



1. Project Data

Project ID P106390	Project Name BR SP METRO LINE 4 (PHASE 2)	
Country Brazil	Practice Area(Lead) Transport	
L/C/TF Number(s) COFN-C1230,IBRD-78690	Closing Date (Original) 30-Jun-2014	Total Project Cost (USD) 130,000,000.00
Bank Approval Date 04-May-2010	Closing Date (Actual) 28-Feb-2018	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	130,000,000.00	0.00
Revised Commitment	130,000,000.00	0.00
Actual	130,000,000.00	0.00

Prepared by Kavita Mathur	Reviewed by Elisabeth Goller	ICR Review Coordinator Ramachandra Jammi	Group IEGSD (Unit 4)
-------------------------------------	--	--	--------------------------------

2. Project Objectives and Components

a. Objectives

The Project Development Objectives (PDOs) as stated in the Loan Agreement (page 6) were:

(a) to improve the quality of service provided to the urban transport users in the area of influence of the new Line 4 stations (São Paulo-Morumbi, Fradique Coutinho, Oscar Freire, Higienópolis-Mackenzie and Vila Sônia), and

(b) to facilitate the integration between metro and bus at those stations.



According to the Project Appraisal Document (PAD para 18), the PDOs were to be achieved by (a) reducing travel times between origins and destinations within the area of influence of those metro stations, and (b) by guaranteeing a smooth integration between the metro and other modes, particularly bus transport. PDO achievement was to be measured by the travel plus average waiting times between pairs of stations during peak hours and the percentage of the five new stations integrated with bus lines.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

The World Bank provided support to the Sao Paulo Metro Line 4 in two phases. The Metro Line 4 Phase 1 Project (P051696, loan amount of US\$301.4 million) was approved in 2002 and closed in 2010. It financed the track, transfer stations and systems for Metro Line 4. This project (Phase 2) had the following two components:

Component A: Infrastructure and Equipment Investment (estimated cost US\$471.4 million (these figures do not include physical contingencies of US\$70.9 million and price contingencies US\$25.6 million), estimated actual cost 526.2 million. This component was expected to finance: (a) completion of the works of the four stations of Line 4 initiated during the Line 4 Phase 1 project; (b) construction of one new station (Vila Sonia) and its access tunnel of about 1.5 km extension; (c) construction of additional facilities at the Vila Sonia yard; and (d) acquisition and installation of escalators, platform doors, and signaling and telecommunication systems necessary to operate these stations (PAD para 19).

Component B: Technical Assistance (estimated cost of US\$32.7 million (excludes contingencies), estimated actual cost US\$33.5 million). The provision of technical assistance was for: (a) the management oversight and supervision of carrying out Component A of the project; and (b) carrying out specific studies or assessments required during the execution of the project, including among other things a study for estimation of carbon emissions reduction due to the implementation of Line 4 (PAD para 19).

Under Phase 1, the private sector concessionaire Via Quatro, contracted to operate Line 4, provided the trains and signaling systems. The same concessionaire was expected to operate the line extension under this project and would purchase 14 additional trains and the signaling systems (PAD para 19).

The components were not revised.



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

Project Costs: The total actual project cost is estimated to be US\$629.1 million (ICR, page 11 Table 2 and Annex 3), which is 4.7 percent higher than the appraisal estimate with contingencies. The actual cost is still an estimate because some works such as the completion of the Vila Sonia station and other civil works are still ongoing.

Financing: The original commitment for the project was for an IBRD Loan of US\$130 million. In addition, the Bank committed an additional US\$210 million to this project under the ongoing Sao Paulo Metro Line 5 Project (P116170). This was because the Borrower, facing fiscal constraints, was unable to finance part of its expected contribution. Total Bank financing for the project, therefore, is expected to be US\$340 million or 162 percent of the appraisal estimate.

There was joint co-financing from the Japan Bank for International Cooperation (JBIC) of US\$130 million, as estimated at appraisal.

Borrower Contribution: The actual borrower contribution was US\$159.1 million, significantly lower than the appraisal estimate of US\$340.9 million.

Dates and Project Restructurings: The project closed on February 28, 2018, almost four years after the original closing date of June 30, 2014. There were two level 2 restructurings:

First restructuring (approved on May 27, 2014). This extended the closing date by 22 months from June 2014 to April 2016 because of procurement and implementation delays in the original civil works contracts.

Second restructuring (approved on April 13, 2016). This restructuring further extended the closing date by 22 months to February 2018 to permit completion of the civil works. *Inter alia*, the delay was due to a contractual dispute, which resulted in the cancellation of the original civil works contracts in 2015 and their rebidding. The new contracts were awarded in May 2016 and signed in July 2016 (ICR para 23).

This restructuring also amended the outcome targets for travel and transfer times between pairs of stations to account for the longer implementation period. The targets are expected to be reached once Vila Sonia Station is completed under Metro Line 5 Project. In addition, the targets for annual passenger boarding volumes were adjusted based on the new information on travel demand and patterns and taking into account the impact of the opening of Metro Line 5 on the demand of Metro Line 4 (Restructuring paper page 4).

Since no changes took place in the project objectives, the outcome targets are expected to be achieved under the Sao Paulo Metro Line 5 Project by 2020, and the project scope was not altered, no split evaluation will be undertaken.



3. Relevance of Objectives

Rationale

Alignment with country's priorities. At appraisal, the Sao Paulo Metropolitan Region (SPMR) had been experiencing rapid urbanization that resulted in uncontrolled urban sprawl, with associated traffic congestion, accidents and increased travel distances. Moreover, low-income households were penalized disproportionately in terms of travel distances by the lack of adequate public transport. The Sao Paulo Metro Line 4 was a priority within the Integrated Urban Transport Plan (PITU) developed in the early 1990s. The line would: (a) connect all three existing metro lines (Lines 1, 2, 3) and Line 5 (under construction), and to move from the existing radial configuration to a network configuration; (b) connect three *Companhia Paulista de Trens Metropolitanos* (CPTM) suburban rail lines (its West line and two at Luz station), (c) integrate with the bus network; and (d) provide access to the low-income population who live in the municipalities surrounding the Vila Sonia station and bus terminal. The project objectives were consistent with the PITU, which set out an urban transport, land use and air quality strategy. At the end of the Project, the whole metro rail network was expected to be interconnected, thereby facilitating access to most areas of the SPMR (PAD page 5). The objectives were also relevant to the Sao Paulo 2014 Strategic Master Plan, which promoted sustainable urban mobility, and included actions such as the introduction of minimum parking requirements, the promotion of a biking culture, and investments in mass transit.

Alignment with Bank's strategy. The objectives were relevant to the World Bank Group's Country Partnership Strategy for Brazil, both at appraisal and completion. At appraisal, they were consistent with the CPS for the period 2008–2011, which identified “insufficient quality and inefficient operation of transport system” as an obstacle for improving the competitiveness and investment climate in Brazil. According to the CPS, improving multi-modal transport routes and logistics, promoting more efficient service delivery models, and creating jobs in cities were critical to advancing the growth agenda.

The project development objectives remained relevant to the FY18-23 World Bank's Country Partnership Framework (CPF) at closure, which focused on (a) the provision of more inclusive and sustainable urban services, and (b) the mobilization of greater investment in infrastructure to improve services.

Rating

High

4. Achievement of Objectives (Efficacy)

Objective 1 Objective



Improve the quality of service provided to the urban transport users in the area of influence of the new Line 4 stations (Sao Paulo-Morumbi, Fradique Coutinho, Oscar Freire, Higienópolis-Mackenzie and Vila Sonia).

Rationale

The project's theory of change indicates that the project investments, such as additional metro stations, signaling and telecommunication systems and equipment, train operation technology, bus terminals, platform screen doors, and escalators, were expected to shorten transfer and travel times and hence improve the quality of service for urban transport users.

Outputs

- The Fradique Coutinho, Higienopolis-Mackenzie, Oscar Freire, and Sao Paulo-Morumbi stations, including escalators and platform doors, were largely completed and became operational by end-October 2018 (completion rate was 94.6 percent). The Oscar Freire station's "*Clinicas*" entrance gate and the bus terminal at the Sao Paulo Morumbi station were expected to be completed by December 2018 .
- The Vila Sonia station was 29 percent completed by September 2018, the tunnel was 77 percent completed, and the yard was 81 percent completed. They are all expected to be completed under Metro Line 5 Project (P116170) in 2020.
- The completion rate of the signaling and telecommunications systems was about 68 percent as of September 2018, compared to the revised target of 73 percent. The original target of 100 percent is expected to be achieved under the Line 5 Project (P116170) once Vila Sonia station is completed.
- The Fradique Coutinho station is equipped with parking facilities for bicycles (ICR para 31).

Outcomes

The project investments have improved and are expected to continue improving the quality of service offered to public transport users in the area of influence of Line 4.

- The ICR reports (para 29) that the travel and average waiting times during peak hours for Phase 2 of the Metro Line 4 Project (which was operational in 2018) were reduced from 55 minutes at appraisal to 32 minutes, exceeding the revised target of 40 minutes, thereby resulting in considerable time savings for urban transport users. A further reduction to 22 minutes is expected once the Vila Sonia station is completed (the original target was 20 minutes).



- The travel and average waiting times for the segments Fradique Coutinho-Luz and Higienopolis-Mackenzie-Luz achieved their revised targets of 11 minutes and 6 minutes, respectively (the original targets were 10 minutes and 5 minutes respectively).
- The speed of boarding and the regularity of train arrivals was improved with the introduction of latest train operation technology (Communication Based Train Control). Platform screen doors that open automatically when the train arrives at the station enhanced passenger security. Information systems informing passengers about train capacity and free spaces further improved service quality. The installation of elevators assisted accessibility for the disabled and elderly. The entire line is equipped with cellular reception.
- Satisfaction surveys showed that commuters satisfaction increased from 90 percent in October 2017 to 93.6 percent in April 2018 for the Phase 2 stations (Oscar Freire and Higienopolis). According to the April 2018 survey, the two main favorable qualities of Line 4 compared to the other lines were the frequency and reliability of trips and the comfort of trains (ICR para 31).
- Accessibility to jobs and urban amenities has also increased for residents in the area of influence of the newly opened stations. According to the above-mentioned user satisfaction survey (April 2018) about 80 percent of users of Line 4 travelled to and from work or school, with up to 86 percent and 71 percent of those boarding or alighting in the Phase 2 stations (Fradique Coutinho and Higienopolis-Mackenzie, respectively). According to the accessibility analysis carried out for Line 4, the estimated mobility benefits are higher for low- and middle-income areas in the vicinity of the Vila Sonia station than for the areas in richer neighborhoods around the stations of Oscar Freire and Higienopolis-Mackenzie (ICR para 32).

As shown under objective 2 below, inter-modal integration also enhanced service quality.

Rating
Substantial

Objective 2
Objective

Facilitate the integration between metro and bus at the new Line 4 stations.

Rationale



The project's theory of change indicates that activities such as the construction of bus terminals within or near metro stations and the design of stations facilitating the ease of transfer to and from buses were expected to facilitate integration between the metro and buses.

Outputs

- The bus terminal at the Sao Paulo-Morumbi metro station was 97.6 percent completed at project completion and was expected to be operational by December 2018 (ICR para 33).
- The bus terminal at the Vila Sônia station is scheduled for completion in June 2020 under the Line 5 project. Once completed, it would allow for passengers to transfer to both municipal and inter-municipal buses.
- The installation of bicycle parking facilities at the Fradique Coutinho station

The ICR does not describe any other activities that would facilitate inter-modal integration.

Outcomes

The ICR reports that by project closure all operating stations were physically integrated with bus services nearby or by direct connection at a bus terminal (para 33). The revised target of 91 percent for the indicator measuring the “percentage of the five new stations integrated with bus lines” was achieved. The original target of 100 percent is expected to be reached in 2020 when the Vila Sonia station is completed (ICR, annex 1).

The ICR reports (para 34) that because of the integration between buses and the metro, the forecast demand for the newly operating stations has materialized. The total annual passenger boarding at the Higienopolis/Mackenzie station was 10 million compared to a revised target of 9.9 million (the original target was 11.3 million). At the Oscar Freire station, the total annual passenger boarding was 7.2 million, in line with the revised target (the original target was 10.8 million). The total annual passenger boarding at Fradique Coutinho station was 3.8 million (October 2018) against the revised targeted of 3.9 million (the original target was 10.6 million). At the Sao Paulo-Morumbi station, in the first week of operation, the daily boarding was 27,000, which indicated that the revised annual demand target of 8.5 million is likely to be achieved (the original target was 17.1 million) (ICR, annex 1).

Following the inauguration of the Higienopolis-Mackenzie and Oscar Freire stations, the number of bus passengers in the adjacent bus corridor (*Campo-Limpo-Rebouças-Centro* corridor) fell by 7.4 percent (August 2018, year-on-year). For the same period, the demand on Line 4 increased by 12 percent. Overall 71.4 percent of passengers of Line 4 transferred from another metro line/mode while the remaining 28.6 percent were new passengers.



The integrated tariff policy (not part of the project) facilitated integration between the metro and bus services. In 2006, the “*Bilhete Unico*” (single ticket) was implemented in the SPMR, allowing for free transfers between the metro, municipal buses, and some inter-municipal buses by way of special farecards. This has significantly increased affordability for the low-income households living in the area of influence of the stations (eastern and northern peripheries of the SPMR) (ICR para 50).

Rating
Substantial

Rationale

The two project development objectives were substantially achieved by November 2018 in line with the revised targets. The original targets are expected to be substantially achieved by 2020. The project has significantly improved and is expected to continue to improve the quality of service for the urban transport users in the area of influence of the new Line 4 stations. Physical integration between the bus and the metro has materialized and further enhancement are expected with the opening of the bus terminals at Vila Sonia and Sao Paulo-Morumbi stations. Integration at the new stations was facilitated by tariff integration, which provides passengers with a single ticket and integrated fares, hence making transfers between modes more convenient and affordable.

Overall Efficacy Rating
Substantial

5. Efficiency

Economic Analysis. At appraisal, economic evaluations for Line 4 as a whole (Phase 1 and Phase 2) and for the incremental investments under Phase 2 were undertaken. The estimated Economic Internal Rate of Return (EIRR) for the project as a whole was 15.6 percent and the Net Present Value (NPV) was US\$824.7 million (at a discount rate of 10 percent). The EIRR for the incremental investments of Phase 2 was 7.6 percent and the NPV was US\$46.8 million using a discount rate of 7 percent (PAD page 52 and ICR para 40).

The PAD explains that the difference in the EIRR between the full project and the incremental investments of Phase 2 are due to (i) the scope of Phase 2, which consisted of adding four intermediate stations and one new terminal station to the operational Line 4, and (ii) the benefits evaluation approach that resulted in the attribution of no travel time savings to existing users of Line 4. The PAD, however, argues that it would be inappropriate to evaluate Phase 2 alone because a large share of its most significant benefits are already attributed to Phase 1 (PAD, annex 9, para 23).



At the 2016 restructuring, the economic analysis nevertheless focused only on the incremental investments of Phase 2. The analysis considered the updated Origin Destination Matrix based on the 2007 Origin Destination Survey, and the impact of opening Line 5 on the demand of the new Line 4 stations (ICR, Annex 4, para 2). The analysis yielded an EIRR of 9.4 percent and an NPV of US\$439.1 million, using a discount rate of 6 percent (ICR para 40).

At closure, the same methodology used at restructuring was adopted with minimal modifications, focusing on the incremental investments of Phase 2 only. This resulted in an EIRR of 8.6 percent, higher than the appraisal estimate of 7.6 percent, but lower than the restructuring estimate of 9.4 percent. The NPV was estimated at US\$140.6 million.

The ICR justifies this approach by the fact that “the entire project (Phases 1 and 2) was not completed”. It mentions that “the full exercise should be carried out at closing of the Line 5 Project in 2010” (annex 4, para 3). Unlike the PAD, the ICR does not acknowledge the shortcoming stemming from a focus on incremental investments only. There is no sensitivity analysis. Finally, the ICR does not elaborate on the impact of using different discount rates (ex-ante, at restructuring and ex-post) on the project's NPV.

Administrative Efficiency. The project incurred a 4.7 percent cost overrun, including contingencies. According to the ICR (para. 39), the total project cost of US\$629 million is in line with benchmarks and lower than similar complex infrastructure projects, for example subway extensions in New York. Administrative efficiency was, nonetheless, negatively affected by: (i) the delay of almost four years in the closing date, which implied a high opportunity cost; (ii) despite the delay, several activities were still incomplete at closure; (iii) penalties payable to the operating concessionaire due to the significant delays in finalizing stations still under negotiation at ICR completion; and (iv) negative public opinion and a lack of trust in the public transport system, which might prevent potential future passengers from using it (ICR, para 42).

Late completion reflected both procurement and implementation delays. The former are discussed in section 10 b below. The main causes of implementation delays were: (i) delays in finalizing the detailed designs, (ii) design modifications because of unforeseen scope changes and lengthy processes to approve these modifications, (iii) unexpected construction site issues, including contaminated soils and water intrusion, (iv) delays in receiving the authorization for traffic management around construction sites, (v) contractual cash flow and management issues, (vi) the need to rebid the civil works contracts in the highly sensitive context of the “*Lava Jato*” (a massive corruption investigation, which banned many large construction companies from bidding and created an environment of increased controls and oversight), (vii) difficulties faced by the new civil works contractor in obtaining financial guarantees and sustaining adequate cash flow, and (viii) contractual disputes with the concessionaire operating Metro Line 4 (ICR paras 23, 52-54).

Overall, efficiency is rated **modest**.

Efficiency Rating



Modest

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	✓	7.60	78.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	8.60	84.00 <input type="checkbox"/> Not Applicable

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

6. Outcome

The project objectives were fully aligned with the Bank's strategy and country priorities, and the relevance of objectives is rated high. Project efficacy is rated substantial. The two project development objectives were substantially achieved by November 2018 and are likely to be fully achieved by 2020. The Phase 2 project has significantly improved the quality of service for the urban transport users in the area of influence of the new Line 4 stations. Bus and metro integration has been achieved and will continue to be improved with the opening of the bus terminals at Vila Sônia and Sao Paulo-Morumbi stations. Supported by the unified tariff, the integration of the new stations is expected to continue benefiting the commuters including low-income residents. Project efficiency is rated as modest because of shortcomings in the economic analysis and significant administrative inefficiencies. Overall, project development outcome is rated **moderately satisfactory**.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

Macro Shocks. The ICR reports (para 73) that while the project is not completely insulated from macroeconomic shocks, this risk is deemed to be low since stronger financial guarantees were required (10 percent of the total value of the contract available at signing).

City Commitment. The city government is fully committed towards promoting sustainable urban mobility. This is reflected in its 16-year Strategic Master Plan developed in 2014, which included investments in mass transit, some of which have already materialized (ICR, para 73).



Operations and Maintenance (O&M). The four completed stations had been transferred to the concessionaire Via Quatro for operation until 2036. The ICR reports (para 73) that Via Quatro has performed well in the O&M of the Phase 1 of Metro Line 4. Recently, Via Quatro was awarded a 20-year contract for the operation of Line 5. The ICR reports (para 73) that there is no reason to believe that the contract would be terminated earlier. The O&M risk is assessed as low.

Ridership. Ridership is facilitated by both physical and tariff integration. The latter has been solidly institutionalized during the last 10 years, which ensures multimodal integration at the Line 4 Phase 2 stations (ICR para 73). Because of the successful integration, the demand at newly operating stations has materialized as planned (ICR para 34).

Completion of civil works for Vila Sonia metro station. The civil works for the station, its bus terminal, tunnel, and yard are on track to be achieved by 2020 under the Line 5 project (ICR para 73).

8. Assessment of Bank Performance

a. Quality-at-Entry

The project was a continuation of the previous Sao Paulo Metro Line 4 Project (Phase 1), and the Bank Team benefited from its long-term engagement in the SPMR and the experience under the Phase 1 Project and other World Bank-financed rail projects.

Safeguards identification was satisfactory as the project was classified as Environmental Category A, and all relevant safeguards policies were triggered and the necessary safeguard instruments were prepared.

The PAD correctly assessed the overall risk associated with project implementation as moderate and identified key risks that materialized, such as problems with counterpart funds and litigation during the procurement phase. While delays in the completion of the detailed designs could have been flagged as a potential risk, the Bank team could not have anticipated the large impacts of these delays on the project, mainly caused by the sensitive “*Lava Jato*” environment. The Bank team could also not have anticipated the need to cancel the original civil works contracts (ICR, para 69).

The project implementation arrangements were adequate and followed the same arrangements as in Phase 1. The implementation agency was the Sao Paulo Metro and it used the same Project Management Unit (PMUs) as the Metro Line 4 Phase 1 project (PAD page 33). The PMU was supported by the Project Management Oversight Consultants (PMOC) who were in charge of providing technical support in areas such as engineering, procurement, environment and financial management.

The key performance indicators were adequate; however, there were minor shortcomings in the M&E design pointed out in section 9.



Quality-at-Entry Rating

Satisfactory

b. Quality of supervision

By December 2013, the Bank team had identified the slowdown of works during the first years of implementation and its causes (see Section 5 above). The Bank team tried to mediate a solution between Sao Paulo Metro and the initial civil works contractor before the cancelation of the two civil works contracts. Before the termination of the original contracts, the Bank conducted a due diligence process to ensure compliance with procurement guidelines, including evidence that the application of contractual remedies was being applied (ICR para 70).

For the rebidding of the contract, the Bank team learned from the previous experience and included a procurement condition whereby the winning company had to present a stronger financial guarantee, with 10 percent of the total contract value available by contract signing. This condition was included to ensure the financial capacity of the company in the fragile post "*Lava Jato*" context.

The Bank team took advantage of the availability of new information to adjust the project performance targets.

Since Brazil's fiscal difficulties would have prevented any additional financing under the original project, the team was flexible in responding to the client's request to transfer the conclusion of Metro Line 4 Phase 2 civil works and systems installation to the Metro Line 5 project. As a result, in 2016, the Bank agreed to restructure the Metro Line 5 project to include the part of the Metro Line 4 Phase 2 that would not be completed at closing by February 2018 (ICR para 20).

The Bank team paid adequate attention to safeguards aspects and was proactive in downgrading the safeguards ratings in the ISRs to "moderately unsatisfactory" in 2016 to signal problems and issues pointed out in section 10.

The Bank developed a strong working relationship with the Sao Paulo Metro. This allowed for honest exchanges during crisis periods and trustful and constructive dialogues that permitted the conclusion of almost all the civil works of Phase 2 despite delays (ICR para 55).

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating



Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The results framework included three outcome indicators: (a) travel plus waiting times between selected stations; (b) the percentage of bus routes integrated with the new Line 4 stations; and (c) the number of annual passengers boarding and alighting at the new stations. Indicator (a) was adequate to measure the achievement of the first project development objective of “improved quality of service for public transport users in the area of influence of the stations built during Phase 2”. Indicators (b) and (c) were designed to measure the second project development objective of “integration between metro and bus at those stations”. The project had several intermediate indicators.

A shortcoming of the M&E design for indicator "a" mentioned above was the lack of description in the PAD of the methodology used to obtain the baseline values. Moreover, additional indicators such as user satisfaction with the service could usefully have been included in the results framework to measure the quality of service.

According to the PAD (page 26), the PMU was responsible for the reporting of project outcome indicators. Data collection was expected to be undertaken by the Sao Paulo Metro, and the Project Management Oversight Consultant (PMOC) was expected to verify it.

b. M&E Implementation

Data collection was carried out in line with the M&E arrangements envisioned in the PAD. The data was reported semi-annually in progress reports. Both PMOC and PMU were experienced and adequately staffed and carried out M&E as planned. There was no modification to the Results Framework during project implementation other than revising the end targets to reflect the revised construction schedule and the updated travel demand as discussed in section 2e. Adjusting the forecasted demand at stations to account for the availability of new travel demand data, the impact of Metro Line 5, and a slower integration with buses was adequate.

Additional indicators on the performance of Phase 2 were monitored by the Sao Paulo Metro. These include: (a) user satisfaction with Line 4 operations after the opening of the new stations; purpose of boarding/alighting at Line 4 Phase 2 stations, overall quality of service, reliability, and comfort of trains; (b) accessibility to jobs defined as the percentage of jobs accessible within a one-hour commute from the district of residence in the area of influence of the Line 4 Phase 2 stations; (c) percentage of passengers of the new Phase 2 stations resulting from transfers (all modes); and (d) reduction of passengers on buses along the corridor of Metro Line 4 after the opening of the new stations.



c. M&E Utilization

M&E was utilized to monitor the implementation progress (para 59) . The ICR does not mention how the information on the performance of the system was used.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

The project was classified as Environmental Category A and two safeguards policies were triggered - Environmental Assessment (OP/BP 4.01) and Involuntary Resettlement (OP 4.12).

Environmental Assessment (OP/BP 4.01). The PAD (para 48) stated that the Environmental Impact Assessment (EIA) and Environmental Management Plan for Phase 1 (Line 4) would apply to the Phase 2 Project. An Addendum to the EIA was required for a new 1.5 km tunnel and the new Vila Sonia station, which were not included in Phase 1. The Sao Paulo Metro’s staff prepared the Addendum for Phase 2, including an Environmental Report that was reviewed by the relevant State environmental agencies.

Although no direct impact on physical cultural resources were identified in the EIA, the applicable local legislation and procedures were to be applied for chance finds of historical artifacts, as Brazil had regulations that were compatible with the Bank’s requirements. If historical artifacts were found, the PAD stated that (para 50) the local authority responsible for historical preservation (National Institute for Historical and Artistic Heritage) would be notified and work would be suspended until such findings could be investigated by experts and it could be determined how to manage such finds.

The ICR (para 61) reports that, the project complied with the Bank’s safeguards policies during project implementation. In 2016 the rating for environmental assessment safeguard was downgraded to “moderately unsatisfactory” due to the slowdown of initial civil works at the construction sites and their temporary abandonment. During this period, it was difficult to obtain data on the environmental performance. The situation was rectified with the signing of the new civil works contract and the restart of the construction work on these sites in 2016.

Involuntary Resettlement (OP 4.12). The proposed Line 4 Phase 2 was expected to require expropriation of 47 properties (16 residential and 31 non-residential). Most properties were identified during Phase 1



(PAD 51). An Abbreviated Resettlement Plan for Phase 2 was prepared by the Borrower, reviewed by the Bank and disclosed in country and in the World Bank *Infoshop* on January 1, 2009 (PAD para 51).

The ICR (para 61) reports that the project complied with the Bank’s social safeguards policy. The Metro staff kept an effective Grievance Redress Mechanism throughout the project life cycle. In total, 29 properties required resettlement instead of 47 as expected at appraisal, which according to the ICR were handled adequately. The project team clarified that the reduction was due to the change in the project design. As the detailed designs were finalized, the scope of works changed and so did the need for expropriations.

b. Fiduciary Compliance

The ICR (para 63) reports that the fiduciary compliance was satisfactory throughout project implementation and that there were no major issues regarding financial management. The PMU was adequately staffed with skilled and experienced financial management staff. During implementation, the PMU staff worked closely with the Bank’s fiduciary team members on financial reports and external audits. The ICR does not mention whether the ISRs and the financial audit reports were prepared on time or if the external audits were unqualified.

Procurement. There were significant delays due to procurement-related issues and contractual disputes. Phase 2 of Line 4 faced delays during the initial procurement of the two main civil works contracts. Although, the basic engineering designs for the civil works were completed in 2011, procurement did not start until 2012 (the ICR does not specify the reasons for this delay). Once initiated, procurement took longer than anticipated due to: (a) legal injunctions by firms that were not pre-qualified which halted the procurement process (but all were ultimately unjustified); and (b) additional time required by the winning international bidder to register as a company in Brazil. As seen in section 8 b, due diligence was exercised when cancelling the original civil works contracts and rebidding them. This rebidding also took longer than expected.

c. Unintended impacts (Positive or Negative)

d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
---------	-----	-----	----------------------------------



Outcome	Moderately Satisfactory	Moderately Satisfactory	---
Bank Performance	Satisfactory	Satisfactory	---
Quality of M&E	Modest	Substantial	There were some shortcomings in M&E design. However, the M&E design was sufficient to measure project outcomes. Data collection was carried out in line with the M&E arrangement envisioned in the PAD. Additional indicators were monitored by Sao Paulo Metro.
Quality of ICR		Substantial	---

12. Lessons

The following lessons are taken from the ICR with some modification by ICR reviewer:

- **Tariff integration is key to successful multimodal integration.** For this project which supported physical integration between the metro system and buses, tariff integration was already in place. This made it possible for the expected demand to materialize. Without integrated tickets, many potential passengers might have been reluctant to switch to the metro system since they would have had to pay two fares.
- **Insufficiently stringent working capital or financial guarantee requirements may delay project implementation.** The original civil works contractor under this project experienced cash flow limitations, which could have been avoided through more rigorous working capital or financial guarantee requirements in the bidding documents. During the rebidding when only small construction companies with limited cash flows were available because of the "Lava Jato" investigations, a condition was added whereby the winning company had to present a stronger financial guarantee, with 10 percent of the total contract value available by contract signing.
- **Procurement for large and complex civil works that is based mainly on basic/preliminary engineering designs may cause important implementation delays.** The decision to carry out the procurement of the civil works based on the basic engineering designs since the detailed designs were not yet ready, together with the choice of using a unit price model, led to major bottlenecks during project implementation. This was due not only to the delay in finalizing of the detailed designs, but also due to contract modifications, resulting in lengthy and complex control and approval processes. Bundling the preparation of the detailed designs with the civil works contract can be a better alternative, as the contracted



construction company has the right incentive to ensure their timely completion. Advanced designs are needed in such cases.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

This was a complex project and the ICR is comprehensive, thorough, candid, and well written. It is supported by useful graphs and additional information in text boxes. The assessment of the results is supported by additional aspects, such as data from the satisfaction surveys, information on the boarding volumes derived from transfers and the reduction of bus traffic on the corridor, and the accessibility index. There are some shortcomings. The ICR does not elaborate what the impact of using different discount rates in the economic analysis (ex-ante, at restructuring and ex-post) was on the efficiency. Also, it does not discuss the disadvantages of focusing on incremental investments only and does not include a sensitivity analysis. The ICR provides limited information on the outputs produced and the fiduciary performance of the project.

a. Quality of ICR Rating Substantial