



Completion Report

Project Number: 33176
Loan Number: 1851-PRC
August 2008

People's Republic of China: Guangxi Roads Development Project

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – yuan (CNY)

		At Appraisal (31 August 2001)	At Project Completion (30 April 2008)
CNY1.00	=	\$0.1208	\$0.1432
\$1.00	=	CNY8.2767	CNY6.9849

ABBREVIATIONS

AADT	–	annual average daily traffic
ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
EIA	–	environmental impact assessment
EIB	–	European Investment Bank
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
GCD	–	Guangxi Communications Department
GDP	–	gross domestic product
GMS	–	Greater Mekong Subregion
GSEC	–	Guangxi Southwest Expressway Company
ha	–	hectare
km	–	kilometer
m ²	–	square meter
MOC	–	Ministry of Communications
NCB	–	national competitive bidding
NH	–	national highway
NTHS	–	National Trunk Highway System
O&M	–	operation and maintenance
PMU	–	project management unit
PPMS	–	project performance monitoring system
WACC	–	weighted average cost of capital

NOTES

- (i) The fiscal year (FY) of the Government ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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BASIC DATA

A. Loan Identification

1.	Country	People's Republic of China
2.	Loan Number	1851
3.	Project Title	Guangxi Roads Development Project
4.	Borrower	Ministry of Finance
5.	Executing Agency	Guangxi Communications Department
6.	Amount of Loan	\$150.0 million
7.	Project Completion Report Number	PCR: PRC 1028

B. Loan Data

1.	Appraisal	
	– Date Started	17 Apr 2001
	– Date Completed	30 Apr 2001
2.	Loan Negotiations	
	– Date Started	11 Jul 2001
	– Date Completed	12 Jul 2001
3.	Date of Board Approval	30 Oct 2001
4.	Date of Loan Agreement	12 Aug 2002
5.	Date of Loan Effectiveness	
	– In Loan Agreement	12 Nov 2002
	– Actual	10 Jan 2003
	– Number of Extensions	1
6.	Closing Date	
	– In Loan Agreement	31 Oct 2005
	– Actual	12 Mar 2008
	– Number of Extensions	2
7.	Terms of Loan	
	– Interest Rate	LIBOR-based lending rate for US dollars
	– Maturity (number of years)	24
	– Grace Period (number of years)	4
8.	Terms of Relending (if any)	
	– Interest Rate	LIBOR-based lending rate for US dollars
	– Maturity (number of years)	24
	– Grace Period (number of years)	4
	– Second-Step Borrower	Guangxi Southwest Expressway Corporation Limited

9. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
25 Aug 2003	12 Mar 2008	54.6 months
Effective Date	Original Closing Date	Time Interval
10 Jan 2003	31 Oct 2005	33.7 months

b. Amount (\$)

Category or Subloan	Original Allocation	Last Revised Allocation	Amount Canceled	Amount Disbursed
I. Civil Works	107,700,000	121,608,000	0	121,609,571
II. Equipment	10,600,000	11,071,000	0	11,070,355
III. Consulting Services and Training	1,700,000	1,321,000	0	1,320,073
IV. Front-End Fee	1,500,000	1,500,000	0	1,500,000
V. Interest and Commitment Charge	12,500,000	14,500,000	0	14,500,000
VI. Unallocated	16,000,000	0	0	0
Total	150,000,000	150,000,000	0	150,000,000

LIBOR = London interbank offered rate.

Note: Figures may not add up to totals given because of rounding.

C. Project Data

1. Project Cost (\$ million)

Cost	Appraisal Estimate	Actual
Foreign Exchange Cost	193.2	177.9
Local Currency Cost	262.0	287.4
Total	455.2	465.3

2. Financing Plan (\$ million)

Cost	Appraisal Estimate	Actual
Implementation Costs		
Borrower-Financed	182.0	93.1
ADB-Financed	137.5	135.5
Other External Financing	110.4	207.9
Total	429.9	436.5
IDC Costs		
Borrower-Financed	12.8	14.3
ADB-Financed	12.5	14.5
Other External Financing	n.d.	n.d.
Total	25.3	28.8

n.d. = no data, ADB = Asian Development Bank, IDC = interest during construction.

3. Cost Breakdown, by Project Component (\$ million)

Component	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total	Foreign Exchange	Local Currency	Total
A. Base Cost						
Civil Works	139.3	150.0	289.3	149.5	178.2	327.7
Equipment	10.6	0.0	10.6	11.1	2.3	13.4
Land Acquisition and Resettlement	0.0	38.8	38.8	0.0	51.2	51.2
Consulting and Training Services	1.7	11.2	12.9	1.3	11.2	12.5
Complementary Road Program	0.0	27.7	27.7	0.0	30.2	30.2
Subtotal (A)	151.6	227.7	379.3	161.9	273.0	435.0
B. Contingencies						
Physical Contingencies	7.0	8.9	15.9	0.0	0.0	0.0
Price Contingencies	14.1	19.1	33.2	0.0	0.0	0.0
Subtotal (B)	21.1	28.0	49.1	0.0	0.0	0.0
C. Front-End Fee	1.5	0.0	1.5	1.5	0.0	1.5
D. Interest During Construction	19.0	6.3	25.3	14.5	14.3	28.8
Total	193.2	262.0	455.2	177.9	287.4	465.3

Note: Figures may not add up to totals given because of rounding.

4. Project Schedule

Item	Appraisal Estimate	Actual
Date of Contract with Consultants	Jan 2002	8 Apr 2003
Completion of Engineering Designs	Sep 2002	16 Sep 2002
Civil Works Contract		
Date of Award	Oct 2001	30 Mar 2003
Completion of Work	Apr 2005	Apr 2006
Equipment and Supplies		
First Procurement	Aug 2002	24 May 2004
Last Procurement	Mar 2003	26 Jul 2006
Completion of Equipment Installation	Jan 2005	May 2007
Start of Operations		
Completion of Tests and Commissioning	Apr 2005	28 Dec 2005
Start-Up	Apr 2005	28 Dec 2005

5. Project Performance Report Ratings

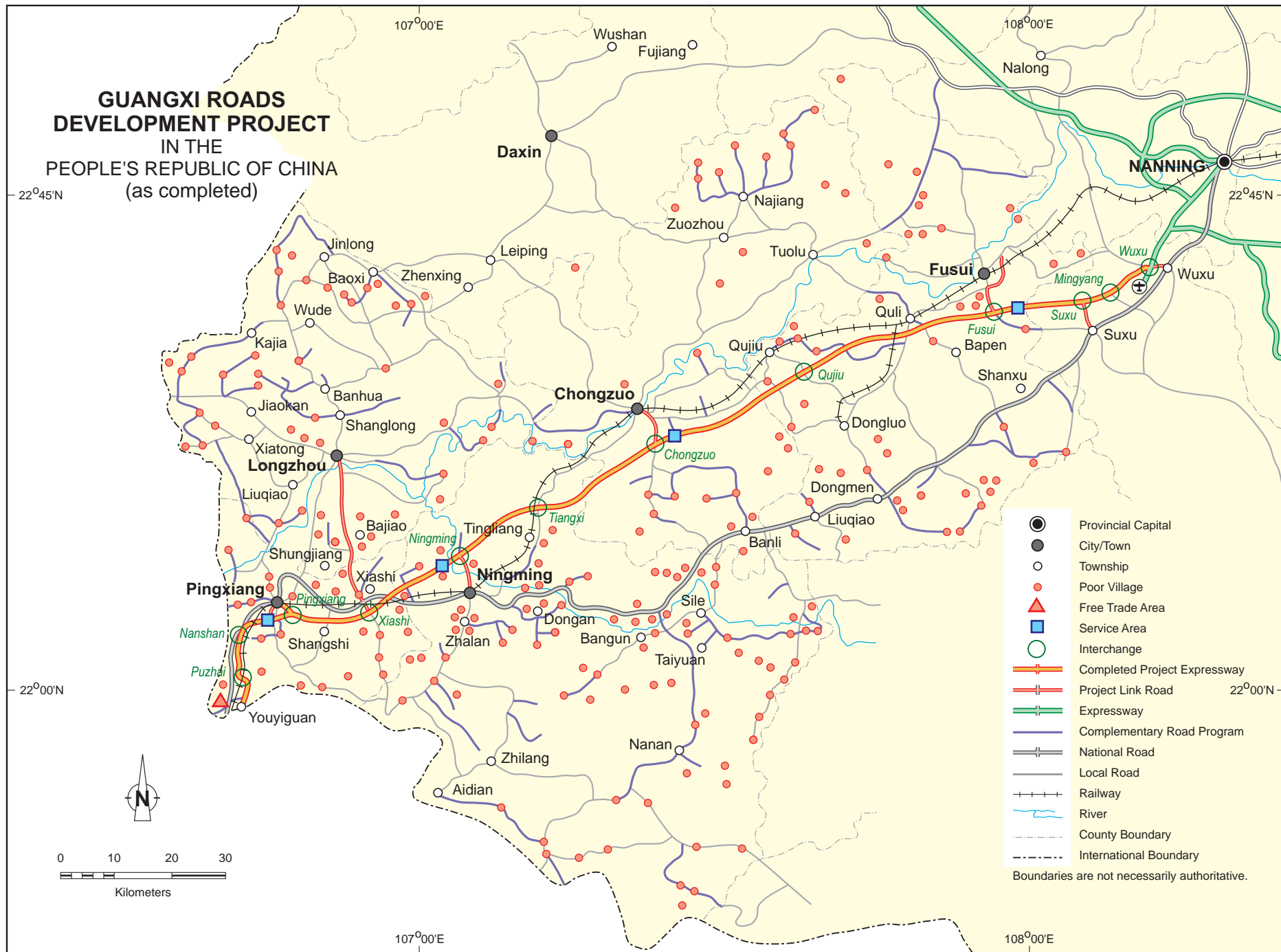
Implementation Period	Rating	
	Development Objectives	Implementation Progress
From 31 Oct 2001 to 31 Dec 2002	Satisfactory	Satisfactory
From 1 Jan 2003 to 31 Dec 2003	Satisfactory	Satisfactory
From 1 Jan 2004 to 31 Dec 2004	Satisfactory	Satisfactory
From 1 Jan 2005 to 31 Dec 2005	Satisfactory	Satisfactory
From 1 Jan 2006 to 31 Dec 2006	Satisfactory	Satisfactory
From 1 Jan 2007 to 31 Dec 2007	Satisfactory	Satisfactory

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members^a
Fact-Finding Mission	7–21 Feb 2001	8	112	a, a, b, c, d, e, f, g
Appraisal Mission	17–30 Apr 2001	8	104	a, a, b, c, d, e, g, h
Inception Mission	5–10 Dec 2003	3	15	c, i, j
Midterm Review	19–27 May 2005	3	24	a, f, j
Review Mission 1	5–9 Sep 2006	1	5	a
Review Mission 2	24–30 May 2007	1	6	a
Project Completion Review	1–14 Apr 2008	4	43	a, f, j, k

^a a – transport specialist, b – poverty reduction specialist, c – financial analyst, d – environment specialist, e – social development specialist, f – staff consultant, g – resettlement specialist (consultant), h – programs officer, i – resettlement specialist, j – assistant project analyst, k – transport economist .

GUANGXI ROADS DEVELOPMENT PROJECT IN THE PEOPLE'S REPUBLIC OF CHINA (as completed)



I. PROJECT DESCRIPTION

1. The economy of the People's Republic of China (PRC) has grown rapidly, by more than 9% yearly since 1978, when the Government embarked on economic reforms. Strong economic growth has resulted in strong demand for road transportation services, as road transportation is more flexible and responsive than other modes to the needs of a market economy. But, despite the Government's accelerated efforts and massive investment to increase the country's transport capacity, including the National Trunk Highway System (NTHS),¹ the Western Region Development Strategy,² and the Rural Road Construction Program,³ transport network density is still low, many villages have no road access, and many townships in the western region have no paved roads. While the PRC has made remarkable progress in economic growth and poverty reduction, about 135 million still live on less than \$1 a day.⁴ Also, the gap in income between the coastal and interior provinces, and between the urban and rural areas, is widening. Poverty is widespread in the western region. Guangxi Zhuang Autonomous Region (Guangxi) with a per capita gross domestic product (GDP) of CNY8,788 in 2005, 63% of the national average, ranked 27th of 31 administrative regions. Underdeveloped roads and associated high transport costs and lack of access to job opportunities are the major causes of poverty in Guangxi. Rural poverty incidence in the project area was 30% at the time of appraisal. Hence, economic infrastructure in key corridors, including seaport links and trade corridors connecting the western and coastal regions and neighboring countries, must be developed to promote economic growth and reduce regional development disparities.

2. Guangxi is the only province in the western region with a coastline and one of the two provinces bordering countries in the Greater Mekong Subregion (GMS).⁵ It therefore assumes a very important role in the Western Region Development Program and in increased cross-border trade and regional cooperation with other countries within GMS and the Association of Southeast Asian Nations (ASEAN).⁶ In the face of its significant progress in poverty reduction and abundant natural resources, Guangxi remains one of the most undeveloped regions in the PRC. Many counties in the project area are either national or provincial designated poverty counties. Almost all border counties are poverty counties and among the poorest counties in the PRC.

3. The Guangxi Roads Development Project (the Project), in the southwestern part of Guangxi, covered part of the Kunming–Nanning–Hanoi section of the GMS economic corridor (Eastern Corridor). This major artery for the regional transport network connects with the NTHS corridor 40 linking Chongqing Municipality via Guiyang, in Guizhou Province, and Nanning to Zhanjiang, in Guangdong Province, and to the NTHS corridor 75 from Kunming to Hengyang in Hunan Province. The Project was designed to promote pro-poor economic growth in Guangxi by

¹ Formulated in 1990 under the 10th Five-Year Plan (2001–2005) and involving the construction of 35,000 kilometers (km) of interprovincial expressways and high-class highways along five north–south and seven east–west transport corridors over the 20 years up to 2010.

² A key theme of the 10th and 11th 5-year plans, the strategy is aimed at reducing developmental disparities between the western and eastern regions.

³ A key theme of the 11th Five-Year Plan (2006–2010), it assigns high priority to local road development to promote economic growth and reduce poverty.

⁴ World Bank. 2006. *China Country Partnership Strategy* (2006–2010). Washington, DC.

⁵ The GMS comprises Cambodia, Guangxi and Yunnan Province of the PRC, Lao People's Democratic Republic, Myanmar, Thailand, and Viet Nam. The six member countries launched the GMS program in 1992 with the assistance of ADB.

⁶ The ASEAN comprises Brunei, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam.

facilitating trade and attracting investment to the project area.⁷ It was also intended to reduce poverty by improving living standards and creating employment in the poor counties and townships in the project area. Moreover, as traffic along a key section of National Highway (NH) 322 was becoming more congested and exceeding the road's capacity, the Project was expected to relieve traffic congestion and bottlenecks on a parallel section of NH322, and improve access to growth centers for poor communities by building link roads and upgrading local roads. The Project, in sum, was to (i) provide additional transport capacity, ease congestion, reduce traffic accidents and vehicle emissions, and lower vehicle operating costs; (ii) give the poor rural population in the transport corridor better access to market and job opportunities; and (iii) facilitate regional cooperation in the GMS by improving access from Guangxi and other PRC provinces to Viet Nam, and linking the road network of the GMS. The Project was classified as an economic growth project with poverty reduction as a secondary objective. The project framework is shown in Appendix 1.

4. A feasibility study was done for the Project in 2000 by the Guangxi Communications Department (GCD) with the assistance of the Guangxi Communications Planning, Survey, and Design Institute. An environmental impact assessment (EIA) and a resettlement plan were prepared by the Xi'an Highway University. The Asian Development Bank (ADB) extended a technical assistance grant to supplement the government studies and support refinements.⁸ The technical assistance project confirmed the technical, financial, and economic viability of the Project.⁹ The project expressway was opened to traffic in December 2005 and the local roads were completed by the end of 2006. A chronology of major events is given in Appendix 2.

5. The Project involved the construction of 136 kilometers (km) of four-lane, access-controlled tollway between Nanning and Ningming and a further 43 km of class 1 highway between Ningming and Youyiguan at the border with Viet Nam, interchanges with toll stations, as well as 49 km of connecting roads, tunnels, bridges, administrative buildings, and service areas, were also built. In addition, the Project included the improvement of about 507 km of local roads serving poor areas; the procurement of equipment for road maintenance, toll collection, traffic surveillance, communications, vehicle axle load testing, and road safety; land acquisition and resettlement; and consulting services and capacity building.

II. EVALUATION OF DESIGN AND IMPLEMENTATION

A. Relevance of Design and Formulation

6. The PRC Government's road development policies at the time of the Project entailed (i) building expressways to expand the NTHS so as to link all cities with a population of over 500,000; (ii) developing secondary roads, particularly to help reduce poverty and promote economic growth; and (iii) building roads to support regional cooperation with neighboring countries. The project roads formed a strategic link in the NTHS and were deemed crucial to the economic development of the western region, including the border counties. The expressway was among the GMS transport corridors identified in the GMS Transport Sector Strategy as linking Nanning with Hanoi in Viet Nam, with the strategic objective of strengthening connectivity and facilitating cross-border movement and tourism. The Project was also in line with the recent

⁷ The project area is defined as Chongzuo, Fusui, Longzhou, Ningming, Pingxiang, and Yongning counties along the expressway and the local roads.

⁸ ADB. 1999. *Technical Assistance to the People's Republic of China for Guangxi Highway Development Project*. Manila.

⁹ ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of China for the Guangxi Roads Development Project*. Manila.

policies set out in the Government's Western Region Development Strategy and the Rural Roads Construction Program.

7. ADB's strategy for the road sector in the PRC at the time of appraisal gave high priority to removing infrastructure bottlenecks and supporting policy and institutional reforms by (i) building roads to connect major growth centers and improve access in the western and central regions; (ii) integrating the road network, with local roads supporting the NTHS; (iii) promoting road safety and a reduction in vehicle emissions; (iv) adopting toll policies that optimize the use of road transport capacity; and (v) using alternative methods of investment financing including private sector participation. The Project was consistent with this ADB strategy.

8. The expressway was designed according to the design standards of the Ministry of Communications (MOC) for expressways and class I highways. The design was appropriate, except for the Ningming–Youyiguan section, where the designed road width was narrower (at 22.5 meters) and speed reduced (at 60 km per hour). Mixed traffic allowed on this stretch of road led to many road accidents after the expressway was opened. Also, the Pingxiang toll station was unsuitably located on a downhill slope close to an intersection, resulting in traffic confusion and many accidents. GCD had to use its own funds to correct these deficiencies in 2007.

B. Project Outputs

9. **Expressway.** The completed expressway consists of 179.2 km of four-lane, access-controlled tollway from Wuxu in Nanning to Youyiguan at the border with Viet Nam. The expressway passes through six counties (Yongning, Fusui, Chongzuo, Longzhou, Ningming, and Pingxiang) and includes 10 large bridges, 113 medium and small bridges, 12 interchanges, 3 tunnels, 4 service areas, 3 administrative centers, and 12 toll stations.

10. **Link Roads.** Seven link roads totaling 64.0 km were built from the Wuxu (6.1 km), Suxu (5.0 km), Fusui (10.2 km), Longzhou (31.9 km), Chongzuo (1.3 km), Ningming (7.8 km), and Pingxiang (1.7 km) interchanges, compared with the 49 km total estimated at appraisal. These link roads connecting the expressway with the local road network and rural areas now provide comfortable connections with the counties and townships and has facilitated the establishment of three joint PRC-ASEAN industrial zones in Guangxi and a more unified GMS.

11. **Rural Roads.** During the Project, 977.2 km of rural roads in poor areas were upgraded and rehabilitated to either class III or class IV highway standards, giving the poor communities in the project area better access to townships, transport services, markets, off-farm employment, and public services, and better opportunities to increase their income. The roads built were nearly twice the length estimated at appraisal (Appendix 3). This result was highly commendable, as no ADB loan funds were used.

12. **Equipment.** The equipment procured pertained to (i) communication, toll collection, and traffic surveillance; (ii) axle load and vehicle weighing; (iii) road maintenance; and (iv) highway operation. All the equipment has been installed and has been observed to be functioning properly and serving the intended purpose.

13. **Consulting Services and Capacity Building.** An international consulting firm was hired by GCD to help supervise the construction of the project expressway and set up a project performance monitoring system (PPMS). The consulting firm provided 53.1 person-months of

services, against the appraisal estimate of 60 person-months, and completed its assignment at a total cost of \$858,196. The 53.1 person-month total covered construction (45.3), road safety audit (2.0), resettlement monitoring (0.7), tunnel specialist services (3.8), and PPMS development (1.3). GCD also hired eight national supervision firms through national competitive bidding (NCB) to assist in the quality control of expressway civil works, and appointed two individual highway experts, one to act as chief supervision engineer and the other as one of the two assistant chief engineers (the team leader of the international supervision firm was the other assistant chief engineer). In total, about 5,200 person-months of national consulting services were used, against the appraisal estimate of 4,900 person-months. All the national consulting services were financed by GCD.

14. The Project also required consulting inputs for design, material testing, and external monitoring of resettlement and environmental protection. About 598 staff members of GCD and the Guangxi Southwest Expressway Company (GSEC) underwent an average of 2.46 person-days of in-country training per person, in measurement, contract administration, quality control, financial management, software applications, and other topics. In addition, 54 senior staff members of GCD and GSEC were sent to the European Union, Japan, Republic of Korea, and North America for international training, each averaging 24.7 person-days and covering subjects such as human resources development, highway operation and management, procurement, and contract management. The training programs are listed in Appendix 4.

C. Project Costs

15. At appraisal, the project cost was estimated at \$455.2 million equivalent, of which \$193.2 million was in foreign exchange and \$262.0 million equivalent in local currency. The actual cost was \$10.1 million higher, at \$465.3 million, mainly because of an increase in the cost of expressway civil works. More interchanges and link roads than anticipated at appraisal were built. The Ningming–Yuoyiguan section had to be upgraded to expressway standard with limited access to be consistent with the design for the remaining sections of the expressway. The Pingxiang toll station also had to be moved to a safer location. The higher project cost was likewise due in part to an increase in land compensation and resettlement costs brought about by the acquisition of more land for the expressway and a higher contracted price for equipment. Appendix 5 gives a breakdown of the appraisal estimate and the actual project costs.

16. The financing plan envisaged at appraisal included a \$150.0 million loan from ADB (about 32.9% of the project cost), a \$50.0 million loan from the European Investment Bank (EIB) (11.0%), a loan of \$60.4 million equivalent from the China Development Bank (13.3%), a grant of \$101.0 million from MOC (22.2%), and a grant of \$93.8 million from GCD (20.6%). At project completion, the actual funding from ADB and EIB had remained unchanged. The central Government had contributed \$91.6 million equivalent in local currency, \$15.8 million of this from GCD. A loan from the China Development Bank financed the remaining \$157.9 million in local currency. The actual financing sources are shown in Appendix 5.

D. Disbursements

17. The loan amount of \$150.0 million was fully disbursed after ADB approved an increase in the percentage of financing for the expressway civil works from 48% to 54%. The disbursement started in August 2003 and ended in March 2008. The payments for civil works were made through reimbursement, while payments for equipment and consulting services were settled through direct payment. GCD said it was satisfied with the payment procedures, but added that disbursements from ADB were generally slow. GCD expressed appreciation for

ADB's approval of an increase in the percentage of financing for the expressway civil works, which enabled GCD to draw down the full loan amount before loan closing. The actual interest and commitment charge, including front-end fee, amounted to \$16.0 million. The projected and actual disbursements are presented in Appendix 6.

E. Project Schedule

18. ADB approved advance procurement action for the expressway civil works on 4 April 2001 and advance recruitment action for international consultants on 1 June 2001. The expressway civil works started in April 2003 and were completed in December 2005, when the expressway was opened to traffic. The completion date was 8 months behind schedule. The service areas and administration buildings were completed in April 2006, as was the rural roads component, and the international consultants completed their services in December 2006. But the loan period was extended to January 2008 when GCD decided to upgrade the Ningming–Youyiguan section to a limited access expressway and to relocate the Pingxiang toll station. The loan extension also allowed ADB to make final payments upon the expiry of the warranty for equipment and civil works. The upgrading work on the Ningming–Youyiguan section was completed in December 2007 and the loan was closed after final loan disbursement in March 2008. The appraisal and actual implementation schedule is in Appendix 7.

F. Implementation Arrangements

19. As envisaged at appraisal, GCD was the executing agency and was responsible for the overall planning and implementation of the Project. GCD appointed a deputy director general as project director and formed a project management unit (PMU) with responsibility for procurement and training, to coordinate and monitor the project activities. GSEC, which was established in September 2005, later took over as the implementing agency for the expressway and assumed responsibility for all construction activities related to the expressway. It was assisted by the chief engineer's office and eight resident engineer's offices, staffed with national and international experts totaling about 250 at the peak of construction. The various county communications bureaus under the supervision of Nanning Communications Bureau were the implementing agencies for the local roads component. The PMU hired the Guangxi Communications Planning, Survey, and Design Institute to prepare the feasibility study and detailed designs. The PMU also hired a local procurement agency to assist in international procurement. These arrangements proved to be effective, as, despite an initial delay of over a year in project implementation, the expressway was completed and opened to traffic only 8 months behind the appraisal schedule. With the various county governments, the PMU set up county resettlement offices at the counties along the expressway to implement land acquisition and resettlement and to see to it that land was acquired on time and compensation paid without delay. The organization charts of the PMU, the chief engineer's office, and GSEC are in Appendix 8.

G. Conditions and Covenants

20. All loan and project covenants (Appendix 9) were met, except for the project covenants on financial performance, nongovernment financing, and the establishment of an independent corporation responsible for the construction, operation, and management of all the expressways in Guangxi. The covenanted debt service coverage ratio of 1.2 will not be met until 2009, as the toll revenue was lower than the appraisal projections in the first 3 years of operation because of lower traffic volume on the expressway. Traffic has, however, steadily gone up since 2006. The unprofitable operation in the first few years also did not allow GCD to attract nongovernment

investors. The corporation that was to build, operate, and manage all the expressways in Guangxi had to be established by 30 June 2004, but GCD had difficulties securing the required approval from the government. Also, there were no clear procedures in Guangxi for the establishment of such a corporation. Hence, GCD was not able to comply with this covenant. Instead, GCD proposed, and ADB agreed during the processing of the Guangxi Roads Development II Project (Loan 2094-PRC), that the new corporation, to be established by 30 September 2005, would be responsible only for ADB-financed expressways in Guangxi. This was reflected in the project agreement for Loan 2094-PRC. To keep the corporatization and concession agreement provisions consistent between the two project agreements, the covenant was amended through an exchange of letters in May 2007.

H. Consultant Recruitment and Procurement

21. The procurement of the expressway civil works was carried out through international competitive bidding, according to ADB's *Procurement Guidelines* (2007, as amended from time to time). The expressway subproject comprised a package of 15 civil works contracts—13 to be financed by ADB and 2 by EIB. Site construction work started in April 2003 and was completed by December 2005. To expedite the civil works, GCD decided to award two engineering contracts through NCB and to use its own funds to supply the bulk of the concrete beams (up to 20 meters in length) for bridge construction and all concrete pipes. This move enabled all bridges to be completed ahead of time. GCD also awarded four service contracts through NCB, using its own funds. These were completed in April 2006. Sixteen contracts for traffic engineering works were similarly awarded through NCB.

22. For the complementary rural road upgrading, civil works were procured through NCB. A total of 105 contracts involving 977.2 km of rural roads and amounting to CNY641.2 million were awarded between 2001 and 2005 by the communications bureaus and were completed by 2006. These rural roads provide all-weather access roads to the affected villages.

23. The international consulting firm for the project expressway was hired in April 2002 in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). Nine equipment contracts were awarded in late April 2005 through international competitive bidding, and the equipment was delivered and installed in late 2006. Details of the procurement packages financed by ADB and the mode of procurement are in Appendix 10.

I. Performance of Consultants, Contractors, and Suppliers

24. The consultants who were hired for the project preparatory technical assistance were able to produce a good final report and assisted the GCD in preparing the resettlement plan, the EIA report, and the summary EIA. The consultants who were hired for the Project performed satisfactorily. All the consultants had good working relations with GCD and contributed to the good quality and early completion of the expressway. Technical problems met during site construction were quickly brought to the attention of GCD and resolved through design modifications and the issuance of the related variation orders. The international team leader performed well and his valuable inputs were held in high regard by the PMU staff.

25. The international consultants completed their assignment in December 2006 after a total of 53.1 person-months of services. The decrease in the person-month total versus the appraisal estimate was due to GCD's decision to arrange its own international training and to reduce the participation of the PPMS consultant. The in-country training conducted by the international consultants and the international training arranged by GCD were effective and useful to the

PMU in project implementation and to GSEC in the subsequent operation and management of the expressway.

26. The Guangxi Communications Planning, Survey, and Design Institute drew up a broad design for the expressway, the first with asphalt pavement in Guangxi, in accordance with international standards. But insufficient geological investigation along the alignment before preliminary design resulted in frequent changes in design to accommodate newly discovered karsts and unstable soil along the alignment. The civil works were well constructed. The expressway was seen to be in good condition and offered a smooth ride, with an international roughness index of about 3 meters per km, even after more than 2 years of use and the less than strict enforcement of the ban on overloading by trucks.

27. The expressway design, with three different speeds and particularly the mixed traffic allowed on the Ningming–Youyiguan section, gave rise to a number of traffic accidents. Also, the location of the Pingxiang toll station on a downhill slope close to an intersection created traffic confusion and caused accidents. In hindsight, the expressway should have been designed with one uniform speed wherever possible, with limited access throughout. GCD later increased the speed limit on the expressway to a uniform 100–120 km per hour except on the Ningming–Youyiguan section, which was assigned a speed limit of 80 km per hour and was fenced to limit access. The toll station at Pingxiang was relocated to a safer location. The median traffic strip was also found to be too narrow for the safe cropping of ornamental plants without the partial closing of one traffic lane. The civil works contractors worked efficiently despite the low contracted price and were able to complete the expressway about 6 months before the contracted construction deadline.

28. The interchanges were generally well constructed and the drainage was functioning well. But the interchange at Xiashi was poorly designed, with crisscrossing traffic, likely to cause accidents. Also, some road signs were noted to have misspelled words and to be poorly placed. Cut slopes were protected by a combination of reinforced concrete retaining walls, open lattice blocks, and grass turfing, but some, though within the MOC standards, were noted to be too steep and could result in landslides during the rainy season. Minimum damage to the limestone outcrop was noted; the beauty of the scenery was preserved. Tunnels were appropriately constructed. The toll collection and communications systems were functioning well.

J. Performance of the Borrower and the Executing Agency

29. The Borrower, the Ministry of Finance, took nearly 10 months to sign the Loan Agreement and 5 more months to complete the requirements for loan effectiveness because of its late approval of the feasibility study, thus delaying the award of civil works contracts and the fielding of the international consultants by over a year. GCD had prior years of experience implementing a World Bank–financed expressway and, hence, was able to expedite project implementation and to make up for lost time. GCD acted promptly when technical problems were brought to its attention. To make up for lost time, GCD devised a bonus scheme to induce contractors to complete the construction ahead of the contract deadline. In fact, the expressway was built in 30 months, against the contract period of 36 months, with no loss of quality or safety.

30. The Project was implemented through the arrangements envisaged at appraisal. All contractors were paid on time, as attested to by the early completion of the expressway. However, GCD could not prepare a regular report on the PPMS as its efforts were directed mainly at expediting the completion of the expressway and it did not devote enough resources to data gathering. Land acquisition and resettlement were timely, although the last eight

households that lost their houses have only recently started to rebuild their houses. They had decided to rebuild in Pingxiang town, where the assignment of housing lots was more complex and GSEC took longer to acquire and parcel out the land to the eight families. Interviews with some affected households, including those whose houses were demolished, indicated their satisfaction with the compensation and resettlement arrangements. The performance of the Ministry of Finance and GCD is rated satisfactory.

31. The training program was effective in transferring knowledge on effective highway contract management during implementation, and in assisting in the establishment of a lean and efficient organization setup for GSEC. About 419 staff members were recruited by GSEC to operate and manage the expressway. Each one was recruited after passing an examination and is subject to annual performance assessment.

K. Performance of the Asian Development Bank

32. Despite the delay in loan signing, ADB did not field an inception mission to follow up on the loan signing until December 2003. ADB at the time was reorganizing and had assigned a new project officer to the Project. But ADB conducted regular loan review missions during project implementation, including a midterm review. GSEC appreciated the advice provided by ADB and the good cooperation in resolving issues. ADB also took prompt action in the reallocation of loan proceeds when the original allocated loan amount for civil works proved to be insufficient. When substantial loan savings were realized, ADB approved an increase in the financing percentage for the expressway civil works, resulting in full loan utilization. The frequent changes in project officers did not affect project implementation or the close relationship with GCD. However, GCD complained of not being notified about the changes, and said that it had difficulties following up procurement and disbursement matters with ADB for that reason. GCD was, however, satisfied with ADB's performance and has sought further assistance from ADB for its road development program. The performance of ADB is rated satisfactory.

III. EVALUATION OF PERFORMANCE

A. Relevance

33. The Project is rated highly relevant. The project expressway was a top priority of the Government under the NTHS and part of its strategy of economic growth and poverty reduction through infrastructure links between the poor western region and the economic growth centers in the eastern region, regional cooperation with ASEAN, and the integration of less-developed areas into the economic mainstream. The Project was also in line with ADB's current operational strategy for the road sector in PRC, which supports (i) the Government's NTHS, Western Region Development Program, and Rural Infrastructure Development; (ii) institutional capacity building, to strengthen the commercial operation of the expressway; (iii) improvements in road safety and the environment; (iv) the adoption of pricing policies that will optimize the use of expressway capacity; and (v) the use of alternative investment financing options including private sector participation. The Project helped expand the Guangxi road network from a total length of 52,910 km in 2000 to 90,318 km in 2006. By the end of 2006, passenger traffic on the network amounted to 471.43 billion passenger-km (an increase of 7.94% over 2005), and freight traffic to 286.85 billion ton-km (9.56% higher than the 2005 figure). The expressway, an essential part of the GMS economic corridor, has enabled the Guangxi government to establish three joint Guangxi-ASEAN industrial zones to attract investments from ASEAN countries, and the Wantong Logistic Center at Pingxiang to process cross-border trade with Viet Nam.

B. Effectiveness in Achieving Outcome

34. **Expressway, Link Roads, and Local Roads.** The expressway was completed 8 months behind the appraisal schedule but within the appraisal cost estimate despite an initial delay of over a year in project implementation. While the actual cost based on the original scope was lower, the subsequent upgrading of the Ningming–Youyiguan section and the relocation of the Pingxiang toll station increased the overall cost of the civil works. The expressway is one of the main economic corridors in the GMS and promotes cross-border trade with Viet Nam and other countries in ASEAN. In 2006 the value of cross-border trade jumped by 28% over the previous year's total, to \$1,049 million. The expressway has cut travel time from Nanning to Youyiguan from more than 5 hours to less than 2 hours, and travel distance by 45 km. It has also relieved traffic congestion and bottlenecks on the parallel NH322. With the expressway, traders from Pingxiang can now do business in Nanning and be back home on the same day, instead of a day or so later. The link roads and local roads enable the poor living in the project area to seek employment elsewhere and allow easier access to market and public services. The link roads provide good access to the three new Guangxi-ASEAN industrial zones (one each in Chongzuo, Fusui, and Pingxiang) and the Wantong Logistic Center, and have attracted new industry into the project area. The Project has stimulated the local economy and enhanced cross-border trade. Fixed asset investment in 2007 was CNY25.5 billion in Chongzuo (78% over the 2006 figure), CNY21.89 billion in Fusui (32.7%), and CNY11.3 billion in Ningming (30.3%). GDP that same year was CNY50.23 billion in Chongzuo (18.4% higher than in 2006), CNY54.44 billion in Fusui (11.8%), and CNY30.8 billion in Ningming (18.8%). Property values in the project area have gone up by more than 40% since the completion of the Project. The expressway—its construction and subsequent operation and maintenance (O&M)—has provided employment to the local residents, particularly the poor. About 28,382 of those in the project area who were previously classified as poor are no longer considered such because of the improvement in rural incomes.

35. **Road Safety and Vehicle Emission.** The expressway has safety features including reflective traffic signs, continuous guardrails along the median with ornamental plants to minimize glare from oncoming vehicles, guardrails along the roadside, underpasses and overpasses for pedestrian and local traffic crossing, and hard shoulders wide enough for emergency stops and with perimeter fencing to prevent unauthorized crossing by pedestrians and local traffic. In addition, the traffic surveillance system allows constant monitoring of traffic along critical sectors of the expressway, and in an accident road users can seek assistance at emergency telephone booths installed at 2 km intervals. A highway unit regularly patrols the expressway to enforce traffic rules and to assist road users. The expressway has reduced traffic congestion, and thus effectively curtailed vehicle emissions and reduced traffic accidents, along NH322, as faster-moving vehicles emit less air pollution and good pavement along the expressway produces less wear and tear on vehicles. Noise barriers near residences and schools and other sensitive areas keep traffic noise within allowable limits. Traffic accidents occurred along the Ningming–Youyiguan section and at the Pingxiang toll station soon after the opening of the expressway, but have been effectively eliminated after the installation of fencing to restrict access and the relocation of the toll station. Weigh-in-motion equipment has been installed and should discourage overloading by vehicles once the weight-based toll rates are applied, as overloading is a major cause of traffic accidents and the premature wear and tear of the pavement.

36. **Institutional Development.** GCD established GSEC in 2005 under the Company Law of the PRC to operate and manage ADB-financed expressways. GSEC has well-qualified and experienced staff. The training provided under the Project has enabled GSEC to adopt modern

management techniques in operating and managing the expressway, and to develop a future restructuring plan. The toll operators are well trained and courteous. Overall, the Project is rated effective.

C. Efficiency in Achieving Outcome and Outputs

37. **Traffic and Toll Revenue.** The traffic projections at appraisal were based on a combination of actual traffic surveys, historical trends, economic development in the project areas, and changes in the composition of the freight and passenger vehicle fleet. It was anticipated that all long-distance traffic would eventually be diverted to the expressway to take advantage of large time and distance savings. The actual annual average daily traffic (AADT) for tolled vehicles after the opening of the expressway was 2,420 vehicles in 2006, or only about 64% of the projected traffic (3,785 vehicles). This shortfall was partly due to overly optimistic traffic projections, and also partly to the toll rates, which were 13.1% higher than the rates assumed at appraisal. Moreover, the projected traffic from GMS did not materialize, as the cross-border framework agreement with Viet Nam was finalized only in March 2008. Besides, some heavy trucks still preferred to use the NH322, where the ban on overloading was enforced less strictly and travel cost was perceived to be lower. However, traffic on the expressway picked up rapidly in 2007. The actual AADT in 2007 was 2,885 vehicles, an increase of 19.2% over 2006. Toll revenue was CNY96 million in 2006 and CNY116 million in 2007. Toll revenue was less than the appraisal estimate because of lower traffic volume, although actual average toll rates levied were higher than the appraisal estimates. The revised traffic growth projections for 2008–2025 were based on the actual traffic observed in 2006 and 2007, and took into account the expected industrial and population growth in the project area. Traffic was expected to increase by 16% from 2008 to 2010, by 10% from 2011 to 2015, and by 7%–8% in the remaining study period. Appendix 11 compares the original projections and the actual and revised traffic volume forecast.

38. **Financial Reevaluation.** The financial internal rate of return (FIRR) was reevaluated with the same methodology used at appraisal and the major assumptions in Appendix 12. The reevaluated FIRR of 11.1%, in constant prices, is higher than the 9% estimated at appraisal despite the lower-than-expected traffic volume, owing to higher toll rates and a shorter construction period than stipulated in the contract. The recalculated weighted average cost of capital (WACC), in constant prices, is 3.54%. Since traffic trends are improving and economic growth is very solid in the project area, the Project will undoubtedly facilitate the transport of more passengers and freight. The Project is therefore considered financially viable and sustainable. Traffic volume would have to decrease by 54% or O&M costs increase by over 3,000% for the FIRR to fall below the WACC. The FIRR sensitivity tests indicate that conditions that might cause the Project's viability to fall below the WACC are unlikely to occur.

39. The financial projections for GSEC, using financial data from audited reports for 2005–2007, revised operation revenues, and the current tax regime, indicate that the operation of the project expressway will be profitable from 2009. The working ratio will decrease from 23.3% in 2007 to 11.5% in 2012, and the debt service coverage ratio will increase from 1.0 to 3.8 and the equity-to-debt ratio from 0.85 to 1.64 over the same period. The results indicate that the forecast income is sufficient to cover recurrent costs, depreciation, and debt service, and generate reasonable profits from 2009, 4 years after the full commercial operation of the project expressway.

40. **Economic Reevaluation.** The Project Completion Review Mission reevaluated the economic internal rate of return (EIRR) using the same methodology. The reevaluated EIRR is

19.4% and the net present value (NPV) is CNY2,205 million—lower than the appraisal forecasts of 20.0% and CNY2,615 million (Appendix 13). The slightly lower economic return primarily reflects lower traffic than originally estimated. Economic benefits from vehicle operating cost savings, time savings, and accident cost savings are all based on traffic volumes and traffic composition on the project expressway. Traffic growth has been rapid and traffic volumes are projected to be close to the appraisal estimates by 2025. The total economic benefits are therefore expected to be close to the appraisal results. Sensitivity analysis of the EIRR shows that traffic volume would have to be 64.5% lower or the total benefits 48.2% lower for the EIRR to fall below the cutoff rate of 12%. Both cases are unlikely, considering that the PRC's economy continues to grow and that the Government has successfully implemented many ADB-financed road projects. On the basis of these analyses, the Project is rated highly efficient.

D. Preliminary Assessment of Sustainability

41. The expressway has relieved traffic congestion along NH322, stimulated the development of local industry, and generated many employment opportunities for the local population during construction and after its opening. The AADT on NH322 went down from 7,603 to 5,920 passenger car units 1 year after the opening of the expressway, confirming that about 25% of the traffic has been diverted to the expressway. Fixed asset investment in the project area went up by about 30% in 2007. The Project has also accelerated the development of transport services and local tourism. Tourist arrivals in Ningming went up by 22% in 2007 and tourist-related income was CNY30 million in 2007, an increase of 23% over 2006. Land prices in the project area have gone up by over 40% since the opening of the expressway. The link roads and local roads provide better access for the poor in the project area. Overall, the Project has contributed to faster economic growth in the project area, and helped to reduce poverty through better access to jobs, markets, and services.

42. The sustainability of the Project is likely, as the expressway is well constructed and is one of the top-priority economic corridors of the GMS. Furthermore, the Government has recently approved a development plan for Guangxi Baibu Bay Economic Zone to further accelerate the economic development in four major municipalities including Nanning and part of the project area. GSEC is well managed and has the capacity to operate and manage the expressway, and its revenue is sufficient to service its debts from 2009 onward. Now that the cross-border framework agreement has been signed with Viet Nam, cross-border trade and traffic volumes are likely to accelerate.

E. Impact

43. **Environmental Impact.** The Project was classified as Category A in the environmental category. On the basis of the EIA prepared by the Xi'an Highway University, a summary EIA was drafted, circulated to the ADB Board, and published on the website. The expressway alignment was selected to minimize damage to limestone outcrops and resettlement impact. The recommended mitigating measures were incorporated in all civil works contracts and their implementation was strictly enforced through regular monitoring by an external environmental agency. The measures included providing cut slopes and soil protection, landscaping exposed areas, properly disposing of solid waste, treating wastewater, and minimizing dust, vehicle smoke emissions, and noise during construction. Wastewater and surface water runoff was channeled to sedimentation pits before discharge to natural water bodies. Borrow and disposal sites were leveled and restored with original top soil so that farmers could use the land for farming. However, some cut slopes were too steep, such that some landslides occurred. Proper

signs on HIV/AIDS¹⁰ and safety were put up at worksites. Noise barriers were installed near sensitive sites such as schools and residential areas.

44. An air quality measurement taken in 2007 confirmed that air quality along the expressway mostly meets class II air quality standards. Measurement of water upstream and downstream of bridges confirmed that the expressway has little impact on water quality.

45. **Land Acquisition and Resettlement.** The Project involved a significant amount of land acquisition and resettlement. GCD prepared a resettlement plan with the assistance of Xi'an Highway University in February 2000. The plan was later revised and updated to reflect design changes. At appraisal, it was anticipated that the Project would require permanent land acquisition of 1,200 hectares (ha), including about 780 ha of cultivated land (117 ha of rice fields and 663 ha of sugarcane and vegetable land). The Project was also expected to require temporary land acquisition of about 196 ha during construction. About 30,600 people in 6,440 households would be affected by partial land loss and 632 people would need to be relocated. About 10,000 people would require full economic rehabilitation. At completion, the permanent land acquisition totaled 1,381.4 ha (182 ha of rice fields, 176 ha of dry land, 506.5 ha of sugarcane land, 7.7 ha of vegetable farms, 107.4 ha of orchard land, 30.2 ha of fishponds, and 373 ha of forest and other land), 15% more than anticipated in the resettlement plan, and the temporary land acquisition during construction amounted to 444.3 ha, 127% more than expected (Appendix 14).

46. The acquisition of land affected 10,041 households, involving 46,021 persons. The main increase in permanent land acquisition came from the three additional interchanges, longer link roads, land required for service areas (which had not been included in the plan), and additional land needed to stabilize cut slopes. The temporary land acquisition increased because a mismatch in progress rate between civil works and pipe and beam casting had made it necessary to temporarily store the completed precast pipes and beams at the two casting yards. Actual structures demolished, including houses, covered 27,586.7 square meters (m²) (versus 14,000 m² at appraisal), requiring the resettlement of 862 persons (versus 1,100) from 289 households (versus 200). But only 131 households had to rebuild their houses, because some had more than one house while others lost only the nonessential part of their houses. The increase in demolished structures was mainly due to poor estimation at appraisal, changes in expressway design, and damage to houses as a result of rock blasting. Of the 131 households, 123 have rebuilt their houses within the same villages. The other eight have only started to rebuild their houses on assigned lots in Chongzuo City, where housing lots took considerable time to acquire. The new homes are one- to three-story brick-and-concrete houses with an average floor area of 24.23 m² per person, compared with the previous 11.23 m². The new homes are provided with electricity and water supply. Some even have a telephone and a biogas facility. Interviews with some of the relocated people confirmed their satisfaction with the compensation rate and arrangements. The actual cost of land acquisition, resettlement, and relocation was CNY389.3 million, 21.2% more than the resettlement plan figure of CNY321.1 million.

47. GCD hired the services of Guangxi Academy of Social Sciences to monitor and prepare an annual report on the implementation of land acquisition and resettlement. (The quarterly progress reports also gave an account of the progress of resettlement.) Four annual reports were submitted to ADB. Income restoration of the affected people was closely monitored. About 95% of the borrow and disposal sites have been restored, with most sites used for farming.

¹⁰ Human immunodeficiency virus/acquired immune deficiency syndrome.

Some of the remaining land could not be restored; GSEC has acquired this land. There was a dispute on one borrow site, which the absentee owner wanted restored to its original condition even though his brother had accepted compensation on his behalf. A survey conducted by the external monitor indicated that while the affected people initially lost an average of 0.026 ha (about 22%) of farmland, their income from farming did not decrease, as they were able to switch to higher-value crops such as sugarcane and tapioca and to convert available wasteland into sugarcane farms. In fact, by 2006 the overall annual income of the affected people had gone up by 60%, to CNY22,090 per household. This increase was also partly due to employment in the more prosperous neighboring Guangdong Province. According to the survey, about half of the farmer population had at least one member working in the more prosperous provinces. About 8.5% of the affected people, however, are still poor and vulnerable.

48. The Government provides a regular annual subsistence allowance of CNY20 to CNY650 per person to the remaining poor and vulnerable groups to keep them above the poverty line and allow them to have adequate food and proper shelter. These groups can also avail themselves of low-interest micro credit to start small businesses. During the Project, skill enhancement training in improved farming methods and poultry breeding was conducted for about 1,023 affected persons (one from each affected household, and including 648 females). Only about 4.6% of affected people were not satisfied with the resettlement, as they deemed the compensation low. Overall, the impact of the land acquisition and resettlement was positive.

49. **Socioeconomic Impact.** Since the opening of the expressway, cross-border trade with Viet Nam has increased, from \$987 million in 2005 to \$2,380 million in 2007. Overall bilateral trade between Guangxi and ASEAN increased from \$1,224 million to \$2,910 million over the same period. In 2006, a year after the opening of the expressway, primary industry in the project area grew by 28.0% (compared with the 13.1% average in Guangxi), secondary industry by 74.1% (versus 24.3%), and tertiary industry by 33.8% (versus 16.0%). The share of secondary and tertiary industry in GDP increased from 61.9% to 65.9%. About 15,000 people in the project area, of which 35% were female, were employed for construction work for an average of about 2 years, generating total income of about CNY328 million. In addition, some materials such as aggregates, sand, and cement were procured from local sources. During the expressway operation, about 67 people from the project area were hired as landscape maintenance and laborers at an average monthly salary of CNY600. The growth in cross-border trade, secondary and tertiary industry, and overall employment confirms that the expressway has stimulated economic development in the project area. The link roads and local roads provide cheaper and better transport services to the people, particularly the poor. Bus fares have gone down by an average of about 15% since the completion of the Project. Similarly, freight charges per ton-km have gone down by the same margin as a result of better roads and lower vehicle operating costs despite the rise in fuel costs. From 2003 to 2006, the net income of farmers in the project area went up by an average of 42.9%, compared with 32.2% for the entire province. Faster economic development of the project area was partly responsible. In conclusion, land acquisition and resettlement (including income restoration) were timely and effective, and the socioeconomic impact of the Project was positive (Appendix 15).

IV. OVERALL ASSESSMENT AND RECOMMENDATIONS

A. Overall Assessment

50. The Project, with its highly relevant, effective, and highly efficient rating and positive impact, was successful. It was implemented basically as planned and achieved its main objective of promoting pro-poor economic growth in Guangxi through regional trade, investment,

and cross-border trade. The actual achievements are shown in the project framework in Appendix 1. The expressway is well maintained and has not had any major structural defects or operational problems. The expressway serves as the main economic corridor with Viet Nam and other countries in the GMS. The link roads and local roads give the poor better access to employment, markets, and social services and contribute to a better life and higher incomes.

B. Lessons Learned

51. An in-depth geological survey, including more extensive soil testing, should have been undertaken before the alignment was finalized to ensure the appropriateness of the design and avoid frequent changes in technical specifications during construction, as was the case in the Project, where a number of karsts and poor expansive soil were detected only during excavation. Projects approved in later years have basically incorporated this lesson.

52. Though the median meets the design standards of the MOC, a wider median should have been considered to allow safe maintenance of plants on the median and the future expansion of the expressway, should traffic volumes ultimately require this.

53. A road safety audit was conducted during detailed design and before the opening of the expressway, but some recommendations of the road safety specialist, such as limiting access to the Ningming–Youyiguan section, were not implemented until after the opening of the expressway, by which time a number of road accidents had occurred. ADB should have insisted that the recommendations from the road safety audit be fully implemented.

54. Despite the limited training provided to affected people, the incomes of the affected households were restored without any detailed rehabilitation strategy through the conversion of wasteland into sugarcane farms. This success can be attributed to the strong entrepreneurship of the affected people and the rapid economic development in the area. The periodic reports on land acquisition and resettlement in general were not well prepared and lacked details. Proper monitoring and correct reporting would have benefited from the participation of a resettlement specialist in the loan review missions.

55. A uniform design standard should be adopted wherever possible for a continuous stretch of highway to avoid road accidents, as many drivers have a strong tendency to maintain constant speed throughout the highway.

B. Recommendations

1. Project-Related

56. The poorly placed traffic signs with misspelled English words should be replaced particularly on the expressway, which international travelers are likely to frequent once the transport corridor is opened. Further, slope protection should be implemented on steep cut slopes to minimize the possibility of landslides.

57. The Xiashi interchange should be modified to prevent merging of traffic entering and exiting from the interchange.

58. **Future Monitoring.** The final project performance evaluation report, based on data collected after 3 years of operation, should be submitted to ADB in 2009. GSEC will need to

allocate sufficient budget and staff for data collection in 2008 to ensure that the report conclusions are based on recent data.

59. **Covenants.** GSEC will need to continue exploring the possibility of private sector participation in the expressway once GSEC shows steady profits.

60. **Further Action or Follow-Up.** Weigh-in-motion equipment has been installed at all toll stations, but the introduction of weight-based tolls needs to be followed up to curb overloading by trucks.

61. **Timing of the Project Performance Evaluation Report.** Since the adjacent Nanning–Baise expressway was opened to traffic toward the end of 2007, the project performance evaluation report should be prepared toward the end of 2009, when more accurate traffic flow data should be available to allow a reassessment of FIRR and EIRR.

2. General

62. Since the local roads program is being implemented by the local communications bureaus, with little or no ADB financing, the executing agency should provide quarterly reports on the program through the implementing agencies so that ADB can closely monitor progress and ensure good-quality and timely completion. The local roads are generally scattered and it is difficult for the review missions to visit some of them.

PROJECT FRAMEWORK

Design Summary	Performance Indicators/Targets	
	Appraisal	Actual
A. Goals 1. Promote pro-poor economic growth in GZAR by facilitating trade and attracting investment into the project area. 2. Reduce poverty by improving living standards and creating employment in poor counties and townships in Guangxi Province.	1.1. Economic growth in affected cities and counties in 2001–2005. Increased tonnage of interprovincial and international trade by road. Increased domestic and foreign direct investment in the project area. 2.1. Increased per capita incomes, fewer poor people, and better access to social services in the counties in the project area.	1.1. GDP increased by 15.8% per year from 2001 to 2005, and foreign direct investment by 28% from 2004 to 2005. 2.1. Per capita GDP for the rural population increased by 13.6% in Fusui, from CNY3,407 in 2006 to CNY3,870 in 2007, by 13.2% to CNY3,006 in Ningming, and by 22.2% to CNY3,912 in Chongzuo.
B. Purpose 1. Improve road infrastructure by increasing the capacity for more efficient movement of freight and passengers at lower cost.	1.1. Removal of serious congestion on NH 322 between Nanning and Viet Nam border (Youyiguan) through the construction of a four-lane, controlled-access expressway and class I road. 1.2. Increased east–west corridor capacity at expressway opening in 2005. 1.3. Improved access to townships and villages through interchanges to connecting roads and complementary local roads. 1.4. Average travel time between Nanning and Youyiguan (over 180 km) reduced by 4 hours in 2005. 1.5. Reduced vehicle costs and freight and passenger charges in the project area. 1.6. Safer roads in the project area through separation of slow- and fast-moving traffic and of opposing flows.	1.1. Congestion on NH322 relieved since 2006, after the opening of the expressway. 1.2. Traffic capacity has increased in the project area by 48%, from an AADT of 12,000 passenger car units in 2000 to 29,750 in 2005, after the opening of Nanning–Youyiguan expressway. 1.3. Seven link roads built and 977 km of local roads upgraded, and travel time reduced by 3 hours for most townships and villages. 1.4. Travel time from Nanning to Youyiguan shortened from 5 hours to 2 hours. 1.5. Bus fares and freight charges reduced by 15% after the opening of the expressway. 1.6. Road accidents along NH322 reduced from 390 in 2003 to 301 in 2006, and fatalities from 53 to 31. In 2006, there were 55 accidents on the expressway but only 4 fatalities. In 2007, there were 146 accidents resulting in 7 fatalities and 16 injuries,

Design Summary	Performance Indicators/Targets	
	Appraisal	Actual
2. Provide improved access to poor counties.	<p>2.1 Improved all-weather access through complementary local roads component.</p> <p>2.2. More reliable and faster delivery and lower transport costs for rural and agricultural inputs and outputs.</p> <p>2.3. Increased volume and higher proportions of high-value agricultural products marketed. Increased mobility of the relatively poor and minorities. Increased ownership of motorized vehicles in rural communities.</p>	<p>but these numbers were expected to drop substantially after the upgrading of the Ningming–Youyiguan section to a limited-access expressway.</p> <p>2.1. Local roads (977.2 km) and link roads (64 km) built in the project area to provide fast and all-weather access to villages.</p> <p>2.2. There is now one bus leaving Chongzuo for Nanning from every 2 hours to every 40 minutes.</p> <p>2.3. Production of high-value sugarcane increased by 1.3% to 311 kilograms per person in 2006. Vehicle ownership in Chongzuo increased by 2.9% to 29,411 from 2005 to 2006. About half of the households in the project area have at least 1 member working outside the project area.</p>
3. Catalyze restructuring of expressway agencies, as corporations improve expressway management, and create conditions to attract private sector financing.	3.1. GCD to create the Guangxi Expressway Management Company by 30 June 2004 to build and operate expressways in GZAR. Financial self-sufficiency with possible net income within 5 years of project completion.	3.1. Guangxi Southwest Expressway company created in September 2005.
Outputs 1. Civil Works and Equipment 1.1 Build 136 km of expressway, 43 km of class I road, and 48 km of class II connecting roads including bridges, tunnels, interchanges, and service areas. 1.2. Upgrade about 507 km of local roads. 1.3. Install equipment for road maintenance and safety, toll collection, communications, traffic management, vehicle weight and emissions testing, and office administration.	<p>1.1. Construction completed and opened to traffic by first quarter of 2005. Pavement roughness index lowered to below 3 meters per km.</p> <p>1.2. Improvement completed by 2005.</p> <p>1.3. Equipment operating and incident response plans implemented.</p>	<p>1.1. Expressway opened to traffic on 28 December 2005.</p> <p>1.2. Total of 977.2 km of local roads upgraded by April 2006.</p> <p>1.3. All equipment procured is now operating and appropriate plans are being implemented.</p>

Design Summary	Performance Indicators/Targets	
	Appraisal	Actual
2. Consulting Services 2.1. Strengthen GCD's and national consultants' capacity to undertake project management, quality control, traffic engineering and safety, and monitoring and evaluation. 2.2. Establish and upgrade O&M systems and management systems. 2.3. Establish monitoring and evaluation methodology.	2.1. On-the-job training of GCD staff and domestic consultants. Implementation of a human resources development plan. 2.2. Monitoring of O&M costs. Level of service meets international standards. 2.3. Traffic volumes, passenger fares, and freight fares; social impact of the expressway; impact on resettled, relocated, and indigenous people; environmental impact; and upgrading and maintenance of local roads.	2.1. About 597 staff members have undergone in-country training and 54 others have received international training in best practices in expressway O&M. 2.1. About 597 staff members have undergone in-country training and 54 others have received international training. 2.3. Monitoring and evaluation report not regularly prepared, but external report on land acquisition and resettlement prepared regularly.
3. Resettlement and Compensation 3.1. Acquire about 1,200 ha of land. 3.2. Resettle about 1,130 people.	3.1. Land acquisition and resettlement plan implemented. 3.2. Welfare of those resettled reestablished to their level before acquisition or better.	3.1. Permanent land acquired totaled 1,383 ha, and temporary land acquired, 444.3 ha. 3.2. Welfare of affected people has been restored. Income in general is higher than before land acquisition.
4. Environment 4.1. Implement environmental protection measures.	4.1. Implementation and monitoring plan based on summary environmental impact assessment agreed on by GCD and ADB. Mitigation measures included in contractors' contracts.	4.1. Mitigation measures incorporated in civil works contracts. Mitigating measures implemented during construction and subsequent operation.
Activities and Inputs 1.1. Provide adequate counterpart funds. 2.1. Recruit supervision consultants. 3.1. Carry out survey and design.	1.1. Funds allocated by the MOC, GCD, and local governments. 2.1. Consultants to be recruited by November 2001. 3.1. Survey and design completed by second quarter of 2001.	1.1. Funds have been adequately allocated by CDB (\$157.9 million), MOC (\$91.6 million), and local governments (\$15.8 million). 2.1. Consulting services contract awarded in April 2002 but services began only in March 2003 and were completed by December 2006. 3.1. Detailed design completed by September 2002.

Design Summary	Performance Indicators/Targets	
	Appraisal	Actual
4.1. Award contracts and undertake procurement.	4.1. ADB civil works contracts awarded by February 2002 (EIB contracts awarded in December 2001).	4.1. Civil works contracts financed by ADB and EIB awarded in April 2003.
5.1. Build expressway and improve selected provincial and county road sections.	5.1. Construction and improvement completed by April 2005.	5.1. Expressway opened to traffic in December 2005. Local road completed in 2006.
6.1. Supervise construction and installation, and provide on-the-job training.	6.1. International consultants (60 person-months) and national consultants (120 person-months) to be hired for construction supervision, road safety, and resettlement.	6.1. Total of 53.1 person-months of international consulting services and 5,200 person-months of national consulting services used in construction supervision.
	6.2. Construction supervision completed by April 2005. GCD staff trained in contract administration, quality control, design, and traffic management.	6.2. Construction supervision completed by December 2006.
7. 1. Provide capacity building and human resources development to GCD.	7.1. International training (46 person-months) in construction supervision, highway management, human resources development, international procurement and contract management, quality control, and road O&M provided.	7.1. International training in human resources development, highway O&M, procurement, and contract management for 54 senior staff members in Europe, Republic of Korea, Japan, and North America.
8.1. Acquire land, agree on compensation levels, restore livelihoods, and replace lost assets.	8.1. Resettlement plan and compensation measures completed by December 2002.	8.1. Resettlement activities were conducted in accordance with the resettlement plan and basically completed by mid-2005.
9.1. Incorporate appropriate environmental mitigation measures in project design.	9.1. Adverse environment impact minimized and environmental enhancement measures implemented according to implementation action plans.	9.1. Mitigation measures were included in the contracts. Environmental monitoring was conducted according to the recommendations of the environmental impact assessment report on the Project. External monitor confirmed that dust, noise, and water quality were within allowable limits.

AADT = annual average daily traffic, ADB = Asian Development Bank, CDB = China Development Bank, EIB = European Investment Bank, GCD = Guangxi Communications Department, GDP = gross domestic product, GZAR = Guangxi Zhuang Autonomous Region, km = kilometer, MOC = Ministry of Communications, NH = national highway, O&M = operation and maintenance.

CHRONOLOGY OF MAJOR EVENTS

Year	Date	Event
1999	12 July	PPTA 3220-PRC: Guangxi Highway Development approved
2001	7–21 February	Fact-Finding Mission fielded
	4 April	Management Review Meeting held
		Advance procurement action approved
	17–30 April	Appraisal Mission fielded
	2 May	Summary environmental impact assessment circulated to the Board
	22 June	Staff Review Committee Meeting held
	11–12 July	Loan negotiations held
	30 October	Loan approved by the Board
	28 November	Request for proposal for international consulting services issued
2002	19 April	Contract for consulting services and construction supervision awarded
	31 October	Prequalification of civil works contractors approved
	12 August	Loan and project agreements signed
	21 November	Bidding documents for civil works issued
2003	10 January	Loan declared effective
	17 March	International consultant fielded
	24 March	12 civil works packages awarded
	28 April	Civil works started
	25 August	First disbursement made
	5–10 December	Inception Mission fielded
2004	6 May	Change of date of corporatization from 30 June 2004 to 30 September 2005 approved
	10 Dec	Extension of loan closing date from 31 October 2005 to 31 October 2006 (first extension) approved
2005	14 April	First equipment contract (for supply and installation of communication, surveillance, and tolling systems) awarded
	19–27 May	Midterm Review Mission fielded
		One LCB civil works contract package for link road awarded
	28 September	Expressway partially opened
	13 October	Contract for supply and installation of safety and testing equipment awarded
	28 October	Three maintenance equipment contract packages awarded
	28 December	Commercial operation of expressway started
2006	11 January	Three equipment contract packages awarded
	17 July	Extension of loan closing date from 31 October 2006 to 31 January 2008 (second extension) and change in project rating from partly satisfactory to satisfactory approved
	26 July	Awarded four packages of road maintenance and inspection equipment
	5–9 September	Review Mission fielded

Year	Date	Event
2007	20 April	Reallocation of loan proceeds approved
	8 May	Amendment of Project Agreement on Corporatization approved
	24–30 May	Review Mission fielded
	6 November	Reallocation of loan proceeds approved
2008	25 January	Change in ADB financing of CW category from 48% to 54% (retroactive) approved
	12 March	Loan account closed
	1–14 April	Project Completion Review Mission fielded

ADB = Asian Development Bank, CW = civil works, LCB = local competitive bidding.

Source: Asian Development Bank, Guangxi Communications Department, and Guangxi Southwest Expressway Company.

RURAL ROADS UPGRADED UNDER THE PROJECT

Rural Road		Road Classification	Finished Standard	Length (km)	Cost of Upgrade (CNY million)
A.	Fusui County				
1.	Su-Lao	county road	class III asphalt	10.0	2.40
2.	Xi-Da K0-K52.5	county road	class III asphalt	20.0	4.80
3.	Futai K8-K28	county road	class III asphalt	20.0	4.80
4.	Zhonglong-Zhongdon K8-K18	county road	class III asphalt	10.0	2.40
5.	Qili-Quijiu	county road	class III asphalt	32.0	8.00
6.	Nalian-Gutan	village road	class IV	19.2	0.58
7.	Xichang-Pokan	village road	class IV	2.5	0.12
8.	Liuqiao-Yongliu	village road	class IV	3.5	0.21
9.	Sanxu-Napai	village road	unclassified	7.8	—
10.	Dongmen-Zhiyao	village road	unclassified	2.8	—
11.	Dongmen-Banbao	village road	unclassified	7.7	—
12.	Fongshuengshan-Weiiju	village road	unclassified	7.7	—
13.	Shangtun-Pingpo	village road	unclassified	5.0	—
14.	Tuomu-Tuoya	village road	unclassified	2.7	—
15.	Bani-Zhongyuan	village road	unclassified	3.5	—
B.	Chongzuo County				—
16.	Bande K0-K70	county road	class III asphalt	20.0	4.80
17.	Chongshui K0-K20	county road	class III asphalt	20.0	4.80
18.	Xingyan-Puli	village road	unclassified	5.4	—
19.	Liupu-Faming	village road	unclassified	15.8	—
20.	Renti-Nanei	village road	unclassified	10.5	—
21.	Fuquan-Renbi	village road	unclassified	7.7	—
22.	Nalong-Hehu	village road	unclassified	11.0	—
23.	Bawang-Biliu	village road	unclassified	3.8	—
24.	Nahe-Wangsa	village road	unclassified	11.5	—
25.	Gongfeng-Changzi	village road	unclassified	8.7	—
26.	Jiangzhou-Baoan	village road	class IV cobble stone	4.0	0.24
27.	Xincun-Liuli	village road	class IV cobble stone	5.0	0.30
28.	Nazhon-Napai	village road	class IV cobble stone	8.0	0.48
29.	Quanfong-Quao	village road	class IV cobble stone	5.0	0.30
30.	Heijang-Kulong	village road	class IV cobble stone	5.0	0.30
C.	Longzhou County				
31.	Chongzuo K21-K74	county road	class III asphalt	20.0	4.80
32.	Puai-Raoxiu	county road	class III asphalt	11.0	9.74
33.	Raoxiu-Canmen	county road	class III asphalt	5.0	4.43
34.	Canme-Kunlun	county road	class III asphalt	7.0	6.20
35.	Kunlun-Chunsui	county road	class III asphalt	10.0	8.85
36.	Anma-Longdong	county road	class III asphalt	4.0	3.54
37.	Longdong-Buju	county road	class III asphalt	5.2	4.60
38.	Buju-Gengyi	county road	class III asphalt	7.2	6.37
39.	Gengyi-Shuikou	county road	class III asphalt	5.0	4.43
40.	Shuikou-Kejia	county road	class III asphalt	28.0	24.78
41.	Qunhe-Hengluo	county road	class III asphalt	12.0	10.62
42.	Hengluo-Baluo	county road	class III asphalt	28.0	24.78
43.	Banwang-Shanglong	village road	unclassified	5.3	—
44.	Wuquan-Minquan	village road	unclassified	6.5	—
45.	Minquan-Shanglong	village road	unclassified	6.0	—
46.	Huangtian-Nongnong	village road	unclassified	4.2	—
47.	Jingwei-Sikuaidi	village road	unclassified	5.4	—
48.	Jinmei-Jingwei	village road	unclassified	14.0	—
49.	Buowei-Aikou	village road	unclassified	7.0	—
50.	Siqi-Luohui	village road	unclassified	8.6	—
51.	Kangning-Luohui	village road	unclassified	10.5	—
52.	Heping-Dongqui	village road	unclassified	4.0	—
53.	Wulian-Jinlong	village road	unclassified	5.7	—
54.	Zaigai-Jinqe	village road	unclassified	7.5	—

Rural Road		Road Classification	Finished Standard	Length (km)	Cost of Upgrade (CNY million)
55.	Sansheng–Gaizai	village road	unclassified	6.7	—
56.	Banji–Banmen	village road	unclassified	12.0	—
57.	Anzhen–Minan	village road	unclassified	13.0	—
58.	Chongde–Buwang	village road	unclassified	4.5	—
59.	Hongyang–Xiangshui	village road	unclassified	4.5	—
60.	Pingnan–Sancha	village road	unclassified	6.0	—
61.	Gaofeng–Heishuihe	village road	unclassified	9.0	—
62.	Lianggang–Jinming	village road	unclassified	7.0	—
63.	Zhongshan–Shangjin	village road	unclassified	10.8	—
64.	Juanfang–Langan	village road	unclassified	9.3	—
65.	Banma–Longshan	village road	unclassified	6.0	—
D. Ningming County					
66.	Dongna K14–K30	county road	class III asphalt	13.6	12.04
67.	Banlan–Nadang	county road	class III asphalt	16.0	14.16
68.	Nadang–Aidian	county road	class III asphalt	8.6	7.61
69.	Chongning K38–K50	county road	class III asphalt	12.0	3.48
70.	Banzai K7.2–K35.7	village road	class III asphalt	28.5	8.27
71.	Beiban K0–K82.5	village road	class III asphalt	82.5	23.93
72.	Songlin–Sifenchang	village road	unclassified	2.5	—
73.	Beizhang–Tulong	village road	unclassified	10.0	—
74.	Huanli–Sifenchang	village road	unclassified	2.5	—
75.	Nalian–Zaian	village road	unclassified	2.5	—
76.	Anyang–Baikang	village road	unclassified	3.0	—
77.	Bankiang–Paian	village road	unclassified	4.0	—
78.	Narong–Jiunarong	village road	unclassified	8.0	—
79.	Dongmen–Ningai	village road	unclassified	3.0	—
80.	Baiquan–Anma	village road	unclassified	3.0	—
81.	Anma–Donglang	village road	unclassified	9.0	—
82.	Hongjiang–Xiangchun	village road	unclassified	6.0	—
83.	Mingjian–Xiangchun	village road	unclassified	10.0	—
84.	Dongan–Xiangchun	village road	unclassified	3.0	—
85.	Dongpin–Baihe	village road	unclassified	5.0	—
86.	Liuzhang–Nahuai	village road	unclassified	2.0	—
87.	Jia ai–Santang	village road	unclassified	10.0	—
88.	Kangning–Hailing	village road	unclassified	10.0	—
89.	Nagong–Nahou	village road	unclassified	4.0	—
90.	Baiyan–Paizhou	village road	unclassified	2.5	—
91.	Nabing–Najia	village road	unclassified	6.0	—
92.	Sizai–Huaitai	village road	unclassified	6	—
93.	Beiguo–Siliu	village road	unclassified	2.0	—
94.	Huaitai–Nakan	village road	unclassified	10.0	—
95.	Zaimi–Ningming	village road	unclassified	1.5	—
96.	Najiao K67	village road	unclassified	3.0	—
97.	Guwang–Kunan	village road	unclassified	3.0	—
98.	Nadong–Nadong	village road	unclassified	12.0	—
99.	Niuchang–Sima	village road	unclassified	19.5	—
E. Pingxiang City					
100.	Nasan–Shangliu	county road	class III asphalt	3.2	2.83
101.	Jiaoai–Chalou	county road	class III asphalt	8.3	7.25
102.	Guanai–Pingxiang	village road	class III asphalt	3.2	1.12
103.	Puhe–Wonghuai	village road	class III asphalt	4.1	1.44
104.	Xiadong–Xiasi	village road	unclassified	16.5	—
105.	Sonchang–Nahua	village road	unclassified	6.0	—
Total				977.2	229.90
County Road				336.1	192.61
Village Road				641.1	37.29

— = cost cannot be ascertained (financed by local government; generally, upgrading cost is about CNY100,000 to CNY150,000 per km); km = kilometer.

Source: Guangxi Communications Department.

TRAINING PROGRAMS PROVIDED

Table A4.1: International Training Programs

Topic	Place	No. of Trainees	Attendees' Information	Period	Days
Human Resources Development	UK, Germany	6	GCD deputy directors and division chiefs	Sep 03–Oct 03	30
Quality Control and Management of Highway Projects	Canada	8	GCD director, Deputy directors, and managers	Nov 03–Dec 03	30
International Procurement and Contract Management	North America, UK	6	GCD director and deputy directors	Oct 04–Nov 04	30
Road Operation and Maintenance	Denmark	8	GCD director and deputy directors	Oct 05–Oct 05	26
Policies, Management Mechanisms, and Government Bodies in the Road Sector	Japan, Republic of Korea	6	GCD division chief and staff	Aug 05–Sep 05	21
Road Operation and Maintenance Management	USA, Canada, UK	10	GCD directors and staff	May 07–Jun 07	20
Human Resources Development	Germany	10	GCD directors, division chiefs, and staff	Jul 07–Jul 07	20

GCD = Guangxi Communications Department, UK = United Kingdom, USA = United States of America.

Table A4.2: National Training Programs

Topic	No. of Trainees	Attendees' Information	Period	Days
Communication Dossier	2	Dossier administrators	Dec 02	7
Training for Measurement Engineers	32	REO measurement engineers and staff	Jan 03	14
Training for Testing and Checking Workers	3	REO and central laboratory test workers	Mar 03	10
Training for Measurement Engineers	60	REO and contractor measurement engineers	Apr 03	2
Training for Senior Administrative Workers	42	Senior supervision engineers, managers, and other staff	Jun 03	1
Progress Management	28	REO and contractor staff	Jul 03	1
Supervision	4	Supervision engineers and staff	Sep 03	30
Office Software	30	Chief supervision engineer's office	Nov 03	1
Testing and Checking of Traffic Engineering	37	Testing and checking staff of Nanning–Youyiguan Highway	May 04	1
Pavement Construction	100	REO and contractor managers and engineers	Jun 04	2
Laws and Regulations	30	REO and contractor senior staff	Jun 04	1
Training of Test Principals	30	REO and contractor test principals	Aug 04	1
Pavement Construction	100	REO and contractor managers and engineers	Oct 04	2
Pavement Construction	100	REO and contractor managers and engineers	Mar 05	2
Project Financial Settlement	100	REO and contractor managers and engineers	Apr 05	2
Project Completion Documentation	100	REO and contractor managers and engineers	Aug 06	1

REO = resident engineer's office.

Source: Guangxi Communications Department.

PROJECT COST AND FINANCING PLAN

Table A5.1: Project Cost
(\$ million)

Item	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
A. Base Cost						
1. Civil Works	139.3	150.0	289.3	149.5	178.2	327.7
2. Equipment	10.6	0.0	10.6	11.1	2.3	13.4
3. Land Acquisition and Resettlement	0.0	38.8	38.8	0.0	51.2	51.2
4. Consulting Services and Training	1.7	11.2	12.9	1.3	11.2	12.5
5. Complementary Road Program	0.0	27.7	27.7	0.0	30.2	30.2
Subtotal (A)	151.6	227.7	379.3	161.9	273.2	435.1
B. Contingencies						
1. Physical Contingencies	7.0	8.9	15.9	0.0	0.0	0.0
2. Price Contingencies	14.1	19.1	33.2	0.0	0.0	0.0
Subtotal (B)	21.1	28.0	49.1	0.0	0.0	0.0
C. Front-End Fee	1.5	0.0	1.5	1.5	0.0	1.5
D. Interest During Construction	19.0	6.3	25.3	14.5	14.3	28.8
Total	193.2	262.0	455.2	177.9	287.4	465.3

Source: Guangxi Communications Department.

Table A5.2: Financing Plan
(\$ million)

Source	Appraisal				Actual			
	Foreign Exchange	Local Currency	Total Cost	% of Total	Foreign Exchange	Local Currency	Total Cost	% of Total
ADB Loan	150.0	0.0	150.0	32.9	135.5	14.5	150.0	32.2
EIB Loan	24.0	26.0	50.0	11.0	42.4	7.6	50.0	10.7
CDB Loan	0.0	60.4	60.4	13.3	0.0	157.9	157.9	33.9
MOC Grant	0.0	101.0	101.0	22.2	0.0	91.6	91.6	19.7
GCD Funds	19.2	74.6	93.8	20.6	0.0	15.8	15.8	3.4
Total	193.2	262.0	455.2	100.0	177.9	287.4	465.3	100.0

ADB = Asian Development Bank, CDB = China Development Bank, EIB = European Investment Bank, GCD = Guangxi Communications Department, MOC = Ministry of Communications.

Source: Guangxi Communications Department.

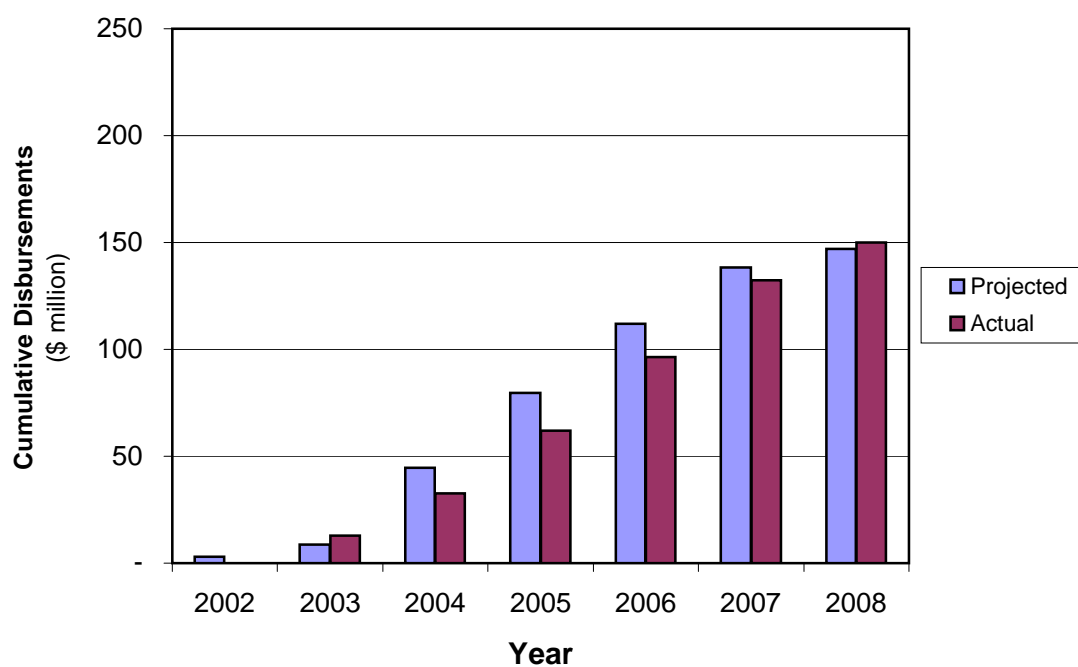
PROJECTED AND ACTUAL DISBURSEMENT SCHEDULES
(\$ million)

Table A6: Disbursement Schedule

Year	For the Year		Cumulative		% of Loan
	Projected	Actual	Projected	Actual	
2002	3.00	-	3.00	-	
2003	8.62	12.75	8.62	12.75	8
2004	32.00	19.93	44.75	32.68	22
2005	47.00	29.29	79.68	61.98	41
2006	50.00	34.43	111.98	96.41	64
2007	42.00	36.05	138.41	132.46	88
2008	14.50	17.54	146.96	150.00	100

Source: Asian Development Bank. Loan Financial Information System.

Figure A6: Cumulative Disbursement



IMPLEMENTATION SCHEDULE



ORGANIZATION CHARTS
Figure A8.1: Guangxi Southwest Expressway Company

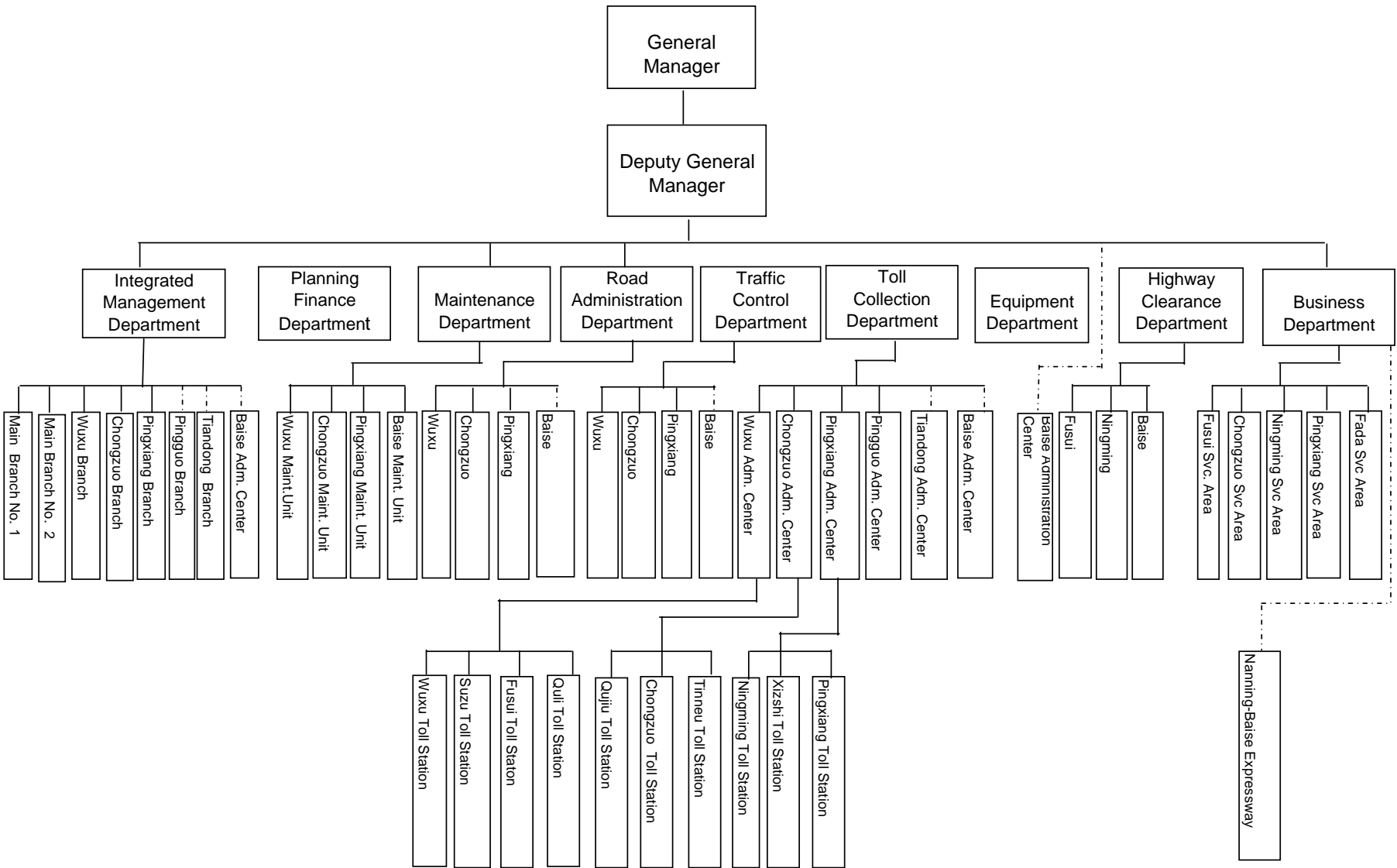


Figure A8.2: Chief Supervision Engineer's Office Organization

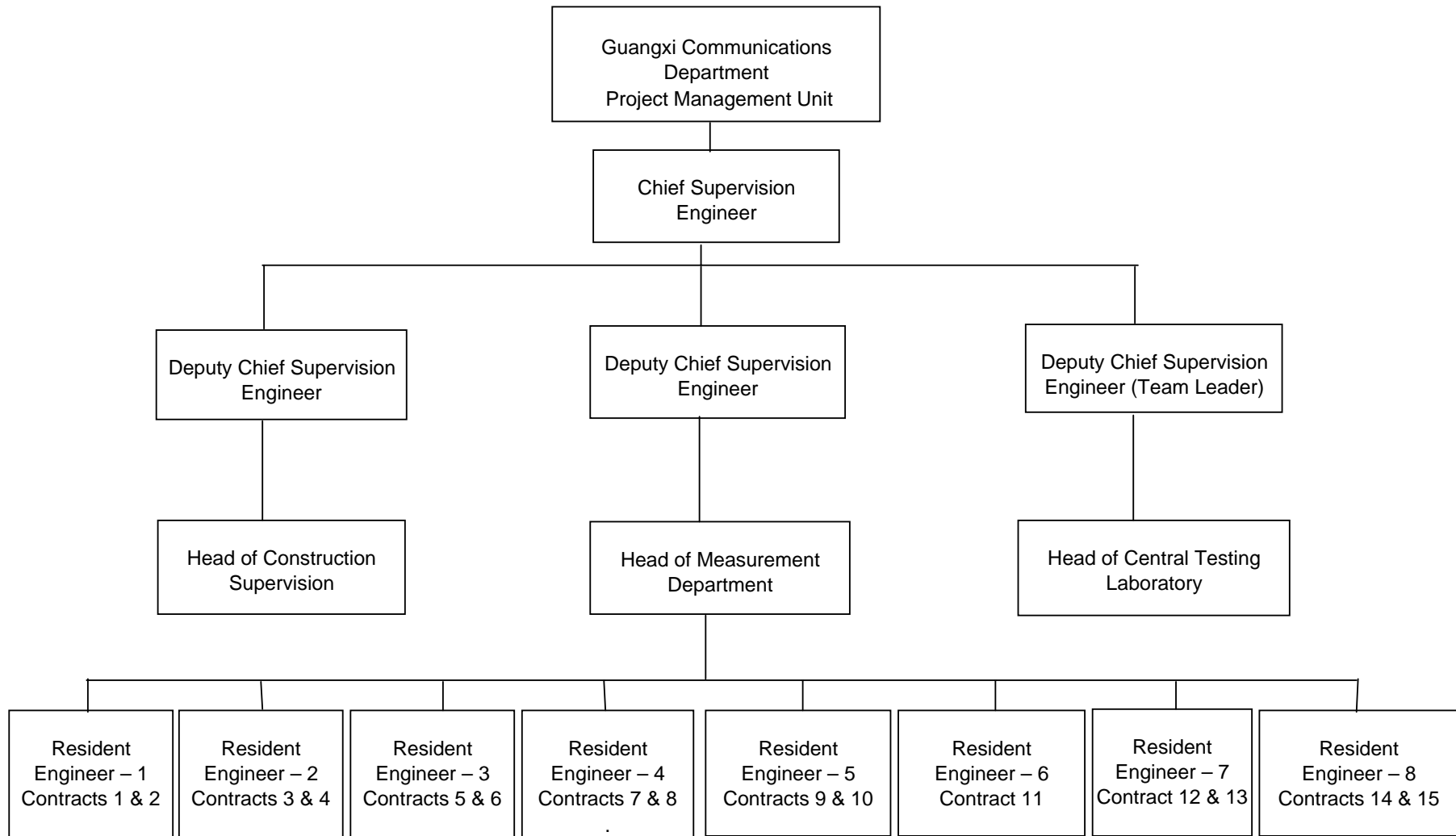
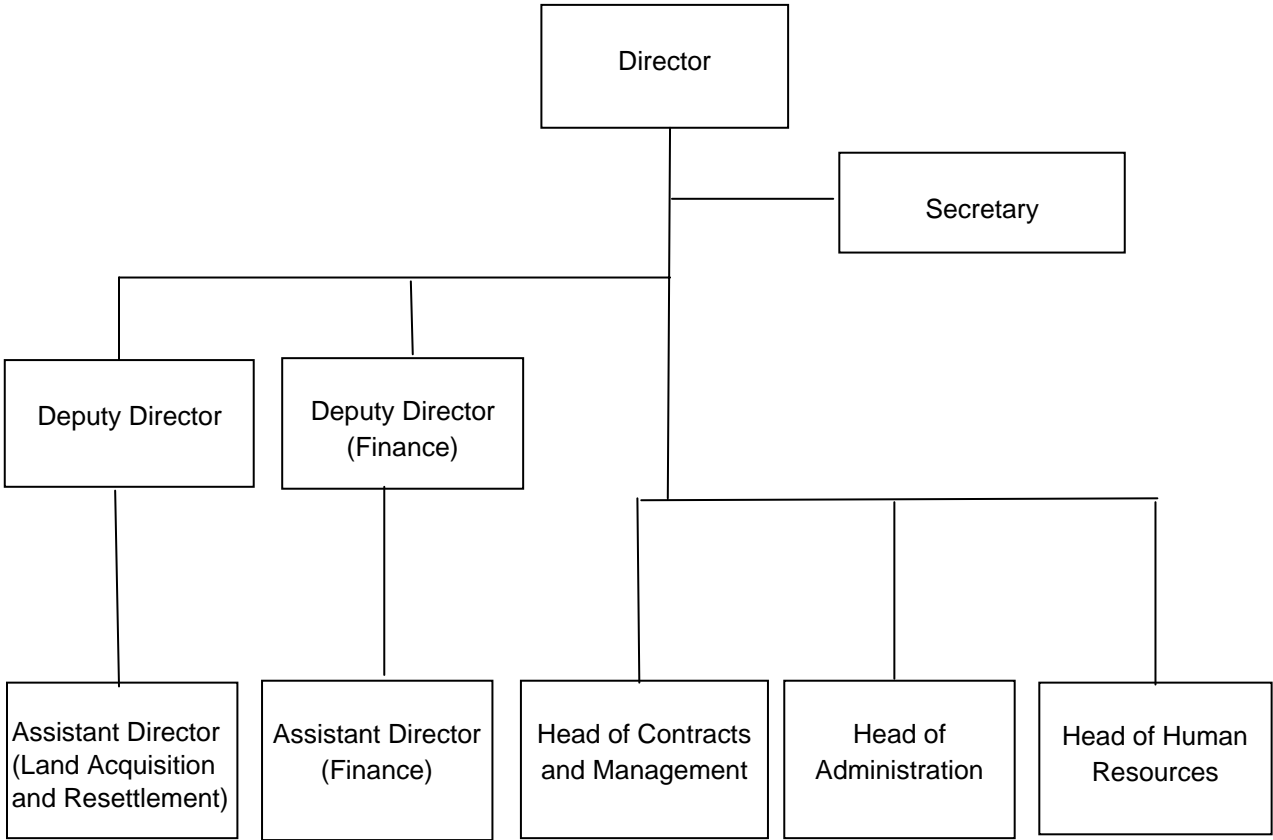


Figure A8.3: Guangxi Communications Department Management Unit



Source: Guangxi Communications Department.

COMPLIANCE WITH LOAN COVENANTS

Covenants	Reference in Loan Documents	Status of Compliance
Project Executing Agency GCD and later, after the establishment of GEMC, GEMC shall be the Project Executing Agency and shall be responsible for implementation, monitoring and coordination of all activities under the Project.	Loan Agreement (LA) Section 4.01 Project Agreement (PA), Schedule, para. 1	Delayed compliance. Guangxi Southwest Expressway Company was established in September 2005.
Project Management Unit Guangxi shall cause GCD to establish and maintain a Project Management unit responsible for the coordination and monitoring of all activities under the Project. The Project management unit shall be headed by a Deputy Director of GCD and staff with adequate technical and administrative personnel including a Project coordinator.	PA, Schedule, para. 3	Complied with. PMU was established with a deputy director of GCD appointed as project director and staffed with experienced and qualified personnel.
Financial Ratios Guangxi shall ensure that GEMC, after it is established, (a) shall not incur any debt, if after the incurrence of such debt the ratio of debt to equity shall be more than 65:35.(b) shall incur, for each fiscal year, any debt unless reasonable forecast of the revenues and the expenditures of GCD or GEMC for each fiscal year during the term of the debt to be incurred shall be at least 1.2 times the estimated maximum debt services requirements of GCD or GEMC for any succeeding fiscal year on all debt of GCD or GEMC, including the debt to be incurred, (c) GCD shall ensure that GEMC shall maintain a ratio of total working expenses to total working revenue not higher than 12%.	PA, Schedule, paras. 4, 5, and 6	Delayed compliance. Debt-to-equity ratio more than 65:35. Debt service coverage ratio of more than 1.2 expected to be met by 2009. Working ratio of not higher than 12% expected to be met by 2012.
Counterpart Financing Guangxi shall ensure that GCD obtains, on a timely basis, all fund and resources necessary for construction of the project roads, in accordance with the financing plan for the Project as agreed to by ADB.	LA, Section, 4.02 PA, Schedule, para. 7	Complied with. Adequate funding was provided on time.
Nongovernment Financing Six months prior to the opening of the project roads, Guangxi shall cause GCD to analyze the feasibility of attracting nongovernment investment funds in the project facilities, including private sector participation in the operation, maintenance, and management of the project roads, reports its conclusions and objectives to ADB, and outline the approach for achieving these objectives.	PA, Schedule, para. 8	Not complied with. However, GCD was able to attract 13 BOT road projects with total private sector investment of CNY29.6 billion.
Tolls The tolls for the Project roads shall be set at levels sufficient to ensure the maximum debt service coverage, the operation and maintenance costs, and depreciation in excess of debt service, and to generate an acceptable return on assets as adjusted from time to time for inflation.	PA, Schedule, para. 9	Complied with. Toll rates were able to cover debt service and operation and maintenance cost.

Covenants	Reference in Loan Documents	Status of Compliance
Six months prior to the start of commercial operations, GCD shall prepare and submit to ADB's concurrence a report on the proposed toll structure and levels, prior to submission of the application for Guangxi's approval.	PA, Schedule, para. 9	Complied with. Five classes of toll rates enforced
For the first five years of operation, Guangxi shall cause GCD to review the toll structure and levels annually and submit a report to ADB. If an adjustment of the toll levels is required in accordance with the above-mentioned principle, Guangxi shall cause GCD to submit for ADB's concurrence the toll adjustment plan, prior to finalizing and submitting the plan to Guangxi's approval.	PA, Schedule, para. 9	Complied with.
Corporatization Sixth months prior to the expected date of completion of the Project and not later than 30 June 2004, Guangxi shall have caused GCD to create a corporation, tentatively called Guangxi Expressway Management Company (GECM) to construct, operate and maintain all expressways in Guangxi.	PA, Schedule, para. 9	Delayed compliance. Guangxi Southwest Expressway Company was established in September 2005.
Change in Ownership In the event that (a) any change in ownership of the Project facilities, or (b) any sale, transfer, or assignment of GCD's or GEMC's interest in the project roads, is anticipated, Guangxi shall consult ADB at least six months before the change is implemented. Guangxi shall ensure that any proposed change in the ownership of the project facilities is carried out in a legal and transparent manner.	PA, Schedule, para. 12	Complied with.
Construction Quality and Sound Development Management Guangxi shall cause GCD to ensure that that the Project roads are constructed in accordance with the Borrower's technical standards of highway engineering. Guangxi shall cause GCD to promote sound development management, and ensure that quality control, contract management, and construction supervision, are performed in accordance with national standards and internationally accepted practices. Guangxi shall cause GCD to provide the international consultant recruited as the team leader-cum-deputy chief engineer with all the necessary powers to review and certify variation orders and contractors' monthly payments, prior to their approval by the chief supervision engineer.	PA, Schedule, para.13	Complied with.
Road Traffic Safety Guangxi shall cause GCD to ensure that the recommended road safety enhancement measures are incorporated in the design of the Project and implemented, and that road safety audits are carried out prior to start of construction, and prior to the commencement of operations. Guangxi shall ensure that the Project roads are adequately patrolled to mitigate against illegal use of the facilities.	PA, Schedule, para. 14	Complied with. Though some of the recommendations were implemented after opening of the expressway.

Covenants	Reference in Loan Documents	Status of Compliance
Axle Load Guangxi shall take appropriate measures to prevent overloading on the Project roads by installing vehicle axle weighing equipment at selected locations, and making suitable arrangements for operation of such equipment. Guangxi shall cause GCD to submit to ADB a statement indicating legal axle load limits, frequency of testing, and penalties for infringement.	PA, Schedule, para. 15	Complied with. New weigh-in-motion equipment installed and weight-based toll rate will be enforced shortly.
International Roughness Index Guangxi shall ensure that, upon completion of the Project, the Project facilities shall be adequately operated and maintained, and that the project road pavement shall be maintained at an international roughness index (IRI) level not more than 3 meters.	PA, Schedule, para. 16	Complied with. IRI maintain within 3 meters.
Human Resource Development and Training Guangxi shall cause GCD to prepare human resource development plan based on their future requirements and strategy. Prior to undertaking international training financed under the Loan, GCD shall prepare for the concurrence of ADB (a) a training plan and a list of candidates nominated for international training, (b) a program of workshops to be delivered by GCD by those trained internationally, and (c) a list of training equipment an aids required to strengthen and implement GCD's in-country training programs. Upon completion of the workshops, GCD shall provide ADB with an evaluation of the international training and workshops, and identify subjects that are appropriate for formal incorporation into GCD's regular staff training curricula.	PA, Schedule, para. 17	Complied with.
Poverty Reduction Guangxi, through GCD, in cooperation with the Guangxi Poverty Alleviation and Development Office and Labor Bureau, shall ensure that: (a) contractors maximize the employment of local poor persons for construction of the project roads; and (b) local villagers working for the complementary road program shall receive a salary based on market rates.	PA, Schedule, para. 18	Complied with. About 15,000 people from project area were engaged during construction.
Guangxi shall cause GCD to monitor the impacts on poverty with the assistance of a local institute. Guangxi shall cause GCD to provide semi-annual monitoring reports to ADB during construction, as part of the quarterly progress reports, and an evaluation report shall be submitted three years after project completion.	PA, Schedule, para. 18	Complied with. Guangxi Academy of Social Sciences was engaged to monitor the impact of the Project.
Gender and Development Guangxi shall cause GCD to follow ADB's Policy on Gender and Development during implementation of the Project, and shall take all necessary actions to encourage women living in the project area to participate in planning and implementing the Project, including construction work.	PA, Schedule, para. 19	Complied with. About 35% of the local residence engaged during construction were female.

Covenants	Reference in Loan Documents	Status of Compliance
GCD shall monitor effects on women during project implementation through gender-disaggregated data in the Resettlement Plan and the monitoring and evaluation system, in consultation with the All-China Women's Federation at the provincial and local levels.	PA, Schedule, para. 19	Complied with
Health Risks		
Guangxi shall cause GCD, together with the appropriate authorities to ensure that contractors disseminate information on the risks of sexually transmitted diseases to those employed during project implementation. GCD shall also ensure that similar information is disseminated to transport operators during operation of the project facilities.	PA, Schedule, para. 20	Complied with.
Vehicle Emissions		
Guangxi shall cause GCD to cooperate with and assist the environmental protection bureau in controlling vehicle emissions on the project roads. GCD shall submit to ADB, before commercial operation of the project facilities, the emission regulation limits prescribed by the Borrower, penalties for their infringement, and a plan for operation of vehicle emission testing stations.	PA, Schedule, para. 21	Complied with.
Environment		
Guangxi, through GCD, shall ensure that the Project roads are constructed and operated or upgraded and maintained (as the case may be) in accordance with national and local government environmental procedures and guidelines and ADB's guidelines and procures on environment.	PA, Schedule, para. 22	Complied with.
Guangxi, through GCD, shall ensure that any adverse environmental impacts arising from construction and operation of the Projects will be minimized by implementing the mitigation measures, environmental monitoring program, and other recommendations presented in the Environmental Impact Assessment and Summary Environmental Assessment.	PA, Schedule, para. 23	Complied with.
Guangxi, through GCD, shall submit to ADB bi-annual report summarizing the implementation of the environmental monitoring program, including mitigation measures, and copies of permits, licenses and clearances as required by relevant safety and environmental regulatory agencies.	PA, Schedule, para. 24	Complied with.
Land Acquisition and Resettlement		
Guangxi, through, GCD, shall ensure that all land and rights-of-way required for the Project are made available in a timely manner. Guangxi, through GCD, shall ensure that the Resettlement Plan is carried out promptly and efficiently in line with the Borrower's Land Administration Law, other relevant regulations, and ADB's Policy on Involuntary Resettlement.	PA, Schedule, para. 25	Complied with.

Covenants	Reference in Loan Documents	Status of Compliance
Guangxi, through, GCD, shall ensure that all affected people be consulted on the specific entitlements for which are eligible and their concerns addressed at least four months before ground clearing commences and that sufficient budget be made available to meet the Resettlement Plan objectives. Guangxi, through GCD shall ensure the compensation to the affected people be made as scheduled in the Resettlement Plan and those affected will be at least as well off as they would have been in the absence of the Project.	PA, Schedule, para. 26	Complied with.
Guangxi, through GCD, shall ensure that a local institute independently monitors and evaluates implementation of the Resettlement Plan, reports annually during resettlement implementation, and evaluates resettlement achievements.	PA, Schedule, para. 27	Complied with.
Guangxi shall cause GCD to keep ADB informed of the progress of resettlement activities through quarterly progress reports and through a report to be submitted on completion of the resettlement and one year and two years thereafter.	PA, Schedule, para. 28	Complied with.
Complementary Road Program		
Guangxi shall (a) ensure that the county governments implement the Complementary Road Program as agreed with ADB, (b) provide, in a timely manner, adequate funds to implement the program, as well as, implement the social and environmental mitigation measures for the program, and (c) ensure the governments adequately operate and maintain the roads constructed/upgraded under the program.	PA, Schedule, para. 28	Complied with.
Monitoring and Evaluation		
Guangxi shall cause GCD to monitor and evaluate project impacts through a project performance management system to ensure that the Project facilities are managed effectively and the benefits, particularly to the poor, are maximized. GCD shall collect data agreed with ADB prior to implementation, at completion, and annually for three years thereafter.	PA, Schedule, para. 30	Being complied with.
Financial Reporting		
GCD shall maintain separate accounts for the Project; have such accounts and related financial statements (statement of source and application of funds, statement of implementation of loan agreement, statement of income and expenses, and related statements) audited annually, in accordance with appropriate auditing standards and submit to ADB promptly after their preparation but in any event not later than nine months after the close of fiscal year to which they relate.	PA, Section 2.09 (a)	Complied with.

ADB = Asian Development Bank, BOT = build-operate-transfer, GCD = Guangxi Communications Department, GMCE = Guangxi Expressway Management Company, PMU = project management unit.

CONTRACT PACKAGES FINANCED BY THE ASIAN DEVELOPMENT BANK

Contract					Final Contract	ADB Financing	Contract	
No.	Contract Description	Approved	Date	Contractor/Supplier/Consultant	Currency	Cost	\$ Equivalent	Completion
A. Expressway Civil Works								
1.	K0+000-K14+800	24-Mar-03	08-Apr-03	China Railway 19 Bureau Group Corp	CNY	176,944,971	11,977,011	Apr-06
2.	K14+800-K28+300	24-Mar-03	06-Apr-03	Longjian Road & Bridge Ltd Co.	CNY	203,634,960	13,903,596	Apr-06
3.	K28+300-K42+477	24-Mar-03	30-Mar-03	China Harbour Eng.Co. Group (CHEC)	CNY	146,170,404	9,911,044	Apr-06
4.	K42+408-K58+300	24-Mar-03	30-Mar-03	Central South Municipal Eng.I Construction Corp.	CNY	136,048,619	9,194,216	Apr-06
5.	K58+300-K69+400	24-Mar-03	30-Mar-03	The First Eng. Co. of the First HW Eng. Corp. of China Road	CNY	133,244,390	9,025,633	Apr-06
6.	K69+400-K84+600	24-Mar-03	30-Mar-03	The First Eng. Co. of the First HW Eng. Corp. of China Road	CNY	175,745,104	11,956,153	Apr-06
7.	K84+600-K96+002	24-Mar-03	06-Apr-03	CHEC Second Navigational Eng. Bureau	CNY	139,513,838	9,454,244	Apr-06
8.	K95+400-K108+700	24-Mar-03	06-Apr-03	Guangxi Road and Bridge Eng. Corp.	CNY	166,974,840	11,322,671	Apr-06
9.	K108+700-K123+800	24-Mar-03	06-Apr-03	Guangxi Road and Bridge Eng. Corp.	CNY	197,081,468	13,327,991	Apr-06
10.	K123+800-K135+701	24-Mar-03	06-Apr-03	Guangxi Road and Bridge Eng. Corp.	CNY	193,461,504	13,039,675	Apr-06
Longzhou Class II Connector								
11.	K0+284-K15+000	24-Mar-03	06-Apr-03	Guangxi Navigation Eng. Division	CNY	52,463,273	3,537,439	Apr-06
12.	K15+000-K31+258	24-Mar-03	06-Apr-03	Lianyungang Huaxiang International Eng. Co. Ltd.	CNY	78,659,650	4,959,907	Apr-06
Subtotal (A)						1,799,943,021	121,609,580	
B. Equipment								
1.	Toll System	14-Mar-05	24-Apr-05	Guangxi Communications Science Res. Institute	CNY	25,815,542	3,362,055	May-07
2.	Safety an Testing Equipment	12-Sep-05	23-Sep-05	Guangxi Communications Science Res. Institute	CNY	4,285,275	577,491	Dec-07
3.	Asphalt Pothole Patcher	28-Oct-05	11-Nov-05	Anshan Senyuan Road and Bridge Maintenance Machinery	CNY	910,000	113,255	Mar-06
4.	Highway Operations Vehicle	28-Oct-05	11-Nov-05	Nanning Jianjing Trade Co. Ltd	CNY	3,008,400	374,412	Mar-06
5.	Road Maintenance Vehicle	28-Oct-05	11-Nov-05	China Xi'an Xijin Import and Export Co. Ltd	CNY	1,412,057	175,738	Mar-06
6.	Road Maintenance Equipment (two trucks, hydraulic cranes)	26-Jul-06	04-Aug-06	Systeq Instruments Canada	\$	1,506,164	1,506,164	Nov-06
7.	Road Maintenance Equipment (asphalt mixer/spreader)	26-Jul-06	04-Aug-06	EA Machinery Equipment Company Ltd	\$	2,766,114	2,766,114	Nov-06
8.	Road Maintenance Equipment (vibratory roller, loader, etc.)	26-Jul-06	13-Sep-06	China National General Machinery Engineering Corp.	CNY	12,497,061	1,637,125	Sep-07
9.	Road Maintenance Equipment (bridge inspection, etc.)	26-Jul-06	13-Sep-06	Henan Economic Trade International Transportation	\$	558,000	558,000	Dec-07
Subtotal (B)							11,070,355	
C. Internmtional Consultant								
	Construction Supervision	19-Apr-02	08-Apr-03	SMEC International Pty Ltd (Australia)	\$	858,196	858,196	Jun-07
	Training				\$	376,298	376,298	Jul-07
Subtotal (C)						1,234,494	1,234,494	
Total							133,914,428	

TRAFFIC FORECAST

1. **Current Traffic Situation.** The project expressway was partially opened to traffic in October 2005, and full commercial operation began on 26 December 2005, 8 months behind the original schedule at appraisal. According to a traffic count conducted on the project expressway by Guangxi Southwestern Expressway Company in 2006, the actual average annual daily traffic (AADT) on the project expressway was 2,420 vehicles, or about 64% of the traffic volume (3,785 vehicles) projected at appraisal. This lower-than-expected traffic volume was due partly to the delayed start of operation, and possibly also to an overestimation at appraisal of the amount of traffic that would be diverted from the national highway (NH322) to the project expressway. NH322 is still the preferred route for many shipping trucks, as the travel cost is perceived to be lower and the regulations prohibiting overloading are less strictly enforced. Traffic on the project expressway, however, started to grow rapidly in 2007. AADT that year was 2,885 vehicles, 19.2% over the 2006 figure. Table A11.1 compares the traffic volume forecast at appraisal with the traffic volume observed by the Project Completion Review Mission.

Table A11.1: Forecast and Actual Traffic on the Project Expressway and NH322 (AADT)

Item	2006		2007			2015		2025	
	Actual	RRP	Actual	2008	2010	Projected	RRP	Projected	RRP
Project Expressway									
Wuxu–Chongzuo	3,197	5,150	3,782	4,501	6,056	9,753	10,200	19,186	19,100
Chongzuo–Ningming	1,809	2,300	2,187	2,603	3,502	5,640	5,100	11,095	11,400
Ningming–Youyiguan	1,395	2,600	1,691	2,012	2,708	4,361	4,600	8,578	8,500
Average, whole alignment	2,420	3,785	2,885	3,434	4,620	7,441	7,550	14,637	14,670
Annual growth rate ^a (%)			19.2	19.0	16.0	10.0	8.0	7.0	6.9
Real GDP growth (%)	13.5	n.d.	12.0	9.0	8.0	7.5	7.5	7.0	7.0
NH322 Traffic	4,757	3,400	5,287	5,446	5,778	6,697	4,030	8,571	4,865
Annual growth rate (%)		n.d.	11.1	3.0	3.0	3.0	1.9	2.5	1.9

n.d. = no data, GDP = gross domestic product, RRP = report and recommendation of the President.

^a Guangxi Zhuang Autonomous Region.

Source: Guangxi Communications Department and staff estimates.

2. **Toll Rate.** The slight reduction in actual traffic volume was due in part to the toll rates, which were 13.1% higher on average than the rates assumed at appraisal (Table A11.2).

Table A11.2: Toll Rates on the Project Expressway (CNY)

Vehicle Classification	Appraisal	Current
Small passenger car (1–7 tons)	0.30	0.40
Medium passenger car (8–19) / Small truck (2–5 tons)	0.58	0.80
Larger passenger car (20–39 tons) / Medium truck (5–10 tons)	1.00	1.20
Larger truck (10–15 tons)	1.85	1.55
Large passenger car (40 tons and above)	1.85	1.60
Heavy truck (15 tons and above)	2.60	1.68
Average toll, weighted according to traffic volume	0.528	0.598

Source: Guangxi Southwestern Expressway Company.

3. **Traffic Volume Reevaluation.** The projected traffic growth pattern from 2008 to 2025 is based on (i) actual traffic (2006–2007), and (ii) actual and expected industrial and population growth in the project area. Even though the start of operation was delayed by 8 months, growth has been rapid and the traffic volumes are projected to be close to the appraisal estimates in 2025. For a conservative estimate, the projected average traffic growth rate for 2008–2010 was assumed at about 16% per year, despite the very high growth rate (19%) currently. The projected average growth rate for 2010–2015 was thus reduced to 10%. The expected annual growth rate was assumed to be 7%–8% in the remaining study period (2016–2025).

FINANCIAL REEVALUATION

A. Financial Internal Rate of Return

1. The financial internal rate of return (FIRR) was reevaluated with the use of the same methodology used at appraisal. The FIRR is based on the traffic forecasts prepared by the Project Completion Review Mission and the current toll rates. The major assumptions were as follows:

- (i) The FIRR was calculated in constant 2000 prices. The cash flows and financing plans are in real prices. They cover a period of 23 years—3 years of construction (2003–2005) and 20 years of operation (2006–2025).
- (ii) The FIRR was calculated after corporate income tax.
- (iii) Capital costs include all incremental capital expenditures related to the construction and equipment of the project expressway, but exclude price contingency provisions and interest during construction.
- (iv) Operation and maintenance (O&M) costs include all incremental costs for operating the project expressway, but exclude depreciation provisions.
- (v) Operating revenues were projected on the basis of forecast traffic for the toll rates for all vehicle types in real terms. The toll rates were applied to the whole project expressway in real terms during the period of analysis. The traffic volumes take into account vehicles that are exempt from tolls, such as military, emergency, and public security vehicles.

2. The actual capital mix and cost of funds were used in calculating the estimated weighted average cost of capital (WACC), after tax, in real terms. Costs were considered as follows: (i) an estimated interest rate of 5.76% per year for China Development Bank, and (ii) an opportunity cost of equity capital of 8%. The cost of debt was also adjusted to reflect the impact of an income tax rate of 33%. Domestic long-term inflation rates were applied to the nominal cost to convert it into real cost. WACC at project completion equaled 3.54.

3. The FIRR for the Project, computed after tax, is 11.1% (Table A12.1), higher than the WACC. The Project is therefore considered both financially viable and sustainable. The recalculated FIRR, in constant prices, is higher than the FIRR at appraisal (9.0%), owing to higher-than-anticipated tariff rates. Toll rates are 13.1% higher on average than the rates assumed at appraisal. The FIRR sensitivity tests indicate that conditions causing the Project's viability to fall below the WACC are unlikely to occur. The sensitivity of the project's financial indicators to cost and revenue variations is shown in Table A12.2. The traffic volume would have to decrease by 54%, or the O&M costs increase by 3,049%, for the FIRR to fall below the project's WACC. Thus, the Project is financially viable.

B. Financial Projections

4. The consolidated financial statements (income statement, cash flow, and balance sheet) cover 4 years of construction from 2003 to 2006 and 6 years of full commercial operations from 2007 to 2012 (Table A12.3). All accounts and projections are in current prices. Financial data for 2005–2007 are from the audited accounting reports of the Guangxi Southwestern Expressway

Company. The financial projections for 2007–2012 are based on the following information and assumptions:

- (i) The domestic inflation rate is projected to be 2.8% in 2007 and 3.0% thereafter. The international inflation rate is assumed to be 1.9% throughout the study period.
- (ii) Operating revenue estimates are based on the traffic forecast and the official toll rates (Table A13) set by the government of the Guangxi Zhuang Autonomous Region government.
- (iii) In line with the People's Republic of China's (PRC) new tax regulations, the business tax rate was reduced from 5.45% before June 2005 to 3.34% after June 2005 to help loan-burdened expressway companies improve their financial capacity. The corporate income tax rate 1 remains at 33%.
- (iv) Straight-line depreciation was calculated, according to domestic accounting standards.
- (v) The Asian Development Bank (ADB) loan yielded \$150.0 million in actual proceeds. The loan had a maturity of 24 years, a grace period of 4 years, and a London interbank offered rate (LIBOR)-based floating interest rate. The interest-only loan of CNY1.2 billion from China Development Bank (CDB) had a maturity of 16 years and a fixed interest rate of 5.76%.
- (vi) The grants provided by the Ministry of Communications and the Guangxi Communications Department are treated as equity capital in the balance sheet.

5. The financial projections indicate a profitable operation for the project expressway from 2009 onward. The working ratio (operating expenses, excluding depreciation, over net operating revenue) will decrease from 23.3% in 2007 to 11.5% in 2012, the debt service coverage ratio will increase from 1.0 in 2007 to 3.8 in 2012, and the equity-to-debt ratio will increase steadily from 0.85 in 2007 to 1.64 in 2012. The results show that the forecast revenue is enough to cover annual recurrent costs, depreciation, and debt repayments, and generate reasonable profits from 2009, 4 years after the start of the project's full commercial operation.

Table A12.1: Financial Internal Rate of Return
(CNY million)

Year	Capital Cost	O&M Cost	Gross Revenue	Net Cash Flow	Corporate Tax	Net Cash Flow	
						PCR	RRP
2001	0.0	0.0	0.0	0.0	0.0	0.0	(299.7)
2002	0.0	0.0	0.0	0.0	0.0	0.0	(931.7)
2003	342.7	0.0	0.0	(342.7)	0.0	(342.7)	(919.5)
2004	753.9	0.0	0.0	(753.9)	0.0	(753.9)	(928.1)
2005	1,165.1	7.5	0.8	(1,171.8)	0.0	(1,171.8)	15.7
2006	411.2	10.3	100.5	(321.0)	0.0	(321.0)	279.0
2007	753.9	10.6	121.2	(643.3)	0.0	(643.3)	284.4
2008	0.0	10.8	146.6	135.8	10.7	125.1	290.3
2009	0.0	11.1	177.4	166.3	19.8	146.5	296.6
2010	0.0	11.4	216.5	205.0	31.4	173.6	340.7
2011	0.0	11.8	264.1	252.3	45.6	206.8	349.0
2012	0.0	12.1	322.2	310.1	62.8	247.3	358.2
2013	0.0	12.4	386.6	374.3	82.0	292.3	367.9
2014	0.0	12.7	464.0	451.3	105.0	346.3	378.2
2015	89.7	13.0	556.8	454.0	132.7	321.3	330.1
2016	0.0	13.3	668.1	654.8	165.9	488.9	429.4
2017	0.0	13.6	801.8	788.2	205.8	582.4	442.6
2018	0.0	14.0	962.1	948.1	253.6	694.5	456.1
2019	0.0	14.3	1,154.5	1,140.2	311.0	829.2	470.4
2020	0.0	14.7	1,385.4	1,370.7	379.9	990.8	560.1
2021	0.0	15.0	1,662.5	1,647.5	462.7	1,184.8	577.7
2022	0.0	15.4	1,995.0	1,979.6	562.0	1,417.6	597.0
2023	0.0	15.8	2,394.0	2,378.2	681.2	1,697.0	616.6
2024	0.0	16.3	2,872.8	2,856.6	824.2	2,032.4	638.1
2025	(1,370.7)	16.7	3,447.4	4,801.5	995.9	3,805.6	2,070.9
					FIRR =	11.1%	9.0%

() = negative, FIRR = financial internal rate of return, O&M = operation and maintenance, PCR = project completion report, RRP = report and recommendation of the President.

Source: Asian Development Bank estimates.

Table A12.2: Sensitivity Analysis

Item	FIRR (%)	Switching Value (%)
Baseline	11.1	
1. Decrease in traffic by 20%	9.0	53.7
2. Increase in O&M cost by 20%	11.0	3,049.3
3. (1) + (2)	8.9	0
4. Increase in traffic by 20%	12.7	0
5. Decrease in O&M cost by 20%	11.1	0
6. (4) + (5)	12.7	0

0 = magnitude zero, FIRR = financial internal rate of return, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

Table A12.3: Financial Statement, Actual and Projected
(CNY'000)

Item	2005	2006	2007	2008	2009	2010	2011	2012
Total revenue (1)	791	97,472	117,730	142,230	171,880	209,420	255,200	311,020
1. Toll revenue	788	96,081	115,872	140,190	169,630	206,950	252,480	308,030
2. Damaged road compensation	1	699	927	1,020	1,120	1,230	1,360	1,490
3. Salvation	3	612	599	660	730	800	880	970
4. Others	0	80	332	360	400	440	480	530
Total expenditure (2)	1,168	29,188	64,412	90,780	95,460	100,380	105,580	111,030
1. Personnel	815	13,191	22,590	23,720	24,910	26,150	27,460	28,830
2. Administration and service	353	3,491	4,403	4,750	5,130	5,540	5,990	6,470
3. Operation cost	0	12,506	37,420	62,310	65,420	68,690	72,130	75,730
Profit of key operation (1-2)	(377)	68,285	53,318	51,450	76,420	109,040	149,620	199,990
Other business profit	0	1,391	1,859	2,040	2,250	2,470	2,720	2,990
Interest payment	0	52,345	53,391	54,459	54,187	53,916	53,647	53,378
Operation profit	(377)	17,331	1,785	(969)	24,483	57,594	98,693	149,602
Current capital	4,623	58,369	114,012	162,314	235,534	341,374	494,272	701,540
Original fixed asset	1,795,200	3,622,915	4,916,776	4,934,376	4,938,376	4,930,102	4,902,684	4,861,355
Depreciation	0	1,620	8,556	9,414	10,214	11,014	10,194	9,375
Fixed net asset	0	3,621,295	4,908,220	4,924,962	4,928,162	4,919,088	4,892,490	4,851,980
Total capital	1,799,823	3,679,665	5,022,232	5,087,276	5,163,696	5,260,462	5,386,761	5,553,519
Liability	1,795,200	2,121,637	2,720,006	2,584,000	2,454,800	2,332,060	2,215,457	2,104,684
Current liabilities	0	37	6	0	0	0	0	0
ADB loan	752,400	889,200	1,140,000	1,083,000	1,028,850	977,408	928,537	882,110
Domestic loan	792,000	936,000	1,200,000	1,140,000	1,083,000	1,028,850	977,408	928,537
Other liability	250,800	296,400	380,000	361,000	342,950	325,803	309,512	294,037
Equity	4,623	1,558,028	2,302,226	2,503,276	2,708,896	2,928,402	3,171,304	3,448,835
Capital contribution	0	1,485,120	2,176,000	2,325,600	2,454,800	2,565,266	2,658,548	2,736,089
Actual capital revenue	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Unallocated profit	(377)	67,908	121,226	172,676	249,096	358,136	507,756	707,746
Total (Liability + Equity)	1,799,823	3,679,665	5,022,232	5,087,276	5,163,696	5,260,462	5,386,761	5,553,519
Equity to debt ratio	0.00	0.73	0.85	0.97	1.10	1.26	1.43	1.64
Working ratio (%)	148.3	17.4	23.3	20.3	17.7	15.3	13.2	11.5
Operating ratio (%)	0.0	13.0	32.3	44.4	38.6	33.2	28.6	24.6
Debt service coverage ratio	0.0	1.3	1.0	1.0	1.5	2.1	2.8	3.8

() = negative, 0 = magnitude zero.

Source: Guangxi Communications Department.

ECONOMIC REEVALUATION

1. The economic analysis covers the 4 years of project implementation from 2000 to 2003, and the 20 years of full operation from 2006 to 2025. In the economic analysis the same methodologies and assumptions were applied as at appraisal, but adjustments were made to reflect (i) actual construction costs, (ii) actual operation and maintenance (O&M) costs, and (iii) actual traffic volumes in the past 3 years since the project expressway began operation. As in the analysis in the appraisal, constant 2000 prices were used to derive real economic costs and benefits, which are expressed in the local currency (CNY) using the domestic numeraire.

2. The project's economic costs consist of (i) the capital investment, including land acquisition, resettlement, and environmental mitigation costs; and (ii) O&M costs, including the costs of replacing depreciated equipment, routine maintenance, full replacement of equipment in 2015 (10 years after all major equipment was purchased and installed), and a comprehensive expressway maintenance project in 2020 (15 years after the start of full commercial operation). The capital investment was divided into tradable materials and equipment, non-tradable materials, and skilled and unskilled labor. A composite conversion factor of 0.967 was used to project the financial prices of the capital costs to their economic prices. Economic benefits include (i) vehicle operating cost savings resulting from reduced travel distance and improved road conditions, (ii) time savings for passenger and freight traffic, and (iii) accident cost savings. Because of data constraints, the economic analysis is focused only on a cost-benefit analysis of the project expressway and does not consider the rural roads component.

3. The Project's expected economic internal rate of return (EIRR) is 19.4% and its net present value is CNY2,205 million, as compared to the appraisal forecast of 20.0% and CNY2,615 million (Table A13.1). The reduced economic return is primarily a result of lower traffic volume than estimated at appraisal. Economic benefits from vehicle operating cost savings, time savings, and accident cost savings are all based on traffic volumes and traffic composition on the project expressway. As actual and forecast traffic volumes and composition do not differ significantly from the appraisal forecast, the total economic benefits are expected to remain similar to the appraisal results. With lower costs and similar benefits, the economic return is expected to be higher than estimated at appraisal.

4. The sensitivity analysis of the EIRR (Table A13. 2) shows that the traffic volume would have to be 64.5% lower, or the total benefits 48.2% lower, for the EIRR to fall below the cutoff rate of 12%. Since the economy of the People's Republic of China is projected to continue growing rapidly, and the Government has had experience in successfully implementing Asian Development Bank road projects, neither situation is likely to happen. In addition, this economic analysis does not consider the benefits from economic multiplier effects, as such effects are difficult to quantify. Such benefits would further increase the economic return of the Project. Thus, the Project is considered viable in economic terms.

Table A13.1: Economic Internal Rate of Return
(CNY million)

Year	Costs			Benefits								Net Benefits	
	Project Investment	O&M Cost	Total Costs	VOC Savings	Value of Time Savings	Accident Savings	Generated Traffic	Freight Transit Savings	Benefits of Diversion from Rail	Benefits of Complementary Roads	Total Benefits	PCR	RRP
2001	0	0	0	0	0	0	0	0	0	0	0	0	(290)
2002	0	0	0	0	0	0	0	0	0	0	0	0	(915)
2003	339	0	339	0	0	0	0	0	0	0	0	(339)	(923)
2004	746	0	746	0	0	0	0	0	0	0	0	(746)	(922)
2005	1,154	7	1,161	0	0	0	0	0	0	0	0	(1,161)	286
2006	407	10	417	235	18	19	9	1	2	25	310	(108)	510
2007	746	11	757	269	22	21	12	1	2	28	354	(403)	557
2008	0	11	11	307	26	23	15	1	2	31	405	394	609
2009	0	11	11	350	30	25	19	1	2	34	462	451	666
2010	0	11	11	398	35	27	24	2	2	37	526	515	717
2011	0	12	12	452	41	30	31	2	2	41	599	587	786
2012	0	12	12	512	48	32	38	2	3	45	681	669	862
2013	0	12	12	512	48	32	38	2	3	45	681	761	946
2014	0	13	13	654	66	39	61	3	3	53	879	866	1,040
2015	0	13	13	738	77	42	76	3	3	58	998	985	1,048
2016	0	13	13	803	87	46	92	4	3	61	1,095	1,082	1,310
2017	0	13	13	926	94	50	111	4	3	64	1,252	1,239	1,498
2018	0	14	14	1,064	102	55	134	5	3	67	1,429	1,415	1,711
2019	0	14	14	1,220	110	59	162	5	3	71	1,629	1,615	1,952
2020	0	15	15	1,394	118	64	196	6	3	74	1,855	1,841	2,223
2021	0	15	15	1,611	128	70	239	7	3	79	2,137	2,122	2,529
2022	0	15	15	1,833	137	76	289	7	3	83	2,428	2,413	2,875
2023	0	16	16	2,081	145	83	350	8	3	87	2,757	2,742	3,266
2024	0	16	16	2,359	154	90	423	9	3	91	3,129	3,113	3,708
2025	(1,352)	16	(1,335)	2,670	162	97	511	10	3	96	3,549	4,884	5,457
											EIRR	19.4%	20.0%
											NPV	2,205	2,615

() = negative, EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance, PCR = project completion report, RRP = report and recommendation of the President, VOC = vehicle operating cost.

Source: Asian Development Bank estimates.

Table A13.2: Sensitivity Analysis

Scenario	EIRR (%)	Switching Value (%)
1. Base case	19.4	0
2. 10% increase in operating cost	19.3	0
3. 10% decrease in total benefit	18.0	48.2
4. 10% decrease in total traffic	18.1	64.5
5. 10% increase in total traffic	20.6	0
6. 10% decrease in net economic value added	19.3	744.9
7. 10% increase in net economic value added	19.4	0
8. 4 and 6 combined	18.8	107.3
9. 5 and 7 combined	19.8	0

0 = magnitude zero, EIRR = economic internal rate of return.

Source: Asian Development Bank estimates.

LAND ACQUISITION AND RESETTLEMENT

A. Background

1. The Project involved the construction of 179.2 kilometers (km) of four-lane, access-controlled expressway between Nanning and Youyiguan, 49 km of link roads, and four service areas, and the upgrading of 507 km of local roads. The expressway, familiarly known as the Nan–Yu Expressway, starts at the end of the Wuxu–Nanning Airport Expressway and passes through Yongning, Fusui, Chongzuo, Longzhou, Ningming, and Pingxiang counties before ending at Youyiguan, where it connects with Viet Nam Highway No. 1. The upgrading of the local roads involved the improvement of the roads on the existing alignment, with minor adjustments at some difficult terrains in the counties of Fusui, Chongzuo, Longzhou, Ningming, and Pingxiang, where poverty incidence is among the highest. Permanent and temporary land acquisition, house demolition, and resettlement were also undertaken.

2. Most of the expressway and link roads pass through counties inhabited by minority people. The villages with minority people constitute over 95% of all villages. The Zhuang make up most of these minority people. In addition, there are also a very small number of Yao, Miao, and Maonao. The largest minority group among the 55 minorities in the PRC, the Zhuang account for 33% of the population of Guangxi, and have their own language and script. Traditionally, the Zhuang mainly live on farming but are also good at metallurgy, pottery, and textile production. Finding part-time employment in other areas is an important means of increasing their income. The Zhuang have lived with the Han people for thousands of years and their relationship is so harmonious that intermarriage is common. The Zhuang are generally well educated, with a small proportion of illiterates. Women play an important role in both families and communities. As young male members leave their hometown for work, women take over the farm work and the education of children. The minorities in the project area enjoy preferential policies for minorities not only under the Constitution but also under the Western Development Program and the Rural Infrastructure Development Program. Hence, there was no need to prepare an ethnic minority development plan or indigenous people development framework under the Project.

3. The resettlement plan was prepared by Xi'an Highway University in February 2000 and revised with the assistance of the PPTA consultants. The plan provided the basis for the implementation, monitoring, and evaluation of land acquisition and resettlement. The construction of the expressway started in April 2003 and was completed in December 2005, when the expressway was opened to traffic.

B. Scope of Land Acquisition and Resettlement

4. By project completion, actual permanent land acquisition was 20,721 mu, or 1,381.4 hectares (ha), 15.7% more than anticipated in the resettlement plan. This was because three more interchanges were added, the length of the link roads was increased, additional land was needed to stabilize cut slopes, and land needed for service areas was not provided for in the plan. The actual temporary land occupation covered 6,663 mu (444.2 ha), 270% more than the 196.0 ha estimated in the resettlement plan, because a mismatch in progress rate between the civil works and pipe and beam production made it necessary to store the finished precast pipes and concrete beams temporarily at the two casting yards. The permanent land acquisition affected 46,021 people from 10,041 households, compared with the resettlement plan estimate

of 39,510 from 8,671 households. Tables A14.1 and A14.2 below show the types of land required for the Project and compare the planned and actual land acquisition data.

Table A14.1: Type of Land Required by the Project (mu)

County/ City	Permanent Land Acquired	Paddy Field	Dry Land	Sugar- cane Land	Vegetable Plot	Orchard	Fish- pond	Forest	Others
Yongning	2,138.00	336.84	98.06	789.98	0.00	362.89	37.32	341.78	161.58
Fusui	5,653.00	198.10	1,007.23	2,424.87	13.83	512.99	155.09	571.35	769.50
Chongzuo	3,449.00	303.37	490.09	1,615.13	31.62	193.45	37.93	300.54	477.09
Ningming	4,939.00	855.29	485.63	2,230.41	29.67	251.19	55.06	356.71	675.71
Pingxiang	3,449.00	841.33	415.15	318.61	29.12	96.10	134.69	672.67	941.79
Longzhou	1,093.00	185.42	143.82	221.68	11.27	193.93	33.39	220.02	105.62
Total	20,721.00	2,720.25	2,639.99	7,600.68	115.51	1,610.55	453.48	2,463.07	3,131.29

Source: Report on External Monitoring and Evaluation Action Plan No. 4 (August 2007).

Table A14.2: Planned and Actual Land Acquisition (mu)

County/City	Permanently Acquired Land		Temporarily Acquired Land		Planned (no.)		Actual (no.)	
	Planned	Actual	Planned	Actual	Household	Population	Household	Population
Yongning	1,696	2,138	n.d.	162	503	2,796	1,338	6,154
Fusui	4,532	5,653	1,260	1,747	3,611	16,825	3,611	16,258
Chongzuo	2,620	3,449	n.d.	1,205	862	4,258	1,156	5,317
Ningming	4,102	4,939	n.d.	2,433	1,920	7,680	1,856	8,723
Pingxiang	3,724	3,449	n.d.	873	968	4,065	1,386	6,377
Longzhou	1,233	1,093	n.d.	241	807	3,886	694	3,192
Total	17,907	20,721	2,934	6,661	8,671	39,510	10,041	46,021

n.d. = no data.

Source: Report on External Monitoring and Evaluation Resettlement Action Plan No. 4 (August 2007).

5. Actual demolition of structures, including houses, covered 27,586.7 m² and affected 862 persons, 649 of whom were from 129 households that required resettlement. The area demolished was about double the figure in the resettlement plan, but the number of persons affected increased by only 230 and the number of persons requiring resettlement by only 17. The differences were due to the use of the preliminary expressway design layout in resettlement plan preparation, the acquisition of additional land beside the expressway, the construction of additional link roads, and damage to buildings during excavation and blasting. Tables A14.3 and A14.4 below show the types of structures demolished and compare the planned and actual areas and affected people.

Table A14.3: Project Actual Demolition

Project Area/ Agency	Township (number)	Village (number)	Demolition Area (m ²)	Brick- Concrete Structures (m ²)	Non- residential Structures (m ²)	Affected Enterprises (number)
Yongning	2	3	3,365.02	2,499	6,705	1
Fusui	4	6	4,993.17	1,607	11,253	0
Chongzuo	3	6	2,699.22	2,039	1,951	0
Ningming	3	32	3,331.51	3,059	381	26
Pingxiang	4	14	7,893.87	6,513	870	62
Longzhou	1	4	5,303.94	2,549	70	0
Total	17	65	27,586.73	18,266	21,230	89

0 = magnitude zero.

Source: Guangxi Communications Department.

Table A14.4: Planned and Actual Demolition Compared

Affected County/City	Planned		Actual		Difference (+ or -)	
	People Affected (number)	Area Affected (m²)	People Affected (number)	Area Affected (m²)	People Affected (number)	Area Affected (m²)
Yongning	54	1,561	86	3,365.02	13	1,128
Fusui	20	2,457	166	4,993.17	89	1,198
Chongzuo	81	1,074	78	2,699.22	(51)	1,131
Ningming	12	706	101	3,331.51	89	2,770
Pingxiang	278	7,274	284	7,893.87	6	1,281
Longzhou	187	803	147	5,303.94	(40)	1,817
Total	632	13,875	862	27,586.73	230	18,529

() = negative.

Source: Guangxi Communications Department.

C. Compensation Standards

6. The resettlement plan specified different compensation standards for rice field, dryland, sugarcane land, vegetable land, orchard, fishpond, forest land, and wasteland. Yongning County, which is close to Nanning City, is classified as class I land, while other counties are classified as class II land. During implementation, the Guangxi government published (in document numbers 39 and 274) the approved compensation standards for all major projects in Guangxi. Publication was preceded by a detailed and in-depth study by the local governments to determine the actual yield and appropriate compensation rates, taking into account local economic development and living standards. Hence, the actual compensation standards for the class I county were better than those in the resettlement plan, while the standards for class II counties were generally lower than the plan standards. A survey and interviews with affected persons confirmed their satisfaction with the compensation standards. In fact, only 4.6% of the affected people felt that they deserved a higher compensation standard. Tables A14.5, A14.6, and A14.7 show the actual compensation standards used.

Table A14.5: Land Compensation Standard for Permanent Acquired Land
(CNY/mu)

Project	Class	Paddy Field	Dryland	Vegetable Plot	Fishpond	Sugar-cane Land	Wasteland	Forest		Orchard
								Harvested	Not Harvested	
Product per mu	I	1,245	1,030	3,268	3,811	1,317	1,030	1,030	1,030	3,020
	II	1,054	918	2,189	3,328	1,067	918	918	918	2,334
	Multiple	7	6	6	6	6	1	4	2	5
Land Compensation	I (unit price)	8,715	6,180	19,608	22,866	7,902	1,030	4,120	2,060	5,150
	II (unit price)	7,378	5,508	13,134	19,968	6,402	918	3,672	1,836	4,590
	Multiple	5	5	5	5	5	0	4	2	4
Resettlement Subsidy	I (unit price)	6,225	6,180	16,340	19,055	6,585	0	4,120	2,060	4 x 1030
	II (unit price)	5,270	4,590	10,945	16,640	5,335	0	3,672	1,836	4x 918
Total	Class I	14,940	11,330	35,948	41,921	14,487	1,030	8,240	4,120	22,240
	Class II	12,648	10,098	24,079	36,608	11,737	918	7,344	3,672	17,676

Note: Nanning suburb and Yongning County belong to class I. Fusui, Chongzuo, Ningming, and Longzhou are class II counties.

Source: District Planning Committee, The Notice of Publication of Annual Production Radix and Demolition Compensation Standard of Infrastructure Construction Land in GZAR, 14 June 2002, Guilin Region [2002]274.

Table A14.6: Permanent Land Acquisition Standards for the Project Expressway
(CNY/mu)

Land Type	Land Compensation		Resettlement Compensation		Young Crop Compensation
	Collective	State-Owned	Collective	State-Owned	
A. Yongning					
Paddy field	9,079	6,354	6,484	4,539	648
Dryland	6,210	4,347	5,175	3,622	518
Sugarcane	7,814	5,470	6,512	4,558	1,302
Vegetable plot	20,382	14,266	16,984	11,888	1,698
Orchard	18,994	13,296	4,140	2,898	3,165
Wasteland	1,035	725	0	0	0
Forest	2,070–9,315	1,449–6,521	3,764	2,634	175–4,084
B. Fusui, Chongzuo, Ningming, Pingxiang, and Longzhou					
Paddy Field	6,783	4,748	4,845	3,391	485
Dryland	4,968	3,477	4,140	2,898	414
Sugar Cane	5,826	4,078	4,855	3,398	971
Vegetable Plot	12,648	8,853	10,540	7,378	1,054
Orchard	19,230	13,461	16,025	11,217	3,205
Wasteland	828	9,450	0	0	0
Forest	1,745–7,452	1,159–5,216	3,312	2,318	175–4,084

Source: Guangxi Communications Department.

Table A14.7: Project Compensation Standard for Temporary Land Acquisition
(CNY/mu/year)

Land Type	Paddy Field	Dryland	Sugarcane Land	Vegetable Plot	Fish-pond	Orchard	Waste-land	Forest
A. Yongning Country	1,297	1,035	1,302	3,396	3,977	3,165	200	175–4,084
B. Fusui, Chongzuo, Ningming, Pingxiang, Longzhou	969	828	971	2,108	3,205	2,250	300	175–4,084

Source: Guangxi Communications Department.

7. The compensation standards for structures were different from those in the resettlement plan as the government had published document 501 reclassifying the structures into three different groups—brick-and-concrete structures, brick-and-wood structures, and earthen structures. The rates for most groups were higher than those in the resettlement plan, except for earthen group, for which the rates were 43% lower than in the plan. The compensation amount was generally adequate for the construction a modern structure of similar area. However, almost all the resettled people rebuilt their houses with a much bigger built-up area, and many were two- or 3-story concrete-brick houses. Table A14.8 shows the actual compensation paid for the structures demolished.

Table A14.8: Building Demolition Compensation Standards

Project Structures		Unit	Compensation standard
Buildings	Earth wall and grass surface	m ²	100
	Earth wall and tile surface	m ²	140
	Brick-wood structure	m ²	200
	Brick-concrete and frame structure	m ²	250
	Brick-tile kilns	piece	3,000
	Tombs with owners	piece	40
	Tombs without owners	piece	0
Other ground attachments	Pool	piece	1,500
	Well	piece	1,500
	Irrigation waterwheel	piece	5,000
	Food processing water mill	piece	5,000
Walls	Cleft stone	m ²	15
	Earth wall	m ²	7
	Red brick concrete wall	m ²	20
Simple houses	Earth wall and grass surface	m ²	40
	Earth wall and tile surface	m ²	60
	Brick-wood structure	m ²	90
	Brick-concrete and frame structure	m ²	120
	Grass/bamboo wall, grass or asphalt felt, asphalt tile surface	m ²	10
	Biogas	piece	1,500–1,800

m² = square meter.

D. Resettlement Organizations

8. The Executing Agency was the Guangxi Communications Department (GCD), which established a project management unit (PMU) to manage the expressway construction. Once the Guangxi Southwest Expressway Company (GSEC) was established by GCD, the GSEC land acquisition and resettlement department became responsible for land acquisition and resettlement. To facilitate land acquisition and resettlement, PMU established a county resettlement office at each county along the expressway to coordinate with the local government and finalize land acquisition formalities within the jurisdiction. Each county resettlement office, well staffed with properly trained personnel, conducted surveys along its section of the expressway, signed a contract with each local government and affected person, and conducted regular internal monitoring. The county resettlement staff carried out extensive public consultations and a publicity campaign to explain the purpose of the resettlement and the compensation policies. Staff were designated to handle grievances and make payments to the affected people. The county resettlement offices were disbanded once the land acquisition and resettlement were completed. To ensure the effective implementation of resettlement and income restoration of affected persons, the PMU engaged Guangxi Academy of Social Sciences to conduct external monitoring and evaluation.

E. Resettlement Cost

9. The total actual cost of compensation for land acquisition, house relocation, and relocation of public facilities such as power and telecommunication cables, irrigation system, water supply, and access roads was CNY389.3 million, 21.2% more than the resettlement plan estimate. The cost included CNY365.8 million for permanent and temporary land acquisition and CNY22.8 million for building demolition. The higher cost was due to the larger-than-expected land acquisition and resettlement (see Tables A14.9 and A14.10).

Table A14.9: Total Compensation for Land Acquisition

Type		PCO	Yongning	Fusui	Chongzuo	Ningming	Pingxiang	Longzhou	Total
Permanent Land Acquisition	Land Compensation	642,444	1,393,306	31,940,580	18,733,966	26,534,272	16,345,374	6,784,953	119,914,896
	Land Settlement Fee		11,433,451	23,591,815	13,628,651	19,478,700	15,701,965	5,168,783	89,003,368
	Young Crop Compensation		3,075,198	5,419,101	2,093,081	3,981,161	2,068,506	775,241	17,412,290
	Attachment Compensation	20,389,084	265,417	646,562	1,291,860	355,757	2,733,953	825,678	26,508,312
	Demolition Compensation		1,846,086	2,971,443	1,461,968	1,762,468	2,972,718	1,394,517	12,409,203
	Vegetation Recovery Fee	3,382,206	0	0	0	0	137,268	0	3,519,474
	Pollution Compensation		132,839	0	48,665	41,814	135,436	0	358,755
	Feeling Fee		0	0	0	5,109	208,835	0	213,943
	National Tax	350,119	0	0	310,288	0	0	0	660,407
	Land Acquisition Management	5,730,088	0	0			0	0	5,730,888
	Subtotal	30,493,941	18,146,297	64,569,501	37,568,479	52,159,281	40,304,055	14,949,172	275,731,536
Temporary Land Acquisition	Renting Fee	738,125	0	0	0	0	1,255,660	0	1,993,785
	Demolition Compensation		289,796	3,789,469	2,856,229	4,410,302	447,347	1,237,493	13,030,639
	Reclamation Fee	71,209,500	126,171	0	165,2374	2,497,094	0	518,125	75,003,264
	Subtotal	71,947,625	415,967	3,789,469	4,508,603	5,907,396	1,703,007	1,755,618	90,027,688
Total		102,441,566	18,562,264	68,358,970	42,077,082	58,066,677	42,007,062	16,704,790	365,759,224

PCO = Project Construction Office.

Source: Nanning Youyiguan Highway Construction Office.

Table A14.10: Total Compensation for Building Demolition (CNY)

Type		PCO	Yongning	Fusui	Chongzuo	Ningming	Pingxiang	Longzhou	Total
Cable	Length (km)	58.36	5.37	2.35	1.25	1.39	1.03	6.27	76.02
	Compensation	9,267,062	167,650	93,400	139,859	37,530	38,175	298,050	10,041,726
Electric Power	Length (km)	21.24	4.86	12.17	8.40	1.45	13.37	2.49	63.98
	compensation	3,600,323	170,000	768,865	513,250	714,750	672,335	145,490	6,585,013
Tomb	No.		1,174	2,098	980	856	709	425	6,242
	Compensation		194,720	251,760	62,062	92,000	86,460	51,540	738,542
Housing	Area (m ²)		3,365	4,993.17	2,699	3,331	7,893.87	5,304	27,586.04
	Compensation		758,799	1,078,181	492,686	741,063	1,667,064	673,329	5,411,122
Total		12,867,385	1,291,169	2,192,206	1,207,857	1,585,343	2,464,034	1,168,409	22,776,403

km = kilometer, m² = square meter, PCO = Project Construction Office.

Source: Guangxi Communications Department.

10. GSEC allocated compensation to county resettlement offices, which in turn distributed funds to affected village collectives and individuals through the Agricultural Bank of China after the agreed compensation standards were published and the land acquisition contract was signed. The affected persons were given bank savings books reflecting their full compensation, which they could withdraw from the bank. For house compensation, the full compensation was paid directly to the affected people through the bank before the houses were demolished.

11. For temporary land occupation, civil work contractors paid compensation directly to the affected collectives or households based on an annual fee equivalent to the 3-year average annual crop yield. In total, about CNY90.0 million was paid out for the temporary occupancy.

F. Resettlement Implementation

12. A joint survey team from GCD and Xi'an Highway University was established in March 1999 to investigate the land acquisition and the socioeconomic conditions along the project expressway. Land for acquisition was measured jointly by GCD, the affected persons, and the local government before the contract with each affected person was signed. The compensation standards were published in local news media and in leaflets distributed to the affected areas. In December 2002, the acquisition of land and relocation of housing and buildings began. By the end of 2004 most of the land acquisition and housing relocation work had been completed. Sporadic land acquisition as a result of minor changes in road design, damage from subgrade excavation, and residual land continued till 2005.

13. Land in the rural areas belongs to village collectives and is distributed to villagers by the village committee. The affected population can be divided into directly affected villagers, who were contracted to use the land according to the land contract responsibility system, and indirectly affected villagers. Funds for land acquisition and resettlement were transferred from GCD to the county offices, which then made payments for land, resettlement, and crops forgone to the affected households through the local branch of the Agriculture Bank of China. In Pingxiang, full payments were made to the affected households. In Yongning, payments for land were made to village collectives, but resettlement compensation and crop compensation were paid directly to the affected households through the local bank. The affected household was issued a bank passbook with a saving account. A survey by the Mission confirmed that full land compensation was paid to affected households if the land was contracted; 80% of the land compensation was paid if the land was collective wasteland, 10% was paid to the village brigades, 8% to village cooperatives, and 2% to the village committee.

14. Compensation for house and structure demolition was paid promptly to affected households before demolition to allow the households to rebuild their houses before they had to relocate. Affected households could choose the resettlement sites and the design of their houses. Generally, the resettlement sites were located near the expressway. GCD provided some of the households with free residential land and housing plans. Some decided to build their houses on their own contracted land and used the land compensation money to build better houses. The local government provided water, electricity supply, telephone, and cable television and constructed an access road. The affected households used the compensation money to buy new construction materials and rebuilt their own houses. Generally, the compensation money was sufficient to rebuild houses of similar size to those about to be demolished, but most households decided to rebuild much larger and better houses with their savings or with money borrowed from relatives and banks to supplement the housing compensation. All affected households have since rebuilt their houses except for eight families, which decided to rebuild their houses in Chongzuo City. These eight families have just started constructing their houses, as the acquisition of housing lots in the city and the conversion of the families' resident registration status from rural to urban took a considerable time. During the transition period, all affected households were provided with a transition allowance of

CNY300 per household per month by GCD. Generally, it took about 3 months to rebuild the houses.

15. The new houses were one- to three-story structures with built-up areas larger than those in the previous houses. The new houses were brick and concrete with an average floor space of 24.23 m² per person, more than double the previous floor space. All the new houses were provided with water and electricity. Some even have a telephone, cable television, and a biogas facility.

G. Assessment of the Quality of the Resettlement Implementation and Rehabilitation

16. According to updated data on the socioeconomic conditions along the project expressway, which were collected during the Mission and from external monitoring reports, as well as feedback from project beneficiaries, local government officials, and affected people and a survey among 105 households using the cluster sample survey approach, the land acquisition and resettlement were implemented in a timely and satisfactory manner and the affected people were satisfied with the compensation and resettlement arrangements. The survey confirmed that the income of affected people has basically been restored and many have in fact improved their incomes and living conditions. Temporarily acquired land has been appropriately restored for farming. The main grievance concerned the land compensation policy, particularly the different standards applied in urban and rural areas for similar land. Many found fault with the different compensation standards applied to land on different sides of the road, although the resettlement office pointed out that the road in question happened to be the demarcation line between two counties with different compensation standards.

H. Conclusion and Lessons Learned

17. It can be concluded that the resettlement was implemented according to the resettlement plan except for the compensation standards for land, crop, and structures. The compensation standards were based on Guangxi published standards after an extensive survey of the socioeconomic conditions in the project area. The employment of affected people, particularly the poor, during the construction of the expressway, the subsequent hiring of local people for toll operation and minor maintenance, training provided to enhance crop yield and alternative employment opportunities, and the conversion of wasteland to sugarcane land—all these have basically restored the income of the affected people, who have rebuilt better and more spacious houses and declared themselves satisfied with the compensation.

18. The successful implementation of the resettlement plan can be attributed to the early establishment of the county resettlement office, which paid special attention to the views of the affected people. Frequent consultations were held with the affected local governments, village collectives, and affected people before procedures for land acquisition and resettlement were formulated. An external monitor was appointed to provide feedback.

19. A more detailed resettlement plan with a breakdown of affected land, houses, and people in each village would have enabled more effective monitoring of the land acquisition and resettlement.

20. The participation of an ADB resettlement specialist in the review missions would have helped ensure proper monitoring and accurate reporting.

21. The resettlement plan should be updated whenever there is a change in project scope or alignment to reflect the impact of such changes and to facilitate monitoring.

SOCIOECONOMIC ASSESSMENT

1. A socioeconomic assessment was carried out in the project area with the assistance of the domestic consultant. The assessment was based on a sample survey of 100 households, interviews with local government officials, and an analysis of economic data from the statistical yearbook and publications made available to the mission.
2. The evaluation report on the socioeconomic development of the project area was composed of two parts: an evaluation of the state of development in Chongzuo City, where 90% of the expressway is located; an evaluation of the counties of Fusui, Ningming, and Pingxiang.

A. Part 1: Chongzuo City

3. Chongzuo City is the main administrative center of Jiangzhou District, Fusui County, Daxing County, Longzhou County, Ningming County, Tianden County, and Pingxiang Township, with a combined area of 17,351 square kilometers, 619,000 households, and a total population of 2.38 million people (52% male and 48% female), 1.95 million of whom are farmers.

Table A15.1: Socioeconomic Data for Chongzuo City, 2003–2007

Item	2003	2004	2005	2006	2007
GDP (CNY million)	10,648	12,555	15,113	19,403	22,996
Primary industry (CNY million)	4,071	4,834	4,911	6,645	7,468
Primary industry growth rate (%)	3.76	10.1	8.8	10.1	7.6
Secondary industry (CNY million)	2,548	3,108	3,661	6,658	7,846
Secondary industry growth rate (%)	15.1	18.6	29.5	28.0	23.0
Tertiary industry (CNY million)	4,030	4,613	4,175	6,100	7,682
Tertiary industry growth rate (%)	9.8	12.1	8.5	15.3	20.3
Per capita GDP (CNY)	4,687	5,488	6,566	8,366	10,737
Per capita income of rural residents (CNY)	1,950	2,122	2,300	2,700	3,010
Financial revenue (CNY million)	1,301	1,484	1,674	2,050	2,694
Industrial output (CNY million)	5,240	7,471	9,585	14,597	16,884
Social fixed-assets investment (CNY million)	3,249	4,073	5,260	7,110	11,520
Tourism					
Domestic tourists (number)	740,000	2,319,400	2,721,000	3,209,800	n/a
Foreign tourists (number)	39,500	67,000	93,000	117,000	n/a
Income from tourism (CNY million)	41.01	737.58	935.58	1,111.30	n/a
Primary school enrollment rate (%)	98.04	98.3	98.0	98.2	98.7
Farmer's expenditure (CNY per person)	1,704.9	1,711.6	1,913.0	2,364.0	2,644.0
Resident savings deposit balance in banks and financial institutions (CNY million)	6,429.7	7,400.6	8,498.2	9,640.0	10,898.4
No. of mobile phone users	101,364	413,586	555,742	579,000	n/a

GDP = gross domestic product, n/a = not available.

4. As seen from Table A15.1, gross domestic product (GDP) has increased since the opening of the expressway, with tertiary industry contributing 33.4% (an increase of 5.8%). Per capita GDP and rural income savings, industrial output, and financial revenue have all increased because of improved access to markets, new jobs, reduced costs of travel, and the expansion of border trade with Viet Nam and other ASEAN countries, coupled with increased income from tourism. Though rural incomes have improved since the completion of the Project, rural expenditures have also increased as a result of a higher domestic inflation rate and better standard of living. However, the Project has also had some negative impact, such as a reduction in the number of primary schools and rural clinics, as parents prefer to send their children to better schools and seek treatment in nearby cities now that they have better incomes and transportation is easier. Unemployment rate in the city was reduced to 3.5% in 2007. About 12% of the population (with females making up about a third of this number) ventured out to

Nanning City and coastal cities to seek employment, generating an annual income of about CNY879.7 million. Border trade has accelerated, from CNY2,763 million in 2003 to CNY 7,204.6 million in 2007. The number of poor has been reduced by 10,097 since the expressway opening.

B. Part II: Fusui County

5. Fusui County has a combined area of 2,836 square kilometers and a population of 4.27 million, of which 3.44 million are farmers. The county has eight townships, 13 districts, and 128 administrative villages. GDP has grown since the completion of the Project, with tertiary industry contributing about 26.6% of the growth. Per capita income, rural incomes, savings, industrial output, and government revenue have all improved. However rural expenditures have also gone up. Now all villages are accessible and public transport is available at 30-minute intervals. Every adult now has at least one bicycle and every household has one or two motorcycles. With convenient transportation and a good road network, many new industries have been set up in Fusui County particularly in sugar processing, Manila hemp, cement products, and mineral, chemical, and fruit processing. Unemployment rate has been reduced to 3.3% and the number of poor people has gone down, from 84,795 in 2005 to 73,335 in 2007.

Table A15.2: Socioeconomic Data for Fusui County, 2003–2007

Item (CNY million)	2003	2004	2005	2006	2007
GDP (CNY million)	2,182.9	2,955.0	3,578.5	4,863.9	5,391.3
GDP growth rate (%)	9.5	35.4	21.1	35.9	10.8
Primary industry (CNY million)	1,141.0	1,339.9	1,586.0	1,960.7	2,199.1
Primary industry growth rate (%)	16.1	17.4	18.4	23.6	12.2
Secondary industry (CNY million)	541.7	689.3	972.8	1,637.4	1,677.4
Secondary industry growth rate (%)	50.6	27.2	41.1	68.3	2.4
Tertiary industry (CNY million)	500.2	925.8	1,019.7	1,265.9	1,514.8
Tertiary industry growth rate (%)	(13.0)	85.1	10.1	24.1	19.7
Per capita GDP (CNY)	5,288.0	7,069.0	8,526.0	11,482.0	12,581.0
Per capital income of rural residents (CNY)	2,062.9	2,365.0	2,623.0	3,407.0	4,620.0
Financial revenue (CNY million)	274.9	303.5	337.0	462.8	644.4
Industrial output (CNY million)	1,317.5	1,659.6	2,205.0	3,545.0	3,865.0
Social fixed assets investment (CNY million)	740.3	1,092.3	1,362.5	1,685.0	1,906.0
Primary school enrollment rate (%)	95.8	96.3	99.0	99.5	n/a
Farmer's expenditures (CNY per person)	2,186.4	2,103.0	2,122.0	2,752.0	3,593.0
Resident savings deposit balance in banks and financial institutions (CNY million)	1,285.4	1,501.8	1,706.4	2,021.8	2,095.4
No. of mobile phone users	n/a	66,547	80,820	113,623	n/a

GDP = gross domestic product, n/a = not available.

C. Ningming County

6. Ningming County has a total area of 3,695 square kilometers and a population of 405,900, including 342,800 farmers. It has four townships and 11 districts and shares 212 km of border with Viet Nam. Its GDP increased from CNY1,922.2 million in 2005 to CNY3,080 million in 2007 (for an average annual GDP growth rate of 30.1%). Tertiary industry contributed 26.2% of GDP in 2007. Tertiary industry growth rate has accelerated with the completion of the Project. Per capita GDP, rural incomes, savings, industrial output, and revenue have all gone up. The expressway, coupled with the upgraded local roads, has stimulated the development of tourist sites, resulting in increasing income from tourism. Foreign tourist sites have also become more accessible, with the expressway connected to Highway No. 1 in Viet Nam. Cross-border trade has gone up as well, from CNY348 million in 2005 to CNY615.6 million in 2007. Many new industries, such as sugar refineries, furniture manufacturers, and agro industries have been set

up, creating new employment opportunities for local residents. Fixed-assets investment jumped from CNY719.8 million in 2005 to CNY1,130 million in 2007. With better access, 51,007 people from the county are currently working in Nanning City and in Guandong Province, earning an annual income of CNY276 million. Primary school enrollment is now 100%. However, the number of primary and secondary schools has decreased as more students opt to study in nearby townships with better school and health facilities.

7. The county has eight district bus stations, 22 passenger routes, and 197 buses, of which 118 serve 115 administrative villages with a daily frequency of 243 trips.

8. The Project provided employment to about 5,850 local residents, 35% of them women, during construction, generating an annual income of about CNY4.1 million. Since the opening of the expressway about 500 people from the county have been employed in the toll station and service areas. The number of poor people has been reduced, from 86,893 in 2005 to 81,803 in 2007.

Table A15.3: Socioeconomic Data for Ningming County, 2003–2007

Item (CNY million)	2003	2004	2005	2006	2007
GDP (CNY million)	1,354.1	1,572.2	1,922.2	2,546.8	3,080.0
Per capita GDP (CNY)	3,424.0	3,944.0	4,780.0	6,300.0	7,223.0
Primary industry (CNY million)	606.8	742.8	829.7	1,017.3	1,135.3
Primary industry growth rate (%)	8.8	22.4	11.7	22.6	11.6
Secondary industry (CNY million)	310.0	291.3	523.8	868.9	1,020.2
Secondary industry growth rate (%)	18.8	(6.0)	79.8	65.9	17.4
Tertiary industry (CNY million)	437.2	538.1	568.7	660.5	807.7
Tertiary industry growth rate (%)	(52.0)	23.1	5.7	16.2	22.3
Per capita income of rural residents (CNY)	1,874.2	2,015.0	2,159.0	2,655.0	3,006.0
Financial revenue (CNY million)	182.9	204.9	220.1	379.4	334.4
Industrial output (CNY million)	579.4	759.8	1,221.7	2,162.9	n/a
Social fixed assets investment (CNY million)	371.5	470.9	719.8	866.7	1,130.0
Tourism					
Domestic tourists (number)	50,000	62,000	80,000	90,000	n/a
Foreign tourists (number)	8,000	12,000	22,000	26,000	n/a
Income from tourism (CNY million)	10.6	13.2	18.4	28.8	n/a
Primary school enrollment rate (%)	98.9	98.9	100	100	100
Farmer's expenditures (CNY per person)	1,273.9	1,346.0	1,638.0	2,320.3	n/a
Resident savings deposit balance in banks and financial institutions (CNY million)	944.2	1,023.6	1,226.2	1,459.0	1,541.5
No. of mobile phone users	n/a	80,900	81,500	85,450	n/a

GDP = gross domestic product, n/a = not available.

D. Pingxiang County

9. Pingxiang County occupies an area of 650 square kilometers and has a population of 107,000, including 75,500 farmers. It has four townships and shares 97 km of border with Viet Nam, with which it has the most land ports. GDP increased from CNY1,134.5 million in 2005 to CNY1,888.1 million by 2007, or by about 33% yearly. Per capita GDP, rural revenues, industrial output, financial revenue, and savings have all increased since the completion of the Project. Fixed-assets investment and tourism have picked up with improvements in the road network. About 36 new agro-industry-based factories have been set up in the county to take advantage of cross-border trade with other Association of Southeast Asian Nations (ASEAN) countries and the improved road network. A Guangxi-ASEAN logistic center was established and opened in December 2006 to provide one-stop processing center for cross-border trade with Viet Nam and other ASEAN countries. The center processes an average of 400 cargo

trucks a day and about 5,000 tons of goods. Cross-border trade in 2007 amounted to CNY12.59 billion, an increase of 8.8% over the 2006 figure. The Youyiguan customs processed permits for about 96,700 land trips over to Viet Nam in 2007. Property in the county has gone up by over 60% since the opening of the expressway. Twenty eight out of 33 administrative villages are now connected with paved roads; bus frequency to Nanning is at 30-minute intervals with a better road network and cheaper transport fares.

10. An increasing number of people have sought employment in Guangdong Province. The number of persons working outside the project area has gone, up from 7,100 in 2005 to 8,300 in 2006. During the project implementation, about 5,850 people from the county, 35% of them females, were engaged for clearing, landscaping, and other miscellaneous work, generating a total income of about CNY98.3 million. In addition, about 28 female residents were engaged as toll operators and 470 other persons from the county were employed in the service areas. The number of poor people has been reduced, from 56,407 in 2005 to 54,612 in 2007.

Table A15.4: Socioeconomic Data for Pingxiang County, 2003–2007

Item (CNY million)	2003	2004	2005	2006	2007
GDP (CNY million)	616.0	954.3	1,134.5	1,386.2	1,888.1
Per capita GDP (CNY)	6,022.0	9,167.0	10,743.0	13,049.0	17,579.0
Primary industry (CNY million)	127.4	157.5	166.9	189.1	224.6
Primary industry growth rate (%)	33.7	23.6	6.0	13.3	18.8
Secondary industry (CNY million)	107.9	139.4	179.5	248.6	373.1
Secondary industry growth rate (%)	62.3	9.4	28.8	36.5	50.1
Tertiary industry (CNY million)	380.7	660.2	788.1	948.5	1,290.5
Tertiary industry growth rate (%)	(60.3)	73.4	19.4	20.4	13.6
Per capita income of rural residents (CNY)	1,873.0	1,994.0	2,134.0	2,493.6	3,118.0
Financial revenue (CNY million)	126.3	144.0	160.2	200.3	300.4
Industrial outputs (CNY million)	70.3	126.3	250.6	410.1	690.0
Social fixed assets investment (CNY million)	376.2	476.9	567.7	922.2	1773.0
Tourism					
Domestic tourists (number)	25,600	394,600	608,200	698,120	n/a
Foreign tourists (number)	37,000	48,400	66,800	78,680	n/a
Income from tourism (CNY million)	142.7	199.0	293.0	307.2	n/a
Primary school enrollment rate (%)	100.0	98.0	99.0	99.8	n/a
Farmer's expenditures (CNY per person)	1,292.6	1,317.0	1,312.0	1,447.3	1,758.0
Resident savings deposit balance in banks and financial institutions (CNY million)	997.3	1,072.6	1,226.6	1,356.2	1,516.5
No. of mobile phone users	n/a	34,000	70,516	73,130	n/a

GDP = gross domestic product, n/a = not available.

**Table A15.5: Sector Distribution before and after the Project
(2003–2006)**

Sector	Project Area				Guangxi			
	2003	2004	2005	2006	2003	2004	2005	2006
Primary (%)	40.7	39.3	38.1	34.2	23.8	24.4	22.4	21.4
Secondary (%)	24.1	24.4	27.7	33.7	36.9	38.8	37.1	38.9
Tertiary (%)	35.2	36.3	34.2	32.1	39.3	36.8	40.5	39.7

**Table A15.6: Per Capita Income Growth in the Project Area,
2003–2006**

County	Average Annual Gross Domestic Product Per Capita Income Growth (%)	Average Annual Net Farmers' Income Per Capita Growth (%)
Fusui	39.0	21.7
Chongzuo	26.2	14.5
Ningming	28.0	13.9
Longzhou	33.3	12.4
Pingxiang	38.9	11.1
Guangxi Provincial Average	24.1	10.8

**Table A15.7: Farmers' Income before and after the Project
(CNY)**

Year	County					Guangxi Average
	Fusui	Chongzuo	Ningming	Longzhou	Pingxiang	
2003	2,063	1,928	1,874	1,829	1,873	2,095
2006	3,407	2,767	2,655	2,511	2,494	2,771

**Table A15.8: Industrial Sector Output in Project Area before and after the Project
(CNY million)**

Sector	Fusui		Ningming		Chongzuo		Pingxiang	
	2003	2006	2003	2006	2003	2006	2003	2006
Primary	1.14	1.96	0.61	1.02	4.1	6.64	0.16	0.19
Secondary	0.54	1.64	0.29	0.87	2.5	6.66	0.10	0.25
Tertiary	0.50	1.27	0.47	0.66	3.83	6.10	0.56	0.95

**Table A15.9: Average Annual Sector Growth Rate in Project Area
Compared with Guangxi as a Whole, 2004–2006**

Sector	Project Area			Guangxi		
	2004	2005	2006	2004	2005	2006
Primary (%)	17.20	8.54	28.18	24.40	12.46	13.15
Secondary (%)	13.74	26.75	74.10	27.81	17.27	24.35
Tertiary (%)	15.98	5.38	33.84	13.54	35.40	16.03