

CHAPTER 11

What Multilateral Banks (and Other Donors) Can Do to Reduce Greenhouse Gas Emissions: A Case Study of Latin America and the Caribbean

Deborah Bleviss

Energy use and greenhouse gas (GHG) emissions from transportation in developing countries are increasing more rapidly than in the wealthier industrialized countries, as shown in Figure 11-1. Most strategies and policies under consideration to counter these trends, such as fuel economy standards, target the design of vehicles or the fuels they use. GHG reductions achieved by these types of strategies, however, are likely to be dwarfed by increased emissions from the expected flood of new vehicles in developing countries, most of which will inevitably be fueled by carbon-intensive petroleum fuels. The light-duty vehicle stock in developing countries is projected to equal that in the rest of the world by 2050, compared to only one-third of the rest of the world today.

Developing countries suffer from substantial infrastructure limitations that raise questions about whether or not the high rate of growth projected will actually be realized. The capacity of existing roads is very low, leading already to severe traffic congestion, not only in the megacities of the developing world, but in many of the secondary and tertiary cities as well. Most of these countries have limited access to funds to expand the existing

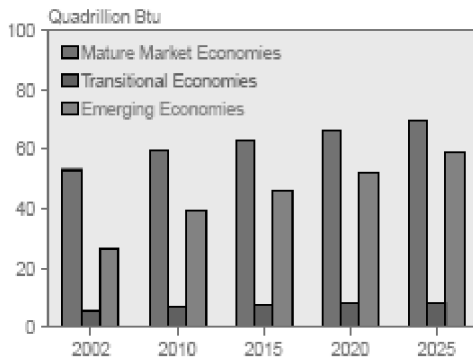


FIGURE 11-1. Projected transportation sector energy consumption by region, 2002–2025. *Source: EIA, 2005.*

infrastructure. Moreover, even with the current infrastructure and vehicles in these countries, their cities are already suffering from substantial—and increasingly intolerable—levels of air and noise pollution from transportation, levels that will only rise as the number of roads and vehicles grow.

With rising oil prices, oil import costs have also become unbearable. The existing levels of congestion only exacerbate pollution and increase oil consumption, since fuel consumption and pollution are the highest at the lower road speeds and stop-and-go conditions of congestion. Finally, traffic congestion has increasingly hampered the mobility of the poor, who comprise the majority of the population in these countries. They rely primarily on walking and public transportation to meet their mobility needs, both of which are compromised as private vehicles increasingly dominate the existing roads.

Given the challenges facing developing countries, a systemic approach is needed to slow the rate of energy growth for transportation and, therefore, the rate of growth of GHG emissions. This type of approach, referred to as “sustainable transportation,” enables transportation and mobility needs to be met in a financially sustainable manner, while also minimizing local pollution, global greenhouse gas emissions, noise, accidents, congestion, and barriers to transportation access by the poor. In addition to the policies already mentioned, such an approach also consists of the following strategies:

- Emphasize high-quality, efficient, and clean public transportation for a substantial majority of the population, including the middle class
- Establish incentives and capacities for good nonmotorized transportation, including walking and biking, as well as other alternatives to motorized transportation such as telecommuting and electronic commerce

- Discourage the use of private vehicles when other modes are available
- Encourage good land use management to reduce congestion and promote demand for public transportation and nonmotorized transportation

The adoption of sustainable transportation approaches broadens the types of governments involved in transportation policymaking. Rather than a primarily national governmental approach that is necessary for implementation of policies such as fuel economy standards and adoption of alternative fuels, local governments must become increasingly involved as well, since they are responsible for oversight of public transportation and implementation of land use priorities.

Opportunities for Donor Agencies in Climate Change and Transportation

Multilateral development banks (MDBs) and other donor agencies have many opportunities to assist in the implementation of sustainable transportation strategies in developing countries to reduce the risk of climate change. These include tools directly available to limit carbon emissions from the transportation sectors of developing countries, as well as indirect tools that are oriented to other goals but that provide the cobenefit of reducing GHG emissions.

The most mature of the direct tools to address transportation and climate change in developing countries is within the Global Environmental Facility (GEF). The GEF was established in 1991 to help developing countries fund projects and programs that protect the global environment, including those that protect against climate change. Operational Program #11 within the climate change portion of the GEF's mandate specifically addresses environmentally sustainable transportation, including improved transportation systems. GEF projects in sustainable transportation, as in other areas, may be developed directly by the World Bank and the regional development banks, including the Asian Development Bank, the Inter-American Development Bank (IDB), the African Development Bank, and the European Bank for Reconstruction and Development. The United Nations (UN) may also develop GEF projects, primarily through the UN Development and Environment Programmes. Other donors may develop GEF projects by partnering with one of these agencies.

A new tool to address transportation and climate change in developing countries is the Clean Development Mechanism (CDM), defined by the Kyoto Protocol, which recently entered into force. The CDM enables public and private entities in developed countries to invest in projects or programs in developing countries that reduce projected GHGs. By doing so, these entities may get credits that can be applied against the GHG emissions targets agreed to by industrialized country signatories to the Kyoto Protocol. Many

bilateral donors have been sponsoring demonstration programs using the CDM for several years in preparation for the full-scale implementation of the Kyoto Protocol. Moreover, several developed country governments, led by the Netherlands, are already planning to invest in CDM projects, in several cases developed by MDBs, to acquire carbon credits. All CDM projects must be approved by the CDM Executive Board. To date, the Board has not approved any transportation system projects, although one application is pending from the city of Bogota, Colombia.

There are other programs by donor agencies that can render benefits for GHG emissions in transportation. Programs to reduce local air pollution, if focused on transportation systems, often reduce GHG emissions as well. Programs in governance reform, particularly to support the decentralization of governance, can lead to the creation of strong and capable local agencies specializing in the planning for and regulation of local transportation systems. Assistance in urban development reform and investment can include strategies to encourage better land use management and creation of pedestrian-only commercial zones. Donor programs in transportation sector reform and investment can include the establishment of bus rapid transit systems to improve public transportation, sidewalks, and other pedestrian facilities, and strategies to reduce the excessive driving of private motorized traffic, including taxis.

While there are numerous opportunities for donor agencies to support activities in sustainable transportation that will reduce the risks of climate change, the challenges are also substantial. A viable sustainable transportation approach requires that donors work with national and subnational governments. To improve the chances of success, it is especially important to identify cities and city governments that are most prepared to move forward with sustainable transportation approaches.

The IDB undertook a study in 2004 to determine which cities in Latin America and the Caribbean are most prepared to advance to become candidates for GEF or CDM funding (Bleviss, 2004). The study had the following objectives:

- To identify medium-sized cities undertaking some sustainable transportation activities
- To define criteria in the context of successful experiences elsewhere for identifying the cities most prepared to advance
- To identify a first tier and a second tier of cities most prepared to advance, using the defined criteria
- To provide recommendations to the IDB on next steps based upon the analysis undertaken

Review of Cities and Development of Criteria

Over 50 cities in Latin America and the Caribbean were identified in the IDB study that are undertaking some types of sustainable transportation

activities. Most involve efforts to reform urban public transportation systems. However, activities in such diverse areas as creating bicycle paths, developing pedestrian walkways, and establishing parking programs were also identified. Sources of information in identifying the active cities included existing literature, websites, and information from contacts throughout the region, including from the MDBs. Successful experiences from five cities around the world were documented to serve as a baseline for evaluation criteria. The cities were Curitiba, Brazil; Bogota, Colombia; Cuenca, Ecuador; London, England; and Singapore.

Curitiba was the first city to initiate a unique transportation path. Initial efforts began during the 1970s for this city with a population today of 1.6 million. The goal was to avoid a transportation path of intense motorization, exemplified by Los Angeles, California. Emphasis in Curitiba was placed instead on developing an efficient and cost-effective bus transportation system that would enable users to easily and quickly travel from their homes to work and other destinations. This system consists of high volume, exclusive lane trunk lines along major arteries of the city, which subsequently connect to smaller feeder lines and then to neighborhood lines. One fare is charged for entrance into the system, and all transfers to other lines are free.

Long-term concessions are awarded on a competitive basis by the city to private professional companies to operate specific public transportation lines. The municipal government retains the responsibility to plan future changes and expansions to the public transportation system and provides oversight and regulation of the concessionaires. Accompanying the design of this public transportation system in Curitiba was the development of substantial pedestrian-only walking areas, including shopping districts; land use code changes that required the most dense development to be near public transportation lines; and an extensive bicycle path system.

Bogota, Colombia, a much larger city than Curitiba with a population of over 7 million, adopted many of the principles of Curitiba when it began reforming its transportation sector in the mid-1990s. Today, it has a single-fare public transportation system, also consisting of trunk lines connecting to feeder lines. The process of creating this trunk-and-feeder-line system also included reform of its public transportation concessions process. New, exclusive concessions are now awarded to professional companies, in many cases consisting of groups of individual bus owners that had previously long dominated public transportation. In addition to public transportation changes, the city also enjoys pedestrian-only zones and an extensive bike system that is integrated with the public transportation system. Furthermore, to discourage the driving of private cars during peak traffic hours, the city has instituted a constraint on vehicle use. Vehicle owners are prohibited from using their vehicles at peak hours on specific days of the week, depending on the last number on the license plate.

Cuenca is a smaller city than Curitiba, with just over 250,000 inhabitants. Nevertheless, it, too, has adopted many of the features of larger cities.

They include an integrated public transportation system with some exclusive-lane trunk routes and new public transportation concessions agreements focused on professional companies, pedestrian-only areas, and bicycle lanes. The city has also developed a well-enforced parking program that has reduced traffic congestion substantially. Vehicle users buy prepaid parking cards and park their cars in spots where the allowable length of time for parking is clearly marked by the city.

Finally, London and Singapore have adopted congestion pricing to discourage use of private vehicles in their center cities. In these cities, private vehicles must pay a toll for entering designated areas. Furthermore, Singapore has invested in an efficient metro rail system. It also has other strategies for discouraging the ownership and driving of private vehicles, including a vehicle quota system in which the government determines how many new vehicles of different size classes may be registered each year. An auction is conducted on the Internet for certificates of entitlement allowing purchase of these vehicles by the highest bidders. In addition, Singapore has established a road tax that is assessed annually and increases with the size of the vehicle engine and the age of the vehicle.

Based on the experiences of these five cities, two categories of criteria were developed in the study for the IDB—those criteria most important in the short term and those most effective over the longer term. The identification of cities most prepared to advance tended to weight criteria aimed at the short term more heavily, with the thought that the criteria aimed at the longer term could be developed by the cities that were selected as they evolved. Criteria identified as most important for cities to advance in the short term included:

- Strong support and leadership from political leaders, especially at the local level. In the experiences of both Curitiba and Bogota, the mayors of these cities established the initial vision, worked with the public to gain its acceptance, created the local governmental capacity to plan for and regulate the transportation sector, and stuck with their vision even when problems occurred.
- Substantial progress in establishing and beginning to implement effective transportation master plans. Such plans need to address reform of the public transportation system in most cities, although the most successful cities have also added components to encourage nonmotorized transportation and to discourage the use of private vehicles.
- Strong local planning capability in transportation and urban planning, preferably in a local government institution. Curitiba and Bogota owe a good measure of their success in sustainable transportation to the establishment of such institutions. The most successful are characterized by their capacity to address a multitude of issues related to transportation, rather than just being constrained to planning for public transportation.

- Strong local regulatory authority to design public transportation concessions and oversee the sector. Local regulatory authorities in Curitiba and Bogota were critical in the reform of the public transportation sector, which included the renegotiation of concessions agreements with larger, more professional public transportation companies.
- Existence by the local government of the financial capacity to invest in the needed transportation infrastructure. Ultimately, the success of a sustainable transportation strategy depends on a municipality's capacity to invest in the necessary infrastructure, either by borrowing or through internal resources.

The following criteria were identified as most important for cities to advance in the longer term:

- Ample awareness of and support by the public of efforts to change the transportation system. The most successful cities have sought to build support from all major stakeholders, including existing bus owners and operators and their associated support industries such as mechanics and garage operators, public transportation users, and the general public.
- Substantial progress in the decentralization of governance. The most successful cities have established the capacity to create strong local planning and regulatory institutions without the interference of national institutions. In addition, they have had the local capacity to collect revenues to support these institutions.
- Significant advancement in establishing and implementing an Urban Development Master Plan. Such a plan has proved most successful when it is structured to complement a Transportation Master Plan, emphasizing mixed use development and denser development near public transportation corridors.
- Sufficient financial resources for the operating budgets of local transportation sector planning and regulatory agencies. The most successful cities have dedicated specific revenues, such as licensing fees or inspection fees, for the budgets of these agencies so that they can achieve greater autonomy from political pressures that inevitably would arise if such organizations had to rely solely on the annual municipal budgeting process.
- Progress in transforming public transportation concession owners into mature public transportation companies. In most Latin American and Caribbean cities, one of the greater challenges to successfully implementing public transportation reform is facilitating the transition between the present owners and operators of the system, who tend to own only one or two buses and have access to very limited financial credit, and the operators of the future, which will hopefully be professional companies with the expertise to run their companies well and the financial assets to invest in their buses and other equipment.

- A strategy developed for attracting financing into new public transportation companies. A major challenge for these companies is being able to attract both debt and equity financing. In several cities, public and private financing programs have been established to respond to this challenge.

Identification of Candidate Cities

Two tiers of cities were identified by the IDB: a first tier of those most prepared to advance and a second tier of those still prepared to advance but not as quickly as the first tier. For both of these tiers, the ranking of each city was determined by how they “rated” against each criterion. The identified first tier cities were Concepcion, Chile; Cordoba, Argentina; Cuenca, Ecuador; Fortaleza, Brazil; Guatemala City, Guatemala; Queretaro, Mexico; and Quito, Ecuador.

Table 11-1 shows the ranking of each of these cities by criterion; criteria identified as most important for the short term are shown in gray.

The identified second tier cities were Arequipa, Peru; Cali, Colombia; La Paz, Bolivia; Panama City, Panama; San Salvador, El Salvador; Sao Bernardo do Campo, Brazil; and Rosario, Argentina.

Table 11-2 presents the ranking of each of these cities by criterion; again, criteria identified as most important for the short term are shown in gray.

Conclusions and Recommendations

The IDB study demonstrated that MDBs and other donors have the potential to play a catalytic role in helping cities in Latin America and the Caribbean make progress toward sustainable transportation as part of a strategy to reduce carbon emissions growth from the transportation sector in the developing world. The process of identifying the cities most prepared to advance in sustainable transportation strategies enables cities to be targeted where the chances of success are greatest. Similar studies need to be done examining opportunities in Asian and African cities.

The study identified specific unmet needs facing MDBs and donors in the area of climate change and transportation. Chief among these is the lack of adequate methodologies and data to assess baseline carbon emissions and the carbon emissions savings resulting from transportation system improvements. The most efficient way to address this inadequacy is for MDBs and donors to work together to develop common methodologies and improve data so that projects may eventually qualify for CDM credits. Otherwise, needless delays will occur, as differing data sets and methodologies are likely to emerge. Additional funds will inevitably be required downstream to develop the common data sets and methodologies needed in the first place.

TABLE 11-1. Ranking of First-Tier Cities by Criterion

| <i>City</i> | <i>Political Commitment</i> | <i>Transportation Master Plan</i> | <i>Local Planning Capability</i> | <i>Local Regulatory Capability</i> | <i>Government Financial Investment Capability</i> |
|---------------------------|-----------------------------|-----------------------------------|----------------------------------|------------------------------------|---|
| Concepcion, Chile | √√ | √√√ | ? | ? | √√√ |
| Cordoba, Argentina | √ | √√ | √ | √ | ? |
| Cuenca, Ecuador | √√√ | √√ | √√√ | √√√ | √ |
| Fortaleza, Brazil | √ | √√ | √√√ | √√√ | √ |
| Guatemala City, Guatemala | √√√ | √√ | √√ | √√ | √ |
| Queretaro, Mexico | √√ | √ | √√ | √√ | √ |
| Quito, Ecuador | √ | √ | √ | √ | ? |

| <i>City</i> | <i>Public Support</i> | <i>Decentralization of Government</i> | <i>Urban Development Master Plan</i> | <i>Sufficient Resources for Local Institutions</i> | <i>Development of Public Transport Companies</i> | <i>Financial Climate for Transport Companies</i> |
|---------------------------|-----------------------|---------------------------------------|--------------------------------------|--|--|--|
| Concepcion, Chile | √ | ? | √√√ | ? | √√ | √ |
| Cordoba, Argentina | √ | √√ | √ | ? | — | — |
| Cuenca, Ecuador | √√ | √√ | √√ | √√ | √√√ | ? |
| Fortaleza, Brazil | ? | √√√ | √√ | √√ | √√√ | √ |
| Guatemala City, Guatemala | ? | √√ | √√ | √ | √ | √ |
| Queretaro, Mexico | √√√ | √ | √ | ? | √ | ? |
| Quito, Ecuador | ? | √√ | ? | — | √ | ? |

√ Positive √√ More positive
 —Negative √√√ Most positive
 ? Not known

Source: Bleviss, 2004.

TABLE 11-2. Ranking of Second-Tier Cities by Criterion

| <i>City</i> | <i>Political Commitment</i> | <i>Transportation Master Plan</i> | <i>Local Planning Capability</i> | <i>Local Regulatory Capability</i> | <i>Government Financial Investment Capability</i> |
|----------------------------------|---------------------------------|---------------------------------------|--------------------------------------|--|---|
| Arequipa, Peru | √√ | — | √ | √ | — |
| Cali, Colombia | √√ | √ | ? | ? | √ |
| La Paz, Bolivia | √ | — | ? | ? | ? |
| Panama City, Panama | ? | √ | ? | ? | √ |
| Rosario, Argentina | ? | √√ | √ | √ | — |
| San Salvador, El Salvador | — | √ | ? | ? | √ |
| Sao Bernardo do Campo, Brazil | √√ | — | √ | √ | √ |

| <i>City</i> | <i>Public Support</i> | <i>Decentralization of Government</i> | <i>Urban Development Master Plan</i> | <i>Sufficient Resources for Local Institutions</i> | <i>Development of Public Transport Companies</i> | <i>Financial Climate for Transport Companies</i> |
|----------------------------------|---------------------------|---|--|--|--|--|
| Arequipa, Peru | ? | √ | — | ? | ? | ? |
| Cali, Colombia | ? | √ | ? | ? | ? | ? |
| La Paz, Bolivia | ? | √ | √ | ? | — | ? |
| Panama City, Panama | ? | — | ? | ? | √ | √ |
| Rosario, Argentina | ? | √√ | ? | ? | — | — |
| San Salvador, El Salvador | ? | — | ? | ? | √ | √ |
| Sao Bernardo do Campo, Brazil | ? | √√ | ? | ? | √ | ? |

√ Positive

√√ More positive

— Negative

√√√ Most positive

? Not known

Source: Bleviss, 2004.

The study also found that assistance needs for a city or group of cities are often too large for one donor to handle. Hence, there is a need to work together among MDBs and donors to deliver assistance effectively. The ongoing assistance in Lima, Peru, on implementing a sustainable transportation system is a good, but rare, example of the type of cooperation needed. At present, assistance is being provided in Lima by the World Bank, the IDB, the United States Agency for International Development, and Swiss and Japanese bilateral aid agencies.

Finally, the study identified ways in which MDBs and donors that are working in developing country cities in other areas can include in their assistance components that will benefit transportation and climate change. By doing so, donors' strategies can yield bigger benefits. With regard to air pollution from transportation, for example, at present, most donor support has concentrated almost exclusively on vehicles themselves, rather than the overarching transportation system in which they operate. In particular, the activities have concentrated on the development of minimum vehicle emissions standards and associated vehicle inspection and maintenance, and the development of cleaner fuels. Major air pollution reductions that can accrue through transportation systemwide improvements, such as the widespread use of bus rapid transit systems, are not adequately assessed in these narrow programs.

Similarly, donors' support of government reform should include the development of local transportation planning and regulatory agencies. Traditionally, donors providing assistance on government reform have concentrated on finance and budget agencies, since they are critical to the long-term financial sustainability of governments. Expanding the donor effort to include transportation and planning agencies can also achieve important results, and it can open a door to strengthening other government functions. It is also critical that donors assist in identifying independent sources of financing for these agencies in order to lessen the political pressures on them.

Yet another focus for donor assistance in governance reform should be an assessment of administrative options to address the challenges of multiple governmental jurisdictions over urban transportation. In most urban areas, transportation systems extend beyond the jurisdiction of a single municipal government. While the United States dealt with this challenge with the creation of metropolitan planning organizations governed by each of the relevant municipal governments in an urban region, similar structures rarely exist today in developing countries.

In assistance on urban development reform and investment, donors can also catalyze a linkage between Urban Development Master Plans and Transportation Master Plans. Donors often focus their assistance on development of one of these plans, but linkages between the two are frequently missed. Unless land use and development is explicitly addressed in Transportation Master Plans, cities risk seeing their efforts to rehabilitate their

public transportation systems fall short as the cities sprawl and the costs of the systems skyrocket in trying to serve these sprawled populations. Similarly, unless transportation needs are explicitly addressed in Urban Development Master Plans, city planners could well see goals fail because the needed transportation systems do not reach urban subcenters away from downtowns created by urban master plans.

Finally, donors can encourage cities to develop integrated Transportation Master Plans, which address all modes of transportation. At present, most donor assistance in transportation focuses only on infrastructure building—primarily roads and bridges—and, more recently, on reform of the public transportation systems. Without planning transportation systems as a whole, the interactive effects of all modes of transportation are frequently missed. All the benefits, for example, of integrating a bicycle path system or pedestrian system with public transportation can be lost by concentrating on only one mode of transportation. It is also important that donors provide assistance to analyze the environmental, social, and economic impacts of transportation master plans, including the impacts on greenhouse gas emissions.

References

- Bleviss, D. *The Opportunities for Sustainable Urban Transportation in Medium-Sized Cities in Latin America and the Caribbean*. Washington, D.C., November 2004. www.iadb.org/sds/doc/Bleviss.pdf.
- The Sustainable Mobility Project 2004. *Mobility 2030: Meeting the Challenges to Sustainability*. World Business Council for Sustainable Mobility, July 2004. www.wbcsd.org/DocRoot/nq0qcbBcHFhW4iBEYWTs/mobility-full.pdf.
- U.S. Energy Information Administration (EIA). *International Energy Outlook, 2005*. Washington, D.C.: EIA, July 2005. [www.eia.doe.gov/oiaf/ieo/pdf/0484\(2005\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2005).pdf).
- World Business Council for Sustainable Development (WBCSD). *Mobility 2030: Meeting the Challenges to Sustainability*. 2004. www.wbcsd.org/web/publications/mobility/overview.pdf.