

# URBAN MOSAIC

The Gateway  
Of  
HANOI







POLITECNICO  
DI MILANO

School of Architecture Urban Planning Construction  
Engineering

Master of Science in Sustainable Architecture and  
Landscape Design

**URBAN MOSAIC " The Gateway Of Hanoi "**

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Since its inauguration in the early 20th century, Hanoi Railway Station has always played an important role as a major transportation hub of Hanoi through ups and downs, through wars, struggles, as well as reconstruction and development. When Vietnam carried out economic reform in the 80s, the rapid economic growth brought about the rapid change of cities. Poor management that has failed to keep pace with the urbanization and population boom has created the messy cityscape we see today, the infrastructure of the Hanoi Railway Station and the neighboring area have seriously degraded, resulting in the decay of the urban and social environment affecting the lives of its citizens. In an age when rail transport, with a lack of investment for many years, has been suffering fierce competition of more efficient types of transportation such as intercity-buses and aviation, come along with the emergence of new hubs in the inner city, the station is gradually becoming obscured on the city's transportation map. The vision of Hanoi Station Area is proposed as an urban interchange

center of Hanoi City and northern Vietnam, with commercial and economic competitiveness with vital people's livelihoods and harmonized cultural and natural properties. In future, Hanoi Station area will be a main gateway as well as an urban center of a capital city, in terms of transport, commercial and business, culture and amenity. How to adapt it? **How to cure a sick neighborhood and restore its inherent position, and how to manage its urban transition and conflicting developments?**

To address these issues, improvement of environment and preserving natural resources are considered as well as repairing urban fabric, culture and social growth as the significant characteristics of a city. These characteristics as the different pieces of mosaic meet and collide at the point of the project, the main gateway into the city.

THE GATEWAY OF HANOI

# URBAN MOSAIC



Figure 1 Hanoi

## HANOI

Hanoi is the capital of Vietnam. Located in the north of the country on the right bank of the Red River and about 130 km from its mouth in the Tonkin Gulf , it has an estimated population of about seven million inhabitants in 2013 (of which 2.6 in its city center), what makes it the second largest city in Vietnam in terms of population after the city of Ho Chi Minh, located 1 760 km to the south. The urban landscape of Hanoi is characterized by the presence of numerous lakes (such as the central lake of the returned Sword) as well as several religious buildings, mainly Confucian and Taoist (the temple of literature and the Ngoc Son temple) but also Catholics (like the cathedral of St. Joseph ). His old town also has a large number of Buddhist pagodas.

From 1010 until 1802 Hanoi remained the most important political center of Vietnam, to then be eclipsed by Hué, the imperial capital of Vietnam under the Nguyễn dynasty (1802 - 1945 ). Conquered by the French in 1873, between 1883 and 1945 it served as the administrative center of the colony of French Indochina . The French built a modern European city south of the old city, creating wide, tree-lined streets lined with churches, theaters, government buildings and luxurious villas.



From 1940 to 1945 Hanoi, as well as most of French Indochina and Southeast Asia , was occupied by the Japanese Empire . Following the proclamation, on 2 September 1945, of the Democratic Republic of Vietnam ( North Vietnam ) by Ho Chi Minh , the Vietnamese national assembly decided, on 6 January 1946, to make Hanoi the capital of the country. The city was the capital of North Vietnam from 1954 to 1976, eventually becoming the capital of a reunified Vietnam in 1976, after the victory of the North in the Vietnam War. In October 2010, celebrations were held to celebrate the thousand years since its foundation.

Over the entire 20th century, Hanoi has experienced a population explosion and strong economic development, making it an emerging metropolis today. Numerous skyscrapers were built there, including the Keangnam tower (the tallest building in Vietnam until July 2018), while in 2010 construction work began on the metro. University and cultural center, Hanoi counts among other things the main museums of the country, including the national museum of Vietnamese history and the museum of fine arts of Vietnam.





## GEOGRAPHY

Location, topography



Figure 2 Vietnam Location in the world map

Hanoi is located in northern region of Vietnam, situated in the Vietnam's Red River delta, nearly 90 km (56 mi) away from the coastal area. Hanoi contains three basic kinds of terrain, which are the delta area, the midland area and mountainous zone. In general, the terrain is gradually lower from the north to the south and from the west to the east, with the average height ranging from 5 to 20 meters above the sea level. The hills and mountainous zones are located in the northern and western part of the city. The highest peak is at Ba Vi with 1281 m, located west of the city proper.

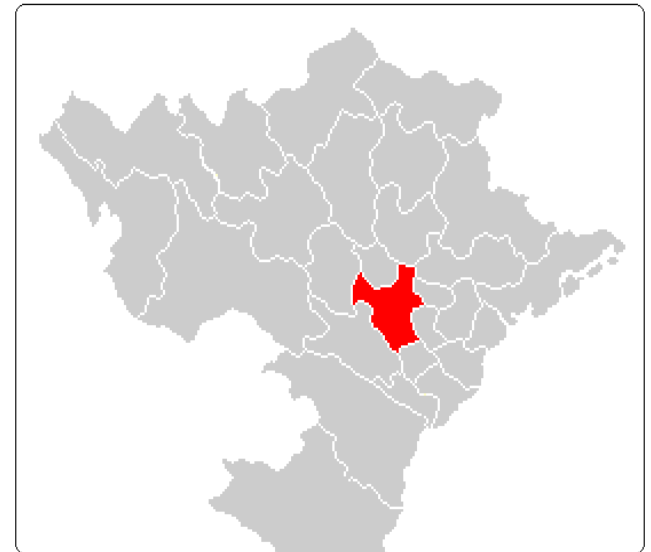
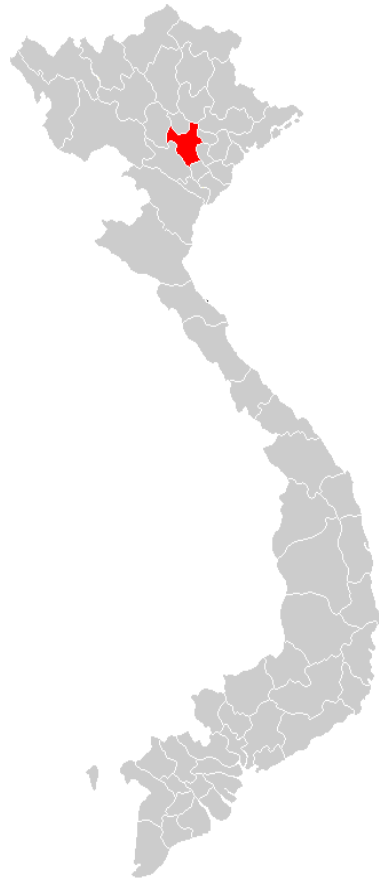


Figure 3 Hanoi location in Vietnam

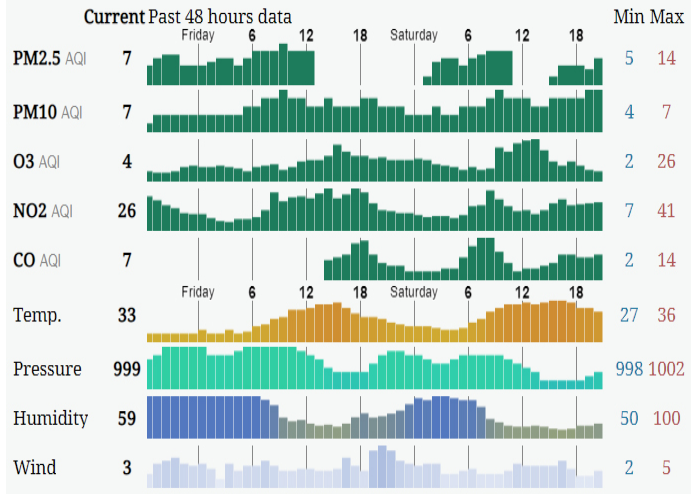
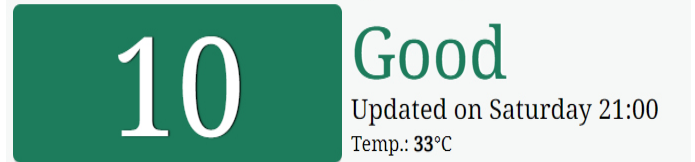
# HANOI CLIMATE

Hanoi features a warm humid subtropical climate with plentiful precipitation. The city experiences the typical climate of northern Vietnam, with four distinct seasons. Summer, from May to August, is characterized by hot and humid weather with abundant rainfall. From September to November comprise the fall season, characterized by a decrease in temperature and precipitation. Winter, from December to January, is dry and cool by national standards. The city is usually cloudy and foggy in winter, averaging only 1.5 hours of sunshine per day in February and March.

Hanoi averages 1,612 millimetres (63.5 in) of rainfall per year, the majority falling from May to October. There are an average of 114 days with rain.

The average annual temperature is 23.6 °C (74 °F), with a mean relative humidity of 79%.[18] The highest recorded temperature was 42.8 °C (109 °F) in May 1926, while the lowest recorded temperature was 2.7 °C (37 °F) in January 1955.

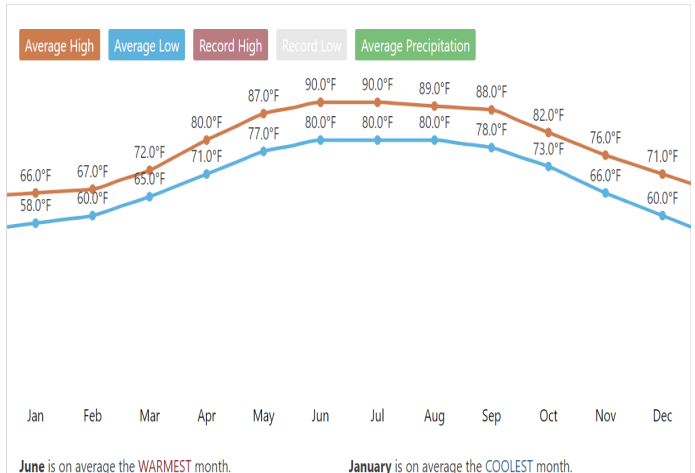
Hanoi AQI: Hanoi Real-time Air Quality Index (AQI).



Air Conditions 07/06/2019

Climate data for Hanoi												[hide]	
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	32.0 (89.6)	34.7 (94.5)	37.2 (99.0)	39.0 (102.2)	42.8 (109.0)	42.5 (108.5)	40.1 (104.2)	38.2 (100.8)	39.0 (102.2)	36.6 (97.9)	34.7 (94.5)	31.5 (88.7)	42.8 (109.0)
Average high °C (°F)	19.7 (67.5)	20.1 (68.2)	22.9 (73.2)	27.2 (81.0)	31.4 (88.5)	32.9 (91.2)	33.1 (91.6)	32.3 (90.1)	31.2 (88.2)	28.8 (83.8)	25.3 (77.5)	22.0 (71.6)	27.2 (81.0)
Daily mean °C (°F)	16.4 (61.5)	17.2 (63.0)	20.0 (68.0)	23.9 (75.0)	27.4 (81.3)	28.9 (84.0)	29.2 (84.6)	28.6 (83.5)	27.5 (81.5)	24.9 (76.8)	21.5 (70.7)	18.2 (64.8)	23.6 (74.5)
Average low °C (°F)	14.3 (57.7)	15.3 (59.5)	18.1 (64.6)	21.7 (71.1)	24.6 (76.3)	26.1 (79.0)	26.3 (79.3)	26.0 (78.8)	24.9 (76.8)	22.3 (72.1)	18.9 (66.0)	15.6 (60.1)	21.2 (70.2)
Record low °C (°F)	2.7 (36.9)	6.0 (42.8)	6.0 (42.8)	11.8 (53.2)	17.2 (63.0)	20.0 (68.0)	21.0 (69.8)	22.2 (72.0)	16.1 (61.0)	14.0 (57.2)	10.0 (50.0)	5.0 (41.0)	2.7 (36.9)
Average rainfall mm (inches)	18 (0.7)	19 (0.7)	34 (1.3)	105 (4.1)	165 (6.5)	266 (10.5)	253 (10.0)	274 (10.8)	243 (9.6)	156 (6.1)	59 (2.3)	20 (0.8)	1,612 (63.4)
Average rainy days	10.3	12.4	16.0	14.4	14.5	14.6	15.6	16.9	13.6	10.9	7.9	5.0	152.1
Average relative humidity (%)	80.9	83.4	87.9	89.4	86.5	82.9	82.2	85.9	87.2	84.2	81.9	81.3	84.5
Mean monthly sunshine hours	74	47	47	90	183	172	195	174	176	167	137	124	1,586

Source #1: Vietnam Institute for Building Science and Technology<sup>[19]</sup>





*Hanoi Satellite image*

## HISTORY

The region around present-day Hanoi was settled in pre-historic times, and the location was often chosen as a political centre by Chinese conquerors. In 1010 Ly Thai To, the first ruler of the Ly dynasty (1009–1225) of Vietnam, chose the site of Hanoi—then called Thang Long (“Rising Dragon”)—for his capital. Thang Long remained the main capital of Vietnam until 1802, when the last Vietnamese dynasty, the Nguyen (1802–1945), transferred the capital south to Hue. The city occasionally was renamed for periods of time, and one of these names, Dong Kinh, given to it during the Later Le dynasty (1428–1787), became corrupted by Europeans to Tonquin. During the French colonial period (1883–1945) the name Tonkin was used to refer to the entire region. In 1831 the city was renamed Ha Noi (“Between Two Rivers”) by the Nguyen dynasty.

Under French rule, Hanoi again became an important administrative centre. In 1902 it was made the capital of French Indochina. This was largely because of Tonkin’s proximity to southern China, where the French sought to expand their influence, and because of Tonkin’s mineral resources. Hanoi remained the administrative centre during

the Japanese occupation (1940–45) of the territory.

In August 1945, following the Japanese surrender, the Viet Minh under the leadership of Ho Chi Minh seized power in Hanoi, and the city was established as the capital of the Democratic Republic of Vietnam. The French, however, reasserted their control over Hanoi from 1946 until their defeat at Dien Bien Phu on May 7, 1954. Shortly thereafter Hanoi became the capital of the Democratic Republic of Vietnam (North Vietnam).

During the Vietnam War, the bombing of Hanoi by the United States in 1965, 1968, and 1972 caused massive damage. Following the collapse of South Vietnam on April 30, 1975, North Vietnam extended its control over all of Vietnam. On July 2, 1976, the Socialist Republic of Vietnam was proclaimed, and Hanoi was established as its capital. The city observed its 1,000th anniversary in early October 2010 by staging a number of events that culminated with a massive parade on October 10.



Figure 4 The Old Quarter



Figure 5 The old Quarter

## THE CONTEMPORARY CITY

Since 1954 Hanoi has been transformed from a primarily commercial city into an industrial and agricultural centre. Manufactures include machine tools, electric generators and motors, plywood, textiles, chemicals, and matches. Rice, fruits and vegetables, cereals, and industrial crops are grown in the surrounding area.

Hanoi is also a communications centre. Roads link Hanoi with other major Vietnamese cities, and railway lines provide access to its port of Haiphong; to Kunming in Yunnan province, China; and to Ho Chi Minh City (Saigon). Small oceangoing vessels can sail to Hanoi on the Red River, and many small rivers are navigable from the capital to most parts of northern Vietnam. Hanoi has two airports.

Many of Hanoi's centuries-old monuments and palaces have been destroyed by foreign aggression and civil war, but there remain several historical and scenic points. Among the latter is Lake Hoan Kiem ("Lake of the Restored Sword"). Historical sites include the Co Loa citadel, dating from the 3rd century BCE; the Temple of Literature (1070), dedicated to Confucius; the Mot Cot ("One-Pillar") Pagoda (1049); and the Temple of the Trung Sisters (1142). In addition, the Central Sector of the Imperial Citadel of Thang Long, built in the 11th century, was designated in 2010 as a UNESCO World Heritage site. The University of Hanoi, the Revolutionary Museum, the Army Museum, and the National Museum are important cultural institutions.

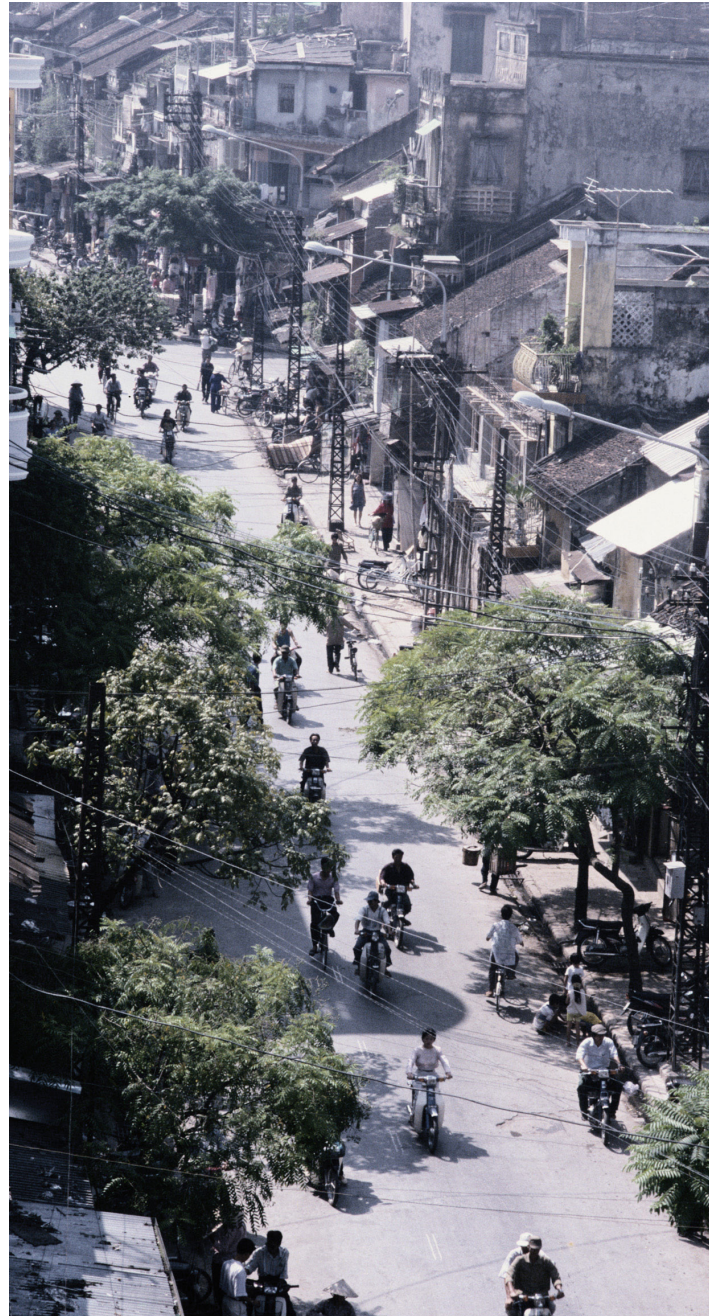


Figure 6 The Old Quarter of Hanoi

Tim Hall/ Getty images

## TERRITORY, POPULATION, AND ECONOMY

*Hanoi is situated in the head of Vietnam's Red River delta.*

*The city-province is bordered by the provinces of Thai Nguyen to the north, Bac Ninh and Hung Yen to the east, Vinh Phuc to the south, and Phu Tho and Hoa Binh to the west.*

*Most of Hanoi's area lies within the low floodplain of the Red River, historically a site of intensive wet rice agriculture. The remaining area is part of Soc Son District (to the north), which is somewhat mountainous and hilly.*

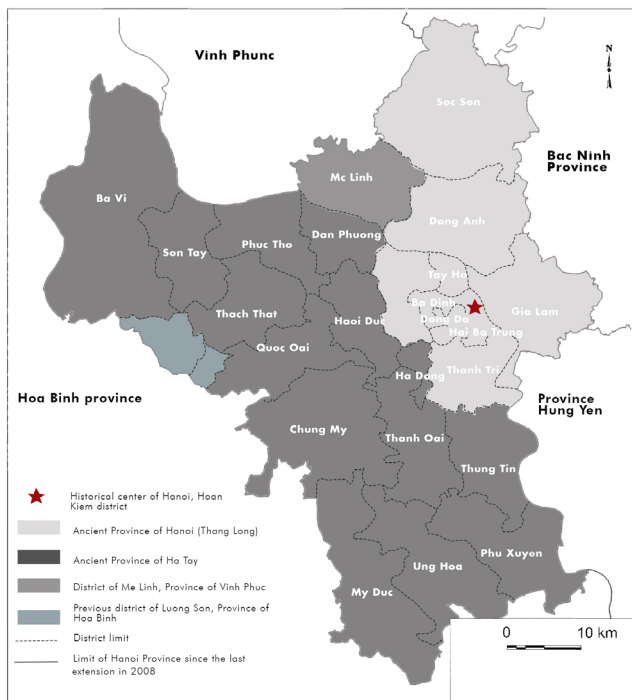


Figure 7 Province map

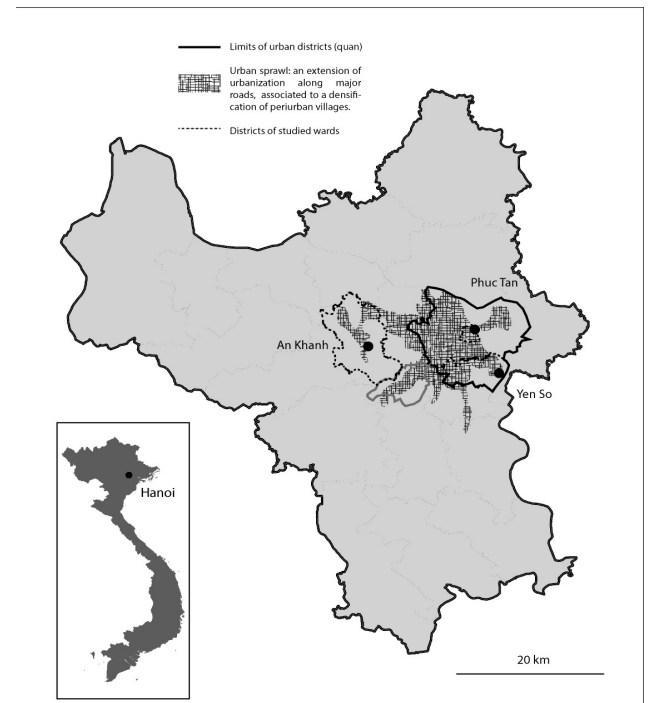


Figure 8 Province map

## Population, And Economy

While Hanoi has been occupied by human populations for more than 2,000 years, the city's origins officially date back to 1010, when the emperor Ly Thai To built a citadel and established the capital of his empire on the right bank of the Red River.

Progressively, a small trade area developed next to the imperial city that is now referred to as the "Old Quarter". Throughout the following eight centuries, the city developed slowly due to state control of trade and a succession of tumultuous wars between competing dynasties. By the time the French settled in the city, in 1874, Hanoi was a relatively small agglomeration of less than 100,000 people. Socio-spatially, it consisted of a combination of three distinct spaces: a citadel, a merchant quarter, and an agglomeration of rural villages surrounded by a dike.

Hanoi was the capital of French Indochina from 1902 to 1953, during which time it remained a modest city both in size and population, never exceeding 400,000 inhabitants. Yet French planners greatly transformed the appearance and functioning of the city. Up to the end of the 19th century, colonial authorities expanded the city area toward the south and west. There, they developed a new area with broad avenues which, organized in a grid system and flanked by spacious villas and gardens, is now referred to as the "Colonial Quarter." The French also developed major infrastructures and facilities, including the Long Bien Bridge, **a railway and train station**, a post office, and an opera house.

In 1946, the Democratic Republic of Vietnam (DRV) took power and declared Hanoi its capital. The newly independent nation went through the First Indochina War (1945-1954), followed by the Vietnam War (1962-1975). During the Vietnam War, the bombing of Hanoi by the United States in 1965,

1968, and 1972 caused massive damage. Following the collapse of South Vietnam on April 30, 1975, North Vietnam extended its control over all of Vietnam. The city observed its 1,000th anniversary in early October 2010 by staging a number of events that culminated with a massive parade on October 10.

Among the major changes was the large territorial expansion of the province in 1978 to encompass over 3,000 km<sup>2</sup>. The boundaries of the province were then redrawn in 1991 around a smaller territory of 900 km<sup>2</sup>. Thereafter, most of the administrative territorial changes consisted of attributing an urban status to parts of rural districts peripheral to the city.

In 2008, the administrative boundaries of Hanoi were once again extended to include the neighboring province of Ha Tay as well as a handful of districts and communes that formerly belonged to the provinces of Vinh Phuc and Hoa Binh. Upon completion of this project, the territory of the capital reached 3,300 km<sup>2</sup> (3.6 times the size of the previous area). This expansion also implied a doubling of the official population of the capital city, namely, from 3.2 to 6.4 million inhabitants. The so-called "New Hanoi" is expected to become a centre of politics, education, science, economics, and international exchanges.

The exact intentions for the future of the New Hanoi was revealed with the release of the Master Plan for 2030 and Vision for 2050. These two documents have been in preparation since 2009 by a consortium of three planning and architectural firms from South Korea (JICA and Posco) and the United States (Perkins Eastman) working in collaboration with the Vietnam Institute of Architecture and Planning (VIAP).

## Economy



Hanoi is only home to 7% of Vietnam's population, it contributes 12.5% of the national GDP.

Hanoi's economy is growing steadily. The city's GDP expanded three-fold between 2000 and 2008.

The current intentions of the national and municipal authorities are geared to develop a knowledge-based urban economy. This is manifest in the decision to build a large high technology satellite city 30 kilometers west of the city. Upon completion, the so-called "Lang Hoa-Lac Hi-tech City" will accommodate major universities and high-quality industrial production and human resources. The creation of this "high-tech city" is part of a larger regional development approach that fosters the creation of a multi-polar urban region consisting of autonomous satellite cities dispersed around the existing agglomeration.

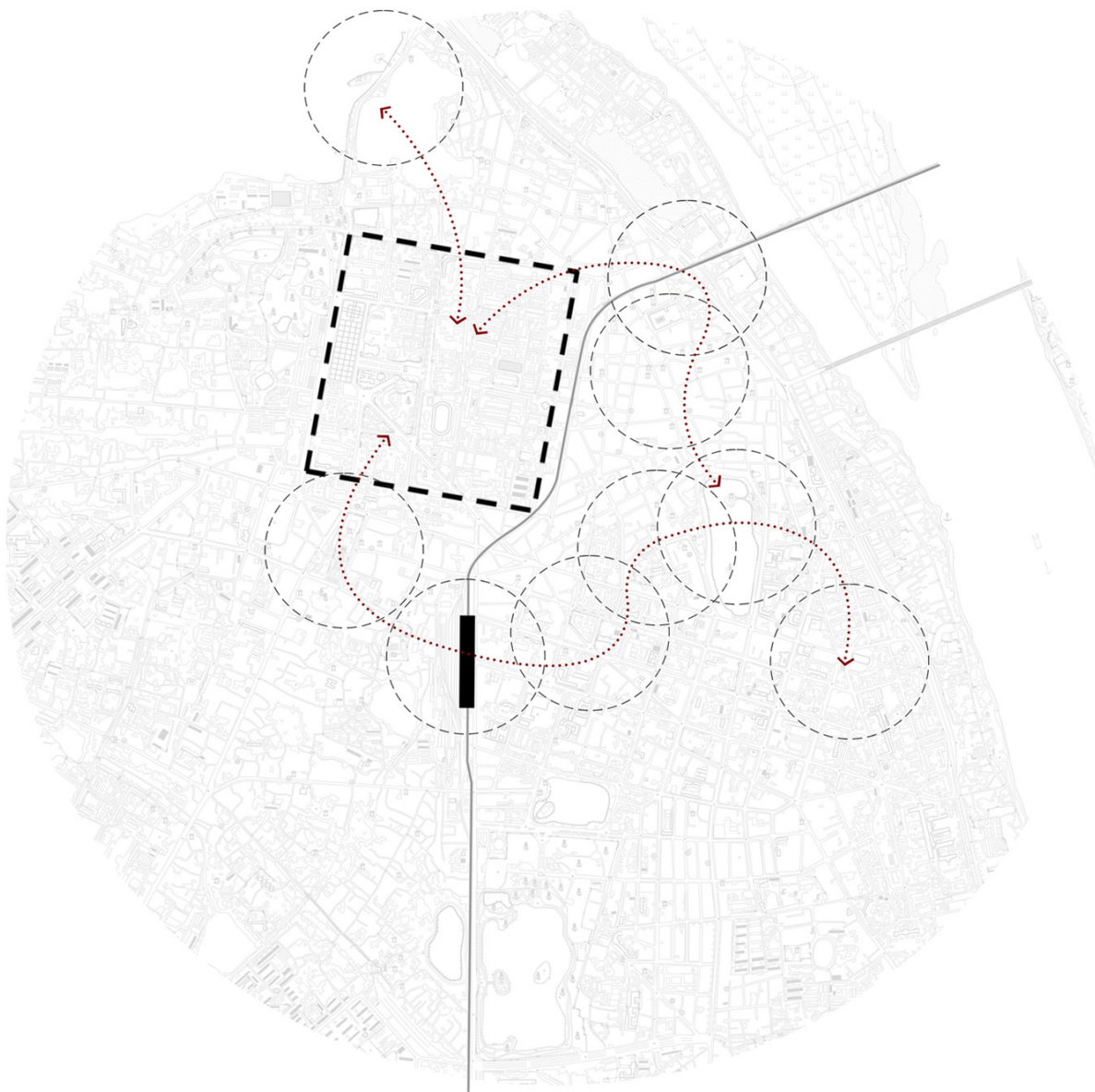


# City Zones

- Green/recreation
- Cultural/heritage
- Political/administrative
- Commercial/business
- Transportation hub



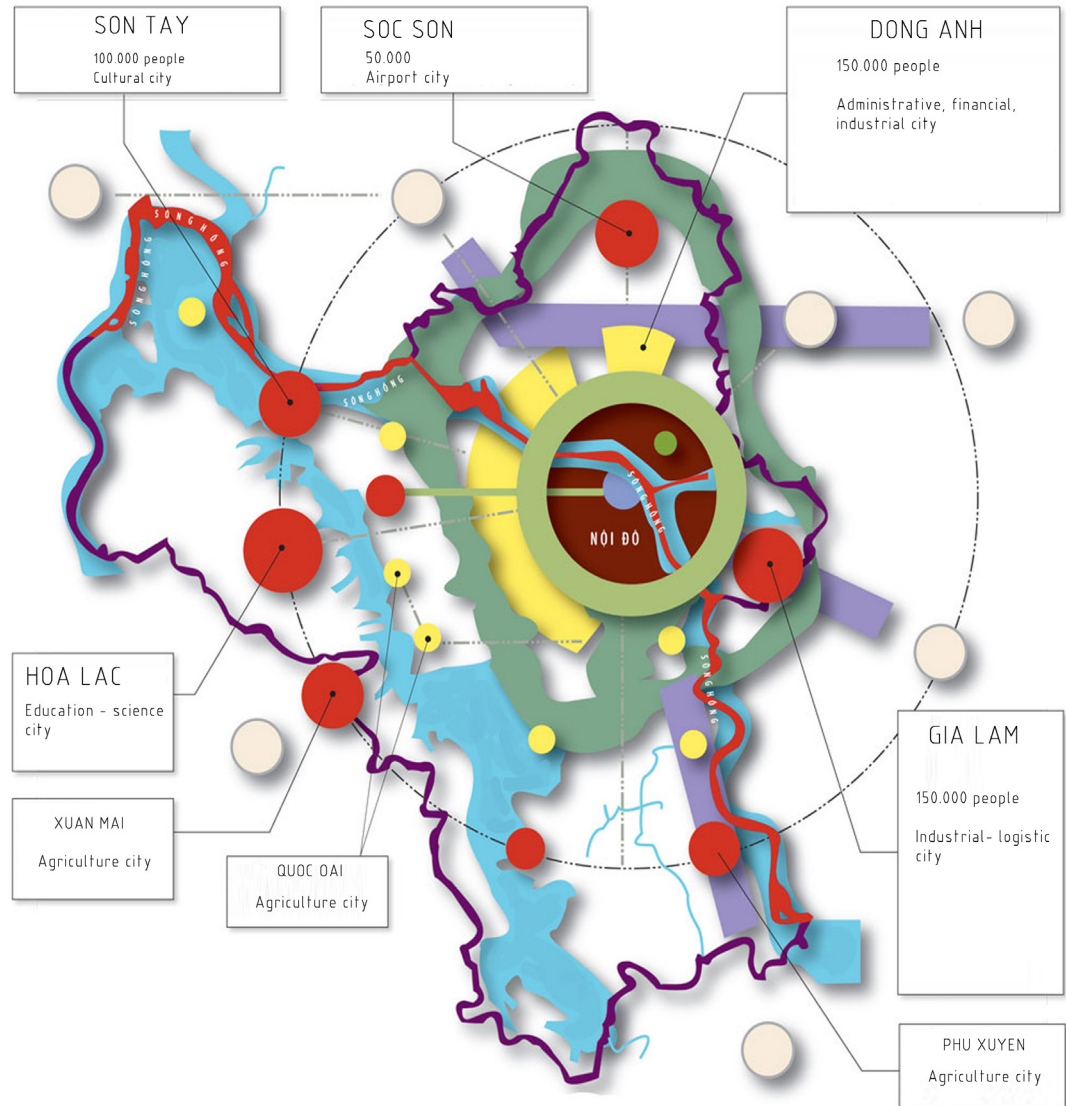
## Cultural Zones



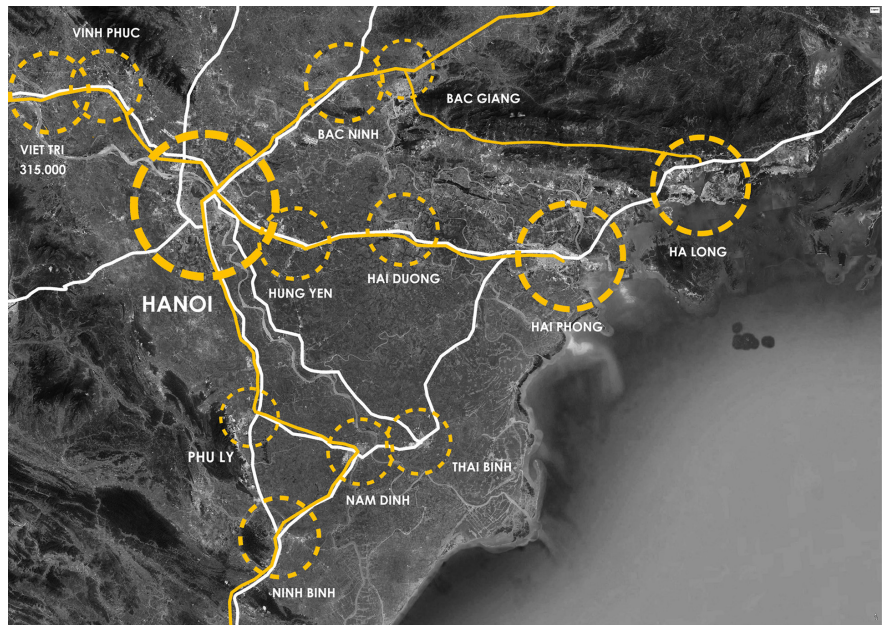
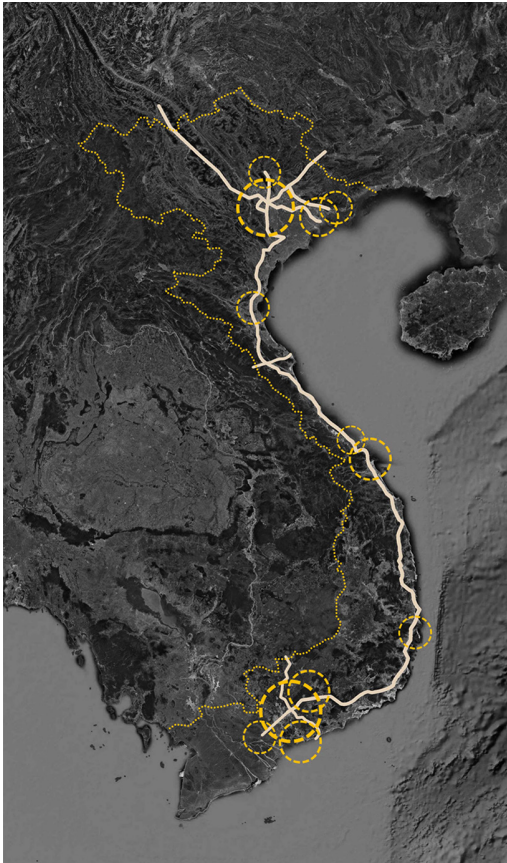
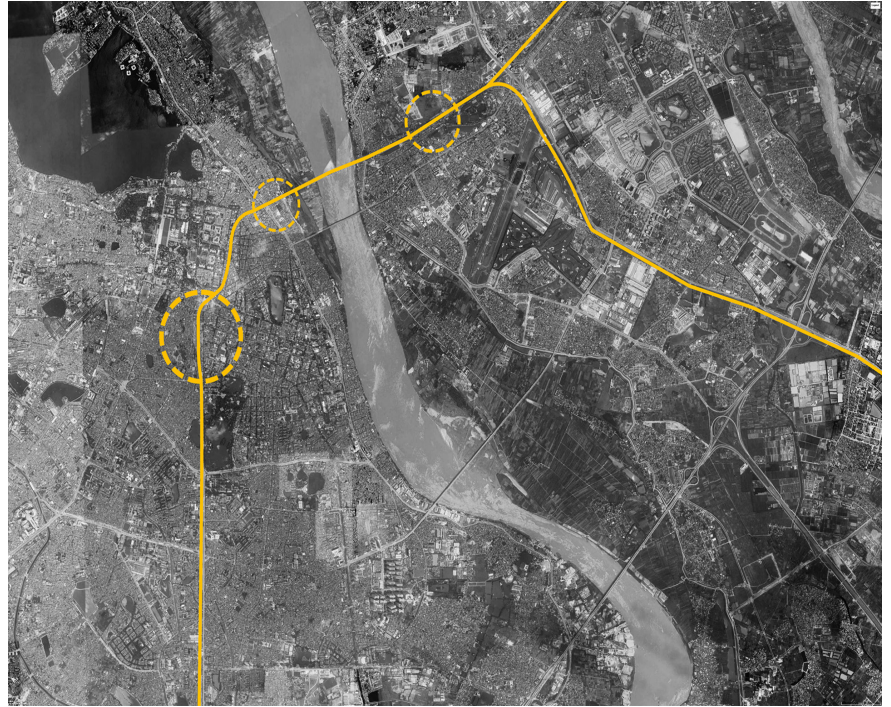
## Economic and Cultural Linkages

A decade is not long compared to the history of the development of the capital city and the country, but this is a particularly important period to create new strength and power for Thang Long - Hanoi and the country to move forward in the cause of promoting industrialisation, modernisation and international integration. The expanded land has created favourable conditions for socio-economic and urban development in Hanoi.

It was the largest expansion ever of Hanoi in terms of area, administrative scale and population with a total area of 3,344.7 sq. km, 3.6 times larger than the old boundary, 29 administrative units and a population of more than six million people. Currently, Hanoi has 30 districts and towns with a population of approximately 7.7 million.



The expanded land has created favourable conditions for socio-economic and urban development. Abundant human resources have increased the attractiveness of the capital city. The confluence of rich traditional cultural values has created greater motivation to promote the development of Hanoi in a sustainable manner. Besides the advantages, the city is also facing new tasks and challenges which put higher demands on the state's management capacity for a new large urban area with bigger population.



## HANOI ARCHITECTURE

Hanoi's Colonial Architecture

**Hanoi is long known for its famous colonial architecture.**

Although the French colonial period came to an end a long time ago, much of the French arts and deco style are still imprinted in the architecture of Hanoi. One hundred years under colonization of French, Vietnam did not lose its traditional color, but it also absorbs new perspectives from a modern France. Along the history of Hanoi city, it is not overstated to claim that ancient French architecture has contributed significantly in creating a unique, magnetic and charming Hanoi with its elegance and nobility.

It is complicated to tell exactly the time French colonial construction format penetrated into Hanoi, but most archaeologists and architectural researchers consent that the first appearance of French architecture in Hanoi was more than 200 years ago, when King Gia Long initiated a project to reconstruct Hanoi under Vauban architectural style with the monitor of French architects.

However, it was not until 1875 when the Concession Area was generated, the construction with ancient French style has been built in larger number and larger area in Hanoi with various designs that were Western-like for most public constructions. Art Deco Style, which is designed with simple shapes, Neo-Gothic Style for churches and Rural style for villas with memory of French of their homeland. The combination of French format with other architectural culture of Vietnam and China was also encouraged.

At that time, French colonial architecture played a crucial role in transforming Hanoi from an obsolescent city with old Eastern constructions to a fresh modern and allured city with Western features. Nevertheless, the transformation did not totally eliminate all elements of Vietnamese architectural culture, but merged them with appropriate characteristics of French construction to invent new style of architecture name Dong Duong (Indochina) style which is distinctive, harmonious and charming. It is said that among those colonial areas of French Empire all over the world, Hanoi in particular and Vietnam in general possess the most wonderful ancient French constructions.

There is a considerable number of classical French constructions that are conserved at present in Hanoi and fortunately most of them have retained the original appearances with initial patterns and materials. They have all become either culture symbols of Hanoi or used by Vietnamese authorities as office of numerous important departments such as Ministry of Foreign Affair, State Banks of Vietnam, The Palace of Presidents. Some others are still admired in the daily life of Hanoians as places to be resident and historical evidence of French cultural appearance in this allured city and tranquil elements of memorial Hanoi inside a modern, uproarious and active Hanoi today.

## Urban And Architectural Heritage Protection

Many of Hanoi's centuries-old monuments and palaces have been destroyed by foreign aggression and civil war, but there remain several historical and scenic points.

The protection of architectural heritage in central Hanoi has a long history. The roots of this movement can be traced back to the beginning of the 20th century when the French started to identify and catalogue remarkable monuments on the Indochinese peninsula. While concerns for the built heritage faded during wartimes and throughout the subsidy era, it revived again in the early 1990s. Following the reopening of Vietnam's borders to foreign visitors, Hanoi revealed to the rest of the world one of the best-preserved cities of Southeast Asia.

The city's architectural and urban heritage combines exceptional monuments and compounds such as pagodas, temples, the citadel, and government buildings scattered through the urban fabric. Hanoi also displays exceptional urban ensembles. The core of the city consists of a traditional merchant quarter dating back to feudal times. This area is characterized by an organic network of narrow streets lined with traditional shop-houses

South of the **Old Quarter** is the **Colonial Quarter**, an area planned under the French that functioned as the administrative and commercial centre of Indochina. As mentioned, this area is characterized by a regular street grid of broad avenues, lined with trees and flanked by luxurious villas. Hanoi's urban fabric further includes a myriad of erstwhile rural villages now engulfed into the urban fabric. The city is also characterized by a unique natural environment with numerous rivers and lakes, treelined streets, and parks.

**Thang Long Imperial Citadel** The citadel is a highly significant place in Vietnam's national history. The complex

covers approximately 50 hectares. It corresponds to the areas of the Forbidden City and Imperial Citadel which were first built during pre-colonial times. While most of the original buildings were destroyed during wars, many relics remain underground that have been unearthed by archaeologists, including many architectural vestiges and art facts from the period during which Vietnam was under Chinese domination and from more recent dynasties. All over the site, cultural layers appear and are testimonies of continual cultural and physical changes during a period of over 13 centuries.

This built and natural heritage experienced considerable transformations over time, either due to war destruction, poor maintenance during less affluent periods, transformations by users due to changes in needs and tastes, and demolition to make way for larger and more profitable buildings. According to many experts, Hanoi's built heritage is at risk of disappearing if nothing is done to curb degradation, inappropriate renovations, and rapid demolitions.



Figure 9 Colonial Quarter

## Public Space Upgrade And Provision

Hanoi is recognized as one of the most overcrowded cities in the world. In 2008, human densities in the urban districts reached an average of 272 persons per hectare and up to 404 persons per hectare in the historic core (compared to 370 persons per hectare in Hong Kong, 86 in Paris, and 62 in London) (ABD 2006). Such human densities put enormous pressure on the city to provide common spaces for people to engage in social interactions, exercise, get away from the traffic and pollution, and enjoy environments other than the exceptionally cramped quarters of their homes. However, Hanoi can hardly meet the demand of its citizens for public space.

Recreational areas, in particular, are insufficient to serve the urban population. Urban parks account for only 0.3% of the city's territory and represent less than 1m<sup>2</sup> per person. Existing parks are unevenly distributed across the city. They concentrate in the urban core with approximately 1.5 m<sup>2</sup> of park space per capita in the four central districts, while the urban peripheral districts offer only 0.05 m<sup>2</sup> of park space per capita.

The parks in Hanoi lack accessibility, in particular for young people and the elderly. About half of Hanoi's residents do not have a park within walking distance or with easy access from their house (HAIDEP 2005). Moreover, existing public spaces, even large ones such as Reunification Park, often offer few recreational options to users. Instead, urban public spaces in Hanoi are generally designed with an emphasis on ornamental flowerbeds and geometrically patterned alleyways. Such areas can hardly meet the population's growing demand for spaces that foster socializing and participation in recreational activities. The lack of formally designated and easily accessible urban public parks is informally compensated by the extensive use of the sidewalk and street spaces in the inner city. The sidewalks of Hanoi are the site of an eclectic array of activities spanning domestic, social, recreational, and commercial uses. Such practices often result in conflicts between public uses and the private appropriation of public space.



Figure 10 Yen So Park



Figure 11 Thong Nhat Park

## Urban Transportation: From Private Motorbikes To Rapid Mass Transit

Urbanization in Hanoi is accompanied by rapid motorization, much of which due to recent wealth accumulation during the liberalization of the private economic sector. The resulting urban traffic is nearly unparalleled by that of other cities in the world. The Vietnamese capital is indeed characterized by the lowest use of public transportation and the highest proportion of private transportation of all Asian capitals.

The rapid motorization of Hanoi is characterized by a pre-dominance of motorcycles.

Since its first introduction to Vietnam during the subsidy era, this small four-stroke, two-wheel vehicle has become a symbol of high personal mobility, an asset value, and one of the most convenient means of transportation in a city the urban fabric of which is dominated by narrow alleys. Motorbike ownership in Hanoi is reaching high rates compared to income levels, and this despite high import-taxes (70% to 100%) and registration fees. Four households out of five in Hanoi own a motorbike and two out of five own at least two.

The rise of motorbike ownership has turned a city where, in 1990, over 80% of trips were made by bicycles to one where, in 2005, nearly 65% of the 6.3 million dailies journeys were made on motorbikes (ABD 2006).

The constant increase in motorcycle ownership is now also becoming paralleled by a growing number of cars. In 2005, only 2% of households in Hanoi owned cars, representing less than 4% of the city's modal share. But between 2004 and 2007, new vehicle registrations in Hanoi increased at a two-digit rate, reaching 20% over the last two years. In the meantime, the number of non-motorized vehicles—especially bicycles—on the streets of Hanoi is plummeting.

The already overloaded and weak traffic infrastructure of Hanoi is bearing increasing pressure. The road network represents less than 7% of the land area (compared to about 15% in most European cities and 11% in China's large cities). An expansion of the road system is restricted by the severely high cost of resettlement, which constitutes over 80% of a given project budget. Over the last decade, travel speed and travel time in downtown Hanoi have worsened not only due to traffic congestion but also to longer travel distances. The latter is fostered by a master plan prescribing the decentralization of spatial structures, which further exacerbates the need for transportation linkages between the city center and the suburbs changes in the mix of traffic, slow progress in roads development, undisciplined driving styles, and lax enforcement of traffic laws increasingly worsen the traffic in the city. The ever-growing traffic congestion has many negative effects: exclusion of vulnerable populations (children, the elderly or disabled, poor populations without vehicles, etc.), rise in transport costs, urban productivity declines, as well as increasing greenhouse gas emissions, air pollution, noise, and accidents.



Public transportation once played a significant role in the capital's urban transportation system, namely, in the early 1980s, when the modal share of buses accounted for 25 to 30%. However, the number of routes and the frequency of the service then decreased in the 1990s, when subsidies for state-owned enterprises began to get curtailed (JBIC 1999: III). Public transportation nearly collapsed entirely in the late 1980s when ridership dropped from about 40 million per year to almost nothing. For more than ten years, Hanoi thus seemed to be establishing itself as a non-public transit city. To counter this direction, the national government recently launched a new policy that places public transportation as a priority over other urban concerns. Among its ambitious targets for Hanoi is the stipulation that 50 to 60% of trips in 2020 must be carried by public transportation.

In 2002, the city of Hanoi, for its part, launched a policy aimed at reviving the nearly extinct bus system. New bus

routes were established, the vehicle fleet was expanded, and bus shelters and passenger information schemes were introduced. The resurgence of the public bus system since 2002 succeeded beyond expectations.

In light of the fact that the above-mentioned traffic congestion limits the attractiveness and impacts of a public bus system, new rapid mass transit (RMT) projects operating outside the regular road network are currently on the drawing boards. Two rail-based projects are also in the making: a 12.5-kilometer east-west light rail transit line partly financed by France and a new metro line linking downtown Hanoi to its international airport (15 kilometers to the north), financed by the Japan Bank for International Cooperation (JBIC). These two projects were originally expected to be completed by 2020-2025.



## Housing Provision

Urban housing is a perennial problem in Hanoi. The issue can be traced back to the subsidy era when the urban housing sector was allocated a meagre part of state resources. This was compounded by a subsequent 30 years of war time economy and the destruction of buildings by bombing (1945-1975). By the late 1980s, the acute lack of housing space manifested in population densities reaching 30,000 persons/km<sup>2</sup> in the inner city

The adoption of the Doi Moi policies greatly influenced housing production in Hanoi.

## Peri-Urban Integration

For four decades Hanoi remained confined within limited space. Under the influence of a planned economy, lack of foreign investment, and moderate population growth, the city was restricted to its four central administrative districts (1950-1990). The city's built fabric only started to overflow into suburban districts in the early 1990s. And, at the turn of the century, urban expansion really began to accelerate with the relaxation of state control over rural-to-urban land-use conversions. Since then, thousands of hectares of agricultural land and hundreds of erstwhile rural communities have been engulfed into the city's physical and functional space (see Fig. 7.1). The scope and speed of these changes pose an enormous challenge for local populations who face intensive sociospatial transformations as well as for planning authorities who are struggling to cope with new demands for urban infrastructures, services, land uses, and environmental controls.

Major changes included the withdrawal of public housing subsidies and the encouragement of an emerging private housing development sector along with traditional self-help housing production. In the 1990s, the progressive removal of state control over the housing and construction market conflated with newly formed private capital to foster a construction boom mainly driven by informal self-help housing practices.

Between the 1990s and the early 2000s, the urban expansion of the city into its rural hinterland took place mostly informally. The process was largely driven by in-situ urbanization of pre-existing settlements at the rural-urban interface of the city. Preurban populations and territories were predisposed to such change. For hundreds of years, the livelihood of people living outside of the city was based on rice cultivation and market gardening with crafts and semi-industrial activities such as basket weaving, metallurgy, textiles, and food processing. This combination of activities required a large workforce and fostered very high population densities: 1,200 inhabitants/km<sup>2</sup> on average, up to as much as 15,000 inhabitants per km<sup>2</sup> in residential areas.

**How to cure a sick neighborhood, to manage its urban transition and conflicting developments?**



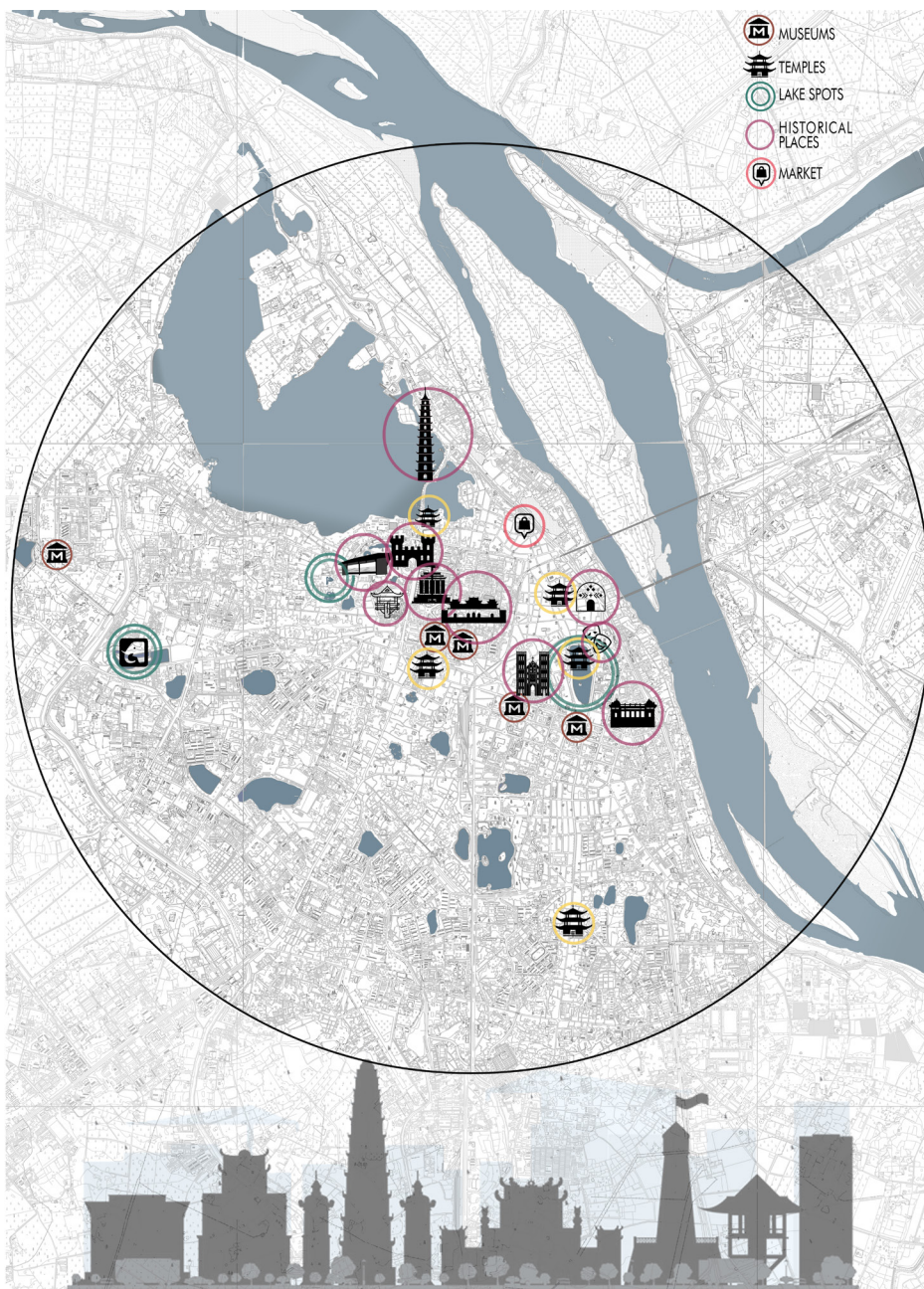
Figure 10 Tube houses top view



Figure 11 tube houses

## LANDMARKS

Hanoi is loaded with landmarks and monuments - more so than any other Vietnam city. There are temples galore here, including the stunning Ngoc Son Temple and the Temple of Literature, plus a decent selection of parks and gardens. It's hard to imagine Hanoi, and Vietnam in general, without its famous architectural landmarks. You will never be stuck for something to do in Hanoi, where ancient and proudly preserved Vietnamese culture is felt most keenly by visitors, and progress wrestles with tradition in different districts of the city. Hanoi is over 1000 years old so the wealth of history here is mind boggling: Hanoi Cathedral, Ho Chi Minh Mausoleum, Ho Chi Minh Museum, and Flag Tower of Hanoi have shaped the historical and architectural look of Hanoi.





**The Imperial Citadel of Thang Long** is an intriguing relic of Vietnam's history and, signifying its historical and cultural importance, is now a UNESCO World Heritage Site. Standing 40 metres high, the central flag tower is the most recognizable feature of the Imperial Citadel and is often used as a symbol of Hanoi.



The final resting place of Vietnamese communist leader **Ho Chi Minh** sits in Ba Dinh square, the location where he read the nation's declaration of independence in 1945. This tall, blocky pillared building is modeled after Lenin's crypt in Moscow and meant to evoke a traditional communal house, though to many tourists it looks like a concrete cubicle with columns. Contrary to his desire for a simple cremation, the embalmed body is on display in plexiglass casing, and a dress code of long sleeves and pants is required to visit.



**The Temple of Literature** is often cited as one of Hanoi's most picturesque tourist attractions. Originally built as a university in 1070 dedicated to Confucius, scholars and sages, the building is extremely well preserved and is a superb example of traditional-style Vietnamese architecture. This ancient site offers a lake of literature, the Well of Heavenly Clarity, turtle steles, pavilions, courtyards and passageways that were once used by royalty.



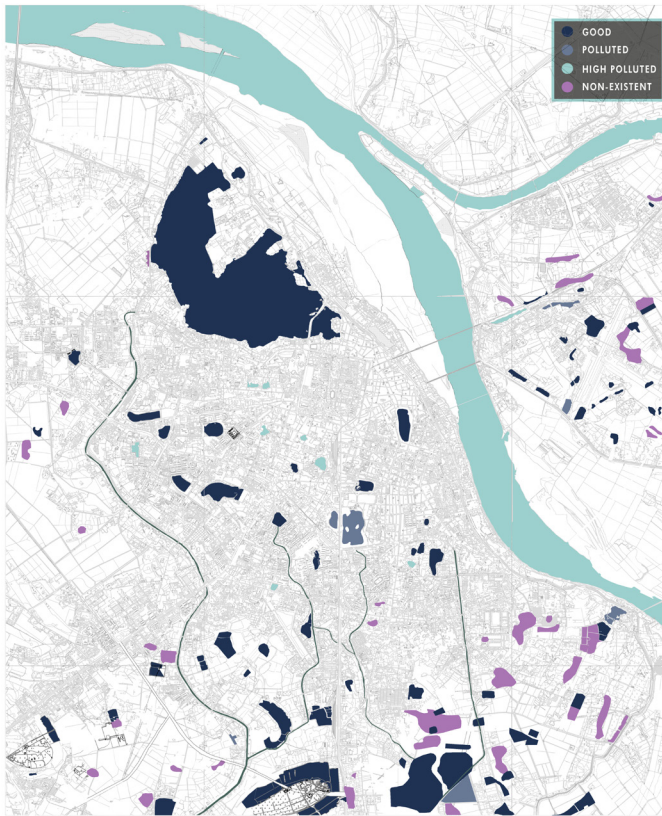
**The one pillar pagoda** eleventh century temple was built by the emperor in gratitude for finally being blessed by a son. The temple was meant to look like a lotus flower blossoming from a single pillar in the pond, similar to the one seen in the prophetic dream of a child that this emperor had received. Inside, there is a small shrine to the Bodhisattva of Mercy. The current structure is a rebuild, as the French had the first destroyed after their retreat from the country.



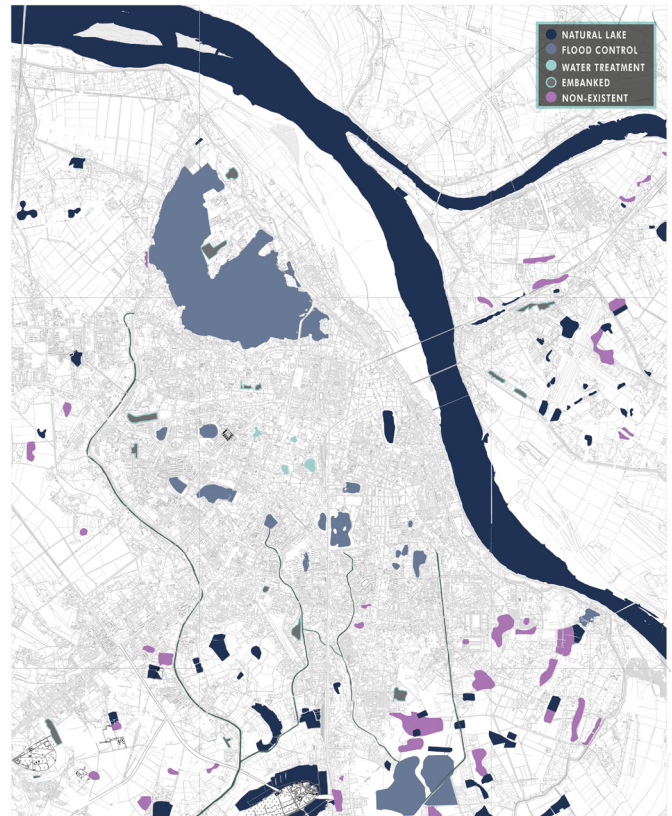
**Hoan Kiem Lake** Known as the lake of the returned (or restored) sword, this lake marks the historical center of ancient Hanoi. The name comes from a legend in which Emperor Le Loi was given a magical sword by the gods, which he used to drive out the invading Chinese.

# WATER

Lakes and rivers in Hanoi play an important role in local human life. However, along with the economic and social development, some urban lakes have been polluted



Lakes' Quality



Lakes' Uses



## Water During the Time

Federal Era  
(1009-1881)



French colonial  
Era (1882-1954)



Soviet Era  
(1955-1985)



Post Doi Mai Era  
1986-Present



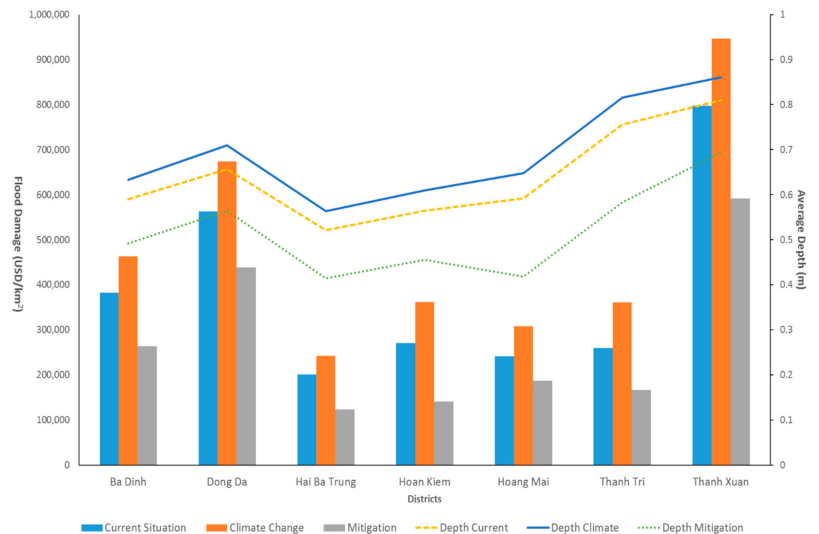
According to statistics, Hanoi leads the country in the number of rivers and lakes, with 122 lakes in the inner city, 185 lakes on the outskirts and 13 rivers flowing through its territory.

These lakes play an important role for local human lives: harmonize climate, regulate stormwater/rainfall, provide place for human entertainment, the lakes are also the landmark of the capital city, being associated with the spiritual and cultural life of Hanoians, and a key tourist attraction. Unfortunately are also considered as a container for domestic wastewater for Hanoi.

Previous studies indicated that the water of most lakes in Hanoi is polluted and of which, some lakes (Hoan Kiem, Giang Vo, Thanh Cong, Ngoc Khanh etc.) were seriously polluted, e.g. very high values of BOD, COD were found. As other big cities in developing countries,

Hanoi faces problem of managing the domestic and industrial wastewater. The untreated or partially treated domestic and industrial wastewater which was discharged directly or indirectly to the lakes through the channels in the city has caused lake pollution. Recently, some positive solutions for lake protection such as lake embankment, preventing untreated wastewater to the lake have been taken.

Along with the expansion of administrative boundaries, the fast speed of urbanization has put pressure on the river and lake systems in Hanoi, prompting the city's authorities to revive its rivers and lakes to ensure environmental harmony.





## GREEN LANDS

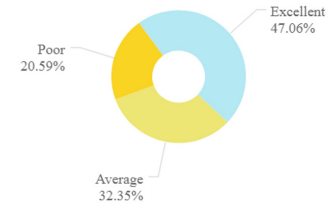


Under the policies of market orientation economy and rapid urbanization process in last ten years, the development of Hanoi Capital City has been growing rapidly. Hanoi has become more attractive for investors, contractors, urban developer, and many flows of rural migration year by year. Therefore construction process and city sprawl of Hanoi has also been increasing time by time. This impacts much on urban landscape and environment as well as community benefits. Especially, urban open space and green areas are decreasing time by time. It can say that Hanoi is facing further threatens on Urban environment and landscape due to urban development process.

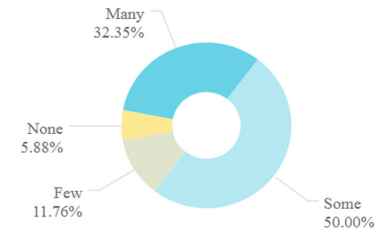
There has recently been a growing awareness about the roles and benefits of greening in urbanized areas. As a result, planners and decision-makers propose a combination of water bodies and green areas, using cultural as well as historic values, in a strategic concept for city planning in Hanoi. This study aims at quantifying the landscape patterns and ecological processes or clearly linking pattern to process to identify green space changes and their driving forces, based on gradient analysis combined with landscape metrics, GIS support, and FRAGSTATS 3.3, from 1996 to 2003. The results of gradient analysis taken four directions show that green spaces have been become more fragmented in this period, especially in the south and west directions. These changes could be caused by land use change, economic growth, population increase, urbanization, and weakness in planning and managing the urban development. From this context, graph theory was also applied to find any eco-networking, by mitigating the fragmentation and enhancing the green space connectivity, as a biodiversity conservation strategy for the city.



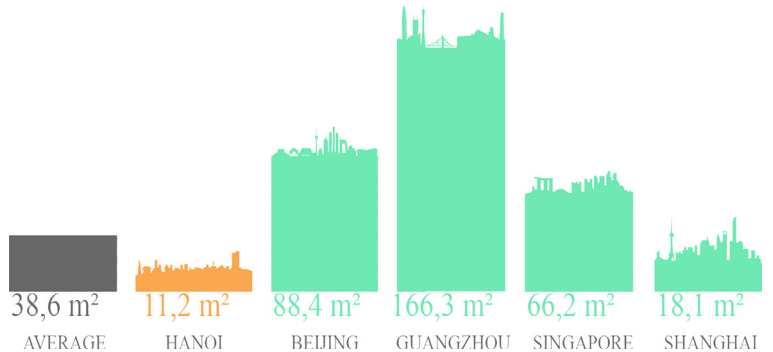
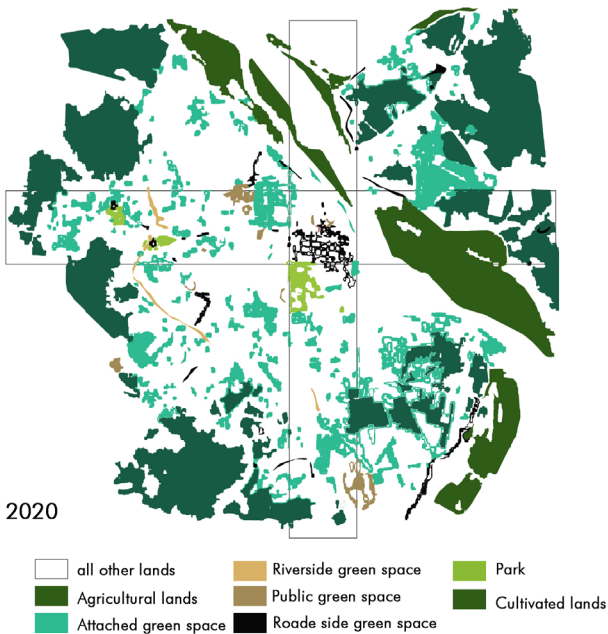
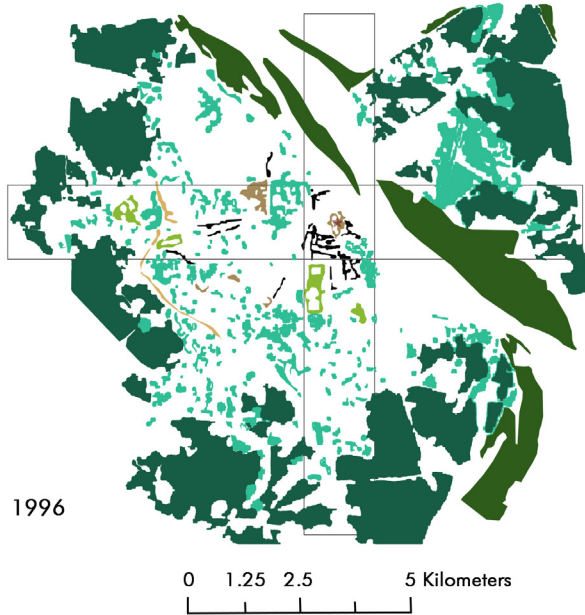
PROVISION OF FACILITIES IN HANOI'S PARKS AND PUBLIC GARDENS (N=34)



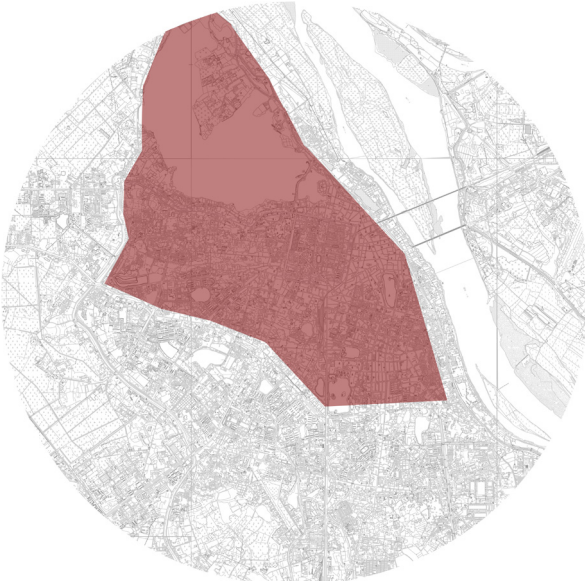
OPPORTUNITIES FOR PASSIVE ENGAGEMENT (N=34)



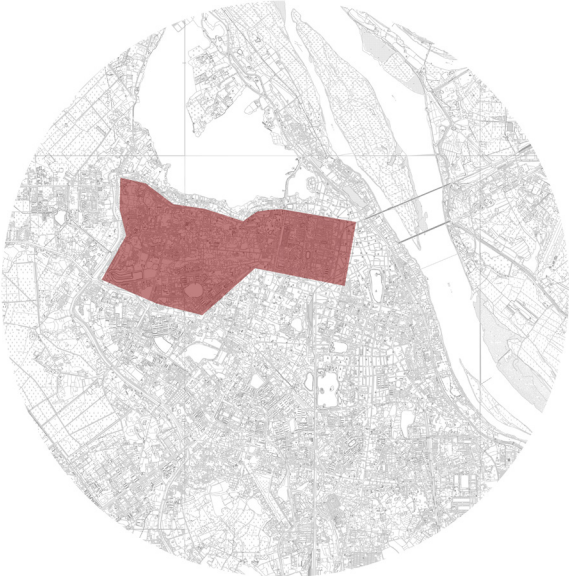
Enlarging urbanization process has impacted strongly in the quality of environment, socio-economic condition of the city. Especially open space and green areas are decreasing time by time. It decreasing urban identity value as well as community benefits.



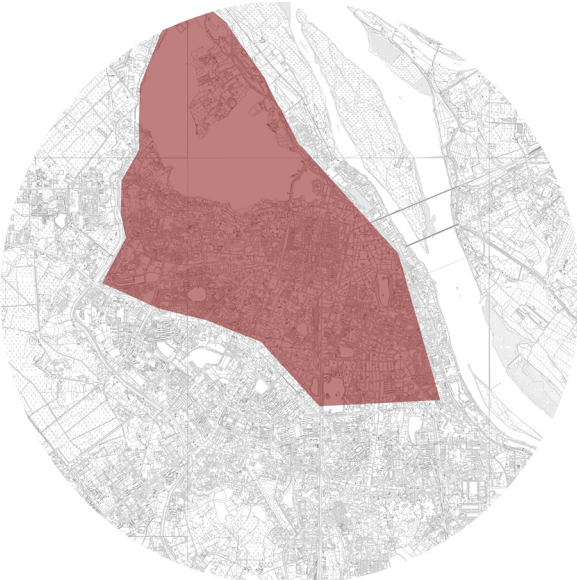
**CITY DEVELOPMENT**



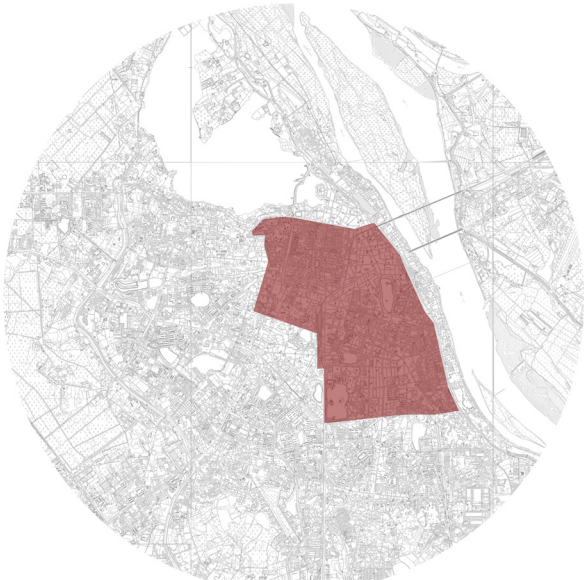
**Before 10th Century**



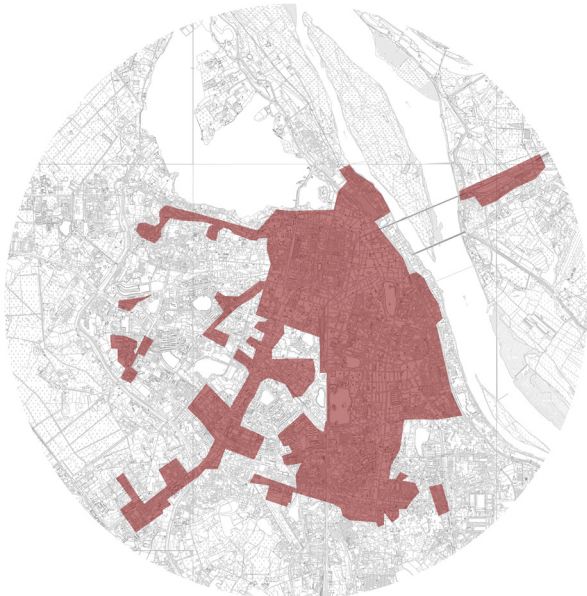
**12th Century**



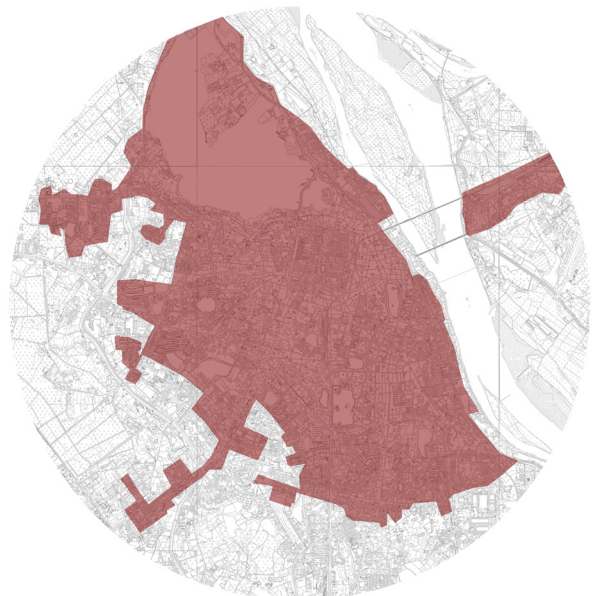
**16th Century**



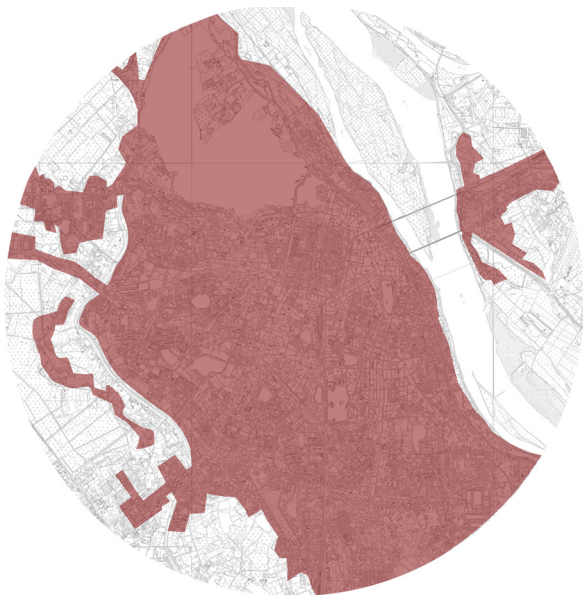
**1930s**



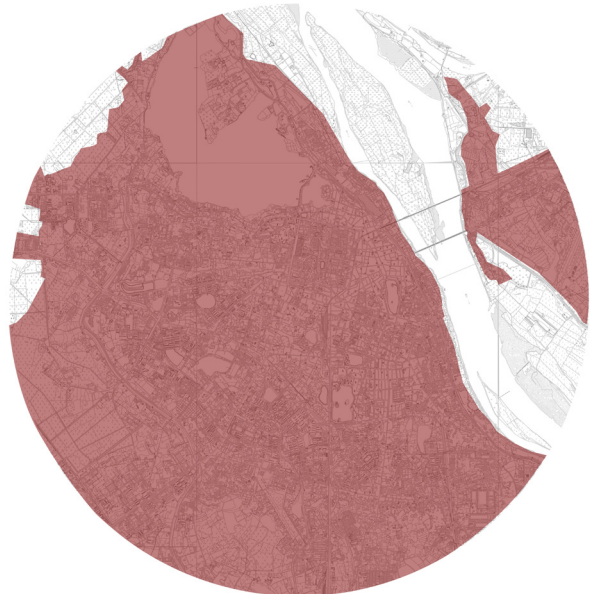
1960s



1980s

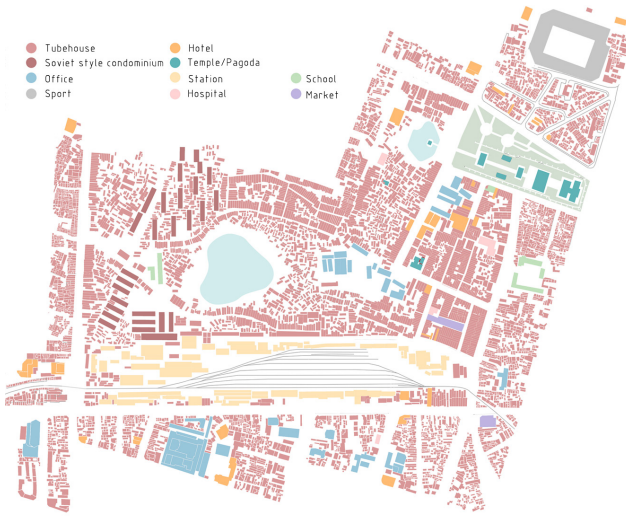


2000s

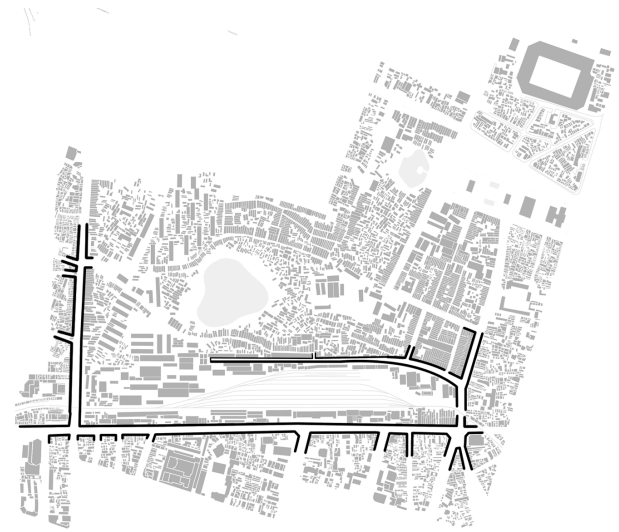


NOW

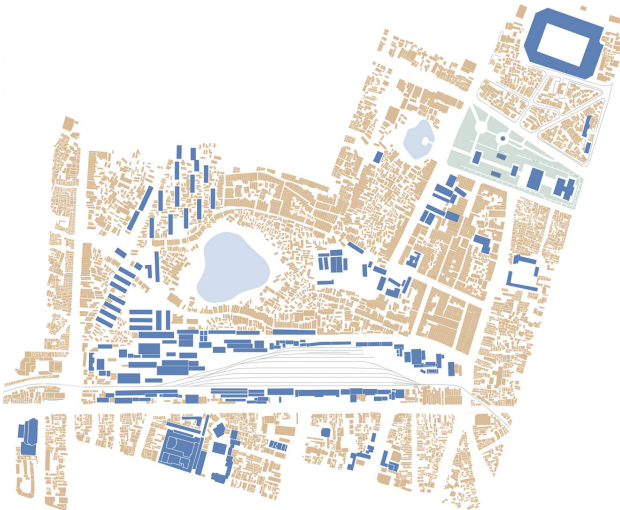
## URBAN FABRIC



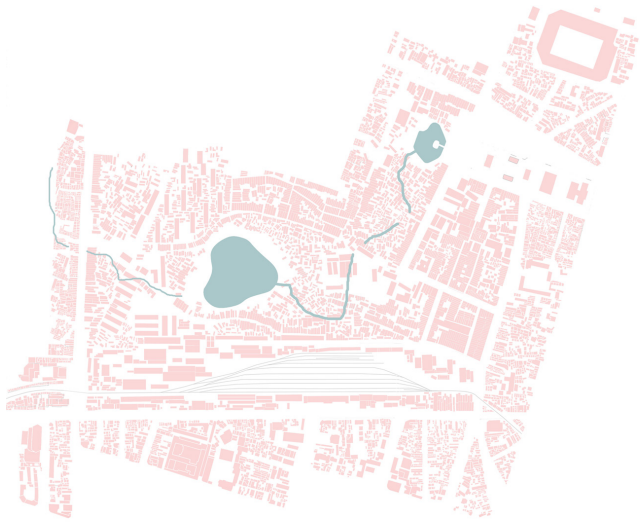
The area is mainly residential area, tube houses and condominiums in soviet form. Some positions have commercial functions, offices, schools and markets to serve people's needs



The station and its tracks are now a 700m long wall and barrier that cuts into urban fabric without a path to cross, even for pedestrians. The entire inner area belongs to the station and is completely closed, not connected to outside public spaces



There is an overlap in regional ownership, in addition to private ownership and state ownership, there are also mixed ownership types such as soviet-style apartment buildings.



There were small canals connecting lakes in the past, where hundreds of years ago was a swamp with continuous rivers and lakes. But the explosion of urbanization in the last few decades along with the management burnt, the canals have been encroached and filled

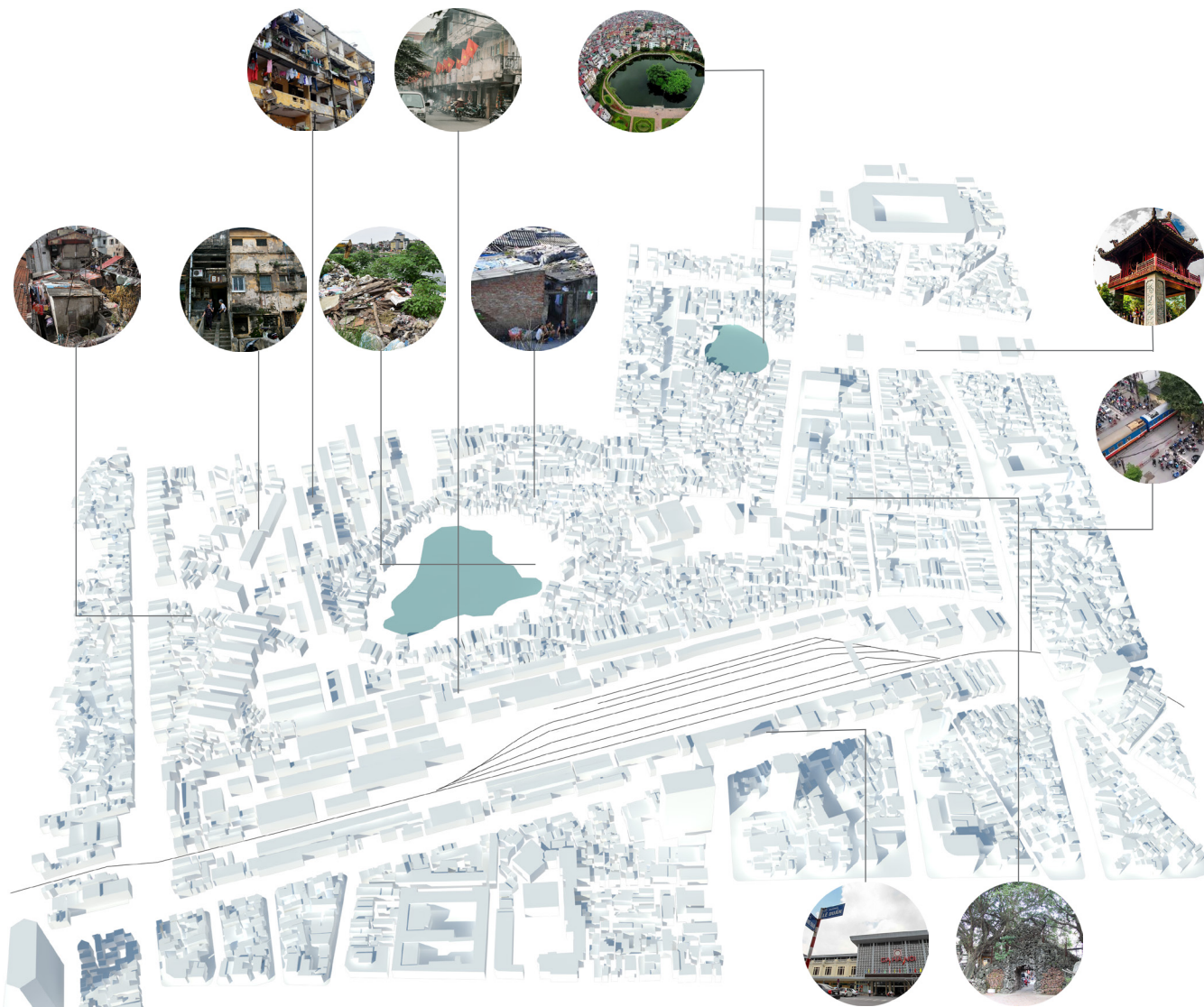


The project area has a system of heritage hundreds of years ago, from large-scale and famous ones like Temple of Literature to smaller temples under the shadow of new buildings or old buildings but rarely be seen as a heritage like The Hanoi Station



As a consequence of the Hanoi railway station and a poorly planned, too narrow road system, the public transport system in the area is also inefficient, inaccessible to the areas. residential

## Current views and functions





# TPOLOGY

16th century

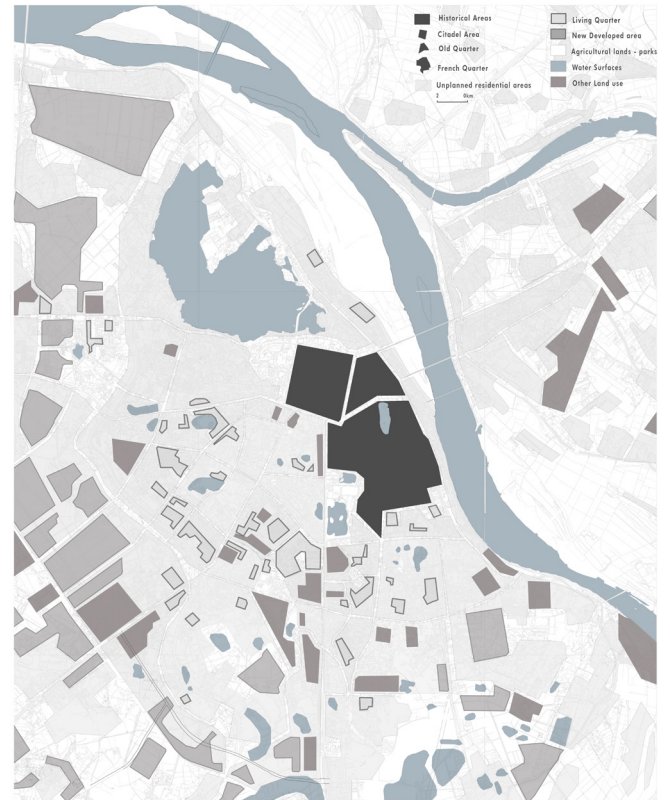
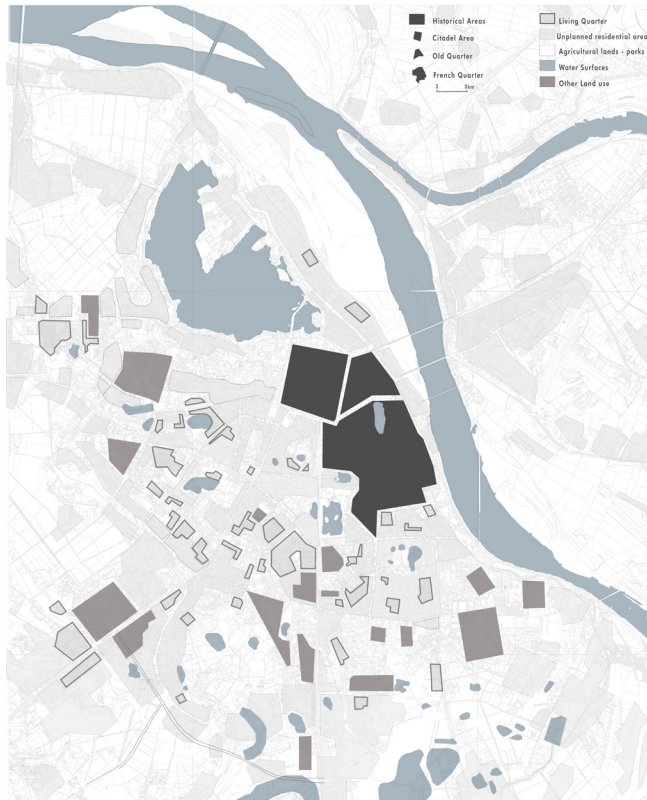


1920s



1980s

2010



# MORPHOLOGY





Urban fabric of Ancient Quarter. The oldest form of fabric that has emerged and developed with the development of the city throughout history as the main residential and commercial part of the capital next to the palace. Of course, it was no longer original, the French came and renovated and rectified in order to fit with the French Quarter



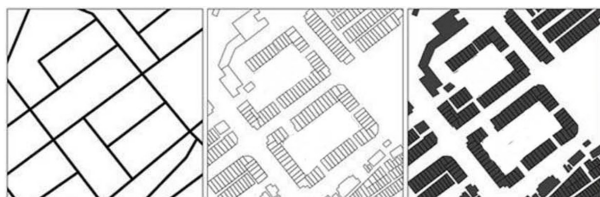
Created as a replica of European cities. And continue to be developed throughout the colonial period with added local characteristics. This is the main urban structure of the Hoan Kiem District, the heart of the city.



First appeared in the form of peri-urban villages from Feudal Age. This fabric have developed spontaneously, uncontrollably, spreading and connecting with the central urban area. especially after the 80s of the 20th century. This is a fabric form that accounts for most of the city area, the main cause of major urban problems such as traffic congestion, environmental and social problems due to its improvised development

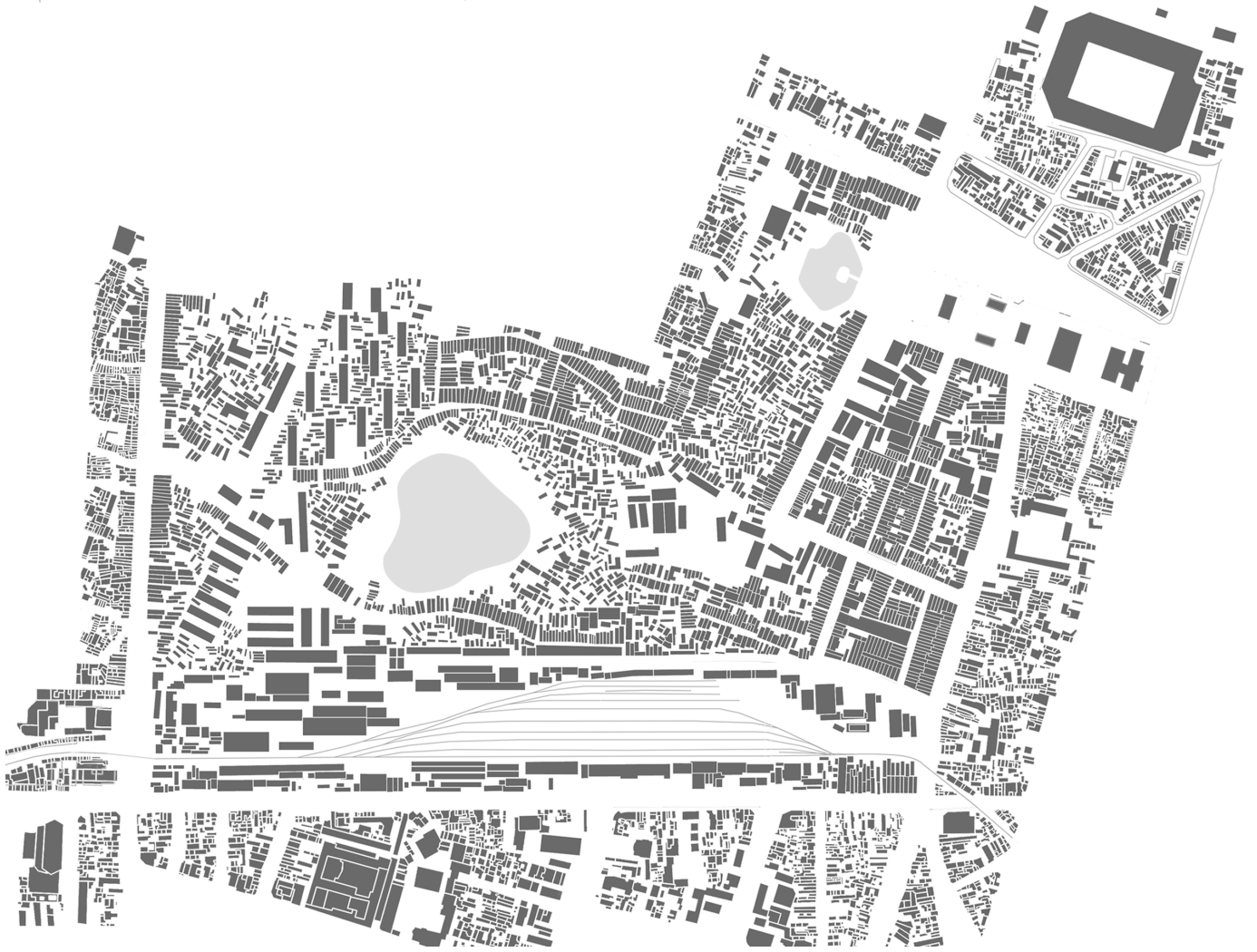


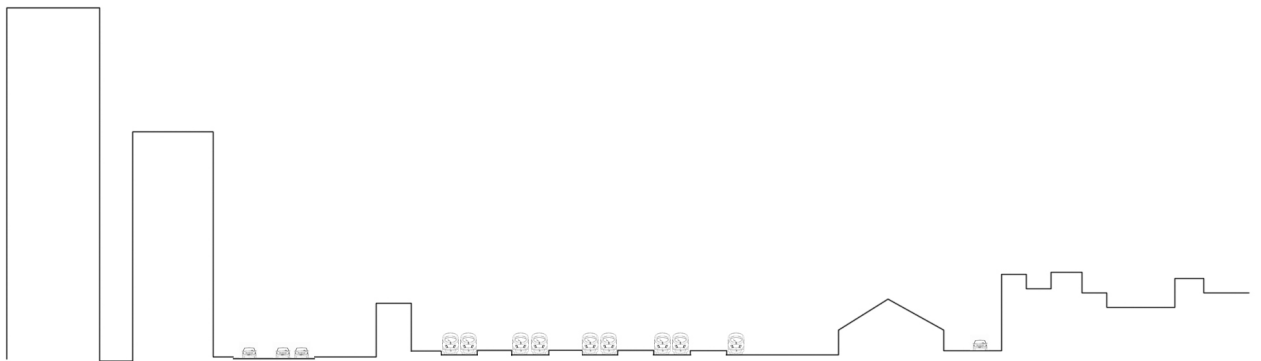
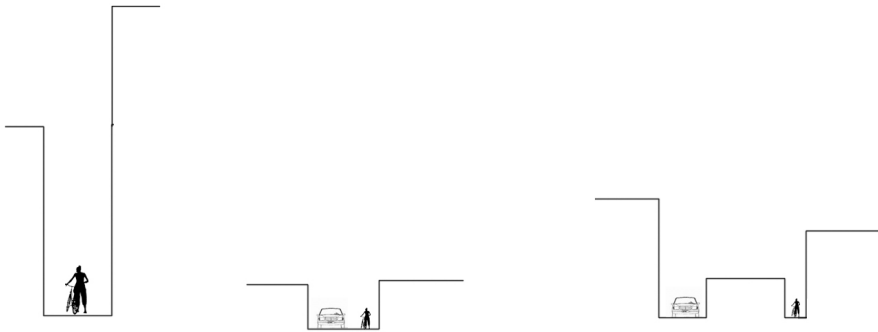
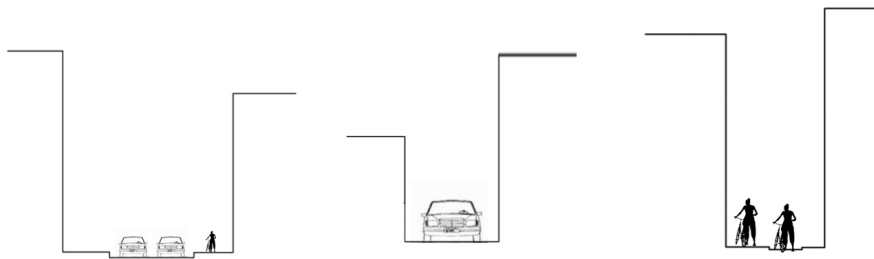
Appeared when the Soviet apartment buildings were introduced in the 50s. They were the first completed community of the city with utilities included and the community spaces arranged along the apartment blocks in an orderly manner. In the 80s' urban boom the third form has invaded and intertwined into the empty public areas, created several urban-social-environmental issues



Appeared when the Soviet apartment buildings were introduced in the 50s. They were the first completed community of the city with utilities included and the community spaces arranged along the apartment blocks in an orderly manner. In the 80s' urban boom the third form has invaded and intertwined into the empty public areas, created several urban-social-environmental issues



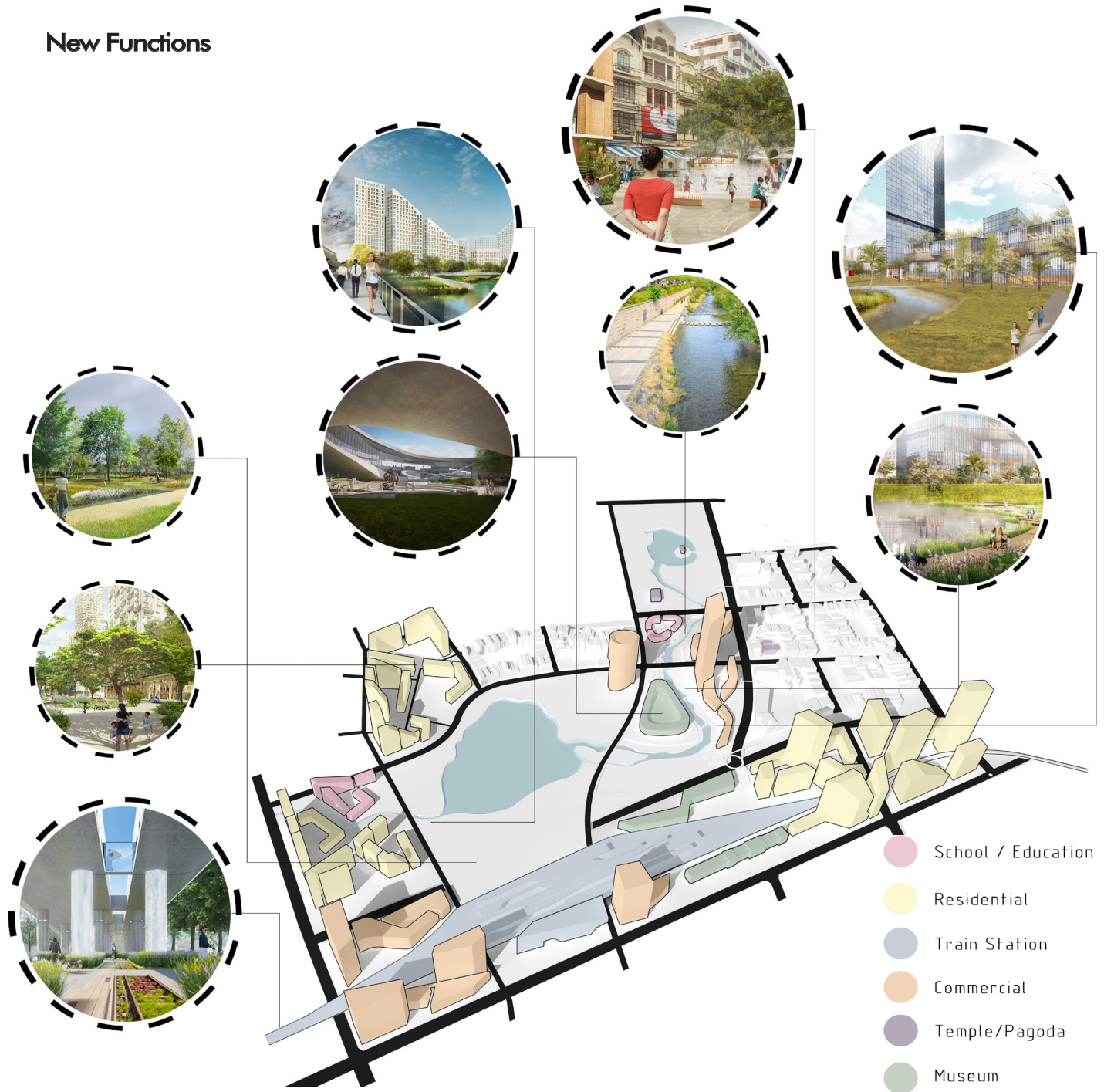




MASTERPLAN



# New Functions



# NEW SPACES

New Functions

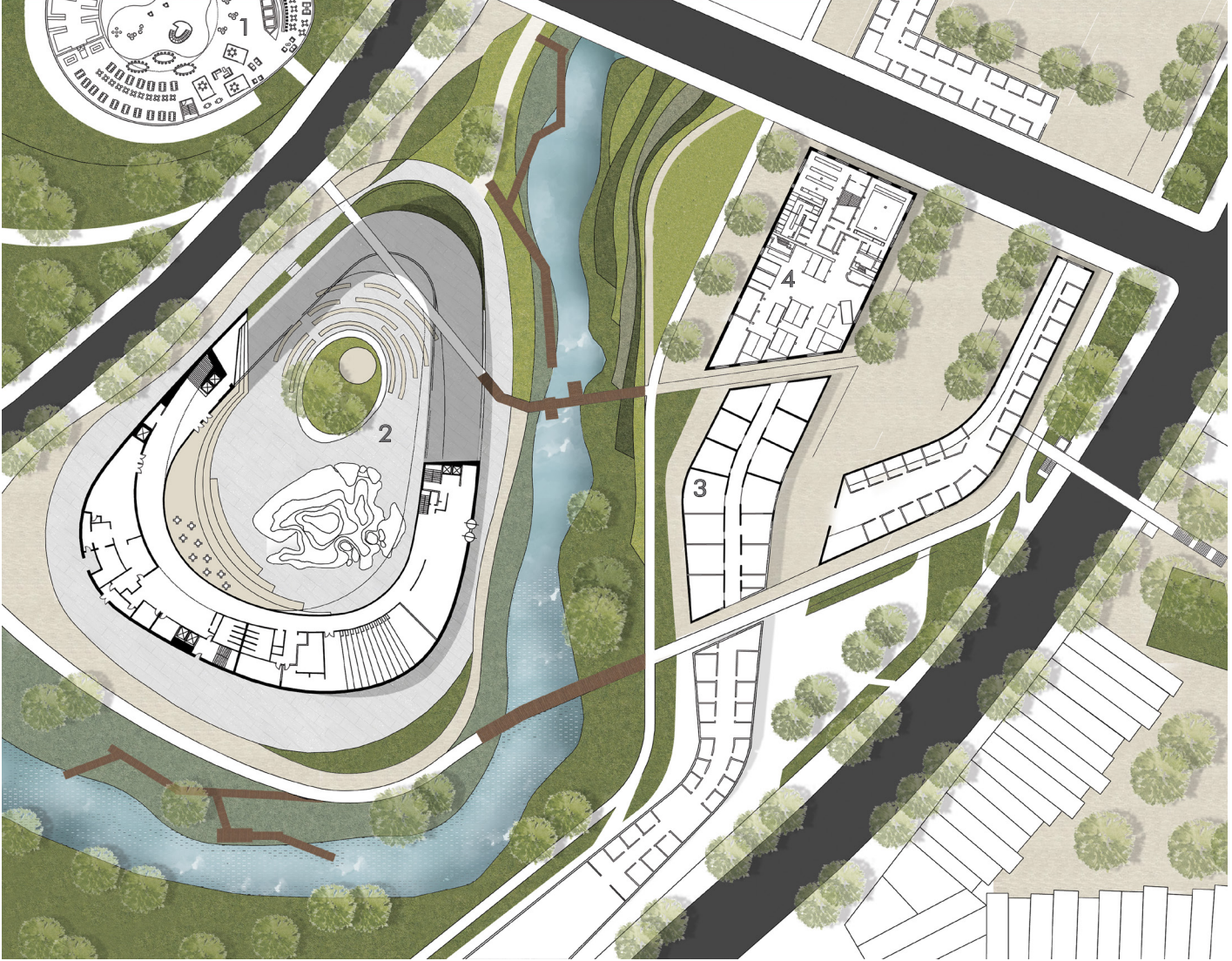
New Activites

1- Hotel

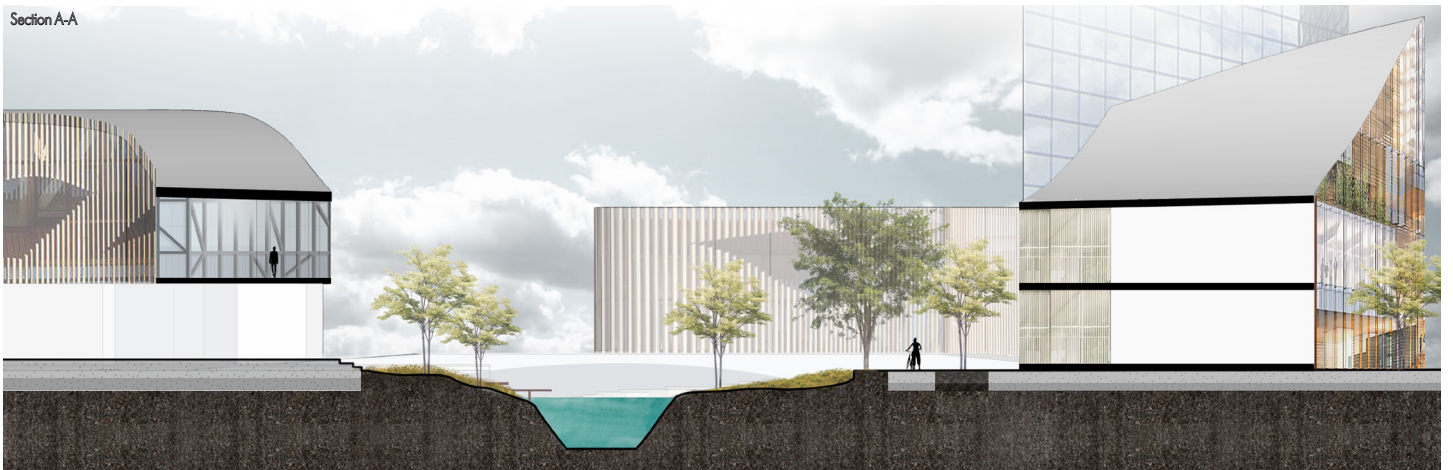
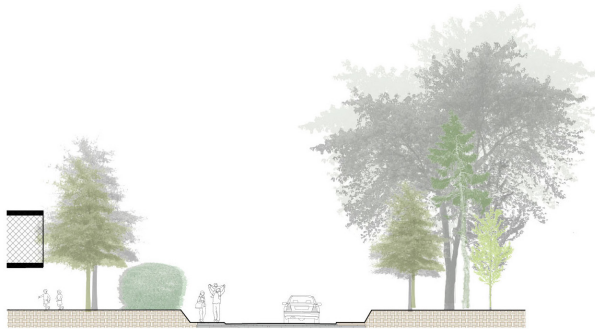
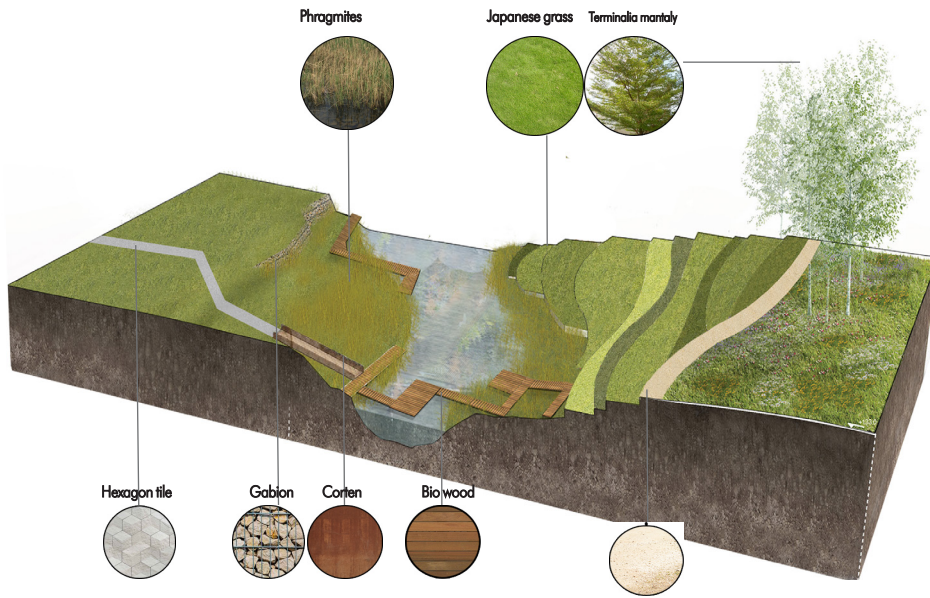
2- Natural History Museum

3- Retail

4- Office Building

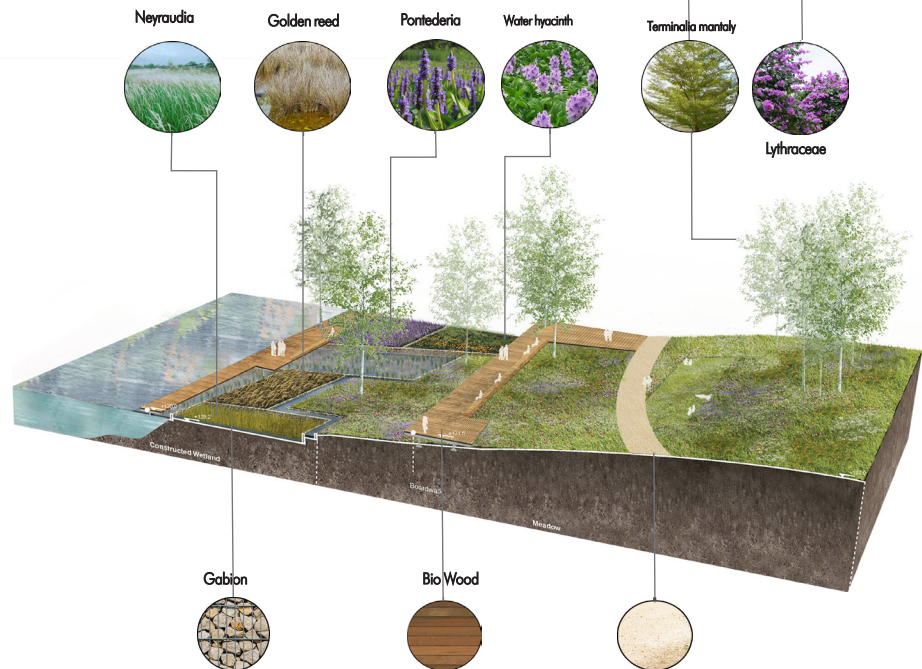
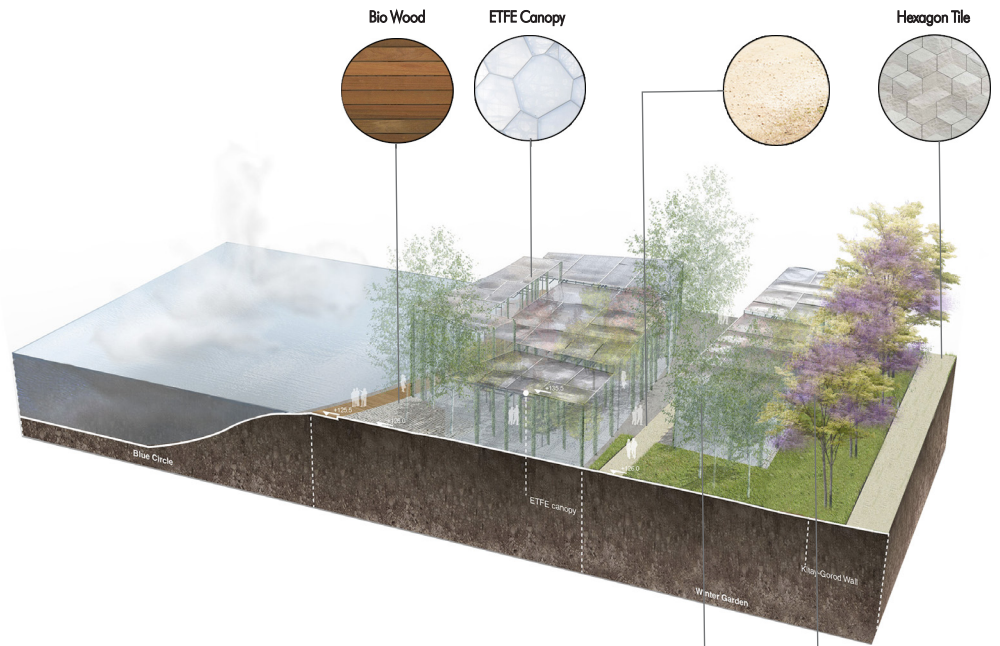




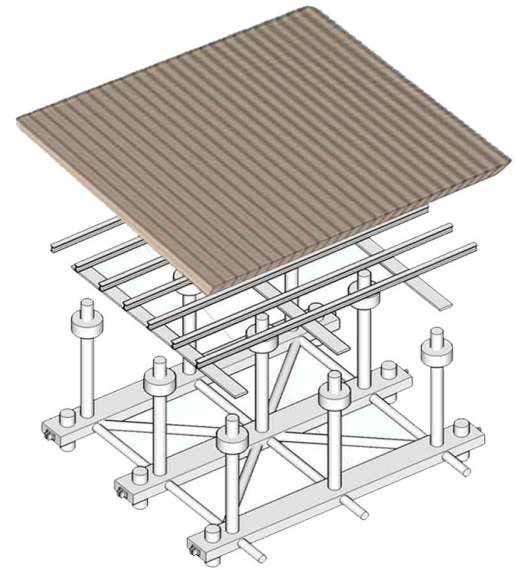
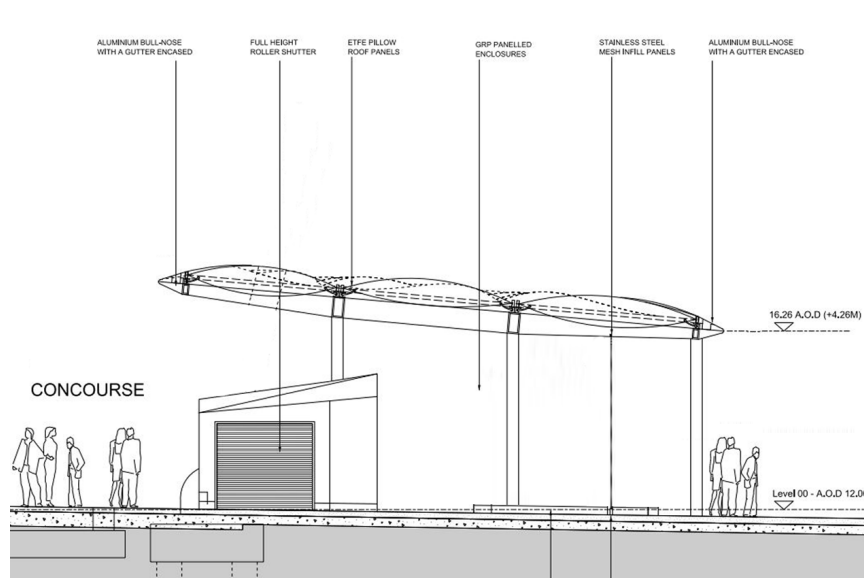






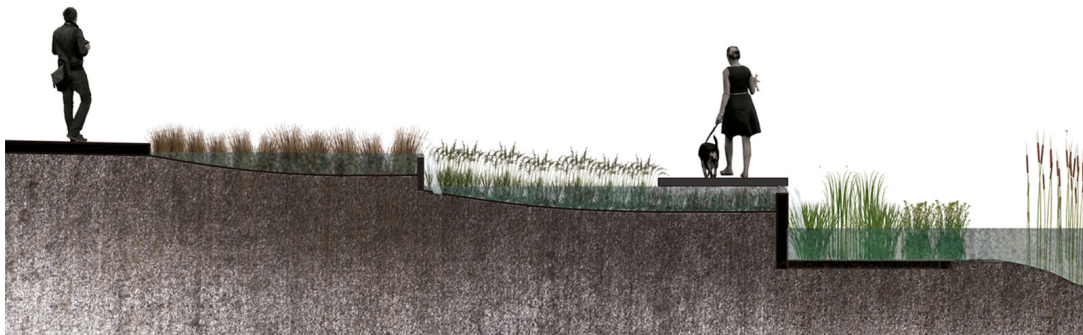


### ETFE Conopy section



Wooden platform structure

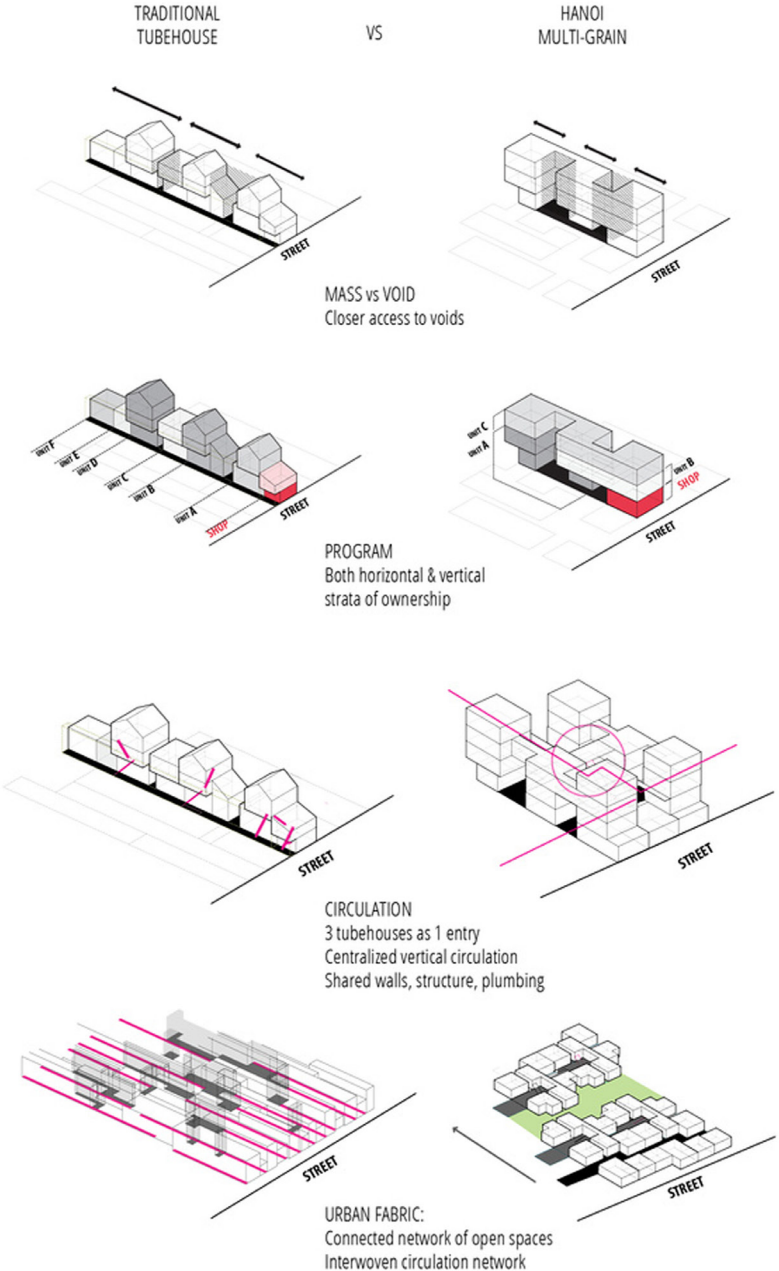
### Rain Garden Section







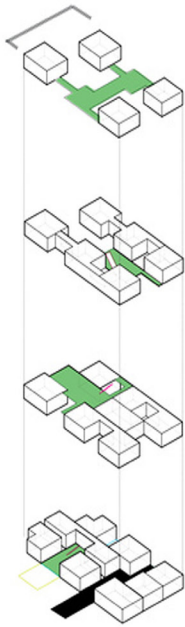
# Residential Blocks Strategy



The broke down and ruined buildings are replaced with new residential blocks to accommodate people whom used to live in old and slum areas. The diagrams indicate the strategy and design process of new blocks according to the style of common houses (tubehouses) and urban context of Hanoi.



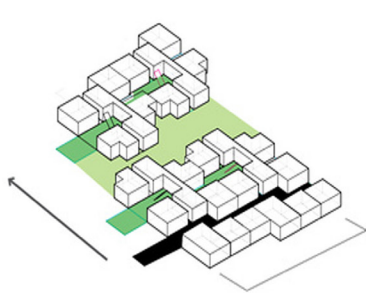
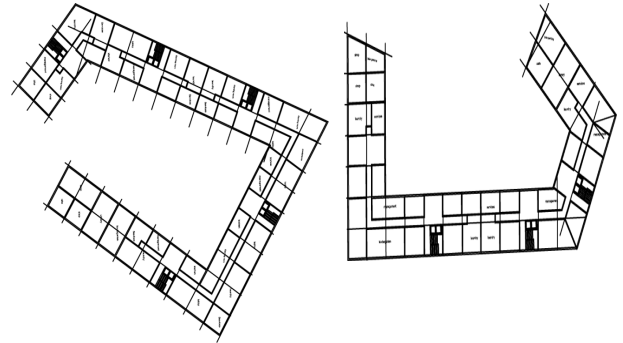
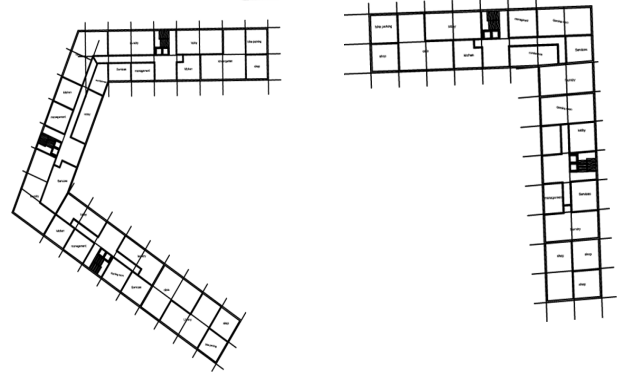
AGGREGATION MOTIF



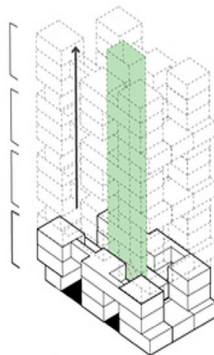
1  
3 Tubehouses as 1 entity



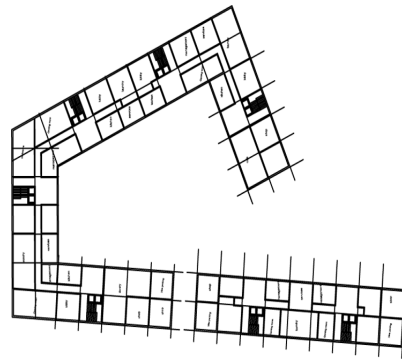
2  
Horizontal aggregation



3  
Mirror across greenbelt



4  
Vertical aggregation



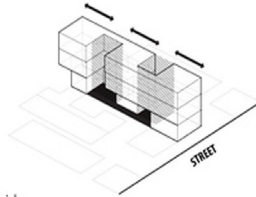
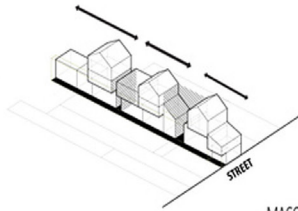




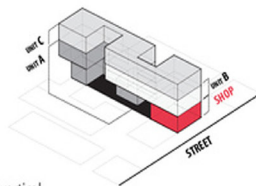
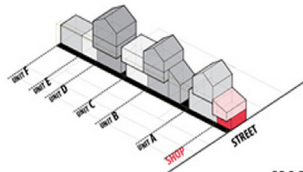
TRADITIONAL  
TUBEHOUSE

VS

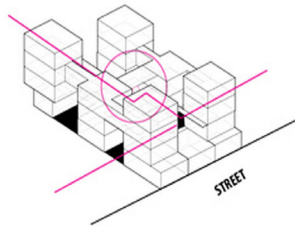
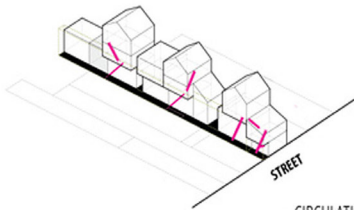
HANOI  
MULTI-GRAIN



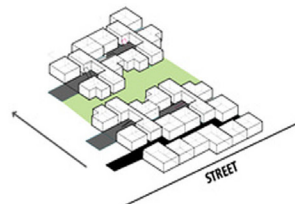
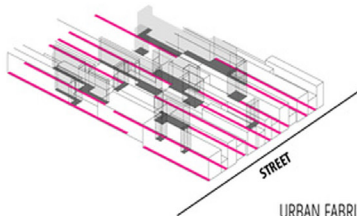
MASS vs VOID  
Closer access to voids



PROGRAM  
Both horizontal & vertical  
strata of ownership



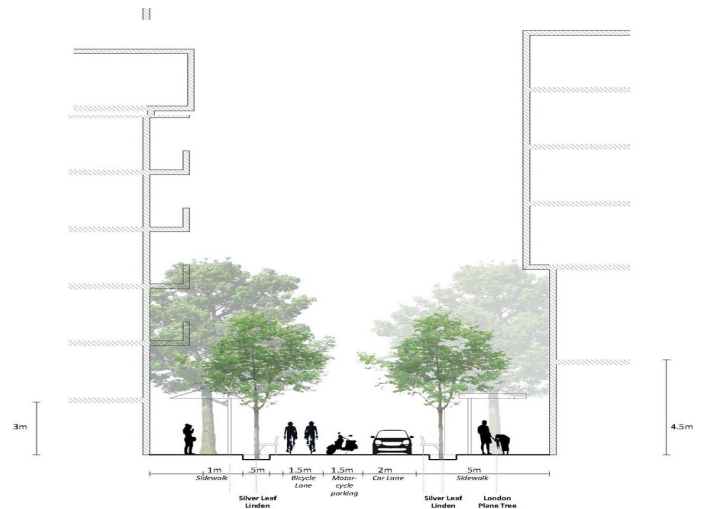
CIRCULATION  
3 tubehouses as 1 entry  
Centralized vertical circulation  
Shared walls, structure, plumbing

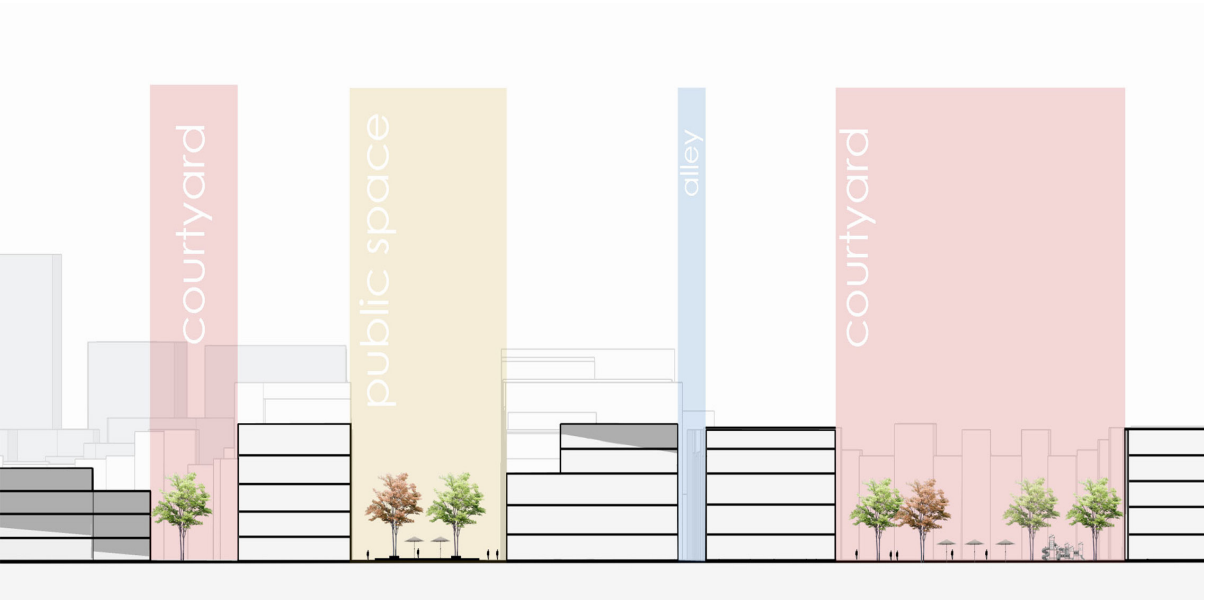


URBAN FABRIC:  
Connected network of open spaces  
Interwoven circulation network

## Existing Residential Areas

According to the style of existing residential areas (tube houses), there was not considered any public spaces in these areas for houses. We destroyed some houses in the middle of these zones which they were already broke down and create free spaces to have more public spaces for these buildings. In this case we have tried to keep the urban context as they are.

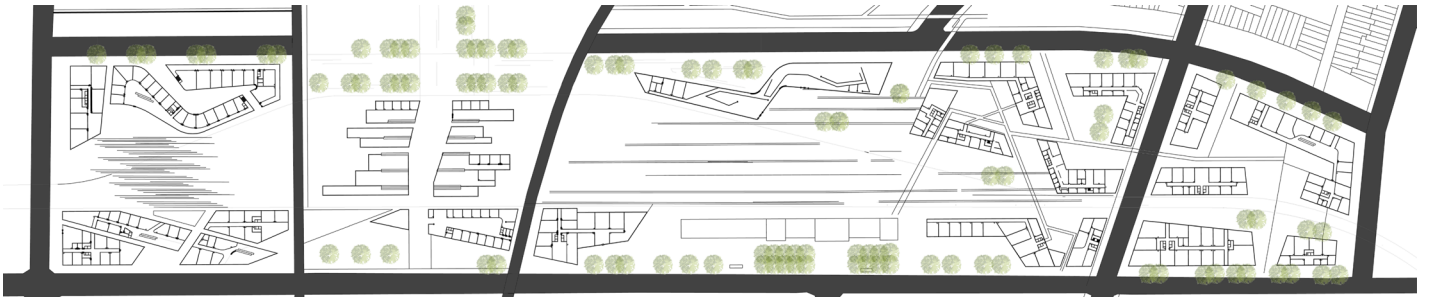




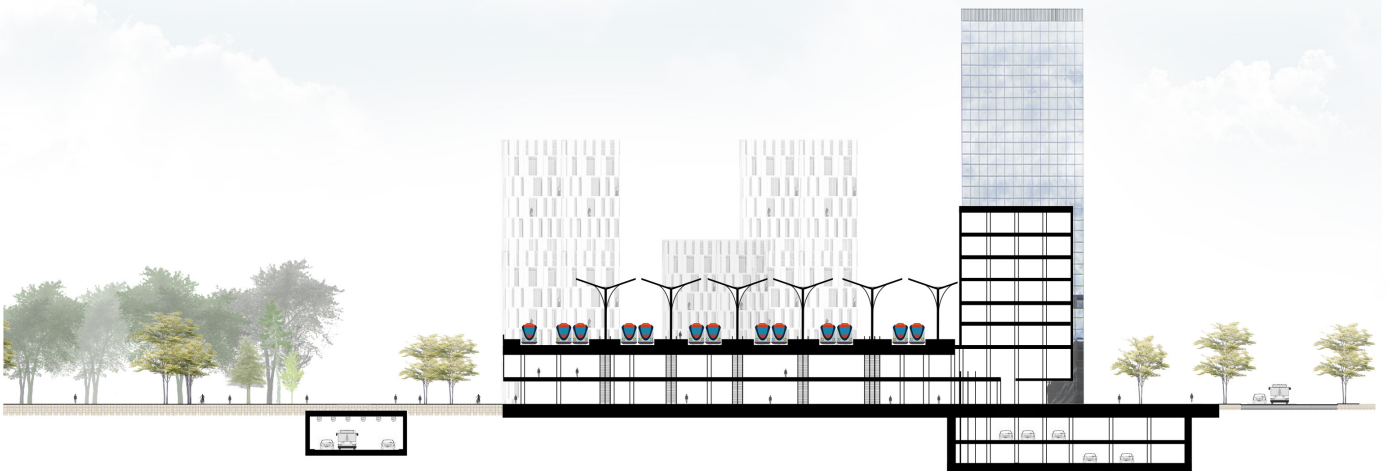




# TRAIN STATION



Section A-A



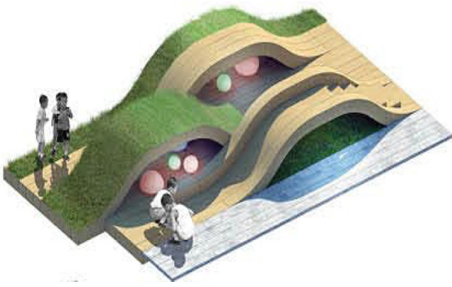


Section B-B





**TAXONOMY**





The space under the station and the railroad is organized into a public space combined with urban green areas to soften the roughness of the railway infrastructure and station platform. At the same time many tracks of the old station on the ground are retained as part of the regional landscape and reminiscent of what once existed and acted as a bridge between the two old stations and the museum. north of the platform and complete the cultural axis of the entire project with the end of the old Hanoi station building. Beside the central station, also include sales kiosks for daily and weekend markets.

## CULTURAL AND HISTORICAL PARK

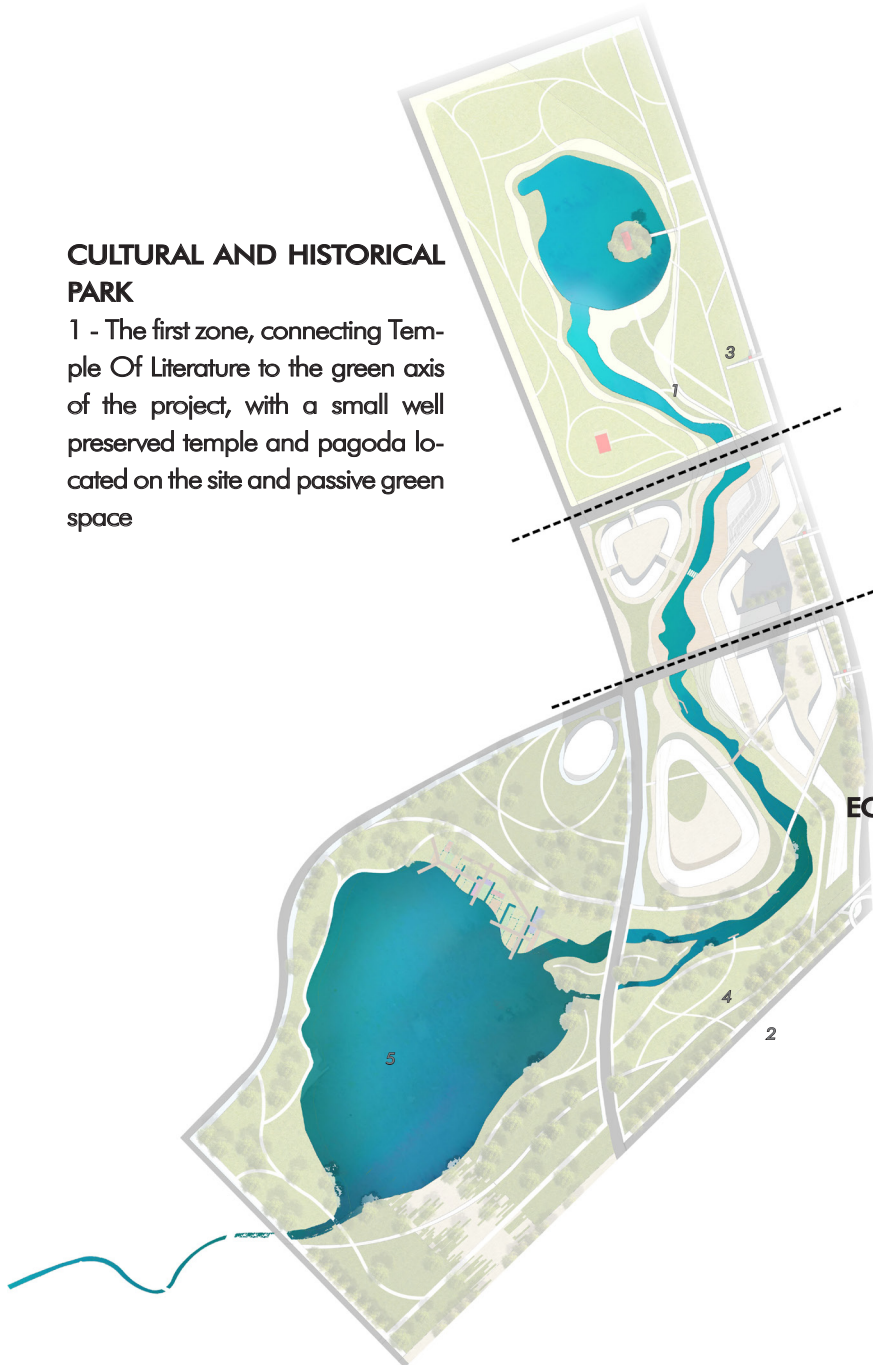
1 - The first zone, connecting Temple Of Literature to the green axis of the project, with a small well preserved temple and pagoda located on the site and passive green space

## PUBLIC PIAZZA

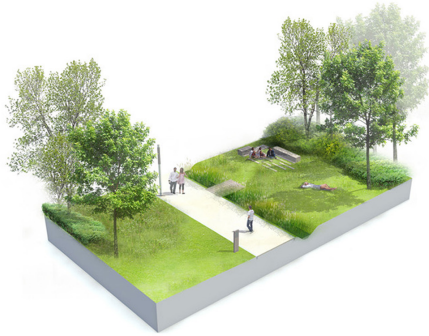
Zone 2 is active green space, with event plaza and embankment, large open space spaces for entertainment **activities and crowds**

## ECOLOGICAL PARK

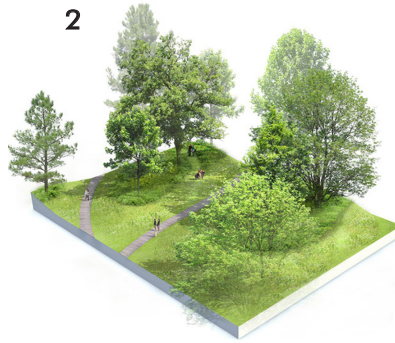
4 - This is the largest green space, playing the role of connecting all subdivisions of the project, where there are many activities, alternating both active and passive. Play an important role in regulating the microclimate for the region as well as creating landscapes, viewpoints and completing cultural-landscape connections from Temple Of Literature to the station and into the French Quarter



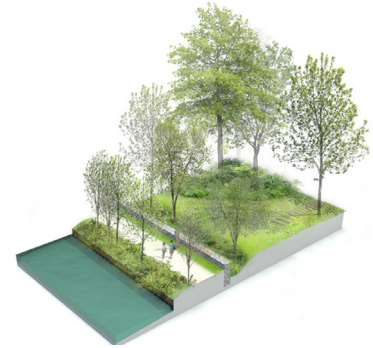
1



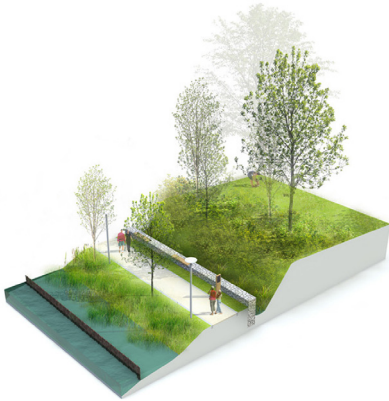
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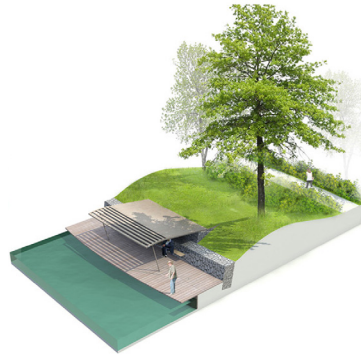
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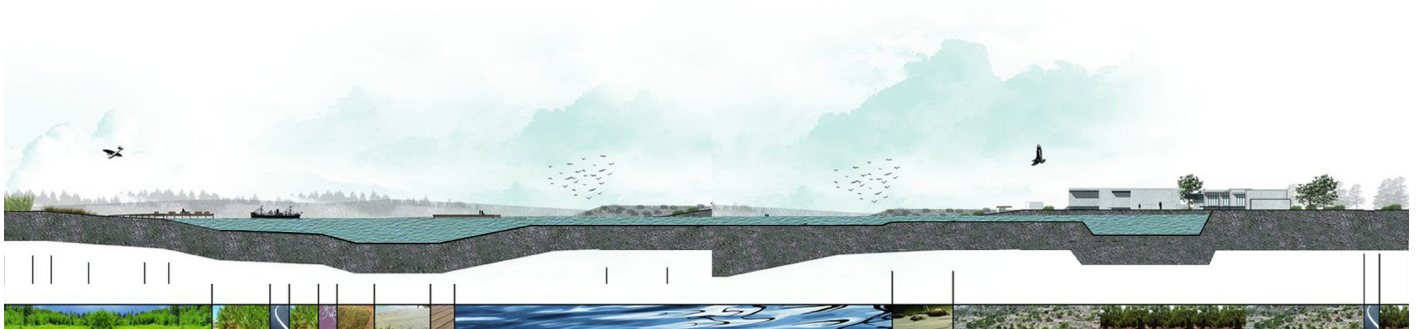
4



5



The water section shows Giam lake with a hard embankment of bricks like an old well, connected to Linh Quang lake by the canal with the canal bed lower toward the big lake, helping to drain water for Quoc Tu Giam area. which suffered by flooding problems every summer when it rains too much.



## WATER TREATMENT

Four Step Lake Renewal Process starts with cutting-edge, natural technologies to rapidly reduce the harmful nutrients causing unwanted weeds, algae, and muck in the lakes.

### Step1: Revive

Get the Lakes Breathing Again

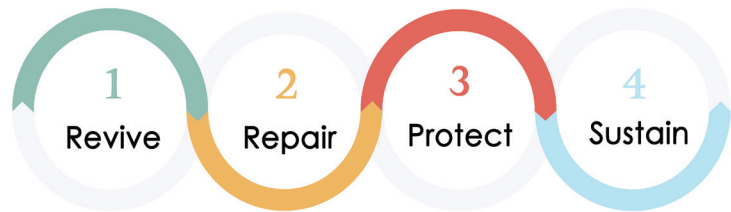
#### Lake Bottom Aeration

Excess weeds, algal blooms and sediment muck are clear signs a lake is overfed, out of balance and suffocating.

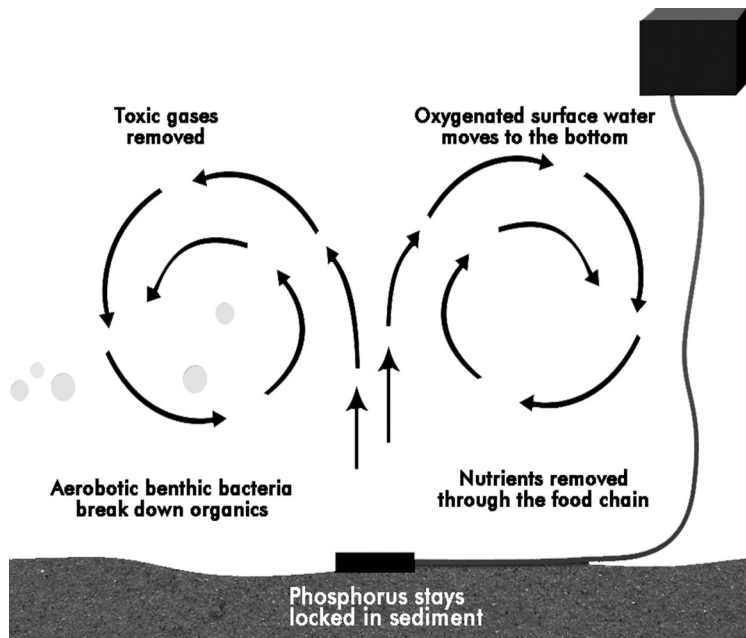
As lake-choking weeds and algae die they sink and coat the bottom. Their decay consumes dissolved oxygen. When the dissolved oxygen is gone, the partially decayed weeds and algae turn into septic muck creating a lake-bottom "dead zone".

The muck becomes a nutrient-laden compost pile that feeds the next cycle of explosive weed and algae growth. It's a vicious, self-defeating cycle that is slowly killing the lakes.

Lake Bottom Aeration Technology gets lakes breathing again. We revive and boost the lake's capacity to process nutrients — the root cause of weed, algae and muck problems. Because it attacks the root cause, Lake Bottom Aeration is the non-negotiable first step to solving weed algae and muck problems, permanently. Lake Bottom Aeration is a unique type of aeration technology that precisely duplicates and accelerates nature's own mechanism for oxygenating the water and the septic muck at the lake-bottom. Shore-based compressors deliver air to our specially designed air diffusers at the lake-bottom. The diffusers produce a powerful column of micron-sized bubbles. These tiny bubbles gently and continuously lift the "dead" water from the bottom to the surface where it gets fully saturated with oxygen. The oxygen rich water is then pulled back down to the bottom and throughout the water column restoring oxygen to the suffocating lake.



STEP 1	STEP 2	STEP 3	STEP 4
<b>Lake Bottom Aeration Technology</b>	<b>Biological Augmentation</b> - Clean & Clear Enzyme Formulation - Clean Flo Living Bacteria Formulation - Nualgi Lakes	<b>In-Lake Nutrient Filtration</b> - Wetlands trap - Lake Coral	- Invest - Maintain - Perform - Engage



Non-toxic Biological Augmentation

## Step2: Repair

Unleash Nature's best cleaners in the lakes!

### Biological Augmentation

**Excess Nutrients and Muck are Steadily Killing Your Lake. Repair the Damage With Biological Augmentation.** Once your lake is well oxygenated, it sets the stage for Nature's best water cleaners (Diatoms) and muck digesters (aerobic bacteria) to go to work.

These powerful, beneficial organisms rapidly consume the excess nutrients in the water and the septic lake-bottom muck that feeds explosive weed growth and algae blooms.

Combined with Lake Bottom Aeration our powerful, non-toxic Biological Augmentation products literally bring your lake back to life with billions of beneficial organisms that out-compete weeds and algae for the nutrients in your lake.

These beneficial organisms form the base of a healthy and thriving fish food chain. As we rid your lake of excess weeds algae and muck, we are growing bigger, healthier fish.

Our natural, non-toxic Biological Augmentation products work with Lake Bottom Aeration to turn your lake into a natural cleaning, fish growing machine. That's nature's way. That's our way...and it works! Lake-bottom muck reductions of one foot and phosphorus reductions of 30% to 50% per season are typical.

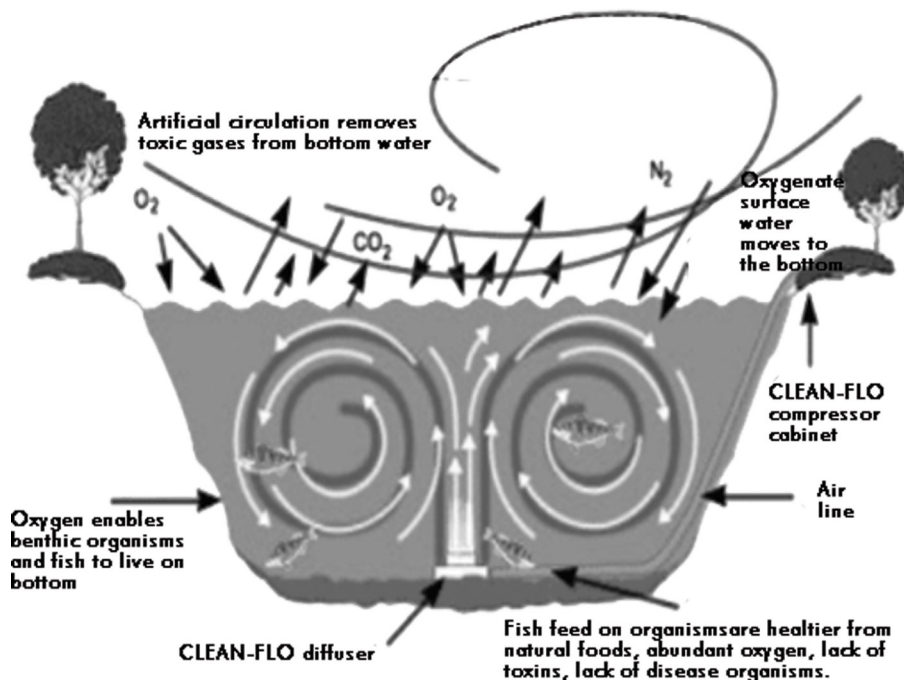


## Biological Augmentation systems

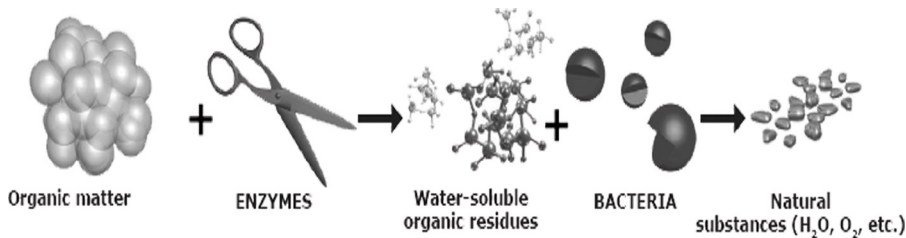
**Clean & Clear Enzyme Formulation** breaks down the tough cellular wall of decaying plant material and provides nutrients to support exponential growth of the beneficial bacteria that eat the organic muck at the bottom.

**C-Flo Living Bacteria Formulation** introduces the right beneficial bacteria at the lake bottom to aggressively consume lake-bottom muck. Reductions of one foot per season are typical.

**Nualgi Lakes** is a patented micro-mineral formulation that has been scientifically proven to grow diatoms in water. Diatoms are Nature's best water cleaners and are the base of a healthy fish food chain. By growing more diatoms in the lakes we are feeding fish while taking nutrients away from weeds and algae. 30% to 50% reductions in Phosphorus and Nitrogen are typical.



C-Flo Living Bacteria Formulation



Clean & Clear Enzyme Formulation



### Step3: Protect

#### Defend the Lakes from Nutrient Pollution!

#### In-Lake Nutrient Filtration

##### *Protecting the lake from watershed pollution*

Preventing nutrients from entering your lake from the surrounding watershed isn't easy. In fact, it can take decades to implement a comprehensive watershed management program.

However, there are simple, common sense steps that every lake community can take to protect the lake from incoming nutrients.

Nature's way of filtering nutrients from the watershed is a wetland. Wetlands trap incoming nutrients and convert them into beneficial microorganisms that are the building blocks of the food chain. A lake without a working wetland has no filtering defense against the watershed.

#### Lake Coral — A Game-Changing Technology

Developed in partnership with Floating Islands International, Lake Coral precisely duplicates nature's "wetland effect." Like naturally occurring coral reefs, artificially constructed Lake Coral:

- Acts as a nutrient filter.
- Accelerates the growth of aerobic bacteria in the water column which divert nutrients into food for fish instead of weeds, algae and muck.
- Provides sustainable habitat for Periphyton, diatoms, and other beneficial microorganisms such as phytoplankton, zooplankton, and insects – all of which are critical for continual fish growth.
- Radically increases biodiversity and water quality.

*Best of all – it can be installed in a matter of minutes, and is a very cost-effective lake renewal technology.*



Securely anchored just below the surface of the lake, each unit weighs 4 lbs. Units can be joined together in any configuration to meet the specific filtering needs of any lake.

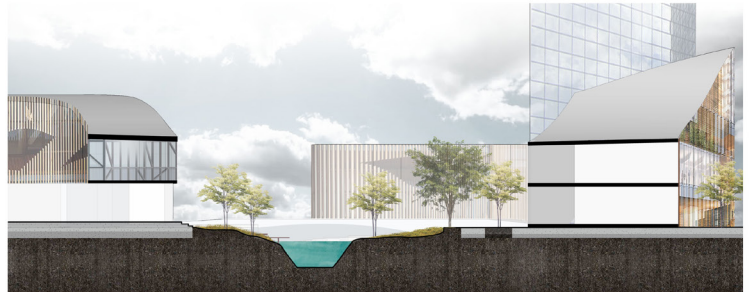
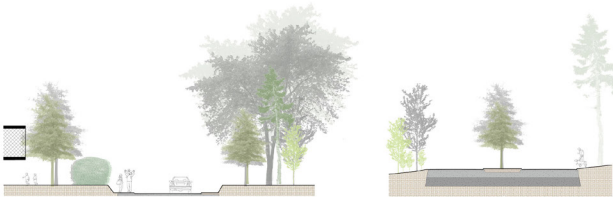
Each pound of Lake Coral provides 170 square feet of wetland filtration surface area.

Putting 250 lbs of coral into a water body is the equivalent of building a 1 acre wetland filtration area for the lake.

# Street Sections



BACK ELEVATION



# Axonometric

