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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF

US$250 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

NANCHANG URBAN RAIL PROJECT

May 20, 2013

China and Mongolia Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective, January 1, 2013)

Currency Unit	=	RMB
RMB1.00	=	US$0.16
US$1.00	=	SDR6.21

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ATP	Automatic Train Protection
ATO	Automatic Train Operation
ATS	Automatic Train Supervision
AFC	Automatic Fare Collection System
BOQ	Bill of Quantities
DA	Designated Account
EA	Environment Assessment
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
ESMP	Environmental and Social Management Plan
FM	Financial Management
FSR	Feasibility Study Report
GDP	Gross Domestic Product
HSR	High-Speed Rail
JPAO	Jiangxi Provincial Audit Office
JPFD	Jiangxi Provincial Finance Department
km	Kilometer
NDRC	National Development and Reform Commission
NMFB	Nanchang Municipal Finance Bureau
NM	Nanchang Municipality
PAP	Project Affected Person
PCR	Physical Cultural Resources
PDO	Project Development Objective
PDR	Preliminary Design Report
PLG	Project Leading Group
PMO	Project Management Office
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SOEs	Statement of Expenditures
SQM	Square Meters

SS	Summary Sheet
TA	Technical Assistance
URC	Urban Rail Company

Regional Vice President:	Axel van Trotsenburg, EAPVP
Country Director:	Klaus Rohland, EACCF
Sector Director:	John Roome, EASSD
Sector Manager:	Mark Lundell, EASCS
Task Team Leader:	Gerald Ollivier, EASCS

CHINA
Nanchang Urban Rail Project

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PAD DATA SHEET

China

China: Nanchang Urban Rail Project (P132154)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

EASCS

Basic Information			
Project ID	Lending Instrument	EA Category	Team Leader
P132154	Specific Investment Loan	A - Full Assessment	Gerald Paul Ollivier
Project Implementation Start Date		Project Implementation End Date	
20-June-2013		31-Dec-2017	
Expected Effectiveness Date		Expected Closing Date	
31-Oct-2013		31-Oct-2018	
Joint IFC			
No			
Sector Manager	Sector Director	Country Director	Regional Vice President
Mark R. Lundell	John A. Roome	Klaus Rohland	Axel van Trotsenburg

Borrower: Ministry of Finance			
Responsible Agency: Nanchang Urban Rail Group Co.			
Contact:	Ms. Lin Jie	Title:	Chief Financial Officer
Telephone No.:	(86-791) 8396-1897	Email:	898547137@qq.com

Project Financing Data(US$M)					
[X]	Loan	[ ]	Grant	[ ]	Other
[ ]	Credit	[ ]	Guarantee		

For Loans/Credits/Others	
Total Project Cost (US$M):	2571.23
Total Bank Financing (US$M):	250.00

Financing Source	**Amount(US$M)**

Borrower	2321.23
International Bank for Reconstruction and Development	250.00
Total	2571.23

Expected Disbursements (in USD Million)

Fiscal Year	2014	2015	2016	2017	2018	0000	0000	0000	0000
Annual	5.00	20.00	55.00	100.00	70.00	0.00	0.00	0.00	0.00
Cumulative	5.00	25.00	80.00	180.00	250.00	0.00	0.00	0.00	0.00

Project Development Objective(s)

Proposed Development Objective(s)

The proposed project development objective (PDO) is to provide an effective urban mass rapid transit system of appropriate quality along the Line 2 corridor from ZhanQianNanDaDao Station to XinJiaAn Station.

Components

Component Name	**Cost (USD Millions)**
Component 1: Construction of Line 2	1,139.04
Component 2: Equipment for Line 2	624.99
Component 3: Design, Construction Management and Technical Assistance	185.48
Component 4: Safeguards and Other Construction Costs	370.65
Physical and Price Contingencies	100.87
Interest During Construction and Initial Working Capital	147.44
Front-end Fee	0.63

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [X]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**

Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants

Name	Recurrent	Due Date	Frequency
Implementation arrangements	X		Yearly

Description of Covenant

The Project Implementing Entity shall maintain throughout the period of implementation of the project an organizational structure satisfactory to the Bank including a Project Leading Group responsible for overseeing implementation, making decision on key projects issues and carrying out interagency coordination; and a Project Management Office responsible for project management and implementation.

Name	Recurrent	Due Date	Frequency
Integration Plan	X		Yearly

Description of Covenant

The Project Implementing Entity shall implement, through NM, the Integration Plan, as approved, or as adjusted when required, in consultation with the Bank.

Name	Recurrent	Due Date	Frequency
Safeguards	X		Yearly

Description of Covenant

The Project Implementing Entity shall cause NM and URC to implement the Safeguards Instruments in a manner and substance satisfactory to the Bank.

Name	Recurrent	Due Date	Frequency
Reporting	X		Yearly

Description of Covenant

The Project Implementing Entity shall monitor and evaluate the progress of the Project and prepare Project Reports based on Section 5.08 (b) of the General Conditions, including project indicators, and furnish the semi-annual Project Reports to the Bank by March 31 and September 30 each year, beginning on September 30, 2013.

Name	Recurrent	Due Date	Frequency
Financial management	X		Yearly

Description of Covenant

The Project Implementing Entity shall maintain a financial management system and prepare interim unaudited financial reports for the Project at the end of each calendar semester in form and substance acceptable to the Bank.

Name	Recurrent	Due Date	Frequency
Financial reports	X		Yearly

Description of Covenant

The Project Implementing Entity shall furnish the audited financial statements to the Bank and the Borrower not later than six months after the end of each fiscal year of the Project Implementing Entity.

Conditions

Name	Type
Subsidiary Agreement	Effectiveness

Description of Condition

The Subsidiary Agreement has been executed on behalf of the Project Implementing Entity, NM and URC in accordance with Section I.A.1 of the Schedule to the Project Agreement.

Team Composition

Bank Staff

Name	Title	Specialization	Unit
Gerald Paul Ollivier	Senior Infrastructure Specialist	Task Team Leader	EASCS
Kishor Uprety	Senior Counsel	Legal	LEGES
Holly Krambeck	Transport Economist	Project Finance	EASIN
Hooi Boon Phua	Senior Transport Specialist	Transport Policy and Transport Integration	EASIN
Guoping Yu	Procurement Specialist	Procurement	EASR2
Jun Zeng	Social Development Specialist	Social Safeguards	EASCS
Yiren Feng	Senior Environmental Specialist	Environmental Safeguards	EASCS
Reindert Westra	Senior Urban Transport Specialist	Urban Rail	EASIN
Yi Dong	Senior Financial Management Specialist	Financial Management	EASFM
Haiyan Wang	Senior Finance Officer	Disbursement	CTRLN
Junxue Chu	Senior Finance Officer	Disbursement	CTRLN
Xuan Peng	Program Assistant	Coordination	EACCF
Jingyi Zhang	Junior Professional Associate	Urban rail finance	EASIN
Shomik Raj Mehndiratta	Lead Urban Transport	Peer Reviewer	LCSTR

	Specialist		
Om Prakash Agarwal	Senior Urban Transport Specialist	Peer Reviewer	TWITR
Arturo Ardila Gomez	Senior Urban Transport Specialist	Peer Reviewer	LCSTR
Zhiyu Jerry Chen	Urban Specialist	Peer Reviewer	SASDU
Maria Luisa G. Juico	Program Assistant	Program Assistant	EASIN

Non Bank Staff

Name	Title	Office Phone	City
Yi Yang	Urban Transport Consultant		Beijing
Richard Bullock	Railway Economic & Financial Evaluation Advisor		Melbourne
Eric Ho	Urban Transport Modeling Specialist		
Andrew Salzberg	Transport Consultant		Washington
Li Qu	Transport Consultant		Beijing

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
China	Jiangxi Sheng	Jiangxi Sheng		X	

Institutional Data

Sector Board

Transport

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Transportation	Urban Transport	100		3
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Urban development	Other urban development	90
Urban development	Municipal governance and institution building	10
Total		100

I. STRATEGIC CONTEXT

A. Country Context

1. Thirty years of rapid economic growth have supported unprecedented urbanization in China. According to the National Statistics Bureau, China's urban population reached 690 million in 2011, accounting for 51 percent of the total population. The United Nations projects that the number of Chinese urban residents will grow to over 1 billion by 2030.

2. Urbanization has been accompanied by an equally rapid motorization. From 1990 to 2010, the number of private vehicles in Chinese cities increased at an average of 24 percent annually. While motorization has supported economic development and enhanced mobility at an individual level, it has also brought about a range of adverse economic, environmental and social impacts, including increases in traffic congestion, air pollution, fossil fuel consumption, greenhouse gas emissions and road accidents.

3. To mitigate these growing challenges, Chinese cities are increasingly investing in public transport networks and services, particularly in urban rail. As of June 2012, 14 Chinese cities were operating urban rail system with over 1,700 kilometers of track and 31 cities had urban rail plans approved. Approximately 5,000 km of urban rail is either in operation, under construction or under preparation.

4. To facilitate this process, the State Council adopted a directive on Prioritization of Urban Public Transport Development, on December 29, 2012. This Directive 64 provides a new framework for public transport, drawing on lessons learned from the past. It lays out four broad principles: (i) the provision of convenient services to users; (ii) the provision of integrated and interconnected transport services closely integrated with urban master plans and long term land use; (iii) the pursuit of green development with an emphasis on efficient and high capacity rapid transit systems on major corridors; and (iv) the determination of solutions that are context sensitive and appropriate.

B. Sectoral and Institutional Context

5. Nanchang is the capital city of Jiangxi Province and a renowned historic and cultural city in China with over 2,200 years of history. In 2010, the city of Nanchang covered an area of 618 square km with an urban population of 3.3 million in 265 square km of built-up urban area. Nanchang's GDP represented 23 percent of the GDP of Jiangxi Province and reached 269 billion RMB (approximately US$43.3 billion equivalent) in 2011, a 22 percent increase over the previous year, with an average GDP per capita of 53,000 RMB (approximately US$8,500 equivalent).

6. **Nanchang has rapidly expanded like many other Chinese cities, and has laid out detailed plans for future development in western Nanchang.** Nanchang is split in two by the Gan River. Nanchang plans to develop on both sides of the Gan River. The older part of the city, located on the eastern side of the river, has dense residential areas, commercial centers and public facilities. The development of the western side of the river started a decade ago with the construction of high density office buildings, a provincial stadium and a network of large

avenues. Further development is planned in the yet lightly developed southwest Nanchang, with additional residential areas, a central business district, a high-tech zone, a high-speed rail (HSR) station (under construction) and a large provincial government compound (under planning). According to Nanchang's Master Plan (2003-2020), total development in the western area will reach 95 square km by 2020, with a population of 950,000.

7. **Urbanization has been accompanied by rapid motorization and its consequences.** By the end of 2011, total auto vehicle ownership in Nanchang exceeded 470,000. Traffic surveys indicated that the share of all motorized road trips (including public transport) grew rapidly from 22 percent in 2002 to 30.5 percent in 2010, while 67 percent of trips were still by bicycle or walking. The average distance travelled per motorized trip was 9.4 km. Public transport accounted for only 13.5 percent of total daily trips – relatively low compared to cities with similar sizes and GDP such as Changsha (24.5 percent) or Wuhan (23.4 percent), where the share of walking and biking is lower. The eastern part of the city and the four bridges across the river now routinely experience congestion with average driving speed down to 11 km per hour during rush hour. Car traffic is expected to grow rapidly in the western part since the design featuring wide roads and ample parking is amenable to car traffic.

8. **In response to these challenges, the Nanchang Municipality (NM) aims at developing an integrated urban transport system that anticipates the needs arising from its new urban development.** NM plans to implement attractive alternatives to car transport by emphasizing integrated and efficient public transport services. NM has adopted the following specific targets to be achieved by 2020: (i) rapid transport with all car trips between any two points within the city core below 30 minutes; (ii) safe transport with less than 5 fatalities per 10,000 vehicles; (iii) efficient transport with a public transport mode share over 30 percent and private car mode share below 25 percent; (iv) comfortable transport with reasonable public transport load in terms of passenger per square meter during peak hours; and (v) eco-friendly transport with noise at junctions below 60 dB and emission per vehicle cut by half compared to today.

9. **NM sees urban rail as the backbone of such an integrated public transport system**, able to attract passengers with growing expectations in terms of quality and comfort. In 2008, it developed an urban rail network plan consisting of 5 lines, totaling 168 km and 128 stations. The first stage, as set forth in the Nanchang Urban Rail Transit Construction Plan (2009-2016) approved by the National Development and Reform Commission (NDRC), includes the construction of Line 1 and Line 2 from 2009 to 2016. The construction of Line 1, totaling 28.7 km with 24 stations, one depot and one train parking yard started in February 2012 and is expected to enter operation in December 2015. Line 2, from ZhanQianNanDaDao Station to XinJiaAn Station, to be financed under the project, will have 23.78 km with 21 stations and one depot according to its latest Preliminary Design Report (PDR). NM expects to start the construction of Line 2 in mid-2013 and put it in operation before end 2017 as part of the approved Urban Rail Transit Construction Plan. NM also plans the construction of Line 3 and phase 2 of Line 1 and 2 by 2020 and may launch the construction of additional lines sequentially (Line 4, 5), subject to further approval.

10. **Bus services will be re-organized in accordance with the urban rail network to better feed the urban rail network.** By the end of 2011, the Nanchang Bus Company (a state-

owned enterprise operating all bus services in the city) was a major component of the urban transport system with total annual passenger ridership of 548 million. It operated 162 bus lines, forming a 3,400 km long network, with 3,095 buses in operation. Since the urban rail network will need to be closely integrated with bus services, the bus company has launched a specific study on bus route optimization which plans for route re-organization in the short-term (before urban rail opening) and medium- to long-term (after urban rail opening).

11. **While multi-modal integration is central to NM's urban transport strategy, its implementation is often institutionally challenging.** Urban rail systems compete effectively with car transport only when well-integrated with other modes of transport. From an end-user perspective, this integration needs to combine the necessary physical facilities for different transport modes[1], with seamless transport services in terms of schedule, fares, fare media and information. Chinese design institutes and construction companies have accumulated extensive experience in building urban rail lines in China. However, the design and implementation of seamless transfers across modes and related technologies and policies have remained an institutional challenge that NM seeks to address, learning from good international and domestic practices. NM has prepared an integration plan for Line 2 to that end (Line 2 Integration Plan). This Plan includes several interchange locations between bus and rail along the network alignment.

12. **NM also aims at better coordinating its land use planning in western Nanchang with the new Line 2 in terms of planning, connection and financing.** Nanchang has a dense urban core located on the east side of the Gan River. That area offers transit supportive densities of over 10,000 residents and jobs per square km. Line 2 will also connect the new HSR station in western Nanchang to eastern Nanchang and its existing rail station. In between, Line 2 will go through areas in western Nanchang that are currently lightly populated but for which NM has drawn plans for major population growth over the period 2020-2030. By building part of Line 2 in anticipation of future urban development, Nanchang aims to guide its urban structure and optimize its urban space layout by applying transit oriented development concepts to these new urban areas. NM will also seek to draw on the increase in land value in the city as a result of better public transport to support the project financing, by transferring primary or secondary development rights to the municipality-owned Urban Rail Company (URC).

C. Higher Level Objectives to which the Project Contributes

13. The Bank's Country Partnership Strategy (2013-2016) for China is aligned with the country's 12th Five-Year Plan, and focuses on two strategic themes: supporting greener growth and promoting more inclusive development. This project will support both of these themes.

14. The project will support the promotion of low carbon urban transport, by emphasizing urban transport integration and land use planning in the capital of a central province. It will help pilot transit oriented development along a mass transit corridor in support of the public transport policies in China. The project will also promote more inclusive development by introducing fare

[1] Such as provision of parking spaces for bicycles, allocation of taxi waiting area, minimized walking distance between metro entrance and bus stop, or provision of park-and-ride facilities.

policies integrating affordability considerations, while considering long term financial sustainability requirements. Jiangxi Province is a central province of China ranking 24 out of 31 provinces (including the four province-level municipalities) in terms of gross regional product per capita.

15. The project will contribute to the definition of solution for urban transport in China by bringing lessons learned in urban rail development and financing to the attention of other cities developing or planning to develop urban rail systems. A first event of this type took place on December 7, 2012, gathering practitioners from 16 cities in China and sharing good practices in alternative analysis, sustainable financing and public transport integration for urban rail. Further events will take place during the implementation of the project. These events will contribute to TransFORM, a collaborative solution platform to make urban transport safer, cleaner and more affordable in China, announced as a first pilot under the China and World Bank Knowledge Hub for Development established in November 2012.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

16. The proposed Project Development Objective (PDO) is to provide an effective urban mass rapid transit system of appropriate quality along the Line 2 corridor from ZhanQianNanDaDao Station to XinJiaAn Station.

B. Project Beneficiaries

17. The direct beneficiaries of the Project are the individuals who will live, work or commute along the alignment catchment area that Line 2 will serve (about 506,000 in 2020). Public transport users are likely to experience significant improvement in mobility and accessibility to their homes, jobs and urban services in terms of speed, safety and commuting quality. Nanchang residents will benefit from the project as a result of a slowdown in the growth rate in passenger car use. This will limit the negative local externalities caused by private car traffic (principally air pollution, congestion and traffic accidents). Businesses in the catchment area will also benefit from improved accessibility.

18. In the longer term, such improvement in transport infrastructure will improve the attractiveness of the city as an economic hub for the region, attracting investments and creating opportunities for local residents. In particular, Line 2 will enable a direct mass public transit connection between the new HSR station, the new Central Business District on the west side of the river, the existing city center and the existing rail station. This will help integrate a variety of critical modes of transport at both urban and regional scales, providing benefits to long distance and regional passengers.

C. PDO Level Results Indicators

19. Achievement of the PDO will be measured by the following indicators:

(a) Effective urban mass rapid transit system, measured by ridership level compared to forecast, time savings for users on Line 2, and the increase in the proportion of urban rail commuters along Line 2 with access to a car; and

(b) Appropriate quality, measured by the proportion of users that rate the service as satisfactory or better.

III. PROJECT DESCRIPTION

A. Project Components

20. The project includes the following four components.

21. **Component 1: Construction of Line 2.** This component includes all construction activities for the Urban Rail Line 2 (about 23.78km). Line 2 will connect western and eastern Nanchang. It will start from the Line 2 depot, go through the ZhanQianNanDaDao Station in southwest Nanchang, run along the west bank of the Gan River, up to Chunhui Road, then move east under the Gan River onto Yangming Road and turn south to XinJiaAn Station in southeast Nanchang. Line 2 includes 21 stations, which will all be located underground and connected by tunnels. The Line 2 depot for maintenance and stabling will be located above ground at the end of Line 2 in southwest Nanchang. The project contributes partially to the cost of a command and control center for the urban rail network. Six interchange stations will provide convenient interchange with other urban rail lines.

22. The Bank loan is expected to be fully used under this component. It will support the construction of eight stations and eight tunnels in between. All are located on the east side of the Gan River. These civil works will take place in the densest part of the city and are expected to be among the most complex. Those stations include interchange stations with the planned Line 3 and future Line 4, and an interchange with Nanchang east railway station.

23. **Component 2: Equipment for Line 2.** This component includes all the equipment necessary to the successful operation of Line 2 such as rolling stock, power supply, control system, signaling system, communication system, monitoring system, fare collection system, safety and security system, ventilation and air conditioning system, water supply, sewerage and fire protection system, and station auxiliary equipment.

24. **Component 3: Design, Construction Management and Technical Assistance.** This component includes (i) activities for design and preparation of the project; (ii) activities for construction management and quality assurance; and (iii) technical assistance and capacity building to relevant staff in NM and the URC to take steps to improve ridership levels (ridership modeling, scenario testing, fare integration), to increase land value around stations, and to improve financial management and internal audit functions for the Nanchang URC. These consulting services are expected to be funded by the URC, under terms of reference discussed with the Bank.

25. **Component 4: Safeguards and Other Construction Costs.** This component will include the land acquisition and resettlement costs, construction site preparation (environmental

mitigation measures) as well as other project related construction costs such as engineering insurance, work safety assurance, inspection and acceptance, and project cost estimation.

B. Project Financing

Lending Instrument

26. The World Bank will finance the Project through an IBRD specific investment loan (SIL). The commitment-linked loan will be payable in 30 years, including a five year grace period, level repayments of principal at six-month LIBOR-based US dollar, plus variable spread, with all conversion options, and a front-end fee of 0.25 percent.

Project Cost and Financing

27. The estimated total cost of the Project is US$2,421.03 million excluding financial cost and US$2,571.23 million including financial costs during construction, to be funded with US$2,321.23 million in local counterpart financing (including commercial loans secured by the URC) and a US$250 million IBRD loan. The Table below (in US$ million) provides an overview of project costs and financing arrangements.

28. The URC will receive financing from NM, estimated to represent 37.3 percent of construction expenditures. In addition to the World Bank loan, the URC has completed negotiations with a consortium of domestic banks covering the remainder of project expenditures.

Project Components	**Project cost**	**IBRD or IDA Financing**	**% Financing**
1. Construction of Line 2	1139.04	249.37	21.9%
2. Equipment for Line 2	624.99	0	0%
3. Design, Construction Management and Technical Assistance	185.48	0	0%
4. Safeguards and other Construction Costs	370.65	0	0%
Total Baseline Costs	**2320.16**	**249.37**	**10.7%**
Contingencies	100.87	0	0
Total Project Costs	**2421.03**	**249.37**	**10.3%**
Interest During Implementation	147.44	0	0
Initial Working Capital	2.13	0	0
Front-End Fees	0.63	0.63	100%
Total Financing Required	**2571.23**	**250.00**	**9.7%**

C. Lessons Learned and Reflected in the Project Design

29. The project design reflects the key lessons learned from international urban rail experience. Relevant lessons include:

(a) Multi-modal integration is critical for an urban rail system to achieve its potential as a mass transit mode. Bus services need to be adjusted to complement rather than compete with rail services, with integrated fare structures and fare media, and adjusted operational schedules. Physical interchange facilities need to be built for buses, cars and bicycles to support such integration, with close attention to pedestrian accessibility. This requires a multitude of governmental and non-governmental stakeholders with disparate and sometimes conflicting interests to work together. These include different levels of government such as municipal agencies with fare-setting authority, municipal level planning, land and transport management agencies, as well as enterprises such as bus companies. Achieving effective coordination in this respect primarily serves the best interests of the rail operator - and requires sustained effort on its part. These aspects have been systematically discussed as part of project preparation. NM and the URC prepared, in consultation with all concerned agencies, the Line 2 Integration Plan, which includes clear implementation responsibilities and arrangements. This Plan has been adjusted to reflect public consultation, and was endorsed by NM on April 9, 2013. NM will closely monitor its implementation as part of the project.

(b) Urban rail projects can achieve desired compact growth patterns only as a part of an integrated package of activities. In regions where urbanization rate and income levels are both increasing rapidly, isolated public transport improvements have only a limited impact on spatial development patterns. Effective public transport needs to be coordinated with complementary urban growth and transport strategies that actively manage rather than simply accommodate automobiles. At the moment, broader transport policies in Nanchang (as in almost all second and third tier cities in China) are still supportive for automobiles, with rapid expansion of parking and road space. The city has started to adjust its approach, and, although overnight progress is unlikely, the construction of the urban rail network makes potential restrictions on car use politically palatable while also underscoring their importance to the success of the urban rail program. In terms of urban design, as in almost all cities of China, proposed development along the alignment is likely to be of high density by western standards. Nonetheless, improvements could be made in the degree to which design creates a walkable environment with smaller setbacks and street widths, easily accessible by bikes, as well as the degree to which density is tied explicitly to transit proximity, rather than being uniformly dense. These aspects have been discussed as part of project preparation with walkability surveys at each station and review of the land use plans along the line. The NM leadership confirmed that the results will be integrated in the land use planning. Dialogue on these matters will be further pursued as part of project implementation.

(c) Demand forecasts for urban rail tend to be optimistic because they assume multi-modal integration and an integrated public transport oriented urban management approach that is not fully realized in practice. There is a need to ensure that the financial and economic forecasts include sensitivity analyses that reflect this consistent *ex-post* finding. The URC has supported the preparation of independent, updated ridership forecasts (in conjunction with a design institute responsible for the city's comprehensive transport model) that allow for much more refined analysis of critical variables that support metro ridership, including: bus and rail level of integration; changes in fares; pace of land development; and the impact of restrictions on car and motorcycle use in

central areas. Although fairly standard practice in many western countries, this level of analysis is not yet common in Chinese cities, and represents a significant opportunity for enhanced analysis, dialogue, and policy refinement within NM agencies. This work will form the basis for continued dialogue and will be furthered as part of Component three.

30. The project design also reflects the lessons learned from the Bank's portfolio of urban transport projects including other urban rail projects in China, especially in achieving effective collaboration among various municipal agencies. Physical and service integration of the urban rail system with other transport modes depends significantly on the effective coordination and alignment of interest among different line agencies. In China, institutional arrangements for urban transport planning and management are fragmented, making coordination by a single line agency difficult.

31. In this respect, the Bank's experience from the Kunming Urban Rail Project has brought a number of lessons. The initial emphasis of the Kunming URC was on designing and constructing the urban rail system as quickly as possible with perfunctory attention paid to executing the integration plan with other modes. By now this has been replaced with a focus on the different urban transport companies and government departments working closely with each other to ensure that the bus and rail systems are integrated as a system within a more holistic urban transport policy framework for the city. Key to this shift has been the appointment of a single Vice Mayor responsible for both the bus and rail system, as well as the Central Government's requirement for Kunming to develop a holistic transport action plan as one of the cities appointed as a Chinese Transit Metropolis.

32. The integration of physical urban rail investment with surrounding real estate features and development plans has been a second area of focus in Kunming. In some cases such integration was initiated early, while in other cases it took place later, after metro designs were near completion, such that a redesign and a re-tendering of contracts became necessary. While this sequence of decision making is understandable, it illustrated the value of pursuing such integration at an early stage.

33. Hence for Nanchang, a high level group, chaired by the Vice Mayor in charge of urban development and gathering relevant NM agencies, has been established to ensure the effective coordination and collaboration required under the project. Detailed coordination has taken place among agencies and has been integrated in the preliminary design stage and the Line 2 Integration Plan, so that issues and suggestions to improve multi-modal and urban integration could be surfaced to the city's leadership in time before the final design is set.

34. More generally, the project design reflects recommendations emerging from the Independent Evaluation Group review of the transport sector (*A Decade of Action in Transport: An Evaluation of World Bank Assistance to the Transport Sector, 1995-2005*) and IEG report on financial sustainability[2].

[2] Specifically, the following three questions from IEG's report were considered:
(i) Does the agency responsible for developing, operation, and maintaining the system have the necessary capacity to organize and manage the relevant components and coordinate these with the development of the city and its major transportation nodes?

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

35. Jiangxi Province will sign the Project Agreement and will be the Project's formal implementing entity, responsible for managing, coordinating and monitoring the Project implementation. It will delegate most of these responsibilities, through NM, to the Nanchang URC. The URC is an entity of NM responsible for implementing the Nanchang Urban Rail Transit Construction Program as well as raising, managing and repaying funds for the program. Jiangxi will enter a subsidiary agreement to make the proceeds of the Loan available to NM and through NM to the URC. The subsidiary loan will be repaid by the URC.

36. To provide overall governance and leadership for project preparation and implementation at the municipal level, a Project Leading Group (PLG) was established by NM in August 2012. The PLG is currently chaired by the Vice Mayor, co-chaired by the Deputy Municipal Secretary General and the Board Chairman of the URC, and composed of top leaders from all key municipal line agencies, including the Finance Bureau, the Development and Reform Commission, the Urban Management Commission, the Planning Bureau, the Construction Commission, the Land Resources Bureau, the Environmental Protection Bureau, the Housing Management Bureau, the Price Bureau, the Traffic Management Bureau and the Bus Company.

37. A Project Management Office (PMO) has been established under the Urban Rail Development Headquarters Office/URC, chaired by the URC Board Chairman. It will be responsible for the daily operations of the Project, including project management, technical preparation, environmental and social safeguards, procurement, financial management, and monitoring and evaluation in accordance with the Bank's policies and guidelines.

B. Results Monitoring and Evaluation

38. **Annex 1** lists the PDO level results indicators for the project as well as the intermediate results indicators for each component. The PMO will coordinate the relevant agencies in collecting data required for monitoring and evaluation of outcomes. The PMO will review the results on the basis of various progress reports, and take appropriate corrective actions as needed.

C. Sustainability

39. Long-term sustainability of the urban rail system will depend on early consideration of long-term financial resources and coordinated planning among different agencies whose responsibilities will be affected by the urban rail program. In general, the overall policy environment to achieve these outcomes is favorable in China. Municipal boundaries cover both urban and suburban areas, limiting fragmentation of metropolitan governance, while local governments have a strong level of control over key factors such as bus service, urban land

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(ii) Is the agency responsible for delivering urban transport services financially self-sufficient or do they require periodic infusions of funds from the government?
(iii) Are the urban transport facilities or services congested now or likely to become congested in the near future?

development and fares. Moreover, the national government is actively promoting public transport priority.

40. While construction of an urban rail line is a large financial undertaking, NM is expected to be able to afford the contributions to capital costs and operations that Line 2 will require[3]. Based on the analysis carried out as part of preparation, even under pessimistic scenario tests for low ridership and high operations and maintenance costs, the required NM contributions to support the project (inclusive of disposable income and land transfer proceeds) is not expected to exceed 1.2 percent of NM disposable income in any given year during construction or operations[4]. The URC has been trained under the Project to use the model and is expected, as the Project progresses, to ensure that NM is fully aware of the future commitments required to ensure sustained high-quality operations.

41. Social and economic sustainability of Line 2 will be dependent on ensuring reasonable fares and sufficient ridership for Line 2 in the mid-term. The level of fares applied in China usually reflects a strong emphasis on fare affordability. Line 2 fares are expected to follow a similar pattern. The use of integrated fares between bus and urban rail are expected to facilitate affordability for those who need to transfer multiple times or for those who make chained trips. The URC and NM fully understand the need to optimize land use planning and urban rail integration, as well as public transport integration around the Line to support the development of ridership. Their efforts in that respect will be supported by technical assistance under Component three.

42. From a broader sustainability perspective, Line 2 is planned as part of a broad hierarchized public transport system, including other urban rail lines, a bus rapid transit system and a bus network. This project will support the integration of Line 2 in this network to provide effective accessibility and mobility. In the longer term and beyond the project, Line 2 will also support sustainable patterns of urban growth in western Nanchang, building on transit oriented development principles and its location between the two major rail stations in Nanchang. Western Nanchang offers a supportive environment given the availability of developable land, and the urbanization trends in China. The project will support exchange of experience with other cities with mass transit system regarding the development of urban space of high density, mix use and high quality nearby stations.

[3] During project preparation, a financial model was developed to determine the Project's financial sustainability. It incorporated estimated operations and maintenance costs over the study period, as well as expected replacement costs. These future expenditures were evaluated against expected revenues from operations and real estate development by the URC. The results of this analysis were used to assess the level of annual municipal government contribution required to support debt service obligations, continuing operations, and critical replacements, relative to expected disposable income in each year of the study period. Scenario tests were conducted on the results, to determine level of financial sustainability risk.

[4] Until 2042, when substantial expenditures on equipment replacement are expected.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

Risk Category	Rating
Stakeholder Risk	M
Implementing Agency Risk	
- Capacity	S
- Governance	M
Project Risk	
- Design	S
- Social and Environmental	S
- Program and Donor	L
- Delivery Monitoring and Sustainability	S
Overall Implementation Risk	S

Note: L (Low), M (Moderate), S (Substantial)

B. Overall Risk Rating Explanation

43. The project has been rated Substantial for Overall Implementation Risk due to the following considerations:

(a) This is the PMO's first engagement with the Bank and it is unfamiliar with the Bank's fiduciary and safeguards policy. Substantial training on Bank's policies has been and will be provided to the PMO. External consultants experienced in World Bank fiduciary and safeguards aspects will support the PMO. The project procurement packaging has been kept simple to facilitate implementation. The Bank and NM will also increase their monitoring activities to ensure compliance with financial management (including availability of counterpart funding), procurement, and safeguards aspects in the early stage of implementation.

(b) Urban rail projects are technically complex with many construction risks that require close attention. The URC has engaged independent reviewers to review the preliminary design. In addition, the preliminary design for stations and tunnels funded by the loan has been reviewed and adjusted, where appropriate, to reflect technical recommendations from another independent reviewer selected by the Bank.

(c) Urban rail projects need to focus on integration and institutional coordination challenges. The preparation of a well-coordinated Integration Plan as part of preparation indicates this is a primary focus of NM leadership.

(d) The URC needs to ensure timely availability of large commercial loans, and set up of fare policies that balance affordability and financial sustainability. The URC has negotiated with domestic banks the necessary funding and provided written letters from

lending institutions confirming the availability of loans. Project reporting will cover the overall project and enable the monitoring of any shortfall in counterpart funding, in case such shortfall occurs.

(e) The planned schedule including construction start in July 2013 and starting operation in 2017 is achievable but tight. The preparation is at an advance stage, with prequalification already initiated.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

Economic Analysis

44. According to the latest ridership estimates, the Nanchang Line 2 is expected to carry approximately 250,000 passengers in the third year of operation (assumed 2020), the majority of whom will be former bus passengers. Based on this ridership and growth rates in line with forecasts for urban growth in Nanchang, the line is expected to deliver an economic rate of return of approximately 9.6 percent. The results of this economic analysis and sensitivity analysis are presented in the economic analysis report available in the project files.

45. The benefits of the Line 2 considered in this analysis fall into three main categories:

- The change in user benefits for passengers transferring to the Line 2; this is a combination of travel time savings, together with any changes in interchanges, headways and service frequencies.
- Changes in the operating costs of urban transport i.e. the cost of the Line 2 net of the change in the cost of operating the urban bus network as well as the operating costs of car users who also transfer to transit.
- Changes in the external costs of the urban transport system. These have been identified in five groups:
    - Accident benefits due to the reduced travel on the surface street network;
    - Congestion benefits for other road users;
    - Pollution benefits from the reduction in car and bus traffic;
    - Noise benefits from the reduction in motorized traffic, and
    - Greenhouse gas benefits due to the reduction in petroleum-powered vehicles.

46. The above benefits are all quantifiable and were used in the economic analysis. There are, however, a number of non-quantifiable benefits which were not captured in the cost-benefit analysis but are worth noting:

- *Accessibility:* The Line 2 will promote interconnection between residential and employment areas and social facilities (hospitals, schools) by lowering the obstacles

to travel within the city. Although the economic evaluation quantifies improvement in travel time savings, it does not directly quantify the benefits of this increased accessibility for residents of Nanchang. The urban rail system will provide increased access to economic opportunity for all of Nanchang's residents, including those of low income.[5]

- *Compact City Growth:* One of the primary goals of Nanchang's planned urban rail system is to focus urban growth on the upgraded public transport network. Experience elsewhere has demonstrated that this will require a package of measures designed to support the new urban rail network. Over the long term, compact urban growth can substantially reduce the energy intensity and greenhouse gas emissions of urban areas. This is particularly crucial as decisions on urban development made now will be 'locked in' over the long term – for better or for worse. These long term secondary impacts are not quantifiable in a traditional cost-benefit analysis.

47. The analysis relies on a spreadsheet model built on the outputs of a full travel demand model built and maintained by the Shenzhen Urban Design Institute, based on household surveys conducted in 2010 and urban growth forecasts prepared in conjunction with the Nanchang Urban Planning Bureau. To augment this analysis, a bottom-up analysis based on current bus ridership was prepared. It provides a basic 'reality check' on the feasibility of the base year numbers above.

Financial Analysis

48. **Construction Period.** The expected total project cost, inclusive of contingency and excluding financing charges, is estimated to be US$2.42 billion, or US$102 million per km. This cost estimate, which is based on the completed preliminary project design, is in line with the expected costs of other Bank-supported urban rail projects in China. During the construction period, NM will pay 37.3 percent of construction expenditures. The largest of these contributions, about US$230 million, is expected to occur in 2017, and would equal 1.2 percent of expected disposable income in that year. Disposable income is comprised of tax revenue, non-tax revenue, fund income, and income from central government transfers. Remaining construction costs will be primarily supported through domestic loans.

49. **Operating Period.** Operating and maintenance costs, by the fifth year of operations (in nominal terms), are expected to be US$89 million. Operating revenues (fares, advertising, and retail space) in the same year are expected to be US$56 million – resulting in a fifth year recovery ratio of 0.63. Due to expected steady increases in ridership as western Nanchang develops, this recovery ratio is expected to exceed 1.00 by operating year 15. In addition to operating revenue, there are two sources of income derived from land that may be used to support rail operations and debt service payments, namely, real estate development near stations (expected net profit of US$166 million) and land transfer fees. For land transfer fees, to date, 25 parcels covering 10,878 of developable mu (1 mu=666 square meters) (out of a total envisaged

[5] Tools have begun to be developed to directly measure the accessibility impacts (i.e., the increase in the number of jobs that can be reached within a given time frame by a given mode for different social groups) of major infrastructure projects. Due to a lack of data and the relative novelty of these techniques, this study did not seek to quantify these impacts in Nanchang.

50,000 mu) have been formally allocated to the urban rail program, representing a potential net contribution of US$3.54 billion to the program. These parcels will be transferred on an as-needed basis to support debt-service and operating subsidy requirements. An estimated average US$142 million per annum equivalent to less than 1 percent of disposable income per annum may be required from this source to support Line 2 operations, debt service obligations and system replacement costs.

50. **Indicators and Scenario Testing.** The financial sustainability of the project has been tested under multiple scenarios – low ridership, high operations and maintenance costs, high replacement costs, and higher fares. Ultimately, given the manageable government contribution requirements relative to expected municipal disposable income over the study period, as well as substantial gap-filling measures offered through land transfer revenues, from a financing perspective, the city would be able to support this Project even under adverse risk scenarios.

B. Technical

51. The Bank's focus during preparation and project design was on three key issues:

(a) Identifying and addressing barriers to the development of an effective multi-modal public transport system with urban rail as the network backbone;

(b) Reviewing the technical aspects and risks related to the civil work construction of tunnels and stations; and

(c) Ensuring that the design of the stations and inter-modal integration facilitate safe and easy access from the user's perspective in a holistic manner.

52. **Multi-modal integration.** A fundamental barrier to effective multi-modal integration common to many metro projects in China is that the project scope for urban rail projects does not include associated bus, bicycle, taxi, and car parking facilities. While the need and value of such facilities is recognized, institutional or implementation structure often do not exist to ensure that demand for such interchange facilities is identified and such facilities are planned for and built.

53. NM has put in place institutional arrangements to ensure coordination and integration, and the URC and NM have prepared a Line 2 Integration Plan. This Plan includes implementation responsibilities, as well as funding, construction and operation arrangements. NM has organized consultation with relevant agencies and the public, and a revised version of the Plan was endorsed by NM on April 9, 2013. Its implementation will be closely monitored. The Plan identifies parcels of land for key interchanges (scaled to their respective demand based on traffic modeling). The design of the station entrances has been adapted to facilitate transfers to and from these facilities.

54. Additionally, as part of the ridership analysis described above, the URC and bus company have started analyzing the impacts of Line 2 on bus routes in the corridor. Principles for route restructuring have been outlined in the Integration Plan, and the bus company has launched a specific study on bus route optimization. This topic will remain a priority supported as part of implementation and monitored as part of the result framework. Previous work

supported by the Bank in Beijing analyzing potential route changes in a new metro corridor will be used as a resource.

55. Finally, in terms of integrated fare policy, NM has already introduced a multi-use contactless smartcard for small transactions and put it in use on the bus system. This smartcard will also serve as the fare medium on Line 2. On the policy side, the URC and the Municipal Price Bureau have started to discuss on the design of fare structures, as part of project preparation, and established a tentative schedule for setting up fares. The fares are expected to provide potential riders an integrated rail-plus-bus public transport system rather than competing rail and bus choices. The refined ridership analysis and financial model described above enable the URC to analyze the ridership and financial impacts of various fare policies on both the urban rail and bus systems, and will help support dialogue going forward. It is expected that decisions on tariff policy will take place one year before Line 2 opening. Continued dialogue on this aspect will form a critical element of project support going forward.

56. **Technical Aspects**. The Project Feasibility Study Report (FSR) and PDR have been prepared by the Guangzhou Metro Design Institute, a Chinese design institute with significant prior experience with urban rail projects in other cities in China. Line 2 will use technology that is compatible with Line 1 (currently under construction) and Line 3 (being planned). Underground tunnels will be constructed mostly using the shield tunneling method with a tunnel boring machine, with half cut-and-cover and open cut methods used selectively for a few tunnels. Underground stations will be constructed by open-cut bottom up method, except for an expected three stations where half cut-and-cover method will be used to reduce traffic disruptions.

57. The project entails major investment in survey and design (US$72 million). The preliminary designs of the entire line have been reviewed by the Jiangxi Provincial Development and Reform Commission. A supplemental review has also been carried out for all Bank funded stations. From a geological point of view, construction of tunnels and underground structures in alluvial soil in strong presence of water in an urban setting entail risks that need to be carefully managed. The review covered the structural design and design criteria, structural stability of surrounding buildings, construction techniques and parameters, proposed excavation approach, groundwater management, risk management, passenger safety and contingency plans. Based on the review, designs have been modified and mitigation measures introduced to mitigate both geological and engineering risks. An independent third party has been hired to assess the risk for each construction site and develop mitigation measures. For any site rated above Grade 2, risks including a mitigation plan are reported to the municipal government for overall control.

58. Construction management, supervision and commissioning have been duly budgeted for (US$93 million), drawing on the experience of Line 1. A Quality and Safety Committee will oversee the quality and safety aspects. A Quality and Safety Department under the URC will be responsible for construction risks. A risk control consulting company will prepare regular report on risks and mitigation measures. The Quality and Safety Department will conduct random checks on site to control the implementation of mitigation measures. A Quality and Safety management information platform will be established to record and analyze the construction risks during implementation.

59. The system will use a 1,500 V DC traction power supply system with overhead catenary collection. The choice of catenary technology over third rail power supply reflects the maturity and wide use of catenary systems in China. In addition, the costs of both the system itself and the train cars compatible to such systems are lower than third rail power supply systems in China.

60. **Station Design.** Most of the stations follow one of a number of standardized designs that have been optimized over time in China. Nonetheless, there are a few station locations where the passenger profile is unique (such as Stadium station and Railway station), for which designs were adjusted to reflect such traffic flows. The stations and their access will be designed to ensure universal accessibility design with barrier free passage for the disabled in wheelchair and guidance on sidewalks and in station for blind people. Furthermore, the city has revised the design institute's standard design to incorporate the following modifications:

(a) Revised provision ratios of male and female bathroom facilities in all stations, reflecting gender considerations in design based on its projected passenger profile; and

(b) Additional elevator or escalator for busy stations to facilitate barrier-free accessibility for disabled people and movement of passengers with luggage.

61. In parallel to the project, the URC real estate entity will support land use and mass transit integration by combining urban rail development and real estate development at selected locations. Such approach is currently expected at Line 2 depot, HongDuZhongDaDao station, QingShanLuKou station and XinJiaAn station. In particular, the URC identified a comprehensive redevelopment opportunity at QingShanLuKou Station, located on Line 2 at the junction of two major roads in the eastern part of the city. At that location, the area around the station will be combined with commercial redevelopment, offering an opportunity of close integration between land use planning and mass transit. The city has planned and made provisions for a 35-storey commercial development with shops, offices and a hotel with a plot ratio of 6.4 above the Line 2 station. The development will be integrated with the station at its basement level. This redevelopment proposal will complement the other new residential development in the vicinity of the station, and serve to help revitalize the eastern part of the city.

C. Financial Management

62. The PMO established under the URC will be responsible for managing the preparation and implementation of the project. The Bank loan proceeds, including overseeing the Designated Account, will be managed by Jiangxi Provincial Finance Department (JPFD). A financial management (FM) capacity assessment has been conducted by the Bank and actions to strengthen project's FM capacity have been agreed with the relevant implementing units. The FM assessment has concluded that with the implementation of these proposed actions, the FM arrangements will satisfy the Bank's minimum requirements under OP/BP 10.02. **Annex 3** of the PAD provides additional information on FM.

D. Procurement

63. The URC is now implementing Line 1 for which civil works have been procured and construction has started. The capacity assessment of the URC has been conducted by reviewing

the project organization structure and functions, past experience of the URC, staff skills, quality and adequacy of supporting and control systems, and the legal and regulatory aspects. The URC has been legally established with one designated procurement staff for the project. Despite its experience with procurement, the URC and its staff do not have adequate experience with Bank procurement procedures. The key risks identified from the procurement capacity and risk assessment include: (i) the domestic practice of inviting bids on the basis of preliminary designs rather than detailed designs; (ii) inaccurate cost estimates; (iii) possible delays in processing procurement because of differences between Bank procurement guidelines and domestic procurement practice; and (iv) inadequate contract management practices.

64. The assessment however concluded that the URC has adequate capacity to carry out procurement activities for the proposed Project, after putting in place a set of mitigation measures. These include: (i) the appointment of a procurement agent with World Bank experience; (ii) the selection of a consulting firm by the URC to review the design for all civil works; (iii) training of URC procurement staff; (iv) a procurement management manual; and (v) a procurement plan that contains only a few large contracts.

65. To build the capacity of the staff from the URC, the Bank conducted a training workshop on Bank's procurement during the project preparation mission. These trainings are expected to continue over the course of project implementation. In addition the project procurement staff attended a procurement training workshop on Bank financed projects organized by one institution, and will attend procurement training courses organized periodically by the Bank or by other institutions acceptable to the Bank. Furthermore, procurement activities under the project will be guided by the project procurement manual which has been prepared and reviewed by the Bank.

66. The initial procurement plan describing procurement activities to be undertaken for the whole project has been prepared and agreed to by the Bank. Subsequently, the procurement plan will be updated annually, or as required to reflect actual project implementation needs and submitted to the Bank for review.

E. Social (including Safeguards)

67. The project will generate significant social benefits in accessibility and mobility by supporting the development of Line 2 and its integration in the public transportation system of Nanchang with convenient transfer to other public transport modes. All stations will have a universal accessibility design with barrier free passage for the disabled in wheelchair, including at least one elevator per station, and guidance on sidewalks and in station for blind people. The project is expected to benefit the local communities by enhancing the options for affordable, safe and fast public transport in the vicinity of the line.

68. The project will also have social impacts related to the need for land acquisition and involuntary resettlement. The project will require the acquisition of 746 mu of village land (including 259 mu of cultivated land) which will affect 142 people from 31 families. The project would also require the demolition of 83,817 square meters of existing structures owned by 1043 families and affecting 4,001 people. 201 shops, 22 enterprises and organizations will be demolished as well.

69. Following the relevant Chinese laws, regulations and World Bank OP 4.12 on Involuntary Resettlement, the PMO prepared a Resettlement Action Plan (RAP) to address involuntary resettlement impact caused by project construction. A Resettlement Policy Framework (RPF) was also prepared for components that might change their locations during project implementation. The resettlement cost under the project is included in project cost estimates.

70. The resettlement planning work was carried out by the line agencies under the guidance of a team from Wuhan University with prior experience in resettlement planning for World Bank financed projects. Planning work included project impact inventory surveys, social economic surveys and consultations over resettlement and livelihood restoration strategies. The RAP and the RPF were disclosed at the URC on January 30, 2013 and in Infoshop on February 5, 2013. A final RAP and RPF were disclosed on April 3, 2013 in Infoshop and April 17, 2013 at the URC.

71. The following guiding principles have been applied when developing the RAP/RPF:

(a) The original living standards of all affected people should be improved or at least be restored;

(b) Resettlement plans, sites of new houses, standards and building areas should be determined after consultation with the affected people;

(c) For all affected buildings, the compensation should be calculated on the basis of current replacement cost;

(d) Compensation rates, location of new residential sites and areas should be formulated after consultation with the affected people;

(e) All compensation funds should be paid before any demolition of house or land taking; and

(f) Special assistance should be provided to the vulnerable households identified during the detailed planning and implementation process.

72. **Livelihood Restoration**. For Project Affected Persons (PAPs) affected by collective land acquisition, cash compensation will be arranged. The socio-economic survey has shown that those PAPs' livelihood do not depend on agricultural activities, therefore land for land compensation was not planned. The cash compensation was accepted by the PAPs and the compensation distribution plan has been agreed by the PAPs during public consultation. For PAPs affected by house demolition, the options of cash compensation and house property exchange scheme have been arranged. Cash compensation rates for structure were calculated based on replacement cost and the construction work for resettlement house compounds has been partially completed already. The affected shops will be compensated at replacement cost and the business losses caused by demolition will be compensated as well.

73. **Capacity of Resettlement Organization.** The PMO will assume the overall responsibility for the implementation of the resettlement program. The PMO will work with the district and county government offices to implement the resettlement programs. These offices

have competent staff, with rich experience on domestic projects. Their respective responsibilities and functions are detailed in the RAP. Capacity building activities have been arranged for relevant staff during project preparation and training will be provided to project staff during project implementation.

74. **Consultation and Participation**. Resettlement planning followed a participatory process. Affected people and various government agencies participated in the social economic survey, impact census, inventory and formulation of the compensatory and livelihood restoration plan. Project information, relevant government policies and regulations were broadly disseminated through village meetings and urban meetings in the project areas.

75. **Gender Mainstreaming**. Women's views and concerns on resettlement were collected and analyzed through public consultation, and were incorporated into project RAP preparation. Surveys were also conducted around future stations to assess the walkability around the station and to identify aspects to be improved. These surveys noted difference in priorities between genders (security around station being a higher priority for women). During the construction detailed design stage, the task team will continuously work with the client to better reflect gender needs. The focus on fare integration will also be pro-women, because women tend to make more chained trips – e.g. they may drop their child at school on their way to work, or pick up some groceries before going to back home. An integrated fare system means that some of the chained trips could be completed under one fare.

76. **Grievance Redress.** A mechanism has been established for grievance redress. Grievances can be filed both orally and in writing. Starting at village level, the grievances can be elevated to county, district, or city level if they are not satisfied with the resolution at the lower level. The affected people could also file their cases in court if they are not satisfied with the resolution by the project authority. All grievances and their resolution will be recorded. This mechanism has been disclosed to the local population and will be further disseminated through a Resettlement Information Booklet.

77. **Monitoring and Evaluation.** Both internal and external monitoring is planned for resettlement implementation. The NM resettlement offices will be responsible for the internal monitoring. An experienced team is being appointed as the external institute to undertake the independent monitoring of the resettlement program. The monitoring scope, targets, indicators, procedures, methodology and reporting requirements are described in the RAP.

78. **A Resettlement Policy Framework** has been developed according to relevant local laws and regulations as well as World Bank OP 4.12 on Involuntary Resettlement for components that might change their locations during project implementation. It describes the overall legal framework, planning principles, procedures, compensatory and rehabilitation approach, consultation and participatory requirements, grievance redress mechanisms, organization and monitoring arrangements.

79. The RAP and RPF, as well as the related monitoring requirements apply to any land acquisition or involuntary resettlement taking place prior to project effectiveness. The resettlement work started in mid April 2013.

80. **Project Linkage.** From a resettlement point of view, the project boundaries have been defined as including transfer stations outlined in Annex 2 in addition to Line 2 itself. A number of other lines (line 1, 3, 4, 5) are expected to be constructed partly at the same time as Line 2, with different alignments between 2012 and 2025. The transfer stations for these lines with Line 2 have been reviewed as part of the RAP, where specific plans exist. Those other lines will not have a bearing on the development objective of this project. Line 2 will have its own depot and will be able to function independently from other lines.

F. Environment (including Safeguards)

81. The project is classified as a Category A project as per OP4.01. Environment Assessment (EA) reports were prepared in accordance with national requirements and the Bank's OP 4.01. The reports include an EA Executive Summary, Environmental Impact Assessment (EIA), and Environmental and Social Management Plan (ESMP). The EA reports have been prepared incorporating the Bank's comments and found to be satisfactory.

82. The project will bring significant positive environmental impacts by promoting mass public transportation, which will in turn help alleviate urban traffic congestion, reduce environmental pollution related to vehicle emissions, and improve overall quality of life in the Nanchang metropolitan area.

83. The potential negative environmental impacts related to the project will occur mainly during the construction phase. These potential impacts include: disruption to urban traffic, business and utilities caused by construction sites; reduced walkability and accessibility to businesses around construction sites; noise, vibration, dust and air pollution nuisance during construction; damage to surrounding buildings and physical cultural sites; disturbance to the groundwater regime; risk of construction related accidents; and impacts from transportation and disposal of spoil material. Other impacts during operation include noise and vibration, electromagnetic radiations near substations, impacts on land use and urban planning, and waste management from rail operation facilities.

84. To enhance the environmental benefits of the project, the project has integrated a comprehensive set of mitigation measures into the project design, construction phase and operational phase respectively. These environmental and social impacts are thoroughly addressed by the EIA report, and preventive and mitigation measures have been developed in the ESMP. These measures estimated to cost RMB131.6 million are included in the cost estimates. The Bank review has concluded that these adverse environmental and social impacts can be adequately avoided, minimized and mitigated with good management practice and mitigation measures, as developed in the EIA/ESMP.

85. Two rounds of public consultations including expert consultations, questionnaires, symposia, and interviews were conducted with the different stakeholders during EA preparation according to requirements of both Chinese legislations and the World Bank's OP 4.01. The availability of the EA reports, and how to access them, was announced in a major local newspaper, Nanchang Daily on February 9, 2013. The EA Executive Summary was disclosed on February 5, 2013 in the World Bank's Infoshop and an updated version on May 17, 2013. The

EIA report and ESMP were disclosed in Infoshop on February 7, 2013 and February 12, 2013, respectively. The EA reports were disclosed at the PMO and on the website of the URC, on February 8, 2013. A finalized version of the EIA and ESMP were disclosed on April 9, 2013 in Infoshop and on April 19, 2013 on the website of the URC.

Annex 1: Results Framework and Monitoring

CHINA: Nanchang Urban Rail Project

Project Development Objective (PDO): The proposed PDO is to provide an effective urban mass rapid transit system of appropriate quality along the Line 2 corridor from ZhanQianNanDaDao Station to XinJiaAn Station.

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5				
Indicator One – Effective urban mass rapid transit system **Sub-Indicator One:** Line 2 ridership	☐	Passenger - trips/weekday	0	0	0	0	0	200,000	Year 5	Operational statistics	PMO	Number of trips made per weekday on Line 2
Sub-Indicator Two: Reduced travel time on public transport modes along Line 2 corridor	☐	Minutes	0	0	0	0	0	>25	Year 4&5	Travel time survey	PMO and bus company	OD pairs: HSR station to the existing railway station, and XinJiaAn station to WoLongShan station
Sub-Indicator Three: Percentage of urban rail commuters along Line 2 with access to a car	☐	%	0	0	0	0	0	>15	Year 5	Passenger survey	PMO and bus company	
Indicator Two - Quality: Percentage of users that rate the service "satisfactory" on average (also recorded for each gender for reference)	☐	%	0	0	0	0	0	>70	Year 5	User satisfactory survey	PMO	
INTERMEDIATE RESULTS												
Intermediate Result (Component One): Construction of Line 2												
Intermediate Result Indicator One: Percentage of construction of stations (in value)		%	0	0	10	50	70	100	Annually	Project Management Statistics	PMO	

Intermediate Result Indicator Two: Percentage of completion of tunnels (in value)		%	**0**	0	10	50	70	100	Annually	Project Management Statistics	PMO	
Intermediate Result Indicator Three: Level of integration in terms of facilities for bus/rail/bike transfer designed and constructed in line with integration plan		%		N/A	N/A	N/A	90	90	Year 5	Detailed architectural plan	PMO	
Intermediate Result Indicator Four: Level of integration in terms of bus routes reorganized to reflect Line 2 opening			**No**	No	No	No	Plan defined and communicated	Routes Reorganized	Year 4 & 5	Operational plan	Bus company	
Intermediate Result Indicator Five: Level of integration in terms of availability of a single payment card for rail and bus			**No**	No	No	No	Yes	Yes	Year 5	Site survey	PMO	
Intermediate Result Indicator Six: Accessibility – percentage of stations with barrier-free accessibility to the wheel-chair bound and sight impaired		%	**0**	N/A	N/A	N/A	100	100	Year 5	Detailed architectural plan	PMO	
Intermediate Result (Component Three): <u>Technical Assistance and Capacity Building</u>												
Intermediate Result Indicator One: Number of TAs completed (cumulative)			0	0	0	0	2	3	Annually	Project Management Statistics	PMO	

Annex 2: Detailed Project Description

CHINA: Nanchang Urban Rail Project

1. The Nanchang Urban Rail Project consists of the construction of the Nanchang Urban Rail Line 2 (about 23.78km), starting from the Line 2 depot and running from ZhanQianNanDa Dao Station in the southwest of Nanchang along the west bank of Gan River up to Chunhui Road, then move east under the Gan River onto Yangming Road and turn south to XinJiaAn Station in southeast Nanchang. Line 2 includes 21 stations, which will all be located underground and connected by tunnels. The Line 2 depot for maintenance and stabling will be located above ground at the end of Line 2 in southwest Nanchang.

2. The project includes construction of the line; provision of maintenance and stabling facilities for the trains; traction, control systems, signaling, communication, monitor, fare collection; procurement of the train sets; all other works related to implementation of the line; resettlement and land acquisition; environmental mitigation measures and relevant technical assistance and capacity building. Line 2 will use technology that is compatible with Line 1 (currently under construction) and line 3 (being planned).

3. As part of the preparation of the FSR/PDR (prepared by the Guangzhou Metro Design Institute) and EIA, the route alignment, station location and construction method were optimized so as to minimize costs, reduce the need for land acquisition, mitigate construction risks, minimize resettlement, avoid environmental and cultural sensitive sites, reduce disruption of traffic, increase the accessibility and convenience of public transport transfer, and to integrate with the overall public transport plan. Further optimization will be conducted during detailed design preparation.

4. The project includes the following four components: (i) construction of Line 2; (ii) equipment for Line 2; (iii) design, construction management and technical assistance; and (iv) safeguards and other construction costs. The total project cost will be US$2,571.23 million, with US$2,321.23 million of local counterpart financing and a US$250 million IBRD Bank loan. Detailed cost breakdown by component is provided in the table below.

Table 2-1: Project Costs (US$ million)

Project Cost by Component	Total	Bank Finance	% Financing
Component 1: Construction of Line 2	**1139.04**	**249.37**	**21.9%**
Sub 1.1: Station	599.52	154.00	
Sub 1.2: Tunnel	345.05	95.37	
Sub 1.3: Track	77.66		
Sub 1.4: Depot	108.09		
Sub 1.5: Operation Buildings	8.72		
Component 2: Equipment for Line 2	**624.99**	**0.00**	**0.0%**
Sub 2.1: Rolling Stock	138.16		
Sub 2.2: Communication System	59.35		
Sub 2.3: Signal System	52.27		
Sub 2.4: Power Supply	191.2		
Sub 2.5: Monitoring System (incl. Environment)	19.32		
Sub 2.6: Safety/Security/Civil Air-Defense	30.16		
Sub 2.7: Ventilation/AC	36.29		
Sub 2.8: Water Supply/Sewerage/Fire Protection	24.4		
Sub 2.9: AFC	30.21		
Sub 2.10: Station Auxiliary Equipment	43.63		
Component 3: Design, Construction Management and Technical Assistance	**185.48**	**0.00**	**0.0%**
Sub 3.1: Pre-stage work, Design, Surveys and Revisions	86.23		
Sub 3.2: Construction Management and Supervision	97.25		
Sub 3.3: Technical Assistance	2.00		
Component 4: Safeguards and Other Construction Costs	**370.65**	**0.00**	**0.0%**
Sub 4.1: Land Acquisition and Resettlement	295.14		
Sub 4.2: Construction Site Preparation	35.67		
Sub 4.3: Other Construction Cost	39.84		
Total Baseline Cost	**2320.16**	**249.37**	**10.7%**
Contingency	100.87		
Interest during Construction	147.44		
Initial Working Capital	2.13		
Front End Fee (0.25%)	0.63	0.63	
Total Project Cost	**2571.23**	**250.00**	**9.7%**

Component 1: Construction of Line 2

5. The component consists of the construction of Line 2 from ZhanQianNanDaDao Station to XinJiaAn Station (23.78 km), including a total of 21 stations (all underground), one depot, tracks and tunnels. The construction of stations will mainly use the cut-and-cover method and the tunnels will be constructed primarily by shield tunneling method. Stations will be designed to provide convenient interchange with the other lines of the urban rail system and other transport modes. The specific interchange facilities at each station will be constructed based on the Line 2 Integration Plan, as amended from time to time.

6. The Bank loan will support the construction of the following eight stations and the tunnels in between (Bayi Square Station is within the scope but not financed by World Bank since it has started construction along with Line 1 construction). These are all located on the east side of the Gan River. The characteristics below are based on the final PDR. They are subject to adjustments during project implementation as the detailed design is optimized.

7. Yangming Park Station. This station will be located to the east of the intersection of Yangming Road and Xiangshangbei Road. It will be an underground two-level island-type station with a single crossover on the east end of the station. The total construction area of the station will be 13,584 sqm. This station will be located in a mature and high density area, which includes Xiangshan Road Business Circle, Yangming Park, Jiangxi Daily Press, Nanchang No. 10 Middle School, and Hongdu Hotel.

8. Tunnel betweenYangming Park Station and QingShanLuKou Station. This tunnel will be constructed using the shield method. The two tracks will be 807.9 and 795.0 linear meters respectively.

9. QingShanLuKou Station. This station will be located to the southwest of the intersection of Bayi Avenue, Qingshan South Road and Yanming Road. It will be the transfer station of Line 2 and Line 3, with an underground three-level island-type station for Line 2. There will be a tie-line on the east side and a single crossover on the north side of the station. The total construction area of the station will be 36,996 sqm. One main power substation will be built next to this station to be shared with Line 3. This station will be located in a mature and high density area, which includes Nanchang Education College, Nanchang No.28 Middle School, Jiangxi University of Traditional Chinese Medicine, two residential communities, Northern Bus Terminal, etc. This station involves major resettlement work. Real estate development will be carried out by the URC above the station including a commercial center.

10. Tunnel between QingShanLuKou Station and FuZhouLu Station. This tunnel will be constructed using the shield method. The two tracks will be 510.8 and 545.7 linear meters respectively.

11. FuZhouLu Station: This station will be located to the south of the intersection of Bayi Avenue and Fuzhou Road. It will be an underground two-level island-type station. The total construction area of the station will be 11,197 sqm. This station will be located in a mature and high density area, which includes No.2 Hospital affiliated to Nanchang University, Nanchang

Sanitation and Anti-epidemic Station, Jiangxi Labor Union, Jiangxi Revolutionary Martyr Memorial Hall, Jiangxi Hotel, Hongkelong supermarket, etc.

12. Tunnel between FuZhouLu Station and Bayi Square Station. This tunnel will be constructed with the half cut-and-cover method, with 229.6 double-track linear meters and the construction area will be 18,141 sqm. It will be ready for underground commercial development.

13. Tunnel between Bayi Square Station and YongShuLu Station. This tunnel will be constructed using the shield method. The two tracks will be 555.8 and 544.6 linear meters respectively.

14. YongShuLu Station. This station will be located at the intersection of Bayi Avenue and Yongshu Road. It will be an underground two-level island-type station. The total construction area of the station will be 11,375 sqm. This station will be located in a mature and high density area, which includes Jiangxi Party School of CPC, Gangjiang Hotel, Shanghai Pudong Development Bank, and the Nanchang Long-Distance Bus Terminal (already relocated).

15. Tunnel betweenYongShuLu Station and DingGongNan Station. This tunnel will be constructed using the shield method. The two tracks will be 485.9 and 475.9 linear meters respectively.

16. DingGongNan Station. This station will be located to the west of the intersection of Luoyang Road and Dinggong Road. It will be an underground two-level island-type station. The total construction area of the station will be 9,613 sqm. This station will be located in a mature and high density area, which includes Galactic International Hotel, Nanchang Railway No.1 Middle School, Meicheng International Hotel, Jiangxi Geological Mineral Exploration and Development Authority, Nanchang Tea Factory, and the Railway No.1 Village.

17. Tunnel between DingGongNan Station and Nanchang Railway Station. This tunnel will be constructed using the shield method. The two tracks will be 838.3 and 838.9linear meters respectively.

18. Nanchang Railway Station. This station will be located on the north side of the east square of Nanchang Railway Station, and to the south of Luoyang Road. It will be adjacent to the Luoyang Road tunnel and the planned integrated transport hub (long-distance bus station). The total construction area of the station will be 11,689 sqm. This station will serve as part of the multi-modal interchange among the national railway, long-distance bus, local bus and urban rail.

19. Tunnel between Nanchang Railway Station and HongDuZhongDaDao Station. This tunnel will be constructed using the shield method. The two tracks will be 507.0 and 504.4 liner meters respectively.

20. HongDuZhongDaDao Station. This station will be located at the intersection of Hongdu Avenue and Luoyang Road. It will be the transfer station of Line 2 and Line 4 with an underground two-level island-type station for Line 2. The total construction area of the station will be 25,857 sqm, including 13,159 sqm for Line 2 and 12,698 sqm for Line 4. This station will

be located in a mature and high density area, which includes Nanchang Special Police Detachment, Railway No.8 Village, Jiangxi Commodity Inspection Bureau, Tangxia and Wan Village. Real estate development will be carried out at the station by the URC.

21. Tunnel between HongDuZhongDaDao Station and XinJiaAn Station. This tunnel will be constructed using the shield method. The two tracks will be 1,177.9 and 1,201.4 linear meter respectively.

22. XinJiaAn Station. This station will be located north-south direction along Shanghai Road. It will be the terminal station of Line 2. It will be an underground two-level island-type station. The total construction area of the station will be 23,282 sqm. This station will be located in a mature and high density area, which includes Nanchang Hangkong University Science School, Hufang County, Shanghai Road Xin Cun Residential Area, Nanchang Ribbon Factory, and Hualian supermarket. Real estate development will be carried out at the station by the URC.

23. Line 2 depot. The depot will be located to the southwest of Nanchang HSR station. The total area of the depot will be 107,121 sqm and the total length of tracks within the depot will be 17 km. It will be used for the routine maintenance work for Line 2, and will also assume large frame repair work for rolling stocks of Line 1, 2, 3, while reserving capacity and space for future Line 4 and 5. Real estate development is planned above the depot.

24. Administrative building. The administrative building will be located in the business district of Honggutan on land assigned by NM. The construction cost of this building is borne by the 5 lines currently planned in the network collectively. The total planned area for the building will be about 13,838 sqm with an underground area of 36,264 sqm. There will be 3 underground floors and 45 floors above ground with the height of 192.85m. Floor 1-5 will be for the command and control center for the urban rail network while floor 6-12 will be reserved space for the control center. The rest of the building is planned for commercial use. The control center will be physically separated from the commercial space and will be managed by different property companies for safety and security considerations.

Component 2: Equipment for Line 2

25. This component includes all the equipment necessary to the successful operation of Line 2 such as rolling stock, power supply, control system, signaling system, communication system, monitoring system, fare collection system, safety and security system, ventilation and air conditioning system, water supply, sewerage and fire protection system, and station auxiliary equipment. This component will be 100% financed by local counterpart funding.

26. Line 2 will use a 1,500 V DC traction power supply system with overhead catenary collection. The signaling system will use moving block automatic control system with automatic train protection (ATP) and automatic train operation (ATO) and automatic train supervision (ATS) subsystems. The project will provide an efficient passenger information system. The fare collection system will be an automatic fare collection system (AFC) with contactless tickets.

27. Each train will have a carrying capacity of 1,460 passengers with 6 persons per square meter. The system will be capable of running 30 services an hour in each direction, though based on projected ridership, the service is expected to start with 12 services an hour in each direction with 18 6-car trains, increasing to 26 services an hour in each direction with 51 6-car trains in the long-term. Trains will use a regenerative braking system which will enable substantial saving in traction power.

Component 3: Design, Construction Management and Technical Assistance

28. **Sub-Component 3.1: Pre-stage Work, Design, Surveys and Revisions.** This component supports all activities required in the preparation phase of the project including the necessary pre-stage work, research, design, surveys and review of designs for the construction of Line 2. It is 100% financed by local counterpart funding.

29. **Sub-Component 3.2: Construction Management and Supervision.** This component will support activities for construction management and quality assurance, including engineering survey and design, construction design review, construction supervision, bid agency and service fee, and commissioning. It will be 100% financed by local counterpart funding.

30. **Sub-Component 3.3: Technical Assistance** This component will provide technical assistance and capacity building to relevant staff in NM and URC to take steps to improve ridership levels (ridership modeling, scenario testing, fare integration, public transport information integration), land value increase and to improve financial management and internal audit functions for the Nanchang URC. This component will be 100% financed by local counterpart funding.

Component 4: Safeguards and Other Construction Costs

31. This component includes: (i) land acquisition and resettlement; (ii) construction site preparation (environmental mitigation measures), including the provision of water, electricity and access to the construction site and traffic diversion during construction; (iii) other project construction costs such as engineering insurance, work safety assurance, inspection and acceptance, and project cost estimation. This component will be 100% financed by local counterpart funding.

Annex 3: Implementation Arrangements

CHINA: Nanchang Urban Rail Project

Project Institutional and Implementation Arrangements

Project Administration Mechanisms

1. Jiangxi Province will sign the Project Agreement and will be the Project's legal implementing entity. On behalf of the Jiangxi Province and the JPFD, the project will be implemented by NM, through the URC, which will be responsible for managing, coordinating and monitoring the implementation of the Project.

2. To provide overall governance and leadership for project preparation and implementation at the municipal level, a PLG was established by NM in August 2012. The PLG is currently chaired by the Vice Mayor, co-chaired by the Municipal Deputy Secretary General and the Board Chairman of the URC, and composed of top leaders from all key municipal line agencies, including the Finance Bureau, the Development and Reform Commission, the Urban Management Commission, the Planning Bureau, the Construction Commission, the Land Resources Bureau, the Environmental Protection Bureau, the Housing Management Bureau, the Price Bureau, the Traffic Management Bureau and the Bus Company. The PLG will be maintained throughout project implementation, with membership and function satisfactory to the Bank, to carry out policy guidance and strategic coordination of the Project. The PLG will meet regularly (twice a year) to keep track of implementation progress and upon request to resolve any critical issue that arises.

3. A PMO has been established on August 17, 2012, under the Urban Rail Development Headquarters Office/URC, chaired by the URC Board Chairman. It will be responsible for the daily operations of the Project, including project management, technical preparation, environmental and social safeguards, procurement, financial management, and monitoring and evaluation in accordance with the Bank's policies and guidelines. It will be responsible for the implementation of the project and its various components, through the respective departments/subsidiaries of the URC: (i) technical – General Engineering Office; (ii) financial management – Finance Department; (iii) procurement – Bid Department; (iv) construction – Construction Management Subsidiary; (v) property development – Real-Estate Development Department; and (vii) other dedicated staffing for environmental aspects, land acquisition and resettlement.

4. As part of the construction of Line 2, NM agreed to carry out the Line 2 Integration Plan, endorsed by NM on April 9, 2013, in accordance with the implementation arrangement set forth in the Plan. NM decided that the implementation of the Integration Plan will be led by the Nanchang Traffic Improvement Leading Group[6] and executed by the Traffic Improvement

[6] The Nanchang Traffic Improvement Leading Group is an existing municipal entity established in early 2012, headed by the Vice Mayor, in order to improve the traffic conditions in Nanchang. The Traffic Improvement Office is responsible for carrying out its day-to-day work, such as junction channelization, construction of minor transport facilities, proposing transport and congestion related policies, revision of traffic management plans during construction, etc.

Office. Specifically, the bus stops, terminals and interchanges will be funded, designed, constructed and operated by the Bus Company. The Park-and-Ride facilities, taxi stands, bicycle facilities, pedestrian underpasses and overpasses will be funded by NM and designed, constructed and operated by Traffic Improvement Office. The allocation of associated land will be arranged by the Land Resource Bureau.

5. NM was involved in a Bank financed highway project implemented at the provincial level by Jiangxi Province over 20 years ago. Currently it is engaged in a GEF China Urban Transport Partnership Program, which provides technical assistance on urban transport planning and management to 14 Chinese cities. Nevertheless, the PMO does not have prior experience in implementing a stand-alone Bank lending project. Unfamiliarity with Bank's safeguards, fiduciary policies and other requirements during project implementation is a major capacity constraint for the PMO. Accordingly the PMO needs substantial training on Bank's policies and procedures. The Bank provided training in procurement, financial management, safeguards, and project management to the PMO and relevant municipal agencies as part of project preparation. Additional training will continue throughout project implementation as needed.

Financial Management, Disbursements and Procurement

Financial Management

6. The FM capacity assessment identified the following principal risks: (i) the PMO is new to Bank-financed project; (ii) since the Bank loan accounts for only about 10% of total investment, management of counterpart funds might not be as strict and efficient as the Bank loan and might create some reputational risks; and (iii) the internal audit unit is only staffed with two people and the function of internal audit and its scope of work are quite limited.

7. Mitigation measures, to address the above risks, have been agreed and will include: (i) FM/disbursement training (formal and ad hoc) to be provided to the project financial staff by JPFD and the Bank; (ii) close monitoring and guidance from JPFD and Nanchang Municipal Finance Bureau (NMFB); (iii) use of the PMO's existing FM system for the proposed project with uniform FM requirements applied for both Bank loan and counterpart funds; and (iv) a capacity building activity to be set up within the TA component (financed by counterpart funds) to strengthen the internal audit function within the company.

8. Overall, the residual financial management risk after mitigating measures for the project is assessed as Moderate.

9. **Budgeting.** The project will use the URC's existing budget preparation and execution system, which is considered adequate. The annual project implementation plan including capital budget will be prepared by the URC based on consultation with related government entities. The budget for counterpart funds committed by the municipal government will be reviewed and approved by its People's Congress and included in the sectorial budget. Based on the approved budget and implementation progress, the NMFB will provide government appropriations to the project. Budget variance analysis will be conducted regularly by the URC providing timely

information to the URC management and to the Bank on project execution thus enabling timely corrective actions.

10. **Funds flow.** One segregated designated account (DA) in US dollar will be opened and managed by JPFD at a commercial bank acceptable to the Bank. The ceiling of the DA will be determined and documented in the Disbursement Letter. JPFD will be directly responsible for the management, maintenance and reconciliation of the DA activities of the project.

11. Contractors and suppliers will be paid by the URC which will request reimbursement from the DA through NMFB and JPFD based on payment requests submitted by the URC. The URC would prepare State of Expenditures (SOEs)/Summary Sheets (SSs) and other supporting documents to request reimbursement of expenditures and submit them for approval and review by NMFB and JPFD. JPFD will transfer the reimbursement to the URC directly. JPFD would prepare and send a World Bank Withdrawal Application (WA) to the Bank to replenish the DA as needed.

12. The Bank loan will be signed between the Bank and the People's Republic of China through its Ministry of Finance (MOF), and on-lending arrangements for the Bank loan will be signed between MOF and the Jiangxi Provincial Government through its JPFD and then between JPFD and NM through NMFB. Finally, on-lending arrangement will be signed between NMFB and the URC.

13. **Accounting and financial reporting**. The URC's existing accounting system, which is set up based on the "Enterprise Accounting standards" and "Accounting Regulation for State-Owned Construction Enterprises" issued by MOF, is acceptable and can provide the required accounting information. Therefore, it is agreed that the URC will use its accounting policies, procedures, and chart of account, which are consistent with Circular 13. In order to facilitate reporting and monitoring, the format and content of financial statements stipulated in Circular 13 will be used for project financial reporting.

14. The URC will manage, monitor and maintain the project accounting records. Original supporting documents for project activities will be retained by the URC. The URC will work together with JPFD to prepare the project financial statements, which will then be submitted to the Bank for review and comment on a regular basis. The interim unaudited project financial statements should be prepared and furnished to the Bank by the URC no later than 45 days following each semester (due dates will be August 15 and February 15), in form and substance satisfactory to the Bank.

15. **Internal Control.** The related accounting policy, procedures and regulations have been issued by MOF and will be followed by the URC. Detail internal controls procedures including segregation of duties, review, approval and reporting procedures as well as safeguard assets have been established and documented in the URC's own financial management regulations. A capacity building activity will be set up within the TA component (financed by counterpart funds) to strengthen the internal audit function within the URC.

16. **Audit**. Jiangxi Provincial Audit Office (JPAO) will be authorized to be the auditor for the project. Annual audit report will be issued by JPAO and will be due to the Bank within 6 months after the end of each calendar year. Following the World Bank's formal receipt of the audited financial statements from the borrower, the World Bank will make them available to the public in accordance with the World Bank Policy on Access to Information.

Disbursements

17. Four disbursement methods: advance, reimbursement, direct payment and special commitment are available for the project. The primary Bank disbursement method will be advances to the DA. WAs will be prepared to request Bank disbursements and to document the use of Bank financing. WAs will include supporting documents in the form of SOEs and SSs and source documents identified in the Disbursement Letter issued by the Bank.

18. One DA in US dollar will be opened at a commercial bank acceptable to the Bank and will be managed by JPFD. The ceiling of the DA will be determined and documented in the Disbursement Letter.

19. The Bank loan would be disbursed against eligible expenditures (taxes inclusive) as in the following table:

Disbursement Categories	IBRD Loan	
	Allocated Amount (US$ million)	Percentage of Expenditures to be financed (percentage)
(1) Goods, works, non-consulting services and consultants' services for the Project	249.375	100
(2) Front end fee	0.625	Amount payable pursuant to Section 2.03 of the Loan Agreement in accordance with Section 2.07 (b) of the General Conditions
(3) Interest rate cap of interest rate collar premium	0.000	Amount due pursuant to Section 2.07 (c) of the Loan Agreement
Total	250.000	

20. Contracts expected to be procured in advance of the loan signing date and financed under retroactive financing are included in the Procurement Plan and will be subject to prior review. Retroactive financing of up to US$25,000,000 equivalent would be available for payments made

on or after April 15, 2013, for all Eligible Expenditures according to the requirements specified in the Loan Agreement and Project Agreement.

Procurement

21. **Mitigation Measures for Procurement Risks**. The procurement capacity assessment concluded that the procurement risk is rated as moderate. The URC has adequate experience and capacity to carry out procurement. However, the URC lacks Bank project experience and needs to develop its capacity in World Bank procurement and in keeping procurement records. Measures to enhance its procurement capacity, to further strengthen the URC's procurement management for the project and to mitigate the potential procurement risks have been agreed as follows:

- A procurement agent with procurement experience in projects financed by the Bank or other multilateral financing institutions has been hired by the URC to assist it in procurement of goods, works and non-consulting services by ICB and NCB.
- A consulting firm has been hired by the URC with counterpart funds to assist it in reviewing all the designs for civil works under the project. The Bank task team also hired an international consulting firm to review the bidding documents, including designs, technical specifications and bill of quantities (BOQ) for all civil works contracts financed by the Bank.
- The URC will continue to send its procurement staff and other key staff to attend workshops on procurement and contract management under Bank-financed projects, including procurement of goods, works and non-consulting services, as well as selection and employment of consultants.
- The Bank will continue to provide training on procurement as needed throughout implementation of the project.
- A procurement management manual has been prepared and reviewed by the Bank. The manual provides guidance to the URC on how to carry out the procurement under the project.
- The initial procurement plan has been kept straightforward with a few large contracts.

22. Procurement for the project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants" dated January 2011; and "Guidelines: Selection and Employment of Consultants Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011, and the provisions stipulated in the legal agreement.

23. **Frequency of Procurement Supervision**. In addition to the prior review supervision to be carried out by the Bank, Bank procurement supervision missions will conduct field visits to carry out annual post review of procurement actions. The post review sampling ratio will be one out of five contracts.

24. **Procurement Plan.** The URC has developed an initial Procurement Plan for those activities to be procured by the URC for the whole project following the Bank template. The initial Procurement Plan has been reviewed and approved by the Bank. This Plan is available in the URC, and it has been published in the Bank Project Portal and disclosed on the Bank external website through Imagebank. The Procurement Plan will be updated, reviewed and agreed with the Bank annually, or as required, to reflect actual project implementation needs.

25. **Procurement and Selection Methods and Prior Review Thresholds**. The table below indicates the procurement and selection methods and prior review thresholds for goods, non-consulting services, works, and consulting services to be procured by the URC under the project.

Thresholds for Procurement Methods and Bank Prior Review

Expenditure Category	Contract Value (US$)	Procurement Method	Bank Prior Review
Goods/IT Systems and Non-Consulting Services	>= 3 million	ICB	All ICB contracts
	< 3 million	NCB Remarks: Where goods are not normally available from within China, the method of procurement will be ICB even if the contract value is less than USD 3 million.	First 2 NCB goods contracts by each PIU irrespective of value and all contracts >= USD 3 million.
	< 100 K	Shopping	None
	N/A	DC	All DC contracts
Works/ Supply & Installation	>=25 million	ICB	All ICB contracts
	< 25 million	NCB	First 2 NCB works contracts by each PIU irrespective of value and all contracts >= USD 15 million.
	< 200 K	Shopping	None
	N/A	DC	All DC contracts
Consultants	>= 300,000	QCBS, QBS	Firms: First contract for each selection method and all contracts >=USD 300 K; Firms: All SSS contracts; Individual Consultant: Only in Exceptional Cases; SSS for individual consultant: >=USD 20 K
	< 300,000	QCBS, QBS, CQS	
	N/A	SSS	
	N/A	IC	

Notes:
ICB: International Competitive Bidding
NCB: National Competitive Bidding
DC: Direct Contracting
QCBS: Quality- and Cost-Based Selection
QBS: Quality-Based Selection
CQS: Selection Based on the Consultants' Qualifications
SSS: Single Source Selection
IC: Individual Consultant selection procedure
NA: Not Applicable

26. **Advance Contracting and Retroactive Financing**. Retroactive financing will be applied for the project. The date of eligible expenditures, as noted in the legal agreement is April

15, 2013, and the amount for retroactive financing is US$25 million (10 percent of the total loan amount). All advance contracting contracts are subject to Bank's prior review. Payments will be eligible only for contracts procured in accordance with applicable Bank procurement procedures.

Environmental and Social (including safeguards)

Environmental

27. The project is classified as a Category A project as per OP4.01 due to the scale of tunnel construction, waste disposal and potential environmental and social impact from construction and operation in an urban context. EA reports were prepared by the Environmental Protection Center of the Ministry of Transportation in accordance with relevant national laws, regulations, and technical guidelines and standards applicable to the project, as well as the World Bank Safeguards Policies. The reports include an (i) EA Executive Summary, (ii) EIA, and (iii) ESMP. A revised EA report has been prepared, incorporating the Bank's comments, and found to be satisfactory.

28. **Main Environmental Impacts and Mitigation Measures.** The EA identified and assessed the project benefits and impacts to the natural and social environment and concluded the project will bring significant net positive environmental benefits through promotion of mass public transportation, reduction of traffic congestion and consequent reduction of vehicle emissions and improvement of overall quality of life in the Nanchang Metropolitan Area. It will improve accessibility for vulnerable groups and take into account gender considerations when applicable.

29. The potential negative environmental and social impacts related to the project will occur mainly during the construction phase. These potential impacts include: disruption to urban traffic, business and utilities caused by construction sites; reduced walkability and accessibility to businesses around construction sites due to temporary occupancy of sidewalks; noise, vibration, dust and air pollution nuisance during construction; damage to surrounding buildings and physical cultural sites; disturbance to the groundwater regime; risk of construction related accidents; and impacts from transportation and disposal of spoil material. Other impacts during operation include noise and vibration, electromagnetic radiation near substations, impacts on land use and urban planning, and waste management from rail operation facilities.

30. **Physical Cultural Resources OP/BP 4.11.** The proposed line 2 rail project will pass near some cultural relics including the August First Uprising Cenotaph, Jiangxi Provincial Exhibition Center (Wan Sui Guan) among others. Given the potential risk of impact from tunnel excavation during construction and vibration during operation, the Physical Cultural Resources (PCR) policy is triggered.

31. Adequate site survey and consultation with the relevant cultural relic bureau were conducted during EA preparation to ensure all the relevant cultural relics along the rail were identified. These potential impacts were carefully addressed through mitigation measures in project design, alignment optimization and construction technologies, construction management approach, and monitoring of settlement. Chance-find procedures will be included in bidding

documents and contracts and will include provisions and procedures stipulated in the Cultural Property Law. A PCR Management Plan was prepared as part of the EIA/ESMP to address any possible impacts during the project implementation given the proposed works in areas of identified cultural significance.

32. **Sensitive sites.** In addition to the cultural resource buildings, the EIA identified other sensitive sites such as residential areas, schools and hospitals along the line, that are subject to potential noise, air pollution, vibration and electromagnetic impact during the construction and operation stages. Adequate mitigation measures have been designed.

33. **Cumulative Impacts.** The construction of Line 1 started in 2012 and Line 2 will be implemented in parallel over the next few years according to the Nanchang Urban Rail Network Construction Plan. Line 3 is at a planning stage and expected to be in service by 2020[7]. Extension of Line 1 and 2 may also take place during the period 2016-2020. None of the other lines or extensions is required to achieve the project development objectives. In addition, several other key infrastructures such as the HSR Station are under construction. Two Line 2 stations have been integrated in the design and development of the HSR Station and Nanchang East Train Station. Passengers at these two stations can easily access to HSR, train, urban rail system and other public transport. The implementation of these infrastructures will fundamentally improve public transportation in Nanchang and provide people with an efficient and comfortable ride, while providing a good alternative to car transportation.

34. The major cumulative impacts include cumulative traffic congestion, construction waste, common construction related negative environmental impacts such as noise, vibration and dust, and cumulative noise and vibration impacts during the operation phase. Adequate mitigation measures for the cumulative impacts were recommended in the EIA accordingly, in particular regarding detailed traffic management schemes, based on the actual construction schedule.

35. To enhance the environmental benefits of the project, the project has integrated a series of mitigation measures into the project design, construction phase and operational phase respectively. These environmental and social impacts are thoroughly addressed by the EIA report, and preventive and mitigation measures have been developed in the ESMP. The Bank review has concluded that these adverse environmental and social impacts can be adequately avoided, minimized and mitigated with good management practice and mitigation measures, as developed in the EIA/ESMP.

36. **Project Feasibility Study and Design.** The earthquake and flooding risks have been considered during the Feasibility Study stage, and the relevant prevention measures have been incorporated into the project design. During the design phase the EA team worked closely with project planners/ owners and the feasibility study teams to compare and evaluate alternatives. The EA identified, evaluated and compared various options for alignment selection, station location selection, and construction method selection, and optimal alternatives were selected based on the avoidance of (or minimization of) social and environmental impacts, as well as other engineering technology, and financial considerations for least cost solutions. A "no

[7] Lines 4 and 5 are planned as part of the Nanchang Urban Rail Transit Network Plan, but not yet in the Urban Rail Rapid Transit Construction Plan.

project" scenario was also considered as an alternative. Adequate engineering measures have been designed to mitigate the expected impacts, including noise barriers, vibration reduction equipment, intensive greening plan, and landscape design for stations, and parking/depot site.

37. As a result, the alignment, station location and construction method were optimized so as to reduce the land acquisition, decrease construction risks, minimize resettlement, avoid environmental and cultural sensitive sites, reduce disruption of traffic and increase the accessibility and convenience of public transport transfer, and ensure integration with the overall public transport plan. Further optimization will be conducted during detailed design preparation.

38. **Construction phase.** To address the potential adverse impacts as mentioned above, preventive and mitigation measures during the construction phase have been developed in the ESMP to adequately avoid, minimize and mitigate these adverse environmental and social impacts. These impacts will be avoided, minimized or mitigated by the following measures, which include but are not limited to: implementation of traffic diversion plan and utility relocation, coordination with police department, and prior notice through public media; fencing of construction sites for safety; setup of temporary access roads; public consultation throughout the construction period to address public concerns and improve construction activities; proper management of spoil wastes; use of low noise equipment and construction technologies; careful scheduling of construction activities near sensitive sites; installation of temporary noise reduction facility at sensitive sites; restriction of night-time construction; required prior public notice, as well as night-time construction permit from city Environmental Protection Bureau (EPB), for activities that need continuous construction during the night; measures for air and wastewater pollutant control; risks assessment; and application Environmental, Health and Safety (EHS) guidelines. Shield tunneling and cover-and-cut method will be used for the tunnel and most of the stations to minimize noise and vibration impact.

39. **Operation phase.** To address potential impacts during operation phase, a number of mitigation measures were adopted. Some of the critical measures follow. For land use change, Nanchang city has mature institutions and procedures to manage land development to ensure that land development induced by the rail network is in line with the urban master plan, and conducted in an orderly and legal process. For noise sensitive sites, noise barrier and ventilation shafts will be installed with low noise equipment and silencers, and ventilation shafts will be located at least 15 m from nearby residential areas. For vibration sensitive sites, vibration-reduction facilities will be installed. Measures for air quality, wastewater and solid wastes have also been formulated.

40. **Risks Analysis and Management.** From the environmental impact point of view, the EIA reviewed the incidents and accidents that happened nationwide relevant to Line 2 construction and operation, and identified risk elements to this project and their potential impact. During the construction phase, the following cause and consequences were identified: (1) improper construction method causing differential settlement, ground subsidence or upheaval; (2) inadequate protective measures causing collapses, roof falling, sand/water gushing, flooding; (3) cut of drainage by mistake resulting in building cracking or collapse. The EIA predicted that the most difficult and risky parts of Line 2 construction include the tunnel construction crossing the Gan River, the ramp to BaYi Bridge, FengHe Overpass Bridge, LaoFuShan Overpass Bridge,

and the construction of several stations where the engineering geological conditions are complex. During the operation phase, risks include arson, terrorist attacks, and mechanical failure caused by improper operation.

41. The EIA recommended the following risk management measures. During the construction phase: (i) conduct risk source screening and fine tuning design prior to construction; (ii) establish environmental security classification system; (iii) adopt new construction technologies and processes; (iv) strengthen on-site monitoring and engineering supervision; and (v) prepare construction phase contingency plan. During the operation phase: (i) prepare contingency plan and conduct simulation exercises; (ii) equip the sites with the state-of-the-art monitoring and alarm system; and (iii) conduct public awareness education.

42. **Environmental and Social Management Plan.** A stand-alone ESMP has been developed which details the policy basis, applicable environmental standards, environmental management organization and responsibilities, sufficient mitigation measures, capacity training plan, environmental supervision of construction, environmental monitoring program, and budget estimates of ESMP implementation. The ESMP measures were developed in consistency with World Bank Group EHS Guidelines. The ESMP also includes procedures and mitigation measures to deal with any project site that is not determined at the time of preparation. The ESMP measures will be incorporated into bidding documents and contracts in order to ensure effective implementation.

43. In parallel to the project, the URC will support land use and mass transit integration by combining urban rail and real estate development at an expected four locations situated above or adjacent to Line 2 stations. The ESMP contains measures to address impacts related to any such construction activities.

44. Environmental management responsibility will be built into the relevant divisions of the overall project management structure, with dedicated management staff. Dedicated environmental staff will also be assigned to Supervision Engineers and Contractors to ensure effective ESMP implementation. A training plan will be implemented prior to/and during construction for project management staff, Supervision Engineers, and Contractors.

45. A two tier monitoring program has been developed for this project: daily and regular monitoring to be carried out by contractors and construction supervision companies, and periodical compliance monitoring by professional monitoring specialists. Comprehensive environmental monitoring programs have been designed for both construction and operation phases of the project. Monitoring parameters during construction include environmental quality of air, noise, vibration, surface water and groundwater in the project affect areas. Environmental monitoring during operation phase will focus on noise, vibration, electromagnetic radiation and wastewater from the Line 2 depot at HongJiaoZhou. Environmental monitoring report will provide key and timely information twice a year, focused on environmental impacts and mitigation to the borrower and the Bank to evaluate the success of environmental management.

46. **Public Consultation and Information Disclosure.** Two rounds of public consultation were conducted during the EA preparation. The first round was conducted from June 2012 to

August 2012 through meetings, field interviews and questionnaire surveys among project-affected people, local residential and village committees, schools and hospitals, and through a telephone hotline. The main concerns raised by the public are resettlement compensation, information disclosure, disturbance of traffic, and night time construction noise. All these concerns were addressed in the RAP and EIA/ESMPs.

47. The second round of public consultation was conducted from September to December 2012 after the draft EIA reports had been prepared. During the consultation, the key findings of draft EIA report and proposed mitigation measures were explained, as well as the responses to the questions raised from the first round consultation. Surveys of people likely to be directly influenced by the project construction indicated that over 90 percent expressed their support for the project.

48. Information about the project was disclosed following both the domestic and Bank requirements. The availability of the EA reports, and how to access to them, were also announced in a major local newspaper, Nanchang Daily, on February 9, 2013. The EA report has also been disclosed at the PMO and on the on the website of the URC on February 8, 2013 (http://www.ncmtr.com/newsshow.php?id=1095.It). The EA Executive Summary was disclosed on February 5, 2013 in the World Bank's Infoshop and an updated version on May 17, 2013. The EIA report and ESMP were disclosed in Infoshop on February 7, 2013 and February 12, 2013, respectively. A finalized version of the EIA and ESMP was disclosed on April 9, 2013 in Infoshop and on April 19, 2013 on the website of the URC.

49. Appropriate grievance handling procedures and arrangements for monitoring ESMP implementation are in place. With the mitigation measures in design, construction and operation phase including grievance handling mechanisms and monitoring and evaluation arrangements mentioned above, the Bank Safeguards requirements will be met in full.

Social Safeguards

50. **Resettlement organization.** The PMO will assume the overall responsibility for the implementation of the resettlement program. The PMO will work with the district and county government offices to implement the resettlement programs. These offices have competent and experienced staffs. Their respective responsibilities and functions are detailed in the RAP. Some training sessions were delivered to relevant staffs on Bank's OP4.12 during project preparation. Training will be provided to the project staff during project implementation. The detailed capacity building plan was included in the Chapter 8 of the RAP.

51. **Monitoring and Evaluation.** Both internal and external monitoring is planned for resettlement implementation. The NM resettlement offices will be responsible for the internal monitoring. An experienced team is in the process of being appointed as the external institute to undertake the independent monitoring of the resettlement program. Both internal monitoring and external monitoring report will be submitted to the Bank on a six-month basis. The monitoring scope, targets, indicators, procedures, methodology and reporting requirements are described in the RAP. The Bank's Social Specialist will join the Bank supervision missions during project implementation and will conduct special social safeguards supervision when needed.

52. **Preparation and Review of new RAP/Abbreviated RAP**. As indicated by the prepared RPF, the RAP/Abbreviated RAP will be prepared by client in case of additional investments being determined during project implementation. The Bank's team will review the documents and provide clearance before related resettlement work start.

53. **Gender Mainstreaming**. Women's views and concerns on resettlement were collected and analyzed through public consultation, and were incorporated into project RAP preparation. Surveys were also conducted around future stations to assess the walkability around the station and to identify aspects to be improved. These surveys noted difference in priorities between genders (security around station being a higher priority for women). During the project detailed design stage, the task team will continuously work with the client to better reflect gender needs. The focus on fare integration will also be pro-women, because women tend to make more chained trips – e.g. they may drop their child at school on their way to work, or pick up some groceries before going to back home. An integrated fare system means that some of the chained trips could be completed under one fare.

54. **Disclosure.** The RAP and the RPF were disclosed at the URC on January 30, 2013 and in Infoshop on February 5, 2013. A finalized version was disclosed on April 3, 2013 in Infoshop and April 17, 2013 at the URC.

Monitoring & Evaluation

55. Most of the data that need to be collected to monitor the PDO-level results indicators will be new to Nanchang since there is currently no operating urban rail system. However, the data can be collected readily as part of the regular urban rail and bus daily operations, and as part of regular customer surveys that URC will be conducting on its services to ascertain customer satisfaction and identify areas for improvement. Hence the incremental cost associated with data collection will be minimal. During project implementation, progress monitoring will focus on intermediate result indicators, which capture progress in project implementation.

56. **Average weekday ridership on Line 2 after 1 year of operation**. All commuters using the urban rail system will have to pass though fare gates using contactless smart cards. Hence it is expected that the fare system will be able to ascertain the number of unique journeys made on the system each day on a daily basis. The URC will collect and average this data for a few typical weekdays, avoiding holiday periods, days when there are exceptional events or when school is out.

57. **Evolution in travel time on public transport modes along corridor.** This indicator measures the difference in travel time (expected wait+travel) at peak period, between selected origin/destination pairs along Line 2, by bus before opening of Line 2 and by urban rail after opening. The travel time for Line 2 will be measured by monitoring the movement of the trains from the operations control center for a representative period, while the average wait time will be assumed to be half the headways of the train. The travel time for buses is less regular and therefore a larger sample will have to be taken. This can be ascertained through the dispatch records, and as with Line 2, wait time will be assumed to be half of the headways.

58. **Percentage of urban rail commuters along Line 2 with access to a car.** The annual public transport survey described below will include a question to ascertain whether the respondents have access to a car. This will indicate the extent to which Line 2 has succeeded in attracting car users.

59. **Line 2 user satisfaction survey (Percentage of respondents "satisfied" or above)**. The survey will be used to measure the level of satisfaction of users of Line 2. It will be also request feedback on the quality of integration with other transport mode. The survey will disaggregate feedback by gender.

Annex 4

Operational Risk Assessment Framework (ORAF)

China: Nanchang Urban Rail Project (P132154)

<table>
<tr><th colspan="8">Project Stakeholder Risks</th></tr>
<tr><td>Stakeholder Risk</td><td colspan="2">Rating</td><td colspan="5">Moderate</td></tr>
<tr><td rowspan="2">Description:

(a) NM. NM has shown its commitment to developing high quality and integrated public transport along Line 2 corridor, as well as to learning and following Bank’s policies and procedures for project preparation and implementation. However, the focus on starting the construction of the line by July 2013 may reduce the emphasis on integration aspects.

(b) Local Residents. The project will require some land acquisition and house demolition, rationalization of bus services as well as substantial public works, which will affect the daily life and the travel patterns of many residents, both during and after construction.

(c) Urban Rail Company. The URC’s primary focus may be on delivering on a tight schedule more than on integration. Part of the company funding is expected to come from real estate development proceeds, creating a financing risk if the real estate market slows down significantly.

(d) Nanchang Bus Company. The operations of the bus company will be significantly affected by the introduction of an urban rail system, with the potential for conflict if the relationship is not carefully managed from the early days.</td><td colspan="7">Risk Management:

(a) NM leadership confirmed its commitment to integration concepts. NM and the URC have formulated an integration plan and finalized consultation on this plan. Adequate resources will need to be allocated during implementation to ensure that the integration plan gets implemented.

(b) Surveys organized as part of the preparation indicated broad based support to the project and its mitigation measures, even for the affected population. Draft traffic management plans have been prepared to minimize the impact of construction on the local residents (as presented in the ESMP) and will need to be finalized and carefully communicated and implemented. Consultation on bus changes will be needed.

(c) Discussions on station design and procurement packaging have taken place early in project preparation to integrate these aspects in a timely manner. The company optimized the packaging of contracts for ease of implementation. Project preparation entailed detailed discussions with the URC and NM regarding the needs for municipal financial contributions for the Line 2, and confirming the affordability for NM.

(d) The Nanchang Bus Company is represented in the PLG. The Company is also having frequent interactions with the URC regarding fare integration and bus route rationalization, and such cooperation is expected to continue. Through those mechanisms, the Bus Company will be kept appraised of project progress and will have an avenue through which to provide inputs.</td></tr>
<tr><td>Resp: Both</td><td>Stage: Implementation</td><td>Recurrent: ☐</td><td>Due Date: 31-Dec-2013</td><td>Frequency:</td><td>Status: In Progress</td></tr>
</table>

<table>
<tr><th colspan="8">Implementing Agency (IA) Risks (including Fiduciary Risks)</th></tr>
<tr><td>Capacity</td><td>Rating</td><td colspan="6">Substantial</td></tr>
<tr><td rowspan="2">Description:

(a) Jiangxi Province implemented a highway project over 20 years ago and part of the project was to build a bridge across the Gan River in Nanchang; NM is currently implementing a GEF grant for an urban transport planning study. However, this will be the first stand-alone infrastructure project implemented by the city. The municipal government staff has limited familiarity with World Bank procurement, safeguards, and financial management policies.

(b) The development of an integrated transport system will require substantial levels of institutional coordination across different municipal agencies – many of which may have limited previous experience with collaboration.

(c) The lack of timely counterpart funding could delay project implementation. NM is confident in its ability to raise sufficient counterpart funding through various financing sources, but this could change if there is a change in the macro-economic environment and/or related national policy.</td><td colspan="7">Risk Management:

(a) A number of measures have been put in place to facilitate implementation. Substantial training on Bank's policies has been and will be provided to the PMO. External consultants experienced in World Bank fiduciary and safeguards aspects will support the PMO. The project procurement design has been kept simple to facilitate implementation. The Bank and NM will also increase their monitoring activities to ensure compliance with financial management (including availability of counterpart funding), procurement, and safeguards guidelines.

(b) A PLG has been established to coordinate among the various municipal agencies for project preparation and implementation. An Integration Plan has been prepared to deal with the transfer between different modes and has gone through consultation. It includes a detailed implementation plan with designated responsible agencies. The URC will report on implementation of the Plan.

(c) Fiscal capacity has been assessed during project preparation and found that sufficient funds would be available to support the construction of Line 2. Domestic loan availability has been confirmed as part of appraisal. Project reporting will cover the overall project and enable the monitoring of any shortfall in counterpart funding, in case such shortfall occurs.</td></tr>
<tr><td>Resp: Bank</td><td>Stage: Implementation</td><td>Recurrent: ☐</td><td>Due Date: 31-Dec-2013</td><td>Frequency:</td><td>Status: In Progress</td></tr>
<tr><td>Governance</td><td>Rating</td><td colspan="6">Moderate</td></tr>
<tr><td rowspan="2">Description:

Urban rail development is on top of Nanchang's agenda for infrastructure development, with support from both the provincial and the national level. NM has a system of accountability in place, that will be further refined for project purposes. Successful project implementation is contingent on strong support from NM leadership, which is likely to continue throughout the project period. The effectiveness of the institutional setup for coordination in</td><td colspan="7">Risk Management:

A PLG has been established by NM to oversee the preparation and implementation of the proposed Project. The PLG is chaired by the Vice Mayor of NM, and comprises senior officials from relevant municipal agencies, including the Finance Bureau, the Development and Reform Commission, the Urban Management Commission, the Planning Bureau, the Construction Commission, the Land Resources Bureau, the Environmental Protection Bureau, the Housing Management Bureau, the Price Bureau, the Traffic Management Bureau and the Bus Company.</td></tr>
<tr><td>Resp: Client</td><td>Stage: Preparation</td><td>Recurrent: ☐</td><td>Due Date: 01-Dec-2012</td><td>Frequency:</td><td>Status: Completed</td></tr>
</table>

making informed decisions at various levels is being vetted as part of project preparation.						

Project Risks						
Design	Rating	Substantial				
Description: (a) The physical design of the stations may fail to address key issues of integrating the urban rail system with other modes of transport, including buses, bicycles, pedestrians, taxis and motorized private transport. (b) There may not be a clear program in Nanchang to allow for high-density land-use development along the Line 2 corridor in order to maximize the benefits of an urban rail system. (c) The construction of the line under the river bed and of a number of stations is complex and will require good quality civil engineering, risk management and supervision.	**Risk Management:** (a) By focusing the loan from the World Bank on stations, it is anticipated that a stronger emphasis will be put on building stations that better meet the needs of users and are well integrated with other modes. NM, the URC and the Bank have discussed good international and domestic practice to improve station design and support multi-modal integration as part of preparation. The design of stations has been adjusted where warranted and an Integration Plan for Line 2 has been prepared to ensure those discussions will be reflected in implementation. NM has put in place the required institutional mechanism to follow up on these aspects. (b) The Bank and NM will continue interactions on land use planning along the corridor. This will be supported through the technical assistance component during implementation. (c) The level of complexity is substantial considering soil conditions but not unusual by Chinese standards. It will require ensuring that well qualified supervision engineers are selected, and that risk management system and careful supervision are in place and effective. The Bank has reviewed the design of station funded under the loan and comments have been reflected in the design where appropriate, in addition to the reviewer hired by the URC for the entire line.					
	Resp: Bank	Stage: Implementation	Recurrent: ☐	Due Date: 31-Dec-2013	Frequency:	Status: In Progress
Social and Environmental	Rating	Substantial				
Description: (a) PMO staff has limited experience with Bank's safeguards policies, as this is the first Bank financed project prepared and implemented by NM. (b) The project will have substantial environmental and social impacts, typical of such a large program in an urban setting (traffic disruption, resettlement, disposal of materials). If not carefully managed, the project will impose a significant negative impact in the city. Established legal procedures and institutional capacity are in place to manage the safeguards issues related to urban construction activities.	**Risk Management:** Social and environmental consultants with extensive Bank project experience have been hired by the PMO to prepare the safeguards documents. Further, the Bank worked closely with the PMO and its consultants and provided further guidance and training, to ensure successful preparation of the RAP and EA reports. The implementation arrangements that are being put in place, with internal and external monitoring, are satisfactory. (b) A public consultation program was incorporated in preparation to understand and address the needs of the project affected people. Results from surveys indicate strong support for Line 2. A comprehensive ESMP has been developed for the project.					
	Resp: Bank	Stage: Implementation	Recurrent: ☐	Due Date: 31-Dec-2013	Frequency:	Status: In Progress

<table>
<tr><td>Program and Donor</td><td>Rating</td><td colspan="5">Low</td></tr>
<tr><td rowspan="2">Description:

The project does not involve other donors at this point. The project is self-standing irrespective of the other urban rail lines.</td><td colspan="6">Risk Management:</td></tr>
<tr><td>Resp:</td><td>Stage:</td><td>Recurrent: ☐</td><td>Due Date:</td><td>Frequency:</td><td>Status:</td></tr>
<tr><td>Delivery Monitoring and Sustainability</td><td>Rating</td><td colspan="5">Substantial</td></tr>
<tr><td rowspan="3">Description:

(a) NM will build on the lessons learned in the implementation of its first urban rail line, with respect to delivery monitoring. Nonetheless, urban rail projects are complex and will require close monitoring of delivery, coordination among multiple suppliers and active contract management.

(b) Long term sustainability of the Project depends on enduring political will and a permanent institutional structure that can manage integrated planning and service provision. Major cities in China have embarked in a major program of urban rail development. Early indications show that suitable budget allocations are being provided to urban rail in those cities to maintain good quality services. The level of required subsidies in the case of NM will need to be assessed as part of project preparation and compared with NM fiscal capacity.</td><td colspan="6">Risk Management:

(a) The task team has agreed with NM on follow up arrangements and reporting to monitor progress in implementation.

(b) During project preparation, the task team has provided guidance to NM on how to establish procedures and guiding principles for accessibility and multi-modal physical and service integration. The task team has also helped NM assess future subsidy requirements stemming from the project. Furthermore, training and technical assistance has been incorporated into project design to help NM and related municipal entities to promote the institutional capacity for integrated transport planning and service provision.</td></tr>
<tr><td>Resp: Bank</td><td>Stage: Implementation</td><td>Recurrent: ☐</td><td>Due Date: 01-Dec-2013</td><td>Frequency:</td><td>Status: In Progress</td></tr>
<tr><td>Resp: Both</td><td>Stage: Preparation</td><td>Recurrent: ☐</td><td>Due Date:</td><td>Frequency:</td><td>Status:</td></tr>
<tr><td colspan="7">Overall Risk</td></tr>
<tr><td colspan="7">Implementation Risk Rating: Substantial</td></tr>
</table>

Description:

(a) This is the PMO's first engagement with the Bank and it is unfamiliar with the Bank's fiduciary and safeguards policy.

(b) Urban rail projects are technically complex with many construction risks that require close attention.

(c) Urban rail projects need to focus on integration and institutional coordination challenges.

(d) The URC needs to ensure timely availability of large commercial loans, and set up of fare policies that balance affordability and financial sustainability;

(e) The planned schedule including construction start in July 2013 and starting operation in 2017 is achievable but tight.

Annex 5: Implementation Support Plan
CHINA: Nanchang Urban Rail Project

Strategy and Approach for Implementation Support

1. The strategy for implementation support (IS) has been developed based on the nature of the project and its risk profile. It aims at making implementation support to the client more flexible and efficient, and focuses on implementation of the risk mitigation measures defined in the ORAF. The ORAF rates the following risk categories "Substantial": implementing agency capacity; project design, social and environmental safeguards, and delivery monitoring and sustainability.

2. **Implementing Agency Capacity.** The task team will monitor the implementation of project components on regular basis as well as the ESMP, RAP, RPF and the agreed procurement and financial management policies and procedures. In addition, it will continue to provide specialized training on procurement, financial management, and social and environmental safeguards as required. The procurement packaging has been kept simple to facilitate implementation. All Bank-financed contracts will be reviewed, supervised and monitored by the Bank procurement specialist on a regular basis, as per the project procurement arrangements and the PMO will be supported by a qualified procurement agent. Finally, technical assistance on financial management and internal auditing will be provided to the PMO under the project (financed by counterpart funding, but assisted by the Bank financial management specialist on need basis) to address relevant FM issues identified during the preparation stage.

3. **Project Design.** The task team has engaged an international consulting firm to review the bidding designs to mitigate the risks related to the physical design of Line 2, especially the safety aspect. The task team will also allocate adequate resources during project implementation to review the supervision of the construction of the stations, tunnels and tracks and the effectiveness of the risk management system in place.

4. In addition to the construction of the line itself, multi-modal integration and compact urban growth have been identified at the preparation stage to be two critical challenges to the success of an urban rail system. The project includes a capacity building component (financed by counterpart funding) to enhance the PMO and other relevant agencies' capacity to increase ridership and land value. Adequate resources will be allocated to provide substantial guidance on these two topics to the client during implementation. Specifically, the team will work closely with NM to follow up on the Line 2 Integration Plan implementation, as endorsed by NM. Monitoring of the implementation of the Integration Plan has been built into the results framework as an intermediate indicator. To help facilitate compact growth in Nanchang, the task

team will continue its dialogue with NM on transport policies and urban design during project implementation.

5. **Social and Environmental Safeguards.** Implementation of the ESMP, RAP and RPF will be closely supervised by the PMO and experienced external monitoring consultants during project implementation. The task team will carry out regular field supervision and provide safeguards training and guidance to the PMO. Adequate resources will be allocated to ESMP/RAP/RPF monitoring.

6. **Delivery Monitoring and Sustainability.** The task team will periodically monitor the project quality through supervision missions, semi-annual progress reports and result indicators. In order to sustain project impact, capacity building on understanding and maximizing Line 2 ridership will be provided under the project with technical support from the task team. At the end of the project the team will seek to record Greenhouse Gas emission reduction as a result of the project, drawing on methodologies being developed Bank wide.

Implementation Support Plan

Table A5-1: Primary Focus of Implementation Support

Time	Focus	Skills Needed	Resource Estimate
First 36 months	• Project construction • Capacity development • Procurement • Financial management • Safeguards • Integration • Commercial development	• Technical (engineering/ policy/planning/economics/ urban planning) • Procurement • Financial management • Safeguards	US$100,000 per annum
37-60 months	• Project commissioning • Tariff Policy • Financial management • M&E • Integration	• Technical (policy) • Financial management	US$75,000 per annum

Table A5-2: Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Technical (engineering)	17	10	1 staff: 2 trips + 3 weeks per staff per project year; 2 extra weeks per staff in the first year
Technical (planning)	7	5	1 staff: 1 trip + 1 week per staff per project year; 1 extra week per staff in the first 2 years
Technical (policy)	7	5	1 staff: 1 trip + 1 week per staff per project year; 1 extra week per staff in the first 2 years
Technical (economics)	7	5	1 staff: 1 trip + 1 week per staff per project year; 1 extra week per staff in the first 2 years
Safeguards	12	10	2 staff: 1 trip + 1 week per project year; 1 extra week per staff in the first year
Financial management	6	5	1 staff: 1 trip + 1 week per staff per project year; 1 extra week per staff in the first year
Procurement	4	4	1 staff: 1 trip + 1 week per staff in the first 3 years; 1 extra week per staff in the first year

7. Location of Staff Expertise. Team leadership, safeguards, financial management and procurement expertise will be provided by country office-based staff. Technical expertise will be provided by both country office-based as well as headquarters-based staff.