International Transport Forum

Perspectives from Mexico to Achieve More with Less

Alternative Transport Modes and their Social and Environmental Benefits

06

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INTERNATIONAL TRANSPORT FORUM

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EXECUTIVE SUMMARY

The discussion presented below focuses on improving the decision-making process as the true challenge of mobility we face. It proposes a way of thinking about some of the key topics within each of the layers involved in decision-making at the strategic level, including attributes of the transport system and regulatory frameworks.

This discussion is intended for reflection and to challenge the accepted practice, and is based on CTS Mexico's work in developing country contexts with a range of authorities and projects. Four final points that synthesize neatly these reflections are:

- Emphasizing multimodal transport is essential in increasing accessibility and mobility, and we must move away from corridor-based solutions to transport networks
- Ongoing innovation and new technologies will make the alternative selection more complex, but will also increase the possibility of achieving positive impacts
- The highest cost for any city is that of "doing nothing" – we must take advantage of windows of opportunity
- Think of decision making strategically across its various levels in order to implement the mobility solutions we already know that work.

Once we can begin to question the underlying truths and assumptions in the practice of sustainable transport, we can begin to understand where the true bottlenecks lie. Only in this way, can we begin to evolve the decision-making process to become more effective in implementing the transport solutions we already know under fiscally constrained conditions, and achieve the full potential of social and environmental benefits possible through these types of projects.

1. Introduction

The current working paper was written in the context of the roundtable seminar on *Meeting Society's Transport Needs under Tight Budgets*, held in Mexico City on 8 March 2011, organized by the International Transport Forum of the OECD and the Secretaría de Comunicaciones y Transporte of the Federal Government of Mexico. The purpose of this session was to provide input for the 2011 summit of the International Transport Forum, to take place on 25-27 May in Leipzig, Germany, under the theme of *Transport for Society*.

The specific title of the presentation that accompanied this paper is *perspectives from Mexico on achieving more with less: alternative transport modes and their social and environmental benefits*. The objective of this session was to discuss the relevant attributes of different motorized and non-motorized transport modes and alternatives available to achieve not only ever increasingly relevant environmental benefits, but social benefits as well.

This topic was presented by Adriana Lobo, director of the EMBARQ – World Resources Institute Center for Sustainable Transport in Mexico (CTS Mexico) given the center's broad experience in Latin America working with sustainable transport solutions. Among its portfolio of projects, CTS Mexico has worked in the implementation of the BRT systems in Mexico City and Guadalajara, helped strengthen urban planning practices in areas like Aguascalientes and Chihuahua, and has acted as technical advisor to the Federal government's mass transit support program, the PROTRAM under the national infrastructure fund, FONADIN.

The objective of this working paper was not to treat the topic of sustainable transport solutions exhaustively, but rather to take advantage of the opportunity to propose some questions and lessons learned throughout its experience that challenge conventional wisdom and shift emphasis from current topics of debate, to other areas where the sustainable transport community must move forward in order to be successful.

1.1. The True Challenge of Urban Mobility

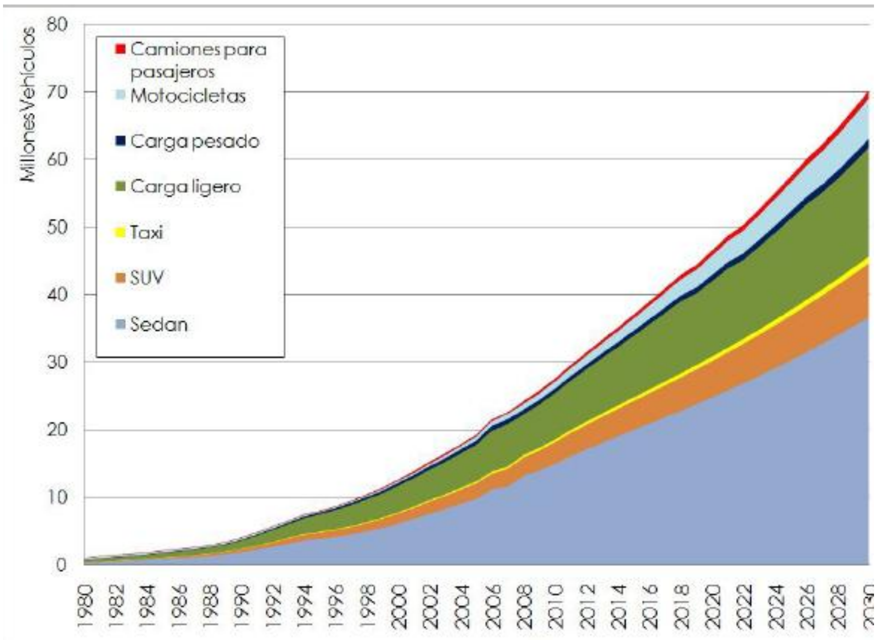
Several studies coming from the public, private, non-governmental and multilateral development institutions, have clearly documented and synthesized the problem of mobility urban areas in both rapidly growing developing countries, and developed regions as well, are facing.

Many of these problems of mobility center on the impact that transport and urban planning decisions, coupled with rapid geographic and population growth, and a heightened awareness and knowledge of the true costs of degradation of the environment brings to human society. They include increasing levels of congestion which hamper productivity and lead to time loss – with people in Mexico City spending on average 5 years of their life in avoidable traffic – and increasing rates of deaths and material loss due to traffic accidents, increasing greenhouse gas emissions that contribute to global warming, with transport being the second largest contributor to this, and a general deterioration of public space and urban quality of life as a consequence. The general level of congestion and traffic related problems have spread, from large megalopolises to medium-sized cities. In Mexico, we not only find the problems of urban mobility affecting citizens of Mexico City, but also of Chihuahua, Guadalajara and Monterrey.

Figure 1. **Traffic congestion in Guadalajara, Monterrey and State of Mexico**

This is mainly attributable to the increasing rates of motorization and shift towards private modes, which not only are less efficient modes of travel within urban areas, but also lead to patterns of development that induce longer journeys and require more limited urban surface space and costly infrastructure. In Mexico alone, the car fleet is expected to double in 10 years.[1]

Figure 2**. Motorization growth in Mexico over 50 years**



Not only has the problem of mobility been clearly documented in previous studies, but also the possible solutions to these problems. On the one hand, we understand the importance of moving towards more sustainable transport modes, particularly mass transit and non-motorized to satisfy the majority of our journeys. On the other hand, we also understand the need to plan land use zoning accordingly, with mixed uses and dense city areas that prioritize public space and pedestrian quality of life. This combination of strategies comes down to micro level interventions, including bicycle lanes, Bus Rapid Transit (BRT), and or traffic-calmed streets. However, best practices and technical guidelines for how these solutions work have already been developed to a certain extent and **the bottleneck of current solutions lies increasingly at our ability to implement these solutions in a timely and cost-effective way**. This working paper explores the question of how this can be advanced by focusing on the strategic decision-making framework in an integrated way so that both the solutions we know to the problems we understand cannot just be known, but also implemented.

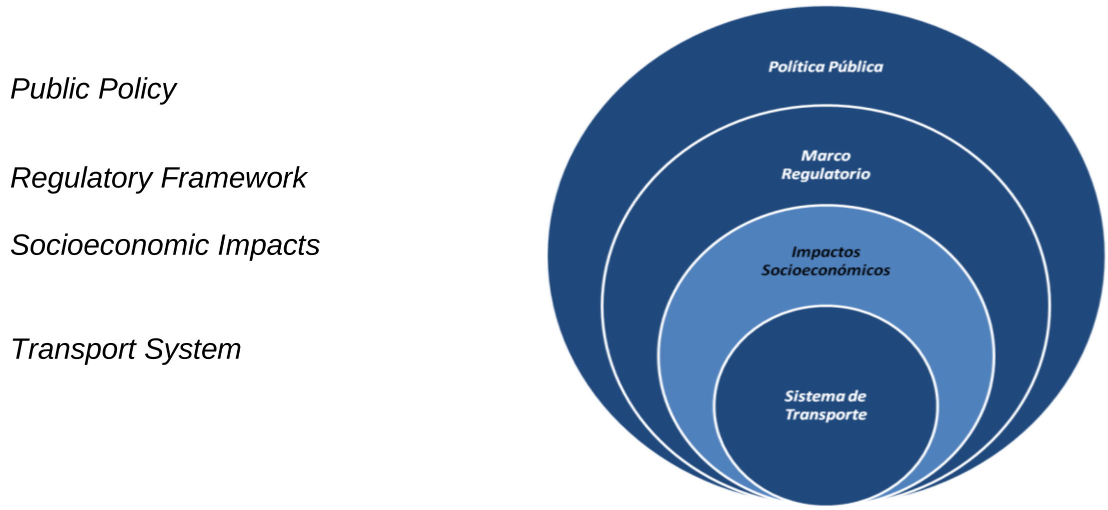
1. CTS México MEDEC Study, 2008 (www.embarq.org/en/project/medec-study).

1.2. Towards a Strategic Vision

In order to begin to tackle the question of how to implement sustainable transport solutions, it is necessary to think of the decision-making process across its various layers. Only this way can we begin to put into context the specific debates that take place over the relative superiority of different transport alternatives, their social and environmental impacts, and the challenges they pose.

The first layer is that of the transport system, and it includes all the characteristics – technical and institutional – that are intrinsic to alternative modes. These characteristics are important to understand in order to effectively achieve the transport objectives set out. The second layer is the first part of the decision-making context, or the regulatory framework. Within this framework are the evaluation criteria and process, as well as the financing mechanisms that decide which projects get implemented and how these intrinsic attributes translate to social benefits from the public sector perspective. Socioeconomic impacts are proposed as an intermediate layer between the transport system attributes and the evaluation framework that measures them. Finally, the second part of the decision-making layer encompasses public policy decisions, or those decisions that determine the priorities and values that society places on alternative investment decisions with limited public funds, trading off between the opportunity cost of carrying out certain sectors such as transport, with respect to others, as well as trading off between cost and value. The regulatory framework serves as the bridge between these public policy decisions and the transport system performance and selection.

Figure 3. **Decision-making levels from a strategic perspective**



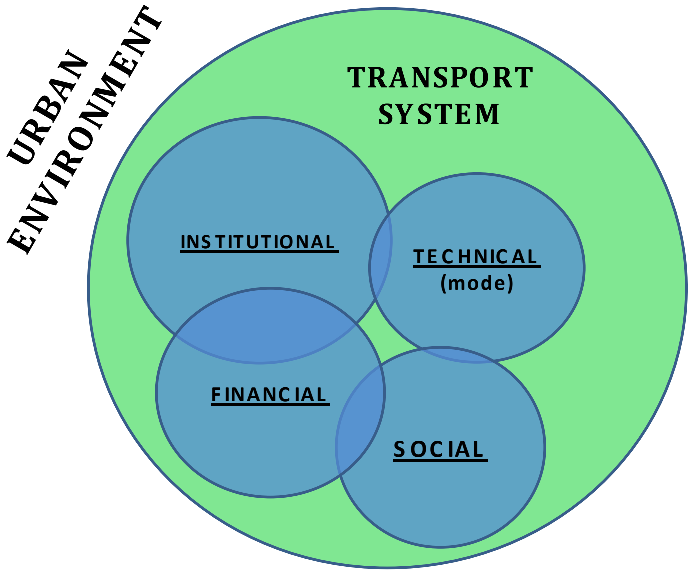
2. Transport System

The first layer is the transport system and its inherent attributes, which when seen through the regulatory framework result in a measurement of social and environmental impacts. The transport system is the foundation for sustainable transport projects and is where most of the energy on the alternative selection phases is devoted, given its concreteness when compared to evaluation and financing framework development. This section seeks to show that even though the inherent characteristics of the transport alternative are determinant in the effectiveness of transport investments, they are also only one layer and move beyond just the choice of technology which current debates seem to focus on.

2.1. Components of Decision Making

There are five components with respect to the transport system that must be taken into account within a strategic decision-making framework. The first four are inherent to the system and they are the technical (or technological), institutional, financial and social dimensions. The fifth component is the urban environment and the way the transport system interrelates with it. Each of these dimensions must be considered when selecting among transport mode alternatives, as they affect not only its final performance along service quality and cost dimensions, but also in terms of its feasibility of implementation.

Figure 4. **Transport system components of decision-making process**



The technical dimension, also known as the choice of mode technology, is preoccupied with the capacity and service quality that can be achieved. This debate is often where a lot of the attention gets shifted to, in many cases stalling the remaining evaluation and selection process, with politicians and other key actors stalling moving forward with decisions and remaining at traditional and narrow-minded bus vs. rail comparisons. This dimension is nevertheless important, but the point being that it is only one in several components to be considered, and not necessarily the most crucial one in order to achieve success.

The institutional dimension is concerned with the laws and organizations surrounding a given transport project. This dimension can be the defining factor between success and failure, with projects focusing only on infrastructure reform and ignoring deeper longer-lasting institutional changes achieving only temporary success – as was observed for example in the busways of the 1980's and 90's, with the one built along the Avenida Caracas in Bogotá being an example. In the case of many developing cities in Latin America, the creation of public decentralized entities, or OPD's in Spanish, allowed for BRT and other mass transit projects to thrive and change the economic incentives behind the previous *hombre-camion* or owner-operator models that resulted in poor performance. This is often one of the most difficult dimensions to tackle in the implementation of a transport project, and must be taken into account explicitly in order to consider a project feasible from the onset.

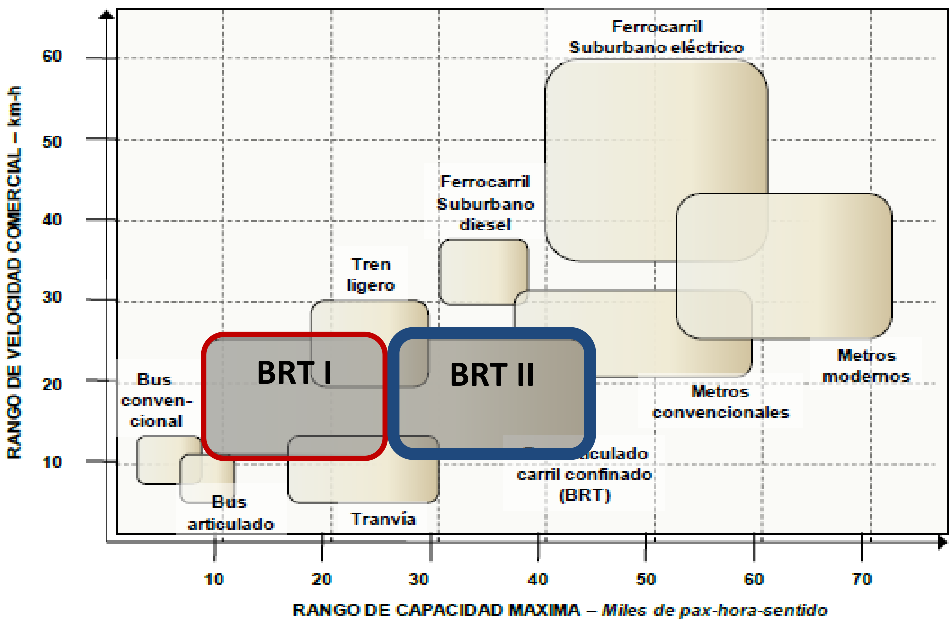
The financial dimension is also important to take into account, as will later be shown in this paper, because of the role it plays in being the decisive element in leveraging public funds with private participation in order to achieve more with less. Because transport is a public service and involves as such public infrastructure, its financial sustainability becomes a necessary prerequisite, and governments are often forced to provide support in cases where poor design or deliberate investment in quality do not make the system feasible to pay for itself. The financial component can thus make or break a project, if the appropriate financing mechanisms are not in place, even if it is positive from the socioeconomic point of view.

Lastly, the social dimension is crucial to take into account, especially in developing countries where it can often be overlooked or lead to significant negative impacts if not planned for. In the implementation phases of transit projects, existing interest groups can be powerful enough to block and even cancel a project, as we have observed in some cities in Mexico with BRT initiatives, and the negotiation process leading in many cases to significant changes in the technical components of a project.

2.2. Transport Alternative Selection

The selection of transport alternative in terms of the capacity of passenger throughput and the level of service (speed, comfort, waiting times, etc.) that can be achieved has always been at the center of project design and evaluation. The technical characteristics of the various bus-based and rail modes are well understood and documented.[2] Until recently the appropriate technological choice for certain capacity and cost ranges was relatively simple, with bus-based modes unexplored and mainly serving lower capacity and lower cost scenarios, and rail modes attending higher capacity and/or level of service requirements.

Figure 5. **Transport mode capacity and commercial speed (Vuchic, 2005).**



2. See Vuchic – *Urban Transit: Operations, Planning and Economics* (2005).

However, with the appearance of high-capacity bus-based systems such as those found in Bogotá's Transmilenio BRT, or cost-effective solutions like those in Leon, Mexico averaging at around US$2 million per kilometer of infrastructure for a light BRT, the technological choice scenarios became more complex. Second generation BRT began to question how much society, and more specifically decision-makers, investors, and passengers, valued the differences in quality of service once capacity requirement could be achieved at a fraction of the cost in infrastructure. In Guadalajara, Mexico, this has been one of the questions at the forefront in the mass transit system's expansion now that it contains successful BRT and LRT corridors, with significantly different levels of cost of infrastructure (US$ 5 and 30 million per km respectively), and comparable number of trips served each day (120 000).

Figure 6. **Guadalajara Light Rail and Bus Rapid Transit Systems**

In addition, there are four dimensions that are not considered in the capacity and level of service attributes in the technological choice of mode: comfort and convenience, the urban environment, capital and operational costs, and externalities and fares. These are discussed below.

Comfort and convenience is one of the most important attributes of a public transport system, and in many cases, particularly in developing countries and fiscally constrained societies, is one of the attributes that gets left out first. Systems are designed in some cases to cater to the captive demand that exists in these cities due to the relatively low incomes (low enough to be unable to purchase a car), and are not designed to induce mode shift away from private to public modes. This presents a long-term problem not only because it reinforces the stigma that public transport is "for the poor", but also renders it uncompetitive in the long term to sustain ridership and incomes through fares to pay for itself. Low quality transport systems only capture demand so long as it does not have an alternative mode of travel, and will not sustain itself in the future, not to mention it does not yield the important socioeconomic benefits expected from this type of investment. In order to obtain quality transport systems, it is important not to seek a minimum cost solution, but rather a quality maximizing scenario that is financially feasible with public support.

The impacts of the transport system on the urban environment are a crucial component that is often left out of planning and evaluation. In many cases, transport investment projects are focused on the primary components of the heavy infrastructure (right of ways, stations, communications systems, etc.) and leave out important urban renewal projects that can occur in parallel. This truncates the potential positive impact these projects can have on surrounding urban areas, not to mention that it is often a necessary component in order to provide the conditions to attract the pedestrian demand that will eventually feed the system.

Finally, the selection of technological alternative is complicated by the fact that more often than not for public transport systems, the cost of operations and the amortized capital expenditures cannot be repaid through income from fares alone. This is mainly due to the difficulty that arises when one tries to quantify and capture the total positive externalities that these systems bring to society to a price that consumers of the service are willing to pay for (e.g. cleaner air from using the system). This imbalance in what users are willing to pay for and how much their journey on the public transport system, as opposed to private modes, is worth to society, is one of the primary rationales for the public sector supporting through subsidies or financing mechanisms, the full fare for quality service. Because this is not the case in many situations, and transit investments are forced to pay for the investment through user fares, quality is often sacrificed and the full social benefits that could have resulted are not reaped.

2.3. Investment Costs and Barriers to Entry

One of the largest barriers to entry in terms of planning and implementing public transport solutions is the initial investment required for construction and acquisition of rolling stock and communications equipment. In fiscally constrained societies, the level of support that (central) governments can facilitate to overcome this initial investment barrier is complicated by the trading off between limited numbers of possible projects, from a larger pool of potential investment. Under this circumstance, the initial cost of investment becomes highly relevant, deemphasizing other values such as operational cost, socioeconomic impact in order to simply become feasible.

Figure 7. **Cost comparison of mass transit technologies (Zhang, 2009)**

	BRT[a]		LRT[b]		MRT[c]	
	$	%	$	%	$	%
Average cost per route mile (millions)	10.2		26.4		128.2	
Cost range (millions)	5.6–41.7		9.4–90.2		63.9–169.6	
Per Mile Cost Breakdown						
Land (right-of-way)	3,018	15.0	1,520	7.8	7,436	5.8
Guideway	6,495	33.5	4,289	22.0	33,333	26.0
Trackwork or special conditions	983	8.5	1,686	8.7	5,385	4.2
Stations	1,387	9.1	1,094	5.6	33,333	26.0
Power and control	113	2.7	2,047	10.5	10,513	8.2
Facilities (yards and shops)	192	1.9	974	5.0	2,820	2.2
Eng./mgt./test (soft costs)	2,948	20.3	5,581	28.6	19,230	15.0
Vehicles	1,483	9.0	2,295	11.8	16,154	12.6
Total	16,620	100	19,486	100	128,203	100

NOTE: Values in 1990 U.S. dollars.
[a]Nine projects reviewed.
[b]Twenty-one projects reviewed.
[c]Four projects reviewed.

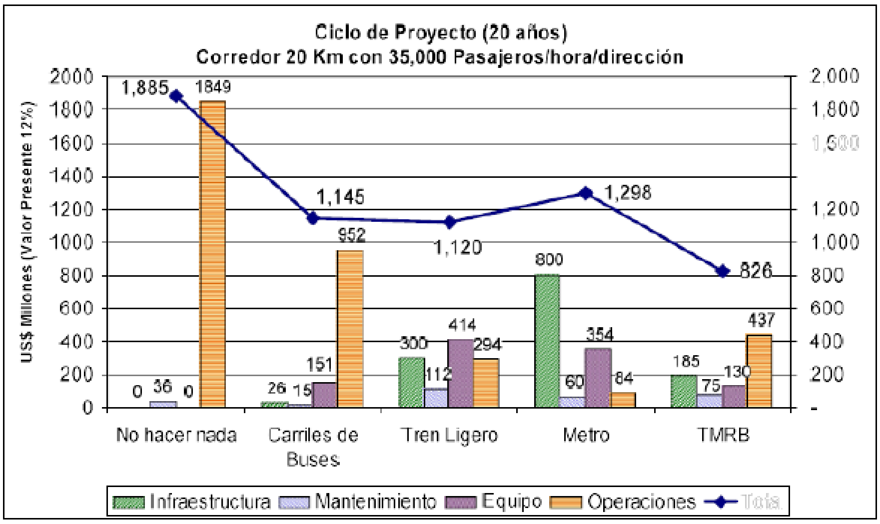
From an investment cost perspective, the gap between the alternative modes of transport becomes more evident, with bus-based technologies significantly lower per kilometer than rail-based modes for comparable carrying capacities. BRT is typically an order of magnitude behind LRT, and heavy rail systems or MRT being significantly more costly.[3]

3. Zhang – *Bus Versus Rail: Meta-analysis of Cost Characteristics, Carrying Capacities and Land Use Impacts* (2009).

2.4. Considering Life-Cycle Cost

Another important issue with current alternative selection of transport mode has to do with the focus on initial costs, described in the previous section. This focus often ignores the full life-cycle costs of transit project alternatives, favoring alternatives that have the lowest construction cost, but might have more costly or competitive operations and maintenance costs. A study of a hypothetical mass transit corridor compared the full life-cycle cost of several alternatives, as is shown in the figure below.[4]

Figure 8. **Life-cycle cost for transit alternatives under a hypothetical corridor (Hidalgo, 2005)**



Two important conclusions from this exercise become evident and inform our current approach to alternative selection. First, we can see that over a period of 20 years, bus-based high capacity investments (TMRB in the Figure) are comparable to light rail and heavy rail alternatives, being slightly less expensive with most of the savings coming upfront, whereas the rail-based modes obtain their savings through lower costs of operations for that level of demand. This highlights the need to select each alternative for realistic levels of demand under each circumstance in order to appropriately obtain the minimum life-cycle cost solution.

Second and more importantly however, is the relatively high cost of inaction as compared to any of the three major mass transit investments. That is, by allowing current operations, in this scenario assumed to be owner-operated fragmented and small vehicle operations, society is at a loss, regardless of the technology selected for investment.

3. Implementation of Quality Transport

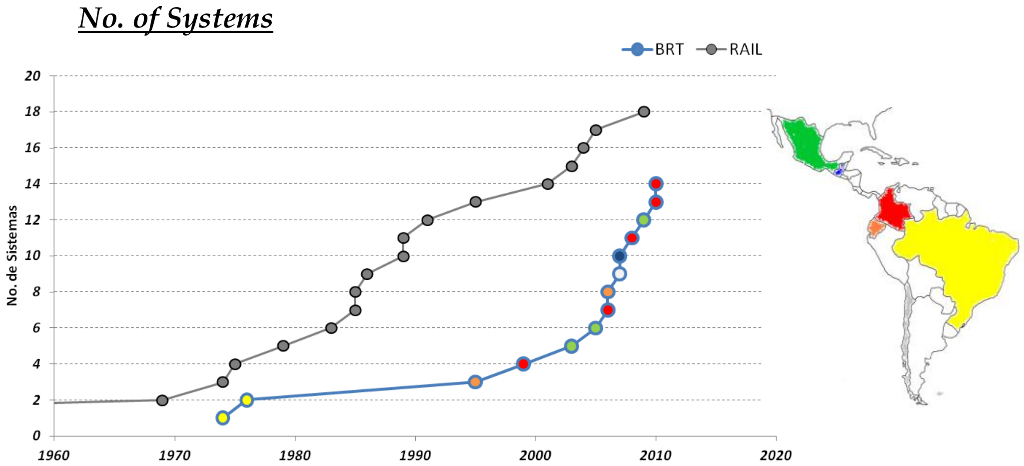
Part of the performance of a transport system undergoing the alternative selection process is its feasibility and timeliness of implementation. That is, beyond looking directly at the transport systems characteristics, it is important to consider the likelihood that a given alternative will experience delays, costs overruns, and be institutionally and politically palatable under the existing circumstances.

4. Hidalgo – Comparison *between Alternatives of Public Transport: A Conceptual Approach* (2005).

3.1. Evolution of Mass Transit in Latin America

A reflection of the combination of attributes that distinguish the different types of technologies and their impact on the feasibility and attractiveness of implementation can be seen with the evolution and proliferation in recent years of BRT systems in Latin American cities. Specifically, during the past decade, over there has been around one new BRT system per year, in addition to expansions of existing ones, each time adding a larger share of total mass transit ridership shared with rail based modes in the region.[5]

Figure 9. **Evolution of Mass Transit Systems in Latin America (Uniman, 2010)**



A number of factors can explain this growth. First, the low initial cost and comparable capacities to light and in some cases heavy rail systems makes BRT systems attractive from the public sector perspective. Second, the ability to integrate more easily existing operators of public transport service makes this model attractive to politicians and decision-makers. Third, the lower cost of the vehicle fleet makes it possible to pay off the private sector's investment in these (under Public-Private Partnership agreements) in a shorter time period than rail-based alternatives, with longer-lasting but also more expensive rolling stock. Finally, the short construction times that BRT presents relative to rail-based modes due to its simplicity of design make it a competitive alternative, with implementation for a 15km corridor averaging between 2-3 years, and almost twice for light rail options.

These conditions have, coupled with support programs from the central government of various countries, led to a proliferation of bus-based transit solutions. In the case of Colombia, after Transmilenio Phase I is implemented in 2000, there are four additional BRT systems in Colombia appearing thanks to 70% total cost coverage provided by the central government. In Mexico, a similar program, PROTRAM-FONADIN, has also led to the planning and future implementation of several potential BRT systems in the upcoming years.

3.2. Transit Provision Coverage

In the case of limited public funds for supporting the development and implementation of sustainable transport projects, the level of service coverage one can achieve per investment amount becomes more important and in a timely way. In rapidly urbanizing areas with high

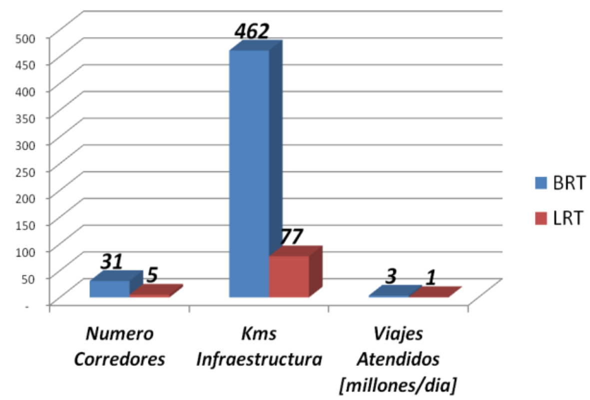
5. Uniman et al. – *CLATPU Presentation* (2010).

motorization rates like Mexico, the ability to implement a high number of mass transit corridors before private automobile usage consolidates itself and begins the cycle of congestion and private vehicle infrastructure expansion, has a high value. In other words, by investing in transit solutions in a number of cities before they become congested has a high value. The question would be how we tradeoff this value with other considerations such as quality of service or population served in a few concentrated cities as opposed to cities with future potential growth but low current demand for public transport. The figure below shows the results of an exercise where a public fund of US$2 billion are invested in just two types of mass transit solutions – BRT and light rail transit.

Figure 10. **Illustration of mass transit investment program alternatives**

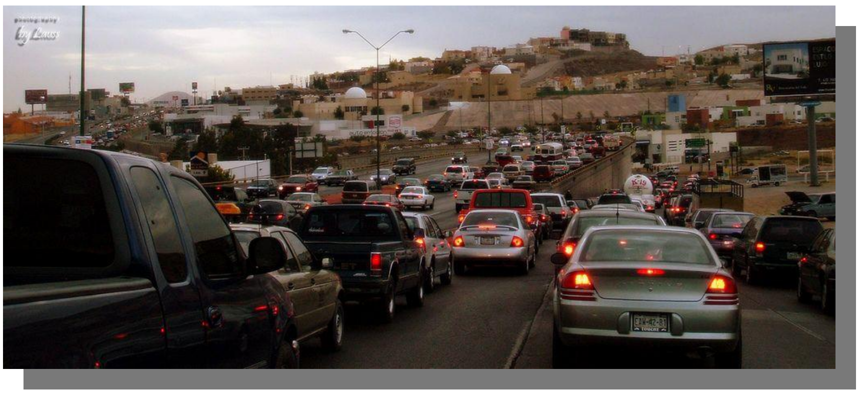
Hypothetical Case

- **US$2 Billion total from public funds** (*MXN$ 30,000 M*)
- **BRT** US$5 M/km
  LRT US$30 M/km
- **8,000** pax/km infrastructure



The two extreme investment patterns simply illustrate the difference in the level of coverage that can be achieved with the same amount of public resources, with BRT system investment only making it possible to establish 31 corridors as opposed to 5 with the LRT solution. This level of transit service coverage would have to be weighed against the possibility of building a lower number of high-quality corridors in select cities, with potentially larger populations being served, however at the risk of not "putting your foot in the door" in the remaining cities before the private automobile congestion effects set in. Chihuahua, Mexico, has less than 20% public transport ridership, one of the lowest in the country for cities over 500 000. However, the recent approval of a BRT corridor signals a shift in priorities for the city, where future demand levels are expected to help justify today in this type of infrastructure.

Figure 11. **Traffic congestion in Chihuahua, Mexico**



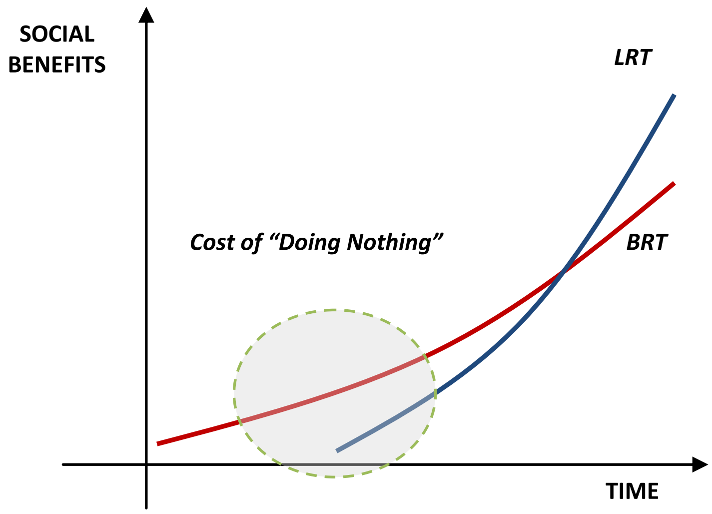
Under this context, it is important to keep in mind not only system coverage for current demand levels, but future impacts as well.

3.3. The Cost of "Doing Nothing"

The seminal study by Flyvberg[6] showed how for transit projects around the world, there was always a tendency to underestimate costs and implementation times by almost half, both because of difficulty in estimation but also because of incentives that lead to deliberately changed values for projects to be approved in the evaluation process. Either way, this underestimation in implementation times and to a certain extent investment costs (which can also halt a project if the cost overruns are significant enough), have an additional cost on society – the "cost of doing nothing".

This cost simply means that in many cases, debates on alternative selection are stalled at technical debates seeking optimal solutions that are infeasible from one of the many dimensions described previously (institutional, financial, social) beyond the technical consideration. This leads often times to no project being built and reconsidered for many years later, missing on the benefits in the present of a less-than-perfect project or simply not clearing the way for an optimal project to be considered in the future through an immediate intermediate success in the present.

Figure 12. **Illustration on the lost social benefits from delays in implementation**



A focus and recognition on the value that implementing gradual solutions towards an optimal transport system should increase; as it is often more feasible to take several small steps in institutionally and politically charged societies that are also fiscally constrained, than one giant leap into the future. Recently in one Mexican city, a debate over whether the existing BRT corridor should have been a different higher capacity technology is a good case in point. Mainly because had it not been for the implementation several years back of the BRT corridor, making it possible to accumulate demand away from informal transport to a formal mode and creating a public entity charged with the technical capacity to implement and operate the system, this debate of upgrading technology today would not be possible. Hence, it is important to weigh the possibility of moving forward partially vs. stagnating in the present while looking for "perfect" solutions that even so, we are not certain will produce the planned results.

6. Flyvberg – *How common and how large are cost overruns in transport infrastructure projects?* (2003).

In the case of Mexico City, the implementation of a first BRT corridor in 2005 detonated several years later a growing network of lines that eventually will integrate with other modes, producing each year additional benefits from the first line.

Figure 13. **Metrobus BRT System Expansion**

METROBUS LINE	KILOMETERS	PASSENGERS PER DAY
Line 1	*28 kms*	*350,000*
Line 2	*20 kms*	*120,000*
Line 3	*17 kms*	*110,000*
Metrobús 2011	***65 kms***	***580,000***
Lines 4 y 5	+	+

This gradual growth of the system has made possible the strengthening of a public entity to regulate transport provision along the corridors of the system, leading to important social and environmental benefits in the process.

3.4. Network Accessibility and Mobility

When implementing sustainable transport solutions, a key element that is often forgotten is that we are planning for networks of mobility and accessibility, and not just piece-wise improvements in infrastructure. With this view in mind, not only the primary parts of the system are important, but also the “software” behind them as well, in addition to complementary strategies like non-motorized transport.

For instance, in Madrid as in London, one of the major factors that allowed the city to turn around its ailing transport system was the implementation of an integrated fare collection system across several modes of transport. This not only helped in integrated multi-modal planning, but more importantly raised the quality of the service towards the user, through the creation of a real network of urban mobility. Other strategies that enhance the value and potential of the transport system are non-motorized investments and feeder and conventional bus improvements.

Figure 14. **Complementary strategies for transport service provision – Mexico City Ecobici bikesharing program and Leon BRT system non-trunk routes**

In the first case, several short-distance trips can be tended through bicycle and walking, as will be discussed in the next chapter, freeing up valuable space for longer journeys in the mass transit system. In the second case, conventional bus routes are one of the most cost-effective ways of improving transit service coverage and quality, and it is important not to forget improving conventional bus routes alongside major transit system improvements along trunk corridors.

4. Decision-Making Framework

Surrounding the transport system and its inherent technical, institutional, financial, and social attributes, and its feasibility of implementation, is the alternative selection process itself.

This is referred to as the second layer of the decision-making framework, and it encompasses both the evaluation criteria that determine, guided by public policies which establish priorities and set values to competing investment programs, which projects will advance the overall objectives for development of each specific country, and the financing mechanisms that make it feasible to implement these socially beneficial projects. In order to understand how to be more effective in implementing sustainable transport solutions, it is important to analyze this decision-making context as it is often one of the key areas where projects get shaped and/or halted, and where there is the largest potential for impact.

4.1. Evaluation Criteria

Project evaluation in Mexico centers around two dimensions, particularly when approving public funds: socioeconomic and financial appraisal.

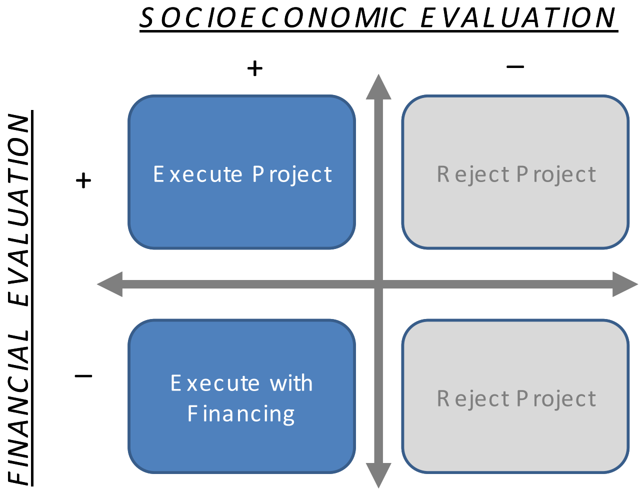
The first measures the merits of the project, giving decision-makers a closer look at whether the project should be executed on the basis of making society better off. Several different methodologies can be used here, ranging from cost-effectiveness analysis (CEA), cost-benefit analysis (CBA), and multi-criteria analysis (MCA). In the particular case of investment in public transport infrastructure, cost-benefit analysis is the preferred method.

The latter dimension measures the financial feasibility of the project from the various perspectives involved, making sure that investment on private returns is acceptable, that there is enough cash flow to sustain the operations of the project throughout its life, and identifying any subsidies, loans and credits that are required on behalf of the public sector in order to make the project possible.

According to a best practices manual put forth by the Inter-American Development Bank on economic project evaluation, from the public sector perspective, a project is required to pass the socioeconomic evaluation but not necessarily the financial evaluation.[7] That is, in the case where a project is socially desirable, but financially unfeasible, ways to finance it would be the best option to pursue. However, if a project is financially feasible or even attractive, but socially undesirable, it should not be allowed to move forward to implementation because it would make society worse off overall.

7. IADB – *Evaluación Económica de Proyectos de Transporte* (2006).

Figure 15. **Project Evaluation Framework (IADB, 2006)**



The important aspect to take into account is the role that the different socioeconomic criteria and financing mechanisms play in determining the portfolio of projects to implement. In the case of Mexico, evaluation criteria focus on direct mobility benefits of projects, measuring travel time savings, and reductions in vehicle purchase, maintenance, and operating costs. This approach does not explicitly account for indirect benefits to the private automobile and other users of the transport system, or externalities through reductions in greenhouse gas emissions, local pollution and traffic accidents. This more rigid focus often has as an objective the prevention of socially "poor" projects, rather than the selection and optimization of socially excellent projects that can be ranked with respect to each other, as is done in more developed country contexts. However, the evaluation criteria determine the placement of each project on the positive or negative side of the approval line, and it is important to reflect on the types of transport projects that will result from a given set of criteria. In the case of fiscally constrained societies with large pent up demand for public transport service across a large geographic area, a shift towards MCA methodologies that weigh heavily on population served could lead to a portfolio of projects that, as discussed in section 3.3, will "put their foot in the door" towards transforming mobility patterns. If other objectives are to be pursued, such as environmental sustainability, then this should be reflected in the evaluation criteria which lead to projects that benefit this particular dimension, alongside other traditional social benefits like travel time savings.

4.2. Financing Mechanisms

The second dimension that plays a determinant role in the selection of transport projects from the public sector perspective are the financing mechanisms available. If a project is deemed socially desirable, but financially infeasible given the current conditions, then it cannot be realized and society will miss out. This is when the use of alternate financing mechanisms comes into relevance. In the case of urban public transport, most of the time projects will fall under this quadrant, where it is difficult for the system to pay for itself through fare revenues and advertising alone – especially if high quality service is desired as discussed in the second chapter of this paper.

Creative financial arrangements, however, have made it possible to overcome some of these barriers. These include the creation of central or federal government limited and reauthorized funds attached to investment programs to support the construction of mass transit systems. Often these programs cover up to a certain percentage of the total or infrastructure costs, leaving the matching fund requirements to be met by either local governments, multilateral banks or the private sector, or a combination of these. This has worked well in countries like Colombia and Mexico, reducing the barriers to entry and making it possible for a large number of mass transit projects to enter the pipeline in a timely way.

In addition, public-private partnership schemes and the unbundling of transit service provision elements (e.g. separating infrastructure construction and maintenance from the operations) have made it possible to deliver different blends of funding sources, maintain low fares, and repay for the private investment in a competitive way. This ability to match public funds with other sources has been an important tool in leveraging the impact of central government investments, achieving greater effectiveness in fiscally constrained societies.

One last area where financing mechanisms have still to be further advanced is in understanding and valuing the relationship between quality of service and subsidies. Often times when sunk funds are put into other transport sectors, they are referred to as “investments”, but in the case of public transport, they are referred to as “subsidies”, implying an inefficiency in its connotation. This reflects a deeper problem of how we value quality of service and how to recognize its importance if we are to achieve the levels of service that will yield in the long-term, the greatest possible social benefits. In other words, looking how to avoid falling into the old maxim of “a penny wise and a pound foolish” by accepting marginally higher investment costs for exponentially greater impacts in the future through quality transport service.

4.3. Prioritization and Public Policies

The regulatory framework can be understood as a translation of the public policy agenda and set of values into a workable and measurable set of guidelines that lead to the selection and implementation of public transport projects. That is why it is important to also question the public policy agenda that is set forth and how this agenda affects downstream the decisions that are made throughout the decision-making process. These values often define the amount of funds to be dedicated across sectors (e.g. public transport vs. highways, or transport vs. energy at a higher level), as well as dictating how much society values certain tradeoffs in coverage vs. depth and quality of service, and the effectiveness of investment programs in achieving objectives.

An illustration of this could be seen in the specific use of bicycles and other non-motorized transport (i.e. walking) as important modes of transport. An average cost of a bicycle lane kilometer would be around US$50 000, and if we consider that in areas like Mexico City around 30% of trips are less than 8 km long, we could be capturing around 10% of all journeys in the city through this mode at a very low cost. Piece-wise planning would say that these types of projects are not highly visible from an investment point of view, and often will not go into larger mass transit investment funds. However, their potential for impact is comparable to other investment options, and their inclusion in the pipeline of possible tools for prioritizing public space and sustainable urban development should not be overlooked.

The important point here being that as we move forward with a more holistic and inclusive vision of urban sustainable transport, including network-level planning and regulatory frameworks that are more flexible and inclusive of externalities as social benefits to be accounted for, public policy must move away from only infrastructure investment and transport engineering practices, and towards an urban planning perspective that puts equity and quality at the forefront. Policies that require land use planning to consider transport system expansion, and vice-versa, will be much more successful in achieving broader development objectives in a more cost-effective way than sector-wise planning. Under this vision, strategies that advance the quality of life of urban areas should not discriminate between price tags or political visibility and instead focus on their ability to bring real transport solutions in a timely way.

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