Infrastructure in Latin America and the Caribbean: Investing in the Future

by

Sri-Ram Aiyer

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Infrastructure in LAC: Investing in the Future

November 6, 1996

Sri-Ram Aiyer
Director

Technical Department
LAC Region
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A. **INFRASTRUCTURE REQUIREMENTS IN LAC**

The purpose of this paper is to highlight infrastructure trends and requirements in LAC and the World Bank’s evolving role in meeting the region’s need for infrastructure in the 21st century. The role of the private sector is discussed as a critical factor in accessing the enormous amount of capital that will be necessary to finance needed infrastructure.

Physical infrastructure is a major factor in development and is inextricably linked with economic growth. It is a major determinant of a country's ability to compete successfully in the world economy, and can make the difference between a country that meets the challenges of competition and one that does not. In aggregate across all countries, an increase of 1 percent in the total infrastructure capacity is correlated with a 1 percent increase in GDP. In the case of urban transport, for instance, an efficient system that is reliable and rapid increases the comparative advantage of that country or region in its ability to produce and distribute goods and services.

**Defining Infrastructure.** Infrastructure is the sum total of the "inner workings" of an economy. It includes public utilities that provide power, telecommunications, water supply and sanitation all of which are essential precursors to economic activity. Infrastructure encompasses public works including highways, irrigation systems and other transportation systems such as railways, ports, and airports. Physical infrastructure is distinct from the social infrastructure which incorporates health, education, pension systems and other activities that directly affect and seek to enhance the capacity and content of human capital inputs into the economy.

**Infrastructure Investment Trends in LAC.** The 1980s and the early 1990s can be characterized as a period of under-investment in infrastructure in the LAC region. Infrastructure investment levels declined in virtually all sectors (see Figure 1). This trend was due largely to the economic downturn in the 1980s in the region which significantly impeded private and public investment. World Bank estimates suggest that $60 billion in annual investments, equivalent to 4.5 percent of GDP, are needed in the coming decade to make up for infrastructural deficiencies in power generation, roads, water and sewerage and telecommunications (see Table 1). The transport sector alone in the LAC Region requires an estimated annual investment of 1 percent of GDP. The level of investments needed is generally comparable to the level in East Asian countries which have been devoting 4.7 percent of GDP to infrastructure -- a level that is expected to increase to 7 percent of GDP per year (see Figure 2). This magnitude of investment cannot be met by the public sector alone. Private sector financing needs to be a cornerstone in the strategy to meet infrastructure requirements. Costs for maintenance of LAC infrastructure are estimated at US$7 billion per year, based on infrastructure investments in 1993.

**Table 1. Infrastructure Investment Requirements in LAC in the 1990s**

<table>
<thead>
<tr>
<th>Sector</th>
<th>US$ billion (1993 prices)</th>
<th>Percent of Regional GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>24</td>
<td>1.8</td>
</tr>
<tr>
<td>Transport</td>
<td>14</td>
<td>1.0</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>10</td>
<td>0.7</td>
</tr>
<tr>
<td>Water and Sanitation</td>
<td>12</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>4.4</strong></td>
</tr>
</tbody>
</table>

*Source: World Bank, Meeting the Infrastructure Challenge in LAC*
Figure 1. Infrastructure Investments Levels in Latin America and the Caribbean 1970s and 1980.

Source: World Bank data.

Figure 2. Infrastructure Investment Levels in the LAC and EAP Regions, 1980s

Source: World Bank data.
A major difference between the LAC region and Asian countries in their capacity to invest in infrastructure is the differential savings rate. While countries in the LAC region had aggregate savings of about 20 percent of GDP in 1980, aggregate savings in the Asia region amounted to 30 percent that same year. Per capita savings increased in Asian countries during the 1980s while LAC countries had to devote an increasing proportion of their savings to pay external debt.

The urbanization of the LAC region is an important reason for the significant infrastructure investments needed. Even though urban populations typically have better access to infrastructure, the population growth in urban areas will pose serious constraints and contribute to an increase in the prevalence of poverty in the urban areas. Rural areas cannot be overlooked. At the same time, an economic case can be made for the higher relative need for infrastructure in areas with high population density in urban areas.

**Trends in Maintenance of Infrastructure.** During the 1980s, the LAC region's expenditures on maintenance and operations of existing infrastructure declined. In Costa Rica, for instance, current non-wage expenditures which are mostly allocated to operations and maintenance expenditures declined from 1.6 percent of GDP to only 0.3 percent. The results were seen in the deterioration of the national and provincial road network where the percentage of roads in poor to very poor condition increased to 70 percent of the total network. The result of continued neglect is that about 45 percent of the road network in the region is unable to provide the level of service intended. The Bank estimates that because of inadequate road maintenance, an additional $3-$4 in expenditure is needed for every dollar not spent on maintenance. Thus, the rate of return on highway maintenance is very high -- higher than new construction. In the railways sector, it has been estimated that in 1991 only 60 percent of all locomotives in LAC were in operating order and available to provide service. With regard to water supply, unaccounted-for-water in Bogota was estimated at 42 percent of the supplier's total operating income. Poor maintenance as well as unauthorized connections account for much of this financial and physical leakage. The drop in maintenance is due not only to the economic decline in the 1980s, but also to the inefficient use of labor that made maintenance more expensive than need be. In Brazil, for instance, it is estimated that one quarter of highway department staff are redundant. In the railway sector in Colombia and Uruguay, overstaffing resulted in the total wage bill being almost equal to total revenues.

**Principles of Infrastructure Investment.** The quantity of investment in infrastructure required should not deter a focus on the type of investment that is appropriate for a country's economic development, the strategic significance of the investment, and, of course, the quality of its construction. Huge resources are invested in infrastructure in LAC and other regions, but its productivity is often highly questionable. Investments to date have not had the impact on development that was expected. This means that it is essential that investments achieve greater efficiency and effectiveness. Priorities for investment across sectors and within each sector are needed. With the increasing emphasis on fiscal decentralization and a growing role of subnational governments in encouraging regional economic growth, a parallel set of infrastructure development could take place. The extent to which infrastructure uses technology that is appropriate and relevant to the circumstances -- financial, physical, and social -- will determine its productivity. Infrastructure investment that is too expensive to maintain -- or impossible to maintain because of the lack of availability of spare parts -- will lose its value in a short period of time.

How can these fundamental issues of infrastructure performance adequately be addressed in investment and maintenance decisions? Several fundamental principles can be applied. First, the discipline of the market needs to be incorporated in the activities involved in making decisions on
investment and operations. Infrastructure operations should be made accountable to the users of the infrastructure services. This necessitates operational autonomy to set tariffs. The role of government should be external to the day to day operations and provide transfers where necessary to achieve social objectives. A second principle of sound infrastructure is encouraging competition among potential providers and supplier of infrastructure services. The opening up of the market to competition in the telecommunications sector has been successful in Chile, Argentina, and Mexico and serves as a model for progress in improving infrastructure. Finally, and most importantly, as with any private good sold in the private market, infrastructure needs to be consistent with and meet the demand of prospective users.

**Infrastructure and Poverty Alleviation.** Investments in infrastructure that are well targeted can go a long way toward mitigating the effects of poverty. The reason is that the poor are often disproportionately adversely affected by the absence of reliable infrastructure. In the case of water supply, the poorest households tend to spend a larger share of their income on water than do higher income households. The cost per unit of water consumed is typically higher for poor households who obtain water from street vendors and other sources where there are limited economies of scale. The cost is borne not only in financial terms but in time associated with fetching water -- a task whose performance is typically the role of women.

What is the extent of disparity in access to basic infrastructure between the poor and higher income households? In Guatemala, 16 percent of the poor have access to electricity while 86 percent of the highest income households have such access. Similar disparities exist with regard to sanitation (sewer) in Mexico (see Table 2).

**Table 2. Percentage of the Poorest and Richest Population Quintiles with Access to Infrastructure, various Countries**

<table>
<thead>
<tr>
<th>Country/area</th>
<th>Access to public water supply</th>
<th>Access to sewers</th>
<th>Access to electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poorest quintile</td>
<td>Richest quintile</td>
<td>Poorest quintile</td>
</tr>
<tr>
<td>National areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Côte d'Ivoire (1985)</td>
<td>2.4</td>
<td>62.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Ghana (1987-88)</td>
<td>10.5</td>
<td>30.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Guatemala (1989)</td>
<td>46.9</td>
<td>86.8</td>
<td>---</td>
</tr>
<tr>
<td>Mexico (1989)</td>
<td>50.2</td>
<td>95.0</td>
<td>14.2</td>
</tr>
<tr>
<td>Peru (1985-86)</td>
<td>31.0</td>
<td>82.0</td>
<td>12.3</td>
</tr>
<tr>
<td>Urban areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia (1989)</td>
<td>84.8</td>
<td>89.9</td>
<td>52.6</td>
</tr>
<tr>
<td>Paraguay (1990)</td>
<td>53.7</td>
<td>88.8</td>
<td>10.4</td>
</tr>
</tbody>
</table>

--- Not available

*Source: Glewwe 1987a, b; Glewwe and Twum-Baah 1991; World Bank 1993c.*

The assumption is frequently made that very poor households are unable to pay for basic services. In some cases this is undoubtedly true. But at the same time, the poor often pay the highest cost per unit of service given their inability to benefit from economies of scale associated with being part of the formal water supply or electricity system. Moreover, because the poor often lie outside of the basic service delivery system, they are not positioned to be able to benefit from available subsidies. In fact, higher income households in five countries in the LAC region were found to receive subsidies for basic water and sewerage services that were 1.3 to 2.8 times the level of subsidies provided to poor households. These findings suggest that better targeting, coupled with user fees for households that
can afford them, can help to reduce the impact of poverty. Of course, the political realities of realigning subsidies so that they benefit the truly needy is a difficult political exercise. But it is the only way to ensure better equity in basic services. There is another advantage to user fees. They help to promote environmentally sustainable development. Underpricing of basic services such as water supply and electricity results in higher usage than if the consumers paid the actual marginal cost of each additional unit of service consumed.

B. THE ROLE OF THE BANK IN MEETING INFRASTRUCTURE REQUIREMENTS IN LAC

A Retrospective Look. The Bank's lending operations in LAC with regard to infrastructure have evolved over the decades. In the 1970s, the Bank focused its lending largely on demonstration projects to improve housing sites and services especially as they pertain to residential services (see Figure 3 and 4 below.) In many respects, the projects funded by the Bank were successful in meeting their physical investment targets. Yet the newly-built infrastructure could not be sufficiently maintained by municipal governments because of insufficient technical and financial capacity.

Figure 3. World Bank Infrastructure Loan Commitments in LAC, 1971-1995

![Graph showing World Bank Infrastructure Loan Commitments in LAC, 1971-1995](image)

*Note:* The curves show a three-year moving annual average.

To improve fiscal capacity for sustainability of infrastructure investment, the Bank focused on municipal development with emphasis on building a base of property tax revenues. Cadastral surveys were financed in Brazil under a municipal development project. But as the Bank’s work was borne out, it became clear that municipal governments played only a minor role in providing infrastructure in urban areas. Many major decisions were made by national government ministries.

In the 1980s, the Bank began to focus heavily on institutional issues. Lending operations revealed overlapping and fragmented functional responsibilities and limited structures for accountability. To build better capacity -- human and fiscal -- in institutions responsible for infrastructure, the Bank increasingly focused on institutional and structural issues. For instance, an analysis of decentralization in Mexico found variations in the basis for allocating intergovernmental fiscal transfers among jurisdictions. Further, a study of Brazil’s fiscal relations noted that municipalities had little incentive for revenue generation because of the incentives inherent in the fiscal transfer system.

In response to the institutional and structural deficits that characterized subnational government organizations responsible for infrastructure development, the Bank conducted a number of lending operations that sought to improve the internal management of municipal government. The first Parana
(Brazil) project emphasized the use of loans rather than grants to support local capital projects. The intent was to promote local capital development with some fiscal discipline and incentive to build in a cost recovery mechanism that could be used for debt service payment. It was anticipated that the fiscal discipline might also engender better management practices promoting efficiency. Other projects in Argentina and Ecuador sought to encourage municipalities to prepare financial plans as a means to enhance their creditworthiness and ability to borrow in the capital markets. One of the lessons learned is that although it is difficult to successfully engage in cost recovery, it has been possible to some extent.

In the mid-1980s, the Bank's focus shifted to programmatic multisectoral urban development projects, which are less prescriptive in the services to be provided. Criteria for funding were identified in advance, but a financial agency or other entity would consider the funding of subprojects based on those criteria. Venezuela's Low Income Barrios Improvement project in FY 1992 is an example of this more open-ended approach. In the late 1980s to the present, municipal development projects came to the fore with components for investment in basic infrastructure. The emphasis in these municipal projects is on urban and intergovernmental fiscal reforms with emphasis on building local municipal capacity. Also during the mid to late 1980s, some shift occurred in bank lending among sectors. In the transport sector, projects for highways, railways, ports and other transport fluctuated somewhat with highways being consistently predominant (see Figure 5).

![Figure 5. World Bank Lending for Transport Modal Distribution in Terms of USS Lent.](image)

In the 1990s, two types of project lending have been initiated. The first is urban environmental management projects which expand municipal development projects to include city or region-wide environmental management issues. Brazil's Ceara Urban Development and Water Resource Management project is a case in point. The key here is flexibility, and participatory strategies that
involve the beneficiaries are part and parcel of this approach. Finally, the 1990s has seen the emergence of periurban water supply and sanitation projects. The thrust of these types of projects is providing urban and periurban communities a choice of technical options for water and/or sanitation that optimise investment costs and maintenance requirements. Brazil's PROSANEAR project is an example of this more flexible approach to urban lending.

The Bank's strategies are reflected in its lending in the LAC region. During 1971-1995, lending averaged US$1.6 billion per year. It peaked in 1980 at US$2.6 billion and then declined. From a sectoral point of view, investments in the power sector dominated in the early 1980s, but more recently, lending in water supply and sanitation and telecommunications have taken on greater prominence. Lending in 1996 has been somewhat less than in 1995, US$1.2 billion as compared to US$1.3 billion.

**Present Priorities.** The Bank is focusing its assistance to improve the efficiency in the infrastructure sectors in the LAC region. Emphasis is being placed on the power sector, transportation, telecommunications, and water supply and sanitation sectors with a focus on maximizing private sector participation wherever possible, most notably in telecommunications and power. The intent is to work in close cooperation with the IFC, IDB, and other private and public investors. Further, the Bank is increasing its direct lending in infrastructure in cases where it is needed. For the long term, the Bank hopes to stimulate the domestic capital markets to enable private financial intermediation to take the place of public sector funding.

**Lessons Learned.** Several important lessons have been learned from the Bank's experience in urban infrastructure lending. The first lesson is that one size does not fit all. There is no one model of infrastructure development that is suited to all urban areas. Infrastructure projects need to reflect community demand which varies widely. Beneficiary participation at all stages of project design and implementation is essential for success. Before projects get underway, users need to be asked about the best approach and their willingness to pay. A second criteria is ensuring that the services provided in the project are sustainable. That is, are they able to meet capital and recurrent costs of ongoing maintenance long after the project itself ceases. In LAC, the valorization system, in which public works costs are allocated to properties based on the assumed benefit to that property, has had some success. In Colombia, successful valorization schemes are characterized by the participation of communities in both planning and managing, the establishment of an effective collection system. Third, some successful projects aimed at slum upgrading have relied on community-based organizations and NGOs to assess community demand for services, the type of services, and the willingness to pay. Cost recovery is critical, and projects usually seek to recover costs from property taxes, user fees, and cross subsidies for very poor households.

In considering a project, a number of key decision points arise. First, should the locus of a project be in a limited geographic area or a broader citywide area. It is likely that while some progress might be able to be made in a neighborhood approach, and the progress might be visible in the form of new water supply and sanitation systems, system reforms at the city level will likely be needed. A neighborhood approach begs the question, though, of which neighborhoods should be targeted -- of the many that require assistance. The difficulty in answering this question might suggest the need for local determination of targeted areas -- as well as targeted approaches to urban reform. It also points to the need for system oriented reforms given the likelihood of similar impediments to improving the quality of urban life in many urban communities. Another issue is whether multiple sectors should be addressed at the same time, or whether a single sector should be tackled alone. It is important to note that multiple sector strategies implemented simultaneously require strong coordination and cooperation among agencies.
C. ISSUES IN INFRASTRUCTURE DEVELOPMENT IN LAC: THE CASE OF THE PORT SECTOR

Defining the Roles of the Public and Private Sectors. Ports are a critical part of a broader transportation network that links together transport modes and trade markets. An efficient port management strategy needs to combine private flexibility with public responsibility. Public and private partners need to play roles that are consistent with their comparative advantage: the private sector should provide a cost effective transport system, while the public sector should provide an efficient and clear regulatory environment. There is no valid economic argument for Government involvement in most port operations. But in any port reform scheme, there is a role for a port authority which can carry out activities beyond landlord management functions, and act on behalf of the public interest.

What is appropriate public intervention in the ports sector? It needs to ensure safety in port and navigation activities and compliance with environmental policies. It should establish common development policies between ports and cities on land development issues, for instance. The public sector also needs to create a legal and regulatory environment that promotes fair competition. National trade policies need to be reviewed to ensure efficient customs clearance and documentation and communication standards. Public sector financing is appropriate in targeted interventions for which no alternative financing exists. The goal with such investments, though, should be that the costs of day to day operations are borne by private sector users. Finally, the public sector role is to share non-commercial political, regulatory, and other risks that impinge on the economic rate of return.

Steps Toward Private Sector Participation. Inefficient port operations increase operating costs and are a serious obstacle to the export-led growth strategies of most countries in the LAC region. It is estimated that foregone net export earnings in Brazil due to inefficient port operations in 1994 exceeded US$1 billion. Loss estimates in Colombia in the same year exceed US$200 million. The largest port in Latin America, Santos, was barely able to increase cargo tonnage from 1993 to 1994. The average waiting time has increased from four days to two weeks. Dramatic improvements can be achieved with little additional investment by improving management and incentives. For instance, the recent concession policy in Argentina resulted in a decrease in tariffs of 46 percent on products exported to the U.S. and Europe. Likewise, tariffs in Colombia’s leading ports have been reduced by 52 percent and productivity has increased by more than 60 percent. In Uruguay, productivity increased more than 300 percent within eighteen months of the new port system regime.

Can It Work? There are lessons to be learned from countries that have privatized port operations and concessioned terminals. First and foremost is the feasibility and validity of privatization in a wide variety of country circumstances. An important vehicle for privatization was an autonomous decentralized Port Administration. This approach to private sector participation helps to capture most of the efficiency gains of full privatization, but obviates the associated political resistance. Resistance by labor to change is not uncommon, but it is not insurmountable. Uruguay, Argentina, Barcelona, Mexico, and Trinidad and Tobago experienced significant reductions in part due to labor rationalization programs that were generous and included re-employment and training opportunities which are critical to a successful transition. The reform of Argentina’s railways represents a successful case in point. Starting with 95,000 employees at the end of the 1980s it was estimated that about 50 percent of the workforce could be eliminated without affecting the quantity or quality of services. Through a two-year severance pay that encouraged voluntary retirement, more than 30,000 employees left. Thus, there are ways that the discipline of the commercial sector can gradually be implemented in the infrastructure sectors.
**Enabling Environment.** A proper enabling environment should include antitrust legislation and an effective enforcement agency. And as with any sector, the capacity for regulatory oversight should keep pace with privatization. The reason is that market forces alone do not provide adequate discipline and efficient functioning of the market requires regulation especially for monopoly services. In the port sector, regulation of tariffs is not necessary in large ports with several multi-use terminals that create competition. Competition is facilitated by allowing a single operator to operate no more than one terminal. The enforcement of antitrust requirements can obviate any one port group from monopolizing market share and influencing market outcomes. But regulation is needed, though, in small ports with one terminal without competition. To control the exercise of monopoly power in market entry and operations ensure the quality and safety of services and their consistency with environmental standards.

**Minimizing Investment Risk.** The financing of ports is the role of the private sector. Competition may, at the outset, result in initial overinvestment as multiple and competing countries attempt to be a regional hub. The primary factors for location are geographic location and efficient operations. A number of risks need to be acknowledged: currency risks, political and regulatory risks, and commercial risks. Currency risks arise from liabilities incurred in funding a project in a currency different from the currency of project revenues. There are also risks of inconvertibility of the currency, exchange requirements, and repatriation restrictions. They can be mitigated by providing currency exchange agreements, establishing currency reserve accounts, and by purchasing currency hedges. Cash flows can be required to be converted frequently.

Political and regulatory risks can be mitigated by credible public commitment with a high cost of reversing that commitment. Political and regulatory risks can be alleviated by guarantees from the World Bank, MIGA, U.S. Export-Import Bank, and the Overseas Private Investment Corporation. Commercial risks can be mitigated by structuring the operator fee as a percentage of revenue. Also, allowing structuring elements such as dual amortization, obtaining third party credit support, requiring operator minimum performance guarantees, requiring government guarantees and sales contracts with cost pass-through features can help to lower commercial risks. Construction and technology can be reduced risks using a variety of vehicles, namely business interruption insurance, property and liability insurance, liquidation damages, independent engineer review of construction, and construction and maintenance reserves.

**D. MAKING DECENTRALIZATION WORK**

Why is decentralization important to infrastructure development? An analysis of Bank-funded projects in roads revealed that countries with decentralized road maintenance have better roads (see Figure 6). In this regard, the movement toward fiscal decentralization in LAC has opened up significant opportunities for improvement in infrastructure investment and ongoing maintenance. It also brings the challenges that coincide with establishing capacity in subnational governments. So far, decentralization is reorienting the locus and approach to governance in the region. The Bank has incorporated municipal development, intergovernmental fiscal relations, and infrastructure into almost all of its recent lending operations consistent with the decentralization theme which is taking shape in many countries in the region.

There are three fundamentals of good infrastructure vis a vis decentralization. The first is making sure that the responsibilities for infrastructure are given to the right level of government. A national highway system is logically in the purview of the national government. A municipal highway
system is likewise within the purview of subnational government, although externalities may dictate some fiscal role for a higher level of government. The designation of functional responsibilities to a given level of government does not mean, though, that the government must be the direct provider of a service, it could equally contract out while overseeing standards and measuring consumer satisfaction. Legislation alone is not sufficient to desegregate and clarify functional responsibilities. The political will to respect the boundaries of such responsibilities is essential to ensure the integrity of each level of government.

Figure 6. Countries with Decentralized Road Maintenance have Better Roads.

Source: World Bank data for 42 developing countries.

The assignment of functions to subnational governments needs to occur simultaneous to the assignment of revenue capacity and the requisite authority to carry out designated functions. Countries in LAC and other regions are currently in the process of building the appropriate fiscal relationships among levels of government. This means that if governments have a given level of functional responsibility for infrastructure, then they also have the responsibility for local revenue capacity from taxes, user fees, and other sources. Different types of revenue sources are appropriate for different functions. Local taxation is a means to finance infrastructure services whose benefits accrue not only to individual households, but also to the local economy at large. These benefit taxes play a critical role in financing infrastructure in many countries. But establishing a local tax base and implementing a new tax system needs to overcome regulatory or administrative constraints set by higher level governments on the uses of the tax proceeds. Indeed, in a number of countries, the national government sets parameters for local taxation, and these need to be consistent with and supportive of the development of local revenue raising capacity.

Some transfers from national or other higher level governments are necessary and desirable for designated infrastructure. Matching grants are typically used for capital projects whose benefits extend beyond local borders. The usual systems of intergovernmental transfers are based on annual grants whose amounts are subject to political persuasion in contrast to a formula-based system. Arbitrary grantmaking gives incentive to subnational governments to spend a disproportionate amount of time
extracting revenue from higher level governments in lieu of developing their own tax base and revenue raising capacity. As noted, Ecuador is an example of a country that has moved from a transfer system based on ad hoc grants to a formula-driven system. Such formulas need to account for, among other things, the income and population of subnational governments. Of course, many jurisdictions may not have accurate data which complicates a formula-driven system -- at least at the outset. It nonetheless remains a superior means of allocating transfer payments. But transfers also need to account for the functions that a given government is going to perform and the externalities associated with the benefits of local infrastructure. The importance of a regional port system to a national economy may suggest transfers that recognize these external benefits.

In LAC, revenue transfers have moved ahead at a pace faster than the transfer of expenditure responsibilities. This has generated political support for decentralization among subnational governments. But it will be important for expenditure responsibilities to be transferred sooner rather than later. Otherwise the central government could seek to regain revenues that have been transferred and rise destabilizing the fiscal decentralization process. Moreover, the transfer of significant revenues without subnational governments having the requisite capacity to use such revenues effectively for infrastructure investments can get decentralization and its potential beneficial effects on infrastructure off on an imbalanced footing. The magnitude of the revenue transfer has been quite significant. In Brazil, about 6 percent of its total share of public sector revenues has been transferred to subnational governments. Likewise, in Guatemala, 8 percent of central government revenues are to be transferred to local governments, but the expenditure responsibilities have not been transferred. The more appropriate approach is for revenue transfers -- their magnitude and form -- to be determined based on the expenditure responsibilities that subnational governments need to carry out. Local leaders typically express concern that the level of responsibilities that would be transferred may be greater than the commensurate revenue required. To stave off the use of "unfunded mandates" which has characterized U.S. federal-state relations, Colombia's constitution now prohibits the central government from mandating that certain responsibilities or standards by abided by without providing the resources to meet those requirements and standards.

Transfers should not undermine local incentives for revenue raising for infrastructure. There is some evidence that central government revenue sharing has substituted for locally generated revenue. This does not augur well for encouraging local governments to assume greater responsibility for infrastructure development. In some cases, central governments restrict the level and type of local taxes that local governments can collect, but more significant is the reluctance of municipal governments to use the taxation authority they do have. In some cases, though, municipalities are being given more flexibility to raise local revenues in the form of greater discretion to charge fees for municipal services, establish tariffs for basic services such as water supply and sanitation, and finance infrastructure investments via benefit taxes on those who benefit directly and indirectly. Moreover, some municipal government leaders prefer to have control over revenue generation in their own communities since reliance on transfers from the national government can be viewed as uncertain and risky. This can be a potentially difficult concern especially since decentralization policies are carried out without a reliable estimates of the costs necessary to implement new responsibilities. In those communities that have a sufficient tax base, municipalities may be eager to become self-reliant. For smaller communities without a large tax base, this may not be the case.

Through its lending operations the Bank has attempted to encourage local resource mobilization through enhancement of technical capacity, but the "know how" is inadequate and political will is needed to encourage the electorate that local revenues will be used effectively to enhance infrastructure and other services. This may be due in part to the fact that there is little direct
connection between infrastructure services received by local citizens and the costs of those services. It appears so far that in LAC there has been insufficient user participation in determination of the quantity and type of services desired, as is the case with social investment funds. Such participation should generate interest and willingness to pay on the part of users for new infrastructure investments and maintenance and operating costs of more effective and efficient services. Studies of participation in water supply and sanitation services show that participation increases the effectiveness of projects by improving maintenance. This finding is based on a review of 121 rural water supply projects in Africa, Asia, and LAC (see Figure 7).

**Engaging the Beneficiaries of Infrastructure.** One of the more successful experiences in engaging infrastructure beneficiaries in determining the type and content of infrastructure most needed is with Mexico’s municipal fund program. In this, beneficiary participation is made possible by fiscal decentralization in which funds are transferred to local governments for building infrastructure. Public funds are matched by community contributions either in the form or in-kind labor or local materials. The municipal funds have financed 75,000 projects at a cost of only 50-75 percent of the cost of similar projects managed by the public sector. The lessons learned in Mexico suggest that decentralization can be used as a vehicle to enable more responsive infrastructure consistent with local preferences. Likewise, in Brazil’s PROSANEAR project, communities are consulted with regard to the basic design and technology. This approach suggests that community input can lower per capita investment cost and enhance local ownership of infrastructure projects. The costs of technology declined because communities could choose different service levels and among different technical solutions. A 1985 World Bank review of twenty-five projects in agricultural and rural development found that participation by the users of the infrastructure was a major factor in project success.

Accountability for effective and efficient infrastructure is a fundamental component of sound decentralization. Local elected governments are accountable to the electorate, but to the extent that local governments also raise revenue, they become accountable for the use of those funds for infrastructure investments. In theory, local governments are closest to the populace and are better able to represent and implement policies consistent with their preferences. One of the more successful examples of local accountability are the comités de vigilancia established in Bolivia which monitor the effectiveness of local public services and infrastructure delivery. But local governments may not always be responsive to local preferences and central governments may need to step in to ensure basic services. At the same time, central governments have reason on occasion to regulate activities in local jurisdictions that affect national policy.

Different approaches can be used to promote accountability. In Bolivia grassroots community organizations represent the interests of the community and monitor the performance of municipalities with regard to infrastructure and other services. Venezuela has relied on town meetings to obtain the input of residents, but the cabildos are often perceived as lacking in real accountability. Referenda and elections are an ultimate vehicle for accountability. But given the general nature of elections, they may not be sufficient vehicles for communities to represent their views on specific issues pertaining to infrastructure and basic services. Tijuana, Mexico used a public referendum process to gain support for a capital investment program consisting of road construction and replacement and drainage. Although referenda are not binding in this country context, the positive response by voters encouraged the state to authorize the bond issue.
Access to Capital. In decentralized systems, government transfers can only go so far in building the needed infrastructure in the region. Subnational governments need to think of different ways to access financing for capital investments for infrastructure. Some national governments maintain loan programs that enable subnational governments to borrow for infrastructure investments. But the incentives for fiscal discipline remain weak since taxpayer supported loans can sometimes too easily turn into subsidies for jurisdictions with certain political characteristics. A next step toward a more disciplined approach to financing is access to private capital. Foreign financing of infrastructure privatization is important in LAC (see Figure 8). The attractiveness of using the private capital market for infrastructure investments is that it imposes a degree of discipline similar to that required of private sector borrowers. Moreover, the initial stock offerings for privatization in telecommunications have generated financing from pension funds which has stimulated capital market growth in Argentina and Mexico (see Figure 9).

For a number of subnational governments in the LAC region, it will take time to develop creditworthiness to access the private market. Interim steps, include establishing municipal credit institutions with the financial backing of national governments which gives more assurance to private lenders. Lending and loan administration are essentially separated from government. To make a municipal credit institution work, two features are essential. The first is organizational and political separation of government and the institution. Furthermore, even a hybrid organization is not sufficient to redress an uncreditworthy government entity. Hence, fiscal discipline is an essential component. Sometimes the intent of a municipal credit institution is undermined when national governments continue to provide grant funding for competing or similar infrastructure investments which gives little incentive or opportunity for a financially self-disciplined entity to take root.
Figure 8. Infrastructure is a Large Share of Privatization Proceeds; Foreign Financing of Infrastructure Privatization is Important in Latin America.

<table>
<thead>
<tr>
<th>Privatization proceeds (billions of US dollars)</th>
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<tbody>
<tr>
<td>Domestic 44%</td>
</tr>
<tr>
<td>Foreign 56%</td>
</tr>
<tr>
<td>Foreign 2%</td>
</tr>
<tr>
<td>Domestic 98%</td>
</tr>
<tr>
<td>Noninfrastructure</td>
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<tr>
<td>Infrastructure</td>
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</tbody>
</table>

**Source:** Sader 1993.

**Access for the Poor.** As noted earlier, access to infrastructure among the poor is an important way to ameliorate the effects of poverty. The question is, though, how can access be enhanced without subsidies disproportionately benefiting higher income households? Lessons learned in water pricing suggest that “lifetime” rates that are very low for the first increment of usage can be a way to target subsidies more efficiently to the poor simple by limiting the amount of subsidy that is based on an established number of liters of water consumed per person. Another approach to increasing access among the poor is to reduce the initial up front - and usually high cost - of connection charges. In Colombia, a household survey in Bogota and Medellin identified the rich and poor households. The latter were provided subsidized connections as well as “lifeline” tariffs. To finance the subsidy, the highest income households paid a tax which gave the 20 poorest percent of households a subsidy equivalent to 3.4 percent of their income.

**Environmentally Sustainable Infrastructure.** Investments in infrastructure -- and policies governing their price-- need to account for environmental considerations. Prices for electricity and other important services remain at a level less than marginal cost. Estimates suggest that consumers in developing countries use 20 percent more electricity than they otherwise would if pricing was based on the incremental cost of supply.

Another aspect of environmentally appropriate infrastructure pertains to the technology used. Incentives that encourage energy efficient technologies in power generation, for instance, can go a long way towards significantly reducing water and air pollution. While the cost of the emerging technologies that are more environmentally sound will increase the cost of service, an enabling environment for conservation should be encouraged wherever possible.
E. LOOKING AHEAD: BANK ASSISTANCE IN INFRASTRUCTURE INVESTMENT IN LAC

The Bank's assistance in the LAC region will be based on the lessons learned to date. Simultaneous work is needed on a number of fronts: in policy and institutional reforms, coupled with actual investments in physical infrastructure. It will be critical for Bank involvement to be consistent with the overall macroeconomic framework and efforts to achieve and/or maintain stabilization. A coherent macroeconomic and infrastructure strategy should be the bellweather of potentially successful investments. The linkages need to be made between economic issues and sector-specific reforms. An overriding interest in Bank lending is to promote more private sector participation in the power and telecommunication sectors, and to the extent possible in other sectors by assisting with reforms that open these sectors to private entry. The Bank can be expected to enhance its lending in infrastructure sectors to US$3 billion annually with the intent of using Bank lending as a means to leverage additional funds although peaks and troughs may occur in lending levels from year to year. Co-financing of Bank lending has averaged about US$1.3 billion per year, and in some years totaled US$4 billion, principally with the Inter-American Development Bank.
The Bank’s direct support will finance about 5 percent of total annual infrastructure investment requirements. It aims to involve the private sector in investing and operating infrastructure, and to this end, will encourage more infrastructure investment with the Multilateral Investment Guarantee Agency (MIGA) and the International Finance Corporation (IFC). Simultaneously, the Bank hopes to encourage borrowers to increase the involvement of domestic capital markets in the financing of infrastructure. The intent is to leverage additional private and public sector investment that would supplement the Bank's lending. The Bank's resources can be used to establish infrastructure funds that can be a focal point for private and public sector funding, as well as bilateral support. The key here is for the Bank to complement available resources rather than supplant them.

The Bank’s strategy also involves the use of two types of guarantees: partial risk guarantees and partial credit guarantees. Partial risk guarantees help to address risks that are politically-related, including delays or interruptions arising from actions by a government, rather than commercial risk. Partial credit guarantees offer the availability to private lenders to roll over medium term financing into longer term financing. Another financing vehicle to encourage private sector funding is the development of an investment fund managed by a corporate entity that pools loans from private lenders for a series of infrastructure projects in multiple sectors. Public sector funds might be used to initiate such a fund or provide a backstop guarantee, but the investment funds would essentially be privately financed.

**Sector Priorities.** The Bank's role will continue to be to carry out analytical reviews of the legal and regulatory framework to shift toward more open entry for the private sector, provide technical assistance to conduct project appraisals in collaboration with IFC wherever possible, and assess the environmental and other risks associated with an infrastructure project and the expected revenues. The Bank will assist borrowers in cases where private sector participation opportunities are evident from the outset, and where projects are designed by the government with future private participation in mind. In the latter cases, good project preparation can add greater attractiveness to prospective private investors. As noted in Figure 10, private sector participation can lead to large welfare gains. Bank analysis of policy issues affecting sector investment and emphasis on a dialogue between the borrower and the Bank should help improve the enabling environment for private investors. In addition, the Bank's technical assistance lending has proved to be valuable in reinvigorating the legal and regulatory frameworks. Technical assistance loans to Peru, for example, will be used for implementation of privatization and a loan to Mexico is aimed at building the appropriate regulatory capacity for telecommunications and other sectors.

In the power sector, emphasis continues on creating an appropriate enabling environment in the legal and regulatory sphere. In countries where the rehabilitation of existing power capacity would yield high returns, this, in turn, would be a priority target. Rehabilitation is likely to be preferable in many cases to building additional capacity. In cases where power systems are amenable to full or partial privatization, Bank lending can assist in the transition in providing practical advice based on its experience in privatization in many sectors in a variety of country contexts.

There are some instances in which the public sector will remain in the forefront of infrastructure investment. Rural electrification is a case in point. Where projects are especially complex or require a long-term gestation, public sector involvement is not atypical, hydroelectric projects are an example. The natural gas pipeline between Brazil and Bolivia is an example of efforts that will have a long-term effect on integrating regions and in providing an alternative, less polluting energy source.
The Bank is supporting a number of urban transport projects in Brazil, Jamaica, Chile and Mexico. The growth in the urban population necessitates more efficient means of transportation. The urban poor can spend upwards of four hours per day commuting to work. There is a role for the private sector in providing urban transportation alongside a role for the government in managing transportation routes and allocating services. Government can also stimulate investment in the transport sector to address the needs arising from population growth. The Bank also is investing in measures to upgrade road infrastructure, pave roads, and manage traffic demand through traffic engineering. The Bank can support road maintenance funds, assuming that procurement guidelines are abided by. The balance between new construction and maintenance needs to be managed. Some new construction may be warranted in cases where it will generate private sector investment and improvements in productivity.

But a larger view of the transportation sector is essential. Integrated transport systems that link highways, ports, airports and railways are key to facilitating regional trade arrangements. These regional trade arrangements are necessary if a country is going to become a reliable supplier in a competitive global market. Among the transitions that are needed are consistency in administrative, customs and information systems that can make regional systems work efficiently.

In the water supply and sanitation sector, the Bank is placing emphasis on assuring poor households in urban areas access to water supply. Successful water supply initiatives in Chile and Brazil have demonstrated that connection rates can approach almost universal coverage. The approach used by the Bank in Brazil's PROSANEAR project to provide $100 million for water and sanitation infrastructure to about 800,000 people in poor areas in eleven cities. The Bank has learned from this project that it will sometimes need to adjust its way of lending to achieve maximum impact. The Bank approved the project without defined service levels. Working from broad principles, the project involved significant participation by communities, and the Bank increased its supervision and staff time to monitor the implementation of subprojects selected by the communities.

Meanwhile, the Bank is also involved in rehabilitating existing water supply systems. The rationale for this investment is the increase in unaccounted-for-water which reaches above 50 percent in some countries. This level -- which is far higher than the 20 percent figure that characterizes even among the best managed systems -- is the result of two factors: the decentralization of functions to municipalities that were not ready to undertake the responsibility, coupled with poor enforcement of legal connections. The funding of rehabilitation of water supply systems comes under the rubric of municipal development lending. The thrust of this lending is toward engaging private sector participation in which private lenders manage financial transactions and collect loans while other private firms are responsible for operations and maintenance.

The Bank is engaged in water resources management improvements in the LAC region with emphasis on demand management, notably in countries or regions that are characterized by varying degrees of water scarcity. The aim is to build in economic discipline into water resource allocation. Brazil's water pollution control project has engaged the Bank in a unique initiative to curb water pollution using water basin management. The approach has helped in addressing multiple sources of pollution as well as the limited ability of the government to regulate multiple sectors that can cause pollution. At the same time the Bank is involved in sewerage treatment projects in Chile and Mexico where the priority is implementing low cost sewage treatment that will allow the reuse of treated effluents for the industry and agricultural sectors.
Figure 10. Privatization in Telecommunications can Lead to Large Gains.

<table>
<thead>
<tr>
<th>Total welfare gains as a percentage of annual sales</th>
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<tr>
<td>180</td>
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<tr>
<td>160</td>
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<tr>
<td>140</td>
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<td>120</td>
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<td>20</td>
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Telecom (Chile) Telmex (Mexico) British Telecom

Note: Welfare gains are the sum of gains accruing to all parties—enterprises, workers, and consumers.

Research Agenda. As the Bank moves forward in promoting infrastructure investment in LAC, a number of questions remain. A few examples follow. It will be important for the Bank to build an inventory of best practice in devolving responsibilities and fiscal authority to subnational governments in ways that augment infrastructure investment and maintenance capacity. Another area of inquiry is the impact of variable approaches to financing subnational governments and their track record in enhancing the quality of infrastructure services. Is it the case, for example, that infrastructure investment supported by locally raised revenue and private capital results in more sustainable infrastructure investment? (There is evidence that unit costs of recent private power generation plants were lower than comparable publicly funded plants.)

While decentralization in LAC raises opportunities and challenges for better investment and management of infrastructure, by itself it is no guarantor of improved performance. The Bank's focus is to build the capacity of subnational governments to engage in more effective management of infrastructure. As a result, new operational approaches towards municipal governments are being explored. This necessitates the Bank examining the totality of intergovernmental finance, inclusive of transfer payments and fiscal capacity at the local level. Another is the introduction of a corporate model of financial management of states and municipalities with a view to raising their real creditworthiness to enable them to tap capital markets, while safeguarding the Government from contingent liabilities.
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