

Document of
The World Bank

Report No: ICR0000918

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-47460)

ON A

LOAN

IN THE AMOUNT OF US\$ 200 MILLION
TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR A

SECOND NATIONAL RAILWAYS PROJECT

August 15, 2008

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

CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2008)

Currency Unit = Renminbi (Yuan)

RMB1.00 = US\$0.1389

US\$1.00 = RMB7.00

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
CR	China Railways
EAP	Environmental Action Plan
EASTE	East Asia Transport, Energy and Mining Sector
EIRR	Economic Internal Rate of Return
GDP	Gross Domestic Product
IBRD	International Bank of Reconstruction and Development
ICB	International Competitive Bidding
ICR	Implementation Completion Report
IT	Information Technology
MOF	Ministry of Finance
MOR	Ministry of Railways
NA	Not Available
NDRC	National Development and Reform Commission
NPV	Net Present Value
PAD	Project Appraisal Document
PDO	Project Development Objective
PMO	Project Management Office
RA	Regional (Railway) Administration
RAP	Resettlement Action Plan
RMB	Renminbi
TA	Technical Assistance

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CHINA

CN-Second National Railways Project

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MAPS

1. China Railway Network (IBRD 35662)
2. Second National Railway Project (IBRD 33201)
3. Second National Project Zhe-Gan Line (IBRD 33202)

Note: The following Annexes are not applicable to this project and have been excluded:

- Beneficiary Survey Results
- Stakeholder Workshop Report and Results
- Comments of Cofinanciers and Other Partners/Stakeholders

A. Basic Information			
Country:	China	Project Name:	Second National Railways Project (Zhe-Gan Line)
Project ID:	P075602	L/C/TF Number(s):	IBRD-47460
ICR Date:	08/17/2008	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	P.R. CHINA
Original Total Commitment:	USD 200.0M	Disbursed Amount:	USD 199.0M
Environmental Category: A			
Implementing Agencies: Ministry of Railways, Foreign Capital & Technical Import Center			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	02/20/2003	Effectiveness:	01/16/2005	01/16/2005
Appraisal:	03/29/2004	Restructuring(s):		
Approval:	06/24/2004	Mid-term Review:		
		Closing:	01/31/2008	01/31/2008

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Satisfactory
Risk to Development Outcome:	Low or Negligible
Bank Performance:	Satisfactory
Borrower Performance:	Highly Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Highly Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Highly Satisfactory
Overall Bank Performance:	Satisfactory	Overall Borrower Performance:	Highly Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project	No	Quality at Entry	None

at any time (Yes/No):		(QEA):	
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Central government administration	1	1
Railways	99	99
Theme Code (Primary/Secondary)		
Climate change	Secondary	Secondary
Infrastructure services for private sector development	Primary	Primary

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	James W. Adams	Jemal-ud-din Kassum
Country Director:	David R. Dollar	Yukon Huang
Sector Manager:	Ede Jorge Ijjasz-Vasquez	Jitendra N. Bajpai
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ICR Team Leader:	John Carter Scales	
ICR Primary Author:	Richard G. Bullock	
	Jitendra Sondhi	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

This Project has two objectives:

- (a) improve services provided to customers of the Zhe-Gan railway line; and
- (b) upgrade the quality of track maintenance on heavily used portions of China Railways' network.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	The transit time per trip for freight trains (minutes)			
Value quantitative or Qualitative)	1,575	1,400		931
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	150%			
Indicator 2 :	The transit time per trip for passenger trains (minutes)			
Value quantitative or Qualitative)	829	600		561
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	107%			
Indicator 3 :	The transit time per trip for express passenger trains (minutes)			
Value quantitative or Qualitative)	660	660		336
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	196%			
Indicator 4 :	Average track downtime (minutes per day) reduced by 50%			
Value quantitative or Qualitative)	180	180		90
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	200%			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Number of pairs of passenger express train per day at a maximum speed of 200 km/h.			
Value	0	2		2

(quantitative or Qualitative)				
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	100%			
Indicator 2 :	The traffic volume for freight (billion ton-m)			
Value (quantitative or Qualitative)	40.0	42.6		51.6
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	121%			
Indicator 3 :	The traffic volume for passenger (billion pass-km)			
Value (quantitative or Qualitative)	24.0	27.3		40.1
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	147%			
Indicator 4 :	Design headway between trains (minutes)			
Value (quantitative or Qualitative)	8	7		7
Date achieved	12/31/2003	12/31/2007		12/31/2007
Comments (incl. % achievement)	100%			

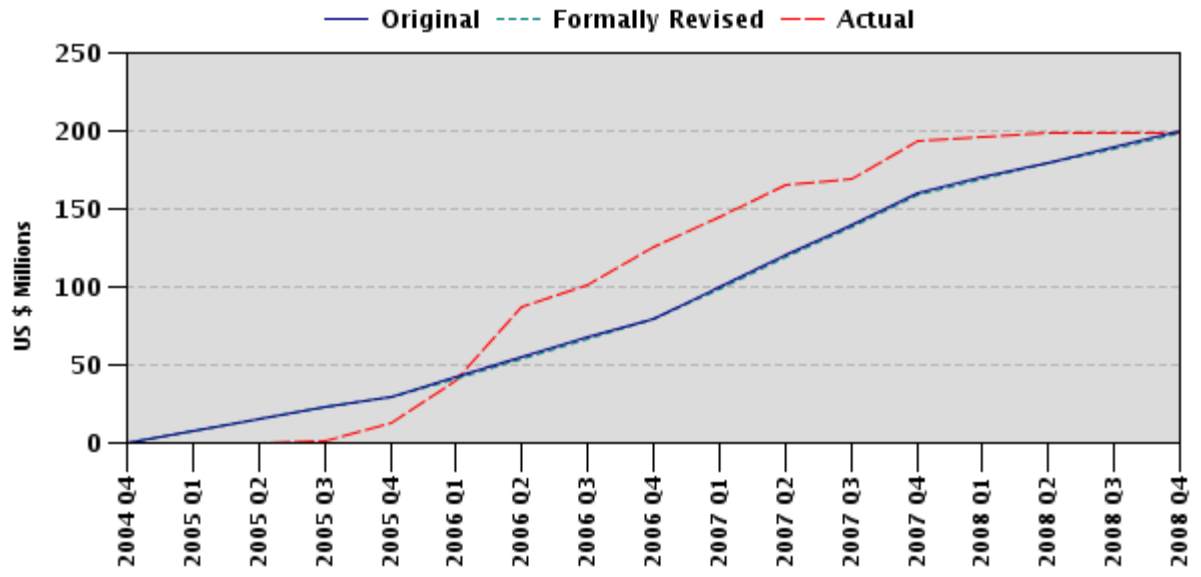
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	11/24/2004	Satisfactory	Satisfactory	0.00
2	01/07/2005	Satisfactory	Satisfactory	0.00
3	05/26/2005	Satisfactory	Satisfactory	1.00
4	03/20/2006	Satisfactory	Satisfactory	101.86
5	03/30/2007	Satisfactory	Satisfactory	169.29

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

The Country Assistance Strategy (CAS) (25141-CHA, January 22, 2003) included as priorities the strengthening of transport links within and to lagging regions, improving public sector management and delivery of services and facilitating an environmentally sustainable development process. This project responded to these three CAS priorities. It was also in line with the Bank strategy for the Railway Sector in China of supporting increased capacity, improved service quality of passenger and freight transport services on rail and the adoption of modern railway technologies. Before this project the Bank had supported eight projects with the national railway and one with a provincial railway. The first project went to the Board in 1984.

The Ministry of Railways (MOR) has been facing mounting competition from the expanding highway system. It faced the dual challenges of increasing capacity as well as increasing service quality while maintaining profitability. This project was designed to improve the transport connectivity of southwestern China to the east, enhance capacity and improve service quality by upgrading an important rail line linking Shanghai and Zhejiang with Jiangxi and Hunan (and from there to Guizhou and Yunnan) provinces, thereby helping to address the needs of poorer and disadvantaged regions. In addition, the conversion of this line from diesel to electric traction (which is partly generated from hydropower sources) will yield environmental benefits.

Although China Railways has been successful in expanding its network and serving growing volumes of business, both freight and passengers, it continued to lose market share as other transport modes, particularly the highways, modernized. Additional capacity is planned in the Government's 11th Five Year Plan (2006-2010) and Mid- and Long-Term Development Plan (2006-2020). In addition, the Government has encouraged the railway to continue adapting to the challenges of operating in a competitive transport market and has sought the Bank's advice in this respect on the strength of its experience with railways around the world. It also expected the international financial institutions to facilitate its access to international technology and best practice in planning and management.

1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)

This Project has two objectives: (a) improve services provided to customers of the Zhe-Gan railway line; and (b) upgrade the quality of track maintenance on heavily used portions of China Railways' network.

Project outcomes were to be measured by three groups of indicators:

Zhe-Gan Line

- (a) The transit time per trip to be reduced by:
- freight trains: 15%
 - ordinary passenger trains: 50%
 - express passenger trains: 40%

- (b) The unit operating cost to be reduced by:
 - freight trains: 45%
 - passenger trains: 4%

Track Maintenance

- (c) average track downtime (minutes per day) to be reduced by 50%

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

The development objectives remained unchanged throughout the implementation of the Project. However, two key indicators for the Zhe-Gan line were modified by a formal amendment to the loan agreement dated June 26, 2006.

(a) It was not possible for MOR to provide meaningful data for the ‘variable operating cost’ for the Zhe-Gan line since MOR does not work out such costs by line. It was therefore agreed that this indicator be deleted from the loan agreement since it did not directly correspond to the project’s development objectives and the data for the indicator is not available.

(b) The travel time of (non-express) passenger trains in 2008 and 2009, was listed as 415 minutes in the Supplemental Letter No. 2 to the Loan Agreement that reduced the transit time per trip by 50 percent. It was felt that 415 minutes may have been listed in error and it was revised to 500 minutes. A passenger train, to complete the trip in 415 minutes, would have to travel an average of 132 km/h. over the 916 km length of the realigned Zhe-Gan line. The project appraisal document notes that the average speed of *express* passenger trains having a maximum speed of 200 km/h, will only be 141 km/h after improvements. A trip time of 500 minutes for (non-express) passenger trains having more stops and a maximum speed of 160 km/h, on the other hand, can be accomplished at a more reasonable, but respectable, average speed of 110 km/h that still reduces the travel time of ordinary passenger trains by 40 percent.

1.4 Main Beneficiaries

The population of southwestern China was expected to benefit from the increase in passenger services and reduced travel time. The increase in rail freight transport capacity and reduction in transit time of freight trains was expected to benefit the producers of agricultural, mineral, and manufactured goods in southwestern China by improving access to markets in eastern China.

China Railways was expected to benefit from the reduced track downtime across its network due to the modernization of track maintenance technology, as well as from the advisory services that would strengthen its planning, management and technology capacity.

1.5 Original Components *(as approved)*

The Project included the following components:

1. Zhe-Gan Line Improvements
 - 1A Speed Raising
 - 1B Signaling and Communications
 - 1C Electrification
 - 1D Land Acquisition and Resettlement
2. Modernization of Track Maintenance Technology
3. Technical Assistance

Zhe-Gan Line Improvements

The original Zhe-Gan line was a 942-km long, double track, diesel-powered, and allowing a maximum speed of 120 km/h. This project installed new signaling, realigned sharp curves and carried out other civil works needed to permit higher speeds. The line has been electrified throughout and is now capable of 200 km/h express trains operated by electric multiple units (EMUs), while slower passenger and freight trains are operated with electric locomotives. End-to-end trip times have been cut by several hours. The new signaling and communications equipment allow design headway between trains to be reduced, increasing the line capacity significantly. Electrification allows the maximum gross weight of freight trains to be increased by at least a third.

Modernizing of track maintenance technology

The project also acquired additional mechanized, high-capacity equipment for replacing worn rail and switches, renewing ballast, and other maintenance tasks on heavy-traffic lines. In addition rail-based mobile cranes were procured that can be deployed rapidly to sites of accidents and derailments, enhancing the capacity to clear accidents and restore normal operations quickly on heavy-traffic lines.

Strengthening MOR's planning, management and technology capacity

It had been expected that studies for the improvement of business processes may be carried out.

1.6 Revised Components

There was no revision of components.

1.7 Other significant changes

Due to the appreciation of Chinese currency against US\$, the US\$ value of RMB contracts increased. This together with an increase in the price of certain commodities caused a shortfall in Bank funding for goods. Subsequently, MOR requested the Bank to reallocate US\$ 1.6 million from “consultant services” to “goods” category in order to allow the purchase of remaining track maintenance equipment. The loan agreement was amended on June 26, 2006. Following this amendment, the table in paragraph 1 of

Schedule 1 of the Loan Agreement provided US\$ 197.5 million for goods and US\$ 0.5 million for consulting services and training.

Goods:	\$197.5 million (previously \$195.9 million),
Consulting services and training:	\$0.5 million (previously \$2.1 million), and
Fee:	\$1.0 million (previously \$2.0 million)
Total	\$199.0 million (previously \$200.0 million)

(The fee was reduced by the Bank from 1.0 to 0.5%. The government decided to reduce the total loan amount from \$200 to \$199.0 million)

Further shortfall in Bank funding for the same reasons stated above resulted in the eventual reallocation of the remaining US\$0.5 million from the Consultants' services category to the Goods category. Specific studies were not identified in the Loan Agreement and the delivery of technical assistance was not required to achieve the development objective, where on the other hand, the purchase of the remaining track maintenance equipment was essential to the achievement of the development objective.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

The project focused on the prevailing needs of the rail sub-sector at the time of project appraisal. Capacity constraints were causing shortages of coal at power stations and the stockpiling of imports at certain ports and the need to improve service quality, particularly for passenger services, had become important as competition from highways and air services increased. The project components were in line with the CAS and addressed four important issues related to rail transport in China: (i) enhancing the capacity and service quality on an important corridor that connects lagging southwestern China with prosperous eastern region by upgrading an important rail link; (ii) improving railway's operating efficiency by modernizing track maintenance technology, (iii) supporting environmental sustainability by conversion of this line from diesel to electric traction and (iv) providing advisory services to strengthen MOR's planning, management and technology capacity.

Lessons learnt from Railway VI and VII projects had shown the project should not include components to which the client is not fully committed, nor so many components that they cannot be properly supervised during implementation. Accordingly, this project had fewer components and the client supported all project components.

Another lesson learnt was that the participation and co-operation of regional administrations with MOR in the design and implementation of projects was important and project planning included close contact with regional administrations during project launch and project supervision.

At appraisal MOR had completed the technical design for Zhe-Gan line improvements, covering speed raising, modifying signaling and telecommunications and electrification. The Bank's appraisal team reviewed in detail various aspects of the project feasibility report, including technical parameters and engineering design, projected traffic volumes, estimates of costs and benefits and safeguard issues, in Beijing and during site visits. The

project was well within the capacity of MOR. The project team received MOR's full support in project preparation and appraisal.

The technical risks noted at appraisal included the non-availability of sufficient electric power, non-availability of EMUs to operate 200 km/h trains, work rules not being modified to exploit the full benefits of electrification and the adverse impact of shock waves of trains entering tunnels at high speed. Specific measures were included in the loan conditions to eliminate or reduce the above risks.

The Bank did not assess any significant risk in respect of MOR's ability to implement the project in an efficient and timely manner or in the realization of projected increase in traffic volume. Although China Railways had steadily improved its implementation of safeguard policies, and it was expected that these would be aligned closely with those of the Bank, its commitment to Bank resettlement and environmental guidelines and procedures was also ensured through planning close supervision of safeguard-related activities during project implementation.

The project was well prepared. Sound background analysis had been undertaken. The project was well designed, the government was fully committed, and most risks reasonably assessed. However, the growing risk of the Chinese currency strengthening against US\$ and the eventual steep rise in project commodity costs during project implementation was not recognized. As a result, even after the reallocation from the non-essential consultants' services category to the goods category, there was insufficient Bank funds to finance the purchase a small (US\$400 thousand) amount of goods.

2.2 Implementation

The Bank loan to support this project was approved in June 2004. Construction (realigning and upgrading track to 200km/h speed capability and increasing the axle load from 20.3 to 25 tonnes) commenced in July 2004. In addition, flood protection works and relocation of a major station were undertaken simultaneously, funded by MOR and local government¹. The civil works were substantially complete by the end of 2006, a commendable achievement since they were carried out while the line was operational and the construction teams were only given track possessions for four hours or so each day. The procurement of goods for signaling and communications, electrification and track machines was processed in parallel. The procured equipment was delivered and installed by the end of December 2006 as per the project implementation schedule. Electric locomotives were progressively introduced on the upgraded Zhe-Gan line from January 2007. The EMU trains capable of operation at 200km/h were delivered on schedule in early 2007. After initial testing, the 200km/h service was introduced on this line from April 18, 2007.

The main reasons for the satisfactory and timely implementation of the project were:

- (i) strong political commitment at a high level;

¹ In all about RMB 3.1 billion of MOR funds were used for the flood prevention works and RMB 1.2 million for the relocation of Yiwu station.

- (ii) timely availability of counterpart funding;
- (iii) meticulous project planning, including deployment of multiple groups for construction work;

Under the second component for modernization of track maintenance technology, it was planned to procure 28 large track maintenance machines. Due to a substantial increase in metal prices and the strengthening of the Chinese currency against the US \$, there was a significant increase in the US\$ cost of goods procured in China. Although US\$ 1.6 million of the US\$ 2.1 million originally earmarked for consulting services was reallocated to goods, Bank funds were still insufficient to procure all the track maintenance machines and as such 23 track machines were procured against the original planned 28. Available counterpart financing was not available to procure the remaining 5 track machines.

Eventually and in agreement with the Bank, the residual US\$ 0.5 million allocated for consulting services was also utilized for funding the procurement of goods. As the goods procured were necessary to support the achievement of the development objective they took precedence over the technical assistance studies. The technical assistance studies originally proposed for this project are now being considered for possible delivery through subsequent Bank-financed projects with the Ministry of Railways.

The total cost of the project was 5.2 percent higher than the appraisal estimates. The cost of Bank-financed equipment and services was lower than the estimates in RMB terms but higher in US\$ terms. The cost of locally funded equipment and works was higher by about six percent.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

The M&E key performance indicators for the components supporting the development objectives are mostly simple and concise measures which directly monitored the achievement of the PDO. The exception is the indicator for "operating expense per thousand ton-km"; this is in practice calculated by MOR for entire railway administrations rather than a specific route or line and could not be estimated as intended for the specific project line. As such this indicator was deleted through a formal amendment to the loan agreement dated June 26, 2006.

The M&E key performance indicator for track maintenance monitors the track down-time for maintenance; this is a direct (inverse) reflection of the benefits.

The M&E key performance indicators for the infrastructure and track maintenance components are routinely collected by MOR and can be taken as accurate. As with all linear transport infrastructure projects, performance indicators can only be collected once the project has been physically completed.

Since the M&E indicators selected (other than the discarded cost indicator) are routinely collected by MOR, these provide an ongoing capability to MOR to monitor the performance on the project line beyond the project implementation period.

2.4 Safeguard and Fiduciary Compliance

Environment

The overall implementation of Environmental Management Plan (EMP) was satisfactory. It is noted that MOR and its three Administrations paid much attention to environmental protection and the mitigation measures developed in EMP were effectively implemented.

During the field visit, it was observed that all embankment slopes were properly protected with engineering and plantation stabilization and abandoned railway sections were either reclaimed as green belt/farmland or converted to public roads for the benefit of local communities. The soil borrow sites/quarries (24 sites in total), spoil disposal sites (79 sites in total) and temporary occupied lands were all reclaimed as farmland, water/fish ponds, forest/grass land or construction land for urban/industrial development. Many access roads upon construction completion have been properly paved and upgraded as local roads which are greatly appreciated by the local population. Noise barriers were installed at 108 sites. Fine tuning of alignment during detailed design stage avoided some of the noise sensitive sites originally identified during EA preparation. Several additional passages (overpasses and culverts) were constructed in consultation with local communities during construction. New stations were well planned with full consultation of local governments and great efforts have been made on station design featuring local culture and greening of environment around the stations. Adequate sanitary facilities were installed for sewage treatment (discharged to local sewage network) and garbage collection. According to the final monitoring conducted by OASIS in November 2007, the wastewater discharge and noise impact on selective sensitive sites are in compliance with relevant standards.

The project continued the practice of engaging an independent Environmental Compliance Monitor (which was first adopted in National Railway I Bao-Lan Line Project) in addition to the traditional Supervision Engineer. The Monitor conducted independent field supervision for environmental performance of contractors, provided environmental protection training to management staff from railway administrations, supervision engineers and contractors, and submitted monitoring reports to the Bank. The independent Environmental Compliance Monitor approach has proved to be effective and has been adopted in subsequent Bank funded railway projects.

Social Safeguards

An ICR mission to the project line in March 2008 visited five resettlement villages in five different counties and after discussions with resettled persons, resettlement staff and local officials, concluded that the resettlement was completed successfully. It found that the affected people were satisfied with their compensation and other arrangements.

The resettlement and land acquisition work associated with the project was monitored by Southwest Communication University, with annual review as part of Bank missions. The monitoring reports were well prepared, with only minor matters that required follow-up, and were a significant improvement on those prepared during earlier railway projects. Resettlement was jointly managed by the relevant local governments and railway administration and implemented in line with, and in some cases beyond, the requirements

of the Resettlement Action Plan (RAP). The RAP was well publicized and the distribution of compensation funds determined locally. Persons affected were compensated either through redistribution of land, being provided with an alternative site, or cash compensation.

Fiduciary

Financial management and reporting was in accordance to the Loan Agreement and the project complied with all Bank guidelines. Disbursement tracked largely in accordance to initial projections, with a slower pace at the beginning but coming closer or surpassing initial targets after a year-and-a-half after the declaration of effectiveness.

Procurement

Procurement was carried out relatively smoothly though protracted delays in Bank HQ procurement approvals on some contracts led to Government complaints. Project procurement was carried out in compliance with the Bank's procurement guidelines.

2.5 Post-completion Operation/Next Phase

The service on the line continues to meet or exceed expectations and track and rolling stock is being well maintained². Further, data for the year 2007 shows that the operational performance on the Zhe-Gan line continues to improve. The required maintenance facilities for newly introduced electric locomotives and EMU train sets have been set up. Adequate number of operational and maintenance staff was trained to handle electric locomotives and EMUs. The track machines procured under this project are operational and are based at existing well established track maintenance depots that are capable of their efficient operation as well as maintenance. Bank's experience has been that MOR maintains such assets in good condition and there is a high level of confidence for the sustainability of this project.

Based on the experience of previous rail projects, no specific measures by the Bank are required to ensure sustainability of this specific project beyond the normal operating and maintenance practices of MOR. No follow-up phase to the upgrading component is necessary.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

The objectives, design and implementation of the project remain relevant in today's context. The project directly responds to the current Country Partnership Strategy 2006-10 (CPS) that consists of five pillars. This project addresses the integration of China into world economy (Pillar 1) by developing rail infrastructure connecting south-western China with ports located on east coast and, given its location on the main transport link

² This conclusion is based upon field visits in April 2007 and March 2008. In April 2007, the team traveled a distance of 600 km from Nanchang to Hangzhou on a 200 km/h speed train at an average speed of 150 km/h including four stops enroute. The quality of track was excellent and train ride smooth and comfortable. The interior of the eight car train set was somewhat better than equivalent airline standard.

for south-western China. The project also supports a second pillar of CPS: to address poverty reduction by providing the relatively poor region access to efficient rail transportation. The third pillar of CPS that gives priority to managing resource scarcity and environmental challenges is supported by the promotion of rail transportation on an important corridor that makes much less demand on land use, is more energy efficient and causes less pollution with the change over from diesel to electric traction as well as competing with the more energy-intensive alternatives of road and air transport. The beneficiaries include three of China's six poorest provinces, with average household expenditures in 2006 that were around two-thirds of those for China as a whole. Their access to the markets of eastern China has been significantly improved (see indicators in Annex 1).

3.2 Achievement of Project Development Objectives

Based on the performance indicators the project has achieved its primary objective to improve services provided to customers of the Zhe-Gan railway line. The project was implemented efficiently and completed on schedule. The project has generated additional transport capacity on a busy east-west corridor and the volume of traffic for freight as well as passenger in 2007 has already exceeded the targets for the year 2009 by a wide margin. The project is a key investment eliminating a major bottleneck on one of the most important rail corridors in China. It has not only increased rail transport capacity between southwestern China and Shanghai but also has created major operational benefits by significantly increasing the speed of both passenger and freight trains.

All the key performance indicators associated with this component have been met or exceeded. Furthermore, the service quality for passengers has improved dramatically with the introduction of 200km/h trains that not only reduce the travel time by 40 percent but also provide a very high standard of comfort. The travel time of ordinary passenger trains in 2007 had also been reduced by over 30 percent, in line with key monitoring indicators.

The deployment of new track machines has helped improve the quality of track maintenance. Zhe-Gan line, as indication of other heavily used portions of the network, has had a 50 percent reduction in down time of track a year earlier than targeted.

3.3 Efficiency

The estimated project economic return has been derived on the same basis as that adopted in the PAD, i.e. a conventional transport project evaluation framework which identifies the operational benefits arising from the project: savings in operating cost and travel time and service-related user benefits. Based on the analysis in Annex 3, the reevaluation estimates that the economic rate of return for the Zhe-Gan project is 26 percent, compared to the economic return of 19 percent reported in the PAD.

No re-evaluation has been undertaken for the track machinery (which had an IRR of 106% at appraisal based on two case studies) as the indicators on which this was based have been achieved or exceeded and a re-evaluation using the appraisal framework will thus give at least as good a result.

3.4 Justification of Overall Outcome Rating

Rating: *Satisfactory*.

The primary operating efficiency and capacity outcomes including decreased transit time per trip and reduction in track downtime have been substantially achieved well ahead of plan.

3.5 Overarching Themes, Other Outcomes and Impacts

Not applicable

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

Not applicable

4. Assessment of Risk to Development Outcome

Rating: *Negligible*.

There is little risk that the development outcome associated with the physical component will not be maintained. The project has already achieved all the physical KPIs projected for 2008 a year in advance and, as part of the main south-west route in China, will be a priority link for the foreseeable future. This project will continue to provide significant support to the development objectives included in 2003 CAS and 2006- 10 CPS.

5. Assessment of Bank and Borrower Performance

(relating to design, implementation and outcome issues)

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: *Satisfactory*.

The project was highly relevant within the context of the CAS and its preparation was thorough that enabled smooth implementation. Safeguard policies were carefully reviewed at appraisal and no unforeseen issues arose. The project built upon lessons learned from previous China railway projects avoiding many of the earlier problems.

(b) Quality of Supervision

(including of fiduciary and safeguards policies)

Rating: *Satisfactory*.

Field supervision missions concentrated on the progress of physical works and adherence to safeguards policies. With the exception of the issue discussed in the next paragraph, no major issues arose that required unusual attention or special remedial measures.

In 2006 it became clear that the currency appreciation and increase in commodity prices would cause a shortfall in funds for procurement of goods. In order to support achievement of the development objective, the Bank processed the amendment to the loan agreement and end of project reallocation to reallocate a total of US\$ 2.1 million from “consulting services” to “goods” category.

(c) Justification of Rating for Overall Bank Performance

Rating: *Satisfactory*.

The overall Bank performance is rated as satisfactory.

5.2 Borrower Performance

(a) Government Performance

Rating: *Highly Satisfactory*.

The Government was strongly committed to the project, appropriately represented the eventual benefits of the project, ensured capable implementation staff and provided adequate counterpart funding in a timely manner.

(b) Implementing Agency or Agencies Performance

Rating: *Highly satisfactory*.

The project was implemented to budget and on schedule. Disbursement was consistently at or above the original schedule. Project quality was excellent. Though there were a few delays in implementation of resettlement due to the administrative structure (MOR is primarily responsible for the costs and local government is primarily responsible for administration), the implementing agency (FCTIC in MOR) proactively intervened to the ultimate satisfaction of those impacted and the Bank. In addition, FCTIC addressed the currency appreciation issue and the rise in project commodity prices in a timely manner and ensured that all essential project equipment was procured and made available on time.

(c) Justification of Rating for Overall Borrower Performance

Rating: *Highly Satisfactory*.

The overall Borrower performance is rated as highly satisfactory. Reflecting this performance, the Bank's Board of Directors has, subsequent to this project, approved two additional China railway projects and the Bank is in the process of preparing an additional two continuing to reinforce the China Ministry of Railway's position as one of the Bank's strongest partners.

6. Lessons Learned

The efficient implementation of the project again demonstrated the value of a well designed project and clear and thorough project planning. The one area which continues to require some attention is in the area of resettlement compensation. The Minister of Railways does not directly administer resettlement; this is done in cooperation with local governments from the provincial level down to the village level. On China railway projects this can lead to a disconnect between the project's Resettlement Action Plan and actual implementation. Reinforcing the control mechanisms is an important lesson to be applied to future China railway projects.

The use of an independent Environmental Compliance Monitor was a success and is now being employed for other major projects with potential environmental sensitivity, ensuring that proper attention is paid to environmental safeguards while freeing the supervising engineer to concentrate on technical issues.

Earlier practice had been to include contingencies in an “unallocated” category to cover unexpected cost overruns. At the time this project was appraised though, many transport infrastructure projects in China were coming in under cost estimates due to conservative estimates and strong competition from construction companies emerging from State administration with the result being that loan savings emerged which were often canceled. This Project did not include a provision for physical and price contingencies and thus did not have any flexibility to cover the unexpected sharp price rises in metals and an unexpected strengthening of the RMB against US\$ that increased the cost of RMB contracts in US\$ terms. This led to a shortfall of funding for Bank funded procurement. The practice of including contingencies to cover potential increase in prices and exchange rate fluctuations should be carefully considered in future projects.

Finally, the loan was amended to drop two indicators that could not reasonably be measured given the data collection mechanisms of the railway owner. KPIs should, as far as possible, relate to indicators which are routinely reported (of which there is no shortage in the railway sector) and clearly understood by the client.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

The Borrower’s comments are complementary of the project’s achievements and the relationship established between the Bank and the Ministry of Railways.

(b) Cofinanciers

Not applicable

(c) Other partners and stakeholders

Not applicable

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
ZHE-GAN LINE IMPROVEMENTS	1,496.90	1,733.40	115.8
MODERNIZATION OF TRACK MAINTENANCE TECHNOLOGY	75.00	67.30	89.7
TECHNICAL ASSISTANCE	2.00	0.00	0.0
Total Baseline Cost	1,573.90	1,800.70	114.4
Physical and Price Contingencies	96.30	0.00	0.00
Interest During Construction	83.30	45.80	55.2
Total Project Costs	1,753.50	0.00	0.0
Front-end fee PPF	0.00	0.00	
Front-end fee IBRD	2.00	1.00	50.0
Total Financing Required	1,755.50	1,847.50	105.2

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		1555.50	1,648.50	106.0
International Bank for Reconstruction and Development		200.00	199.00	99.5

Annex 2. Outputs by Component

Component/Output	Planned (PAD 2004)	Actual on completion
Zhe-Gan Line Improvements		
Speed Raising	Realigning and upgrading of existing track: 900 track km	1,164 km
Signaling and Communications	Improving signaling and communications on double track: 916 route km	939 km
Electrification	Electrification: 3,045 track km	2,826 km
Land Acquisition and Resettlement	Land acquisition: 26,668 mu Resettlement: 2,666 families	31,800 mu 7,573 families
Modernization of Track Maintenance Technology	Procure track machines 28 Increase coverage of track maintenance depots from 40,000 to 67,000 track-km	23 machines 73,000 track-km.
Technical Assistance	4 TA studies	None

Zhe-Gan Line Improvements: This was a double track, 942 km long railway line operated by diesel locomotives. The project includes realigning and upgrading track (financed by MOR) to enable raising the speed from 120 to 200 km/h and increase axle load from 20.3 to 25t. This required improvement of about 900 km of track (about 50% of track length), and construction of 109 bridges (26.8km total length) and 24 double track tunnels (9.5km) and 4 single track (1.8 km) tunnels. Due to realignment the length of the line was reduced from 942 to 916 km. The signaling and telecommunications systems were improved (partly funded by the Bank) to reduce design headway between trains from present 8 to 7 minutes. Further, the line was electrified (partly financed by the Bank) with a catenary height of 6.45m to permit double stack container operation. These improvements increased the transport capacity on this east –west railway corridor and reduced the travel time on ordinary and express passenger trains by 40 percent and that for freight trains by 33 percent.

Modernization of Track Maintenance Technology: The project also financed procurement of track maintenance machines (Bank financed). These machines were deployed on Zhe-Gan line as well as other lines of MOR. As a result the track down time per day on the Zhe-Gan line was reduced from 180 to 90 minutes. The coverage of track maintenance by machines was increased from 40,000 to 73,000 track km.

Technical Assistance: Four TA subjects were planned to be addressed to strengthen MOR's planning, management and technology capacity. These studies could not be carried out since funds allocated for TA were reallocated to goods to cover funding shortfall due to appreciation of RMB against the US\$ and increase in commodity prices, particularly steel and copper.

Annex 3. Economic and Financial Analysis

Introduction

This Annex presents the economic re-evaluation of the component of the Second National Railway Project covering the electrification and upgrading of the 942 km double-track Zhe-Gan line linking Hangzhou and Zhuzhou.

The line is the main corridor linking Shanghai with southern and south-western China (Hunan, Jiangxi, Guangdong, Guangxi, Guizhou and Yunnan) and, prior to the project, was operating close to capacity. Given the continuing traffic growth projected for at least the medium term, whilst the primary benefit of the project has been the reduced operating costs and passenger time savings from the better alignment and reduced transit times, it has also created benefits by providing increased capacity.

The ICR re-evaluation adopts the same approach as used in the PAD and concentrates on the operating cost savings from electrification and speed-raising and the benefits to the additional traffic that can be carried from 2015 on because of the increased capacity since project completion. In the 'without-project' case this traffic (most of which would be comparatively short-distance traffic of, say 300-500 km) is assumed to be either suppressed or to require additional road capacity (which would typically be local improvements, such as widening, to existing roads) to be constructed at the time of its diversion. The re-evaluation has, however, modified the treatment at project appraisal of a number of complementary costs; rollingstock capital costs have been estimated on a fleet-average basis, as it is not captive to a particular line section and the cost of purchasing electricity and maintaining the electrical supply system (catenary and substations) is included as an operating cost.

The re-evaluation concludes that, based on a discount rate of 12 percent, the net present value (NPV) for the project is RMB 33 billion and the economic rate of return (EIRR) is 26 percent for the base case – compared to the 19 percent figure reported in the PAD. If the benefits to diverted and suppressed traffic are excluded, the EIRR only reduces very slightly, as these only begin to appear after 2015, some four years after project payback has been achieved. The improved result compared to the PAD is due to the strong growth in passenger traffic (nearly 50%) between 2003 and 2007 and the conservative assumptions on time savings that were made in the PAD.

To maintain consistency with the PAD methodology, the evaluation has been done over a twenty-year period and excludes benefits related to reduced greenhouse gas emissions caused by the transfer of road traffic to rail.

Traffic Forecasts

Table 1 shows volumes have grown steadily over the past decade, with passenger traffic growing rather faster than freight. The PAD assumed annual growth rates of around 7 per cent for passenger traffic and 1.2 percent for freight traffic to 2015 and no growth thereafter; both growth rates appear conservative based on historic trends (although

freight has been flat for the past three-four years, this has been when the line has been upgraded with a consequent reduction in capacity). It also seems unlikely that volumes will be constant after 2015, especially given the improvements in service levels. The re-evaluation has assumed the same growth rates of 5% p.a. and 3.5% p.a. for passenger traffic to 2015 and post-2015 respectively and corresponding growth rates of 3% p.a. and 2% p.a. for freight.

Table 1: Traffic on Zhe-Gan Line 1998-2007
(all traffic figures in millions of traffic units)

	Task	
	Pass-km	Net t-km
1998	18123	34590
1999	20938	35799
2000	22150	38186
2001	24136	40289
2002	26716	45533
2003	27723	48626
2004	32585	54524
2005	33882	51773
2006	36431	52734
2007	40073	51646
Growth rate		
1998-2007	9%	5%
2002-2007	8%	3%

Source : MOR

The project has increased capacity on the route by about 10 per cent, due to the reduced headways, and this, combined with the increased size of freight trains possible with electric traction, means it is unlikely to reach capacity until after 2025, instead of at around 2015 in the absence of electrification. The evaluation assumes that, in the absence of the project, freight traffic would be progressively displaced and either divert to road or be suppressed.

Direct Project Costs

The total direct outlays of the project, excluding the track machinery, front-end fee and TA, amounted to RMB 14.36 billion (USD 1.73 billion) (Table 2). Of this, RMB 1.18 billion, which was largely funded by the local authority, was to relocate the line away from the centre of Yiwu. As this is largely independent of the main objective of the project, it has been omitted from the construction cost included in the re-evaluation. The re-evaluation also made a small adjustment to the project costs to allow for the new track on the existing line, which is essentially of a replacement nature rather than upgrading the infrastructure and hence would also be incurred in a 'without-project' case, although maybe not at this precise time. Table 2 summarizes the various functional elements of the line upgrading project and the share of each included in the re-evaluation.

Table 2: Expenditure Included in Economic Evaluation (RMB million current)

Item	Total	Included	Comment
Civil works			
Land	1148	1148	100%
Subgrade	1776	1776	100%
Bridges	770	770	100%
Tunnels	306	306	100%
Buildings	205	205	100%
Track	1084	976	90% - allowance for cascaded track
Other	1650	1650	100%
Subtotal	6939	6831	
Equipment			
Signalling and communications	1298	1298	100%
Electrification	1884	1884	100%
Subtotal	3182	3182	
Flood prevention	3057	3057	100%
Yiwu relocation	1185	0	0%
Total	14363	13070	91%

The re-evaluation thus includes 91% of the expenditure associated with the project, after allowance for cascading and unevaluated benefits, compared to 100% (of a project with a much smaller scope) at appraisal. For simplicity, this proportion of 91% has been applied equally to all years, although in practice it is more concentrated towards the later years of the construction period, when the track maintenance equipment was purchased. Because of the long life of many of the infrastructure works, a residual value of 50% of the capital expenditure has been included at the end of the evaluation period.

The PAD shadow-priced the assumed labour component of local costs to allow for meals and other payments to in-house labour. However, as the work was done by contract rather than by direct labour, such items are already included in the contract cost and this adjustment has not been made in the ICR re-evaluation. The costs were converted into 2006 constant prices using the annual price indices for construction and equipment to give the total economic direct costs of the project (RMB of 2006) as RMB 13.048 billion.

Complementary Costs

The PAD evaluation included a number of items as complementary costs, which have been excluded from the re-evaluation. The incremental rolling stock capital in this type of project is most realistically measured as annualized costs included in operating costs, and this approach has been adopted in this case. No complementary costs for the incremental electrical generating capacity needed by the change from diesel power to electric traction have been included in the re-evaluation, as this item is already included in the cost of electricity. The additional annual operating cost of the maintenance of electrical infrastructure is also not a complementary investment, but is part of the differential operating costs.

Project Benefits

Project benefits fall into two categories. First, all traffic hauled on the line benefits from the improved operating conditions, which reduce operating costs per unit of traffic. These arise from:

1. Reduced transit times because of the increased capacity, reducing rail operating costs and providing benefits to passengers.
2. Reduced distance due to the improved alignment.
3. Reduced energy costs and rolling stock maintenance costs per unit of traffic because of the much better alignment of the new line, the improvements to the existing line and the fewer en-route stops required for crossing purposes.
4. An increase in the ruling load for freight trains in both directions because of the increased power of the electric locomotives.
5. Against this, there is the cost of maintaining the electrical infrastructure for the route.

The second category of benefits are those accruing to traffic which would be suppressed or diverted if the project were not undertaken (albeit that this would only have happened after 2015). Very little of this traffic would be diverted to other rail routes in the 'without-project' case, as these are also operating close to capacity. Most such traffic would thus not be able to travel by rail and would either be forced onto other forms of transport or would not be able to travel at all. For this traffic, the benefits of the project are the reduction in operating cost, and in user disbenefit, of now being able to travel by rail on this route compared to the alternative, which is assumed to be by road. The change in user benefits should take into account not only the tariffs by the alternative route, but also characteristics such as speed, frequency and access/egress time. Where the road network is approaching congestion, any traffic which does travel by road is likely to impose costs on other road users; these have been approximated by assuming additional road capacity is created in the 'without-project' case, by local road works, to preserve the level of service.

Some traffic will decide that the alternative arrangements are too hard and not travel at all in the 'without-project' case. Their benefits in the 'with-project' case are estimated using the 'rule-of-a-half'³

The incidence of these various costs and benefits depends on the way in which the available capacity would have been allocated in the absence of the project. As these benefits play a relatively minor role, the re-evaluation assumes that in the 'without-project' case none of the incremental 'with-project' traffic uses the alternative rail routes, but that 25% (primarily local short-distance traffic of up to 600 km) uses road with the remaining 75% suppressed.

³ This is a standard technique in transport project evaluation.

Benefits to Existing Traffic in Project Corridor

The operational benefits to the existing traffic are largely associated with time savings because of the increased commercial speed⁴ possible on the section and the reduction in distance following the re-alignment. These reduce the costs of on-train crew, part of locomotive maintenance and rolling stock capital. The re-evaluation has derived these costs from first principles, using realistic engineering-based unit costs and an estimated breakdown of MOR operating costs. Table 3 summarizes the estimated operating cost benefits in 2006 prices.

The reduced travel times also creates time savings for passengers and these have been valued using a value of time of RMB 7 per hour (2006 prices), based on recent surveys of passenger income undertaken on an adjacent line, adjusted for the above-average incomes in Shanghai and Zhejiang, two of the main regions served by the line. This value was increased by 7% p.a. to 2012 and by 5% p.a. thereafter to reflect the forecast increases in per capita incomes. Although there will be some benefits to freight traffic from the reduced transit time, these are likely to be small and have been excluded.

Table 3: Estimated Operating Cost Benefits, 2007 (2006 prices)

	Unit	Passenger	Freight
Annual saving per passenger/tonne	RMB	12.64	24.99
Traffic volume (passengers/tonnes) (2007)	Million	42.5	54.7
Annual saving (2006 prices)	RMB million	536	1367

The estimated operating cost benefits at 2007 volumes RMB 1903 million per year. In addition, there would have been RMB 1712 million per year of time savings to passengers in a full year.

Penalties incurred by diverted traffic

Freight traffic which would otherwise be diverted to road was given a benefit based on an assumed truck operating cost of RMB 0.40 per net ton-km in 2007. The truck operating cost is assumed to reduce at 6% per year to 2019 to reflect continuing improvements in roads and vehicles. The incremental cost of road construction to handle traffic using road is estimated at RMB 0.20 per pcu-km.

Economic Rate of Return and Sensitivity Analysis

⁴ This speed includes allowance for on-route stops for operational purposes and thus takes into account delays caused by congestion in the 'without-project' case.

For the economic re-evaluation, net benefits are calculated for the 24-year period covering the four-year construction period (2004-2007) and benefits for the 20 years from 2008 to 2027⁵. The net present value (discounted at 12% to 2008) is estimated at RMB 33 billion and the economic internal rate of return (EIRR) at 26 per cent. Table 4 summarizes the contributions to the NPV (excluding the discounted construction cost of RMB 12.6 billion).

Table 4: Structure of Base Case NPV (RMB billion, 2006)

	Operating Savings	Time Savings	Diverted/suppressed Traffic	Total	% of Total
Passenger	6.1	30.0	-	36.1	73
Freight	12.2	-	1.4	13.6	27
Total	18.3	30.0	1.4	49.7	100
% of total	37	60	3	100	

Adjustments were made in four of the base case assumptions to test the sensitivity of these results (Table 5).

Table 5: Sensitivity Analysis - Estimated EIRR and NPV

	EIRR %	NPV (RMB bill)
Base Case	26	33
Sensitivity tests		
Reduce operating cost savings by 50%	22	24
Growth halved	24	25
Time savings excluded	13	3
Benefits to diverted/suppressed traffic halved	26	32

These results are similar in structure to those estimated at appraisal, although the make-up of benefits is a little different and the absolute values are larger due to the strong growth that has occurred (and is still occurring) since appraisal. The project is a key investment improving operations on one of the most important rail corridors in China. The EIRR is comparatively high for such a large infrastructure investment, but this is because demand is very high and the project was implemented very quickly and has delivered very substantial physical improvements.

⁵ In practice, benefits were also achieved for at least half of 2007

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Graham Smith	Lead Transport Specialist	EACCF	Task Team Leader (2002-2004)
John Scales	Sr. Transport Specialist	EASTR	Technical
Karin Nordlander	Lead Counsel	LEGEA	Legal
Robert O'Leary	Sr. Finance Officer	LOAG3	Finance
Katerina Baxevanis	Program Assistant	EASTR	Legal
Peishen Wang	Environmental Specialist	EACCF	Environment
Xiaoping Li	Procurement Specialist	EACCF	Procurement
Zhefu Liu	Social Dev. Specialist	EACCF	Social and Resettlement
Yi Dong	Financial Mgt. Specialist	EACCF	Financial Management
Xin Chen	Program Assistant	EACCF	Project administration
Louis Stanley Thompson	Consultant		Railway policy and strategy
Jitendra Sondhi	Consultant		Engineering / Operations
Richard Spero	Consultant		Economist / Finance Analyst
Supervision/ICR			
Graham Smith	Lead Transport Specialist	EASTE	Task Team Leader (2002-2004)
John Scales	Sr. Transport Specialist	EASTE	Task Team Leader (2004-2007)
Richard Bullock	Consultant	EASTE	Economist / Finance Analyst
Jitendra Sondhi	Consultant	EASTE	Engineering / Operations
Yao Songling	Social Specialist	EASCS	Social and Resettlement
Wang Peishen	Environment Specialist	EASCS	Environment
Paul Amos	Transport Advisor	EASTE	Railway policy and strategy
Wu Lei	Program Assistant	EASTE	Project administration

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY02	0	0
FY03	12	72.7
FY04	29	210.6
FY05		
FY06		
FY07		
FY08		
Total:	41	283.3

Supervision/ICR		
FY03	0	0
FY04	0	0
FY05	9	66.8
FY06	9	43.3
FY07	8	42.4
FY08	7	88.6
Total:	33	241.1

Annex 5. Summary of Borrower's ICR and/or Comments on Draft ICR

Hangzhou-Zhuzhou (Zhe-Gan) railway line is the first 200km railway road financed by the World Bank Loan. Through both parties' efforts, we achieve a great success of the project we never had before. Zhe-Gan railway line has already put into operation on September 15, 2006. Almost 2 years passed, Zhe-Gan line operates well with its high safety including the key equipments installed on the line which including communication, signal and electrification equipments financed by The World Bank loan. There is no doubt that the Bank loan plays an important role on this project. Other important thing we must mention here is that both sides developed rich experience for the future Bank loan projects, such as Shijiazhuang-Zhengzhou passenger dedicated line and Guizhou-Guangzhou Railway line.

Finally, we would like take this opportunity to thank all the task team of Bank who gave us full support and help during the entire period of the project. We can not achieve such success without full support and effort from the bank staffs. I wish with my heart the cooperation between MOR and the World Bank will have bright tomorrow.

Annex 6. List of Supporting Documents

A. Project Implementation Plan

Project Implementation Plan*, (English version is available on March 16, 2004)

B. Bank Staff Assessments

Aide Memoire, December 9, 2002

Aide Memoire, March 12, 2003

Aide Memoire, July 18, 2003

Aide Memoire, November 4, 2003

Aide Memoire, November 25, 2003

Aide Memoire, March 5, 2004

Aide Memoire, April 5, 2004

Aide Memoire, August 17, 2004

Aide Memoire, November 15, 2004

Aide Memoire, April 20, 2005

Aide Memoire, February 17, 2006

Aide Memoire, November 22, 2006

Aide Memoire, August 31, 2007

C. Other

Proposal on Zhe-Gan line, January 2003

Loan Agreement between People's Republic of China and International Bank for Reconstruction and Development, October 18, 2004

Revised economic and financial data, November 10, 2003

Organizational Chart, March 16, 2003

Bid Evaluation Report and Recommendation for Award of Contract, September, 2005

Environment

1. Executive Summary of Environmental Assessment*, Second Railway Survey and Design Institute, Ministry of Railways, February 20, 2004
2. Environmental Impact Assessment (EIA)*, the Second Railway Survey and Design Institute, Ministry of Railways, February 20, 2004
3. Environmental Management Plan (EMP)*, the Second Railway Survey and Design Institute, Ministry of Railways, February 20, 2004
4. Executive Summary of Environmental Assessment*, Second Railway Survey and Design Institute, Ministry of Railways, March 2, 2004
5. Executive Summary of Environmental Assessment*, Second Railway Survey and Design Institute, Ministry of Railways, March 9, 2004
6. Environmental Impact Assessment (EIA)*, the Second Railway Survey and Design Institute, Ministry of Railways, March 9, 2004
7. Environmental Management Plan (EMP)*, the Second Railway Survey and Design Institute, Ministry of Railways, March 9, 2004
8. Environmental Impact Assessment (EIA)*, the Second Railway Survey and Design Institute, Ministry of Railways, November 21, 2005

Resettlement










1. Resettlement Action Plan*, Ministry of Railways, February 19, 2004
2. Resettlement Action Plan (Chinese version), Ministry of Railways, March 9, 2004
3. Resettlement Action Plan (English version), Ministry of Railways, East China Investigation and Design Institute under State Power Corporation, March 2004
4. Resettlement Action Plan, Ministry of Railways, May 20, 2004
5. Resettlement Monitoring & Evaluation Report*, Southwest Jiaotong University, June, 2005

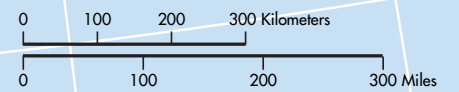
Audit Report

1. Audit Report [2007] No.74, Audit Service Center of China National Audit Office for Foreign Loan and Assistance Projects, June 29, 2007
2. Audit Report [2008] No.52, Audit Service Center of China National Audit Office for Foreign Loan and Assistance Projects, June 27, 2008

* Including electronic files

CHINA RAILWAY NETWORK

- █ BAO-LAN RAILWAY LINE
- NATIONAL RAILWAY SYSTEM:
 -  EXISTING DOUBLE TRACK
 -  EXISTING SINGLE TRACK
 -  UNDER CONSTRUCTION SINGLE TRACK
-  MAJOR RIVERS
-  SELECTED CITIES
-  PROVINCE CAPITALS
-  NATIONAL CAPITAL
-  PROVINCE BOUNDARIES
-  INTERNATIONAL BOUNDARIES



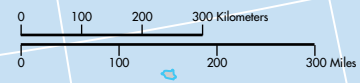
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CHINA SECOND NATIONAL RAILWAY PROJECT

- █ ZHE-GAN RAILWAY LINE
- NATIONAL RAILWAY SYSTEM:**
- ═══ EXISTING DOUBLE TRACK
- +-+ EXISTING SINGLE TRACK
- + + + UNDER CONSTRUCTION SINGLE TRACK
- MAJOR RIVERS
- SELECTED CITIES
- PROVINCE CAPITALS
- ★ NATIONAL CAPITAL
- PROVINCE BOUNDARIES
- - - INTERNATIONAL BOUNDARIES



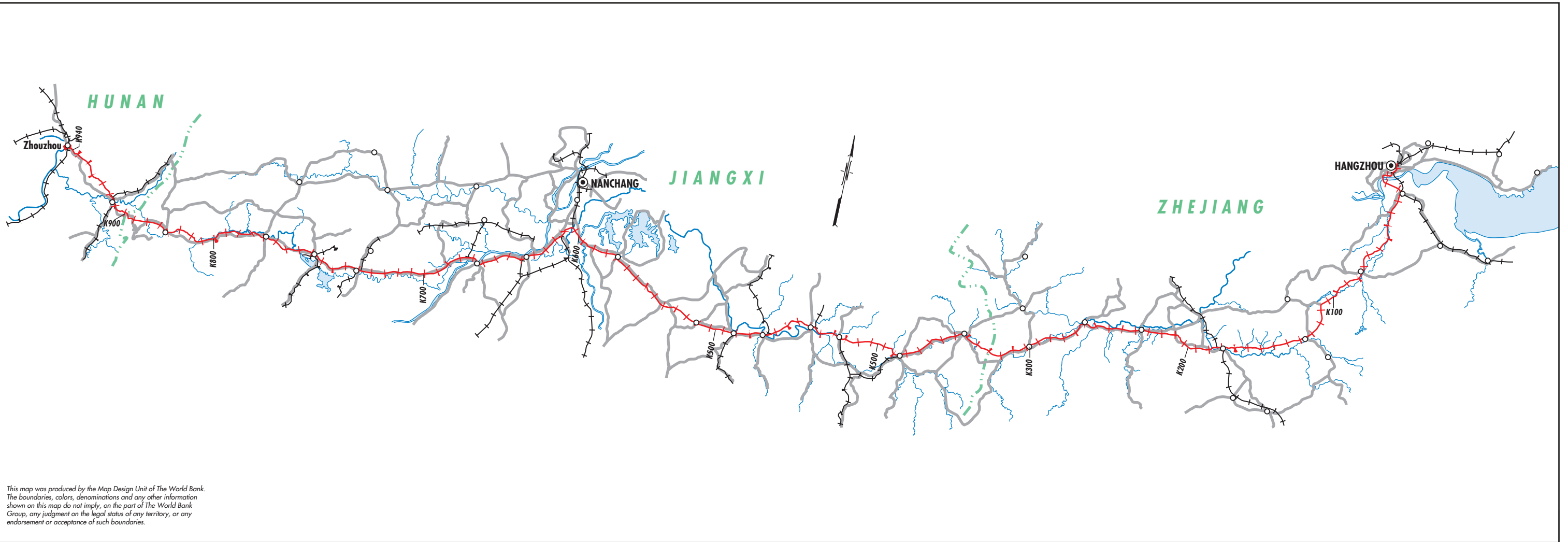
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CHINA SECOND NATIONAL RAILWAY PROJECT ZHE-GAN RAILWAY LINE

-  ELECTRIFICATION OF RAIL LINE
-  EXISTING RAILROAD
-  ROADS
-  SELECTED CITIES AND TOWNS
-  PROVINCE CAPITALS
-  PROVINCE BOUNDARIES
-  RIVERS



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