

# PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC806

<b>Project Name</b>	Ecuador - Quito Metro Line One (P144489)
<b>Region</b>	LATIN AMERICA AND CARIBBEAN
<b>Country</b>	Ecuador
<b>Sector(s)</b>	Urban Transport (95%), Public administration- Transportation (5%)
<b>Theme(s)</b>	City-wide Infrastructure and Service Delivery (99%), Climate change (1%)
<b>Lending Instrument</b>	Specific Investment Loan
<b>Project ID</b>	P144489
<b>Borrower(s)</b>	Municipality of Quito
<b>Implementing Agency</b>	Empresa Pública Metropolitana Metro de Quito (EPMMQ)
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/ Updated</b>	04-May-2013
<b>Date PID Approved/ Disclosed</b>	05-May-2013
<b>Estimated Date of Appraisal Completion</b>	14-Jun-2013
<b>Estimated Date of Board Approval</b>	30-Jul-2013
<b>Concept Review Decision</b>	

## I. Introduction and Context

### Country Context

1. An Interim Strategy Note (ISN) for Ecuador will be discussed at the Board in early April 2013.. The ISN identifies transport and access to basic services at the subnational level as key priorities for the authorities to contribute to their goal for inclusive and sustainable growth. The country has seen a period of relative political stability and the Government has invested unprecedented amounts of resources in infrastructure and the social sectors in an effort to reduce inequality and promote inclusion.
2. Quito lies in a narrow and long valley that runs South-North, with the poorest population concentrating in the south. It is estimated that 17.4% of the Quito population is moderately poor. Quito's historical downtown -CHQ-, a UNESCO World Heritage site since 2007, is also the city's geographic center and main attractor of daily trips (47%). Historically, the north of Quito has been a commercial and residential center for wealthier-than average population, while the south caters mainly for industries and lower income residential neighborhoods. Densities towards the suburban periphery of the city tend to be higher, and the availability of city-scale urban facilities tends to be

lower. 2,239,000 people live in the Metropolitan District of Quito (DMQ). The population in the urban area grows at 1.72% per year and the population in the suburban area grows at a rate of 4.17%. Long, suburban trips are expected to represent 30% of all trips in the DMQ by 2020.

### **Sectoral and Institutional Context**

3. Transport demand in Quito has been growing because of a growing population, which increases the total number of trips, and because of a process of suburbanization, which increases the length of the average trips. According to 2011 data provided by DMQ, nearly 3.7 million daily trips are made in Quito on a weekday. From these, nearly 2.2 M (62%) are made in public transport, 0.85 M (23%) in cars (including taxis), and 0.56 M (15%) in non-motorized modes. Public Transport in Quito is divided in two systems: The conventional system (64% of daily trips in public transport) and the BRT mass transit system Metrobus-Q (23%). The public transport system also accounts for trips done by school or company buses and informal transport (14%). The data from the 2011 mobility survey indicates that people in Quito do in average 1.97 trips per person, while surveys show that actual people who travel daily do in average 2.41 trips per day. Motorization rates in Quito are increasingly high. According to the 2009 Quito Mobility Plan, total private car fleet more than doubled between 2002 and 2009, reaching 405,300. This corresponds to a motorization rate of nearly 180 vehicles per 1,000 inhabitants.

4. The Quito BRT network, known as the Metrobus-Q system, has a total length of 135 Km. Throughout the 1990s Quito became an internationally recognized city in urban transport planning thanks to successfully emulating Curitiba's Bus Rapid Transit technology. The Trole project opened for service in 1995 and it even goes through the narrow streets of historic Quito, a World Heritage site. Subsequently, Quito expanded its BRT network to include other corridors: Ecovia (2002); Central North Corridor (2004); Southeast Corridor (2010); and the recently inaugurated Southwest Corridor (May 2012). Moreover, the DMQ has started the construction of a sixth one called the Northeast Corridor.

5. CHQ has bottlenecks that constrain the provision of surface mass transit corridors (BRT, Rail) and roads for cars. The bottlenecks are the World Heritage CHQ itself which has narrow streets that cannot be widened unless historic buildings are demolished. A second bottleneck is the Panecillo hill in the core of CHQ. A tunnel crosses this mountain, but it is difficult to widen it to increase capacity. This hill divides the wealthier-than-average north of the city, from the south, which has the largest concentration of poor people.

6. The Metrobus-Q system in effect uses all the corridors that could fit a surface, bus-based mass transit system and that can cross the CHQ (see Figure 1 in section III). On average, the Metrobus-Q system moves 7,400 trips per km of network, which is 70% higher than Washington DC's Metro figure at 4,700 passengers per km of network. The Trole as the main line in the system has peaks of 14,000 trips per hour per direction (pphpd) and 248,000 trips per day. The Trole has no overtaking lines and therefore its buses go in line, one after the other. Bus frequency in the Trole is one every 45 seconds. As a result buses easily bunch with up to three and even four buses arriving at the same time to a station. Bunching lowers the quality of service to the user. Moreover, buses during the peak hour carry 175 passengers per bus, well above the 160 passengers the maximum capacity they were designed for. In effect, at a value of 10.0, the Trole has one of the highest IPK (passenger per km logged by the fleet) indicators among BRTs in the World. In comparison Transmilenio's in Bogotá IPK is 5.7 and Transmilenio has overtaking lanes in all its stations.

7. Given the bottlenecks in CHQ, increasing the capacity of the Metrobus-Q system seems infeasible. The capacity of the existing BRT network could be expanded by:

(i) Using a longer bus, such as 24-meter bi-articulated bus instead of the 18-m, articulated bus currently in use. This option does not seem feasible because of some sharp turns that an 18 meter

bus can barely navigate let alone a 24-m one. Average speed in the Trole is only 13.5 mph. But even if a 24-m bus could turn, these buses tend to be slower than the 18-m ones and the increase in capacity will not be able to cope with the increase in ridership once the Northeast Corridor enters into operation and more importantly the SITM (see below);

(ii) Building overtaking lanes particularly at the most heavily patronized stations. The overtaking lanes would allow introducing express buses that stop only at certain stops. The buses in the Metrobus-Q system have to stop in all stations hence capping the total number of buses per hour at about 80. With overtaking the figure could be higher and hence the capacity of the line. But CHQ does not have wide streets. In fact, some BRT lines already use one-lane streets to travel northbound and another one-lane street one block away for the southbound direction. And demolishing historic buildings to create overtaking lanes is not allowed by local and UNESCO World Heritage site regulations.

8. In addition, the Quito municipal government wants to create an Integrated Transit System, locally known as SITM, by linking under one single fare-card all public transport. An SITM, in general, allows users to pay one fare and transfer between modes to complete their trip. An SITM implies physical and fare integration. Physical integration ensures that people get off a bus and can board the metro by walking a short distance. Fare integration ensures that the cost of transferring is low, preferably zero. Because of these benefits, and SITM is a pro-poor, pro-women measure, and pro-disabled. Pro-poor because, as is the case in Quito, poorer households live farther away from their place of work and frequently have to transfer. Pro-women because women make more chained trips – e.g. they may drop the children at day-care, go to work, on the way back they pick up the children, go to the doctor, then shopping, and finally home. An integrated fare means most if not all the chain of trips can be completed under one fare. And the SITM is pro-disabled users because transfer stations can have elevators, podotactile surfaces, and signs in braille.

9. Because of the benefits to riders, SITM tend to increase demand for public transport because it facilitates travel for those that already use transit and it makes transit more attractive for car users. Plans for the SITM show that the demand in the corridor with the highest demand through CHQ will be of 18,500 pphpd by 2016 and 23,000 by 2020. The Trole is functioning at above capacity and saturated at 14,000 pphpd. Hence a subway line is needed to become the trunk service of the SITM and handle the increased demand. The Quito municipal government has studied the issue carefully and has concluded that an underground metro, subway, is the technology that has the capacity to carry above 23,000 pphpd and can cope with the spatial limitations in CHQ.

### **Relationship to CAS**

10. The draft ISN has three main pillars, identified together with the authorities: (i) Sustainable and Inclusive Growth; (ii) Access to Social Protection and Quality Basic Services for all; and (iii) Strengthening Public Sector Capacity to provide Access to Quality Services. The Bank Group is already engaged in all three areas, mainly through advisory services (studies and non-lending technical assistance) and Trust Funds. 11. Under the first pillar, the ISN seeks to carry out lending for urban infrastructure, such as the Quito Metro Line 1 project. In effect, the ISN states that “In Quito, the proposed investments to expand and upgrade the urban public transport system, including the construction of an underground Metro line, will provide significant improvements in the quality of services and important reductions in travel time, particularly for low income users. Poor and very poor citizens are frequent users of urban public transport. In addition, people with disabilities will benefit because public transport projects are designed with universal access features. Designs also give priority to women’s safety considerations.”

12. The Municipality of Quito has requested support from the Bank through an investment lending operation with a central government guarantee for the Quito Metro line, which is co-

financed by the IADB, CAF and EIB. Additionally, the Bank has offered assistance to the Government to build capacity in environmental and social safeguards, particularly for projects that could benefit from Bank financing in the future. IDB, CAF, and EIB have approved financing for this project in the aggregate amount of \$700 million and will finance the contribution the GoE has committed to the project (for a total of \$750.4 million). These MDBs prepared the project during most of 2012, as corroborated during the identification mission. Therefore, while preparation is only starting now for the World Bank team, there is a solid foundation to build on due to continuous dialogue with development partners and the country.

13. In parallel, the GoE has declared the Quito Metro a priority project. The national government is committed to finance half of the required investment and strongly supports the project.

## II. Proposed Development Objective(s)

### Key Results (From PCN)

17. The key result indicators are:
- (a) Reduction in in-vehicle travel time thanks to the metro for a comparable trip (same origin and destination );
  - (b) Number of low-income users of the metro;
  - (c) Percentage of women passengers of the metro;
  - (d) Number of disabled passengers;
  - (e) Reduction in CO2 emissions.
  - (f) Percentage of users that own a car.
  - (g) Once the metro is operational, the Quito ITS will be implemented.

## III. Preliminary Description

### Concept Description

The project will have the following components:

- (1) Construction of two underground stations La Magdalena and El Labrador. Using own funds, the DMQ held a bid for this construction contract and works have started. The estimated cost is \$ 83 million.
- (2) Construction of 23 km of tunnel, 16 stations, and provision of all track and electromechanical equipment needed (signaling, power supply, communications, control center, fare collection, etc.). The World Bank will finance \$200 million of this contract worth around \$1.23 billion. IDB, EIB, and CAF will also finance this contract using co-financing. The bidding process for this contract has started already and the Bank is involved under the figure of Advance contracting/retroactive financing. When required, the client will request an official response from the Bank in accordance to the applicable procurement guidelines.
- (3) Acquisition of 18, six-car trains, with four motorized cars per train. This rolling stock will be built to meet the specifications of the Quito Metro. This component will be financed by the DMQ with own funds. The estimated cost is US\$ 193 million.
- (4) Technical Assistance. Supervision of works is essential to ensure design standards and specifications are met. Project management is needed to emulate the successful Spanish experience with subway construction in which a knowledgeable set of experts is able to address rapidly controversies that emerge between contractor and owner. This component will be financed by the

IDB, CAF, and the DMQ. The estimated cost is \$ 51 million.

The total cost of the project is estimated to be \$1.680 billion dollars, including all applicable taxes.

The expected construction period is three and a half years, from 2013 to 2016. The proposed closing date is December 31, 2018.

#### IV. Safeguard Policies that might apply

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>	<b>TBD</b>
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09			x
Physical Cultural Resources OP/BP 4.11	x		
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12	x		
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

#### V. Financing (in USD Million)

Total Project Cost:	1680.00	Total Bank Financing:	200.00
Total Cofinancing:		Financing Gap:	0.00
<b>Financing Source</b>			<b>Amount</b>
Borrower			830.00
International Bank for Reconstruction and Development			200.00
Andean Development Corporation			200.00
EC European Investment Bank			250.00
Inter-American Development Bank			200.00
Total			1680.00

#### VI. Contact point

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