Sustainable Urban Mobility Planning (SUMP) in the Chinese Urban Context

Lessons from the SUMP Foshan Pilot Project

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Preface

About this guide: This report aims to further promote the concept of Sustainable Urban Mobility Planning (SUMP) in Chinese cities. For this purpose, lessons learnt from the implementation of the SUMP Foshan pilot project are shared, with the intention of guiding other practitioners on how to adapt SUMP to institutional frameworks in their cities. It is noted that the planning insights from Foshan represent recommendations and conclusions drawn from the SUMP process together with the city, but do not represent official planning guidelines.

How was the knowledge obtained? With the aim of strengthening green mobility and reducing carbon dioxide emissions, the development of a SUMP for Foshan was launched jointly in July 2021 by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the China Sustainable Transportation Center (CSTC), and the Foshan Public Transport Management Company (Foshan TC Company) under the support of the Foshan City Transportation Bureau (Foshan TB). The SUMP is owned by Foshan authorities, developed and drafted by the CSTC, reviewed and monitored by GIZ and Rupprecht Consult, the main authors of the SUMP Guidelines,[1] who were also involved in planning quality control processes relating to the requirements of a SUMP. The largest executive challenge of the project was the impact brought by the COVID-19 pandemic and related countermeasures in China, including restrictions on visits to Foshan for on-site engagements, the limited formats available to conduct interactive workshops with stakeholders, and increased difficulties with organising meetings for offline communication within the team and promoting knowledge dissemination processes. Nevertheless, the project team overcame these obstacles with alternative solutions and pooled these experiences to form the basis for sustainable urban transport planning in the post-pandemic era.

Whom is this report for? This report is designed to provide practical advice underpinned by Foshan's example for Chinese cities and planning institutions, who are interested in developing SUMP for their own cities.

The role of this report:

1. To provide reasons for applying SUMP in China by emphasising what benefits could be gained from its application.
2. To obtain general understanding of what steps and methodologies within the SUMP process work within Chinese institutional frameworks, through an actual step-by-step illustration of the practice of SUMP in China.
3. To offer evidence to further integrate the concept of SUMP in other Chinese cities' urban transport planning by drawing upon the successful experience of Foshan.
4. To help to manage risk and uncertainty in the implementation of SUMP in a Chinese context by sharing lessons learnt during the planning process of the pilot project, and providing subsequent solutions to identified challenges.

[1] Guidelines for developing and implementing a Sustainable Urban Mobility Plan (2nd edition), Eltis, 2019, https://www.eltis.org/mobility-plans/sump-guidelines.

1 Introduction of SUMP

1.1 The Purpose of SUMP

A "Sustainable Urban Mobility Plan" (SUMP) with short, medium and long-term elements, is a collaboratively developed, strategic and comprehensive transportation plan, designed to promote the sustainable and low carbon development of cities and their surrounding areas, to improve people's quality of life, and to enhance each city's competitiveness and vitality. They aim to take an integrated approach to mobility planning with an emphasis on stakeholder engagement throughout their development process. The roles of SUMP in transport planning systems include how:

- SUMP is supporting cities worldwide in becoming sustainable places for people to live. Being a concept pursued by the European Commission, SUMPS have become success stories within and beyond the European continent and are now applied in Latin America, Africa, and Asia;
- SUMP helps to achieve cities' short, medium, and long-term urban transport development targets;
- SUMP acts as a tool to develop and implement plans in line with the overarching goals of promoting green and low carbon transport;
- SUMP facilitates better coordination and cooperation between different stakeholders on city and district levels (for example, between urban planning, transport, Big Data or environmental departments, public transport companies, transport associations, and relevant regional departments) to achieve the setting and achievement of strategic goals and to improve planning processes;
- Through public and stakeholder participatory approaches, SUMP helps in satisfying people's mobility needs as well as the needs of business, and improve the quality of urban living;
- SUMP supports the development of all transport modes in an integrated manner and related cooperation measures across institutional boundaries.

1.2 General Principles of SUMP

The process to develop and implement a Sustainable Urban Mobility Plan (SUMP) is based on the SUMP cycle (Figure 1-1) outlined in the Guidelines on Developing and Implementing A Sustainable Urban Mobility Plan[2] (hereafter referred to as SUMP Guidelines) published by the European Commission. The process consists of four phases, each consisting of three steps. The SUMP cycle can be understood as a guiding step-by-step framework which needs to be applied to the specific requirements and conditions as well as targets of the specific city or context in which the SUMP is applied. The four phases to develop a Sustainable Urban Mobility Plan are:

A.Preparation and analysis
1) Set up working structures
2) Determine planning framework
3) Analyse mobility situation

B.Strategy development
4) Build and jointly assess scenarios
5) Develop vision and strategy with stakeholders
6) Set targets and indicators

C.Measure planning
7) Select measure packages with stakeholders
8) Agree on actions and responsibilities
9) Prepare for adoption and financing

D.Implementation and monitoring
10) Manage implementation
11) Monitor, adapt and communicate
12) Review and learn lessons

Through Steps 1 to 9, a SUMP is developed. The development of a SUMP can take between 1 to 3 years, depending on the starting situation of the transport system in the city, the complexity of the targets, the size of the selected area, and related contextual elements. After the successful development and validation of the SUMP, the actual implementation begins (Steps 10 to 12), which, depending on the selected measures, can take between 5 to 15 years.

[2] Please check the full English guidelines here: https://www.eltis.org/mobility-plans/guidelines-developing-and-implementing-sustainable-urban-mobility-plan-2nd-edition
For the Chinese translation, see: https://www.eltis.org/in-brief/news/sump-goes-global-chinese-version-sump-guidelines-available-now-ke-chi-xu-cheng-shi-chu

As Sustainable Urban Mobility Planning follows an integrative approach to transport modes, which is one of its eight core principles (see Figure 1-2), SUMPs should therefore address a variety of interlinked measures for several means of transport modes and services. However, a specific focus can be selected when determining the vision of the plan, such as a city to become a "Cycling City", "City of Public Transport", or have a "Smart Transport" system. In some cities, specific modes of transport might be well developed already, and a focus can be put on the advancement of underdeveloped means of transport or relate topics, such as the integration of modes of transport, the digitalisation of services, Mobility-as-a-Service, and other related plans.

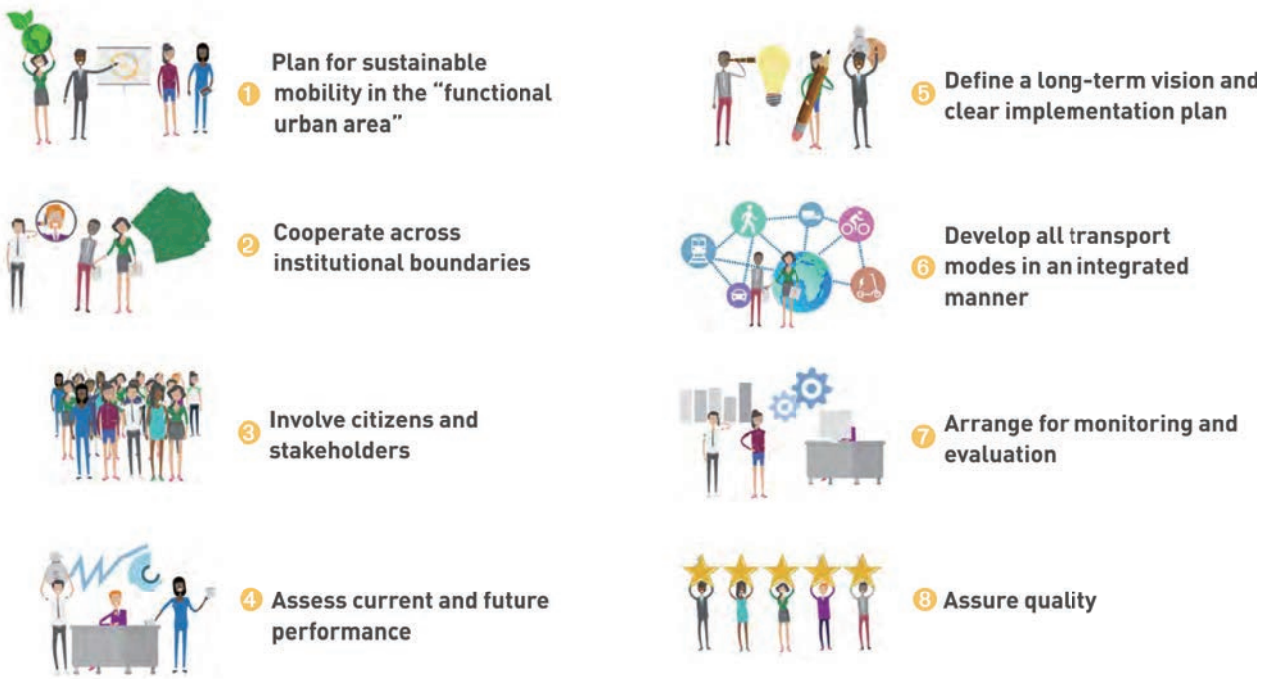
In addition to the main SUMP Guidelines, there are also topic guides[3] which can be used to provide comprehensive planning recommendations on specific topics. The guides focus on specific topics, of which the most relevant to Chinese cities include planning for electric road transport in the SUMP context, the funding and financing of sustainable urban mobility measures, the integration of shared mobility approaches in SUMP, the role of intelligent transport systems in SUMP, Mobility-as-a-Service and SUMP, urban road safety and active travel in SUMP, and SUMP in metropolitan regions. Furthermore, practitioner briefings[4] address emerging topics that have a higher level of uncertainty or are often undervalued, such as road vehicle automation, parking policy, cycling and walking in SUMP, national support frameworks (such as support for financing or legislation assistance), and a national SUMP platform to inform about the overall concept of Sustainable Urban Mobility Planning and its measures and processes.

■ Figure 1-1 Sustainable Urban Mobility Planning Cycle

(Source: https://www.eltis.org/guidelines/sump-guidelines)

[3] These documents can be found here: https://www.eltis.org/mobility-plans/topic-guides.
[4] The documents can be found here: https://www.eltis.org/mobility-plans/practitioner-briefings.

■ **Figure 1-2 The 8 principles of SUMP**



(Source: https://www.eltis.org/guidelines/sump-guidelines)

1.3 Planning Scope and Period of SUMP

- The planning scope and period of the SUMP shall be aligned with existing planning.
- Stakeholders and other departments from planning and practice should be involved early in the process and their interests need to be considered.
- The planning and layout of major urban transportation infrastructure should consider the requirements of long-term urban development.

2 Why apply SUMP in China?

China is pursuing a new stage of unprecedented transformation processes. Its economic and social success is increasingly driven by following an ambitious sustainable development path oriented towards sustainability and resource efficiency, as well as human wellbeing. Following this rationale for the form of China's future socio-economic development, the long-term strategic orientation of China embraces sustainable development as a central policy goal – domestically and internationally. As China is "moving up the value chain"[5], structural changes must be initiated through policies that can effectively facilitate the country's transformation at all governance levels. Cities are important actors in forming such transformative processes. Thus, urban planning as a technical and political process concerned with shaping developments in different fields, including architecture, infrastructure, ecology and economics[6], can be a facilitator of this evolution.

The concept of Sustainable Urban Mobility Planning can provide a planning methodology and approach for Chinese policy makers and planners at the city level to better align transport and mobility planning systems. Furthermore, it can act as a tool to develop and implement plans in line with the overarching goals of promoting green and low carbon transport as stated in the 13th and envisaged in the upcoming 14th Five-Year Plans (FYP). In addition, SUMP provides Chinese policy makers with a comprehensive framework for the better coordination of inter-sectoral and inter-departmental cooperation to reach the long-term aim of more integrated and effective transport and mobility planning and urban development.

Although SUMP first existed as a European planning tool, the concept of Sustainable Urban Mobility Planning shows great potential to complement planning practices in China when adapting it to the specific political, regulatory, technical, and cultural requirements of China. Through the pilot implementation of SUMP in a Chinese city, experiences could be made in the application of the planning tool in China. These experiences are the basis for the development of this Chinese SUMP Guide, which is based on the EU SUMP Guidelines' principles.

The following chapters introduce the key reasons why Chinese cities should take up the concept of Sustainable Urban Mobility Planning.

2.1 SUMPs Help Local Governments to Implement the Goals of Current and Future Transport Policies and Plans

SUMP Guidelines, as a planning tool, can help Chinese cities to achieve their short, medium and long-term urban transport development targets, in particular, regarding the future implementation of the 14th FYP (2021-2025). For example, the measures specifically promoted by the SUMP planning tool are integrated urban transport network development, integration between urban planning and transport planning, strengthening walking and cycling systems, improving barrier-free facilities, the development and application of new energy vehicles (NEVs), the construction of electric charging infrastructure, the optimisation of public transport systems, the development of multi-modal transport system, the development of green and efficient modern logistics systems, the development of Mobility-as-a-Service, the application of Artificial Intelligence (AI) and Big Data in the transport system and also expanding levels of social participation.

The SUMP planning tool can be a blueprint to reference for Chinese cities to achieve their development goals in the above-mentioned fields in an integrated and scientific manner. In addition, the SUMP planning tool can help Chinese cites to become internationally competitive, including by developing liveable and attractive urban areas with high-quality transport and mobility systems.

Having developed a Chinese SUMP Guideline based on the experiences of the Foshan pilot project, this Chinese case study can function as a blueprint for cities in emerging and developing countries around the world which share similar characteristics with Chinese cities (such as having rapid urbanisation processes and/or large scale urban regions).

[5] Neuweg, I. and Stern, N. (2019), China's 14th Five Year Plan, sustainable development and the new era. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science, p. 2.

[6] More details are available at: https://www.ierek.com/news/index.php/2017/01/17/urban-planning-definition-problems-and-solutions/

2.2 SUMPs Help to Develop Strategic Urban Mobility Plans Using Scientific Methodologies

SUMPs can help Chinese cities to plan sustainable urban mobility systems more strategically, systematically, and ensure they are based on scientific data. The planning step in the SUMP cycle to develop a clear vision and subsequent goals for the transport sector of the city helps to prioritise measures and plan systematic implementation of necessary measures (see Figure 1-1, Step 5). Furthermore, in the process of drafting a SUMP, data-based and comprehensive scientific methods[7] are applied to analyse the status quo (see Figure 1-1, Step 3), develop possible scenarios (see Figure 1-1, Step 4), assess and select measures, and conduct monitoring exercises (see Figure 1-1, Steps 11 and 12). For example, the factors that influence transport demand and mobility behaviours, including social, technical, and economic factors, would considered when developing different planning scenarios (see Figure 1-1, Phase 2).

In the SUMP planning steps, a systematic indictor framework is used for the evaluation of different scenarios and measures, and a monitoring framework needs to be established to be able to adapt the development and implementation of the urban mobility strategy throughout the process (see Figure 1-1, Steps 11 and 12). Various data collection methods, such as scientific surveys, are used to gain accurate data (see Figure 1-1, Step 3). Well-structured expert workshops with stakeholders and decision-makers or the application of scientific methods, such as the Delphi method, are very supportive in the process of SUMP development to ensure the quality of the SUMP measures that are selected (see Figure 1-1, Step 7).

2.3 SUMPs Foster Cooperation Between Institutions, Cities, and Regions

Sustainable Urban Mobility Planning aims at facilitating stakeholder participation, roundtable-based planning and implementation processes and in general institutional cooperation and coordination (see Figure 1-1, Steps 5 and 7). SUMPs can facilitate better coordination and cooperation between different stakeholders on city and district levels (for example, between sectors of urban planning, transport, Big Data or environmental departments, public transport companies, transport associations and relevant regional departments) to achieve the setting and realisation of strategic goals, and to improve planning processes.

Furthermore, with a Chinese SUMP Guideline in place, which can (based on existing policies) function as a comprehensive national urban mobility policy, planning processes can be aligned and knowledge exchange between Chinese cities and regions can be facilitated.

In addition, the approach of Sustainable Urban Mobility Planning provides Chinese cities with a framework to participate in international exchanges on experience with urban mobility and urban development in a wider sense. SUMPs can facilitate international cooperation, networking, and exchange activities with other cities, focusing in particular on mutual learning, benchmarking, and the sharing of best practices. Due to the comparability of planning processes, such exchanges can enhance the innovation capacities of Chinese cities to improve their transport systems and services, as well as help to facilitate their international recognition.

[7] Various methods and tools can be found on the website: https://www.eltis.org/resources/tools

2.4 SUMPs Support China on Meeting its Climate and Environment Goals

SUMPs can support Chinese cities in achieving their transport development targets derived from national level policies (such as the 13th and 14th Five-Year Plans or the Outline for Building China's Strength in Transport), especially in the field of air pollution prevention, climate planning, and environmental protection. As a strategic planning tool, the SUMP guidelines can specifically support Chinese cities in optimising their transport systems in a scientific and methodological manner and in fostering integrated development. Through their multi-stakeholder approach, SUMPs support cooperation between ministries and relevant governmental departments on the local level as well as with other related stakeholders, and thus can contribute to the alignment of transport, environmental and climate policies, such as air pollution control plans being coordinated with transport plans.

The development of scenarios and the establishment of monitoring, reporting and verification systems (MRVs) is a prerequisite for planning low carbon transport systems, as scenario-building exercises can help to predict the impact of transport measures on air pollution and the climate and MRVs can provide support in understanding the actual impact of actions after their successful implementation. Additionally, MRV systems can provide the basis for linking air pollution and CO_2 indicator systems with transport planning strategies, as they provide the necessary knowledge about actual emissions of different modes of transport.

While still in its implementation phase, the SUMP of the city of Bremen in Germany can act as an example to show the benefits of the concept of Sustainable Urban Mobility Planning for the environment. The Bremen SUMP has a strong focus on the promotion of active mobility and thus contributes to a shift in modal share to low carbon means of transportation. First indications of the contribution of the plan to climate protection can be seen in changes in car ownership statistics and levels of concentration of NO_2 in the city. In Bremen, the rate of new car ownership has decreased since 2017[8,9] and the concentration of NO_2 has decreased since 2015, and reached levels below the EU NO_2 annual threshold after 2016[10].

2.5 SUMPs Foster Integrated Development and Economic Benefits in Cities

China's economy and overall development is experiencing a transformation from quantity-oriented growth to quality and efficiency-based development. As a planning tool, SUMPs aim at satisfying people's mobility needs as well as business needs and improving the quality of urban living. Their overall aim is to develop all transport modes in an integrated manner and facilitate their cooperation across institutional boundaries. Instead of focusing predominantly on "hard" infrastructure-based transport planning and development, SUMPs aim at "soft"-oriented mobility planning by considering the following aspects in the planning process:

- Cost reduction is promoted for transport infrastructure planning and development, project management and investment of mobility measures, as well as for the operation, maintenance, administration and enforcement of policies. For example, SUMPs aim at fully utilising existing transport infrastructure and focusing on the long-term oriented cost-efficient development, operation and maintenance of current infrastructure before building new systems.

- Direct economic benefits come from reduced operational costs, time saved through decreased congestion and revenues from fees and charges, for example from congestion charges or parking fees. These benefits are achieved, for example, when SUMPs promote Transport Demand Management, transport

[8] The SUMP is defined by four 5-year periods: Period I (2015-2019), Period II (2020-2024), Period III (2025-2029), Period IV (2030 and after).
[9] Statista 2020: Bestand an Personenkraftwagen in Bremen von 2008 bis 2019. Available at: https://de.statista.com/statistik/daten/studie/255181/umfrage/bestand-an-pkw-in-bremen/.
[10] Available to download in German and English at: https://www.bauumwelt.bremen.de/verkehr/verkehrsentwicklungsplan-5586.

and new mobility services and operational processes which have a focus on combined public transport, shared mobility services (for example, ride-hailing) and active mobility choices (for example, cycling and walking), which increase resources and transport system efficiency, an additionally, increases transport service levels and lowers operational costs.

Socio-economic benefits are provided in the form of improved local air quality and noise pollution, reduced emissions contributing to climate change, improved accessibility, and higher levels of traffic safety and liveability[11]. For example, one of the main drivers of creating economic growth is the clustering of human capital, productivity and creative skills, and highly qualified and creative people are more likely to work in liveable cities[12]. Furthermore, vulnerable groups - including the mobility-impaired or economically disadvantaged - are more likely to find work, and thus generate tax revenue and purchasing power, when means of transportation and urban areas are barrier-free[13]. Additionally, measures for the pedestrianisation of commercial areas implemented in many SUMPs can increase sales revenue. In Copenhagen, the pedestrianisation of one street contributed to a 30% increase in goods sales in a single year[14]. During the 2018 Christmas period in Madrid, the temporary closure of the main thoroughfare to cars led to a 9.5% increase in retail spending compared to 2017[15]. The cost-benefit analysis that Arad, Romania, carried out for its SUMP showed that EUR 2.2 million were gained per EUR 1 million of investment[16]. The annual socio-economic surplus as a result of mobility measures in Stockholm is EUR 60 million[17].

2.6 SUMPs Help Achieve Efficient Financing of Urban Sustainable Transport Development

Sustainable Urban Mobility Planning supports cities in identifying and gaining adequate financing sources for the implementation of urban transport and mobility measures, including, for example, by consulting on investment requirements and giving guidance on the long-term oriented assessment of costs related to infrastructure asset management or maintenance (see Figure 1-1, Phase 3).

In the process of developing a SUMP, a sound financial plan that defines how to finance necessary measures is required, including cost estimations, financing and funding sources. The EU SUMP Guideline encourages the sources of funding and financing for SUMPs to be diverse, including available financial resources from various government levels and the private sector. The funding needs of measures relating to each SUMP should consider the capacities of public budgets, municipal loans, public utility loans and, in case they are involved, the private sector. To achieve a match of SUMP financing and municipal and private funding, the following tasks need to be considered: coordinating with other municipalities, regional institutions and at the national governance level; assessing the potential of private investors; discussing measures with potential financing and funding partners to ensure that selected measures are well prepared and in line with funding lines; arranging cost recovery arrangements (for example, for shared systems and services or pubic transport services), and; preparing a detailed financial plan for the first phase of investment.

[11] Further details of benefits can be found in: https://www.eltis.org/sites/default/files/trainingmaterials/evidence_publishable_report_final.pdf .
[12] Florida, R. Who's your city? How the creative economy is making where to live the most important decision of your life, 1st ed.; Basic Books: New York, US, 2008.
[13] https://www.eltis.org/mobility-plans/12-what-are-benefits-sustainable-urban-mobility-planning.
[14] Mattias Kärrholm, 2012. Retailising Space: Architecture, Retail and the Territorialisation of Public Space, Ashgate: Farnham and Burlington, VT, p 44.
[15] Ayuntamiento de Madrid, 2019. 20 millones de transacciones comerciales confirman el aumento del gasto en Navidad tras la implantación de Madrid Central, https://diario.madrid.es/blog/notas-de-prensa/20-millones-de-transacciones- comerciales-confirman-el-aumento-del-gasto-en-navidad-tras-la-implantacion- de-madrid-central/.
[16] Municipal Arad, 2017.Planul de Mobilitate Urbană Durabilă al Municipiului Arad, pp 288-289.
[17] Eliasson, J., 2014. The Stockholm congestion charges: an overview. Centre for Transport Studies Stockholm, p. 34, www.transportportal.se/swopec/cts2014-7.pdf.

3 SUMP Practice in Foshan

In the summer of 2021, the SUMP pilot project was launched in Foshan (in Guangdong province) to support the city in its ambition to further promote green and human-centred mobility. Through wide stakeholder engagement and active public participation as part of the planning process, the Foshan SUMP aims at providing a more practical and comprehensive vision for the city that fosters climate friendly urban transport while reflecting the needs of both stakeholders in the transport field and local citizens.

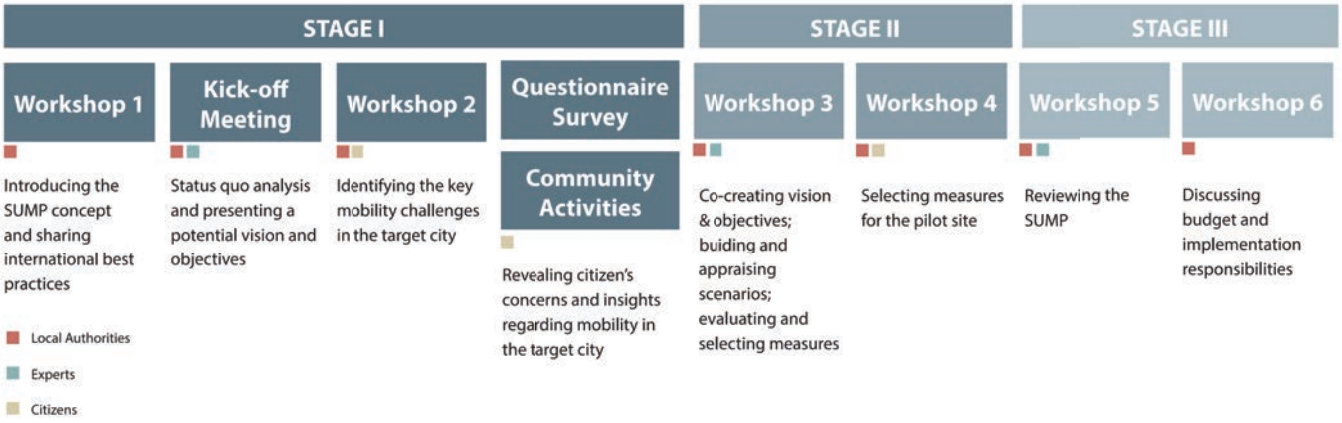
As a pilot project, the development of the Foshan SUMP is limited to a short period of time, and therefore only focused on the first 9 steps of the SUMP Cycle (the pilot only led up to the phase of its finalisation and adoption, while its subsequent implementation can take several years). In this regard, the Foshan pilot project aims to explore the first three phases of the SUMP cycle, before the implementation phase.

This chapter consist of ten sections, corresponding to the nine steps of the first three phases in the SUMP cycle (refer to Figure 1-1), and one section specifically on the use of public participation across all SUMP steps, highlighting the inclusion of citizen and stakeholder voices throughout the planning process. In the following sections, the achievements and lessons learnt during the planning process are divided according to the respective steps of the SUMP. A summary of achievements offers a general understanding of which steps and methodologies within the SUMP process worked in the Chinese institutional framework. These successes demonstrate the potential for further applications of the SUMP concept in the urban transport planning of other Chinese cities. The lessons learnt from the trial identify bottlenecks in the planning process and give solutions identified through the pilot project, which can help future planners to manage risk and uncertainty in the implementation of SUMP in a Chinese context.

Public participation and stakeholder engagement

were the highlights of the Foshan SUMP. The 'bottom-up planning' approach has been shown to make urban mobility planning truly people-centred. In traditional Chinese transport planning, the collection of opinions from citizens and stakeholders is more prevalent in the form of an ex ante evaluation. However, the importance of public participation and stakeholder involvement is often underestimated in ex post evaluations following project implementation. Taking the successful experience of the Foshan SUMP as reference, a detailed public participation and stakeholder involvement scheme (see Figure 3-1) is recommended to be drawn up at the initial stage of planning for future initiatives.

■ **Figure 3-1 Public Participation Scheme**



Stage I: From the preparation stage, workshops, questionnaires, and on-site community engagement activities could be organised to reveal citizens' concerns and insights regarding their perceptions on the current characteristics and key challenges of urban mobility (see Figure 3-1 - Workshop 2, Questionnaire Survey, and Community Activities). To co-create a common vision for the city's future mobility, and jointly develop related objectives and measures, the opinions of key and primary stakeholders could be gathered by holding interactive workshops (see Figure 3-1 - Workshop 3). Furthermore, opportunities to present and compare alternative scenarios for future urban transport systems resulting from the varied strategic priorities of different stakeholders can be established. Through voting and scoring methods, citizens and stakeholders can then jointly choose the most suitable scenario for themselves, followed by planning how their vision and objectives can be achieved (see Figure 3-1 - Workshop 3).

Stage II: Building on above-mentioned strategic planning elements, a long list of measures should be created by the planners and experts from different sectors (in the case of the Foshan SUMP, the opinions from veto, key, and secondary stakeholders in Figure 3-4 were gathered through interviews), while taking the engagement of community representatives and all transport user groups into consideration (see Figure 3-4, Primary and Secondary Stakeholders). There is still space for improvement in this link of the Foshan SUMP (see the gap between Stage I and II in Figure 3-1).

It is expected that when conducting SUMP in other Chinese cities, each group of stakeholders as well as the city's citizens would propose measures that they most care about. Relevant groups of stakeholders include transport planning departments as well as departments in other fields (for example, key involved actors include the Municipal Bureaus of Rail Transportation, Finance, and Regional Transportation, all primary stakeholders, secondary stakeholders such as retailers and local businesses, as well as departments of energy and the environment). For an overview of stakeholders see the Stakeholder Map in Figure 3-4. Proposals for measures can be gathered through workshops, website forums, and open opinion collection through the WeChat official accounts of local authorities. By organising scoring assessments during stakeholder workshops and conducting online public surveys, appropriate measures can be selected based on the specific mobility characteristics and key challenges of each city, which reflect the interests of both citizens and different stakeholders (see Figure 3-1 - Workshop 4).

Stage III: Key decision makers, such as the veto and primary stakeholders, and external experts as secondary stakeholders (see. Figure 3-4) should be invited to review and comment on the draft SUMP in an ex post evaluation (see Figure 3-1 - Workshop 5). It is noted that a potential adjustment and improvement of the plan should be adopted after post-evaluation outcomes are carefully assessed. Subsequently, the relevant veto and primary stakeholders, especially the Municipal Finance Bureau, should be involved to discuss the budget and their implementation responsibilities (see Figure 3-1 - Workshop 6).

Capacity Development: As SUMP is a new planning concept in China, it is advised to include capacity trainings on the methodology so that the local planners and other stakeholders are empowered to effectively, efficiently, and self-sufficiently manage and deliver intended products and services to their target groups. The experience in Foshan showed that trainings which showcase SUMP methods by linking them to concrete planning topics, such as Transit-Oriented Development (ToD) or multimodality in transport planning, are the most valuable as, through these practical and specific learning exercises, local planners could understand the methodological steps of SUMP by applying it to concrete issues in their cities.

Format of public participation, stakeholder involvement, and capacity development activities. The Foshan SUMP has accumulated successful, practical experience, which is expected to be shared in order to drive other cities to apply the SUMP methodology. Due to China's COVID-19 regulations, most events and activities were held online. Although the online environment helped to reach a broader audience, it posed greater challenges to interactivity, which was identified as vital to including citizens and stakeholders in the planning process.

The Foshan SUMP employed a variety of formats, adapted to ensure interaction with and between participants during online workshops, surveys, and capacity development

sessions. A variety of tools were used to make public participation and stakeholder engagement more inclusive and interactive. Firstly, WeChat red packets[18] were offered to mobilise the enthusiasm of citizens to participate in the public surveys. Secondly, a scoring assessment was designed to encourage vigorous discussion and active exchange of opinions among stakeholders in strategy workshops. Thirdly, during a capacity training exercise on public participation, the organisers shared a mobile phone screen to encourage stakeholders to try an innovative public participation app, aiming to let them explore and embrace public participation in transport planning.

As the use of smartphones is increasing, conducting online public surveys through mobiles is a prevalent activity in planning processes. An online survey can reach a wider audience and is more efficient for data analysis than other types of questionnaires such as printed surveys, which would require the manual entry and then scoring of answers. However, when surveys are only conducted online, there is a risk that the opinions of groups who do not have access to technology, especially elderly citizens, are underrepresented as the share of elders using smartphones is lower than other groups. To reduce this risk, volunteers could provide help to the elderly in filling out the survey on site (see Figure 3-2).

■ Figure 3-2 Public Survey and On-site Community Engagement Activity of Foshan SUMP

[18] A form of online voucher based on gifts of cash traditionally given in China on certain holidays and celebrations.

Step 1: Set up a working structure

As a complete planning process, covering mobility systems from their preparation to monitoring phases, a SUMP requires solid preparation prior to the formal commencement of plan development. This step is the first in the SUMP cycle (see Figure 1-1). To tailor the SUMP process to each city that seeks to improve its current mobility situation, it is necessary to set up clear structures that specify what activities should be conducted from the start to the end of the planning process, who will take responsibility for which activity, what resources and capacities are needed to carry out the activities, and how to involve citizens and stakeholders effectively and efficiently in these activities.

Working Mechanism

A working mechanism refers to the definition of an organisational structure and operating system to develop the SUMP, including establishing and arranging clear ways for team members to work together and complete their tasks.

In the Chinese planning context, after the local authorities[19] publish open tenders, the winning planning institute will be selected from all bidders through a reasonable appraising method and be responsible for the compilation of a Comprehensive Urban Transport Plan. When there is only one planning institute involved as the main body to develop the plan, the internal operating mechanism of the institution can instead act as a substitute for the working mechanism for planning activities.

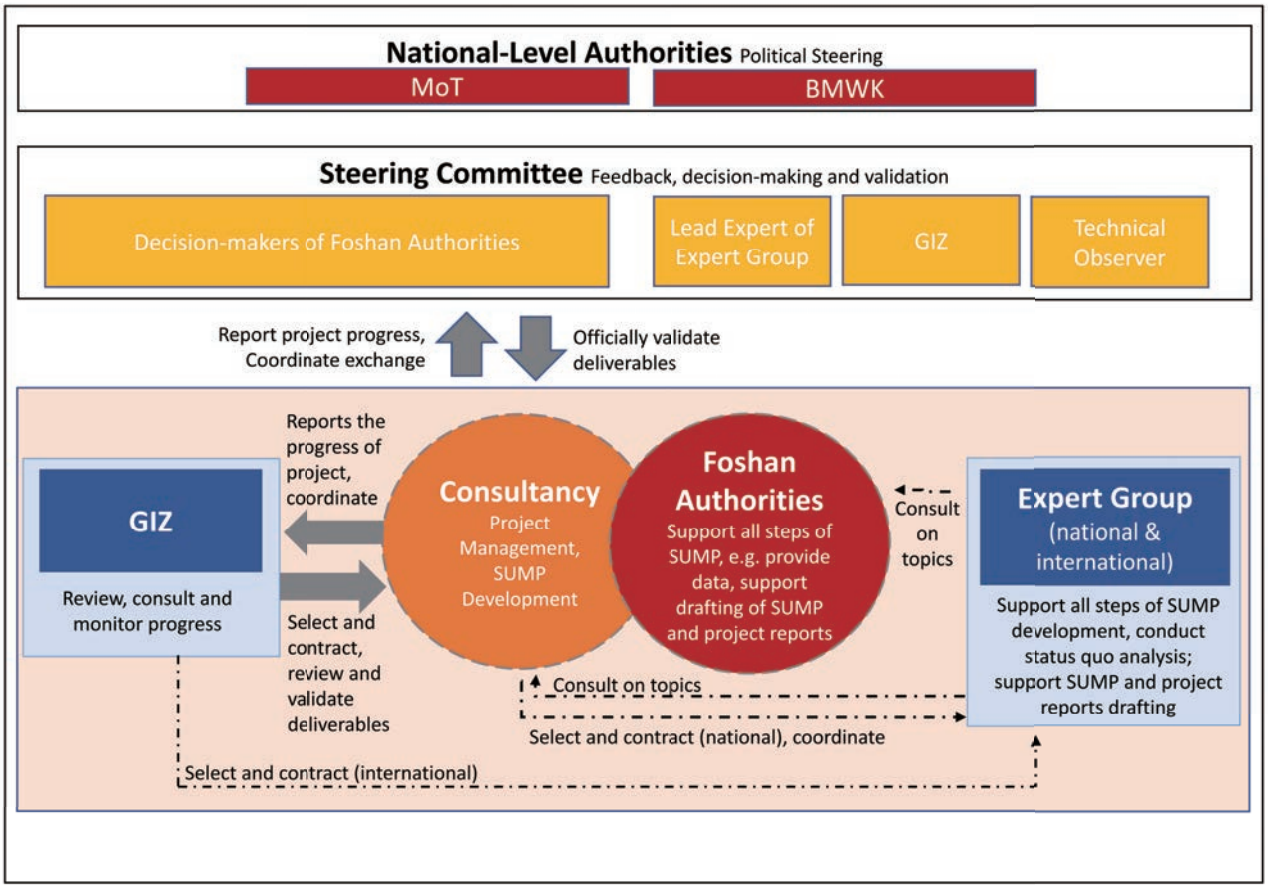
Although only few consulting companies have the corresponding qualifications to hold a role as the main contractor of this type of governmental planning project, it is still common in China to have cooperative agreements between multiple institutions and organisations in the form of subcontracts. In these cases, each planning agency only bears the responsibility for its own deliverables as specified in the contract, without being well informed of the holistic working mechanism involving other partners. However, when they are unaware of the positioning of their responsibilities in the overall working framework of the project, and of the linkages of their work with that of other project members, planning agencies can barely understand what other project members are doing. Establishing a well-structured working mechanism with clear responsibilities as suggested in the SUMP methodology could be helpful to address this issue.

As one of the vital tasks in the SUMP planning process, the establishment of a working mechanism can make the entire working framework coherent and accessible to any member involved in the planning project, and each are able to see what tasks and responsibilities are assigned to corresponding organisations and institutions, and how their own work fits into this strategy. Taking the Foshan SUMP as an example, a tailored working mechanism allowed each project member to identify what their responsibility was, and with whom they should communicate, from the very beginning.

The Foshan SUMP's successful working mechanism can provide a reference for other Chinese cities (see Figure 3-3). Under its mechanism, the commissioning party provided the political framework in support of the planning project. The steering committee, consisting of decision-makers from local authorities, a mediator and technical observer, ensured the smooth progress of the planning of the project, validated deliverables, and coordinated cross-party activities. The core working team, including the technical consultancy team, Foshan authorities, and an external technical support group, developed and drafted the Foshan SUMP pilot strategy, planned stakeholder and citizen involvement, and reviewed, consulted, and monitored the progress of the overall project. The Foshan authorities acted as the SUMP owner and supported all steps of the SUMP by providing data and planning documents, taking part in workshops, and reviewing project reports.

[19] The local authorities that are responsible for organising the compilation of urban comprehensive transport planning in China are the: City Transportation Bureau of the prefecture-level city, Beijing Municipal Commission of Planning and Natural Resources, Beijing Municipal Transportation Commission, Shanghai Municipal Transportation Commission, Tianjin Urban and Rural Construction and Transportation Commission.

Figure 3-3 Working Mechanism of the Foshan SUMP



Skill Management

When conducting traditional transport planning in China, the skill requirements of the core planning team are only stipulated in the form of the number of technicians with sufficient qualifications needed for the tendering or in the contract. This information is mostly used to calculate the cost of the planning of the project, while little attention is paid to the connection between the required skills needed for each step of the planning process. However, each planner, project manager, and expert has their own certain field of expertise, therefore their qualifications alone cannot provide a solid reference for how to allocate their responsibilities and roles for the project.

Based on this consideration, the Foshan SUMP created a list of skills that technicians would need to fulfil their roles, according to the requirements of the planning activities to be performed (see Table 3-1). For instance, personnel undertaking the status quo analysis of the Foshan SUMP were required to have not only data interpretation skills, but also the ability to seek potential cooperation opportunities and coordinate with local authorities to combine public surveys with ongoing promotional events. Therefore, to conduct the status quo analysis and to further promote the entire planning process successfully, qualified traffic planners and project managers were required. It was demonstrated in the Foshan SUMP that the SUMP approach of clarifying core skill requirements to effectively guide personnel allocation in the initial stages of project planning and to provide effective support for subsequent work plans could benefit planning processes in other Chinese cities.

■ **Table 3-1 Skill Management Plan of Foshan SUMP**

Management skills (required during the entire SUMP)
Project management (incl. political liaison, time management)
Technical management
Financial management
Staff management (incl. multidisciplinary teams made up of internal and external staff)
Technical skills (required during the SUMP Pilot)
Urban planning and transport planning
Basic knowledge of other important sectoral policies (environmental, economic, social)
Thorough understanding of governmental transport and planning policy at other levels – regional, national, international
Data collection methods and empirical analysis (surveys, interviews and modelling)
Numeracy and data interpretation skills
Operational skills (required for particular activities)
Moderation and mediation
Writing and design skills for public relations
Excellent verbal and written communication skills
Budget monitoring

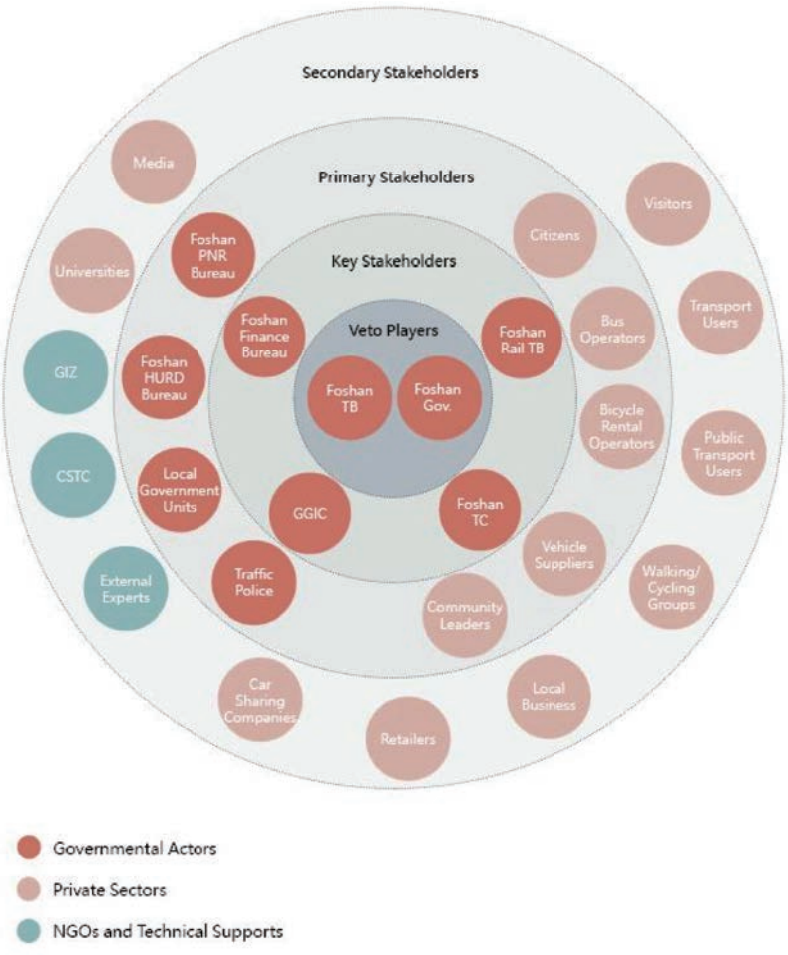
[20] The State Council of the People's Republic of China, 2021. The 14th Five-Year Plan for the Development of a Modern Comprehensive Transportation System,https://www.mot.gov.cn/zhuanti/shisiwujtysfzgh/202201/P020220129657756692258.pdf

Stakeholder Analysis

Cross-departmental collaboration to promote the high-quality development of comprehensive transport systems is a future trend worldwide and in China[20]. In line with this trend, the involvement of relevant stakeholders is highlighted throughout the planning process of SUMP. The Foshan SUMP provides persuasive evidence that the identification of stakeholders who are relevant to the project enables inter-sectoral cooperation and makes cross-organisational communication more effective.

Taking Foshan as an example, the most relevant urban transport planning stakeholders in the Chinese institutional context can be identified (see Figure 3-4). In Foshan, the **veto players** were the Municipal Government and the Municipal Transportation Bureau, the key stakeholders included the Municipal Bureaus of Rail Transportation, Finance, and Regional Transportation, the primary stakeholders included the Bureaus of Planning and Natural Resources, and of Housing and Urban-Rural Development, local government units, community leaders, traffic police, bus/taxi operators and drivers, vehicle suppliers, and citizens, and secondary stakeholders included universities, media, NGOs and technical support groups, car sharing companies, retailers, local business, walking/cycling groups and all other transport users. This enumeration can be used as an example to show the diversity of the groups with stakes in transport planning. These actors can be extended depending on the local conditions in each city. The more thoroughly the stakeholders are involved in early planning stages, the more likely the project is it to achieve consensus and acceptance in the implementation stage.

■ **Figure 3-4 Stakeholder Map of Foshan SUMP**



Step 2: Determine planning framework

After a thorough assessment of the local context, capacities, and resources, a clear picture can be obtained, which depicts the strengths, weaknesses, and opportunities of developing a SUMP in the target city. The planning framework of the SUMP can then subsequently be determined.

Planning requirements and scope

When adapting SUMP in the Chinese context, the planning requirements and scope of the strategy should follow the guidance of the Guidelines for the Compilation of Urban Comprehensive Transportation System Planning[21] (hereinafter referred to as the 'Guidelines'). In addition to obeying the planning principles in the Guidelines, planners should have a thorough understanding of the local standard of the Guidelines[22], if available.

Alignment with existing policies

To increase the acceptance rates of the comprehensive planning actions proposed in a SUMP, it should be well aligned with existing policies. In the Chinese case, these include:

- **The latest Five-Year-Plan (FYP) at national and city levels**
  Align the vision and goals of SUMP with the overall goals of urban development in the next five years, including the general requirements for the development of the transportation system.

- **Provincial government documents regarding carbon dioxide emissions peaking and carbon neutrality goals**
  Ensure the consistency of the objectives of the SUMP with provincial government documents addressing the 'dual-carbon' goals, which extend beyond the transportation sector also to the fields of energy and the environment.

- **Transport Development Annual Report of the city**
  Obtain basic knowledge on current residents' travel patterns and present urban transport system conditions.

- **Citywide Comprehensive Transport Plan**
  Understand the long-term plans of transport infrastructure for each mode of transport.

- **White Paper on Transport Development of the city**
  Clarify the development goals and main tasks of the transportation system for the next five years, and identify the role of the transportation system in land and space development, industrial gradient transfer, urban layout optimisation, and economic and trade exchanges.

- **Ongoing action plans (such as the Green Mobility Action Plan 2020, the Two-Year Smooth Traffic Project 2021)**
  Make sure that the SUMP is in accordance with the direction of the ongoing action plan, which is an important starting point for adapting SUMPs to the local planning context.

- **Ongoing construction planning (such as Construction Planning of the Second Phase of Urban Rail Transit in Foshan City, Guangdong Province 2021)**
  Ensure a full understanding of the approved major transport infrastructure projects and assess future development trends of the transport supply.

- **Best practices of international SUMPs**
  Learn from the successful experience of international SUMP practices, through concrete case studies of their planning steps, get inspiration for local SUMP implementation processes and reasonably adopt methods that have been successfully applied elsewhere.

In the Foshan SUMP, planning was closely linked with the 14th FYP of the city and the Urban Comprehensive Transportation Plan[23], which indicates that transport development in the future needs to have the five key objectives of being accessible, coordinated, efficient, green, and safe. Additionally, Foshan is currently in its implementation phase of the Green Mobility Action Plan[24] and is advocating green mobility and a determination to embrace the people-oriented concept. Foshan SUMP's vision and objectives have been refined and adapted with reference to these two existing plans.

[21] Ministry Of Housing and Urban-Rural Development of the People's Republic of China, 2010. Guidelines for the Compilation of Urban Comprehensive Transportation System Planning, https://www.mohurd.gov.cn/gongkai/fdzdgknr/tzgg/201006/20100608_201282.html.

[22] For example, Guangxi has its own local standard of the Guidelines for Compilation of Regional Comprehensive Transportation Planning, referring to Guangxi Zhuang Autonomous Region Department of Transportation, 2021. "Guidelines for Compilation of Regional Comprehensive Transportation Planning" (DB45/T 2323-2021) Guangxi Local Standard Release Notice, http://jtt.gxzf.gov.cn/ztzl/jtkjybzh/t9711958.shtml.

[23] Foshan Transport Bureau, 2017. Citywide Comprehensive Transport Plan of Foshan, https://wenku.baidu.com/view/9b2fa091fe0a79563c1ec5da50e2524de418d047.html.

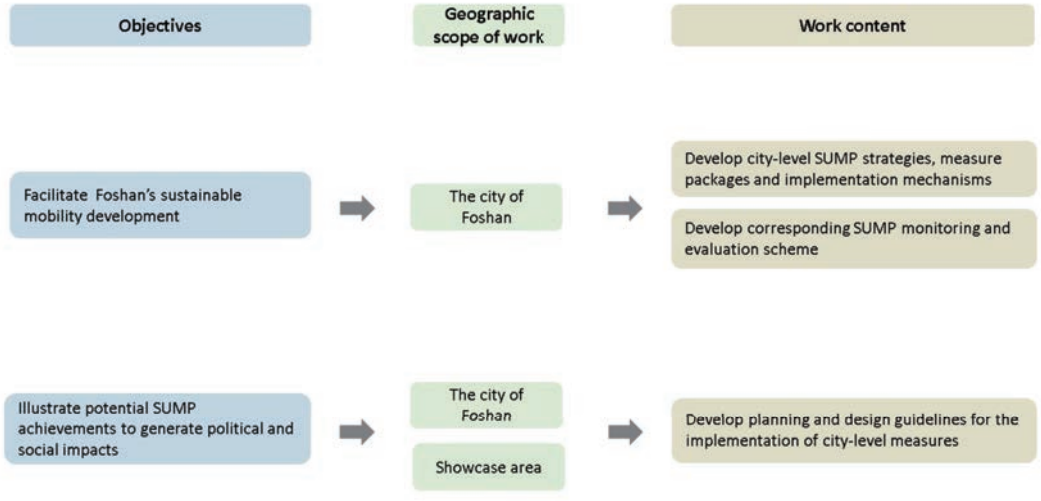
Piloting Approach in a Showcase Area

In the Chinese context, planning approaches with an initial implementation showcase in a pilot city are proved to increase acceptance rates for the project by planners and citizens. As a result, the Foshan SUMP suggested the implementation of selected measures in a showcase area in a central district of Foshan. In selecting measures for the showcase area, two criteria were applied. The first criteria – if support for the measure was given by the public and experts – was reflected by the measured scores rated by participants in the measure development workshop. The second criteria was the feasibility of the implementation of the measure. Feasible measures were considered to be those with appropriate implementation scopes that were in line with the local government's recent action plans.

The **benefits of showcasing** were harnessed in the Foshan SUMP case (see Figure 3-5). Through the concretisation of city-level measures in the showcase area, the results of planning work could be shared with relevant departments at the district and street levels in the form of a workshop, and all participants were encouraged to actively exchange opinions. By providing a cross-administrative level communication platform, the feasibility of measures in the showcase area were well discussed. All participating units at the municipal, district, and street levels gave positive feedback on the proposed measures of action, and it was agreed that indeed offered effective solutions to solve the current issues identified in the showcase area. In addition, the participants of the workshop also had an in-depth exchange on the possibility of integrating the measures with other ongoing local action plans, such as the old community renewal plan already underway in the showcase area and a road section improvement plan.

In the Foshan SUMP pilot project, **lessons learnt** from the planning work in the showcase area were considered to be valuable. Due to the limited time period of the pilot project, construction-level work was not within its scope, but rather specific measures planned to be undertaken at the showcase level were then selected for implementation by local authorities upon the finalisation of the SUMP pilot document – which included an implementation and monitoring plan to guide these actions. It was agreed that before work on measures would commence, communication channels between the core planning team and the district-level Transport Bureau, as well as with the Street Office should be established. From the initiation stage of SUMP, it was noted that these actors should be well informed about the roles that they were to play in the entire planning process and how the strategic relevance of their work in the showcase area would also benefit the whole city. Once the city-level vision and objectives had been established, regular updates on planning progress should be reported to district- and street-level departments to obtain cross-government-level executive support. When the city-level strategic measures package was completed, ongoing action plans and detailed planning documents at the district and showcase level were supposed to be requested for the selected measures in the showcase area. In this way, feedback on the feasibility and urgency of the proposed measures from all stakeholders could be summarised and collaborated in advance.

■ Figure 3-5 Showcasing Area in the Overall Scope of Foshan SUMP



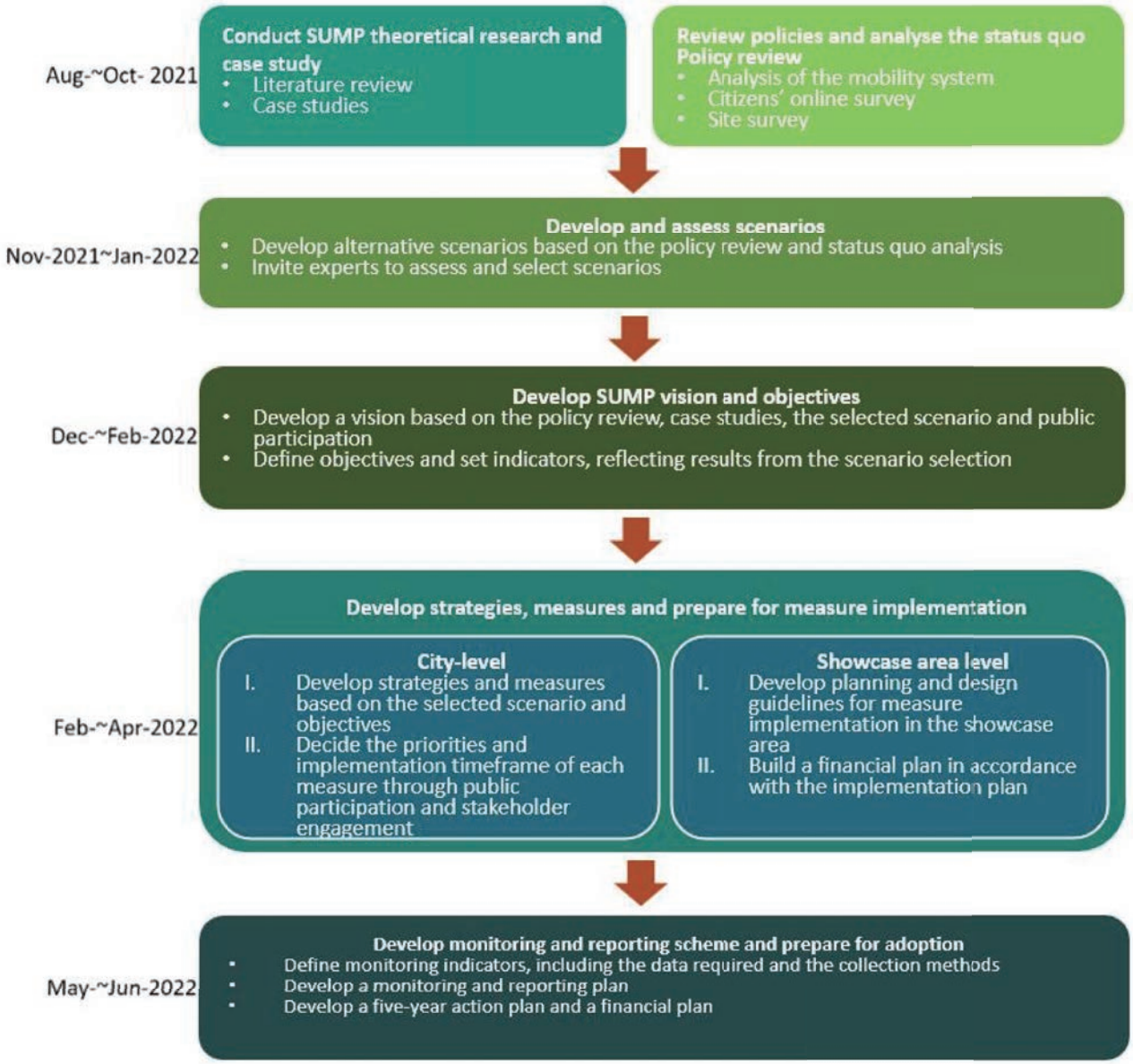
[24] Foshan Transport Bureau, 2020. Foshan Green Mobility Action Plan

Project Roadmap

Similar to traditional planning processes, the formulation of a roadmap is an essential step in helping planning teams to successfully implement their SUMP. The project roadmap defines the timeline for the outcomes of the plan and provides a visual blueprint of actions, which makes it convenient for the involved planners to check SUMP progress. The roadmap is also the main basis for formulating the project budget and efficiently allocating human and financial resources.

Based on findings from the pilot in Foshan (see Figure 3-6), it is recommended to take into full consideration each location's external factors (such as national policies towards large-scale metro construction) and local characteristics (such as scattered urban clusters, large inter-city commuting demands and short average travel distance within clusters) when formulating the project roadmap. In order to better adapt SUMPs to the local mobility planning context, planning teams need to use the roadmap to proactively assess potential risks to the success of the project, and then flexibly respond to them.

■ **Figure 3-6 Roadmap of the Foshan SUMP**



Step 3: Analyse the mobility situation of the targeted city

Similar to traditional Chinese planning methods, the analysis of the mobility situation of the city is a major milestone outcome that provides the basis for the rational and transparent strategy development of SUMP. Besides identifying issues and opportunities in the field of urban mobility, the analysis system suggested by SUMP aims at including citizens' opinions, and proposes the identification of data and sources needed from the initial stages of project planning.

Overview of data needs and sources

The availability of data is a common challenge for urban and transport planners, especially when adapting SUMPs to Chinese cities.

In the Chinese planning context, there are three main approaches to obtaining data. The first approach is to obtain data directly from relevant government departments. Data relating to population and employment can be obtained from the National Population Census and the National Economic Census, but these censuses are only conducted every ten years. In China, where the population keeps increasing and urbanisation is rapidly progressing, this data may not reflect the most current socio-economic status. Data on the construction status of urban transportation infrastructure can be obtained from the Urban Transportation Annual Report. However, some cities either lack a regular compilation and release scheme of this report, or limit the use of the reports to internal information sharing, and therefore do not freely provide the public with access to their contents. Though data on the distribution of land use is available in the Comprehensive Territorial Spatial Planning system,25 normally this data is only available with a rough degree of precision. In general, government data lacks unified standards, does not exist on freely accessible open-source platforms, and does not have a regularly integrated data collection scheme. Consequently, it is difficult to obtain up-to-date and comprehensive data from the government.
The second approach to obtaining data in China is to secure it from large internet companies. Based on their huge user bases, the amount of data collected by large internet companies in their daily operations is massive. However, the cost of purchasing data from these companies is staggeringly high, and the quality and accuracy of data is not guaranteed if official verification of it by the government is lacking. Therefore, it is also difficult to obtain suitable data through this approach, particularly on limited budgets.

The third approach to collecting data in China is to sample a certain area through a public survey and extrapolate the trend of these findings to the whole city. This approach is the most feasible and cost-effective, and was also adopted in Foshan's SUMP to collect information on citizens' satisfaction with public transport services. However, access to the raw data of the survey results should be restricted to the project team, and it should only be shared with other organisations and institutes with specific consent from survey participants.

Each of these three approaches has their own limitations, and collected data has not yet been integrated into a systematic and open data platform. It is highly recommended to form a data sharing platform that merges multiple data sources and allows academic and governmental partners, and even third-party consulting agencies to freely access a regularly updated database. There are best practices in many countries and regions to consider when considering methods of data collection. For example,, Chinese cities could learn from the successful example of the 'Greater Region Geographical Information System (GIS-GR)'26 - an open data platform providing geographical cross-border and harmonised data for the entire Greater Region.27 The GIS-GR makes various thematic, modular maps and geo-data files available to citizens, spatial planners, authorities, political decision makers and experts. Through the work of the GIS-GR, spatial development and spatial planning policy can be aligned and stakeholders can be supported in their decision-making processes. Taking advantages of metropolitan and city cluster development processes in China, opportunities to foster such an open data platform with cross-border, cross-department, and cross-field cooperation should eventually be identified.

[25] In 2018, the Land Administration Law (Draft Amendment) stipulates that if the Comprehensive Territorial Spatial Planning has been complied, the Land Use Planning and the Master Planning is no longer necessary to be complied. http://www.npc.gov.cn/zgrdw/npc/lfzt/rlyw/node_35755.htm.

[26] For more details about the Greater Region Geographical Information System (GIS-GR), please see: https://www.grossregion.net/Institutionen/Raumbeobachtung/Geografisches-Informationssystem-der-Grossregion.

[27] The Greater Region lies at the crossroads of the rivers Rhine, Saar, Meuse, and Moselle. It covers 65,401 km² with more than 11.6 million inhabitants from the territories of Lorraine in the French region Grand Est, Wallonia, the Federation Wallonia-Brussels and Ostbelgien in Belgium, Saarland and Rhineland-Palatinate in Germany, as well as the Grand Duchy of Luxembourg. https://www.granderegion.net/en.

Step 4: Build and jointly assess scenarios

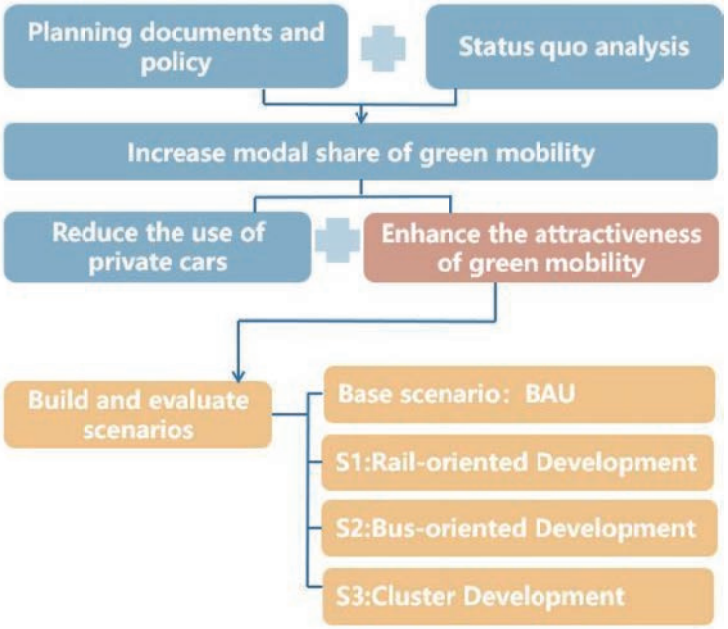
What is a scenario? A scenario is a description of a specific set of developments in the future which are relevant to urban mobility, including the likely effects of external factors (such as demographic and economic circumstances), as well as those of strategic policy priorities (such as a strong active mobility or electromobility focus).

Why build scenarios? The development of scenarios is important to illustrate to decision-makers the potential different pathways for the future development of a city, and to make better choices when building a common vision and objectives with local stakeholders. Concept maps can be used to visualise the results of changed parameters of each scenario and act as major references in scenario assessment processes.

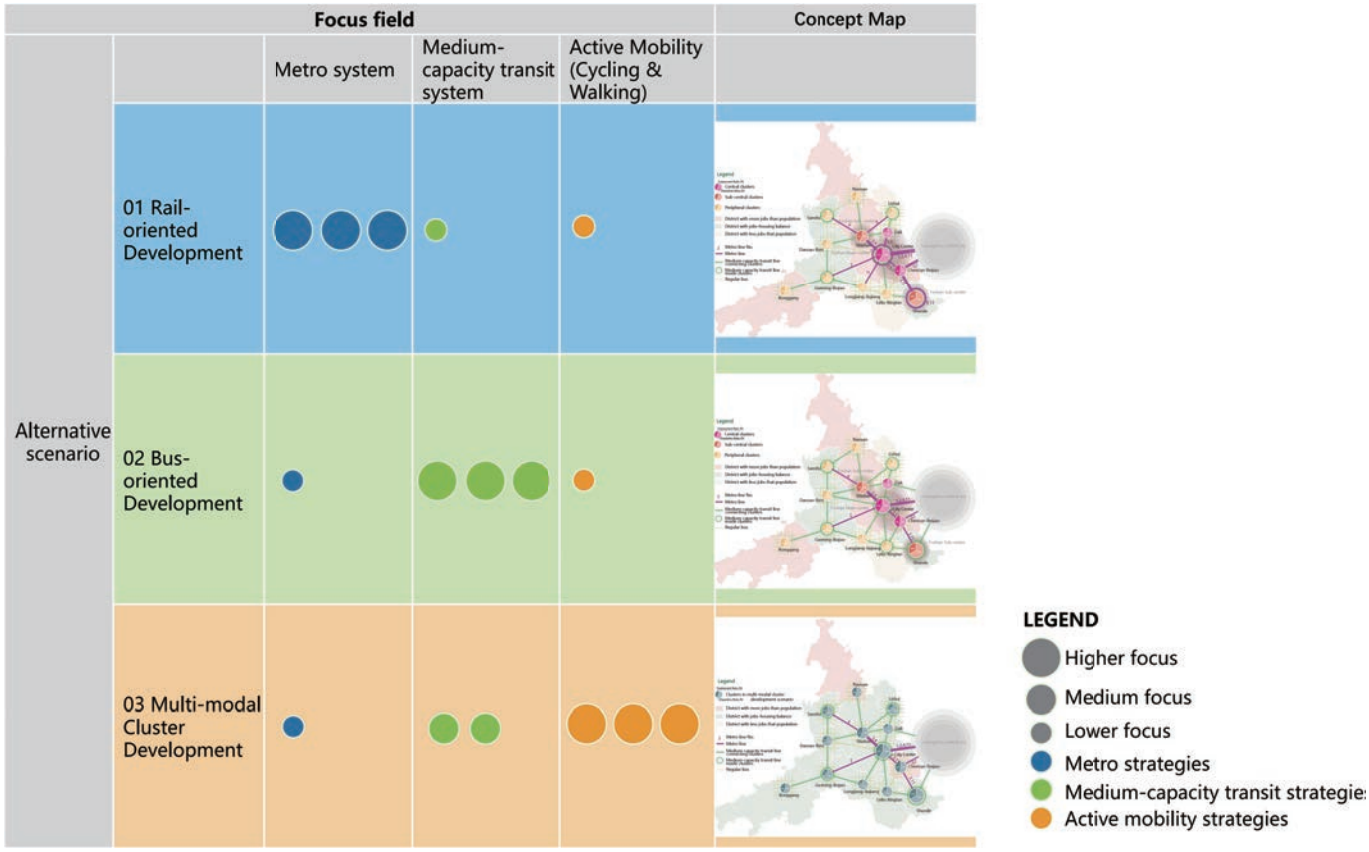
Scenario analysis in Chinese planning: Scenario analysis is conducted commonly during transport planning phases, which integrate qualitative and quantitative analysis and comprehensively considers the main factors affecting transportation development (such as land and space use patterns, economic strength, and related issues). Combining the knowledge of expert groups with actual data, various information, and computer technologies, and the experience and wisdom of mathematical models and decision makers, the initial probability and simulation probability of key events are obtained. In turn, the occurrence probability of a scenario is calculated. Finally, the scenario most likely to occur is identified, which is used as the basis for optimising traffic forecasting results, thereby guiding the development of transport planning processes.

Base scenario and alternative scenarios developed in the Foshan case: The base scenario for the pilot project was established based on population projections, employment opportunities, urban spatial planning documents, and structural models of passenger transport demands (see Figure 3-7, Figure 3-8, and Figure 3-9). The length and layouts of the metro, bus, cycling, and pedestrian networks, employment distribution, and corresponding strategic policies were adjusted to obtain three alternative scenarios, which differentiated themselves by areas of focus. Scenarios were then presented with the help of descriptive indicators and concept maps. Per capita travel distance and time, the number of clusters with a jobs-to-housing balance, the proportion of inter-cluster trips, CO_2 emissions, construction cost, and related factors, were set as the descriptive indicators of each scenario to compare pros and cons as well as scenario feasibility.

■ **Figure 3-7 Methodology of Building Scenarios**



■ Figure 3-8 Establishment and Presentation of Alternative Scenarios



■ Figure 3-9 Descriptive Characteristics of Alternative Scenarios

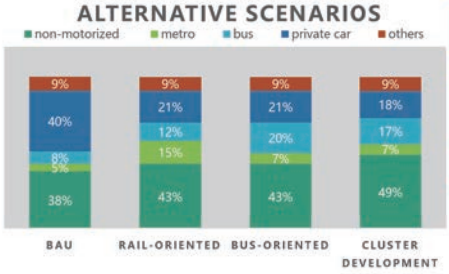
	Base Scenario	Alternative scenario 01	Alternative scenario 02	Alternative scenario 03
Modal share of green mobility				
Per capita traveling distance (km)				
Per capita traveling time (min)				
Average operating speed on the road (km/h)				
Length of the rail network (km)				
Medium-capacity transit track kilometer (km)				
Coverage of bike lane				
500m coverage rate of rail-transit stations				
Number of clusters with jobs-housing spatial balance				
CO2 emission (Mt)				
Construction cost (billion)				

Selected scenario for a future Foshan

The evaluation of scenarios was conducted in the form of analysis and scoring assessments during a stakeholder workshop. The workshop was organised with decision-makers, key stakeholders, and local experts to debate on the three alternative scenarios, comparing their pros and cons as well as the feasibility of each scenario. Recommendations from local experts made the selected scenarios more suitable for the characteristics of Foshan. The participation of stakeholders set the basis for the successful coordination of multiple departments in the implementation stage of the pilot project.

The opinions of the decision makers were the key to the agreement of Foshan's future development directions. Based on the status quo together with the base scenario, the participants gave composite scores by comparing the values of indicators in different scenarios and voted for the target scenario. Afterwards, comments were solicited to explain the scores and choices given by the workshop participants. One of the scenarios was selected to act as the guide for Foshan's future mobility development, contributing to the next stage of building the plan's vision, objectives, strategies, and measures (see Figure 3-10).

■ **Figure 3-10 Modal Share and Scoring Sheet Used During the Scenario Selection**



	Fitness to Foshan future development (1-5)	Political feasibility (1-5)	Economic feasibility (1-5)	Technical feasibility (1-5)	Vote count for chosen scenario	Composite score
01 rail-oriented development	2.0	2.3	1.8	2.7	0	2.2
02 bus-oriented development	3.5	3.8	3.3	3.7	1	3.6
03 multi-modal cluster development	4.3	3.8	4.5	4.0	5	4.2

Step 5: Develop vision and objectives with stakeholders

What is a vision? A vision is a short, qualitative description of the desired future for the city and its mobility systems, which is then specified by concrete objectives that indicate the type of change that the city is aiming for. A vision usually has a long-term horizon that can even go beyond the timeframe of the SUMP, envisioning situations in 20-30 years.

What is an objective? An objective is a broad, qualitative statement of vision, describing an improvement that is being targeted by the city.

Visionary planning in China: Generally, traditional planning in China is based on the national goals at the macro-level, adapted to the scale of city in terms of economic and demographic characteristics, and formulated to be seen as the 'overall goal' at the city-level. An 'overall goal' is more similar to the role of the vision of SUMPs, and it guides the formulation of sub-level objectives. However, goals generally cover a wider range of fields, lack focus and conciseness, and in most cases, pay more attention to the supply side of projects.

The following list gives suggestions on adapting the vision building process of SUMPs to the Chinese context, based on the experience accumulated in Foshan's pilot project:

1)Build a vision based on the 'overall goals' of existing plans (including aligning goals with existing policies from Step 2), to be captured in an expression from which few but precise keywords can be extracted. These keywords can effectively highlight the focus of the development of future mobility systems, guide the selection of tailored indicators, and support the development of appropriate measures.

2)As the SUMP principle of vision creation slightly differs from traditional visionary planning in China, taking reference from how this process rolls out in international cities might be advisable.

3)Objectives should be distinguished from strategies and measures. Objectives specify the desired type of change, and the directions for improvement and priority areas, but not the means for achieving them. A simple way to distinguish them from strategies is by checking whether the objective states exactly which aspect needs to be 'reduced', 'increased', or 'maintained'. As objectives should be well linked to notions of sustainability, a review of holistic sustainable transport objectives that can be drawn upon is available at the Victoria Transport Policy Institute.[28]

4)Scenarios, the vision, and objectives should be strongly interrelated. A vision is supposed to be a brief summary of the most proper development pathway for the selected scenario. Objectives should not only contribute to achieving the picture of the city depicted in the selected scenarios, but also aim to address any identified key mobility challenges.

5)To create an environment for awareness and broad acceptance, as many stakeholders as possible should be actively engaged in the vision building process (for example, through workshops such as those undertaken in Foshan's SUMP). Additionally, learning from challenges in Foshan, citizens should also be actively informed (for example via posts from official accounts on Weibo or WeChat) about project progress and outcomes as the draft vision and objectives are established, and should be provided with an accessible platform for feedback (such as a sufficiently advertised public survey with open questions distributed by the Transport Bureau's Official WeChat account).

Step 6: Set indicators and targets

What is an indicator and what is a target?

An indicator is a clearly defined data set used to monitor progress in achieving a particular objective, while a target is the expression of an aimed-for-value of a strategic indicator[29]. Indicators are very commonly used in traditional Chinese planning, and their functions are similar to those in SUMP. However, most of the traditional indicators focus on the supply-side of processes, and there is a lack of people-oriented subjective indicators.

There are two types of indicators in different planning stages of SUMP. At the initial stage, core indicators should be formulated following a goal-oriented approach, to guide following planning processes. At the later stage, after identifying the necessary actions to achieve the objectives and the corresponding responsible bodies, the monitoring indicators that help measure progress and ensure the success of implementation are refined following the implementation-oriented approach. It has been proved in the practice of Foshan that both types of indicators are key to the successful implementation of SUMP in China.

A good indicator should not only be able to quantitatively measure the desired change specified in the objectives, but also has the characteristics[30] of being clearly defined and easy to understand, based on available and measurable data, as well as being controllable/attributable, cost-effective, limited in number, responsive/timely, statistically/scientifically valid and comparable/consistent over time.

How should target values for indicators be set? The first method of setting indicators is to analyse and evaluate the current value of the indicator based on reliable and validated data. The second method is to identify the gap between the current value and the ideal value required to achieve the objectives. The third method is to apply an evidence-based traffic and transport model combined with a sensitivity analysis to clarify the expected outcome under the guidance of the vision. Finally, a reasonable target value can be set through averaging the trade-off between the gap and the expected outcome.

[28] Victoria Transport Policy Institute,2017. Sustainable Transportation and TDM, http://www.vtpi.org/tdm/tdm67.htm

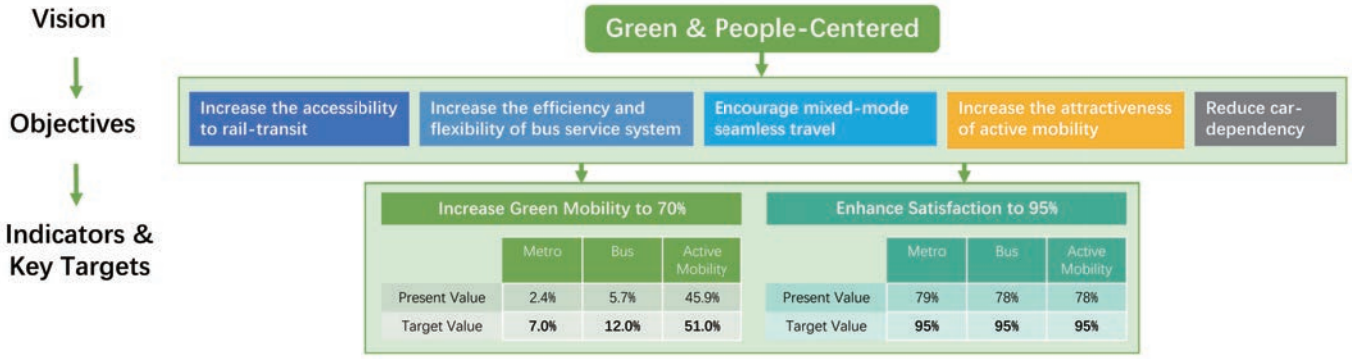
[29] Definition derived from the Guidelines for SUMP in English: https://www.eltis.org/mobility-plans/guidelines-developing-and-implementing-sustainable-urban-mobility-plan-2nd-edition

[30] Further details of the characteristics of a good indicator: DISTILLATE, 2005. Deliverable C1: Sustainable Transport Indicators: Selection and Use, http://www.distillate.ac.uk/outputs/C2%20Selecting%20Indicators%20Report%20(09-04-08).pdf

Logic graph for the entire objective-target system

In China, strategic objectives are rarely presented in a systematic and visual way in planning documents. In traditional planning processes, the interconnection of planning elements is rarely explicitly addressed as part of the work. Foshan's SUMP has attempted to use a logic diagram (see Figure 3-11) so as to establish the causal links between objectives and anticipated or targeted outcomes. This adaptive approach allows the planning team to arrange a systematic and scientific assessment of the rigour of the draft vision and objectives. At the same time, the diagram makes the exchange of opinions between the core project members more efficient. As a visual manifestation, the diagram enables stakeholders and citizens who are newly involved at any stage of the planning process to quickly and easily understand the core content of the entire SUMP.

■ **Figure 3-11 Logic Diagram of the Vision, Objectives, and Key Targets of the Foshan SUMP**



Step 7: Select package of measures with stakeholders

In traditional planning, there is no standardised method of selecting choices from a long list of possible measures of programming, created beforehand through participatory assessments. Instead, measures are usually formulated by combining expert experience and similar policies adopted elsewhere. Measures at the city level are packaged based on infrastructure required by different modes of transport, including with soft measures (for example, mobility management and campaigns). When the entire planning process is completed, the entire planning document (rather than a list of individual measures) will be reviewed by an expert group who will then decide on the final assessment goals. After approval, the draft plan is released to the public, where the channels for collecting public opinions are then relatively simple. The degree of participation in the formulation of measures is relatively low in the Chinese planning context.

The practice of SUMP in Foshan has proven that using a participatory method for the formulation and selection of measures in the Chinese context is feasible. Existing planning documents, domestic and international best practice cases, face-to-face interviews, as well as open-ended questions in public surveys can all be accessible sources for creating a long list of measures that can then be drawn from. Moreover, to effectively incorporate the opinions of stakeholders and citizens into the measure selection process, a scoring assessment (see Figure 3-12) is suggested to be used, which then engages stakeholders to assess the urgency and feasibility of each measure based on scoring and discussion in workshops, and invites citizens to evaluate the importance of measures through questionnaires. As one of the items to be scored in the scoring assessment, an assessment on the degree of contribution of individual measures to the achievement of objectives should be conducted. Eventually, the selected measures are ranked by priority based on the scoring results.

It is additionally recommended to group selected measures according to specific objectives and **embed them into the formulated logic diagram** (see Figure 3-13). By combining measures into packages, the impacts of single actions are

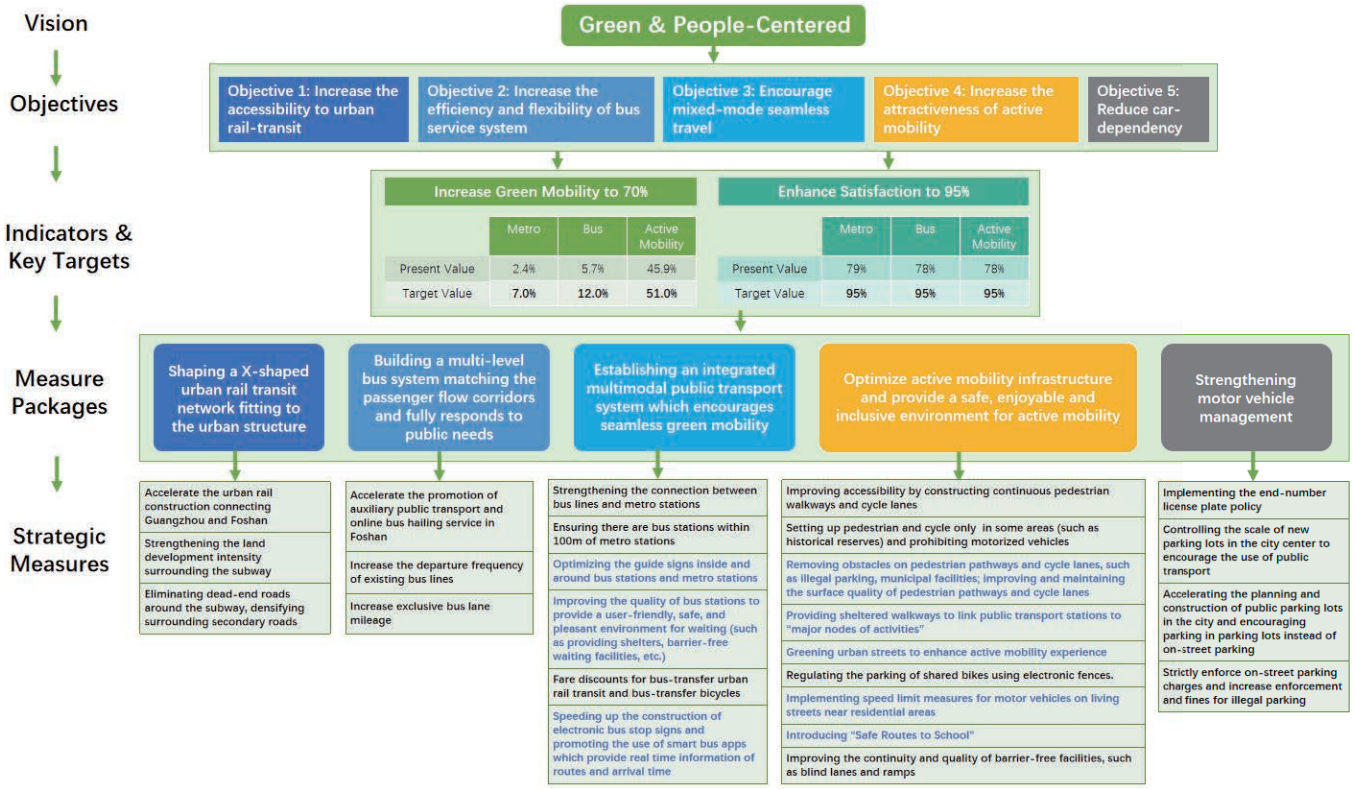
increased by their association with other measures. For instance, under the 'Optimise active mobility infrastructure and provide a safe, enjoyable, and inclusive environment for active mobility' measure package, the individual measure for 'Improving accessibility by constructing continuous pedestrian walkways and cycle lanes' itself can only improve the condition of the infrastructure. However, combined with the measure on 'Removing obstacles on pedestrian pathways and cycle lanes, such as illegal parking, municipal facilities; improving and maintaining the surface quality of pedestrian pathways and cycle lanes,' the high-quality operation and maintenance of the active mobility infrastructure can be guaranteed as well. Thus, the actual walking and cycling experience can be effectively enhanced and a pleasant active mobility environment can then be built accordingly.

During the Foshan pilot, the responsible departments and institutions for each measure were agreed upon by the stakeholders in the workshop. Due to the time constraints of the Foshan SUMP project, only monitoring indicators for the measures in the showcase area were developed. When SUMP is implemented in other Chinese cities, monitoring indicators should be formulated for each measure after finalising the measure packages, and these should be consistent with the core indicators.

■ Figure 3-12 Score Sheet for Measure Assessment and Selection

		City-level measures	Importance (1-5)	Urgency (1-5)	Feasibility (1-5)	
					economi	technica
Shaping a X-shaped rail transit network fitting to the urban structure.	1	Accelerating the rail construction connecting Guangzhou and Foshan	4.0	3.8	3.5	3.2
	2	Strengthening the land development intensity surrounding the subway	4.0	3.5	3.7	3.2
	3	Eliminating dead-end roads around the subway, densifying surrounding secondary roads	3.5	3.3	3.5	3.8
Building a multi-level bus system matching the passenger flow corridors and fully responds to public needs	4	Accelerate the promotion of auxiliary public transport and online bus hailing service in Foshan	4.2	4.2	4.0	3.8
	5	Increase the departure frequency of existing bus lines	3.5	3.3	3.5	3.8
	6	Increase bus lane mileage	3.8	3.7	3.5	3.7
	7	Increase land ensurance for bus stations	3.8	3.8	3.8	3.7
Establishing an integrated multimodal public transport system which encourages seamless green mobility	8	Strengthening the connection between bus lines and rail stations	4.3	4.5	4.8	4.3
	9	Ensuring there are bus stations within 100m of rail stations	4.3	3.8	4.5	4.5
	10	Optimizing the guide signs inside and around bus stations and rail stations	4.2	3.8	4.3	4.5
	11	Improving the quality of bus stations to provide a user-friendly, safe, and pleasant environment for waiting (such as providing shelters, barrier-free waiting facilities, etc.)	4.3	4.2	4.2	4.7
	12	Fare discounts for bus-transfer rail transit and bus-transfer bicycles	4.0	4.2	3.8	3.3
	13	Speeding up the construction of electronic bus stop signs and promoting the use of smart bus apps which provide real time information of routes and arrival time	3.8	3.7	4.2	4.7
Strengthening motor vehicle management	14	Banning motorcycles in downtown	3.2	3.3	4.0	3.7
	15	Implementing the end-number license plate policy	2.8	3.0	2.7	2.7
	16	Controlling the scale of new parking lots in the city centre to encourage the use of public transport	3.5	3.2	2.8	2.5
	17	Accelerating the planning and construction of public parking lots in the city and encouraging parking in parking lots instead of on-street parking	3.5	3.2	3.3	3.2
	18	Strictly enforce on-street parking charges and increase enforcement and fines for illegal parking	4.5	4.5	4.3	4.0
Creating a high-quality and vibrant street environment	19	Improving accessibility by constructing continuous pedestrian walkways and cycle lanes	4.0	3.8	3.5	4.0
	20	Building cycle lanes to connect parks and public spaces	3.2	3.3	3.7	3.7
	21	Setting up pedestrian and cycle only in some areas (such as historical reserves) and prohibiting motorized vehicles	3.7	3.7	4.0	3.5
	22	Removing obstacles on pedestrian pathways and cycle lanes, such as illegal parking, municipal facilities; improving and maintaining the surface quality of pedestrian pathways and cycle lanes	4.3	4.3	4.5	4.0
	23	Providing sheltered walkways to link public transport stations to "major nodes of activities"	3.8	4.2	4.0	4.2
	24	Greening urban streets to enhance active mobility experience	3.7	3.0	3.7	3.5
	25	Creating public spaces on the street (e.g., seating, rest space, etc.)	3.2	3.3	3.3	3.3
	26	Providing more shared bicycles and e-bikes	3.5	3.3	3.5	3.7
	27	Regulating the parking of shared bikes using electronic fences.	3.8	3.8	4.0	4.2
	28	Implementing speed limit measures for motor vehicles on living streets near residential areas	4.0	3.8	3.8	4.3
Providing safe and inclusive mobility environment for all-ages	29	Improving the continuity and quality of barrier-free facilities, such as blind lanes and ramps	4.2	4.2	4.2	4.2
	30	Increasing crossing aids, including active mobility crossings, active mobility traffic signals, safety islands, etc	3.7	3.7	3.5	3.8
	31	Introducing "Safe Routes to School"	4.0	4.3	4.0	4.5
	32	Introducing elderly-friendly facilities	3.8	4.0	3.5	4.2
	33	Improving road safety and adding surveillance in accident-prone areas	3.8	4.2	3.7	4.3
	34	Setting up physical segregation between cycle lanes/pedestrian pathways and motored vehicle roads	4.3	4.3	3.7	3.7
	35	Setting up physical segregation between cycle lanes and pedestrian pathways	4.3	4.2	3.7	3.5

■ **Figure 3-13 Measures Fitting to The Entire Vision and Objective System**



Step 8: Agree on actions and responsibilities

In the Chinese institutional context, similar to SUMP, city-level measures for action are divided into tasks with timelines for the departments and institutions that are in charge of their implementation, through a government-assigned approach. As the government-assigned approach has an inherently one-way communitive attribute, barriers between departments working on implementation and related institutions urgently need to be broken down, so that the impact of actions taken in different fields of the urban transportation system can be identified, and relationships can be established. Finding clear links between measures taken by different actors can help to indicate how the actions relate to, and can benefit from, each other in the actual implementation of the project. Additionally, there is also space for an improvement in communication with the most affected stakeholders and the public regarding the concrete impacts of planned actions.

The decision to develop action plans in a showcase area was adapted by the Foshan SUMP with the hope to visualise the key concepts of SUMP, such as human-centred and sustainable development, to citizens and decision makers. This process was intended to get more social and political support for the SUMP approach in Chinese cities. Due to the limited time period of the Foshan SUMP pilot project, the final steps of the project remained at a conceptual level, with the physical implementation of further measures left as subject to adoption and financing decisions made by local decision-makers. Findings from the pilot suggested to keep using the showcasing method to demonstrate and localise the SUMP concepts to better provide a visualisation of its positive effects on the lives of residents and its contribution to green mobility development.

Step 9: Prepare for adoption and financing

Differing from SUMP, traditional steps in China's project planning focus on the formulation of action plans, and rarely involve the estimation of direct financial revenues resulting from project actions and an understanding of the expected degree of cost recovery. The financial estimates of action plans are mostly allocated from the government's annual budget by based on the creation of a planned project inventory. In Step 9, the Foshan SUMP pilot project focused on strategic planning, and specific measures were only conceptualised in the showcase area, therefore in-depth project financial estimates were not fully completed. As a result, only the unit prices of items that were expected to be procured in the implementation segment of the measures were roughly estimated. However, the social and economic benefits brought by the measures in the showcase area were evaluated in the Foshan SUMP.

When implementing SUMP in other Chinese cities, it is recommended to strengthen the financial planning process by including monitoring indicators (for example, a Cost Recovery Ratio) related to monetary input and revenues, such as returns on investments. Additionally, it is suggested to assess whether the planned solution will bring greater social benefits than the expenditure incurred by conducting a Social Cost-Benefit Analysis (SCBA).
As previously discussed, the three final steps of the SUMP Cycle, which form the implementation and monitoring phase, were not covered in the SUMP Pilot in Foshan and therefore no conclusions from the implementation of these steps in China can be made at this point. These steps remain highly important as the final stages of the SUMP process and will be completed by local authorities upon adoption of the developed measures.

4 Contextualisation of SUMP in the Chinese Context

Continuing the step-by-step planning process for future planners to follow in implementing SUMP in a Chinese context, this chapter aims to offer a general summary of the potential issues that might be encountered, and suggested related adaptions that could be useful when conducting SUMP in other Chinese cities. In order to provide an intuitive and essential overview of the added value and benefits of SUMP, an overview showing the differences between SUMP and traditional planning methods in China is presented.

Overview of the differences between Chinese Traditional Transport Planning and Sustainable Urban Mobility Planning

An overview of the differences between SUMP and Chinese traditional transport planning methods is provided in Table 4-1, to demonstrate potential improvements in planning methods when implementing SUMP in Chinese cities. These differences were adapted from the Guidelines for Developing and Implementing a SUMP by selecting and comparing the characteristics of traditional transport planning and SUMP that were identified during the Foshan SUMP Pilot project, as being applicable to the Chinese context.

■ Table 4-1: Differences between Traditional Transport Planning and Sustainable Urban Mobility Planning proved in the Chinese context[31]

Traditional Transport Planning	Sustainable Urban Mobility Planning
Focus on traffic	Focus on people
Primary objective: traffic flow capacity and speed	Primary objectives: accessibility and quality of life
Model-focused	Integrated development of all transport modes and shift towards sustainable mobility
Infrastructure as the main topic	Combination of infrastructure, market, regulation, information and promotion
Focus on building new infrastructure	Full utilisation of existing infrastructure assets
Sectorial planning document	Planning document consistent with related policy areas
Domain of transport engineers	Interdisciplinary planning teams
Planning by experts	Planning with the involvement of stakeholders and citizens using a transparent and participatory approach
Limited impact assessment	Systematic evaluation of impacts to facilitate learning and improvement

[31] drafted by authors based on: Rupprecht Consult – Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, second edition published in 2019.

Traditional transport planning in China has, for a long time, been focusing on vehicles, while SUMP regards people as the focal point of urban mobility systems, and takes the targeted needs of different groups of people as the starting point for creating transport strategies Additionally, differing from traditional transport planning, where usually traffic demand forecasting models play an important role, SUMP considers the coordinated development of all traffic modes as a whole, so as to promote the evolution of an integrated urban transport system that promotes sustainable mobility.

Traditional transport planning in China usually focuses on how to efficiently build new infrastructure within cities, while SUMP adopts both 'hard' and 'soft' methods for system development, namely combining the creation of infrastructure together with the creation of regulations, market needs and the promotion of the effective use of existing infrastructure. Furthermore, traditional transport plans in China are often drafted within the transport sector, based on the experience of experts, compiled by transport engineers and planners, and having the goal of assessing expected impacts of plans in a limited area. In comparison, SUMPs maintain a level of active interaction with stakeholders throughout the planning process, and reasonably adopts multi-sectoral opinions (not only focusing on expert and professional inputs). As such, they conduct cross-departmental joint planning exercises led by an interdisciplinary team composed of professionals in various fields. Furthermore, the impact assessments of SUMP are both scientific and systematic. With a variety of optional toolkits, the end point of each plan is treated as a new starting point to facilitate learning and thus to support improvements in future planning endeavours.

Lessons from the Foshan SUMP Pilot and solutions for applying SUMP in China

The SUMP planning methodology puts a high emphasis on the participation of citizens and various stakeholders by involving them in planning processes from an early stage. By receiving opinions and evaluations from the public and relevant stakeholders, the SUMP process aims at increasing levels of acceptance of proposed measures as well as levels of satisfaction and the quality of life of the city's citizens. Due to its highly participatory, systematic, and rigorously scientific nature, SUMPs have significant potential to be adapted in other Chinese cities to help them meet the requirements of China's sustainable and people-centred planning reforms.

Valuable lessons for the application and localisation of SUMP were learned throughout the preparation for, and development of, the Foshan SUMP Pilot, from which other Chinese cities could also learn. To help with the further integration of the SUMP concept in other Chinese cities, the following challenges and solutions identified in the Foshan SUMP Pilot project could serve as a helpful reference for cities seeking to apply SUMP in their planning:

- First, the scale of many cities in China could be highly challenging when effectively developing and implementing SUMPs, particularly when planning and carrying out related public engagement and data collection and modelling activities, as well as general project management programming. There are examples of the successful implementation of SUMP and similar planning principles in large cities in Europe and Asia, such as Singapore, Paris, and London. However, an additional challenge particularly prominent in China is the rapid and dynamic growth of urban areas and their transport demands, which require equally dynamic development practices, such as the frequent updating of analyses and maintaining nimble project management capacities.

  √ Rather than being measured by their size, the success of a SUMP should rest with an effective scaling of the SUMP process, clearly defined feasible ambitions, and often, with the establishment of specific focus areas or transport modes as central topics of plan. For the effective and adaptive management of SUMPs, it is important to understand SUMPs more as processes than plans. For large Chinese cities, it is vital to properly scale SUMP processes while continuously coordinating with the status quo and defined ambitions of the city.

  √ When SUMP is implemented in medium, large, and mega cities in China with high demands on planning and coordination activities, the maximum utilisation of ongoing planning efforts by the city and consistency in the target city's system should be ensured. Attention should be paid to the compatibility and sharing of work results with ongoing traditional transportation planning systems, which usually focus more on modelling and other related planning projects carried out simultaneously. When budgets and resources are

limited, current mobility challenges should be prioritised to optimise resource allocation and address the most pressing issues first. For example, when increasing the proportion of urban railway trips in a city is identified as a priority, the SUMP project could focus on strategic measures in the field of urban railway transit, and measures relating to buses, cars, and active mobility could be made auxiliary.

- Second, traditional planning could pay more attention to active forms of interaction for public participation and stakeholder engagement, which would lay a solid foundation for subsequent inter-departmental collaboration in implementing action plans.

  √ A diverse variety of participatory methods could be applied to ensure the interaction of participants during stakeholder workshops, public surveys, and capacity development sessions. Steps should be taken to ensure high levels of active participation, such as providing red packets to survey participants, which can help to mobilise the enthusiasm of citizens to participate in a public survey. To obtain expert opinions from stakeholders, scoring assessments can be an impactful tool to induce vigorous discussions and active exchanges of opinions among stakeholders in workshops.

- Considering that SUMP is a newly introduced planning concept in China, the description and display of SUMP's expected effects and added values need to be intuitive and adaptable when promoting the plans and securing their approval and adoption by decision-makers, as well as to ensure that they are accepted by stakeholders and citizens in Chinese cities.

  √ Using showcasing to break down broader planned measures into actionable tasks in a selected 'showcase' area of the city would demonstrate good practices and mobilise the enthusiasm of the other city areas to implement similar measures. In addition, the concepts of SUMPs also needs to be clearly visualised with outcomes in smaller-scale showcase areas clearly presented to decision-makers and stakeholders.

- In the established frameworks of traditional Chinese planning, it is difficult to clearly distinguish between objectives and strategies as two essential SUMP elements. The internal logical relationships between the vision, goals, objectives, strategies, and measures of these plans are also not immediately clear to relevant stakeholders, decision makers, and citizens in a Chinese planning context and should therefore be presented clearly and intuitively during relevant workshops and public participation events.

  √ A logic diagram can make the exchange of opinions between core project members more efficient. In particular, as a visual manifestation, these diagrams can enable stakeholders and citizens who are newly involved at any stage of the planning process to quickly and easily understand the core content of the entire SUMP.

- Finally, financial analysis is generally lacking due to budget constraints and gaps between cost-benefit analyses and urban transport planning systems. Financial analysis processes have not received sufficient attention, and there is currently no standard and systematic process or framework for financial analysis methods in the Chinese planning environment.

  √ The inclusion of financial monitoring indicators and the conducting of a Social Cost-Benefit Analysis (SCBA) could serve as an alternative to traditional financial planning frameworks that may not be suitable to the context of SUMPs. Indicators such as cost recovery rates and profit margins will help the government decide whether to subsidise operators while guaranteeing the quality of public transport services. The concept of an SCBA is based on monetisation and intertemporal discounting. By involving broader socio-economic considerations in financial analysis processes, SCBA's can assess a projects' impacts on macroeconomic levels as well as present an understanding of its possible long-term social benefits. An additional outcome of this process would be a more comprehensive analyses of the cost-effectiveness of the overall project during medium and long-term operation periods.

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