UNASUR

Infrastructure for regional integration

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Infrastructure for regional integration

ECLAC

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FOREWORD

In 2011 the Union of South American Nations (UNASUR) gradually consolidated its role as the leading regional integration body with the ratification and entry into force of its Constitutive Treaty, signed in Brasilia in May 2008. The 12 UNASUR member States have thus laid the foundations for building a participatory and consensual forum for dialogue on strengthening cultural, social, economic and political integration and undertaking joint infrastructure development in South America. UNASUR offers the member States a platform for jointly addressing development challenges and pursuing socioeconomic inequality, social inclusion, citizen participation and the strengthening of democracy.

This document is the second in a series prepared by the Economic Commission for Latin America and the Caribbean (ECLAC) and the General Secretariat of UNASUR in the framework of intensive collaboration between the two bodies. Its main purpose is to provide national and subnational government authorities, the academic and business sectors, and the public in general, with an analytical perspective on infrastructure and related services, which are central to the integration agenda and development of South American nations.

The document is divided into four chapters that examine different aspects of infrastructure in South America. Chapter I analyses the connection between the provision of infrastructure services, economic development and equity and reflects on the impact of infrastructure investment, as well as the role of the State, public policy and the new State-market-society equation.

Chapter II offers an overview of infrastructure in the region, referring to both investment issues and economic infrastructure (energy, telecommunications, transport and sanitation); it also addresses the organization of infrastructure markets, institutions and policies on transport infrastructure and services, putting forward the need for a paradigm shift. A number of basic indicators on transport infrastructure and logistics are presented to complement the assessment of the sector in South America.

Chapter III examines the regional integration of infrastructure and its importance, looking in particular at the progress made towards regional physical integration in South America since the start-up of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA) and, more recently, the emergence of the new regional infrastructure agenda of UNASUR. Lastly, chapter IV contains some final reflections in relation to the main infrastructure-related challenges in UNASUR countries, with a particular emphasis on transport and logistics.

One of the main challenges the document identifies for infrastructure in South America is to design new ways of approaching public policy to ensure development with equity. To that end, the conception, design, execution, follow-up, oversight, assessment and monitoring of policies on infrastructure services must be aligned in order to maximize their impact on development. What is needed is a paradigm shift in the development and oversight of public policies: instead of treating modes of transport individually and separate from each other, integrated and sustainable policies should be forged by adopting a co-modal approach to transport. By making optimal use of each mode of transport or combining different modes, efficiencies can be achieved in the distribution of transport and related services for every trip. As part of this paradigm, market regulation and technical aspects of transport should be optimized to drive the modal shift towards sustainability.

A paradigm shift is indispensable for progressing towards a strategy of integrated and sustainable policies on infrastructure, logistics and mobility in South America. This would not only help to tackle development issues, but would also favour greater economic efficiency in transport services and reduce negative externalities affecting the population, such as congestion and pollution. The integration of infrastructure and related policies within UNASUR presents great opportunities for boosting growth and economic and social development in accordance with the aims of the Union's Constitutive Treaty.

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I. INFRASTRUCTURE AND DEVELOPMENT[1]

Public policies, an efficient private sector performance and citizen participation are crucial for countries striving to meet major objectives on the path towards economic development, equality and societal well-being. The challenge facing policymakers is to find a long-term strategy in which the synergies of the production model's economic vibrancy and the principles of sustainability and equity support and reinforce one another in a virtuous dialectic. This endeavour must be framed by the awareness that growth is needed for equality and equality is needed for growth (ECLAC, 2010d).

The development of infrastructure and related services[2] are indispensable tools for reaching major development objectives along the road towards inclusive, sustainable and egalitarian development. Even though the positive correlation between socioeconomic development and infrastructure and its related services may seem obvious, the point made here is that it should be given priority when designing and executing development strategies; economic and social development are not possible if the infrastructure or associated services are not in place.

The efficient provision of infrastructure services is one of the most important aspects of a development strategy, both at the national and regional levels. A lack of appropriate infrastructure and efficient service provision are major obstacles to implementing a social development policy effectively, achieving sustained economic growth and attaining integration objectives. Infrastructure and the related services, by their very nature, act as vehicles for territorial, economic and social cohesion since they not potentially increase connectivity, reduce transport costs and improve mobility, logistics and, ultimately, competitiveness and trade, they also facilitate regional social development by integrating and unifying territories, making them accessible from the outside and enabling their inhabitants to connect with their environment and access fundamental services for production and for improving their situations and quality of life (Rozas and Sánchez, 2004).

Infrastructure is critical for economic growth, productivity and balanced territorial development, and expanding it helps to reduce regional and local inequalities. Economic infrastructure is key to developing exports, too. Progress and gaps in infrastructure do much to determine transport costs, which have an impact on trade just as large —or larger than— tariffs or exchange-rate fluctuations. Investment in infrastructure can be decisive in improving the living conditions of the poorest families, particularly in rural areas. In fact, in rural areas, infrastructure is crucial not only for expanding and diversifying production and strengthening competitiveness, but also for increasing employment and income in the poorest households and reducing various systemic risks. As a result, developing infrastructure and the associated services has great potential for fostering the social inclusion of the most deprived population, improving income distribution and reducing poverty.

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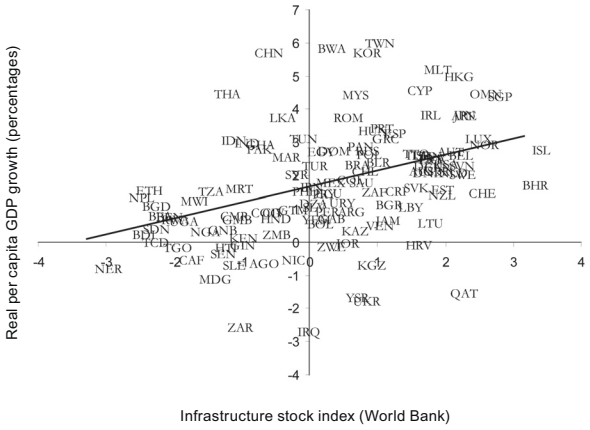
[1] This section was taken from Cipoletta Tomassian (2011) and Sánchez (2011).

[2] Even though, in conceptual terms, a large part of the overview presented here is applicable to all economic infrastructure services (energy, transport, telecommunications and water and sanitation) in Latin America and the Caribbean, this document focuses on transport infrastructure and services.

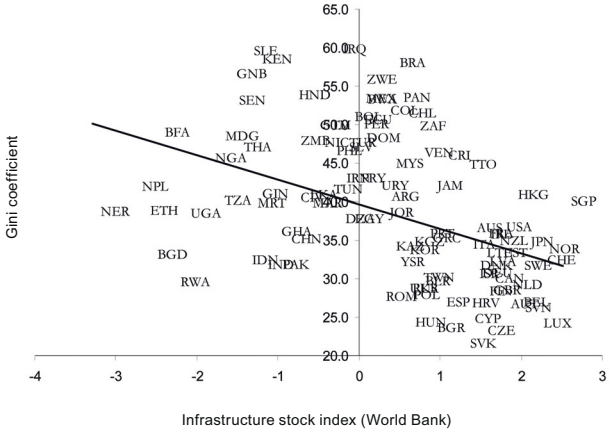
Figure 1 shows a clear positive correlation between infrastructure services and economic and social development. Given infrastructure's positive correlation with economic growth and negative correlation with income inequality, the countries with better infrastructure availability are those with higher economic development indices (measured in terms of year-on-year GDP growth) and a less unequal income distribution. These two correlations hold true for both endowment and quality of the infrastructure in place. The effect is magnified when the infrastructure is related to connectivity and where social inclusion policies target the regions that are most disadvantaged economically and socially.

Figure 1
WORLD (SELECTED COUNTRIES): RELATIONSHIP BETWEEN INFRASTRUCTURE STOCK, ECONOMIC DEVELOPMENT AND INCOME INEQUALITY

A. Infrastructure stock and economic development



B. Infrastructure stock and income inequality



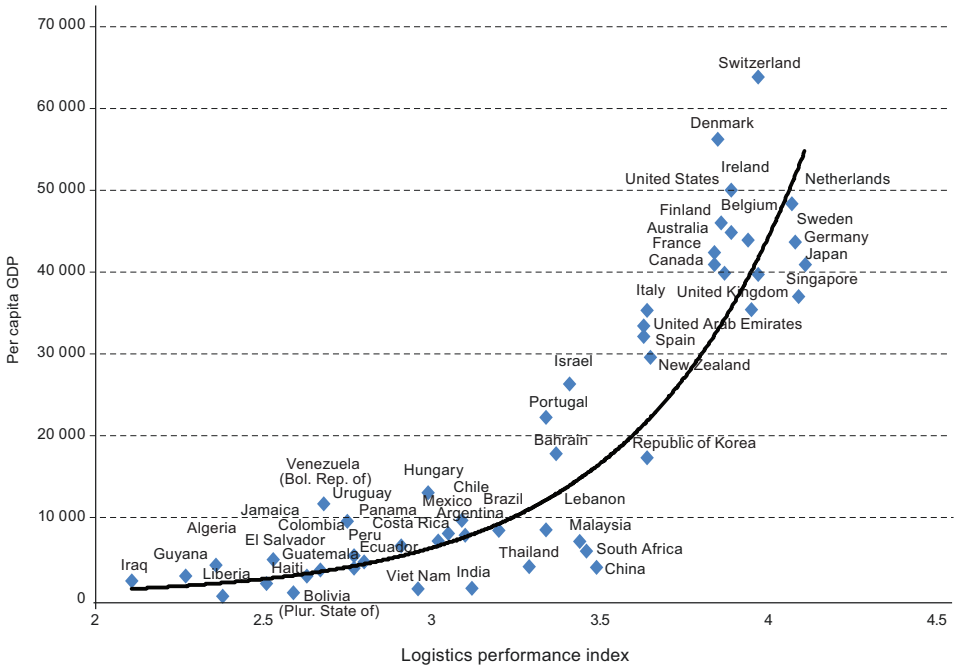
Source: Servén, 2008.

With regard to logistics, figure 2 shows a positive correlation between the logistics performance index[3] (measuring countries' capacity to move their goods efficiently and connect producers and consumers with international markets) and countries' levels of development, measured by per capita GDP.

Despite the fact that transport infrastructure and services are key to operationalizing the State's development measures, they are often not taken into account in social and economic public policies. Some sectoral public policies still fail to explore or take advantage of this positive correlation as they should, mainly because policy design and execution does not take a comprehensive and sustainable approach to these indispensable tools to achieve nations' major objectives.

[3] Logistics performance index data reported by the World Bank for 2009.

Figure 2
WORLD (SELECTED COUNTRIES): PER CAPITA GDP AND LOGISTICAL PERFORMANCE, 2009



Source: Prepared by the authors on the basis of information from the Economic Commission for Latin America and the Caribbean (ECLAC) and the World Bank (2011).

In fact, much of South America has neglected the undeniable link between infrastructure and economic and social development and has fallen behind in developing infrastructure, thus limiting the potential for long-term growth and opportunities for poverty reduction. Even in those countries that have made greater efforts to tap this virtuous link, policies associated with infrastructure development are often unconnected to those on territorial and productive development (Cipoletta, Pérez and Sánchez, 2010).

ECLAC (2010d) has taken a clear position regarding the conditions and characteristics necessary for development. Full development in South America requires a combination of economic and social development, within a framework of equal rights. ECLAC argues that the concept of rights equality must be the framework and basis for regulating social covenants that generate greater opportunities for those who have less. For this to come about, a fiscal covenant must be struck in which tax structures and the tax burden do more to redistribute income, and governments and public policy must play a stronger role in guaranteeing general well-being. The type of economic drive that transforms production models is not incompatible with social equality: on the contrary, growth and equality nourish each other within a system of synergies between the market, the State and society which leverages the positive development impacts of infrastructure services (ECLAC, 2010d).

In sum, equal rights, economic and social development, public policies, the State-market-society equation, sustainability and infrastructure services are all keywords in efforts to promote virtuous linkages between infrastructure, poverty reduction and growth in developing or less developed economies, and especially in South America.

II. SPOTLIGHT ON INFRASTRUCTURE

A. INVESTMENT IN AND PRESSURE ON ECONOMIC INFRASTRUCTURE[4]

1. Introduction

Studies over recent years have confirmed that economic infrastructure is a high-impact tool, promoting and boosting economic activity to achieve poverty reduction and sustained economic growth. The relationship between infrastructure and economic development can be viewed as follows: on the supply side, more and better infrastructure services help to increase factor productivity and bring down production costs, thus making companies more competitive and encouraging investment and economic growth; on the demand side, economic growth generates greater demand for infrastructure services, thus completing the virtuous circle.

The adequate provision of infrastructure and associated services, in terms of both quantity and quality, is central to economic development.

But the economic infrastructure of South America has come under considerable stress in recent decades, in particular because of volatile investment in the sector, inconsistent economic, infrastructure and maintenance policies (which directly impact infrastructure supply development) and constantly growing demand for infrastructure services. The disconnect between supply and demand, in addition to the lack of an integrated policy approach and certain institutional and regulatory issues, puts ever more pressure on infrastructure, leading to the widening of the infrastructure gap (when supply and demand are out of sync).

2. Recent investment in infrastructure

Over the last three decades, investment in infrastructure has shrunk significantly in several countries in South America: from 4% of GDP in 1980-1985 to 2.3% in 2007-2008 (see table 1).

Table 1
SOUTH AMERICA: INVESTMENT IN INFRASTRUCTURE
(Percentages of GDP)

Selected countries	1980-1985	1996-2001	2002-2006	2007-2008
Public sector	3.1	0.9	0.4	0.8
Private sector	0.9	1.5	1.0	1.5
Total	4.0	2.4	1.4	2.3

Source: Prepared by the authors on the basis of Perrotti and Sánchez (2011).

[4] This section is based on Perrotti and Sánchez (2011).

Public and private investment followed different patterns.

- With regard to public investment, in the early 1980s governments invested heavily in infrastructure —about 3% of GDP, the highest amount during the period under consideration. This investment took place despite fiscal constraints, difficulties accessing external financing and inflationary spirals. In the 1990s, the new role assigned to the market and the resulting change in the role of the State led to a contraction in public investment overall. Investment in infrastructure was hit particularly hard, dropping to only 0.8% of GDP towards the second half of the decade. During this period, many State enterprises were privatized; regulatory frameworks were created or modified accordingly. Following the turn of the century infrastructure investment continued its downward trend, to 0.4% of GDP, although this situation has reversed somewhat in the most recent period under consideration.

- Private investment began to pick up at the end of the 1980s and played a key role in the 1990s. In both periods, investment was associated mainly with privatizations and other takeover operations. As a result, private investment was equivalent to 1.5% of GDP between 1996 and 2001, after representing 0.9% of GDP at the beginning of the previous decade. Between 2002 and 2006, private investment declined significantly compared with the previous period, dropping to 1.0% of GDP. There has been something of a reversal in the last few years: the figures for 2007-2008 were encouraging, with private investment equivalent to 1.5% of GDP. In the past few years, investments in transport have experienced an upsurge and account for a growing proportion of total private investment in infrastructure.

A breakdown of investments by sector shows that the largest amounts were invested in energy infrastructure and, to a lesser extent, transport in the early 1980s. Towards the end of the 1990s, the largest investments were in telecommunications, which was the only sector to see an increase in investment compared with the first half of the decade; private investment had a positive impact in this area. However, in 2002-2006, investment slumped in almost all sectors, with the exception of transport, which saw a slight increase. The data available for 2007-2008 show a significant step up in investment in transport and a slight upturn in other sectors (see table 2).

Table 2
SOUTH AMERICA: INVESTMENT IN INFRASTRUCTURE BY SECTOR
(Percentages of GDP)

Sector	1980-1985	1996-2001	2002-2006	2007-2008
Telecommunications	0.5	1.0	0.5	0.6
Energy	2.6	1.0	0.4	0.6
Transport	0.8	0.4	0.5	1.1
Total	4.0	2.4	1.4	2.3

Source: Prepared by the authors on the basis of Perrotti and Sánchez (2011).

3. The infrastructure gap in South America

The drop in investment in recent decades has opened a gap between the infrastructure indicators of South America and those of other subregions used for comparison, such as East Asia. Table 3 compares the infrastructure of the two regions in 2005.

Table 3
SOUTH AMERICA AND EAST ASIA: INFRASTRUCTURE STOCK, 2005

Sector	Unit	South America	East Asia [a]
Power generation capacity	MW per 1,000 inhabitants	0.51	1.32
Fixed telephony	Lines per 1,000 inhabitants	189	400
Mobile telephony	Lines per 1,000 inhabitants	461	835
Fixed broadband Internet	Subscribers per 1,000 inhabitants	11	205
Paved roads	km per 1,000 inhabitants	0.82	1.86
Railways	km per 1,000 inhabitants	0.22	0.06
Access to improved water sources	Percentage of the population	93	100
Access to sanitation	Percentage of the population	79	97

Source: Prepared by the authors on the basis of Perrotti and Sánchez (2011).

[a] Includes Hong Kong Special Administrative Region of China, Malaysia, Republic of Korea and Singapore.

The question, therefore, is how much it would cost if South America had to make, over the medium run (2020), the investments necessary to match the level of infrastructure seen in the countries of East Asia in 2005.

Answering that question requires measuring the horizontal gap, i.e., quantifying the differences between the infrastructure stock indicators for the countries of the subregion and for the countries of South-East Asia. Once that difference has been quantified, the associated infrastructure costs are calculated in order to estimate the investment required. The resulting estimate is that South America would have to allocate 8.1% of its annual GDP to close the infrastructure gap with selected countries in South-East Asia by 2020. This percentage takes into account the costs associated with maintenance.

According to these calculations, the sectors requiring the most investment are energy and transport, while those linked with water and sanitation need the smallest share of resources (see table 4).

Table 4
SOUTH AMERICA: ANNUAL AVERAGE COST OF CLOSING THE GAP WITH EAST ASIA
(Millions of United States dollars at constant 2000 prices and percentages of GDP)

Sector		
Electrical energy	69 412	3.1
Telecommunications	30 377	1.4
Land transportation	74 092	3.3
Water and sanitation	5 704	0.3
Total	179 584	8.1

Source: Prepared by the authors on the basis of Perrotti and Sánchez (2011).

Another option is to measure the vertical gap by identifying the infrastructure flows required to meet the needs of companies and end consumers. Based on annual GDP growth of 4.4% for South America for the period 2006-2020, the investments needed to meet the demand for infrastructure for that same period would equal an annual average of 5.7% of South America's GDP, with 3.1% going towards new investments and 2.6% towards maintenance costs.

The sectors with the greatest need for investment are telecommunications and electrical energy (requiring an annual average of 2.3% and 2% of South America's GDP, respectively). The water and sanitation sector requires the least expenditure (an annual average of 0.2% of the GDP of South America as a whole). For further details, see table 5.

Table 5
SOUTH AMERICA: PROJECTED ANNUAL AVERAGE INFRASTRUCTURE SPENDING NEEDS, 2006-2020
(Millions of United States dollars at constant 2000 prices and percentages of GDP)

Sector		
Electrical energy	44 865	2.0
Telecommunications	52 062	2.3
Land transportation	25 958	1.2
Water and sanitation	5 022	0.2
Total	127 907	5.7

Source: Prepared by the authors on the basis of Perrotti and Sánchez (2011).

In conclusion, South America currently invests about 2.3% of its GDP per year on infrastructure (some US$ 53.5 billion at constant 2000 prices). But the subregion would need to invest an annual average of between US$ 128 billion and US$ 180 billion at constant 2000 prices (or between 5.7% and 8.1% of regional GDP) in the capacity expansion and maintenance needed to close the infrastructure gap. An additional US$ 74.5 billion and 126.5 billion at constant 2000 prices (or between 3.4% and 5.8% of regional GDP) should therefore be spent per year in the period 2006-2020 in order to maximize the positive effects of infrastructure on the economy.

Closing the infrastructure gap is necessary, but it is not the only action that needs to be taken. As ECLAC (2010) has highlighted previously, there are other equally important issues that must be resolved in order to take full advantage of infrastructure. However, even if the resources were available to meet the investment requirements outlined above, the outcome would not necessarily be greater efficiency because the mere physical existence of infrastructure, while essential, is not enough to maximize the benefits to be gained from infrastructure and associated services. Not only is it a question of investing more, but also of investing smarter, optimizing the way in which the State plans, evaluates, monitors and audits infrastructure projects and setting up channels of coordination with the private sector to meet the economic and social needs of each country.

The propitious combination of public and private investment should be accepted and promoted by establishing the necessary mechanisms, standards and regulations to allow them to work together (for example, by fostering public-private partnerships). In order to do this, clear rules must be established from the start and the strategic sectors that are most in need of investment should be made a priority and provided with incentives. The goal is to shift the focus from maximizing individual benefit to a strategic vision that maximizes the social benefit and makes the public interest paramount.

In order to achieve this, the capacities of the public sector must be strengthened and a new State-market-society equation must be built so that the positive development effects of infrastructure services can be maximized.

In addition, the existing infrastructure investment pattern must be replaced by a new approach that encourages sustainability and efficiency in investment decision-making, as recommended herein (see section II.B.2).

4. Foreign direct investment

In order to understand the role of foreign direct investment (FDI) in South America, and specifically with regard to economic infrastructure, information was drawn from the fDi Markets[5] database on reported investments in new projects[6] during the period 2003-2011.

The following sections examine FDI in the Latin American and Caribbean region as a whole and in the South American subregion, looking at region of origin, economic infrastructure sector and destination country, as well as investments that have both their origin and destination within the subregion. As shown below, the energy sector is the most dynamic in terms of FDI movements, while transport still lags some way behind. With regard to FDI by country, the main recipients in South America are Brazil, Argentina, the Bolivarian Republic of Venezuela and Peru.

(a) Global investment in Latin America and the Caribbean in economic infrastructure sectors

By region of origin

Figure 3 shows the breakdown by region of origin of all investments in greenfield projects in the economic infrastructure sectors (alternative/renewable energy, coal, oil and natural gas, communications, transport) in Latin America and the Caribbean, which totalled some US$ 290.430 billion between 2003 and 2011. As the figure shows, a large part of those investments come from Western Europe (46%) and North America (24%).

By economic infrastructure sector

FDI in economic infrastructure in Latin America and the Caribbean can be broken down into the following sectors: coal, oil and natural gas (51%), communications (24%), alternative/renewable energy (17%) and transport (8%) (see figure 4).

(b) Global investment in South America in economic infrastructure sectors

By region of origin

Figure 5 shows global investment in new projects in economic infrastructure sectors in South America, broken down by region of origin. Totalling some US$ 227.165 billion between 2003 and 2011, the largest proportion of that investment was from Western Europe (49%), followed by North America (22%) and Latin America and the Caribbean (17%).

By destination country

Figure 6 shows global FDI received by South America, broken down by destination country. During the period 2003-2011, the lion's share of that investment was received by Brazil (33%), Argentina (15%) and the Bolivarian Republic of Venezuela (14%), followed by Colombia (12%), Chile (10%) and Peru (10%).

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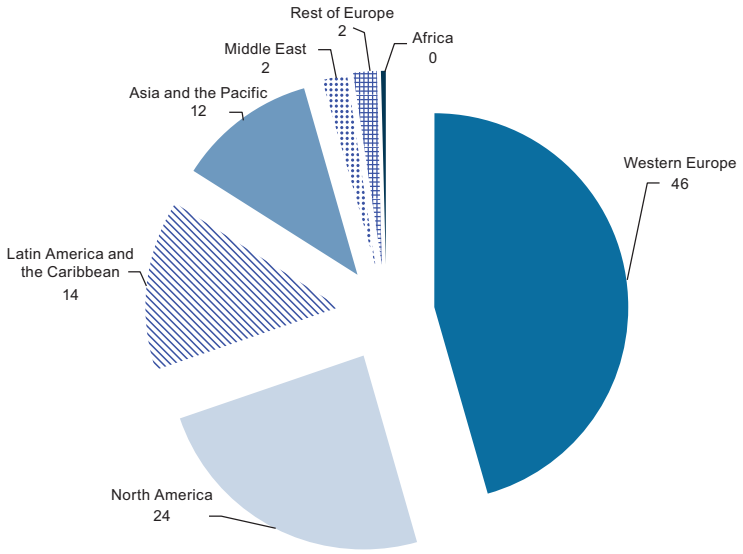
[5] fDi Markets is an online database tracking cross-border greenfield investment covering all sectors and countries worldwide. It provides real-time monitoring of investment projects, capital investment and job creation.

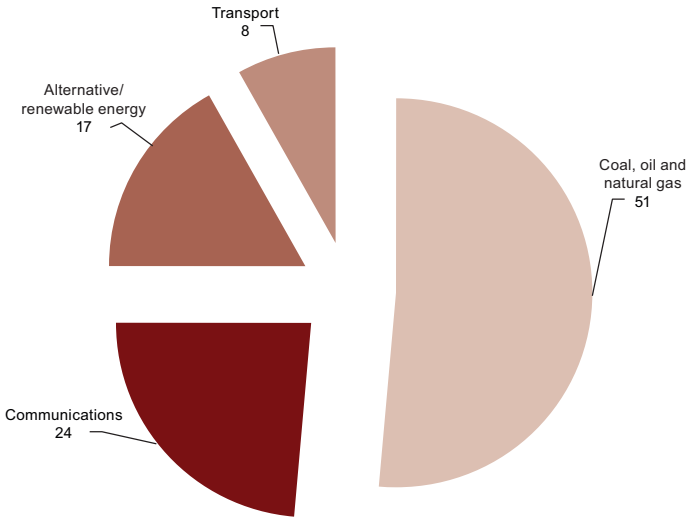
[6] Does not include mergers and acquisitions.

Figure 3
LATIN AMERICA AND THE CARIBBEAN: GLOBAL INVESTMENT IN ECONOMIC INFRASTRUCTURE BY REGION OF ORIGIN, 2003-2011
(Percentages)



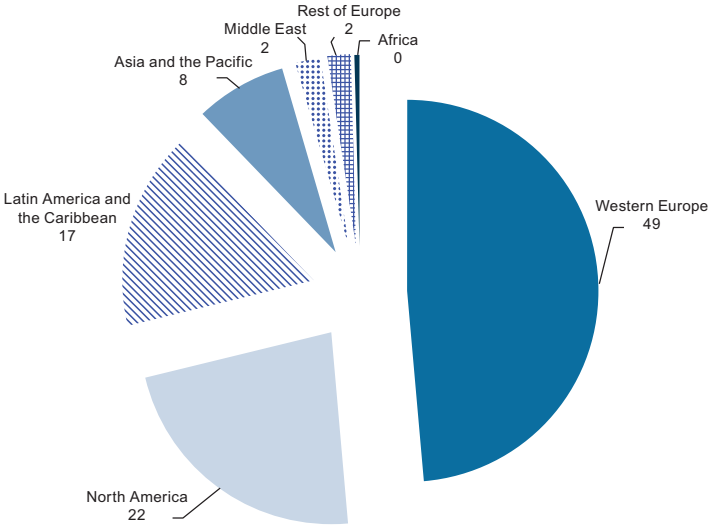
Source: Prepared by the authors on the basis of information from fDi Markets.

Figure 4
LATIN AMERICA AND THE CARIBBEAN: GLOBAL INVESTMENT IN ECONOMIC INFRASTRUCTURE BY SECTOR, 2003-2011
(Percentages)



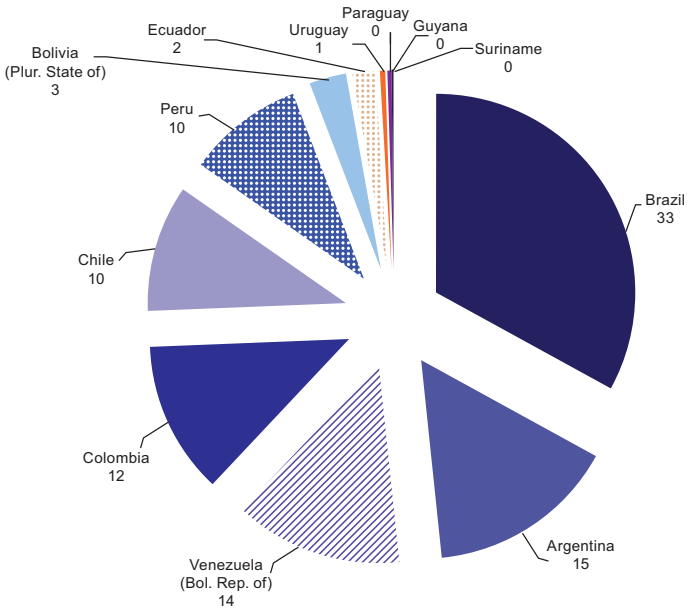
Source: Prepared by the authors on the basis of information from fDi Markets.

Figure 5
SOUTH AMERICA: GLOBAL INVESTMENT IN ECONOMIC INFRASTRUCTURE BY REGION OF ORIGIN, 2003-2011
(Percentages)



Source: Prepared by the authors on the basis of information from fDi Markets.

Figure 6
SOUTH AMERICA: GLOBAL INVESTMENT IN ECONOMIC INFRASTRUCTURE SECTORS BY DESTINATION COUNTRY, 2003-2011
(Percentages)

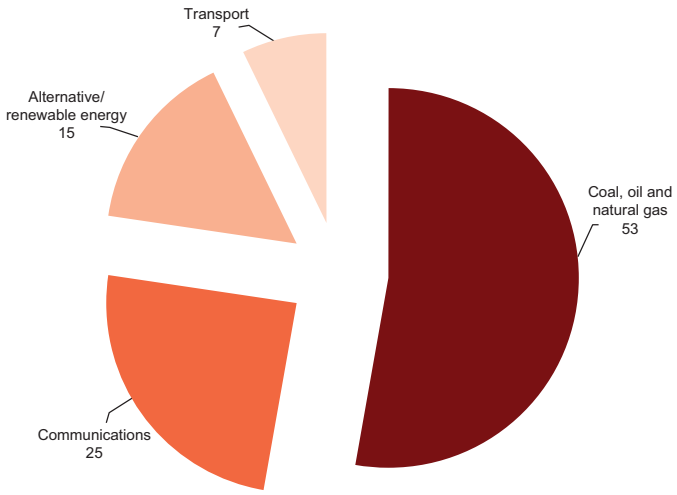


Source: Prepared by the authors on the basis of information from fDi Markets.

By economic infrastructure sector

Global FDI in South America can be broken down as follows by economic infrastructure sector: coal, oil and natural gas (53%), communications (25%), alternative/renewable energy (15%) and transport (7%) (see figure 7).

Figure 7
SOUTH AMERICA: GLOBAL INVESTMENT IN ECONOMIC INFRASTRUCTURE BY SECTOR, 2003-2011
(Percentages)



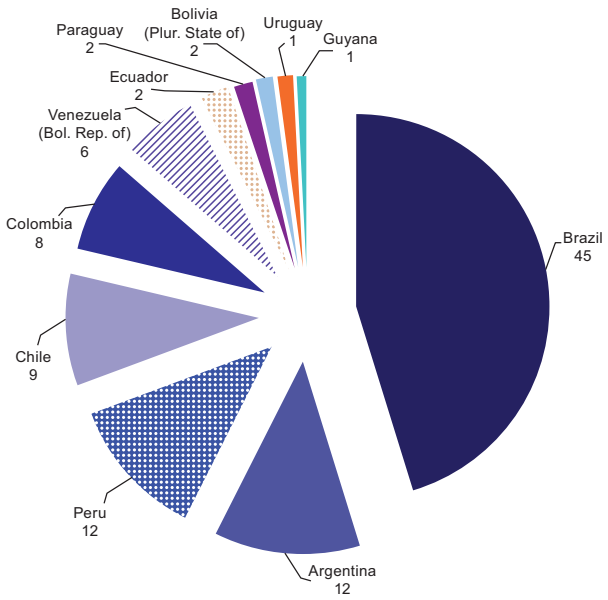
Source: Prepared by the authors on the basis of information from fDi Markets.

(c) Investment by Latin America and the Caribbean in economic infrastructure sectors in South America

By destination country

Figure 8 shows the breakdown of investment by Latin America and the Caribbean in greenfield projects in economic infrastructure sectors in South America, which amounted to US$ 37.770 billion between 2003 and 2011 (equivalent to 17% of global investment in South America). Brazil received the largest share (45%), followed by Argentina (12%), Peru (12%), Chile (9%), Colombia (8%) and the Bolivarian Republic of Venezuela (6%).

Figure 8
LATIN AMERICA AND THE CARIBBEAN: INVESTMENT IN ECONOMIC INFRASTRUCTURE SECTORS IN SOUTH AMERICA BY DESTINATION COUNTRY, 2003-2011
(Percentages)



Source: Prepared by the authors on the basis of information from fDi Markets.

By economic infrastructure sector

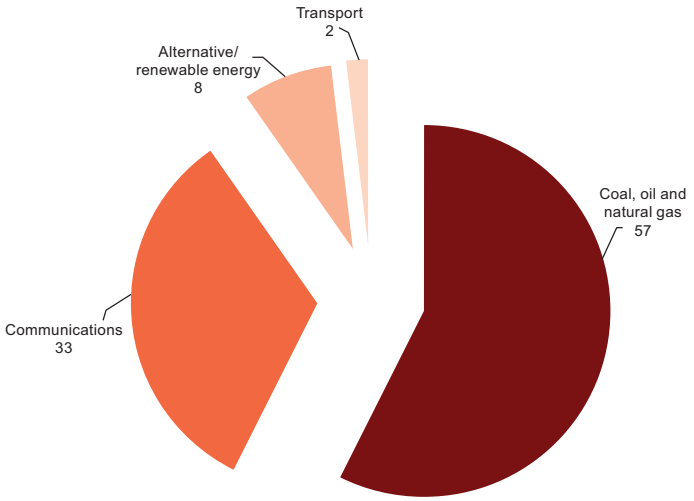
FDI originating in Latin America and the Caribbean received by South America can be broken down as follows by economic infrastructure sector: coal, oil and natural gas (57%), communications (33%), alternative/renewable energy (8%) and transport (2%) (see figure 9).

(d) Intrasubregional investment in economic infrastructure sectors

By country of origin

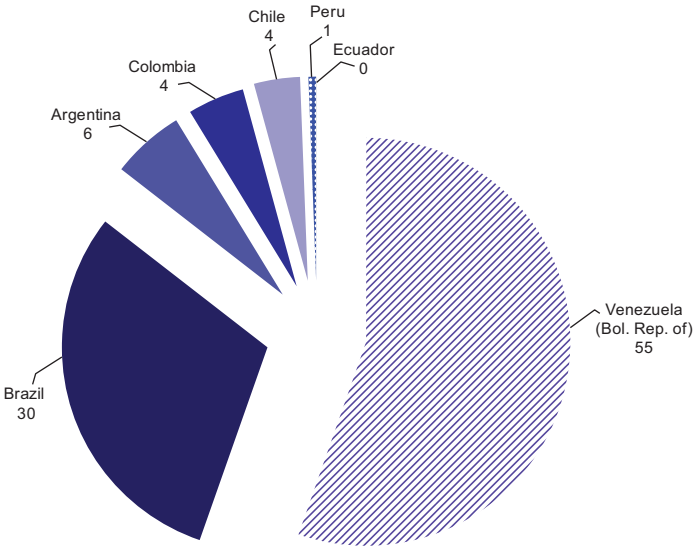
Figure 10 shows global investment in greenfield projects in economic infrastructure sectors in South America, broken down by country of origin. Totalling US$ 26.295 billion between 2003 and 2011, the bulk of that investment was generated by the Bolivarian Republic of Venezuela (55%), followed by Brazil (30%), Argentina (6%), Colombia (4%) and Chile (4%).

Figure 9
LATIN AMERICA AND THE CARIBBEAN: INVESTMENT IN SOUTH AMERICA BY ECONOMIC INFRASTRUCTURE SECTOR, 2003-2011
(Percentages)



Source: Prepared by the authors on the basis of information from fDi Markets.

Figure 10
SOUTH AMERICA: INVESTMENT IN ECONOMIC INFRASTRUCTURE SECTORS IN SOUTH AMERICA BY COUNTRY OF ORIGIN, 2003-2011
(Percentages)

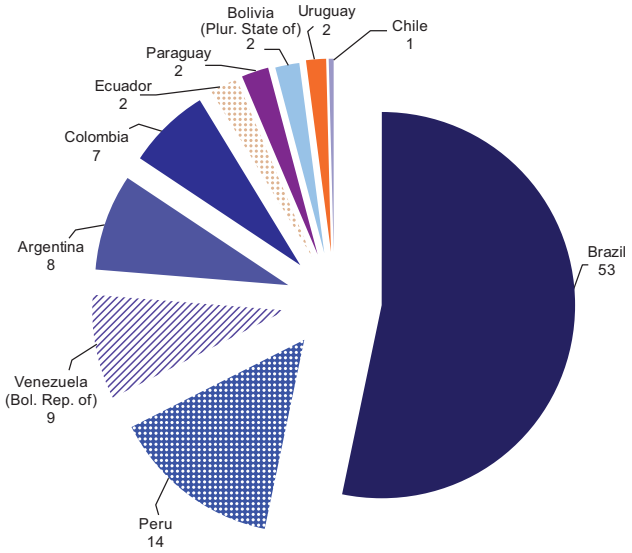


Source: Prepared by the authors on the basis of information from fDi Markets.

By destination country

The breakdown of FDI originating in and received by South American countries can be seen in figure 11. During the period 2003-2011, the majority of these investments were received by Brazil (53%), followed by Peru (14%), the Bolivarian Republic of Venezuela (9%), Argentina (8%) and Colombia (7%).

Figure 11
SOUTH AMERICA: INVESTMENT IN ECONOMIC INFRASTRUCTURE SECTORS IN SOUTH AMERICA BY DESTINATION COUNTRY, 2003-2011
(Percentages)

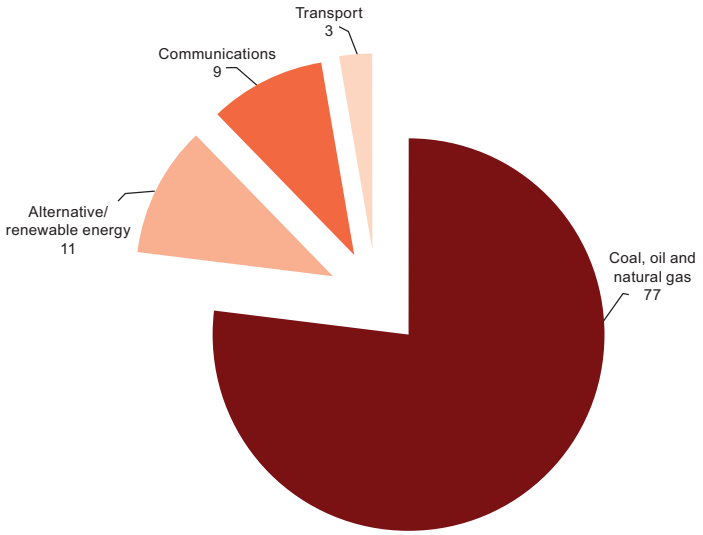


Source: Prepared by the authors on the basis of information from fDi Markets.

By economic infrastructure sector

South American FDI in South America can be broken down as follows by economic infrastructure sector: coal, oil and natural gas (77%), alternative/renewable energy (11%), communications (9%) and transport (3%) (see figure 12).

Figure 12
SOUTH AMERICA: INVESTMENT IN SOUTH AMERICA BY ECONOMIC INFRASTRUCTURE SECTOR, 2003-2011
(Percentages)



Source: Prepared by the authors on the basis of information from fDi Markets.

B. TRANSPORT AND LOGISTICS

1. The current position[7]

South America's lack of adequate infrastructure and truly efficient services is a major roadblock to the effective deployment of public policies that would help the region achieve social and economic development goals and regional integration objectives.

There is therefore considerable scope for improving the implementation of infrastructure services and maximizing the positive effects highlighted earlier. Efficient infrastructure services are crucial to economic and social development and integration, so it is abundantly clear that the main challenge facing the countries of South America and this subregion as a whole consists of aligning policy planning, design, execution, follow-up, oversight and evaluation to achieve maximum developmental impact. In other words, UNASUR member countries need to review their policies on infrastructure services; such a review should immediately be put on regional and national development agendas.

Investment in road infrastructure has helped bring about a complex scenario in which demand for transport infrastructure is increasing but supply is not; numerous bottlenecks have also appeared, caused by inadequate overland connections between the main corridors; too few transport links from major production centres to processing, consumption and export markets; physical constraints limiting bridge capacity; problems accessing the main cities; and physical deficiencies and poor organization at border crossings.

[7] Parts of this section draw on Cipoletta Tomassian and others (2011) and Cipoletta Tomassian (2011b).

Roads are not the only source of difficulty. Other transport infrastructure problems include limited sea lane capacity; connectivity problems; minimal or non-existent rail links; rail networks that are unable to handle the weight of trains operating at full capacity or unable to operate larger or faster trains; and insufficient overland access to the region's main ports, combined with inadequate depth and a shortage of yards.

The rail situation gives cause for concern since there have been lengthy delays in investing in and updating the network; only very recently has there been renewed interest in railways. The risk of port congestion is one of the most pressing problems, given that progress on port development projects has slowed. The following points must be emphasized with regard to port infrastructure and services: (a) traffic in the region is steadily growing and asset productivity is on the rise, but there has been little in the way of increases and improvements in sea access infrastructure, logistics and inland connectivity; and (b) the main ports have, in general, adapted to recent economic trends, although, worryingly, the region has been somewhat slow to undertake the renovation work necessary for sustainable port development moving forward. Inland connectivity, meanwhile, is suffering from organizational setbacks and failures that are driving up overall logistics costs and pose an obstacle to improving the competitiveness and productivity of the economies of the region.

Transport and trade development is hampered not only by inadequate infrastructure but also by institutional and regulatory issues in the sector. For example, a study on obstacles to the international overland transportation of freight within the Southern Common Market (MERCOSUR) (Cipoletta Tomassian and Sánchez, 2003) found that institutional problems were of greater consequence than physical infrastructure shortcomings.

Institutional issues include in particular the following points concerning market regulation, management and organization:

- Regulatory framework for infrastructure
- Risk management
- Competitive and transparent tendering processes
- Dispute resolution mechanisms
- Design of tendering, regulatory and oversight frameworks
- Barriers to international suppliers: for example, failure to provide tendering documents or databases in other languages limits competition among bidders, to the detriment of potential non-traditional foreign investors
- Project launch procedures
- Frequent contract renegotiation
- Poor public agency organization
- Lack of continuity within public organizations - of both civil servants and policy criteria
- Financing problems and practically non-existent operative capacity to maintain tertiary networks
- Red tape, multiple and overlapping national standards and procedures that cause delays and uncertainty over international transport clearance
- Too many trans-shipments, and excessive overtime and costs at border crossings and in loading and unloading operations at origin and destination
- Non-compliance with subregional regulations
- Varying degrees of professionalism among transport companies from different countries
- One-way, highly seasonal traffic and with frequent ballast-only return trips

- Asymmetrical tax treatment among countries
- Corrupt practices, such as informal payments

Other concerns include security of equipment and goods ("asphalt piracy"), physical safety (violence and theft) and high accident rates.

Furthermore, private investment generally targets the most profitable segments of the network and preservation and improvement activities, leaving the State responsible for the rest of the network. The installed capacity of the sector, therefore, tends to be limited by these peculiarities.

Both physical and regulatory or institutional shortcomings translate into high logistics and transportation costs that hinder future development. These costs loom larger than traditional trade barriers. A number of studies[8] have estimated logistics costs in Latin American countries to be around 16% to 25%, and the figures for South America are similar; this compares unfavourably with the average of 9% recorded in the member countries of the Organization for Economic Cooperation and Development (OECD). This situation has at least two consequences: (a) it is detrimental to the participation of South American economies in world trade since makes Latin American producers less competitive and pushes up the prices of imported goods; and (b) it erodes capacity to boost factor productivity. Both limit the potential social and economic development of UNASUR member States.

The immense pressure infrastructure is under, together with the importance this has acquired in development policy discussions, makes it increasingly urgent for countries to call for analysis of the main patterns of investment in infrastructure and the services that flow from it, especially transport. Investment and policies should be analysed and executed with attention to the following: (a) the level of coverage offered; (b) service efficiency and quality; (c) sustainability; and (d) links to complementary infrastructure services (in the case of transport, intermodality or co-modality). This requires:

- Appropriate operation of public-private partnerships
- A business environment that (a) offers greater investment security and efficiency and (b) promotes fairness for suppliers and users in the face of market distortions and failures, such as monopolistic practices
- A modern, integrated and sustainable public policy that can create appropriate conditions for developing infrastructure services, and regulatory mechanisms that prevent pernicious and abusive distortions

There is also a need for appropriate plans to maintain existing infrastructure;[9] better supervision and oversight of concession project management; improvements to the legal and regulatory framework governing infrastructure concessions; and restructuring of business areas during contract renegotiation.

The challenges facing the countries and the region as a whole regarding transport infrastructure services may be summarized as follows:

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[8] See for example ECLAC/IDB/WB (2010).

[9] Currently, poor preservation and maintenance policies tend to exacerbate problems ensuing from an intensive or excessive use of the existing infrastructure (Sánchez, 2008).

- Transport infrastructure under strain, testifying to the shortfall in these and related services
- Insufficient integration of policies on infrastructure and services, and multiple public perspectives (encompassing planning, design, implementation and follow-up, oversight and evaluation)
- Institutional and regulatory obstacles affecting policy management and market organization
- Lack of sustainability criteria when designing infrastructure service policies, particularly in the area of transport
- Transport and trade facilitation issues, principally owing to flawed technical regulations and bureaucratic trade processes
- Gaps in access to financing, limited sources of funding and immature capital markets
- Flawed design and set-up of public-private partnerships, whose potential is only partially exploited
- Immature infrastructure markets and regulatory accounting issues
- Gaps in professional and job training

Maximizing the development impact of infrastructure services also calls for a review of infrastructure and services at the regional level so as to deepen the physical integration of the countries of South America. The weak and unsatisfactory development of transport infrastructure has not only had a direct, negative impact on the productivity of economic agents and the competitiveness of firms in the region; it has also made it more difficult to develop and link territories and markets at both the national and regional level (Cipoletta Tomassian, 2011).

In connection with the analysis presented here, the ECLAC publication entitled *Time for equality: closing gaps, opening trails* highlights that current infrastructure and transport policies largely reflect a system of market, State and society relationships that to date has not maximized the positive development impact of infrastructure services. Accordingly, ECLAC (2010d) has stressed that comprehensive development requires a new State-market-society equation including political agreements geared towards a new social and inter-generational commitment with well defined responsibilities and clear accountability. For this to happen, integrated and sustainable public policies on logistics and mobility are needed and must become true matters of State, steered by institutions instead of being tied to any given administration. State capacities must also be buttressed and public policies must be addressed from a more comprehensive and sustainable point of view, with greater involvement on the part of the private sector and civil society.

2. Evaluation of transport infrastructure service policies and proposed paradigm shift

Based on the evaluation above, and according to a number of studies[10] conducted in the countries of South America by the Infrastructure Services Unit of ECLAC, the weakening role of the State since the 1990s has led to a decline in the use of strategic planning instruments and tools. This has fuelled two key problems, as mentioned earlier, which now emerge as major factors for assessing the sector's development and will be discussed in the sections that follow. They are the lack of an integrated approach to transport, infrastructure, logistics and mobility policymaking, and a failure to apply sustainability criteria when designing and implementing policies. In response, this section also proposes a policy paradigm shift.

[10] For further details, see Cipoletta Tomassian (2011b).

(a) A comprehensive approach to public policy

Public infrastructure and transport policies have traditionally been handled separately and implemented in a different way depending on the mode of transport (mode-specific policies), hampering the efficient provision of public assets of strategic interest. Because of this disconnect, in most instances infrastructure is planned by one institution (ministry, specialized agency or other government body) and implemented by another. Services tend to be regulated by a third institution that very often had no input at the design stage. Similarly, plans relating to freight transport, passenger mobility and environmental considerations tend to be dealt with separately; responsibility for planning very often falls to yet another public body. Even though logistics is universally acknowledged to be crucial to the competitiveness of an economy, it is frequently left out during infrastructure and transport planning.

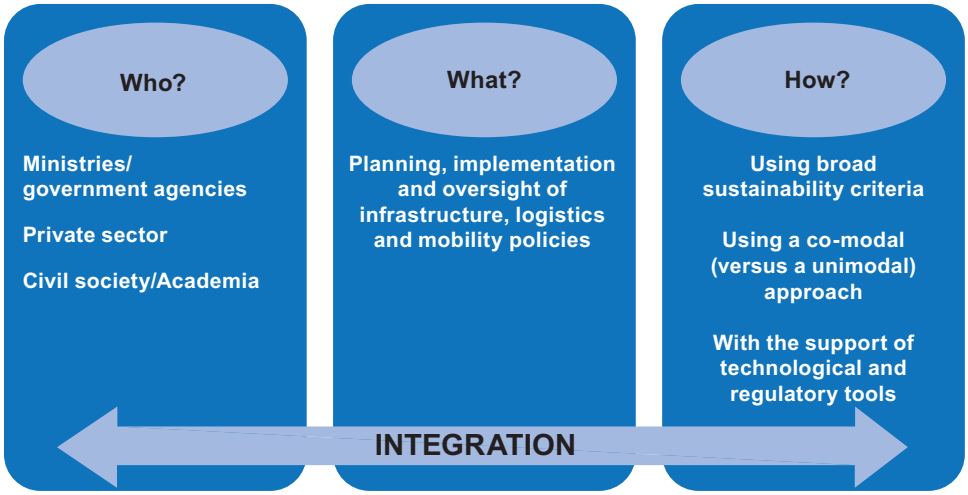
As previously highlighted, even though it is well known that transport infrastructure and services have a positive development impact, studies of South American transport and infrastructure policies (Cipoletta Tomassian, 2011a) reveal a disconnect between policies for planning and providing infrastructure and policies relating to transport operation and promotion. This appears to be rooted, among other factors, in overlapping roles and, in some cases, in open competition between or lack of coordination among State bodies, which undermines the effectiveness of the proposed public or private action. In fact, in more than a few cases in the subregion, the ministry of infrastructure or public works responsible for infrastructure planning is completely separate from the transport ministry, as though infrastructure and the transport services that use it could possibly exist independently of one another, or as though the operation of transport services did not lead to changes in demand for infrastructure or social and economic development externalities for the country in question. There may also be a planning ministry, responsible for studying territorial development, an agency fostering private investment and yet another working on environmental protection. It is clear that when coordination is so complicated, the overall consistency of the policy area suffers and, above all, development issues may be pushed into the background and endlessly delayed as other matters take priority at the national level. The failure to take an integrated approach to the design and implementation of infrastructure service policies ultimately affects the end user, who, whether directly or indirectly, has financed a project that is more costly, unsafe or fails to offer positive synergies for local and regional development because it was planned without an overarching vision (Cipoletta Tomassian and others, 2010a).

The lack of comprehensive infrastructure and transport service policies leads to situations such as this. An integrated approach, on the other hand, is defined as coordinated planning and implementation by public agents and civil society for all the modes of transport involved in moving passengers and domestic and international freight, together with the corresponding logistics. Such an approach also requires the coordinated incorporation of criteria for efficient use of transport infrastructure, promotion of intermodality/co-modality and ICT support.

An integrated approach means bringing all the parts together to make a whole. In terms of policies on infrastructure and transport services, this comprises at least three areas: Who? What? How? Figure 13 provides a snapshot of the arguments put forward in the conceptualization of the integrated approach.

An integrated approach to national policymaking means acknowledging the multidimensional nature of certain pillars of social and economic development such as infrastructure, logistics and mobility; interdependent policies would address this more effectively than the current disjointed ones.

Figure 13
INTEGRATED APPROACH



Source: Cipoletta Tomassian (2011b).

Logistics is clearly a cross-cutting matter; it encompasses production, trade and business development, the transport sector, information and communications technologies, goods control and the facilitation of transport and trade, and it includes the entities involved in the whole process. These entities may be private sector (producers, logistics and transport companies, distributors, and other actors associated with trade in goods) or public sector (regulation, oversight, security, infrastructure provision and trade facilitation). There are plenty of reasons why governments should strive to develop a more efficient logistics system, whether to boost the competitiveness of exports and national infrastructure, spur international trade, conquer new markets, promote employment in the services sector, or mitigate environmental and social externalities such as congestion, high accident rates, poor security and pollution. (Cipoletta Tomassian, Pérez and Sánchez, 2010a). Transport mobility measures must be implemented in parallel, since they connect residents and facilitate their access to activities and to services via various modes of transport. The aim is to maximize access while minimizing pollutant emissions, congestion and accidents.

In light of the above, uncoordinated policy action on infrastructure, in the absence of an overarching vision of the supply chain and trade and production flows or public connectivity, fails to capitalize on opportunities to improve mobility and the national logistics system and, consequently, the associated social and economic benefits.

Incorporating an integrated approach to infrastructure, logistics and mobility policies would help improve and strengthen Latin American government institutions, boosting coordination and consistency within the State and consolidating the relationship with the private sector through modern regulatory frameworks that strike a balance between investment planning, evaluation, capacity and maturity. The main focus should be on overall economic development encompassing not only financial factors but also infrastructure services, logistics and mobility, all of which are fundamental to driving the region's economic and social development.

To summarize, then, consolidating an integrated infrastructure, logistics and mobility policy at the national level via the organization, cooperation and coordination of inter-sectoral, interdepartmental and intermodal action is the most feasible way of ensuring that passengers and goods circulate as efficiently, effectively and safely as possible. This will boost productivity, competitiveness and national economies and promote social inclusion and development.

(b) Sustainability and public policies

Sustainability is defined as a set of strategies that ensure current needs are met without compromising the ability of future generations to meet their needs (Brundtland, 1987). It encompasses the environmental, economic, social and institutional spheres. When referring to infrastructure and transport services, it means sustainable transport under policies that cover creating infrastructure, improving transport services and incorporating logistics, mobility and trade and transport facilitation, all based on development that is sustainable in time and space.

South America lags behind on transport and infrastructure partly because there is a substantial shortfall of transport infrastructure services but also because the region is taking a long time to apply sustainability criteria (economic, social, institutional and environmental considerations) when designing and implementing transport programmes and policies and, as a result, when making investment decisions. This lag is clearly illustrated by the modal transport split in the countries of the region, in which more-polluting modes have an ever larger share. While in the European Union the modal distribution is already shifting towards less-polluting forms of transport, in South America, worryingly, policy decisions tend to focus on the highway sector to the detriment of rail and water transportation (such as short-distance maritime transport and river and lake systems).

The study on Latin American transport policies coordinated by the Infrastructure Services Unit of the Natural Resources and Infrastructure Division at ECLAC found that the concept of sustainability was explicitly mentioned by almost every country in the region in its government policies. Yet when it comes to specific transport and infrastructure service policies and plans, there has been very little development or actual implementation. This finding may be easily extrapolated to South America: although some countries have laid out objectives, strategies and lines of action for including environmental sustainability in their transport policies, in most cases, these criteria have not been incorporated into policy benchmarks. Moreover, the concept of sustainability in its broad sense is usually overlooked, with attention being focused on its economic, and to a lesser degree, social dimensions while its institutional dimension is almost entirely neglected (Cipoletta Tomassian and others, 2010b).

Case studies on institutional sustainability reveal a number of factors hindering the design and implementation of public policies, owing to weaknesses in the prevailing political and institutional framework. These may be summarized as follows: little political will to implement strategic planning (political theory rather than implementation); inconsistent policies; lack of measurable indicators for follow-up; uncertainty regarding change in the public administration; fear of a paradigm shift in planning and executing policies; pressure, political lobbying and too-powerful sectoral interests, perpetuating the imbalance among transport modes; multiple, uncoordinated jurisdictions over federal territories, and poor training of technical staff responsible for sectoral policy. These limitations are found in the countries of South America in different forms and to varying degrees. They represent significant potential obstacles to the formulation and implementation of transport and infrastructure policies and must be acknowledged in order to find positive ways to address them.

As far as planning is concerned, the region's transport and infrastructure policies and programmes sometimes call for improving the sustainability of their transport systems but make no provisions for tools that would incorporate this. Environmental policies have just begun to include transport and infrastructure proposals, but it is still unusual to come across specific projects with clear and detailed goals for developing and promoting lower-emission modes of transport to replace cars and improve the environmentally regressive modal distribution that currently prevails in South America. Besides, there are few instruments or methodologies for assessing the sustainability of transport infrastructure service policies or mechanisms[11] for overseeing and monitoring the implementation of these criteria (Cipoletta Tomassian and others, 2010b).

The countries of South America thus need to start including broad sustainability platforms in their public infrastructure and transport policies, not only because it is a way to address negative externalities and mitigate the environmental and social costs associated with building infrastructure and use of this infrastructure by transport services, but also because sustainability can affect competitiveness and insertion throughout the domestic economy. This becomes plain in light of the measures taken by some European governments and companies, such as the growing trend for the carbon footprint of imported food products to be marked on the label to make the consumer aware of the greenhouse gases produced in processing and transporting products. Such steps tend to equate to non-tariff barriers to trade, and although these regulations are currently not widespread, they have the potential to become so in the near future. As governments continue to sign international environmental protocols, there will be rising pressure for them to incorporate these guidelines, which could significantly affect the competitiveness of exports. Depending on when these guidelines are introduced, the impact on the domestic economy will vary. If they are adopted early, they could provide an added value to export competitiveness, making it possible to conquer new markets with greater purchasing power and higher levels of environmental awareness. Late adoption, on the other hand, could mean loss of market share even though the competitive value of products remains the same.

In the case of freight, the absence of sustainability criteria is clearly demonstrated by the rising share of motor vehicles at the expense of other available modes of transport. Without sustainability criteria, it is impossible to weigh all the available technological options when evaluating a transport system, using objective parameters such as the investment required, the operational costs and the number of tons transported for the emissions generated. These factors translate into additional logistics costs, which detract from an economy's competitiveness and generate rising negative social and environmental externalities owing to the use of road vehicles even when the distance involved makes it uneconomical to do so.

Accordingly, a key objective in pursuit of sustainable transport is to change the existing distribution of modes of transport employed in the domestic and regional mobility of people and goods. This requires application of the co-modality principle. Co-modality, a concept used in the field of transport policy, seeks efficient modal distribution of transport and related services for each trip and group of trips via the optimal use of each mode of transport and its possible combination with other modes, so that the overall journey is efficient and sustainable depending on the transport needs and the

[11] Some countries have suggested incorporating strategic environmental assessments. This would constitute a formal, systematic and broad process for determining and assessing the environmental impact of the proposed policies, plans and programmes to ensure that these criteria are incorporated and addressed at the earliest possible stage of decision-making, together with economic and social considerations. However, this mechanism has not yet been implemented on a large scale.

distance to be covered.[12] The co-modality principle may therefore be applied to both passenger mobility and freight transportation in all geographical settings. Co-modality represents a new approach to transport policy. It is not based on competition or connections between different modes of transport, but rather endeavours to achieve optimal levels of resource utilization via the use of different modes on their own or in combination in the most convenient and sustainable way. The co-modality principle therefore encompasses and even surpasses multi-modality and intermodality: rather than focusing on the legal regime regulating transport, or on whether the transport system employs two or more different modes, or on who organizes and takes responsibility for trips, it focuses on the effectiveness and efficiency of transport services as a key link in the supply chain. This makes co-modality a key criterion for achieving sustainable transport infrastructure services. The concept proposes a paradigm shift that would help reduce logistics and transportation costs (social and economic impact), make transport more energy efficient (environmental and economic impact) and reduce externalities (social and environmental impact) (Cipoletta Tomassian, 2011b).

(c) Proposal for a policy paradigm shift

The latest ECLAC studies on infrastructure and transport policies in the region recommend that countries include both passengers and goods (mobility and logistics) in their policies and incorporate the integration and sustainability criteria set out herein. At minimum, policies should be (Cipoletta Tomassian, 2011b):

- National: they should cover the whole country and be endorsed at the highest level of government in the form of consistent policies and plans;
- Integrated: they should make reference to both transport infrastructure and transport services, include all modes of transport in a single review process and incorporate mobility and logistics as the common theme;
- Consensus-based (participatory): they should result from discussions that include the public and all public and private actors in the sector, and should be decided by consensus;
- Accepted: they should be well known to and accepted by operators, users, and by public opinion, so they are not vulnerable to shifting circumstances and eventualities;
- Coordinated: the institutions involved should have clear roles and should coordinate among themselves to ensure any action taken is consistent and concerted;
- Able to rely on institutional capacity for implementation: there should be an appropriate institutional framework that covers all bodies associated with the issue in order to avoid gaps and overlaps; trained, committed staff is a must;
- Based on clear concepts: central ideas are needed that serve as the policy linchpin, that are in harmony with broader national policies on economic and social development and with regional integration goals;
- Co-modal: they should include all modes of transport; and
- Based on sustainable development: broad sustainability criteria (economic, social, environmental and institutional considerations) should be included throughout.

With a view to finding a solution, the studies conducted by ECLAC suggest initiating a paradigm shift, to begin moving away from the current modal, disjointed policies towards others that are integrated,

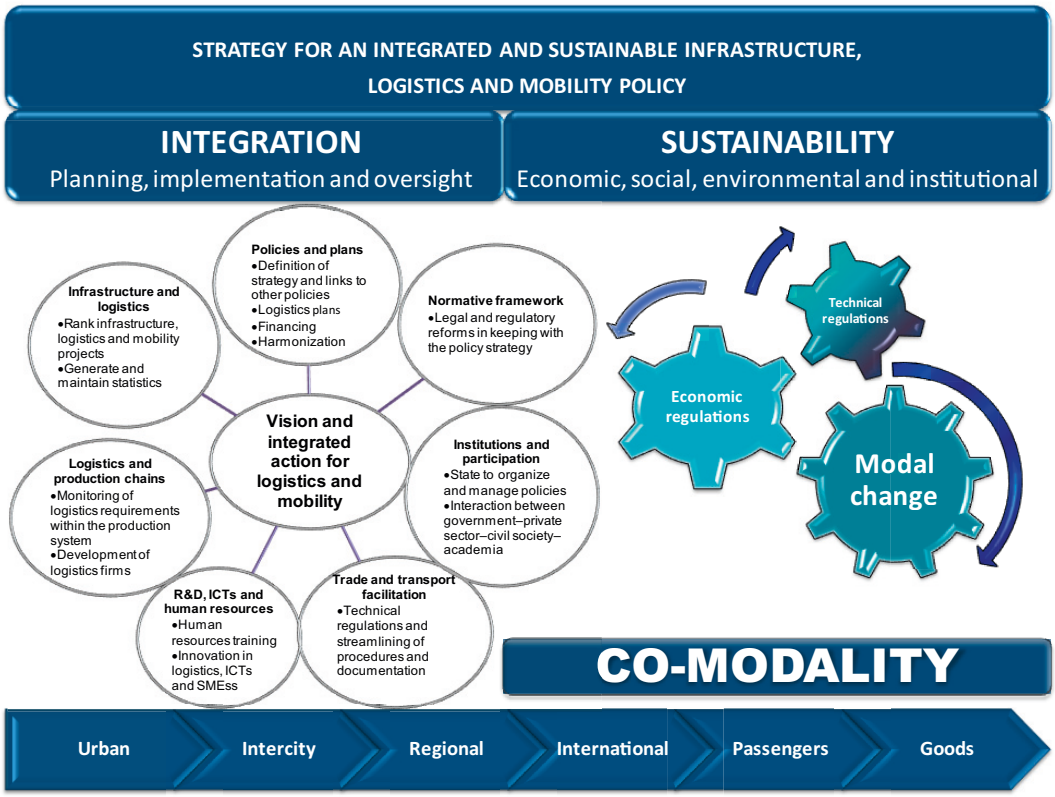
[12] This definition of co-modality is in line with that originally coined by the European Commission (COM (2006) 336 final), according to which co-modality is the efficient use of transport modes operating on their own or in multimodal integration in the European transport system to reach an optimal and sustainable utilization of resources.

sustainable and designed from a co-modal perspective. These policies should call for instruments to regulate the market (economic) and the sector's technical aspects and drive modal change towards sustainability.

The proposed paradigm shift is a necessary step in order to make progress on formulating a strategy for integrated and sustainable policies on infrastructure, logistics and mobility in South America. Such a strategy offers the best prospects for addressing the problems associated with development and will also help make transport services more cost-effective and reduce negative externalities that affect the public.[13]

Figure 14 outlines the proposed paradigm shift towards a strategy comprising integrated and sustainable infrastructure, logistics and mobility policies.

Figure 14
SOUTH AMERICA: PROPOSED PARADIGM SHIFT



Source: Cipoletta Tomassian (2011b).

In brief, then, UNASUR countries need to review their transport infrastructure service policies and adopt a new paradigm with an integrated and sustainable approach. The main challenge consists of aligning policy planning, design, execution, follow-up, oversight and evaluation with maximum

[13] See Cipoletta Tomassian, Pérez and Sánchez (2010a) for case studies of countries that have implemented the integrated approach in their policies.

development impact. Developing and incorporating indicators for tracking the strategy will be fundamental to monitoring policies, assessing progress and adjusting the variables as required.

Incorporating an integrated approach to infrastructure, logistics and mobility policies would help improve and strengthen Latin American and Caribbean government institutions, boosting coordination and consistency within the State and consolidating the relationship with the private sector through modern regulatory frameworks that strike a balance between investment planning, evaluation, capacity and maturity. Without doubt, the main focus should be on overall economic development —not only financial aspects, but also infrastructure services, logistics and mobility, all of which are fundamental to the subregion's development. Consequently, consolidating an integrated infrastructure, logistics and mobility policy at the national level via the organization, cooperation and coordination of inter-sectoral, interdepartmental and intermodal action is the best way to ensure that passengers and goods circulate as efficiently, effective and safely as possible. This will boost productivity, competitiveness and national economies and promote social inclusion.

UNASUR countries also need to start bringing broader sustainability issues into their public infrastructure and transport policies. This means approaching the problem not only as a way to address negative externalities and mitigate the environmental and social costs associated with building infrastructure and using it to provide transport services but also to boost competitiveness and the engagement of the entire domestic economy. This means striving for sustainable public policy in order to foster modal change that will benefit the four pillars of sustainability.

The modal shift that is needed here is not simply a redistribution. It is a change that is in keeping with the principle of co-modality in passenger mobility and freight transportation in all geographical settings (urban, intercity, regional and international). Nevertheless, technical and economic regulation tools are needed for this pillar to operate fully. This involves introducing technical standards that make up a regulatory and supervisory mechanism and incorporating pricing tools to correct, penalize, offset or encourage certain behaviours among users in order to stimulate this modal shift and achieve a balance between modes of transport that optimizes resource utilization.

The proposed new paradigm to improve infrastructure and transport services must be part of a broader State policy to boost competitiveness and social and economic development. Modal complementarity, modernization and lower emissions from the transport sector contribute to these objectives and, accordingly, must be dealt with within an integrated and sustainable policy. In conclusion, the new paradigm of integrated and sustainable infrastructure, logistics and mobility policies, based on the principle of co-modality and supported by appropriate regulatory tools, is an approach that can make a real contribution to the main national goals for economic and social development. It can also help reduce transport's negative externalities (in relation to climate, environment and society for example) by providing infrastructure more efficiently and promoting alternative, more sustainable, modes of transport.

The foundations for this paradigm shift have been laid down; they call for reviewing the existing policy structure and working on drawing up a strategy for formulating and establishing integrated and sustainable infrastructure, logistics and mobility policies to be incorporated into regional and national development agendas.

The weak and unsatisfactory development of transport infrastructure has not only had a direct, negative impact on the productivity of economic actors and on the competitiveness of the region's companies, territories and countries. It has also indirectly affected the region's development through its

adverse impact on the furtherance of links between territories and markets both domestically and internationally, diminishing the benefits of integration for productivity and competitiveness.

Aside from the points already mentioned, such the region's physical integration, logistics and transport costs, and the productivity of economic agents, this process has also resulted in poor inland connectivity, persistent difficulties facilitating transport and trade, and, above all, a loss of competitiveness in the production activities of countries and territories. This loss of competitiveness arises both from the growing divergence between supply and demand for infrastructure services and from the widening infrastructure development gap between the region and developed countries, and most worryingly, between the region and other emerging economies. Infrastructure services in the latter were clearly below Latin American standards a few decades ago, but they are now outperforming the region.

Developing and linking territories and markets nationally and regionally is strategically important because carrying out infrastructure work within the framework of regional integration policies makes it possible to internationalize infrastructure services, promotes the economic, political and social integration of countries, and helps compensate for natural resource shortfalls in individual countries. Furthermore, it would help the countries of the region achieve a greater level of product specialization, reduce their logistics costs, develop competitive advantages in global markets and raise their profile in the global economy if sufficient infrastructure works of regional interest are in place that facilitate connectivity and the efficient provision of related services (Cipoletta Tomassian, 2009).

Regional integration of infrastructure is a key factor in fostering growth and achieving higher levels of development in the subregion. South America therefore needs to develop and pursue formulas that enable it to operate as an integrated area. An essential element of this is physical infrastructure that connects all the countries of the subregion, providing road, railway, river, air and sea transport links and efficiently integrating the different forms of energy and telecommunications. To move closer to achieving this goal, connectivity problems need to be resolved, encouraging better national integration policies that facilitate the development of transport and trade in the region. The long-term goal would be to move towards a regional infrastructure, transport and logistics policy that meets South America’s needs.

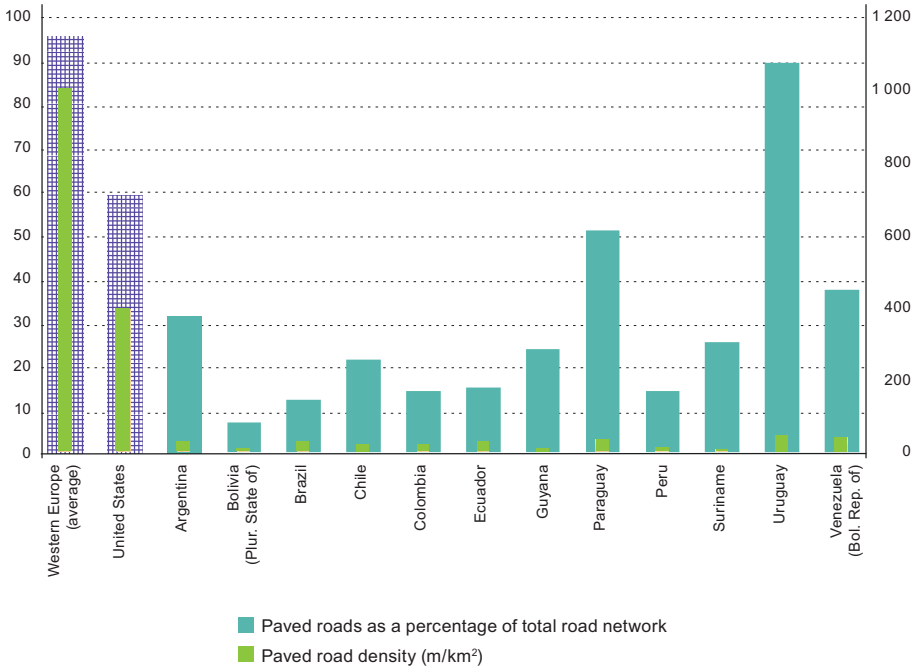
3. Basic transport infrastructure indicators in South America

(a) Physical infrastructure indicators

In order to assess the current state of transport infrastructure in South America and the challenges facing the subregion, a set of data and basic infrastructure indicators will be reviewed. Key data on transport infrastructure (roads, railways, maritime, river and air transport) will be studied for the countries in the subregion under review. These indicators will also be compared with those for developed countries.

Some road network indicators (see figure 15) show a widespread, substantial dearth of paved roads in comparison with developed countries in Western Europe and the United States. Uruguay is the only exception, with a significantly higher percentage of paved roads (89% of the total). It is followed by Paraguay (51%), the Bolivarian Republic of Venezuela (37%) and Argentina (31%). Nevertheless, the land area density or coverage of this network of paved roads in Uruguay, measured in total linear metres of paved roads per square kilometre of land area, is low (44 m/km^2) compared with developed countries (the average in Western Europe is 944 m/km^2, while in the United States it is 390 m/km^2).

Figure 15
SOUTH AMERICA: PROPORTION OF PAVED ROADS
(Percentages and linear metres per square kilometre)



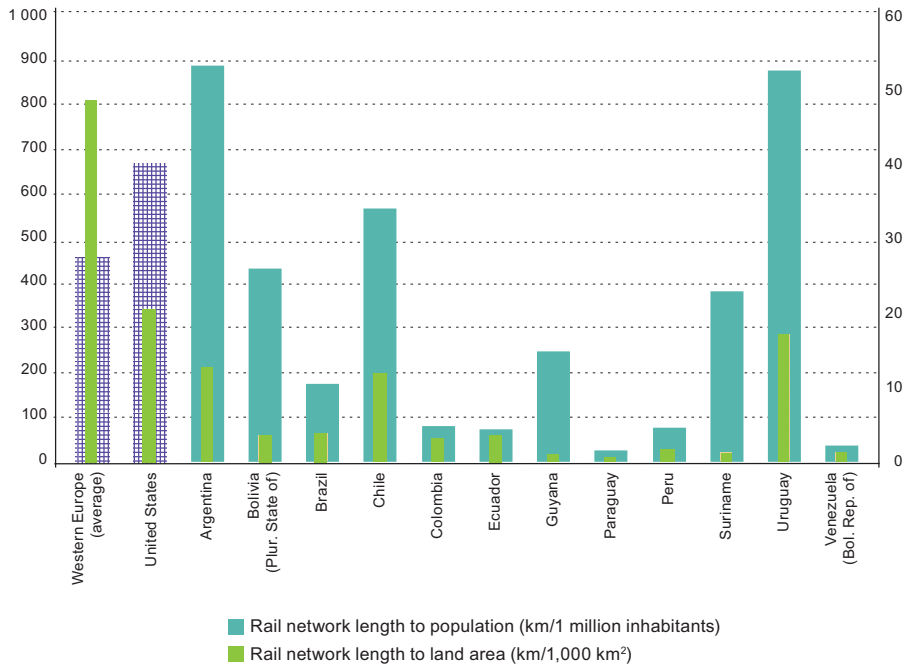
Source: Economic Commission for Latin America and the Caribbean (ECLAC) and World Bank (2011).

With regard to rail infrastructure, figure 16 shows the land area density or coverage of the rail network and the coverage of the network in terms of the total population in each South American country, compared with the United States and the average for Western Europe. Rail network density in Argentina and Uruguay is better (17 km/1,000 km^2 and 12 km/1,000 km^2, respectively), but it still significantly lower than the average for Western Europe (48 km/1,000 km^2) and the United States (20 km/1,000 km^2). Nevertheless, the findings for network density by population are unusual: some South American countries (Argentina, Plurinational State of Bolivia, Chile and Uruguay) score higher than Europe or the United States.

According to figure 17, the figures for the land area and population density of waterways compare favourably with the United States and Europe, particularly in the case of land area density in Colombia and population coverage in Suriname. However, this is not reflected in the actual utilization of the river transport mode, which, apart from in Paraguay and Uruguay, is marginal in South America in terms of the modal distribution of passenger and goods transport (ECLAC, 2009).

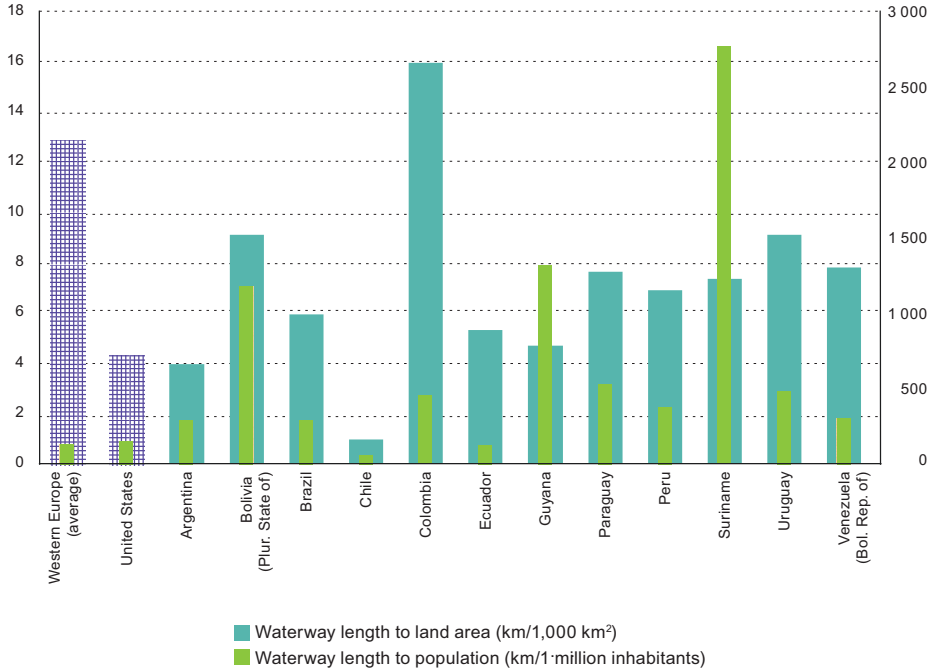
Table 6 presents some of the main maritime and port activity indicators, to be viewed in conjunction with the logistics performance indicators shown in the pages that follow. These indicators provide a clearer picture of the capacity of South American countries to cope with a sustained increase in foreign trade.

Figure 16
SOUTH AMERICA: RAIL NETWORK DENSITY



Source: Economic Commission for Latin America and the Caribbean (ECLAC) and World Bank (2011).

Figure 17
SOUTH AMERICA: WATERWAY DENSITY



Source: Economic Commission for Latin America and the Caribbean (ECLAC) and World Bank (2011).

Table 6
SOUTH AMERICA: MARITIME AND PORT ACTIVITY INDICATORS

Countries	**Port infrastructure quality indicator**	**Shipping connectivity index**	**Port container traffic, 2010** *(twenty-foot equivalent units (TEU))*
Argentina	3.76	27.61	1 821 162
Bolivia (Plurinational State of)	2.87	...	...
Brazil	2.94	31.65	7 576 075
Chile	5.46	22.05	3 137 285
Colombia	3.46	26.13	2 447 727
Ecuador	3.68	18.73	1 221 849
Guyana	3.50	3.95	...
Paraguay	3.35	0.65	7 045
Peru	3.30	21.79	1 532 100
Suriname	3.32	4.12	57 000
Uruguay	5.15	24.46	671 952
Venezuela (Bolivarian Republic of)	2.43	18.61	333 539

Source: World Economic Forum, Global Competitiveness Report 2011-2012; United Nations Conference on Trade and Development (UNCTAD), Review of Maritime Transport 2010; Economic Commission for Latin America and the Caribbean (ECLAC), "Base de datos del perfil maritimo"; ci-online, www.ci-online.co.uk.

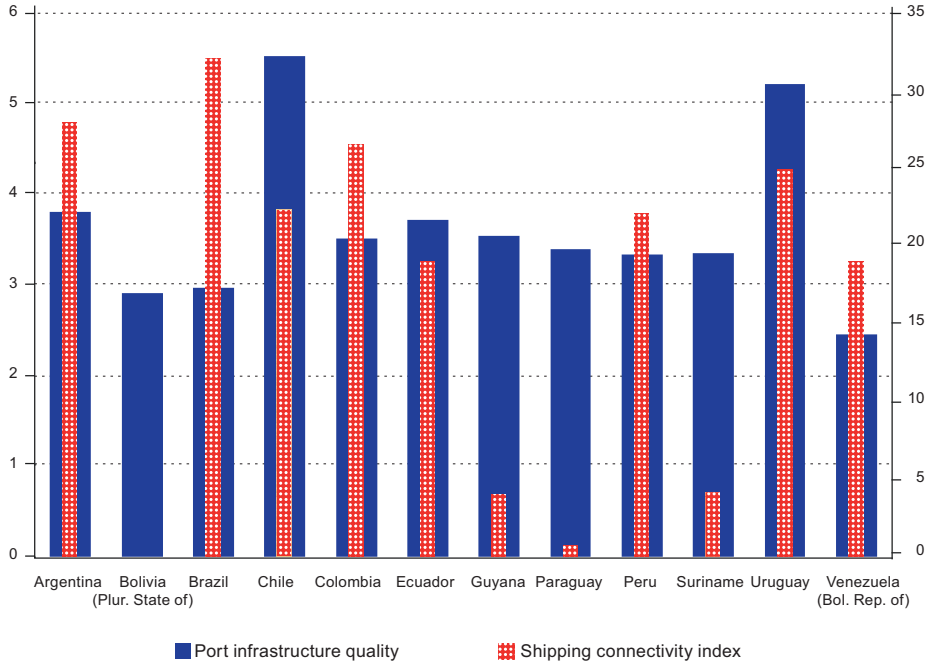
Port infrastructure quality (World Bank/WDI, 2011) measures business executives' perception of their country's port facilities. The data are taken from the Executive Opinion Survey, conducted annually for the past 30 years by the World Economic Forum in cooperation with 150 partner institutes. The 2009 round included more than 13,000 respondents from 133 countries. Sampling follows a dual stratification based on company size and sector of activity. The scores range from 1 (port infrastructure considered extremely underdeveloped) to 7 (port infrastructure considered well developed and efficient by international standards). Efforts have also been made to evaluate the accessibility of port facilities in landlocked countries (1=extremely inaccessible; 7=extremely accessible). Among the South American countries under review, the results for Chile (5.46) and Uruguay (5.15) were very good while the Bolivarian Republic of Venezuela (2.43) and the Plurinational State of Bolivia (2.87) performed less well.

The shipping connectivity index (World Bank/WDI, 2011) indicates how well connected countries are to global shipping networks. It is calculated by the United Nations Conference on Trade and Development (UNCTAD) on the basis of five shipping sector components: number of ships; their container-carrying capacity; the size of the largest vessels; the number of services provided; and the number of companies deploying container ships in a country's ports. The countries with the highest indices were Brazil (31.65) and Argentina (27.61), while Paraguay (0.65), Guyana (3.95) and Suriname (4.12) had the lowest indices.

The indicators described above are depicted in figure 18.

In terms of maritime traffic, measured in twenty-foot equivalent units (TEU), Brazil, Chile and Colombia perform better than the rest of South America.

Figure 18
SOUTH AMERICA: PORT INFRASTRUCTURE QUALITY INDICATOR AND SHIPPING CONNECTIVITY INDEX, 2010



Source: World Bank (2011).

Figure 19 shows port development over the period 2002-2010 on the east coast of South America. Port activity has expanded on average by around 10%, despite the 2009 economic crisis.

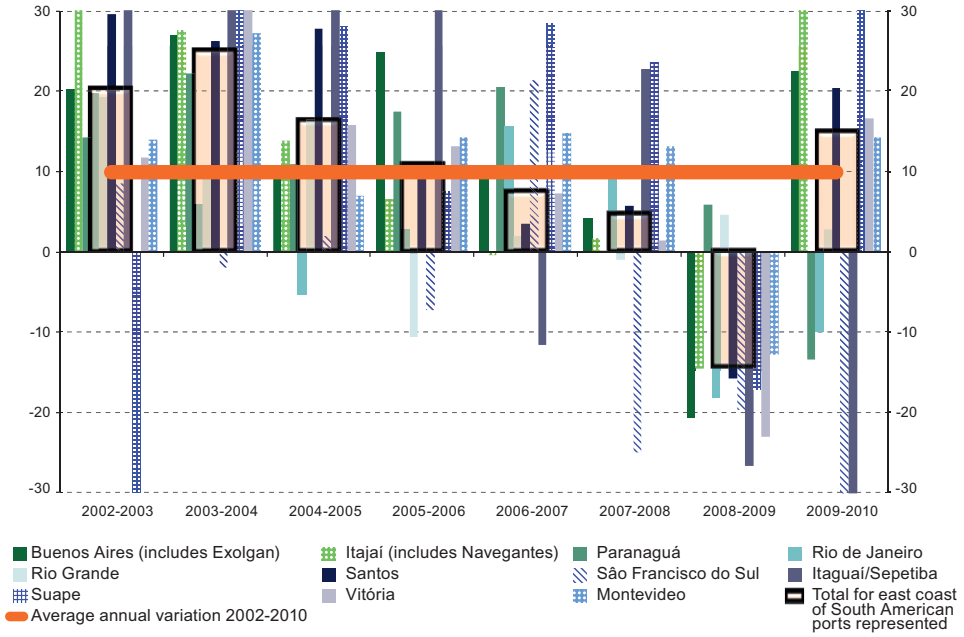
Port activity on the west coast has growth by an average of 14%, despite the 2009 economic crisis (see figure 20).

With regard to air freight, Brazil, Chile, Colombia and Peru stand out. But international air freight in the subregion generally accounts for a small share of total international air freight flows in comparison with other modes.

The number of airports per country in South America is another interesting indicator. Further information on this is provided below.

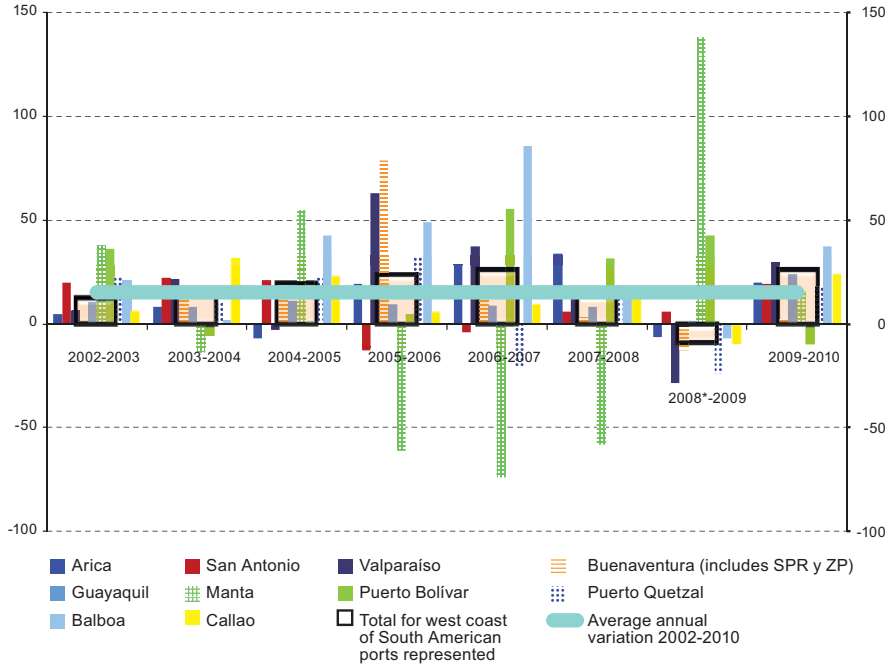
Argentina's National Airport System has 54 airports, 37 of which are concessions. Other airports are run by the National Airport System Regulatory Agency, set up in 1997 to regulate and supervise airport activity.

Figure 19
SOUTH AMERICA (EAST COAST): PORT DEVELOPMENT, 2002-2010
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC) (2011a).

Figure 20
SOUTH AMERICA (WEST COAST): PORT DEVELOPMENT, 2002-2010
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC) (2011a).

Table 7
SOUTH AMERICA: AIR FREIGHT, 2009
(Millions of tons per kilometre)

Countries	Air freight
Argentina	111.66
Bolivia (Plurinational State of)	6.87
Brazil	1 782.30
Chile	1 179.05
Colombia	2 419.93
Ecuador	3.23
Guyana	1.60
Paraguay	0.00
Peru	256.94
Suriname	35.20
Uruguay	3.76
Venezuela (Bolivarian Republic of)	1.86

Source: International Civil Aviation Organization (ICAO), world civil aviation statistics and estimates by ICAO staff.

The Plurinational State of Bolivia has 13 airports, but only three are international terminals.

There are 67 airports in Brazil; they are managed by the State via INFRAERO (Brazilian Airport Infrastructure Company). A total of 31 are international airports.

Chile has seven international airports, 28 airports run by the General Directorate of Civil Aeronautics, 38 private airfields for public use, 198 private airfields, 53 government-owned public airfields and 6 military airfields.

Colombia's irregular topography has spurred the development of air transport. For many isolated communities in the Amazon region, the Orinoco area and along the Pacific coast, air transport is the only transport link with the rest of the country. Air transport also plays a key role in the international transportation of freight and passengers. In fact, international air freight flows from Colombia are second only to Brazil in South America and are among the largest with United States. Flower exports are included in these flows. Airports run by the Special Administrative Unit of Civil Aeronautics (UAEAC) handle most of the air passengers and freight. Eight of the country's airports are international. Most airports not run by UAEAC are paved airstrips with low levels of traffic by national standards, but they are important to the communities they serve. These airstrips may be regulated by the State (departments and municipalities) or privately managed.

Ecuador has some 30 airports. Quito airport leads the way in international freight transport, with 66.17% of the total in 2007. It is followed by Guayaquil airport with 30.18%, while the airports of Manta and Latacunga make up the remaining 3.65%.

In Guyana, the busiest airports are Cheddi Jagan (the main airport), Lethem, Linden and Ogle.

There are two international airports in Paraguay. The main one is the Silvio Pettirossi International Airport, which sees the greatest traffic and has the most connections. It is located in the city of Luque, close to Asunción, Paraguay's capital city. The other is Guaraní International Airport, which serves Ciudad del Este.

In Peru, there are 32 main airports; they are managed by the State-owned company Corporación Peruana de Aeropuertos y Aviación Comercial (CORPAC).

The main airport in Suriname is Johan Adolf Pengel International Airport in Zanderij, 45 kilometres from the country's capital Paramaribo. Another 20 or so airports are located in various cities and districts.

Uruguay has eight main airports.

In the Bolivarian Republic of Venezuela, there are over 60 airports and paved airstrips, including 11 international airports (Maiquetía, Maracaibo, Porlamar (Isla de Margarita), Barcelona, Maturín, Barquisimeto, Valencia, Santo Domingo, San Antonio del Táchira, Las Piedras and Ciudad Guayana).

Table 8 provides a summary of the basic indicators covered in this assessment of the current state of transport infrastructure in South America.

Table 8
SOUTH AMERICA: GENERAL INFRASTRUCTURE DATA

Countries	**Paved roads as a percentage of total road network**	**Road density to land area m/km^2**	**Paved roads to land area m/km^2**	**Road density by population m/inhabitant**	**Rail network length to land area km/1,000 km^2**	**Rail network length to population km/ 1 million inhabitants**	**Waterway length to land area km/1,000 km^2**	**Waterway length to population km/1 million inhabitants**	**Port infrastructure quality, 2010**	**Shipping connectivity index, 2010**	**Port container traffic, 2010** *(twenty-foot equivalent units (TEU))*	**Air freight, 2009** *(millions of tons per km)*
Argentina	31.1%	83.62	26.02	5.91	12.46	889.58	3.96	282.65	3.76	27.61	1 821 162	111.66
Bolivia (Plurinational State of)	7.1%	48.38	3.41	5.68	3.37	430.91	9.10	1 164.63	2.87	...	...	6.87
Brazil	12.2%	188.34	23.06	8.47	3.71	173.28	5.89	275.45	2.94	31.65	7 576 075	1 782.30
Chile	21.3%	106.59	22.73	4.91	11.70	565.46	0.96	46.28	5.46	22.05	3 137 285	1 179.05
Colombia	14.1%	144.22	20.29	3.61	2.90	79.30	15.93	435.41	3.46	26.13	2 447 727	2 419.93
Ecuador	15.0%	152.34	22.81	3.15	3.41	70.46	5.29	109.41	3.68	18.73	1 221 849	3.23
Guyana	23.5%	18.60	4.38	5.24	0.87	244.85	4.65	1 309.38	3.50	3.95	...	1.60
Paraguay	50.8%	72.53	36.84	4.89	0.37	24.85	7.62	513.51	3.35	0.65	7 045	0,00
Peru	13.9%	61.29	8.83	2.86	1.42	74.93	6.85	360.84	3.30	21.79	1 532 100	256.94
Suriname	25.2%	27.51	6.92	9.87	1.02	381.22	7.35	2 755.78	3.32	4.12	57 000	35.20
Uruguay	89.0%	49.76	44.29	2.57	16.98	876.86	9.08	468.75	5.15	24.46	671 952	3.76
Venezuela (Bolivarian Republic of)	37.3%	102.49	38.26	3.79	0.96	35.61	7.78	287.98	2.43	18.61	333 539	1.86

Source: Economic Commission for Latin America and the Caribbean (ECLAC) (2011a).

4. Logistics indicators

Based on the assessment of current transport infrastructure and services in South America, road and rail networks need to be upgraded and expanded; river and lake networks should be put to use; rolling stock needs to be increased and used more efficiently; and air transport should be promoted more (ECLAC, 2009).

Parameters such as the ratio of paved roads to the total road network and the ratio of paved roads to land area or population reveal that infrastructure is lacking in both quantity and quality. Although obtaining good-quality data is difficult, the empirical evidence would seem to show that the findings would be negative.

The rail sector is characterized by growing economies of scale. Given the high fixed costs, a large number of traffic units must turn a profit. In other words, high volumes of freight must be transported. In addition, in many parts of South America topographical difficulties increase infrastructure costs. Nevertheless, the cost difference between rail and road transport is considerable. Though complementary, these two modes are often, wrongly, considered to be competitors. Trucks are more cost effective for short hauls; trains are better for long hauls.

South America is in need of an intermodal transport system based on a co-modal approach promoting transport mode complementarity.

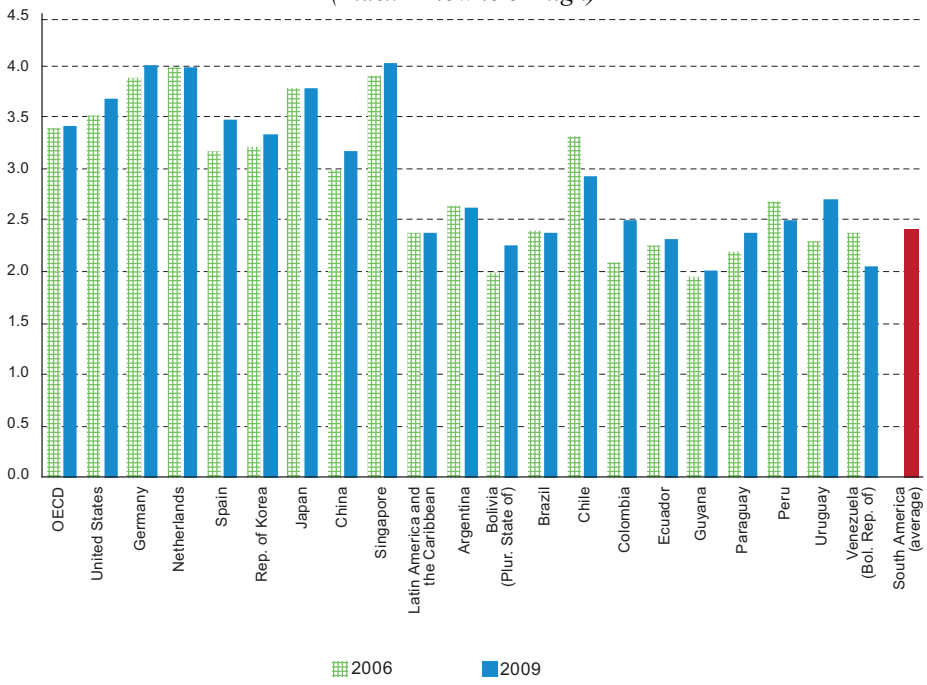
Improvements in infrastructure, transport intermodality and logistics should improve investment project cash flows and yield better rates of return. This will in turn boost supply and create the right conditions for lower prices and increased trade and production. For this reason, the importance of logistics in general has been assessed, with a view to improving the performance of transport infrastructure services.

Several logistics performance indicators have been selected and are presented in the following figures. These indicators are used to compare South American nations with countries that have highly developed logistics systems.

As figure 21 shows, the Chilean customs clearance process is the most efficient in South America. Even though Chile's score declined between 2006 and 2009 (from 3.32 to 2.93), it remains the highest among South American countries. Uruguay, meanwhile, moved up from sixth to second place between 2006 and 2009, overtaking Peru, Argentina, Brazil and the Bolivarian Republic of Venezuela.

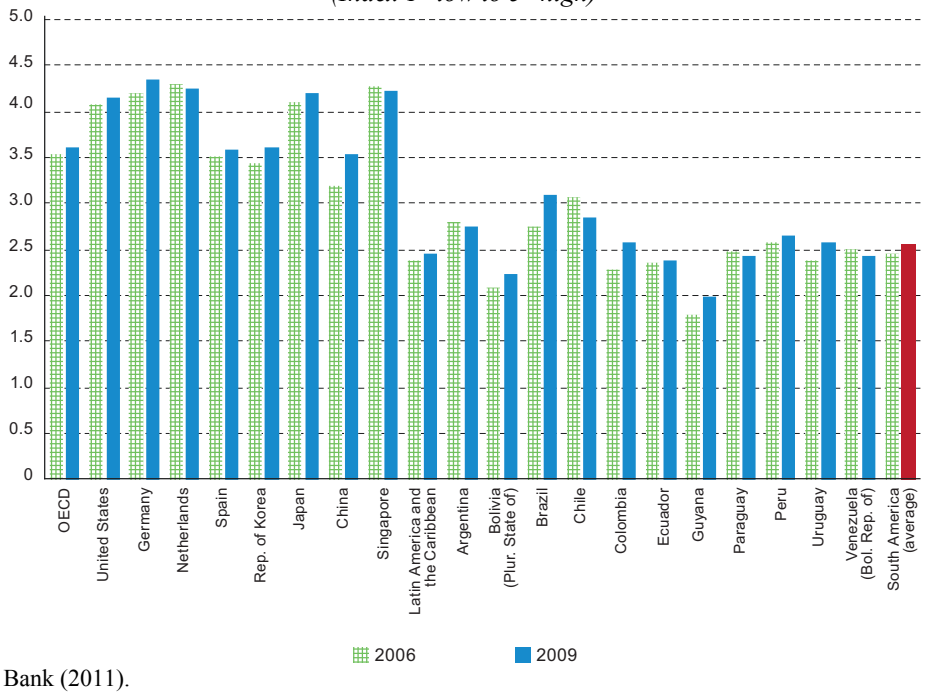
Almost all of the countries of South America score lower than developed countries. The best performers are Germany (4.0), the Netherlands (3.98) and Singapore (4.02).

Figure 21
LOGISTICS PERFORMANCE INDEX (CUSTOMS CLEARANCE EFFICIENCY), 2006 AND 2009
(Index 1=low to 5=high)



Source: World Bank (2011).

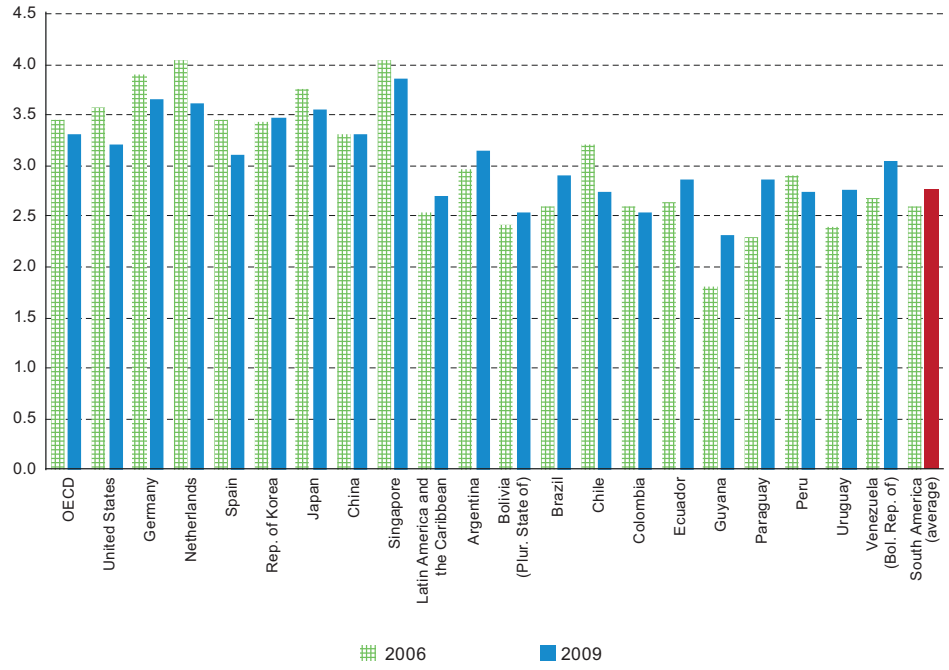
Figure 22
LOGISTICS PERFORMANCE INDEX (QUALITY OF TRADE AND TRANSPORT-RELATED INFRASTRUCTURE), 2006 AND 2009
(Index 1=low to 5=high)



Source: World Bank (2011).

Argentina, Brazil and Chile all score well on the quality of trade and transport-related infrastructure (see figure 22). However, all of the countries of South America are outperformed by the developed countries.

Figure 23
LOGISTICS PERFORMANCE INDEX (EASE OF ARRANGING COMPETITIVELY PRICED SHIPMENTS), 2006 AND 2009
(Index 1=low to 5=high)

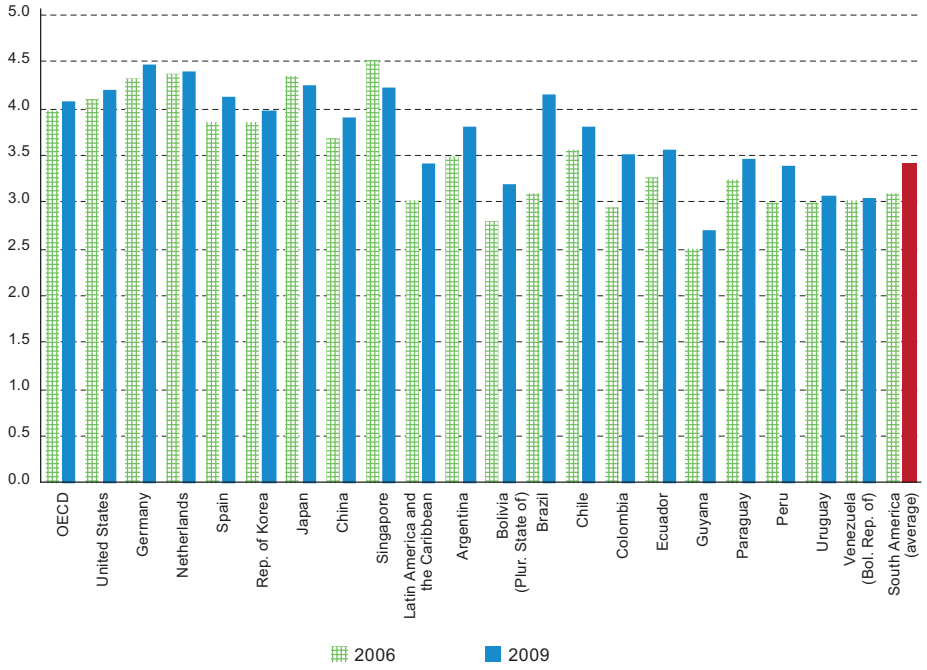


Source: World Bank (2011).

The results for the indicator of the ease of arranging competitively priced shipments (see figure 23) are interesting. Between 2006 and 2009, Chile lost its leading position among South American countries. Argentina, meanwhile, has the best and most stable results for this indicator. The Bolivarian Republic of Venezuela made significant progress over the same period, putting it in second place behind Argentina. Once again, and in keeping with other findings, South American countries do not perform as well as developed countries.

Regarding the on-time delivery of shipments (see figure 24), Argentina, Brazil and Chile were the top performers among South American countries. Brazil improved its performance between 2006 and 2009, putting it in first place, but its results are still below those of developed countries.

Figure 24
LOGISTICS PERFORMANCE INDEX (ON-TIME DELIVERY OF SHIPMENTS), 2006 AND 2009
Index 1=low to 5=high)



Source: World Bank (2011).

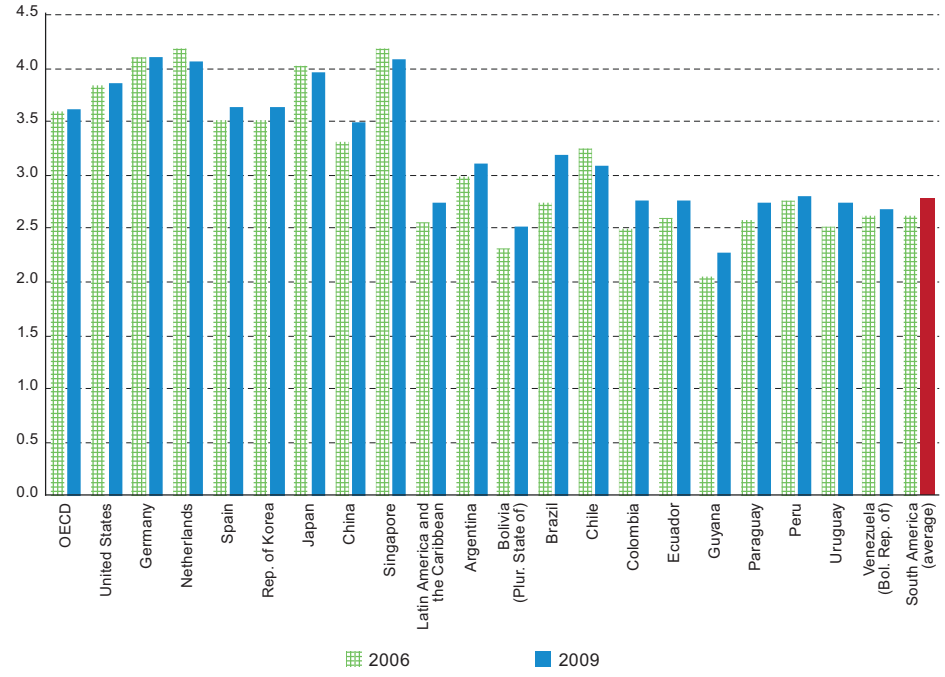
The overall logistics performance index is a synthesis of all the logistics indices presented herein. It reflects perceptions about a country's overall logistics, based on customs clearance efficiency, the quality of trade and transport-related infrastructure, the ease of arranging competitively priced shipments, the quality of logistics services, the ability to track and trace shipments, and on-time delivery of shipments. The index ranges from 1 to 5, with 5 being the best-performing index.

Figure 25 shows this overall indicator. The countries with the highest scores, and therefore the best logistics performance, are Brazil (3.2), Argentina (3.1), Chile (3.1) and Peru (2.8). These were all above the average for South American countries in 2009. Developed countries perform better on all the indicators, in particular Germany (4.1), the Netherlands (4.1), Japan (4.0) and Singapore (4.1).

Figures 26 and 27 illustrate the performance of South American countries with regard to import and export times and costs.

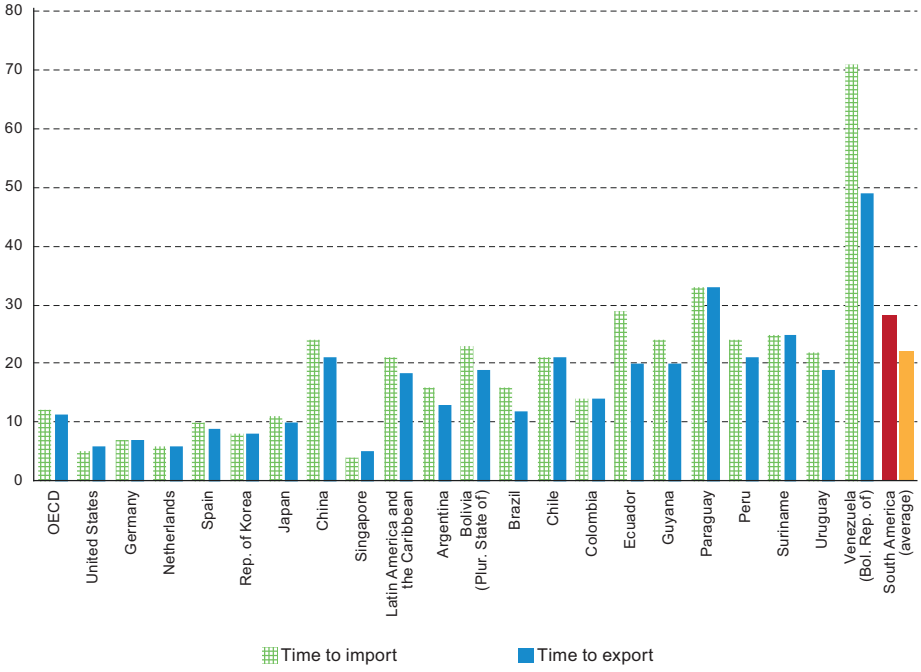
On average, performance in terms of import and export process times (see figure 26) is similar to the scores for logistics performance indicators: the developed countries do better. China shows times that are similar to those of the South American region. Singapore has the shortest import time (four days) and export time (five days).

Figure 25
OVERALL LOGISTICS PERFORMANCE INDEX
(Index 1=low to 5=high)



Source: World Bank (2011).

Figure 26
IMPORT AND EXPORT TIMES
(Number of days)

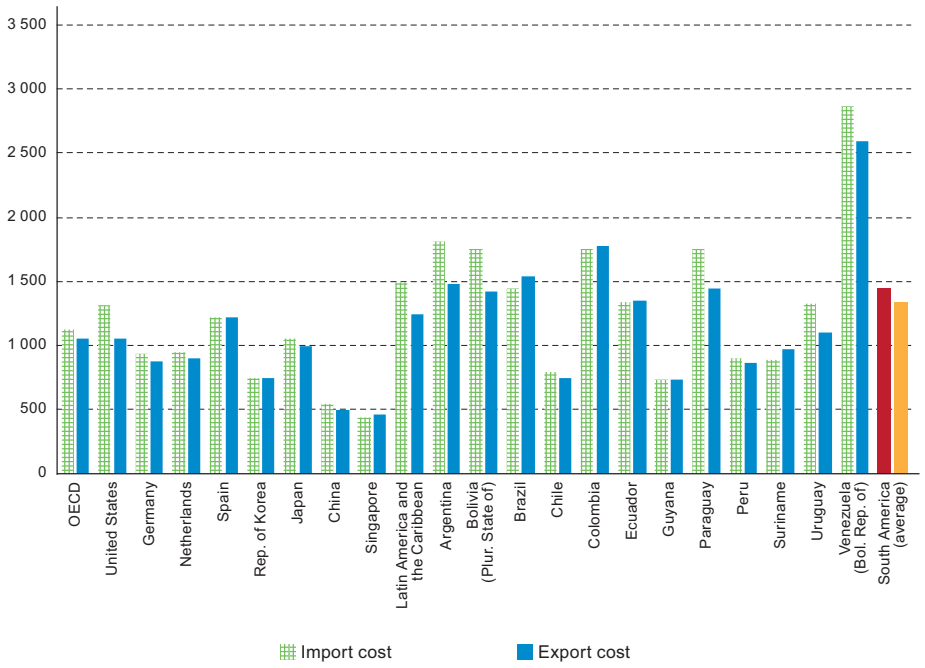


Source: World Bank (2011).

The South American countries that require the most days and whose import and export processes therefore take the longest are the Bolivarian Republic of Venezuela and Paraguay. The best-performing countries are Brazil (16 days for imports and 12 days for exports), Argentina (16 days for imports and 13 days for exports) and Colombia (14 days for imports and 14 days for exports).

The cost of importing and exporting containers (see figure 27) is highest in the Bolivarian Republic of Venezuela, Colombia and Argentina. Guyana, Chile, Peru and Suriname have the lowest costs.

Figure 27
IMPORT AND EXPORT COSTS
(US dollars per container)



Source: World Bank (2011).

Among extra-regional countries, China and Singapore stand out for their low import and export costs.

In conclusion, the countries of South America fall short with respect to physical indicators of transport infrastructure and logistics performance indicators. This presents a number of structural and strategic challenges for the subregion.

III. REGIONAL INFRASTRUCTURE INTEGRATION

Regional integration helps national economies work as a more complementary whole, thereby enhancing mutual benefits. By forming integrated regional blocs, member state economies gain broad advantages, such as increased negotiation leverage, greater ability to attract resources from international sources, more effective use of economies of scale in production, a larger effective market and decreased economic vulnerability to external factors.

Integrated regional or subregional blocs can be better positioned to seize opportunities in the globalized world economy while helping to mitigate member state vulnerabilities to global market risks and fluctuations.

In general, regional integration has three main dimensions:

(i) economic and trade integration: varying degrees or stages of integration (preferential trade agreements, free trade zones, customs unions, common markets, and economic and monetary unions);
(ii) political integration: increasing cooperation at the governmental and institutional level among members; and
(iii) physical integration: focusing on infrastructure and infrastructure services.

Latin America and the Caribbean has achieved a certain degree of integration over the years. The first steps towards economic and trade integration were taken in the 1950s and ultimately led to today's MERCOSUR, Andean Community, Central American Common Market and CARICOM, to name some examples.

Integration —especially trade integration— in Latin America reached a milestone in the first half of the 1990s. But there was much less of a push to continue integration during the latter half of the decade, primarily due to a string of international crises that hit the region, as well as political issues and a crisis of confidence.

A. SILENT INTEGRATION

The first two forms of regional integration (economic/trade and political) have been thoroughly analyzed in studies and papers from around the world. So, without minimizing their importance, they will not be discussed in depth herein. However, examinations of regional integration have not paid nearly enough attention to physical integration.[14]

Physical integration is not as widely discussed as the other forms, but this "silent integration" is both real and beneficial. Even when economic and political integration run into obstacles or virtually grind to a halt, physical integration continues to move forward.

[14] See ECLAC (2005) and Ruiz Caro (2006).

As mentioned above, there are serious constraints to the provision of infrastructure services (especially where transport is concerned) in Latin America, and they could badly hamper the region's trade competitiveness and future development.

Implementing infrastructure projects within a policy framework geared towards regional integration furthers the internationalization of infrastructure services. This encourages economic, political and social integration among countries and helps make up for the lack of natural resources in some of them. Adequate infrastructure serving the regional interest, as well the efficient provision of infrastructure services, helps countries achieve greater levels of productive specialization and gain competitive advantages in the global market.

Regional infrastructure integration is therefore a key factor in fostering regional growth and development. For this reason, South America needs to continue to develop and expand its approach to integration. It needs physical infrastructure providing road, rail, inland waterway, air and maritime transport links between countries and efficiently integrating energy and telecommunications systems.

Regional physical integration is important for the following reasons:

(i) it contributes to effective economic and trade integration (and even political integration), which would be all the more difficult without appropriate infrastructure;
(ii) it allows for progressive, joint resolution of shared problems such as physical bottlenecks, missing communications links and trade barriers while encouraging the creation or reorganization of production chains, facilitating more competitive insertion into the world's major markets, stimulating the development of remote areas, favouring decentralized development, bringing marketing and distribution costs down and helping address concrete issues in ways that benefit all parties, regardless of political or diplomatic differences between member countries;
(iii) it has great potential for encouraging unity, peace and development in the broadest sense, as well as promoting social equality and decreasing asymmetries in and between countries;
(iv) its impacts are those of infrastructure investments themselves: by playing out over the medium and long run they allow for more measured deployment that does not necessarily come to a standstill during crises;
(v) it can be an appropriate vehicle for promoting consensus on decisions advancing sustainable development; and
(vi) it can increase active participation and involvement in decision-making on the part of local governments and the private sector in promoting, financing, building and operating physical integration projects.

This last point is an important one. The public sector is the most active player in economic/trade and political integration (often at a very high level), making it easier for the agenda to be "captured" by central government interests and for priorities to be changed during emergencies (like those caused by major economic crises) while making it more difficult to implement effective integration policies. Regional physical integration, however, with the participation of the private sector and local governments (within an appropriate framework), can catalyze the process and mobilize interests and resources to complete projects. Once the physical connection is complete, economic actors who either did not participate in the market beforehand or only did so on a small scale begin to use the new infrastructure, extending markets and increasing interregional trade among subregions.

B. PROGRESS ON REGIONAL INTEGRATION IN SOUTH AMERICA

At least three ongoing initiatives in Latin America and the Caribbean provide for regional physical integration: the Initiative for the Integration of Regional Infrastructure in South America (IIRSA), the Mesoamerica Project (MP) in Central America and CARICOM in the Caribbean.

Though these initiatives have set laudable strategic targets, it does not mean they are free of problems or conflicts.

1. The Initiative for the Integration of Regional Infrastructure in South America (IIRSA)

IIRSA, with 10 years of work under its belt since its formation in 2000, is one of the most successful recent regional initiatives. It is a mechanism for cooperation and dialogue among 12 South American countries, enabling them to exchange information and coordinate policies and sectoral investment plans.[15] IRSA aims to foster sustainable development in the region by promoting physical integration in transport, communications and energy. It plays a strategic role in mitigating and, as much as possible, eliminating the biggest obstacles to physical integration (such as bottlenecks and missing links). IIRSA also encourages intraregional trade in South America; promotes the reorganization of supply chains; assists in the construction of a more integrated, competitive and dynamic South American economy within a framework of social and environmental sustainability; fosters private sector participation; works towards the harmonization of public policies and regulatory frameworks between countries and sectors; and reduces marketing and distribution costs by developing transport, energy and telecommunications infrastructure.

The IIRSA project portfolio as of August 2011 contains 524 transport, energy and communications infrastructure projects spread over 10 integration and development hubs; these projects have the potential to generate an estimated US$ 96.111 billion in investments.[16] Table A.1 in the annex shows the sectoral composition of the IIRSA portfolio; figures A.1 and A.2 show their funding by sector and source, respectively.

Portfolio projects are selected in the best interests of the region by consensus among the 12 South American countries. To that end, the portfolio aims to organize, prioritize and promote infrastructure investment, with a common goal of sustainable development for South America. Although including a project in the portfolio gives it initial priority, it does not guarantee that it will be funded or executed. Nor does it mean that all of the requisite studies have been completed.

According to the most recently published figures,[17] 73.7% of the 524 projects in the IIRSA portfolio, i.e. 386 projects, showed concrete progress. Of these, 10% (53 projects) had already been completed, 34% (176) were being executed, and the remaining 30% (158) were in the planning phase. Total investment in project execution breaks down as follows: completed projects, 8.8%

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[15] See IIRSA (2011).

[16] See "Portfolio Summary" at www.iirsa.org. The information given corresponds to that published in the IIRSA database, retrieved in August 2011.

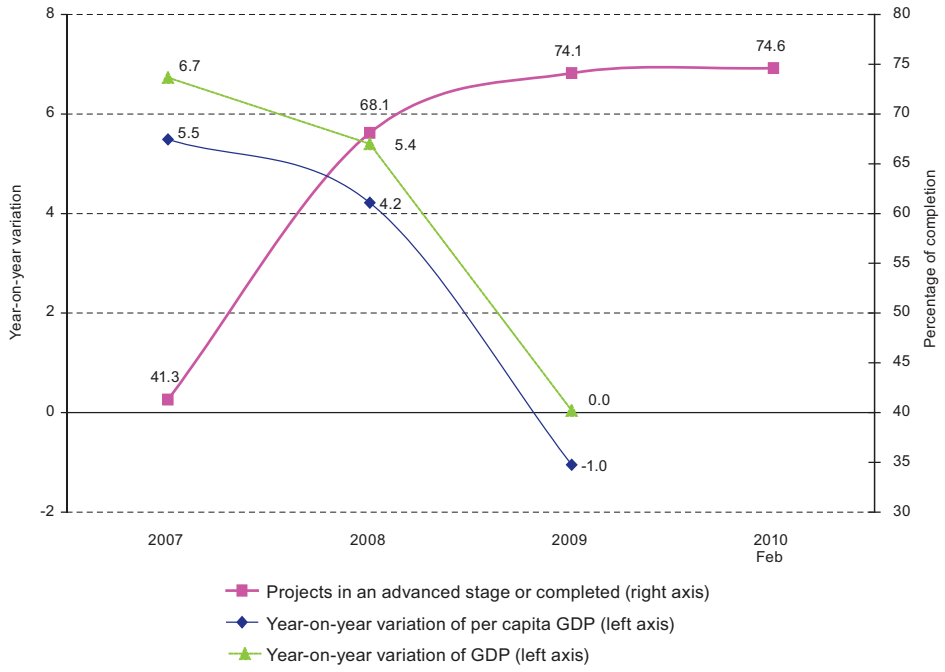
[17] Ibid.

(US$ 8.469 billion); projects in process, 47.7% (US$ 45.836 billion); and projects in preparation, 30% (US$ 29.059 billion). The remainder is for projects still in the design stage.

As these figures show, even if a stricter definition of the term "concrete progress" were used and taken to mean only projects that have been completed or are being executed, the degree of progress made up to June 2010 would still be high: 229 projects (43.5% of the portfolio) and US$ 54.305 billion (56.5% of total estimated portfolio investments).

Figure 28 shows the degree of progress attained for the projects in the IIRSA portfolio during the period 2007-2009 in the context of the GDP of the subregion covered by IIRSA during the period. Notwithstanding the impact of the recent international economic crisis on the performance of the subregion's countries in 2009, the figure shows that concrete progress was still made in physical integration.

Figure 28
INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA (IIRSA): PROJECT PORTFOLIO AND PER CAPITA GDP GROWTH BETWEEN 2007 AND FEBRUARY 2010
(Percentages)



Source: Georgina Cipoletta Tomassian (2011a).

Note: Figures are based on GDP data in constant United States dollars at 2000 prices and refer to cumulative annual changes for the 12 IIRSA countries. Data for 2007 to 2009 and early 2010 are shown in order to correlate different stages of the initiative with the region's economic cycle (peak, onset of the crisis and valley).

In addition to the progress made in the project portfolio, tools such as those listed below have been designed to support the initiative's goals: [18]

(i) IIRSA Methodology for Analysis of the Productive Integration Potential and Development of Value Added Logistics Services
(ii) IIRSA Methodology for Strategic Environmental and Social Evaluation (EASE).

Under its sectoral integration work plan for identifying regulatory and institutional obstacles to the development of basic infrastructure in the region, IIRSA has conducted substantial studies and diagnostic reviews of laws and regulations governing infrastructure service provision. Sectoral integration involves maritime, air and multimodal transport, border crossings, energy integration, financial instruments and information and communications technologies (ICT). Some of the main goals in this regard include the convergence of relevant laws and regulations, competiveness in service provision, promotion of private investment in infrastructure, and facilitation of trade and transport. Apart from the 524 portfolio projects, there are two sectoral integration projects under the 2005-2010 IIRSA Consensual Implementation Agenda (AIC).[19] They are the Exports through Postal Services for SMEs project and the South American Roaming Agreement project. Investments in these projects are estimated at US$ 6.3 million (see [online] www.iirsa.org, August 2011).

In summary, IIRSA has made progress in planning and implementing physical integration projects on a regional level. However, much work remains to be done to reach its goals. The completion of infrastructure projects must be more efficiently prioritized based on development gaps and on sector-based objectives as key for the dynamic, efficient infrastructure markets needed for regional integration. In addition to promoting the role of IIRSA in the region, there is also a need to better dovetail IIRSA with the economic and political dimensions of other regional integration initiatives in South America[20] and to develop effective institutions that can implement sustainable regional policies and create a systematic regulatory framework to make regional physical integration goals viable.

2. The new regional infrastructure agenda in UNASUR

The priority given to infrastructure integration is based on political coordination among South American countries. Between 31 August and 1 September 2000, South American leaders met in Brasilia to take part in the First Meeting of Heads of State of South America. For the first time, joint actions for infrastructure modernization were discussed as a way to promote development and the integration of the least favoured areas into national economies. IIRSA was launched at this meeting and has become the main organizational framework for common subregional infrastructure.

In May 2008, the 12 independent countries of South America signed the UNASUR constitutive treaty, creating a subregional intergovernmental organization that is an international legal entity. Through participation and consensus, UNASUR strives to cultivate cultural, social, economic and political

[18] For more details, see IIRSA (2011).
[19] The AIC is a set of 31 high-impact physical integration and sustainable development projects in the region, chosen by government consensus from the IIRSA portfolio with a view to fast-tracking their financing and execution. Investment under AIC is estimated to be US$ 14 billion (see [online] www.iirsa.org, August 2010).
[20] IIRSA is now part of UNASUR (a political and economic community formed by the 12 independent South American countries) as a technical advisory forum of the South American Council of Infrastructure and Planning (COSIPLAN).

integration and union among its peoples, giving priority to political dialogue, social policies, education, energy, infrastructure, financing and the environment, among others. These goals are steps toward eliminating socioeconomic inequality, achieving social inclusion and the participation of civil society, strengthening democracy and reducing asymmetries while enhancing the sovereignty and independence of the States. The creation of UNASUR provides a new framework for consensus-based integration as the member countries work towards regional infrastructure.

The South American Infrastructure and Planning Council (COSIPLAN) was created in August 2009 at the Third Ordinary Meeting of Heads of State and Government of UNASUR, held in Quito. The decision to create COSIPLAN made the IIRSA Executive Committee part of the council, as a technical advisory forum. It recognized the achievements made under the initiative while reiterating the decision to "deepen and improve the progress made in the identification, evaluation and implementation of integration projects within the framework of the regional planning process undertaken by the countries of South America" (Cochabamba Declaration, 9 December 2006). The Council's role is to garner political support for activities and projects that lead to sustainable social and economic development in South America. Adding this issue to the common agenda of UNASUR renews physical integration as a priority and reinforces the legitimacy of regional infrastructure integration efforts.

Domestic development in the subregion has been proposed as a priority in the framework of COSIPLAN, calling for the strengthening of relations between member countries. In this context, UNASUR countries are drafting a new Priority Agenda for Integration Projects (API) and a Strategic Action Plan (PAE) 2012-2022 to be defined and approved by COSIPLAN ministers in late 2011. The principal elements of the API as of November 2011 can be found in table 9.

API investments to October 2011 total an estimated US$ 16.73 billion.

ECLAC is contributing to the drafting and implementation of PAE 2012-2022, whose goals include improving methodologies and tools in order to better execute and complete projects, incorporating social participation mechanisms, focusing on funding projects with high regional impact, following up on and evaluating projects and working towards harmonizing regulatory and institutional frameworks.

Table 9
DRAFT PRIORITY INTEGRATION PROJECT AGENDA (API)

Number	Integration and development hub	Project name	Countries involved	Amount in millions of United States dollars
1	AMA	Paita - Tarapoto – Yurimaguas road, ports, logistics centres and waterways	PE	842.5
2	AMA	Callao - La Oroya - Pucallpa, road, ports, logistics centres and waterways	PE	2 529.4
3	AMA	North-eastern access to the Amazon River	BR / CO / EC / PE	105.5
4	AND	Caracas - Bogotá - Buenaventura / Quito road	CO / EC / VE	3 350.0
5	AND	Colombia – Ecuador border crossings	CO / EC	208.6
6	AND	Colombia – Venezuela border crossings	CO / VE	6.3
7	AND	Desaguadero binational border centre (CEBAF)	BO / PE	4.0
8	AND	Autopista del Sol Highway: Improving and rehabilitating the Sullana - Aguas Verdes section	PE	90.3

Table 9 (concluded)

Number	Integration and development hub	Project name	Countries involved	Amount in millions of United States dollars
9	CAP	Construction of the Salvador Mazza-Yacuiba binational bridge and border centre	AR / BO	23.0
10	CAP	Argentina – Bolivia, western interconnection	AR / BO	165.0
11	CAP	Paranaguá – Antofagasta bioceanic railway corridor	AR / BR / PA / CH	944.6
12	CAP	Foz - Ciudad del Este - Asunción – Clorinda road	AR / BR / PA	316.0
13	CAP	500KV transmission line (Itaipú - Asunción - Yacyretá)	PA	255.0
14	GUY	Rehabilitation of the Caracas – Manaus road	BR / VE	480.0
15	GUY	Boa Vista - Bonfim - Lethem - Linden – Georgetown road	BR / GU	250.0
16	GUY	Venezuela (Ciudad Guayana) - Guyana (Georgetown) - Suriname (South Drain - Apura - Zanderij - Moengo - Albina) road, including construction of the bridge over the Corentyne River	GU / SU / VE	358.0
17	HPP	Improving navigability of rivers in the River Plate basin	AR / BO / BR / PA / UR	354.8
18	HPP	Paraguay - Argentina – Uruguay railway connection	AR / PA / UR	268.0
19	HPP	Rehabilitation of the Chamberlain - Fray Bentos railway branch line	UR	100.0
20	HPP	Nueva Palmira beltway and port access roads network	UR	8.0
21	IOC	Passenger and cargo hub airport for South America (Viru-Viru - Santa Cruz International Airport).	BO	20.0
22	IOC	Improving road connections in the central interoceanic hub	BO / BR	383.0
23	IOC	Infante Rivarola - Cañada Oruro border crossing	BO / PA	2.0
24	IOC	Central bioceanic railway corridor (Bolivia)	BO	3 093.3
25	MCC	Northeastern Argentina gas pipeline	AR / BO	1 000.0
26	MCC	Construction of Jaguarão - Río Branco international bridge	BR / UR	65.0
27	MCC	Multimodal transportation in the Laguna Merín and Lagoa dos Patos system	BR / UR	100.0
28	MCC	Montevideo – Cacequi railway corridor	BR / UR	196.0
29	MCC	Optimization of the Cristo Redentor border crossing	AR / CH	243.0
30	MCC	Agua Negra binational tunnel	AR / CH	850.0
31	PBB	Porto Velho – Peruvian coast connection	BR / PE	119.0
			Total	16 730.3

Source: Presidency pro tempore of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA), South American Infrastructure and Planning Council (COSIPLAN), Union of South American Nations, "Draft priority integration project agenda" to be submitted for approval at the second meeting of COSIPLAN ministers, Brasilia, 30 November 2011.

IV. CONCLUSION

Infrastructure services —and ensuring that they are efficient— are one of the cornerstones of any national or regional development strategy because they directly impact cohesiveness among the three aspects of development: territorial (connecting inhabitants to their environment), economic (ensuring basic services necessary for production) and social (improving living conditions and the quality of life of the population). In short, efficient infrastructure services increase connectivity, reduce transport and logistics costs, and improve services for moving people and goods. This leads to corresponding increases in productivity, competitiveness and economic growth.

The States have not devoted sufficient social and economic public policy effort to the development of infrastructure and infrastructure services, despite their vital importance, huge potential and contribution to social inclusion of the most disadvantaged, improved income distribution and poverty reduction. In fact, over considerable periods of time a large part of South America has lagged behind in infrastructure development, hampering its potential for long-term growth and poverty reduction.

This document has focused primarily on examining the current state of infrastructure in UNASUR countries, as well as the design of infrastructure, transport and logistics policies. A lack of investment in this area has widened the infrastructure gap, that is to say the lag between changes in supply (triggered by investment volatility as well as economic, infrastructure and maintenance policy instability) and demand (which continues to grow during periods of GDP expansion). The lack of comprehensive policies on top of institutional and regulatory problems exacerbates the situation.

In order to meet expected levels of economic infrastructure demand during the period 2006-2020 (or to match within the same timeframe the per capita levels recorded by a set of countries in Southeast Asia in 2005) and maximize the positive effects of the new infrastructure on the economy, the region needs to invest between US$ 128 billion and US$ 180 billion (expressed in 2000 dollars) per year during that period. This equates to between 5.7% and 8.1% of the region's GDP and would mean a deficit of between US$ 74.5 billion and US$ 126.5 billion in 2000 dollars, i.e. between 3.4% and 5.8% of the region's GDP. And additional investments in the subregion's transport, logistics and mobility sector will be necessary, although they are not quantified herein.

Investments to reduce the infrastructure gap are necessary for development, but they are not enough. Investments must be made smarter by optimizing the institutional, regulatory, management and operational aspects of the market. States need to improve how they plan, evaluate, monitor and audit public works and concessions. They also need to establish channels for coordinating with the private sector, with clear rules so that the States and the private sector can complement each other for the greatest social benefit. The countries of South America need to strengthen national public investment systems in order to overcome weaknesses in how projects are evaluated and chosen. These systems need to be reinforced not only in the technical sphere (strict evaluation methodology and standards), but also in the political sphere, especially with regard to project design, selection and investment.

Regional infrastructure integration has benefited from the significant progress made in the past decade in the area of planning and implementation of physical integration projects. However, much work remains to be done in order to meet target goals. The weaknesses discussed herein call for more effective coordination of infrastructure projects among the countries of South America. But coordination alone is not enough; indeed, it must be coupled with efforts seeking greater convergence of relevant laws and

regulations and progress towards common policies for transport, investment promotion and trade and transport facilitation.

Recommendations set out in an ECLAC study[21] based on surveys of national authorities and relevant actors in regional infrastructure development in the countries of South America led to identification of the following issues as key components for strategic planning for physical integration in the subregion over the next 10 years:

(i) inclusion and equality;
(ii) promoting regional connectivity, building infrastructure networks to ensure physical integration;
(iii) balanced and sustainable modal distribution of transport (aiming for co-modality), with a focus on water and rail transport;
(iv) funding;
(v) logistical integration;
(vi) harmonization of technical and economic regulations;
(vii) harmonization of production and territory development strategies;
(viii) design of common infrastructure and transport policies;
(ix) regional policy integration (funds to counteract asymmetries, investment funds, etc.).

The 2012-2022 PAE, pending review and approval by UNASUR representatives in late November 2011, has incorporated nearly all the recommendations made to the IIRSA presidency regarding technical assistance. The project also emphasizes the importance of continuing to forge common infrastructure, transport, logistics and mobility policies, as well as institutionalizing solutions for regional infrastructure asymmetries.

For UNSUR countries, the main challenge in designing such policies will be coordinating the planning, design, implementation, monitoring, auditing, evaluation and control phases of infrastructure and infrastructure-service policies in order to maximize developmental impacts. Therefore, ECLAC proposes a paradigm shift away from current policies (which take an uncoordinated modal approach) towards an integrated, sustainable and co-modal approach that draws on economic tools for regulating the market and on the technical characteristics of the activity in question in order to encourage a modal shift towards sustainability. This paradigm shift is key for moving towards integrated, sustainable infrastructure, logistics and mobility policies in South America that will not only better address development issues but will also promote greater economic efficiency in transport systems and fewer negative externalities for the population.

There is an ever-increasing need for countries to focus on creating and implementing policies and investments that take into account the degrees of coverage offered, the efficiency and quality of services provided, sustainability and coordination of complementary infrastructure services (inter-modality, in the case of transport systems), all of which require the following:

[21] Sánchez, Ricardo J., Georgina Cipoletta Tomassian, Octavio Doerr and Maricel Ulloa (2010): First report on survey results and preliminary recommendations for establishing a Strategic Action Plan (2012-2022) for COSIPLAN of UNASUR. ECLAC Technical Assistance for the IIRSA Initiative. Infrastructure Services Unit, ECLAC Natural Resources and Infrastructure Division, United Nations. Santiago, Chile, December.

(i) effective public-private partnerships;
(ii) a business environment that offers increased investment security and efficiency and protects suppliers and users from market abuses, distortions and failures, such as monopolistic practices; and
(iii) modern, comprehensive and sustainable public policy that promotes the development of infrastructure services and regulatory mechanisms that prevent harmful or damaging distortions.

The primary infrastructure service challenges facing UNASUR countries may be summarized as follows:

(i) infrastructure stress, which reflects a shortage of infrastructure and infrastructure services;
(ii) lack of a comprehensive approach in infrastructure and service policies, as well as overlapping planning, design, implementation, monitoring, funding, auditing and evaluation of public policy;
(iii) institutional and regulatory obstacles to implementing policies and organizing markets;
(iv) failure to take sustainability criteria into account when designing infrastructure service policies, especially with regards to transport;
(v) gaps in access to funding, limitations in sources of funding and immature capital markets;
(vi) weaknesses in the design and establishment of public-private partnerships, thus failing to harness their full potential;
(vii) immature infrastructure markets, and regulatory accounting issues;
(viii) failure to attract sufficient foreign investment in South American infrastructure integration projects;
(ix) highway, railway, maritime, port and air transport infrastructure quality shortfalls that require balanced solutions to modal splits in passenger and freight transport (co-modality);
(x) transport and trade facilitation issues, due primarily to weaknesses in technical regulations and bureaucratic trade processes; and
(xi) shortcomings in professional and workforce training.

ECLAC (2010) has argued that successfully facing these challenges and advancing towards fuller development of the region calls for a new State-market-society equation with political agreements for new social and intergenerational commitments with well-defined responsibilities and clear accountability. To do so requires developing comprehensive and sustainable public logistics and mobility policies that are true matters of State and, as such, are channeled through institutions instead of being identified with any single administration. This, in turn, requires strengthening the capacities of States and adopting a more comprehensive and sustainable public policy approach to infrastructure and transport with increased involvement of the private sector and civil society.

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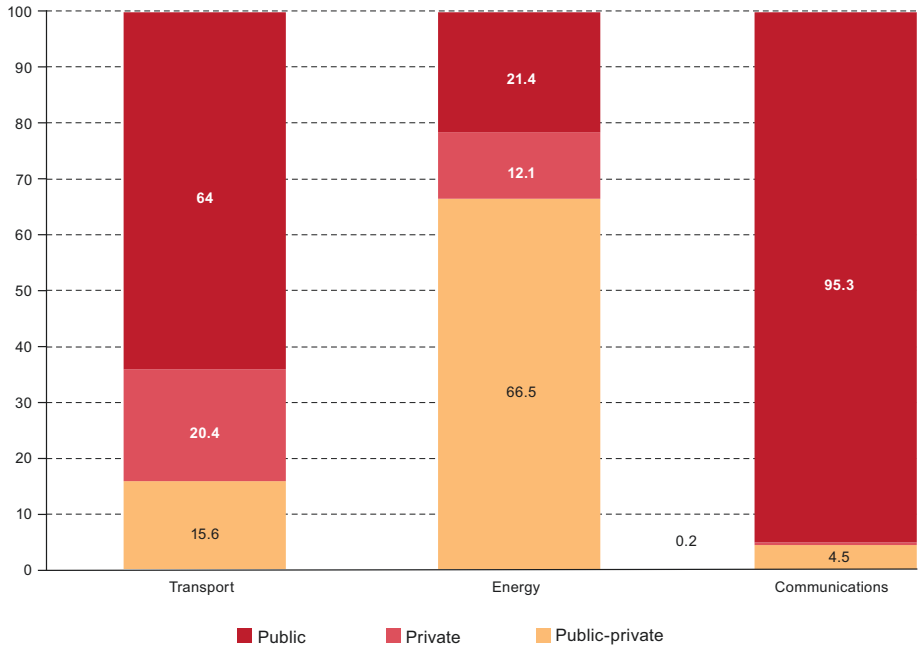
Annex

Table A.1
INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA (IIRSA): SECTORAL AND SUBSECTORAL COMPOSITION OF PORTFOLIO
(Number of projects and millions of dollars)

Sector / Subsector	Transport		Energy		Communications	
	Number	Amount	Number	Amount	Number	Amount
Air	24	2 690				
Road	207	32 991				
Rail	61	12 747				
River	74	2 837				
Maritime	31	3 391				
Multimodal	15	440				
Border crossings	39	294				
Harmonization of energy regulation			1	380		
Energy generation			27	28 433		
Energy interconnection			36	11 871		
Communications interconnection					9	44.7
Total	**451**	**55 390**	**64**	**40 684**	**9**	**44.7**

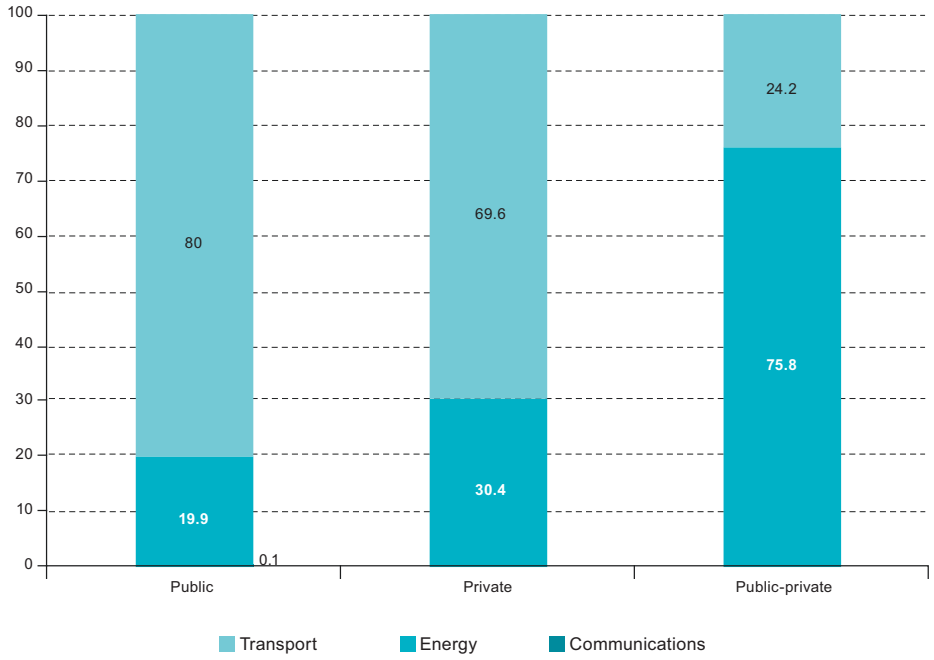
Source: Initiative for the Integration of Regional Infrastructure in South America (IIRSA) (2011).

Figure A.1
INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA (IIRSA): TYPE OF FUNDING OF PORTFOLIO BY SECTOR
(Percentages of investment)



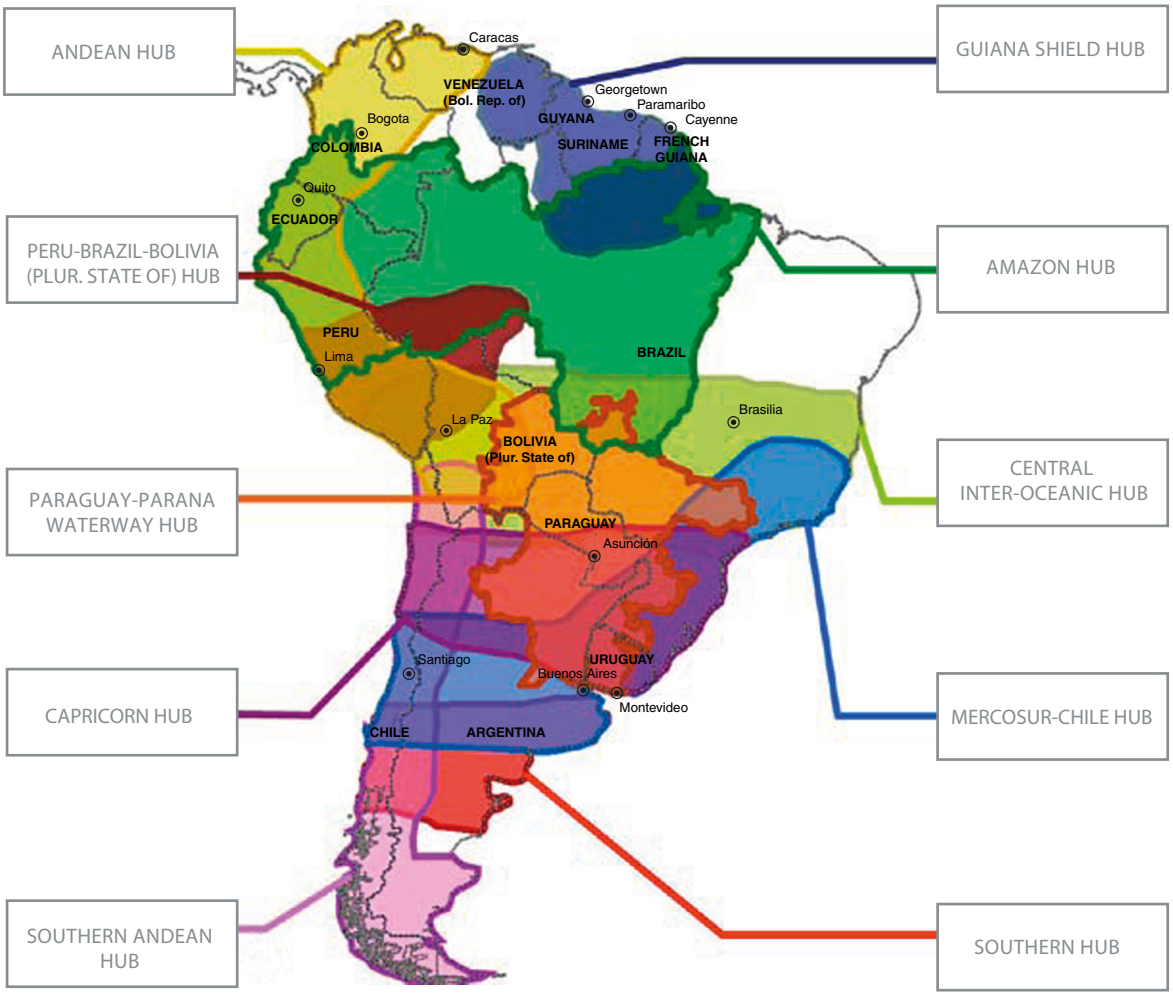
Source: Initiative for the Integration of Regional Infrastructure in South America (IIRSA) (2011).

Figure A.2
INITIATIVE FOR THE INTEGRATION OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA (IIRSA): TYPE OF FUNDING OF PORTFOLIO BY SOURCE OF FUNDING
(Percentages of investment)



Source: Initiative for the Integration of Regional Infrastructure in South America (IIRSA) (2011).

Map A.1
SOUTH AMERICA: MAP OF INTEGRATION AND DEVELOPMENT INFRASTRUCTURE [a]



Source: Initiative for the Integration of Regional Infrastructure in South America (IIRSA) (2011).

[a] The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

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