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FACILITATION OF TRANSPORT AND TRADE IN LATIN AMERICA AND THE CARIBBEAN

Convergence and divergence of transport and mobility policies in latin america: lack of urban co-modality

Introduction

Appropriate infrastructure and decent urban, interurban and international transport services that move passengers and cargo in a timely, reliable, efficient and sustainable fashion are not only a basic need but are also essential for economic development. Because of its very nature, the transport market is a highly imperfect one with many externalities. Public intervention in transport markets is therefore a necessity, particularly in Latin America, where growing motorization and unsatisfactory modal distribution are creating significant congestion along with enormous social and environmental costs and a high accident rate. To address the issue, major cities in the region have made significant transport system design and planning decisions. But most of those decisions have attempted to address two overlapping issues at once: expanding capacity to handle private automobile traffic while extending, expanding or upgrading mass transit systems. Both initiatives are praiseworthy and involve substantial investments, but the lack of a clear, consensus-based, integrated vision that is sustainable over the long run has put the two alternatives at odds with each other and, in the end, worsened the problem they were meant to solve. This phenomenon is called policy convergence/divergence; it reveals the lack of integrated public policy for urban mobility where the failure to take coordinated, consistent action over time leads to complex dilemmas when prioritizing investments and makes it impossible to coordinate existing initiatives (both public and private), thus hampering sustainable development. A co-modal approach to urban mobility is therefore proposed. This issue of the *FAL bulletin* looks at these issues, using Santiago, Chile as a case study.

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This issue of the *FAL bulletin* analyses transport and mobility policy in Latin America, where the lack of integrated public policies for urban mobility and the failure to take coordinated action over time make it difficult to prioritize investments and coordinate existing initiatives (both public and private). This works against sustainable development. This issue is one of the products of a joint effort by ECLAC and the French Ministry of Foreign and European Affairs. The authors are Gabriel Pérez Salas and Ricardo J. Sánchez, ECLAC Infrastructure Services Unit.

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I. Infrastructure services and sustainable development

Efficient infrastructure services are a core issue for the development of countries, especially if the goal is an economic and social development model that is sustainable, equitable and lasting. Integrated and consistent transit and mobility policies help guide economic activity towards this goal, regardless of where they are executed or whether they refer to moving passengers or cargo.

Transit, infrastructure, mobility and logistics policies (at the local, subnational, national, regional and even global level) are thus an ongoing concern for the authors. This article discusses transit and mobility in urban agglomerations, whose rise is part of the development process itself; they both result from and drive economic growth. But as cities continue to expand in both area and population they place growing demands on social and transit infrastructure, with a substantial impact on sustainable development in the future.

Appropriate infrastructure and decent urban and interurban transport services that move passengers and cargo in a timely, reliable, sustainable and economic fashion are a basic need. Because of its nature, the transport market is a highly imperfect one with many externalities. These market imperfections and the fact that transport is a general need call for public intervention, particularly in Latin America, where growing motorization and unsatisfactory modal distribution are creating significant traffic congestion along with enormous social and environmental costs and a high accident rate. Latin America has one of the poorest records in the world in terms of traffic accident damage and deaths. To address the issue, major cities in the region have made key urban and transport system design and planning decisions, both for themselves and in the area of transit systems. But most of those decisions have attempted to address two overlapping issues at once: expanding capacity for private automobile traffic while extending, expanding or upgrading mass transit systems. Both initiatives are praiseworthy and involve substantial investments, but the lack of a clear, consensus-based, integrated vision that is sustainable over the long run has put the two alternatives at odds with each other and, in the end, worsened the problem they were meant to solve. This phenomenon is called policy convergence/divergence (Lupano and Sánchez, 2008). It reveals the lack of integrated public policy for urban mobility where the failure to take coordinated, consistent action over time poses complex dilemmas for authorities as they prioritize investments and makes it impossible to coordinate existing initiatives (both public and private). This has significant repercussions for sustainable development, i.e., development that, in addition to environmental considerations, takes account of economic implications, social costs and the institutions involved. This bulletin therefore examines the lack of integrated transit and mobility policies and the negative effect this has on sustainable development in Latin America.

II. Transport and infrastructure

Transport systems and their underlying infrastructure are essential if the measures called for by economic and social development policy goals are to be viable. An examination of the Millennium Development Goals makes this clear. Although these goals do not explicitly mention infrastructure and transport services, such services are obviously important for development and for overcoming poverty. Improving the design, regulation and operation of transit systems provides access to centres of production at a lower economic and social cost (related to Millennium Goal 1) and provides and improves the connectivity and mobility that enable the entire population —particularly the poorest segments and those living in rural areas— to access basic education and health services (Millennium Development Goals 2 to 6). Rethinking how transit systems are provided and operated leads to low-carbon infrastructure and sustainable transport, thus contributing to the achievement of Millennium Development Goal 7. And effectively solving transport provision and competitiveness issues directly benefits landlocked countries and small island States, tying in directly with Millennium Development Goal 8 (Pérez, G. et al., 2009). All of the above provides a rationale for active State and local government involvement in the provision and appropriate regulation of transport services, especially public transit systems.

Transport encompasses many approaches and areas, involving moving passengers and cargo internationally, regionally, between cities and between rural and urban areas by land (road and rail), water, air or a combination thereof. This inherent complexity has gradually given rise to a modal approach to transport, marked by public policies designed to promote a particular mode of transportation instead of systemic improvement of the transport services network infrastructure. This is often exacerbated by the existing separation between policies for designing and providing infrastructure and those for operating and promoting transport, and it has made public and private

interventions significantly less effective. In many cases, the result has been cost overruns, duplication of functions between State agencies with conflicting goals and opposing visions of the kind of transport that society needs.

Approximately 75% of the population of Latin America and the Caribbean lives in cities, and the region's urban population is expected to reach 80.4% by 2020 (United Nations, 2010). These figures are in line with worldwide trends: urbanization is part of development itself and is both the result and the engine of economic growth. Globalization and better living standards account for a good part of the increase in personal trip frequency and in the volume of cargo transported. This is especially the case in urban centres where population and economic activity are highly concentrated because of the availability of higher-quality, better-paid jobs and more opportunities to access education and culture (Lupano and Sánchez, 2008). The resulting constant migration and urban concentration create new and growing needs for mobility and for transporting passengers and goods and put local and national authorities under considerable pressure to provide efficient urban transit infrastructure solutions in large metropolises and medium-sized cities alike.

This constant expansion of the urban fabric in both area and population density puts more and more demand on the available economic and social infrastructure (such as water distribution, sanitation, energy and transportation networks) and increases the pressure for meeting basic housing, education and health needs. An appropriate urban transport infrastructure that moves passengers and cargo in a comfortable, timely and economical fashion is one of the basic needs requiring State oversight and active participation. Transport services constitute imperfect markets and transfer all kinds of externalities, thus calling for public intervention in all spheres including at the urban and sub-urban level. Worldwide, it is estimated that by 2015 urbanized areas will demand much more energy (especially for transportation) and will be the source of 80% of CO_2 emissions. This will require new State action to offset the effects of climate change and meet transport and energy needs without affecting economic and social development.

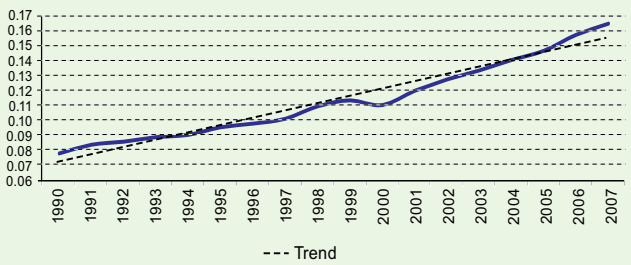
Despite significant environmental and social impacts and related economic costs, transport policy in Latin America has tended to overlook sustainability (both in its broadest sense and in a strictly environmental one) when designing public policy and investing in city cargo and passenger transport systems. This has brought the authorities up against complex dilemmas when prioritizing investments in urban mobility infrastructure. These dimensions are particularly pressing in developing countries, where very low-income social strata are often concentrated metropolitan peripheries, living in precarious conditions with substantially unequal access to the benefits of urbanization.

III. Urban mobility policies

One approach to these issues that has been gaining strength is the idea of mobility as a way to stress the movement of persons and goods from one place to another in a sustainable manner, regardless of the mode of transport. This approach addresses the different facets of the issue: modal options, transport infrastructure and integration with other policies such as land use, urban development, energy efficiency and the elimination of poverty (United Nations, 2010).

As for passenger mobility, despite the extensive literature highlighting the importance of favouring public transit over private transportation, urban mass transit is still largely inefficient, inflexible and, in some cases, simply not decent. All of these factors (and, especially, economic improvement and more readily available credit) have led to an ever-growing number of vehicles on the road in the region: from 0.08 to 0.17 vehicles per person between 1990 and 2007 (see figure 1). This rising motorization rate in the cities of the region has sent traffic congestion spiralling up, with a negative impact on transit times and the quality of life in major cities. The number of traffic accidents has increased to the point that Latin America has the worst record in the world for damage and death from traffic accidents.

Figure 1
SELECTED COUNTRIES[a]: MOTORIZATION RATES, 1990-2007
(Number of automobiles per person)



Source: Prepared by ECLAC based on statistics about the number of vehicles on the road, from the database of social, economic and environmental indicators for Latin America and the Caribbean (CEPALSTAT). Online: http://websie.eclac.cl/sisgen/ConsultaIntegrada.asp. Date of reference October 2009.

Note: Yearly variation 1990-2007: 6.59%.

[a] Includes statistics for Argentina, Belize, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru and the Plurinational State of Bolivia.

But improving economic conditions are not the only explanation for motorization in Latin America. In many cases, the increase is due to a familiar private response to State ineffectiveness in providing decent, flexible and competitive public transit, as emerges from an examination of the exponential increase in the number of motorcycles in most Latin American cities. The population (especially the lower-income segments) has turned to buying motorcycles on credit in search of an economical, efficient solution for day-to-day mobility problems. This situation is cause for concern, not only because of the congestion it can produce on city streets that were not designed to be shared with motorcycles but also because it poses an additional road safety risk. Most of these motorcycles lack basic safety equipment (including an approved helmet). Indeed, motorcycles are the segment with the highest death rates in Latin America and the Caribbean (United Nations, 2010).

The following table provides region-wide historical and projected figures on victims of the lack of road safety.

Public road safety policies are often geared towards protecting occupants of vehicles. However, nearly half of the people who die in traffic accidents each year are pedestrians, motorcyclists, bicyclists and public transit passengers. Non-motorized means of transport (such as walking or biking) or public transit are often the only viable mobility option for the neediest sectors of society. This figure is even higher for the world's poorest countries and communities. It is therefore essential that road safety, land use and city traffic planning decisions take account of the needs of all those who use the roads (including the most vulnerable groups). ECLAC has stressed the importance of infrastructure development policies that encompass mitigation actions as well as measures for protecting the most vulnerable users of the roads (such as pedestrians and motorcyclists), designing and installing footbridges, grade-separated crossings, signage and adequate markings. But such measures must be accompanied and bolstered by coordinated, integrated action in other areas, such as education, legislation and health, in a multidisciplinary effort.

IV. Advances in public policy on urban mobility in Latin America

Latin America has a decades-long history of inefficient, unsafe and polluting transport services with very long trip times. Deregulation of the sector in several countries of the region in the mid-1980s not only did not solve the underlying service problems but rather increased congestion and pollution and made public transit less safe. It was not until the early 2000s that the governments of the region acknowledged that the situation was untenable and required immediate improvements, with robust intervention (direct or indirect) by the State. This shifted the responsibilities assigned to different levels

Table 1
PREDICTED TRAFFIC DEATHS BY REGION, CORRECTED FOR UNDERREPORTING, 1990-2020
(Thousands of persons)

Region	Number of countries	1990	2000	2010	2020	Variation (%) 2000-2009	Lethality rate (deaths per 100 000 persons)	
							2000	2020
Sub-Saharan Africa	46	59	80	109	144	80	12.3	14.9
Latin America and the Caribbean	31	90	122	154	180	48	26.1	31.0
South Asia	7	87	135	212	330	144	10.2	18.9
East Asia and the Pacific	15	112	188	278	337	79	10.9	16.8
Eastern Europe and Central Asia	9	30	32	36	38	19	19.0	21.2
Middle East and North Africa	13	41	56	73	94	68	19.2	22.3
Subtotal	**121**	**419**	**613**	**862**	**1 124**	**83**	**13.3**	**19.0**
High-income countries	35	123	110	95	80	-27	11.8	7.8
Total	**156**	**542**	**723**	**957**	**1 204**	**67**	**13.0**	**17.4**

Source: WHO, Global status report on road safety, 2009.
Note: Data presented in keeping with World Bank classifications.

of government. In many countries, the trend towards decentralization was consolidated and made it possible to devolve jurisdiction to the local authorities and put the transit agenda in the hands of municipal governments. This process was not without complications and institutional failures. Nevertheless, the State did take on an increasingly substantial role in developing transport infrastructure and working with public-private partnerships in the search for new solutions for the old problem of public transit.

As a result, many public transit systems have been rolled out over the past decade in an effort to eliminate the historical gap in transport infrastructure and provide cities with improved, efficient and competitive public transit services.

V. Convergence and divergence of public policy on urban mobility

While significant progress has been made in the region, particularly during complex political, economic and social times, there are some general concerns as to how national and local governments have handled these investments and their urban mobility policies. In most major cities in the region, these policies have sought to address two overlapping issues at the same time: (i) increase capacity to move private automobiles by building urban highways and widening streets and avenues to handle more vehicles; and (ii) extend, expand or upgrade mass transit systems like subways and buses, including the implementation of integrated mass transit systems such as the Transmilenio system in Bogota, Colombia (Lupano and Sánchez, 2008).

The results of these decisions can be seen in many cities in the region; one example is Santiago, Chile. While this response might suggest that urban mobility policies are inconsistent, it also reflects the contradictory pressures that decision-makers are under. There is a desire for more mass transit, but individual transportation is also pushed as a response to the urban congestion that is behind the drive for expanded capacity. As discussed extensively in the literature, expanding street and highway capacity helps solve the vehicle congestion problem over the short run but also encourages automobile use and leads to further congestion over the medium run (Lupano and Sánchez, 2008).

VI. Case study: Santiago, Chile

This section looks at the city of Santiago, in Chile, where the public transit system known as Transantiago was inaugurated at the same time urban highways entered operation. This is a clear example of urban mobility policy divergence, mixing several contradictory initiatives that promoted mass transit while encouraging the use of the automobile. In short, the gains for society arising from one approach worked against those from another.

From an urban mobility viewpoint, strong and genuine (albeit partial) support for public transit led to implementation of a mass transit system whose technical design was patterned on other successful initiatives in the region (like in Bogota and Curitiba) and was complemented by an expansion of the subway network. However, two factors should be pointed out. Any mobility policy should provide solutions for other requirements of society (pedestrians, bikers and others that make up **the universe** of the population's mobility needs), and technical solutions should favour co-modality in urban transit. Co-modality means planning and combining all technical alternatives for addressing mobility needs (with the most efficient economic equation for meeting those needs in a socially sustainable fashion), seeking the most socially efficient share of trips on each mode and maximizing total trip efficiency. For example, light rail and streetcars are standard alternatives in more advanced countries, where traditional bus, bus rapid transit (BRT), subways and other solutions are combined with private vehicles, strategic car parks and street design, for example, while meeting the requirements of pedestrians, cyclists and other less favoured groups.

In the case of Santiago, though, there were measures that partially favoured some components over others. All of the mass transit attention focused on Transantiago and on expanding the subway system. This obviously resulted in mass bi-modality that was not coordinated with the rapidly expanding network of urban highways. Complementary modes were either low-priority or non-existent, and other mobility needs were neglected.

Bi-modality (Transantiago/subway) is thus a clear case of divergence, and expansion of the urban highway network strongly encouraged the use of private automobiles. This article will examine these components, although the authors would like to point out that little or no attention has been paid to other types of mobility or complementary modes such as streetcars.[1] Strictly speaking, an examination

1 This happens frequently in Latin America, where transit planning does not include light rail or streetcars despite the fact that current technology offers high-capacity modes at a

of the amounts involved in both projects (Transantiago and subway) reveals policy convergence, with both solutions responding to concerns about shared problems such as congestion, trip times and externalities.

Transantiago is a program promoted by the Government of Chile to improve public transit coverage in Santiago, reducing the number of transfers, shortening wait times and increasing the number of routes by redesigning the system and implementing physical and fare integration of the city's bus and subway services. But its roll-out in February 2007 was chaotic. Despite the project's commendable goals and the enormous public and private investments made (as will be discussed below), the outcome of the intervention fell far short of expectations and even underperformed the old system that was being upgraded. Even today, three years after the start-up of operations, the system is far from providing the level of services that citizens were promised despite a redesign and special funding to better match the route network to the needs of the populace, expand the fleet, establish segregated corridors and make other substantial investments in public infrastructure and modal integration (subway and bicycles). The main complaint about the system has to do with longer wait and trip times than with the old system. Service quality is poor (mainly in the form of crowded stops and vehicles) especially but not exclusively during peak hours. The problem has spilled over into the subway system; ridership has increased so much despite a fare hike that at peak times it is almost impossible to find room. Citizen dissatisfaction has increased fare evasion on trunk and feeder bus lines, creating a complex funding scenario. Neither the previous administration nor the current one has come up with a sustainable solution that is attractive for the general public of the city of Santiago.

This is a clear example of misguided public policy in the area of urban mobility. Despite an investment of some US$ 2.5 billion (see the table below), the system has been unable to capture user preferences. One reason for this is the public policy divergence discussed above: the system was inaugurated at the same time that Santiago's urban highways were. The highways now stretch for 210 kilometers. Although these highways are congestion-priced toll roads, they are used intensively and to the detriment of public transit —to the point that some bus lines use them to improve route times.

substantially lower investment than for traditional rail and subway systems.

Table 2
MASS TRANSIT INVESTMENTS IN SANTIAGO, CHILE, 2005-2009

Item	Millions of dollars
Installing tracks and special corridors and starting construction of transfer stations	172
Concessions during 2005 and 2006	230
Complementary concessions: corridors, transfer stations, stops	440
Immediate upgrades post-rollout of the Transantiago plan	102
Santiago street and avenue improvements to accommodate the new buses	174
Administrative and other expenses	43
Subtotal Transantiago	**1 161**
Investment in subway lines 4 and 4 A	1 230
Extending subway line 2	172
Subtotal subway	**1 402**
Total investments, urban transit	**2 563**

Source: The authors, on the basis of information from the Government of Chile.

It is also estimated that the total annual cost of investing in and operating the buses is US$ 316.8 million. This includes operating the system's trunk and feeder buses, plus a margin for the operators equal to 12% of the investment and operating costs.

For the subway system, if the cost of extending Line 1 (3.8 kilometers) east from the capital city of Santiago and the cost of building Line 4 (32.8 kilometers) southeast from the capital are considered in addition to the cost of operating the existing lines, the annual cost is US$ 236.0 million. Just for extending Line 1 and building Line 4, the investment is US$ 320 million. This includes engineering, tracks, building and outfitting stations, signage and traffic control systems, among other, minor items.

For urban highways in the Santiago metropolitan area, public bidding was conducted for four interoperable free-flow electronic tolling highways. The projected investments are shown in the table below.

Table 3
BASIC INVESTMENTS IN URBAN HIGHWAYS IN SANTIAGO, CHILE

Highway section	Investment amount per bid (millions of dollars)
Autopista Central	455
Costanera Norte	385
Túnel San Cristóbal	70
Vespucio Norte	320
Vespucio Sur	271
Total	**1 501**

Source: The authors, on the basis of information from the Government of Chile.

However, the amounts in the table are from initial bids from the concession-holders. Experience shows that they will be subject to adjustment. For Chile, the cost of all concessions granted between 1992 and 2007 was an average 24.5% above the initial bids. In view of this it can be assumed that these concessions will also have similar cost overruns, bringing the investment in urban highways in Santiago up to some US$ 1.87 billion.

In short, the investments in implementing Transantiago (not including buses) total US$ 1.16 billion, while US$ 1.87 billion was invested in urban highways and US$ 1.4 billion was invested in expanding the subway system. All in all, US$ 2.56 billion was allocated to mass transit and US$ 1.87 billion to urban highways, for a total investment of US$ 4.43 billion. This level of investment, which is unusual for Latin America, exemplifies the convergence/divergence of urban mobility policies in Latin America because they promote greater capacity for automobile traffic while extending or upgrading mass transit systems. While each approach is valid from a partial viewpoint, there is obviously no clear, consensus-based, long-term, integrated and sustainable vision. For this reason, the two initiatives work against each other and in the end worsen the problem they were meant to solve despite the enormous investments made. This can be seen in the public's dissatisfaction with the mass transit system and its longer wait and trip times, poor quality service and crowded stops and vehicles at certain times of day. The situation has spilled over into the subway, where ridership has grown so much despite fare hikes that the system has been unable to maintain historical levels of service.

VII. Initial reflections

In Latin America (and throughout the world), there is awareness of the benefits of encouraging the use of mass transit instead of private automobiles. And there are noteworthy experiences in the region. However, the Santiago, Chile case study shows that there are still contradictory, convergent/divergent policies in the region that encourage the improvement and use of often-upgraded mass transit systems while expanding automobile traffic capacity into the same urban areas served by mass transit. The two alternatives end up competing for the same space and get in each other's way. Similar amounts are invested in each, totalling more than US$ 4.4 billion in the case of Santiago, Chile.

Such urban mobility policies promote a uni-modal public transit system or a bi-modal one (as in Santiago), overlooking technologically and socially efficient alternatives and severely limiting the options for meeting other social mobility needs (such as those of cyclists and pedestrians). In short, urban co-modality is ignored in the very design of urban mobility policy.

There are three obstacles to moving ahead in this sphere:

- The lack of integration between sustainable mobility policies and land use and urban development policies, which seemingly favours dependence on the automobile because city growth is not accompanied by efficient, effective public transit system growth;

- Second, certain institutional weaknesses seem to be blocking adoption of co-modal urban mobility as the approach that should replace the uni-modal urban transit model that prevails in most of our cities, changing how policies are designed and taking into account all available alternatives for providing economically, socially, environmentally and institutionally sustainable mass transit;

- Last, international experience tells us that efficient transportation is not enough to discourage use of the automobile; integrated policies need to be put in place to solve mobility problems. In this context, policies for discouraging automobile use should consider four complementary factors: (i) quality public transit that is attractive not only for the lower-income population; (ii) economic instruments geared toward disincentivizing the use of private vehicles (road tolling, for example); (iii) adequate infrastructure for meeting other mobility requirements in cities, including non-motorized transport (bicycles, walking) and promoting co-modality and a combination of transit modes; (iv) education and awareness-building concerning the air pollution impacts of transport and the benefits associated with different modal options.

Transit policy should therefore shift from a strong uni-modal focus towards integrated, co-modal policies based on a broad definition of urban mobility. Against this backdrop, planning should encompass infrastructure development and transit services based on sustainable development and the appropriate use of public space.

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Essentially, urban mobility may be linked to ECLAC's approach to cargo transport in that public policy planning and execution should be based on the competitiveness and output of the goods or services that the country produces and markets, instead of on the predominant mode of transport (Pérez, G., 2008). In the case of public transit, this consists of fashioning a mobility policy that guides investments and integrates the various modes of transport (including private automobiles) so as to create a truly flexible, efficient and sustainable transport network that meets the inhabitants' needs and fosters their economic and social development in a healthy, safe environment.

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