The 3rd Global Meeting for the GPSC (Global Platform for Sustainable Cities) and the Brazil’s SCP (Sustainable Cities Program)’s 2nd International Conference on Sustainable Cities were successfully held in Sao Paulo, Brazil during September 16-20, 2019 with the theme of “Catalyzing Sustainable Urban Futures”. During the meeting, a two-day TOD City Academy training session was organized by the World Bank. Furthermore, a thematic session on TOD was held on the afternoon of September 19, 2019. Senior Government and technical representatives from Tianjin, Ningbo, Guiyang Municipality and China Academy of Urban Planning and Design (CAUPD) participated in the events and have widely exchanged knowledge and experience with delegates from many other countries all over the world. During the event, Mr. Sameh Wahba, Global Director for Urban Disaster & Risk Management, Resilience and Land Global Practice of the World Bank met with Mr. Shen Min, Vice Mayor of Ningbo Municipality. They both highly valued the long term and win-win collaboration between the World Bank and Ningbo. They also explored future collaboration opportunities and strategies.

During November 27 to December 12, 2019, Ms. Fang Wanli, Urban Economist and Task Team Leader for the GEF China Sustainable Cities Integrated Approach Pilot Project led the implementation support missions and visited Guiyang, Tianjin and Nanchang. The objectives of the missions were to understand the progress of the procurement activities, contract implementation, as well as institutional arrangements of the Project Management Office (PMO), and to agree on next steps and action plans for year 2020. The missions also conducted site visits to Sanqiao Station on Guiyang Rail Transit Line 2, the urban rail transit complex of Qingshuijiang Road Station on Guiyang Rail Transit Line 1, Jinshiqiao Station on Tianjin Rail Transit Line 1, and Xingfu Park Station on Tianjin Rail Transit Line 5.
Ministry of Housing and Urban-Rural Development (MoHURD)

Contract on the national level TOD platform: The technical proposal is being reviewed by relevant departments of MoHURD. The proposal is expected to be finalized by the end of December 2019. The draft contract and negotiation records has been submitted to the World Bank for review by December 15, 2019. The contract is expected to be signed in January 2020.

Beijing

City level TOD Strategy (GEBJ-1): Contract negotiation was completed, and the contract is expected to be signed in January 2020.

Corridor and station level TOD application (GEBJ-2): After the publication of the REOI, 10 expressions of interest have been received as of November 1, 2019. The review of the short-listed companies/institutions and the issuance of the RFP is expected by the end of December 2019.

District level TOD application (GEBJ-3): Due to the changes to the original selected district as well as with the city’s master planning, according to the discussions between the Beijing PMO and relevant line departments, it is now confirmed the original selected project area will remain unchanged. However, the content of the work will be adjusted and refined. The draft TOR is expected to be submitted to the WB in mid-January 2020.

Tianjin

The contract on the Preparation and Implementation of a City TOD Strategy and Project Management Support (GETJ-1) has completed data collection and scoping, institutional analysis, consultations with stakeholders, citizens engagement, and vision formulation. Phased reports have been submitted. The consultants are carrying out diagnostic analysis and screening on TOD types. The second milestone deliverable review is expected to be completed by the end of December 2019.

TOR for the Study on the urban rail transit financing mechanism (GETJ-2) has been through rounds of revisions and finally received Bank’s confirmation on December 13, 2019. The REOI is planned to be published in January 2020.

Tianjin PMO proposed to cover a study on corridor-level TOD application (GETJ-3) for areas along Metro Line 4 (phase II) in order to be more responsive to the development priorities of Tianjin. The draft TOR is planned to be submitted to the WB by the end of December 2019.

Shijiazhuang

The review of the technical proposal for the City level TOD strategy (GESJ-1) started on December 6, 2019. It is expected that the procurement process will come to an end and the contract will be signed by in January 2020.

TOR preparation for (GESJ-2) started in mid-October. The draft TOR will be submitted to the Bank no later than the end of December 2019. The preparation for the TOR for the 3rd contract is still at its early stage.

Nanchang

City level TOD strategy (GENC-1): Procurement process for the contract is already finished and the contract is now in the signing process. It is expected that the contract will be signed during the second half of December 2019.

On December 10, 2019, Nanchang PMO organized a panel review on the shortlist of the contract on corridor level TOD strategy (GENC-2). The shortlist evaluation report is planned to be submitted to the Bank later in December 2019.
A preliminary research has been carried out for the Station/site-level TOD application study (GENC-3). Nanchang PMO proposed to cover a TOD study for the High-speed Rail East Station along the Nanchang Rail Transit Line 2 in order to better respond to the development needs of Nanchang. The draft TOR is planned to be submitted to the World Bank by the end of February 2020.

**Ningbo**

TOD study for the improvement of existing urban rail stations (GENB-3) has finished all the procurement process and the contract was signed on Oct 30, 2019. The preparation of the inception report was already launched. Supported by the Ningbo PMO, the consultants will start to visit relevant government agencies to collect basic data and information.

On city level TOD strategy (GENB-1), the bid was opened on November 26, 2019. The winning bidder was already selected. Contract negotiation will be carried out in December, and the contract is expected to be signed in January 2020.

**Guiyang**

A panel review for the technical proposal for the City level TOD strategy (GEGY-1) was carried out on December 3, 2019. The contract is expected to be signed in January 2020.

In order to ensure that the output of the study could be utilized and provide guidance to the urban development of Guiyang, the PMO proposed to adjust the project sites and research scope for the corridor-level TOD application study (GEGY-2) and the study on corridor level TOD application along the BRT line (GEGY-3). It is still in the preliminary stage of research and analysis and the final scope will be confirmed in May 2020.

**Shenzhen**

Shenzhen PMO submitted the REOI for the contract on the city level TOD strategy (GESZ-1) on December 13, 2019 and received Bank’s comments for revision the same day.

On October 24, 2019, Shenzhen PMO visited WB Beijing office and discussed the possibility of revising the content of the 2nd contract (GESZ-2). The draft TOR is expected to be submitted to the Bank later in December 2019.

On October 25, 2019, Shenzhen PMO visited Tianjin PMO for peer-to-peer learning. They had intensive discussions in areas of procurement, contract management, capacity building and so on. Tianjin PMO proactively shared their experiences on project management which is considered extremely helpful and instructive.

Figure 4: Shenzhen PMO visited WB Beijing office and discussed with WB task team
The group of 20 experts led by Deputy Director Feng Keliang went on a 14-day study trip to Tokyo and Osaka in Japan. The purpose of this training is to learn from Japan’s (especially Tokyo’s) experience on Transit Oriented Development (TOD). The takeaways of the training will be applied to Beijing’s TOD practice regarding its characteristics. The training was supported by the Global Environment Facility (GEF) and organized by the Beijing Housing and Urban-Rural Construction Technology Promotion Center.

The Greater Tokyo Area consists of the Tokyo metropolis and three prefectures around Tokyo (Saitama, Chiba, and Kanagawa). It has a total area of 13,400 square kilometers and a population of 37 million. Japan started the TOD practice since the 1970s when the fast-growing population started to affect public transportation in Tokyo. To successfully implement the TOD project, the Japanese government made some important changes in five areas: legal, decentralization, government's role, finance, and construction standardization.

Firstly, the Japanese government perfected the laws relating to railway system development to validate fair competitions and to stabilize financial support for rail transit development. For example, Japan passed the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade in 1947 to ensure fair competition among private railway companies. Moreover, the legislation also ensured the quality of housing constructions by setting the standard for assembled components.

Second, in 2000, the Japanese Central Government decided to decentralize some of the authorities to turn Tokyo into a "multifunctional compact city". In 2002, they set special FAR application districts and passed the Urban Regeneration Special Law to make urban development more flexible. Besides, the Japanese government privatized Japan National Railway in the 1980s to solve the debt problem as well as improve the operation quality.

**Study Report Sharing**

**Beijing PMO**

Transit-Oriented Development is Path for Metropolitan Development: The Study Report for TOD Training in Japan

The group of 20 experts led by Deputy Director Feng Keliang went on a 14-day study trip to Tokyo and Osaka in Japan. The purpose of this training is to learn from Japan’s (especially Tokyo’s) experience on Transit Oriented Development (TOD). The takeaways of the training will be applied to Beijing’s TOD practice regarding its characteristics. The training was supported by the Global Environment Facility (GEF) and organized by the Beijing Housing and Urban-Rural Construction Technology Promotion Center.

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Second, in 2000, the Japanese Central Government decided to decentralize some of the authorities to turn Tokyo into a "multifunctional compact city". In 2002, they set special FAR application districts and passed the Urban Regeneration Special Law to make urban development more flexible. Besides, the Japanese government privatized Japan National Railway in the 1980s to solve the debt problem as well as improve the operation quality.
Third, when further advancing TOD in Japan, the government not only provides legal and policy support but also plays the role of plan-maker and supervisor. Railway companies and other development entities are responsible for establishing rail transit construction plans, negotiating with landowners, and other matters relating to actual operations.

Fourth, the railway companies and the Urban Renaissance Agency (UR) are aware of the cost of a rail transit project is enormous. So, they will sell the lands surround the station to private owners. The revenue will provide funds and capital for the project. After the project is finished and put into operation, the stable revenue from tickets and the real estate development ensures that the price-performance ratio of the project is desirable. During the process, UR is responsible for building and operating public housing. The success of TOD in Japan is based on cooperation among all entities.

Fifth, the refined management of residential building construction, housing industrialization, and normalized residential maintenance make sustainable residential buildings in Japan.

Through the study trip, there are 7 points which the group thinks applies to Beijing's TOD project:

1. Developing rail transit should be the priority. Similar to Tokyo, rail transit is also the major commuter tool in Beijing. On September 25, 2019, President of China, Xi Jinping, pointed out that urban rail transit development is the guide for urban transit development. It is not only an efficient way to resolve big city disease, but also a right path to turn Beijing into a smart and sustainable city.

2. Building a multi-dimension rail transit system in different areas based on different needs. For the main function area, such as CBD the density of railroad stations should be large. On the other hand, for an area which is mainly used for residential purpose, such as a commuter town, the distance between stations should be longer.

3. Moving the railroads which have functions of freight and medium-long distance passenger transport to the suburban area. Besides adding some necessary transfer hubs, Beijing should refine the design of the facilities at the transit hubs, simplifying the security check. In this way, it will relieve transport pressure in the urban area whose function is mainly daily commute.
4. Beijing should combine the transit facility construction and the land investment along the railway. The revenue from the land investment can support the construction and the operation of the transit infrastructure.

5. Beijing should have high development intensity around the transportation hub. Specifically, building overpass or tunnels to connect the buildings that surround the station. Based on the overall urban planning of Beijing, development entities should also add or reduce the “micro centers” around the stations in each zone of the city.

6. Beijing’s municipal government’s promotion on TOD will have great impacts on the industries and the population layout. Thus, the impact of any changes which will affect the traffic demand should be analyzed in advance.

7. TOD in China should have Chinese characteristics. We cannot simply copy the TOD model from Japan due to a different political system. Moreover, we should have both short-term and long-term goals based on our actual situation to improve land-use efficiency, such as protecting current farmlands and arable lands.

To summarize, after studying from Japan’s TOD experience, Beijing’s municipal government understands the importance of improving the coordination among different departments. Furthermore, development entities should maximize the function of the existing railroads to improve the urban commuter service. Building an efficient rail transit system requires large financial funds. Thus, being creative on the investment and financial models is essential to the sustainability of the station. The final goal of TOD in Beijing is to continue improving Beijing residents’ happiness by improving services related to their daily life.

(The above brief report is abstracted from the full report of Transit Oriented Development is Path for Metropolitan Development: The Study Report for TOD Training in Japan, by Beijing PMO)

Tianjin PMO
The Study Report for TOD Training in Brazil, Germany, and Denmark

Invited by World Bank, Zhang Jiliang and Ma Fengju participated in the 3rd Global Platform for Sustainable Cities (GPSC) Global Meeting in Brazil from Sept 19-20. From Sept 22-25, the group visited Germany and Denmark to study and communicate with local experts regarding their experience in financial management and risk control when promoting TOD in cities.

Figure 8: Tianjin delegation communicated with local experts in Germany

This meeting was co-organized by the World Bank GPSC Platform and the Sustainable Cities Programme (SCP). Experts from different areas were invited to discuss the possible challenges and opportunities that development entities will face when operating transit and urban development projects.

Through the GPSC meeting, we mainly studied subjects relating to the financial management and Public-Private Partnership (PPP) for TOD. Mr. Francisco Cabrera from Deloitte highlighted the aspects during the financing stage, such as real estate financing, infrastructure investment, and the role of private developers in TOD. Furthermore, on the topic of PPP, Mr. Jeff Delmon from the World Bank Global Infrastructure Facility explained the pros and cons of the PPP
model. For example, PPP models increase the economic and time efficiency as well as improve the financial robustness in public and private sectors. However, the specially authorized private company may become a monopoly in that industry. One of the unsolved issues is that the change in leadership in local or central government will have financial effects in both the public and private sectors. Yet, the effect is greater on private sectors.

After the GPSC meeting, the group visited Germany and Denmark. Frankfurt and Copenhagen took different methods and perspectives when planning their cities. Yet, the similarities are that they are people-oriented and sustainable. Both cities considered the functions, needs, and traffic flows in the initial planning stage. They kept a certain amount of land specifically for green spaces for residents of the cities to improve the comfort level.

GFW Duisburg introduced two public transit projects: Stuttgart 21 and Messestadt Riem. In Stuttgart, the central train station and city railway systems are underground. This design has released 109 square kilometers for more leisure and commercial functions in the area. The Stuttgart 21 project also reduced the pressure on the living environment caused by the train stations. Stuttgart 21 is an example of how to improve the crowded living environment by building the public transit system underground. Messestadt Riem is an example of building a people-oriented sustainable city through existing technology.

Another important lesson from Germany is the investment and financing of rail transit projects. To facilitate fundraising, Germany has established a financing institution affiliated to Deutsche Bahn. Although state investment remains as the main source, they have broadened the channels. The German government also established the local special fund for the reconstruction and development of the station. The source of the local special fund is the collection of the gasoline tax. Similar to the fund composition of rail transit projects, state investment is also the main source for road building. Private capital and non-state guaranteed bonds are also sources for road maintenance and construction. Besides, there are generally two modes of operation for long-distance road construction in Germany: A Mode and F Mode. A Mode means entrusting the expansion, maintenance, and operation of the driveway to a private operator. F Mode is to entrust the construction, maintenance, and operation of long-distance roads to the private operator for 30 years. All tolls and funds must be charged based on laws.

Denmark has been encouraging its citizens to use bicycles for commuting by improving cyclists’ safety and building facilities for bikes. Moreover, Denmark also imposes a heavy vehicle tax to lower the demand for cars. To build a sustainable city, Copenhagen uses Transit-Oriented Development (TOD) as its urban development.
approach. The Finger Plan shows the shape of the public transit system in Copenhagen. The purpose of the Plan includes preventing building too many commercial buildings in the suburban areas, improving the utilization of lands between the “fingers,” and retain the existing green space inside the city. TOD is relatively successful in Copenhagen. However, there are several issues in Denmark’s green transit development. First, the development of electric vehicles is relatively behind other European countries. If the government wants to drastically reduce the CO2 emission, it will need to encourage investment in green technologies as well as formulate practical policies. As a result, with policy support, the market will be able to effectively create new types of employment and services. Furthermore, building more technology transportation facilities near schools, hospitals, and residences can also encourage people to use this type of transportation.

In summary, Germany and Denmark’s focus on TOD show how to use public transit to improve people’s living environment and make land-use efficient. They use PPP as the method for investment and financing to ensure the stability of the funds for TOD projects. Moreover, when making the urban development plans for Frankfurt and Copenhagen, developers will consider the effects of any projects in the long term.

Tianjin as one of the seven GEF China Sustainable Cities Integrated Approach pilot cities should catch this opportunity to attract investment and experts in this field. We should also focus on conducting research on public transit development so that we can implement practical policies. Moreover, while promoting the TOD-led planning and construction concept of urban expansion, we should consider using different high-capacity and high-quality public transportation models to realize TOD. Lastly, paying attention to financial capital risk control of transportation investments is essential. We must give full play to the guiding role of state-owned capital and allow more equity capital to become the main body of an investment capital structure. In this way, the proportion of capital liabilities will reduce. As a result, the financial risks of government transportation investment can be controlled.

Latest China TOD Knowledge Events

- On the afternoon of October 11, 2019, Zhejiang Rail Transit Industry-Education Integration Alliance was established in Hangzhou. It is voluntarily established by domestic research institutes, universities, and well-known enterprises of rail transit. They included 20 joint presidium organizations and 41. At the alliance founding conference, the Regulations of Zhejiang Rail Transit Industry-Education Integration Alliance (Draft) was adopted. The alliance aims to establish a modern vocational education model integrating industry and education, combining practice with study, and adapting to the development of the industry. This education model will coordinate the training of rail transit professionals, scientific research, and social services to provide intellectual support for the operation and management of rail transit in Zhejiang, which will also contribute to the rail transit development in Zhejiang province, the Yangtze River Delta region, and eventually for the whole country. (link)

- On November 7, 2019, the opening meeting of the Standards for Comprehensive Development of Urban Rail Transit Stations and Surrounding Land and the Evaluation Standards for Comprehensive Development of Urban Rail Transit Stations and Surrounding Land was held in Chongqing. The purpose of the meeting was to make standards
and specifications for the comprehensive development of domestic rail transit stations and surrounding lands. These standards are to guide the comprehensive development practices conducted by various rail transit owners and related developers. Representatives of urban rail transit owners, design organizations, consulting companies, and developers from Beijing, Shanghai, Shenzhen, Chengdu, Chongqing, Hangzhou, and Qingdao raised questions and had discussions on the planning, design, construction, and post-evaluation related to the comprehensive development of urban rail transit stations and surrounding lands. They officially started the preparation of the above standards. Representatives plan to complete the drafting and evaluation of the standards by the first half of next year. (link)

- On November 8, 2019, Beijing Jiaotong University entered into a comprehensive strategic cooperation agreement with China State Railway Group Co., Ltd. (China Railway). Both sides, to build a strong transport power and advance railways, promoted in-depth integration of railway industries, universities, research institutes, and applications for win-win cooperation. China Railway will serve as an important base for basic railway research and technology R&D for Beijing Jiaotong University. Beijing Jiaotong University will provide high-quality support and services for China Railway in professional construction, personnel training, technology R&D, standard-setting, and decision-making consultation. (link)

- On November 8, 2019, Nanning Municipal Government held a seminar on transit-oriented development (TOD) of rail transit in Nanning. Over 300 people attended the seminar, including the Deputy Mayor of Nanning Municipal Government, the Executive Deputy Head of the Urban Rail Transit Construction Office, and members of the Leading Group of Nanning Metro Town Development and Construction, major leaders and responsible heads of the departments directly under the municipal government, the county and district governments, the administration committee of the development zone, personnel from the city’s platform companies, and related planning/design and consulting institutions. (link)

- From November 15 to 16, 2019, the 2019 RT FORUM Autumn Conference (Regional Railway Development Conference) was held in Shanghai. The conference focused on urban rail planning, construction, and operation. It attracted more than 500 representatives from municipal governments, design, consulting and research organizations, universities and entities related to railway development. (link)

**China TOD Industry News**

**Urban rail transit planning**

- The CPC Central Committee and the State Council issued the Outline for Building China’s Strength in Transportation. The document states that by 2035, China will be a transport powerhouse. A modern comprehensive transport system will be basically in place. The “national 123 travel circle” (1-hour commute in metropolitan areas, 2-hour access to urban agglomerations, and 3-hour coverage of major cities in China) and the “global 123 express logistics circle” (1-day delivery domestically, 2-day delivery to neighboring countries, and 3-day delivery to major cities in the world) will be basically formed. It aims to build an integrated transportation network of urban agglomerations; promote the integrated development of trunk railways, inter-city railways, municipal (suburban) railways, and urban rail transit; respect the laws of urban development; promote the overall and systematic growth of cities; coordinate urban functions and land use layout; and
scientifically formulate and implement urban comprehensive transportation system plans. As for the transportation system, it points out to strengthen the connection between urban rail transit and other modes of transport, improve road accessibility and elevate the quality of walking and cycling. Under the trend of urban agglomerations, especially for the Beijing-Tianjin-Hebei region, the Yangtze River Delta region, and the Guangdong-Hong Kong-Macao Greater Bay Area, it promotes to create globally competitive international hubs and develop the hub economy.

On October 8, 2019, the Development Plan of High-speed Railway Economic Belt in Jiangxi (2019-2025), issued by the Jiangxi Provincial Government, was officially announced. This Plan aims to accelerate the construction of the high-speed railway economic belt and support the high-quality leap-forward development of the greater Nanchang metropolitan area. Focusing on the Shanghai-Kunming High-speed Railway Economic Belt and the Beijing-Kowloon High-speed Railway Economic Belt, this plan plays the role of high-speed railways in the agglomeration effect. Moreover, the Plan drives the development of towns along the railways and forms a pattern of high-speed railway economic development in the whole province. (link)

On November 6, 2019, Guiyang announced the procurement requirement for Guiyang Tram Line Network Planning (2019-2035) and Guiyang Comprehensive Transportation Development Research, with a total procurement budget of RMB 7.32 million. It is reported that Rail Transit Line 1 has been completed and started to operate in Guiyang. With the development of Rail Transit Line 2, Line 3 and tram, Guiyang will soon form a public transport network system with large and medium capacity supported by “rail transit + tram + BRT.” How to promote the effective connection of the conventional public transport network through the optimization scheme will be the key to the realization of the integrated public transport network. (link)

On November 15, 2019, the Environmental Impact Assessment of Planning Adjustment of Nanchang Urban Rail Transit Phase II Construction (2020-2025) passed the examination of the Ministry of Ecology and Environment. This planning adjustment has been approved by the National Development and Reform Commission. Nanchang will achieve a seamless connection between the subway, the airport, and the High-speed Railway East Station. Nanchang will strengthen the close connection between contiguous areas and the central urban area, and promote the development of the greater Nanchang metropolitan area. (link)

Investment and financing

The National Development and Reform Commission approved the issuance of corporate bonds by Wenzhou Mass Transit Railway Investment Group Co., Ltd. on October 24, 2019, with a limitation of RMB 3 billion. Specifically, Type I raised RMB 1 billion and Type II raised RMB 2 billion, both for the Phase I project of Wenzhou’s municipal railway Line S2. (link)

On November 7, 2019, the Phase I project of Guiyang’s Rail Transit Line S1 officially started the construction, marking the acceleration of Guiyang-Gui’an integrated construction. According to the report, the Phase I project is 30.32km long with a total investment of RMB 17.252 billion. RMB 14 billion of the total investment is the green low-interest loan raised through the green finance fund channel. According to the Special Action Plan for Road Network Construction in Guizhou, the Province will invest RMB 43 billion from 2019 to 2022. Among them, RMB 5 billion will be invested in 2019 to speed up the construction of Guiyang’s
Rail Transit Lines 2 and 3. The Phase I project of Rail Transit Line 2 will be completed and start to operate in 2020. The Phase II project of Line 2 will be completed and opened to the public in June 2021. The Phase I project of Line 3 will be basically completed by 2022. (link)

The executive meeting of the State Council, which was held on November 13, 2019, decided to improve the capital system for fixed assets investment projects. The decision was made to ensure that some assets are retained, while others are controlled and treated differently, and to promote the combination of effective investment and risk prevention. According to the meeting, first of all, the minimum capital ratio for some infrastructure projects is reduced. The minimum capital ratio for port, coastal, and inland waterway projects is reduced from 25% to 20%. On the premise of reliable returns and controllable risks, the minimum capital ratio can be appropriately reduced by no more than 5 percentage points for infrastructure projects in the areas of roads, railways, ecological environment protection, and social livelihood which can make up the weakness from other projects. Second, infrastructure projects can raise up to 50% of the capital by issuing interest and equity financial instruments. Third, we will strictly standardize management and strengthen risk prevention. The project loan funds must not be used as capital. Raising capital must not increase the hidden debts of local governments illegally. Project payment must not be delayed. (link)

Strategic cooperation

On October 16, 2019, Guizhou Provincial Government and China Railway Group Limited signed a strategic cooperation framework agreement in Guiyang. Both sides will establish a long-term cooperation mechanism. The cooperation aims to give a full play to Guizhou's advantages in resources the economy and policies. China Railway Group Limited should exert its advantages in investment and finance in this relationship. Both parties will carry out long-term and effective cooperation through multiple channels and fields in infrastructure constructions, such as roads, railways, and other elements related to urban development. (link)

On November 18, 2019, Chongqing Railway Investment Group Co., Ltd. was officially inaugurated. As a joint venture railway company jointly funded and operated by the Chongqing Municipal Government and China State Railway Group, the company has a registered capital of RMB 27.912 billion. It is responsible for the investment and financing, construction and operation, asset management, comprehensive development of lands along the railways, and other services related to national and local joint railway projects. Concerning the Ministry of Finance’s management model for China National Railway Group, Chongqing Finance Bureau performs the functions as an investor, while China Railway Chengdu Group Co., Ltd. and Chongqing Development Investment Co., Ltd. perform the functions as shareholders. Chongqing Railway Investment Group signed strategic cooperation agreements with China Development Bank, Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, and other financial institutions. In the next five to ten years, these banks will provide Chongqing Railway Investment Group RMB 150 billion as intentional financing support. They will also carry out in-depth cooperation in financing projects such as joint venture railways, inter-city railways, and comprehensive development of land along the railways. (link)
Enterprise TOD practices

On the morning of September 4, 2019, Country Garden Holdings Co., Ltd. signed a cooperation framework agreement with Guangzhou Metro Group Co., Ltd. According to the report, Guangzhou Metro Group is fully promoting the development of integrated properties along the rail transit lines. Based on rail transit hub stations, the surrounding land will be used efficiently and intensively to build an industrial development carrier. To create the emerging city development layout featuring "hub + community + industry" and shape a new pattern of rail transit development in the Guangdong-Hong Kong-Macao Greater Bay Area, this cooperation is important. (link)

In October 2019, the acquisition of 51% rights and interests of two TOD real estate projects in Luogang and Chentougang was approved at the stockholders' meeting of Yuexiu Property, deepening the cooperation with Guangzhou Metro. Upon completion of the acquisition, the total floor area of Yuexiu Property's rail transit property projects will increase to about 3.2 million square meters, accounting for about 15% of Yuexiu Property's total land reserve and 36% of the land reserve in first-tier cities. Guangzhou Metro stated that in 2019, Guangzhou Metro is preparing to operate three intercity lines to help integrate the development of the Greater Bay Area, and will open 165 kilometers of new lines by 2020. By 2023, Guangzhou will form a large urban rail network with a length of 823 kilometers. Concerning the 33 rolling stock depot projects involved, Guangzhou Metro will selectively cooperate with Yuexiu Property depending on specific project conditions. (link)

In November 2019, Shenzhen Metro Group launched the country’s first commercial housing rental pilot project with “stable rent.” Shenzhen Metro Group promised to ensure that a certain proportion of public housing will be built in the properties along the subway. By October 2019, Shenzhen Metro Group had completed 1.85 million square meters of 22,400 public housing units, with more than 5,400 units under construction, covering a total area of about 2 million square meters. The public housing includes four large-volume public housing projects on the subway in Qianhai, Shekou West, Tanglang, and Henggang. Shenzhen Metro Group has actively cooperated with the Housing and Construction Bureau of Shenzhen Municipality, the Shenzhen Municipal Bureau of Planning and Natural Resources, the Development and Reform Commission of Shenzhen Municipality, and other departments to expand the public housing supply channels with the "rail transit + property" model. The cooperation also aims to provide large quantities of high-quality housing and to create a sound environment for the construction of pilot demonstration zones in Shenzhen. (link)

In November 2019, Shenzhen solicited the conceptual design proposals and the main architectural design proposals for the Xili Integrated Transportation Hub from all over the world. The deadline was 18:00 on November 30, 2019. This hub is located in the central urban area of Shenzhen. It is an important link between the central urban area and the science and technology innovation axis in Nanshan District of Shenzhen. It enjoys a prominent urban location advantage. According to the National Railway, Intercity Rail and Urban Rail Planning, the Xili Integrated Transportation Hub will introduce four high-speed railways (Ganzhou-Shenzhen High-speed Railway, Shenzhen-Maoming High-speed Railway, Shenzhen-Shantou High-speed Railway, and Shenzhen-Zhuhai Intercity High-speed Railway), two Pearl River Delta intercity railways (Shenzhen-Huizhou Intercity Railway and Shenzhen-Dongguan-Zengcheng Intercity Railway), and four urban rail transit lines (Lines 13, 15, 27 and 29). The hub will build urban space together with other public facilities, urban roads, and slow traffic systems. (link)
TOD Best Practical Case

Liuyun Community in Guangzhou
Theme for this Issue: TOD Best Practical Case: the Liuyun Community in Guangzhou
Case city: Guangzhou City, Guangdong Province, China

Project Overview

The scope of the Liuyun Community in this research is the block surrounded by Huangpu Avenue, Sports West Road, Tianhe South 1st Road and Sports East Road (The original community only includes Liuyun 1st Street and Liuyun 3rd Street).

The Liuyun Community is located in the business district of the city. It is accessible to both the subway and the BRT. The interior of the complex is mainly composed of 9-story medium-to-high-rise buildings. These buildings are located in a small block dominated by public space and define and limit the space for motor vehicles. Sharp corners and split roads minimize the space for car activities and limiting the speed, allowing it to provide more walking and green space. Inside the block is a tree-lined garden open to residents, and most of the open area is used for walking space and greenery. The parking space in this area is very limited by the periphery of the community.

In 2009, the Liuyun Community became an integral part of the central axis of Guangzhou’s new city, and is adjacent to the main venue of the Asian Games. Therefore, the Tianhe District Government proposed to the Guangzhou Municipal Government to upgrade and renovate the Liuyun Community. The renovation includes improving infrastructure, making the community pedestrian-friendly, and redesigning the landscape and building facades. The parking demand of the community is met by using nearby off-road parking garages and on-road metered parking lots. After the completion of renovation, the Liuyun Community was upgraded to a fully open and pedestrian-friendly mixed-function area. The rent of the ground floor doubled (based on a comparison of 2009 and 2010 data from Yingshang.com). Two years later, the price of second-hand housing increased by another 50% (compared with data from Anjuke in March 2010 and March 2012).
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<tr>
<th>Case Name</th>
<th>The Liuyun Community (&quot;Liuyun&quot; is named after the Sixth National Games held in Guangzhou in 1987)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Location</td>
<td>Located in Tianhe District, Guangzhou City, PRC, south of Tianhe Sports Center, and north of Zhujiang New Town</td>
</tr>
<tr>
<td>Total Area</td>
<td>22.5 ha., whose boundaries include Sports West Road, Huangpu Avenue West, Sports East Road and Tianhe South 1st Road</td>
</tr>
<tr>
<td>Completion Time</td>
<td>1989</td>
</tr>
<tr>
<td>Land Use</td>
<td>Commercial and residential uses</td>
</tr>
<tr>
<td>Population</td>
<td>17,618 (Data of Tianhe South Sub-district Office in 2014)</td>
</tr>
<tr>
<td>Project Launcher</td>
<td>Guangzhou Tianhe District Government</td>
</tr>
<tr>
<td>Project Design Company</td>
<td>Guangzhou Tianhe Architectural Design Institute</td>
</tr>
<tr>
<td>Total Investment Amount</td>
<td>RMB 230 million (The estimated amount of Asian Games renovation works, including street renovation, building facade refurbishment, drainage system renovation, and landscape design)</td>
</tr>
<tr>
<td>Capital Contributor</td>
<td>Guangzhou City Investment Co., Ltd. (Guangzhou Municipal Government)</td>
</tr>
<tr>
<td>Traffic location</td>
<td>Car-free community, 5 minutes walking distance to Tiyuxi subway station, Tianhe Sports Center BRT station, Tianhe APM station and Huangpu Avenue APM station.</td>
</tr>
</tbody>
</table>

**Liuyun Community Regeneration Project**

**key design**

- Make the entire community pedestrian-friendly and separate motor vehicles
- Open public pedestrian network
- Function improvement: widen the central pedestrian street
- Mixed use: turn the ground floor of the residential building to commercial use (retail stores, cafes, bars, etc.)
- Pay attention to the detailed design of pedestrian facilities (lights, plants, sunshade facilities, public seats, and fitness facilities, etc.)
- Facade renovation

**Stakeholders**

- **Public Sector**: Guangzhou Municipal Government, PCO of the Tianhe District Government, Guangzhou Urban Investment Co., Ltd., Tianhe South Sub-district Office, Nanyi Road Community Residents Committee, Sports West Community Residents Committee, and Yulei Community Residents Committee
- **Private Sector**: Guangzhou Construction Property Management Co., Ltd.
- **Civic Organization**: Ground Floor Store Alliance and residents
- **Design Institute**: Guangzhou Tianhe Construction Design Institute (Decoration Project for 2010 Asian Games)
Design features

- **Mixed use**: allow change from residential to commercial use to make community more active.

- **Motor vehicle restrictions and dense pedestrian networks**: Pedestrian networks in the community are very dense and are isolated from motor vehicles by bollards. This not only improves the pedestrian connectivity of the community and the surrounding area, but more people enter the community, which improves and promotes the development of business within the community.

- **Open Blocks**: Liuyun Community has no walls, and all pedestrians and bicycles are allowed to enter. The community is protected by CCTV and pedestrians a the "eyes of the street".

- **High-density development**: The buildings in the Liuyun Community are mainly 9 story medium- and high-rise buildings, which meet the standards of sunshine and ventilation. The buildings also provide a pleasant scale for living and shopping.

- **Public transportation**: The proximity and easy access to public transportation stations (BRT and subway) encourages people to use public transportation and walking, and inhibits the use of motor vehicles.

- **Landscape and public space**: The central pedestrian street, which is the largest public space in the Liuyun Community, integrates the designs of stores, public space, plants, and sunshade facilities. There are big trees on the streets and in the squares, providing shade, and beautifying the environment.

- **Parking management**: Parking is prohibited in the community and restricted around the community. There are no parking lots in the Community since it was built before China began to motorize. Because of the lack of parking management, illegal parking occupied the streets of the community before the pedestrian renovation. After the completion of the renovation project in 2010, the community became car-free. The need for necessary parking is met through on-road and off-road parking in the surrounding area. Since Liuyun Community is located in Parking Toll Zone 1 of Guangzhou, non-essential parking demand is filtered through higher parking fees. These measures have successfully made the community a car-free community and discouraged people from driving to this area.

Economic benefits

- **An increase in real estate prices**: As more residential units have been transformed into commercial units and the pedestrian environment has been improved, the average housing price in the community have been significantly increased. The rent of shops has increased by 30% since the completion of the renovation in 2010.

- **An increase in shop turnover**: After the Liuyun Community became more open and walk-friendly, it attracted many visitors to come to the shop and dine, and more residents have converted their houses to commercial uses.

Social benefits

- **More vibrant communities**: Unlike other communities in the late 1980s, the Liuyun Community not only failed but prospered. It was due to the mixed development and utilization in the community, environmental improvement, good accessibility to public transportation, and convenient and accessible Various dining and shopping spots.

- **Safer neighborhoods**: As cars are forbidden inside the community, accidents
caused by motor vehicles are eliminated. Standardized commercial activities and the flow of people on the street have reduced the crime rate in the area.

- **Healthier residents**: Since the use of cars is prohibited in the community and there are good walking paths to Zhujiang New Town and Tianhe Sports Center, it can better encourage people to walk or cycling. As a result, the residents of the community have a healthier life.

### Environmental benefits

- **Reducing carbon emissions**: the location of the community is close to several working spots (including the community interior, Tianhe City, Zhengjia Plaza, Zhujiang New Town, Tianhuan Plaza, etc). So the commuting distance can be greatly reduced. Also, since the community is non-motorized, it relies heavily on public transit, walking, cycling, and other types of transit which have low carbon emission.

- **Beautifying the urban environment**: the Liuyun Community is a pedestrian block made of dense public spaces and greenery, which gives the city a new look.

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**Before the renovation (2009)**

The north side of the Central Avenue connecting to the Liuyun Community was narrow. The street was occupied by illegal parking. (Image Source: Guangzhou Tianhe Construction Design Institute)

Many cars were parked in the southern section of Central Avenue connecting to the Liuyun Community. Some cars occupied the sidewalk. (Image Source: Guangzhou Tianhe Construction Design Institute)

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**After the renovation (2015)**

Observing photos were taken at the same angle. We can find that the Central Avenue of the Liuyun Community has become pedestrian-friendly. The exterior wall of the buildings has been refurbished. The entrances and exits of motor vehicles have also been separated by flower boxes. Commercial activities have become more active.

The southern section of Central Avenue connecting to the Liuyun Community has also become walkable. Moreover, lots of bollards have been used to prevent the entry of motor vehicles.
Cars also occupied the sidewalk in the middle section of Central Avenue connecting to the Liuyun Community. (Image Source: Guangzhou Tianhe Construction Design Institute)

The middle section of Central Avenue connecting to the Liuyun Community has also become walkable. Through underground pedestrian connections, pedestrians can directly reach the rail station and the underground shopping mall in Zhujiang New Town.

Evaluation of Liuyun Community based on TOD Assessment Standards 2.1

1. Walking

1.1 Walkway

Inside the Liuyun Community, there is a safe pedestrian network connecting almost all the buildings and destinations inside and outside the area. The roads which are isolated from the motor vehicles protect the pedestrians in the area. The network meets the requirements of barrier-free accessibility. There is sufficient lighting. Almost all the streets are shaded with green trees which can ensure pedestrians and bicyclists can safely share. In the middle of the community, there is an urban life-style branch road from the east to the west (on the Tiyuxi Bystreet). Although motor vehicles are driving on the road, there are specially protected sidewalks; 100% of the walking network in the Liuyun Community is complete.
1.2 Pedestrian crossings

There are complete pedestrian crossings at all intersections inside and outside the Liuyun Community. There are safe barrier-free crosswalks (the width of the sign is no less than 2m). It is necessary to set up a barrier-free safety island for any crosswalks crossing more than two lanes (16m or above).

1.3 Visually active interface

On the first floor of each residential unit in the Liuyun Community, along the side of the public walkway, there are mainly cafés, restaurants, small retail stores, etc. These shops were able to operate because the first floor of the residential unit has changed its usage from residential to commercial. The facades of the commercial units are all or partially transparent glass materials. There are seats and recreational facilities, etc., inside the space. The visual activity interface in the Liuyun Community is as high as 89.76%.
1.4 Active interface along the street

There are many pedestrian entrances and exits of shops or buildings (including bicycles, pedestrian passageways, entrances and exits of shops, restaurants, cafes, building lobbies, parks, and squares) in the street interface of the Liuyun Community. All the entrances and exits greatly improve the activity practice generated by the block interface. The number of pedestrian entrances and exits of shops or buildings per 100m block interface in the area is up to 9.34.

1.5 Shelter from sun and rain

It is hot in the summer in Guangzhou, but there are green trees along the walkway in the Liuyun Community which can provide sufficient shelter. The building spacing is small. Many sections of the walkway can be covered by architectural shadows most of the day. Thus, it enhances people’s willingness to walk to a large extent. In the middle of the contiguous area is Sports West Byroad. The trees and a variety of shelter facilities, such as the canopies of shops along the street, can improve the suitability of the walking environment.

Contiguous areas for pedestrians with sufficient facilities providing shelters from sun and rain in the community account for 97%.
2. Bicycles

2.1 Bicycle network

Although there is no dedicated or isolated bicycle lane inside the Liuyun Community, as a car-free community, most of the interiors are people-oriented streets and speed-limited shared streets (≤15km/h). They are connected to public transit stations; the walking distance of each building in the area to a safe bicycle lane is less than 100m.

2.2 Bicycle parking at public transit stations

Within the scope of contiguous areas of the Liuyun Community, except for one side of Huangpu Avenue, almost all sidewalks along the motorway are provided with multi-berth bicycle parking facilities. Safe bicycle parking facilities are also installed in front of some shops. The facilities encourage cycling.

2.3 Bicycle parking facilities in buildings

According to statistics for the buildings with more than 500 m² building area or more than six residential units within the scope of contiguous areas of the Liuyun Community, bicycle parking facilities in the buildings should be arranged within 100m outside of the building entrance and the pedestrian and motor vehicle areas. Nearly 70% of the buildings in the community provide ample bicycle parking facilities as described above, and each facility can accommodate 20-30 bicycles at the same time.

2.4 Bicycles entering buildings

The Liuyun Community is mainly composed of residential, retail, and commercial buildings. The internal roads of the community are bike-friendly. Bicycles are allowed to enter the management area of the buildings. Residents or shop renters can store bicycles in private places at night and for a long time. It is to ensure that there is sufficient and safe bicycle storage space in the community.
3. Connectivity

3.1 Small blocks

There is a highly integrated network of paths and streets across small blocks in the Liuyun Community. The dense network provides a variety of path choices, enriching the walking and cycling experience. According to the statistics on the length of each block’s long side in the area, the pedestrian intersection density that can reflect the street connectivity has been calculated. The result is to see whether the walking and riding paths within the community are short, direct, and diverse. The Liuyun Community has composed of small size blocks and some large residential blocks in the eastern and southern part of the community. The length of the long side of 90% of blocks in the community is below 140m.

3.2 Priority connectivity

An important criterion for TOD is the connectivity of walking and cycling, rather than the connectivity of the motor vehicles. According to the intersection of four roads = 1 intersection, the intersection of three roads = 0.75 intersections, and the intersection of five roads = 1.25 intersections, the ratio of pedestrian intersections and intersections of motor vehicles is selected as the benchmark for measuring priority connectivity. There are 7.25 motor vehicle intersections in the contiguous areas of the community and 42.75 intersections for pedestrians and bicycles, showing that the ratio of priority connectivity in the community is 5.9.

The walking and cycling environment in the Liuyun Community is suitable for all types of people to travel and stay leisurely.
4. Public Transit

4.1 Walking distance to public transit

The high-capacity public transit stations around the Liuyun Community include the Sports West Road Subway Station, the Sports Center Subway Station, the Sports Center South APM Subway Station, the Tianhe South APM Subway Station, the Huangpu Avenue APM Subway Station, and the Sports West Road BRT Station. The 500m service area of various high-capacity public transit stations basically covers the entire Liuyun Community. Besides, there are several stations with direct service lines leading to the above-mentioned high-capacity bus lines around the community, which can be used as a supplement.

That is to say, the walk distance from the inside of the Liuyun Community to each high-capacity public transit station is within 1 km, or the walking distance to the stations with direct service lines is within 500 meters. All of the above meet the basic requirements of TOD.
5. Mixed use

5.1 Functional complementation

In a small area, if we can make the balance of mixed-use functions and activities (such as residence, work, retail business, etc.), walking will be encouraged. As a result, unnecessary car travel will reduce. At the same time, because the peak usage time of various functions is different, the mixed-function distribution makes the street active and safe. A lively and livable environment will be created. The Liuyun Community integrates residential, commercial, and other spaces into adjacent blocks. The first floor and some lower floors of each residential unit have different functions (see the right figure for details), including daily necessities, catering, hotel, personal or community public service, entertainment, business, medical insurance, education, etc. The dominant function (residence) in the community only accounts for about 70% of the total building area.

5.2 Purchases of fresh food

Chinese people rely heavily on purchasing fresh food, which is the basis of daily life for every household. Therefore, to be able to purchase fresh food on foot is an essential part to ensure a higher quality of life. Select some the buildings in the contiguous areas of the community covered by supply areas, including daily necessities stores, vegetable markets, street vendors, or high-frequency fairs of any scale, within the service radius of 500m to measure whether the area can gradually obtain the standard of daily supply goods and services. In the north of the Liuyun Community, there are supermarkets in Teemall and Grandview Mall. In the middle, there are many fresh food supply places with different sizes inside the Sports West New Street market. 100% of the buildings are within the walking range of fresh food supply places.
5.3 Affordable housing

The existence of affordable housing shortens the commuting distance of lower-income groups. There is no corresponding low rent housing and affordable housing in the Liuyun Community. The changes in the average price of second-hand housing in the Liuyun Community, Tianhe South Area, and Guangzhou city from December 2011 to March 2016 are as follows. The price of the Liuyun Community is above the average price of Guangzhou City and a bit above the average price of the Tianhe South Area. The comparison of second-hand housing in the Liuyun Community and that in the surrounding communities are as follow:

![Comparison of Average Prices of Second-hand Housing (2011.12-2016.02)](image)
6. Density

6.1 Land use density

The high-density development area guided by public transit can create a vivid stage to ensure activity, vitality, safety, and livability. The Nanyayuan Community (Nanyayuan Community: RMB 28,136 / m²; Tianhe South area: RMB 25,447 / m²; March 2016), which has similar land use function to the Liuyun Community and whose real estate value is above the urban average, is selected as the benchmark value area. After estimating the total population, the number of employment positions, and the number of visitors of the Liuyun Community, the three items are all above the benchmark values.

7. Compactness

7.1 City base

The most fundamental principle of organizing urban development density is intensive development, which can minimize travel time and energy consumption. The built-up area in the Liuyun Community out of the land capable of being developed is 100%.

7.2 Public transportation options

There are four high-capacity public transit lines (BRT, Metro Line 1 and Line 3, APM Line) and 34 conventional public transit lines within the service radius of 1km around the main public transit stations in the contiguous areas of the Liuyun Community. However, high-density public bicycle projects are lacking.
8. Transition

8.1 Off-road car parking

A good public transit can cultivate good public transit habits so that the demand for cars in daily life will be greatly reduced. More off-road car parking space can be released as the resources for the urban space, which will be transformed into better functions in terms of social and economic benefits. At present, there are many ground and underground parking lots in the Liuyun Community, whose entrances and exits are mainly distributed in the central and southern peripheral areas. There are 836 parking spaces in total, with a building area of 21,000 m², accounting for 9.01% of the total area of the Liuyun Community. Notably, part of the underground parking lots on Sports West Bystreet can be combined with the shared parking platform for efficient resource allocation.

Schematic of the use of shared parking platform in the Liuyun Community

Utilization the underground parking lot of the shared parking platform

8.2 Motor vehicle entrance and exit density

The Sports West New Street market in the middle of contiguous areas
The frequency of interruption by motor vehicles can be measured by the density of entrances and exits for motor vehicles on the pedestrian road. The interference of the pedestrian network can be encouraged to be minimized. Entrances and exits for motor vehicles inside the Liuyun Community are mainly distributed on the central Sports West Bystreet. The average number of motor vehicle entrances and exits per 100m block interface is 0.14. The pedestrian road at the motor vehicle entrances and exits has not been elevated accordingly.

8.3 Traffic space

Most of the streets inside the Liuyun Community are car-free community streets. The actively shared streets provide a good environment for pedestrians and bicycle riders. Also, the total road area for motor vehicle traffic and on-street parking in the Liuyun Community is about 34,776 m², accounting for 15% of the total area of the community.
## Evaluation Item

<table>
<thead>
<tr>
<th>Walking</th>
<th>Maximum Score</th>
<th>Specific Items</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Completeness of walk network</td>
<td>3</td>
<td>100%</td>
<td>3</td>
</tr>
<tr>
<td>The percentage of safe, barrier-free walkways out of block boundaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 Pedestrians crossing the street</td>
<td>3</td>
<td>100%</td>
<td>3</td>
</tr>
<tr>
<td>Percentage of intersections with safe and barrier-free pedestrian crossings in all directions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Visually active interface</td>
<td>6</td>
<td>89.76%</td>
<td>5</td>
</tr>
<tr>
<td>Percentage of block boundaries adjacent to public footpaths and activities within buildings that can produce a visual connection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Activity infiltration interface</td>
<td>2</td>
<td>9.34</td>
<td>2</td>
</tr>
<tr>
<td>The average number of pedestrian entrances and exits of shops or buildings every 100-meter-long block interface</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 Shelter from sun and rain</td>
<td>1</td>
<td>97.85%</td>
<td>1</td>
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<tr>
<td>Percentage of walkways with adequate facilities protecting people from the sun and rain</td>
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<tr>
<td><strong>Sub-total of the walking aspect</strong></td>
<td><strong>15</strong></td>
<td></td>
<td><strong>14</strong></td>
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</table>

### Bicycle

<table>
<thead>
<tr>
<th>Bicycle</th>
<th>Maximum Score</th>
<th>Specific Items</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Bicycle network</td>
<td>2</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>The maximum walking distance to safe bicycle lane less than 100m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Bicycle parking at public transit stations</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>The maximum walking distance to safe bicycle lane between 100m and 200m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 Bicycle parking facilities in buildings</td>
<td>1</td>
<td>10%</td>
<td>0</td>
</tr>
<tr>
<td>The maximum walking distance to safe bicycle lane more than 200m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 Bicycles entering buildings</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Provide safe bicycle parking facilities with multiple berths at high capacity public transit stations</td>
<td></td>
<td></td>
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<tr>
<td><strong>Sub-total of the bicycle aspect</strong></td>
<td><strong>5</strong></td>
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</table>

### Connectivity

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>Maximum Score</th>
<th>Specific Items</th>
<th>Scores</th>
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</thead>
<tbody>
<tr>
<td>3.1 Small-sized blocks</td>
<td>10</td>
<td>140.37</td>
<td>2</td>
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<tr>
<td>90% of the length of the long side of the block</td>
<td></td>
<td></td>
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<tr>
<td>3.2 Priority connectivity</td>
<td>5</td>
<td>5.90</td>
<td>5</td>
</tr>
<tr>
<td>The ratio of priority connectivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intersections for motor vehicles</td>
<td></td>
<td>725</td>
<td></td>
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<tr>
<td>Intersections for pedestrians and bicycles</td>
<td></td>
<td>42.75</td>
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<td><strong>Sub-total of the connectivity aspect</strong></td>
<td><strong>15</strong></td>
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### Public transit

<table>
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<th>Section</th>
<th>Description</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>4,1</td>
<td>Walk distance to public transit</td>
<td>The walking distance to high-capacity public transit stations is within 1 km, or the walk distance to the stations with nonstop service lines is within 500 meters</td>
</tr>
</tbody>
</table>

**Does it comply with the basic requirements of TOD?** Yes, it does.

### Mixed utilization

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,1</td>
<td>Function complementarity</td>
<td>The percentage of dominant functions of station areas to the total building area</td>
</tr>
<tr>
<td>5,2</td>
<td>Purchases of fresh food</td>
<td>The ratio of buildings with supply places providing fresh food with a walk scope (500m)</td>
</tr>
<tr>
<td>5,3</td>
<td>Affordable housing</td>
<td>The ratio of residential units of affordable housing</td>
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</tbody>
</table>

**Sub-total of the mixed utilization aspect** 15

### Density

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>6,1</td>
<td>Utilization density of land</td>
<td>The gaps between total population, number of employments, and number of visitors and benchmark values</td>
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</tbody>
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**Sub-total of the density aspect** 15

### Compactness

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>7,1</td>
<td>City base</td>
<td>The percentage of the built-up area out of the land capable of being developed</td>
</tr>
<tr>
<td>7,2</td>
<td>Public transport options</td>
<td>Selection of public transit routes within one km around the contiguous areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of high capacity public transit lines (rail, BRT, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conventional bus lines</td>
</tr>
<tr>
<td></td>
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<td>Qualified public bicycle stations</td>
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**Sub-total of the compactness aspect** 15

### Conversion

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>8,1</td>
<td>Off-road car parking</td>
<td>The percentage of the building area of unnecessary off-road parking space to the total land area of the contiguous areas</td>
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<tr>
<td>8,2</td>
<td>Density of entrances and exits of motor vehicles</td>
<td>Average number of entrances and exits of motor vehicles per 100m block interface</td>
</tr>
<tr>
<td>8,3</td>
<td>Transport space</td>
<td>The percentage of on-road parking and motor vehicle traffic space</td>
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**Sub-total of the mixed utilization aspect** 20

**Total Score** 80/100
Report Sharing

- ATKINS - The Value of Stations

Upcoming TOD Events


- January 16-17, 2020, Transforming Transportation 2020, Washington, D.C., U.S.