Global Environment Facility

China Sustainable Cities Integrated Approach Pilot

Terms of Reference (TOR)

Research on Rail Transit Station Area Planning Based on TOD Concept

[Nanchang]

Contract Ref. No. [GENC-3B]

1. Project Background

Sustainable Cities Integrated Approach Program is a global innovative project of the Global Environment Facility (GEF), aiming to adopt comprehensive management measures to alleviate the environmental problems arising from the global urbanization process, and to promote global environmental governance and sustainable development. The project consists of 11 sub-projects at national level implemented in China, Brazil, India and etc.. The sub-project in China is carried out by the Ministry of Housing and Urban-Rural Development of China and seven Chinese cities, namely Beijing, Tianjin, Shijiazhuang, Ningbo, Nanchang, Guiyang and Shenzhen.

In recent years, China's economy has developed by leaps and bounds, leading to a rapid expansion in both the scale of cities and the number of urban population. Thus an unprecedented urbanization process has begun. With 300 million rural people going to settle down in towns and cities in the next decade, urban development will be curbed due to limited resources, energy, environment and etc..The capacity of the already saturated urban area is constantly being challenged in every aspect, especially the constantly overloaded traffic infrastructure, making traffic jams a typical "urban disease." Tackling traffic issues has therefore become an unavoidable yet vital task for cities to develop successfully.

At present, China is promoting rapid rail transit systems (including high-speed railways and urban rail transit) at the national level, which provides new opportunities for regional development and urban transformation. So far, various regions and cities have entered a critical period of urban development. The Transit Oriented Development (TOD) model will promote the urban to evolve from a traditional single-center structure to a multi-center one. Against this backdrop, methods such as improving land use efficiency and carrying capacity, boosting urban vitality, and alleviating urban traffic congestion are the effective ones for solving urban development problems.

To help Nanchang City better move towards sustainable urbanization in the future, this consulting service will take the Metro Line 2 East Extension Section as the main subject and apply the TOD concept to conduct development model research on the land surrounding the rail stations. Taking this as an opportunity, an economic growth point for Nanchang with complete urban functions, compact layout, and comfortable environment will be created, so as to support a new spatial structure and new forms, achieve intensive use and efficient expansion of land, eventually forming an urban construction model that integrates environmental protection, fair resident travel planning, urban design and development, all into one.

2. Aim of Consulting Service

Study the TOD of stations along Metro Line 2 East Extension Section, and explore the integrated mode of urban transportation construction and land development management. In particular, the overall goal of the TOD of this project is to achieve the full-cycle financial sustainability of the urban rail transit line project and the complementary development of urban land development, to build sustainable urban development, and to advance low-carbon transportation. The specific goals are as follows:

-- Carry out research on the integration of urban rail transit and land use, and guide the implementation of integrated project construction.

-- Discuss the financial balance plan for the project regarding the support for construction of the Metro Line 2 East Extension Section, the operation and maintenance of not only the East Extension Section but also the whole Metro Line 2.

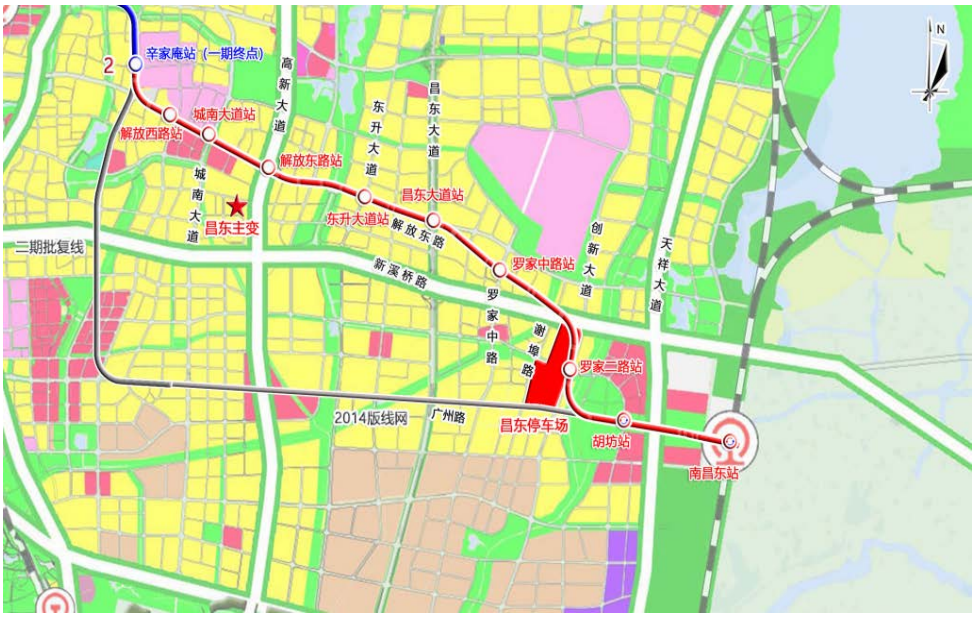
-- Design an overall plan that benefits all stakeholders involved, takes into account their demands, and minimizes the resistance occurred during the integrated construction and development process of rail transit stations and in their surrounding areas.

-- Form TOD planning and design guidelines for rail transit stations to provide technical guidance for the construction of other lines in the future.

-- Form a TOD action guide for rail transit stations that determines the operation process, and provides effective action routes for the policy formulation, planning, design, construction, operation and maintenance, investment and financing modes for building rail transit stations in the future.

3. Research Scope and Period

The East Extension Section of Nanchang Metro Line 2 runs from Xinjia'an to Nanchang East Railway Station, with a total length of 10.52km. Connected to Metro Line 2 (Phase 1 and South Extension Line) , it has 9 stations, namely Jiefang West Road Station, Chengnan Avenue Station, Jiefang East Road Station (single crossover set up in front of the station), Dongsheng Avenue Station, Changdong Avenue Station, Luojia Mid. Road Station (there is a parking line behind the station and is connected to the access line), Luojia Er Road Station, Hufang Station, Nanchang East Railway Station, and one depot, namely Changdong Depot (near Luojia Er Road Station).



Map of East Extension Section of Nanchang Metro Line 2

The scope of the research space is the ten stations of Nanchang Metro Line 2 East Extension Section (including the completed one-Xinjia'an station) , one depot, the area within a radius of 800 meters around the standard stations, and the area within a radius of 1000 meters around the interchange stations and the shuttle service stops, Among them, the 200-meter area around a station is considered the core area, and the area around the Changdong Depot should not be smaller than twice the white area of the main body project.

The study period is consistent with the latest land and space master plan prepared by Nanchang City. If there is no corresponding land and space master plan, the planning period can be short-term (2025) or long-term (2035).

4. Content of Consulting Service

4.1 Basic data collection and analysis

Task 1: Data collection

This task includes collecting and analyzing various types of data required for TOD research on the East Extension Section of Metro Line 2, as well as understanding the factors surrounding the stations that either restrict or develop the city and its transportation to ensure that the data collected in this task cover the needs of this project. Meanwhile, the baseline of the project will be established according to the research result. Types of data include but are not limited to the following:

--Collect relevant data to analyze the status quo and planning of urban development, land use, current population, national economic and social development,

and environmental conditions in the research area;

--Collect relevant data to analyze current topographic maps (including planned road red lines and repair and survey of current topographic maps), aerial photos, video images, information on natural conditions such as topography, river system, vegetation, and ecological environment, risk exposure from natural disasters (such as floods), Historical and cultural materials such as historical and cultural blocks, Cultural Relics Sites Under the Protection at various levels, etc., Collect and analyze relevant data along the extension line including geology, hydrogeology, groundwater, energy consumption, environmental pollution and environmental capacity, road safety, health of the population, etc;

--Collect relevant data to analyze the supply and demand of the real estate market, including its different types and combinations of uses, vacancy rates, price evolution analysis, future supply conditions, etc.;

--Collect relevant data to analyze policies, regulations and functions of management department related to the acquisition of local land use rights, infrastructure construction approval, etc., and analyze relevant technical standards and implementation rules for urban planning;

--Collect relevant data to analyze the city's rail transit network, especially the operation of passenger flow on the existing lines such as Metro Line 2;

--Collect relevant data to analyze the city's rail transit network planning and construction plan, the feasibility study of the East Extension Section project of Line 2, the integrated transportation hub planning, the planning of connecting rail transit to other types of transit, and the planning of integrated connection facilities for related stations, etc. And understand the related investment and operating costs of transportation facilities;

--Collect relevant data to investigate major provincial and national rail transit projects (such as railway projects), analyze project relevance and conflicts; consider and analyze the cumulative impact of project construction, such as cross-effects this project has with other existing lines and planned lines;

--Collect relevant data to analyze planning and construction guidelines related to pedestrians and non-motor vehicles around public transportation stops;

--Collect relevant data to analyze the status and planning information of other facilities, such as public management and public service facilities and commercial service facilities, schools, medical institutions, road transportation facilities, parks, municipal public facilities, public safety facilities and underground space utilization, underground facilities along the line (such as tap water pipe network, rain sewage

pipe network, wires and cables, gas pipelines, etc.), construction status data, land economy, etc.

--Collect relevant data to analyze the current and planned population details and residential data, including size, density, distribution, composition of the population, the low-income housing project within 800 meters from the station, and the residential layout, etc.;

--Collect relevant data to analyze other basic information required for this consultation;

Within one month of signing the contract for this project, the consulting firm will submit an opening report, the content of which is based on the plan and schedule proposed in the proposal to develop a detailed work plan and schedule for follow-up tasks.

When completing the task, the consulting firm will submit the collected original data, graphs, and results of investigation and analysis of the current situation and planning. (including but not limited to superior and related planning analysis, land ownership analysis and value judgment, research and analysis of plots with development potential, real estate market research and analysis, etc.) That is, text reports, drawings, calculation tables, and data files on geographic information system.

Task 2: Stakeholder analysis and public participation

Carry out analysis and evaluation of stakeholders involved in the station areas of Metro Line 2 East Extension Section to identify the main stakeholders and their impact on the development of regional TOD, and put forward corresponding suggestions for development. Specific tasks include:

--Analyze and determine the stakeholders of this project, which are not limited to governmental departments managing the project, constructors, operators, users, other participants, etc., analyze the departments, enterprises, and individuals that various stakeholders may involve, and determine who are most relevant to the development of TOD among them. In addition, fully take into account the relevance of public sectors which manage or utilize public utilities, such as water pipes, rain and sewage pipes, gas pipes, wire and cable and other facilities, and analyze whether these public sectors should be a stakeholder in this project;

--Organize the solicitation of opinions from major stakeholders in the research area to develop a clear vision based solely on the opinions of stakeholders;

--Formulate procedures and mechanisms for public participation to promote citizens' participation in regional TOD planning and construction.

--Once the task is completed, the consulting firm will submit an analysis report of stakeholders.

Task 3: Case study

Choose one overseas and two domestic TOD cases that are of similar scale to that of the Metro Line 2 East Extension Section and of its stations. Thoroughly benchmark the existing lines of Nanchang Metro and the East Extension of Line 2 with the chosen cases to guide the subsequent tasks. Details of the task are as follows:

--Overall situation of TOD or situation of the built land: The relationship between TOD and the overall spatial layout of the area, the relationship between TOD and the track line and station (parking station) it depends on, TOD spatial scope, TOD overall spatial layout plan, TOD design guidelines (from the perspective of major stakeholders), real estate market conditions in TOD planning areas, considerations of urban elastic disaster reduction, low-income housing projects, human health, environment, resources and energy that are related to TOD and indicators in TOD planning and design. Summarize several successful TOD spatial layout patterns of the station area: analyze the combination of above-ground and underground development volume, TOD land use function (residential, commercial, office, etc.) mode, whether a station is located in the center or the side area of TOD, number of entrances and exits of stations, the degree of integration of the entrances of an station with the building, etc.

--TOD transportation system: Study the TOD rail transit passenger flow and rail service status, overall functions in the urban rail network (E.g. single station, core interchange station, hub station) indicators and plans for ground road planning, TOD slow traffic system, other transportation services on the ground in TOD (regular buses, taxis, private cars), parking policies, total parking spaces of TOD buildings, building construction indicators and parking charging policies, traffic safety effects and policies, etc in each case.

--TOD coordination mechanism: Explain the existing institutional environment for TOD implementation in each case, including a description of the main stakeholders, the main aspects of the applicable legal framework, and a description of their interaction: The roles, responsibilities, obligations, contributions of stakeholders, and the types of benefits they obtain from the TOD development.

--TOD related policies: research and analyze urban rail transit construction funding solutions based on relevant cases in other cities, and specific measures implemented by TOD.

--TOD performance goals: describe the TOD development goals, related

monitoring and evaluation indicators, and related quantitative values in each case.

At the end of this task, the consulting firm will submit the research results of the case study, that is, text reports, drawings, calculation tables, and calculation formulas used in the reports to provide reference for the development of TOD planning and guidance programs in subsequent tasks.

The consulting firm should also summarize meaningful control indicators (in addition to the basic indicators, the research result should also reflect indicators of environmental protection, resource and energy utilization, traffic safety, flood control capabilities, and protection of people's health, etc.) in order to manage TOD planning and design in different types and functions of station areas.

4.2 Planning guidance for the area around the stations

Task 4: Functional positioning around the stations

This task includes find outing the urban function positioning and main function composition of the area around the stations. The functional positioning should be able to provide the necessary work depth to meet the full-cycle financial sustainability calculation of the follow-up TOD project of Metro Line 2. The task includes but not limited to the following:

--Establish an evaluation indicator system related to the development of the surrounding area of the station, and find out the TOD development goals and related specific indicators of the station, including social, economic, financial and environmental, resource and energy utilization, traffic safety, resistance to related natural disasters and secondary disasters, completeness of public service facilities and other aspects;

--Find out the TOD boundary of the area around the station, and preliminarily determine its scope of the key plots.

--- Analyze the role of each station along the East Extension Section in Nanchang's overall transportation network. Through analysis of every main feature, these stations can be aggregated accordingly and divided into different types, using a 3V framework or similar equivalent methods;

--Study the functional positioning, spatial structure and development focus of the surrounding area of the station, and the conceptual construction scale and development intensity, and explore different types of development according to the current conditions and advantages of each station;

--Based on the risk areas identified in Task 1, verify the risk exposure of those development projects;

--Make an initial evaluation of the financial feasibility through preliminary calculation of the available land resources along the metro line;

--Provide relevant industrial development strategies for plots around each station;

--Provide market positioning, property portfolio suggestions, and project development competition analysis for the development of industries around the station, In particular, provide relevant strategies to ensure the supply of a certain amount of low-income housings around most stations.

Task 5: Guidance on classification planning of the area around the stations

The task focuses on classification planning of the area around the stations and make TOD staged implementation plans accordingly; the plan should be able to provide necessary parameters to meet the financial sustainability calculation of the TOD project of Line 2 throughout the whole cycle. Meanwhile, it should consider aspects such as environmental protection, resource and energy utilization, traffic safety, and the residents' health protection. In addition, in order to consider the implementation of potential proposals, it is necessary to identify the potential problems involved in the implementation of each stage, and put forward relevant suggestions, including but not limited to:

--Planning guidance for integrated comprehensive development project: Determine 4 key stations with the project owner that cover 4 types of stations (departure station, interchange station, completed station, Depot), Guide the integrated comprehensive development planning for 4 stations respectively;

-- Implementation scope of integrated comprehensive development project: determine the scope of development and the level-by-level plan for construction.

-- Road system and parking facilities: Based on the TOD plan and the analysis of the current traffic carrying capacity, determine the following aspects in the area: the road grade, functions and road section forms; regulations on the structure and on the set-up of pedestrian and non-motor vehicle transportation systems; the routes to and from the station related to the surrounding road network, as well as the road network and motor/non-motor vehicle parking facilities. And make guidelines for the design of roads and parking lots at important intersections.These regulations should follow the national guidelines on the implementation of promoting small-scale blocks, high-density road networks, and priority for pedestrians and non-motor vehicle users;

-- Transportation connection: including but not limited to interchange facility system, connection facility system, non-motorized vehicle and pedestrian system;

--Land use control for rail facilities: including but not limited to land used for lines and various laying methods, stations, land for the depot, connecting lines and return lines in front of and behind the stations, etc. Find out the land boundary and control conditions of various rail transit facilities;

--Municipal pipeline control: including but not limited to municipal pipeline network, underground comprehensive corridor and underground space, etc.;

--Drainage system: Taking into account the climatic characteristics of Nanchang, in order to prevent the occurrence of urban waterlogging, the drainage facilities of the station and surrounding plots should be put into primary consideration with the sponge city construction concept integrated;

--Urban design control elements: determine the structure, scale, location and control requirements of urban public spaces, and propose conceptual plans for the architectural form and landscape environment design in the planning area;

--Develop a phased TOD implementation plan at the corridor and station level, and determine the target value of the performance indicators.

After concluding task 4 and 5, the consulting firm will submit the results regarding the functional positioning and classification planning guidance of the surrounding area of the stations(including functional positioning, spatial structure, industrial research and development planning positioning, etc.), that is, text reports, drawings, calculation tables, calculation formulas used in the reports, and suggestions for adjustments from laws and regulations to increase implementation possibilities.

Task 6: Comprehensive environmental and social assessment in the area around the stations

This task will comprehensively assess the environment and society around the stations, including but not limited to:

--Predict and evaluate possible environmental impacts during project planning, design, and construction, including impacts on land, water resources and atmosphere, and propose countermeasures and implementations to reduce the adverse ones;

--Predict and evaluate possible social impacts on the daily life of communities and residents during the project planning, design, and construction process, and propose policy recommendations and measures to reduce impacts, so as to promote a sustainable and fair social environment in the area;

--Put forward countermeasures and implementations to prevent or reduce adverse environmental and social impacts.

At the end of this task, the consulting firm will submit a comprehensive environmental and social assessment report for the surrounding area of the East Extension Section of Metro Line 2, that is, text reports, drawings, and calculation forms in Excel (for Chinese and English contents, a work link should be used).

4.3 Fund balance and coordination of benefits

Task 7: Traffic prediction and plan testing of Metro Line 2 based on TOD pan and guidance project

Based on the guidance of the TOD plan, the travel demand forecast of Line 2 is carried out to provide feedback on the plan and parameter information on the relationship between traffic passenger flow and other factors like fare for subsequent financial analysis.

Task 7.1: Traffic prediction along Metro Line 2 and in TOD areas

Based on the in-depth analysis of urban planning and urban transportation, taking into account the possible impact of the implementation of TOD along the rail transit line, and the future changes in population, employment situation and industrial positioning, use a variety of forecasting methods, a calibrated and verified traffic model for example, to make predictions on various parameters of all stations on the whole line related to the transportation corridor where the line is located, and of various future travel modes within the planning guidance range, such as passenger flow (including up and down passenger flow, changing passenger flow, line flow) throughout the day and at various times (morning and evening peaks and flat peaks) , average distance and average passenger flow load intensity,etc. By doing so, the task will quantify the effect of the TOD-guided project, and to provide feedback on its improvement.

In addition, before task 7.1 establishes a traffic prediction model based on TOD, a traffic prediction model based on existing planning information needs to be established in parallel, which can be used as a baseline for evaluating the effectiveness of the TOD-guided project.

Task 7.2: Test of the passenger flow plan of stations along the Metro Line 2

Combined with the follow-up tasks, the consulting firm will conduct simulation and testing of multiple plans under different scenarios before and after the TOD construction along the line, including the policy of car parc, public transportation ticket fare policy, parking policy, real estate property policy, different property development portfolios and other scenarios, so as to provide information on key parameters, such as traffic passenger flow and fares, for subsequent sustainable financial analysis. The results of this analysis will be used to evaluate the values of

key performance indicators defined in different scenarios and previous tasks.

Upon completion of this task, the consulting firm will submit the results of the traffic prediction and project test of stations along Metro Line 2 based on the TOD plan and guidance project, that is, text reports, drawings, demonstration materials for results , calculation tables with formulas as well as process documents and final documents of traffic model establishment and testing, etc.

Task 8: Financial analysis of Metro Line 2

Based on the full-cycle financial sustainability goal of the Metro Line 2 project, determine its investment, financing and funding model, plan the contribution capabilities of each station to support the construction and operation of this transit line project, thereby regulating the planning indicators of TOD, so as to explore the integrated mode of urban transportation construction and land development management, to realize the financial sustainability of urban infrastructure construction and the sound development of urban land use. Details include but are not limited to following:

--Based on the Excel model, determine the investment, financing and funding mode of Metro Line 2; estimate the investment amount of the construction and the future operation and maintenance costs based on the passenger flow forecast. Through the analysis of financial policies related to project investment and operation, passenger income (as a function of fare and passenger flow), determine the additional financing requirements for Line 2 and estimate the source of funding (recovered funds) during its service life.

--Analysis of the contribution capacity of TOD investment, financing and funding of each station: Use the TOD-guided plan of each station to estimate every cash flow respectively. To this end, determine the development model of key plots around each station (first- and second-level linkage, property ownership, lease or sale, etc.), and establish investment estimates and financial evaluation studies for land use around each station, carry out relevant operating cost[1] estimates and conduct overall financial analysis based on Excel files for those projects (including but not limited to the financial parameter setting, and each project participant's investment cost estimation, operation income and expense estimation, and investment benefit estimation), and the potential contribution to the investment, financing, and funding of Line 2. confirm the relevant strategies for land development and land value capture, and take into account the detailed market conditions[2] evaluated in Task 1 to propose the best timeline for development implementation.

[1] It especially includes upgraded public facilities that accommodate higher population and job post density, improved urban space around stations including non-motorized traffic entrances and exits, and improved shuttle bus services

[2] In successful international TOD cases, financing requires a strong market demand, and at the city level, real estate supply is in short supply.

--According to the TOD phased implementation plan, from the perspective of the municipal government, metro company and TOD developers, estimate the cash flow from the investment, operation and financing aspects of the rail transit plan, of each station and of the "track + property" master plan in the Excel file-based financial model. Estimate the contribution of cash flows obtained through the implementation of TOD, which can provide partial funding for rail investment. The Excel model should allow for corresponding project analysis due to differences in core inputs (such as the volume of real estate that can be developed). Based on these cash flows, confirm the financing (debt and equity) that can be obtained in the financing market and from investors. And calculate the difference between the scale of investment and the scale of financing required by the rail transit project; conduct risk analysis on TOD projects of each station and determine corresponding measures to mitigate or prevent risks.

--According to the above situation, estimate the level of government's funding required under different plans to support the construction and operating costs of Line 2 and related TOD investment.

At the end of this task, the consulting firm will submit a financial analysis report on the construction and operation of Metro Line 2 (including but not limited to key plot development planning and positioning and property portfolio, key plot development sequence, land value evaluation and economic and technical indicators, investment income calculation, investment and financing strategies and plans, rail transit related policy recommendations, etc.), that is, text reports, drawings, calculation tables in Excel workbooks (use work links for Chinese and English characters), and geographic information system data files involved in TOD planning.

The consulting firm needs to organize all the data involved in the TOD project into a database format compatible with the geographic information system used in Nanchang to facilitate data sharing.

Task 9: Research on the overall benefit plan

For the four typical stations selected under Task 5, combined with factors such as land ownership analysis, urban regeneration and division of integration of land resources and early stage land development, coordinate the demands of all parties, adopt a development- and demand-oriented approach to consider the public facilities, the layout of large-scale infrastructure and the comprehensive benefits of each unit to determine an overall benefit plan and to ensure the feasibility of unit division.

Upon completion of this task, the consulting firm will submit a report on the overall benefit plan involving all the relevant stakeholders which contains text reports, drawings, process documents and final documents involving project adjustments.

4.4 Summary and applications

Task 10: Summary and applications based on TOD project

Considering the actual implementation of the subsequent TOD project, perform the tasks which include but not limited to the following:

--Based on the TOD results, provide various relevant departments in Nanchang (including Rail Company, Natural Resources Bureau, etc.) with key points explanation for implementing the TOD project, and formulate the TOD design guidelines of metro stations in Nanchang for subsequent implementation.

--Based on the TOD results and the experience accumulated in the previous tasks, a TOD operation guide suitable for metro stations in Nanchang will be formed, focusing on the key or difficult parts in realizing the operation process and related processes, at the same time, the specific solutions should be given accordingly.

Upon completion of this task, the consulting firm will submit TOD design guidelines and operation guidelines for metro stations in Nanchang.

Task 11: Capacity building and public awareness promotion

--Develop learning and training plans related to TOD concepts and development for the project owner, provide relevant training topics and content, and organize and implement relevant trainings after clearing them together with the project owner and related organizations.

--According to the needs of the project at different phases, organize project seminars, invite domestic and foreign experts to provide suggestions for the project, and increase the participation of people all sectors of society.

--Produce relevant publicity materials about the city's TOD development concept and Nanchang's TOD development practice, and conduct extensive publicity through various channels such as traditional media and social media.

--Assist the project owner to prepare relevant materials, including but not limited to briefings, reports, press conference materials, etc.

Upon completion of this task, the consulting firm shall submit a summary report on capacity building and public awareness.

5. Timing and output

5.1 Output

For each phase, see the specific tasks explained above for the expected results.

Phase One:
(1) Opening report: work plan, technical route, training plan
(2) Current status survey and analysis of basic data, as well as geographic information system database
(3) Analysis report of stakeholders in the area
(4) Case study on best practices at home and abroad

Phase Two:
(5) Function positioning of TOD surrounding area and classification planning guidance report
(6) Comprehensive assessment report on the environment and society of the East Extension Section of Metro Line 2

Phase Three:
(7) Geographic information system database based on the data involved in the TOD project
(8) Traffic forecast and project test report of Metro Line 2
(9) Financial analysis report of construction and operation of Metro line 2
(10) Overall benefit plan

Phase Four:
(11) TOD design guidelines and operation guidelines for metro stations in Nanchang
(12) Initial draft and simplified version of the final report
(13) Summary report on capacity building and public awareness promotion
(14) Final report

The results of this project must be presented in bilingual (Chinese and English), including electronic text (word and pdf), text instructions (word and pdf), drawings (word, pdf and cad), and presentation materials (ppt); paper documents must be submitted at the same time together with results (2 copies in Chinese version, and 2 copies in English version).

Among them, the original data related to task 1 should be based on GIS format. Data related to Excel file or other project data, as well as process files, Excel files with formulas, and final results are all required for submission. The financial Excel workbook needs to be in both Chinese and English. Clear data link and complete data are a must.

In addition, when compiling various documents, the accurate source of the data and materials (down to the page number of the original materials) must be provided in the documents. When submitting the final documents, the original data materials

(electronic files) must be provided.

5.2 Time: Start in June 2021. The advisory service needed for this project is for a period of 18 months.

Seq.	Main Task	Estimated Time of Submission	Conditions
1	Opening report: work plan, technical route, training plan	Within 1 month after signing the contract	Public seminar
2	Current status survey and analysis of basic data, geographic information system database	Within 3 months after signing the contract	Expert review
3	Analysis report of stakeholders in the area	Within 5 months after signing the contract	
4	Case study	Within 6 months after signing the contract	
5	Function positioning of TOD surrounding area and classification planning guidance report	Within 7 months after signing the contract	
6	Comprehensive assessment report on the environment and society of the East Extension Section of Metro Line 2	Within 8 months after signing the contract	
7	Geographic information system database based on the data involved in the TOD project	Within 10 months after signing the contract	Expert review
8	Traffic forecast and project test report of Metro Line 2	Within 10 months after signing the contract	
9	Financial analysis report of construction and operation of Metro line 2	Within 12 months after	

		signing the contract	
10	Overall benefit plan	Within 13 months after signing the contract	
11	TOD design guidelines and operation guidelines for metro stations in Nanchang	Within 15 months after signing the contract	Expert review or public seminar
12	Initial draft and simplified version of the final report	Within 16 months after signing the contract	
13	Summary report on capacity building and public awareness promotion	Within 18 months after signing the contract	
14	Final report	Within 18 months after signing the contract	
15	Phased progress report (including project completion report)	According to the actual needs of the work	-

6. Required Expertise

6.1 Professional qualification requirements for the consulting firm

It should have extensive expertise and profound experience in formulating and implementing urban TOD strategies, schemes, plans and projects. It should have more than 8 years of experience in international or domestic urban planning and rail transit planning. Or in the past 5 years, it has completed TOD planning and development strategy consultation, pre-consultation, planning research, planning design, engineering consultation and investment and financing planning involved in a pre-consultation TOD project of area along the transit lines or of a station/depot.

6.2 Project personnel qualifications

The firm should be equipped with a competent team for the job, which has rich project experience and abundant knowledge in the field of rail transit TOD planning, design and implementation. It is estimated that the total workload of "experts with international experience" is 49 person-months, and the total workload of "experts with domestic experience" is 111 person-months. Specific requirements for manpower and work duration are estimated as follows:

Seq.	Job Title	Years of experience	Person-month
1	Project Manager / International Urban Planning Expert	20	12

2	Deputy Project Manager/International Transportation Planning Expert	18	12
3	International Urban Planning Expert	12	4
4	Domestic Urban Planning Expert	12	8
5	Domestic Urban Design Expert	10	8
6	Domestic Architectural Design Expert	10	7
7	International Urban Industry Expert	12	6
8	Domestic Urban Industry Expert	8	8
9	Domestic Land Development Expert	10	10
10	International Market and Property Development Expert	12	4
11	Domestic Market and Property Development Expert	8	6
12	International Rail Transit Expert	12	5
13	Domestic Rail Transit Expert	8	5
14	International Transportation Planning Expert	12	6
15	Domestic Traffic Model Expert	12	10
16	Domestic Investment, Financing and Financial Expert	12	10
17	Domestic Municipal Engineering Expert	10	10
18	Domestic Social Security Expert	10	7
19	Domestic Environmental Safety Expert	10	8
20	Domestic TOD Planning and Policy Expert	10	12
21	Domestic Publicity Expert	5	2
Total			160

1) Project Manager / International Urban Planning Expert: The team leader should be a consulting expert with more than 20 years of urban planning consulting work experience and have an international reputation, someone who has international experience in urban planning and design, rail transit planning, construction and operation, transportation infrastructure investment and financing, and urban development policy research. The team leader should possess the project experience undertaking the research or preparation of TOD planning and design in a minimal of 7 rail transit projects. He or she should be able to communicate in Chinese or English, and is responsible for all management and coordination in this consulting service, acting as the representative of the consulting service expert team.

2) Deputy Project Manager/International Transportation Planning Expert: The deputy team leader should be a consulting expert with more than 18 years of urban planning consulting work experience, someone who has international experience in urban planning and design, rail transit planning, construction and operation, transportation infrastructure investment and financing, and urban development policy research. The deputy team leader should possess the project experience undertaking the research or preparation of TOD planning and design in a minimal of 6 rail transit projects. He or

she should be able to communicate in Chinese or English. When the team leader is absent, the deputy team leader is responsible for the management and coordination of the consulting service, and is the authorized representative of the team leader.

3) International Urban Planning Expert: More than 12 years of experience in urban planning consulting services. Participated in the implementation of TOD projects as one of the main personnel and own work experience in at least five similar TOD projects, while being able to communicate in Chinese or English.

4) Domestic Urban Planning Expert: More than 12 years of experience in urban planning consulting services. Participated in the implementation of TOD projects as one of the main personnel and own work experience in at least five similar TOD projects.

5) Domestic Urban Design Expert: More more than 10 years of experience in urban planning and urban design. Familiar with both domestic and international theories and practices of urban planning, urban design and public transportation planning.Presided over and completed a number of urban planning, urban design, integrated planning around the rail and other TOD related planning and design projects with experience in similar TOD projects.

6) Domestic Architectural Design Expert: More than 10 years of relevant experience in architectural design, familiar with TOD theory and practice. Presided over and completed a number of architectural design projects in urban transportation hubs, integrated areas around rail or TOD areas. Experienced in similar TOD projects.

7) International Urban Industry Expert: More than 12 years of consulting experience in industries along urban rail transit. Participated in the consulting service work of TOD industry projects as one of the main personnel with similar TOD project experience. Able to communicate in Chinese or English.

8) Domestic Urban Industry Expert: More than 8 years of consulting experience in industries along urban rail transit. Participated in the consulting service work of TOD industry projects as one of the main personnel with similar TOD project experience.

9) Domestic Land Development Expert: More than 10 years of relevant experience in land development and consulting, familiar with relevant policies and regulations such as land transfer, urban regeneration, integration of land resources and early stage land development, and land development practices in mega cities.Presided over and completed a number of related consulting projects such as real estate development, urban regeneration, land development in industrial areas, and land development around railroads in mega cities with experience in similar TOD projects.

10) International Market and Property Development Expert: More than 12 years of

working experience in market and property development consulting services. Participated in the consulting service work of TOD market and property development projects as one of the main personnel with similar international TOD project experience. Able to communicate in Chinese or English.

11) Domestic Market and Property Development Expert: More than 8 years of working experience in market and property development consulting services. Participated in the consulting service work of TOD market and property development projects as one of the main personnel with similar TOD project experience. Able to work on-site for no less than 5 months.

12) International Rail Transit Expert: More than 12 years of work experience in urban rail transit system consulting services. Participated in consulting services for the construction and operation of rail transit system as a key personnel. Similar project experience is required. Able to communicate in Chinese or English.

13) Domestic Rail Transit Expert: More than 8 years of work experience in urban rail transit system consulting services. Participated in consulting services for the construction and operation of rail transit system as a key personnel. Similar project experience is required.

14) International Transportation Planning Expert: More than 12 years of experience in urban comprehensive transportation planning and prioritized public transportation system consulting services.Participated in consulting services for the implementation of transportation projects as key personnel. Similar project experience is required. Able to communicate in Chinese or English.

15) Domestic Traffic Model Expert: More than 12 years of experience in urban traffic surveys and establishment of traffic models. Have experience in carrying out resident travel surveys and establishing traffic models for cities with a planned population of more than 1 million. Similar project experience is required.

16) Domestic Investment, Financing and Financial Expert: More than 12 years of work experience in urban land development and rail transit project investment and financial calculation consulting services. Similar project experience is required.

17) Domestic Municipal Engineering Expert: More than 10 years of experience in municipal engineering consulting services. Participated in consulting services of the implementation of TOD municipal engineering projects. Experienced in similar international and domestic projects. Able to work on-site for no less than 2 months.

18) Domestic Social Security Expert: More than 10 years of work experience in social security of urban development and transportation system. Participated in the social security work of developing transportation system in large-size cities. Experienced in

similar projects with ability to understand and implement the social framework of similar projects.

19) Domestic Environmental Safety Expert: More than 10 years of work experience in environmental impact assessment of rail transit planning. Participated in the environmental impact assessment of developing rail transit system in large-size cities. Similar project experience is required.

20) Domestic TOD Planning and Policy Expert: More than 10 years of work experience in urban development and transportation system institution, mechanisms and policies. Participated in developing transportation system institution, mechanisms and policies of large-size cities. Similar project experience is required.

21) Domestic Publicity Expert: More than 5 years of work experience in organizing publicity campaigns and knowledge popularization.