People’s Republic of China: Strategy for Restructuring Inland Waterway Transport and Multimodal Logistics in Chongqing
CURRENCY EQUIVALENTS
(as of 15 August 2013)

Currency unit        yuan (CNY)
CNY1.00 = $0.16341
$1.00 = CNY6.1196

ABBREVIATIONS

ADB – Asian Development Bank
CCC – Chongqing Communications Committee
IWT – inland waterway transport
PRC – People’s Republic of China
TA – technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Type
– Policy and advisory technical assistance (PATA)
Targeting classification
– General intervention
Sector (subsectors)
– Transport, and information and communication technology (water transport, rail transport, road transport)
Themes (subthemes)
– Economic growth (promoting economic efficiency and enabling business environment, widening access to markets and economic opportunities), private sector development (private sector investment)
Location (impact)
– Rural (low), urban (high), national (medium), regional (low)

NOTE

In this report, "$" refers to US dollars.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.
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I. INTRODUCTION

1. Inland waterway transport (IWT) is an efficient, cost-effective, and environmentally friendly way to move bulk commodities over long distances. Efficient use of waterways to transport cargo can reduce transport cost, congestion on roads and railways, energy usage for transport, and vehicle emissions including greenhouse gases. IWT can also be developed in ways that bring other benefits, such as generation of hydroelectric power. The Sustainable Transport Initiative Operational Plan of the Asian Development Bank (ADB) points to IWT as a key opportunity to promote safe and low-carbon transport that can support environmentally sustainable and inclusive growth.¹ ADB plans to scale up its technical assistance (TA) and lending activities in IWT and in 2012 approved its first IWT loan to the People’s Republic of China (PRC) for the Hunan Xiangjiang Inland Waterway Transport Project.² A second IWT project, the Anhui Intermodal Sustainable Transport Development Project is being proposed for Board consideration in 2014.

ADB plans to scale up its technical assistance (TA) and lending activities in IWT and in 2012 approved its first IWT loan to the People’s Republic of China (PRC) for the Hunan Xiangjiang Inland Waterway Transport Project.² A second IWT project, the Anhui Intermodal Sustainable Transport Development Project is being proposed for Board consideration in 2014.

2. The Government of the People’s Republic of China has asked ADB for policy and advisory TA to help prepare a strategy to further develop IWT in Chongqing by enabling efficient multimodal connections between railway, road, and the waterways; develop an investment program and policies to better balance supply and demand for freight transport; and develop strategies and policies to maximize capacity of shipping along the Yangtze River and navigable tributaries. Initial discussions regarding the TA proposal were held during the ADB Sustainable Inland Waterway Transport International Workshop on 11–12 September 2012 in Chongqing. This TA report is based on the understandings reached between the government and the TA fact-finding mission fielded on 24–26 March 2013. The report reflects agreements reached on the impact, outcome, outputs, implementation arrangements, costs, financing, and terms of reference for consulting services for the TA.³ The design and monitoring framework is in Appendix 1.

II. ISSUES

3. Chongqing is a major municipality in the southwestern part of the PRC near the confluence of the Jialing and the Yangtze rivers, making it one of the country’s most important inland ports. The Yangtze River connects the major cities of Nanjing, Shanghai, and Wuhan to Chongqing. In 2011, the State Council of the PRC endorsed a plan to accelerate the development of the Yangtze River and other inland waterways within 10 years. As part of the effort, the improvement of the Chongqing Yangtze River shipping center has been adopted as a national strategy. The Chongqing municipal government is promoting development of the upper reaches of the Yangtze River shipping center with the goal of making Chongqing the main freight transport and logistics hub for the western part of the PRC.

4. Before the construction of the Three Gorges Dam, the government gave less attention to the development of inland waterways and focused more resources on improving highways and railways. Public investment in IWT fell below what was needed to maintain and renew the IWT infrastructure. Despite recent increases in IWT investment, many inland ports serving IWT are old and lack specialized berths and modern handling equipment. Several port handling facilities exist throughout Chongqing, including many impromptu riverbank sites. The contribution of IWT

³ The TA first appeared in the business opportunities section of ADB’s website on 19 August 2013.
to the overall transport system has also been constrained by weak institutional coordination between the local, regional, and national governments.

5. The Yangtze River can provide a low-cost, low-emission, and efficient freight route linking the vast and relatively poor interior of the western PRC to the economically advanced coastal regions. The development of the Three Gorges Dam and the completion of the ship locks bypassing the dam in 2003 have created a major new high-capacity transport corridor between Chongqing and the eastern PRC and international markets. Ocean-going vessels are now capable of navigating the 2,400 kilometers between Shanghai and Chongqing. In addition, rapid development of railways and roadways continues into the western PRC, which will better connect the western provinces to Chongqing and then to the central and eastern PRC via the Yangtze River.

6. After the introduction of ship locks, the total annual waterway capacity through the Three Gorges area increased from 18 million tons to 100 million tons. The construction of the Three Gorges Dam was estimated to reduce shipping costs by 35%–37%. Between 2003 and 2011, freight volume through the Three Gorges Dam grew by 17% per year and reached the stated capacity of the Three Gorges ship locks in 2011. Over the same period waterway freight ton-kilometers in Chongqing municipality grew over 30% per year and by 2011, waterway port throughput in Chongqing exceeded 100 million tons, making it one of the largest inland ports in the PRC. Coal, raw minerals, and containerized goods provide the majority of traffic plying this section of the river.

7. The capacity bottleneck at the ship locks serving the Three Gorges Dam now limits the potential development of the western PRC, increasing the transport cost for all goods. Various measures are under way to expand the capacity through the Three Gorges Dam. First, a ship lift is under construction and expected to open by 2015. Second, short portage railways are proposed on both sides of the dam to bypass the ship locks. Lastly, the national government, with the support of Chongqing, plans to add another ship channel and ship lock to the Three Gorges Dam to increase throughput. Additional capacity can be derived from optimizing and standardizing ship types so that the available capacity is used more efficiently. With these efforts, the demand for IWT is expected to continue its rapid growth, fueling further industrial development, international trade, and better market access for the less developed regions in the western PRC.

8. Rapid growth in freight throughput notwithstanding, the market for passenger travel on the Yangtze River has changed markedly since the late 1990s. There are many passenger ships that originate or terminate at Chongqing, cruising downstream along the Yangtze River to Yichang, Wuhan, Nanjing, or Shanghai. In the past, this provided virtually the only transportation option along the river. However, improved railways, expressways, and aviation services have captured much of the passenger traffic; thus most of the river ferry traffic now consists of leisure cruises for tourists rather than serving transportation needs. Many ships formerly used for ferry service are ill-suited to serve the current passenger market.

9. There are also imbalances in the supply and demand for certain types of freight-handling facilities. The government has supported the development of several large IWT container-handling ports that are operating far below capacity. The Chongqing Shipping Exchange has

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5 Three Gorges Navigation Administration.
6 Chongqing municipal government statistics.
also been established to provide a single place for shippers and carriers to conclude transactions and integrate services for settlement, insurance, and customs processing. However, only about 30% of the Chongqing IWT market makes use of the exchange. Detailed analyses of freight and logistics market demand, capacity and multimodal connections, potential economic and financial returns, and competitiveness of alternative modes are needed to develop plans, policies, and investment project proposals that respond to market opportunities and rectify sector imbalances.

III. THE TECHNICAL ASSISTANCE

10. The TA will help the government devise a sector restructuring and development strategy for IWT and multimodal freight transportation in Chongqing municipality. It will define investment opportunities and promote rebalancing of supply and demand where needed. The strategy will be based on a detailed and comprehensive assessment of the freight and logistics market in Chongqing to ensure that the investment program is economically and financially viable and promotes private sector participation. The TA will outline opportunities for future ADB-financed projects related to IWT and multimodal logistics.

A. Impact and Outcome

11. The impact of the TA will be the development of Chongqing as the IWT freight hub for the western PRC. The outcome will be the adoption of a sector development strategy and sound investment program for IWT and multimodal logistics in Chongqing.

B. Methodology and Key Activities

12. The TA will develop a sector development and restructuring plan to (i) promote IWT reforms, (ii) promote multimodal integration, (iii) help the government maximize capacity utilization of IWT infrastructure by promoting standardization of the shipping fleet operating in the upper Yangtze, and (iv) promote private sector participation and the development of e-commerce in IWT.

13. The TA will produce the following outputs:
   (i) **Freight market assessment for Chongqing.** The TA will provide a detailed review of regional freight market demand by industry and transport mode; assess freight capacity by cargo type and mode, and determine capacity constraints; develop indicators of capacity utilization, throughput, mode share by cargo type and region; and suggest appropriate levels and targets based on economic and financial viability.

   (ii) **Infrastructure development and management plan for inland waterways.** The TA will assess the investments targeted under the Twelfth Five-Year Plan, 2011–2015 and assist the government in adjusting and revising the IWT investment program; provide inputs to support the development of the Thirteenth Five-Year Plan, 2016–2020 based on projected economic and financial returns; identify missing links, key bottlenecks, and potential multimodal connections between roads, railways, and waterways that would facilitate further development of IWT in the upper Yangtze River; link proposed investments to potential financing options, including proposed IWT or port projects that would be appropriate for ADB financing; and evaluate the management structure for existing and future investments, such as the potential for private sector financing and management, and public–private partnerships.
(iii) Ship fleet standards, equipment, and organizational review. The TA will review the prevailing national cargo ship standards and recommend options for standardizing specifications for cargo ships operating in the Upper Yangtze to optimize capacity utilization of the IWT system; provide input to the Ministry of Transport on the regulation of standards for ships operating through the Three Gorges ship locks; develop a strategy for reforming the inland water transport market and ship fleet along the upper Yangtze River; recommend legal and regulatory actions needed to promote private sector participation in IWT; and recommend ways to minimize environmental impacts with respect to ships and other equipment.

(iv) Recommendations for further development of the Chongqing Shipping Exchange. The TA will assess the functions and efficiency of the exchange center; evaluate the level of service integration for settlement, financing, insurance, and customs processing, and compare it with best international practices; conduct performance and cost benchmarking against best-practice international exchanges to single out areas that need improvement; and make recommendations to integrate and promote the use of information technology and e-commerce platforms in the exchange.

(v) Assessment of future research needs. The TA will prepare short policy notes on (a) safety and security needs, (b) energy saving and environmental protection, and (c) human resource development in IWT. The policy notes will seek to present the key issues under each topic, develop a plan for further research on innovation in the sector, and institutional capacity building that could be implemented under a future ADB-financed loan or TA project.

14. The TA activities will include stakeholder workshops to promote consensus on the policy proposals, a seminar to present the results to key decision makers, and a proposed implementation strategy for all recommendations.

15. The TA assumes that Chongqing municipality is motivated and capable of reforming inland waterway institutions and is willing to allow the private sector to play an increasing role in freight transport and logistics in Chongqing. The main risk to the TA is that the proposed capacity expansion of the Three Gorges ship locks fails to be implemented, which could constrain further development of IWT in Chongqing.

C. Cost and Financing

16. The TA is estimated to cost $400,000, which will be financed on a grant basis by ADB’s Technical Assistance Special Fund (TASF-other sources). The government will provide counterpart professional and support staff; a suitably furnished office with utilities and telecommunication access; materials, maps, available data, and documents required by the TA; and will cover the cost of utilities (not including telephone) for the consultants. The detailed cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

17. The Chongqing Communications Committee (CCC) will be the executing agency for the TA and will be responsible for guiding and supervising the TA activities and for coordinating with relevant government agencies and organizations. An expert panel of local and national experts on IWT, agreeable to ADB, will be nominated by the CCC to provide peer review and guidance to the consultant team. Up to three workshops will be held in Chongqing to review the results of
the TA and receive feedback from the expert panel. The TA consultants will organize and implement an international study tour to learn about international best practices in inland port development, management, and e-commerce.

18. A team from a national consulting firm, including at least one international consultant, will be engaged by ADB in accordance with ADB’s Guidelines on the Use of Consultants (2013, as amended from time to time). The consulting firm will be selected through the fixed budget selection method. The TA will require an estimated 25 person-months of national and about 4 person-months of international consulting services to carry out the assignment. Procurement will follow the ADB Procurement Guidelines (2013, as amended from time to time), and equipment will be turned over to the CCC upon completion of TA activities. TA proceeds will be disbursed in accordance with ADB’s Technical Assistance Disbursement Handbook (2010, as amended from time to time). The TA will be implemented over 14 months from 15 February 2014 to 15 April 2015. The outline terms of reference for consultants are in Appendix 3.

19. The TA will produce three reports and three policy notes during implementation. Each report will be delivered in English and Chinese. The initial report will detail the data collection and survey results, and the analysis of freight market demand in Chongqing. The TA consultants will then prepare the draft policy notes and the interim report containing the initial infrastructure development and management plan, the ship fleet recommendations and organizational review, and the recommendations for the Chongqing Shipping Exchange. After review by the expert panel, ADB, and the executing agency, the draft final report will be prepared and will combine the project outputs into a single volume. After further review, the final report will be prepared and submitted to ADB and the executing agency.

20. Outputs of the TA will be disseminated at a high-level seminar for key stakeholders in Chongqing. The final report is expected to be prepared and distributed as a joint publication of ADB and the government for wider distribution within the PRC, and to provide lessons for ADB’s other developing member countries. The government will confirm the achievement of the project outcome within 1 year of TA closing.

IV. THE PRESIDENT’S DECISION

21. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $400,000 on a grant basis to the Government of the People’s Republic of China for Strategy for Restructuring Inland Waterway Transport and Multimodal Logistics in Chongqing, and hereby reports this action to the Board.
# Appendix 1

## DESIGN AND MONITORING FRAMEWORK

<table>
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<tr>
<th>Design Summary</th>
<th>Performance Targets and Indicators with Baselines</th>
<th>Data Sources and Reporting Mechanisms</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td>IWT shipping volumes continue to increase by 8% per year through 2020</td>
<td>Chongqing Statistical Yearbook</td>
<td><strong>Assumption</strong></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Continued economic growth in the region</td>
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<td></td>
<td></td>
<td></td>
<td><strong>Risk</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The proposed capacity expansion of the Three Gorges ship locks fails to be implemented, which constrains further development of IWT in Chongqing</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>Sector strategy and investment program accepted by the government by 2016</td>
<td>Chongqing municipal government</td>
<td><strong>Assumption</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Local government departments are willing to cooperate and incorporate best practices and international experience into policy formulation</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>Market assessment submitted to the government and ADB by 2014</td>
<td>Final report, review meeting, and presentation in the workshops</td>
<td><strong>Assumptions</strong></td>
</tr>
<tr>
<td>1. Freight market assessment for Chongqing</td>
<td></td>
<td></td>
<td>Government provides counterpart support as committed</td>
</tr>
<tr>
<td>2. Infrastructure development and management plan for inland waterways</td>
<td>Infrastructure development and management plan submitted to the government and ADB by 2015</td>
<td></td>
<td>Active stakeholder participation and support</td>
</tr>
<tr>
<td>3. Ship fleet standards, equipment, and organizational review</td>
<td>Recommendations on standards and sector organization submitted to the government and ADB by 2015</td>
<td></td>
<td>China Railway Corporation, shipping companies, provincial and local governments provide data and information needed to support market assessment and policy analysis</td>
</tr>
<tr>
<td>4. Recommendations for further development of the Chongqing Shipping Exchange</td>
<td>Development strategy submitted to the government and ADB by 2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Assessment of future research needs</td>
<td>Policy notes submitted to the government and ADB by 2015</td>
<td></td>
<td></td>
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Activities with Milestones

Output 1: Freight market assessment for Chongqing (April 2014)
1.1 Collect and analyze freight market demand data, capacity, and throughput of existing and planned freight facilities
1.2 Collect and analyze existing development and investment plans and conduct surveys
1.3 Determine key bottlenecks, capacity constraints or excess capacity
1.4 Develop key indicators or capacity utilization, throughput, mode share, and suggest appropriate targets

Output 2: Infrastructure development and management plan for inland waterways (April 2015)
2.1 Assess the Twelfth Five-Year Plan, 2011–2015 and suggest opportunities for revisions
2.2 Support development of the Thirteenth Five-Year Plan, 2016–2020 by highlighting missing links, multimodal connections, and investment opportunities
2.3 Assess economic and financial viability of investment proposals and propose suitable investments for ADB financing
2.4 Evaluate sector and facility management and propose appropriate roles for private sector
2.5 Prepare infrastructure development and management plan

Output 3: Ship fleet standards, equipment, and organizational review (April 2015)
3.1 Recommend options for fleet standardization
3.2 Prepare sector and market reform strategy

Output 4: Recommendations for further development of the Chongqing Shipping Exchange (April 2015)
4.1 Benchmark the shipping exchange against international practice
4.2 Conduct international study tour
4.3 Prepare policy reform and investment plans to promote e-commerce

Output 5: Assessment of future research needs (April 2015)
5.1 Prepare policy note on safety and security
5.2 Prepare policy note on energy saving and environmental protection
5.3 Prepare policy note on human resource development

Milestones
1. Submit project implementation plan February 2014
2. Project initiation conference March 2014
3. Submit initial report April 2014
4. Initial project seminar April 2014
5. Submit revised initial report May 2014
6. Submit draft interim report and policy notes July 2014
7. Midterm project seminar August 2014
8. International study tour May–August 2014
9. Submit revised project interim report August 2014
10 Submit draft final report and policy notes October 2014
11. Final seminar November 2014
12. Submit project final report April 2015
13. TA closing October 2015

Input

ADB: $400,000

<table>
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<th>Item</th>
<th>Amount (’000)</th>
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<tr>
<td>1. Consultants</td>
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<tr>
<td>2. Equipment</td>
<td>10.0</td>
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<tr>
<td>3. Workshops, training, seminars, and conferences</td>
<td>60.0</td>
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<tr>
<td>4. Studies, surveys, and reports</td>
<td>30.0</td>
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<tr>
<td>5. Miscellaneous administration and support costs</td>
<td>5.0</td>
</tr>
<tr>
<td>6. Contingencies</td>
<td>20.0</td>
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</table>

Note: The government will provide counterpart support in the form of a suitably furnished office with utilities and telecommunication access; materials, maps, available data, and documents required by the TA; will cover the cost of utilities (not including telephone) for the consultants, counterpart professional staff, and support staff; and provide other in-kind contributions.

ADB = Asian Development Bank, PRC = People’s Republic of China, IWT = inland waterway transport, TA = technical assistance.
## COST ESTIMATES AND FINANCING PLAN
($'000)

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td><strong>Asian Development Bank</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>1. Consultants</td>
<td></td>
</tr>
<tr>
<td>a. Remuneration and per diem</td>
<td></td>
</tr>
<tr>
<td>i. International consultants (4 person-months)</td>
<td>83.0</td>
</tr>
<tr>
<td>ii. National consultants (25 person-months)</td>
<td>127.0</td>
</tr>
<tr>
<td>iii. Resource persons (up to seven for expert panel review)</td>
<td>25.0</td>
</tr>
<tr>
<td>b. International and local travel</td>
<td>20.0</td>
</tr>
<tr>
<td>c. Reports and communications</td>
<td>20.0</td>
</tr>
<tr>
<td>2. Equipment (e.g., computer, printer)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10.0</td>
</tr>
<tr>
<td>3. Workshops, training, seminars, and conferences&lt;sup&gt;c&lt;/sup&gt;</td>
<td>60.0</td>
</tr>
<tr>
<td>4. Studies, surveys, and reports</td>
<td>30.0</td>
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<tr>
<td>5. Miscellaneous administration and support costs</td>
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<tr>
<td>6. Contingencies</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400.0</strong></td>
</tr>
</tbody>
</table>

Note: The technical assistance (TA) is estimated to cost $400,000, of which contributions from the Asian Development Bank (ADB) are presented in the table above. The government will provide counterpart support in the form of a suitably furnished office with utilities and telecommunication access; materials, maps, available data, and documents required by the TA; and will cover the cost of utilities (not including telephone) for the consultants, counterpart professional staff, support staff, and other in-kind contributions. The value of government contribution is estimated to account for 25% of the total TA cost.<br>
<sup>a</sup> Financed by ADB’s Technical Assistance Special Fund (TASF-other sources).<br>
<sup>b</sup> All equipment will be purchased in accordance with ADB Procurement Guidelines (2013, as amended from time to time) and will be turned over to the executing agency upon closing of the TA.<br>
<sup>c</sup> Workshops, trainings, seminars, and conferences to be implemented by national consulting firm and cost administered through the national consulting firm’s contract. Overseas training costs will be incurred in ADB member countries.<br>
Source: Asian Development Bank estimates.
OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Background

1. The government has requested technical assistance (TA) from the Asian Development Bank (ADB) to prepare a strategy for restructuring inland waterway transport (IWT) and multimodal logistics in Chongqing. The research will be based on an analysis of freight multimodal infrastructure supply and market demand to prepare a sector development strategy focusing on IWT and intermodal connectivity. IWT sector development plans will be based on the assessment of economic and financial returns and seek to promote private sector participation where appropriate. The research will assist the government in promoting Chongqing as a shipping center of the upper reaches of the Yangtze River; develop an efficient, safe, green, and modern inland waterway system; and apply international best practices to support sector reform and development.

B. Technical Assistance Outputs

2. The terms of reference (TOR) are output-based which will not dictate the specific inputs needed to produce the required outputs. The team leader and deputy team leader will be responsible for assigning experts to each task to produce the TA outputs as effectively and efficiently as possible. Each output will be peer reviewed by an expert panel, the Executing Agency, and ADB before formal acceptance. The tasks and TA outputs are described below:

3. Output 1: Freight market assessment for Chongqing. This includes freight market assessment methodology, all data and information collected and analyzed to support the analysis, market analysis results and key indicators and measures, assessment of economic and financial trends in the IWT and freight shipping sector. Tasks include the following:

   (i) Conduct a detailed review of regional freight market demand by industry and transport mode.
   (ii) Assess regional economic trends and the potential impact of a free trade zone proposed for Chongqing, and analyze the impact on the freight transport market in Chongqing and the western PRC.
   (iii) Conduct research on impact of economic growth and economic structural changes on freight demand.
   (iv) Analyze the link between local government industrial development plans and targets to freight market demand.
   (v) Assess the economic and financial viability of IWT versus other modes for major classes of commodities and types of cargo.
   (vi) Assess freight capacity by type and mode and determine where there are constraints and bottlenecks.
   (vii) Determine indicators of capacity utilization, throughput, mode share by cargo type and region, and suggest appropriate levels and targets.
   (viii) Research method will include collection of local economic data, industrial development plans, and surveys of major shippers, ports, logistics facilities, and shipping companies.
4. **Output 2. Infrastructure development and management plan for inland waterways.** Infrastructure development and sector management plan including the proposed revisions to the 12th five-year plan and proposed projects for the 13th five-year plan. Report will include expected financial and economic returns to the investments, financing plans indicating potential for ADB, private sector financing and management, and/or public private partnerships. Tasks include the following:

   (i) Assess the achievements and investments targeted under the Twelfth Five-Year Plan, 2011–2015 and assist the government in adjusting and revising the investment program as needed.
   (ii) Provide inputs to support the development of the Thirteenth Five-Year Plan, 2016–2020.
   (iii) Point out missing links, key bottlenecks, and possible multimodal connections that would facilitate further development of IWT in the upper Yangtze River.
   (iv) Assess the expected economic and financial viability of investment options.
   (v) Link proposed investments to potential financing including proposed IWT or port projects that would be appropriate for ADB financing.
   (vi) Evaluate the optimal management structure for existing and future investments, and the potential for private sector financing and management, including public–private partnerships.

5. **Output 3: Ship fleet standards, equipment and organizational review.** This refers to the analysis of ship fleet capacity, options for standardization, environmental recommendations, and economic rationale for reforming the ship fleet standards. Tasks include the following:

   (i) Recommend options for standardizing specifications for cargo ships to optimize capacity utilization of the IWT system.
   (ii) Provide input to the Ministry of Transport on the regulation of ship standards with particular focus on ships operating through the Three Gorges ship locks.
   (iii) Develop a strategy for reforming the IWT market and ship fleet along the upper Yangtze River.
   (iv) Promote IWT transport for freight and passengers.
   (v) Promote further development of the shipping transport industry in Chongqing.
   (vi) Make recommendations to minimize environmental impacts with respect to ships and other equipment.

6. **Output 4: Recommendations for further development of the Chongqing Shipping Exchange.** This includes methodology for analyzing the performance of the Chongqing shipping exchange, all data collected to support the analysis, the results of the assessment and recommendations to increase utilization of the exchange. Include detailed assessment of all key functions of the exchange, identify areas in need of improvement, and present lessons learned from international experiences and the study tour. Tasks include the following:

   (i) Assess the functions and efficiency of the exchange center and conduct surveys of users and service providers.
   (ii) Plan and implement the international study tour of best-practice IWT facilities and shipping exchanges.
   (iii) Evaluate the level of service integration for settlement, financing, insurance, and customs processing, and compare with best international practices.
   (iv) Conduct performance and cost benchmarking against best-practice international exchanges to single out areas that need improvement.
(v) Make recommendations to integrate and promote the use of information technology and e-commerce platforms in the exchange.

7. **Output 5: Assessment of future research needs.** Policy notes should be concise and included as an appendix to the main report. The policy notes should seek to present the key issues under each topic and present a plan for further research and capacity building that could be implemented under a future ADB financed loan or TA project. The policy notes will be prepared early during TA implementation to provide ample time for review and revision. Policy notes will focus on the following topics:

   (i) safety and security needs in IWT,
   (ii) energy saving and environmental protection, and
   (iii) human resource development in IWT.

8. The TA report will combine all five outputs into a single volume that will (i) promote the reform and balancing of supply and demand in IWT, (ii) promote multimodal integration, (iii) promote standardization of shipping fleets operating in the upper Yangtze, and (iv) promote e-commerce in IWT. All outputs will be delivered in English and Chinese.

C. **Consulting Firm**

9. A consulting firm will be selected to produce the required outputs under the TA. A review panel of local and national experts on IWT, agreeable to ADB, will be nominated by the government to provide peer review and guidance to the consultants. The consulting firm will provide honoraria and per diem for up to seven national resource persons nominated to serve on the review panel.

10. The consulting firm shall meet the following requirements:

   (i) Have a port ocean engineering qualification issued by the national development and reform commission of the PRC.
   (ii) Over the past 10 years, successfully completed at least three major IWT planning studies (provincial level or above), at least one IWT planning study at the local level, and a major inland port channel planning study (demonstrated approval or acceptance of the results).

11. The consultant team should include, at a minimum, the experts described in this section. The international inland waterway planning consultant (deputy team leader) will have a minimum required inputs of 4 person-months, but all other experts inputs will be assigned jointly by the team leader and deputy team leader as required to produce the TA outputs.

   (i) **Inland waterway transport planning consultant (team leader, national).** The team leader will have a degree in engineering and at least 15 years of experience as an IWT planning consultant. He or she shall be responsible for management and coordination of all consulting tasks, assignment of experts to produce the required outputs, overall management responsibility for the project team, and have responsibility for the quality and timeliness of all project outputs.

   (ii) **Inland waterway planning consultant (international, minimum 4 person-months, intermittent).** The expert will be a transport economist with extensive knowledge of freight transport and at least 10 years of experience in IWT, including experience in leading planning and evaluation of major inland waterway
infrastructure projects and investment programs. Experience in the PRC is preferred. The consultant will serve as the deputy team leader and will review the national consulting firm's methodology and survey designs, contribute to all project outputs, ensure overall report quality, advise on IWT infrastructure development strategy and sector management in Chongqing, and recommend potential projects that could be financed by ADB.

(iii) **Comprehensive transportation planning consultant (national).** The expert will have a degree in transport planning or engineering and at least 5 years of experience in similar projects. He or she must demonstrate extensive multimodal freight transport planning experience and be familiar with domestic integrated transportation development policy, multimodal network planning in the freight sector, and local and regional comprehensive transportation planning.

(iv) **Transportation planning and economic consultant (national).** The expert will have a degree in economics and at least 5 years of experience in similar projects. He or she must demonstrate extensive experience in freight traffic analysis and forecasting, freight traffic planning, and economic analysis, preferably with knowledge and experience in the project region and in the economy of the western PRC.

(v) **Harbor channel engineering consulting expert (national).** The expert will have a degree in civil engineering specializing in waterways and at least 5 years of experience in similar projects. He or she must demonstrate extensive experience in inland port waterway infrastructure planning and harbor design.

(vi) **Shipping consultant (national).** The expert will have a degree in transportation management, planning, or engineering and at least 5 years of experience in similar projects. He or she must demonstrate extensive experience with inland waterway shipping and service planning and be familiar with national IWT development policies, preferably with the Yangtze River transportation market for integrated shipping services and logistics.