SECTOR ASSESSMENT (SUMMARY): TRANSPORT, AND INFORMATION AND COMMUNICATION TECHNOLOGY

A. Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. Yichang is the second-largest prefecture city after Wuhan, the capital of Hubei province in the People's Republic of China (PRC). Yichang municipality covers 21,084 square kilometers (km^2) in western Hubei province and includes both urban and rural areas. It has 4.15 million inhabitants with an urban population of 1.34 million. The urbanization rate is about 32% and the rate of car ownership is 118 vehicles per 1,000 residents. The growth of vehicles from 2007 to 2008 was 14.7% per year. The urban part of Yichang is a linear shape following the Yangtze River valley and hemmed in by mountains to the north. Most of the urban area is located on the north bank of the river.

2. The central region of the PRC has become an important industrial center for energy, agricultural, and high-tech manufacturing, with comprehensive transportation logistics hubs.[1] Major investments include two sizable hydroelectric projects that provide substantial low-cost energy to meet the growing demand for power; in transport, substantial investments in a new high-speed rail service, road network expansion, and terminal facilities for waterborne traffic are underway to boost regional connectivity and development.

3. **Need for freight transport capacity.** Yichang has been a major inland port for freight movements on the Yangtze River. It has long been the economic hub of western Hubei province and an intermediary between the major cities of Chongqing and Wuhan. Rapid industrial development and a quickly expanding manufacturing sector have driven heavy increases in freight traffic on both regional roads and the Yangtze River. The city is located between two major hydroelectric projects—the Three Gorges Dam and Gezhouba Dam. Fast-growing demand for freight movements has caused Yangtze River freight traffic to divert to area roads to avoid capacity bottlenecks.

4. The projected bi-directional freight volume of the Three Gorges ship lock will reach 185 million tons in 2020 and 248 million tons in 2030. Such estimated freight demand suggests that pass-dam transshipment[2] could increase from 12.4 million tons in 2010 to 85 million tons in 2020, and to 148 million tons in 2030. In the next 10 to 15 years, the proportion of pass-dam transshipment is expected to exceed 50% of the total freight volume at the Three Gorges and Gezhouba dams.

5. Rapidly growing freight transport demand is a major challenge for the transport system in Yichang. The city needs to divert traffic out of the center of the urban area to prevent the urban transport system from being overwhelmed. In addition, it is necessary to enhance the logistics hub function of Yichang through better accessibility to the logistics parks and manufacturing facilities being developed in the city. More efficient access to logistics facilities and increased pass-dam transshipment capacity will reduce logistics costs and environmental impacts around the region by maximizing the use of inland waterways.

[1] Opinions of the Chinese Communist Party Central Committee and the State Council on the Promotion of the Rise of the Central Region (Zhong Fa No.10 [2006]).

[2] Pass-dam transshipment is shipping of goods or containers by road or rail to an inland waterway port located upstream or downstream of a dam to bypass the ship lock or ship-lifting facilities at the dam.

6. **Need for more effective public transport.** Rapid urbanization, unprecedented growth in motorization, and an insufficient public transport system create formidable tasks for the urban transport sector in Yichang. Transport also needs to become more sustainable, using less energy and emitting less carbon dioxide. Given the expanding scale of urbanization and transport needs in Yichang, the transport sector must find new sources of financing, strengthen institutional arrangements, and develop multimodal transport connections that will facilitate continued economic development and inclusive growth.

7. Roads serving the central urban area have become increasingly congested. The Yichang government has improved the traffic management system and safety measures in the central urban area, but the impacts are not fully satisfactory. Good practices have not been fully implemented and programs for road safety education are urgently needed. Based on the Yichang Urban Master Plan, 2011–2030, the city will expand toward the north and east to accommodate population increases, but additional road capacity and more effective public transport services are urgently required for the city to grow sustainably.

8. The modal share of public transport is 25% and mainly comprises bus passengers in the central business district (CBD) area. Bus priority schemes to date have not been successful because of curb-side traffic interference and poorly designed bus stops. A bus rapid transit (BRT) system, along with major traffic and demand management measures, will be implemented in the city. Complementary to the BRT, Dongshan 4th Road will function as a bypass and divert freight and intercity traffic from the central urban areas, thus making room to implement the BRT system.

9. While bus frequencies in Yichang are quite high, service reliability is often poor. For some bus routes with scheduled frequency of 10 minutes or less, operating problems result in waiting times between under 5 minutes to over 20 minutes due to bus bunching. In the absence of real-time information passengers have no way of knowing how long they will need to wait. Introduction of the BRT would be expected to result in (i) a greater level of control of bus dispatching and bus route frequencies for BRT routes, and greater control of bus bunching through the BRT control center; and (ii) real-time information displays at BRT stations so that passengers know how long they need to wait for the next bus. These improvements are expected to increase public transport ridership and provide significant benefits to existing riders.

10. **Need to step up pedestrian and nonmotorized transport.** To maximize BRT ridership it is important to improve pedestrian access in the CBD of Yichang directly adjacent to the BRT corridor. People who walk or use bicycles need good connectivity to the BRT. To provide access to the BRT corridor and nearby destinations, additional pedestrian paths are needed. Pedestrian crossings are needed (i) at all BRT stations and other bus stops, (ii) at intersections of roads with pedestrian paths or other roads, and (iii) in general every 100 meters along major urban arterial roads where no intersections or bus stops occur.

11. For pedestrians to find their way to the BRT, it is important to provide signs with local maps and information. Such maps should show the location of the BRT stations, the roads around it, and the destinations (e.g., shopping centers, schools, offices). To facilitate bicycle access to and from the BRT, additional bicycle parking is required in the BRT corridor. Additional on-street parking, guarded and publicly accessible parking, and residential parking should be implemented as part of the BRT system.

12. **Need for urban road safety.** Given the increase in traffic and automobiles, road safety is likely to become a much bigger problem. According to the Yichang Traffic Police Department data in 2011, there were 558 traffic accidents that killed 226 persons (16.14 death per 100,000

people) and injured 750 persons. The reported road accident fatality rate before World Health Organization (WHO) adjustment[3] is very close to WHO's estimate for the PRC average.[4] The actual accident risk in Yichang is very high in urban areas due to lack of pedestrian and bicycle safety facilities and unsafe driving behavior. The dangerous locations for pedestrians are intersections and mid-block crossings, bus stops, and access points to local roads from the main roads. There are no dedicated bicycle lanes yet—bicycles run alongside vehicles without any protection.

2. Government's Sector Strategy

13. Transport sector policy is guided by the Twelfth Five-Year Plan, 2011–2015, which continues the agenda of sustainable development initiated under the 11th plan. The government now places more emphasis on green and low-carbon growth and on coordinated urban and rural development with better basic public services. Its new objective for the sector is to develop an integrated transport system that provides high-quality, efficient, and affordable transport services in a safe and environmentally sound manner. It is anticipated that the 12th plan will pursue further reform in the sector to make it more sustainable and greener.

14. The Yichang Region Economic Development Plan is a strategic development program in the Twelfth Five-Year Plan that receives national and provincial support. The Yichang municipal government has focused on improving the environment and developing urban infrastructure and systems, including major roads, and associated improvements and integration of public transport to meet the challenges of rapid urban expansion. The government expects the Asian Development Bank (ADB)-financed project to provide a major boost to sustainable urban transport development in Yichang.

3. ADB Sector Experience and Assistance Program

15. ADB has been a key development partner of the PRC in its transport sector since 1991. It has provided 71 loans totaling more than $13.5 billion to the PRC for transport and information technology projects since 1992. ADB has also provided $56 million for more than 82 technical assistance projects for policy reform, institutional strengthening, environmental management, poverty reduction, vocational training, and project preparation.

16. Through ADB's Sustainable Transport Initiative, approved in 2010, ADB has established new strategic directions for its transport operations to 2020. Four new focus areas are to be scaled up in future ADB operations: urban transport, climate change, cross-border transport and logistics, and road safety and social sustainability. In line with the initiative, ADB has recently begun to diversify its assistance to the PRC into urban transport, inland waterways, and logistics. It also initiated steps to provide assistance in the road subsector toward better road asset management and road safety. The goal of ADB transport sector support under the country partnership strategy, 2011–2015 is to promote inclusive growth and environmental sustainability in the PRC by developing a more efficient, safe, green, and sustainable transport system.

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[3] The fatal accident data of the PRC in the WHO report are (i) adjusted based on official statistics to be equivalent to a definition of death within 30 days of the crash; and (ii) modeled by making use of the expected relationships between economic indicators, vehicle fleets, development status, and road safety indicators such as helmet laws and speed limits from countries that have reasonably complete accident reporting systems and good hospital records. WHO. 2009. *Global Status Report on Road Safety*. Geneva.

[4] WHO estimates suggest that the actual road traffic accident fatality rate may be significantly higher than the reported rate, with a national rate per 100,000 people of 16.4 rather than the reported rate of 6.2.

17. **Support for low-carbon transport.** ADB will support low-carbon transport by investing in regional railways, inland waterways, and multimodal logistics infrastructure. In the railway subsector, the focus of support will be on strategic railway programs, including subregional railway links, energy efficiency improvement, and investment to enhance the competitiveness of railways for freight and passenger traffic.

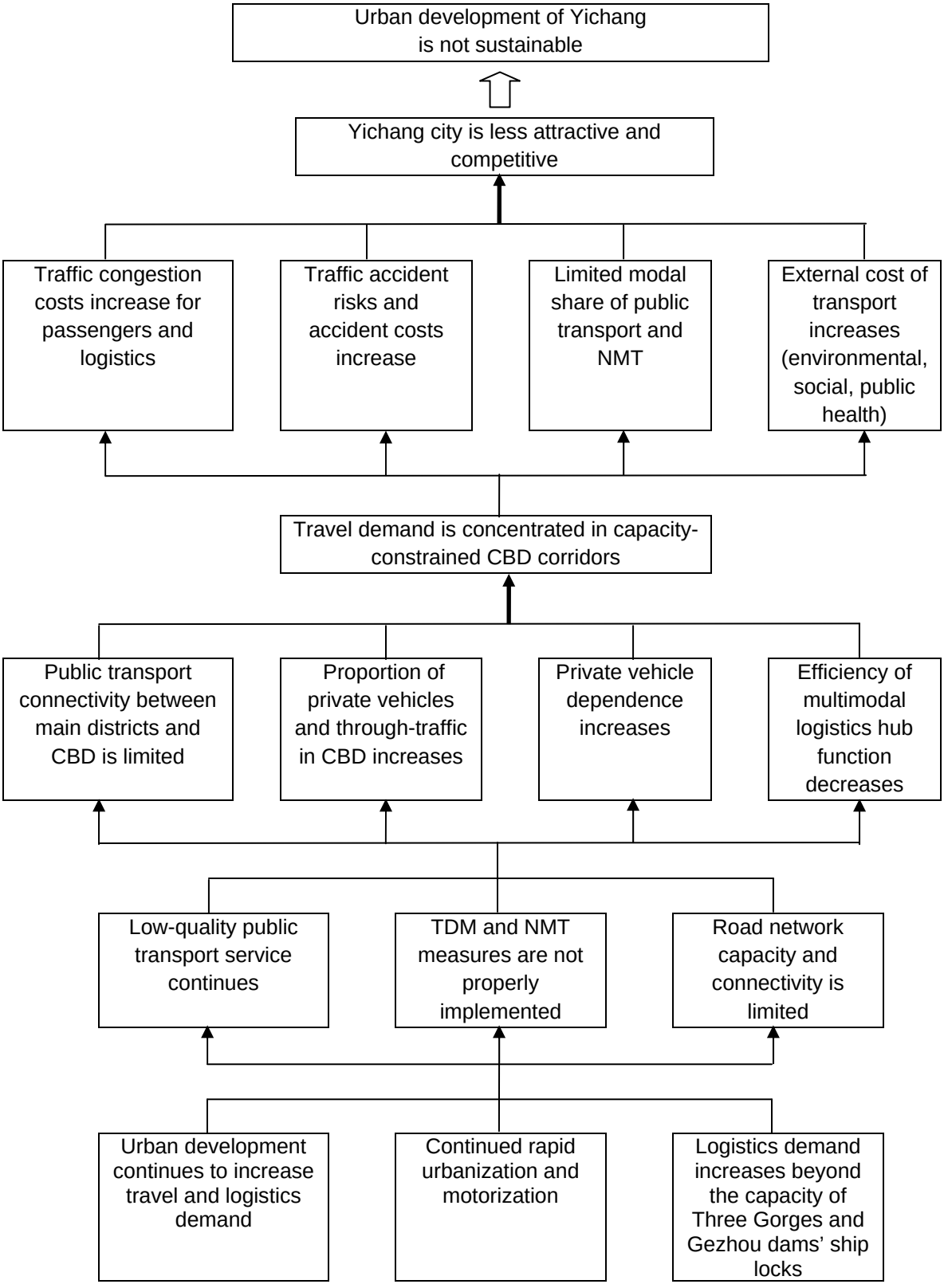
18. **Support to develop sustainable urban public transport.** ADB will provide support for efficient, high-capacity, and affordable public transport. It will help develop integrated and sustainable urban transport systems by supporting urban strategic planning, traffic management, public transport, and urban development. The main focus will be on improving transport services for people, and not simply on making room for more vehicles. In selected cities, ADB will support (i) integrated land and transport planning; (ii) road improvement, rapid transit, and local transit facilities; (iii) stronger traffic management, enforcement, and truck management; and (iv) nonmotorized transport systems, travel safety, emissions control, and travel demand management.

19. **Support to improve the ordinary road network.** ADB will assist in improving the efficiency and sustainability of the road subsector, focusing mainly on providing support for planning, financing, and implementing arrangements for more robust maintenance and road asset management. Toward these objectives, ADB will help (i) develop more effective ways of integrating the planning, financing, and execution of ordinary road upgrades, rehabilitation, and maintenance; (ii) prepare long-term and annual road network rehabilitation and maintenance plans; (iii) devise sustainable financing arrangements; (iv) accelerate sector reforms to promote market-based mechanisms in road maintenance; (v) reduce overloading; and (vi) promote transport efficiency through greater use of buses, containers, and large multi-axle trucks. Moreover, ADB will continue to support rural transport by providing year-round road access and related services to poor rural areas. In urban areas, ADB will make transport accessible and safe for all users and social groups, including poor women and other vulnerable groups.

20. **Scaling up safety and social sustainability.** In line with the PRC's commitment as signatory to the United Nations Decade of Action for Road Safety, 2011–2020 and of ADB's Road Safety Action Plan, ADB will scale up road safety in its operations. This will include piloting better approaches to road safety that emphasize improved engineering, enforcement, education, information sharing, evaluation, and emergency response in road safety. ADB will expand its road safety operations initially by including more road safety components in project loans, more technical assistance support, and regional cooperation in road safety. Further, ADB will integrate components in transport projects to promote inclusive dimensions such as nonmotorized transport systems, rural transport services, gender equity, and HIV/AIDS prevention.

21. **Value addition.** As ADB's resources are small in comparison with the PRC's transport development requirements, ADB will focus its transport support where it can add value to transport development in the PRC, including financing innovative projects, piloting and scaling up successful projects, promoting technology and knowledge transfer, building capacity, and encouraging public–private partnerships. Close integration of support for new knowledge, lending, technical assistance, and knowledge products and services will be forged. Through its projects, ADB will help the government apply new technologies and designs to make better use of existing transport infrastructure and to reduce emissions. This can involve innovations such as intelligent transport systems and advances in fleet technology. ADB will also help search for solutions to improve air quality and lower greenhouse gas emissions, utilizing resources from the Global Environment Facility and other trust funds.

PROBLEM TREE FOR TRANSPORT, YICHANG



CBD = central business district, NMT = nonmotorized transport, TDM = transport demand management.

SECTOR RESULTS FRAMEWORK (TRANSPORT SECTOR, 2011–2015)

Country Sector Outcome		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contributions	**Indicators with Targets and Baselines**	**Outputs with ADB Contribution**	**Indicators with Incremental Targets**	**Planned and Ongoing ADB Interventions**	**Main Outputs Expected from ADB Interventions**
The movement of people and goods in the PRC is made more efficient, inclusive, sustainable, and safe.	Rail passenger traffic grows by 4% per annum, from 876 billion passenger-km in 2010. Rail traffic for freight grows by 3% per annum, from 2,733 billion ton-km in 2010. Railway energy consumption per unit of traffic is reduced by 5% from 2010 to 2015, from 4.94 tons of standard coal equivalent per million ton-km in 2010. Inland waterway traffic for freight grows by 1% per annum, from 433 billion ton-km in 2009. In areas supported by ADB urban transport projects, public transport ridership increases by 5% from 2010 to 2015. In areas supported by ADB road projects, the road accident fatality rate per vehicle-km and per 100,000 inhabitants in 2015 is 10% lower than in 2010.	Integrated, low-carbon transport system is expanded, improved, managed, and maintained.	Rail route network is expanded from 91,000 km in 2010 to about 120,000 km by 2015, including 45,000 km of a high-speed railway network able to carry traffic at over 200 km per hour. 42 national comprehensive transport hubs are developed by 2015. High-class (class III and above) inland waterway network is expanded from 10,000 km in 2010 to over 13,000 km by 2015. In areas supported by ADB projects, new bus rapid transit system in operation by 2015 (baseline: zero). In provinces supported by ADB road projects and technical assistance, financing for road maintenance increases from its current amount by project completion.	Planned key activity areas: (i) lending operations totaling $2.71 billion in 2011–2014 for rail transport, especially regional or subregional links; (ii) inland waterway transport, urban transport; (iii) road asset management, rural transport; and (iv) road, rail, and inland waterway safety. Pipeline projects (2011–2014) totaling $2.71 billion: (i) railway ($1,160 million) (ii) road ($980 million) (iii) urban transport ($370 million) (iv) inland waterway ($200 million) Nonlending programs in fuel tax reforms, low-carbon urban transport, intermodal logistics, energy efficiency, and safety Knowledge products based on technical assistance findings and policy notes aimed at supporting government policymaking 24 ongoing projects totaling $6.2 billion at the end of 2010	Pipeline projects: (i) first bus rapid transit system operational in Lanzhou, (ii) about 650 km of ordinary roads rehabilitated and operational, and (iii) road asset management system established and operational in one province. Ongoing projects: (i) 1,947 km of new railway built, (ii) 121 km of urban roads upgraded in Xi'an and Lanzhou, (iii) 1,883 km of expressways built, (iv) 3,881 km of local roads rehabilitated, and (v) 1,308 km of rural roads built or rehabilitated

ADB = Asian Development Bank, km = kilometer, PRC = People's Republic of China.
Source: ADB estimates.