PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No.: PIDC2751

Project Name	Wuhan Integrated Transport Development (P148294)
Region	EAST ASIA AND PACIFIC
Country	China
Sector(s)	Urban Transport (95%), Public administration- Transportation (5%)
Theme(s)	City-wide Infrastructure and Service Delivery (90%), Municipal governance and institution building (10%)
Lending Instrument	Investment Project Financing
Project ID	P148294
Borrower(s)	People's Republic of China
Implementing Agency	Anlu City World-Bank Loan Project Management Office, Wuhan Urban Construction Utilization of Foreign Investment Project Management Office
Environmental Category	A-Full Assessment
Date PID Prepared/ Updated	26-May-2014
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Estimated Date of Appraisal Completion	
Estimated Date of Board Approval	23-Jul-2015
Concept Review Decision	Track I - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

1. China is getting richer. China’s average economic growth rate has been 10% per year for the last three decades. Two historic transformations –market reform and urbanization– have driven China's economic expansion. China’s growth pattern has generated more productive and better paid jobs in urban areas, while rural productivity and incomes have also increased dramatically. In addition, the Government of China (GoC) has made important efforts to improve the provision of basic necessities and improve access to essential social services, such as health and education. As a result, more than 600 million people have left the ranks of the poor and have become middle class. All Millennium Development Goals have been achieved or are within reach.

2. Yet China remains a developing country. In 2011, China's gross national income per capita of $4,930 ranked 114th in the world; and over 170 million people live below the $1.25-a-day international poverty line. China is home to the second largest number of poor in the world. As

recognized by China's 11th Five-Year Plan (FYP, 2005-2010), the country's pattern of growth has led to growing economic, environmental, and social imbalances. Moreover, these traditional sources of growth are likely to weaken. China's main challenge in the medium term is to navigate the uncertain global economic environment while putting the economy on a more sustainable growth path. This involves reinvigorating the underlying drivers of growth –market reform and urbanization– shifting to a more consumer based economy, addressing pollution and natural resource depletion, and reversing inequalities of income and opportunity. China's 12th FYP (2011-2015) addresses these issues by highlighting the development of services and measures to address environmental and social imbalances, setting targets to reduce pollution, increasing energy efficiency, improving access to education and healthcare, and expanding social protection.

3. Urbanization creates a space for enhanced productivity, economic growth and poverty alleviation. Rapid urbanization –the largest peacetime movement of people in history– has transformed China into an increasingly urban and economically diversified economy from a rural, agricultural one. Thirty years ago, 80% of China's population lived in rural areas and agriculture accounted for about one third of GDP. Today, 622 million people –just over half the population– live in urban areas, while agriculture makes up around only one-tenth of GDP. By 2013 over 1 billion people will live in cities in China (64% of the population). Moreover, the 49 large Metropolitan Regions (MR) in China account for 32% of the population, 57% of the Gross Domestic Product, and 95% of the population growth between 2000 and 2010. People are concentrating in cities because cities are an engine of economic growth and poverty alleviation. Indeed, each percentage point of economic growth produced 1.4 million jobs in urban areas in 2013 but only 1 million before 2008.

4. Yet economic prosperity is concentrated in the eastern coast, especially in large cities with good access to international markets. Per capita income is higher in coastal large cities, followed by coastal small cities, and then by inland cities. Indeed, using income and poverty as a lens, the central and western regions of China, home to 55% of the population, have lagged behind with an income per capita about half that of the coastal region.

5. The Wuhan Metropolitan Region (WMR) is located in central China. The WMR has a per capita income of RMB 12,300 per year (US$ 1,937) whereas the per capita income in the Pearl River Delta MR is RMB 50,000 (US$7,873), in the Yangtze River Delta MR RMB 36,000 (US $5,669), and in the Beijing-Tianjin-Hebei MR it is RMB 20,600 (US$3244). To propel the economic development of Central China, the GoC launched the program the “Rise of Central China,” which seeks to form a pattern where eastern, central and western parts of China interact with and complement each other to improve economic growth. Indeed, the Wuhan MR is strategically located by being roughly equidistant from the three aforementioned MRs –the most important ones in China.

6. The GoC has selected the Wuhan MR as a pilot to apply the “Two-Oriented Society.” The “Two Oriented Society” seeks to preserve resources and improve environmental quality. The strategy emphasizes the integrated development of the central city in the MR and the surrounding cities, by balancing the resources and services in the region, in a sustainable manner. In the WMR this approach takes the name "1+8 Wuhan Metropolitan Area," and it is formed by an 8-city cluster within a 100 km radius around the core city, Wuhan.

7. Improving transport within the 1+8 region is critical for connectivity and integration and the overall economic functioning of the MR. Rail networks –both high-speed and intercity lines– are under construction. Wuhan itself is in the midst of an unprecedented construction boom to upgrade transport infrastructure through a metro system (three lines currently operational with 73 km that carry over 700,000 trips per day, 282 km planned for 2020, and 540km by 2050) and an urban expressway network (currently comprising 224 km). Despite these investments, the WMR has only

30-50 m of road per km2 compared to 130-150 m in the Pearl and Yangtze River Deltas MRs. And the metro network is a fraction of Shanghai's (577 km) or Beijing's (465 km). In part for this reason, the WMR produces only RMB 6.6 million GDP per km2 (US$1.04 million) compared to RMB 24.8 million (US$3.91 million) and RMB 27.5 million (US$ 4.33 million) in the Pearl and Yangtze River Deltas MRs, respectively. Poor transport can also hurt the urban labor market from working properly and poor transport can constrain urban economic growth. Moreover, poor transport increases the carbon footprint of the urban area.

8. The WMG has realized that infrastructure alone is not sufficient and this project will fund an Intelligent Transport System (ITS) Platform. This platform will be one of 15 platforms being implemented under the Smart City approach in Wuhan. It will be a pilot for increasing open data access for the general public and for data sharing between different agencies. The Smart City approach aims to improve public transport, non-motorized transport (NMT), road safety and the overall functioning of the transport system. It seeks to make the best use of the existing transport network and thus could free up resources to fund other transport facilities or measures in other sectors such as education and health. Transport investments will not only be made in Wuhan but also in Anlu, a small, county-level city within one of the 8 city clusters. In this way, innovative integration solutions within and between the "Big City" and the "Small City" can be showcased as a model for replication nationwide.

Sectoral and Institutional Context

9. China is motorizing rapidly with severe negative impacts. Along with the rapid economic growth and urbanization, China is also experiencing rapid motorization. In 1995, there were 240,700 private cars; by 2012 this total reached 53 million. Yet with a population of 1.3 billion, there are only 41 cars/1,000 population. The United States and the wealthier countries in the European Union have 400 or more cars per 1,000 inhabitants. Nonetheless, Chinese cities have higher levels of congestion, significant pollution problems, and poorer road safety. China's fatality rates remain high compared to other Asian and European Countries, and the US –13.33 fatalities/10,000 registered motor vehicles (MVs) and 20 fatalities/100,000 population in 2010. This compares badly with Australia, Japan, Sweden, Germany and the UK for example whose corresponding figures are less than 1 fatality/10,000 MVs and between 5-6 fatalities/100,000 population; while the US figures are 1.37 and 11.38 respectively.

10. Wuhan also follows this motorization pattern. Even with about 130 cars/1,000 population and 224 km of urban expressways, the city is still congested. For example, a typical intersection reaches saturation at 5,000 veh/h. In 2010 there were 61 congested intersections in Wuhan and by 2012 there were 116. Queuing traffic spreads congestion not only to other intersections but also to road links, not only during the peak hour but off-peak as well. The congestion hurts above all the poor who have to ride a bus that shares the roads with cars. Buses are more efficient than cars at carrying people. Usually, a bus carries 3 passengers/m2 while a car carries only 0.2; that is a bus can be 14 times more efficient than a car.

11. Congestion is therefore regressive: it disproportionately hurts bus users, who tend to have lower incomes than car users. Poor people also walk and use bicycles and electric bicycles to commute. The highest burden of injuries and fatalities is borne disproportionately by poor people in developing countries, as pedestrians, passengers of buses and minibuses, and cyclists. Furthermore, the slower speed of these Non-Motorized Transport (NMT) modes means that they suffer more severe casualties in accidents. Research has shown that while most vulnerable road users survive if hit by a car travelling at 30km/h, the majority are killed when hit by a car travelling at 50km/h.

12. Congestion is a symptom of several problems: rapid increase of car ownership and use, poorly maintained and operated road systems, inefficient traffic management, poorly educated

drivers, insufficient enforcement of traffic laws, and lack of public transport systems with good quality and coverage. Environmental sustainability is compromised by air pollution from the increasing private vehicle fleet and old public transport vehicles. Underlying everything is a failure in financial sustainability caused by the inadequacy of resources that the MR has to maintain infrastructure and to provide necessary services. Public transport is of lower quality than it should because of the lack of integration between buses on complementary routes and the emerging metro network. Users have to pay multiple times, which increases the expenditure in transport –a particularly important expenditure for lower income households as it can curtail expenditure on other essential items.

13. Integration between different modes of transport is crucial to tackle congestion. At the metropolitan level, the integration between Wuhan and the surrounding municipalities needs improvement. High-speed rail lines will connect Wuhan and Anlu (in Xiaogan) and Wuhan and Xiaogan in the 1+8 city cluster. The Beijing–Hong Kong Highway passes through the WMR. Yet the WMR is not well integrated and hence it is less productive than better integrated MRs, as explained above. Improving transport within the WMR should also expand opportunities beyond Wuhan to the other eight municipalities. Per capita income is the highest in Wuhan but it is less than 50 % in the remaining cities, save Huangshi. Anlu, in particular, in part because of its small size, has a per capita income of just one third of Wuhan's. The high-speed rail connection offers an opportunity, but the city needs to improve its emerging public transport system to integrate it to the rail station and hence take advantage of the enhanced connectivity.

14. Wuhan has already invested in ITS. The city of Wuhan –through a number of different agencies and institutions– has taken steps to address these challenges, and has invested in various Intelligent Transport Systems (ITS) In recent years, Wuhan city agencies have implemented several systems including: (a) Area Traffic Control (ATC) to coordinate the traffic signals; (b) CCTV traffic monitoring cameras with traffic flow capture capability; (c) E-Police enforcement cameras with Automatic Number plate Recognition (ANPR); (d) a Traffic Guidance System using Variable Message Signs (VMS); (e) public bus monitoring, dispatch and monitoring systems (GPS) in 7,000 buses, plus a basic smartphone application for information on routes and timetables; (f) a taxi monitoring, dispatch and information system covering 14,000 taxis equipped with GPS; (g) bridge and tunnel electronic toll collection systems (ETC); (h) a highway toll collection system and (i) public transport monitoring system using smart cards (IC) which anonymously track individual journeys and system-wide utilization and trends. City agencies have also developed capability in traffic monitoring, real time mapping, analysis of traffic flows, and impacts of major events such as public holidays. They have also held meetings with telecom service providers (e.g. China Mobile, China Unicom) about using mobile phone location data (cell site data) to monitor anonymously population movements and flows. City agencies have dedicated staff and resources for the preparation of analytical reports based on stored data (e.g. bus journeys dating back 2 years).

15. Yet these ITS modules in Wuhan are not integrated. These ITS modules are managed by separate agencies and there is no integration of data formats, inputs, outputs and outcomes. The analysis is also disaggregated. There is opportunity to leverage technologies to improve the efficiency of existing systems and introduce new systems. This would enhance interoperability, planning and decision making to make travel more reliable, safe and (prospectively) affordable for the majority of citizens in one of China's "Smart Cities," Wuhan. Furthermore there is a need to complement these investments with measures to: improve regional links to dormitory cities as the urban area spreads; increase the attractiveness of public transport to engender a slowdown in the shift to private vehicles; and enable smoother, safer and more convenient access and mobility for passengers through the use of both technology and on-street measures.

16. Peripheral cities have potential. Anlu is in one of the 8 peripheral cities, with the potential

to exploit its connectivity to Wuhan and to the overall MR. Furthermore, as a small city using NMT –walking, cycling, and e-bikes– is more convenient. However, there is a need to ensure that these sustainable modes are not eroded further by rapid motorization. Measures will be necessary to preserve this NMT advantage in the future, to further increase the public transport mode share and to reduce the dependence on private vehicles. Improving public transport and non-motorized transport facilities is an important step in that direction, but complementary policies aimed at improving transport and land use planning will also be crucial.

17. Strategic and Local Integration Proposed. The proposed project therefore comprises transport integration measures at both strategic and local levels, and consists of a range of Information and Communications Technology (ICT) investments and physical on-street measures. The project will focus on using technology to reduce carbon emissions and enable more seamless trips; on improving public transport and NMT; and on enabling a more equal access to transport for all sectors of society especially the poor.

Relationship to CAS

18. The proposed project is aligned with the 2013-2016 World Bank Group Country Partnership Strategy (CPS) for China, discussed by the Board on November 6, 2012. The 2013-2016 CPS focuses on three main pillars: support greener growth, promote more inclusive development, and advance mutually beneficial relations with the world. The CPS is aligned with China's 12th Five-Year Plan, and the proposed project supports the first two CPS pillars. The project supports the greener growth pillar particularly outcome 1.3 on Promoting Low Carbon Urban Transport. Specifically, the project will help accelerate the shift to public transport, particularly in the central region, and it will promote public transport integration and travel demand management, and improve transport safety, all stated actions in this indicator. The project support the more inclusive development pillar particularly outcome 2.3 on Enhancing Opportunities in Rural Areas and Small Towns. Specifically, the project seeks to enhance secondary town development (Anlu). The project is also aligned with indicator 2.4 on Improving Connectivity for More Balanced Regional Development. The project is in the central region and seeks to help achieve a more balanced and integrated approach within the WMR (1+8 cluster).

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19. The project supports the World Bank's Twin Goals of poverty elimination and enhancing shared prosperity. The project will increase the access to transportation for the poor, the elderly, the disabled and people living in a small town. Less traffic congestion, greater compatibility of surface transportation with the environment, fewer traffic-related deaths and injuries, and a better-managed transportation system are also in line with the Twin Goals. As explained above, congestion is regressive and most people injured or killed in accidents are poor people. A family can sink into poverty for three generations if the main bread winner is injured or killed in an accident. ITS also offers a wide range of immediate and tangible benefits to the people who operate and use the transport system by adding reliability, stability, visibility, information, and control. And more integrated and interoperable set of systems can delivery significant data for analytical purposes and decision-making (e.g. on targeting of concessional fares for public transport based on user demographics/time of day, road safety measures).

20. Feasibility Studies will support Twin Goals. During preparation detailed data will be collected to validate the statements in the previous paragraph. To that effect, the Wuhan PMO and the Anlu PMO have agreed to enhance the terms of reference for the Feasibility Study Report, required by local regulation, to include gathering of data to analyze the alignment of the project with the Twin Goals. The task team will also carry out its own analysis including a cost benefit analysis, as explained below, to study in detail the impacts of the project.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

21. The Proposed PDO is: to improve the integration of transport services, improve reliability of the transport system, improve road safety, reduce travel times by public transport, and decrease operational costs of the transport system in Wuhan and Anlu.

Key Results (From PCN)

22. The achievement of the PDO will be measured through these Key Performance Indicators:
(a) Integration of transport services in Anlu: measured by increase in the number of integration terminals (bus-bus, bus-rail, bus-NMT).
(b) Integration of transport service information in Wuhan: measured by X% increase in the number of requests for information from the ITS information center by public transport users and government agencies.
(c) Wait time for buses at key intersections (reliability): measured by a reduction of X% in Anlu and Y% in Wuhan.
(d) Number of accidents fatal and/or serious injuries: measured reduction of X% in Anlu and Y % in Wuhan, measured by gender and income level.
(e) Travel time by public transport and NMT: measured by a reduction of X% in Anlu and Y% in Wuhan, measured by gender and income level.
(f) Operating cost of bus, car, and truck vehicle fleets: reduction of yearly operating costs by A million in Anlu and B million in Wuhan.

III. Preliminary Description

Concept Description

The project is designed to enhance the integration of Wuhan and Anlu and also to showcase innovative integration solutions within each city. In Wuhan, the project comprises a comprehensive ICT platform to improve the planning, operation, management of the city's transport system and make it more reliable, convenient, safe and accessible. Here, integration is tackled at a strategic level to strengthen the foundations for efficient and seamless journeys and to enhance the strategic link to Anlu. In Anlu, the focus is more local with the improvement of railway and bus stations connecting with Wuhan, the development of integrated public transport corridors, improvement of public transport, road safety measures, and road infrastructure improvements focused on the re-functioning of key roads. The proposed project will have the following components:

24. Component 1: Integrated Corridor and Road Safety Improvements for Anlu:
(i) Road Network Re-functioning including road rehabilitation, road pavement improvements, construction of new road sections and public transport priority (where appropriate on around 35km of integrated corridors.
(ii) NMT Improvements on existing roads in the downtown area within the confines of Handan Railway, Jiefang Avenue and Fuhe Avenue.
(iii) Road Safety Measures including a Traffic Command Center, traffic signal control system, CCTV monitoring, E-police enforcement cameras, traffic information collection system, bus lane enforcement, Road Safety Center and Road User Education (RUE) measures.

25. Component 2: Public Transport Improvements for Anlu: purchase of new energy saving public transport vehicles; public transport IC card system; improvement of PT interchanges (PTIs) including High Speed Rail Station, Anlu Station, Long Distance Bus Station, Anlu Bus Station and Central Passenger Station.

26. Component 3: Intelligent Transport System for Wuhan:

(i) A Transport Information Center, including software and hardware procurement, data center construction, and networking/communications;
(ii) A Comprehensive Intelligent Transport Information Service System, comprising four service platforms and nine information management platforms. The nine information platforms comprise, Three Foundation Platforms: (1) Transport Infrastructure plus planning and social data using a multi-layered GIS; (2) Vehicle Traffic Flows; and (3) Passenger Traffic Flows. Two Progressive Platforms: (4) CCTV traffic monitoring cameras on urban and external roads; and (5) Emergency response system; and Four Complementary Platforms: (6) Parking Information and Guidance; (7) Urban construction information database; (8) Highway management; and (9) Comprehensive transport system including road, rail, air and waterways. The system will also require an interface with citywide urban planning data, in particular the city's GIS (One Map).
(iii) A field information collection network, including data collecting equipment and DSRC application node equipment in a potential Demonstration Zone (DZ) in order to monitor and measures outcomes before scale-up to the entire city (using the city's own resources). The DZ would be located within the second ring road and could include a pilot congestion charging area and parking control area.

27. Component 4: Technical Assistance for Anlu and Wuhan: For Anlu: Technical assistance and capacity building including consulting services for project management and international and domestic training and study tours as well as consulting services for design and supervision of civil works and preparation and implementation of related environmental and social safeguard document from the Bank. For Wuhan: Technical assistance (TA) activities supporting implementation, strategic studies, and institutional capacity building.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	×		
Natural Habitats OP/BP 4.04		×	
Forests OP/BP 4.36		×	
Pest Management OP 4.09		×	
Physical Cultural Resources OP/BP 4.11			×
Indigenous Peoples OP/BP 4.10		×	
Involuntary Resettlement OP/BP 4.12	×		
Safety of Dams OP/BP 4.37		×	
Projects on International Waterways OP/BP 7.50		×	
Projects in Disputed Areas OP/BP 7.60		×	

V. Financing (in USD Million)

Total Project Cost:	256.00	Total Bank Financing:	120.00
Financing Gap:	0.00		

Financing Source	Amount
Borrower	136.00
International Bank for Reconstruction and Development	120.00
Total	256.00

VI. Contact point

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