

ABSTRACTO DE COOPERACIÓN TÉCNICA

I. Información Básica del Proyecto

▪ País/Región:	ECUADOR/CAN - Grupo Andino
▪ Nombre de la CT:	Comprendiendo los impactos de los sistemas de metro en ALC: El caso de la Primera Línea de Metro de Quito
▪ Número de CT:	EC-T1584
▪ Jefe de Equipo/Miembros:	CALATAYUD, AGUSTINA (INE/TSP) Team Leader; ARMIJOS LERAY, JEAN POL (INE/TSP) Alternate Team Leader; GOMEZ DE LAS HERAS, EDUARDO (INE/TSP); PEDRAZA SANCHEZ, LAURAMARIA (INE/TSP); NAVAS DUK, CRISTIAN LEE (INE/TSP); BORJA PLAZA LEONEL ALEJANDRO (INE/TSP); SCHOLL, PATRICIA LYNN (INE/TSP); BRITO VERA, JUAN CARLOS (CAN/CEC); ZANONI LOPEZ, WLADIMIR (CAN/CEC); OSCAR MITNIK (SPD/SDV); QUINTERO ESCOBAR, LUIS (SPD/SDV); CHAUVIN RODRIGUEZ, JUAN PABLO (RES/RES); LAGUADO GIRALDO, ROBERTO (VPC/FMP); CARDENAS GARCIA, CLAUDIA MYLENNA (VPC/FMP); FERRO BRICENO PAULA VANESSA (INE/TSP); RAMIREZ PIMIENTO GERMAN DANIEL (INE/TSP); PAREDES CALERO ADRIANA JACQUELINE (INE/TSP); JIMENEZ MOSQUERA, JAVIER I. (LEG/SGO)
▪ Taxonomía:	Research and Dissemination
▪ Número y nombre de la operación que apoyará la CT:	N/A
▪ Fecha del Abstracto de CT:	03 Sep 2024
▪ Beneficiario:	Empresa Pública Metropolitana Metro de Quito (EPMMQ)
▪ Agencia Ejecutora:	INTER-AMERICAN DEVELOPMENT BANK
▪ Financiamiento solicitado del BID:	US\$375,000.00
▪ Contrapartida Local:	US\$0.00
▪ Periodo de Desembolso:	36 meses
▪ Tipos de consultores:	Individuos; Empresas
▪ Unidad Responsable de Preparación:	INE/TSP - Transporte
▪ Unidad Responsable de Desembolso:	CAN/CEC - Representación Ecuador
▪ CT incluida en la Estrategia de País (s/n):	Sí
▪ CT incluida en CPD (s/n):	Sí
▪ Alineación a la Actualización de la Estrategia Institucional 2010-2020:	Igualdad de género; Diversidad; Personas con discapacidad; LGBTQ+; Inclusión social e igualdad; Productividad e innovación; Sostenibilidad ambiental

II. Objetivos y Justificación de la CT

- 2.1 El objetivo de la evaluación es determinar el impacto de la Primera Línea de Metro de Quito (PLMQ) en la movilidad de los habitantes de la ciudad, así como en los resultados socioeconómicos y ambientales. La pregunta principal de la evaluación es el impacto de la operación del metro en la movilidad, el acceso a instalaciones de salud y educación, y a empleo, uso del suelo, contaminación y la actividad económica.
- 2.2 The main question of evaluation is the impact of the operation of the metro on mobility, access to health and education facilities and jobs, land use, pollution, and economic activity. This inquiry is rooted in a large body of literature that shows that not only can metro systems significantly increase access to city health and educational facilities (Alba-Vivar, F. M. , 2024), but they can also increase the economic activity of places

that benefit from it (Gendron-Carrier, P., Gonzalez-Navarro, M., Polloni, S., & Turner, M., 2018). Metro systems have also been shown to increase the number of jobs that households in remote city locations have access to (Zárate, Román D, 2022). The impact on pollution has also been studied in developed countries (Gonzalez-Navarro, M., & Turner, M. A., 2018). This evaluation will extend the understanding of the impact in developed countries. It also provides an optimal setting to understand the impact of implementing a whole new transit system instead of the potentially milder effect of adding metro lines to an existing system, which has been more widely studied.

- 2.3 The main evaluation methodology exploits realized and unrealized plans for the metro line. The placement of metro stations results from a planning process that considers the outcome variables of our analysis. This gives rise to an endogeneity problem. At the conceptual design stage 20 Metro Stations were planned; however, due to budget and planning issues, 5 of those stations were not built. Their sites have been left as potential future stations. They are not currently in operation. These provide suitable locations to use as controls of the areas treated with a running station. Plans that may vary from realization provide an identification strategy previously used in the literature to estimate the impact of infrastructure projects (Duranton et al. 2013). Our first approach will estimate a difference in differences (DID) model using these unopened metro stations as controls. Under the assumption of parallel trends between these controls and the treated locations, these comparisons identify the metro's operation impact with standard DID estimators.
- 2.4 This identification approach may suffer from external validity issues. To address this, we will check the robustness of our results by expanding the selection of control areas to the sites of 5 planned stations for an upcoming extension of the first line that has been announced but not yet built. We also will consider 6 planned stations that come from historical metro plans from the 1980s that were also not realized.
- 2.5 Finally, to further increase the scope of the analysis, additional locations will be considered as controls in a synthetic DID design (Arkhangelsky et al., 2021), a method that further ensures satisfaction of the parallel trend assumption by constructing synthetic controls from weighted averages of potential control units. In this last analysis, the locations with planned but unopened stations will still be in the control candidate pool, and we expect those to receive the largest weights.
- 2.6 Resources from the Intelligence Fund will be used to process and analyze mobility, socio-economic and environmental data, and to carry out a purpose-specific household survey.

III. Descripción de las Actividades y Resultados

- 3.1 **Componente I: Component I: Collection and preparation of data** . This component collects all the activities related to the collection and preparation of data needed to use it to perform an evaluation analysis. First, this component will finance activities required to clean the data that the team has begun collecting, and access additional registry data that is not yet publicly available. Second, this component will finance collecting primary data on mobility.
- 3.2 **Componente II: Component II: Analysis** . This component will finance activities and human resources that will help analyze the data and estimation of impacts. Specifically, this component will finance hiring 2 full-time data analysts for two years, namely a data scientist and an economist.
- 3.3 **Componente III: Component III: Dissemination** . This component will finance conference travel and editing services to support disseminating the knowledge created through the impact evaluation.

IV. Presupuesto

Presupuesto Indicativo

Actividad/Componente	BID/Financiamiento por Fondo	Contrapartida Local	Financiamiento Total
Component I: Collection and preparation of data	US\$225,000.00	US\$0.00	US\$225,000.00
Component II: Analysis	US\$127,500.00	US\$0.00	US\$127,500.00
Component III: Dissemination	US\$22,500.00	US\$0.00	US\$22,500.00
Total	US\$375,000.00	US\$0.00	US\$375,000.00

V. Agencia Ejecutora y Estructura de Ejecución

- 5.1 The execution will be carried out by the Inter-American Development Bank through the Transport Division (TSP/CEC), under the supervision of the knowledge lead specialist, and the local transport specialist. The Bank will be responsible not only for the contracting but also for monitoring, follow-up, and approval of the respective deliverables.
- 5.2 This scheme is justified by the level of inter-institutional coordination and technical knowledge required for the TC. It has been observed that this scheme is beneficial for the execution of TCs with local governments in Ecuador, as their institutional capacity is currently limited. Successful examples of TCs executed by the Bank include EC-T1286 and EC-T1426. In the case of the Metro de Quito TC (EC-T1378), there was a request to transfer execution to the Bank due to issues specific to the municipal government. Additionally, this TC will utilize the procurement policies of the IDB, which may not be familiar to local governments.
- 5.3 The determination of which consultancies are selected will respond to a process of dialogue and strategic planning with the client. These consultancies will be conducted according to the Bank's procurement policies for hiring individual consultants or firms as appropriate. The Bank will follow its policies and guidelines for contracting consultancies: (i) individual consultants will be contracted with the AM-650 guideline; (ii) consulting firms that develop intellectual products will be hired in accordance with the Institutional Procurement Policy (GN-2303-33) and its Guidelines; and (iii) other services other than consulting in accordance with the "IDB Institutional Procurement Policy" (GN-2303-28).

VI. Riesgos Importantes

- 6.1 No major impacts are identified in the execution of this TC since it involves consultancies, studies, and administrative expenses. However, there is a risk of delay in approval of technical cooperation products, due to delays in the approval process of the local authorities. To mitigate this risk, the Bank will lead the implementation of activities and ensure effective coordination and communication among the parties.

VII. Aspectos Ambientales y Sociales

- 7.1 Esta TC no tiene requisitos aplicables del Marco de Política Ambiental y Social (ESPF) del Banco.