

RICE UNIVERSITY

Along The Line

by

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A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE

Master of Architecture

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Director of Graduate Study



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HOUSTON, TEXAS
MARCH 2015

ABSTRACT

Along The Line

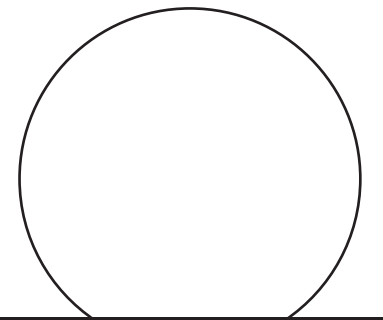
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The thesis focuses on the plan and design of a new urban axis based on the HSR at the suburban town, Baohua town, along the HSR between Shanghai and Nanjing. With the HSR as an urban trigger, the project redefines the function of infrastructure as a public promenade. Through design and plan of the axis and the landmark space it connects, the future satellite city will not only embrace the resource brought by high-speed rail, but also rethinks and adapt vernacular culture and industry to create a variety of leisure and low-density spaces for the residents. The project redefines the relationship between city and infrastructure. The infrastructure is not simply designed for transportation, but transformed into occupiable public space. Through the planning of the urban axis, the infrastructure efficiently supports people to commute locally, regionally and nationally. Through architectural intervention, the infrastructure is designed to connect and blend into the landmark spaces. It become an urban promenade to experience the city.

ALONG THE LINE

城市动脉





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CONCLUSION

HIGH-SPEED RAIL IN CHINA

From 2008 to 2013, a new, 13,000km long high-speed rail system was built in China. Crossing all regions of the country, this new infrastructural system connects more than forty major cities.



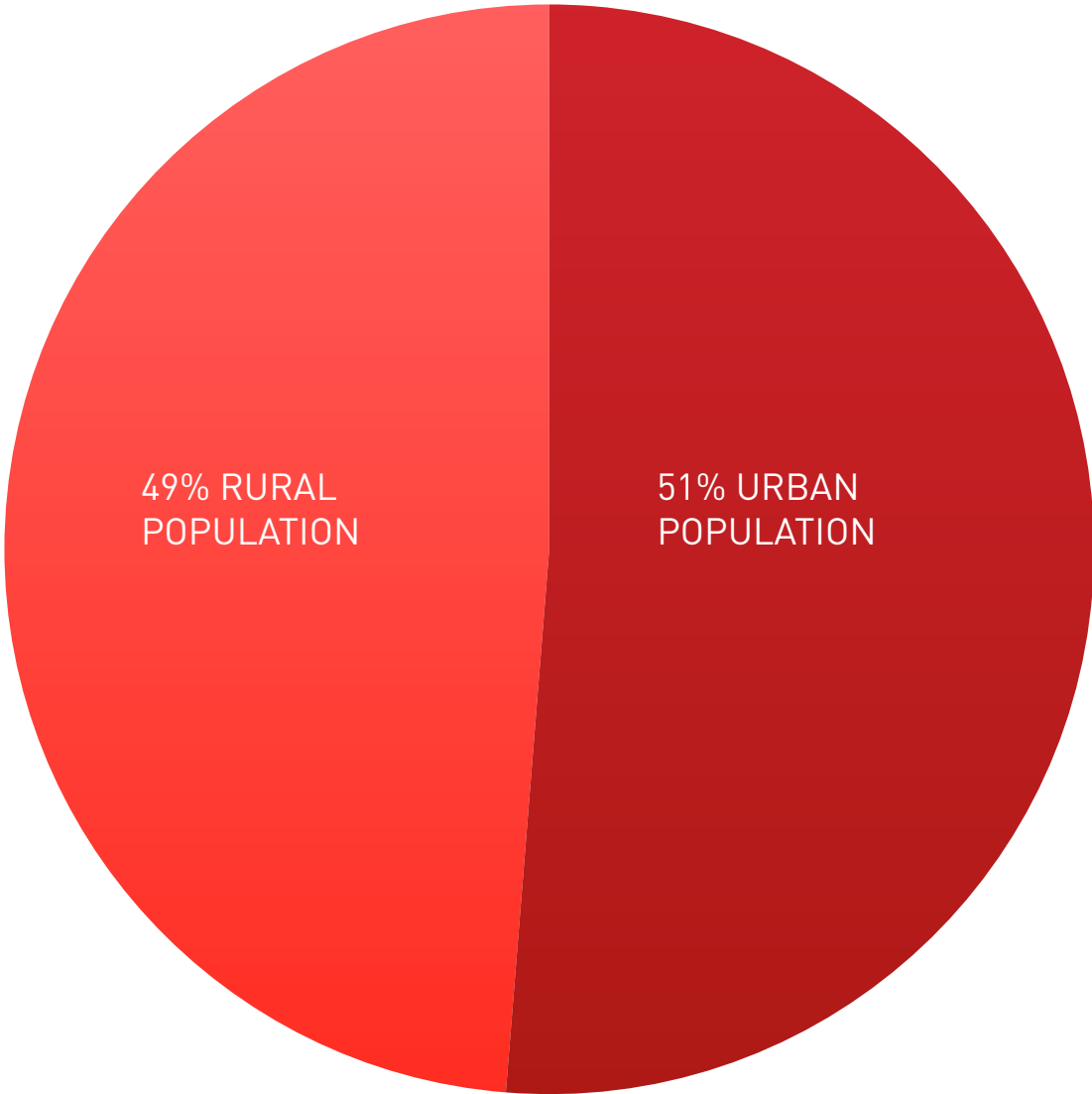
HIGH-SPEED RAIL IN CHINA

Taking the high-speed rail, millions of passengers are exposed to the rapidly growing suburban towns along the rail everyday. The convenience of the transportation system changed people's understanding of distance and city.

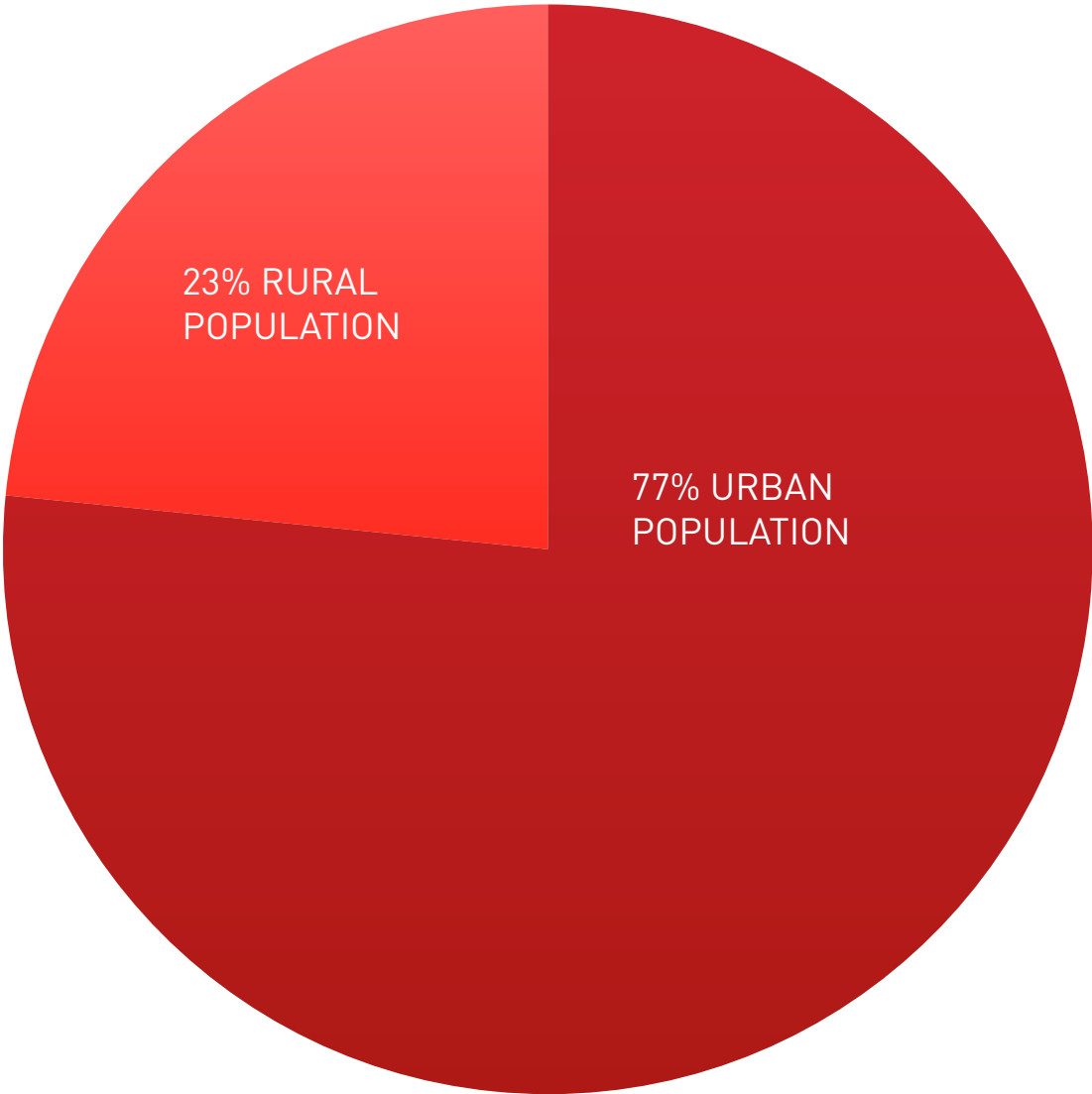


GROWTH OF URBAN POPULATION

All the major cities connected by the high speed rail, will face a faster expansion. As reported by the United Nations, the urban population in China will grow by 341 millions by 2050.



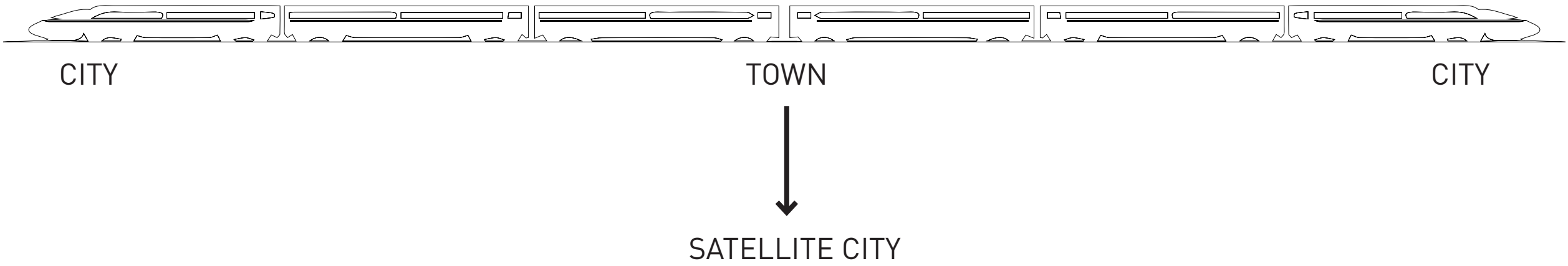
2012 URBAN AND RURAL POPULATION



2050 PROJECTED URBAN AND RURAL POPULATION

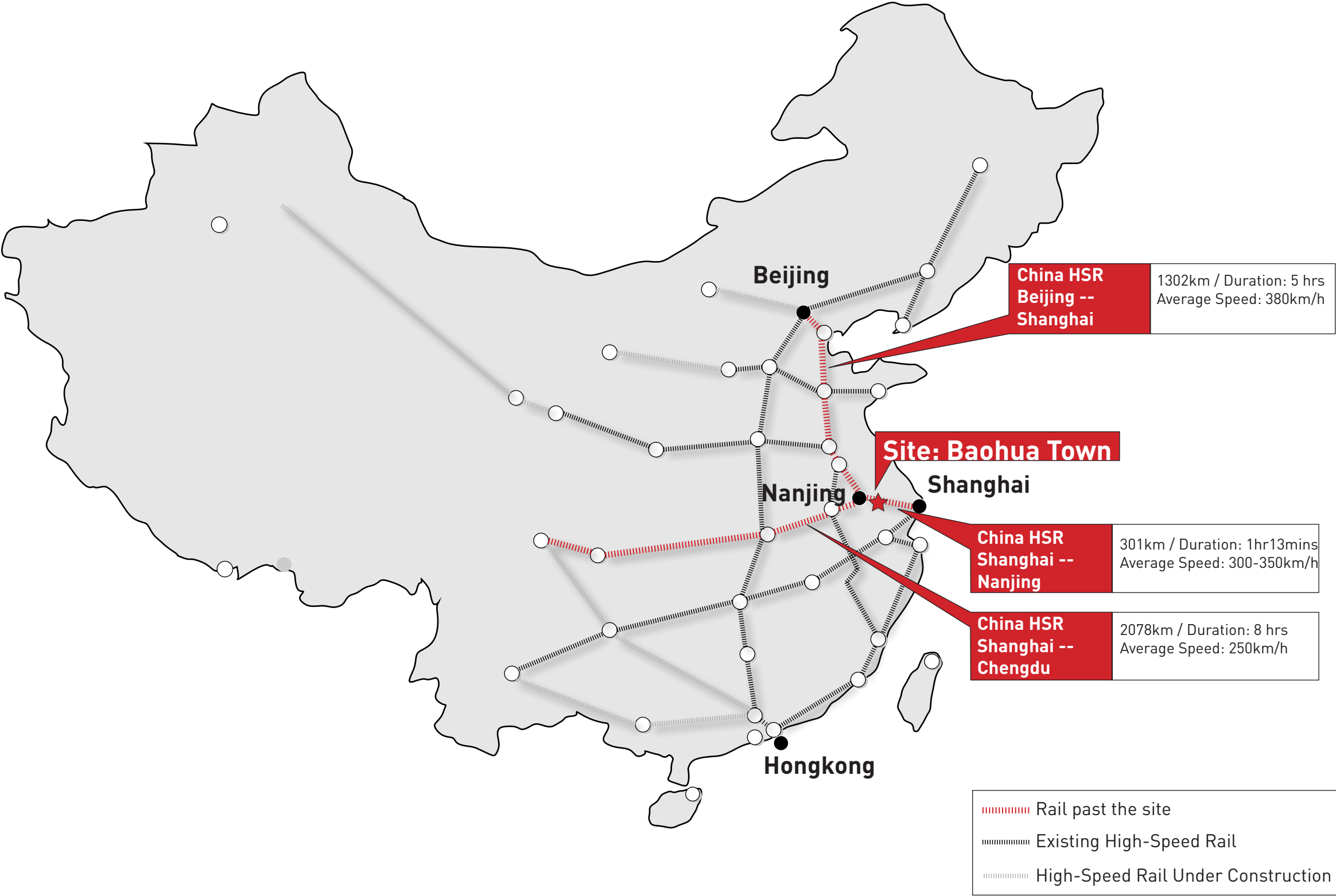
GROWTH OF SUBURBAN TOWN

With the fast growth of large cities, the suburban towns at the periphery of these large cities along the rail tend to develop rapidly into densely inhabited satellite towns for metropolis. With the HSR travels across, suburban towns demand a new urban strategy to embrace the national infrastructure system, and provides a comfortable living environment with a local identity.



THREE MAJOR HIGH-SPEED RAILWAY CONNECTING TO BAOHUA

With the HSR as an urban catalyst, the project redefines the mono-functionality of infrastructure into a public promenade in the city. Through the design and planning of the axis and the landmark space it connects, the future satellite cities will not only embrace the resources brought by the high-speed rail, but also rethinks and adapts vernacular cultures and industries to formulate a variety of leisure and dynamic low-density spaces for the residents.



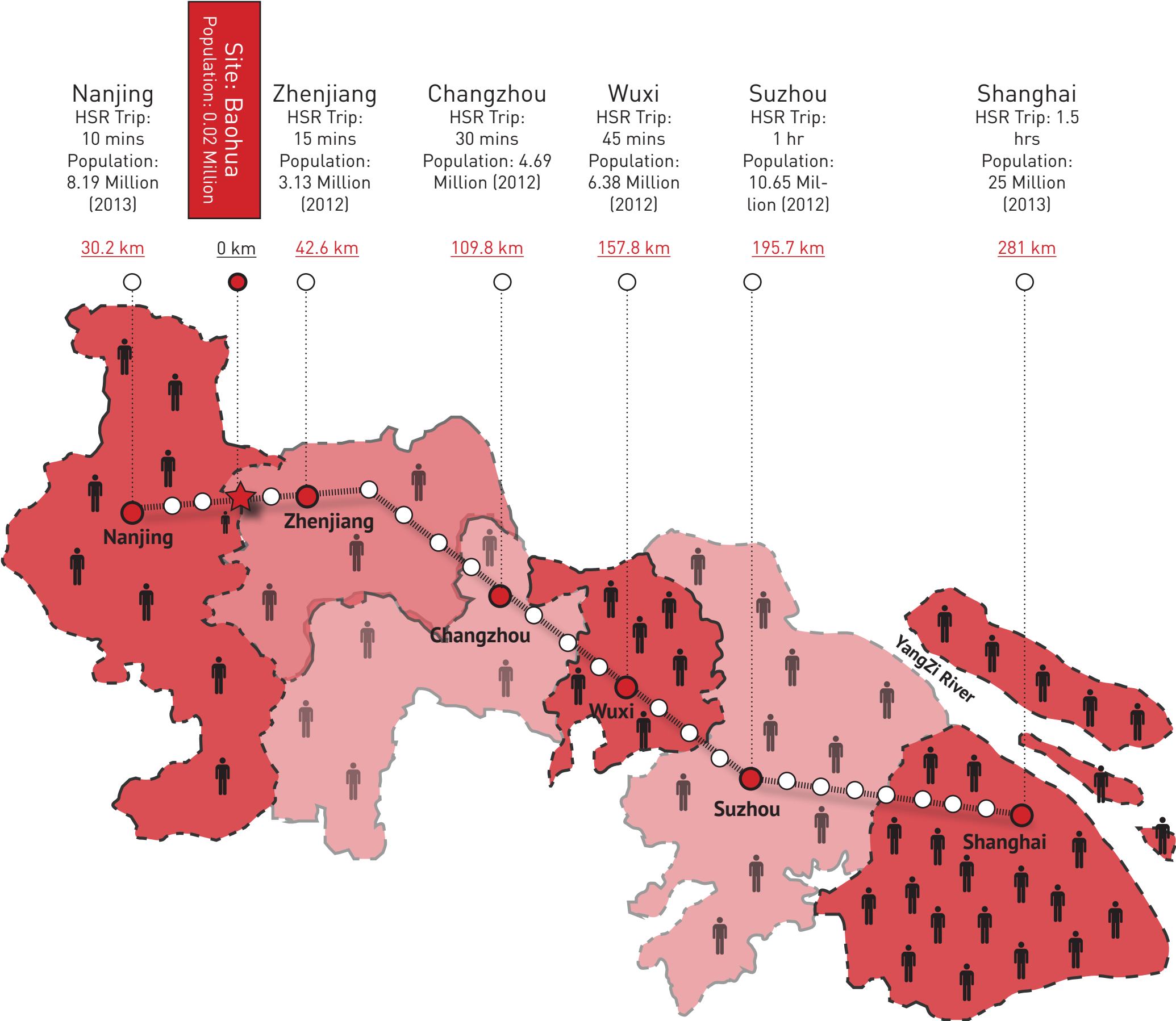
THREE MAJOR CITIES CONNECTING TO BAOHUA

There are three metropolis connecting to the site, Baohua Town -- Nanjing, Shanghai, and Hangzhou. Each of these cities have populations surpassing 10 million, where numerous people take the high-speed rail to travel among them. Baohua Town will be highly influenced by the fast development of these major cities.



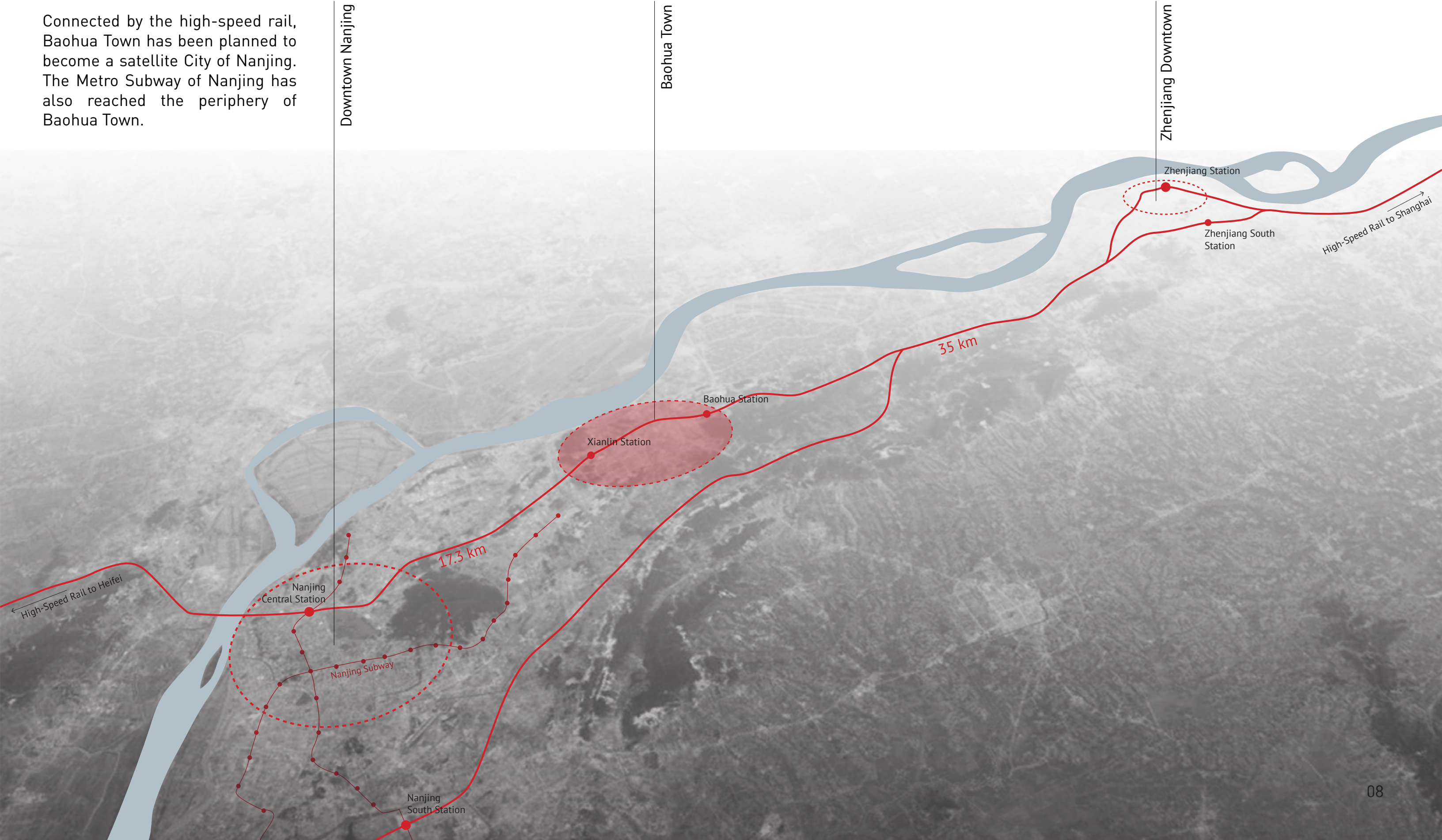
BAOHUA TOWN -- SUBURBAN TOWN ALONG THE HSR BETWEEN NANJING AND SHANGHAI

Along the high-speed rail between Nanjing and Shanghai, there are 6 large cities and 21 small stops in suburban area. Like Baohua Town, all the small towns with stops along the rail will experience the development brought by the operation of High-Speed Rail. The urban strategy designed for Baohua Town becomes a prototype that can also be applied to other suburban towns along the rail.



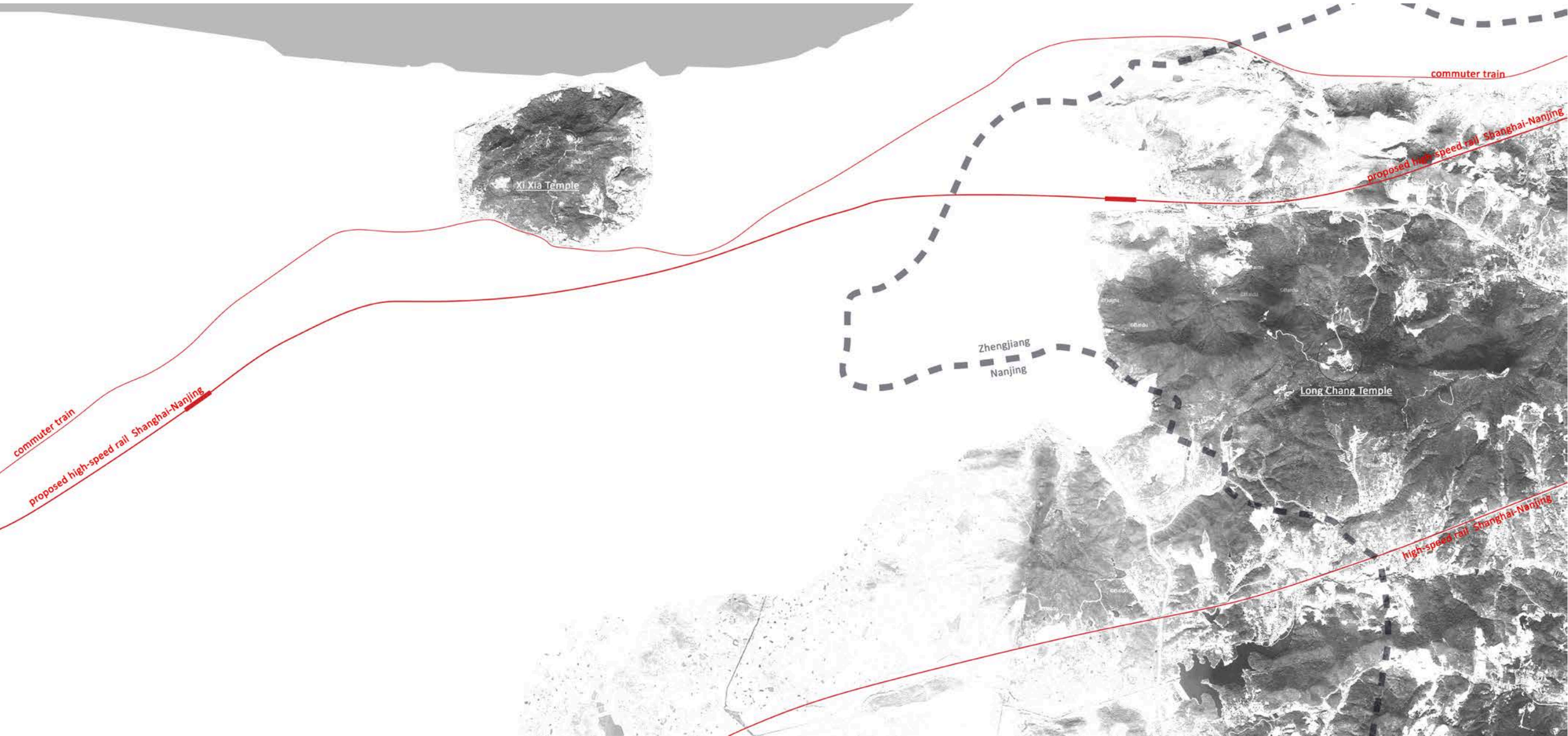
CONNECTION AMONG NANJING, BAOHUA AND ZHENJIANG

Connected by the high-speed rail, Baohua Town has been planned to become a satellite City of Nanjing. The Metro Subway of Nanjing has also reached the periphery of Baohua Town.



EXISTING TRANSPORTATION SYSTEM CONNECTING BAOHUA WITH NANJING

COMMUTER TRAIN ROUTE AND PROPOSED HIGH-SPEED RAILWAY



HIGHWAY SYSTEM



METRO SYSTEM OF NANJING



EXISTING RESOURCE TO SUPPORT FUTURE POPULATION

EDUCATIONAL RESOURCE -- UNIVERSITY CAMPUSES

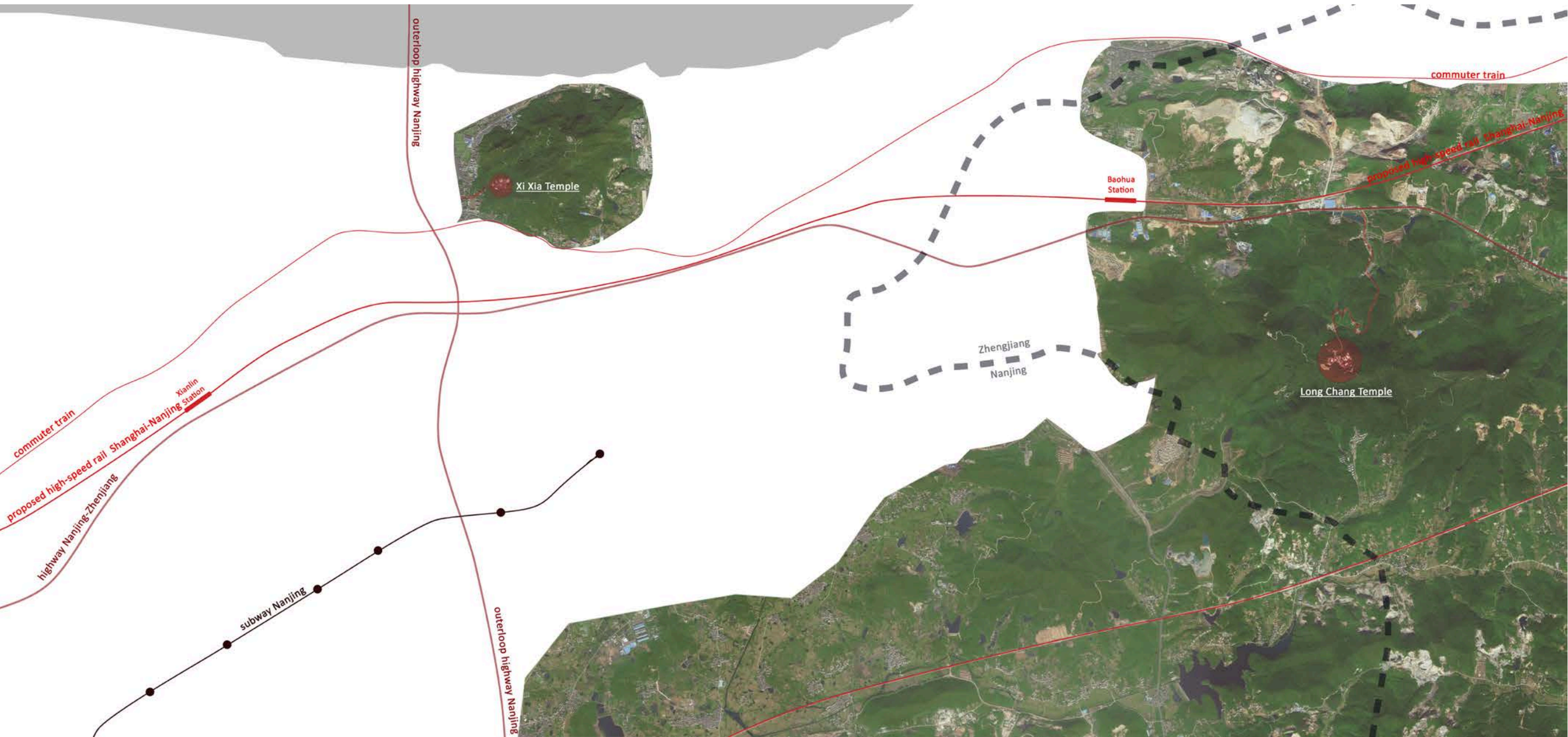
Near Baohua Town, Nanjing has built one of the largest University Campus District in the country. A total of 13 universities from Nanjing have developed their campus in the area. For example, Nanjing University, one of the best universities in China, has a new-built campus here.





TOURISM RESOURCE -- BAOHUA NATIONAL PARK

Baohua Town is also well-known for its natural and tourism resources. Baohua National Park is at the southeast area of the town and within those mountains there is a famous Buddhist Temple, Long Chang Temple, where thousands of monks and pilgrims travel to the temple each year for ceremonies and Buddhists studies.

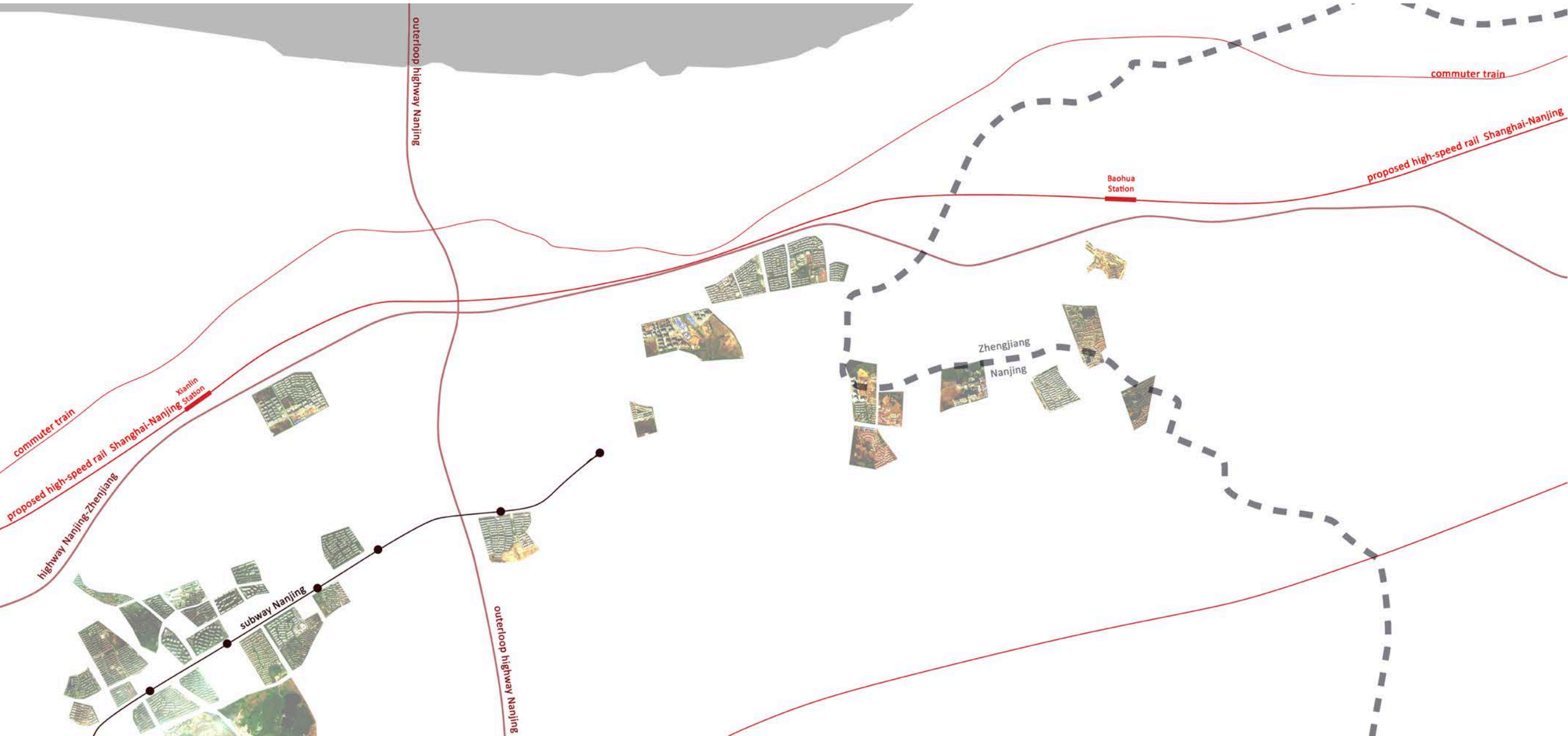


LONGCHANG TEMPLE IN BAOHUA MOUNTAINS



RESIDENTIAL PROJECTS

Due to its rich educational and tourism resource, many developers have planned and built new residential projects around Baohua Town. Most of these properties are highrise buildings with good amenities to provide leisure spaces in the community.



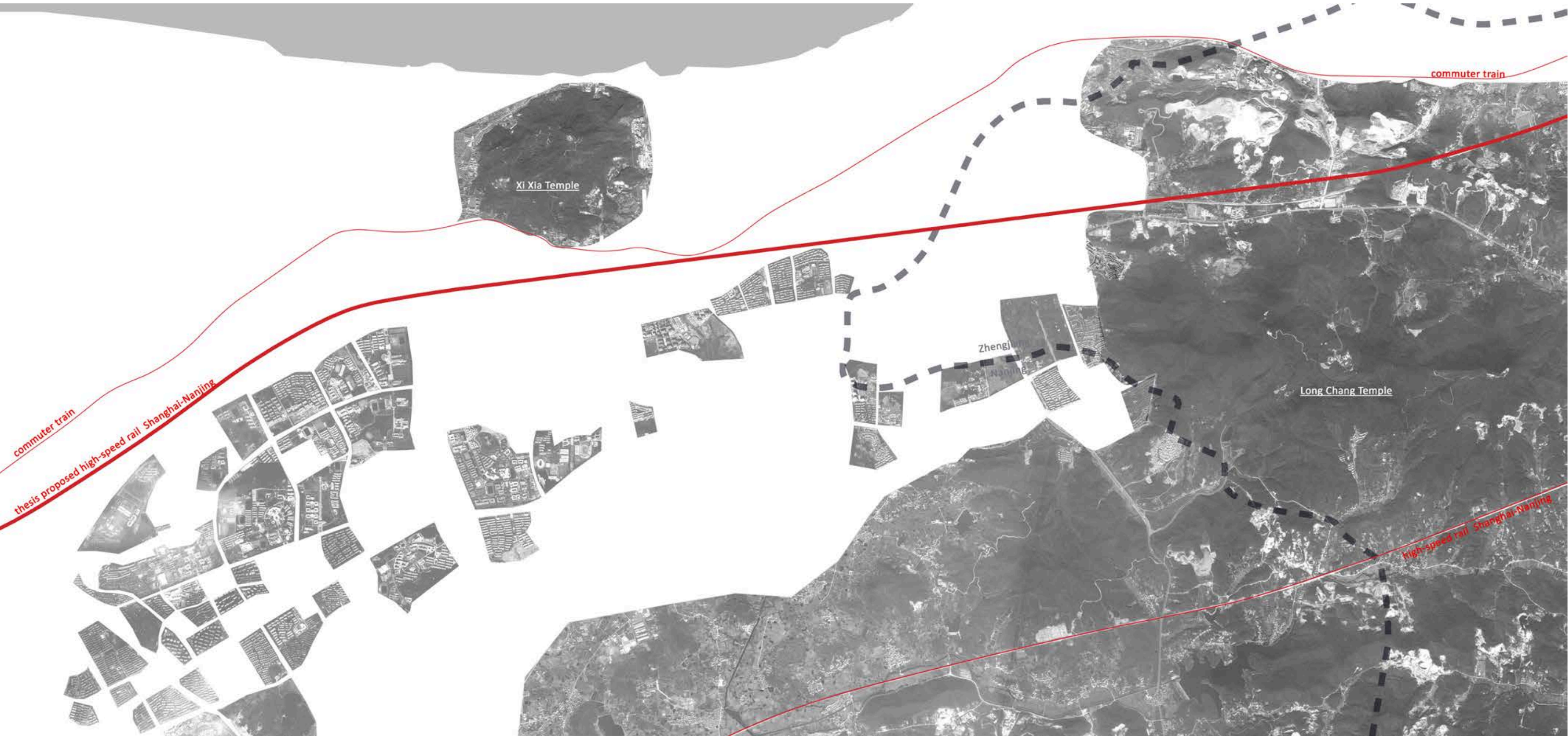
RESIDENTIAL PROJECT RENDERING



PROPOSED TRANSPORTATION SYSTEM FOR NEW BAOHUA TOWN

NEW PROPOSED HIGH-SPEED RAIL ROUTE FOR BAOHUA TOWN

In order to form a dominant city axis centering the High-Speed Rail, the original curved route was straightened. This straight spine will connect Baohua Town with Nanjing and the rich resources in Nanjing will be able to reach Baohua and compliment the urban life of the new town.



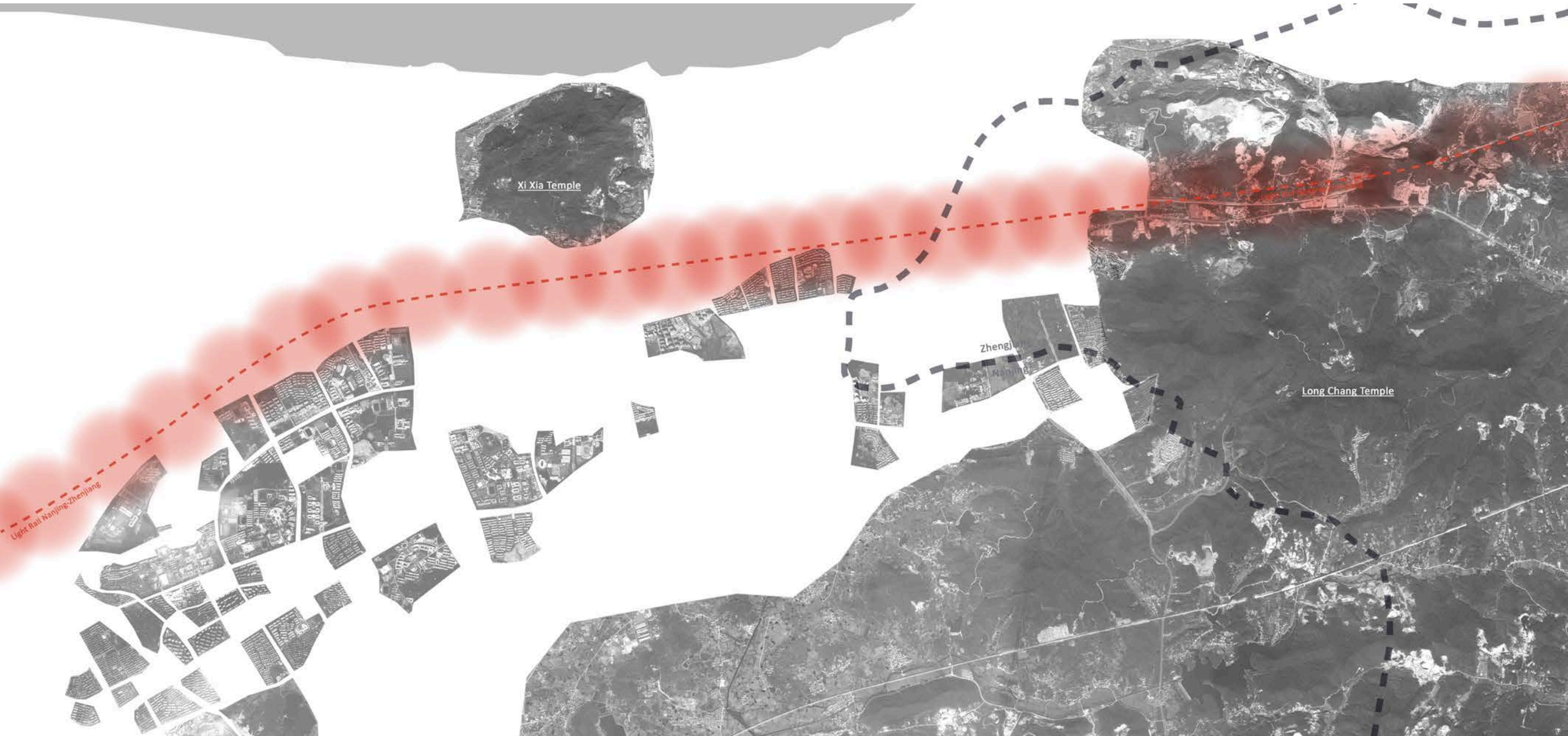
NEW HIGHWAY ROUTE AND EXITS

The highway is also straightened and aligned with the new High-Speed Rail route and four exit intersections are planned along the route to enable vehicular access to landmark spaces in the new town.



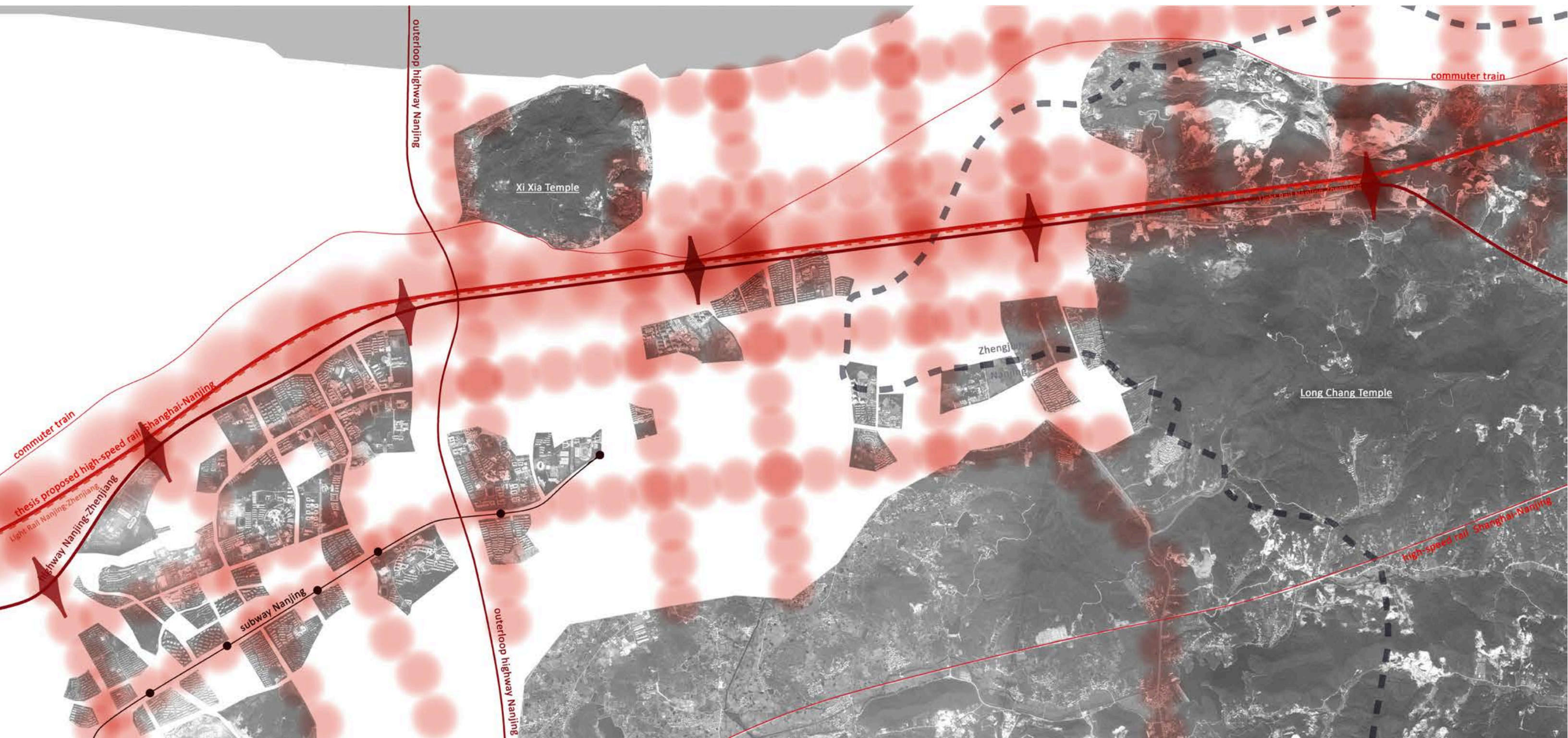
LIGHTRAIL SYSTEM BETWEEN NANJING AND ZHENJIANG

To make this new axis more accessible for pedestrians, a new light-rail train system is also introduced to connect Nanjing, Baohua and Zhenjiang. With stops every 800m, the city axis would provide a convenient transportation system to support the town as a satellite city for those large metropolis.



TOTAL TRANSPORTATION SYSTEM WITH PROJECTED BUS SYSTEM

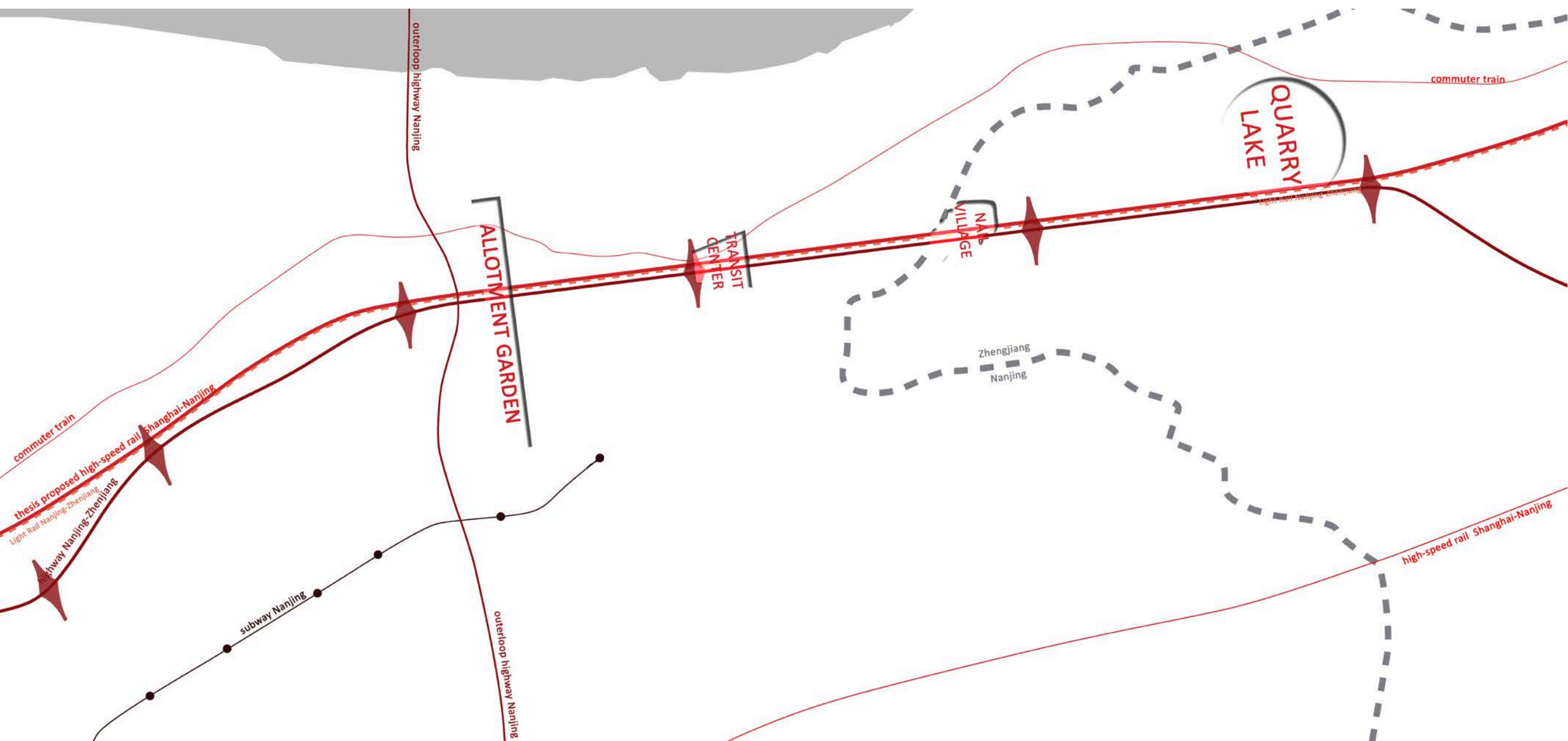
Growing from the city center, a bus system better connect the local commuting population access to different landmark spaces along the High-Speed Rail route. The route becomes a pedestrian friendly, populated spine for the urban life in the town.



PROPOSED URBAN LANDMARKS TO FORM THE CENTER OF NEW BAOHUA TOWN

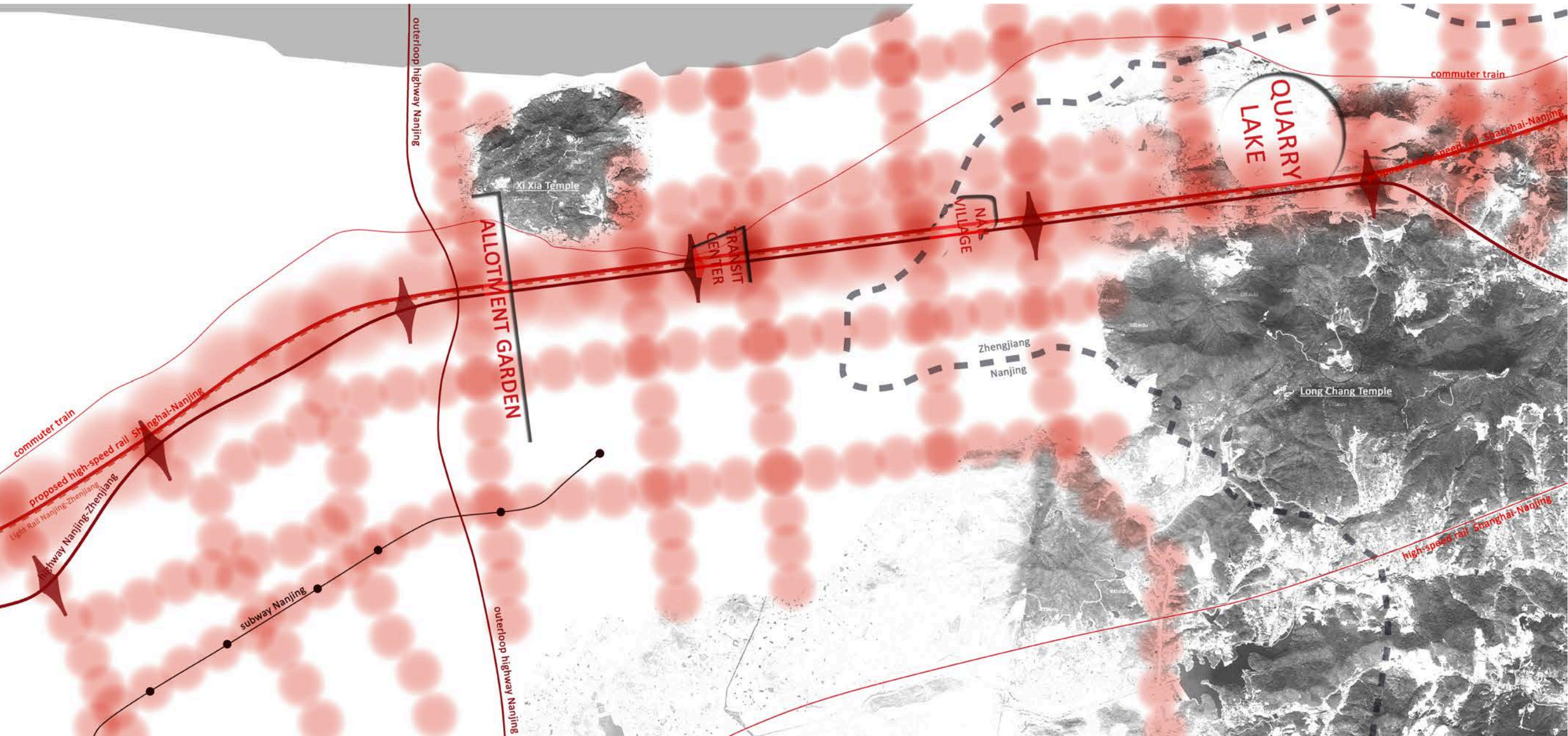
FOUR LANDMARK SPACES ALONG THE LINE

Beside the new axis in Baohua Town, four landmark spaces are planned and designed along the spine. These landmark spaces have reserved low-density leisure places for the future town with a high-density of population. At the same time, with creative strategies, they are intended to blend the vernacular culture and industries into the growth of the new town.

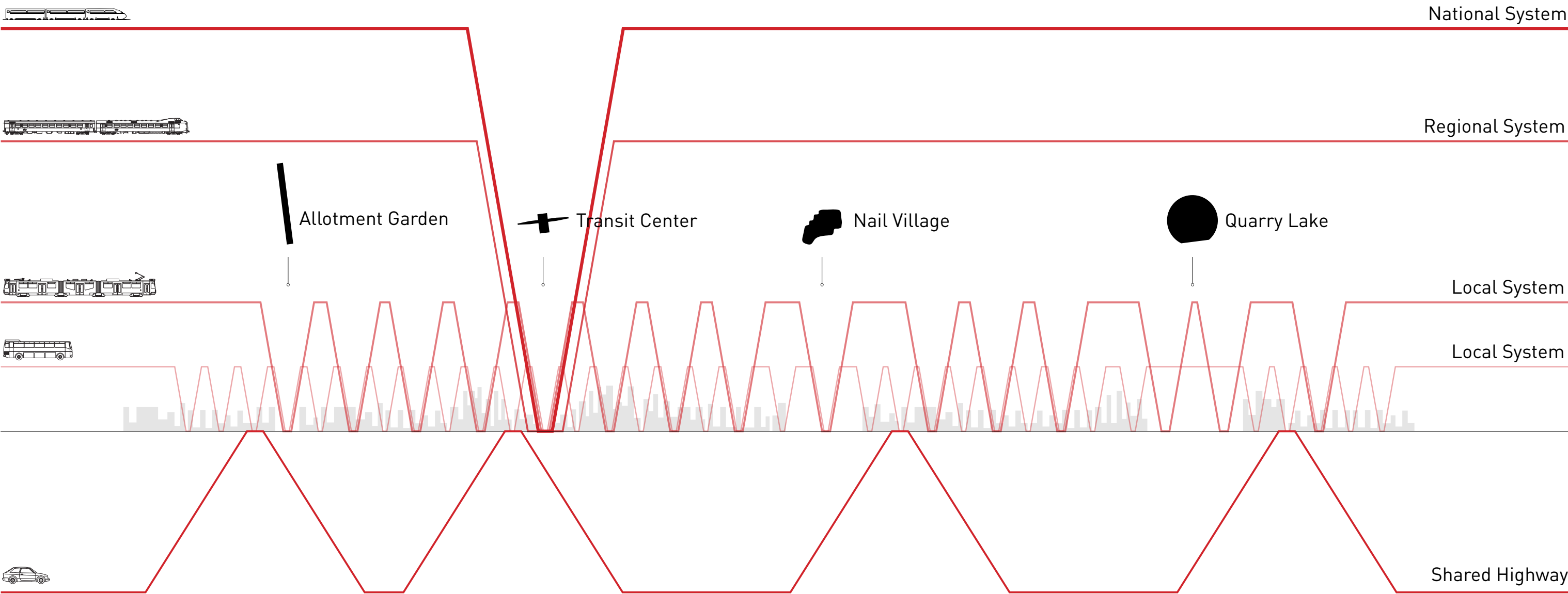


TRANSPORTATION SYSTEM TO SUPPORT THE LINE AND LANDMARK SPACE

The allotment gardens enable agriculture to be part of the urban life in the city. The Nail Village provides options for local villagers who choose to live in their old houses, or re-locate to the new town. The Quarry Lake reused the holes of quarry industry to provide a poetic recreational space. Finally, the Transit Center where all the local and regional transportation routes meet, has been designed to provide a sloped plaza where the dense city fabric opens up and welcomes people to experience the city.

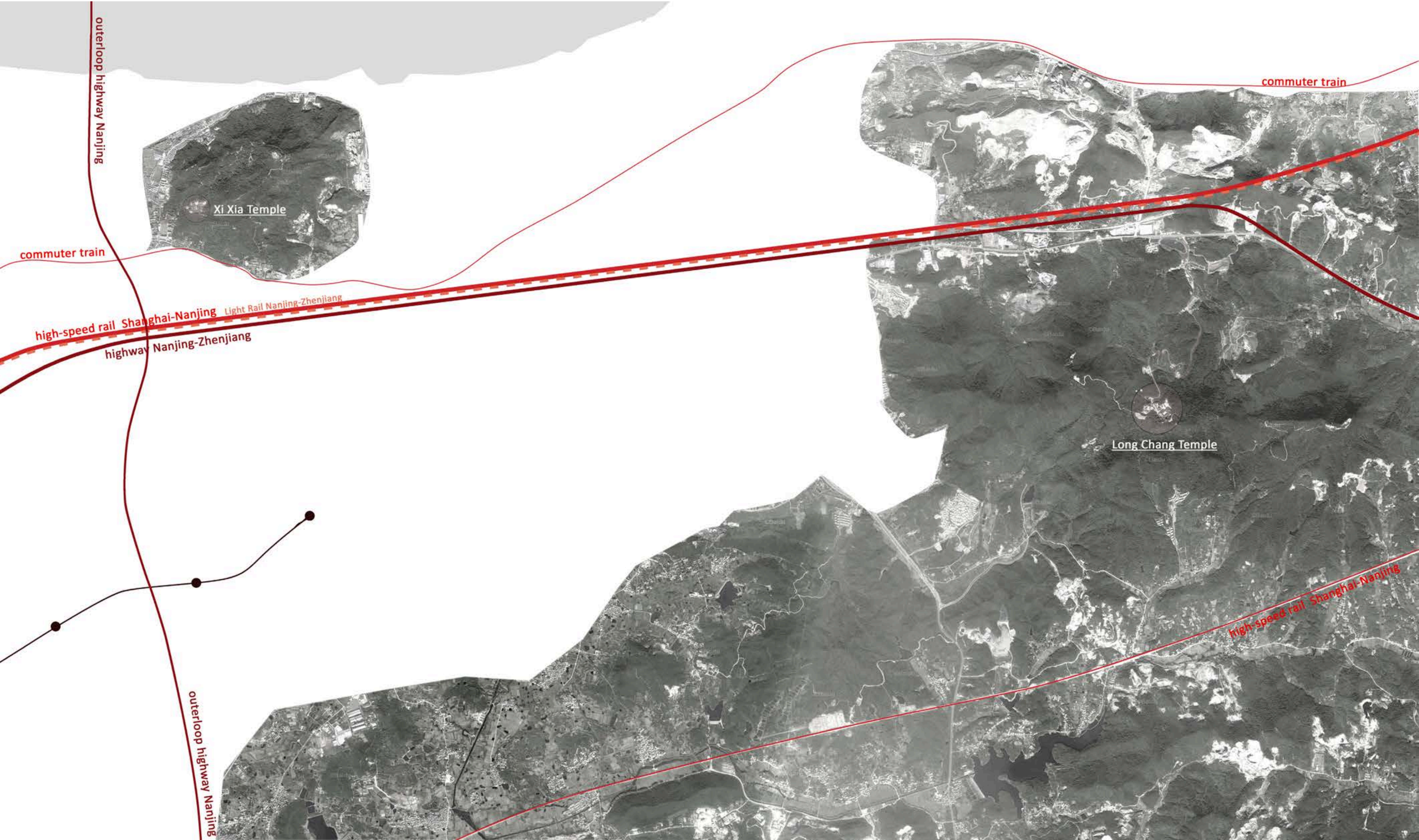


TRANSPORTATION SYSTEM ALONG THE LINE



PROJECTIONS: FUTURE DEVELOPMENT OF NEW BAOHUA TOWN

2018 INFRASTRUCTURE LINE BUILT



2021 LANDMARK SPACES AND SURROUNDINGS



2024 AREA ALONG THE LINE DEVELOPED



2027 DEVELOPMENT TO THE SOUTH AND NORTH PARTS OF THE TOWN



2030 EXPANSION OF NANJING AND ZHENJIANG REACH BAPHUA TOWN AT WEST AND EAST



Xi Xia Temple

Long Chang Temple

2033 THE NEW TOWN FULLY DEVELOPED WITH DENSE POPULATION

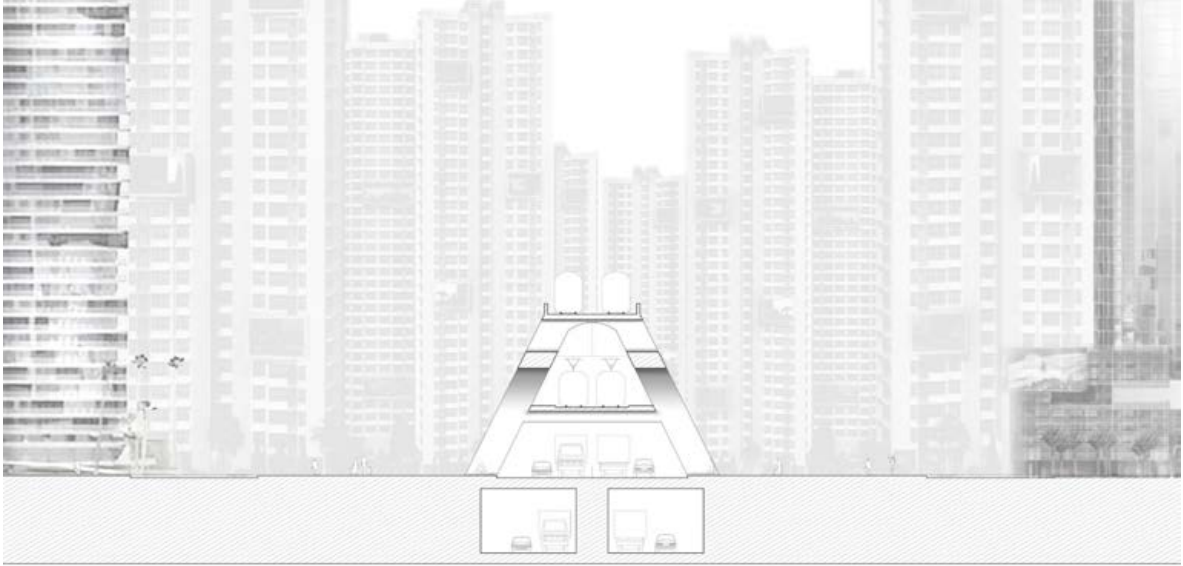


THE LINE

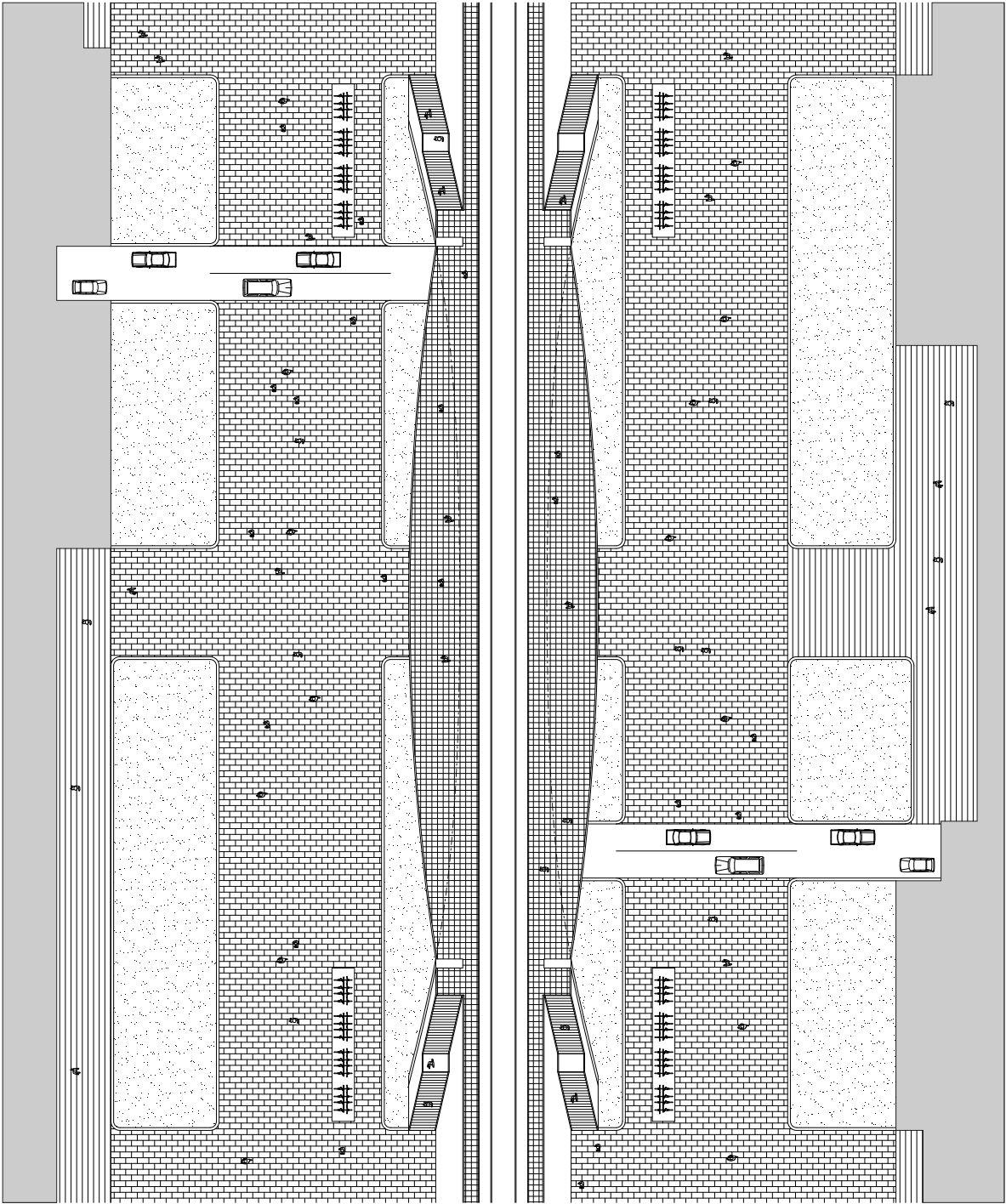


STANDARD STRUCTURE

A



SECTION



PLAN

STANDARD STRUCTURE



STANDARD STRUCTURE



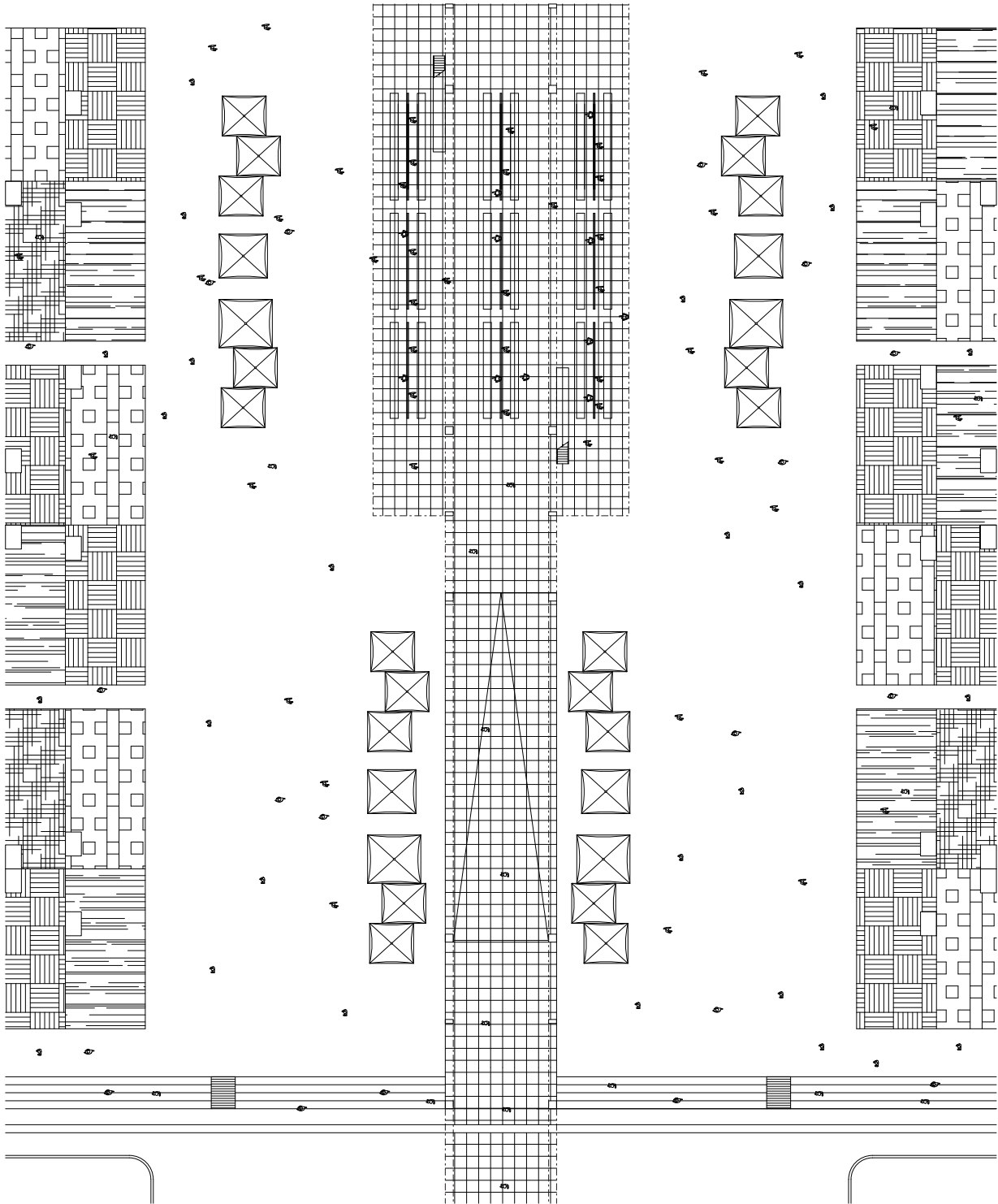
ALLOTMENT GARDEN



ALLOTMENT GARDEN



SECTION



PLAN

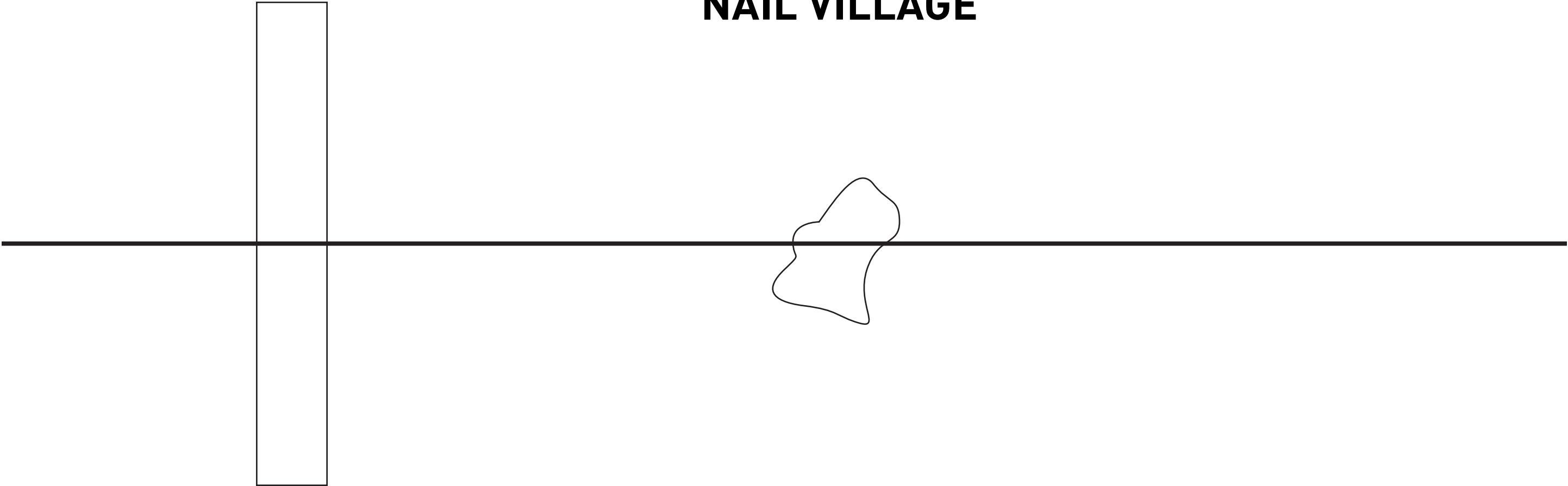
ALLOTMENT GARDEN



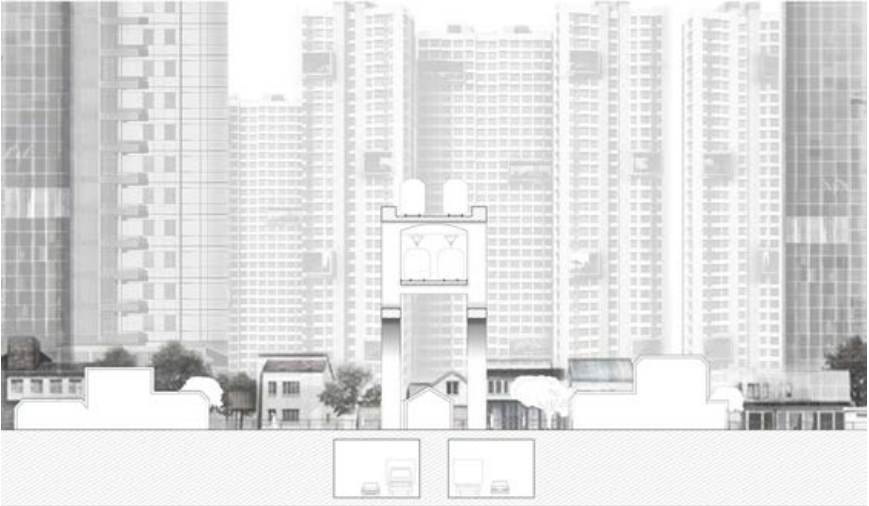
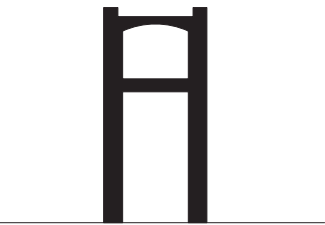
ALLOTMENT GARDEN



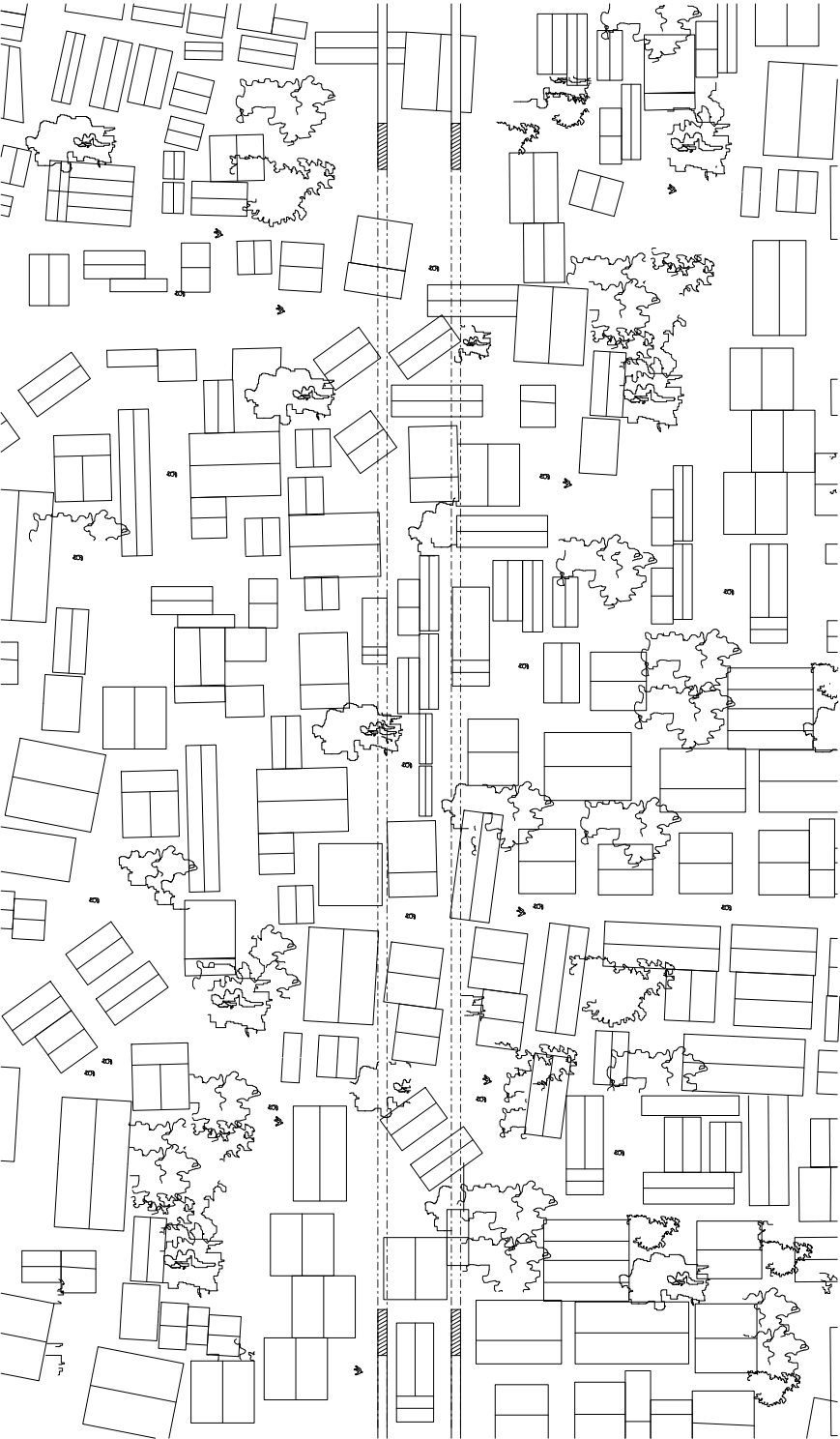
NAIL VILLAGE



NAIL VILLAGE



SECTION



PLAN

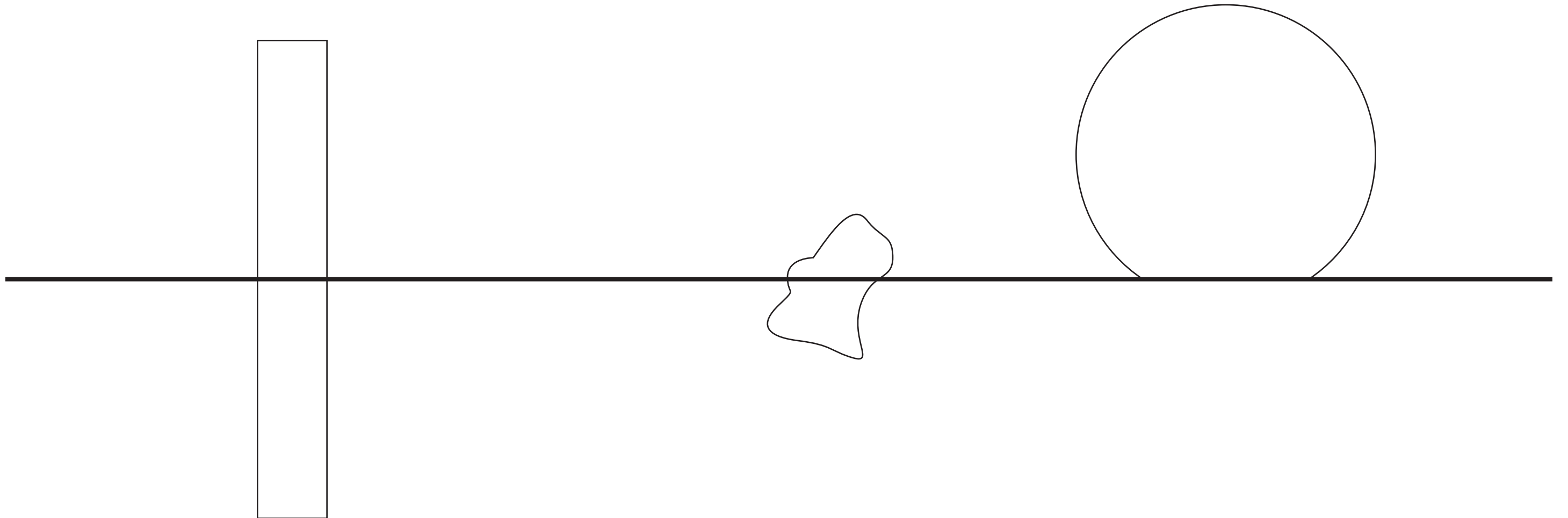
NAIL VILLAGE



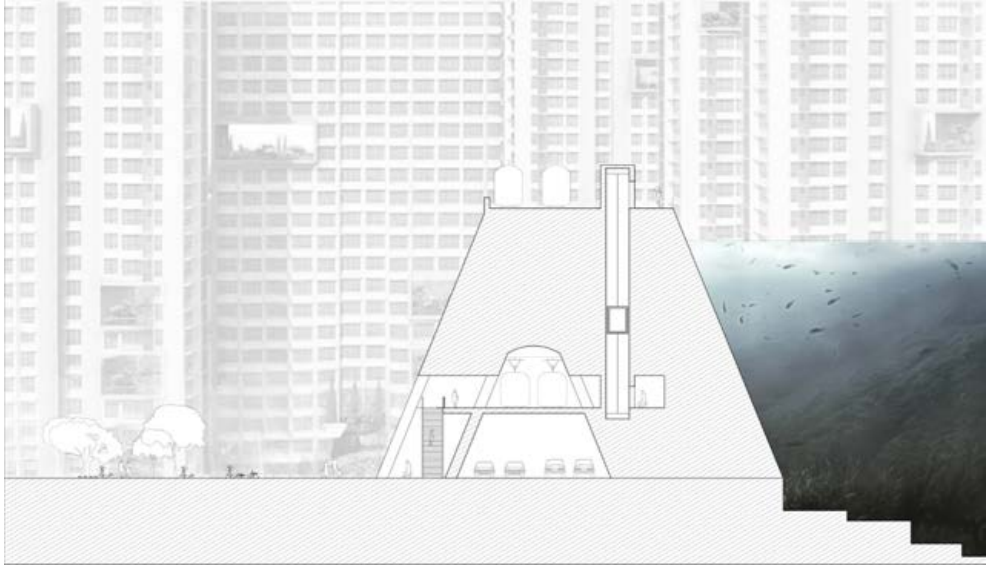
NAIL VILLAGE



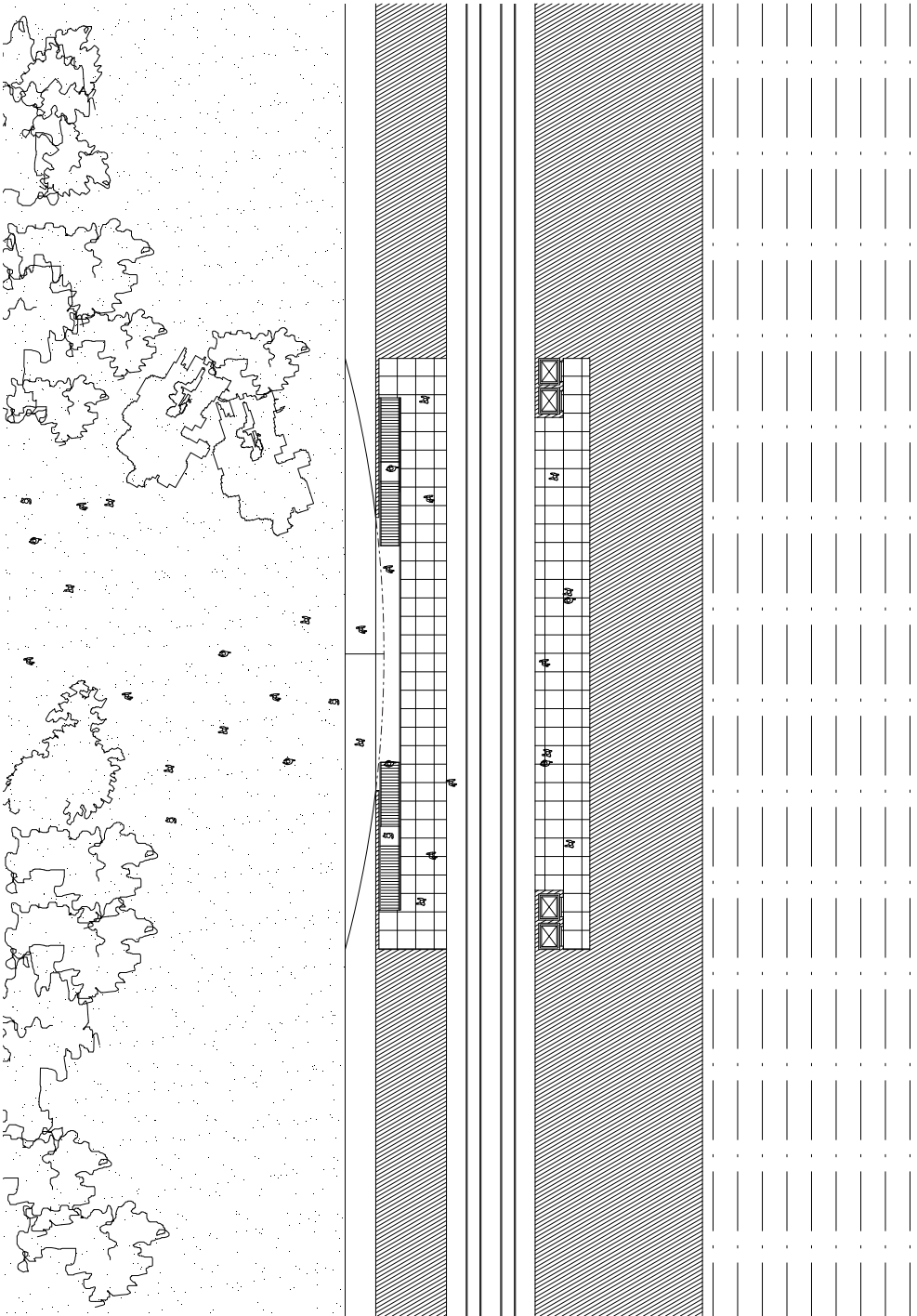
QUARRY LAKE



QUARRY LAKE



SECTION



PLAN

QUARRY LAKE

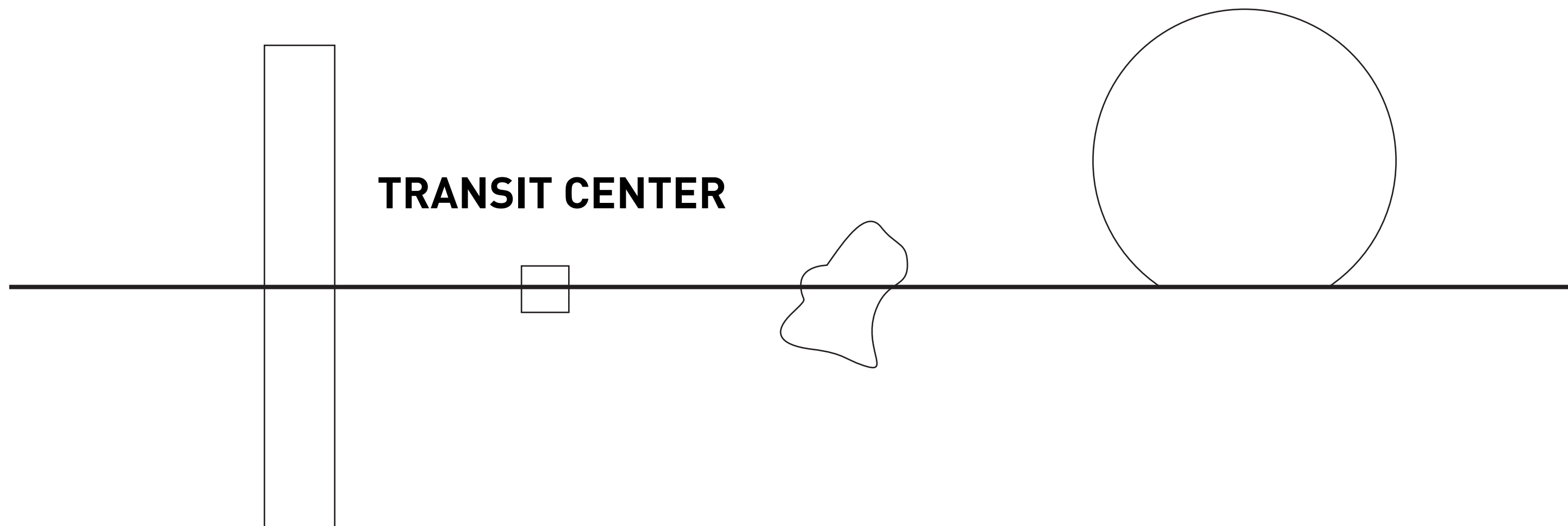


QUARRY LAKE

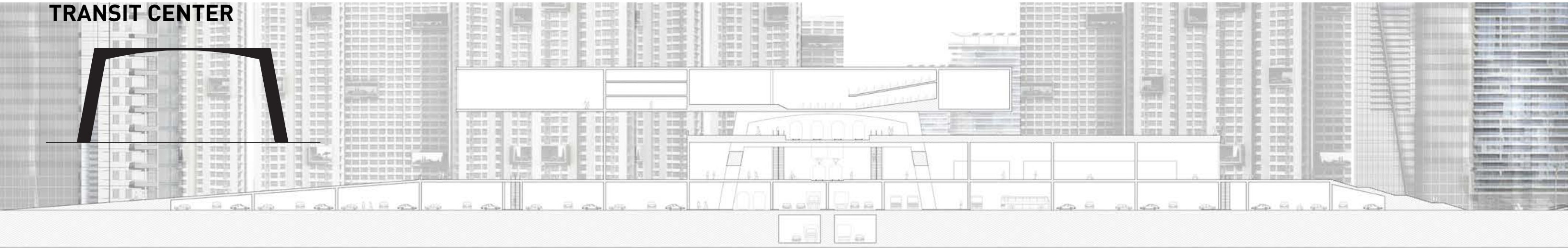


QUARRY LAKE

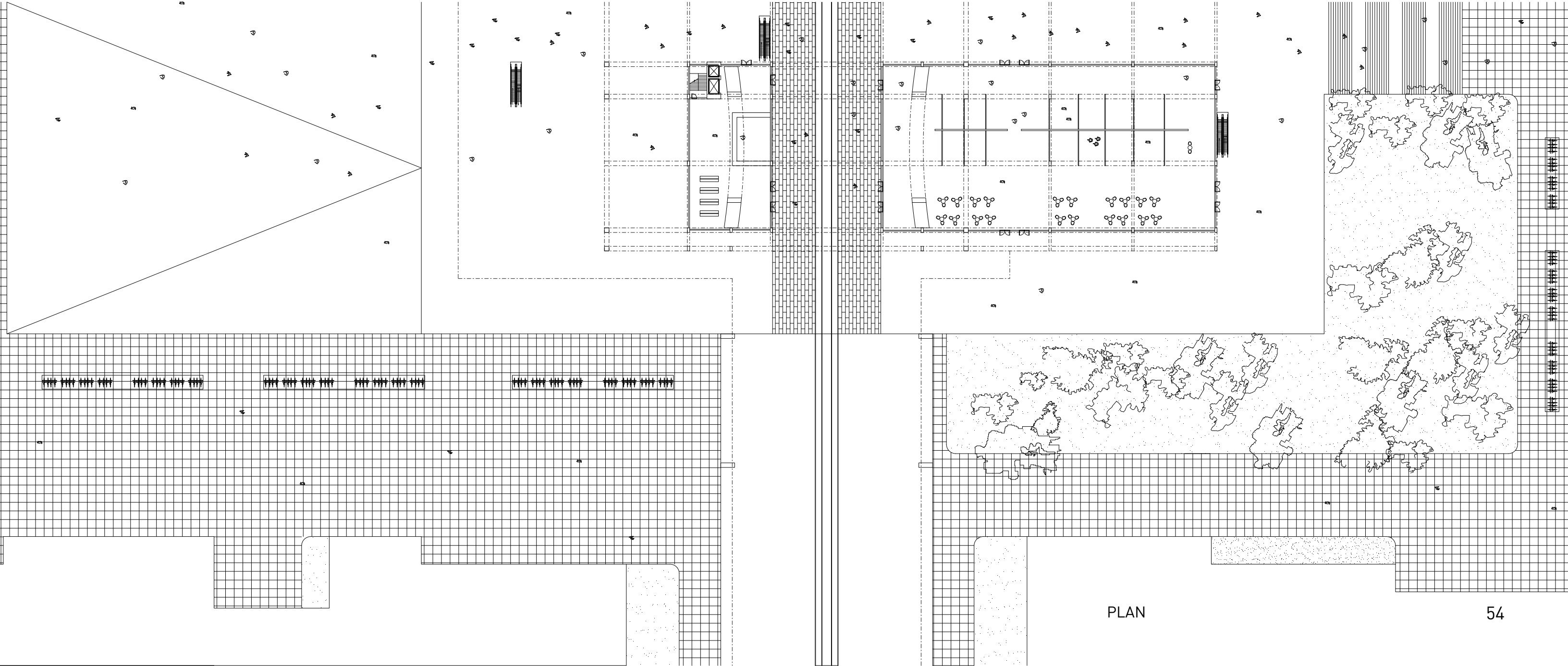




TRANSIT CENTER



SECTION



PLAN

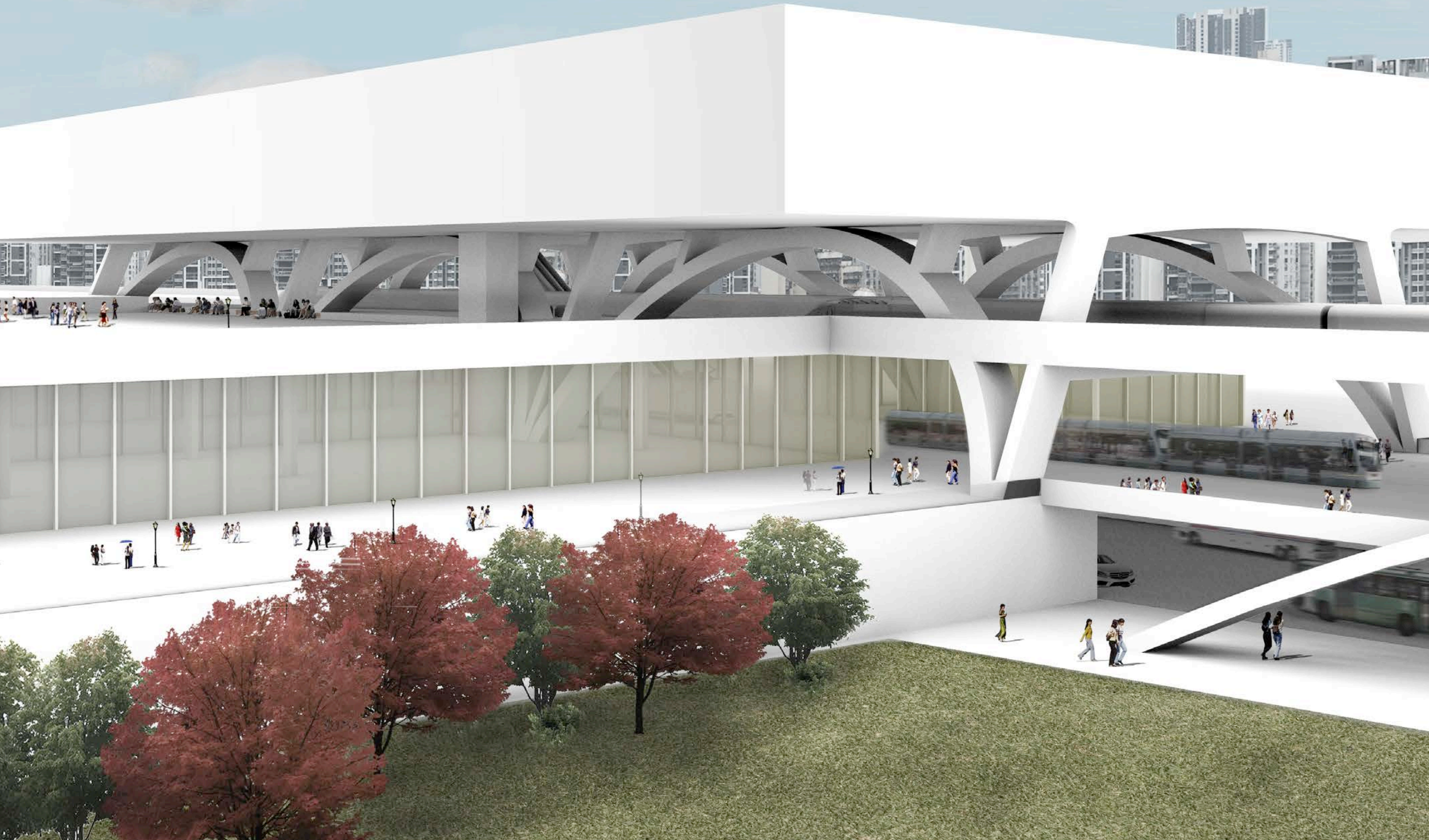
TRANSIT CENTER



TRANSIT CENTER

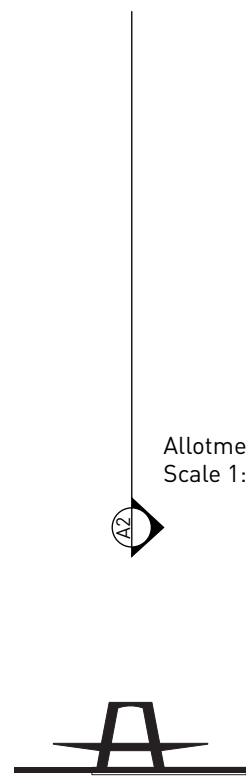
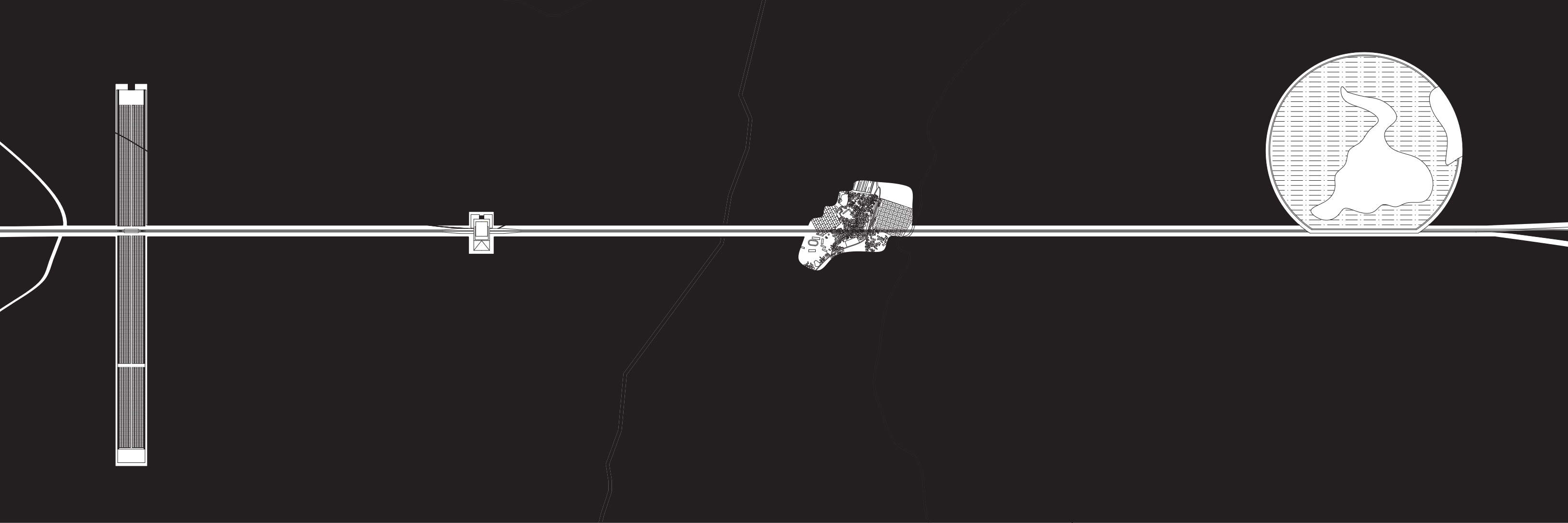


TRANSIT CENTER

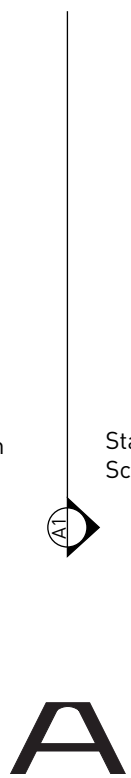


TRANSIT CENTER

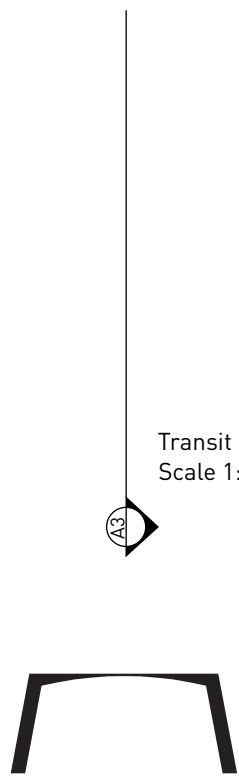




Allotment Garden Section
Scale 1:200



Standard Section
Scale 1:200



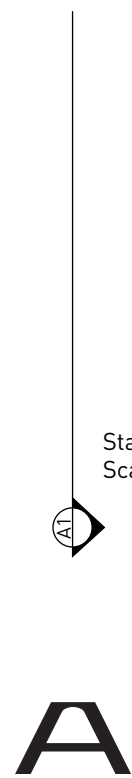
Transit Center Section
Scale 1:200



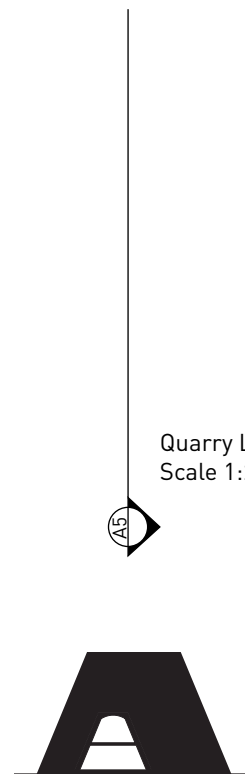
Standard Section
Scale 1:200



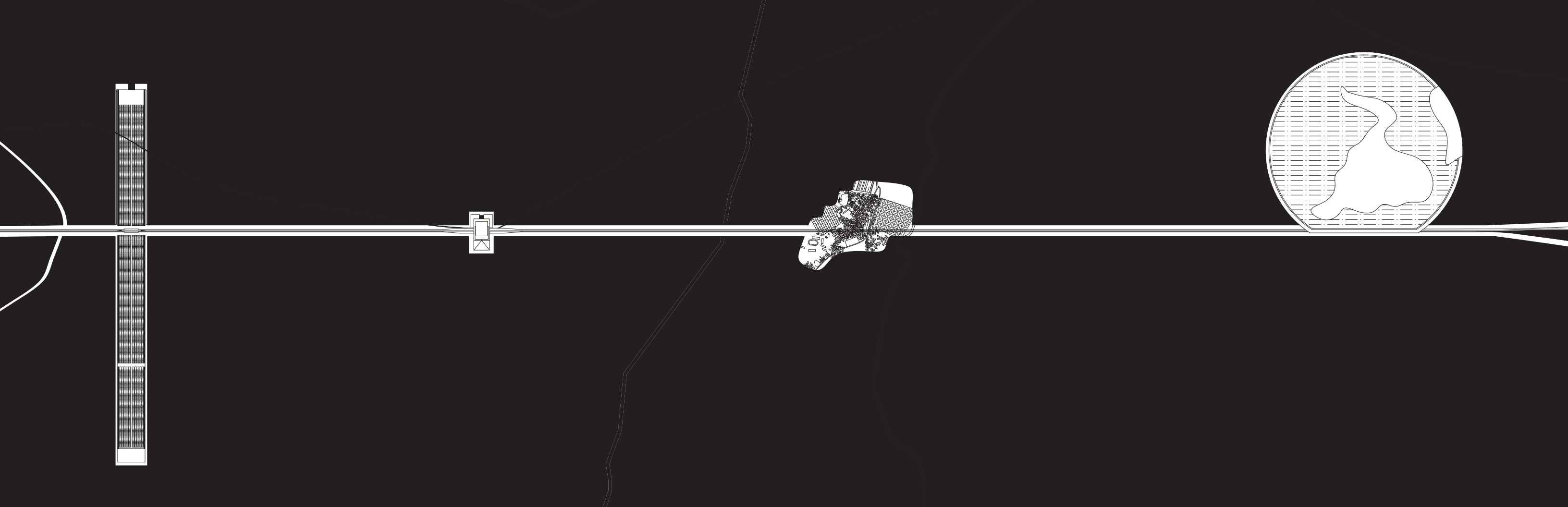
Nail Village Section
Scale 1:200



Standard Section
Scale 1:200



Quarry Lake Section
Scale 1:200



CONCLUSION

Connecting the four public spaces, the new infrastructure forms the axis of the public life in the city. This system not only serves the local lifestyles, but also becomes an urban promenade that guides visitors who arrived on the High-Speed Rail train system to experience the city and the culture it offers.

The thesis redefines the relationship between the city and the infrastructure, where the infrastructure is not simply designed for transportation, but transformed into a public space available for the urban life consumption. Through the planning of the urban axis, the infrastructure efficiently supports people to commune locally, regionally and nationally. At the same time, though architectural interventions in the city, the infrastructure is designed to connect and blend into the landmark spaces and becomes an urban promenade to experience and enjoy the city from within.

APPENDIX

ALONG THE LINE

城市动脉

From 2008 to 2013, a new, 13,000-km long high-speed rail system was built in China. Crossing all regions of the country, this new infrastructural system connects more than forty major cities and exposes millions of passengers to the rapidly growing suburban towns along the rail everyday. Commuting has become more convenient and hence suburban towns at the periphery of larger cities tend to develop rapidly into densely inhabited satellite towns for metropolitans. Along the high-speed rail network, a new urban grid is taking shape and gradually replacing existing industries and stretches of rural settings and the countryside.

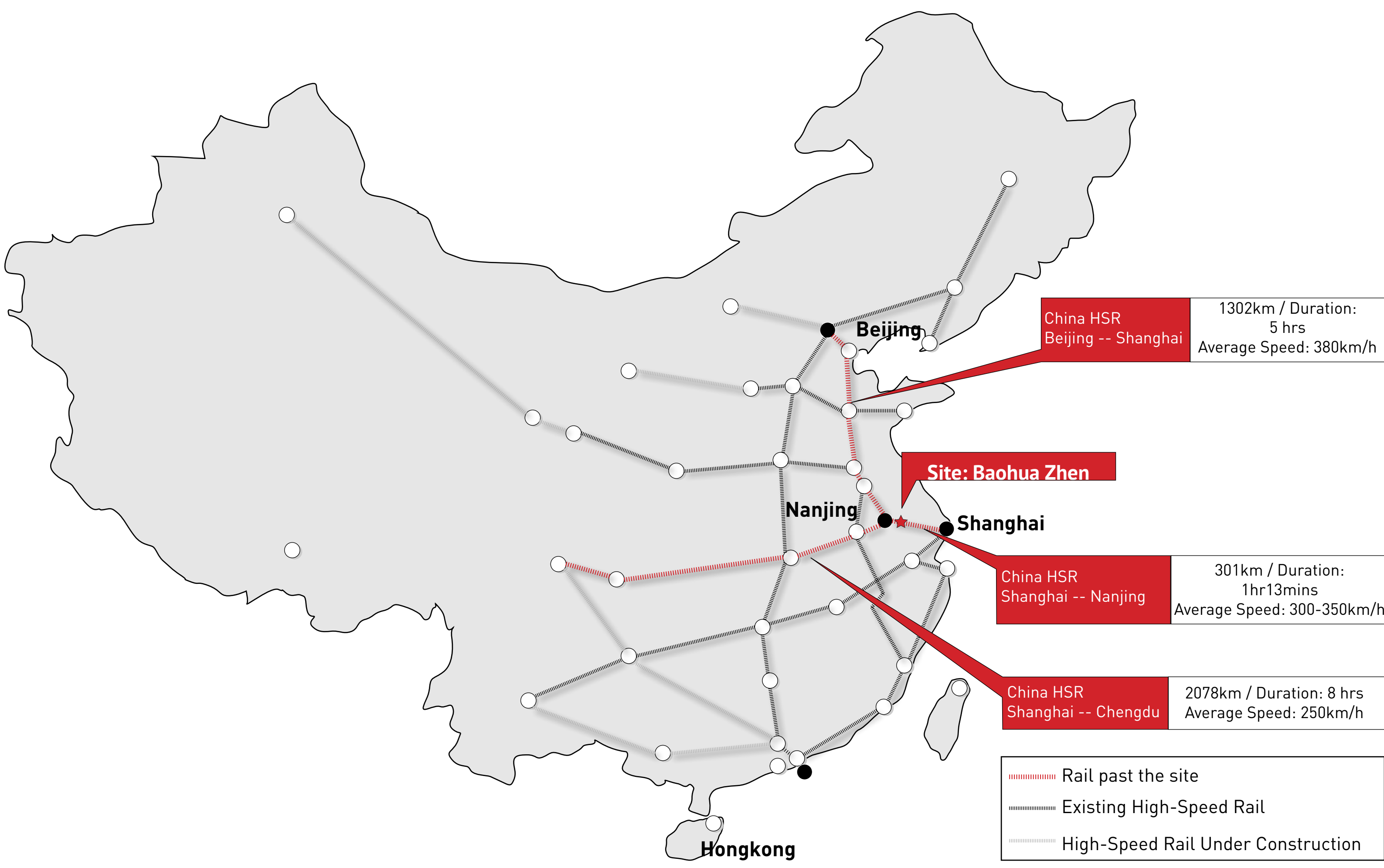
Facing the large amount of immigrants and growing development, the suburban towns demand new urban strategies for its growth. The thesis proposes to develop the high speed rail as an urban axis that will trigger the city development. Through design and plan of the axis and the landmark space it connects, the future satellite city will not only embrace the resource brought by high speed rail, but also re-thinks the function of infrastructure and design it as a public space to connect city landmarks. These landmark urban space has reserved low-density leisure places for the future town of a high-density of population. At the same time, with creative strategies, they are intended

to blend the vernacular culture and industries into the growth of the new town. The allotment gardens enabled agriculture to be part of the urban life. The nail village provided options for local villagers to choose live in their old houses, or move to the new town. The quarry lake reused the holes of quarry industry to provide a poetic lake space. Finally, the transit center where all the local and regional transportation routes meet, has been designed to provide a generous plaza, where the dense city fabric opens up and welcomes people to experience the city. Connecting the four public space, the infrastructure forms the axis of the public life in the city. It not only serves the life of local residents, but also becomes an urban promenade that guides visitors brought by high-speed rail to experience the city and its culture.

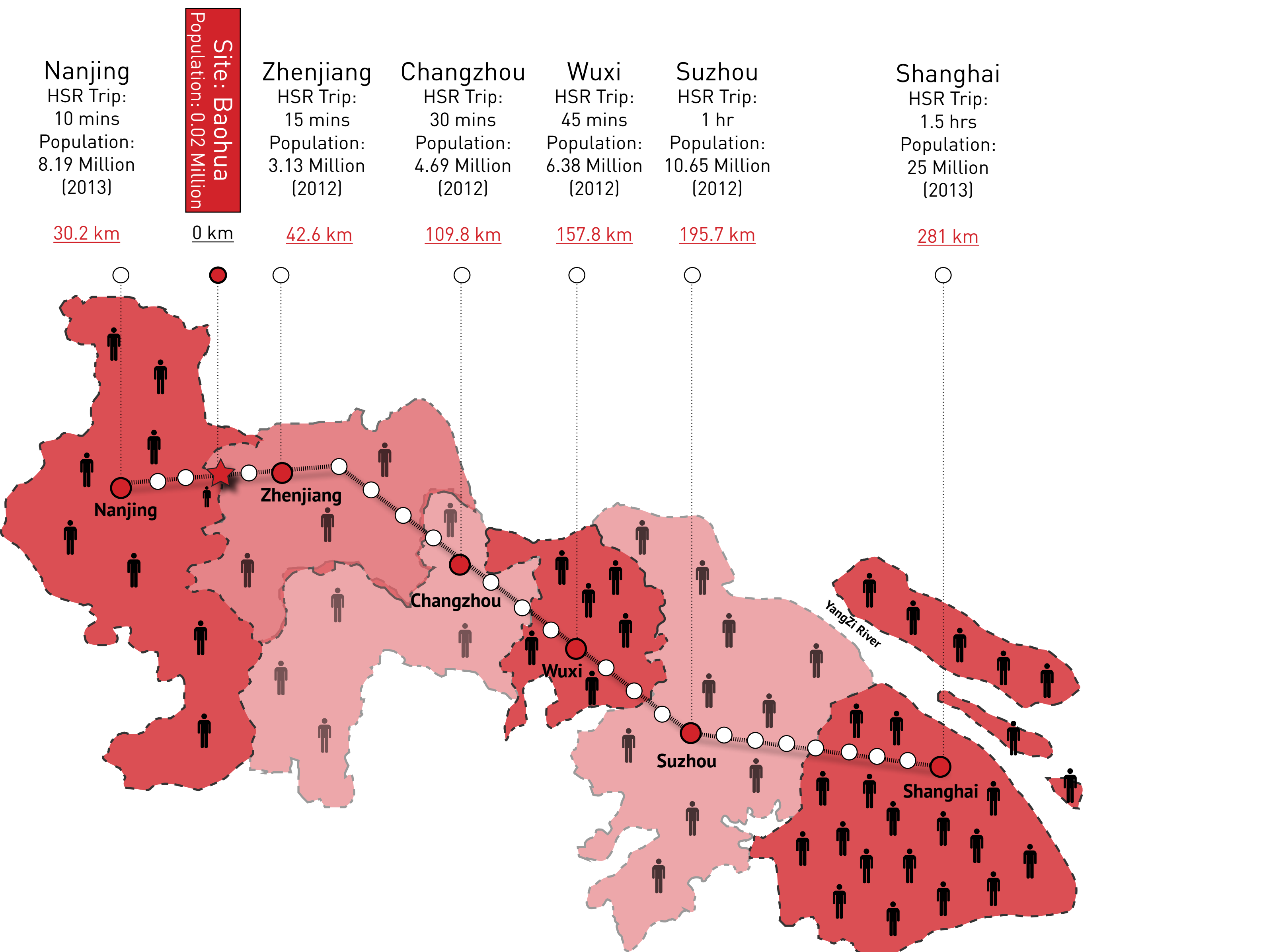
The thesis redefines the relationship between city and infrastructure. The infrastructure is not simply designed for transportation, but transformed into occupiable public space. Through the urban planning of the spine, the infrastructure efficiently supports people to commute locally, regionally and nationally. Through architectural intervention, in the city, the infrastructure is designed to connect and blend into the landmark spaces. It become an urban promenade to experience and enjoy the city.



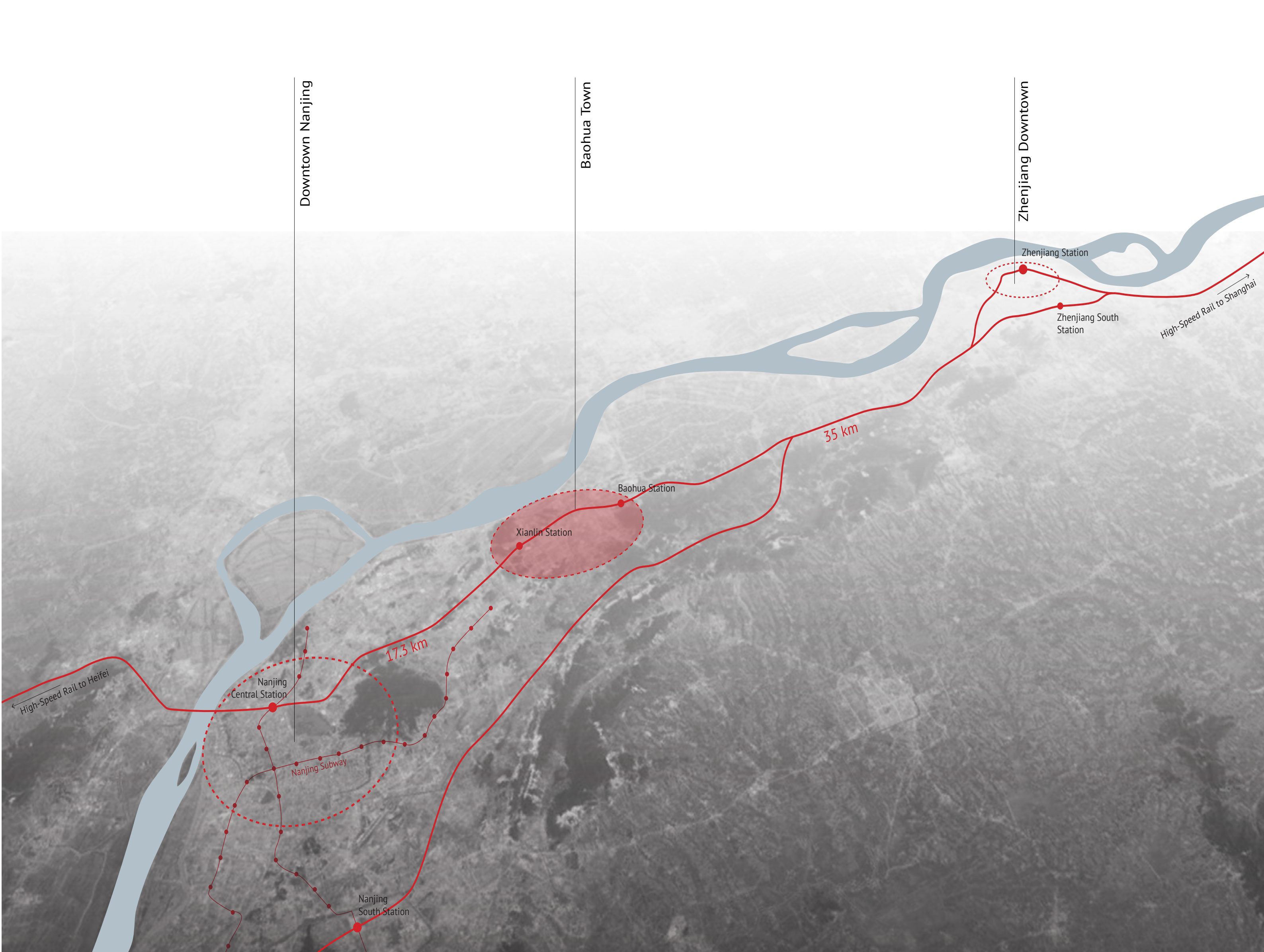
THE HIGH-SPEED RAIL SYSTEM IN CHINA



THREE MAJOR HIGH-SPEED RAILWAYS CONNECTING TO BAOHUA



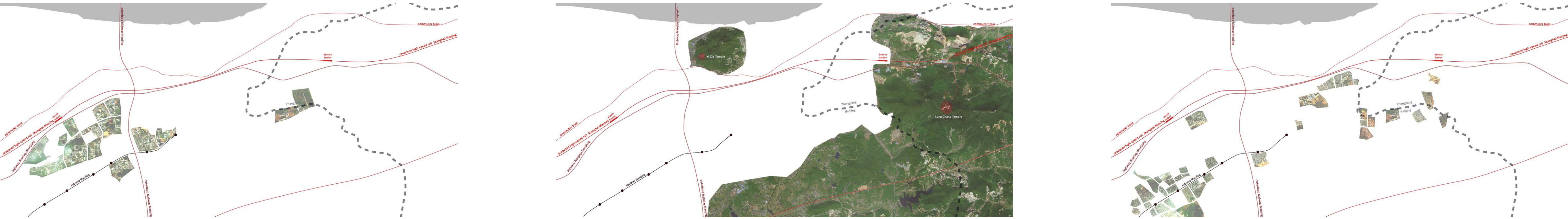
BAOHUA TOWN ALONG THE RAILWAY BETWEEN NANJING AND SHANGHAI



CONNECTION AMONG NANJING, BAOHUA AND ZHENJIANG



EXISTING TRANSPORTATION SYSTEM CONNECTING BAOHUA WITH NANJING

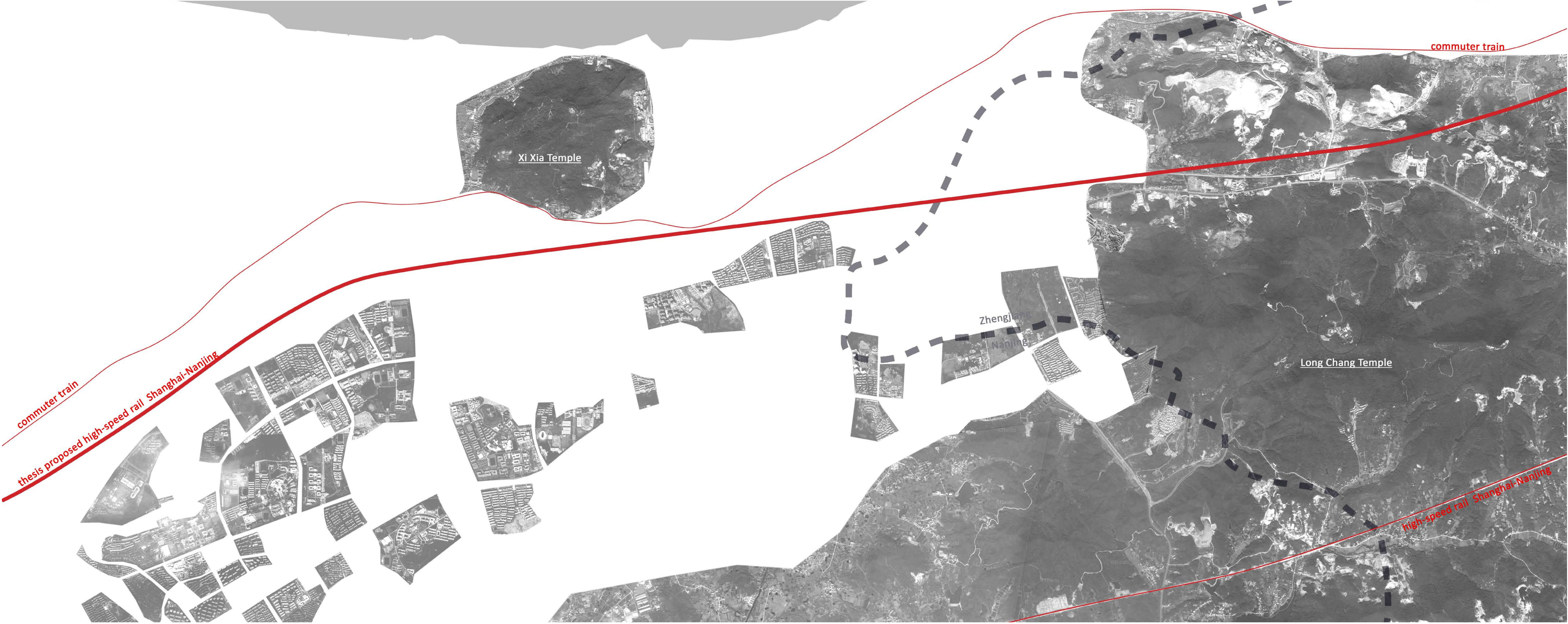


EDUCATION_ UNIVERSITY CAMPUSES

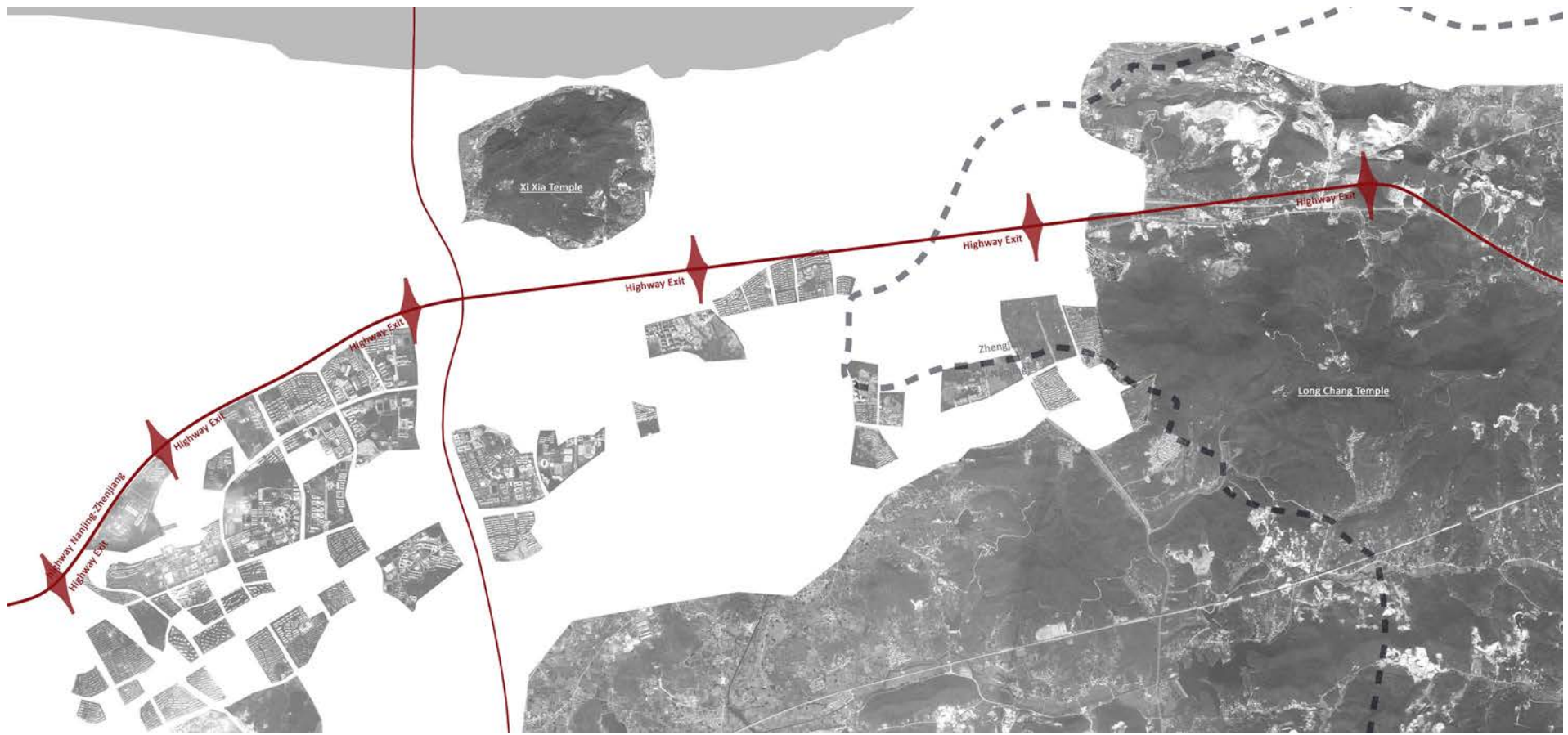
TOURISM_ BAOHUA NATIONAL PARK

RESIDENTIAL PROJECTS

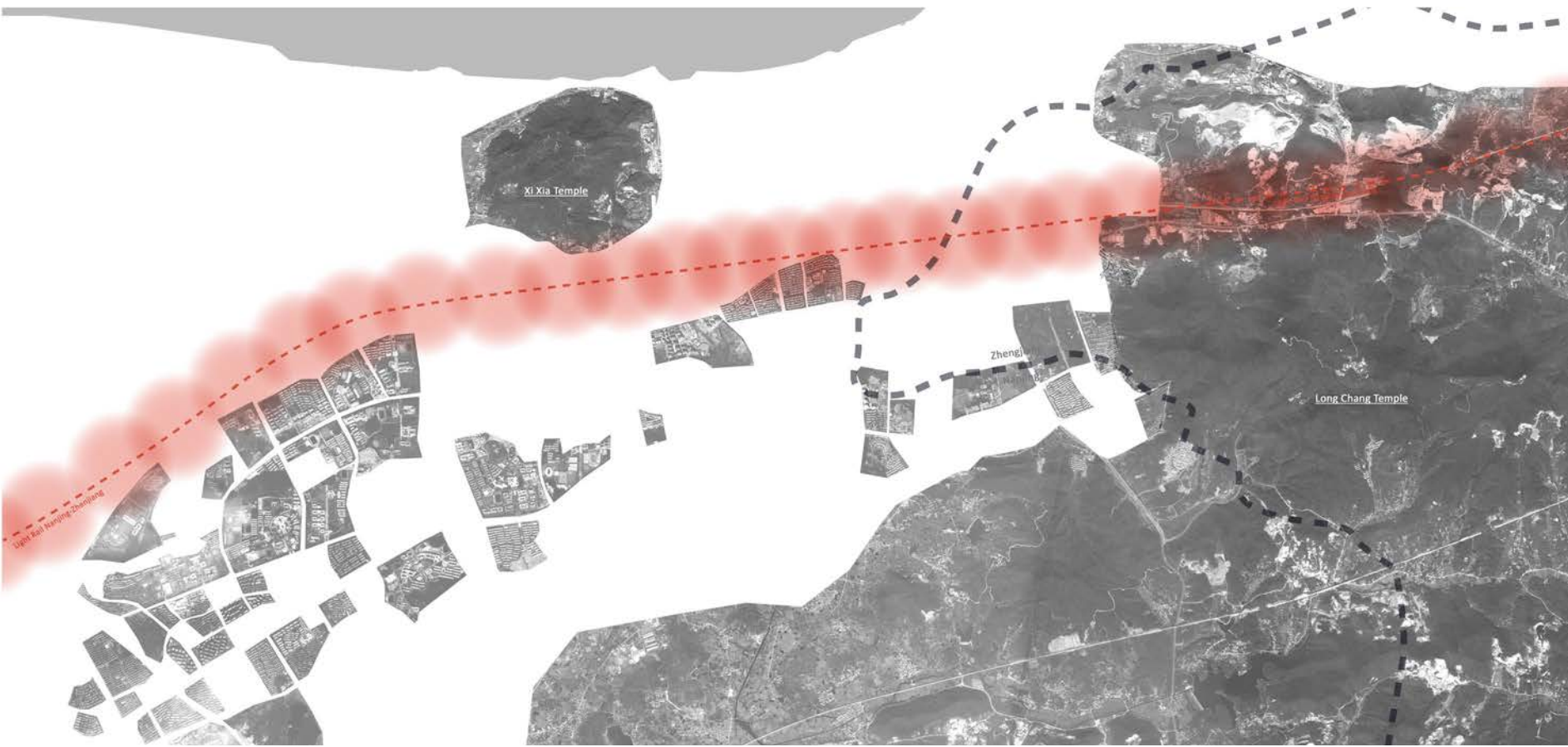
EXISTING LOCAL RESOURCE FOR FUTURE POPULATION



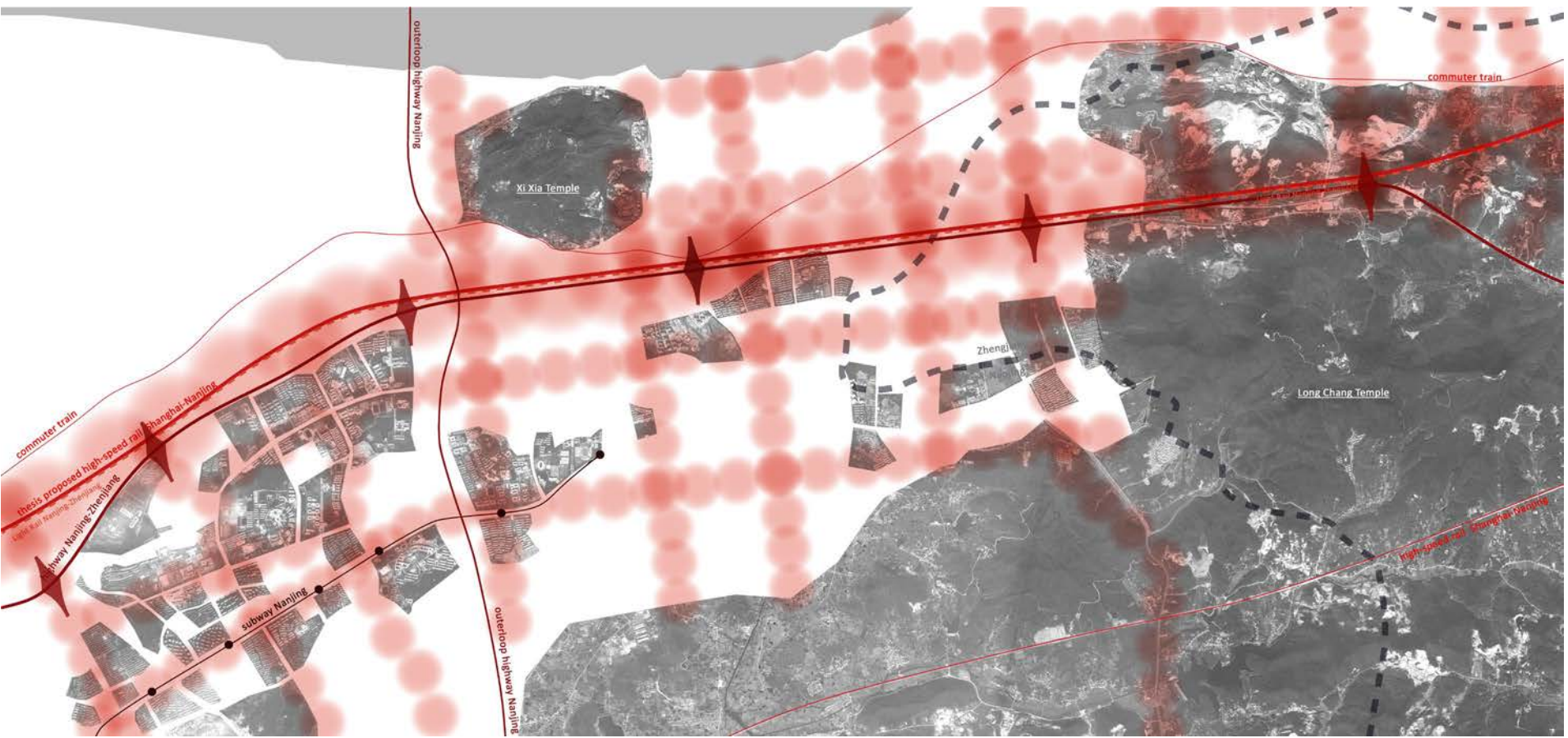
NEW PROPOSED HIGH-SPEED RAIL ROUTE



PROPOSED HIGHWAY AND EXITS

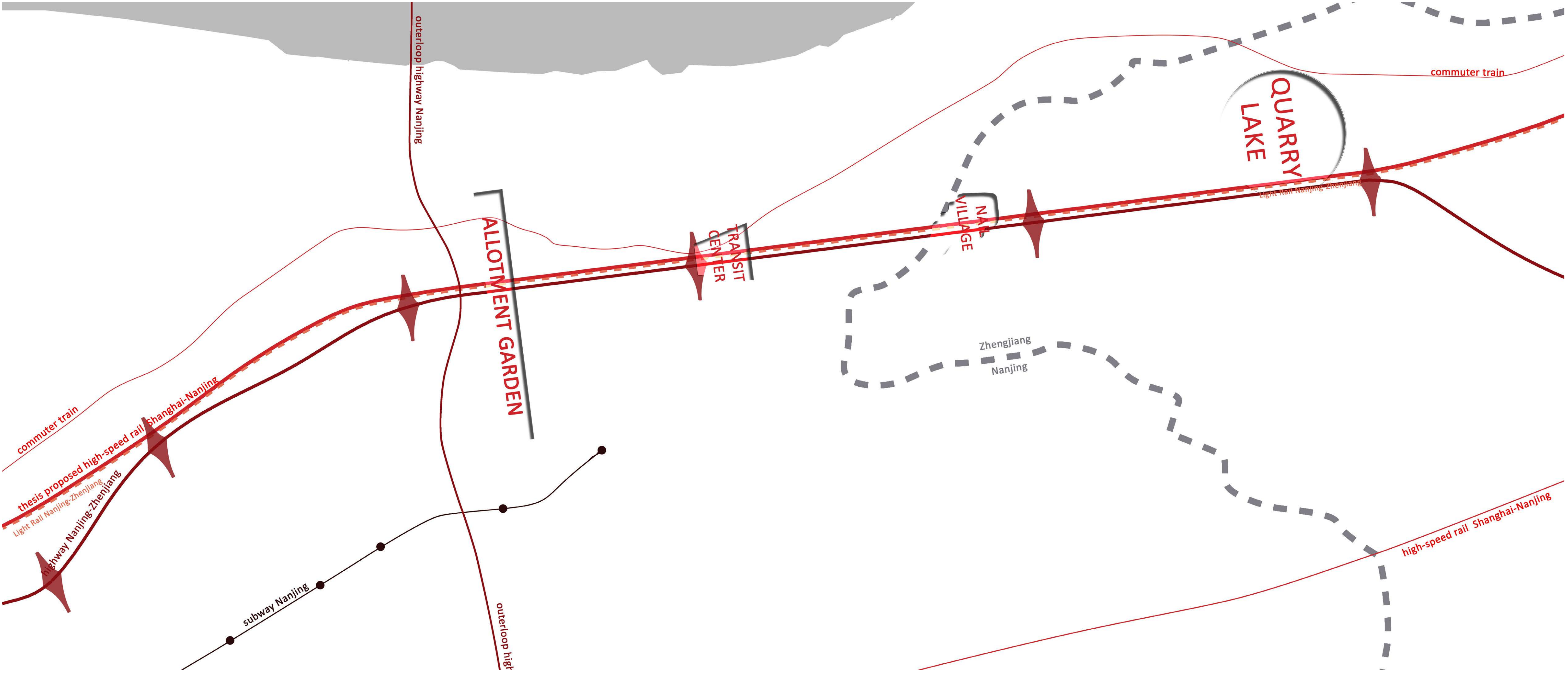


PROPOSED LIGHTRAIL NANJING - ZHENJIANG

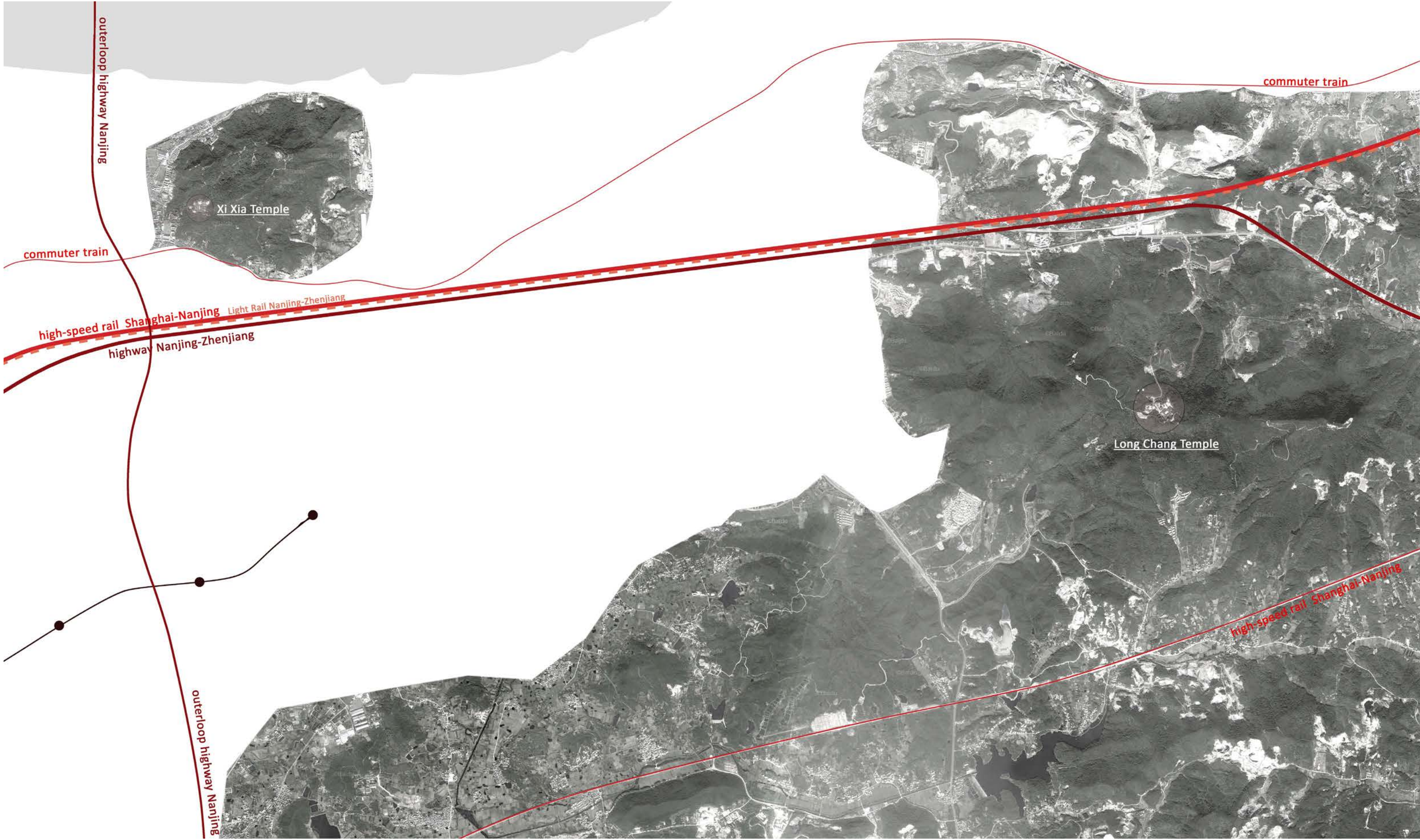


PROJECTED BUS SYSTEM

PROPOSED TRANSPORTATION SYSTEM



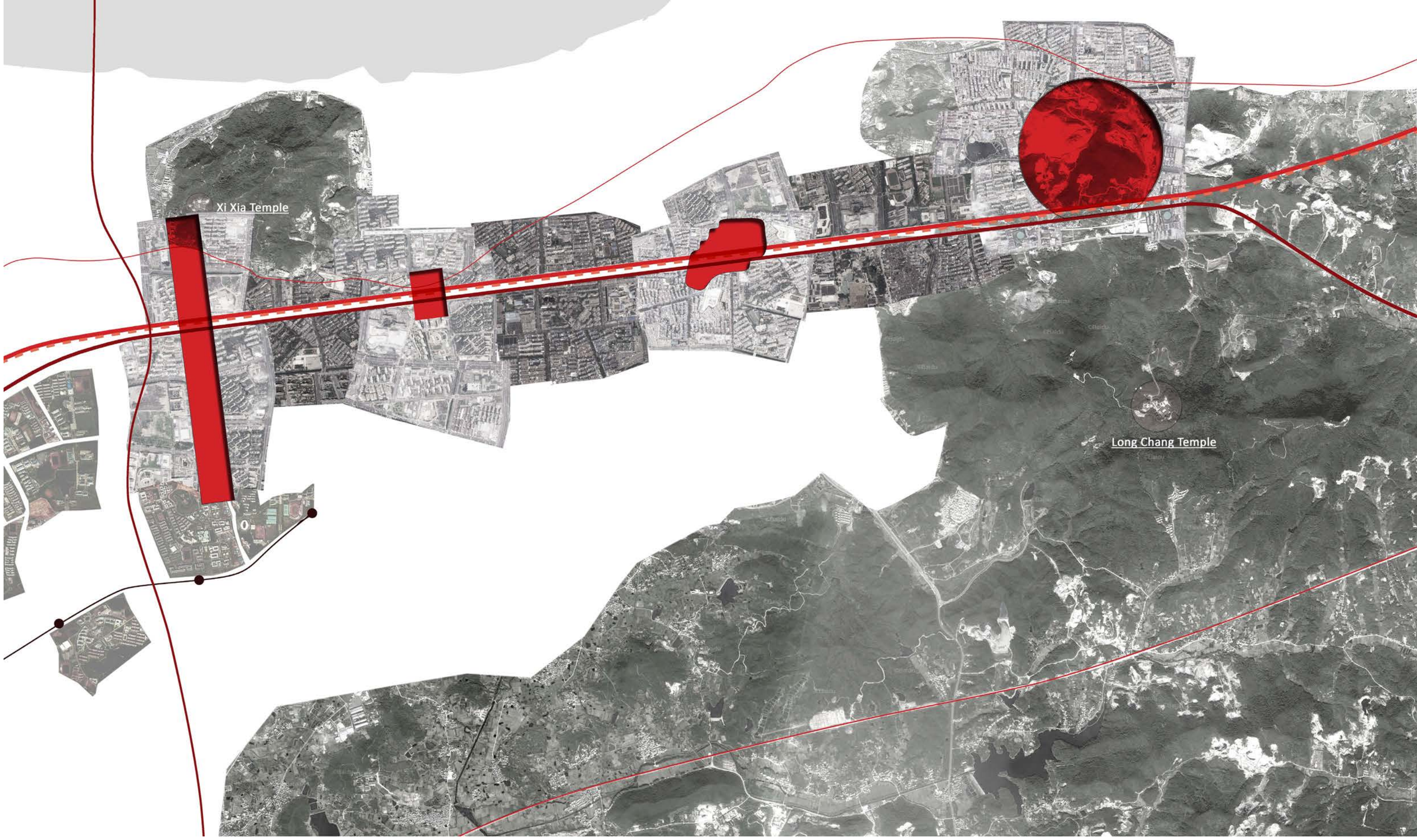
PROPOSED FOUR URBAN SPACES ALONG THE SPINE



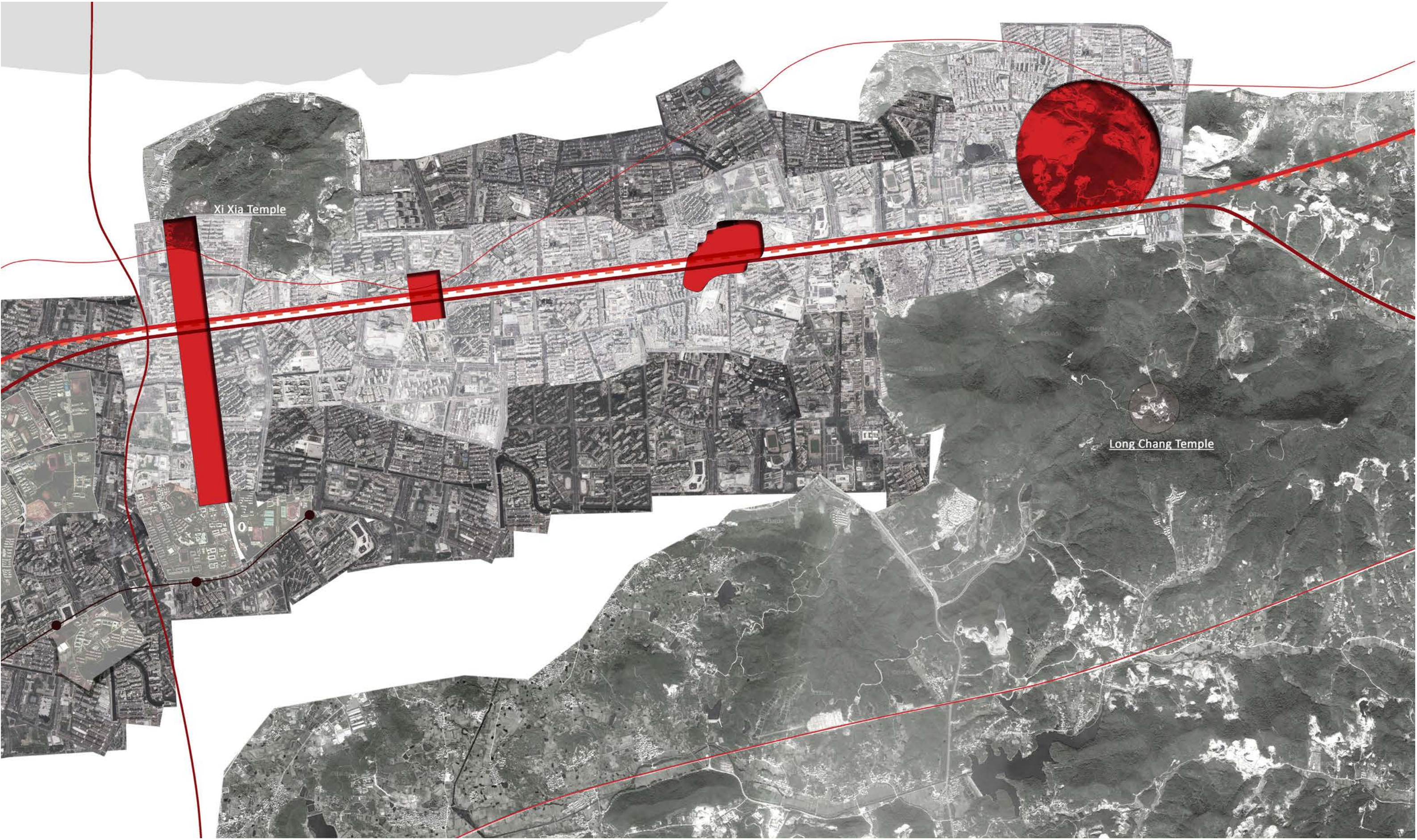
2018



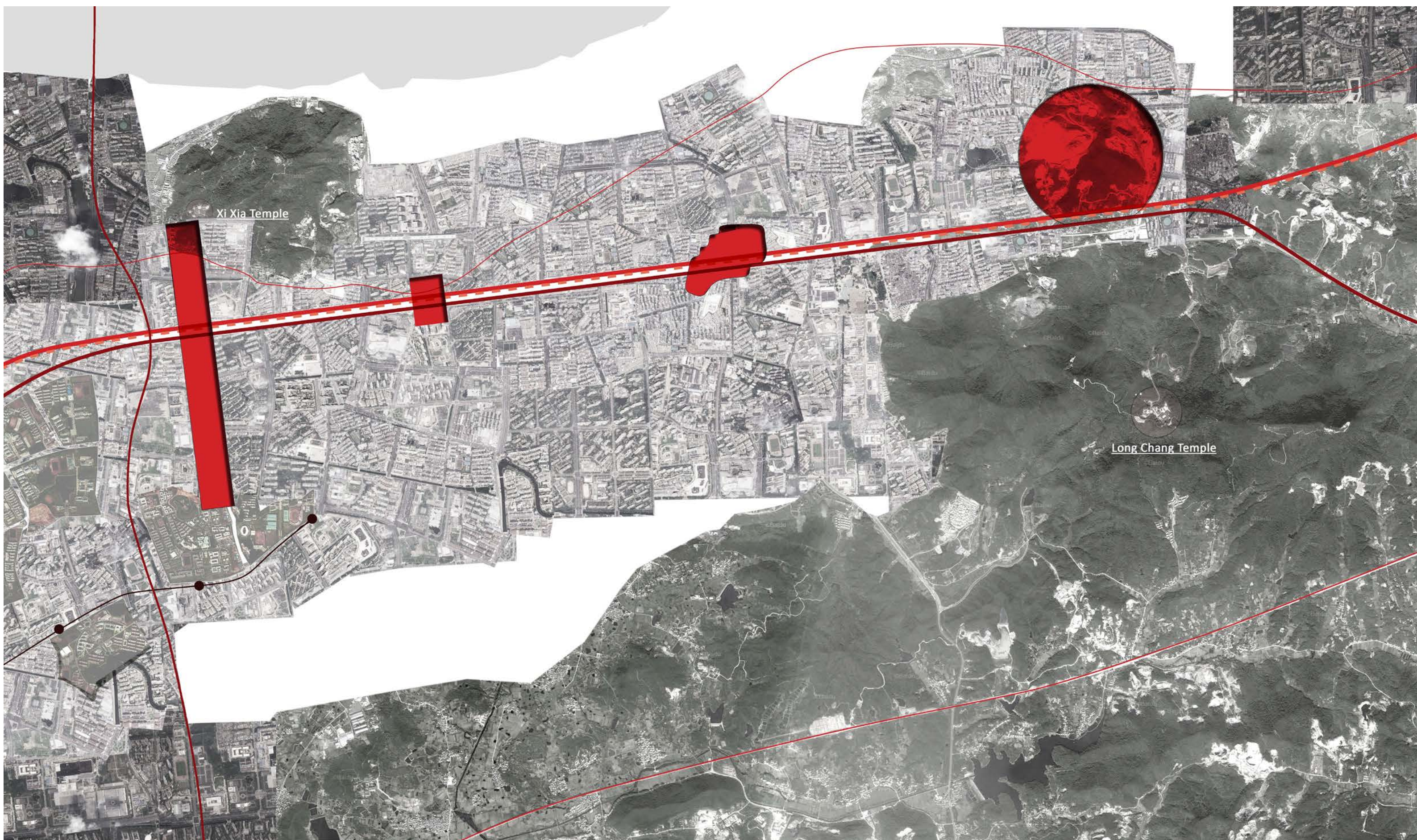
2021



2024



2027

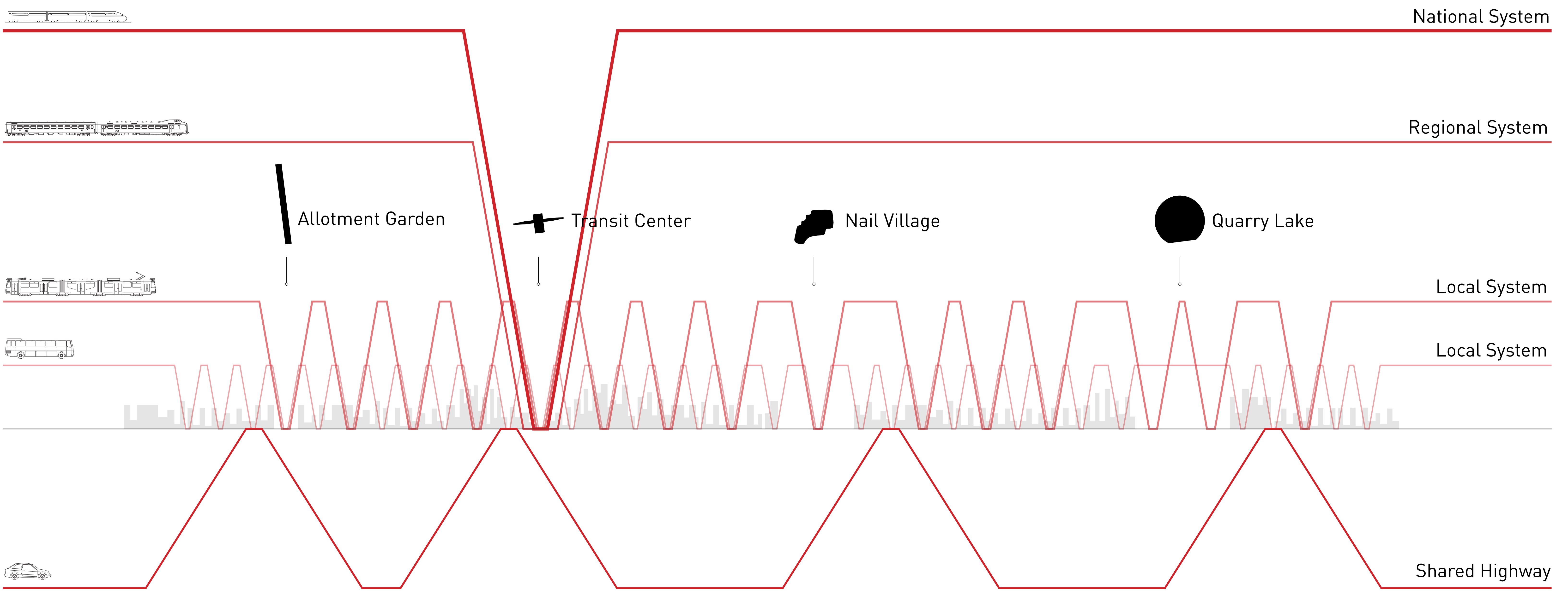
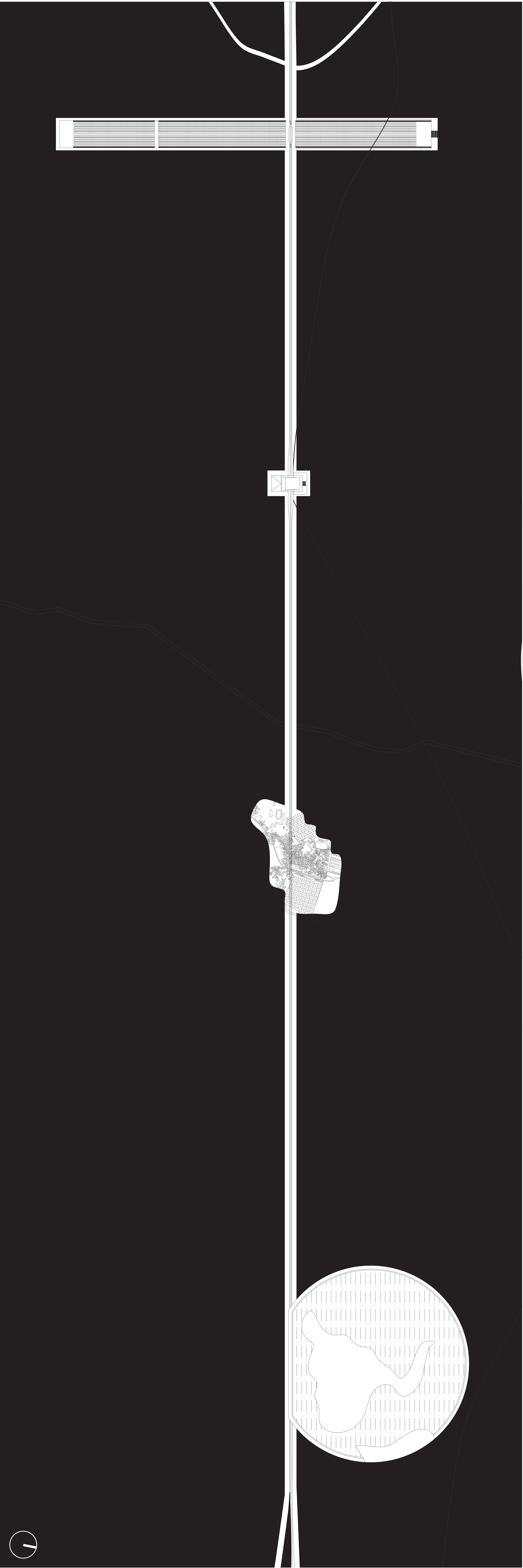
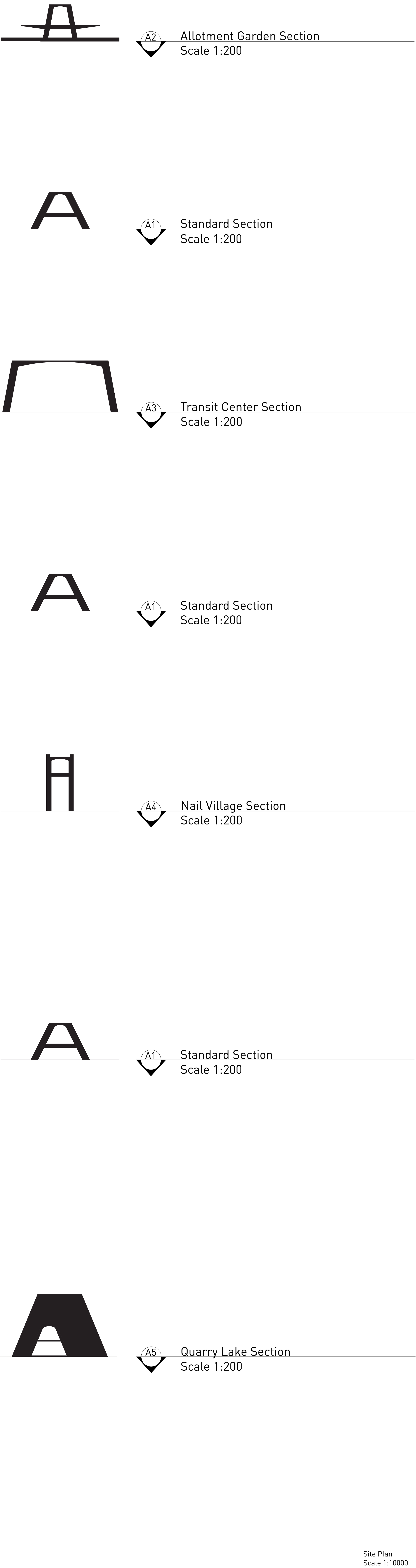


2030



2033

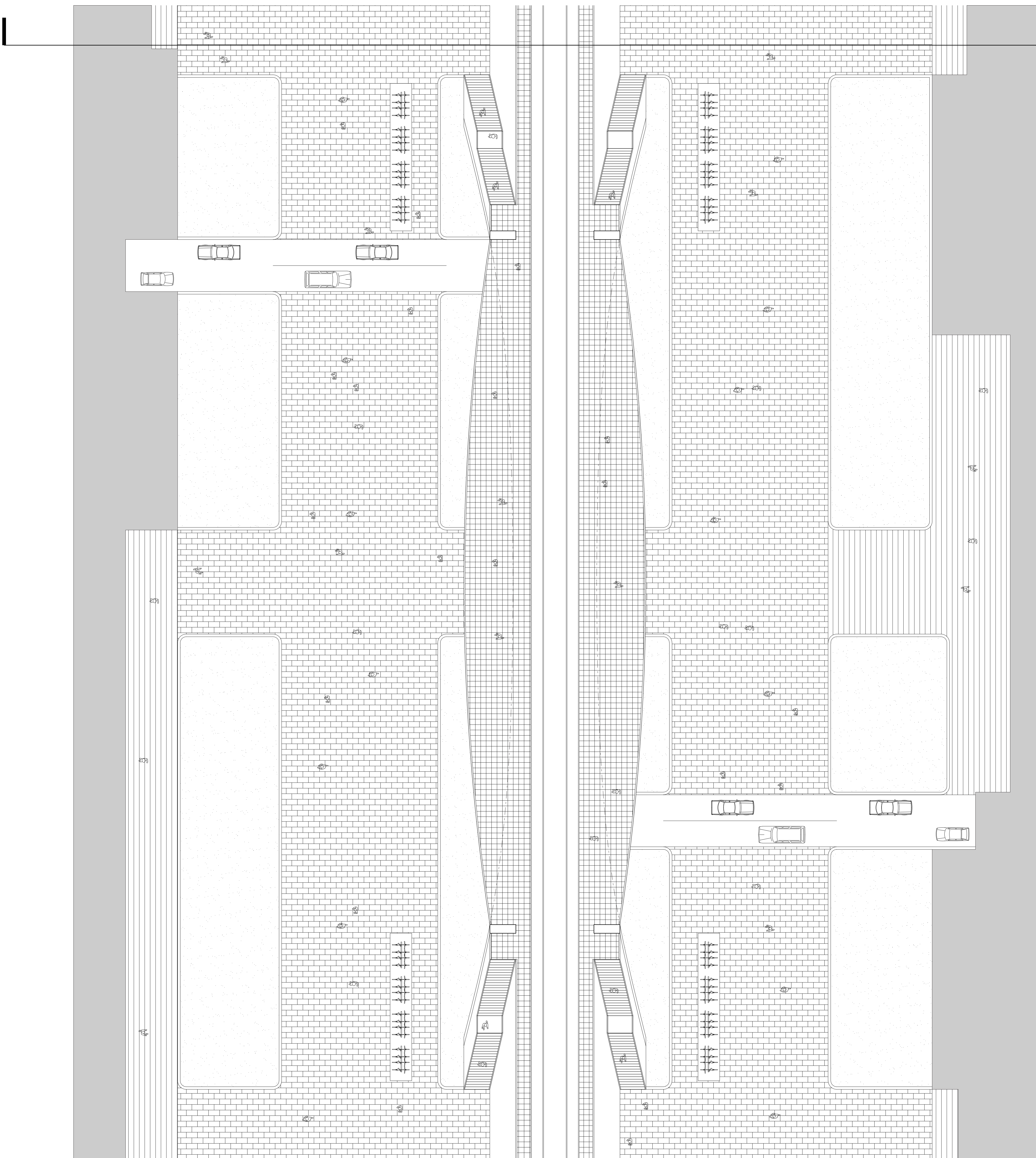
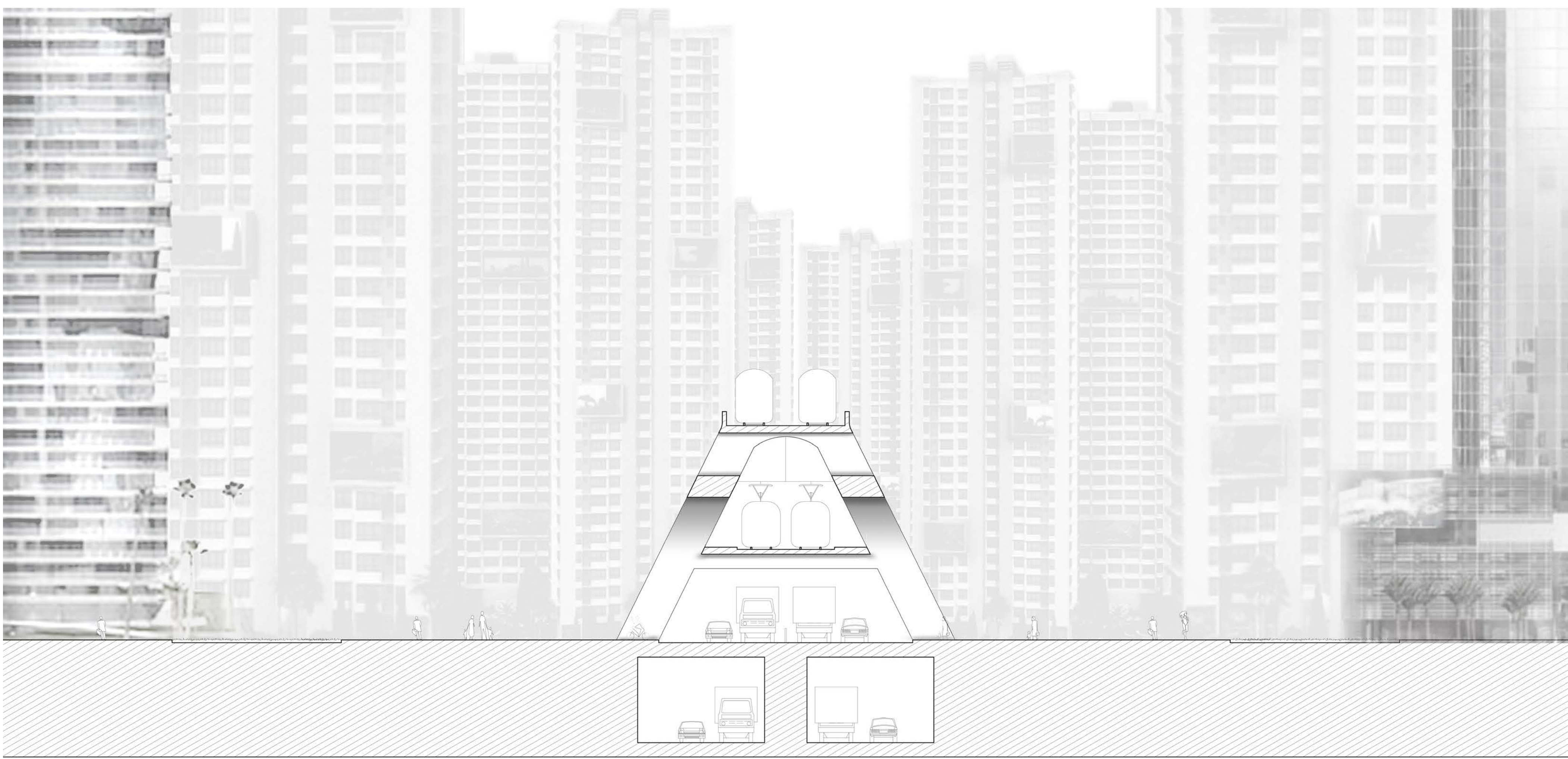
Projections





STANDARD
STRUCTURE

A

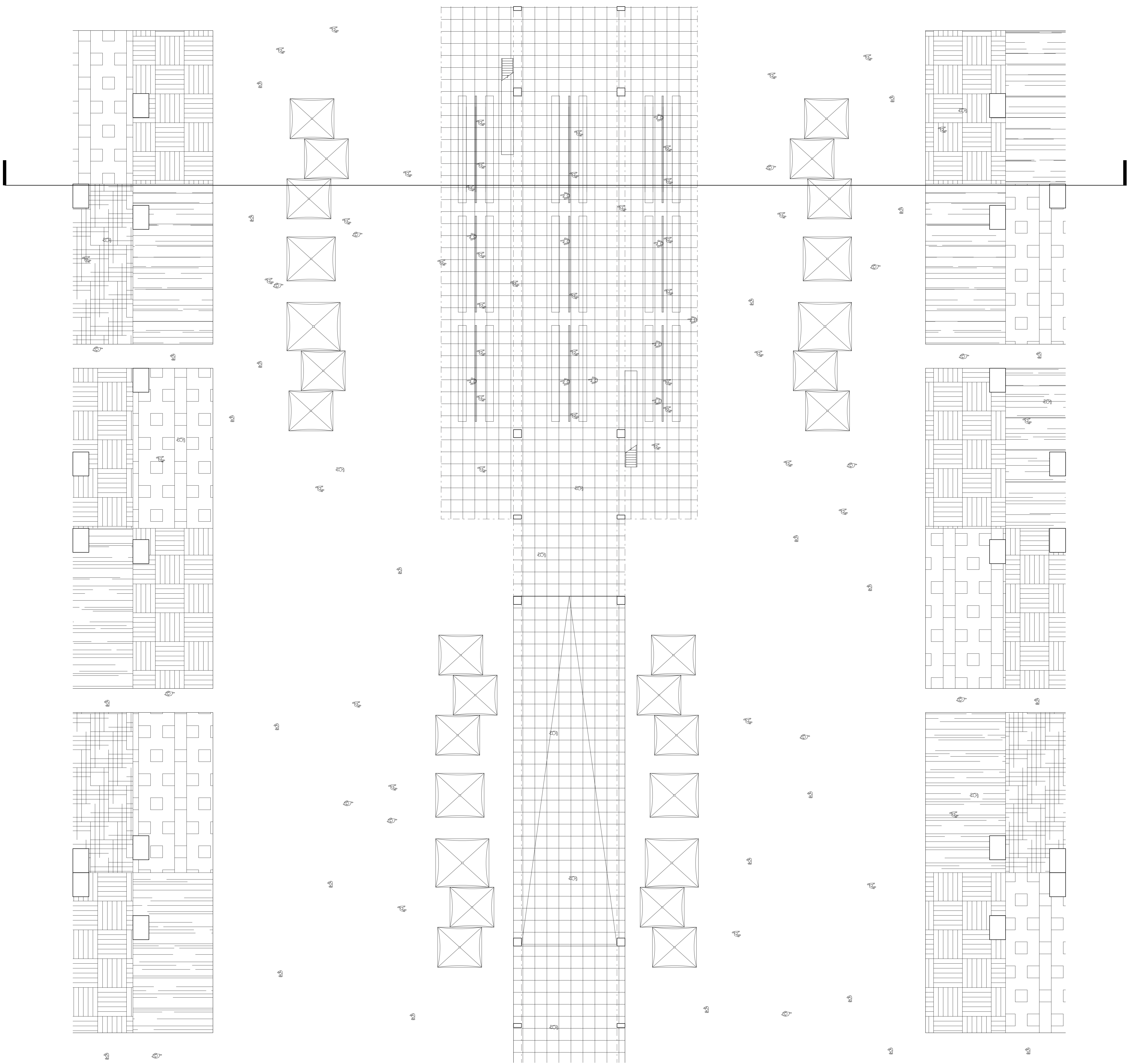
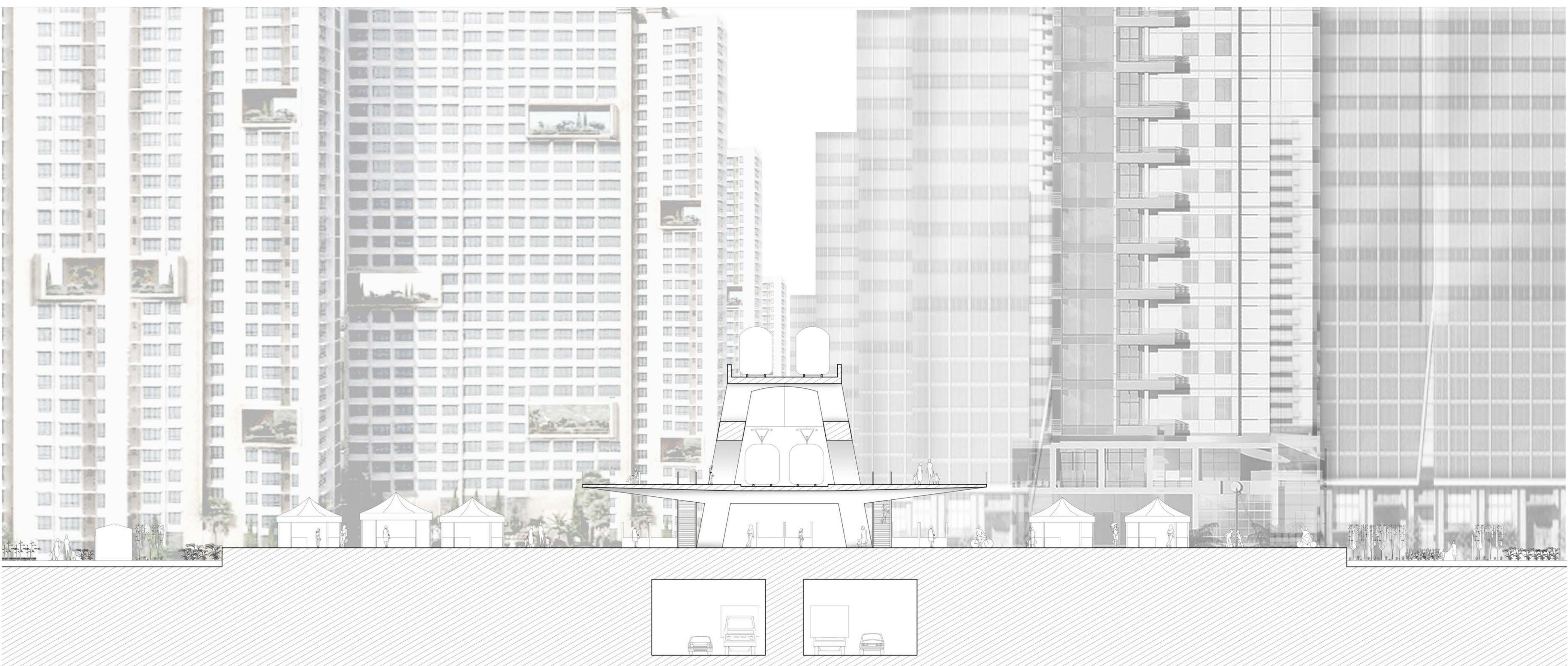


Section and Plan
Scale 1:200





ALLOTMENT
GARDEN

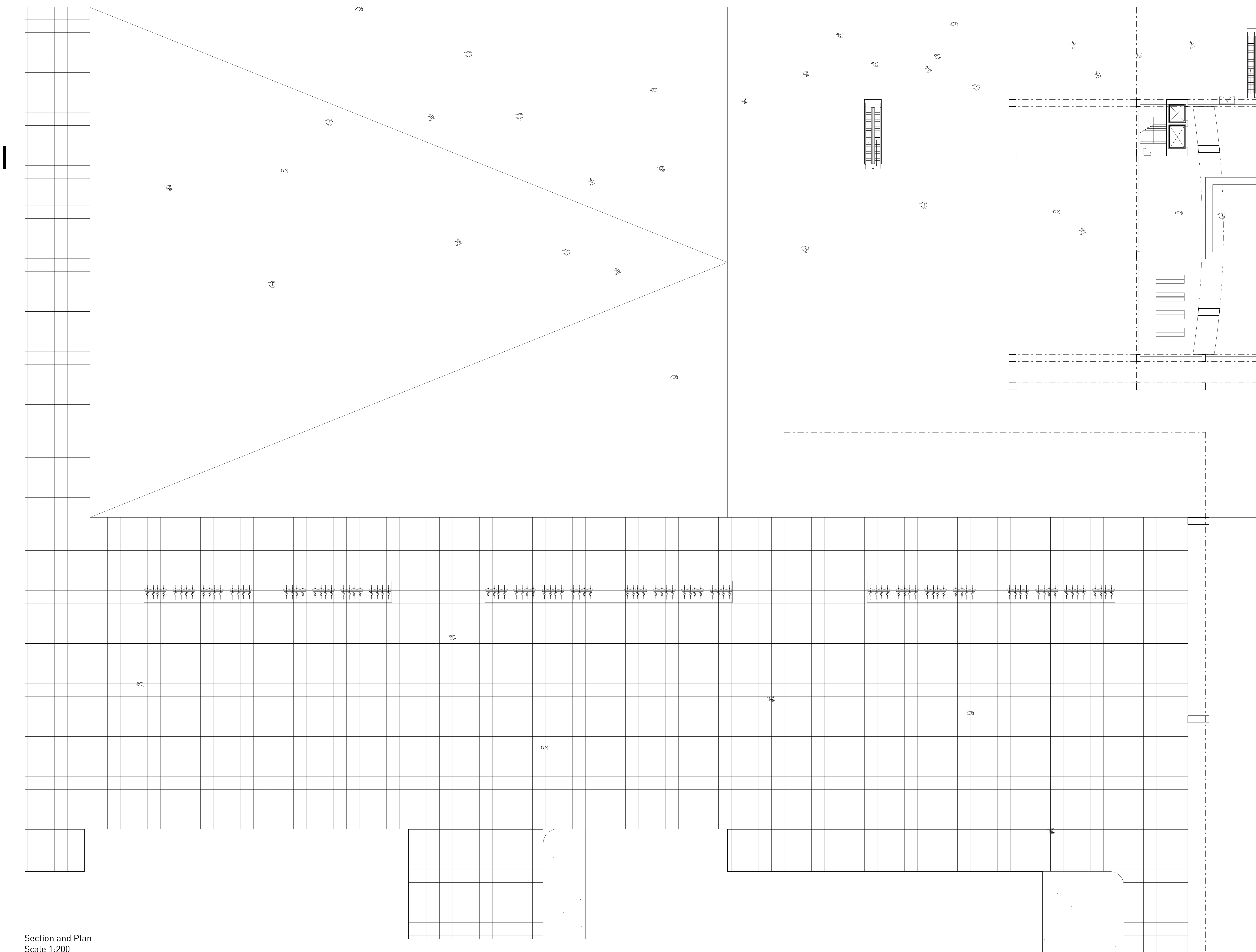
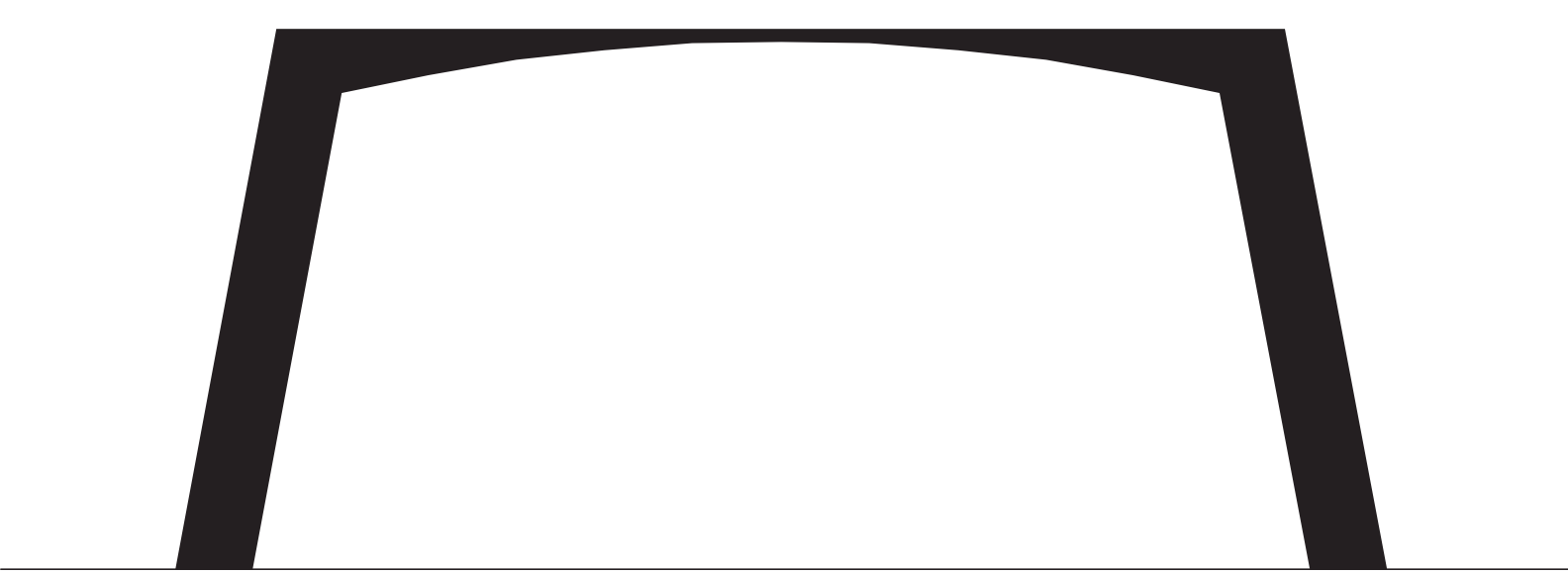


Section and Plan
Scale 1:200

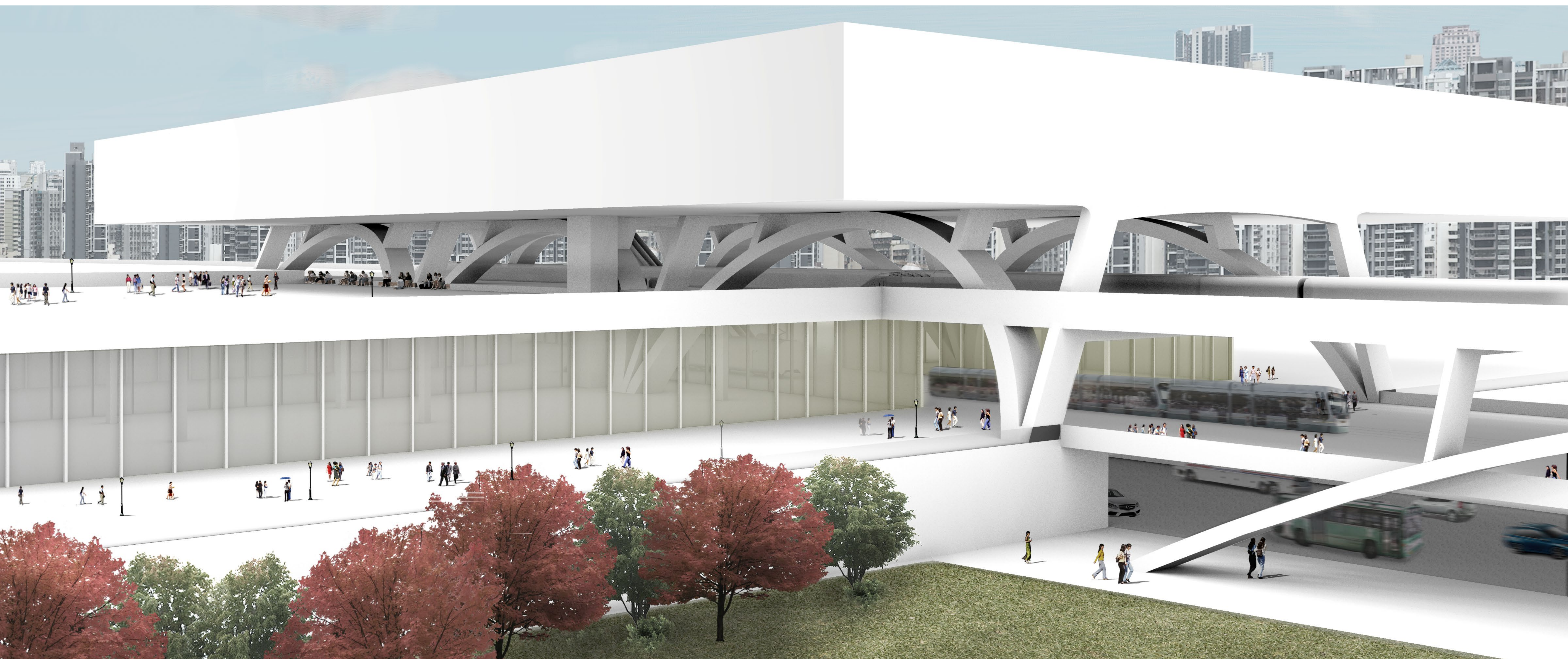


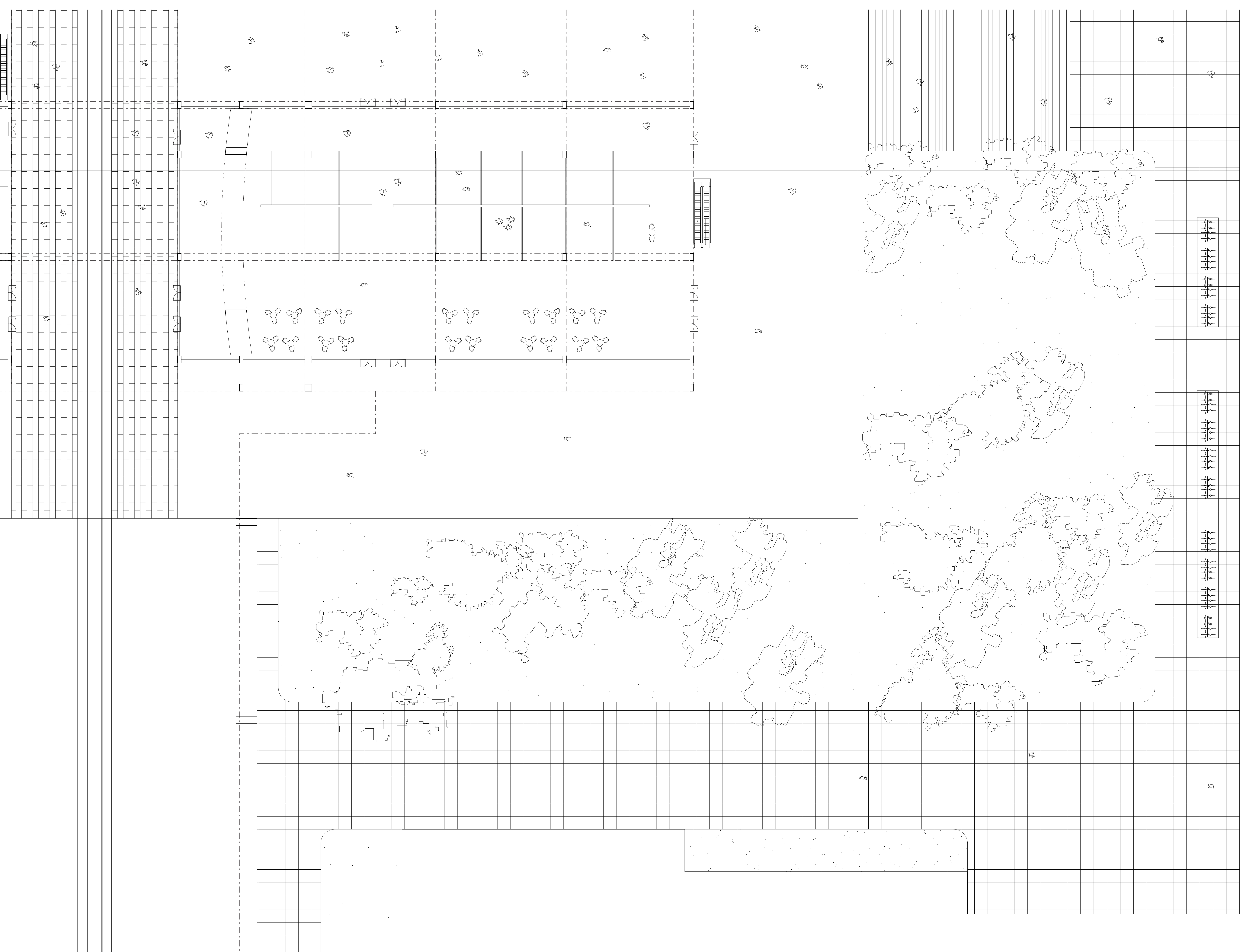
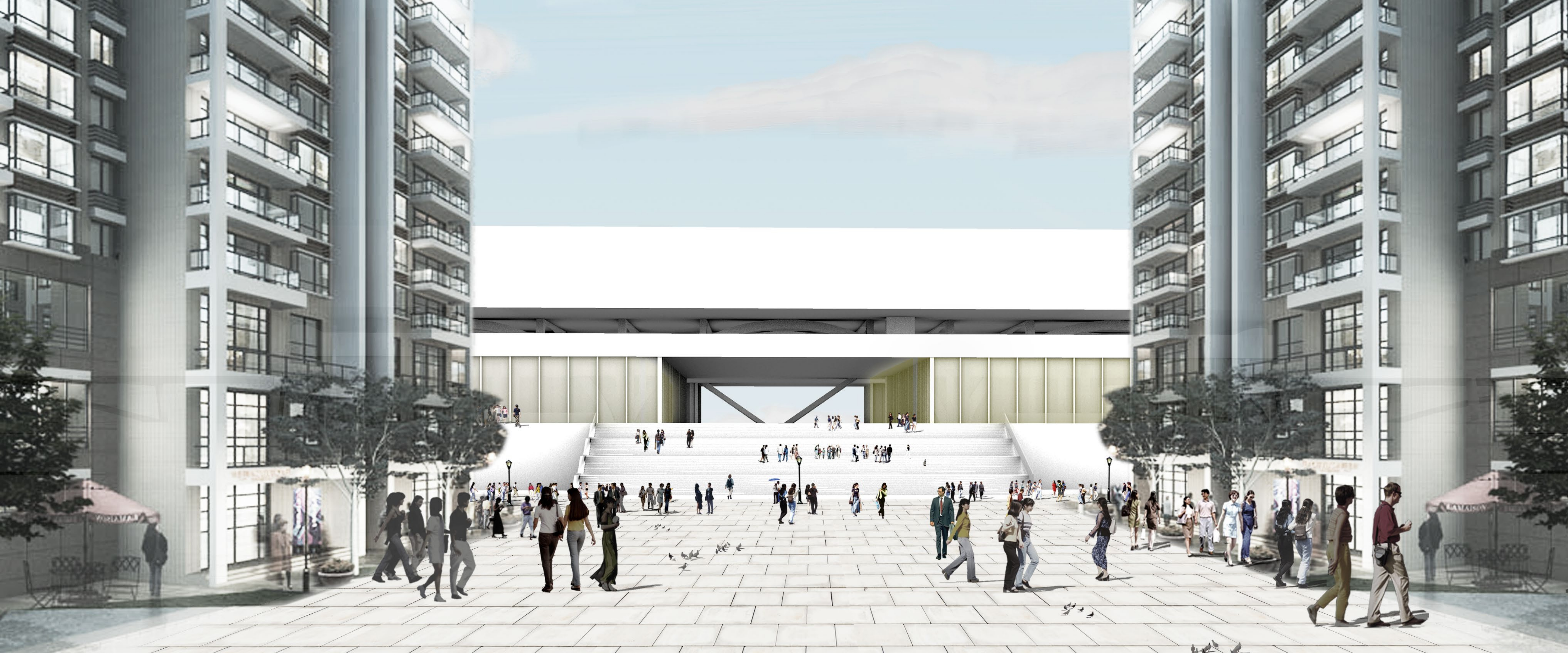


TRANSIT CENTER



Section and Plan
Scale 1:200



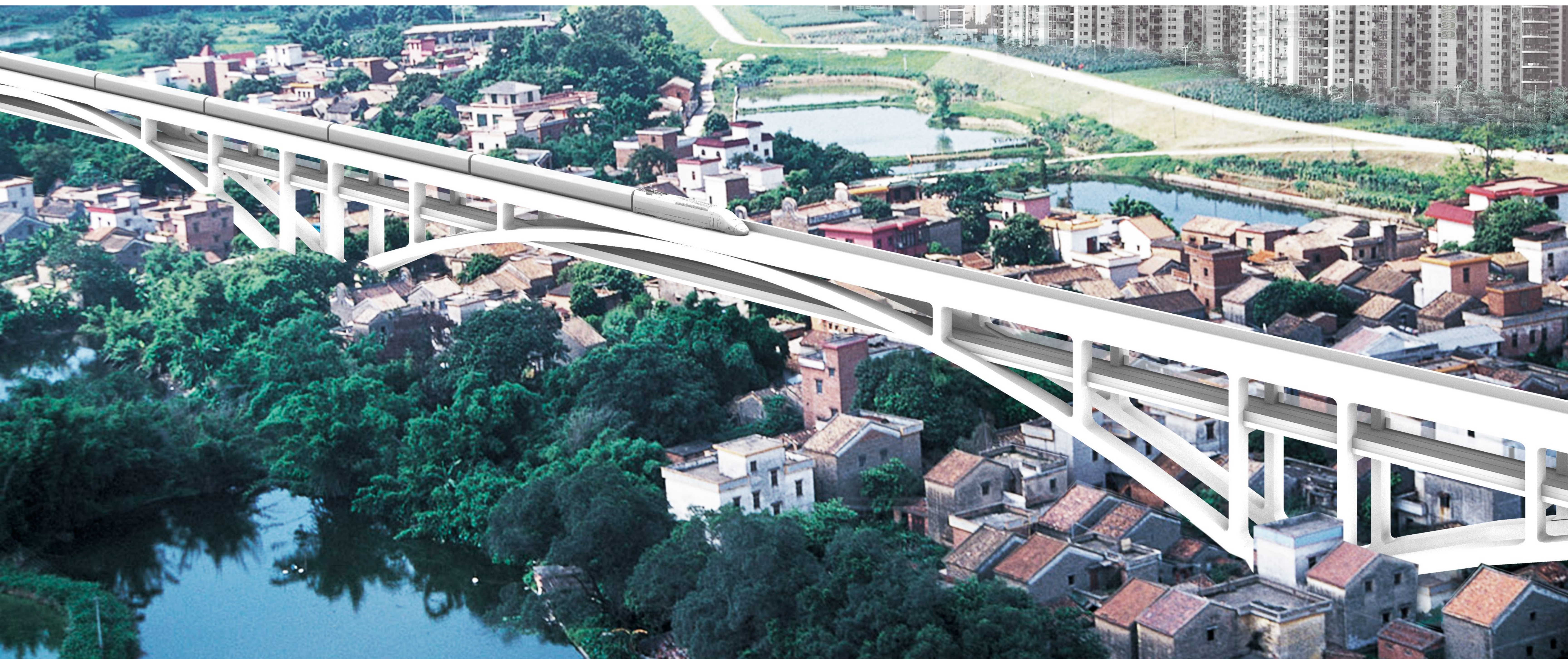




NAIL VILLAGE

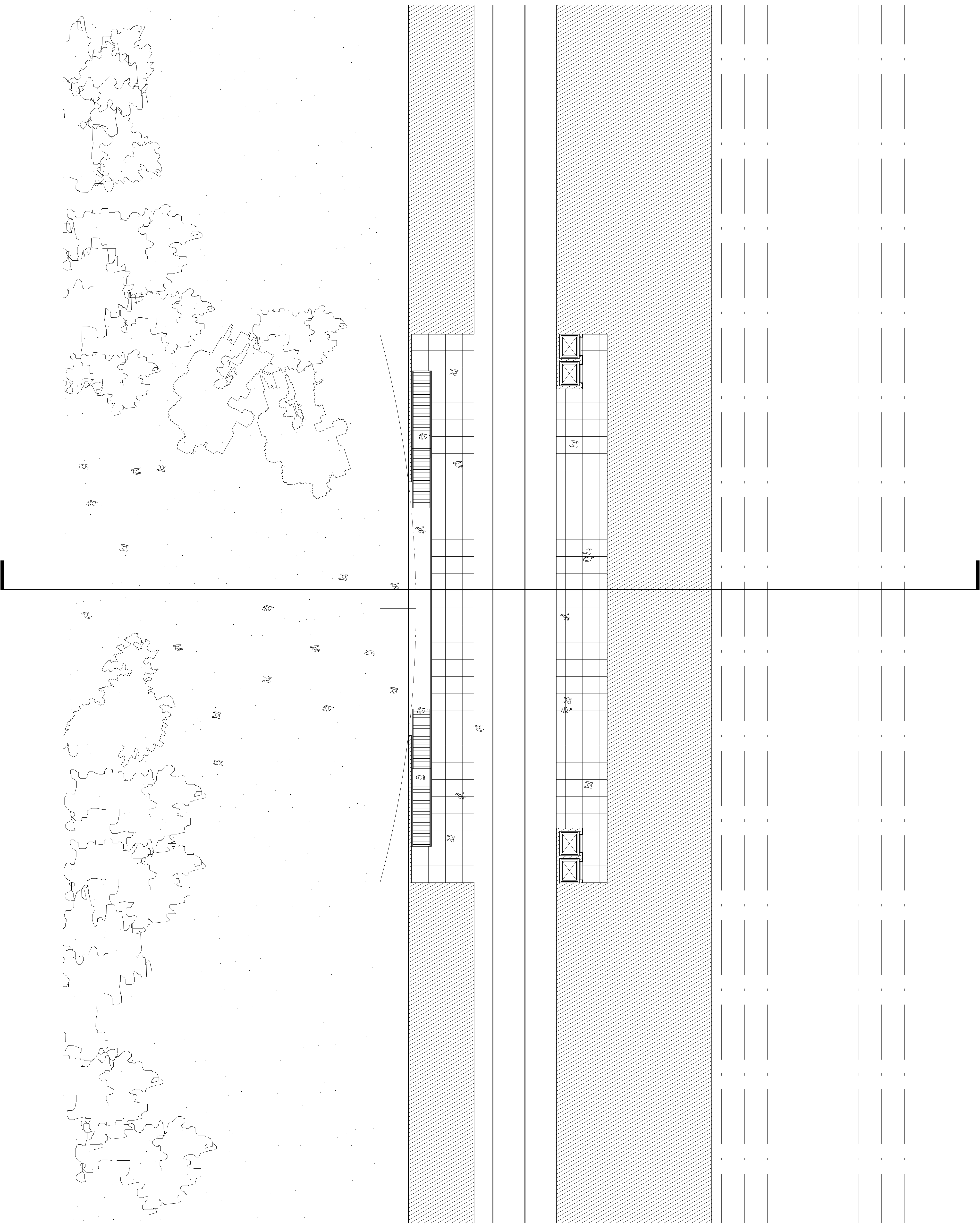
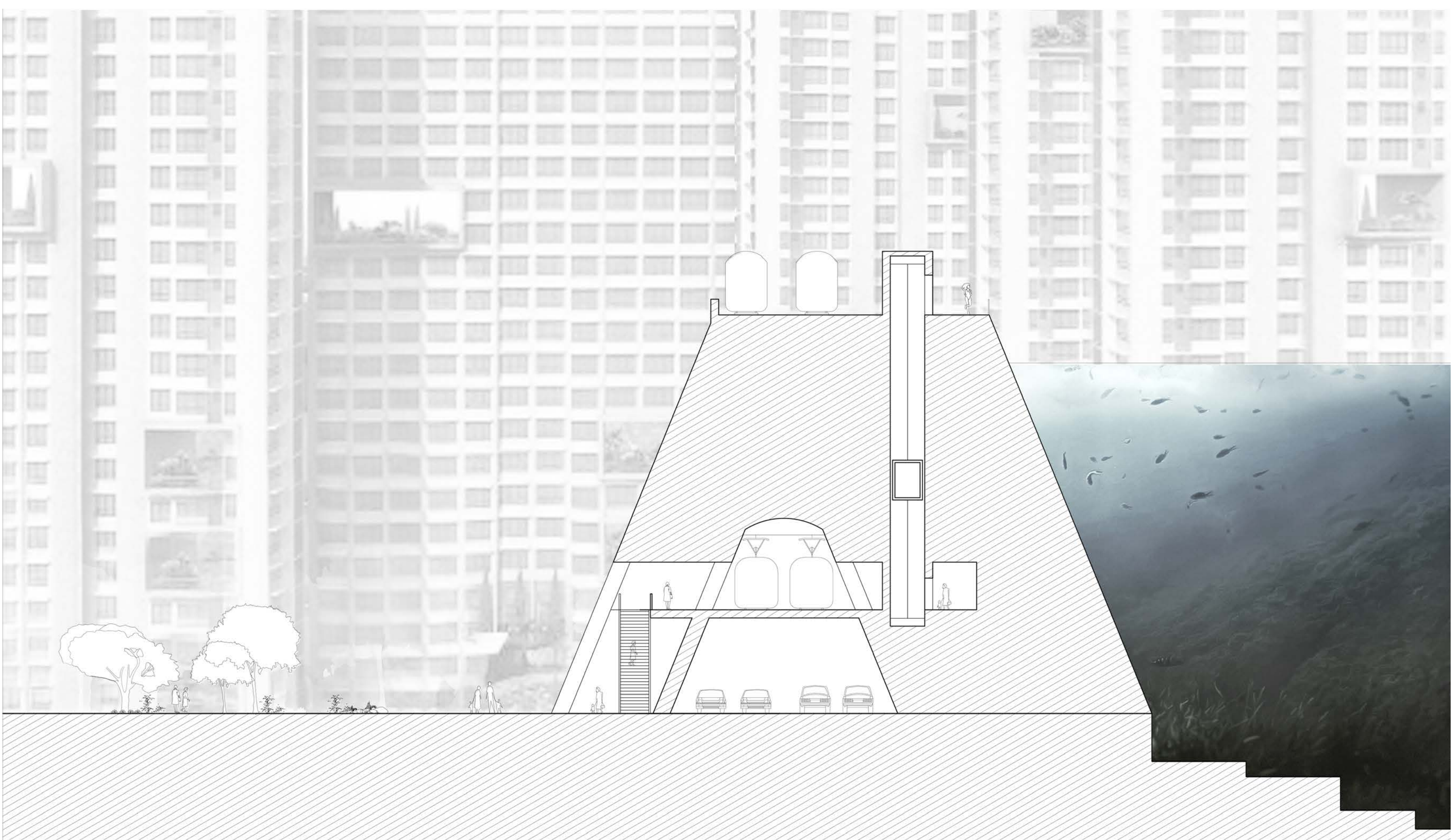


Section and Plan
Scale 1:200





QUARRY LAKE



Section and Plan
Scale 1:200

