

FINANCIAL ANALYSIS

A. Financial Sustainability of Yichang Municipality

1. Yichang municipality has experienced robust socioeconomic development with average gross domestic product (GDP) growth of 15.0% per annum between 2005 and 2011. Yichang municipal government's fiscal revenue has also increased rapidly, from CNY5,292 million in 2006 to CNY12,489 million in 2011—an average annual increase of 18.7%. The government's growth targets in its Twelfth Five-Year Plan, 2011–2015 are a 13.0% annual increase in GDP and a 15.0% annual increase in total fiscal revenue from 2011 to 2015.

2. The fiscal status and fund requirements were projected for the project implementation period, 2013–2017. The analysis results indicate that, during implementation, total project cost will account for 2.52% of total fiscal expenditure, 2.36% of local fiscal revenue, 1.92% of total disposable fiscal revenue, and 27.71% of fiscal expenditure on urban development. In general, the project-funding requirement, especially from Yichang municipal government, will be relatively small in relation to Yichang municipal government's total fiscal capacity. However, the project is expected to be one of the largest infrastructure investment projects in Yichang between 2013 and 2015. Table 1 presents an analysis of fund availability.

Table 1: Analysis of Fund Availability

Item	2013	2014	2015	2016	2017	2013–2017
Total fiscal expenditure (CNY million ^a)	14,139	15,553	17,108	18,819	20,701	86,320
Total local fiscal revenue (CNY million)	15,112	16,623	18,286	20,114	22,125	92,260
Total disposable fiscal revenue (CNY million)	18,561	20,417	22,458	24,704	27,174	113,314
Fiscal expenditure on urban development (CNY million)	1,287	1,416	1,558	1,713	1,885	7,860
Total Project Cost^b						
Total Government Funding for the Project (CNY million)						
% of total fiscal expenditure	1.9%	1.6%	1.3%	0.8%	0.2%	1.1%
% of total local fiscal revenue	1.8%	1.5%	1.3%	0.8%	0.2%	1.0%
% of total disposable fiscal revenue	1.5%	1.3%	1.0%	0.6%	0.2%	0.8%
% of fiscal expenditure on urban development	21.0%	18.1%	14.8%	8.8%	2.7%	12.2%

^a \$1 = CNY6.3.

^b Estimate as of December 2012.

Source: Asian Development Bank estimates.

B. Financial Management Arrangement and Assessment

3. For this loan, the borrower will be the Government of the People's Republic of China (PRC), and the final borrower will be the Yichang municipal government. The Asian Development Bank (ADB) loan will be lent to the Government of the PRC and relented by the Ministry of Finance, as the representative of the Government of the PRC, to the Hubei Provincial Financial Department, as the representative of the Hubei provincial government, which will onlend the funds to the Yichang Municipal Financial Bureau, as the representative of the municipal government—all on the same lending terms. The Yichang Municipal Financial Bureau will transfer both the ADB loan and government counterpart funds to the implementing agency, Yichang Urban Construction Investment and Development (YUCID). The municipal government will bear responsibility for repaying the loan, including principal and interest. Loan repayment to ADB will be done level-by-level in the opposite direction of the outgoing loan.

4. Financial management assessment under project preparatory technical assistance found that the implementing agency has adequate financial management capacity and expertise and has successfully implemented numerous large infrastructure projects in the past. However, it has never implemented an ADB-financed project. The implementing agency will (i) establish a special account for financially managing the project, (ii) designate staff to manage project funds, (iii) establish mechanisms to avoid or mitigate the risks associated with foreign exchange and the floating interest rate for the ADB loan, and (iv) assist the work of financial staff members with adequate equipment.

C. Financial Evaluation of the Bus Rapid Transit Component

5. The bus rapid transit (BRT) component will generate revenue from passengers and advertisers. The financial viability of the BRT component was evaluated using an estimated financial internal rate of return (FIRR) and comparing it with the weighted average cost of capital (WACC) of the project. To assess the financial sustainability and adequacy of the proposed tariff and revenues, the future financial performance of the proposed BRT component was analyzed.

6. **Project cost.** The project capital cost for the BRT component was estimated at CNY1,280.9 million¹ (\$203.3 million equivalent²). Construction of the BRT system is expected to begin in 2013, open for partial operations in 2014, and be completed by the end of 2015.

Table 2: Project Capital Cost of the Bus Rapid Transit Component
(CNY million)

Item	Amount	% of Total Cost
A. Base Cost^a		
1. Civil works	788.4	61.6
2. Goods and equipment	142.2	11.1
3. Land acquisition and resettlement	28.3	2.2
4. Design, project management, and supervision		
Design and project management	88.4	6.9
Consulting service for project supervision	14.2	1.1
Subtotal (A)	1,061.5	82.9
B. Contingencies		
1. Physical ^b	84.9	6.6
2. Price ^c	82.4	6.4
Subtotal (B)	167.3	13.1
C. Financing Charges During Implementation^d		
1. Interest during construction	50.6	4.0
2. Commitment charges	1.5	0.1
Subtotal (C)	52.1	4.1
Total Project Cost (A+B+C)	1,280.9	100.0

^a. In mid-2012 prices using an exchange rate of \$1 = CNY6.3. The cost includes taxes and duties.

^b. Physical contingencies are computed at 8% of the base cost.

^c. Price contingencies are computed by year and expenditure type based on cumulative domestic and foreign cost escalations.

^d. Includes interest charges during implementation and commitment charges. Interest on the Asian Development Bank (ADB) loan during implementation has been computed at the 5-year US dollar fixed swap rate plus a spread of 0.40%. Commitment charges for the ADB loan are computed at 0.15% on the projected undisbursed loan balance.

Source: Asian Development Bank estimates.

¹ Yichang BRT Preliminary Design, Final Report. 31 January 2013.

² Converted at \$1 = CNY6.3.

7. **Weighted average cost of capital.** The FIRR for the project is compared with the WACC for the project.³ For the BRT component, ADB financing would be CNY 896.6 million (70.0% of the total BRT capital cost), government financing would be CNY153.7 million equivalent (12.0% of the total BRT cost), and 18% of the cost will be financed by a local bank loan. The WACC for the BRT was computed at 2.58%. Table 3 details the WACC calculation.

Table 3: Weighted Average Cost of Capital for the Bus Rapid Transit Component
(CNY million)

Item	ADB Loan	Yichang Government	Local Bank	Total
Capital cost	896.6	153.7	230.6	1,280.9
Weighting	70.0%	12.0%	18.0%	100.0%
Nominal cost	4.0%	8.0%	8.0%	
Tax rate	25.0%	0.0%	25.0%	
Tax-adjusted nominal cost (A)	3.0%	8.0%	6.0%	
Inflation rate (B)	0.5%	3.9%	3.9%	
Real cost $[(1+A)/(1+B)-1]$	2.5%	3.9%	2.0%	
Minimum rate test	4.0%	4.0%	4.0%	
Weighted Component of WACC	1.7%	0.5%	0.4%	2.58%

ADB = Asian Development Bank, WACC = weighted average cost of capital.

Source: Asian Development Bank estimates.

8. **Bus rapid transit operation and maintenance costs.** The Yichang Municipal Bus Company provided the following information on its bus operating costs, which was applied to the proposed BRT service:

- (i) **Driver salary.** Two drivers (no conductor) per bus, CNY2,600 per driver per month plus 20% other benefits.
- (ii) **Vehicle insurance.** CNY14,000 per bus per year.
- (iii) **Bus operating cost.** About CNY200 per bus per year for vehicle tax and inspection fee, IC card and tickets producing.
- (iv) **Management expenses.** About CNY700 per bus per year for administration staff and office management.
- (v) **Station worker salary.** Six persons per station, CNY1,800 per month per person plus 20% other benefits. There are 38 stations.
- (vi) **Fuel.** Average 18 trips per BRT bus per day, 23.68 kilometers (km) per trip, fuel consumption of 45 liters per 100 km, and CNY7.37 per liter (mid-2012 price). It was considered that the BRT buses might use compressed natural gas, which would significantly reduce the fuel cost.
- (vii) It was assumed that there would be 150 buses for daily BRT operation.

9. According to the above assumptions and estimations, the total fixed operating cost for the BRT system was estimated at CNY13.5 million per year, and the variable operating cost was CNY39.1 million per year (mainly for fuel). Factoring in traffic growth and service improvements, it was assumed that the operating cost would increase by 5% per annum.

10. The maintenance costs of the BRT system were estimated for both routine and periodical maintenance:

- (i) The fixed vehicle maintenance cost is 4% of the bus purchasing price per year.
- (ii) The office maintenance cost is about CNY1.00 million per year.
- (iii) The station maintenance cost is about CNY1.00 million per year.

³ ADB. 2005. *Guidelines on the Financial Management and Analysis of Projects*. Manila.

- (iv) The variable cost is 1% of the bus purchasing price, mainly for replacing vehicle equipment and parts.
- (v) The periodic rehabilitation cost is based on an 8-year lifetime for vehicles and 20-year lifetime for civil works. The BRT buses would be replaced every 8 years, which was assumed to take place in 2022 and 2030. The current price for a domestic-made BRT bus (about CNY800,000) was applied.

11. According to the above assumptions and estimations, the annual total routine maintenance cost would be about CNY20.1 million. The total cost for the periodical replacement of buses would be about CNY120 million for 150 buses. Factoring in traffic growth and service improvements, it was assumed that routine maintenance costs would rise by 5% per annum.

12. **Bus rapid transit revenues.** The financial analysis assumes that the single ticket price for the BRT service matches the existing fare (CNY1.0 per passenger ride)—an exceedingly low fare designed to benefit the poor. This price level would be adjusted in future years. It was assumed that the base fare increases to CNY1.50 after 5 years, and to CNY2.0 after 10 years. Current pricing policies that charge students half-price and provide free rides to senior citizens are expected to continue.

13. Non-ticket revenue from advertising and bus leasing is expected to be about 5% of the ticket revenue. The central government provides a fuel subsidy to public transport businesses to compensate for the national fuel tax.⁴ The fuel subsidy amounts to about CNY40,000 per bus per year. In addition, the municipal government also provides fiscal subsidies to the Yichang Public Transport Company through its annual fiscal budget to compensate for discounted fares for students and senior citizens, plus subsidies for purchasing new public transport buses and for replacing public transport facilities.

14. For the BRT operation, the fuel subsidy is estimated to provide about CNY6.0 million per year in 2014–2015, CNY8.0 million in 2016–2020, and CNY10.0 million in 2021 and onward. The fiscal subsidy from the municipal government allocated to BRT operations is estimated to be about CNY15.0 million per year.⁵

15. **Financial evaluation.** The FIRR for the BRT component was calculated to be 4.2% before corporate income tax, and 2.7% after tax.⁶ As the FIRR after tax is higher than the WACC, the BRT component is financially viable.

16. Sensitivity testing revealed that the BRT component is sensitive to fare levels and passenger numbers. To account for this, the project includes periodic review and updating of bus fares along with capacity building support for BRT operation and management to ensure service quality.

⁴ Starting from 1 January 2009, the central government has been collecting a fuel tax, a portion of which is paid to public transport operators.

⁵ A discussion on the government fiscal subsidy to the BRT operation was carried out between the project preparatory technical assistance consultants and the municipal financial bureau.

⁶ The business tax for transport entities is 3.36% of sales, and the corporate income tax for all businesses is 25.00% of profit.

Table 4: Financial Evaluation of the Bus Rapid Transit Component
(CNY million)

Year	Cost Capital	Operation	Maintenance	Total	Revenue and Subsidy					Net Revenue	Business Tax	Cash Flow Before Tax	Corporate Income Tax	Cash Flow After Tax	NPV Without Tax	NPV Before Tax	NPV After Tax	
					Ticket	Others	Fuel Subsidy	Government Subsidy	Total									
2013	358.5			358.5						(359.3)			(358.5)	(350.6)	(350.6)	(350.6)		
2014	334.0	25.8	6.4	366.2	23.4	1.2	6.0	15.0	45.6	(322.5)	0.9		(321.5)	(306.7)	(307.5)	(307.5)		
2015	294.8	45.3	17.0	357.1	64.4	3.2	6.0	15.0	88.6	(269.7)	2.4		(270.9)	(251.2)	(253.4)	(253.4)		
2016	188.2	53.2	21.3	262.7	83.2	4.2	8.0	15.0	110.3	(151.1)	3.0		(155.4)	(139.4)	(142.2)	(142.2)		
2017	53.4	55.8	22.4	131.6	85.9	4.3	8.0	15.0	113.2	(15.8)	3.1		(21.5)	(16.5)	(19.3)	(19.3)		
2018		58.6	23.5	82.1	88.7	4.4	8.0	15.0	116.1	34.0	3.2		30.8	29.8	26.9	25.2		
2019		61.5	24.7	86.2	132.8	6.6	8.0	15.0	162.4	76.2	4.8		71.4	65.2	61.1	50.7		
2020		64.6	25.9	90.5	137.0	6.8	8.0	15.0	166.8	76.3	5.0		71.3	63.9	59.7	49.6		
2021		67.8	27.2	95.0	141.3	7.1	10.0	15.0	173.4	78.3	5.2		73.2	64.1	59.9	50.0		
2022	120.0	71.2	28.5	219.8	145.8	7.3	10.0	135.0	298.1	78.3	5.3		73.0	62.7	58.4	58.4		
2023		74.8	30.0	104.8	150.4	7.5	10.0	15.0	182.9	78.1	5.5		72.6	61.2	56.9	47.5		
2024		78.5	31.5	110.0	193.1	9.7	10.0	15.0	227.8	117.8	7.1		110.8	90.2	84.8	68.4		
2025		82.5	33.0	115.5	199.3	10.0	10.0	15.0	234.2	118.7	7.3		111.5	88.9	83.5	67.3		
2026		86.6	34.7	121.3	205.6	10.3	10.0	15.0	240.8	119.6	7.5		112.1	87.6	82.1	66.1		
2027		90.9	36.4	127.3	212.1	10.6	10.0	15.0	247.7	120.3	7.7		112.6	86.2	80.6	65.0		
2028		95.5	38.3	133.7	218.8	10.9	10.0	15.0	254.7	121.0	8.0		113.0	84.8	79.2	63.8		
2029		100.2	40.2	140.4	225.7	11.3	10.0	15.0	262.0	121.6	8.2		113.4	83.3	77.7	62.5		
2030	120.0	105.2	42.2	267.4	232.9	11.6	10.0	135.0	389.5	122.1	8.5		113.6	81.8	76.1	76.1		
2031		110.5	44.3	154.8	240.2	12.0	10.0	15.0	277.2	122.5	8.8		113.7	80.2	74.5	60.0		
2032		116.0	46.5	162.5	247.8	12.4	10.0	15.0	285.2	122.7	9.0		113.7	78.6	72.8	58.6		
2033	(440.6)	121.8	48.8	(270.0)	255.7	12.8	10.0	15.0	293.5	563.5	9.3		554.1	347.2	264.3	264.3		
					FIRR @WACC(2.35%)		(without tax)		4.8%		(before tax)		4.2%		(after tax)		2.7%	
					FNPV @WACC(2.35%)				396.9				308.1				60.4	

() = negative, FIRR = financial internal rate of return, NPV = net present value, WACC = weighted average cost of capital.