

Document of
The World Bank

Report No: ICR00003622

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-95695)

ON A

GRANT

IN THE AMOUNT OF US\$5.378 MILLION

TO THE

UNITED MEXICAN STATES

FOR A

GEF SUSTAINABLE TRANSPORT AND AIR QUALITY PROGRAM

May 26, 2016

Transport & ICT Global Practice
Colombia and Mexico Country Management Unit
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective as of April 11, 2016)

Currency Unit = Mexico Peso

US\$ 1.00 = MXN 17.64

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

APL	Adaptable Program Loan
BANOBRAS	<i>Banco Nacional de Obras y Servicios Públicos</i> (National Development Bank for Public Works and Services)
BRT	Bus Rapid Transit
CAI	Clean Air Institute
CO ₂ e	Carbon dioxide equivalent
CPS	Country Partnership Strategy
CTF	Clean Technology Fund
EMBARQ	Center for Sustainable Transport
FM	Financial Management
FONADIN	<i>Fondo Nacional de Infraestructura</i> (federal fund to promote investments in infrastructure)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEF–STAQ	GEF’s Sustainable Transport and Air Quality Program
GEO	Global Environment Objectives
GHG	Greenhouse Gases
GoM	Government of Mexico
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion Report
IFR	Interim Unaudited Financial Report
IP	Implementation Progress
LAC	Latin America and the Caribbean
M&E	Monitoring and Evaluation
MASTU	<i>Marco de Salvaguarda Ambiental y Social para el Transporte Urbano</i> (Environmental and Social Safeguard Framework for Urban Transport)
NDP	National Development Plan
NGO	Nongovernmental Organization
NMT	Non-motorized Transport
OP	Operational Policy
PAD	Project Appraisal Document
PCN	Project Concept Note
PDO	Project Development Objective
PIMUS	<i>Plan Integrado de Movilidad Urbana Sostenible</i> (Integrated Sustainable Mobility Master Plan)
PIU	Project Implementation Unit
POM	Project Operational Manual
PROTRAM	<i>Programa Federal de Apoyo al Transporte Urbano Masivo</i> (Federal Mass-Transit Support Program)
SEDATU	<i>Secretaría de Desarrollo Agrario Territorial y Urbano</i> (Secretariat of Territorial Agricultural and Urban Development)
SHCP	<i>Secretaría de Hacienda y Crédito Público</i> (Secretariat of Finance and Public Credit)
STAQ	Sustainable Transport and Air Quality
TDM	Travel Demand Management
TOD	Transit-oriented Development
TORs	Terms of Reference
UTTP	Urban Transport Transformation Project
WRI	World Resources Institute

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MEXICO
Sustainable Transport and Air Quality

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DATA SHEET

A. Basic Information			
Country:	Mexico	Project Name:	Sustainable Transport and Air Quality
Project ID:	P114012	L/C/TF Number(s):	TF-95695
ICR Date:	05/26/2016	ICR Type:	Core ICR
Lending Instrument:	APL	Borrower:	MEXICO GOVERNMENT
Original Total Commitment:	USD 5.38M	Disbursed Amount:	USD 5.20M
Revised Amount:	USD 5.20M		
Environmental Category: B		Global Focal Area: C	
Implementing Agencies:			
BANOBRAS			
Secretaria de Desarrollo Agrario, Territorial y Urbano (SEDATU)			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	04/08/2005	Effectiveness:	11/24/2010	02/24/2011
Appraisal:	08/17/2009	Restructuring(s):		02/24/2011 04/12/2012 12/11/2013 12/16/2014
Approval:	12/23/2009	Mid-term Review:	10/15/2012	10/15/2012
		Closing:	12/31/2013	11/30/2015

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Moderately Satisfactory
Risk to Global Environment Outcome	Moderate
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Unsatisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Moderately Unsatisfactory
Overall Bank Performance:	Moderately Satisfactory	Overall Borrower Performance:	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
GEO rating before Closing/Inactive status	Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Health	10	10
Public administration- Transportation	50	50
Urban Transport	40	40
Theme Code (as % of total Bank financing)		
City-wide Infrastructure and Service Delivery	26	26
Climate change	46	46
Environmental policies and institutions	25	25
Pollution management and environmental health	3	3

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Jorge Familiar Calderon	Pamela Cox
Country Director:	Gerardo M. Corrochano	Gloria M. Grandolini
Practice Manager/Manager:	Aurelio Menendez	Aurelio Menendez
Project Team Leader:	Felipe Targa Rodriguez	Arturo Ardila Gomez
ICR Team Leader:	Alejandro Hoyos Guerrero	
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F. Results Framework Analysis

Global Environment Objectives (GEO) and Key Indicators(as approved)

The objective of the Project is to assist the Selected Municipalities to: (i) reduce GHG emissions growth rates by fostering long term increases in the use of less energy intensive transport modes; and (ii) induce policy changes in favor of sustainable transport projects.

Revised Global Environment Objectives (as approved by original approving authority) and Key Indicators and reasons/justifications

In the restructuring approved in February 2011 by the Bank management, the term Selected Municipality was replaced by Eligible Territories to acknowledge the participation of metropolitan areas and allow for supra-municipal entities to implement the project. The revision clarified the legal reference to the implementing units, and did not represent a change in the expected outcomes. The Key Indicators did not require a revision.

(a) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Decrease of CO ₂ e tons emitted by ground transport in intervened corridors			
Value (quantitative or qualitative)	179,825	Two new BRT corridors in operation and emissions in intervention corridors reduced by 58,000 CO ₂ -equivalent tons annually. Baseline level was calculated with studies financed by the grant	121,825 CO ₂ e annual tons. It corresponds to 58,000 CO ₂ -equivalent annual emissions savings with respect to the baselines calculated in studies.	116,961 CO ₂ e annual tons. It corresponds to 62,864 CO ₂ -equivalent annual emissions savings
Date achieved		12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement: 108.4 percent. Two new BRT in operation in Monterrey and Leon. GEF financed studies, the Borrower their implementation. The project financed studies for BRT in Ciudad Juarez and Monterrey, which have not yet been implemented.			
Indicator 2:	Number of trips in public transportation in intervened corridors compared to corridor baseline			
Value (quantitative or qualitative)	95,9705	5 percent increase in number of trips in public transport in Intervention corridors. Baseline was calculated with studies financed by the grant	1,007,690trips in public transport. It correspond to a 5 percent increase in number of trips in public transport in	1.55 percent increase 96,7081 trips in public transport in Intervention corridors

			Intervention corridors with respect to the baseline estimated in studies.	
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement:15.4 percent. GEF financed studies for public transport systems in Monterrey and Leon, which are in operation (implementation financed by PROTRAM and the Bank). The project also financed studies in Juarez and Monterrey not yet implemented.			
Indicator 3:	Increase in number of NMT trips in intervened areas compared to corridor baseline			
Value (quantitative or qualitative)	4,648,295	2% increase in non-motorized trips in intervention corridors. Baseline was calculated with studies financed by the grant	4,741,260.90 non-motorized trips in intervention corridors It corresponds to a 2 percent increase in non-motorized trips in intervention corridors with respect to the baseline estimated in the studies.	N/A
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement: n/a. NMT studies in the four territories were financed by GEF and completed shortly before the closing date. Studies are in various stages of initiating implementation. NMT trips would increase by 11.5 percent after implementation.			
Indicator 4:	Number of cities that are integrating environmental and climate-change components with urban transport and land use in master plans and studies developed, including regulatory and financial frameworks that promote sustainable transport systems at local and national levels.			
Value (quantitative or qualitative)	0	New land use regulations in place in Ciudad Juarez and Puebla	New land use regulations in place in Ciudad Juarez and Puebla	Monterrey, León and Puebla have PIMUS or master plans in place that have climate, land-use and transport considerations. Juárez regulation also qualifies.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement:200 percent. GEF triggered the mobility agenda in the territories. They all conducted regulations with own resources, to qualify for federal resources to finance the projects designed with the grant.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Design of routes plans and regulatory framework for freight transport			
Value (quantitative or qualitative)	0	Ciudad Juarez has route plan for freight transport under implementation	Ciudad Juarez has route plan for freight transport under implementation	Juárez study for freight management has been completed.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement (%):100 percent. The project financed a study for freight management in Ciudad Juarez including a framework to optimize freight vehicle flows within the existing and future network, as well as recommendations to improve of existing regulation.			
Indicator 2:	Development and preparation of policies, regulations and plans to integrate land-use and sustainable transport development			
Value (quantitative or qualitative)	0	New land use regulations in place in Ciudad Juarez and Puebla	New land use regulations in place in Ciudad Juarez and Puebla	Monterrey, Puebla and León have updated PIMUS or master mobility plans. Juárez regulation includes these considerations.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement (%):200 percent. GEF triggered the mobility agenda in the territories. They prepared regulations with own resources, to qualify for federal resources to finance the projects designed with GEF. The master plans have informed their design (Leon Optibus, Monterrey Ecovia, and Puebla Ruta in operation; Juarez Tecnológico, in design).			
Indicator 3:	Feasibility studies for BRT completed, with consideration for intermodal connectivity.			
Value (quantitative or qualitative)	0	Optibus corridor beginning operation Monterrey BRT corridor beginning operation	Optibus corridor beginning operation Monterrey BRT corridor beginning operation	Leon Optibus Phase II is in operation. Monterrey BRT: Monterrey ECOVIA I is in operation. For Monterrey ECOVIA II and III, the study has been completed. In addition, Juárez Corredor

				Tecnologico: studies are ongoing.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement: Over 100 percent. GEF financed studies for BRT in Monterrey and Leon, both in operation (implementation financed by the Bank and PROTRAM). GEF also financed 2 studies in Monterrey (Ecovia II and III) and Juarez (corridor Tecnológico). Ecovia II and III studies are finished. Juarez Tecnologico study will finish soon.			
Indicator 4:	Number of cyclists in intervened corridors/areas			
Value (quantitative or qualitative)	90254 (Juárez: 19,500 + Puebla: 67,659 + León: 0 + Monterrey: 3,095)	To be defined during implementation. Target and baselines were calculated with studies financed by the grant.	99,280 (10 percent increase)	N/A
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement: n/a. The grant financed studies in all four territories. Studies provide information to calculate baselines and potential impact when implemented.			
Indicator 5:	Number of programs to promote the use of facilities for pedestrians and cyclists			
Value (quantitative or qualitative)	0	Public awareness campaigns underway	Public awareness campaigns underway	The public awareness campaigns are not yet under preparation or implementation.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015
Comments (incl. % achievement)	Achievement: n/a (all outputs were delivered). Monterrey, Puebla, and Juarez have NMT plans financed by the grant that include campaigns to be implemented. GEF financed a campaign in Leon. Leon will launch the campaign with the bike share system.			
Indicator 6:	Completion of NMT plans in all four cities			
Value (quantitative or qualitative)	0	New NMT infrastructure operational in Ciudad Juarez (6.5 km pedestrian/bike paths), Leon (40 km bike paths), Monterrey (17 km bike paths) and Puebla (30 km bike paths and 7 km pedestrian paths)	New NMT infrastructure operational in Ciudad Juarez (6.5 km pedestrian/bike paths), Leon (40 km bike paths), Monterrey (17 km bike paths) and Puebla (30 km bike paths and 7 km pedestrian paths)	All the cities completed their NMT plans. They are not yet implemented.
Date achieved	07/31/2010	12/31/2013	11/30/2015	11/30/2015

Comments (incl. % achievement)	Achievement (%): n/a (all outputs financed by the grant were delivered).
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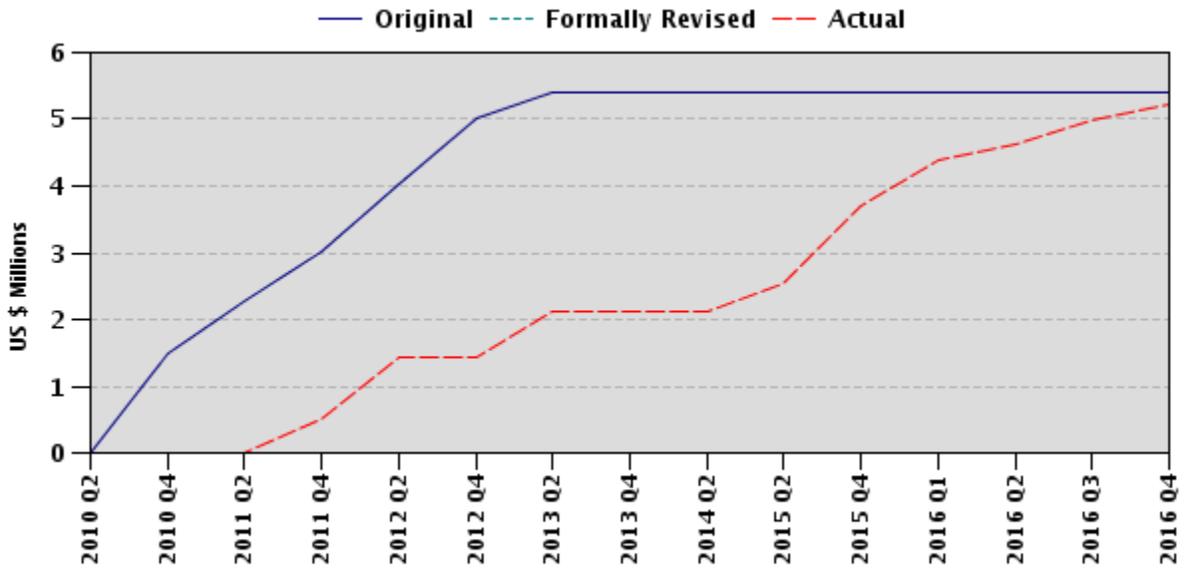
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	GEO	IP	Actual Disbursements (USD millions)
1	05/21/2010	Satisfactory	Satisfactory	0.00
2	02/26/2011	Satisfactory	Satisfactory	0.00
3	07/27/2011	Satisfactory	Satisfactory	0.50
4	03/27/2012	Satisfactory	Satisfactory	1.44
5	10/19/2012	Satisfactory	Satisfactory	2.11
6	06/23/2013	Satisfactory	Moderately Satisfactory	2.11
7	01/25/2014	Satisfactory	Moderately Satisfactory	2.11
8	09/30/2014	Satisfactory	Moderately Satisfactory	2.25
9	02/20/2015	Satisfactory	Moderately Satisfactory	2.98
10	06/04/2015	Satisfactory	Moderately Satisfactory	3.68
11	11/30/2015	Moderately Satisfactory	Moderately Satisfactory	4.37

H. Restructuring (if any)

Restructuring Date(s)	Board Approved GEO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		GEO	IP		
02/24/2011		S	S	0.00	Grant agreement amended on October 5th, 2010, but effective on February 24th, 2011. Amendment to change (i) the definition of the assisting implementing entities, and (ii) the legal reference to the name of the Project intervention areas
09/10/2012		S	S	1.44	Bank to reallocate among disbursement categories, as follows: US\$35,000 from Category 1 (Goods) to Category 2(Consulting Services).
12/11/2013	N	S	MS	2.11	Extension of the project closing date for one year to December 2014
12/16/2014		S	MS	2.54	Extension of the project closing date for eleven months to November 2015

I. Disbursement Profile



1. Project Context, Global Environment Objectives and Design

1.1 Context at Appraisal

1. **Country and sector background.** The transport sector is the highest contributor to carbon dioxide (CO₂) emissions both in Latin America and in Mexico. During the past quarter-century, Mexico faced an intense urbanization process that led to a twofold increase in the urban population and a sevenfold increase in the urban footprint. This urbanization trend affects the form and functioning of cities as well as the population's mobility patterns. Low residential density and high downtown employment density, still prevalent in most cities, make for long commutes. In addition, Mexico has undergone an important increase in car ownership (WB,2012)¹. Urban sprawl and the higher motorization rate combined resulted in more and longer trips, particularly motorized trips, and led to an increase in transport-related emissions. A model more dependent on individual motor vehicles is also leading to environmental degradation of the natural and built environment and deterioration of transit systems.
2. Transport-sector CO₂ emissions in Latin America represent more than a third of total emissions. Their growth rate (from 1990 to 2012) nearly doubles world totals: 106.5 percent versus 59.9 percent. Road-transport emissions account for the majority (around 94 percent) of overall transport emissions. In Mexico, as in the region, transport is the largest contributor to CO₂ emissions (35.1 percent), with a growth rate (83.8 percent) that is above the world's average and below the region's average. Mexico is among Latin America's most carbon-intensive economies, and its transport sector is one of the main drivers (IEA, 2014)

Table 1. World, LAC and Mexico CO₂ emissions figures

	CO ₂ e emissions (million tons of CO ₂ e)			1990–2012 growth rate of CO ₂ e emissions (%)			Share of CO ₂ e emissions (%)	
	All sectors	Transport sector	Road transport	All sectors	Transport sector	Road transport	Transport sector	Road Transport
World	31,734	7,187	5,373	51.3%	56.9%	64.1%	22.7% (2 nd)	17.0%
LAC	1,583	571	535	89.3%	106.5%	110.2%	36.1% (1 st)	33.8%
Mexico	435	153	148	64.3%	83.8%	86.2%	35.1% (1 st)	34.2%

Source: Adapted from International Environmental Agency, 2014.

3. **Rationale for Bank involvement.** The Mexico GEF Project was part of a regional initiative, it was aligned with Mexico priorities, and included lessons learned from Bank's previous projects. The Regional initiative was the STAQ Program. It was approved under the GEF III Strategic Priorities, and consistent with the programmatic goals of GEF Operational Policy (OP) 11 and the GEF Strategic Priority in Climate Change Focal Area CC-6. Participation in

¹ Higher rates of car ownership are explained by a combination of factors including rising Gross Domestic Product (GDP) per capita, a downward trend in the price of automobiles, more dispersed urban development patterns, and cheap or subsidized fuel. Mexico's 2012 motorization rate reached 300 vehicles per 1,000 inhabitants, which nearly doubles the 2000 motorization rate of 160 vehicles per 1,000 inhabitants.

the STAQ program was limited to cities from Brazil, Argentina and Mexico. In addition to the regional initiative, the main reasons behind the Bank's involvement were to: complement its efforts in Mexico to help reconcile mobility needs with quality of life and global and local environmental sustainability issues; and share the Bank's successful experiences in designing and implementing previous GEF subprojects.

4. The design of the Mexico Country Project built on the Bank's longstanding engagement in the urban transport sector and in climate change issues in Mexico: (a) the Mexico–Medium-Size Cities Transport Program (P007648) had strengthened local agencies, supported the federal urban transport decentralization process, and helped cities develop their first Integrated Transport Plans; this was a comprehensive approach to transport planning at the city level; (b) in the climate and transport area, the Bank's more than ten-year partnership with Mexico City had resulted in pioneering achievements;² and (c) the Bank had helped Mexico obtain the world's first carbon-finance contract signed in the transport sector.³ The pioneering experience obtained through the GEF and carbon-finance projects was used as a reference and a source of information for project design.
5. The project was also expected to have positive impacts on the population's living standards while responding to other problems associated with urban poverty, in terms of (a) access to economic opportunities and (b) social inclusion. The technical assistance and studies financed by the GEF project were aimed at improving physical access to and the quality of public transport, enhancing non-motorized infrastructure, and improving the built environment. The project was expected to have a positive environmental impact in the long run as a result of the implementation of the strategies and subproject design to be financed by the GEF. The investments, to be later materialized based on the support provided by this project, were expected to have a positive long-term impact due to the reduction of global and local emissions of CO₂, nitrogen oxide (NO_x), sulfur oxide (SO_x), particulate matter and other contaminants. The expected reductions were directly linked to improved vehicle operation, reduced trip lengths, use of more efficient modes of transport, and improved technologies.
6. ***Institutional framework.*** The institutional framework of the project was complex and included numerous actors with different roles. Main actors were BANOBRAS, financial agent of Mexico (the Grantee); the Project Implementation Unit (PIU), SEDATU⁴ (Secretaría de Desarrollo Agrario, Territorial y Urbano); and the Eligible Territories, which selected an Eligible entity each for project implementation. The Clean Air Institute is an NGO that supported project preparation and implementation.
7. In the context of the Mexican urban transport sector, the GEF was part of a coordinated effort from the World Bank to support Mexico's transport transformation. (Figure 1). At the federal level, SEDESOL was responsible for formulating the federal policy on urban development, including transport. PROTRAM was a World Bank designed federal program

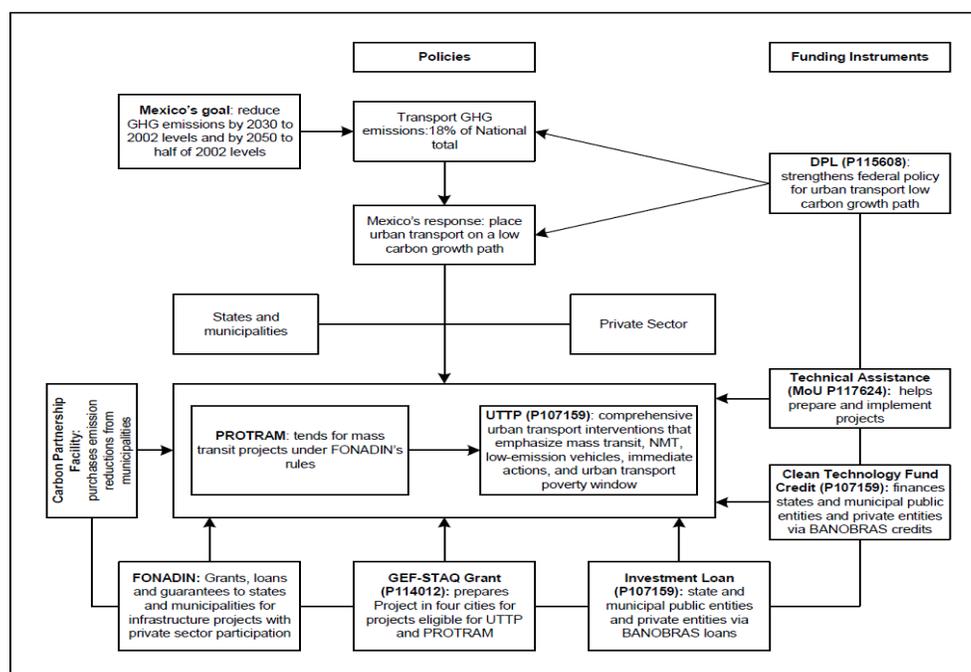
² With Bank support, Mexico led the formulation and approval of the first transport and climate operation under the Financial Instrument of the United Nations Framework Convention on Climate Change (UNFCCC) (Mexico, Introduction of Climate-friendly Measures in Transport: P059161).

³ Mexico City *Insurgentes* Bus Rapid Transit (BRT) System Carbon Finance Project: P082656.

⁴ SEDESOL (Secretaría de Desarrollo Social) was the original PIU, it was replaced by SEDATU in 2013.

that supports mass transit projects infrastructure. Finally, UTTP was a credit line with BANOBRAS that combined International Bank for Reconstruction and Development (IBRD) funds with Clean Technology Fund (CTF) concessional loans. The UTTP offered financing, through BANOBRAS, for mass-transit infrastructure, rolling stock, and interventions to boost less energy-intensive and cleaner modes of transport while promoting modal change (e.g., NMT and TDM interventions).

Figure 1. Coordination of UTTP, GEF–STAQ and federal programs



1.2 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

8. The project's objectives, as defined in the Grant Agreement, were to assist the selected municipalities in: (a) reducing GHG emission growth rates by fostering long-term increases in the use of less energy-intensive transport modes; and (b) inducing policy changes in favor of sustainable transport projects.
9. Key indicators as defined in the Project Appraisal Document (PAD) and linked to the first part of the GEO were: (a) the number of public-transportation trips in intervened corridors compared to the corridor baseline; (b) the number of NMT trips in intervened areas compared to the corridor baseline; and (c) the decrease of CO₂-equivalent (CO₂e) tons emitted by ground transport in intervened corridors, all measured within the area of influence of the relevant component or subproject. The following indicator was linked to the second part of the GEO: the number of cities that are integrating environmental and climate-change components with urban transport and land use into master plans and studies developed, including regulatory and financial frameworks that promote sustainable transport systems at local and national levels.

1.3 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

10. In the restructuring approved in February 2011 by the Bank management, the term Selected Municipality was replaced by Eligible Territories to acknowledge the participation of metropolitan areas and allow for supra-municipal entities to implement the project. The revision clarified the legal reference to the implementing units, and did not represent a change in the expected outcomes. The Key Indicators did not require a revision.

1.4 Beneficiaries

11. The Bank and federal authorities identified four metropolitan areas as beneficiaries of the Mexico GEF Project: Ciudad Juárez, Monterrey, León and Puebla. Policymakers and urban transport experts at federal and local levels were expected to have increased awareness of best practices in urban transport and strengthened capacity to develop sustainable urban transport solutions. These four cities were economic and government centers at national or state levels, and the state and municipal governments were committed to addressing environmental and sustainable urban transport issues. Furthermore, the preliminary diagnostic of sectorial needs presented a diversity of problems to be addressed (e.g. in Table 2 we can observe that cities in the north of Mexico are usually more sprawled and have higher motorization rates) by means of different planning instruments, consistent with the areas of interventions proposed for the project.

Table 2. Mexico GEF Project beneficiary cities (data at approval date).

	Population (million inhab.)	Area (km²)	Vehicle motorization (veh./1,000 inhab.)
Ciudad Juárez (State of Chihuahua)	1.3	4,853	480
León (State of Guanajuato)	1.4	195	208
Monterrey (State of Nuevo León)		580	?
Puebla (State of Puebla)	1.4	524	?

Source: Mexico GEF STAQ Project PAD

1.5 Original Components (as approved)

12. *Technical Assistance and Capacity-Building Activities in Selected Cities (GEF US\$5,378,000⁵)*: The Mexico GEF Project and the specific city subprojects were expected to cofinance measures in four thematic windows, following the cities' and GEF's priorities for climate-change mitigation in the urban transport sector.⁶

⁵ The financing table in the PAD showed the Recipient's contribution (see Annex 1); however, the description of components only includes GEF contributions.

⁶ Karekezi, S., L. Majoro, T. Johnson, 2003. *Climate Change Mitigation in the Urban Transport Sector: Priorities for the World Bank*.

13. **Window (Component) 1: Freight Management (GEF US\$120,000).** Provision of technical assistance to improve the planning, management and control of freight transport in Ciudad Juárez, including:
- (a) the provision of technical assistance to improve the regulatory framework for freight transport in Ciudad Juárez; and
 - (b) the provision of technical assistance to carry out a comprehensive plan for the regulation of freight transport, including a route system and a traffic-control and supervision system, in order to reduce traffic emissions of GHG in Ciudad Juárez.
14. **Window (Component) 2: Land Use/Transport Coordination (GEF US\$205,000).** Provision of technical assistance to develop a sustainable approach toward addressing urban mobility patterns and lessening barriers to better integrated planning in Ciudad Juárez and Puebla, including:
- (a) the creation of a specialized entity responsible for urban transport planning in the municipality in Puebla;
 - (b) the development of a medium-term plan for improving pedestrian mobility; and
 - (c) the conduction of studies for promoting the use of NMT and for recovering public spaces in Ciudad Juárez's historic center.
15. **Window (Component) 3: Public Transport Enhancement (GEF US\$3,647,000).** Provision of technical assistance and training to the selected municipalities to facilitate the improvement of public transport systems and the effectiveness and interconnectivity of those systems with other modes of transport; and to induce mode switching away from the use of private cars, including the conduction of studies for:
- (a) the planning and design of additional corridors and terminals for the BRT network in León in order to expand the integrated transport system in that municipality;
 - (b) the planning and design of a BRT-type busway corridor in Monterrey in order to establish the first stage of multimodal integration with other existing systems, as well as with NMT systems;
 - (c) the planning and design of the 2002 BRT Project (*Corredor Tecnológico*) in Ciudad Juárez;
 - (d) the design of the rationalization of routes and of a BRT corridor project in Puebla; and
 - (e) the development of strategies for private-sector participation in urban transport management in the selected municipalities.
16. **Window (Component) 4: Non-Motorized Transport (GEF US\$1,116,000).** Provision of technical assistance to the selected municipalities to better integrate walking and biking in the municipalities' cultural and planning processes and to create incentives for their use as a viable and safe alternative to traditional motorized transport systems, including:
- (a) the conduction of studies for the design and the implementation of a non-motorized urban mobility system; and
 - (b) the conduction of studies and the design of projects for the construction of bike paths in the selected municipalities.

17. **Component 5: Project Management (GEF US\$290,000).** Provision of technical assistance and financing for short-term technical support staff in the Project Coordination Unit (PCU) to supervise and monitor project implementation in the selected municipalities.

1.6 Revised Components

18. The project components were not revised; although, the Eligible Territories requested changes to the specific activities under each component (see Annex 2 for a description of final outputs, and section 2.2 for explanation of reasons for changes).

1.7 Other significant changes

19. The project underwent four restructurings, which comprised changes in implementation arrangements, reallocation of funding, and two extensions of the closing date.
20. **First restructuring.** A second-level restructuring conducted in September 2010 led to an amendment to the Grant Agreement in order to modify: (a) the definition of the participating implementing entities; and (b) the legal reference to the name of the project intervention areas. The amendment incorporated clearer definitions of *Eligible Territories* and *Eligible Entities* and removed the definition of *Selected Municipality*, to reflect the participation of Metropolitan Areas, as in the case of Puebla or Monterrey that have benefited from GEF funds for activities beyond the municipality – concerning the whole metropolitan area. The revision clarified the legal reference to the implementing units, and did not represent a change in the expected outcomes.
21. **Second restructuring.** A minor restructuring was conducted in September 2012 to reallocate funds among disbursement categories. BANOBRAS officially requested the Bank to reallocate US\$35,000 from Category 1 (Goods) to Category 2 (Consulting Services). Puebla decided not to use the entire amount originally authorized in Category 1 for the purchase of computers and traffic-monitoring equipment. The proposed reallocation was necessary to increase Category 2 and cover two studies that Puebla was preparing under Window 4 (i.e., the design of an urban street-safety master plan, and a pre-feasibility study for the implementation of a non-motorized plan). The reallocation of funds maintained the total amount of resources authorized for Puebla. During execution, Puebla decided to finance the urban street-safety master plan with own resources, and reallocate the full amount to the non-motorized plan.
22. **Third restructuring.** In May 2013, the Bank received a formal request from the client to amend the Grant Agreement. The request included three specific items to be amended: First, a change in the executing agency, following a federal institutional reform that reallocated some functions from SEDESOL to SEDATU. The latter, a new entity created in 2012, inherited some responsibilities from SEDESOL, including the execution of this grant. According to this reform, SEDATU was proposed to be the executing agency of the Project. A second request involved the extension of the closing dates from December 31, 2013 to December 31, 2014 due to the delays in project implementation stemming from the abovementioned institutional reform, and the lack of effective coordination between institutions. A third request involved a reallocation of US\$185,000 from Category 3 (Operating Costs and Training) to Category 2 (Consultant Services) for increasing resources

to finance the existing studies, taking advantage of the fact that the executing agency covered many of the operating costs with its own resources.

23. ***Fourth restructuring.*** In December 2014, the project underwent a new restructuring which extended the closing date to November 30, 2015. This extension was deemed necessary in order to: (a) enable SEDATU to conduct a comprehensive technical supervision of consultant deliverables and enhance the quality of the studies while building capacity in the cities; (b) mitigate the risk of delays from a tight schedule in order to complete the studies (some contracts under execution were lagging behind the original tight schedule). Most of the contracts' execution periods were closing in December 2014, the same closing date as that of the project, with no room for any possible delay in the execution of the studies; and (c) manage two delayed contracts under Window 3: at that time, 9 of 11 pending procurement processes had been successfully concluded (contracts awarded). Juarez studies for the corridor Tecnológico design was pending to be awarded and represented 15 percent of the total grant amount. The importance of this contract was the main reason for requesting an 11-month extension of the closing date.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

24. The background analysis of the project was sound and comprehensive, but delays in the preparation of the regional STAQ and institutional arrangements with GoM lengthened formulation and compromised the participating entities' commitments and their prioritization of activities to be supported under the grant. Project preparation was characterized by an extensive consultation process, with a design that required substantial information from prospective eligible territories. The client, with Bank support, selected four eligible territories for the project, out of the 13 that sent proposals. The selection was based on an analysis of the potential impact of proposed activities and their implementation readiness. Detailed project preparation, with a competitive scheme and analysis of proposals in several cities on a wide range of interventions, demanded time and resources. During project preparation the task team carried out a lengthy policy dialogue with Mexican counterparts. Finally, SEDESOL was the one selected due to its knowledge of public transport. The Project Concept Note (PCN) was first reviewed in April 2005; the project was approved by the Board in December 2009; and effectiveness conditions were met in February 2011. As a result, despite the efforts to include cities' priorities, by the time of execution these priorities were different and caused implementation delays, which eventually caused two extensions in the closing date.
25. The project incorporated lessons from previous operations. In particular, the preparation relied on prior Bank experience in GHG emissions and air-quality management operations, and their interrelationship with urban transport in the Latin American and Caribbean (LAC) region and in Mexico. In order to bring those lessons into the project design, the Clean Air Initiative participated in project preparation and implementation. The Bank and other partners created this Initiative in 1998 to disseminate lessons learned from previous activities in Mexico City and to involve other cities that could benefit from sharing these experiences. As a result, the project design incorporated not only support to mass transit

corridors infrastructure, but also softer interventions like NMT plans, or sustainable mobility plans integrating mobility and land use.

26. The high level PDO (a)⁷ and the results framework do not reflect what the project should be reasonably held accountable for; induced policy changes and associated ancillary investments and regulation will pay off in the longer term with benefits beyond the PDO, and the life of the project. The interpretation of the GEF requirement about additionality by competing Eligible Territories led them to link GEF supported studies with overly ambitious commitments to implement studies during the life of the grant. These commitments were reflected in a high level PDO, and an inconsistent PAD. The PAD description of GEF project components included only studies and designs; on the other hand, the financing plan, the PDO, and parts of the results framework assumed that the studies would be executed with counterpart resources during the project life. It should be noted that the project achieved the high level PDO (a) (see paragraph 29), and all the GEF project outputs – studies and designs – were delivered; even though, some intermediate indicator targets were not met. Induced policy changes and associated ancillary investments, even once implemented, require long term decisions, which impact happens several years after implementation.
27. Despite lack of full implementation of the activities, the project achieved additionality in several dimensions: (i) it fostered sustainable transport agenda of Mexico, particularly by generating the conditions for the creation of PTTU and PROTRAM programs (ii) two BRT corridors are under operation in Leon and Monterrey, (iii) the Bank, the GoM represented by SHCP, BANOBRAS and SEDATU, and the participant cities have established a rich dialogue, and (iv) CO2 emissions assessment methodologies have been further developed. However, the implementation and operationalization of subprojects required additional activities, resources and time, which in most cases were underestimated by the eligible territories. Therefore, not all the city subprojects have been yet implemented.
28. *Assessment of risks*. Among the risks envisaged at the project design and appraisal stages, one in particular materialized in a way that affected project implementation. This risk was related to changes in local administrations, both municipal and federal, which delayed implementation and forced two extensions of the grant's closing date. Although not stated explicitly in the project design, a critical risk for achieving the GEO was that supported subprojects with studies and designs were not implemented during the implementation of the grant due to delays, such as one that could arise from changes in local administrations, or from a lack of local government resources to implement these subprojects.

2.2 Implementation

29. **The retroactive financing of two studies expedited the disbursements and allowed for PDO achievement.** In Mexico, the standard BRT project cycle, from preparation to operation, takes about five to eight years. The grant's original timeframe was four years. Consequently, the project should not have been held accountable for project implementation. However, the experiences in Leon (Optibus) and Monterrey (Ecovia I) shows that expedite

⁷ (a) reducing GHG emission growth rates by fostering long-term increases in the use of less energy-intensive transport modes

implementation can be achieved when certain local conditions are met. Both Leon and Monterrey agencies showed capacity, started procurement before the GEF was approved, entities' administration were committed to the project, and the local finances allowed for implementation. The retroactive funding of the Monterrey and León BRT studies was a success in terms of the grant's project execution and allowed the project to meet the high level PDO (a).

30. The remaining fourteen activities suffered from delays during implementation:
31. Delays in effectiveness declaration for the Regional STAQ and in signing participation agreements caused one year delay in declaring effectiveness. Delays in the declaration of effectiveness of the regional CSTAQ grant affected the effectiveness declaration of the Mexico GEF Project. In addition, the signature of one Participation Agreement between the Recipient (through SEDESOL) and a selected municipality was an effectiveness condition that the parties did not meet on time. The first Participation Agreement between SEDESOL and a beneficiary was signed in February 2011 with Monterrey's State Transportation Council (*Consejo Estatal de Transporte*), thirteen months after World Bank Board approval.
32. **Delays in declaring effectiveness aggravated the consequences of a complex design, which made implementation difficult.** Coordinating the Bank, BANOBRAS, SEDATU, Eligible Entities, and consultants was difficult and caused delays during implementation. It was aggravated by changes in the actors, such as the replacement of SEDESOL by SEDATU in 2013. These delays were mitigated once all the parties started holding joint periodic coordination meetings. In addition, due to delays in declaring effectiveness, changes in administration happened earlier in the project cycle than expected. This impacted procurement processes, which in some cases had to be resumed after long periods of paralysis. In addition, delays in budget approval from SHCP for fiscal year 2011 led SEDESOL to postponing hiring of PIU staff. Delays in the signature of a new Cooperation Agreement between SEDESOL and BANOBRAS due to changes in PIU staff remuneration payment mechanisms and fiduciary changes in the Project Operational Manual (POM) also delayed implementation.
33. In the ISR corresponding to the mid-term review, progress toward achieving the GEO was rated as satisfactory (S), and implementation Progress as Moderately Satisfactory (MS). At the time of the midterm review (October 2012), 39.2 percent of the grant was disbursed while the estimated disbursement at that time should have been 75 percent. Nevertheless, the project was making progress toward the achievement of its development objectives, due to the operation of the OPTIBUS BRT Phase II in León and the construction of the Ecovia I BRT Corridor in Monterrey. Design studies for both subprojects were retroactively financed by the grant.
34. **After the midterm review, the project continued to experience additional implementation delays,** in particular due to: (a) changes in local staff and technical teams in charge of procurement processes; and (b) a change in the original executing agency from SEDESOL to SEDATU.
35. **Actions taken in response to problems.** After the third restructuring in 2013, the Bank, BANOBRAS and SEDATU agreed on an Action Plan to meet the proposed new closing date. This plan comprised the following tasks: (a) establishment of a new communications framework that included all parties in order to reduce reaction time; (b) updating of the

monitoring framework to include the critical path for each grant activity; (c) conduction of project supervision meetings twice a month, including the participation of beneficiaries' representatives, consulting firms as needed, SEDATU, BANOBRAS, and the Bank; and (d) organization of periodic technical supervision visits to the cities as needed, and weekly follow-ups.

36. The grant's implementation pace improved substantially in 2014 and 2015. In 2014, eleven contracts were pending signature. By the end of the project, nine contracts had been successfully executed, and the remaining two are under execution and will be completed with local counterpart funding.
37. The grant disbursement performed well despite the dollar valuation. At the time of the grant's closure, the client had not executed US\$181,768 (equivalent to 0.3 percent of the total grant amount). These resources were cancelled. Most contracts were signed in pesos, which devaluated during the grant life. The Bank, BANOBRAS, and SEDATU coordinated with PROTRAM to co-finance design studies for a BRT in Juarez. As dollar value generated a surplus in the grant, PROTRAM agreed to reduce its share of the co-financing to increase the grant's share financing for this study.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

38. **M&E Design** presents some deficiencies related to (i) the appropriate alignment of two Project Outcome Indicators with the GEO, (ii) the disconnection between the definition of some intermediate outcome indicators and their targets, and (iii) the inclusion of overly ambitious commitments by the participant entities in the project definition.
39. The Outcome Indicator #1 was the most appropriate indicator for measuring PDO (a); Outcome indicators #2 and #3 measure interim outcomes, and their targets are excessive for the short term. Outcome Indicator #1 measures directly GHG emissions reduction. Modal shift and increase of number of trips in public transport are drivers of CO2 emission reduction; therefore, they measure interim outcomes. In addition, the targets proposed were not necessary to achieve the expected reduction of 10 percent in CO2 emissions. This is a reflection of the early stage of development of CO2 assessment methodologies at project approval. Furthermore, the targets for indicators #2 and #3 are achievable only in the longer term if combined with ancillary investments and integrated transport systems. The definition of Intermediate Indicators #3, #5, and #6 is inconsistent with their target, and Intermediate Indicator #4 definition was not useful during implementation. The definitions of the former indicators measure the completion of studies, while the targets imply the execution of said studies. Intermediate indicators #3, #5, and #6 are defined as feasibility studies for BRT completed, number of programs to promote the use of NMT facilities, and completion of NMT plans, respectively. In contrast, the targets were Leon (Optibus II) and Monterrey (Ecovia I) corridors beginning operation, public awareness campaign underway, and new NMT infrastructure operational, respectively. Intermediate Indicator #4, number of cyclists in intervened corridors, does not measure project financed outputs. It measures expected impacts, which would not be achieved until the studies were executed, and the project in operation.
40. **M&E Implementation** was marked by the delay in the studies' execution, the lack of financial resources to properly collect data, and the active role of the Bank and SEDATU in

collecting data from the cities to update the baselines and targets in the results framework. Baselines were expected to be generated by studies funded by the grant. Since these were completed with delays, baselines were available later than expected. Since NMT subprojects were not executed by the eligible territories, baselines for intermediate indicators with targets requiring the implementation of the studies were not calculated until the end of the project. Besides, although the M&E design included surveys to measure demand and modal shift during system operation, the grant did not include resources for conducting these activities, and the cities did not have resources to conduct such studies. The studies financed by the grant provided most baselines. Finally, the Bank performed a more active role during the M&E implementation than expected in the PAD. As mentioned before, CO2 assessment methodologies were underdeveloped by the time of the appraisal stage of the project. The project implementation helped develop this methodology. During the time of the project the methodologies to measure GHGs emissions improved, and the Bank helped the PIU and Eligible Entities not only to identify the necessary data for the analysis but also to develop the evaluations.

41. **M&E Use.** Task teams used intermediate indicators during supervision, coupled with disbursements. The Bank, SEDATU, and the cities monitored the development and completion of studies especially close during the last years of execution. In addition, the Bank and SEDATU had extensive conversations with the cities to gather information required to use the Results Framework.

2.4 Safeguards and Fiduciary Compliance

42. The Environmental Safeguards Policy triggered (Operational Policy/Bank Policy [OP/BP] 4.01) was complied with. The project was qualified as Category B, following the Bank's OP 4.01, and based on the nature of studies and consulting services supported by the grant. In terms of the subprojects supported with studies and designs, and in particular for the two in operation (i.e., BRT in Monterrey and León), these are part of PROTRAM, in compliance with the Environmental and Social Safeguards Framework for Urban Transport (*Marco de Salvaguarda Ambiental y Social para el Transporte Urbano*, MASTU). The subproject in Monterrey was also financed by the Bank (P107159 UTTP). MASTU is a PROTRAM requirement for projects to be eligible to receive UTTP financing and follows the World Bank's environmental and social safeguards and Mexican legislation.
43. Despite delays, procurement processes under the project complied with Bank policies and were handled in an adequate manner. The procurement plan was kept updated and was followed throughout project implementation. Prior reviews of procurement took place as defined in the procurement plan. Post reviews took place annually and have not identified any substantial problems; no cases of misprocurement were declared. Only minor procedural deviations from procurement guidelines were identified throughout project execution, but compliance with the Bank's procurement policy was adequate. Some procurement processes were severely delayed due to changes in local administrations, but these situations were handled in compliance with the Bank policies.
44. Financial Management (FM) of the project complied with Bank policies, except for delays during the final stage of the grant. BANOBRAS did not submit the last two Interim Unaudited Financial Reports (IFRs) to the Bank on time due to institutional changes in SEDATU. SEDATU reported that the IFRs were ready to be sent on time. However, the

new counterpart focal point did not have the authorization to sign these reports. This issue was included in the last Aide-Mémoire, in which SEDATU was asked to resolve this matter. The Bank sent a formal letter to SEDATU and SHCP. At the time of the completion of this ICR, the Bank had not received the pending IFRs.

2.5 Post-completion Operation/Next Phase

45. SEDATU, BANOBRAS and the Bank are supporting the cities in identifying strategies and potential financial resources to ensure the implementation of participant entities subprojects after the closure of the grant. All participant entities' subprojects have received the financial support from PROTRAM and UTTP. Three of them (Monterrey (Ecovia I), Leon (Optibus II), and Puebla (Ruta) BRT⁸s) received financial resources for infrastructure – as expected in the original design of the grant. Juarez has also received support from PROTRAM to partially finance the design for the BRT corridor Tecnológico. The city is preparing the application to receive resources for infrastructure from PROTRAM, and potentially from the Bank. During the final supervision mission, all the above local counterpart agencies expressed their interest and desire to: (a) support a strategy to scale up the grant experience with the Bank and the federal government; (b) continue providing technical and financial assistance to more Mexican cities; and (c) seek solutions to take the supported subprojects to final implementation and operation.
46. New funding mechanisms and the improvement of the existing ones had been suggested by the Sustainable Urban Mobility Strategy for 59 Mexican cities. This strategy was developed by SEDATU and presented in October 2014. The strategy, promotes the implementation of integrated urban mobility systems, transit-oriented development, travel-demand management, freight management, and complete streets, connecting people and places with greater efficiency, safety and convenience by promoting non-motorized mobility and transit use.
47. Following a GoM request, the Bank has initiated the preparation of a new project proposal for GEF-6 under the climate-change focal area. The Low-Carbon Emissions Transformational Agenda for Sustainable Urban Mobility and Clean Freight Transport Project proposal builds on the previous GEF–STAQ experience. It includes a component to promote the CO_{2e} mitigation potential in urban transport projects by leveraging existing political instruments at local and federal levels; promoting financial mechanisms; and incorporating mobility-related elements with a holistic approach.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

48. **Relevance of the PDO: High.** PDO was highly relevant for the Bank, the country and the GEF at appraisal, and continues to be relevant at project completion. The PDO was linked to the CPS at approval (2008-2012). Said links are found both within the environmental agenda of the CPS, and in the main objectives of growth and poverty reduction. Project

⁸ Puebla BRT studies were eventually financed with the entity's own resources. However, the infrastructure was financed by PROTRAM as expected.

objectives remained consistent with the country's current development strategy and with GEF priorities. The current Mexico CPS (2014-2019) is aligned with the goals of Mexico's National Development Plan (NDP) and National Climate Change Strategy. Under the current CPS, the project is aligned with the thematic area of "Promoting Green and Inclusive Growth." In terms of design and implementation, the project was also aligned with the CPS and with GEF priorities, and its design proved to be an effective tool for promoting coordination between federal and subnational authorities during implementation. The current CPS supports project-related strategies such as: (a) the provision of new urban layouts needed to promote public and non-motorized transport; (b) the development of mass transit in appropriate corridors and the creation of a sustainable urban mobility strategy; (c) the enhancement of energy efficiency through the promotion of labels, standards and green technologies in the transportation sector. Land-use and transport planning coordination, integrated transit systems, fleet energy efficiency, TDM and NMT are key strategies to be considered under the new GEF-6 climate-change focal area. The project design was consistent with other federal programs to support subnational entities and projects and improve inter-institutional coordination.

49. **Relevance of the Design (and Implementation): High.** In terms of design, the project solutions were aligned with country priorities, best practices in the sector, and recommendations from scientific research to facilitate, not only the achievement of the PDO, but a potential impact beyond the life and design of the project. The project focused on four important cities where urban mobility issues, in terms of CO₂ emissions and air quality, tend to be severe. Since early 2000, a number of academic research authors have examined the role of transport in climate-change mitigation.⁹ All of them suggest that there is neither a single nor a simple plan to effectively reduce GHG emissions, but mitigation strategies should be designed using a comprehensive and integrated approach. Successful solutions to achieve low-carbon transport systems should include the coordination of transport and land use, the promotion of integrated transit systems and NMT, the improvement of vehicle fuel efficiency, and the implementation of TDM strategies. This holistic approach showed by the scientific research was incorporated in the project design throughout the different project components. Induced policy changes will pave the way for ancillary investments and integrated transport and land use policies. Once implemented, these interventions will allow boosting CO₂ emissions reduction (PDO (a)) and other congestion-reduction related benefits in the longer term, far beyond the life of the project (see Annex 2 for specifics on outputs' contribution to PDO).
50. The Bank implementation assistance was relevant to enable that the activities were implemented by the appropriate institutions. The Bank first restructuring enable supra-municipal entities to be eligible to implement project activities. Project activities were originally designed to be implemented in metropolitan areas. Therefore, this changed allowed the appropriate institutions to implement the activities.
51. Finally, the project complies with the additionality required for GEF projects: without the project (i) the PROTRAM and UTTP programs would not have happened; (ii) the transport

⁹ Banister et. al., 2000; OECD, 2000; Schipper and Fulton, 2003; Åkerman and Höjer, 2006; Hickman and Banister, 2007; Chapman, 2007; Bristow et. al., 2008; Yang et. al., 2009; Hickman et. al., 2010.

policy dialogue between the Bank and the GoM would not exist; (iii) the GHGs assessment methodologies for BRT corridors would not have been improved; and (iv) Leon and Monterrey would not have implemented their BRT projects.

3.2 Achievement of Global Environmental Objectives¹⁰

52. **Objective 1: Reducing GHG emission growth rates by fostering long-term increases in the use of less energy-intensive transport modes was achieved to a substantial extent.** In terms of GHG emissions, the project exceeded the target for annual CO₂ savings by 8.4 percent. The fostering of long term increases in the use of less energy-intensive transport modes was achieved by the completion of studies financed by the grant that will maximize GHG emission savings in the long term (see Annex 2).
53. The outcome-indicator target directly related to a reduction in CO₂ emissions was reached, even under conservative assumptions, via the two BRT corridors in operation. This target required two BRT corridors in operation with an emissions reduction of 58,000 CO₂e tons per year in these corridors. There are two corridors in operation: ECOVIA in Monterrey and OPTIBUS phase 2 in Leon. The GEF donation financed their studies and the Borrower financed their implementation with PROTRAM and UTTP (Annexes 1 and 2). The current estimation of emissions reduction in these two corridors is 62,865 CO₂e tons per year (a 31.3 percent of the CO₂ emissions savings of the project, relative to the without project scenario). This reduction is due to a more efficient operation (fewer vehicles-km travelled) and to modal shift from private vehicles in equal parts. The original emissions reduction model for Mexico (further information about the model and the assumptions can be found in Annex 3) considered a 7 percent modal shift as a safe figure. However, after data corroboration with the cities, we are using conservative assumptions for modal shift (2 percent for OPTIBUS BRT León and 3.7 percent for ECOVIA I BRT Monterrey).
54. In addition, the project financed additional studies in Juarez, Leon and Monterrey that, once implemented, are expected to generate further CO₂ emissions savings in the short term similar to those generated in the above corridors. For example, the study for Juarez corridor Tecnológico will finish soon and is very likely to be implemented as the territory is already taking steps to request PROTRAM support to build the infrastructure. Ecovía II and III in Monterrey are also likely to be implemented in the medium term, once the government overcomes current budget constraints. In addition, the study for Torres Landa corridor in Leon was finalized before the closing date and is very likely to be implemented as part of the expansions of the system that the municipality of Leon is implementing. High local capacity in Leon also favors likelihood to implement (see Annex 2 for further examples).
55. In term of fostering long term increases in the use of less energy-intensive transport modes the induced policy changes (see next paragraph) are expected to generate an increase in public transport trip; in addition, it is also reflected in the potential increase of NMT:

¹⁰ In comparison, Argentina GEF substantially achieved the GEO. The project objective was the same as in Mexico GEF. The project achieved 165.32 CO₂ equivalent tons annual savings, which are expected to increase once three BRT corridors supported by the grant are implemented. On policy changes, local authorities of all four cities selected under the project in Argentina were exposed to cutting edge trainings and world level conferences on sustainable transport, largely impacting the mind-frame of decision makers at local level and consequently becoming a relevant topic within the public agenda.

56. Although Outcome Indicator #2 did not meet the target, induced policy changes (see next paragraphs) are expected to generate a further increase in transit ridership years after the implementation of the studies (see Annex 2). Integration of transit systems, increase in NMT and other ancillary investments, and integration of mobility and land use policies are topics covered by the studies financed by the grant in all four territories. Induced policy changes in this direction will increase modal shift (trips in public transport) and NMT trips. The increase will happen directly, once the implementation of the grant financed studies has impacted long term decisions of agents in the territories, and indirectly, through influencing future studies and decisions. The increase of trips in public transportation in Monterrey and Leon was lower than the target defined in the Outcome Indicator #2. Both project together reached 1.55 percent while the target was 5 percent. However, this increase was enough to achieve the 10 percent GHG emission reduction of Outcome indicator #1. Growth in transit ridership in a given corridor will depend largely on its integration with a larger public transportation system. NMT and other ancillary investments also foster modal shift and use of public transport systems. Finally, the integration of mobility and land use policies maximize long term benefits of public transport projects.
57. Regarding Outcome Indicator #3, the grant financed studies for the four territories that show a potential for increasing NMT trips by 11.5 percent. Among the studies financed by the grant (see Annex 2): (i) Juarez: a bike mobility plan would generate 1,113,300 new NMT trips (+2.7%); (ii) Puebla carried out a NMT transport plan that would generate 4,060,000 NMT trips (+14%); (iii) Leon bike sharing system would induce 4213 new NMT trips; finally, Monterrey master plan for bike routes would generate 4251 NMT trips (+46.1%). Participating territories are seeking resources and funding to prepare detailed designs and implement NMT initiatives. For instance, two municipalities in the Puebla metropolitan area (San Pedro and San Andrés Cholula), are already developing detailed designs to implement Zone 30, bikeways and complete street corridors in central areas by prioritizing NMT, and have requested World Bank financial support. These projects were proposed in the grant financed study. Leon is waiting for the completion of Optibus phases 3 and 4 to implement the bike sharing system associated with Optibus that was designed with grant proceeds. Monterrey bike plan is probable to be implemented once the city has overcome current budget constraints.
58. **Objective 2: Inducing policy changes in favor of sustainable transport projects was achieved to a substantial extent.** Based on the information gathered during the final supervision mission and the closing workshop organized by SEDATU, BANOBRAS and the Bank with participating cities, there is strong evidence that the activities financed under the grant are inducing policy changes in favor of sustainable transport projects. First, all participating cities (two times the target for Outcome Indicator #4) have developed and adopted PIMUS (not financed by the grant) that have climate, land-use and transport considerations. The cities adopted PIMUS because they are required to access PROTRAM and UTTP resources for the implementation of the grant-financed studies recommendation. As a result, two BRT corridors are under operation in Monterrey and Leon and all the feasibility studies for BRT in the four territories were completed with consideration of intermodal connectivity. All the territories have elaborated programs to promote the use of facilities for pedestrians and cyclists. The territories are including many of the grant financed studies as part of their planning instruments and documents. In addition, all the cities have completed NMT, and have plans to implement them soon (see annex 2 for

details). Finally, Mexican entities are using GEF-supported studies as guidelines or references to develop comprehensive NMT plans, new urban mobility policy frameworks and regulations. For example, territories are using the GEF studies as guidelines or references to develop NMT plans or projects recommended in the studies (e.g., in San Pedro and San Andrés Cholula, which are municipalities in Puebla) and to advance the sustainable urban mobility policy agenda. The implementation of this grant has also contributed to the improvement of institutional relationships and coordination between the federal and subnational governments on the sustainable urban mobility agenda. This process has resulted in capacity building at the local level, and in initial dialogue on the need to create a long-term federal government program to assist municipal governments in sustainable urban mobility interventions. As a result, all four eligible territories undertook numerous initiatives with similar objectives to promote less energy-intensive transport modes and induce policy change to promote sustainable urban transport mobility. Some of these examples are presented in Annex 10.

59. The GEF-STAQ project fostered the implementation of both the PROTRAM and the UTTP programs, and paved the way for improved GHG accounting methodologies for urban transport projects. PROTRAM has a pipeline of 40 projects, six of which are in operation, four under implementation, and eleven under evaluation. Total PROTRAM portfolio adds up to more than USD 3bn. A public transport policy dialogue between the Bank and the GoM was initiated during the appraisal phase and has been reinforced during the implementation phase. These conversations have resulted in the reinforcement of institutional relationships. At the time of the project appraisal, GHGs assessment methodologies were underdeveloped. Before the GEF donation feasibility studies have not included a GHGs evaluation of the project. The studies funded by the donation required this appraisal. After that not only the feasibility studies, but also the PIMUS included this type of assessment.

3.3 Efficiency

60. The interventions supported by GEF-financed studies are generating impacts on the reduction of GHG emission growth rates and inducing policy changes in favor of sustainable transport projects; however, its current impact could have been higher if all studies had been already implemented. Despite delays in implementation, as explained in the previous section, most of the studies supported by the grant are already informing investment plans and policy changes in all four cities. Most of these subprojects and policies are likely to be implemented, replicated and scaled up in the medium term but after the project closing date. In addition, the grant financed the designs of two BRT systems that are now in operation and are generating CO₂ emission savings.
61. The Economic and Financial Analysis in the PAD considers two scenarios to assess cost effectiveness: (i) an upper-limit scenario in which all the cities achieve the modal-share change for Mexico City; and (ii) a conservative or lower-limit scenario in which they achieve only 20 percent of the observed modal-share change for Mexico City. The only available interventions to conduct a GHG emission assessment were the two BRT corridors in operation: ECOVIA in Monterrey and OPTIBUS in León. Because the UTTP partially financed the execution of these subprojects, the methodology used follows the one that was developed for this program and tailored with specific data for these two corridors.

62. **Cost effectiveness.** Cost effectiveness is calculated for the two BRT corridors under operation. The calculation is done both for amount of the GEF donation (cost of studies) and for the amount of the GEF donation plus the co-financing required for subproject implementation (total cost) over the total amount of estimated CO₂e reduced.¹¹ The cost effectiveness of the BRT operating corridors is US\$2.5 per ton of CO₂e reduced considered only the GEF funds. When the total cost of the two BRT corridors is also considered, the cost effectiveness is US\$84.44 per ton of CO₂e reduced is modest. Still, it is below the USD100 threshold generally considered acceptable¹². Table 2 summarizes the calculation of cost effectiveness and Annex 3 includes additional information on the issue.

63. **Based on the above, the efficiency of the project in achieving its objectives is rated Modest.**

Table 2. Mexico GEF Project cost effectiveness figures

	Accumulated 25-year emission reductions (CO ₂ e ton)	GEF funding (USD M)	GEF + cofinancing (USD M)	GEF cost effectiveness (USD/CO ₂ e ton reduced)	Total cost-effectiveness (USD/CO ₂ e ton reduced)
Monterrey	997,475	0.9	95.11	0.90	95.35
León	574,175	0.6	37.6	1.04	65.49
Total	1,571,650	1.5	132.7	0.95	84.44

3.4 Justification of Overall Outcome Rating

Overall rating: Moderately Satisfactory (MS)

64. The project’s overall outcome rating is MS in consistence with the high relevance of the PDO and design, substantial achievement of the two PDOs, and the modest efficiency.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

65. The proposed GEF project was expected to have positive impacts on the population’s living standards. Studies financed by the GEF project were aimed at improving physical access and quality of public transport, enhancing non-motorized infrastructure, and improving the built environment. There is considerable evidence, both from the region and globally for the developing world, that sustainable transport interventions, such as BRT and NMT projects promoted by the donation, usually improve transport conditions and overall accessibility among low-income users, who typically suffer the most from inequitable access to transport and tend to be most affected by transit service shortfalls. However, the client did not report any robust evidence on poverty, gender or social-development impacts.

¹¹ This cost-effectiveness follows the guidelines developed by the CTF Trust Fund Committee in October 2013.

¹² The USD 100 is the threshold considered acceptable in CTF guidelines. See Summary of the Co-Chairs Meeting of the Clean Technology Fund Trust Fund Committee October 28-29, 2013 (p.4 b)

(b) Institutional Change/Strengthening

66. The project positively impacted capacity and institutional development in Mexico’s urban transport agenda. In particular, SEDATU’s capacity as an executing agency and its relationship with subnational governments was strengthened, as well as participating cities’ capacity and their relationship with federal government entities. The implementation of this grant has strengthened institutional capacity and coordination to promote the sustainable urban mobility agenda in the participating cities with the active engagement of federal agencies. SEDATU, through its office for Sustainable Urban Mobility Strategy, has been actively interacting with participating cities to supervise activities, and has used this interaction to expand the strategy to other cities. In addition, during the final stage of the grant, SEDATU, BANOBRAS and the Bank organized workshops and site visits to the participating cities to gather information on the project’s impact, share lessons learned, and identify institutional and financial needs to continue supporting subproject implementation. All cities reported that GEF-funded studies have contributed toward building longer-term capacity and promoting institutional development at the local level, and have improved inter-institutional coordination and relationships across different levels of government.

(c) Other Unintended Outcomes and Impacts

67. All participating cities and federal government agencies, in particular BANOBRAS and SEDATU, have initiated a dialogue to begin conceptualizing a long-term program at the federal level aimed at assisting municipal governments in sustainable urban mobility interventions. This potential federal program could assist, grant and co-finance transformational low-carbon urban mobility projects on NMT, complete streets, vision zero, TOD and TDM as complementary investments to the PROTRAM mass-transit projects. This program could represent the most important outcome and by-product of the GEF grant in terms of inducing policy changes in the long term in favor of sustainable urban mobility projects.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

68. In coordination with SEDATU, the Bank organized a workshop during the “11th International Congress of Cities and Transport” of the Center for Sustainable Transport EMBARQ¹³ Mexico from October 12 to 14, 2015. The aim of the workshop theme—“GEF Funds: Donations to Implement Sustainable Urban Mobility Projects. What are the benefits for the cities?”—was to present and discuss the lessons learned during the grant’s implementation. Findings are summarized in Section 6 of this report: Lessons Learned.

4. Assessment of Risk to Development Outcome

Rating: Moderate

69. The overall risk to the associated development remains moderate because federal and local governments are taking specific actions to ensure project sustainability; however, the

¹³ World Resources Institute (WRI)’s Center for Sustainable Transport EMBARQ is now WRI Ross Center for Sustainable Cities.

original project design did not consider a critical risk for achieving the GEO: participant entities subprojects were not implemented during the execution of the grant due to delays, such as one that could arise from changes in local administrations, or from a lack of local government resources to implement these subprojects. First, SEDATU, BANOBRAS and the Bank are supporting participating cities in identifying strategies and potential financial support to ensure the subprojects' implementation and sustainability after the end of the grant. Second, cities and SEDATU are initiating a dialogue on the need to create a long-term federal government program to assist municipal governments in sustainable urban mobility interventions, which are not currently eligible under PROTRAM. Third, during the final mission all local counterpart government representatives, including those who were recently elected, expressed their interest in and desire to support a strategy to scale up the grant experience to the rest of the country, and to take their current subprojects to final execution. Some of the cities have been developing detailed designs for subprojects based on the feasibility studies supported by the grant. All these actions will ensure project sustainability and a broader achievement of development outcomes in the long run.

5. Assessment of Bank and Borrower Performance

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Unsatisfactory (MU)

70. The Bank's support for the project was built on a solid rationale; however, delays during project preparation and limitations in the design of the project definition and associated results framework explain the MU rating. The background analysis was sound and aligned with the Mexico CPS and the GoM's plan for improving urban transport sustainability. These principles continue to apply and are included in Mexico's development objectives. The overly ambitious selection of activities to be supported in the Mexico project and the aforementioned delays in implementation resulted in some shortcomings in the selection of indicators and their targets for the results framework. This framework also proved to be too ambitious and required data collection efforts that were very complex in terms of the capacity and available resources in participating cities.

(b) Quality of Supervision

Rating: Moderately Satisfactory (MS)

71. According to the PAD, Bank supervision of the operation was undertaken with the PIU, in coordination with the CAI, which was supporting the implementation of the Regional Program and providing technical assistance to the cities for their procurement processes. In practice the CAI's role during project implementation was small, especially after the project's midterm review in 2012.

72. After the delay in the declaration of effectiveness and the changes in the client's and beneficiaries' administrations, the Bank was flexible in working with the client and making timely adjustments in order to comply with project objectives, as shown in the last two restructurings. This was especially evident in the third restructuring, which was complemented by an Action Plan that increased the pace of project supervision meetings and missions. In particular, the frequency of Bank team missions increased considerably

since the last restructuring, totaling nine joint UTTP–GEF missions conducted during the last year of the grant

73. The Bank should have conducted a restructuring to modify the M&E framework and adapt it to the implementation progress and the actual outputs of the project. By the time of the midterm review, most of the grant activities had not started. The implementation delays should have been taken into account by modifying and adjusting the M&E framework and adapting it to the project’s implementation reality, and to the availability of and local capacity to collect baseline and indicator data.

(c) Justification of Rating for Overall Bank Performance

Rating: Moderately Satisfactory (MS)

74. The Bank’s overall performance is considered moderately satisfactory based on the Moderately Satisfactory overall outcome of the project.

5.2 Recipient

(a) Government Performance

Rating: Moderately Satisfactory (MS)

75. Despite delays in declaring effectiveness and during implementation, and changes in the client’s and beneficiaries’ administrations, the government representatives of participating cities and SEDATU’s PIU made considerable efforts to execute the grant activities efficiently and ensure that the expected impacts were achieved during the last stage of the grant. Moreover, these federal and local government representatives have expressed their interest and desire to: (a) support a strategy to scale up the grant experience with the Bank and the federal government; (b) continue providing technical and financial assistance to more Mexican cities; and (c) seek solutions to take the supported subprojects to final implementation and operation. Besides, Mexico is proving a leading role in the climate change agenda implementing different projects to achieve a more sustainable transportation: Mexico was the first development country to present to UN an INDC with specific commitments to reduce GHGs, and to approve a Climate Change law.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Unsatisfactory (MU)

76. The PIU’s supervision and coordination role was irregular during the implementation. Supervision was weak during the first two years of the donation; nevertheless, after the change in the PIU, it was outstanding and largely responsible for meeting the new closing date, using most of the grant resources, and ensuring a sound supervision of grant activities. The periodic technical supervision visits to the cities and weekly follow-ups were essential for improving the project’s implementation rate during the last year of the grant. However, delays in compliance with the reporting of fiduciary obligations during the last six months, due to new institutional changes in this period, suggest an MU rating.

(c) Justification of Rating for Overall Borrower Performance

Rating: Moderately Satisfactory (MS)

77. The Borrower’s overall performance is rated as MS because the overall outcome of the project was MS.

6. Lessons Learned

78. **Definition of TA activities should follow a straightforward structure to facilitate implementation.** In this project, the expected counterpart contributions to the activities, which were needed to achieve the objectives, significantly exceed the grant resources. In view of this design, the Bank should apply further measures to ensure timely implementation of the studies so there is room for counterpart follow-up prior to the project closing date. Coordinating the Bank, BANOBRAS, SEDATU, participating cities and consultants was difficult and caused delays during implementation. These delays were mitigated once all the parties started holding joint periodic coordination meetings. The Bank should also apply very tight supervision to mitigate any political changes that may affect client engagement or implementation pace. Project design should take transaction costs into account, try to minimize the number of links in the chain, and establish formal, simple coordination mechanisms. The framework of the regional STAQ umbrella project implied a limit that did not allow to define this project as a technical assistance project. In that case, the definition of objectives would have been less ambitious, and the M&E would only have included the results that can be achieved with the implementation of the studies.
79. **Additionality in climate finance for transport projects produces unexpected positive outcomes, but its interpretation during appraisal should be realistic in order to avoid overly ambitious commitments by the eligible beneficiaries.** Without the GEF donation, sustainable transport projects implemented using the PTTU and UTTP programs in Mexico would have never been happened. This project has also helped to strengthen the relationship and the transport policy dialogue not only between the Bank and the GoM but also among different administration levels in the country. And also, it is important to highlight the GEF role in the improvement of the transport emissions assessment methodologies. However, interpretation of the condition of additionality at appraisal level should be more realistic. In the case of this GEF donation, the competition to be an eligible beneficiary during appraisal, made cities promise a lot and additionality forced to link the studies to be financed by the GEF project with actual investments. Cities committed to overly ambitious intermediate targets and results taking into account the tight timeframe of the donation and the big amount of counterpart funds needed to put project under operation.
80. **Comprehensive programs that include preparation and implementation funds enrich and advance the assessment transport project impacts.** The GEF Grant co-finances studies and technical assistance that have ease eligibility for funding from the PROTRAM and UTTP. The STAQ and the UTTP helped develop simple methodologies for measuring GHG impacts of transport projects. The studies financed by the grant started to include the assessment of GHG impacts, and some years after it was natural for both PIMUS and FS to include this analysis. All the GEF-STAQ task teams and counterparts had to learn how to measure the impact of transport projects on GHG. The GEF STAQ, therefore, marked the beginning of this learning curve: when there was not even a methodology to assess a baseline
81. **Modal shift has proven very effective for CO₂ emissions reduction, but also much more difficult to achieve and measure than expected.** The operating systems in Monterrey and León were sufficient for the CO₂ emission-savings indicator to achieve the target. Nevertheless, the increase in public transportation use and the modal-shift indicators were not fully achieved. System integration and infrastructure interventions related to the

systems would improve modal shift. Modal shift is the main driver of CO₂ emission reductions. . In addition, the project has financed studies that will be implemented after the closing date. Therefore, the project could have achieved an even greater CO₂ emission-reduction objective.

82. **Projects should provide specific resources to conduct surveys if they are needed.** Cities should have conducted household surveys to develop the baselines and assess the results indicators. However, these surveys have not been carried out due to budget and time constraints. Projects should provide specific resources for surveys or be more realistic in what to expect of participating entities.
83. **To achieve the expected outcomes, it is important to be realistic and take into account the supported subproject cycle length.** Commitments acquired by the cities regarding results and targets required systems under operation; and therefore, it could only be expected from subprojects at a mature stage of the project cycle. For example, in Mexico, the cycle of a BRT corridor project or a mass-transit system project, from preparation to operation, takes about five to eight years. The grant's original timeframe was four years. The retroactive funding of the Monterrey and León BRT studies was a success in terms of the grant's project execution. However, this was the only case in the context of the project's implementation, and support was given retroactively to studies already executed. Bank should carefully assess that authorities' commitment, capacity, and local conditions will ensure project implementation. Among others, the Bank should assess, if applicable, that there are mechanisms in place to mitigate risks from changing administrations. The Bank would also benefit from including creditworthiness' assessment of the potential beneficiaries with GEF resources. Project design of potential GEF donations should take into account that beneficiary cities have the financial space to carry the proposed projects to further contribute to original estimates with regards to GHG emissions cuts.
84. **The Bank should provide enough time for sound supervision of activities.** The grant's implementation pace improved substantially during the last two years, especially in 2015 when a total of 11 pending contracts for studies were signed and nine were completely finalized. During this time, SEDATU organized periodic technical supervision visits to the cities and weekly follow-ups. Although this strategy meant that all studies fully financed by the GEF had to be completed by the closing date, the quality of supervision by the Bank and SEDATU was compromised due to the amount of deliverables and reports produced in the last year. It was not feasible to accurately supervise and review a large number of documents in such a short period of time.
85. **Climate funding programs for transport are crucial to induce policy changes and catalyze capital for sustainable urban transport projects.** On the one hand, cities and SEDATU are initiating a dialogue to create a long-term federal government program to assist municipal governments in sustainable urban mobility interventions. These initiatives are not currently eligible under PROTRAM guidelines. However, their consideration by PIMUS is a prerequisite for PROTRAM-supported projects. These interventions are also essential to fully achieve the potential benefits and transformational impact of mass-transit systems. This potential federal program could assist, grant and co-finance transformational low-carbon urban mobility projects on NMT, complete streets, vision zero, TOD and TDM as complementary investments to PROTRAM's mass-transit projects. This program could represent the most important outcome and by-product of the GEF grant in terms of inducing

long-term policy changes in favor of sustainable urban mobility projects. To continue supporting these efforts, the GoM requested the Bank's support to prepare a new GEF-6 proposal aimed at leveraging existing political instruments at local and federal levels, promoting financial mechanisms, and incorporating mobility-related elements with a holistic approach.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

86. BANOBRAS prepared a report for the closing of the grant. Main messages are summarized in Annex 7. Despite expedite revision time by the Bank during the last stage of implementation, the reports noted the negative impact of slow response times for procurement processes related reviews in some cases. On the other hand, the report acknowledged the successful completion of the grant and valued the experience acquired during the implementation.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Window 1	120,000	120,000	100%
Ciudad Juárez	120,000	120,000	100%
Window 2	205,000	319,906.27	156.1%
Ciudad Juárez	80,000	0	0%
Puebla	125,000	0	0%
León	0	102,886.62	n/a
Monterrey	0	217,019.65	n/a
Window 3	3,710,000.00	3,804,606.39	102.6%
Ciudad Juárez	700,000	1,238,497.38	176.9%
León	1,105,000	954,185.16	86.4%
Monterrey	1,870,000	1,611,923.85	86.2%
Puebla	35,000	0	0.0%
Window 4	1,116,000	754,045.89	67.6%
Ciudad Juárez	131,000	134,332.18	102.5%
León	296,000	124,119.91	41.9%
Monterrey	599,000	234,934.61	39.2%
Puebla	90,000	260,659.19	289.6%
Operating Costs	290,000	197,673.20	68.16%
Total Baseline Cost	5,378,000		
Physical Contingencies	0.00		
Price Contingencies	0.00		
Total Project Costs	5,196,231.78		
Project Preparation Facility (PPF)	0.00		
Front-end fee IBRD	0.00		
Total Financing Required	n/a		

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		31.58	106.00	336%
Global Environment Facility (GEF)		5.38	5.20	96.6%

(c) Financing by participant entities (in US\$ million equivalent)

IV. SUBPROJECT BUDGET (CIUDAD JUÁREZ)			
Window	Expenditure Category	GEF Contribution (US\$)	Co-financing (US\$)
Window 1: Freight Management	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	120,000	0
	Operating Costs	-	-
	Subtotal	120,000	0
Window 2: Land Use/ Transport Coordination	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	0	0
	Operating Costs	-	-
	Subtotal	0	0
Window 3: Public Transport Enhancement	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	1,239,781.15	295,866.46 ¹⁴
	Operating Costs	-	-
	Subtotal	1,239,781.15	295,866.46
Window 4: Non-motorized Transport	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	134,332.18	0
	Operating Costs	-	-
	Subtotal	134,332.18	0
Overall Project Budget	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	1,494,113.33	-
	Operating costs	-	-
	Total	1,494,113.33	295,866.46
IV. SUBPROJECT BUDGET (LEÓN)			
Window	Expenditure Category	GEF Contribution (US\$)	Co-financing (US\$)
Window 3. Public Transport Enhancement	Goods & Non-consulting services	-	-
	Works	-	42,200,000 ¹⁵
	Consulting Services	954,185.16	136,797.6 ¹⁶
	Operating costs	-	n/a
	Subtotal	954,185.16	42,336,797.60
Window 4. Non-motorized Transport	Goods & Non-consulting services	-	-
	Works	-	-

¹⁴ Total contract amount: MXN 23,311,130.67. We are using the exchange rate of the day of contract signature, USD/MXN = 15.18

¹⁵ It corresponds to MXN 633M at USD/MXN = 15 on civil works, rolling stock and equipment co-financed by the government and the private operators.

¹⁶ It corresponds to the deliverables of the Torres Landa Study that were delivered after the grant closing date. These were covered by Leon with own resources.

	Consulting Services	124,119.91	-
	Operating costs	-	-
	Subtotal	124,119.91	0
Overall Project Budget	Goods & Non-consulting services	-	-
	Works	-	42,200,000
	Consulting Services	1,374,110	136,797.6
	Operating costs	-	n/a
	Total	1,078,305.07	42,336,797.60

IV. SUBPROJECT BUDGET (MONTERREY)

Window	Expenditure Category	GEF Contribution (US\$)	Co-financing (US\$)
Window 3. Public Transport Enhancement	Goods & Non-consulting services	-	-
	Works	-	114,133,333 ¹⁷
	Consulting Services	1,611,923.85	0
	Operating costs	-	n/a
	Subtotal	1,611,923.85	114,133,333
Window 4. Non-motorized Transport	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	234,934.61	-
	Operating costs	-	-
	Subtotal	234,934.61	0
Overall Project Budget	Goods & Non-consulting services	-	-
	Works	-	114,133,333
	Consulting Services	1,846,858.46	-
	Operating costs	-	-
	Total	1,846,858.46	114,133,333

IV. SUBPROJECT BUDGET (PUEBLA)

Window	Expenditure Category	GEF Contribution (US\$)	Co-financing (US\$)
Window 4. Non-motorized Transport	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	260,659.19	-
	Operating costs	-	-
	Subtotal	260,659.19	0
Overall Project Budget	Goods & Non-consulting services	-	-
	Works	-	-
	Consulting Services	260,659.19	-
	Operating costs	-	-
	Total	260,659.19	0

¹⁷ It corresponds to MXN 1,712M at USD/MXN = 15 on civil works, rolling stock and equipment co-financed by the government and the private operators.

Annex 2. Outputs of the project

1. The tables below show the outputs that the project delivered and their contribution to the achievement of the project outcome (PO) indicators and to the Global Environment Objectives (GEO). Changes in original definition of activities are also included.

Table 1. Activities financed by the grant: Status, likelihood to implement and link to PDO

Beneficiary	Output financed by the Grant	Status at ICR	Likelihood to be implemented	Link to PDO	Window
SEDESOL / SEDATU	Project Management	Successfully completed. Although during the last year, lack of budget adjustments in SEDATU did not allow to hire consultants for project management during the last year	n/a		Component 5: Project Management
JUÁREZ	Regulatory framework for freight transport // Estudio Integral y Plan regulatorio para el transporte de carga.	<p>The study is completed, but not yet incorporated to the local regulation.</p> <p>Juárez has completed its comprehensive Freight Diagnosis Study which comprises an analysis of the infrastructure available, the past Freight Route Plan, and data on freight traffic and accidents, along with the proposal and assessment of different route enhancements and alternatives.</p>	<p>Very likely to be implemented, and is already influencing public policy.</p> <p>The study on freight was subject to public consultation in the end of 2015.</p> <p>The study has been incorporated as part of the new Sustainable Urban Development Plan, which will be subject to public consultation in June 2016.</p> <p>There will be elections in Juárez' state in June 2016; therefore incorporation in local regulation will happen after the elections.</p>	<p>Impact on PDO (a) will materialize once the plan is enforced via less emissions from freight traffic and related congestion</p> <p>PDO (b) since the city has explained that it is using this study to develop a new regulatory framework.</p>	Window/Component 1: Freight management

Beneficiary	Output financed by the Grant	Status at ICR	Likelihood to be implemented	Link to PDO	Window
	Bike mobility plan // Elaboración del plan para la movilidad ciclista	<p>The study is completed, but not yet incorporated to the local regulation</p> <p>For the purposes of potential impact on NMT indicator, the project considered 3 different scenarios and 3 different timeframes. With the first phase of scenario implementation, we complied with the indicators. Although the plan's focus is on bike mobility, it also considers changes in pedestrian mobility for the entire city. Studies estimate a 10 percent increase in bike trips.</p> <p>The plan considers the creation of different bike routes and changes in pedestrian mobility for the entire city through policies that reduce the use of private transport and promote intermodal solutions between bike and public transport. Both the mobility diagnosis and the different alternatives have been discussed with different stakeholders and citizens in workshops and focus groups.</p>	<p>Very likely to be implemented, and already influencing public policy.</p> <p>Similarly to the freight study above, it has been incorporated as part of the new Sustainable Urban Development Plan, which approval is delayed by the upcoming elections.</p>	<p>Impact on PDO (a) will materialize in the longer term after the plan is enforced via use of less energy intensive modes, and increment in the use of public transport.</p> <p>PDO (b) it induced policy changes since the city has explained that is using this study to develop a new regulatory framework.</p>	Window/C omponent 4: Non- Motorized Transport
	Tecnologico corridor feasibility studies and designs // Estudio integral para el corredor de transporte público Corredor Tecnológico.	The study is almost completed. It lacks some minor adjustments to the executive summary that the consultants are discussing with the authorities. As the study was co-financed by PROTRAM, the Bank agreed on financing the first deliverables to allow full implementation to happen after the grant closing date.	Very likely to be implemented. The studies include the economic analysis methodology to ask for PROTRAM federal resources, and the territory is already undertaking steps to request PROTRAM support to build the infrastructure.	Impact on PDO (a). Once implemented the Project is expected to generate CO2 emissions savings similar in the short term to those generated in Monterrey and Leon.	Window/C omponent 3: Transport Enhancem ent
LEON	Detailed design for Optibus phase II. //Diseño funcional detallado de la segunda fase del Sistema Integrado de Transporte del municipio de León, Guanajuato	All this three studies are completed and part of the Integrated Transport System in Leon. They include two BRT corridor studies. The first one, OPTIBUS Phase II, was retroactively funded in 2012. OPTIBUS Phase II was placed in operation in 2010. The counterpart funding reached US\$37.6M (US\$22.2M committed by the municipality and US\$15.4M committed by the private sector). It adds 32 new routes to the León BRT network system (2 main, 12 alternative and 18 feeder bus routes) and more than 30 km with 61 intermediate stations, 3 transfer stations and 2 microstations. The second feasibility study, the Torres Landa Corridor, was finished shortly before the closing date.	Optibus phase II is already implemented and in Operation. Torres Landa and Miguel Hidalgo are very likely to be implemented, as the municipality of Leon has been consistently expanding the integrated transport system and there is high local capacity for planning and execution.	Impact on PDO (a). Together with Monterrey Ecovia I, Leon Optibus Phase 2 is one of the two corridors that allow the project to comply with the PDO (a). Once implemented the extension of the system will add up to this savings.	Window/C omponent 3: Transport Enhancem ent
	San Jeronimo Station designs // Proyecto ejecutivo de ampliación estación San Jerónimo SIT-Optibús.				
	Studies for adjustments to Torres Landa Corridor and Miguel Hidalgo repavement // Proyecto ejecutivo de ajustes al corredor Torres Landa SIT-Optibús y pavimentación del corredor Miguel Hidalgo.				

Beneficiary	Output financed by the Grant	Status at ICR	Likelihood to be implemented	Link to PDO	Window
	Study for modal integration of bike and public transport. // Estudio de integración modal bici-transporte público	<p>The study is completed, but not yet implemented.</p> <p>The study consists of a bike-sharing system linked to the integrated transport system. From the study we understand that the baseline is 0. Therefore, all the different scenarios (based on different fees for the bike-share system) comply with the end-target indicator. We are presenting the values for the most restrictive scenario, which considers a MX\$10.00 fare. Studies estimate an induced daily demand of 4,213 bike trips</p>	The study is very likely to implement. The city is waiting for the completion of the corridor 3 and 4 to which the bike-sharing system is linked to implement the project.	PDO (a). Once implemented, the bike sharing system will total foster NMT trips, and contribute to increase the use of public transport.	Window/Component 4: Non-Motorized Transport
	Communication and social management campaign to Foster the use of bikes, public transport and road safety. // Campaña de comunicación y gestión social para fomentar el uso de ciclovías, de transporte público, áreas de integración modal y cruce seguro en principales intersecciones conflictivas.	<p>The campaign is designed and ready, but not yet launched.</p> <p>The objective of the campaign to promote the use of bike paths; modal integration areas and safe crossroads have been developed. Besides the cyclist mode, this communication plan also includes pedestrian mobility and public transport initiatives as well as the intermodal connectivity between bikes and public transport.</p>	The study is very likely to be implemented. Leon authorities explained that they are waiting for an extension of the Optibus system to be completed to launch the campaign.	PDO (a) The campaign is part of an integral strategy to increase NMT trips and the use of public transport.	Window/Component 4: Non-Motorized Transport
MONTERREY	Bike mobility master plan "BICIPLAN" // Elaboración de un plan maestro de ciclovías en el Área Metropolitana de Monterrey; Incluyendo los proyectos de las ciclistas alimentadoras y difusoras del BRT Lincoln - Ruiz Cortines	<p>The master plan is finished, but not yet implemented.</p> <p>BICIPLAN considers 3 different scenarios. We are only reporting Scenario 1 bike trips, which complies with the end-target values. Demand data is provided for peak hours. Expected increased bike trips are 46.1 percent.</p> <p>Biciplan focuses on placing bikes as a consolidated transport mode. To do so, it proposes the creation of 150 km of bike paths, bike parking in strategic locations, and 46 bike-sharing stations. An important element of this plan is the integration of the bike system with ECOVIA's BRT corridors. The project has a citizen-centric approach (more than 100 people were consulted during its design) and has been developed with the support of one of the largest cyclist associations, Pueblo Bicicletero.</p>	<p>The study is probable to be implemented in the future, once current constraints are cleared. Main constraints are related to funding. On the other hand, there is significant social pressure to implement the plan. (http://www.pueblobicicletero.org/2015/11/proyectos-movilidad-amm/)</p> <p>Recently elected government express during the last missions its interest in using this plan as basis for the next policy actions on sustainable urban transportation.</p>	<p>PDO (a) Once implemented, the plan will foster NMT trips.</p> <p>PDO (b) The plan shows the potential for the use of NMT modes, and is influence policy making in the territory.</p>	Window/Component 4: Non-Motorized Transport

Beneficiary	Output financed by the Grant	Status at ICR	Likelihood to be implemented	Link to PDO	Window
	Technical specification for improving accesibility in future mobility interventions // Elaboración de especificaciones técnicas para un sistema de movilidad con accesibilidad universal, e inventario de las condiciones de aceras y banquetas en la zona centro del Área Metropolitana de Monterrey	The study is completed and provides guidance on how to improve accessibility in future interventions in the city by using the specifications and recommendations for each kind of intervention.	The study includes recommendations that are ready to be used in any project. It can be considered as implemented.	<p>PDO (a) If recommendations are followed, improving public spaces near stations can improve the use of public transport and the use of NMT modes.</p> <p>PDO (b) The study is inducing policy changes by increasing the likelihood to include accessibility considerations in future projects.</p>	Window/C omponent 4: Non- Motorized Transport
	GHG inventory // Inventario de Gases de Efecto Invernadero.	The study is completed and provided information to improve GHG accounting methodology.	Implemented	PDO (b) Better assessment of CO2 lead to improved decisions and policy making.	Technical Assistance and Capacity-Building Activities in Selected Cities
	Monterrey Ecovia II and III BRT corridor detailed designs // Estructuración Técnica, Legal y Financiera del corredor de Movilidad Sustentable Constitución – Morones Prieto	Two BRT studies were funded in Monterrey: Ecovia I, retroactively, which enabled the execution of the first BRT in the city of Monterrey. The total disbursement, USD 936,610, was made in November 2011. The BRT was placed in operation in January 2014. The Lincoln-Cortines Corridor, consisting of 30 km of dedicated lanes with 39 intermediate stations and 80 buses, serves 5 municipalities in the Nuevo León Region: Monterrey, San Nicolás, Guadalupe, Apocada and Escobedo. It was complemented by an study to improve road safety in the corridor. The second study, Technical Legal and Financial Structure of the Constitución–Morones Prieto Corridors, was finalized. The design proposed for ECOVIA II and III includes criteria for accessibility, sustainable mobility, functionality, road safety, socioeconomic aspects, minimum traffic disturbance, and Santa Catalina river occupation	Ecovia I is already implemented and in Operation	Impact on PDO (a). Together with Leon Optibus Phase 2, Monterrey Ecovia I, is one of the two corridors that allow the project to comply with the PDO (a). Once implemented, Ecovia II and III will add up to this savings.	Window/C omponent 3: Transport Enhancem ent
	Study about road safety in Ecovia I corridor // Elaboración de un estudio sobre la seguridad en el corredor de transporte Lincoln Ruiz Cortines "ECOVIA"		Ecovia II and III is probable to be implemented in the future once the government overcome fiscal constraints.		

Beneficiary	Output financed by the Grant	Status at ICR	Likelihood to be implemented	Link to PDO	Window
	Ecovia I design and estructuración studies // Estructuración Técnica, Legal y Financiera del corredor Lincoln - Ruiz Cortines	limit. The study takes into account intermodal connectivity with other bus lanes and with bikes and transport-oriented development.			
PUEBLA	Non Motorized Transport plan for Puebla // Plan de Transporte No Motorizado en Puebla, Puebla.	<p>The study is finished and some local entities are actively looking for funding to implement some recommendations.</p> <p>The NMT plan is a comprehensive plan that informs the necessary resources to promote NMT modes in the nine municipalities of the Puebla Metropolitan Area. Following a diagnostic of the current NMT context, which included a public participatory process, it proposes a holistic strategy that includes traffic calming, cyclist infrastructure, bike parking, bike-share system, educational and promotional initiatives, modifications to the legislation to promote NMT modes and coordination policies among administrations. Some of the cities in the metropolitan area are already using the study to develop NMT execution projects. Moreover, it is also being used as a basis to develop new policies and regulatory frameworks regarding sustainable mobility.</p>	<p>Probable to be implemented, once some local entities overcome fiscal constraints.</p> <p>San Pedro and San Andrés Cholula), are already developing detailed designs to implement Zone 30, bikeways and complete street corridors in central areas by prioritizing NMT, and have requested World Bank financial support for finalizing designs and the civil works.</p>	PDO (b) Although not implemented, the studies are already inducing policy changes and serve as a benchmark to design other projects to foster NMT.	Window/Component 4: Non-Motorized Transport

Table 2. Changes to the original activities.

Window (component)	Original activities in project design	Comments / Status
Window (Component) 1: Freight Management (Ciudad Juárez)	(a) the provision of technical assistance to improve the regulatory framework for freight transport in Ciudad Juárez; and	Both activities were merged into the same study in Juarez financed by the project.
	(b) the provision of technical assistance to carry out a comprehensive plan for the regulation of freight transport, including a route system and a traffic-control and supervision system, in order to reduce traffic emissions of GHG in Ciudad Juárez.	
Window (Component) 2: Land Use/Transport Coordination (Ciudad Juárez, Puebla)	(a) the creation of a specialized entity responsible for urban transport planning in the municipality in Puebla;	This component was cancelled by the city. Instead, the city established a working group within the secretariat of mobility responsible for implementing mobility projects.
	(b) the development of a medium-term plan for improving pedestrian mobility; and	Puebla undertook a specific Non-Motorized Transport Plan financed by the project. Leon, Monterrey and Juarez also have plans to foster NMT financed by the project.
	(c) the conduction of studies for promoting the use of NMT and for recovering public spaces in Ciudad Juárez's historic center.	This study was cancelled by the city after a change of government.
Window (Component) 3: Public Transport Enhancement (all four territories)	(a) the planning and design of additional corridors and terminals for the BRT network in León in order to expand the integrated transport system in that municipality;	This correspond to Optibus phase 2 and 3, which was implemented on the project financing (grant and recipient) and is in operation.
	(b) the planning and design of a BRT-type busway corridor in Monterrey in order to establish the first stage of multimodal integration with other existing systems, as well as with NMT systems;	This corresponds to Ecovia I which was implemented on the project financing (grant and recipient) and is in operation.
	(c) the planning and design of the 2002 BRT Project (Corredor Tecnológico) in Ciudad Juárez;	This corresponds to the design of the corredor tecnológico, that is being cofinanced by PROTRAM. Studies will be finished soon.
	(d) the design of the rationalization of routes and of a BRT corridor project in Puebla; and	This corresponds to the project Ruta the related studies and implementation was covered by the city with PROTRAM support. The grant did not finance the studies due to delays in declaring effectiveness.
	(e) the development of strategies for private-sector participation in urban transport management in the selected municipalities.	This was not financed by the grant. Strategies to foster private sector participation are being supported by other World Bank projects in the country.
Window (Component) 4: Non-Motorized Transport (all four territories)	(a) the conduction of studies for the design and the implementation of a non-motorized urban mobility system; and	This corresponds to NMT related studies in Leon, Monterrey, and Puebla financed by the project.
	(b) the conduction of studies and the design of projects for the construction of bike paths in the selected municipalities.	
Component 5: Project Management	Provision of technical assistance and financing for short-term technical support staff in the Project Coordination Unit (PCU) to supervise and monitor project implementation in the selected municipalities.	This component financed consultants that supported SEDATU during the supervision of the studies.

Annex 3. Economic and Financial Analysis

Introduction

1. We maintain the appraisal selection of the cost effectiveness of the indirect impacts of the GEF operation as the primary indicator for the economic analysis of the Mexico GEF operation's investment. The Bank considers this indicator appropriate because the primary emphasis of the proposed GEF operation is to enable further action to be taken by cities and state governments. While some direct investments are occurring under the program windows, for example in non-motorized facilities or facilities to coordinate intermodal movements, these were considered primarily demonstrative: to show what kinds of outcomes were feasible.
2. The analysis proposed, therefore, does not consider the immediate program outcomes—that is, the reduction or elimination of barriers that impede adoption of policies that lead to structural reductions in CO₂ emissions from the sector—but rather, the indirect outcomes that will occur if the policies impeded by the barriers addressed by the program do indeed become adopted within a reasonable time frame following the completion of this program. Such an analysis assumes that these more substantive measures will indeed be effective.
3. The methodology draws primarily on previous work developed by Shipper (2000) and Wright and Fulton (2005); it applies the model developed by the latter to the decomposition framework proposed by the former, to examine how aggregate populations have reacted in the past to aggregate changes in the windows of interest. The interventions and investments in León (OPTIBUS) and Mexico D.F. (Metrobus) in the previous years represented the kinds of interventions contemplated through the four windows. It was believed that insight could be drawn on the kinds of changes that could be expected from widespread adoption of these measures in project-related cities, and these changes were used to estimate cost effectiveness of the program.

Justification of the GHG assessment methodology used for the ICR

4. Compared with other energy-consuming sectors, assessing the mitigation impact of transport policies becomes an intricate problem. Among the parameters that make it challenging to quantify the emissions of transport projects, the following can be highlighted: the diffuse nature of emission sources; impacts on other modes, rebound effects, lack of adequate data; difficulties in determining both the counterfactual and the project boundary and in estimating factors affecting fuel or electricity consumption such as vehicle-kilometer traveled, and modal composition, load factors, network travel speeds, driving behavior, traffic composition, technology change (Grütter 2007; Wright and Fulton 2005; Millard-Balla and Ortolano 2010; Bank 2012).
5. During the past years, different authors have developed comprehensive frameworks that describe the drivers of transport energy consumption and emissions. The ASIF methodology (Schipper and Marie-Lilliu 2000) considers the carbon emissions of a particular transport sector function of the total travel activity (A), modal share (S),

modal energy intensity (I), which depends on vehicle technology and driving cycles and the carbon content of fuels (F). Wright and Fulton (2005) have also developed a similar framework in which GHGs are a combination of behavior, design of the transport system and technology. The behavioral component includes the relative market share of a particular mode and the number of passengers carried by vehicle; the transport design takes into account the distance traveled, which is a function of the land-use and transport network design; and finally the technology component, which considers the type of fuel, the weight of the vehicle, and driver behavior, among others.

6. During the past decade different models, based on the ASIF methodology have been developed to assess the GHG emissions of specific transport projects, and recently almost all the IFIs have published assessment studies explaining their scope, advantages and disadvantages, and limitations. (Bank 2012; IDB 2013; EIB 2014; ADB 2010; EBDR 2010). Most of these models are designed for ex ante estimation of emissions. For example, the World Bank's analysis of GHG accounting methodologies, "based on the criteria of simplicity, transparency, harmonization, and credibility" recommends the use of the Excel-based Transport Emissions Evaluation Models for Projects–TEEMP (Bank 2012). CTF–EMBARQ has developed a methodology for Mexico which is not yet approved and does not consider modal shift. Andreas Kopp has also developed an ex ante methodology focused on modal choice in passenger transport but it requires the design of a survey in order to build a robust modal-choice model estimation.
7. The only two measurable short-term impacts with enough data to conduct a GHG emission assessment are the two BRT corridors under operation: ECOVIA in Monterrey and OPTIBUS in León. Because the execution of these projects was partially financed by the PTTU program in Mexico, the methodology used will be the one developed for evaluating this program and tailored with specific data for these two corridors. Other reason for adopting this methodology is the suitability of the data available for the analysis and the fact that it allows for a homogenous and comparable assessment in both cases.

Methodology: general considerations

8. Most of the transport sector's emissions relate to the combustion of fossil fuels that produce emissions of carbon dioxide, water vapor and air pollutants such as CO, NOx, SOx and particulate matter (PM). The literature indicates that the sources of emissions related to transport are the result of four effects: activity, modal distribution, intensity of energy modes and their efficiency, and type of fuels or propulsion mechanisms employed.¹⁸
 - a. *Activity* refers to the number of trips and their length. Quantitatively, activity refers to the total kilometers traveled by the various vehicles. The number of trips is a function of people's need to travel to the sites of their

¹⁸ These elements are defined in the literature with the acronym ASIF (referring to: Activity, modal Share, energy Intensity, and Fuel use).

activities (home, work, school, shops, etc.). The length of the trips also depends on the spatial distribution/location of these activities. A sustainable transport strategy (aimed at reducing GHG emissions) seeks to reduce the length of the trips, for example, with policies that affect the use of land and provide disincentives for urban sprawl.

- b. *Modal distribution* refers to the share of trips that take place in the various modes of transport (private, non-motorized, public). A sustainable transport strategy seeks first to prioritize the non-motorized modes, and second, the use of public transport.
 - c. *Energy intensity and efficiency* refer to two elements: (i) the energy consumed per unit of travel (or its opposite, measured, for example, in kilometers per gallon of gasoline); and (ii) a system's efficiency in terms of energy consumption (measured, for example, in the number of kilometers traveled per day¹⁹ by the public transport fleet or in the number of passenger-kilometers). A sustainable transport strategy should consider the use of vehicles with better performance in terms of kilometers traveled per gallon, and/or the implementation of transport systems that employ high-capacity vehicles, making it possible to reduce the number of passenger-kilometers with efficient route designs.
 - d. *The types of fuel or propulsion mechanism* refer to the fuel or propulsion method used by the vehicle fleet. A sustainable transport strategy seeks to improve propulsion mechanisms, for example, by promoting a switch from the use of diesel to hybrid technologies.
9. The model includes emission reductions due to: (a) modal shift; (b) change in energy intensity (efficient route designs and fewer kilometers traveled) and use of more efficient technologies (less consumption of fuel per kilometer); and (c) the implementation of low-emission technologies, such as hybrid buses. On the other hand, changes in the activity component are not included, since it is difficult to forecast the effects of an urban transport project on land uses, the distribution of trips in the city, and the number of trips.
10. The model considers a 10-year time horizon to calculate emissions once the project has been completed. This horizon was selected due to the high level of uncertainty regarding the performance and programming of the new system as well as the

¹⁹ The kilometers traveled per day mentioned both in the Activity effect and in the Intensity effect of the energy modes and efficiency are the same. It should be noted, however, that their increase has two causes: (i) in terms of the Activity, the kilometers increase as people, using different vehicles, increase their travel requirements (more trips per day; for example, more shopping trips) and/or increase the length of their trips (by moving to housing in the suburbs that are further away from work); and (ii) with regard to the Intensity effect in the energy modes and efficiency, the kilometers increase as the modes of transport, especially public transport, become less efficient. For example, the number of kilometers traveled by the public transport fleet per day could be reduced by designing better routes, reducing oversupply of fleet, and using high-capacity vehicles. These measures taken together have the potential of transporting the same number of people but with fewer kilometers traveled.

projection of a dynamic baseline, which is designed to predict the future emissions under the “without-project” scenario.

11. The emissions resulting from changes in land use were not included in this methodology due to the uncertainty of these impacts in the context of different typologies of subprojects in Mexican cities.

Overall assumptions for ICR calculations

12. The studies funded by the GEF grant and actual operational data from cities are the main data sources for the analyses. Per the selected methodology, the data required for each project can be derived from the demand studies, the default emission factors of traditional buses, and the emission factors of low-emission vehicles. Moreover, for this assessment and because the projects are already under operation, when available, actual data was obtained from cities.
13. Variable K1: Number of kilometers traveled per year by the old public transport fleet in the demand basin to be affected by the project before the project was completed

These inputs were obtained from the Cost-Benefits Analysis of the GEF-funded studies and confirmed by the cities.

- Monterrey (ECOVIA): 175,893 veh-km
- León (OPTIBUS): 259,109 veh-km

14. Variable K2: Number of kilometers traveled per year by the new fleet under the project.

These inputs are actual operational data provided by cities:

- Monterrey (ECOVIA): 141,755 veh-km with an annual growth rate of 1 percent obtained from Table 20 of the CBA: “Average indicators from project scenario.”
- León (OPTIBUS): 221,962 veh-km with an annual growth rate of 1.44 percent reported by the city for a conservative scenario.

15. Variable K1: Projection of the number of kilometers traveled per year by the old fleet if the project is not executed

The cities reported that the use of public transportation prior to the donation was decreasing. However, no data were available for an assessment. We could consider a decreasing rate in both demand and kilometers traveled by the old fleet if the project was never executed. Nevertheless, after conversations with the cities we have finally considered a conservative situation in which the growth rates for both the scenarios (without and with project) are the same: 1 percent for ECOVIA and 1.44 percent for OPTIBUS.

16. Variable K3: Modal shift, number of trips in the new system that would otherwise have been made using private modes, and kilometers logged in those modes in the without-project scenario

Cities did not have data available regarding modal shift. In this case the methodology recommends the use of an average value from international experiences. In the case of the Metrobus system in Mexico City, this change corresponds to 10 percent (Metrobus website). In the case of Lima’s Metropolitano, the change is 3 percent (Total Market Solutions 2010). In the case of Bogota’s Transmilenio, the change is 9 percent (FTA Report 2006). The methodology suggests a value of 7 percent. However, after consulting the cities we considered this figure high.

- Monterrey (ECOVIA): 3.7 percent modal shift was reported by the studies—also financed by the GEF donation—for the second and third ECOVIA corridors (1.6 percent change from cars and a 2.1 percent change from taxis).
- León (OPTIBUS): 2 percent modal change throughout the project was considered. There are no surveys or studies to support this figure. However, the city has a survey stating that at least 10 percent of BRT users own a car, but they prefer to use the BRT service. Moreover, the BRT is a network system with several corridors operating efficiently, which usually imply a modal change. After conversations with the city, we consider a moderate change in the modal split due to the project.

The number of trips per day whose mode would shift must be converted into the number of kilometers per year that these trips would travel in private modes. To obtain this number of kilometers, the methodology suggests taking the number of trips per day and dividing it into the average occupancy of private vehicles. This represents the number of private-mode trips that would be replaced. The result of this operation is divided into the number of daily trips that are made in private modes (two or more trips) to determine how many “vehicle equivalents” would stop running. Finally, this number is multiplied by the kilometers traveled by private mode vehicle per year.

	ECOVIA (Monterrey)	OPTIBUS (León)
Average daily demand with project base year	350,081 (reported by city)	617,705 (reported by city)
Demand growth rate	1 percent (explained in Section C)	1.44 percent (explained in Section C)
Modal shift	3.7 percent (from studies)	2 percent (agreed with city)
Effective days in a year	312 (assumption of the reviewed PTTU methodology)	366 (reported by the city for its operating indicators)
Private vehicle occupancy	1.2 (assumption of the reviewed PTTU methodology. The original model considered 1.5; 1.4 is usually considered but after the revision conducted by the PTTU program team, 1.2 was agreed for the case)	1.2 (assumption of the reviewed PTTU methodology. The original model considered 1.5; 1.4 is usually considered but after the revision conducted by the PTTU program team, 1.2 was agreed for the case)

	of Mexico BRTs)	of Mexico BRTs)
Average km traveled per private vehicle (including taxis)	10,000 km (from the reviewed PTTU methodology)	10,000 km (from the reviewed PTTU methodology)
Number of trips	2 (from the reviewed PTTU methodology)	2 (from the reviewed PTTU methodology)
Modal-shift kilometers traveled (base year)	53,970,821 km	51,475,417 km

17. Variable E_n: CO₂e emission factors in terms of mass per unit of distance (kg/km) of the current fleet, the new system's fleet, and the private project. These factors are dependent on city-specific conditions, driving cycles, and the characteristics of the fleets, including:

- speed in the different segments of the trip;
- temperature;
- fleet age and number of kilometers traveled per year;
- operators' driving practices;
- number of cold starts;
- topographic characteristics of the routes; and
- vehicle subtypes (large buses vs. minibuses).

18. The lack of accuracy in determining these factors introduces great uncertainty in the estimate. Therefore, the PTTU methodology suggests the use of standard values. These standard values were used for the assessment of the ECOVIA corridor. For the OPTIBUS assessment, the city of León reported its own factors.

Emission factors	ECOVIA (Monterrey)	OPTIBUS (León)
Old fleet (ton CO ₂ /km)	0,0012677	0,00068
New fleet–EURO (ton CO ₂ /km)	0,0011372	0,00068
New fleet–CNG	0,0008456	
Buses in trunk line (only for León)	-	0,00224
Private vehicles (ton CO ₂ /km)	0,0002962	0,0002962 (PTTU standard)

% of km of new fleet	ECOVIA (Monterrey)	OPTIBUS (León)
EURO	78%	96.7%
CNG	22%	
Trunk		3.3%

19. Variable K₄: Destination and use of the fleet that the project is decommissioning from the system. For an accurate assessment, the PTTU methodology suggests

determining what the destination of the decommissioned fleet will be. For this assessment, we consider this factor equal to zero.

Description of the calculation procedure

20. Emission estimate at the dynamic baseline. For year 1 (when the project has already been implemented and is fully operational), emissions are obtained by multiplying the number of kilometers that the old fleet traveled per year by the emission factors. For the following years, it is calculated based on the kilometers projected to be traveled by the old fleet in the without-project scenario, times the emission factors.

$$A = \sum_{i=1}^{10} K1_i * E1$$

Where:

K1_i: Number of kilometers that would be traveled by the old fleet in year i.

E1: Emission factor (or factors) of the old fleet.

21. *Estimated emissions of the new system in operation.* This figure is obtained by multiplying the number of kilometers traveled per year by the new fleet, times the respective emission factors.

$$B = \sum_{i=1}^{10} K2_i * E2$$

Where:

K2_i: Number of kilometers that would be traveled by the new fleet in year i.

E2: Emission factor (or factors) of the new fleet.

22. *Estimate of emissions of passengers who have switched to public transport.* This is estimated by multiplying the number of trips by passengers who switched mode (private to public transport), times the emission factors of the private vehicles that have been “left at home.”

$$C = \sum_{i=1}^{10} K3_i * E3$$

Where:

K3_i: Number of kilometers that would be traveled by the private modes in the without-project scenario in year i.

E3: Emission factor (or factors) of the private modes.

23. *Estimated emissions of the old fleet that continues operating.* The emissions of the old fleet, if it was not scrapped, are calculated by multiplying the estimated number of kilometers per year of operation, times its respective emission factor.

$$D = \sum_{i=1}^{10} K4_i * E1$$

Where:

K4_i: Number of kilometers that would be traveled by the private modes in the without-project scenario in year i.

E1: Emission factor (or factors) of the old fleet.

24. *Estimated emissions reduction.* The emissions reduction can be calculated using the following equation:

$$\text{Reduction of GHG emissions} = A + C - B - D$$

GHG emissions assessment results and conclusions

25. The two corridors under operation have achieved an estimated reduction (based on the GHG emissions model) of 62,865 CO₂e tons, which represents a 31.3 percent emission savings with respect to the baseline. The 62,865 CO₂ tons have been calculated by conservatively updating key parameters in the PTTU model with information reported by the cities. The most conservative assumption was modal shift. Although the original methodology considered a 7 percent modal shift as a safe figure, after conversations with the cities it was decided to lower this value to 2 percent for OPTIBUS in León and 3.7 percent for ECOVIA in Monterrey. Therefore, the emission reduction reported has been due to the more efficient operation (fewer vehicles-km travelled) of the new BRT corridors and modal shift in equal parts. Modal shift would account for more than 70 percent of the total savings, if the original estimations of 10 percent had occurred.
26. The original 58,000 CO₂e ton emission reduction target has been achieved. Moreover, there are two more BRT corridor designs financed by the grant in Monterrey, as well as feasibility studies for the second phase of integration in León, which are likely to be implemented in the next two years and potentially supported by the Bank's UTTP, thus bringing additional emission reductions in the medium term.
27. On the other hand, none of the other studies had been considered in the evaluation and, according to Wright and Fulton, additional GHG reductions may double as a result of further modal shift, especially from cars, minibuses, motorcycle, and taxis, provided that the right complementary measures are in place (i.e., regulation, accessibility, effective networks, effective land-use planning).

Cost effectiveness

28. Cost effectiveness in general refers to the benefits achieved for a given level of expenditure. In this case. For the cost-effectiveness assessment of these two BRT projects, this calculation will be done twice: first by dividing the total amount of GEF funds requested for the project over the total amount of CO₂e estimated to be reduced; and second, by dividing the total amount of GEF funds plus the co-

financing required for project execution over the total amount of CO₂e estimated to be reduced.²⁰

	Accumulated 25-year emission reduction (CO₂e ton)	GEF funding (US\$)	GEF + co-financing (\$)	GEF cost-effectiveness (US\$/CO₂e ton reduced)	Total cost-effectiveness (US\$/CO₂e ton reduced)
Monterrey	997,475	0.9	95.11	0.90	95.35
León	574,175	0.6	37.6	1.04	65.49
Total	1,571,650	1.5	132.7	0.95	84.44

29. The cost-effectiveness of the GEF donation for the BRT operating corridors is US\$2.5 per ton of CO₂e reduced. When the co-financing of the two BRT corridors is also considered, the cost effectiveness is US\$84.44 per ton of CO₂e reduced.

²⁰ Following the guidelines developed by the CTF Trust Fund Committee in October 2013.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
FY 2009			
Emmanuel James	Lead Transport Specialist	LCSTR	TTL
Arturo Ardila-Gomez	Urban Transport Specialist	LCSTR	Co-TTL
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Tomás Socias	Senior Procurement Specialist	LCSPT	
Gabriel Peñaloza	Procurement Analyst	LCSPT	
Alejandro Alcala Gerez	Legal Counsel	LEGLA	
Paul Procee	Senior Environmental Specialist	LCSEN	
Victor Ordoñez	Sr Financial Management Spec.	LCSFM	
Dmitri Gourfinkel	Consultant	LCSTR	
Leila Sarquis	ET Temporary	LCSTR	
Hernán Aristizabal	Environmental Specialist	LCSEN	
José Yeng	Institutional Specialist	LCSTR	
Margarita de Castro	Social Specialist	LCSTR	
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Catalina Ochoa	JPA	LCSTR.	
Supervision/ICR			
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Alejandro Hoyos Guerrero	Transport Specialist	GTI04	
Sonia Rousseau Lopez	Program Assistant	GTI04	
Aracelly Woodall	Sr. Program Assistant	GTI04	
Daniel Chalupowicz	Financial Management Specialist	GGO22	
Francisco Rodriguez	Sr. Procurement Specialist	GGO04	
Gabriel Peñaloza	Sr. Procurement Specialist	GGO04	
Luis Eduardo Tafur Herrera	Team Member	GTI04	
Oswaldo Patiño	Consultant	GTIDR	

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY 2009		294.04
Total:		294.04
Supervision/ICR		
2010	1.48	4,511.67
2011	2.41	15,478.12
2012	7.92	41,292.21
2013	9.58	40,570.40
2014	11.30	32,442.66
2015	9.29	22,658.00
2016	4.00	22,745.94
Total:	45.98	179,698.94

Annex 5. Beneficiary Survey Results

N/A

Annex 6. Stakeholder Workshop Report and Results

1. In coordination with SEDATU, and BANOBRAS the Bank organized a workshop during the “11th International Congress of Cities and Transport” of the Center for Sustainable Transport EMBARQ Mexico from October 12 to 14, 2015. The International Congress of Cities and Transport was focused on sharing experiences and knowledge, and on seeking a holistic approach to address local issues and build solutions adapted from a broader perspective to the local context. To this end, various activities have been developed to promote reflections and knowledge-transfer elements.
2. The objective of the workshop’s theme, “GEF funds: Donations to implement Sustainable Urban Mobility projects. What are the benefits for the cities?” was to present and discuss the lessons learned during grant implementation.
3. Participants from BANOBRAS, SEDATU, and the four beneficiary cities participated in the workshop and presented their projects, views and identified lessons learned. The main messages were:
 - The project design should allow for more involvement of the Bank in the technical review during implementation.
 - Project resource allocation should increase its scope to support downstream activities and ensure that the grant supports projects until they are implemented..
 - The Federal Government should provide frame cooperation with a high-impact public policy.
 - Project coordination should be strengthened. Increase support for project management and technical revision.
 - Develop clear, objective, realistic, measurable and verifiable terms of reference (TORs). Due to its limited financial resources, tight timeframe and complex implementation agreements, the donation’s design favors the development of conceptual studies or general plans instead of execution studies, which are those needed prior to implementation. Some of the original TORs were too ambitious and had to be redone to reduce the scope of the studies. This fact caused delays in the signing of contracts and the development of studies, and also made it difficult to execute the final projects during the donation’s timeframe.
 - Grant activities should promote both the involvement and professionalization of local governments.
 - Project design should include activities to integrate local actors in project design.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

1. BANOBRAS drafted a closing report. The main messages are transcribed here.
2. Procurement. Project implementation, in some cases, was affected by the response times of World Bank.
3. Disbursements. Disbursements total USD 5'196,231.84, representing 96.62% of the total amount of the grant provided by the World Bank, having closed this transaction satisfactory to the World Bank. Therefore, it is considered that the financial management of the project by the executing agency, with support provided by the financial agent, was satisfactory.
4. Supervision reports. BANOBRAS in its capacity as financial agent, regularly reviewed the Intermediate Financial Reports (IFRs) received from the SEDATU as part of the progress in the implementation of the project, and made the necessary arrangements with the executor to make the changes coming to later he sent to the World Bank, and give timely compliance with contractual commitments.

It is important to note that reports for the year 2015 were not presented to the World Bank, because the executor did not address BANOBRAS comments on the figures reported.

Similarly, BANOBRAS prepared and delivered to the Ministry of Finance monthly and semi-annual reports on the performance of the project, to give timely compliance with the commitments made in the contract of mandate.

5. Financial audits. BANOBRAS supported SEDATU in the delivery of information to the Internal Control (OIC) of the Secretariat, to undertake the project audits annually.
6. In accordance with national regulations, BANOBRAS received from the OIC-SEDATU audit reports annually, same as presented and had the agreement of the World Bank. It is worth mentioning that once accepted by the World Bank, the Audit Report covering 2013 - 2014, BANOBRAS asked the executor report on the status of follow-up and attention to each of the observations.
7. The presentation of the Audit Report for the year 2015 is pending. It should be implemented by the OIC-SEDATU and sent to BANOBRAS mid-June of this year, for review and submission to World Bank no later than June 30, 2016, according to the provisions of the grant contract.
8. Conclusions. Despite the various administrative changes occurred by the executive, the degree of development in terms of disbursement of this grant is considered satisfactory, because it was able to use most of the resources allocated to this Grant registering 96.6% of the total grant amount.
9. SEDATU to be specially commended for its collaboration to achieve this execution rate, and International Affairs in the Ministry of Finance for its help in resolving institutional difficulties during project implementation.

10. BANOBRAS performance as financial agent in this operation can be described as satisfactory, as it has complied with its obligations. BANOBRAS played its role of intermediary between the executing agency and the World Bank, and took timely and continuous monitoring of the behavior of the project; situation reported to the International Affairs Unit of the Ministry of Finance, in a timely manner.
11. BANOBRAS has earned an extraordinary experience with the execution of the grant, which contribute significantly to the more than 25 years of experience managing international operations.
12. Lessons Learned. It is important to consider that any disconnection that occurs between maturation of a subproject, the local authorities' decision-making, and the administrative period of the municipal presidency are important factors to be considered to ensure the success of a project.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

N/A

Annex 9. List of Supporting Documents

Aide Memoires of preparation and supervision missions, and Implementation Status and Results Reports, series 1 through 11, 2009–2015.

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Bristow, A., Tight, M., Pridmore, A., May, A., 2008. Developing pathways to low carbon land-based passenger transport in Great Britain by 2050. *Energy Policy* 36, 3427–3435.

Candiracci, S. (2009). *Climate change, urbanization and sustainable urban transport in developing countries cities*. Energy & transport policies section, Nov 2009, Nairobi. URL: http://mirror.unhabitat.org/downloads/docs/7997_10872_Sara%20Candiracci.pdf. Accessed 29.7.2015

Chapman, L., 2007. Transport and climate change: a review. *Journal of Transport Geography* 15, 354–367.

Grant Agreement, MX-GEF Sustainable Transport and Air Quality Program.

Guidance note on social value of carbon in project appraisal, 2014. *Social Value of Carbon is short for “the social value of the effort to reduce carbon emissions”*

Hickman, R., Ashiru, O., Banister, D., 2010. Transport and climate change: simulating the options for carbon reduction in London. *Transport Policy* 17 (2), 110–125

Hickman, R., Banister, D., 2007. Looking over the horizon: transport and reduced CO₂ emissions in the UK by 2030. *Transport Policy* 14 (5), 377–387

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Implementation Completion and Results Report (TF-93591), Regional GEF STAQ. Program, Report No: ICR2719, December 20, 2013.

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Project Appraisal Document, MX-GEF Sustainable Transport And Air Quality Reports, MX-GEF STAQ. Program, Report No: 42880-MX, November 24, 2009

Project Progress Reports, Mid-term Review Report, and Financial Implementation Reports MX-GEF STAQ.

Reporte Nacional de Movilidad Urbana en México 2014-2015. Reporte Global en Asentamientos Humanos de ONU-Hábitat. Website: <http://www.onuhabitat.org/mexico>

Schipper, L. et al. (2009) “Considering Climate Change in Latin American and Caribbean Urban Transport: Concepts, Applications and Cases”, University of California. June 2009.

Schipper, L., Fulton, L., 2003. Carbon dioxide emissions from transportation: Trends, driving factors, and forces for change. In: Hensher, D., Button, K. (Eds.), Handbook of Transport and the Environment. Elsevier, London

WB,2012. Situación Actual y Tendencias del Transporte Urbano en México. Primer informe de avance “Una política de movilidad urbana”. Banco Mundial, 2012

Wright, L. and L. Fulton, “Climate Change Mitigation and Transport in Developing Nations”, Transport Reviews, Vol. 25, No. 6, pp-691-717, 2005.

Yang, C., McCollum, D., McCarthy, R., Leighty, W., 2009. Meeting an 80% reduction in greenhouse gas emissions from transportation by 2050: a case study in California. Transportation Research D 14 (3), 147–156.

**Annex 10. Complementary city initiatives to promote less energy-intensive transport modes and induce policy change to foster sustainable urban transport mobility
Monterrey:**

1. Vía Recreativa Metropolitana (2013): <http://www.pueblobicicletero.org/2013/03/viasrecreativas-amm/>. In March 2013, the nine municipalities in the metropolitan area of Monterrey have implemented a weekly recreational street. This initiative involves temporarily restriction of vehicular-motorized traffic and urban transport systems along one street on Sunday mornings. It promotes alternative mobility modes such as foot, bicycle or skates and also fosters family gathering. Besides, it facilitates the recovery of public spaces for different activities such as sports and recreation, arts and culture, science and technology, social development
2. Rehabilitación de Calle Morelos, Barrio Antiguo (Calle Completa, 2014): <http://www.implancmty.org/regeneracion-de-barrio-antiguo-calle-completa-proyecto-morelos/> In December 2014, Monterrey completed the rehabilitation and pedestrianization of Morelos street in Barrio Antiguo. With an investment of Mx\$20M, the initiative included widening pedestrian areas, eliminating parking spaces for private vehicles, reducing speed limits to 10km/h, introducing bicycle parking areas, and installing tarpaulin covers for shade areas. The municipality aims at extending this initiative to other areas of Monterrey city center.
3. Plan Maestro de Ciclovía en San Pedro, Nuevo León (Infraestructura ciclista, 2013): <http://sanpedrogranvia.mx/portfolio/ciclovias-en-san-pedro/>
<http://sanpedrogranvia.mx/preparese-san-pedro-inicia-hoy-gran-via/> In November 2013, San Pedro Municipality initiated “Gran Vía” bike paths civil works, the first stage of its comprehensive bike network which includes 110km of different types of bike paths: segregated, shared and recreational as well as parking for bikes. This first phase comprised 21km of segregated bike infrastructure. The design has been reviewed in the past years and it is expected to be completed soon.
4. Bicicletas en el Metrorrey (Intermodalidad, 2011):
<http://www.pueblobicicletero.org/2011/01/subelabicialmetro/> In January 2011, Metrorrey approved changes in its regulation in order to allow boarding bikes on the metro. They are allowed from Monday to Friday, between 9:30 and 12:30hrs and between 21:00 and 23:45hrs, and all day long Saturday, Sunday and holidays. This measure improves intermodality and fosters soft-mobility modes.
5. Congreso de Ciclismo Urbano (Congreso Nacional, 2011):
<http://www.pueblobicicletero.org/2011/01/4to-congreso-nacional-de-ciclismo-urbano-monterrey-111111/>. In November 2011 in Monterrey, the 4th National Congress of Urban Cycling was celebrated. The aim of this congress was to share experiences and initiatives that seek to promote the use of bicycles as a transport mode and generate alternatives to achieve sustainable mobility in cities. The participants were local, national and international experts who shared with the general public and decision makers their visions on sustainable cities, bicycle economy and public policy, and culture and quality of life. The event was organized by the National Urban Cycling

Network (Bicired) and was organized by the collective Pueblo Biciclero with support from the Institute for Transportation Policy and Development (ITDP)

6. Estudio de exposición personal a contaminantes atmosféricos en corredor del sistema ECOVIA. Besides the inventory of GHGs emissions financed by the Grant, Monterrey has conducted a study to understand the impacts of air pollutants in the ECOVIA operating corridor. The study shows lower concentrations of air pollutants in the ECOVIA (2015) corridor compared with air pollutants emissions before the implementation of the BRT system.

Puebla:

7. Vía Recreativa Metropolitana (2015):

<http://www.lajornadadeoriente.com.mx/2015/05/25/abriran-primera-via-recreativa-metropolitana-en-puebla-para-peatones-y-ciclistas/>

In May 2015, and following other similar initiatives in Mexico (Guadalajara with 72km and Mexico City with 48 km), Puebla opens its first Recreational Street promoted by citizens and the three levels of governance (local, regional and national). The Sunday drive offers of 18 kilometers to enjoy artistic and sports activities, including yoga classes, cycling and urban exhibitions along Cholula Street and at the municipalities' squares. This initiative aims to show that the car is not the only option for moving; and that cycling a green, clean and healthy alternative.

8. SmartBike Puebla (Sistema piloto de bicicletas públicas, 2013):

<http://www.smartbikepuebla.com/>

In 2013, Puebla City Council launched a pilot bike share system with 6 parking, 81 bikes and capacity for 2,500 users. The system aims to reduce travel times for some trips and contribute to a cleaner environment. Due to the success of the pilot, the City Council and the Regional Government approved a 10 year concession to the American company Cycloshare to operate a larger starting in January 2016.

9. Reforma al Reglamento de Tránsito (2015):

http://pueblacapital.gob.mx/component/docman/doc_download/2025-capitulo-10-del-codigo-reglamentario-municipal-referente-a-seguridad-vial-y-transito-municipal?Itemid=; http://implanpuebla.gob.mx/sitio/wp-content/uploads/2015/08/REGLAMENTO_TRANSITO_Y_MOVILIDAD.pdf

In August 2015, Puebla City will have a new Traffic Regulation which main objective is to avoid public way to be monopolized by any of its users. The level of hierarchy in the street has been established attending reason of users vulnerability and externalities generated by each mode. Thus the hierarchy of importance has been modified giving priority to pedestrians and cyclist, followed by public transport vehicles, freight vehicles and finally private cars. Besides, speeds limits have been modified depending on the area, the speed limit was set to 70 kilometers per hour in primary roads, while in secondary roads is 50; and 30 km/h where the number of vulnerable users is higher e.g. the historic center, school zones, hospitals, parks and shopping and entertainment centers. On the other hand, continue right turn is allowed even with red traffic lights but stopping when pedestrians or cyclist are crossing.

10. Norma Técnica de Diseño e Imagen Urbana (2015): <http://pueblacapital.gob.mx/noticias/noticias-destacadas/item/4963-avala-cabildo-plano-oficial-del-municipio-de-puebla>: <http://www.pueblacapital.gob.mx/images/transparencia/obl/24relevante/15/dicta.norma.dis.imag.urb.pdf> In December 2015, the Partial Plan for Sustainable Urban Development of the Historic Center was approved. Its purpose is to transform this area into a national and international reference on urban mobility, green building, heritage conservation, social and economic recovery, making it the best place to live in the city and one of the most important tourist and cultural destinations. Among many other issues, this regulation considers widen sidewalks, development safe routes for cyclists, reducing the speed of motor vehicles, redistribution of public space between roads.
11. Congreso Peatonal (Congreso Nacional, 2015): <http://www.reciudad.mx/> In May 2015, the city of Cholula (Puebla) organized the 2nd International Pedestrian Congress. Cholula's pedestrian nature and high bicycle mobility as well as its activist work for achieving inclusive urban infrastructures (e.g. Zone 30) were key issues for its selection as host city. Besides the presentation of best practices around the world the congress aimed at build a link among national and international experts and Cholula community.

León:

12. SIT OPTIBUS 3rd and 4rd phases. León is implementing the third and fourth phase of its Integrated Transport System which is expected to start operation in November 2016. The BRT system includes integrated payment and control systems, new and more efficient bus fleet and new stations.
13. Día sin Auto (since October 2009): http://www.onuhabitat.org/index.php?option=com_docman&task=doc_details&gid=546&Itemid=330. Public officials in the city of León stop using their private vehicles on Wednesdays (except those such as public safety or police, which activity depend entirely on the vehicle). All citizens, universities and private companies are invited to join this activity. The first year of operation more than 480,000 CO₂e tons were saved.
14. Date una vuelta por la Madero (since 2011): <http://www.oem.com.mx/elsoldeleon/notas/n3109677.htm>. Following the idea of the recreational roads, Madero Street becomes a pedestrian road on Sundays. Different activities can be carried out throughout the street including bike renting in both ends.

Ciudad Juárez:

15. Reforma al Reglamento de Tránsito Ciudad Juárez (OJO: sanciones severas a peatones, 2015):
- <http://www.animalpolitico.com/blogueros-zoon-peaton/2015/07/22/de-reglamentos-seguridad-vial-y-peatones/>
 - <http://www.excelsior.com.mx/nacional/2015/05/23/1025688>

16. Plan de Desarrollo Urbano 2010. Revisar con a partir de p. 469:
<http://www.imip.org.mx/pdu/PDUSEPT2010.pdf>

17. PIMUS

MAP

