

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

ECUADOR

**REFORMULATION OF THE PROJECT
QUITO METROPOLITAN URBAN TRANSPORTATION SYSTEM:
FIRST LINE OF THE QUITO METRO**

(EC-L1111; 2882/OC-EC AND 2882/OC-EC-1)

**PROPOSAL FOR REFORMULATION OF
LOANS 2882/OC-EC AND 2882/OC-EC-1**

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CONTENTS

PROJECT SUMMARY

I.	DESCRIPTION AND RESULTS MONITORING	1
A.	Reformulation of the project	1
B.	Problem addressed, progress, and rationale	1
C.	Objectives, components, and cost	9
D.	Key results indicators	11
II.	FINANCING STRUCTURE AND MAIN RISKS	11
A.	Financing instruments	11
B.	Environmental and social safeguard risks	12
C.	Public management and governance risks	14
D.	Execution risks	14
III.	IMPLEMENTATION AND MANAGEMENT PLAN	15
A.	Summary of implementation arrangements	15
IV.	RECOMMENDATION	17

ANNEXES	
Annex I	SPD Evaluability Note
Annex II	Results Matrix
Annex III	Fiduciary Agreements and Requirements

ELECTRONIC LINKS
<p>REQUIRED</p> <ol style="list-style-type: none"> 1. Multiyear execution plan and annual work plan 2. Monitoring and evaluation plan 3. Environmental and social management report (ESMR) 4. Procurement plan <p>OPTIONAL</p> <ol style="list-style-type: none"> 1. Diagnostic assessment of mobility conditions in Quito 2. Technical study of project progress for Quito Metro 3. Economic assessment update 4. Borrowing capacity analysis for the Municipio of Quito 5. Road map for the start of operations 6. Integrated public transportation system design 7. Integrated Collection System ordinance 8. Draft adjusted Operating Regulations 9. Gender perspective 10. Cooperation principles 11. Request from the borrower 12. Project map 13. Mobile technology for transportation planning 14. Safeguard Policy Filter (SPF) and Safeguard Screening Form (SSF) for classification of projects

ABBREVIATIONS

BDE	Banco de Desarrollo del Ecuador [Development Bank of Ecuador]
BIESS	Banco del Instituto Ecuatoriano de Seguridad Social [Bank of the Ecuadorian Social Security Institute]
CAF	Development Bank of Latin America (formerly the Andean Development Corporation)
CGE	Contraloría General del Estado [Office of the Comptroller General]
CL1	Consortio Línea 1 Metro de Quito Acciona [Consortium Acciona for the First Line of the Quito Metro]
COFYP	Código Orgánico de Planificación y Finanzas Públicas [Code Planning and Public Finance]
EIB	European Investment Bank
EPMMQ	Empresa Pública Metropolitana Metro de Quito [Quito Metro Metropolitan Public Enterprise]
e-SIGEF	Sistema Integrado de Gestión Financiera [Integrated Financial Management System]
FIEM	Fondo para la Internacionalización de la Empresa [Corporate Internationalization Fund]
ICB	International competitive bidding
MDMQ	Municipio del Distrito Metropolitano de Quito [Municipio of the Quito Metropolitan District]
MEF	Ministry of Economy and Finance
NCB	National competitive bidding
PLMQ	Primera Línea del Metro de Quito [First Line of the Quito Metro]
SENPLADES	Secretaría Nacional de Planificación y Desarrollo [National Planning and Development Department]
SERCOP	Servicio Nacional de Contratación Pública [National Public Contracting Service]
SIR	Sistema Integrado de Recaudo [Integrated Collection System]
SITP	Sistema Integrado de Transporte Público [Integrated Public Transportation System]
SNCP	Sistema Nacional de Contratación Pública [National Public Contracting System]
WAL	Weighted average life

PROJECT SUMMARY

ECUADOR

REFORMULATION OF THE PROJECT

QUITO METROPOLITAN URBAN TRANSPORTATION SYSTEM:

FIRST LINE OF THE QUITO METRO

(EC-L1111)

Financial Terms and Conditions (New Financing) ^(a)				
Borrower: Republic of Ecuador			Flexible Financing Facility ^(b)	
			Amortization period:	25 years
			Original WAL:	15.25 years
			Disbursement period:	3 years
Executing agency: Municipio of the Quito Metropolitan District (MDMQ), acting through the Quito Metro Metropolitan Public Enterprise (EPMMQ)			Grace period:	7 years ^(c)
			Inspection and supervision fee:	^(d)
			Interest rate:	LIBOR-based
			Credit fee:	^(d)
Source	Amount (US\$)	%	Currency of approval: U.S. dollars (US\$)	
IDB: Reformulation of new financing: ^(e)	250,000,000	12.44%		
IDB: 2882/OC-EC and 2882/OC-EC-1: ^(f)	200,000,000	9.95%		
Other financiers: ^(g)	1,319,224,999	65.63%		
Local:	240,591,194	11.97%		
Total:	2,009,816,193	100%		
Reformulated Project at a Glance				
Project objective: The original project objective remains unchanged: Improve urban mobility in the city of Quito, addressing the growing demand for public transportation. The First Line of the Quito Metro (PLMQ) will shorten travel times; lower the operating costs of transportation service; improve the connectivity, safety, and comfort of the current system; and reduce pollutant and greenhouse gas emissions. Description: A 22-kilometer underground metro line will traverse the city from north to south with 15 stations. The project includes the following components: (i) civil works, facilities, and environmental and social management plan; (ii) rolling stock; and (iii) technical assistance.				
Special contractual conditions precedent to the first disbursement of the new financing: (i) the Bank has received one or more legal reports that establish, citing the relevant legal provisions, that the obligations assumed by the borrower for this new financing are valid and enforceable; (ii) the subsidiary agreement between the borrower and the MDMQ for transfer of the new resources, rights, and obligations has been updated and entered into force; and (iii) the project Operating Regulations have been updated and entered into force on the terms previously agreed upon with the Bank (see paragraph 3.7).				
Special contractual execution conditions: (i) no later than September 2018 the EPMMQ will provide documentary evidence, to the Bank's satisfaction, that the necessary processing has begun for the supply, installation, and operation of the fare collection system for the PLMQ; and (ii) no later than September 2018 the MDMQ will submit an implementation plan, to the Bank's satisfaction, for the restructuring of public transportation routes in Quito (see paragraph 3.8).				
Other conditions precedent to the first disbursement and special execution conditions: See Annex B of the environmental and social management report (ESMR) .				
Strategic Alignment				
Challenges: ^(h)	SI <input type="checkbox"/>	PI <input checked="" type="checkbox"/>	EI <input type="checkbox"/>	
Crosscutting themes: ⁽ⁱ⁾	GD <input checked="" type="checkbox"/>	CC <input checked="" type="checkbox"/>	IC <input type="checkbox"/>	

^(a) The code for the new financing will be processed as 2882/OC-EC-2.

^(b) Under the terms of the Flexible Financing Facility (FN-655-1), the borrower has the option of requesting changes in the amortization schedule as well as currency and interest rate conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

^(c) Under the flexible repayment options of the Flexible Financing Facility, changes to the grace period are permitted provided that they do not entail any extension of the original weighted average life of the loan or the last payment date as documented in the loan contract.

^(d) The credit fee and the inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the relevant policies.

^(e) Increase in the originally approved amount to replace the original sources.

^(f) The financial terms of loans 2882/OC-EC and 2882/OC-EC-1 remain the same as the original operation.

^(g) Financing structure (see paragraph 1.23).

^(h) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

⁽ⁱ⁾ CC (Climate Change and Environmental Sustainability); GD (Gender Equality and Diversity); and IC (Institutional Capacity and Rule of Law).

I. DESCRIPTION AND RESULTS MONITORING

A. Reformulation of the project

- 1.1 **Request from the Government of Ecuador.** On 5 December 2012, the Bank's Board of Executive Directors approved the project "Quito Metropolitan Transportation System: First Line of the Quito Metro," which had the general objective of improving urban mobility in the city of Quito, to address the growing demand for public transportation. The loan contract for 2882/OC-EC and 2882/OC-EC-1 was signed on 16 June 2015 for US\$200 million. The Government of Ecuador, via note MEF-MINFIN-2017-0473-O ([optional electronic link 11](#)), received on 20 September 2017, requested US\$250 million in additional financing from the Bank to continue with the project. These resources will replace original sources of financing that failed to materialize (see paragraph 1.23). This proposal is being processed as a reformulation pursuant to the procedures for the processing of sovereign-guaranteed operations, since fresh resources are being added that exceed 40% of the original amount of the Bank-approved operation, to finance new activities or expand the scope of the original activities.
- 1.2 **Description of the proposed change.** The purpose of the reformulation is to increase financing from the IDB by \$250 million, to close the project's financing gap. This reformulation does not entail changes in the project objective or the Results Matrix targets for loans 2882/OC-EC and 2882/OC-EC-1. The additional resources will help finance Component 1 (civil works, facilities, and environmental and social management plan) and Component 3 (technical assistance). Activities under Component 1 are subdivided into two subcomponents to identify the specific resources for environmental and social management (see paragraph 1.26). The date of the project's last disbursement is three years after approval of this reformulation, to adjust the financing to the completion schedule of the civil works and the first year of metro operations.

B. Problem addressed, progress, and rationale

- 1.3 **Problem addressed.**¹ The Municipio of the Quito Metropolitan District (MDMQ) is growing rapidly, and so is the demand for an efficient mobility system. The current population of the metropolitan area is 2.4 million, increasing at an annual average rate of 2.1%. Residents make 5.6 million trips per day. The number of private vehicles is growing at an annual rate of around 10%, and approximately 35% of the roads are already saturated during peak hours. As a result of traffic congestion, transportation is the source of 56% of the MDMQ's carbon footprint.²
- 1.4 The majority of motorized travel (77%) takes place on public transportation, through an 80-kilometer mass transportation network that features four bus rapid transit lines, and on mass transportation routes served by almost 3,000 conventional buses. However, urban growth has negatively impacted the quality and efficiency of public transportation. The service has problems that impact parameters such as operating speeds and travel times. On the mass transportation network, the corridors have reached capacity. The central streetcar corridor, which serves more

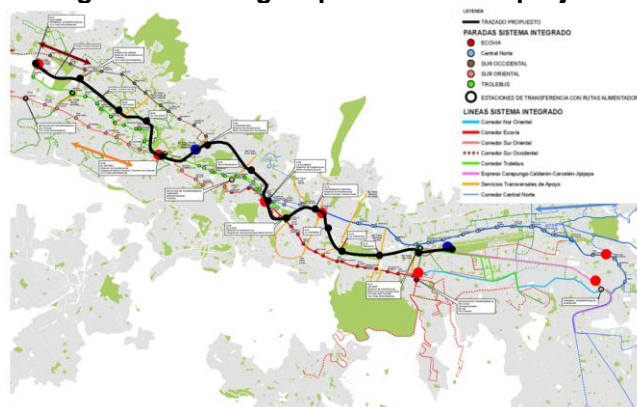
¹ The diagnostic assessment of the problem to be addressed that was presented in the original loan proposal is still current.

² Source: Department of the Environment of the Municipio of Quito. The second-largest source of emissions is residential-commercial (20%).

than 248,000 passengers per day, has an average speed of 13 kilometers per hour and occupancy of more than 7 passengers per square meter at rush hour. Quito's shape and narrow streets limit the alternatives for expanding the mass transportation network.

- 1.5 The conventional public transportation system has operational limitations such as oversupply, low reliability, lack of defined bus stops, substandard vehicles, poor maintenance, high accident rates, and pollution levels. Sixty percent of public transportation offerings have an occupancy rate around 8 passengers per square meter on average at rush hour.³ An important point in relation to these travel conditions is the high rate of harassment on public transportation in Quito, where 40% of female users reported being victims of sexual violence within the system.⁴
- 1.6 **First Line of the Quito Metro (PLMQ).** To improve urban mobility, the MDMQ is implementing its first metro line. This metro line was conceived as a backbone to structure mobility along the city's elongated north-to-south axis, supplementing other modes of transportation, including bus rapid transit lines and conventional buses. The PLMQ will run entirely underground and was planned to cover the city from north to south, with a length of 22 kilometers and 15 stations, providing 370,000 daily trips at an average speed of 40 kilometers per hour. In terms of fares and operations, the project will be integrated with the remaining public transportation methods (see paragraphs 1.15 and 1.16).

Figure 1. Routing map for the PLMQ project



Source: Metro de Madrid (2010) for Empresa Pública Metropolitana de Movilidad y Obras Públicas [Metropolitan Public Enterprise for Mobility and Public Works] (EPMOP).

- 1.7 **Progress made since the operation's approval and current loan status.** The project is currently in execution. Construction was divided into two phases. Phase 1 involved developing two intermodal stations and was executed by the MDMQ with its own resources and national government resources. Phase 2, which is now in

³ Condiciones de alta calidad y eficiencia [High quality and efficiency], page 67, Mobility Master Plan for the Quito Metropolitan District 2009-2025.

⁴ Source: Viteri, M. A.; Artieda López, M.; Barreiro, K.; Pineda, J.; and de la Torre Rojas, A. 2012. Percepciones de seguridad en el sur de Quito [Perceptions of security in South Quito]. Quito: San José Municipal Council.

execution, consists of the construction of the remaining infrastructure and the installation of equipment and systems. In parallel with the infrastructure, rolling stock (trains) is being manufactured for the metro's operation. The project has been advancing on the contractual schedule and budget. Loan contracts 2882/OC-EC and 2882/OC-EC-1 have financed civil works for Phase 2, have been executed in a satisfactory manner, and 94.03% of their resources have been disbursed.

- 1.8 **Execution mechanism.** The MDMQ is responsible for project execution, acting through the Quito Metro Metropolitan Public Enterprise (EPMMQ), which was created in 2012 to develop, implement, and manage the Quito Metro. Given the project's complexity and the Ecuadorian government's lack of metro construction experience, the EPMMQ retained a management firm to provide specialized technical support and strengthen its management capacity. In terms of project management, the EPMMQ optimized the original designs (value engineering) and identified efficiencies and savings with respect to the contracted budget. The EPMMQ has retained inspection firms to supervise construction contracts and ensure their proper execution.
- 1.9 **IDB leadership in coordination with other financiers.** The group of financiers includes the IDB, the World Bank, the European Investment Bank (EIB), and the Development Bank of Latin America (CAF). Beyond providing financing, the IDB is acting as the lead bank and coordinator for multilaterals. To harmonize requirements and procedures, the group of financiers and the executing agency signed a "Cooperation principles" agreement ([optional electronic link 10](#)). The IDB is also representing the World Bank on procurement decisions. This cooperation mechanism has contributed to efficient execution and to harmonizing the dialogue with the MDMQ and the EPMMQ. The project has received recognition in international forums as a successful example of cooperation among multilateral banks.
- 1.10 **Progress on execution.** The civil works for Phase 1 were completed in a satisfactory manner in 2015. They included the construction of two intermodal stations (La Magdalena and El Labrador) to connect with the bus system. Phase 2 construction began after a tendering process that lasted about two years before the contract was signed. Civil works began in April 2016 and are expected to be completed within a contract deadline of 36 months. Phase 2 works are currently being executed in a satisfactory manner within the planned time frames. As of November 2017,⁵ physical progress for the works was 42.75%,⁶ and financial progress was 41.08%. The main civil works are under development, including construction of the tunnel, stations, and depots. The project is currently employing almost 5,000 workers on various sites and using three tunneling machines. In addition to the construction of infrastructure, rolling stock is being manufactured for the metro (18 trains, each with 6 cars and capacity to accommodate 1,500 passengers), and will be delivered starting in August 2018. After the civil works

⁵ The physical and financial execution levels originally scheduled for November 2017 were 50.90% and 48.94%. The executing agency and the inspection firm project that the difference between the scheduled and actual progress does not impact the project's critical path. This difference can be addressed by rescheduling activities, adjusting outputs, and having the contractor add sufficient staff and equipment.

⁶ The executing agency estimates that the physical progress as of March 2018 is 54.13% (pending evaluation from the inspection firm for the work).

are completed, there will be a six-month period to conduct operational tests and prepare for the launch. The expected date to begin operations is still October 2019, as originally scheduled.

- 1.11 **Project amount.** When the project was submitted to the Board of Executive Directors for approval, its budget was US\$1.5 billion. Its current amount is US\$2.0098 billion. The main reason for the change⁷ is the amount of the construction contract for Phase 2, which initially had a lower budget. This variation occurred during the tendering process, which revealed a significant difference (US\$467.44 million) between the indicative budget and the amount of the lowest bid. IDB policies and procedures were followed for this international competitive bidding process. The contract was awarded to the lowest bidder. The MDMQ addressed the increase in the project amount in a timely manner by arranging new sources of financing to cover the difference prior to the award of the contract. To date, there have been no cost overruns during construction of the civil works or manufacturing of trains in terms of the contracted amounts.
- 1.12 **Restructuring of the Consorcio Línea 1 Metro de Quito Acciona Odebrecht [Consortium Acciona Odebrecht First Line of the Quito Metro] (CL1).**⁸ The construction of Phase 2 was awarded to the CL1 consortium in November 2015. In November 2016, the MDMQ asked the four multilaterals participating in the project for their no objection regarding the restructuring of the CL1 consortium. The proposed restructuring substantially modified the equity composition of the CL1 consortium. The no objection was issued after a detailed review of technical, legal, and financial considerations and of the requirements established in the tender. In April 2017, the MDMQ issued a public authorization for the partners to restructure the consortium. On 27 December 2017, the consortium notified the municipio that the legal transactions to restructure the original consortium had been finalized, and the addendum signed modifying the construction contract. The new CL1 consortium is made up of the companies Acciona Construcciones, Acciona Infraestructuras México S.A. de C.V., and Acciona Industrial S.A. With this new structure, the consortium has demonstrated its ability to continue the satisfactory pace of work.
- 1.13 **Operating stage.** The EPMMQ will manage the metro's operations. The MDMQ is interested in developing a solution for operations and maintenance in partnership with the private sector. With support under technical cooperation operation ATN/OC-14132-EC, the EPMMQ assessed different alternatives for a business model. The technical recommendation that the EPMMQ selected was to develop and implement an operations and maintenance agreement with an operating company with performance-based financial incentives. The EPMMQ is currently defining the institutional, legal, and financial parameters that will determine the commercial model to provide operations and maintenance services. The operating company will be retained prior to the start of operations in October 2019. The project's initial financial viability studies⁹ ([optional electronic link 5](#)) showed positive

⁷ Other factors that had an impact: adjustments in the final cost of Phase 1 works, adjustments in contingencies, adjustments for inflation, environmental and social management, and adjustments in the technical assistance budget.

⁸ Made up of Acciona Construcciones and Constructora Norberto Odebrecht.

⁹ [Estudio de viabilidad económico-financiera del proyecto Primera Línea de MQ](#) [Economic/financial viability study for the First Line of the Quito Metro Project], Madrid Metro (2010).

operating flows, taking into account annual operating costs of US\$34.8 million during the launch year and an integrated fare of US\$0.70. The pricing policy and the fare levels for the metro and other public transportation modes¹⁰ are currently in the process of approval via ordinance in the Quito Metropolitan Council.

- 1.14 **Update of the demand model and use of mobile data.** The Municipality of Quito has been updating the studies and the original demand model (2011). This will strengthen the forecasts for passenger numbers, kilometers traveled, and total fare revenue collected in preparation for the start of operations. For this purpose, the data from the study "Application of mobile technology for mobility planning and management in the Quito Metropolitan District" will be used to calibrate and validate the transportation model. This study, funded under technical cooperation operation ATN/OC-14132-EC, looked at mobility patterns in the MDMQ by analyzing large amounts of anonymized data (Big Data) gathered from mobile phone calls during 2016 ([optional electronic link 13](#)).
- 1.15 **Integrated Public Transportation System (SITP).** The MDMQ is planning to integrate all public transportation services. This policy is aimed at optimizing the use of resources and improving service quality. SITP routes and services will be redesigned around the metro, which will be the new backbone. The SITP project has changed from its original configuration. Although structurally the objective of integrating services still remains, operational designs and routes were modified to achieve greater coverage for buses. New public transportation studies ([optional electronic link 6](#)) were conducted in 2016 and 2017, and the city has now begun the communication and awareness process with transportation companies.
- 1.16 **Integrated Collection System (SIR).** The MDMQ is seeking to unify fare collection for all public transportation with a single electronic payment method. This will reduce fare evasion and introduce fare policies to facilitate transfers between modes of transportation and vehicles. In 2017, the Quito Metropolitan Council issued Ordinance 185 ([optional electronic link 7](#)) regulating the implementation of intelligent transportation systems in the MDMQ and delegating responsibility for SIR implementation to the Department of Mobility. The purchase and installation of the metro's fare collection equipment was delegated to the EPMMQ, to ensure that the start date for metro operations will not be jeopardized. The Department of Mobility will structure the contracting process for the purchase and installation of fare collection equipment in the remaining modes of transportation. Currently, that office and the EPMMQ are defining technical standards to ensure collection equipment compatibility and interoperability for all modes of transportation.
- 1.17 **Gender perspective.** The Quito Metro project will benefit from the MDMQ's programs to promote gender equality in public transportation. The MDMQ is leading initiatives like the "Metro de Quito con enfoque de género" [Quito Metro focus on gender] ([optional electronic link 9](#)), whose objective is to train and raise awareness among metro construction staff about mechanisms to eliminate and prevent sexual violence. In 2017, more than 1,200 Quito Metro construction workers received training to raise their awareness and commit to eliminating and preventing sexual

¹⁰ With financing from CAF, the MDMQ conducted a study on structuring a fare model for the Quito metropolitan public transportation system in 2017, to develop cost structures, technical rates, and fare structure models.

violence in public spaces. Likewise, the “Bájale al acoso” initiative to decrease harassment on public transportation implemented a reporting and alert system for cases of harassment in the municipal public transportation system. As of December 2017, the initiative had received and processed 560 reports of harassment from women. In addition, Quito is part of the IDB’s Transport GenderLab initiative (technical cooperation operation ATN/OC-15847-RG), which promotes mainstreaming the gender perspective in public transportation in six Latin American cities through cooperation and a search for joint solutions. The Quito Metro will include lessons learned from programs promoted by the MDMQ and other Latin American cities in setting standards for operations, enforcement, and security to mitigate risks of harassment and reflect gender equality through the system’s satisfaction indicators.

- 1.18 **The literature shows a correlation between interventions in mass transit and productivity.** Investments in mass transit improve access to production factors (IDB, 2015).¹¹ Companies and businesses near a new mass transit line in the city of San Francisco employed more workers from population groups living far from the hubs where the employers were located (Holzer et al., 2003).¹² Likewise, urban areas built out in conjunction with the planned development of transportation systems have important positive impacts on firm productivity. In London, Graham (2007)¹³ estimated that increases of 1% in agglomeration generate productivity increases of almost 0.2% for certain industries.
- 1.19 **Empirical evidence shows a relationship between public transportation interventions and reduced greenhouse gas emissions.** Using bus rapid transit, the city of Guangzhou, China, is expected to decrease its carbon dioxide (CO₂) emissions by 86,000 tons per year. Emissions of CO₂ per person/trip have decreased by 31.5% (UN Habitat, 2012;¹⁴ Suzuki et al., 2013¹⁵). In Bogotá, after two years of operation, the TransMilenio achieved a reduction in CO₂ emissions equivalent to 82,128 tons (CO₂ equivalent per vehicle/kilometer). Emissions in that city decreased by 53.4% (United Nations Framework Convention on Climate Change, 2013).¹⁶
- 1.20 **Several studies demonstrate the importance of effective transportation infrastructure for women’s empowerment.** Passenger crowding in mass transit has a significant impact on perception about a trip. Passengers feel between 2.3 and 2.5 times more uncomfortable when the passenger density is five to six passengers per square meter, compared with a density of one to two passengers per square

¹¹ Scholl, L.; Guerrero, A.; Quintanilla, O.; Celse L’Hoste, M.; Sadeghi, P. 2015. [Comparative case studies of three IDB-supported urban transport projects](#).

¹² Holzer, H. J.; Quigley, J. M.; and Raphael, S. 2003. Public transit and the spatial distribution of minority employment: Evidence from a natural experiment. *Journal of Policy Analysis and Management*.

¹³ Graham, D. J., 2007. Variable returns to agglomeration and the effect of road traffic congestion. *Journal of Urban Economics*, 62(1), pages 103-120.

¹⁴ UN Habitat (2012). State of Latin American and Caribbean cities: Towards a new urban transition. Nairobi: UN Habitat.

¹⁵ Suzuki, H., Cervero, R., and Kanako, L. (2013). Transforming cities with transit. Washington, D.C.: World Bank.

¹⁶ United Nations Framework Convention on Climate Change (2013). Clean Development Mechanism, monitoring report form.

meter (IDB, 2015).¹⁷ The majority of sexual harassment cases on public transportation tend to occur when there is crowding, usually during rush hours (Gekoski et al., 2015)¹⁸ (Gardner, Cui, and Coiacetto, 2017),¹⁹ when perpetrators can blame their actions on overcrowding. An increase in the capacity of public transportation has been documented as a measure preferred by women over various interventions aimed at decreasing harassment situations (Astrop, 1996).²⁰

- 1.21 **Alignment with the Bank's institutional strategy.** The operation is consistent with the Update to the Institutional Strategy (UIS) 2010-2020 (document AB-3008) and aligned with the following development challenges: (i) productivity and innovation, by providing effective, reliable, and affordable transportation infrastructure and services; (ii) climate change and environmental sustainability, by reducing emissions from public transportation; and (iii) gender equality and diversity, by offering better quality public services that decrease the risk of harassment on mass transit. The operation is aligned with: (i) the IDB country strategy with Ecuador 2012-2017 (document GN-2680), by supporting improvements in local public mass transit; (ii) the IDB Infrastructure Strategy: Sustainable Infrastructure for Competitiveness and Inclusive Growth (document GN-2710-5), by promoting access to infrastructure services and improvements in infrastructure governance to increase the efficiency of service delivery; and (iii) the Transportation Sector Framework Document (document GN-2740-7), by consolidating accessible, sustainable, efficient, and safe urban transportation systems. It contributes to the strategic areas of urban transportation and sustainable transportation.
- 1.22 According to the joint methodology of the multilateral development banks²¹ for tracking climate finance and the technical guidelines of the Bank's Corporate Results Framework 2016-2019, 100% of this resource increase will be counted as climate mitigation finance.
- 1.23 **Rationale for the proposed change.**²² The project requires additional financing from the IDB to replace original sources of financing that failed to materialize.²³ The project budget is US\$2,009.8 million, of which US\$632.2 million is pending

¹⁷ Batarce, M.; Muñoz, J. C.; Ortúzar, J. de Dios; Raveau, S.; Mojica, C.; Ríos, R. A. [Evaluation of passenger comfort in bus rapid transit systems](#).

¹⁸ Gekoski, A.; Gray, J. M.; Horvath, M. A. H.; Edwards, S.; Emirali, A.; and Adler, J. R. (2015). 'What works' in reducing sexual harassment and sexual offences on public transport nationally and internationally: A rapid evidence assessment. London: British Transport Police and Department for Transport.

¹⁹ Gardner, N.; Cui, J.; and Coiacetto, E. (2017). Harassment on public transport and its impacts on women's travel behaviour. *Australian Planner*, 54(1), pages 8-15.

²⁰ Astrop, A.; Palmer, C.; Maunder, D.; and Babu, D. M. (October 1996). The urban travel behaviour and constraints of low-income households and females in Pune, India. Second National Conference on Women's Travel Issues, Baltimore (pages 23-26).

²¹ [2015 Joint Report on Multilateral Development Banks' Climate Finance](#).

²² According to Operations Administration Manual, Section OA-430, the change proposed for this operation is being processed as a reformulation because it involves an increase in financing that exceeds 40% of the original amount.

²³ Financing from the Banco del Instituto Ecuatoriano de Seguridad Social [Bank of the Ecuadorian Social Security Institute] (BIESS) did not materialize due to incompatibility between the project's financing needs and the fiduciary structure proposed by the BIESS. The loan from the Banco de Desarrollo del Ecuador [Development Bank of Ecuador] (BDE) was signed on 16 November 2015, but the resources were never used due to a lack of funding sources at the BDE.

processing from sources. To bridge this gap, the Government of Ecuador requested US\$250 million from the IDB and is working to secure additional loans from the World Bank and CAF. The reformulation proposal increases the amount of IDB financing for the project but does not modify the objective or scope. The relevant additional resources will help finance Components 1 and 3 as follows:

Table1. Reformulation proposal (US\$ million)

Component number	Original project			Reformulation proposal			
	IDB 2882/OC-EC and 2882/OC-EC-1 ²⁴	Other sources	Total	IDB 2882/OC-EC and 2882/OC-EC-1 ²⁵	IDB new financing	Other sources	Total
1. Civil works, facilities, and environmental and social management plan	195	1,070	1,265.3	186	247.8	1,317.6	1,751.4
2. Rolling stock	0	188	188	0	0	183.6	183.6
3. Technical assistance and audits	5	41.7	46.7	14	2.2	58.6	74.8
Total	200	1,300	1,500	200	250	1,559.8	2,009.8

- 1.24 **Financing structure.** The project is being financed by the national and municipal governments. The financing from both governments originates from various sources, including four multilateral banks, with the IDB's share currently being US\$200 million. The IDB loan was divided into two identical operations of US\$100 million each (2882/OC-EC and 2882/OC-EC-1), which were approved in December 2012 and January 2013, respectively. For these two operations, 94.03% of the resources have been disbursed. Table 2 shows the sources included in the original structure in 2012, prior to the operation's approval, as well as the sources of financing for the new structure proposed in 2017.²⁶

²⁴ Loan contracts 2882/OC-EC and 2882/OC-EC-1.

²⁵ In November 2017, at the borrower's request, the amounts for Components 1 and 3 were redistributed to increase the amount of technical assistance available for the EPMMQ and strengthen the management structure.

²⁶ With the new financing structure, the total value of the loans from the IDB, the World Bank, and CAF will be, respectively, US\$450 million, US\$430 million, and US\$402.2 million. The level of exposure is comparable, and the additional margin for the IDB is supported by its coordination and leadership role in the project.

Table 2. Financing structure (US\$ million)

Borrower/Source	Original (2012)	Current (2017)	Status
Government of Ecuador			
Own resources	50	40.7	Confirmed
IDB (2882/OC-EC and 2882/OC-EC-1)	200	200	Approved
European Investment Bank (EIB)	250	259.3	Approved
Development Bank of Latin America (CAF)	250	250	Approved
EIB (2)	0	44.1	Approved
IDB: new financing ²⁷	0	250	In preparation
MDMQ			
Own resources	203	199.9	Confirmed
Corporate Internationalization Fund (FIEM)	193	183.6	Approved
World Bank	0	200	Approved
World Bank (2)	0	230	In preparation
CAF (2)	0	152.2	In preparation
Development Bank of Ecuador (BDE)	200	0	Failed to materialize
Bank of the Ecuadorian Social Security Institute (BIESS)	154	0	Failed to materialize
TOTAL	1,500	2,009.8	

C. Objectives, components, and cost

- 1.25 **Objective.** The original project objective remains unchanged: Improve urban mobility in the city of Quito, addressing the growing demand for public transportation. The First Line of the Quito Metro (PLMQ) will shorten travel times; lower the operating costs of transportation service; improve the connectivity, safety, and comfort of the current system; and reduce pollutant and greenhouse gas emissions.
- 1.26 **Component 1. Civil works, facilities, and environmental and social management plan (US\$247.8 million).** The name of this component has been changed²⁸ to include subcomponent 1.2, under which a specific budget is allocated to manage socioenvironmental safeguards associated with construction of the PLMQ. One of the lessons learned during supervision has been the need for a specific expenditure framework to facilitate the implementation of socioenvironmental management and remediation activities. The scope of Component 1 is as follows:
- 1.27 **Subcomponent 1.1. Civil works and facilities.** The PLMQ civil works include construction of approximately 22 kilometers of line, 15 stations, a depot yard with maintenance area, architectural design, and improvements to the system. The construction technique for the underground project includes the use of tunneling machines for 91% of the route and the cut-and-cover technique for the construction of stations and specific track sections. The system facilities include 10 electrical substations, a power distribution system, a rigid catenary system for delivering electricity, rail signals, fire protection systems, ventilation, communications, fare vending systems, systems for station monitoring, and a centralized control room.

²⁷ The terms for transfer of the new resources, rights, and responsibilities between the borrower and the MDMQ will be defined in the subsidiary agreement.

²⁸ In the original operation, this component was called "Civil works, facilities, and expropriations."

- 1.28 **Subcomponent 1.2. Environmental and social management plan.** Includes expenses associated with the project's environmental and social management, based on the environmental, social, health, and safety management plan and the corrective action plan. These activities include: (i) mitigation of environmental liabilities in the project target area or associated facilities; (ii) compensation to owners to mitigate the temporary and/or permanent displacement of businesses at the various work sites that show evidence of loss of income; (iii) compensation to mitigate social impacts of the project in communities directly affected by the project or associated facilities; (iv) mitigation and remediation plans and actions for disaster risk management; (v) implementation of new management plans that must be developed if associated facilities not initially included are used; and (vi) acquisition of the land parcels necessary for project implementation.
- 1.29 **Component 2. Rolling stock.** This component has not changed. It consists of 18 trains, each with 6 cars and capacity to accommodate 1,500 passengers, which are currently being manufactured. The company Construcciones y Auxiliar de Ferrocarriles was awarded the contract to provide rolling stock in July 2014. The trains are being manufactured in parallel during the project's construction period and will be delivered on a rolling schedule starting in August 2018. This will enable the EPMMQ to begin the testing period during the second quarter of 2019. This component will be financed in its entirety with a loan provided by the Fondo para la Internacionalización de la Empresa [Corporate Internationalization Fund] (FIEM).
- 1.30 **Component 3. Technical assistance and audits (US\$2.2 million).** This component will finance the contracting of: (i) a project management firm; (ii) a firm to provide technical assistance and support to the EPMMQ prior to the start of operations and during the first year of operations; and (iii) an inspection firm for PLMQ project construction.
- 1.31 **Cost.** The project's total cost is US\$2,009.8 million, broken down as follows:

Table 3. Cost structure (US\$ million)

Component number		Total	IDB new financing	IDB 2882/OC-EC and 2882/OC-EC-1	Other sources
1	Civil works, facilities, and environmental and social management plan	1,751.4	247.8	186	1,317.6
1.1	Civil works and facilities	1,739.1	243	186	1,310.1
	a. Phase 1	101.1	-		101.1
	b. Phase 2	1,538	243	186	1,109
	c. Adjustments for inflation	65.0	-		65.0
	d. Contingencies	35.0	-		35.0
1.2	Environmental and social management plan	12.3	4.8		7.5
2	Rolling stock	183.6	-		183.6

Table 3. Cost structure (US\$ million)

Component number		Total	IDB new financing	IDB 2882/OC-EC and 2882/OC-EC-1	Other sources
3	Technical assistance	74.8	2.2	14	58.6
	a. Phase 1	14.0	-		14
	b. Management firm	28.8	-	9	44.7
	c. Technical assistance	0.2	0.2	-	-
	d. Inspection firm	32.0	2.0	5	25
	TOTAL	2,009.8	250	200	1,559.8

1.32 **Economic assessment update.** The project's original economic assessment was updated as part of the reformulation of this operation. The main reason for this update was the variation in the contracted amounts for Phase 2 of the project. The assessment's update was based on the originally developed model²⁹ and looked at the following variables, which were updated according to the project's actual progress: (i) schedule and amount of capital expenditures; (ii) updated operating expenditure estimates; (iii) updated macroeconomic variables; and (iv) calculated benefits associated with reduced pollution. The results of the update show that the project remains socioeconomically viable, taking into account increases in the amount of investment costs (capital expenditures). The project has a net present value (NPV) of US\$427 million, an internal rate of return (IRR) of 13.7%, and a benefit-cost ratio of 1.2. The NPV sensitivity analysis included variations of capital expenditures, operating expenditures, and demand, yielding a positive NPV for most of the scenarios considered ([optional electronic link 3](#)).

D. Key results indicators

1.33 There have been no substantial modifications in the Results Matrix. Outcome indicator targets remain constant. The schedule was adjusted for the disbursement period of the new financing. The monitoring and evaluation plan ([required electronic link 2](#)) contains detailed descriptions of every indicator, methodology for data collection, report frequency, and parties responsible for monitoring.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

2.1 The new financing will use the specific investment loan modality with a disbursement period of three years. The disbursement schedule will be according to the following cash flow:

²⁹ According to the [Economic assessment of the First Line of the Quito Metro, Version 4, September 2012](#), the original project had an NPV of US\$810 million, an IRR of 18.35%, and a benefit-cost ratio of 1.74.

Table 4. Disbursement schedule (US\$ million)

Source	2013-2017	2018	2019	2020	Total
IDB (2882/OC-EC and 2882/OC-EC-1)	188.1	11.9	-	-	200
IDB (new financing)	-	130	119.8	0.2	250
Other sources	756	547.6	256.2	-	1,559.8
Total	944.1	689.5	376	0.2	2,009.8

B. Environmental and social safeguard risks

- 2.2 Despite the project's significant benefits for the population of the Quito metropolitan area, this operation was classified as category "A" under the Bank's Environment and Safeguards Compliance Policy (Operational Policy OP-703), due to the potential negative impact and socioenvironmental risks for the population along the project's route, and the impact areas of work sites and associated facilities. In view of the risks and impacts that factored into the classification of the operation, the Bank has closely monitored compliance with environmental safeguards in coordination with the other project financiers.
- 2.3 **Corrective action plan.** Since the operation is in execution, impacts and risks were assessed during preparation of this reformulation according to the definitions of applicable policies and guidelines. This included verifying the level of compliance with socioenvironmental safeguards based on review and analysis of the project activities executed thus far,³⁰ and was documented in the corrective action plan. The corrective action plan identifies specific mitigation and control actions to address existing liabilities and mitigate other risks. The main environmental and social management challenges identified in the corrective action plan include the management of disposal sites,³¹ management of road accidents,³² mitigation of socioenvironmental liabilities,³³ and management of contaminated soils.³⁴ Based on the corrective action plan, action plans were prepared that detail mitigation activities, financing, and scheduling, capacity-building, and procedures and protocols to ensure compliance with the Bank's environmental and social safeguards. The corrective action plan was included as one of the targets for the EPMMQ, and compliance stood at 90% as of March 2018.
- 2.4 Other activities during preparation of this reformulation included: (i) ensuring compliance with the policies and guidelines triggered by the project reformulation process, as follows: Operational Policy on Involuntary Resettlement (Operational Policy OP-710), due to permanent impacts because of land expropriation as well as

³⁰ There are no pending consultation processes. The public consultation process was conducted pursuant to the safeguards during project preparation. For the reformulation, verification was made that the public consultation process is ongoing and the plan for addressing complaints and grievances has been properly implemented.

³¹ Currently, the project is solely dependent on the Parque Bicentenario site (former airport) for the disposal of materials, since the El Troje IV disposal site was closed because of the landslide in December 2017.

³² Since the construction of Phase 2 began, there have been six deaths in accidents related directly or indirectly to project activities. The main cause is traffic accidents involving heavy-duty vehicle (dump trucks and tractor trailers). Five of these occurred between October 2017 and February 2018.

³³ Socioenvironmental impacts around the Oyacoto disposal site (partial property damage) and the El Troje IV disposal site.

³⁴ As a result of tunnel excavation, soils contaminated with hydrocarbons were found in the La Pradera station.

- temporary economic displacement;³⁵ Indigenous Peoples Policy (Operational Policy OP-765), due to potential adverse impacts on new excavation material disposal sites that may be located in indigenous community areas, and impacts identified in the Oyacoto disposal site;³⁶ (ii) reviewing the level of disaster risk assessment for mitigation actions in associated facilities (disposal sites);³⁷ and (iii) updating the environmental, social, health, and safety management plan and the environmental management plan with the mitigation measures recommended in the corrective action plan.
- 2.5 **Environmental and social risks (high).** The main potential risks identified for the current construction stage are as follows: (i) delays in identifying suitable disposal sites for the treatment and final disposal of the excavation material and muck generated by the construction of the tunnel and stations; (ii) increased frequency of accidents related to project activities; (iii) delays in mitigating environmental and social liabilities in the Oyacoto and El Troje IV disposal sites; (iv) delays in compensation to owners of businesses at the various work sites; and (v) potential environmental pollution from soil contamination.
- 2.6 The Bank's close supervision has enabled early action to be taken on aspects of the project to strengthen the safeguard compliance processes. A part of this, an expenditure framework has been established (see paragraph 1.28) for the implementation of project socioenvironmental management activities, including corrective action plan measures (see paragraph 2.3) to mitigate possible existing liabilities. This will facilitate implementation of the mitigation measures recommended below.
- 2.7 **Mitigation measures.** The mitigation and offsetting measures to be implemented by the executing agency for the identified risks are listed below, in the same order: (i) identify and confirm the new definitive sites for final disposal of materials and muck from excavation. This includes obtaining an environmental license, submitting an environmental and social management study and plan, conducting public consultation processes, and other applicable safeguard requirements, as well as preparing a disaster risk assessment for any location selected as a disposal site; (ii) implement the control measures from the improvement plan agreed upon with the executing agency for occupational safety and health, notably: training of operators and drivers on road safety; analysis and review of dump truck routes; audit of the contractor's management of occupational safety and health; and increased monitoring of travel times and speed limits; (iii) implement corrective action plan measures to mitigate environmental and social liabilities at the Oyacoto disposal site (Ancestral Community of San Francisco de Oyacoto) and the El Troje IV disposal site; (iv) implement the compensation plan agreed upon with the executing agency, which includes agreements and procedures for completing the compensations; and (v) comply with a management plan for contaminated waste and implement a

³⁵ Affected persons who have shown evidence of loss of income as a result of temporary and/or permanent displacement.

³⁶ In response to these impacts, the EPMMQ prepared a sociocultural assessment and identified mitigation and recovery measures, ensuring the engagement of the affected indigenous population (Ancestral Community of San Francisco de Oyacoto).

³⁷ Although the operation is classified as "moderate" (Type 1) in terms of disaster risk, disposal sites require a disaster risk assessment for mitigation measures (Type 2) because of the increased risk of landslides.

cleanup plan to mitigate the remaining liabilities in the La Pradera station area, in coordination with the Department of the Environment.

C. Public management and governance risks

- 2.8 **Risk of lack of financing (medium).** There is a medium risk that a lack of new financing may suspend the works and increase the project's cost due to overruns as work slows to a halt. The mitigation measure is to secure additional resources from the multilateral agencies involved in the project, with approvals set to be completed in the first half of 2018. There is a joint commitment from all the financiers to continue supporting the project. The IDB, as well as the World Bank and CAF, are preparing additional financing so that the project has resources available in a timely manner. The borrower will closely monitor internal processing and the fulfillment of conditions precedent, to ensure that the resources are available.
- 2.9 **Risk of lack of budgetary allocations (medium).** There is a medium risk of delays in payments to contractors and vendors, if entities at the local and national levels do not coordinate to make the necessary budgetary allocations for the project. The borrower will mitigate this possibility through technical/financial dialogue among the National Planning and Development Department (SENPLADES), the Ministry of Economy and Finance (MEF), the Municipio of the Quito Metropolitan District (MDMQ), and the Quito Metro Metropolitan Public Enterprise (EPMMQ), to monitor approval and disbursement requirements for the new financing and anticipate the processing required for the institutions to make the budgetary allocations.

D. Execution risks

- 2.10 **Risk of project cost increase (medium).** Construction of a megaproject runs the risk of increases in the original cost of the project. This is a relatively frequent phenomenon in large infrastructure projects and has been widely documented.³⁸ Although construction of the project has progressed and thus far there have been no cost overruns above the contracted price, the executing agency will continue to implement measures to mitigate their likelihood. Currently, the project is costing US\$88.9 million per kilometer. Despite the increase versus the originally estimated amount, the cost of the First Line of the Quito Metro (PLMQ) is below the worldwide average³⁹ for similar projects and below the cost of most of the lines being constructed in Latin America.⁴⁰
- 2.11 This risk is mitigated by the following factors: (i) budget reserves generated during the value engineering process. Although contingencies have arisen during construction, the optimization in the original designs and efficiencies achieved during construction reinforced the capacity of the project and its budget to absorb them; (ii) the EPMMQ will mitigate the risk of construction cost overruns by continuing to make informed management decisions to address situations of high technical complexity based on robust, coordinated technical analyses; and (iii) adequate financing for the project guaranteed by the MDMQ and the Government of Ecuador,

³⁸ Flyvbjerg, B.; Skamris Holm, M. K.; and Buhl, S. L. "How common and how large are cost overruns in transport infrastructure projects?" *Journal of Transport Reviews*. Vol. 23, Issue 1, 2003.

³⁹ Average cost per kilometer of US\$97.1 million and standard deviation of US\$34.6 million (constant 2012 prices). Metro projects cost analysis and their applicability to the Quito Metro project (IDB, 2014).

⁴⁰ Compared with costs per kilometer for similar projects in Lima (US\$131 million), São Paulo (US\$216 million), Rio de Janeiro (US\$250 million), and Santiago, Chile (US\$81 million).

if a higher level of investment is required. An assessment of the municipio's borrowing capacity ([optional electronic link 4](#)) indicates that the MDMQ could take on up to US\$290 million in new loans in addition to those already planned to finance the PLMQ and other investment projects.

- 2.12 **Risk of SIR and SITP implementation delays (medium).** The Department of Mobility is responsible for implementing the Integrated Collection System (SIR) and the Integrated Public Transportation System (SITP). A significant delay would impact the start date for the metro's commercial operations. Likewise, a delay in restructuring bus routes can affect the expected demand for the metro and its economic viability. The risk of delay for the SIR will be partially mitigated by: (i) continued support for the technical dialogue between the Department of Mobility and the MDMQ to plan the timely purchase of equipment and systems and set rules for the distribution of fare revenue; and (ii) support for the SIR's technical designs to ensure their compatibility and interoperability with this project and other modes of transportation. The risk of delay for the SITP will be partially mitigated by: (i) continued support for the MDMQ and the Department of Mobility by defining implementation strategies for the SITP to speed up the process of raising awareness of the project among transportation companies and identifying effective feeder routes for the metro project; and (ii) support for the technical dialogue between the MDMQ and the Department of Mobility to present an integrated fare policy to the Quito Metropolitan Council, which will set the fare amount for every mode of transportation. Beyond the mitigation measures, the MDMQ committed to deliver the implementation plans for both projects to the IDB in September 2018 (see paragraph 3.8).

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation arrangements

- 3.1 The borrower accountable to the IDB is the Ministry of Economy and Finance (MEF) and the executing agency is the Municipio of the Quito Metropolitan District (MDMQ), acting through the Quito Metro Metropolitan Public Enterprise (EPMMQ). The MEF and the MDMQ will sign the necessary subsidiary and/or fund repayment agreements to: (i) assign the resources, rights, and responsibilities for Phase 2 of the First Line of the Quito Metro (PLMQ) to the MDMQ; (ii) determine the mechanisms for repayment of the loans signed to finance the project; and (iii) establish the financial reconciliation and settlement mechanisms for the contributions made by each of the parties.
- 3.2 The MDMQ is responsible for project execution, acting through the EPMMQ. The EPMMQ was created in 2012 principally to develop, implement, and administer the Quito Metro subsystem, according to the policies and rules issued by the MDMQ. The EPMMQ is empowered to perform any and all transactions and agreements allowed by law, as required to fulfill its responsibilities as the executing entity. The municipio and the EPMMQ are jointly responsible to the financiers for fulfillment of the commitments in the respective loan contracts.
- 3.3 The EPMMQ retained a management firm that has experience with metro projects to provide specialized technical support and strengthen its management capacity. Its main responsibilities include: (i) ensuring project development according to the

detailed designs and taking into account unforeseen circumstances that require making technical decisions for the efficient and effective progress of works; (ii) acting in full representation of the EPMMQ in all technical matters related to the construction works; and (iii) providing advisory support to the EPMMQ on an ongoing basis for matters directly within its purview. The project will continue to be supported by the management firm until the start of operations.

- 3.4 The project has Operating Regulations ([optional electronic link 8](#)) common to all the financiers that establish the terms and conditions governing the use of the resources allocated to the project under the different loan contracts.
- 3.5 **Fiduciary agreements and requirements.** There are no changes to the execution mechanism or the institutional structure of the executing agency. Indeed, the executing agency gained experience in managing projects financed with multilaterals. The audits performed showed that the financial and internal controls are effective. Progress in the works has surpassed 40% without additional costs, and the executing agency has gained the necessary experience.
- 3.6 The main procurement processes have already taken place following IDB procedures. New procurements of works, goods, and related services (nonconsulting services) will follow the Policies for the Procurement of Works and Goods Financed by the IDB (document GN-2349-9) of April 2011. The selection and contracting of consultants will follow the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9) of April 2011. Financial management will continue to follow the Financial Management Guidelines for IDB-financed Projects (document OP-273-6). Audits will include this financing and financing already secured.
- 3.7 **Special contractual conditions precedent to the first disbursement of the new financing: (i) the Bank has received one or more legal reports that establish, citing the relevant legal provisions, that the obligations assumed by the borrower for this new financing are valid and enforceable; (ii) the subsidiary agreement between the borrower and the MDMQ for transfer of the new resources, rights, and obligations has been updated and entered into force; and (iii) the project Operating Regulations have been updated and entered into force on the terms previously agreed upon with the Bank.** These conditions are necessary to: (i) establish that the new financing satisfied all the requirements of local legislation and therefore is valid and enforceable; (ii) enable the executing agency to assume responsibility for project execution and allow the transfer of loan proceeds; and (iii) effectively incorporate the new financing into the project's operational agreements.
- 3.8 **Special contractual execution conditions:** (i) no later than September 2018 the EPMMQ will provide documentary evidence, to the Bank's satisfaction, that the necessary processing has begun for the supply, installation, and operation of the fare collection system for the PLMQ; and (ii) no later than September 2018 the MDMQ will submit an implementation plan, to the Bank's satisfaction, for the restructuring of public transportation routes in Quito.⁴¹ These conditions are

⁴¹ The plan will include at least: (i) the list and operational design of the feeder bus routes for the PLMQ stations; (ii) the implementation schedule for the changes to these routes; and (iii) the implementation schedule for the installation of fare collection equipment on these routes.

necessary to mitigate: the risks of implementation delays for the SIR and SITP, since the projects are connected and required to meet development objectives. These two projects have experienced substantial delays in implementation with respect to the plans originally proposed.

- 3.9 **Retroactive financing.** The Bank may retroactively finance, against the loan proceeds, up to US\$50 million (20% of the proposed loan amount) in eligible expenditures incurred by the borrower prior to the loan approval date for Component 1 activities, provided that requirements substantially similar to those established in the loan contract have been met. Such expenditures must have been incurred on or after 23 January 2018 (project profile approval date) but will not under any circumstances include expenditures incurred more than 18 months prior to the loan approval date.
- 3.10 **Monitoring and evaluation.** The monitoring and evaluation plan ([required electronic link 2](#)) has not changed materially from the original version. It contains details about the Results Matrix indicators, as well as the methodology, timing, and parties responsible for monitoring and evaluation of those indicators. Monitoring will take place periodically, on a six-monthly basis, with the executing agency's team.

IV. RECOMMENDATION

- 4.1 Pursuant to: (i) the provisions of subsection B, paragraph 4, of Operations Administration Manual, Section OA-430, "Substantial and Fundamental Changes to Operations;" (ii) the provisions of Annex I of document GN-2601-2; and (iii) the information and analysis provided in this document, this reformulation may be approved by the Board of Executive Directors via short procedure. However, Management recommends that this reformulation be submitted to the Board of Executive Directors via regular procedure.

Reformulation of the Project Metropolitan Urban Transport System of Quito: First Metro Line of Quito (EC-L1111)

Evaluability Note

This reformulation of the EC-L1111 project increases the IDB's financing of the First Metro Line of Quito by US\$ 250 million. These resources will replace original sources of financing that did not materialize and does not generate changes in the objective of the project or its results matrix. The original diagnosis (updated with more recent figures) is still valid, and the vertical logic of the project is still adequate.

As the contracted values of phase 2 of the project are higher than originally planned, an update of the economic analysis of the project was conducted. This update started with the model originally used and updated macroeconomic variables, the calculation of benefits associated with the reduction of pollution and, according to the actual progress of the project, the timing and value of capital expenditures. It also evaluated alternatives for the cost of operation. Despite the increases in the capital expenditures values, the project has a net present value (NPV) of US\$ 427 million and an internal rate of return of 13.7%. The sensitivity analyzes appear to be reasonable, and most of them show NPV positive values.

RESULTS MATRIX

Project objective:	The project objective remains unchanged: Improve urban mobility in the city of Quito, addressing the growing demand for public transportation. The First Line of the Quito Metro (PLMQ) will shorten travel times; lower the operating costs of transportation service; improve the connectivity, safety, and comfort of the current system; and reduce pollutant and greenhouse gas emissions.
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EXPECTED IMPACT

Indicators	Unit of measure	Baseline (2012)	Final target (2021)	Means of verification	Comments
IMPACT 1: Maintain the modal share of public transportation in motorized travel					
Indicator 1: Percentage modal share of public transportation in motorized travel	Percentage	76	76	Mobility surveys Office of the Secretary of Mobility	In addition to information from the Office of the Secretary of Mobility, the EPMMQ expects to receive a report on the results of an updated mobility and demand study during the second quarter of 2018.

EXPECTED OUTCOMES

Indicators	Unit of measure	Baseline 2012	Final target 2021	Means of verification	Comments
OUTCOME 1: Shorten travel times for public transportation users compared to a scenario without the project¹					
Indicator 1: Travel time for public transportation users	Average minutes per passenger ²	38.5	23.1	Satisfaction Survey of Quito Metro users Quito Metro Metropolitan Public Enterprise (EPMMQ)	In the 2019 scenario without the project, that travel time would be 42.5 minutes.
Indicator 2: Passengers per day in the Metro system ³	Number	0	369,714	Electronic Collection System EPMMQ	Start of Metro operations (2019): 50% of demand. Integrated collection in bus rapid transit system (2020): 65% of demand. Integrated collection in conventional buses (2021): 100% of demand.

¹ Results from the Satisfaction Survey will be divided based on socioeconomic aspects (e.g. gender, income level, geographic location, age).

² Travel time door-to-door (including walking, waiting, and vehicle travel) of users of the bus system who will take the Metro system.

³ It is estimated that regular users of public transportation will account for 87% of Metro users, with 10% attributable to users of private cars, and 3% to "new" trips.

Indicators	Unit of measure	Baseline 2012	Final target 2021	Means of verification	Comments
Indicator 3: Level of Metro passenger occupancy	Passengers per m ²	0	6	Field measurements carried out by the EPMMQ	
Indicator 4: Percentage of users satisfied with the Metro. ⁴ Results disaggregated by gender.	Percentage	0	65	Satisfaction Survey of Quito Metro users EPMMQ	For the Satisfaction Survey, a representative sample of passengers will be interviewed. The results will be presented aggregated for the entire population and disaggregated by gender.
OUTCOME 2: Lower the operating costs of Quito's vehicle fleet compared to a scenario without the project					
Indicator 1: Operating cost of Quito's vehicle fleet	US\$ millions per year ⁵	999	1,181	Target assessment survey to update operating cost ⁶ EPMMQ	In the 2021 scenario without the project, that operating cost would be US\$1.249 billion.
Indicator 2: Percentage of Metro feeder routes ⁷ in operation ⁸	Percentage	0	100	Electronic Collection System EPMMQ	Intermediate milestones: 30% in 2019, 65% in 2020.
Indicator 3: MDMQ bus fleet under a unified collection system ⁹	Percentage	30	90	Electronic Collection System EPMMQ	The original results matrix target was 90%.
OUTCOME 3: Reduce greenhouse gas emissions compared to a scenario without the project					
Indicator 1: Greenhouse gas emissions	Million tons per year ¹⁰	1,201	1,407	EPMMQ Records of the City of Quito's Office of the Secretary of Mobility	In the 2019 scenario without the project, emissions would be 1,472 million tons.

⁴ This indicator is based on evaluating user satisfaction according to multiple criteria that define service quality. These include: speed, timeliness, occupancy levels, cleanliness, and safety.

⁵ Total operating cost of the public transportation and private vehicle fleets.

⁶ The estimates for operating cost of Quito's vehicle fleet are included in the economic assessment. The cost model will be updated once operations begin with the actual operating cost for the Metro and the updated cost for other modes of transportation at that time.

⁷ The report on restructuring the public transportation network for passengers of the Quito Metropolitan District identified 31 corridors among the 68 corridors proposed by the study as feeders for the 15 stations of the Quito Metro system.

⁸ The operation of the feeder routes indicates that: (i) current bus travel has been restructured; (ii) the fare system for buses and Metro is integrated; and (iii) passengers have the physical facility of transfer to the Metro system, based on the Implementation Plan for the Integrated Public Transportation System (SITP).

⁹ This means that the system's technology is compatible and interoperable with the Quito Metro project collection system.

¹⁰ Total emissions of the public transportation and private vehicle fleets.

OUTPUTS

Indicators	Unit of measure	Baseline (2012)	Year 1 (2013)	Year 2 (2014)	Year 3 (2015)	Year 4 (2016)	Year 5 (2017)	Year 6 (2018)	Year 7 (2019)	Year 8 (2020)	Year 9 (2021)	Final target	Means of verification	Comments
Component 1: Civil works, facilities, and environmental and social management plan														
Output 1: Construction of underground work ¹¹	Kilometers of tunnel constructed, with structure	0	0	0	0	0	8.74	8.24	5.09 ¹²	0	0	22.07	Inspection report EPMMQ	
Output 2: Construction of boarding stations	Number of stations built ¹³	0	0	0	2 ¹⁴	0	8 ¹⁵	5	0	0	0	15	Inspection report EPMMQ	
Output 3: Construction of depots ¹⁶	Number of depots built	0	0	0	0	0	0	1	0	0	0	1	Inspection report EPMMQ	
Output 4: Facilities completed ¹⁷	Number of full systems in facilities completed	0	0	0	0	0	0	0	0	1	0	1	Inspection report EPMMQ	
Component 2: Rolling stock														
Output 1: Delivery of trains ¹⁸	Number of trains delivered	0	0	0	0	0	0	12	6	0	0	18	Inspection report of verifying entity EPMMQ	

¹¹ Involves the entire concrete structure.

¹² Amount established based on the 2A Alternative Schedule presented by the management firm during the supervision mission that took place from 28 November to 1 December 2017.

¹³ A "station built" is defined as a completed shell and core (civil work), without including architectural elements or facilities.

¹⁴ The two stations built are: El Labrador and La Magdalena.

¹⁵ The eight stations built are: Morán Valverde, Solanda, Cardenal de la Torre, El Recreo, El Ejido, Carolina, Iñaquito, and Jipijapa.

¹⁶ The depot/workshop will be located at the Quitumbe station.

¹⁷ This indicates that all of the project's stations have all the facilities needed for the proper functioning of the line in place: (i) power distribution; (ii) electrification; (iii) ticket control and sale system; (iv) escalators and elevators; (v) fire protection system; (vi) ventilation; (vii) communications system and radio telephony; (viii) monitoring of stations; and (ix) central control room. This also means all of the facilities in the tunnel, including: (i) electrification; (ii) ticket control and sale system; (iii) escalators and elevators; (iv) fire protection system; (v) ventilation; (vi) communications system and radio telephony; (viii) monitoring of stations; and (ix) central control room. In addition, this means all additional facilities in the tunnel, including: (i) railway signals; (ii) electrical substations; (iii) power distribution; (iv) electrification; (v) fire protection system; (vi) ventilation; and (vii) communications system and radio telephony.

¹⁸ Eighteen sets of 6 cars (4 motorized cars for each train) with capacity to accommodate 1,270 passengers.

Indicators	Unit of measure	Baseline (2012)	Year 1 (2013)	Year 2 (2014)	Year 3 (2015)	Year 4 (2016)	Year 5 (2017)	Year 6 (2018)	Year 7 (2019)	Year 8 (2020)	Year 9 (2021)	Final target	Means of verification	Comments
Component 3: Technical assistance														
Output 1: Quarterly reports on project management results	Number of project management reports approved by the EPMMQ	0	0	0	0	3	6	4	4	1	0	18	Certificate of delivery/ acceptance EPMMQ	
Output 2: Monthly reports on inspection results	Number of inspection results reports approved by the EPMMQ	0	0	0	0	10	12	12	4	0	0	38	Certificate of delivery/ acceptance EPMMQ	
Output 3: Reports on inspection results for rolling stock	Number of inspection results reports approved by the EPMMQ	0	0	0	0	0	9	12	8	0	0	29	Certificate of delivery/ acceptance EPMMQ	
Output 4: Quarterly technical support reports for the start of operations	Number of reports approved by the EPMMQ	0	0	0	0	0	0	0	0	3	4	7	Certificate of delivery/ acceptance EPMMQ	

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country	Ecuador
Project number:	EC-L1111
Project name:	Reformulation of the project “Quito Metropolitan Urban Transportation System: First Line of the Quito Metro”
Executing agency:	Municipio of the Quito Metropolitan District (MDMQ) and/or Quito Metro Metropolitan Public Enterprise (EPMMQ)
Prepared by:	Juan Carlos Dugand and Gumersindo Velázquez (FMP/CEC)

I. INTRODUCTION

- 1.1 This document is an update of Fiduciary Agreements and Requirements owing to the reformulation, given the changes in the financing structure and the inclusion of an additional loan.
- 1.2 **There are no changes to the execution mechanism or the institutional structure of the executing agency.** Indeed, the executing agency gained experience in managing projects financed with multilaterals, so no new institutional assessment was performed.
- 1.3 **The Fiduciary Agreements and Requirements of the original loan have not changed.** This annex still applies the same fiduciary policies. It should be noted that this operation will finance the contract for execution of the Metro works, expansions in works inspection, and consulting services, as described in the respective procurement plan. The policies indicated in section VI of this agreement will apply for procurement.

II. FIDUCIARY CONTEXT OF THE COUNTRY

- 2.1 The country's fiduciary context has made significant gains since 2008, as evidenced in recent evaluations of the public procurement system (MAPS 2011) and the public financial management system (PEFA 2014).
- 2.2 **Procurement system.** On 25 February 2013, the Bank's Board of Executive Directors approved advanced use of the National Public Contracting System (SNCP) in Bank-financed operations (document GN-2680-2). The “Agreement for Use of the SNCP of the Republic of Ecuador in Projects Financed by the Inter-American Development Bank” was signed on 13 May 2014 between the Ministry of Economy and Finance (MEF), the National Public Contracting Service (SERCOP) (as apex agency), and the Bank. Paragraph 3.2 of that agreement states that the SNCP will be used on seven projects and expanded gradually. To date, this is still being implemented.

- 2.3 **Financial management system.** Government entities use the e-SIGEF Integrated Financial Management System, which integrates budgetary, accounting, and treasury processes. Government entities are subject to control and oversight by the Office of the Comptroller General (CGE). In general, the country financial management systems have an adequate level of development but need to be supplemented, for the execution of IDB-financed projects, in the areas of financial reporting with nonaccounting records and external audit conducted by audit firms eligible for the IDB.

III. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

- 3.1 The project executing agency is the Municipio of the Quito Metropolitan District (MDMQ), acting through the Quito Metro Metropolitan Public Enterprise (EPMMQ), which was founded in 2012 as an entity with administrative and financial autonomy. The executing agency is currently executing loan contracts 2882/OC-EC and 2882/OC-EC-1, which finance part of this project along with loans from the World Bank, the Development Bank of Latin America (CAF), and the European Investment Bank (EIB) ("the multilaterals").
- 3.2 The borrower is the Republic of Ecuador. There is a subsidiary agreement signed by the Ministry of Finance (now the Ministry of Economy and Finance (MEF)) and the MDMQ and/or EPMMQ, stating the conditions for the executing agency to use the resources. A new or updated agreement will be required, to incorporate the additional financing.
- 3.3 The main procurement processes were already conducted following IDB procedures under the cooperation agreement signed by the multilaterals involved in financing the project. The contracts are in the execution stage.
- 3.4 As part of the execution mechanism, there is a consortium responsible for management and technical assistance, which supports the executing agency and has shown its efficiency through engineering improvements and cost optimization for the project. There is also a works inspection firm that is being financed with resources from IDB and CAF loans.
- 3.5 The consortium that was awarded the construction contract underwent a restructuring in 2017 with the authorization of the multilaterals. This process culminated in the departure of the company Odebrecht and the addition of subsidiaries of Acciona, and gave rise to certain complications that did not impact the project's physical progress.
- 3.6 In terms of information systems to support fiduciary management, the executing agency has independent information systems, since it is not part of the central government. The borrower uses the e-SIGEF Integrated Financial Management System to record transfers of resources to the municipio. Procurement processes are recorded in the public procurement portal.

IV. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

- 4.1 **Procurement execution.** Although the main procurement processes were already conducted, any new procurement processes will follow the Policies for the Procurement of Works and Goods Financed by the IDB (document GN-2349-9) and

the Policies for the Selection and Contracting of Consultants Financed by the IDB (document GN-2350-9). The procurement plan will be updated annually or as necessary.

- a. **Procurement of works, goods, and nonconsulting services.** Contracts for works, goods, and nonconsulting services¹ generated under the project and subject to international competitive bidding (ICB)² will fall within the threshold specified on the [website](#). ICB processes will be executed using the standard bidding documents issued by the Bank.
- b. **Selection and contracting of consultants.** Contracts for consulting services will be executed using the standard request for proposals issued by or agreed upon with the Bank. The selection processes to be conducted using single-source selection will also be identified. Any of the methods described in the Consultants Policies may be used in selecting and contracting consulting services, provided that the method chosen has been identified for the respective contracting in the procurement plan approved by the Bank. The threshold for the short list with international consultants³ will be posted for the project on the [website](#).
- c. **Selection of individual consultants.** In the cases identified in the approved procurement plans, individual consultants must be contracted in accordance with the Consultants Policies, section V, paragraphs 5.1 to 5.4.
- d. **Training.** There are no plans for contracting that involves training.
- e. **Use of the country procurement system.** There are no plans for procurement under the SNCP.
- f. **Retroactive financing.** The Bank may retroactively finance, against the loan proceeds, up to US\$50 million (20% of the proposed loan amount) in eligible expenditures incurred by the borrower prior to the loan approval date for Component 1 activities, provided that requirements substantially similar to those established in the loan contract have been met. Such expenditures must have been incurred on or after 23 January 2018 (project profile approval date) but will not under any circumstances include expenditures incurred more than 18 months prior to the loan approval date.
- g. **Domestic preference.** Bids offering goods originating in the country of the borrower will have a price preference⁴ equivalent to 15% in contracts subject to ICB.

Table 1. Thresholds (US\$)

Works	Goods	Consulting services
ICB	ICB	International publicity – Consulting
≥ 3,000,000	≥ 250,000	≥ 200,000

¹ Document [GN-2349-9](#) (paragraph 1.1): Nonconsulting services are treated as goods.

² At present, the ICB threshold is applicable for amounts of US\$3 million or more for works, and for amounts of US\$250,000 or more for goods and nonconsulting services.

³ The threshold for the contracting of consulting firms is for amounts of US\$200,000 or more; for smaller amounts, the short list may comprise entirely national consulting firms.

⁴ Policy [GN-2349-9](#), Appendix II, and the loan contract.

Table 2. Main IDB procurement processes

Activity	Type of bidding	Estimated date of invitation	Estimated amount (US\$)
Consulting services – firms			
Support for the start of operations	Selection based on the consultants' qualifications	July 2019	200,000.00

- 4.2 **Procurement supervision.** The method for procurement supervision will be determined by the Bank. Procurement supervision will be on an ex post basis, except in cases in which ex ante supervision is warranted. When procurement is conducted using the country system, supervision will also be through the country system⁵ and/or as agreed upon with the Bank.
- 4.3 The supervision method will be determined for each selection process.⁶ Ex post reviews will be every 12 months in accordance with the project supervision plan. Ex post review reports will include at least one physical inspection visit,⁷ selected from the procurement processes subject to ex post review.

Table 3. Thresholds for ex post review (US\$)

Works	Goods	Consulting services	Consulting services – Individual
< 3,000,000	< 250,000	< 200,000	< 50,000

Note: The thresholds for ex post review are based on the executing agency's fiduciary capacity for execution.

- 4.4 **Special provisions.** Measures to reduce the likelihood of corruption are adherence to the provisions of documents GN-2349-9 and GN-2350-9 regarding prohibited practices (multilateral agencies' lists of ineligible firms and individuals).
- 4.5 **Other special procedures.** None expected.
- 4.6 **Records and files.** The executing agency will keep records and files up-to-date and organized with procurement-related documentation in a single file or folder that can be clearly differentiated from processes financed with local counterpart or nonproject resources. Project reports will be prepared and filed using agreed formats or procedures described in the project Operating Regulations.

V. FINANCIAL MANAGEMENT AGREEMENTS AND REQUIREMENTS

A. Programming and budget

- 5.1 The Code Planning and Public Finance (COFYP) establishes the rules governing budget programming, formulation, approval, execution, control, evaluation, and outturn reporting. These rules are applicable to the execution of Bank-financed

⁵ Depending on the scope of use of the system, supervision may be supplemented with project audits, in which case mention should be made in this annex.

⁶ The procurement plan will indicate the review methods applicable to each contract: (i) ex post; (ii) ex ante; or (iii) country system.

⁷ The inspection verifies the existence of the procurements, leaving verification of quality and of compliance with specifications to the sector specialist.

operations in the country. Although the revenues and expenditures of the EPMMQ are not part of the National General Budget, the preparation of pro forma budgets must also conform to COFYP and to the technical rules, guidelines, schedules, and charts of accounts established by the MEF. Programming and budgeting will be performed for each component by the executing agency. The borrower must also budget the resources to be transferred to the executing agency in the e-SIGEF Integrated Financial Management System.

- 5.2 **Accounting and information systems.** The executing agency's systems will be used for project accounting. The borrower will record the funds transferred to the municipio in the e-SIGEF system.
- 5.3 **Disbursements and cash flow.** In 2008, the Government of Ecuador established a national general treasury account as a mechanism to consolidate cash management at all central government entities. The executing agency does not have access to this account,⁸ but the borrower does. The implementation of this mechanism did not eliminate the system of specific or special-purpose accounts managed at the Central Bank of Ecuador for receiving the proceeds of multilateral loans.
- 5.4 Given that the borrower is the Republic of Ecuador, the MEF will coordinate and request the processing of Bank disbursements, which will be deposited in the existing special account at the Central Bank of Ecuador for the management of project resources. These proceeds are then transferred to the municipio and deposited into exclusive accounts it has for each financier. The municipio will make all project payments through its central payment account, so that it can recover value-added tax (VAT), requiring an additional transfer of funds to this account at the time payments are made.
- 5.5 The Bank will disburse loan proceeds using the advance of funds modality according to the project's actual liquidity needs, based on an itemized financial plan and cash flow reflecting the project's actual resource requirements for a period of up to six months. At the borrower's request, the Bank may also make direct payments to suppliers or reimburse expenditures.
- 5.6 A *pari passu* system will be used to ensure a proportional level of disbursements from the respective financiers. However, due to the pace of project execution and the restrictions on some sources, available funds will be disbursed to avoid impacting project progress.
- 5.7 Advances of funds will be accounted for as established in document OP-273-6. A new disbursement can be made once justification has been provided for 80% of the balance of previous advances.
- 5.8 Supporting documentation for payments made will be subject to ex post review by the Bank and/or an external audit firm subsequent to disbursement of the resources.

B. Internal control and internal audit

- 5.9 The Constitution of the Republic of Ecuador establishes that the CGE is responsible for directing the public-sector control system. As part of that sector, the executing

⁸ Under the Public Enterprises Act, central government entities are not required to manage their cash resources through the national general treasury account or to manage their financial information and resources through the e-SIGEF Integrated Financial Management System.

agency has its own internal audit unit reporting directly to the CGE. However, the Bank will not use its services, since that unit's audit plans do not include review of the project.

C. External control and reports

- 5.10 Since the CGE does not currently have sufficient capacity to exercise external control over externally financed projects, the external audit of the project will be performed by independent auditors acceptable to the Bank, in accordance with IDB requirements (document OP-273-6). This will include the funds of all multilateral financiers of the project. The firm will be contracted based on terms of reference previously agreed upon with the other financiers. During execution, the project's audited financial statements will be delivered annually, within 120 days after the closing date of each fiscal year or the date of the last disbursement.
- 5.11 There is no national policy regarding public disclosure of audit reports. Nonetheless, according to the current access to information and disclosure policy, the project's audited reports will be published in the Bank's systems.

Table 4. Fiduciary supervision plan

Supervision activity	Supervision plan			
	Nature and scope	Frequency	Responsible party	
			Bank	Other
Operational	Review of status report	Six-monthly	Project team	
	Portfolio review with the executing agency	As per MEF requirements	Project team	
Financial	Review of cash flow and disbursement schedule	With each request for advance of funds and joint missions with the financiers	Project team	Executing agency
	Inspection visits	Annual	Fiduciary specialist	Consultant/Auditor
	Review of audited financial reports	Annual	Fiduciary specialist/ Project Team Leader	Consultant/Auditor
Procurement	Ex ante review of procurements	During project execution	Project Team Leader/ Executing agency	Executing agency
	Update of procurement plan	Annual	Project Team Leader/ Executing agency	Executing agency
Compliance	Fulfillment of conditions precedent	Once	Project team	Executing agency
	Review of prioritization and budget allocation	Annual	Fiduciary specialist/ Project Team Leader/ Operations analyst	Executing agency
	Delivery of audited financial statements	Annual	Project Team Leader/ Fiduciary specialist	Executing agency/Auditor

D. Execution mechanism

- 5.12 The project executing agency is the MDMQ, acting through the EPMMQ, with technical support from a management firm.
- 5.13 The main activities of the EPMMQ include: (i) administration of the loan proceeds and fiduciary matters (procurement and financing); (ii) planning of loan execution, including preparation of the annual work plans and monitoring and update of the procurement plan; (iii) coordination and supervision of activities relating to procurement processes for the contracting of works and consulting services; (iv) monitoring and supervision of project execution progress; (v) preparation of financial statements and disbursement requests; (vi) evaluation of project impact; and other activities described in the unified Operating Regulations for all the financiers.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/18

Ecuador. Additional Financing to the Republic of Ecuador
Reformulation of the Project Quito Metropolitan Urban Transportation
System: First Line of the Quito Metro
(Loan Contracts 2882/OC-EC
y 2882/OC-EC-1)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Ecuador, as Borrower, for the purpose of granting it an additional financing to that already approved by Resolutions DE-209/12 and DE-210/12 to cooperate in the execution of the Reformulation of the Project Quito Metropolitan Urban Transportation System: First Line of the Quito Metro. Such additional financing will be for the amount of up to US\$250,000,000 from the resources of the Bank's Ordinary Capital, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on ____ 2018)