

**PROJECT INFORMATION DOCUMENT (PID)  
APPRAISAL STAGE**

Report No.: AB3163

<b>Project Name</b>	Xi'an Sustainable Urban Transport Project
<b>Region</b>	EAST ASIA AND PACIFIC
<b>Sector</b>	General transportation sector (96%); Sub-national government administration (4%)
<b>Project ID</b>	P092631
<b>Borrower(s)</b>	PEOPLE'S REPUBLIC OF CHINA
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<b>Environment Category</b>	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
<b>Date PID Prepared</b>	September 27, 2007
<b>Date of Appraisal Authorization</b>	October 15, 2007
<b>Date of Board Approval</b>	March 15, 2008

## 1. Country and Sector Background

### *Country and Regional Context*

Xi'an, the starting point of the “Silk Road”, is one of the most popular tourist destinations in China. The world-renowned Qin Terracotta Army, Tang pagodas, Han and Tang tombs and palace remains (the archaeological site of Han Chang'an), the Ming Walled City (MWC) and other cultural relics, attract millions of tourists every year. But Xi'an has another side – it is a vibrant and growing modern city, home to five million people<sup>1</sup>, high-tech industry and *world class* universities – as well as a transport and logistics hub for western China. The huge challenge for the city is to balance preservation and enhancement of its cultural heritage with the demands of a modern city – especially for access and mobility.

As part of the national goal to “coordinate and harmonize” development between eastern, central and western regions as identified in the 10<sup>th</sup> and 11<sup>th</sup> Five-Year Plans (FYP), the Government of

<sup>1</sup> Urban population – the total population of Xi'an Municipality is 8 million.

China (GOC) has initiated the strategy of promoting the “Development and Exploitation of Western Regions” and the “Rise of Central China”. In line with this strategy, the GOC has designated Xi’an, together with Chongqing and Chengdu, as three major metropolitan hubs to be developed as the growth poles for the Western Regions. Benefiting from this strategy, Xi’an has enjoyed expedited growth in recent years: in 2005, the GDP growth was 13.1% from the previous year; the annual average per capita income for urban residents was CNY9,628<sup>2</sup>, a 12.7% increase from 2004.

However, the rapid urbanization that accompanied Xi’an’s growth has also put great pressure on its infrastructure provision. Transport demand, in particular, has grown much faster than economic growth, resulting in traffic congestion and increasing motor vehicle emissions. Between 1990 and 2001, when real economic growth averaged 10.4% per annum, road traffic grew at 15.7% per annum. During the same period, vehicle ownership grew from 10.1 vehicles per 1,000 people to 23.1. By 2003, urban residents made 1.95 trips/day, with mode shares of walking 22%, bicycle 33%, bus 23%, and car/taxi 22%.

A tourist boom has contributed to this rapid economic growth. In 2004, there were 650,000 overseas tourists, and 20.8 million domestic tourists to Xi’an, with increases of 93% and 29% respectively compared to the previous year. The total revenue of the Xi’an tourism industry was CNY15.44 billion (equal to US\$1.9 billion), which includes foreign exchange of US\$330 million<sup>3</sup>, with increases of 45% and 130% over the previous year. While Xi’an’s rich cultural heritage is an economic resource, it is also a fragile resource. Such large numbers of tourists require adequate access to sites, but at the same time the authenticity of the site has to be preserved.

## **Key Transport Sector Challenges in Xi’an**

### *Coordinating Transportation and Urban Development*

**Conflict between preservation and growth.** Xi’an faces the dual challenges common to all urban areas in China – increasing urbanization and rapid motorization<sup>4</sup>. For a historic city with unrivalled cultural heritage the challenge is heightened as urbanization is threatening the sustainability and livability of the city. The centerpiece of the master plan is the protection of the MWC, which contains many of Xi’an’s important cultural resources. Under the “Imperial City Recovery Plan”, all government offices are being moved from the MWC to the northern quadrant of the city, while traditional commerce and tourism are retained as the main activities.

The MWC is also the location of the Central Business District (CBD), yet few measures have been taken to ensure the integrity of this area. Currently 21% of travel demand has an origin or destination in this area. Xi’an’s transport system is under great pressure to provide an enabling environment for sustaining development, while maintaining urban accessibility and mobility, preserving Xi’an’s cultural and historical characteristics and minimizing environmental impacts.

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<sup>2</sup> Slightly less than the national average of CNY10,493 for 2005

<sup>3</sup> Xi’an Statistics Year Book, 2006 and *Xinhua-PR Newswire* January 13, 2006

<sup>4</sup> Urban population is forecast to reach at least 7 million by 2020, but no reliable estimates have been made of increased travel demand over the same period.

The basic policy for urbanization in Xi'an city is to protect the heritage of the existing urban area, and to provide new areas for economic development. The sub-regional plan designates a number of satellite towns (including Huxian and Xianyang) as the main centers for development, with some development in smaller towns dotted about the sub-region. Most of these new development areas have inadequate internal transport networks. They are also not well linked to Xi'an. Unless improvements are made to extend the transport networks in satellite towns, and high capacity rapid transit services from Xi'an to the satellite towns are provided to support the implementation of this urbanization policy, the tendency will be for trips to and from these satellite towns to be made by car, facilitated by the rising trend in motorization in Xi'an. This will continue to challenge the energy needs of China and increase the level of Green House Gas (GHG) emissions in a city which is one of China's top twenty polluted cities.

**Better context for tourism promotion.** Tourism is a pillar industry for Xi'an and the local government is determined to make it more competitive in world tourism markets.<sup>5</sup> However, Xi'an faces great challenges in maximizing its tourism potential because of poor infrastructure, site planning and management. A historic city such as Xi'an must above all preserve its character. The spirit of a place is its urban fabric which is very vulnerable to air and noise pollution and visual intrusion of traffic. In addition, bicycle routes are being used by buses or as parking lots for cars, making walking and cycling within the MWC more difficult. Investment in high quality transport infrastructure, together with implementation of an appropriate site management system will provide a higher quality tourism experience commensurate with the World Heritage status of its famous site.

### *Improving Functionality of Transport Facilities*

**Roads with incompatibly mixed functions.** Xi'an's road network does not present a reasonable functional road hierarchy (FRH) - where the lower order roads in the network have a predominantly non motor vehicle (NMV) and pedestrian function - because most roads perform incompatible functions of carrying longer distance cross town traffic and short distance traffic, acting as major bus routes, and serving roadside activities (such as shopping).

**Inadequate facilities for NMVs and Pedestrians.** Previously physically segregated wide bicycle lanes have been sub-divided for use by on-street parallel parking and bus lanes. Road space from non-segregated bicycle lanes has been allocated to motor vehicles. Conflicts between motorized and non-motorized vehicles are frequent and severe, facilities for pedestrians and cyclists to cross main roads are inadequate. The only exception is the recently created bicycle route within the MWC adjacent to the city wall. Better traffic management measures are especially needed within the MWC to provide a more human scale to the area, reduce severance for pedestrians and cyclists, and minimize the visual impact on historic sites.

**Inefficient Public Transport (PT) system.** Analysis of overall investment in the Asia

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<sup>5</sup> The Mausoleum of the First Qin Emperor containing the famous terracotta warriors was designated as a World Heritage Site by the United Nations Educational Scientific and Cultural Organization (UNESCO) in 1987..

Development Bank (ADB)<sup>6</sup> project and the 10<sup>th</sup> & 11<sup>th</sup> Five Year Plan showed that the road investment was already far greater than public transport investment, and that PT was failing to meet existing travel demands. Bus operating speeds are now below 10km/h within the MWC. As in other cities there is a shortage of maintenance depots, passenger interchanges and termini. Bus company and sector management needs to be made more efficient and business focused. No steps have been taken to implement the national strategy of “priority to public transport” (as set out in State Council Opinion # 46, 2005). Without greater investment in PT the mobility and accessibility of the majority of the population without access to a car will not be improved.

### ***Inadequate Institutional Framework***

**Limited traffic management, poor road user behavior, and inadequate enforcement.** Use of the existing road space is inefficient, with random illegal parking. Average speeds on trunk roads declined in 2002 to 19.3km/h, with the volume/capacity ratio at 0.95 during peak periods in the MWC. Like other Chinese cities, Xi'an is hoping that automatic enforcement by electronic means will solve the problems of lack of respect for the traffic regulations. However, this requires a strong foundation of a complete and integrated vehicle, driver and traffic violation database. This is currently evolving.

**Scope for improvement in road safety outcomes.** While Xi'an is typical of China, and indeed considerably better than some smaller cities, compared to more developed countries there is scope for improvement. In 2005, within Xi'an Municipality, there were 14.2 fatalities/10,000 registered motor vehicles<sup>7</sup>; this compares with 13.7 for China as a whole (2002); 34.4 and 27.9 for other Bank project cities of Benxi and Fushun respectively (2005); 1.6 for the US (2002); and 1.0 for the UK (2002). Accident analysis are underdeveloped due to a lack of software and equipment. Accident location data is also unreliable - there is no proper grid-reference system so that the exact location of an accident cannot be determined. The development in Xi'an of urban Road Safety Councils as required by the National Road Safety Law of 2004 (NRSL) is behind those being established elsewhere.

**A need to strengthen institutional capacity.** Xi'an exhibits all the shortcomings discussed in the recent East Asia Transport Working Paper. No 4 *China: Building Sustainable Institutions for Sustainable Urban Transport*. It is similar to many cities in China in lacking an organizational structure appropriate to the requirements for integrated policy formulation and program implementation. There is a lack of institutional capacity to plan, design and implement a sustainable transport program. This has been recognized by Xi'an's leadership, who see developing the required capacity and making use of the knowledge base in the various universities in Xi'an as a key outcome of the project.

### ***Deteriorating Air Quality***

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<sup>6</sup> A loan of US\$270 million was made to Xi'an by the ADB in November 2003 for the \$762 million Xi'an Urban Transport Project (PRC 33459) designed to relieve transport infrastructure bottlenecks.

<sup>7</sup> Data Source: Traffic Control Improvement Sub-project of Urban Comprehensive Transport Improvement Project in Xi'an, The Feasibility Study Report, Xi'an Traffic Police Detachment, Chang'an University, November, 2006  
614 fatalities per 432,000 registered MVs

Air pollution is threatening the city's cultural heritage and harming people's health. As air pollution from industrial sources is brought under control, increased motorization is emerging as one of the key sources of pollution threatening the urban environment. Increase of CO<sub>2</sub> emissions from transport sources is also recognized as an issue by the local government. The levels of inhalable particulate matter (PM<sub>10</sub>) for the past five years (2001-2005) have exceeded the National Class 2 Ambient Air Quality Standard. A PM<sub>10</sub> source appointment study indicates that vehicular emissions represent 25% (including 12% of secondary PM<sub>10</sub>) of local emission sources in July 1998, followed by coal combustion (24%) and fugitive dust (22%). Xi'an is enforcing national emission standards for in-use vehicles. However, renewal of inspection equipment and development of quality control system is an urgent need to meet the new inspection requirements of the State Environmental Protection Agency (SEPA) issued in 2005.

### ***Meeting the Challenges***

With increasing motorization and urbanization, the development of more sustainable measures will be necessary to ensure that the economic vitality, cultural heritage and tourism potential of the city are enhanced, and the stature and quality of life in the city are improved. The city leaders recognize this in the proposal mentioned above for new satellite towns, reducing activities within the MWC, and investing in high capacity transit such as the new metro which is under construction.

For this project, the city leaders have identified the specific priorities as:

- (i) Protection of the MWC;
- (ii) Strengthening public transport performance, and implementing Bus Rapid Transit (BRT);
- (iii) Improving local air quality – with a target to meet national standards by 2010; and
- (iv) Developing a transport planning capability in Xi'an Municipality.

An integrated package of investments is proposed which meets this overall vision and these specific priorities. The measures are pioneering and innovative as they seek to promote sustainable (or "green") transport, particularly within the MWC, and address the rapid urbanization that is taking place outside the MWC. The investments are designed to:

- ***Reduce the environmental impact of private car traffic in the MWC*** by reducing the overall volume of cars, by concentrating them onto well designed and managed main arterials, and introducing traffic calming<sup>8</sup> on other roads where appropriate. This is a very new area for Chinese cities and the first time in an urban transport project in China that the idea of traffic calming has been introduced. The project will educate transport professionals and pilot traffic calming techniques (this has already started during project preparation). For the first time, a standardized Chinese term for traffic calming has been established, "*jiaotong pingjing hua*", reflecting the emergence of new thinking by Xi'an.
- ***Foster a Functional Road Hierarchy***, by resolving the incompatible mixed functions of roads and implementing the desired pre-dominant functions through a combination of road

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<sup>8</sup> Covers a range of strategies and techniques designed to reduce the speed, volume and other adverse effects of traffic in urban streets

infrastructure improvements, traffic management, traffic calming, parking, public transport, and environmental measures.

- ***Encourage the use of public transport for travel to the MWC, and for access to newly developed area outside MWC***, by creating a pilot BRT line and giving priority to local public transport through the development of bus lanes coordinated with traffic management measures and service development through out the city.
- ***Encourage and give priority to cycling and walking*** by ensuring continuity and safety of pedestrian and bicycle routes to/from and within the MWC. In Xi'an the bicycle is an essential mode of transport for short and medium distance journeys. At relatively small expense, people can be encouraged to cycle. A bicycle route linking the tourist sites is being designed to continue the high quality of urban design shown on the city wall bicycle route. Through promoting bicycle use for the benefit of the natural environment in a targeted way to tourists, (by improving the urban environment for cycling) it is anticipated that local residents will also see the benefits and increase their bicycle use.
- ***Engender a human scale to the MWC streetscapes*** with road cross-sections related to the desired pre-dominant road functions and adjacent land uses, in proportion to building heights and made visually attractive through urban design, with provision for vulnerable road users, traffic management measures, and new road infrastructure where appropriate.
- ***Encourage tourism development*** by providing a more 'livable' environment within the MWC city through streetscape improvement, improved conditions for walking and cycling, improving traffic safety measures and recreating the road network in an archaeological site. The cultural heritage component demonstrates how modest transport investments can have a positive impact on individual historic and tourist sites. If successful they can be replicated in other locations.
- ***Provide the basis for sustainable improvement in air quality*** by creating a traffic pollution monitoring and analysis capability which can be developed after the project is completed to permit real time assessment of pollution levels.
- ***Manage on-street parking, freeing up space for buses and general traffic*** and remove parking on sidewalks, freeing up space for pedestrians who are otherwise forced to walk in the street.

These investments will assist the Xi'an Municipal Government in tackling the traffic pressures in Xi'an now and in the medium term. They also establish the foundations for Travel Demand Management (TDM) measures, and for complementary measures to reduce CO<sub>2</sub> emissions. The city leaders recognize that, with increasing motorization, additional measures will be required if traffic pressures are to be tackled on a continuous basis. More comprehensive transport planning including TDM and possible congestions pricing will be necessary to ensure that the quality of life and economic vitality of the city are enhanced. For these reasons, the city leaders have submitted a proposal for Global Environment Facility (GEF) funding of such measures as part of the GEF China World Bank Urban Transport Partnership Program.

The project also offers substantial global environmental benefits related to reduced greenhouse gas emissions. A portion of these benefits may translate into additional cash flow and financial returns to the Borrower through the sale of carbon credits under the Kyoto Protocol's Article 12 which establishes the Clean Development Mechanism (CDM) allowing public and private sector parties in industrialized countries to invest in greenhouse gas mitigation projects implemented in

developing countries. The CDM enables investors to receive a credit toward their emission reductions target under the Kyoto Protocol and associated regional agreements such as the European Union Greenhouse Gas Emission Trading Scheme (EU ETS). The Bank is currently exploring a Carbon Finance Project based on the emission reductions associated with the anticipated savings in fossil fuel consumption.

## 2. Objectives

The project development objective is to improve accessibility and mobility in Xi'an while protecting its cultural heritage and reducing the environmental impact of the urban transport system. The priority area for achieving this objective is the MWC.

Achievement of this objective is to be monitored by the following outcome indicators:

- (i) Trip modal split (including walking) in the MWC;
- (ii) Modal split of visitors at cultural heritage sites within the MWC; and
- (iii) Average per vehicle emissions.

Achievement of improved values of these indicators is facilitated through efforts to:

- (i) Reduce motor vehicle (MV) traffic – especially traffic without an origin or destination in the MWC, in part by making the First Ring Road a more attractive route for cross town traffic;
- (ii) Support the basic policy for urbanization in Xi'an by improving accessibility in Huxian through upgrading of the road network;
- (iii) Increase accessibility and mobility by bus, non-motorized vehicle (NMV) and walking by making journeys by these modes quicker, easier, more pleasant and safer;
- (iv) To protect the MWC from the congestion related environmental impacts (air pollution, noise, visual intrusion) of traffic by making journeys by bus and car inside the MWC quicker and smoother;
- (v) Reduce motor vehicle emissions through development and implementation of a Motor Vehicle Emission Control Plan;
- (vi) Protect cultural heritage by increasing bicycle and pedestrian usage for visits to these sites; and
- (vii) Provide the institutional capacity for continued development of policies and investment programs after the completion of the project.

## 3. Rationale for Bank Involvement

The GOC's agenda for the development of the western region (outlined in Paragraph 1) provides the context for economic development in the western provinces. The Bank's support to this region in China is in response to GOC's agenda.

The Bank is well positioned to support these GOC initiatives and to help Xi'an address its development challenges, due to the Bank's competitive advantage in financing and policy advice in urban development, urban transport and cultural heritage. The Bank brings a combination of fifteen years of experience working in China on urban transport with international experience

and good practice on urban transport solutions. Of particular relevance to this project is the Bank's experience in comprehensive resolution of congestion and air quality issues; creation of integrated and sustainable transport systems, institutional strengthening and capacity building. The project goes beyond simply improving the transport infrastructure in Xi'an to encompass urban management and supporting tourism sector development. The Bank's satisfactory engagement in urban and cultural heritage projects, as well as experience in developing cultural heritage sites<sup>9</sup> gives it a comparative advantage.

#### 4. Description

To achieve the above-mentioned objective and outcomes, the project comprises an inter-related package of six components separated into Investment Components and Enabling Components. The Investment Components are the heart of the Project and they comprise: (i) a Road Network Component; (ii) a Public Transport Component, and (iii) Cultural Heritage Component. These are complemented by Enabling Components which are operational, management and monitoring tools to realize the Investment Components, which comprise: (iv) a Traffic Management and Road Safety Component; (v) an Air Quality Management Component; and (vi) an Institutional Strengthening Component.

**The Road Network Component (RN)** [\$215.5 million including resettlement costs of \$16.5 million] will comprise: (i) in Xi'an city improvements to junctions on the First and Second Ring Roads and Taibai Nan Road to increase their functionality as major traffic routes; and (ii) upgrading of the road network in Huxian.

**The Public Transport Component (PT)** [\$77.3 million including resettlement costs of \$10.2million] will comprise: (i) A Pilot BRT line; (ii) Integrated public transport priority/traffic management measures on ten of Xi'an's most heavily used bus corridors; and (iii) Xinzhu bus depot .

**The Traffic Management and Road Safety Component (TM)** [\$35.7 million] will comprise: (i) An Area Traffic Control (ATC) system, with associated junction channelization; (ii) a Road safety program to investigate and analyze accidents, and implement remedial measures; (iii) Enforcement and Road User Education measures; (iv) Parking measures and equipment, and (v) traffic facilities for cyclists and pedestrians, and road marking equipment. All these investments complement investments in the ongoing ADB funded project.

**The Air Quality Management Component (AQM)** [\$16.7 million including resettlement costs of \$2.0 million] will support the Xi'an Environmental Protection Bureau (XEPB) in developing and implementing comprehensive plans for air quality improvement and reduction of vehicle emissions. It will comprise: (i) A building to house the newly established Xi'an Ambient Air Supervising and Monitoring Center; (ii) Equipment for motor vehicle emission inspection compatible with inspection methods issued by SEPA in July 2005; (iii) Civil works and equipment for two ambient air quality monitoring sub-stations and two traffic air pollution monitoring sub-stations for improvement of air quality monitoring network; (iv) Equipment for

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<sup>9</sup> Leshan Grand Buddha, Shenyang Imperial Palace, Chongqing Huguang Huiguan, Lijiang, Gansu, China; Petra, Wadi Rum in Jordan.



improvement of air quality assessment and information publication; and (v) Development of a Motor Vehicle Emission Control Plan (MVECP).

**The Cultural Heritage Component (CH)** [\$50.5 million including resettlement costs of \$9.4 million] will comprise: (i) Han Chang'an Site – recreation of the old Han Dynasty road network in the area of Weiyang Palace; and (ii) MWC - construction of a network of bicycle routes linking the main tourist sites

**The Institutional Development Component (ID)** [\$6.1 million, including GEF Grant of \$2.0 million] will support Xi'an in developing a capacity in the city for transport planning and policy making. It will comprise: (i) Urban Transport (UT) Policy & Comprehensive Planning; (ii) PT planning (GEF co-financed); (iii) Support for Implementation of Project Investments; and (iv) Domestic and International Training and Workshops.

## 5. Financing

Source:	(\$m.)
Borrower	249
IBRD	150
GEF	2
International Bank for Reconstruction and Development	150
	Total 401

## 6. Implementation

Xi'an Municipality and the Infrastructure Investment Company (IIC) will jointly enter into a Project Agreement with the Bank. IIC will be the Project Implementing Entity (PIE).

## 7. Sustainability

The project has been designed with sustainability in mind, and the emphasis has been on scaling 'down' rather than scaling 'up' – choosing investments that are appropriate in scale to the vision of the city leaders for Xi'an's future. However, the continued development of a sustainable transport system in Xi'an requires a change in the current incentive structure for city leaders to one which recognizes and rewards the implementation of sustainable infrastructure. Concepts such as "Green GDP" are just being developed in China. These concepts can help people understand the resource and environmental costs of economic development and avoid seeking economic growth at the expenses of precious resources and the environment. The project has attempted to promote the concept of balanced growth by funding the development of urban transport planning tools which would allow infrastructure investments commensurate with the available financial resources to be designed and optimized. The involvement of Xi'an in the GEF Program provides a further opportunity to advance sustainable transport in the municipality. The emphasis on preservation particularly within the MWC is reflective of the city's vision to protect and sustain its heritage and improve livability by reducing overall vehicle usage. The promotion of NMT, complemented by introduction of other concepts like congestion charging increases the chances of sustainability of the MWC.

The PT investments demonstrate the city's recognition that the sustainability of PT services rests to a large extent on giving priority to public transport. The ten high priority PT corridors in the project are being developed with this in mind, and the GEF grant will allow these lanes to be well designed, which is a key step towards their sustainability.

Socially sustainable development of the transport system in Xi'an requires that policies and investments be designed to benefit all transport users, particularly the socially disadvantaged and not just those with access to motor vehicles. The project places great emphasis on investments to provide mobility and accessibility for people that do not have access to a motor vehicle. The surveys of the disadvantaged groups undertaken during project preparation are being used in the design and refinement of service delivery. The continuation of these surveys throughout project implementation will allow provide feedback on designs to ensure that they do meet the needs of the disadvantaged.

The environmental sustainability of the project is dependent on the extent to which the overall level of local and global emissions due to increasing travel demand is monitored, contained or reduced. The whole AQM component is designed to address the issue of local emissions, and particularly the emissions per vehicle. The investments in facilities for public transport, cycling and walking are all designed to reduce overall vehicle usage and thus the overall level of global emissions. The proposed GEF project is designed to further address global emissions.

Based on the Bank's experience with the transport sector in China, the physical assets are expected to be constructed to high-quality standards and completed on schedule. Long-term sustainability of the road assets will depend on effective and timely maintenance, which is not being addressed in the project. However experience also shows that primary roads usually receive priority in maintenance budgets, and are generally maintained in good condition.

The sustainability of the policy, planning and design approaches introduced during project preparation and reflected in the project design will be facilitated by the further development of a transport planning capacity in Xi'an through the Institutional Development component (as well as the proposed GEF project).

## 8. Lessons Learned from Past Operations in the Country/Sector

**Client driven agenda.** Client ownership is crucial if political support and resources are to be maintained through the life of the project. The key items in this project (protection of the MWC, improvement of PT and BRT, improvement of air quality and institutional development) were announced early in the preparation process by the city leadership and have not changed. Investment in roads in Xi'an was not stated explicitly, but is understood to be an implicit part of the agenda (as in all Chinese cities). The project is also supporting implementation of the three recent policy initiatives on the national agenda – priority to public transport, road safety and stricter vehicular emission control.

**Inclusion of public participation.** International experience has shown that inclusion of the views of the public in the selection, planning and design of investments is essential to ensuring

successful implementation and operation. The recent Liaoning project<sup>10</sup> showed that benefits on the application of these technique in China. It is now being adopted as standard practice in Bank urban transport (UT) projects, and is being used in the design of the various investments in Xi'an.

**Balanced package of investments.** Proposals made by municipalities for Bank UT projects have also tended to allocate the majority of investments to road construction, without adequate analysis of travel demands, the needs of other modes (especially PT) or people's views. Even when the needs of other modes are adequately met, the majority of investment will go on roads. In this project, the need for investment in public transport and NMT was stressed, in part in response to the large investment in roads in the ADB project. The percent allocation to roads is the lowest of any Bank UT project in China.

**Improving Institutional Mandate for Traffic Management.** A thematic review of past Bank projects showed that traffic management implementation responsibilities assigned to the traffic police regarding activities for which they had no functional role (particularly the design and construction of infrastructure for pedestrian, cyclists and bus priority) had mixed success. With the exception of traffic signals and Area Traffic Control (ATC), most traffic management activities were also not directly linked to other project investments. In this project the traffic management component is essentially an operations and enforcement component comprising only activities that are fully under the control of traffic police. Physical measures for on street bus priority are included in the public transport component.

**Bus priority.** In Bank urban transport projects it has proved difficult to find agencies willing to take ownership of on street bus priority measures. Civil works are the responsibility of road agencies. The traffic police are responsible for the design of the traffic signal and traffic engineering aspects, and enforcement. Bus operators (who benefit from the measures) are only responsible for operations and adjusting schedules to make use of reduced travel times. A working group of all three agencies is needed to design and implement schemes – but even then the overall “owner/project manager” is still unclear. The solution would appear to be to create an agency, which is responsible for all aspects of BRT planning, implementation and operation to act as lead agency. This project, also incorporating ten integrated public transport priority/traffic management corridors, is trying this approach.

**Non-Motor Vehicles (NMVs).** In previous projects the Bank tried to enhance NMV mode share through networks of segregated and exclusive NMV and Motor Vehicle (MV) roads. However, experience has shown that only the exclusive MV roads got implemented. In this project, the Bank aims to maintain and enhance NMV mode share by: (a) ensuring that that NMVs are provided with appropriate facilities on as many roads as possible and that there is a spread of routes with NMV facilities across the network; (b) introducing the concept of an functional road hierarchy; and (c) creating an NMV predominant route with a high quality urban design and traffic calming to make cycling both a safe and pleasant experience.

**AQM.** The Bank conducted an AAA scoping study in 2006 focusing on motor vehicle emission control strategies in Chinese cities. The findings and suggestions from this study, as well as the

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<sup>10</sup> China - Liaoning Medium Cities Infrastructure Project (P099992)

experience from previous projects have been incorporated into the design of the AQM component from the early stage of project preparation. In particular, it has resulted in a focus on the establishment of an overall AQM system, and implementation of a Motor Vehicle Emission Control Plan, rather than just the development of such a Plan.

**Institutional Development/Capacity Building** is often seen by clients as a set of studies that the Bank wants done. Yet GOC agencies all say that they value the Bank for the expertise and knowledge transfer it brings to projects as much as the finance. Since developing a transport planning capability in Xi'an was stated by Xi'an as being one of the priorities of the project, the project includes what is considered by the Bank to be minimum amount of support to achieve this objective. The city will use GEF grant funding for the institutional development of public transport planning.

#### 9. Safeguard Policies (including public consultation)

<b>Safeguard Policies Triggered by the Project</b>	Yes	No
<a href="#">Environmental Assessment (OP/BP/GP 4.01)</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Natural Habitats ( <a href="#">OP/BP 4.04</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management ( <a href="#">OP 4.09</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property ( <a href="#">OPN 11.03</a> , being revised as OP 4.11)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Involuntary Resettlement ( <a href="#">OP/BP 4.12</a> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indigenous Peoples ( <a href="#">OD 4.20</a> , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests ( <a href="#">OP/BP 4.36</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety of Dams ( <a href="#">OP/BP 4.37</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas ( <a href="#">OP/BP/GP 7.60</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways ( <a href="#">OP/BP/GP 7.50</a> )	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### 10. List of Factual Technical Documents

##### **Feasibility Study and Plans**

1. Feasibility Study on a Traffic Guidance System for Xi'an (*Xi'an Shi Jiaotong Youdao Xitong Kexingxing Yanjiu Baogao*) (English, undated), Xi'an Public Security Bureau Traffic Police Detachment (XPSB)
2. "Traffic Control Improvement Sub-project of Urban Comprehensive Transport Improvement Project in Xi'an, The Feasibility Study Report, Engineering Design Academy of Chang'an University, June 2007" (Hard copy, English; electronic copies English and Chinese), XPSB
3. A3 Maps of ATC signal locations, CCTV locations and VMS locations (Hard and electronic copies, English), XPSB
4. Xi'an Urban Air Pollution Comprehensive Monitor and Control Construction Project Feasibility Research Report (in English), Xi'an Environmental Protection Bureau
5. "Feasibility Study Report of the Bikeway Project in the Ming Dynasty City Wall Travel Function Area", Engineering Design and Research Institute of Chang'an University, May 2007 (English, hard copy)

6. A3 colored map showing Bicycle Route classified by type of measure (Three hard copies, English)
7. Junction designs for Bei Xin Jie/Xi Qi Lu; Li Xin Jie/Tang Fang Jie; and Dong Xin Jie/Shang Jian Lu. Road section design for Bei Xin Jie south of Hou Zai Men. (Electronic and hard copies, Chinese)

## **Safeguards**

8. Outline of 11<sup>th</sup> Five Year Plan for Socioeconomic Development of Xi'an Municipality, in Chinese
9. Application Document for GEF Fund, October 7, 2006, in Chinese
10. Urban Public Transport Plan of Xi'an Municipality, by Xi'an Communication Bureau and Chang'an University, May 2006, in Chinese
11. Outline of 11<sup>th</sup> Five Year Plan for Socioeconomic Development of Hu County, February 8, 2006, in Chinese
12. Procedures and Document Required for Investment Project Approval, Xi'an DRC, March 2006, in Chinese
13. Statistical Abstract of Socioeconomic Development of Xi'an Municipality (2005), Xi'an Statistical Bureau, February 2006, in Chinese
14. Notice on Mobilizing Feasibility Study for Xi'an Urban Comprehensive Transport Improvement Engineering Project and Relevant Issues, Xi'an Municipal Development and Reform Commission, July 14, 2006, in Chinese
15. Domestic Procedures for EIA, informal, April 2006, in Chinese
16. TOR for Traffic Survey, Traffic Research Institute, April 2006, in Chinese
17. TOR for Bicycle Lane Sub-project, October 2006, in Chinese
18. TOC for Han Palace Sub-project, October 2006, in Chinese
19. TOR for Traffic Management Sub-project, October 2006, in Chinese
20. A set of government financial data, received in June and July
21. Consolidated Environmental Impact Assessment Report, Xi'an Environmental Science Institute, July 2007
22. Environmental Management Plan, Xi'an Environmental Science Institute, July 2007
23. EA Executive Summary, Xi'an Environmental Science Institute, July 2007
24. Environmental Impact Assessment Report for Xi'an Road Network Component, Xi'an Environmental Science Institute, June 2007
25. Environmental Impact Assessment Report for Huxian County Road Network Component, Xi'an Environmental Science Institute, June 2007
26. Environmental Impact Assessment Report for Public Transport Component, Xi'an Environmental Science Institute, June 2007 (Draft)
27. Environmental Impact Assessment Report for Bicycle Route in Ming Wall City Component, Xi'an Environmental Science Institute, June 2007
28. Environmental Impact Assessment Report for Road Network in Han City Component, Xi'an Environmental Science Institute, June 2007
29. Environmental Impact Assessment Report for Air Quality Management Component, Xi'an Environmental Science Institute, June 2007
30. Memo of Comments by the Bank on Chinese EIAs, February – May 2007

## **Public Participation**

31. 1<sup>st</sup> round reports (CN and EN) provided to Rakhi and Mariana in hard copies
32. Bank comments on 1<sup>st</sup> round report (in AM Annex)
33. A summary of issues raised under 1<sup>st</sup> Round public participation
34. 2<sup>nd</sup> round work plan sent via email
35. (i) Bicyclist/ foreign tourist surveys, (ii) responses to team design questions from the February mission, and (iii) responses on the solutions to public raised issues in FSR

## **Procurement**

36. Xi'an Sustainable Urban Transport Project (XSUTP) Procurement Capacity Assessment Report, the World Bank, second draft dated May 15, 2007, revised third draft dated July 10, 2007
37. Procurement manual/instruction, IIC (in Chinese), first draft in June 2007
38. Procurement Packaging Plan, IIC, discussed in June 2007

## **Financial**

39. Xi'an Sustainable Urban Transport Project Financial Management Assessment, Prepared by Yi Geng, Financial Management Specialist, EAPCO, Reviewed by David I, Sr. Financial Management Specialist, EAPCO
40. Xi'an Sustainable Urban Transport Project Draft Financial Management Manual (in Chinese) not finalized, PLGEO, June, 2007

## **Consultant Reports**

41. Urban Design of the Cultural Heritage Component, Mission Report Mission Report from 23<sup>rd</sup> June 30<sup>th</sup> June, 2007 By Hans Carl Jacobsen, Architect, Erik Holm-Petersen, Economist/Tourism Planner, Carlbro (English electronic)

## **Others**

42. Summary English version of Xi'an Urban Traffic Management Plan (*Xi'an Chengshi Daolu Jiaotong Guanli Guihua*) (September, 2003), Xi'an Public Security Bureau Traffic Police Detachment (XPSB)
43. English version of Cost Estimates for a Traffic Guidance System for Xi'an (October, 2004), XPSB
44. Report on Suggestions for Improving Traffic Management in Xi'an ("*The Item Suggestion File about the Improving Engineering of the Road Traffic Management of Xi'an City*"), English (hard and electronic copies), Chinese (electronic); July 2005. This is XPSB's proposals for the project scope.
45. Equipment List, Chinese, (hard copy), XPSB
46. ADB Project Equipment List (Chinese, hard copy), XPSB
47. Draft TOR for AAS ("*Study Outline of Road Traffic Safety and Accident of Urban Area in Xi'an*"), English, (hard copy), Chang'an University

48. Draft TOR for TDM Study (*"Study Outline on the City Transportation Demand Management for Xi'an"*), English, (hard copy), Chang'an University
49. Draft TOR for Parking Study (English), electronic copy
50. Draft TOR for ATC Technical Specification, (English), electronic copy
51. "Research of Xi'an Parking", dated 2005-12, (English and Chinese), electronic copy, XPSB
52. "Research on Area Traffic Control", dated 2006-01, (English and Chinese), electronic copy, XPSB
53. "Research on Traffic Safety in Xi'an", dated 2006-01, (English and Chinese), electronic copy, XPSB
54. "The Study of Traffic Demand Management of Xi'an City", erroneously dated 2006-12, (English and Chinese), electronic copy, XPSB
55. "The Project's Proposal of Xi'an Road Traffic Manage Development", dated 2006-02, Xi'an Traffic Police Detachment/Chang'an University, (English and Chinese), electronic and hard copies, XPSB
56. "The Planning of the Bicycle Line in the Ming City Wall Area", dated 2006-04, Xi'an City Wall Scenery Committee/Chang'an University, (English), electronic copy
57. "The Project's of the Bicycle Line in the Ming City Wall Area", dated 2006-04, Xi'an City Wall Scenery Committee/Chang'an University, (English), electronic copy

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