1. Project Data

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>P128919</td>
<td>Zhengzhou Urban Rail Project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Practice Area(Lead)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Transport</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L/C/TF Number(s)</th>
<th>Closing Date (Original)</th>
<th>Total Project Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBRD-84570</td>
<td>30-Jun-2021</td>
<td>250,000,000.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bank Approval Date</th>
<th>Closing Date (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-Dec-2014</td>
<td>30-Jun-2021</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IBRD/IDA (USD)</th>
<th>Grants (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Commitment</td>
<td>250,000,000.00</td>
</tr>
<tr>
<td>Revised Commitment</td>
<td>250,000,000.00</td>
</tr>
<tr>
<td>Actual</td>
<td>250,000,000.00</td>
</tr>
</tbody>
</table>

Prepared by
Ranga Rajan
Krishnamani

Reviewed by
Peter Nigel Freeman

ICR Review Coordinator
Victoria Alexeeva

Group
IEGSD (Unit 4)

2. Project Objectives and Components

a. Objectives
The project development objective (PDO) as stated in the Loan Agreement dated February 13, 2015 (Schedule 1, page 6) and in the Project Appraisal Document (PAD, page 4):

"To improve urban mobility for the population of Zhengzhou along the catchment area of Line 3 from Xin Liu Lu Station to Hang Hai Dong Lu Station."
b. Were the project objectives/key associated outcome targets revised during implementation?
No

c. Will a split evaluation be undertaken?
No

d. Components
There were four components (PAD, pages 5 - 6).

1. Construction of Line 3. The estimated cost at appraisal was US$1,355.8 million. The actual cost was US$1,205.9 million. This component financed construction of stations, tunnels, depot, a parking yard and operational buildings for Line 3 urban rail.

2. Equipment for Line 3. The estimated cost at appraisal was US$796.0 million. The actual cost was US$719.2 million. This component financed the equipment for Line 3, including rolling stock, systems for power supply, control, communication, signaling, monitoring, fare collection, safety and security, ventilation and air conditioning, water supply, sewerage and fire protection, and station auxiliary equipment.

3. Design, construction management and technical assistance (TA). The estimated cost at appraisal was US$201.8 million. The actual cost was US$101.7 million. This component financed technical advisory services for: (i) design, construction and quality assurance; (ii) TA and capacity building of the Zhengzhou Municipality (hereafter referred to as ZM) and the Urban Rail Company (hereafter referred to as URC).

4. Safeguards and other construction costs. The estimated cost at appraisal was US$201.8 million. The actual cost was US$515.5 million. This component financed costs relating to land acquisition and resettlement, construction site preparation, and other project costs.

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

Project cost. The estimated cost at appraisal (including contingencies) was US$3,089.4 million. The actual cost was US$2,825.6 million.

Project financing. The project was financed by an IBRD credit of US$250.0 million. This amount was fully disbursed.

Borrower contribution. The borrower contribution was estimated at US$2,839.4 million at appraisal. Their actual contribution was US$2,575.6 million.

Dates. The project approved on December 23, 2014, became effective on May 21, 2015, and closed as scheduled on June 30, 2021.

Changes. There were no changes during implementation.
3. Relevance of Objectives

Rationale

**Country context.** Rising incomes and urbanization over three decades led to rapid motorization, with a 25% growth in private cars and a steady decline in biking and walking trips in the years before appraisal in China. This shift in travel patterns resulted in traffic congestion, air pollution, fossil fuel consumption and greenhouse gas emissions at the national level. Zhengzhou - the capital city of Henan Province - with a population of 5.17 million, has a urbanization ratio of 67%. Traffic surveys showed that while the share of private car trips in Zhengzhou increased from 3.7% in 2007 to 7.5% in 2010, public transport accounted for only 13.6% in Zhengzhou (much lower than in similar-sized cities with comparable Gross Domestic Product (GDP) in China (24.5% in Changsha and 23.4% in Wuhan). Major corridors in Zhengzhou downtown area experienced severe traffic congestion during peak hours. An integrated urban rail transport system (with integration of rail with Bus Rapid Transits (BRTs), buses, and other non-motorized transport modes), was therefore required for meeting the anticipated needs of urban development in Zhengzhou.

**Government strategy.** China's State Council before appraisal adopted public transport as a national policy priority. For larger cities, this entailed developing a mass transit system and public transport investments, particularly in urban rail. China's 12th Five-year plan for 2011-2015 highlighted the need for promoting green and inclusive development. China's 13th Five-year plan (2015-2020) identified low-carbon transport as a national priority. The PDO was relevant to the government's pledge of peaking carbon emissions by 2030 and achieving carbon neutrality by 2060, through investments in high-capacity high-speed mass transit system integrated with complementary modes (transit-oriented development, TOD), and integrated planning between land-use and transport for Land Value Capture (LVC - a policy approach that enables communities to recover and reinvest land value increases that result from public investment and government actions).

**Bank strategy.** The PDO was well-aligned with the Bank strategy. At appraisal, the Country Partner Strategy (CPS) for 2013-2016, focused on two strategic themes: supporting greener growth and promoting inclusive development. The PDO is relevant to the Bank's Country Partnership Framework (CPF) for 2020-2025. The engagement area two of the CPF reiterated the need for "promoting greener development" and "promoting law -carbon transport and cities" through a faster, safer, affordable and greener mode of passenger travel in urban areas. The project activities are in line with the Bank's global strategy in the transport sector such as Sustainable Mobility for All (SuM4ALL). The PDO was aligned with SuM4ALL's four pillars: universal access, efficiency, safety and green growth.

**Previous Bank experience.** When this project was approved, the Bank was financing two ongoing urban rail projects in China ((Kunming and Nanchang). The Bank was also financing an on-going China - Urban Transport Project, aimed to integrate multi-modal public transport system to optimize transfers between regular buses, Bus Rapid Transit system and urban lines with respect to physical integration, information service, fare and ticketing. As in the other projects, this project financed works and institutional strengthening activities aimed at improving urban mobility. The project also aided in securing private sector financing for urban rail projects in China.

The PDO is outcome-oriented and clear. The PDO was however not sufficiently challenging, given that it was the third similar urban rail project. Key pioneering innovations in the project series, i.e., determinants of the urban mass rapid transport systems such as the success of TOD and LVC, were not measured. The
project design was similar to the China urban rail projects financed by the World Bank. According to the IEG guidelines (page 21), "The expectation is that a project occurring later in the Bank's engagement with the sector would set more challenging objectives". Therefore, the relevance of the PDO is assessed as substantial.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective
To improve urban mobility for the population of Zhengzhou along the catchment area Line 3 from Xin Liu Lu Station to Hang Hai Dong Lu Station.

Rationale
Theory of change. The outputs of constructing Line 3 (including track and tunnels, stations, interchanges, maintenance depot and a parking yard), and financing equipment for the line (rolling stock, power supply, control, signaling, communication, monitoring and station equipment, safety, security, ventilation, air-conditioning, water supply, sewerage, fire protection systems and integration of the line with other public transport modes), were aimed at developing an effective urban mass rapid system for improving urban mobility. The institutional strengthening activities such as strengthening management and technical assistance for transit-oriented development (TOD), were aimed at applying integration concepts to the Line 3 station. The combination of these activities were expected to lead to the outcome of improving urban mobility for the population of Zhengzhou along the catchment area Line 3 from Xin Liu Lu station to Hang Hai Dong Lu station.

The intended outcomes are predicated on these assumptions: (i) the bus company and transport authorities support integration efforts by optimizing routes, fare integration and bus stop locations; (ii) the municipality and the land bureau include TOD in their planning documents; and (iii) the municipality imposes travel demand management measures restraining the use of private cars.

Outputs (ICR, pages 26 and 27 and page 36).

These activities were completed as targeted.

- 25.5 kilometers (km) of Line 3 were operational from December 26, 2020 from Xin Lu Station to Hang Hai Dong station, with modern, energy efficient, air-conditioned Electric Multiple Unit (EMU) trains travelling at a maximum speed of 80 km/hour. The line adopted energy-efficient and environmentally friendly measures (such a natural ventilation shafts and a water-source heat pump), and the line was equipped with nursing rooms, female toilet cubicles and women-priority cars. Line 3, like other metro lines in Zhengzhou provided discount rates for vulnerable groups, special discounts to
students and people with disabilities, and free rides to elderly residents over sixty on weekends and during non-peak hours on weekdays.

- 21 underground stations (including six interchange stations with other urban rail lines), tunnels, tracks, a parking yard and a maintenance depot. The stations were universally accessible, with barrier-free accessibility to the wheel chair bound and sight impaired. All the stations were equipped with nursing rooms (17 of which were standalone and four combined with barrier free restrooms). The stations were air-conditioned and the digital information display at platforms showed in addition to real-time train schedules, the occupancy rate of the incoming trains.

- The rolling stock systems and operating supporting equipment were installed. The contract covering rolling stock, other equipment and the operation and maintenance (O&M) of Line 3 was through a Public-Private Partnership (PPP) to a Special Purpose Vehicle (SPV) company. The team clarified that a SPV is a specific project company formed for the purpose of a PPP arrangement. The team also clarified that the project company raises finance through a combination of equity provided by the project company's shareholders, debt provided by banks or through other financial instruments. The duration of the PPP contract was for twenty-five years, with five years of construction and twenty years of O&M to ensure that rolling stock and equipment are maintained until the end of their life.

- Interchange facilities for bus, rail and bike transfer facilities were completed. Bus routes were reorganized to optimize transfers between regular buses and Line 3. An automatic fare collection system with multiple payment channels and a single payment system for rail and buses was instituted.

- A bus route optimization plan developed for adjusting/cancelling overlapping routines and introducing feeder routes after the opening of Line 3, became effective on July 1, 2021. The plan included the following changes: (i) cancelling one bus route that overlapped Line 3; (ii) rerouting four bus routes that partially overlapped with Line 3; and (iii) adding five feeder routes to serve the new metro stations on the outskirts of the city.

- The project provided technical assistance for developing transit-oriented development (TOD). This included; (i) preparing TOD schemes for selected stations along Line 3; (ii) preparing two policy documents by ZM TOD; and (iii) preparing guidelines on Integrated land development around rail transit depots and stations in Zhengzhou.

- The Urban Rail Company (URC) finalized the site design at the Jialuhe depot. The depot was to have commercial development over the top to utilize the vacant land, and URC was examining mechanisms to channel some of the profits towards financing urban rail.

- The project trained 1,392 staff from URC and other relevant transport agencies.

Outcomes.

The outputs of activities were aimed at realizing the outcomes of improving urban mobility along these dimensions: (i) increasing average daily ridership on Line 3; (ii) increasing in travel time savings due to factors such as, traffic congestion during peak hours, bus transfers, walking time to the station and waiting time at the station; and (iii) increasing the number of people with access to a car who chose to use public transport after the opening of Line 3.

- The average daily ridership on Line 3 when the project closed on June 30, 2020 was around 140,000 passenger trips per day. This was about 58% of the target of 240,000 trips per day. The shortfall was due factors such as: (i) physical restrictions on public transport in the wake of the COVID-19 pandemic; (ii) the last two stations on the line opened only in June 2021; and (iii) delays in the start of Line 3 operations from December 2019 to December 2020 that left little time for ridership to ramp up and stabilize by project closing. The ICR (paragraph 27) observes that, while there was a gradual
rebound in ridership in 2020 as the pandemic was brought under control, ridership had not recovered fully. The ICR notes that ridership is expected to reach the original target by the end of June 2023.

- Travel time savings on Line 3 were monitored along two origin-destination (OD) pairs. The team clarified that this indicator measured the difference in travel time (expected wait + travel) during peak hours between the two origin/destination OD pairs along Line 3 - by bus before the opening of Line 3 and by urban rail after the opening of Line 3. Travel time savings from Xin Lu Station to Zhong Zhou station decreased to 59 minutes, exceeding the target of 50 minutes due to the worsened ground traffic that resulted in increased travel time savings for rail users. Travel time savings from Zhang Zhou Da Dao station decreased to 40 minutes as targeted.
- The proportion of urban rail commuters on Line 3 with access to a car increased from 45.1%, exceeding the target of 25%. The share of public transport mode increased from 13.6% in 2010 to 15.4% in 2017 of total urban trips in ZM (including 13.6% by bus and 2.9% by metro. The ICR (paragraph 29) notes that more recent data showed that with seven metro lines in operation, metro ridership accounted for 43.7% of all public transport modes in the first half of 2021 in Zhengzhou.
- A user survey conducted at closure indicated that 92.7% of Line 3 users rated the service as satisfactory or better, exceeding the target of 70%. 92.3 of males and 93.2 females rated the service as satisfactory or better, exceeding the targets of 70%. 92.2% of the bottom 40% of the population rated the service as satisfactory or better (the traffic survey indicated 27% of metro users were in the bottom 40% of the population. The team clarified that a survey questionnaire was given to metro passengers randomly from 7.30 to 18.30 on station platforms and hall for a few days in May 2021. The team clarified that the survey covered all stations in operation, with more than 30 people surveyed at each station. In total, 577 questionnaires were collected.

**OVERALL EFFICACY**

**Rationale**
Overall efficacy is assessed as substantial. While the Line 3 did aid in improving urban mobility, it still remains to be seen if the average ridership recovers to the expected level.

**Overall Efficacy Rating**
Substantial

**5. Efficiency**

**Economic analysis.** A cost benefit analysis (CBA) was conducted for the physical investment components, accounting for 92.4% of the appraisal estimate and 92.9% of the actual cost. The project benefits were assumed
to come from: (i) change in user benefits (travel time savings) transferring to Line 3; (ii) changes in urban transport operating costs; (iii) changes in the external costs of the urban transport system, including accident, congestion, air pollution and greenhouse gas emission.

The Net Present Value (NPV) at 8% discount rate at closure was RMB 7,249 million, compared to the NPV of RMB 12,372 at appraisal, using the same discount rate. The team clarified that a discount rate of 8% was used in many other projects in China and was consistent with the Bank guidance (Discounting Costs and Benefits in Economic Analysis of World Bank Projects, 2016). The ex-post Economic Internal Rate of Return (EIRR) was 11.02% compared to the ex-ante EIRR of 12.6% (ICR, paragraph 41). The benefit-cost ratio (BCR) was 1.39. The ex-post EIRR was lower than the ex-ante EIRR, due to the lower-than-expected ridership on Line 3. A sensitivity analysis was conducted assuming: (i) a 50% increase in investment cost due to the flood in July 2021; (ii) halving traffic growth from 2020 onwards; and (iii) excluding external benefits. The worst case scenario resulted in an EIRR of 9.8%.

Administrative and Operational issues. Construction of Line 3 was delayed in the early years of implementation due to factors such as: (i) ZM did not have a detailed PPP plan; (ii) URC was unable to obtain the construction permit in time due to the internal clearance procedure; and (iii) some households did not sign the resettlement agreement due to disagreement on the compensation process (ICR, paragraph 56). During implementation, there were several resettlement issues including, significant increase in resettlement impact due to design changes and resettlement complaints which led to the suspension of construction for several months in some cases (discussed in section 10a). These issues were eventually resolved.

The project was completed in six years with no extensions and the Bank loan was fully disbursed by closure. The final project cost was 92.95% of the appraisal estimate, due to the cost savings due to factors such as optimization in technical design and effective procurement and contract management.

In sum, efficiency is assessed as substantial due to the lower-than-expected EIRR of the project.

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:

<table>
<thead>
<tr>
<th>Rate Available?</th>
<th>Point value (%)</th>
<th>*Coverage/Scope (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraisal</td>
<td>✔️</td>
<td>12.06</td>
</tr>
<tr>
<td>ICR Estimate</td>
<td>✔️</td>
<td>11.02</td>
</tr>
</tbody>
</table>

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome
Outcome is assessed as satisfactory given the substantial ratings for the relevance of objective, efficacy and efficiency.

a. **Outcome Rating**
   Satisfactory

### 7. Risk to Development Outcome

**Financial risk.** There is low to medium financial risk to the sustainability of the development outcome. The ICR (paragraph 79) notes that the project's financial sustainability was tested under multiple scenarios such as, low ridership and high operations and maintenance costs. The analysis indicated that even under the most pessimistic scenarios, the required contributions from ZM would not exceed 1.4% of its revenue. Further, the financial contribution of ZM was further reduced due to the PPP arrangements, which ensured operation and maintenance of the rail for 25 years. However, as in other parts of the world, there is a risk to ridership could be undermined by the restrictions due to the COVID pandemic.

**Exposure to natural disasters.** There is risk associated with exposure to natural disasters. The ICR (paragraph 80) notes that in July 2021, both the hourly and daily precipitation broke seventy-year-old records and exceeded the last historic rainfall in 2020 by 20% and 15% respectively. The heaviest rain on record severely damaged infrastructure, such as urban transportation systems in Zhengzhou. Many metro stations and tunnels were severely flooded and the metro operations were suspended for a month for repair and safety checks. The Line 3 was re opened on September 15, 2021. This incident highlights the need for improvements to the resilience of the urban infrastructure for the long-term sustainability of the metro system.

### 8. Assessment of Bank Performance

a. **Quality-at-Entry**
   The Bank prepared this project based on the experiences from the two previous Bank-financed urban rail transport projects (Kunming and Nanchang), and from the Bank's global experience in multi-modal integration and transit-oriented development (TOD). Lessons incorporated at design included: (i) Given that multi-modal integration is critical for an urban rail system to achieve its potential, the design incorporated features for integrating bus services with urban rail services (such as, integrated fare structures, coordinated operational schedules and physical interchange facilities for bicycles, buses and cars); (ii) coordination of land use plans and urban design through TOD; and (iii). As the demand forecasts proved to be overly optimistic in the other urban rail projects, ensuring that the financial and economic forecasts included sensitivity analyses under alternative scenarios. (PAD, paragraph 26).

The implementation arrangements incorporated at appraisal proved to be adequate. The ZM was the implementing agency, and a Project Management Office (PMO) established in the Zhengzhou
Municipality Financial Bureau (ZMFB) was responsible for day-to-day implementation (PAD, paragraph 29).

Several risks were identified at appraisal including, substantial risks with the implementation capacity risk (as the PMO and URC were unfamiliar with Bank procedures and design risk. Mitigation measures incorporated at design included, hiring external consultants with experience in Bank procedures, and training the staff of PMO and URC (PAD, paragraph 29). These measures proved to be adequate in addressing the project risks identified at appraisal.

The arrangements made at appraisal for monitoring and evaluation, safeguards and fiduciary compliance were appropriate (discussed in sections 9 and 10).

Quality-at-Entry Rating
Satisfactory

b. Quality of supervision
The Bank conducted supervision missions twice a year. The missions included high-level discussions with government officials and conducting field visits (ICR, paragraph 77). There was continuity of leadership, with no change in the core Bank team and the current Task Team Leader (TTL) being the co TTL from identification to implementation. This helped in ensuring stability of project management. The Bank team included international and national experts for technical oversight. The Bank team also included PPP experts from the Global Infrastructure Facility (GIF) for performing a review of the PPP options (including the PPP scope and the PPP financing plan). This helped in leveraging private financing for the project. The support provided by the Bank team aided in completing the project within the time schedule, with no cost overruns and full loan disbursement. The support provided by the team aided in M&E and in safeguards and fiduciary compliance (discussed in sections 9 and 10).

In sum, overall Bank performance is assessed as satisfactory.

Quality of Supervision Rating
Satisfactory

Overall Bank Performance Rating
Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
The project design was simple, with well-defined components to achieve the PDO. The key outcome indicators - average daily ridership on Line 3, travel time savings and the number of people with access to cars and who used the urban line when it opened - were appropriate for monitoring project performance.
The indicator on the number of people with access to cars and who used the urban line when it opened was innovative, since it captured both the effectiveness and quality of urban rail services. The indicators were monitorable. The design envisioned a user satisfaction survey to gauge the quality of services on Line 3 when the project closed.

The M&E arrangements were appropriate, with the Urban Rail Company mainly responsible for monitoring performance with additional input from the bus company. Baseline data and target values were specified at appraisal.

Given that the project aimed at integrating transit-oriented development and integrating urban planning between land-use and transport, there were no indicators for monitoring activities relating to transit-oriented development and land capture value (discussed in section 3).

b. M&E Implementation

The ICR (paragraph 63) notes that URC provided the data and information in a timely fashion. This enabled the Bank team to monitor performance during implementation. As envisioned at design, URC conducted a user satisfaction survey in May 2021, after Line 3 opened. The ICR notes that these progress reports were complemented by monitoring reports from external (third party) reports on implementing the Environmental and Social Management Plan (ESMP) and the Resettlement Action Plan (RAP).

c. M&E Utilization

The information collected during implementation was used for monitoring performance. The Bank assisted URC in designing the user satisfaction survey, and URC continued to conduct the survey after project closure. The ICR notes that the URC used the results from the first survey for improving service delivery on Line 3 (such as improving the restroom directional signs and labels).

In sum, M&E is assessed as substantial, in view of the minor shortcomings in M&E design.

M&E Quality Rating
Substantial

10. Other Issues

a. Safeguards

The project was classified as a Category A (full assessment) category project under the World Bank Safeguard policies, triggering three safeguard policies at appraisal: Environmental Assessment (OP/BP 4.01); Physical Cultural Resources (OP/BP 4.11); and Involuntary Resettlement (OP/BP 4.12).

Environmental assessment and physical cultural resources. The PAD (paragraph 27) observes that the adverse environmental impacts of the project were mainly related to urban construction activities (such as, traffic disruption, tunnel construction safety and disposal of spoil material). The safeguards on physical
cultural resources was triggered, as the proposed Line 3 was in the vicinity of some cultural relics (such as Shang dynasty, City wall relics, Erqi tower, Zhengzhou Wen temple and Peng Xiangian ancestral temple) (PAD, paragraph 67). An Environmental Assessment was conducted at appraisal and an Environmental Impact Assessment (EIA) and Environmental and Social Management Plan (ESMP) were prepared and publicly-disclosed to address issues pertaining to environmental and physical cultural resources issues.

The ICR (paragraph 68) notes that the environmental safeguards performance was highly satisfactory. The Urban Rail Company and the Project Management Office established the environmental management system and assigned dedicated staff for addressing environmental issues. The ICR (paragraph 68) reports that the project presented some best environmental management practices in terms of coordination mechanism, excavated spoil transport and disposal, traffic diversion practices, underground pipelines removal/resettlement and COVID-19 pandemic measures during implementation. The ICR does not report of any whether there were any issues with the safeguards on physical cultural resources.

**Involuntary Resettlement.** The PAD (paragraph 60) notes that the project activities would involve land acquisition and demolition of structures: about 67 people from 239 families would be affected due to the acquisition of 52.4 hectares of collectively-owned land; about 1,308 families from 449 families due to the demolition of 35,347 meters of private houses; and about 1,026 families from 264 enterprises, institutes and small shops due to the demolition of 66,313 structures. The Project Management Office prepared and publicly-disclosed a Resettlement Action Plan (RAP) to address these issues (PAD, paragraph 62).

The ICR (paragraph 58) observes that there were several resettlement issues during implementation such as: (i) significant increase in resettlement due to design changes; and (ii) resettlement complaints related to Shunchengjie station, Dongdajie yard number 88, compulsory expropriation with due process related to Dongdajie yard number 220 and Nanyang road number 111. In all these cases, ZM addressed the issues before proceeding with the construction activities at Bank request.

The ICR (paragraph 71) reports that at closure, the project complied with involuntary resettlement safeguards. The ICR (paragraph 72) notes that altogether 735 residential households and 140 enterprises were affected by the project activities. According to the clarifications provided by the team compensation was paid to the affected people whose land were acquired. Most of the affected households had either moved into the replacement buildings or received cash compensation, except in four cases (The team clarified that these cases are due to the affected people having different preferences and the Urban Rail Company (URC) being responsive to provide as many options as possible to the Project-Affected People). The ICR notes that the Urban Rail Company continues to engage with the four affected households who have particular requests or preferences on details such as apartment selection. The ICR (paragraph 71) notes that each district government set a Grievance Redress Mechanism (GRM) to address complaints from the affected people. All grievance cases were resolved when the project closed.

**b. Fiduciary Compliance**

**Financial management.** The Bank conducted a financial assessment of the Project Management Office (PMO) and the Urban Rail Company (URC) at appraisal (PAD, paragraph). The assessment proposed actions that were deemed to be necessary to satisfy the Bank’s financial requirements.
The ICR (paragraph 75) observes that the financial performance was satisfactory during implementation. The financial management system provided accurate and timely information that the Bank loan proceeds were used for the intended purposes. The required interim financial reports were submitted in a timely manner, and the annual financial audits were unqualified.

**Procurement.** The Bank conducted a procurement assessment of the PMO and URC at appraisal. The PMO and the URC staff did not have sufficient experience with Bank's procurement procedures. Therefore, an experienced agent and a consulting firm were to be hired to support the PMO and URC staff, and a procurement plan was prepared at appraisal (PAD, paragraph 56).

The ICR (paragraph 74) notes that procurement was carried out in a timely fashion, and adhered to the Bank procedures and requirements without complaints. Although there was one red flag on potential collusion, this was satisfactorily resolved. There were no reported cases of mis procurement.

c. Unintended impacts (Positive or Negative)

---

d. Other

---

### 11. Ratings

<table>
<thead>
<tr>
<th>Ratings</th>
<th>ICR</th>
<th>IEG</th>
<th>Reason for Disagreements/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>Highly Satisfactory</td>
<td>Satisfactory</td>
<td>Outcome is satisfactory, based on the substantial rating for relevance of objective, efficacy and efficiency.</td>
</tr>
<tr>
<td>Bank Performance</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>There were minor shortcomings in M&amp;E design.</td>
</tr>
<tr>
<td>Quality of M&amp;E</td>
<td>High</td>
<td>Substantial</td>
<td></td>
</tr>
<tr>
<td>Quality of ICR</td>
<td>---</td>
<td>Substantial</td>
<td></td>
</tr>
</tbody>
</table>

### 12. Lessons

The ICR draws the following main lessons from the experience of implementing this project, with some adaptation of language.

1. **The World Bank can help through its knowledge base in securing private sector financing for public infrastructure investments, especially in middle-income countries.** This project used a "A + B" Public-Private Partnership (PPP) model, a form of PPP for urban rail projects. Under this arrangement, the private sector financed equipment costs and operational and maintenance costs for Line 3 for twenty five years. Although the Bank did not finance the PPP component, the Bank added value through mobilizing its global knowledge and expertise. This helped to set the direction.
for the Bank’s engagement in China from being a financier under Investment Policy Lending (IPL) to adding value through technical assistance and knowledge transfer.

2. Countries need to invest in resilience and climate change adaptation measures in urban projects, given the increasing trend in urbanization in many countries. The July 2001 flooding incident exposed weak points in city planning and management in this project and highlighted the room for improving the city's flood preparedness and response system. The lesson from this is that to improve urban resilience, cities need to scale up its climate adaptation measures, including upgrading construction standards, complemented by effective flood forecasting, early warning and emergency response system.

3. Transit Oriented Development (TOD) and integration of the various transport modes needs to be incorporated in urban projects. This project and two other urban rail projects highlighted the significant challenges to China's long-term decarbonization agenda. The lesson is that the Bank needs to continue its engagement on TOD and help China in addressing the institutional challenges associated with TOD and integration of the modes in urban projects.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is clear and well-written. The theory of change provided in the text presents clear links between the project activities, outputs and the intended outcomes, which were monitorable. The evidence provided in the ICR for supporting its major conclusions is from a credible source (traffic and user satisfaction surveys). The quality of analysis provided in the text and photographs provided in the ICR is helpful to the reader. The ICR draws good lessons from this project.

However there were some minor shortcomings. The ICR does not state the methodology followed in administering the survey and the ICR could have included an annex explaining clearly the PPP arrangements in this project. These issues had to be clarified with the team. The ICR also does not report as to whether there were any issues on physical cultural resources.

a. Quality of ICR Rating

Substantial