



1. Project Data

Project ID P170595	Project Name Lima Metropolitan North Extension	
Country Peru	Practice Area(Lead) Transport	
L/C/TF Number(s) IBRD-90400	Closing Date (Original) 31-Jan-2023	Total Project Cost (USD) 92,998,154.78
Bank Approval Date 30-Jan-2020	Closing Date (Actual) 30-Apr-2024	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	93,000,000.00	0.00
Revised Commitment	93,000,000.00	0.00
Actual	92,999,999.74	0.00

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2. Project Objectives and Components

a. Objectives

The Project Development Objectives (PDOs) as stated in the Loan Agreement (Schedule 1) and the Project Appraisal Document (PAD, p. 11) are “to improve urban mobility and accessibility to jobs in the area of influence of the Metropolitan BRT North Extension”. BRT stands for Bus Rapid Transit. The PAD defines the area of influence of the Metropolitan BRT North Extension as the districts of *Comas*, *Los Olivos*, *Independencia*, and the urban areas of *Carabaylo*.



In this validation, the PDOs are assessed in the two parts as follows:

- (i) to improve urban mobility in the area of influence of the Metropolitan BRT North Extension; and
- (ii) to improve accessibility to jobs in the area of influence of the Metropolitan BRT North Extension.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1. BRT infrastructure and equipment. (Cost at appraisal: US\$117 million, of which the IBRD's commitment was US\$92 million and Metropolitan Municipality of Lima's (MML's) commitment was US\$25 million; actual cost was US\$110.7 million, of which the IBRD's actual share was US\$91.5 million and MML's actual contribution was US\$19.2 million). This component was to finance:

- a. **the Metropolitan BRT North Extension** through (i) (a) construction of 10.2 km of segregated busways between Terminal Naranjal and the new Terminal Chimpu Ocllo, 17 passenger stations, 21 pedestrian crossings, two pedestrian footbridges, and one bus terminal; (b) expansion of the existing bus depot in the Sinchi Roca Park; (c) installation of road safety signaling; and (d) upgrading of the wastewater treatment plant and installation of a technified irrigation system; (ii) installation of equipment and technology to support BRT operations and traffic control; (iii) carrying out of complementary works for the removal of utilities by replacing water and sanitation mains in some intersections of the extended corridor mentioned herein; (iv) implementation of environmental and social instruments; and (v) carrying out of supervision of the works and services.
- b. **Optimization of the Metropolitan BRT operations and services**, including: (i) the preparation of a pre-operational plan for the integration of the Metropolitan BRT North Extension to the current Metropolitan BRT system; (ii) optimization of a services plan and scheduling of feeder routes; (iii) the development of a personalization module for the Metropolitan BRT integrated smart card system; (iv) the provision of a software for bus programming; (v) the development of operational performance indicators; (vi) the carrying out of quality of services surveys; and (vii) the provision of training, preparation of emergency plans and testing and calibration of the Metropolitan BRT operations.

Component 2. Project management and environmental and social management (Cost at appraisal: US\$6 million, of which the IBRD commitment was US\$1 million and MML's commitment was US\$5 million; actual cost was US\$12.4 million, of which IBRD loan was US\$1.5 million and MML's actual contribution was US\$10.9 million). It was to finance:

- a. **Project management**, including inter alia: (i) institutional/technical strengthening of the Metropolitan Municipality of Lima (MML) Project Implementation Unit (PIU) and the Technical Coordination Unit (TCU); (ii) hiring of Project staff; (iii) carrying out of financial management (including project audits), procurement, disbursement, monitoring and evaluation activities; and (iv) carrying out of assessments on the project indicators measuring performance and road safety.



- b. **Environmental and social management**, including inter alia: (i) implementation of the Environmental and Social Commitment Plan (ESCP) and the management tools and instruments referred to therein; (ii) provision of Training to support the implementation of the Environmental and Social Standards and on international good practices to mitigate environmental and social risks; and (iii) development and implementation of a Gender Action Plan (GAP) for MML with concrete actions to address women’s mobility barriers and employment in the Metropolitan BRT.

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

Project Costs. The total project cost at appraisal was estimated at US\$123 million, and the actual project cost was a bit higher - US\$123.1 million (ICR, p. 31, Annex 3).

Financing. The World Bank financed the project with an IBRD loan of US\$93 million, and the loan was almost entirely disbursed. At the closing, disbursement stood at US\$ 92,998,154.78 (ICR, p. i., Datasheet).

Borrower’s contribution. The Borrower, through MML, was expected to contribute US\$30 million. The actual contribution was slightly higher - US\$30.1 million.

Dates. The project was approved on January 30, 2020, became effective on June 19, 2020, carried out a mid-term review (MTR) on December 7, 2021, and closed on April 30, 2024, which was 15 months later than originally planned on January 31, 2023.

Restructuring. The project with disbursement at 86.88 percent underwent a Level 2 restructuring which was approved on January 20, 2023. The restructuring was carried out to extend the closing date of the Project by 15 months from January 31, 2023, to April 30, 2024 and align the implementation schedule with the new closing date.

3. Relevance of Objectives

Rationale

Country and Sector Context at Appraisal. Despite its 49 percent contribution to the national GDP, the Lima Metropolitan Area (LMA) faced persistent poverty, especially in the northern districts at the time of the project appraisal. While serving as a hub for commerce, industry, and services, with predominantly informal economic activities, LMA struggled with inefficient and unaffordable urban public transport services. About 73 percent of the population relied on public transport for their daily commute, which was considered inefficient and unaffordable and, thus, hindering access of the low-income households living predominantly in North Lima to social services, jobs and markets in the LMA spatial development zones. Despite 32,000 buses, minibuses, and vans (*combis*) serving 560 routes and 12.1 million daily trips, urban public transport still struggled to meet the demand. The Lima BRT reached its capacity limit and was functioning over the capacity which led to congestions at some stations. The construction of the North Extension became a priority to improve connectivity and access in low-income districts of the capital, improve the quality of service for vulnerable populations, including women and persons with disabilities, and strengthen institutional capacity for the long-term sustainability of Lima’s urban transport system.



Alignment with the Government Strategies. At the time of appraisal, the PDO was aligned with Peru's National Development Plan 2016–21 that included enhancing connectivity, providing opportunities for the poor, and reducing greenhouse gas (GHG) emissions through efficient transport systems, in alignment with climate change management goals of 30 percent emissions reduction target (2015 Peru's Intended Nationally Determined Contribution; ICR, p.2, para 4). At closing, the PDO remained aligned with the Local Climate Change Plan for Lima province 2021–2030 (PLCC-LIMA), which outlines key initiatives for reducing GHG emissions in Lima's transport sector, including enhancing the BRT (ICR, p. 5, para 16). In addition, the PDO was still aligned with the country's strategy with the 'Strategic Plan for National Development to 2050', Objective 1 "providing the country with quality economic and social infrastructure" and with Lima's Metropolitan Development Plan 2040 (PLANMET 2040, developed by the MML and the Ministry of Housing, Construction and Sanitation; ICR, p. 5, para 14).

Alignment with the Bank Strategies. According to the ICR (p. 5, para 15), the PDO was aligned with the World Bank's Country Partnership Framework (CPF) for FY17–FY21 by supporting Pillar I, "Connecting the Poor to the Services and Markets," Objective 2.2. "Increase mobility and road network both in urban and rural areas". At the time of closing, the PDO remained aligned with the World Bank Group's Strategy – CPF for FY23-27 approved on December 22, 2022, particularly, with its high-level outcomes (HLOs) of "Increased access to quality economic opportunities for workers and entrepreneurs" (HLO1), "Improved access to quality public services across the territory" (HLO2), and "Increased resilience to shocks" (HLO3). Furthermore, the PDO was also aligned with (i) the World Bank's Green, Resilient, and Inclusive Development (GRID) framework, emphasizing "fostering sustainable development pathways that integrate environmental considerations and ensure inclusiveness through a safer and more inclusive BRT system for all, especially women and PWD" (ICR, p. 5, para 15), (ii) World Bank's Climate Change Action Plan for 2021-2025 through the Project's efforts to mitigate the impacts of climate change and promote sustainable urban transport, and (iii) the World Bank's Peru Country Climate and Development Report (Peru CCDR) that recommends the expansion of the BRT system in major Peruvian cities, including Lima (ICR, p. 5, para 16).

Previous Sector Experience. The PDO definition and the project design were informed by the previous engagement which had supported the universal mobility agenda in Lima and the capacity building of the MML (PAD, p. 16, para 21 (d)). The Recipient-executed trust fund technical assistance "Mainstreaming Inclusive Design and Universal Mobility in Lima" which was implemented during 2012-2017 helped design and built a pilot BRT station, Dos de Mayo, with universal mobility/access considerations, specifically to address the mobility needs of people with disabilities. This station became a model for replication and lessons learnt were translated into practical recommendations for BRT and Metro projects and for capacity building in the provision of inclusive urban transport. Peru's Ministry of Housing, Construction and Sanitation updated and strengthened its regulations to ensure that urban transport infrastructure designs included universal mobility/access considerations. As part of this project's preparations, the World Bank also carried out a universal access assessment of the designs of the Metropolitan BRT North Extension and ensured that its relevant recommendations were included in the designs and bidding documents. "That assessment focused, in particular, on the design of pedestrian crossings, access to stations, elevators for people with disabilities, pedestrian bridges, appropriate signaling, fare collection infrastructure, and equipment to support PWD during emergencies" (PAD, p. 16, para 21(d)).

The relevance of the PDO is rated as High. The PDOs were fully aligned with the World Bank and Country's strategies both at appraisal and closing of the project. The PDOs were pitched at the outcome-oriented level of improving urban mobility to address the development problem of inequality in a low-income area (as discussed in the PAD's country context) which was exacerbated by inefficient and unaffordable



public transportation hindering accessibility to socioeconomic opportunities. The PDOs were also formulated at the appropriate level given the capacity of the country and implementing agency at the time of appraisal.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To improve urban mobility in the area of influence of the Metropolitan BRT North Extension.

Rationale

The ICR (p.2, figure 2) presented a Theory of Change (ToC) which was used at the time of appraisal and reflected in the PAD (p. 13). The ToC has been reconstructed by the IEG to better clarify the project's interventions at the start of the results chain as the original ToC in the PAD and ICR limits the interventions to only two activities: design and construction of BRT infrastructure and equipment and plan for the optimization of the BRT operations and services. The ToC for Objective 1 as reconstructed by the IEG is that the project would use the project's inputs - IBRD loan and MML's contribution – to finance such activities as to: (i) construct segregated busways, bus terminals, passenger stations, pedestrian crossings and footbridges; (ii) expand the existing bus depot; (iii) install road safety signaling; (iv) upgrade a wastewater treatment plant; (v) install a technified irrigation system; (vi) install equipment and technology to support BRT operations and traffic control; (vii) carry out complementary works to replace water and sanitation mains in some intersections of the extended corridor; (viii) prepare a pre-operational plan for the integration of the Metropolitan BRT North Extension into the existing Metropolitan BRT system; (ix) develop a plan for optimization of the BRT services and scheduling of feeding routes; (x) develop a module for the Metropolitan BRT integrated smart card system; (xi) provide a software for bus programming; (xii) identify operational performance indicators; (xiii) carry out quality of services surveys; and (xiv) provide training, prepare emergency plans, test and calibrate the Metropolitan BRT operations. The activities would lead to such outputs as (i) constructed segregated busways, bus terminals, passenger stations, pedestrian crossings and foot bridges; (ii) expanded bus depot; (iii) installed road safety signaling; (iv) upgraded wastewater treatment plant; (v) installed technified irrigation system; (vi) installed equipment and technology to support BRT operations and traffic control; (vii) replaced water and sanitation mains in some intersections of the extended corridor; (viii) pre-operational plan in place for the integration of the Metropolitan BRT North Extension into the existing Metropolitan BRT system; (ix) plan for optimization of the BRT services and scheduling of feeding routes developed; (x) module for the Metropolitan BRT integrated smart card system developed; (xi) available software for bus programming; (xii) operational performance indicators identified; (xiii) quality of services surveys carried out; and (xiv) training provided, and prepared, tested and calibrated emergency plans for the Metropolitan BRT operation. In terms of outcomes, these outputs were to lead to improved urban mobility in the area of the project influence as measured by: (i) in-vehicle travel time for public transport users between two terminals, (ii) number of passenger trips per day in the project influence area differentiated



by levels of income of passengers and gender of passengers, (iii) share of users satisfied with the service in the northern BRT extension (coverage, reliability, safety, personal security) differentiated by socioeconomic level and gender, and (iv) change in the share of women passengers satisfied with service in terms of safety, security.

The main assumptions were that (i) the civil works would progress as per the plan, (ii) the integration of the new extension into the existing BRT system would be completed on time, (iii) the reorganization of bus routes would be completed right after the completion of the civil works and bus operators are fully on board with the reorganization, and (iv) the government authority overseeing the Lima BRT operation would ensure that the new terminals and bus stations are open for services soon after the completion of the civil works. The ToC as reconstructed by the IEG had no major logical gaps, and the results are likely attributable to the project activities.

Outputs

The Project delivered the following outputs:

- 100 percent of physical progress in building segregated BRT lanes on the Metropolitan BRT North Extension. **The target of 100 percent was achieved.**
- 10.2 km of the road constructed. **The target of 10.2 km was achieved.**
- 100 percent of physical progress in constructing passenger stations on the Metropolitan BRT North Extension. **The target of 100 percent was achieved.**
- 17 passenger stations were constructed that provide access for people with disabilities. **The target of 17 passenger stations that provide access for people with disabilities was achieved.** However, only four out of 17 at the ICR submission time were in operation.
- 100 percent of physical progress in constructing pedestrian bridges on the Metropolitan BRT North Extension. **The target of 100 percent was achieved.**
- Completed construction of three U-turns on the Metropolitan BRT North extension. **The target of 3 U-turns constructed was achieved.**
- 100 percent of physical progress of constructing the Chimpu Ocllo bus terminal on the Metropolitan BRT North Extension. **The target of 100 percent was achieved.**
- 100 percent of physical progress in expanding a bus depot on the Metropolitan BRT North Extension. **The target of 100 percent was achieved.**
- 10.2 km of Carriageway-km was covered by installing infrastructure and/or equipment designed to reduce speeds (Kilometers). **The target of 10.2 km was achieved.**
- Completed integration of the Metropolitan BRT North Extension into the existing BRT system based on the preoperational plan. **The target (yes) was achieved.**
- Harmonized Response Protocol to address cases of sexual harassment in the Metropolitan BRT is used by Protransporte. **The target (yes) was achieved.**
- The capacity of Protransporte's bus scheduling task team was improved. **The target (yes) was achieved.** According to the Bank team's answer on January 15, 2025, a training on bus scheduling was provided by an expert who used to be the ITS Director in the Transmilenio in Bogota, Colombia.
- Diagnosis and improvement of service plans, route scheduling, and bus dispatch services were completed. **The target (yes) was achieved.**
- The state-of-the-art software and methodology for scheduling feeder and trunk services were not implemented due to the prevalence of a software concession contract for the BRT with the ATU. The



Bank team clarified to the IEG on January 15, 2025 that this contract is due to expire soon. **The target of the state-of-the-art software and methodology for scheduling feeder and trunk services implemented was not achieved.** According to the ICR (footnote 13) and the Bank team (January 15, 2025), the BRT system uses TRANSCAT software, which is modern, but not a state-of-the-art one, for bus programming as of October 2024. The Bank team updated the IEG (January 24, 2025) that the ATU budgeted for various upgrades and improvements to its bus scheduling software and other related technologies through 2025.

- Enhanced M&E framework for monitoring operational performance indicators was implemented on the Metropolitan BRT. **The target (Yes) was achieved.** The Bank team confirmed on January 15, 2025 that the new performance indicators to improve the BRT operation had been proposed during the project preparation. Those new operational performance indicators had been introduced by the Protransporte before they were absorbed by the ATU.
- Operational efficiencies were not implemented. This intermediate indicator was defined in the PAD as progress in implementing preoperational and transition activities as described in Project Subcomponent 1.b for the integration to the current Metropolitan BRT. **The target of 2 operational efficiencies implemented was not achieved.**
- The feeder-route service plan was updated and upgraded. **The target of one (1) feeder-route service plan was updated and upgraded was achieved.**
- The trunk service plan was updated. **The target of one (1) updated trunk service plan was achieved.**
- The plan for an expanded, integrated and improved fare collection system on the entire Metropolitan BRT system was not implemented. **The target (yes) was not achieved.** This is expected to be implemented within 4-6 months after the contract addendum with the concessionaire is signed early this year.
- The integration and expansion of the existing Metropolitan BRT fare collection system with the North Extension (including feeder routes) was completed. **The Target (Yes) was not fully achieved.** The integration of the fare collection system was only done for the four stations in operation, but not for the remaining 13 stations because of the terms and conditions of the current fare collection system concession contract. This is subject to the signing of the contract addendum with the fare collection concessionaire, which is expected early this year according to the Bank team's update on February 10, 2025. Once signed, the installation of fare collection equipment at the 13 stations is expected to be completed and operational within 4-6 months.
- 12 percent of personalized smart cards of total active smart cards for the Metropolitan BRT system was achieved. **The target of 25 percent was not achieved.**

The Project did not deliver the following outputs by the project closing date:

- The pre-operational plan was finalized with delay after the project closing date;
- The new BRT infrastructure built under the project was not transferred to the ATU;
- 13 out of the 17 stations built under the project were not open for the operation. According to the Bank team (February 10, 2025), the contract addendum with the fair collection concessionaire is expected to be signed early this year and the remaining stations are expected to be opened within 4-6 months afterwards.

The ICR also reported on additional outputs not covered by the RF and hence without target values:



- “A GAP (Gender Action Plan) was prepared as part of Subcomponent 1b to guide the implementation of the activities. Adhering to violence prevention environmental design criteria, particularly at stations, pedestrian bridges, and *Terminal Chimpu Ocllo*, the Project incorporated features such as closed-circuit television (CCTV) systems, glass elevators, and open corridors to ensure safe mobility for women” (ICR, p. 10, para 30).
- “in the absence of the new pre-operational plan, the ATU allocated 40 buses from the existing fleet of approximately 300 buses operating in the trunk BRT system. This bus redistribution has affected the level of service, resulting in longer bus intervals and, consequently, longer waiting times for the routes from which the 40 buses were redistributed” (ICR, p. 8, para 20).

Outcomes

The above listed outputs lead to the following outcomes:

- 19.75 minutes travel time between Terminal Naranjal and Los Incas bus station, which is three bus stops before Terminal Chimpu Ocllo (ICR, p. 5, Figure 3). **The target of 17 minutes of travel time for public transport users between *Terminal Chimpu Ocllo* and *Terminal Naranjal* was not achieved** because Terminal Chimpu Ocllo and 13 other bus stations were not open for operation by the project closing date. The target was achieved for 80.35 percent with one terminal and 4 out of 13 bus stations opened. The team informed IEG (January 15, 2025) that Terminal Chimpu Ocllo was open on December 21, 2024. Please refer to the above paragraph about the anticipated opening of the remaining bus stations. The ICR predicts that the situation may worsen as the ATU starts operating the rest of the infrastructure if new buses are not added to the fleet. (ICR, p. 8, para 20).
- 24,000 passenger trips occur per day in the Metropolitan BRT North Extension. **The target of 60,000 passenger trips per day was not achieved.**
- Low-income passengers represent 43 percent of total validations entering the northern terminals of the Metropolitan BRT system. **The target of 42 percent was slightly exceeded** (by 2.38 percent), although the data was collected only at four out of the 13 bus stations which were in operation.
- Women passengers represent 48 percent of total validations per day on the Metropolitan BRT North Extension (feeder and trunk buses) based on the data collected at the four stations in operation. **The target of 49 percent was almost achieved.**
- 3 percent of women passengers of total surveyed women at the four stations in operation reported shifting from informal transport modes to the Metropolitan BRT North Extension. **The target of 10 percent was not achieved.** The ICR attributes this low achievement in the modal shift for women passengers to the low number of stations (only four out of 17) in operation. The ICR, however, highlights once the remaining stations become operational, the target could be achieved because the measures to promote a modal shift among women passengers (e.g., CCTV cameras, increased safety, and time saved) were implemented. “The gender analysis indicated that limited BRT coverage was a significant constraint compared to informal modes like *combis*, which, despite safety issues, offered greater coverage and met the unmet demand, particularly for low-income women. Women mentioned they would use the BRT more if it had better coverage” (ICR, p. 11, para 30). With the opening of the remaining 13 stations, the coverage would significantly expand.
- 77 percent of surveyed users expressed their satisfaction with the service in the northern BRT extension (coverage, reliability, safety, personal security). **The target of 65 percent was exceeded**, although the data was collected at the four stations in operation.



- 20 percent increase in women passengers who expressed their satisfaction with service in terms of safety and security. **The target of 10 percent was exceeded**, although the data was collected at the four stations in operation.
- Women employed in the Metropolitan BRT (Percentage). **No data was reported in the ICR. The target of 20 percent cannot be considered as achieved.**

The ICR reported additional results which were not covered by the results framework and hence did not have target values. Those include the following:

- Currently, passengers spend an average of 32.07 minutes in the BRT. This has increased by 4 percent to 33.31 minutes for those accessing the system in the North.
- Regarding the waiting time at stations, 53 percent of users surveyed wait between 5 and 15 minutes to take the bus, and 44 percent wait more than 15 minutes on average.
- Most BRT users (81 percent of those surveyed) have the perception that the BRT is safe from robbery and theft.
- Out of all surveyed women and elderly people, 79 percent of women and 76 percent of the elderly have the perception that the BRT is safe from robbery and theft.
- 22 percent of women, compared to 12 percent of men, find the service very unsafe regarding harassment. Women view aspects such as personal accidents, traffic incidents, and service facilities 2 to 6 percentage points more negatively than men.
- 82 percent of the respondents consider the BRT better or much better than other transport services.

The Efficacy for Objective 1 is rated as Modest. The project did not achieve most of its outcome indicator targets. While the project exceeded its two outcome targets related to the satisfaction rate and ratio of low-income passengers, and almost achieved the target of women passengers using the BRT North Extension, the assessment was done based on the data collected only for less than a quarter of stations in operation. In the meantime, the key outcomes related to urban mobility – travel time and daily ridership - were not achieved.

Rating
Modest

OBJECTIVE 2

Objective

To improve accessibility to jobs in the area of influence of the Metropolitan BRT North Extension.

Rationale

The TOC for this objective as presented in the PAD (p. 13) and the ICR (p.2, figure 2) is that the activities, outputs delivered and outcomes achieved under Objective 1 would result into the outcome of improved accessibility to jobs in the project influence area as measured by the average number of jobs reachable by public transportation within a 60-minute, one-way commute in the area of influence of the Metropolitan BRT North. The assumptions are that no external factors would cause a decline in the availability of job



opportunities in the project area and demand for jobs from low-income residents in the Northern Lima would remain at the same level as before the project.

Outcome

- 198,106 jobs on average are reachable by public transportation within a 60-minute, one-way commute in the area of influence of the Metropolitan BRT North Extension. This indicator measures the access to jobs by public transport within 60-minute, one-way commute in the area of influence of the whole Metropolitan BRT North Extension (10.2 km). **The target of 165,990 jobs was exceeded** by 19 percent. While this indicator was measured based on the data collected at the four BRT stations in operation because the other 13 stations were not in operation yet, the number of jobs as estimated by the project team would be around 206,123 once the remaining 13 stations are to become operational.

The ICR reported an additional outcome which was not covered by the results framework and hence did not have a target:

- 51 percent of survey respondents believed that the system would reduce their travel time to regular destinations such as workplaces, hospitals, clinics, and educational institutions.

The Efficacy for Objective 2 is rated as Substantial with moderate shortcomings because the outcome target was exceeded based on the data reported for the four stations only in operation. The indicator was used to monitor access to potential jobs rather than the project’s direct contribution to the creation of jobs.

Rating
Substantial

OVERALL EFFICACY

Rationale

Objective 1 is rated Modest and Objective 2 is rated Substantial with moderate shortcomings, resulting in an Overall Efficacy rating of Modest.

Overall Efficacy Rating
Modest

Primary Reason
Low achievement

5. Efficiency

Economic Efficiency

The ICR used the same methodology for a cost-benefit analysis (CBA) to assess the economic efficiency of the project at closing as the one used at appraisal. At appraisal, the CBA compared likely outcomes with and



without the project and calculated the net present value (NPV) of estimated costs and benefits and the economic internal rate of return (EIRR). The economic costs included capital costs during the construction phase and operation and maintenance (O&M) during the operational phase. The project’s quantifiable economic benefits included travel-time savings; savings in vehicle operating costs (VOC) changing from traditional modes of transport to BRT buses; and greenhouse gas (GHG) and pollutant emissions reductions. The proposed project was also expected to yield non-quantified benefits such as reduced accidents and increased accessibility for users with disabilities. The CBA results produced an NPV of US\$75.4 million at a 6 percent discount rate and an EIRR of 11.52 percent for a 20-year evaluation period. A sensitivity analysis was carried out and considered the combined impact of lower demand (20 percent decline) and higher investment costs (20 percent increase), and still produced a positive NPV of US\$46.3 million and EIRR of 9.06 percent.

The ex-post CBA showed that the project achieved an EIRR of 18.6 percent and an NPV of US\$56 million at a 6 percent discount rate. The ICR explains the changes in NPV and IRR values at completion stage with respect to appraisal because of an increase in the construction period and actual civil work costs being lower than estimated at appraisal (given a lower price offered by the contractor). As the number of passengers for the Extension does not meet the original target (since only four out of 17 stations are in operation), benefits from passengers changing modes are less than expected, and the main source of benefits is the reduction in public transit O&M costs given that the overall system is more efficient.

Implementation and Administrative Efficiency

At closing, the project had a minor cost increase – from US\$123.0 million to US\$123.1 million and was completed with a 15-month delay. Almost all activities were implemented by the project closing date, except for the activities (i.e., three activities under Sub-component 1b) which were affected by the terms of the concerned concession contracts signed before the approval of this project. The project experienced implementation delays related to the removal of the utilities interferences which resulted in the suspension of civil works and their subsequent cost increase, though the works were successfully completed by the project closing date. The final contract price increased by 20 percent, which is by the exact same amount that the contract had been awarded lower than the price estimate at appraisal. The project also faced delays in financial management activities and the preparation of the pre-operational plan which was finalized after the closing date. Redistribution of the buses to accommodate the system extension resulted in longer waiting times and intervals on other BRT routes. 13 stations out of 17 stations were not operational at the project closing time, but are expected to become operational in the next 4-6 months after the signing of the addendum to the respective concession contract.

The Efficiency is rated as Substantial because the project was completed with efficiency at the EIRR higher than estimated at appraisal and with some delayed implementation and most of activities, except for the three ones, completed by the closing date without project cost- overrun.

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 (%)
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Appraisal	✓	11.50	82.50 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	18.60	74.00 <input type="checkbox"/> Not Applicable

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

6. Outcome

The Relevance of the PDO to the Government strategy and the current Bank strategy is rated as High, Overall Efficacy is rated as Modest, and Efficiency was rated as Substantial. Overall **Outcome** is, thus, **Moderately Unsatisfactory**.

a. Outcome Rating

Moderately Unsatisfactory

7. Risk to Development Outcome

Institutional risk. The lack of effective coordination between the MML and ATU was the main factor adversely affecting the timely preparation of (i) an operational plan for the integration of the BRT North Extension into the existing system and (ii) service quality surveys. Due to its low capacity and high staff turnover, it took the ATU longer than expected to review and approve the terms of references and subsequently both ATU and MML took a longer time in the review and approval of the deliverables from those two activities. According to the ICR (p. 16, para 50), at the time of the project closing, the ATU did not seem to be well prepared to take over the infrastructure and launch its operation due to the ATU's frequent staff turnovers and lack of appreciation of the M&E in informing their decisions about the BRT system operation. The ATU which had been established right before the project approval was neither the implementing agency nor a party to the Legal Agreement for this project, which affected its project ownership and overall interest in the effective communication with the MML and Bank. As the ATU is a new agency which still experiences frequent staff turnover and disruptions in its capacity building, there may be lapses in the operation and management of the North Extension.

Technical risk. The ICR highlights that the ATU has presented a plan to improve the BRT system and update its bus fleet, but is yet to implement this plan. The lack of operational improvements in the BRT system, timely renewal of the bus fleet and ATU's limited vehicle purchase capacity are likely to continue to affect the BRT's ability to deliver the mobility targets as originally planned in this project.

Contractual risks. The terms of the three current concession contracts which had been signed before the approval of this project prevented the Borrower to open the remaining 13 stations, upgrade the scheduling software to the state-of-the-art level and implement the fare collection system in the remaining stations by the project closing date. The contract addendum with the fare collection concessionaire is expected to be signed early this year, and the opening of the remaining stations and the installation of fare collection equipment are expected to be completed and operational at the 13 stations within 4-6 months. The scheduling methodology and software as part of the fare collection system concession are also under review,



with the potential of the associated contract to be amended as the Bank is supporting the government in these efforts under the ongoing trust fund activity. Until these concessions are either renegotiated or expire and new ones are signed, the ATU will not be able to deliver the completion of these three main activities critical for the full operation of the North Extension and achievement of the targets of the associated operational indicators.

Ownership risk. There may be some resistance or even protests from informal transport operators, *combis*, that provide taxi services in the project influence area, when the remaining stations are open and new bus routing and schedules are implemented. While the *combi* services may be cheaper, people prefer to use feeders that are fare-integrated with the Metropolitan BRT system, as they are safer both in terms of traffic and personal security. *Combis* respond to demand, and if the demand is covered by the feeders, they are likely to take other routes.

8. Assessment of Bank Performance

a. Quality-at-Entry

While the preparation of detailed engineering designs had been contracted out before the project, the project preparation began with significant World Bank support. The Bank allocated considerable resources and supported the counterpart in the design of the Project and the delivery of key preparatory documents. The Project was prepared in a record time of seven months, including completion of the feasibility studies, draft bidding documents for Component 1, and safeguards instruments. The Bank also took on board lessons learnt from similar BRT operations in Lima and other cities in the region. Based on those previous experiences, the Bank ensured that the project preparation (i) prioritized relocation of vendors through participatory approaches, (ii) carried out accessibility and other studies to incorporate technical improvements on universal accessibility and gender in the designs, especially for public spaces, and (iii) collected data on baseline traffic fatalities and injuries and conducted a road safety assessment on the engineering designs to cover the safety of all road users and for the management of temporary traffic diversions (ICR, p. 13, para 38). The universal access assessment of the designs of the Metropolitan BRT North Extension carried out by the World Bank ensured that its relevant recommendations were included in the designs and bidding documents, as the original feasibility studies lacked features of comprehensive urban insertion and associated road safety features. Due to the assessment's recommendations, the designs were revised and enhanced with the pedestrian crossings, access to stations, elevators for people with disabilities, pedestrian bridges, appropriate signaling, fare collection infrastructure, and equipment to support people with disabilities during emergencies.

However, the Bank did not give sufficient attention to urban integration at appraisal. The infrastructure integration in the urban environment was eventually limited, without consideration for nonmotorized transport infrastructure. While a preliminary operational assessment was conducted at appraisal, it had some deficiencies and underestimated the need for new buses. The Bank also failed to recognize the risk of the operating agency not timely delivering the pre-operational plan that adversely affected the reorganization of feeder routes and bus scheduling during the first years after the completion of the civil works. Because the ATU which was to take over the management of the BRT system after the project completion was not involved in the project negotiations and was not part of the Loan Agreement, this later created problems during the implementation.



In light of the above discussed major shortcomings during the project preparation which eventually affected the achievement of part of the PDO-level outcomes, **the Bank's Quality-at-Entry is rated as Moderately Unsatisfactory.**

Quality-at-Entry Rating

Moderately Unsatisfactory

b. Quality of supervision

During implementation, the Bank conducted its supervision missions biannually and increased their frequency when critical issues emerged. The team also held biweekly meetings on technical issues and weekly meetings on safeguards, health and safety issues. The Bank team brought in experience from other BRT projects, including expertise in BRT implementation and operation that the Bank had financed, facilitated coordination between the government entities albeit facing significant challenges, ensured the incorporation of universal accessibility and safety features in the designs through a post-construction safety audit, and provided rigorous technical guidance on addressing the social safeguards issues in the compliance with the Bank requirements which the MML had previously dealt with in a different manner. The Bank enhanced its team with a pavement engineering expert to address the quality issues of the construction works and pavement. The Bank also provided Hands-on Expanded Implementation Support (HEIS) to assist the TCU with procurement tasks.

The ICR (p. 19, para 61) refers to the Bank's lack of proactivity in timely recommendations to the MML and ATU in addressing emerging issues. Due to the Bank's imbalanced attention to Subcomponents 1a and 1b, the activities (1b) related to optimization of the Metropolitan BRT operations and services were slipping in their implementation and quality assurance. It was observed that the Bank team increased their efforts in improving the coordination between MML and the ATU in the second half of project implementation, building the ATU's capacity, and increasing the ATU's understanding of the M&E role in monitoring the project performance.

The Bank informed IEG on January 15, 2025, that they continued a proactive engagement and support to the ATU in resolving the remaining issues which prevented the full operationalization of the North Extension, including technical assistance in the management and renegotiations of the terms of the associated concessionaire contracts. Before the closure of this project, the Bank mobilized several trust fund grants to provide technical assistance to the ATU on (i) fleet management software of the BRT system, (ii) integrated evaluation and planning strategy of the BRT system (operator concession, gas center concession, and proposals for next steps), (iii) modernizing strategy of the fare collection system with PPP (fare collection concession), and (iv) user affordability and subsidy study. As a result, there has been some progress in renegotiation of the terms of concessionaire contracts and the addendum with the software the signing of the contract addendum with the fare collection concessionaire, which is expected early this year. Once signed, the installation of fare collection equipment at the 13 stations and opening of the remaining 13 stations are expected to be completed and operational within 4-6 months. The TF-funded activities also help the Bank continue a dialogue about the follow-up project which will either support the renewal of the bus fleet or acquisition of new ones, or another BRT extension.

According to the ICR (p. 16, para 51), the Bank team made a significant effort in collecting the updated data for the Results Framework at the closing time of the project. Throughout implementation, the Bank



would mainly collect the data updates during its meetings with the ATU and MML as no regular M&E updates were submitted in the progress reports.

The Bank's supervision is rated as Moderately Satisfactory due to the strong technical and operational support provided to the project despite the shortcomings.

Overall Bank performance is rated as Moderately Unsatisfactory. The Guidance Manual for the IEG Validators recommends that the rating for overall Bank performance is determined based on the outcome rating when the rating for one dimension is in the satisfactory range (moderately satisfactory or better), and the rating for the other dimension is in the unsatisfactory. Hence, **overall Bank performance in this project is rated as Moderately Unsatisfactory**, given the moderately unsatisfactory rating for the outcome.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Unsatisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

While there are a few redundant intermediate indicators, overall, the results framework had adequate indicators to capture the contribution of the project activities and outputs towards the achievement of the PDO-level outcomes. The institutional arrangements for the M&E implementation were rather complex with several institutions being involved. The MML was designated to collect data with the assistance of Municipal Company for the Support of Strategic Projects (Empresa Municipal de Apoyo a Proyectos Estratégicos, EMAPE) and Protransporte during construction and operation, respectively. EMAPE and Protransporte were expected to collect data on the PDO and intermediate outcome indicators on quarterly, semiannually and annually bases from surveys, BRT system operator, supervision firm, Protransporte's own databases (sexual harassment cases and human resource records), and other sources. The PAD did not discuss the role of ATU in the monitoring and collecting of the data as the infrastructure was to be transferred to the ATU only after the completion of the construction.

b. M&E Implementation

The M&E system was not revised during implementation or restructuring despite the institutional coordination challenges faced and limited information collected on ad hoc basis. Several PDO-level results indicators and operational indicators in the Results Framework were not regularly updated during project implementation. The TCU, however, regularly collected the data on and updated the intermediate results indicators for Subcomponent 1a only. The TCU had an M&E specialist and an occupational health and safety specialist to oversee the GRM throughout the Project and report on construction progress.



Most of these indicators could not be reported until the launch of the BRT extension operation. Lack of coordination between the ATU and TCU also contributed to the lack of regular data collection, review of evaluation methodologies and timely preparation of progress reports. These challenges clearly indicated the need for adjustments to improve the M&E system and institutional arrangements, but no changes were considered and introduced either during the mid-term review or at restructuring. At closing, the limited involvement of the ATU in updating the status of the indicators, in addition to staff turnover at the ATU, led to gaps in information. The World Bank had to request information from the ATU on an ad hoc basis to update the results.

c. M&E Utilization

Due to the ad hoc M&E reporting and lack of the Borrower's understanding of the M&E value in the project performance and implementation, the use of M&E was limited and did not seem to play a role in informing important decisions about changes in the project activities or restructuring. The restructuring missed an opportunity to improve the M&E design and implementation arrangements.

The M&E quality is rated as Modest because of shortcomings in the M&E design, as well as during implementation and utilization.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

All Environmental and Social Standards (ESSs), except ESSs 7 (Indigenous Peoples) and 9 (Financial Intermediaries), were considered relevant in this project. The draft ESIA-S was disclosed on the MML's website on July 25, 2019 and on the World Bank's website on July 27, 2019. The draft Resettlement Action Plan (RAP) was disclosed by the Borrower and the World Bank on August 21, 2019; the Labor Management Procedure (LMP) on August 6, 2019; the Stakeholder Engagement Plan (SEP) and Grievance Redress Mechanism (GRM) on August 21, 2019.

The safeguards risk was rated as Substantial during preparation and implementation, except for October 2023 when it was temporarily upgraded to High because of road incidents occurrence. The following month the risk was downgraded back to Substantial after the progress made in the Road Safety Action Plan developed by the Technical Coordination Unit (TCU). This rating mainly responded to (a) potential risks and impacts across the Project's direct and indirect area of influence in a highly urbanized area, (b) project activities of large scale and with potentially high risks, such as the relocation of more than 3,000 trees, (c) socioeconomic impacts on local businesses and people's livelihoods, and (d) a lack of capacity of the borrower to manage environmental and social risks.

The project safeguards performance was downgraded to Moderately Satisfactory in June 2021, to Moderately Unsatisfactory in December 2021, and to Unsatisfactory in June 2023, mainly because of delays in addressing the safeguards issues during project implementation. The project had five traffic incidents



since the opening of the auxiliary lanes, two of which resulted in fatalities. All incidents were reported following the ESIRT guidelines. The project closed with the Unsatisfactory rating for environmental and social safeguards performance on April 30, 2024. After all, but one issue, were satisfactorily addressed, the safeguards performance rating was upgraded back to moderately satisfactory in August 2024 after the project closing. The World Bank continues closely monitoring the implementation of the actions in the Post-Closure Action Plan (PCAP) related to the installation of green areas which is to be completed by December 2025. There were many safeguards issues that required a lot of internal reporting that at times caused the Bank to slow down its implementation support to the implementation agency.

b. Fiduciary Compliance

Procurement. Procurement was rated Moderately Satisfactory during implementation. Procurement started immediately after the loan effectiveness on June 19, 2020. Main procurement activities, including the tendering of works and supervision for the investment subcomponent (1a), were executed efficiently and within short period of times. Civil works under Subcomponent 1a began within less than a year on April 19, 2021. The TCU, however, experienced frequent turnover of a procurement specialist. The position was often filled with temporary staff which required ongoing trainings, especially for procurement under the World Bank's standards. In addition, the TCU's senior procurement specialist position was never adequately filled with qualified staff. Therefore, the project faced a number of challenges: (a) delays in timely and adequate document filing within the Systematic Tracking of Exchanges in Procurement (STEP) system, which led to occasional gaps in information records, (b) lack of the TCU's notifications to the World Bank about high cost variations in the works and seeking the Bank's clearances, and (c) lack of following World Bank procurement rules for contract awarding in the first years. An example of procurement inefficiency is the four-month delay in contracting the supervision team after the start of works. The Bank provided Hands-on Expanded Implementation Support (HEIS) to assist the TCU team in its continued efforts of improving its STEP skills, procurement and contract management performance.

Financial Management. At appraisal, no significant risks were identified in financial management based on the assessment of the MML as a PIU with qualified staff and previous experience in World Bank-financed projects coordinated with the MEF. In 2023 there were delays in the submissions of project reports and audit findings after a prolonged vacancy of the senior financial management specialist position in the MML, which was unfilled for about 12 months until September 2023. Specifically, the 2022 audit report was nine months late, and the audit report due in June 2023 was not delivered until March 2024. During the closing mission, the pending audit had been completed. While the financial specialist of the TCU prepared financial reports, the PIU did not take responsibility for these reports, as prescribed in the Project Operational Manual. The auditor's opinions on the financial statements were reported as 'Unqualified'. The main recommendations included timely submission of audit reports and interim financial reports to comply with the Legal Agreement. Overall, expenditures were consistently tracked within the Designated Account, which facilitated the effective monitoring of project's expenses throughout implementation.

c. Unintended impacts (Positive or Negative)

Road safety improvement. The original designs for the BRT extension that were financed by the government counterpart did not include any comprehensive urban insertion, road safety features and NMT



infrastructure. The designs were eventually revised and improved under the World Bank guidance to incorporate needed road safety and urban insertion features (e.g., auxiliary roads, their medians, and curbs, ramps, signage, road demarcation, bike lanes, bike stations, and bike racks) to ensure the efficient and safe movement of vulnerable road users and improved connectivity with the NMT infrastructure. This made an impact on the MML (EMAPE) that has started including these considerations in its plans for future improvements of the entire Metropolitan BRT corridor.

d. Other

Private sector solutions. One of the major impacts that were made by the Project but not reflected in the Results Framework was that the ATU and private operators became aware of private sector solutions to enhance the sustainability and operation of the BRT system in the long term. Since 2008, *Protransporte* which was absorbed by the ATU had signed six public-private partnership contracts for the BRT: four with transport operators, one for the supply of natural gas, and one for the automatic fare collection (AFC) system. By the closing of this project, it became clear that it was important for the ATU to improve service and system operations when renewing these concession contracts, and increasing and renewing the bus fleet to meet the growing demand for the service. As part of the Project, the World Bank supported technical assistance activities on business models for electric bus integration, which advised the ATU and private operators on commercial financing options to renew their fleet through electric bus procurement. (ICR, p. 10, para 33).

Gender Impact. The road user satisfaction survey reported a 20 percent increase in women's satisfaction with safety and security on the BRT North Extension. That is mainly due to the integration in the designs and implementation of a number of safety features in the BRT North Extension, such as closed-circuit television (CCTV) systems, glass elevators, and open corridors to prevent violence at stations, pedestrian bridges and Terminals. Moreover, the ATU approved a new protocol to prevent and respond to sexual harassment incidents in the BRT. This achievement is important for the safety and security of female passengers. The gender study conducted during project preparation showed that about 30 percent of female residents in Lima reported sexual harassment on public transport (ICR, p. 11, footnote 11). The same study also found that the limited BRT coverage had been a major constraint for women's mobility compared to informal modes like *combis*, which, despite safety issues, offered a larger coverage and met the unmet demand, particularly for low-income women. Women stated that they would use the BRT more if it had a better coverage.

In addition, the project also implemented measures to address gender-based violence (GBV) and sexual harassment during construction. The Project incorporated contractual obligations on sexual exploitation and abuse (SEA) mitigation through signing of the Code of Conduct (CoC) by all contractor workers and regular training on their obligations under the CoC. The project's grievance redress mechanism (GRM) offered various communication channels for SEA and sexual harassment survivors to report incidents on a confidential basis. The PIU and the TCU also received training on the identification and management of GBV risks in the Project.

11. Ratings



Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Unsatisfactory	Moderately Unsatisfactory	
Bank Performance	Moderately Unsatisfactory	Moderately Unsatisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	Substantial	

12. Lessons

The following lessons have been derived and summarized from the ICR with a few additions by IEG following the meeting with the Bank team (January 15, 2025):

- If the operation-related interventions are not built into the design of an infrastructure project, the project may not be able to deliver on its outcome targets associated with the operation of that infrastructure.** The original design of this Lima BRT North Extension project did not include activities to improve the auxiliary roads with universal accessibility and safety features, support the urban integration and renewal of the bus fleet, which are essential for the operation of the newly created BRT infrastructure and mobility of the beneficiaries. The North Extension capacity available by the end of the project adversely affected the project’s ability to deliver on improved mobility targets.
- If the agency responsible for the operation of the assets is not involved from the start of the project, the project may face difficulties in its implementation.** The ATU which was created before the project approval did not have the adequate capacity to implement the project. As a result, the MML was assigned to be an implementing agency and was part of the Legal Agreement. As the ATU was not part of the Loan Agreement, had no legal responsibilities in this project and experienced frequent staff turnovers, it was challenging for the Bank to build a strong coordination and team spirit between the MML and the ATU. While in the last year of the project implementation, the ATU finally got more involved, the time was missed for the timely delivery of the operational plan and timely decisions about the renewal of the bus fleet and other critical operation related activities.
- Lack of financial incentives in the project design to motivate the implementing agency to carry out critical institutional reforms (e.g., changes in the management practices) may create delays in implementation.** There were substantial delays in the implementation of studies related to operational activities of the BRT in this project, which were essential for the achievement of several operational targets. The ATU was created in 2018 under the Ministry and had a national status of the agency to manage and operate the Metropolitan BRT system. However, the Protransporte (*Instituto Metropolitano Pro Transporte de Lima*), the previous agency which was in charge of the BRT system management and was of the municipal status, did not transfer its responsibilities to the ATU until September 2020. Because the ATU was not legally part of this project, it also contributed to its lower interest and ownership in the implementation of those studies. Either relevant legal covenants or performance-based conditions should have been considered in the design of this project to



mitigate the risk of delayed operational activities, the recommendations or actions of which would have to be implemented by the ATU.

- **If critical safeguards activities (e.g., relocation of utilities, businesses or people) are not completed by the time of the project site handover to the contractor, this may delay the execution of civil works.** This is often the case in many infrastructure projects where such preparatory or safeguards related activities have not been completed by the time of the contract award or site handover. This project again demonstrated the same issue where the relocation of utilities was not completed on time it resulted in the suspension of the civil works in Subcomponent 1a.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

Overall, the ICR is well written and candid in its discussion of achievements and shortcomings. While the ICR's ToC included a limited number of activities, it provides a comprehensive and clear logical chain results.. It presents candid discussions of (i) shortcomings of administrative efficiency of the project, (ii) factors affecting preparation and implementation, (iii) shortcomings of the Bank's performance, and (iv) specific and useful lessons that were drawn from the experience of this project. The discussions of the factors and lessons are useful not only for an urban transport project in this country but for any infrastructure projects globally.

The ICR has a few minor shortcomings some of which are (i) the same date for the planned and actual dates of the project closing in the datasheet, while the original project closing date was January 31, 2023, and the actual date was April 30, 2024; (ii) limited number of inputs/interventions in the ToC; (iii) lack of discussion about the mid-term review of this project and its role in the decisions about the project's further implementation, and (iv) limited explanation about the factors influencing the ATU's weak involvement in this project during its implementation, which was better explained by the team during the interview with the IEG. **The quality of the ICR is rated as Substantial.**

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

