Report Number : ICRR0020854

1. Project Data

Project ID P113028	**Project Name** IN: Mumbai Urban Transport Project-2A
Country India	**Practice Area(Lead)** Transport & ICT

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
IBRD-79410	15-Jun-2015	925,500,000.00
Bank Approval Date	**Closing Date (Actual)**	
29-Jun-2010	31-Dec-2016	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	430,000,000.00	0.00
Revised Commitment	280,104,815.39	0.00
Actual	280,104,815.39	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
Kavita Mathur	Judyth L. Twigg	Christopher David Nelson	IEGSD (Unit 4)

2. Project Objectives and Components

a. Objectives

The project development objective (PDO) was to "improve the passenger carrying capacity, operational efficiency, level of comfort of, and the institutional capacity of entities involved in the suburban rail system of Mumbai Metropolitan area" (Loan Agreement page 7 and Project Appraisal Document para 15).

The PDO focused on four sub-objectives: (i) operational efficiency; (ii) improving passenger carrying capacity; (iii) improving level of comfort; and (iv) institutional capacity. Achievement of these objectives is assessed separately in section 4 of the review.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

The project included four components:

Component 1. **Electric Multiple Unit (EMU) Rolling Stock Fleet Increase** (appraisal cost US$659.6 million, actual cost US$510.1 million). This component would finance the procurement of 864 additional EMU cars. The Bank loan would finance the electrical equipment for the new cars, to be manufactured at Chennai Integral Coach Factory (ICF), while counterpart funds were to cover the remaining costs of production.

Component 2. **Conversion of Power Supply from Direct Current to Alternating Current (Including Improvements to Signals and Telecoms)** (appraisal cost US$173.8 million, actual cost US$131.1 million). Three sections of the Mumbai Metropolitan Region's (MMR's) Central Railway (CR) network needed to be converted from 1,500V DC traction to 25KV AC. This activity was to comprise: (i) modifying overhead catenaries, (ii) installing power sub-stations, along with switching stations; (iii) procuring catenary maintenance equipment; and (iv) modifying signal and telecom systems.

Component 3. **EMU Maintenance Facilities and Stabling Lines** (appraisal cost US$117.7 million, actual cost US$85.7 million). The capacity of the EMU maintenance depot at Kurla on CR and the maintenance shed at Virar (built under the prior project MUTP-1) would be upgraded with the addition of 73 new stabling lines: 34 (including four extensions from 9-car to 12-car) on the Western Railway (WR), and 39 on CR.

Component 4. **Capacity Strengthening and Technical Assistance** (appraisal cost US$14.6 million, actual cost US$37.6 million). This component would finance strategic and tactical studies, as well as capacity building and training activities.

The strategic studies would include: (i) preparation of a priority development program for the Mumbai suburban rail services; (ii) support to the Indian Railways (IR) in the development of its long-term strategy to implement Vision 2020 for the suburban rail services; and (iii) a study to improve the financial situation of the Mumbai suburban rail operation, mostly by maximizing non-fare box revenues.

Tactical studies would include: (i) a ticketing study aiming at establishing a more efficient and user-friendly ticketing system for Mumbai's suburban rail system; (ii) study and design of an improved passenger information system; (iii) a study to reduce the number of accidents due to trespassing; and (iv) a study to identify specific improvements to environmental practices within the operations of CR and WR.

Capacity building would include supply and installation of software for improved power supply and operation simulation. Training would focus on reinforcing the professional efficiency of Mumbai Railway Vikas Corporation (MRVC) officers based on an approved training plan.

Revised Components
Based on a May 8, 2013 restructuring, US$30 million was reallocated to Component 4 to implement passenger safety-related measures and for trespassing control measures at select suburban rail stations. This additional activity was based on findings from the trespassing and safety action plan funded by the project (ICR para 23).

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

Project Costs: The actual project cost was US$765.5 million, lower than the appraisal estimate of US$970.5 million.

Financing: The original loan amount was US$430 million. The project experienced three cancellations and one reallocation:

- On May 8, 2013, US$45 million was cancelled and $30 million was reallocated to Component 4 to finance new activities relating to passenger safety and trespassing.
- On October 9, 2014, US$41 million was cancelled due to savings from currency depreciation.
- On March 7, 2016, US$35 million was cancelled due to changes in the USD/INR exchange rate.
- Four months after project close, an undisbursed balance of US$28.9 million was canceled when the loan reached its end of disbursement date.

Therefore, the total cancellation was US$149.9 million, and the actual loan was US$280.1 million.

Apart from the IBRD loan, there was no other source of financing.

Borrower Contribution: The original Borrower contribution was US$540.4 million. The actual Borrower contribution was US$485.4 million.

Dates: On October 9, 2014, the project closing date was extended by one and a half years, from June 15, 2015 to December 31, 2016, to complete all project components, especially the supply of EMUs and the completion of trespassing control works.

3. Relevance of Objectives & Design

a. Relevance of Objectives

The backbone of all urban transport in Mumbai is the suburban rail system. Between 1991-2008 passenger-km on the suburban rail network doubled. However, this demand increase did not coincide with a proportional increase in the investment to improve services (ICR para 3). In 2007-08, an estimated 6.8 million passengers traveled on the suburban rail system every day (2.5 billion trips annually). Crowding was extreme, with approximately 5,000 passengers traveling in a nine-car train with a rated carrying capacity of 1,700 passengers. Due in part to this overcrowding, coaches did not close doors; this resulted in passengers dangling outside of moving trains (PAD para 2), resulting in unsafe conditions for passengers. Moreover, nearby squatter settlements and encroachers within the railway right-of-way safety zone were other causes of frequent casualties on the Mumbai system.

The project objectives at appraisal were aligned with Government priorities that include increasing investment in new urban infrastructure (e.g., expanding the metro rail network and the bus rapid transit system); strengthening urban governance; strengthening human and organizational capacities; developing long-term, strategic urban planning capacities; addressing the needs of the urban poor and improving slums; and raising environmental sustainability (Country Assistance Strategy [CAS] FY 2009-12 page 32). The objectives were also consistent with the CAS emphasis on rapid and inclusive growth, sustainable development, and improving government's effectiveness in delivering services. The Bank's support would target sectoral interventions where the integration of environmental considerations would reduce carbon footprint (CAS page 14). The Bank's program in India would also focus on supporting the creation of governance and institutional arrangements that promoted an enabling environment for results, and strengthen the capacity for publicly-provided services (CAS page 15). As discussed above, safety was identified at appraisal as a serious concern. However, it is unclear why safety was not included as an explicit objective.

The project objectives are also relevant to the Country Partnership Strategy (FY13-17) relevant at the time of project closure. Improvement of urban transport services falls under the second engagement pillar, "Transformation." Supporting the modernization and rehabilitation of infrastructure, use of new technology initiatives and technical assistance for greater operational and financial viability, and institutional and capacity development would be a key aspect of the Bank's urban transport strategy (CPS page 33).

Rating
Substantial

b. Relevance of Design

This second project was designed to continue the progress made under the first Mumbai Urban Transport Project (MUTP-1), particularly the capacity building efforts started by the Bank team during first project. The project results framework provided a logical link between the activities financed by the project and the outputs and outcomes related to the attainment of the development objectives. Specifically, the project's design focused on critical aspects of suburban systems rehabilitation. Upgrades to signaling and rolling stock were

logical design choices for improving services and achieving project objectives. Under this project, the traction voltage was to be upped from 1,500 V DC to 25 KV AC, reducing energy losses in distribution; the improved rolling stock would further reduce energy consumption, cutting it overall by about 30 percent compared to the existing system under MUTP-1. The project's technical assistance activities were well designed for tackling relevant but institutionally complex issues such as fares, trespass control, and long-term business planning.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

Objective 1

Objective
Improve the operational efficiency of the suburban rail system of Mumbai Metropolitan area.

Rationale

Outputs

- 1577 km of track was converted from DC to AC.
- A new maintenance shed was built at the Virar facility which improved maintenance capacity and lessened the time required to inspect and maintain new rolling stock (ICR para 40). However, not all mechanical and plant items were delivered and commissioned.
- The planned establishment of 73 new stabling lines supported by the project was not completed.
- Improvements in signal and telecoms were carried out (the ICR does not provide specific numbers).
- The following stations benefited from trespass control measures: CR - Dadar, Kurla, Kanjurmarg, Thane, Thakurli, and Kalyan; WR - Kanivali, Borivali, Bhayander, Vasai and Nallasopara. According to the ICR (para 42), contracts were awarded in March 2014, and the works were scheduled for completion by March 2017, with an impact assessment scheduled upon completion.

Outcomes

- Energy savings were achieved. The average energy consumption per 12-car train-km (kWh/t/km) decreased from 17.62 to 12.48, exceeding the target of 12.76. The regenerative brakes feature of the new rolling stock reduced energy consumption by 35%, saving operating costs and reducing carbon emissions (ICR Annex 2, page 24).

- Because of project-supported improvements to digital axle counters, there was a 61% reduction in track circuit failures. This was due to increased reliability of the signaling system (signal failures were reduced by 47%), and improved functionality, particularly during seasonal monsoons that traditionally flood tracks and short out electrical components. Signal failures require reduced speeds and increased stoppages to mitigate safety risks and have historically constrained capacity and reliability of the suburban system (ICR para 38).

Despite these achievements, the delays in MUTP-2B's works essentially held the entire system back and adversely impacted the performance of this project (ICR para 7). The indicator for punctuality - percentage of trains reaching less than 5 minutes late to destinations along WR and CR -- was not achieved. Reduction in transit time was also not achieved. This was due to the presence of older rolling stock that is still operating on the suburban network at reduced levels of performance with respect to acceleration, braking, and speed (ICR para 65). There were approximately 51 rakes still running with older, antiquated technology, of which 10 operate on the WR and 41 on the CR (including Harbour Line).

Rating
Modest

Objective 2
Objective
Improve the passenger carrying capacity of the suburban rail system of Mumbai Metropolitan area.

Rationale
Outputs

The project supported the procurement of 864 additional EMU cars (72 twelve-car rakes). As of December 31, 2016, 69 rakes were delivered, fully commissioned, and in use (ICR Annex 2, page 24). The new Electric Multiple Unit (EMU) cars enabled a wholesale shift from nine-car rakes to twelve-car rakes. Harbor Line was a primary recipient of new MUTP 2A rakes.

Outcome

The passenger carrying capacity was modestly improved:

- There was a reduction in vehicle kilometers where service extensions were not implemented as planned

or expansion of services along existing routes was not possible due to conflicts with long distance trains. However, the ICR reports (para 62) that the overall service expansion on the suburban rail network using longer, larger-capacity rakes across all lines contributed to capacity increase. There was 21 percent increase in capacity.

- The target for vehicle kilometers on Harbor Line was exceeded by 66%. The target for vehicle kilometers on Harbor Line was exceeded by 66%. However, this can only partially be attributed to the project, as a branch of Harbor Line services was extended to Thane during implementation along existing CR track which had the effect of increasing vehicle kilometers in a way not envisaged during appraisal (ICR para 61).

Rating
Modest

Objective 3
Objective
Improve the level of passenger comfort of the suburban rail system of Mumbai Metropolitan area.

Rationale
Outputs

Same as objective 2.

Outcomes

- The level of comfort improved only for the passengers using the CR Harbor Line due to the introduction of 12- and (more recently at the time of the writing of the ICR) 15-car rakes (ICR Annex 3 para 112). The passengers per 12-car train decreased from 4,200 (baseline April 2009) to 3,924 (actual, December 2016), achieving the target of 4,000.

- For the WR and CR Main Lines, overcrowding increased and the target of 4,000 was not achieved. For WR, passengers per 12-car train decreased from 5,400 to 5,257, and for CR Main Line from 4,800 to 4,340. The ICR reports (Annex 3 para 112) that due to crowding in the central sections of WR, it was almost physically impossible to board trains at many stations during the rush hours (and not so easy during the rest of the day).

- MVRC conducted a beneficiary survey to measure “onboard comfort” of passengers following the introduction of the project’s new rolling stock. The survey asked questions about amenities such as airflow, seating, vibrations, etc. About 98% of survey respondents reported satisfaction with the seating

configuration of the rolling stock, and 93% reported satisfaction with the new forced air ventilation system.

Rating
Substantial

Objective 4
Objective
Improve the institutional capacity of entities involved in the suburban rail system of Mumbai Metropolitan area.

Rationale
Outputs

A total of seven strategic and tactical studies were completed, and two simulation software packages were procured with project support (ICR pages 26-27).

Strategic studies:

- Priority development program for the Mumbai suburban rail services consistent with the TranSforMStudy and including feasibility studies.
- Development of Indian Railways long-term strategy to implement Vision 2020, with a focus on suburban rail services.
- Improvement of the financial situation of the Mumbai suburban rail operation by maximizing non-farebox revenues.
- Gender issues in Mumbai suburban rail system.

Tactical studies:

- Plan for reducing accidents due to trespassing.
- Identification of specific improvements to environmental practices in CR and WR.
- Controlled trespassing works over railway track of suburban railways at station areas in Mumbai.

In addition, training and study tours to reinforce professional efficiency of MRVC officers, based on an approved training plan, were completed.

Outcomes

- Capacity-building focused on the supply and installation of software for improved power supply and

operation simulation, and training (including study tours) to reinforce professional efficiency of MRVC officers based on an approved training plan. MRVC utilized relevant data and simulation information when determining the number of rakes to be the financed by the project.

- The project strengthened MRVC capacity to coordinate the further development of suburban rail services in the MMR. For example, the study relating to a Trespass Control Action Plan (i.e.one element of institutional capacity) resulted in positive actions being taken via the project in the form of works following the 2013 restructuring (ICR para 67). The studies relating to passenger information and ticketing have helped MRVC advance further towards customer-centric thinking.

- The analytical work on non-farebox revenues and long-term strategic planning have supported new policy dialogues about the future of Mumbai's suburban system and how to ensure its sustainability (ICR para 67).

Rating
Substantial

5. Efficiency

Since this project was a continuation of the earlier MUTP-1 project, the economic analysis for this project was conducted comparing the proposed additional project components as the 'with' alternative against the situation at the end of MUTP-1 as the 'without' alternative (PAD paras 44 and 46). The economic analysis of the project considered the following: (i) incremental operating costs; (ii) incremental capital costs; (iii) time savings due to reduced journey times; (iv) benefits of reduced crowding and discomfort for passengers on both bus and rail services; (v) reduced bus operating costs; and (vi) reduced bus emissions (ICR para 68).

The ex-post ERR was 20 percent, slightly higher than the appraisal estimate of 17 percent. The actual passenger demand was lower by 20 percent partly due to crowding in the central sections of WR, where it is almost physically impossible to board trains at many stations during the rush hours (and not so easy during the rest of the day). The reduction in crowding was concentrated in CR, due to the introduction of 12 and (at the time of the writing of the ICR) 15-car rakes (ICR Annex 3 para 112). The cost of the new rakes was substantially less in US$ terms than the appraisal estimate (with US$75 million reduced from the loan component of the cost of the rakes).

There were no cost overruns. The project was extended by one year to complete all project components, especially the supply of EMUs and the completion of trespassing control works that were added at the time of project restructuring in 2013.

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	✓	17.00	0 ☑Not Applicable
ICR Estimate	✓	20.00	0 ☑Not Applicable

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

6. Outcome

The project's objectives were substantially relevant to the needs of urban transport users in the Mumbai Metropolitan Region, and design relevance is also rated substantial. The project's objectives to increase level of comfort and institutional capacity were substantially achieved, but the objectives to improve passenger carrying capacity and operational efficiency were only modestly achieved. The shortcomings were partly due to the non-completion of the parallel project MUTP 2B, funded by the government. Also, some of the project activities were not completed, including delivery and commissioning of mechanical and plant items, and planned establishment of new stabling lines. The efficiency of the project is rated as substantial. Overall, these ratings are indicative of moderate shortcomings in the project's preparation and implementation, leading to an Outcome rating of Moderately Satisfactory.

a. Outcome Rating
Moderately Satisfactory

7. Rationale for Risk to Development Outcome Rating

The ICR reports (paras 75 and 76) that achievements with respect to carrying capacity and operational efficiency are likely to be sustainable in the context of DC to AC conversion, signaling upgrades, and enhanced rolling stock capacity, due largely to improvements in maintenance facilities and stronger maintenance practices that have resulted from this and the previous project.

There is modest risk that the improvements in passenger comfort will not be sustained. Urban rail systems require continuous programs of service enhancement to keep up with evolving customer expectations. This requires stable and reliable funding. Mumbai's suburban system relies on government subsidies for both

operations and new capital investment. In the long run, a sustainable fares policy is needed (fares are an issue with complex political economy considerations).

Regarding institutional capacity, the future role of MRVC needs to be clarified. MRVC was established in 1999 as a joint Indian Railways and Government of Maharashtra undertaking to implement a program of capital investment and enhancement on the suburban network. MRVC does not operate railway services but manages portions of capital investment on the suburban railway. The zonal railways also undertake parallel capital investment. This complex arrangement requires extremely close coordination between MRVC, CR, and WR to implement works in a way that minimizes disruption to services (ICR para 4).

The risk to development outcome is assessed as modest.

a. Risk to Development Outcome Rating
Modest

8. Assessment of Bank Performance

a. Quality-at-Entry
The design of this project incorporated lessons from the previous project, especially regarding the Bank's safeguard standards. The project's components were technically sound, and the financial assumptions were based on economic analyses (ICR para 77). Although at preparation, the Bank knew that MRVC's role was to implement capital investment and that it was not responsible for operating services, the associated risks were not fully assessed and reflected (ICR para 31). There were deficiencies in the monitoring and evaluation (M&E) framework (see section 10 below). In particular, the M&E framework was heavily dependent on factors that were outside the scope of the project or even the implementing agency's general scope of authority.

Quality-at-Entry Rating
Moderately Satisfactory

b. Quality of supervision
The ICR reports (para 79) that the Aides Memoire documented progress, clearly highlighted implementation challenges, and provided realistic, time-bound mitigation strategies. For example, when component 1 experienced delays related to the testing and approval of prototype train sets, the Bank and MRVC proactively worked together to address the delays that MUTP-2A encountered, working closely with the Research Design Standards Organization (RDSO), Integrated Coach factory (ICF) and Indian Railways (IR) to obtain the needed approvals to expedite production and delivery processes (ICR para 36). The supervision team worked with MRVC and other stakeholders to restructure the project in 2013 and advanced the railway safety agenda. Despite this, a key shortcoming in supervision was the missed opportunity to restructure the project's results

framework (see section 10 below).

Quality of Supervision Rating
Moderately Satisfactory

Overall Bank Performance Rating
Moderately Satisfactory

9. Assessment of Borrower Performance

a. Government Performance
The Government of India (GOI) and the Government of the State of Maharashtra (GoM) were fully committed to the project. At the time of project appraisal (in 2008-2009), the GoI and GoM approved a capital investment project "Mumbai Urban Transport Project - 2B" to be delivered in parallel with the Bank's project. These projects were collectively comprised within a single MUTP 2 project umbrella. A key aim of MUTP 2B was to further expand the suburban rail system by developing additional parallel track (ICR para 6).

MUTP 2B works started implementation while MUTP 2A (this project) was already under implementation. However, MUTP 2B encountered delays due to: (i) fiscal constraints and increasing costs, from INR 18.7 billion (US$278 million) in 2013 to INR 32.8 billion (US$561 million) in 2016; and (ii) additional complexities of land acquisition and resettlement (ICR para 6). MUTP 2B project activities did not reach completion by the close of MUTP 2A, preventing MUTP 2A from achieving some of its targets.

There were initial delays relating to MRVC receipt of GoM counterpart funding, but this was resolved. The ICR reports (para 83) that the GoM and the Railway Board officials met regularly with the Bank's supervision team, and supported MRVC's efforts to efficiently and effectively implement the project on a timely basis. The Government counterparts addressed issues raised by the Bank during implementation (ICR para 83).

Government Performance Rating
Moderately Satisfactory

b. Implementing Agency Performance
Mumbai Railway Vikas Corporation (MRVC) was the key implementing agency and coordinated with the main Indian Railways executing agencies.

- MRVC completed: (i) the DC-AC conversion and signal work before the project ended; and (ii) all but one of the capacity building studies on time. Studies relating to passenger information and ticketing have helped MRVC advance further towards customer-centric thinking (ICR para 67). Some trespassing prevention works were ongoing at project closure.

- MRVC conducted data-driven simulation exercises that demonstrated that the rail system could effectively sustain a total of 72 twelve-car rakes by the end of MUTP-2A, leading to a decision to finance the additional twelve rakes to further enhance the system's capacity (ICR page 33).
- MRVC faced challenges in the implementation of the first component, specifically related to design approvals of the electrical equipment for the 72 twelve-car rakes financed by the project. Once the designs were approved, MRVC worked with the Bank and the Integrated Coach Factory to develop an expedited production timeline so that production would be complete by the end of the project (ICR para 84).
- MRVC commissioned a third party to survey commuter passengers on the amenities provided in the twelve-car rakes developed and commissioned into service under the project.

Implementing Agency Performance Rating
Satisfactory

Overall Borrower Performance Rating
Moderately Satisfactory

10. M&E Design, Implementation, & Utilization

a. M&E Design
The M&E Design included several indicators to monitor progress toward achievement of project objectives. These included: (a) additional capacity in vehicle-km during peak hours, (b) reduction in peak hour overcrowding, (c) reduction in journey times, (d) operational efficiency: reduction in energy consumption, and (e) institutional strengthening: carrying out technical assistance and preparing action plans. However, some of the indicators relating to capacity and comfort were not directly attributable to the project, as they were influenced by external factors over which the project had no control (such as the completion of activities under the Government-funded Mumbai Urban Transport Project-2B). For example, punctuality on the Harbor Line did not consider how works to extend platforms for longer trains would affect delays (ICR para 43). The indicators relating directly to rolling stock energy efficiency and institutional development, in contrast, were more realistically attributable to project interventions. The ICR suggests (para 44) that the number of track circuit failures or overall signal failures would have been suitable to capture benefits of the project's investments in digital axle counters. Average rake capacity for daily service could have provided a more attributable proxy for supplied capacity that could be specifically linked to EMU investments with less likelihood of exogenous impacts. These indicators were not included in project design, but the data were collected by the Central and Western Railways as part of their standard business operations.

b. M&E Implementation
During implementation, the project team observed two errors in how the indicators were defined in the Project Appraisal Document (PAD). The first was an incorrect definition of "vehicle km per day during morning peak

hours," whereas the baseline values corresponded to "vehicle km per day." Second, the baseline value for Central Railways Main Line (CR/ML) was incorrectly reflected in the PAD. Instead of 561,461 vehicle km per day, the correct value was 436,500 vehicle km per day. The team decided that the correct definition of the indicator was "vehicle km per day" (i.e. not just peak hours) and considered 436,500 as the baseline indicator value for CR/ML. However, this decision was not reflected in project restructuring documents (ICR para 45).

The ICR reports (para 45) the data on project indicators was collected by the project's implementing agency, Mumbai Railway Vikas Corporation (MRVC), along with the Central and Western Railways. The methodology was sound and used the established systems of Central and Western railways. However, there was some quality issues - the figures for passenger demand were not accurate as the suburban railway operates as an "open system" without gate controlled access that would allow for precise passenger counts. Instead, ticket sales offered a proxy which may expose demand figures to rates of fare evasion which is difficult to quantify.

To assess the quality of service, MRVC commission a third party to survey commuter passengers on the amenities provided in the twelve-car rakes developed and commissioned into service under the project. 1,500 first and second class passengers were surveyed by the firm Storytellers from March 16-20, 2016. Passengers were asked about the following characteristics of the newly designed train compartments (ICR Annex 5):

- Seating pattern;
- Leg space;
- Visibility of passenger information system;
- Ventilation system;
- Electrical fittings, handles for standing passengers;
- Height and width of luggage rack;
- Window size;
- Center pole for boarding and alighting; and
- Width of first and second class seating.

c. M&E Utilization

The ICR reports (para 46) that the data from project indicators was used in making decisions throughout project implementation. For example, the analysis of services supplied and slab-wise analysis of ticket sales underpinned studies on revenue maximization and long-term development planning for the suburban rail system. This data was linked to measures for vehicle kilometers per day and ridership per day as included in the M&E framework of the project. Outputs from the studies supported by the project and data collected have influenced the design of the forthcoming MUTP 3 project (ICR para 46).

M&E Quality Rating

Modest

11. Other Issues

a. Safeguards

Appraisal

The Project was assigned Environment Category B and the following safeguards policies were triggered: Environmental Assessment (OP/BP 4.01), and Involuntary Resettlement (OP/BP 4.12).

Activities under the project were expected to have minor negative environmental impacts. These were expected to occur in areas where new stabling lines or traction substations were planned. These included: tree cutting at proposed sites, potential for damage to (only a few) mangroves in one location, and potential traffic safety hazards due to re-routing in select locations (PAD para 65). Other impacts related to the construction stage were increased air pollution and safety hazard due to increased traffic, increased noise levels, potential impacts from improper handling of hazardous substances like asbestos and oils, and pollution of water sourses close to sites. An environmental management plan (EMP) was prepared.

MRVC carried out a supplementary social impact assessment survey to access the nature and magnitude of adverse impacts on a few households living alongside the rail tracks (near Virar Scrap Yard, the site for the stabling lines) (PAD page 11). The study concluded that there were no land acquisition or resettlement issues. According to the PAD (para 39), the project did not require any land acquisition or resettlement. However, in case of unanticipated land acquisition or resettlement due to any alteration in design or outlay, MRVC prepared a Social Management Framework (SMF) and stipulated that MRVC would prepare a specific resettlement action plan (RAP) during implementation (PAD para 59).

Implementation

According to the ICR (para 47), no major safeguard compliance issues were encountered during the implementation of the project. This project applied lessons learned from the previous MUTP-1 operation which involved a safeguards-related Investigation Panel inquiry.

Environmental Safeguards: The ICR (para 49) reports that there was broad compliance with the EMP provisions relating to work sites, especially in contracts being administered by MRVC. Sites were properly demarcated, dust control measures from site work and the transport of material were in place, and safety measures for workers were recorded on all sites.

Social Safeguards: The project did not require land acquisition or resettlement (ICR para 48).

b. Fiduciary Compliance

Procurement: The ICR does not report any procurement issues.

Financial Management: The ICR (para 50) reports that there were no major issues regarding compliance with financial management arrangements, and regular audits were conducted.

c. Unintended impacts (Positive or Negative)

None reported.

d. Other

---

12. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	---
Risk to Development Outcome	Modest	Modest	---
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	---
Borrower Performance	Satisfactory	Moderately Satisfactory	The Government funded MUTP 2B works started implementation while MUTP 2A (this project) was under implementation. However, MUTP 2B encountered delays due to: (i) fiscal constraints and increasing costs, from INR 18.7 billion (US$278 million) in 2013 to INR 32.8 billion (US$561 million) in 2016; and (ii) additional complexities of land acquisition and resettlement (ICR para 6). MUTP 2B project activities did not reach completion by the close of MUTP 2A, preventing MUTP 2A from achieving some of its targets.

Quality of ICR	Substantial	---

Note
When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.
The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

13. Lessons

Adapted from the ICR (paras 86-89):

- In an environment where major restructuring of institutions is not possible, a first step could be to enhance the implementing agency's capabilities to tackle longer-term sustainability challenges through technical assistance. For example, the studies performed under the technical assistance component have increased Mumbai Railway Vikas Corporation (MRVC's) understanding for long-term planning, customer service enhancements, non-farebox value capture, and safety.

- The complexities of large urban transport systems and the inevitable presence of exogenous factors highlight the need for indicators to measure outcomes that are attributable to project interventions. The indicators and targets developed for MUTP-2A reflected an assumption that MUTP-2B activities would be implemented in a phased manner that complemented MUTP-2A. Since MUTP-2B was not implemented as envisaged, some targets for project indicators could not be achieved.

- The project experience shows that integration of new rolling stock designs with legacy station platforms may cause delays due to configuration issues. It may have been possible to reduce delays through additional engineering due diligence, formal coordination mechanisms, and/or more proactive engagement around the design and approvals processes.

14. Assessment Recommended?

No

15. Comments on Quality of ICR

The ICR is candid, and the narrative on implementation is concise and clear, detailing successes and the challenges that the project overcame. The ICR is appropriately critical of shortcomings in the project's M&E framework. The lessons contain project-specific details but the points/rationale underpinning each of them are universal in nature and can be easily applied to other similar challenges in comparable contexts. The ICR does

not specify which safeguards policies were triggered.

a. Quality of ICR Rating
Substantial