KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE (KSTA) PEOPLE'S REPUBLIC OF CHINA: HUBEI XIANGYANG INTEGRATED SUSTAINABLE TRANSPORTATION AND LOGISTICS PLANNING AND STRATEGIC STUDY

TERMS OF REFERENCE FOR CONSULTANTS

A. Introduction

1. Asian Development Bank is requesting applicants for a knowledge and support technical assistance (TA) study to support the preparation of strategic, sustainable transport and logistics plans to improve access and mobility for passengers and freight both to and within Xiangyang city, Hubei province, People's Republic of China (PRC) over the short-, medium- and long-term.

B. Project Background and Context

2. Rapid economic growth and urbanization in the People's Republic of China (PRC) has placed an enormous strain on transport infrastructure and mobility in urban centers. Insufficient transport infrastructure capacity, fragmented transport systems, inadequate provision and use of public transport and poor traffic management have led to safety incidents, high emissions, inefficient land use and a high cost of transport and logistics. Furthermore, with the advent of high speed rail and the innovation in sustainable and intelligent transport systems, geographic location alone is no longer a strategic advantage for cities and an efficient, green, multimodal transport system is needed to spur sustainable economic growth and development.

3. Xiangyang is located in the center of the PRC and is the second largest metropolitan area in Hubei province, after Wuhan. It is known as a historic city with a rich cultural heritage. Xiangyang greater area is 19,727 square kilometer (km^2) and includes Baokang County, Gucheng County, Laohekou City, Nanzhang County, Yicheng City and Zaoyang City, and the built-up urban city center is currently 190.3 km^2. As of 2016, the population of greater-Xiangyang is 5.65 million, with 1.45 million urban population in the city center which is forecast to grow to 1.7 million by 2020. In 2016, 39.95 million tourists visited Xiangyang, a 12.5% increase from 2015.[1]

4. As a central city located on the Han River and traversed by several tributaries, Xiangyang is an important part of the Yangtze River Economic Belt.[2] It is located 3 hours by road from four major provincial capitals: Chongqing, Wuhan, Xi'an, and Zhengzhou. Historically, this central geographic location provided Xiangyang with a strategic advantage. However, Xiangyang now faces several transport challenges that must be overcome in order for the city to attract business, tourism and industry and spur economic growth.

5. Passenger road transport in 2014 was 4.7 billion kilometers (km), growing 13% over four years to 5.4 billion km in 2017. From 2013 to 2016, the number of private vehicles in Xiangyang grew 87% from 135,500 to 252,800 vehicles (an average growth 23% per annum). Freight traffic in Xiangyang in 2016 was 52.5 billion metric ton-km, growing 9% to 57.4 billion ton-km in 2017.[3] These increases in passenger and freight traffic are placing significant strain on Xiangyang's transport infrastructure and supporting systems.

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[1] Xiangyang Municipal Bureau of Statistics 2018.
[2] The Yangtze River Economic Belt covers nine provinces and two specifically administered cities within the Yangtze River Basin and contributes about 45% of the PRC's economic output.
[3] Xiangyang Municipal Transport Bureau 2018.

6. Road and rail river crossings in Xiangyang are already at capacity and are currently key bottlenecks of the transport system. Highway connectivity to the poorer southwest part of the city is particularly low, and the connection between downtown and the Xiangyang Liui Airport, 18 km northeast of the city, is inadequate. Water and air transport infrastructure is also inadequate to meet current and future demand. These capacity constraints have resulted in high transport costs, reducing the competitiveness of Xiangyang. In addition, the poor connectivity has led to uneven economic development, particularly in the poor mountainous areas.

7. Further, there is a heavy reliance on road-based transportation for both passengers and freight in Xiangyang, resulting in congestion, safety risks, and air pollution. The current modal split for freight transportation is of particular concern; in 2016, the national freight modal split was approximately 77.6% road, 7.7% rail, 14.6% water and 0.02% air transportation, however the modal split in Xiangyang was approximately 91% road, 6% rail, and 3% water transportation (footnote 3). There are currently 11 inland waterway port facilities in Xiangyang, however the infrastructure is fragmented and outdated and as such water transportation is underutilized. Redistribution of the modal split of freight transport from road to waterway transport has the potential to reduce logistics costs, fuel consumption, air emissions, congestion and road accidents.[4] This will require improved infrastructure, planning and institutional strengthening.

8. Urban transport accounts for more than 30% of the city's total emissions, resulting from the reliance on road transportation and the use of old technology, including high-emission buses and trucks. There are currently 92 bus lines in operation in Xiangyang. These bus services transport 550,000–600,000 passengers per day and cover the downtown area, with the exception of Dongjin New Town. Although the public transport system has improved greatly in recent years, there is still a low level of public transport available in the outlying zones of the city, and there is a need to modernize vehicle fleets to reduce urban air pollution. The development of non-motorized transport lanes, bus lanes and urban rail systems are lagging behind other cities in the PRC. Further, there is a lack of grade-separated pedestrian facilities and as such, pedestrian and vehicle interactions are high, interrupting the traffic flow on main roads and posing safety risks for pedestrians.

9. Plans to expand road, rail, air, and inland waterway transport in Xiangyang have been formulated, but their targets are insufficient to meet forecast demand. The logistics plan, in particular, is out of date and inadequate even for current demand. Further, these plans lack integration of physical infrastructure development, transport communications, and systems. The lack of integration of plans to date is in part related to the organizational structure and responsibilities of the transport departments (Organization Chart is accessible from the list of linked documents, Appendix 3). The fragmented infrastructure, systems and planning has led to an inefficient allocation of resources, inefficient logistics, poor utilization of infrastructure and services, poor connectivity, and a high cost of transport for Xiangyang, thus constraining economic growth.

10. The need to develop a more sustainable, modern, integrated transport and logistics system in Xiangyang is becoming increasingly important. Prioritizing public transport, encouraging environmentally friendly transport technologies, and improving information sharing and coordination between different modes of transport to ensure seamless passenger and freight transportation are crucial to improving environmental outcomes and improving the overall efficiency of transport and logistics systems. For Xiangyang, a transport plan that encompasses

[4] ADB. 2016, *Promoting Inland Waterway Transport in the People's Republic of China*, Manila.

these elements and covers all modes of transport and logistics, as well as urban development trends, is required.

11. The Xiangyang Municipal Finance Bureau and the Xiangyang Municipal Transport Bureau (XMTB), including the logistics department, have recognized the need to take a cross-department, multimodal approach to the development of two strategic plans for Xiangyang. First, a high level, comprehensive, integrated, sustainable transport plan, to guide the development of a sustainable transport system for Xiangyang. Second, a specific plan to modernize the logistics industry in Xiangyang to lower the cost of logistics and improve competitiveness and trade outcomes. The improved transport and logistics outcomes will contribute to the sustainable economic development of Xiangyang and contribute to growth of the Yangtze River Economic Belt.

C. Objectives

12. Ultimately, the project is to be aligned to the overall development impact: modern, green, efficient, liveable urban areas in Xiangyang developed. The outcome of the TA will be that a modern, sustainable, integrated transport and logistics system is promoted. This will be achieved through the development of plans which guide integrated decision making for XMTB and other relevant authorities, particularly relating to the selection and prioritization of transport and land use proposals.

13. **Output 1: Comprehensive, integrated, sustainable transport plan completed**. The plan will provide a long-term vision for integrated, multimodal transport development in Xiangyang, including short-, medium-, and long-term actions that improve passenger and freight mobility. The plan will take a user-centric approach to optimizing the mobility of people and the movement of goods. It will include a high-level sector analysis for each of the following: road, rail, air, waterway, public transport, information systems, and logistics. This should include but not be limited to (i) gap analysis of the existing transport infrastructure, systems, technology, and policies; (ii) plans to improve intermodal transport connectivity and information sharing; and (iii) the development of a prioritized project list, recommendations, and next steps specific to the needs and priorities of Xiangyang.

14. **Output 2: Logistics improvement plan completed.** A detailed analysis of the current logistics industry in Xiangyang is needed to understand the underlying causes of the high cost of logistics in the area, and to develop a plan to reduce these costs and improve logistics outcomes for Xiangyang. The plan should include (i) a detailed understanding of the current situation, stakeholder needs, and future demand for the Xiangyang logistics industry, as well as an assessment of international best practice and lessons learned; (ii) a gap analysis of infrastructure, systems, technology, and policies related to the Xiangyang logistics industry; (iii) plans to improve efficiency and reduce the cost of freight and logistics throughout Xiangyang; (iv) a Xiangyang-wide optimal layout for logistics facilities that identifies opportunities for logistics clustering and multimodal hub development based on industry needs as well as transport connectivity assessments; (v) implementation and operational plans for integrated, multimodal logistics systems, including policy recommendations; and (vi) the development of a prioritized project list and implementation plan specific to the needs and priorities of Xiangyang. The public and private sector will be consulted throughout the strategy development.

15. **Output 3: Multimodal integration and logistics capacity strengthened.** The multimodal integration and logistics capacity of the Xiangyang Municipal Transport Bureau needs strengthening to support the operation and development of an effective, multimodal transport and logistics industry in Xiangyang. In particular, the transport bureau staff have identified the need to

develop a deeper understanding of inland waterway transportation, logistics clustering, multimodal logistics hubs, and how to use information technology to more effectively share information between transport modes and thereby improve transport system efficiency. Capacity strengthening should therefore cover infrastructure, technology, and policy development. This will enable effective implementation of the transport and logistics plans, and help improve cooperation and integration throughout the Xiangyang transport and logistics industry. In addition to training activities, a study tour of an operational multimodal transport and logistics facility in the PRC would demonstrate first-hand the efficiencies that can be gained through multimodal integration.

D. Detailed Description of Outputs

16. The overall objective of the assignment is to improve transport and logistics planning in Xiangyang. Xiangyang Municipal Finance Bureau, as the executing agency, will work with the consultant and assist in the coordination of relevant government departments as required. The Xiangyang Municipal Transport Bureau, as the Implementing Agency, will be responsible for guiding the consultant and will provide day-to-day support for the coordination of TA activities. The below specifications apply to all deliverables and tasks for the engagement:

(i) Effective communication will be required in both English and Chinese.
(ii) All reports will be required to be submitted in both English and Chinese.
(iii) All reports must be submitted to both ADB and the government, represented by the EA and IA.

17. The TA outputs detailed above should result in the following outcome: Modern, sustainable, integrated transport and logistics system promoted. This will require the development of a comprehensive, integrated, sustainable transport plan and logistics improvement plan for Xiangyang. The key objectives of the study are to:

(i) Identify the key needs for each type of transport infrastructure, to meet current and future demand, as well as improve the sustainability of Xiangyang. This includes road, rail, air, waterway, public transport, information systems and logistics.
(ii) Identify key transport corridors, future projects and other recommendations for Xiangyang.
(iii) Identify key improvements for the Xiangyang logistics industry, including recommendations on best practice logistics operating philosophies, technology and information systems.
(iv) Develop a Xiangyang-wide optimal layout for logistics facilities based on best-practice

18. Further details and the specific deliverables to meet these objectives are discussed in more detail below.

1. **Inception Report:** The Consultant will begin by preparing an Inception Report with the following contents.

(ii) Study area: The Consultant will confirm the geographic boundary of the study area to be covered in the Strategy with relevant government stakeholders.
(iii) Planning horizon: The Inception Report will confirm the planning horizons for the Strategy and Implementation Plan. It is recommended that the plans cover a period up to 2030 and are in line with the government's 5-year plans (e.g. 2018–2020; 2020–2025; 2025–2030).

(iv) Stakeholder engagement strategy and survey plan: The Consultant will prepare a stakeholder engagement strategy, identifying all key stakeholders, detailing stakeholder engagement activities and all surveys to be carried out as part of the TA. The plan should describe the locations, schedule, sampling approach, and staffing plan for each survey.

(v) Work plan: The Consultant is required to prepare a detailed timeline for the Strategy and Implementation plan preparation process, as well as a detailed study tour and training program.

Deliverable:

- Inception Report

2. A **comprehensive, integrated sustainable transport plan for Xiangyang,** including a high-level analysis of each of the following sectors: road, rail, air, waterway, public transport, information systems and logistics. This should include:

(i) Current state analysis, including:
   a. Review and analysis of existing local, provincial and national transport and logistics plans;
   b. Current passenger and goods flows and needs assessment;
   c. Socioeconomic characteristics (e.g. vehicle ownership, demographics, etc.);
   d. Infrastructure capacity, condition, utilization and key constraints, including major bottlenecks and accessibility constraints;
   e. Develop schematic map of existing transport infrastructure, network, inter-connections between different systems and any bottlenecks or constraints;
   f. Other challenges including operations and policy; and
   g. International and national best-practice case studies and lessons learned.

(ii) Future demand analysis
   a. Development of future passenger, goods flow and land use forecasts;
   b. Identification of growth corridors for both passengers and freight;
   c. Assess planned developments and overlay on schematic map of existing infrastructure; and
   d. Identify gaps.

(iii) Recommendations, including:
   a. Key transport and logistics targets for Xiangyang with realistic timeframes
   b. Identification of short, medium- and long-term project priorities across all sectors, including:
      i. Strategic growth corridors (e.g. key public transport corridors, freight corridors, etc.);
      ii. Specific recommendations to improve the sustainability of transport in Xiangyang, including policy recommendations and plans to improve public transport and non-motorized transport development;
      iii. Identification of multimodal interchange locations (passenger stations, freight or both);
      iv. Identification of locations to improve inter-modal connectivity and improve mobility outcomes (“missing links”);
      v. A list of possible technology and information systems improvements; and
      vi. Other project priorities.
   c. Identification of policy recommendations to improve transport and logistics outcomes in Xiangyang.

Deliverables:

- Transport Plan – Draft
- Transport Plan – Final

3. **Logistics improvement plan**, with a focus on location, potential for clustering, multimodal connectivity and mode and route preference, including:

(i) Detailed investigation of current root-causes of high cost of logistics in Xiangyang

(ii) A gap analysis of infrastructure, systems, technology and policies related to the Xiangyang logistics industry

(iii) Analysis of best practice logistics operation and development and lessons learned, including:
   a. Inland-waterway freight transportation; and
   b. Logistics transportation policies, including optimal modal-split.

(iv) Xiangyang-wide optimal layout for logistics facilities, based on:
   a. Demand analysis and stakeholder needs assessment,
   b. Identification of opportunities for logistics clustering and multimodal hub development,
   c. Layout options assessment and location analysis based on stakeholder needs and transport infrastructure connectivity, and
   d. Any other relevant assessment criteria.

(v) Recommendations
   a. Proposals to reduce costs for the logistics industry:
      i. Immediate
      ii. Short-term
      iii. Medium and long-term
   b. A list of possible technology and information systems improvements which may improve transport outcomes in Xiangyang
   c. Recommended policy improvements for logistics, including best practice logistics park operation and management techniques.
   d. Other key requirements, such as required infrastructure, equipment, facilities, etc.
   e. Identification of priority projects

Deliverables:

- Logistics Plan – Draft
- Logistics Plan – Final

4. **Project Progress Updates**

(i) Monthly Progress updates: The consultant will be required to provide monthly progress updates within one week of the end of the month. These updates should be 1-2 pages and can be in report or email format. The updates should include progress updates, consultations and any difficulties or challenges. These updates should be submitted to ADB by email within one week of the end of the month.

(ii) Interim Report: The consultant will be required to develop an interim report which should include major findings to date, consultations, recommendations and any challenges. Appendices to the interim report should include any tasks that have been completed (e.g. infrastructure gap analysis or draft layouts). The date for submission of this report will be agreed with ADB, the government and the

consultants during inception, however it should be no-later than 6 months after the consultants commence work on the TA. This report should be submitted to both ADB and the government prior to ADB's TA review mission.

Deliverables:
- Monthly Progress Updates
- Interim Report

5. **Capacity Strengthening:** A capacity strengthening program for Xiangyang Municipal Transport Bureau (XMTB) should be developed to support the effective implementation of the TA. The consultant will be responsible for developing the capacity strengthening activities, including:

(i) Development of a study tour for 15 XMTB staff to see best-practice multimodal transport and logistics operating facilities in the PRC (intelligent transport operations center, multimodal transport and logistics hub, inland port) which demonstrate the benefits of integrated multimodal operations, the use of modern technology and intelligent transport systems.

(ii) Design and implementation of a training program for 15 XMTB to enhance technical capacity relating to areas covered by the TA. The training program must include:
   a. Identifying and engaging subject matter experts to conduct all required training, either from within the consultant firm, or through a sub-contract agreement with the consulting firm.
   b. Identifying or developing relevant training modules and material related to each technical area. Final training topics should be confirmed with XMTB during project inception, but are likely to include:
      iv. Inland-waterway transportation;
      v. Logistics clustering, multimodal logistics hub operations and models of implementation; and
      vi. The use of information technology to more effectively share information between transport modes to improve transport system efficiency.
   c. Development of a training program for 15 staff.

Deliverables:
- Study Tour and Training Program Plan
- Study Tour and Training Completion Report

19. **Procedure for Review and Acceptance of Deliverables.** Each of the deliverables will be reviewed by XMTB and ADB. Draft outputs shall be submitted in both hard and electronic form to XMTB and electronic form to ADB. The consultants will address comments from both XMTB and ADB, and then finalize the documents. Upon formal acceptance of the deliverables by the government and ADB, the progress payments will be made according to the payment schedule specified in the contract. The outputs, deliverables and tentative payment schedule are detailed below.

Table 1: Consultancy Deliverables and Target Milestone Dates

Task	Deliverable	Tentative Milestone Completion Date	Tentative Milestone Payment
Mobilization	(i) Mobilization	October 2018	5%
Project Updates	(i) Inception report	October 2018	5%
	(ii) Monthly 1–2 pages project progress updates.	Within one week of the end of the month	N/A
	(iii) Interim report	February 2019	10%
Output 1: Comprehensive, integrated sustainable transport plan for Xiangyang			
High-level Multimodal Transport Plan	(i) Draft report	April 2019	10%
	(ii) Final report	June 2019	20%
Output 2: Logistics Improvement Plan			
Logistics Improvement Plan	(i) Draft report and layout	May 2019	10%
	(ii) Final report and layout	July 2019	20%
Output 3: Multimodal integration and logistics sector capacity strengthened			
Study Tour	Study Tour Plan	November 2018	5%
	Study Tour Completion Report	November 2019	5%
Training Program	Training Program	November 2018	5%
	Training Completion Report	November 2019	5%

E. Required Expertise

20. **Required expertise.** Proposing entities will determine the number and the nature of experts required to deliver the KSTA consultancy outputs and deliverables. Proposing entities must include in their technical proposal, in the personnel work plan, and in the financial proposal, all experts required in accordance with the proposing entity's approach and methodology. The proposing entity must also determine and indicate the number of person-months inputs required for each of the experts and the minimum time each of the experts will deliver their inputs to the assignment. In selecting the consultant for this assignment, preference will be given to proposing firms who draw as extensively as possible on local/national experts with the qualifications and experience required for each position in the team of experts. The team should be comprised of both international and national staff and should include an appropriate mix of time working in the field and from the consultants' office.

21. Both a Senior Transport Planning Specialist and Senior Logistics Specialist must be included in the team of experts. One of these Specialists must be the team leader and act as the single point of contact for ADB throughout the TA.

22. The successful firm will demonstrate their experience working in similar assignments and clearly explain why they are best suited to deliver the required outputs. Experience working with international development partners and an understanding of their policies and practices is considered beneficial. The inclusion of experts with experience in transport information systems and technology is also considered beneficial. In addition, the consultants must include provision for translation and interpretation between Chinese and English to ensure smooth communication with key stakeholders, including both XMTB and ADB. The qualification and experience requirements for key experts are specified in paragraphs 23–25.

23. **Senior Transport Planning Specialist.** The Senior Transport Planning Specialist should have at least 15 years of experience in transport planning, transport infrastructure, traffic systems, public transport planning and implementation of sustainable transport systems. Experience in developing transport masterplans, comprehensive mobility plans, city strategies, and other area-

based plans as a means of economic and social development is required. Sector experience and understanding of transit-oriented development, traffic management, land use and transport integration, bus rapid transport systems, pedestrian safety, and non-motorized transport infrastructure planning is advantageous, as is demonstrated experience and understanding of logistics planning.

24. **Senior Logistics Specialist.** The Senior Logistics Specialist should have at least 15 years of experience in logistics planning and supply chain analysis. Sector experience and understanding of multimodal transport integration, supply chain optimization and logistics planning is required. The logistics specialist should have demonstrated experience in developing logistics plans, goods flow maps, demand analysis and forecasts, logistics operating philosophies and in working with multiple transport, logistics and industry stakeholders to optimize supply chains and urban and rural logistics infrastructure layouts. Experience working with innovative logistics systems and technology is advantageous.

25. **Team Leader.** One of the above Specialists, the Senior Transport Planning Specialist or Senior Logistics Specialist, must be the team leader. The Team Leader must have at least 10 years of demonstrated experience in managing multi-disciplinary teams. They should have demonstrable project leadership experience on similar assignments, such as for the development of transport or logistics masterplans. For the team leader, knowledge of ADB procurement and reporting procedures and experience working both internationally as well as in the People's Republic of China is considered beneficial.

F. Proposal Preparation

26. Proposing entities must prepare a detailed description of how the consultancy outputs will be delivered and the details of the experts to be provided, including the Team Leader/Senior Transport Planning Specialist, and the roles and responsibilities under the contract in the "Approach and Methodology" section of the technical proposal. Only one curriculum vitae (CV) may be submitted for each expert position proposed by the entity. The CV of the Senior Transport Planning Specialist and the Senior Logistics Specialist will be evaluated and scored. Other CVs (those of non-key experts) will not be scored; however, each of the CVs will be reviewed and either approved or rejected based on an assessment of the relevance of the expert's qualifications and experience against the expert's roles and responsibilities stated in the "Approach and Methodology".

27. Bidders are advised that no provisional sums are provided. Bidders financial proposal shall include all costs to deliver the deliverables listed in Table 1 by the completion dates (also listed in Table 1). Bidders financial proposals will be assumed to include:

(i) All experts, including the Team Leader, under the contract based on the person-month inputs identified in the Bidders "approach and Methodology"
(ii) Mobilization and demobilization costs of all experts and the consultant's personnel, including travel, accommodation, per diems and other expenses.
(iii) All surveys and investigations
(iv) Costs for training program and study tour including travel, accommodation, facilitation, materials and all associated expenses.
(v) Costs for sub-consultants (if necessary)
(vi) Corporate overheads, including insurances.