



## 1. Project Data

<b>Project ID</b> P117656	<b>Project Name</b> CN-Kunming Urban Rail	
<b>Country</b> China	<b>Practice Area(Lead)</b> Transport	
<b>L/C/TF Number(s)</b> IBRD-80370	<b>Closing Date (Original)</b> 30-Nov-2016	<b>Total Project Cost (USD)</b> 276,926,592.19
<b>Bank Approval Date</b> 10-May-2011	<b>Closing Date (Actual)</b> 30-Jun-2018	
	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	300,000,000.00	0.00
Revised Commitment	276,926,592.19	0.00
Actual	276,926,592.19	0.00

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## 2. Project Objectives and Components

### a. Objectives

The project development objective (PDO) stated in the loan agreement dated July 28, 2011 (Page 5) was "to support compact, transit-oriented urban development by providing high quality, integrated public transport on the East-West Line 3 corridor." This was identical to the wording in the project Appraisal Document (PAD - Page 5).

The PDO itself was not changed, but the associated outcome indicators were revised in a restructuring approved on November 23, 2015. A split rating for the assessment of the PDO is not deemed necessary as



the outcome indicators were refined to more accurately measure the project achievements; and those that were dropped were not measurable or poorly defined. In the case of the revised outcome targets, a split rating will not affect the ratings as these were revised when the share of the IBRD funds disbursed was 30 percent.

Abbreviated indicators and amendments: (see section 9 for full details).

1. Peak period travel from Shi Zui station site to Xiaoximen along Line 3 was re-defined as peak period travel time between origin and destination pairs along Line 3 (with the same target).
2. Peak period travel time from East Long-distance bus terminal to NanPin Walking Street along Line 3 was re-defined as peak period travel time between origin and destination pairs along Line 3 (with the same target).
3. Average daily weekday ridership on Line 3 after 1 year of operation was revised to after 6 months of operation.

The following four outcome targets were dropped:

4. Percentage of public transport riders who have access to a private car for their commute.
5. Successful multi-modal integration with buses and cycles.
6. Percentage of total new development that occurs along the railway line.
7. Working ratio of the Kunming Rail Transit Company (KRTC), Line 3.

New outcome indicators were:

8. User satisfaction.
9. On-time performance, and
10. Floor Area Ratio (FAR) along Line 3 relative to district FAR in terms of new development.

**b. Were the project objectives/key associated outcome targets revised during implementation?**

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**

Yes

**Date of Board Approval**

23-Nov-2015

**c. Will a split evaluation be undertaken?**

No

**d. Components**



The project had three components linked to the PDO and key indicators (costs are given for IBRD only):

- *Component 1: Civil Works* (appraisal estimate: US\$ 209.4 million, actual at closing US\$ 279.2 million): Carrying out a program of civil works for selected stations, including, *inter alia*, bus interchanges and bicycle parking facilities, where appropriate, and associated facilities such as depots and track; equipment installation; and other related installations at selected stations.
- *Component 2: Equipment* (appraisal estimate \$86.9 million, actual at closing US\$ 18.6 million): Provision of various equipment such as power supply; escalators; fare collection and communication systems; as well as technical equipment at depots and other related facilities.
- *Component 3: Technical Assistance and Capacity Building* (appraisal estimate US\$ 3.0 million, actual at closing US\$ 2.0 million ): Provision of: (i) studies to support bus-rail integration and the future development and construction of the public transport system; and (ii) support for project management capacity building and for operations management.

#### **e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

*Project Cost:* The original total project cost was US\$ 1,711,600,000, but delays before construction could commence led to increases in costs. The final total project cost was US\$ 1,842,400,000 of which US\$ 1,803,926,592 (97.9 per cent) was disbursed.

*Financing:* US\$ 300,000,000 (16.28 per cent) through an IBRD loan. Some 92.3 per cent of the IBRD loan was disbursed (US\$ 276,926,592). The balance was funded by the Borrower.

*Borrower:* US\$ 1,411,600,000 revised at restructuring to US\$ 1,542,400,000 of which US\$ 1,527,000,000 (99.0 per cent) was disbursed.

*Dates:* The original completion date of November 30, 2016 was extended by 19 months to June 30, 2018. This was primarily due to delays in the start date due to traffic management concerns and the need to adjust the urban rail construction schedule, but also because it took longer than expected to resolve the resettlement compensation claims.

*Restructuring:* The results framework was extensively revised at restructuring and some targets for passenger volumes revised downwards slightly based on actual experience from the previous two metro lines that had already been opened.

### **3. Relevance of Objectives**



## Rationale

Increasing urbanization caused the Government of China to look for solutions to lower the levels of traffic congestion, air pollution and greenhouse gas emissions. Other goals were to achieve fewer traffic-related accident fatalities, improve mobility and accessibility (especially for low income populations), and accommodate non-motorized transport needs. This culminated in a State Council Directive to give priority to public transport, a "People First" initiative, and support for the "development of low-carbon compact cities." Urban rail transport was given priority in the development planning of first to third tier cities in China's 12th Five year Plan and Kunming was chosen for a pilot urban rail project. The Kunming Urban Rail Project was the first metro project considered for financial support by the World Bank in China. Selection was influenced by previous sustained support by the Kunming authorities for public transport and the city's location in one of the poorest western provinces of China. The value the Bank added was to provide strong technical support and knowledge of good international practice to enhance urban planning as well as bus, rail and cycling modal integration.

The project was in line with the 2006-10 and 2013-16 Country Partnership Strategies supporting Chinese policies to balance urbanization, reduce poverty, inequality and social exclusion, and support the financing of sustainable and efficient economic growth. The project was also consistent with the goals of the Bank's transport strategy focused on safe, clean and affordable transport services. It continues to be relevant to China's current 13th Five Year Plan (2016-20), which calls for more coordination in development planning, especially in respect of green development, coupled with an acceleration in the development of mass transit in line with Chinese National Plan on New Urbanization (2014-2020). In addition the project was consistent with all aspects of the Sustainable Mobility for all (Sum4All) initiative, a new global partnership in support of sustainable development in the transport sector.

Promoting compact city growth entailed increasing population density around stations, and improving land use between residential and commercial needs to reduce travel distances and thus greener growth solutions. At the local level, the PDO supported Kunming's development priorities as detailed in the city's master plan. These priorities encompassed the curtailment of urban sprawl, the construction of a high quality public transport network, with urban rail as its backbone, and the establishment of an integrated system to achieve seamless transfer between modes.

## Rating

High

## 4. Achievement of Objectives (Efficacy)

### Objective 1 Objective



To provide a high quality rail line along the East-West Line 3 corridor.

### **Rationale**

The Theory of Change predicated that the civil works and associated equipment would reduce travel time, increase public transport ridership, and through high quality features and on-time performance result in user satisfaction.

### *Outputs:*

- The project as completed comprised 17 stations and 19.20 km of track work. Seventeen stations were included as planned in the PAD. A saving in track length of 0.34 km was achieved as a result of alignment optimizations in design. The target was met.
- The completed project also included provision of a power supply system, safety systems, a passenger information system, and a fare collection system.

### *Outcomes:*

- *Average daily ridership after six months of operation.* The target was originally 200,000 riders, revised downwards in the restructuring to 150,000. Actual ridership achieved was 153,800 at project closure, slightly exceeding the revised target. The revised target was based on actual experience on the two earlier metro lines completed. At appraisal this information was not available.
- *On-time performance.* The target was 98 percent and the actual performance at project closure was 99 percent exceeding the target.
- *Peak period travel time (Shi Zui station to Xiaoximen)* was reduced from 43 minutes to 14 minutes against a target of 22.5 minutes, (150 percent achieved).
- *Peak period travel time (East long distance bus terminal to NanPin walking street)* reduced from 38 minutes to 15 minutes against a target of 17.5 minutes, (122 percent achieved).
- *User satisfaction with service* at project closure was 91.2 percent against a target of 80 per cent (114 percent achieved). There has been a high level of service quality conforming with international standards. The stations are air conditioned and there is universal access for the disabled and elderly.

**Rating**  
High

## **Objective 2**



### **Objective**

To integrate public transport along the East-West Line 3 corridor.

### **Rationale**

The Theory of Change was that the bus and rail schedules and fare collection systems would be integrated to achieve efficient mobility and better user satisfaction.

### **Outputs:**

- *Number of stations built with bus/bicycle facilities within 50m of an exit.* Thirteen of the 17 were completed by project closure (76 percent).
- *Shared fare card integrating bus and rail.* This system was in operation at completion as per target.

### **Outcomes:**

- *Bus routes restructured to support integrated public transport as per the results of the route restructuring report.* Partly achieved. Three measurements were used to assess the degree of integration: completion of physical interchange facilities, introduction of integrated fare payment and restructuring of bus routes. An integrated fare payment system was in place but four of the 17 interchange works were delayed due to lower than expected passenger demand. In these four instances road construction including sidewalks were not completed at closure. The implementation of the route restructuring is gradual and ongoing but not yet complete. However, a working mechanism between the authorities is now in place replacing the previous ad hoc integration process. Some overlapping of routes has been eliminated and 12 new feeder routes have been introduced. The ICR (page 18) indicated that it may take up to three years before all the feeder routes were operating, which had the effect of reducing the revised EIRR by 0.2 percentage points. Nevertheless, overall, substantial progress has been made.

### **Rating**

Substantial

### **Objective 3**

#### **Objective**

To support compact and transit-oriented urban development along the East-West Line 3 corridor.

#### **Rationale**



The Theory of Change indicates that the investments in urban rail in the longer term will lead to a more compact and transit-orientated urban development along the Line 3 corridor.

*Outputs:*

- A study on achieving bus-rail integration was completed.
- A study on future development and construction of the public transport system was completed.
- Capacity building activities were rendered related to project management and operations management.

*Outcomes:*

*Transit orientated development (TOD)* is now supported not just by the KRTC but also by the Municipal Construction Bureau and the Development and Reform Commission. However, due to unfavorable real estate market conditions, such development has been concentrated on the middle section of Line 3 where significant re-development has taken place around the stations including pedestrianized shopping streets, high rise commercial complexes and dense residential areas. There was no indicator to measure this process, which is a long-term trend affected by many factors. The ICR says (Page 17) that the original economic evaluation was based on the understanding that there would be significant commercial development at downtown stations as well as at the eastern end of the line. However, the worsening economic conditions have discouraged the eastern end developments and some station and depot developments have been canceled or postponed.

*The target for the floor area ratio along Line 3 (relative to that in the broader district) was to be greater than one.* This was a proxy for compact development and by the end of the project was found to be 1.6 times higher indicating that the city was encouraging more higher density developments.

**Rating**  
Modest

## Rationale

Although a market downturn resulted in less transit-orientated development than expected, such development did take place in the central district. The movement towards compact development has been commenced but will take several years to come to fruition. A high quality rail line has been established and progress made towards bus-rail integration. Ridership was lower than foreseen at appraisal but based on inadequate information. A split analysis of this factor would not have altered the outcome.



## Overall Efficacy Rating

Substantial

### 5. Efficiency

The ex post economic analysis at closure had an economic internal rate of return (EIRR) of 7.9 per cent over the 30 year evaluation period of the project, whereas the PAD estimated it at 8.0 per cent, which met the threshold required by the Government of China (PAD page 67). Annex 4 of the ICR gives a detailed and thorough analysis of factors which changed during the interim. These included higher construction costs, the delayed opening date, an increase in the metro fares, the lack of commercial development at the eastern stations, and the incomplete restructuring of the bus routes to act as feeders to the metro. It also points out that the original population predictions were based on data from an unknown source, whereas at the time of the ICR newer and better data were available. Although the EIRR appears at first sight as marginal, the latest thinking on urban metro planning (see World Bank Urban Rail Development Handbook, 2018) suggests that complex metro projects can be supported with much lower EIRRs nowadays because many other factors are now taken into account including poverty reduction and access to jobs; land values; reducing the intensity of energy consumption so as to reduce the impacts of climate change; and improvements in economic growth due to a concentration of economic activity and the facilitation of business connections. At appraisal techniques to measure these factors had not been developed.

Regarding administrative and operational issues, the project was delayed by 19 months. This was partly due to expected negative traffic impacts from the construction of three new metro lines simultaneously, which led to a decision by the Kunming authorities to delay the commencement of Line 3 construction. This delay reduced the EIRR on Line 3 by 0.2 percentage points. In addition, the relocation of households also contributed to the delay by impacting the procurement schedule. However, two new technical assistance proposals were agreed to be included in the Bank project to strengthen the project's efficiency. The first was to optimize materials management in order to improve cost efficiency and the quality of system construction and maintenance. The second was to improve the passenger survey methods used.

## Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	8.00	99.00 <input type="checkbox"/> Not Applicable



ICR Estimate	✓	7.90	99.00 <input type="checkbox"/> Not Applicable
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\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The relevance of the objectives was high, while the overall efficacy of the three objectives was substantial. Efficiency was also substantial when measured against comparable results in the urban rail sector. The outcome overall is rated satisfactory.

### a. Outcome Rating

Satisfactory

## 7. Risk to Development Outcome

There were three risk areas - the adequacy of sufficient funds for operations and maintenance activities, the sustainability of multi-modal integration, and the sustainability and expansion of compact and transit-oriented development:

*Funds for operations and maintenance (O&M) activities:* Although the overall performance of Line 3 met expectations, the ridership at some stations has yet to reach the initial target, and real estate development is modest in these areas, which means that the expected inflow of funds from such activities by KRTC has not yet fully materialized. The Municipal Corporation and KRTC need to ensure adequate funding for the O&M activities of Line 3, recognizing that maintenance costs are relatively low in the first two years of operation but start to rise in later years. At the same time, ridership will begin to increase and the inflow of funds from the real estate activities of KRTC is expected to materialize over time, thus eliminating the need for special additional funding.

*Sustainability of multi-modal integration:* This will depend on coordination between the urban rail company, the bus company, and the Transport Bureau at the municipal level. At present, according to the ICR (Page 27), the metro company does not report directly to the Transport Bureau, while the bus company does, which makes coordination difficult. The national government has been promoting a single authority for overall planning and design to facilitate the linkages between all transportation modes, which the Bank supports. However, such a major institutional change will take time to become a reality.

*Sustainability and expansion of compact and transit-oriented development:* To mitigate this risk, the Kunming municipality has drawn up a master plan that promotes high density, and compact land use development. It



has already taken actions to curtail unchecked development in Kunming and to enhance the efficacy of land use. Meanwhile, the Kunming Land Bureau is evaluating the impact of regulations on land value capture including the commercial use of land around stations, in order to increase the revenues from land use, and is exploring options to sustain compact growth and Transit Oriented Development. In this regard, the Bank is implementing a China Sustainable Cities Integrated Approach Pilot Project with central government to review national laws and regulations on urban planning and land administration.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

This was the first metro project that the Bank had supported in China. The project design benefitted from the Bank's technical advice including the development of innovative tools and methodologies to forecast *inter alia* urban rail demand. By introducing concepts such as transport oriented demand and transport integration, the team engaged with the government at central, provincial and city levels to discuss the core policy and institutional issues that had to be resolved to achieve sustainable urban mobility. The introduction of international good practices, benchmarks and tools introduced by the team were the main reason for the Bank's involvement and provided opportunities for the client to strengthen the management of urban rail investments and improve the quality of service. According to the ICR (Page 25), "there was sufficient citizen engagement and consultation with key stakeholders during project preparation, and most risks and barriers to transit-oriented spatial growth and to the development of an effective multi-modal public transport system were identified." While IEG concurs with this, it is clear that the project results framework was not given adequate attention since it was almost entirely revised during implementation. The fact that three metro line projects were to be disrupting traffic simultaneously was also not identified as an issue during preparation.

#### Quality-at-Entry Rating

Moderately Satisfactory

### b. Quality of supervision

The Bank fielded a team that was technically strong and enhanced supervision by basing a co-task team leader in China. Mission findings were expressed in Aide Memoires and expedited in timely follow up actions. The team updated and substantially improved the results framework in the 2015 restructuring. It also engaged planning experts to train and arrange study tours for the improvement of Kunming's urban planning capabilities. The Bank organized in-depth discussions with experienced rail transit experts in China and Singapore on the technical aspects of Line 3.

At the Mid-term review in October 2014 the Bank team indicated that the Borrower was falling short in its agreed legal covenants to report on environmental, social and resettlement progress and thereafter there



was an improvement in reporting after the Environmental Management Plan monitoring was assigned to the Quality and Safety Department of the construction management company of KRTC.

The Bank team's supervision activities added value by providing support on engineering designs, procurement, environmental and social safeguards and financial management. The assessment of social safeguard risks, however, was overoptimistic, considering that the project was substantially delayed by resettlement activities, even though it was well known world-wide to be a factor for delay during the early stages of metro project implementation. Nevertheless, the technical advisory support provided by the Bank was practical and well appreciated by the client according to the Borrower's report. The Bank also hired highly specialized international consultants to review designs, technical specifications, bills of quantities and variations for works, equipment supply and installation as well as goods contracts. The Bank's technical support not only benefited this project, but also other KRTC projects. For example, KRTC initiated more citizen engagement by broadly involving the communities around new routes prior to the construction of metro Lines 5 and Line 6. The experience, knowledge and capacity acquired from managing the procurement of this project also helped KRTC to prepare and manage projects financed by other international financial institutions. In addition, some 220 persons completed technical training at Southwest Jiaotong University and between 400-500 persons received operational management training in KRTC.

### **Quality of Supervision Rating**

Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The project results framework could have been much better designed and was almost entirely revised at restructuring. Originally, there were seven PDO indicators but at restructuring four had to be dropped and three new ones added. Baselines were established and the KRTC was given the responsibility for implementing the framework. Although lessons were drawn from previous regional and global experience, insufficient attention was given to the results framework. Measuring project support for compact and transit-oriented development was erroneously based on urban planning regulations and market outcomes that were beyond the control of either the railway company or the Transport Bureau.

### **b. M&E Implementation**



The results framework was almost completely redesigned. The indicator that measured “the percentage of public transport riders that have access to a private car for their commute”, was dropped because the project had no means of establishing whether passengers owned or had access to a private car. It was replaced by user satisfaction (based on project funded surveys conducted by an independent party). Indicators to measure travel time between two pairs of locations (Shi Zui station site to Xiaoximen and East Long-Distance Bus Terminal to NanPin Walking Street) were revised at restructuring. The new baseline and new target only incorporated travel time instead of a division between waiting time, travel time and transit time. They were also adjusted to meet the new implementation schedule following delayed start-up. The Indicator that measured the “Average Daily Weekday Ridership on Line 3 after one year of operation” was revised as monitoring a full year of operations was not considered necessary to assess the quality of operations; as a result, the measurement period was reduced to six months, and the target ridership was identified as optimistic and adjusted downwards from 200,000 to 150,000, based on the observed demand for Line 1 (which opened in 2015).

The indicator to measure the “percentage of total new development that occurs along rail lines”, was considered to be beyond the control of the implementing agency and dropped. Most real estate development induced by Line 3 had already occurred prior to the commencement of construction and given that the baseline was determined in 2008, initial targets were achieved even prior to commencement of operations. Consequently, this indicator was replaced by an indicator to measure the “floor-area-ratio (FAR) along Line 3 relative to district FAR in terms of new development”, as changes in FAR more accurately reflected the concept of compact development. While this indicator reflected compact development, changes in FAR along the Line they were not fully attributable to the project and therefore could only partially measure progress in this regard. An indicator to measure the “Working Ratio of the Kunming Rail Transit Company Line 3” was not considered realistic and dropped. According to the ICR (Page 9) only two metro systems worldwide had ever achieved the original working ratio (operating costs over revenue) target of less than 1. An indicator to measure on-time performance was added to assess the quality of the system. Two intermediate output indicators were deleted, two remained similar, and three were added. All these changes in the view of IEG improved the results framework considerably but further indicators to measure accessibility improvements could have been introduced. KRTC carried out data collection regularly and diligently.

### **c. M&E Utilization**

The M&E information was said to have been used to monitor the progress of project implementation and the achievement of the PDO but since 30 per cent of the project loan had been disbursed by the time the new framework was approved, some of the monitoring would have been retrospective. The user satisfaction survey results were also used for improving the level of service on Line 3. However, the lack of an indicator to measure support to integration made it difficult to track progress on this aspect and according to the ICR (Page 23) affected the dialogue with Kunming on the need to speed up integration between Line 3 and the bus systems.



## M&E Quality Rating

Modest

## 10. Other Issues

### a. Safeguards

The project was classified as Category A because of the scale of the civil works and the potential significant environmental and social effects of building a metro line. Three safeguards were triggered, namely, environmental assessment (OP/BP 4.01), physical and cultural resources (OP/BP 4.11), and involuntary resettlement (OP/BP 4.12).

The EMP (Environment Management Plan) requirements were included in the bidding documents and had been successfully carried out by the time of the ICR mission and this was formally noted in the ICR (Page 24). The ICR confirmed that appropriate traffic management had been conducted at project sites, while safety and dust control measures had also been carried out. Noise control was achieved through disallowing nighttime construction. During the operational phase Bank supervision missions confirmed that vibration impacts and wastewater discharge were in compliance with applicable standards.

Regarding physical and cultural resources, a cultural relics survey along the rail line identified eight buildings that were classified as protected buildings above the tunnel alignment. Chance find procedures were included in the EMP but no relics were found. The "shield" method was used for tunneling since it reduced vibration effects, and land subsidence monitoring was introduced where necessary.

A Resettlement Action Plan was prepared and publicly disclosed. Some 837 residential households and 108 enterprises were found to be affected by the project, even though design consultants had optimized designs to minimize the number of demolitions. Because some technical features of the project needed to be changed and because of protracted negotiations with project affected persons, resettlement took 28 months longer than had been anticipated, concluding in April, 2018. By the end of the project all affected households had moved into new replacement buildings and resettlement compensation had been paid in full.

### b. Fiduciary Compliance

Prior to appraisal, the project's financial management system was assessed as able to meet the minimum Bank financial management requirements, as stipulated in OP/BP 10.02, and financial management risk was rated as "Low." Throughout implementation, the project maintained appropriate financial management arrangements. The interim financial reports were submitted on time, and annual financial reports were audited and



“unqualified”. There were some minor delays in reviewing and processing the physical progress certificate and interim payment requests but overall, the financial management performance of the project was satisfactory.

Procurement was carried out in accordance with Bank procurement policies, procedures and requirements. Eight large supply and installation contracts for equipment to be procured under International Competitive Bidding (ICB) in the original procurement plan. During project implementation these contracts were changed from the goods category to the works category in consultation with the Bank and the procurement method was changed from ICB to National Competitive Bidding based on the procurement threshold for the works category. These actions ensured that the equipment were to be procured, delivered and installed in a timely manner to match the overall project implementation schedule. Contract implementation was delayed, however, due to the resettlement issues mentioned above.

**c. Unintended impacts (Positive or Negative)**

None identified.

**d. Other**

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**11. Ratings**

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Satisfactory	Satisfactory	---
Bank Performance	Satisfactory	Moderately Satisfactory	The fact that three metro line projects were to be disrupting traffic simultaneously was not identified during preparation leading to delays. The results framework at entry was inadequate, and although it was revised during the restructuring, the overall Bank performance is MS following the current guidelines.
Quality of M&E	Modest	Modest	---
Quality of ICR		Substantial	---

**12. Lessons**



**For the optimization of urban metro routes a geological survey may be necessary.** Major resettlements contributed to the delay in the construction of Line 3. An important lesson learned was that detailed geological investigations utilizing modern technologies should be carried out to select the best route and location of stations to minimize the dismantling of existing structures and relocation of households. Urban rail projects invariably require land acquisition - even when tunneling works are carried out underground - for the construction of stations, ventilation shafts, and other surface facilities, risks related to resettlement must be thoroughly assessed during project preparation and during the early stages of implementation.

**In the case of Kunming and perhaps for other larger cities in China, it is necessary to establish a municipal agency to oversee all modes of transport and to ensure multimodal integration.** The weak coordination between the company and the municipality limited multimodal integration under this project. Establishing an apex coordinating body and empowering the implementing agency to do so, or establishing a separate counterpart agency during project preparation, would have facilitated transport integration under the project.

**World Bank's value added initiatives to urban transport in China through transport-oriented design (TOD) and integration need to be further pursued.** At the time of project appraisal, the Bank was engaged in a valuable dialogue with the Government and the second to third tier cities on the need to focus on multi-modal integration to facilitate transit and support the development of compact city growth. China was setting a good example in cross learning from project to project in similar cities, through a good mix of programmatic approach and decentralization of implementation responsibilities. Going forward, projects in China should address institutional challenges identified in this project that prevented the full benefits of TOD and Integration from materializing.

**Appropriate PDO indicators are needed to capture the progress of multi-modal integration, as well as compact and Transit Oriented Development.** Since the appraisal of this project, the Bank has provided improved guidance to staff in defining PDO indicators and these are now reflected in the Bank's ICR Guidelines. Further guidance is that the delivery of the PDO's outcome should fall under the responsibility of the implementing agency. More recently, accessibility indicators have been used in urban projects to quantify increased access to job opportunities. There are also additional economic effects that could also be considered to design a project for more equitable mobility. Poor people might benefit relatively more from better public transport options, since they are more likely to be located further away from the city center. A recent study has helped to quantify the differential impacts in terms of access to economic opportunities of transport projects. Such impacts have been shown to be directly correlated with changes in density, rents, economic activities and welfare in cities. The promotion of compact city development could help to mitigate the relocation effects that tend to affect the poorest people. Similar analyses can be used to quantify welfare increases from a good feeder system, different subsidy/pricing offers across modes, and for coordinating the construction of urban rail with land value capture opportunities.

### 13. Assessment Recommended?



Yes

Please explain

Because many of the benefits of this project depend on developments in land use in the future, it would be good to re-visit this project and other similar projects currently in implementation after a few years have elapsed to see whether the reported expectations will be realized. This will help to fine-tune policy recommendations and design of future indicators.

#### **14. Comments on Quality of ICR**

Overall, the quality of the ICR was substantial. The document was well written supported by sound evidence and illustrated with useful photographs showing some of the facilities provided. The ICR was relatively candid about aspects of the project that were less successful but there was a little internal consistency concerning the rating for quality at entry, given that the results framework was totally inadequate and had to be almost completely re-worked. The lessons were valuable since this was a pioneering urban rail project for the Bank in China.

##### **a. Quality of ICR Rating** Substantial