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FACILITATION OF TRANSPORT AND TRADE IN LATIN AMERICA AND THE CARIBBEAN

Integrated and sustainable mobility policies: review and proposed conceptual framework

Background

In the last 30 years, Latin America has served as something of a model for experimentation in transport policy; from the extreme liberalization of transport services markets in the 1980s and 1990s, to the implementation of home-grown mass-transit solutions in response to previous experiences, the apparent success of which has led to their imitation in other parts of the world.

At the same time, Latin America, like other parts of the developing world, has experienced unprecedented growth in urbanization, tending to favour production in cities owing to their greater integration in the world economy, as well as high economic growth over the past decade.

This study proposes a conceptual framework that balances the four dimensions of sustainability in the design, application and appraisal of transport policies, programmes and projects.

I. Review and Problems

In a sense, Latin America has been a laboratory for urban mobility policies, from the launch of the first public bus services in the 1920s to the installation of electric tramways in virtually all major cities, the expansion of metro systems in the 1970s (and their present-day boom) and the invention of Bus Rapid Transit (BRT) systems, which are exported worldwide.

Experiences have also varied in the industrial organization and management of the sector, which initially consisted of services provided exclusively

This issue of the *FAL Bulletin* examines aspects of current urban transport policies in Latin America and proposes a conceptual framework for an integrated and sustainable mobility policy.
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by small private collective-taxi and bus operators. Large foreign-owned companies, mainly British, began to invest significantly in the construction and operation of tramways from the 1920s onwards. The State gradually entered the sector in the post-war period, initially in a regulatory capacity, and later participated in service provision. This involvement was triggered by the nationalization of the tramways, required to protect them against growing competition from urban bus services, and evolved into the creation of large, ambitious State-owned enterprises. To this day, metro systems remain in the hands of the State. However, in the late 1970s, with a change in the economic model spreading throughout Latin America, governments began to deregulate transport services and reduce public participation: State-owned enterprises were privatized or closed down. The trend peaked in Santiago, Chile, where surface transport services were completely deregulated and operating parameters, including fares, were decided solely by operators. This experiment in total deregulation failed: the sector became unsustainable owing to serious inefficiencies in services, high externalities and limited capacity for business expansion. Between the late 1990s and the present, various efforts have been made to resolve the problems caused by a lack of transport regulation, including the gradual return of the State to this sector.

As part of the process to transform and improve the urban transport sector, many cities have opted for "project-type" solutions, for instance, launching a specific transport infrastructure project as a means of changing management, regulatory and institutional aspects. This approach has predominated since the late 1990s, with the introduction of BRT routes in cities in Brazil, Colombia, Ecuador and Guatemala; and the construction of metro systems in Lima, Medellín, Panama City, Santo Domingo and Valencia (Venezuela). In all of these cases except Brazil, the intention has been to resolve all problems through a large investment in a single project, so as to reverse the pattern of decline in the sector.

While the "project" approach has seen an improvement on previous models, hopes that these projects would spontaneously transform the sector remain largely unfulfilled. Bogota is the best example. The TransMilenio BRT has had notable success, its network expanding to 108 kilometres of trunk routes and more than 600 kilometres of feeder routes, and the project is being exported to many countries. TransMilenio has brought about a major change in culture in Bogota and in Colombia as a whole, boosting public transport and raising awareness about sustainable urban mobility. However, most of the city continues to use the pre-existing operating structure, with fragmented operators, a high level of informality and low quality vehicles providing poor quality services. The same thing has happened in Quito, Lima and Guatemala City, where BRT projects have been implemented, and in Santo Domingo, where surface transport services have not been modernized in spite of a new metro line. Individual infrastructure projects are not in themselves enough to change the entire sector.

A transport policy framework must necessarily include sustainability if it is to be effective. Urbanization processes and rising income levels in emerging economies are significantly increasing fossil fuel consumption, with urban transport services among the biggest consumers of these non-renewable energies. The problem of efficient resource consumption therefore becomes a central concern in transport service sustainability.

II. Conceptual framework for a paradigm shift

Cities are at the heart of all human activities. They are where all stakeholders converge, with divergent interests constantly competing for the scarce resources on hand, simultaneously producing waste and externalities of all kinds. Cities are shaped by the convergence of these elements, and cities' problems therefore cannot be separated from those of their transport infrastructure and services.

Socioeconomic segregation is one of the particular features of Latin American cities, reflecting the continent's considerable economic inequalities. Areas in which activities and facilities are located, and where higher-income households generally live, tend to have higher urban land prices, forcing out lower-income population segments. The concentration of lower-income households and less profitable activities causes a fall in land prices, leading to lower municipal revenues from taxes on economic activities or on households, limiting capacity for infrastructure and public service provision in these districts. In addition, when households raise their income level, they tend to move to areas with better infrastructure and services, thereby perpetuating the segregation. This vicious circle of urban segregation reinforces differences in the coverage and quality of urban facilities and infrastructure, with housing location the basis for widening inequality in relation to quality of life and access to opportunities.

Without State intervention, whether through new local government plans, structural adjustment funding or infrastructure provision, it is impossible to break the vicious circle of territorial inequality, which is detrimental to cities' economic growth and their inhabitants' quality of life. Infrastructure and transport services may be used an exogenous tool in order to help correct these territorial inequalities.

Mobility as a comprehensive and intersectoral concept

The concept of mobility refers to the group of characteristics relating to individuals' movement from one point to another, irrespective of the service or infrastructure used to this end. The concept of transport considers the modes, services and infrastructure that allow individual mobility to take place. By distinguishing between the two concepts, travellers' needs and aspects of their environment can be taken into account in policy design and formulation, while remaining open to the potential and the limitations of transport infrastructure services.

Comprehensiveness refers to the combination of the parts involved in making up a whole. In the area of mobility, the integration of policies and regulations, as well as the participation of public and private actors linked to the activity, should therefore be encouraged through effective and participatory decision-making mechanisms.

Sustainability as a coherent and intersectoral concept

As stated above, in the last thirty years, Latin America has moved from the extreme liberalization of transport services markets in the 1980s and 1990s to the implementation of home-grown, experience-led mass-transit solutions, whose apparent success has sparked imitation in other parts of the world. In this context, it is becoming urgent to seek a balanced approach that accounts for all the converging aspects of mobility, avoiding extreme policy swings while taking into account rapid economic growth, the level of urbanization of Latin American cities, and the need to deliver transport solutions that do not compound negative externalities.

A sustainability approach is a tool that can and must be applied to mobility, precisely so as to provide a framework that is balanced between the contradictory focuses and interests that converge in this area. Sustainability has four dimensions: (i) environmental; (ii) social; (iii) economic and (iv) institutional, each of which highlights aspects that must be combined in order to formulate and implement an integrated and sustainable mobility policy, as proposed by ECLAC.

III. Proposed framework for an integrated and sustainable mobility policy

Activities and functions tended to be segmented under the urban mobility policies that were historically implemented in Latin America, with weak and incomplete legal and regulatory frameworks existing alongside ineffective oversight and control instruments. Sustainability criteria have been essentially absent from the design and formulation of the transport sector, resulting in short-termist policies, plans and projects.

Comprehensiveness and sustainability must be at the core of a proposed framework for an integrated and sustainable mobility policy, since such an approach is needed to achieve a leap forward in the basic quality of urban transport infrastructure and services in Latin America.

In short, the following proposal is structured around strategic guidelines for the formulation of an integrated and sustainable mobility policy.

A. Demand for urban mobility

Demand management is a key element of the proposed policy framework. The demand for urban mobility cannot be met solely through the supply of urban transport services and infrastructure, but must be understood, classified, prioritized and where necessary, reduced, so as to be able to improve potential responses in terms of supply.

Long-term demand is affected by the structure and characteristics of cities, the location of industries, and even the type of architecture. Policies must therefore propose modifications to the urban environment, in coordination with the relevant sectors, which over the long term would reduce travel distances between origin and destination, especially in journeys necessitated by work or study.

B. Accessible public transport service

The importance of ensuring urban mobility for all citizens without distinction clearly indicates that mass transit must be regarded as a public service. The State therefore has an inalienable obligation to guarantee accessibility to urban mobility, with a reasonable level of safety and quality, at a price that is affordable for all, and with a cost that is acceptable to the community. Legal and regulatory frameworks must therefore be developed in order to organize service provision, oversight and control.

C. Modal split in favour of transport services with fewer externalities

Mass transit exponentially reduces externalities and resource consumption per capita, and must therefore be the cornerstone of sustainability in any urban mobility policy, regardless of the characteristics of the vehicles used. Non-motorized modes of transport can and must be promoted, although they use space less efficiently and are ineffective over long distances. They should therefore be used in a complementary capacity and insofar as their limited potential allows.

D. Private automobiles and motorcycles

Modes of individual transport are the least efficient from any standpoint, but they offer the greatest benefits to users in terms of reliability, flexibility and comfort. These modes are subject to strong contradictions between social, environmental and institutional dimensions, since they certainly benefit the user the most and entail the least institutional cost and effort; however, they cause the greatest environmental disutility. The use of this mode must be limited insofar as there is an acceptable public transport alternative.

E. Industrial organization

Public transport service providers must be formally organized as enterprises that internalize the minimum costs of providing the service, namely: (i) the depreciation of vehicles; (ii) preventive maintenance; (iii) labour laws and (iv) applicable taxes. The size and structure of the service providers must guarantee compliance with the standards described above, without which the activity is unsustainable in the medium and long term. The Latin American experience demonstrates that to help boost enterprise in the sector, government contracts must ensure that tendering processes are competitive, thereby avoiding competition on the street.

F. Network structure and modes

Public transport systems and modes must adopt structures that balance the dimensions of sustainability, which may be in conflict. For example:

Network:

(a) Hub and spoke systems: intended to structure the network according to higher-capacity trunk routes and lower-capacity feeder routes, in order to increase the use of trunk routes. Such systems use resources more efficiently and reduce externalities. However, they are less direct and generally do not correspond to user's travel plans, forcing them to make unwanted connections.

(b) Point-to-point systems: implemented when there is less regulation, since operators compete excessively for passenger demand, providing routes for virtually all possible travel itineraries. From the user's perspective these routes are excellent because they avoid connections and overlapping routes tend to offer several alternative itineraries and frequent services. However, overlapping routes also produce congestion, inefficient and excessive resource consumption and greater negative externalities per passenger.

Vehicle size:

(a) High-capacity vehicles: have the advantage of transporting greater numbers of passengers at fixed costs equivalent to those of smaller vehicles, delivering greater operational efficiency, more efficient resource consumption and fewer externalities per passenger. The disadvantage is that operational efficiency depends on filling the vehicle with passengers at each stop, which can mean long waits and lower frequency between vehicles.

(b) Low-capacity vehicles: offer less operational and environmental efficiency per passenger transported, however, they are flexible enough to offer more frequent services, can be used on narrower roads, and are therefore suitable in a larger number of situations and demand structures.

Vehicle technology:

(a) Electric vehicles: are a heavier burden in terms of initial investment, operation and maintenance, but produce fewer environmental externalities where the electricity production mix is not exclusively thermal.

(b) Fossil-fuel vehicles: investment, operation and maintenance costs are lower, since these vehicles are in wider production and use.

(c) Guided vehicles: usually have higher initial investment, operation and maintenance costs, but they produce fewer traffic accidents, since they are controlled by a number of mechanisms that limit driving errors.

The technology and capacity of vehicles, as well as the structure of transport systems, have characteristics that place the social, environmental, economic and institutional dimensions of sustainability in conflicting positions. It is therefore essential that the design of the system and the selection of modes, vehicles and technologies are adapted to the travel demand structure in order to guarantee long-term sustainability. The more closely these volumetric and structural considerations coincide with the demand for travel, the more likely that an appropriate balance will be found between public demand, greater potential for operational efficiency, greater environmental efficiency, and lower costs.

G. Road infrastructure

Road infrastructure underpins mass transit services, private vehicle transport, cargo vehicle transport, and non-motorized and pedestrian transport. Its existence is therefore essential to the functioning of urban mobility

and urban cargo transport. Roads also occupy space, which is an expensive, non-renewable resource that is in competition with other production activities.

The finite nature of space makes it advisable that most of this resource be dedicated to productive activities rather than transport, which is an input activity. This also means that the space allocated to mobility must be used with the maximum efficiency, by prioritizing space-efficient transport services and maximizing roads' dynamic capacity through the preferential use of mass transit, while promoting mixed land use in the city so that roads can provide mobility for various purposes during the day.

H. Financing and subsidies

Financing and subsidies must be regarded as a single issue: the manner in which the State and/or the transport management authority participates in financing public transport services and infrastructure. At stake is whether public transport services and infrastructure should be financed exclusively by users, or whether non-users should make a contribution.

People travel in order to take part in various activities, which all benefit from mobility. For this reason, historically urban roads have been financed with State funds from general revenue; i.e. taxes on users and non-users alike. In addition, and following the same logic, in France and Brazil the cost of employees' public transport tickets is partly funded by employers.

Road infrastructure and public transport services are the same in that they are ultimately beneficial to society as a whole, and not only users. As a result, it is regarded as acceptable for both users and non-users to finance infrastructure and services, subject to the agreement of the State as the representative of the community.

The same logic dictates that a transport system with less dynamic road capacity uses less space. A system that carries more people with lower fossil-fuel consumption leaves more of these resources available for other activities. Furthermore, transport systems with fewer negative externalities (e.g. emissions, noise and accidents) per person transported, are more beneficial to non-users than to users. This is why it seems acceptable for non-users to also contribute to improvements in the efficiency of motorized transport services.

Transport services and infrastructure have been financed in a number of different ways. Infrastructure is generally publicly funded, however there are examples of urban road concessions being partially or totally financed through tolls. Transport services are usually financed according to a mixed model: (i) services without their own infrastructure (buses, collective taxis, etc.) are mainly financed by users' fares. However, in Mexico, Brazil, Uruguay, Argentina and Chile, there are currently examples of State subsidies being provided to bus service operators. In the rest of the world, it is not uncommon for these services to be subsidized; and (ii) services with their own infrastructure (metro, tramways, BRT systems, cable cars, etc.) have mixed financing, with public funds allocated to infrastructure and user fares contributing to operations.

Experience shows that the way in which financing is implemented can affect the operational efficiency of services provided by the private sector. Indeed, granting subsidies to operators can diminish their incentive to provide the service efficiently. It is therefore preferable that public funding is channelled into infrastructure or other investment items that are not included in the economic formula of private operations, and that such contributions as are deemed necessary during the operation of services are provided directly to users rather than to operators. In the case of operators that are State-owned enterprises, subsidies may be granted to the enterprise itself, subject to operating agreements that set targets on service quality and operational efficiency.

The quality of public transport systems and infrastructure must be aligned with users' ability to pay, rather than that of non-users. The cost of the system is determined by the quality of services and the number of externalities that they internalize. It must also tally with the fares that users can afford and the financing that the State can provide. In short, systems that internalize negative externalities cannot be designed if users are unable to pay for this benefit.

IV. Framework for implementing an integrated and sustainable mobility policy in Latin America

The integrated and sustainable mobility policy framework emerges from the concept of comprehensive mobility, considering users rather than vehicles as the target of the policy. In practical terms, this framework consists of a broad series of programmes covering all aspects required by an integrated policy. Said programmes are designed to strike a balance between the social, environmental, economic and institutional dimensions of sustainability.

The specific development of an integrated and sustainable mobility policy should include content on the following chapters: (i) demand-side management; (ii) public transport services; (iii) private transport; (iv) non-motorized transport and pedestrian mobility; (v) cargo transport services; (vi) other transport services; (vii) road infrastructure; (viii) parking; (ix) road safety; (x) traffic management.

A focus on sustainability, and a balance between its four dimensions, runs through the philosophy and content of each of these policy chapters.

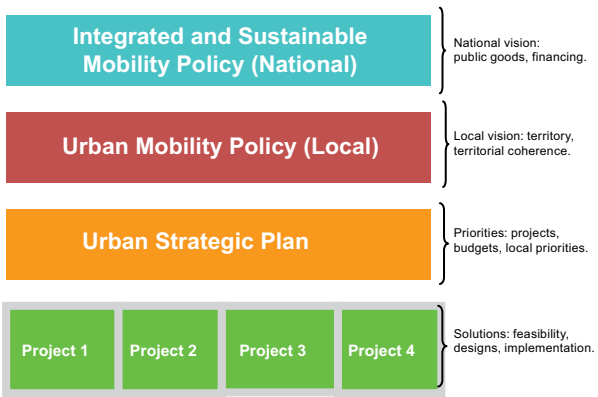
The design and formulation of a mobility policy is a necessary step in developing a comprehensive integrated and sustainable mobility framework. However it must also be accompanied by an implementation plan that ensures the comprehensiveness and the sustainability of the proposed policy.

Mobility policies must be consistent with other national public policies, such as fiscal, macroeconomic, foreign trade, labour and public health policies. They should also set out guidelines for the management of public goods issues, establishing the nationally applicable standards and regulations. This includes issues with an impact beyond the territory in which mobility takes place.

National mobility policies should therefore provide a comprehensive approach, serving as a framework for local policies, plans and projects, and a basis for sectoral coordination in all spheres that affect or are affected by mobility. They must be conceived as long-term State policies and agreed at government level with all stakeholders and civil society, so as to be drawn up in legal documents, preferably with legislative approval.

These national policies should offer a long-term strategic vision, with special emphasis on the coordination between

Diagram 1
IMPLEMENTATION PLAN FOR AN INTEGRATED AND SUSTAINABLE MOBILITY POLICY



Source: Prepared by author.

The strategic plan must base measures, initiatives and projects on the budget situation, public transport users' ability to pay, the political context and local preferences, proposing time horizons for the application of measures and projects, as well as funding commitments, on this basis.

The priorities identified in the strategic mobility plan should be translated into a portfolio of initiatives and projects that are institutionally, economically, socially and environmentally feasible, seeking balanced sustainability at all times. The feasibility of projects must be analysed through pre-feasibility and feasibility studies and corresponding designs, ensuring consistency between the projects and the integrated and sustainable mobility policy.

Lastly, mechanisms must be created in order to plan and implement the measures and projects designed to achieve the objectives proposed in the policy framework. These mechanisms must systematically comply with specific rules, as part of the legal framework that accompanies the