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Barriers to planning and implementing Bus Rapid Transit systems

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ABSTRACT

Bus Rapid Transit, BRT, is now operating in many cities of emerging and developed economies around the world. It provides affordable connectivity, and fast and reliable services for a range of requirements. This paper presents barriers to introducing BRT based on the authors' experience in planning, implementing and improving these systems in cities of emerging countries. We conclude that most issues are related to institutional, financial, legal and political sectors. In particular, BRT planning faces: (i) institutional complexities and lack of technical capacity; (ii) lack of alignment among stakeholders; (iii) strong promotion of competing modes; (iv) perception of BRT as a lower quality mode; (v) traditional bias towards vehicle capacity expansions; (vi) opposition from existing bus operators; and (vii) lack of community participation. BRT implementation barriers include: (i) underestimating the implementation effort, i.e. optimism bias; (ii) discontinuities due to political cycles; (iii) lack of national policies supporting BRT development; (iv) insufficient funding for adequate implementation; and (v) rushed inauguration. By addressing and documenting common issues of many real world experiences, we expect to help cities enhance their ability to advance BRT as part of their portfolio of sustainable mobility improvements.

1. Introduction

Bus Rapid Transit, BRT, defined as "*a flexible, rubber-tired form of rapid transit that combines stations, vehicles, services, running ways and information technologies into an integrated system with strong identity*" (Levinson et al., 2003) has grown from an exotic way of providing mass transit in South America, to a common component of integrated transport systems in 168 cities from 39 countries around the world (Global BRT Data, 2014; Hidalgo, 2011). Besides enabling a more efficient use of urban road space by increasing capacity to carry people, BRT provides affordable connectivity, and fast and reliable services for a range of requirements (Fouracre, Dunkerley, & Gardner, 2003; Lash, Koch, & Lindau, 2012; Muñoz & Hidalgo, 2013; UN-HABITAT, 2013).

But BRT faces similar barriers to other urban mobility projects requiring political economy and community support, institutional capacity and funding. The novel characteristics of the concept – first full BRT system was implemented in Curitiba in 1982 (Lindau, Hidalgo, & Facchini, 2010) and most systems have less than 15 years – and its intrinsic flexibility (Levinson et al., 2003), imposes particular challenges. BRT is not always understood in the same way by practitioners and decision makers, and faces three especially contentious issues: i) institutional arrangements requiring the coordination of multiple agencies and, in many countries, reorganizing private transit service operators; ii) competition for space traditionally assigned to general traffic; iii) the misperception of buses as a low quality mode (Hensher, 2007).

In this paper we concentrate on the barriers to planning and implementing BRT, expanding previous assessments (e.g., GAO, 2011; GAO, 2012; Hidalgo & Carrigan, 2010). Despite the rapid expansion over the last 15 years, the BRT industry is still far from reaching maturity. There is still low technical and institutional capacity in most cities for the development of BRT. By addressing and documenting misperceptions, common issues and actual challenges of many real world experiences, we expect to help cities enhance their ability to advance BRT as part of their portfolio of sustainable mobility improvements.

The issues we raise and the conclusions we reach are mostly based on our experience in planning, implementing and improving urban mass transit systems, particularly in cities of emerging countries. We start by addressing the barriers related to the planning process and in continuation we present those related to the

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implementation of a BRT system. We finish by discussing BRT barriers that are of a more general nature.

2. Barriers in the planning process

2.1. Institutional complexity and the lack of technical capacity

In most cities, different departments and agencies, some of them with overlapping responsibilities, tend to work in isolation and ignorance of each other rather than collaborating on projects and policies. As opposed to institutional arrangements for rail systems, in which a single transit agency is usually designated and empowered to plan, implement and operate the full system, BRT touches on areas that fall under the purview of a range of city officials in different departments. Multiple stakeholders present a significant challenge when planning and implementing multifaceted projects. Governments often struggle to attract and retain top talent with the level of technical expertise and sophistication required to plan, implement, and manage complex urban transportation projects.

Invariably cities end up relying on consultancy services to plan their mass transit systems, including BRT. But a booming BRT market demands more work than experienced consultants with a credible track record in designing successful BRT systems can provide. Contrary to other transit technologies, BRT is not a turnkey project. There are no single companies in the market providing all elements from road infrastructure to rolling stock and control systems. So BRT designers require a very comprehensive understanding of the multiple project components and their interfaces, especially in cases where the BRT systems are expected to deliver high capacity and performance (Lindau, Pereira, Castilho, Diógenes, & Herrera, 2011). There is only a handful of BRT corridors with capacities beyond 15,000 passengers per hour per direction (BRT Data, 2014), so there is insufficient practical knowledge on how to plan, implement and operate such systems.

Experienced BRT experts are aware of the usual project pitfalls (Hidalgo & Carrigan, 2010). Both major and minor design problems are well known to the BRT community and some of them are even reported in the literature (Muñoz & Gschwender, 2008; Wright & Hook, 2007). Anyway, as poor design may lead to future operating and traffic safety problems, it is important to count with sound technical and independent advice during the different phases of project.

2.2. Lack of alignment among stakeholders

There are many stakeholders with overlapping roles and conflicting interests in the decision making process. Recognized BRT systems like Curitiba (Lindau et al., 2010), Bogota (Ardila & Menckhoff, 2002) and Ahmedabad (Rizvi, 2014) have benefited from committed participation of city leaders in either conceiving or leading its planning and implementation. Other systems that have experienced difficulties in implementation, like Santiago (Muñoz & Gschwender, 2008), Cali (Hidalgo, 2013) and Delhi (Rizvi, 2014) lacked the same level of commitment by top city administrators.

Strong leadership is fundamental for mitigating technical, economic, commercial, operational and political risks of BRT projects, as there are many public and private stakeholders involved. A typical BRT implementation is marked by constantly changing challenges imposed by external and internal actors, thus the importance of mapping stakeholders and establishing a close communication channel between stakeholders of the private and public sectors.

The lack of political commitment and strong leadership nurtures the thriving of conflicts. Problems vary from hidden agendas to lobbyists capturing decision makers. Political leadership is also important to ensure that procedures, like licensing by public departments and authorities, do not impose unnecessary delays to the BRT project.

2.3. Strong promotion of competing modes

Evidence shows that transit investments can benefit both the local economic growth and the national economy (Weisbrod & Reno, 2009). Nevertheless, national governments tend to favor the car and motorcycle value chains, especially in countries where vehicle original equipment manufacturers are established (Urry, 2004). While national finances and industrial development gain with sales of private vehicles, cities end up facing the burden of road congestion that, in turn, traps buses operating in mix traffic conditions.

The physical image of transport systems has a strong influence in the formation of user and non-user preferences Rail is often preferred to buses even for similar transport conditions in terms of waiting, travel time and costs (Hensher & Mulley, 2014). Metros tend to be also the favorite transit mode of the media that is seldom aware of their implementation challenges and costs (Ramos Barcelos, 2013). Long established rail transit industries count with active associations to promote their products and interests, like the Association of European Rail Industry, UNIFE, or the Latin-—American Association of Metros and Undergrounds, ALAMYS.

2.4. Perception of BRT as a lower quality mode

Conventional bus systems that have to divide urban road space with other vehicles are seldom ranked high by the population. Current technological paradigms tend to impair the general perception on the future of bus technology, on the great potential for improved vehicle design, internal layout and comfort, and lower emissions. Rare are the bus systems that benefit from proper marketing efforts (Weber, Arpi, & Carrigan, 2010).

Overall, bus is perceived as a lower quality mode than rail. Nevertheless, Buses with High Level of Service, BHLS, have been successfully adopted by many cities in developed countries as an alternative to more expensive rail based transit systems (COST, 2011; Finn et al., 2011; Hodgson, Potter, Warren, & Gillingwater, 2013).

Bus based transit systems can face prejudice by planners and decision makers even when performing well against rail transit

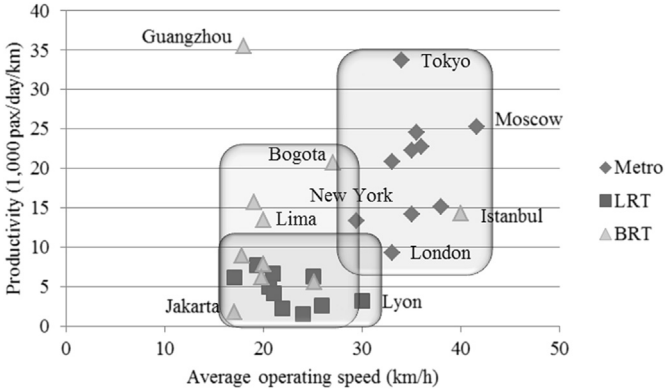

Fig. 1. Comparing the performance of the world's top-ten transit systems. Source: Petzhold, 2012; Lindau et al., 2014.

(Hensher, 1999, 2007). A study by Ben-Akiva and Morikawa (2002) suggests that this prejudice may not be grounded on user preferences. Fig. 1 depicts a comparison, in terms of productivity and operating speed, of the world's top-ten BRT, Light Rail Transit, LRT, and metro systems with respect to daily volumes, grouped into technological clusters (Lindau, Petzhold, Silva, & Facchini, 2014; Petzhold, 2012). The results indicate that seven BRT carry as many passengers per kilometer as the ten top metro systems and two (Istanbul and Bogotá) present comparable operating speeds to the top metros. Most BRT have comparable speeds to LRT.

2.5. Traditional bias towards vehicle capacity expansion

Last century's traffic engineers were forged with the concept of maximizing the volume of vehicles on the roads rather than the flow of people, and interpreting buses as passenger car unit equivalents (TRB, 2000). For decades cities were planned for cars and traffic and the urban road industry thrived by widening avenues, paving streets and constructing flyovers and elevated roads (Hull, 2008).

When facing congestion, private vehicle riders press public authorities for more road space. Taxi drivers tend to insist in requesting the opportunity to share the use of bus lanes. Car and motorcycle drivers are always demanding more road space for them. Owners and riders of private vehicles never lobby for dedicated transit lanes, neither better sidewalks, nor cycle ways.

Planning cities for people (Toth, 2008) is a relatively new concept that is not yet consensus among local planners in many cities of emerging economies that now face rapid motorization. But even in more advanced societies, assigning existing lanes for the exclusive use of buses is not an easy task. For example, widening roads to accommodate existing car lanes is still the predominant way of making space for bus priority lanes in the USA (NCHRP, 2009).

2.6. Opposition from existing bus operators

Bus operators range from subsidized public companies, syndicates of drivers that both own and operate buses, to large international private corporations. But established bus operators tend to be conservative and seek first to protect the *status-quo* instead of taking the risk of investing in BRT and integrated systems (Flores Dewey, 2013). Thus it is important to involve any existing bus operator at the initial stages of a BRT project (Hidalgo & Carrigan, 2010). When existing supply is provided by atomized bus owners that are also bus drivers, there may be a social reasoning to find out a way of incorporating them into a new capitalistic ownership structure.

In a falling market share city context for public transport, at least some of the operators perceive the potential for being transit providers instead of mere suppliers of existing bus services. Such understanding tends to exist where buses are losing market share to motorcycles and cars, strong syndicates or federations of bus operating companies are in place and bus industry is already consolidated for decades, like in Brazil (Fetranspor, 2014). In any case, it is important to promote open bidding processes for BRT services instead of bureaucratically renewing or extending any ongoing bus operating permissions or concessions (Hidalgo & Carrigan, 2010).

2.7. Media, political adversaries, business, land owners and advocates for non-motorized transport

In large cities, traffic and transit are topics that tend to receive daily coverage from the media. As journalists are not necessarily transportation experts, in reporting they rely on specialists. Independent media ends up by mirroring conflicting views and opinions of national and local experts and reproducing any lack of consensus around the most adequate transit solution for a specific situation. Media is keen to provide plenty of opportunities for debates between people that are far too enthusiastic for or radically against BRT and in favor of rail transit. Once a final decision is made to implement a BRT, those that question the solution will always find out media space to echo their opposing opinions (Ramos Barcelos, 2013).

During construction, political adversaries to the party in power thrive with opposition to BRT arising from commerce and services installed along its way (Wright & Hook, 2007). Retail shop owners normally fear negative impacts of the BRT on their businesses, such as the suppression of on-street car parking spaces and logistic difficulties for delivering goods. Informal retailers that occupy public sidewalks are not happy in being displaced so that pedestrians can regain their right-of-way. Real state owners may have a different view of the BRT with the likelihood of increasing construction rights and thus property values (Munoz-Raskin, 2010).

Advocates for non-motorized transportation may not always understand the important role of sidewalks and cycle ways in providing access to BRT networks (Ormnews, 2014). When transit advocates dispute traffic congested road space with non-motorized transport enthusiasts, most likely the interests of cars and motorcycles will end up prevailing in the conceptual arena.

2.8. Lack of community participation

Ideally, public engagement should be part of the BRT planning process and continue through the design and implementation stages. Community participation is fundamental for ensuring that projects do not fall victim to changes in political administrations (El Informador, 2010; La República, 2013). Convinced citizens and their organizations provide credibility to a project, independent monitoring and instant data to complement that from other studies (Sagaris, 2011). Civil society organization partnerships are also important to promote education and social transformation. The case of the bus improvements in New York City, shows that a participatory approach can enhance the success of a project (Laylin, 2012).

But in most emerging economies, community participation in decision making processes of large scale projects such as BRT is still in its early days. In an engagement scale that goes from inform to consult, involve, collaborate and finally empower, it is usual to find out communities in developing cities standing between inform and consult.

There are also awareness, expectations and aspirations gaps between transit user needs and planning (Kash & Hidalgo, 2012). Even well intentioned planners tend to express the user needs in ways that are different than the community. Planners tend to focus in broad impacts, like emissions and traffic safety, while key issues for users are time and cost. Improved methods are required to gather community concerns in a direct way that avoids the capture of interest groups opposing transit improvements.

In many cases there are barriers to aligning citizen's movements around a single cause. It is more likely to find out hostility occurring on issues such as cycling versus buses instead of the understanding that walking, cycling and transit are complementary. Projects need designs that take into account the full potential of BRT in integrating non-motorized modes to transit.

3. Barriers in the implementation process

While BRT shares issues with other mass transit projects, like underestimation of cost and overestimation of demand (Flyvbjerg,

Bruzelius, & Rothengatter, 2003), there are particular topics that relate to the lack of experience with BRT complexity.

3.1. Underestimating the implementation effort

A successful BRT implementation lies well beyond the physical construction of a busway. Open busways are one of the predominant forms of bus priority scheme around the world and have influenced generations of transit designers (Wright & Hook, 2007). In a typical open busway, different bus services enter and leave a single bus dedicated lane at different points and bus bays at stations are shared by multiple services. On the other hand, operations along a full BRT system are marked by strictly regulated services that comply with predefined standards that resemble those of rail services. But strict operational procedures are yet to be fully incorporated by BRT agencies and bus companies operating in most emerging economies (Hidalgo & Carrigan, 2010).

A city's building department may interpret BRT implementation as the usual construction work required to retrofit the road pavement and implement equipment such as passenger stations. Under such perception, in some cases construction may advance while some blueprints are not even finalized. As staff at the city's transportation department is usually busy dealing with burning daily issues, it is common to see BRT implementation mostly in the hands of road builders. Some cities have successfully overcome this problem by installing a BRT implementation executive unit to manage the planning and implementation of BRT projects, with the capacity of coordinating overlapping responsibilities and even overruling those of other city's departments.

3.2. Discontinuities due to political cycles

Similarly to other urban transport projects, a BRT should fit well within the usual time window of one political mandate from initial idea to implementation. Nonetheless, delays in starting or underestimation of the challenges imposed by a BRT due to lack of experience with this concept, can compromise any initial plan. An incomplete project implementation always faces the risk of discontinuation when elections empower a new mayor from an opposing political party (El Informador 2010; La República 2013), thus the importance of counting with a strong buy-in from the key project stakeholders and the civil society.

In one case, a new city administration changed the deals set by the previous mayor. Conventional bus services, due by contract to be discontinued after BRT inauguration, were allowed to keep running and competing with the BRT for the demand along the corridor. As result, the private sector, which invested in acquiring the new bus fleet and running the BRT, lost revenue that would otherwise be generated by passengers transferred from former bus services (Hidalgo, 2013).

3.3. Lack of national policies supporting BRT development

Few emerging countries count with national policies supporting urban transit development; usually they prioritize urban rail (Global Times, 2013; MOUD, 2014). Only established programs tend to have prescriptive guidance such as detailed specifications for cost–benefit analyses and guidelines for managing the project (Owen, Carrigan, & Hidalgo, 2012).

In countries that do not have nationwide BRT development programs, city leaders may require extra stamina to break paradigms. At the city level, it is difficult to conceive and implement innovative transit solutions as there is usually little installed experience with urban projects that require large investments.

3.4. Insufficient funding for adequate implementation

Funding to implement a BRT corridor or network may come from different sources. A city may use its own funds, get funding from the state or borrow money from national development banks or multilaterals. But any cuts in funding during the implementation phase may risk the success of a BRT project, especially if it shortens the extension of a planned corridor or degrades some of its components such as quality of pavement, terminals, fleet, access facilities and stations. As opposed to rail projects, a BRT is able to operate without all the components in place, and usually does so particularly at the beginning (Hidalgo & Carrigan, 2010).

A degraded project may risk revenue generation from expected BRT users and compromise financial deals set by contracts with the private sector. This is especially the case when implementation of a city or region wide BRT network is delayed by the public sector and BRT operations by the private sector start on a corridor that does not present ridership levels capable of generating enough revenue.

3.5. Rushed inauguration

Traditional politicians are focused on elections and thus producing quick wins. One of the attributes BRT is most known for is its comparatively rapid implementation cycle. But if the cycle period of the project results longer than the initial forecast and compromises the time window of the current political mandate, pressure to speed up processes may be imposed on constructors and operators.

Transit projects are top in the list of public visibility. So, when facing the end of their terms, politicians tend to rush for inaugurations that can provide prestigious media coverage. Some politicians risk high in deciding to start operations on an incomplete BRT corridor and take the burden of their decisions to the polls. There is much to lose if some elements of BRT are not in place. This is specifically the case when the letter R of BRT that responds for rapid and reliable is not delivered to the public.

4. Other major barriers

4.1. Failing to realize the potential for reducing crashes and saving lives

General evidence demonstrates that public transport provides a safer environment to road users than cars and motorcycles. A review by Litman (in press) indicates that transit travel has about a tenth the traffic casualty (death or injury) rate than automobile travel. Research studies based on data from different latitudes (Duduta, Adriazola, Hidalgo, Lindau, & Jaffe, 2012; Duduta, Lindau, & Adriazola-Steil, 2013; Goh, Currie, Sarvi, & Logan, 2013) show that a carefully designed busway system can reduce injury crashes and deaths.

When the insertion of bus lanes on highly congested urban arterials enables buses to move faster than conventional traffic, particular attention must be given to at-grade pedestrian crossings and to introducing safer by design elements to deter jaywalking. As safety is not an issue of prime concern to BRT designers and road safety auditing is not yet an established practice in the developing world, few are the BRT corridors that have had their implementation driven by blueprints approved by certified traffic safety auditors.

4.2. Facing environmental issues and expropriation

Some countries face stringent environmental licensing procedures to implement projects. Most transit projects, by favoring public over private mobility, impact the environment in a positive

way both from the local emissions and the global climate perspective. But instead of focusing on the overall impact assessment of a project, where environment is one of the dimensions, licensing can be conditioned to sorting out several minor issues specifically related to the site where the BRT is going to be implemented. Excessive delays in obtaining environmental licenses may compromise the quality of the end product if urban requalification along the corridor is left out for speeding up inaugurations.

Expropriation deserves special communication efforts from decision makers. When decision is to widen the corridor, invariably residents and businesses need to be displaced in making room for more traffic lanes. If the main objective of the expropriation is to keep the same level of service for private motorized vehicles after the one or two lane per direction busway is implemented, so it has to be announced to the public. Properties to be demolished should not be marked and numbered with the BRT logo, as it happened in the case of one city, but with a car sign if these marks are to be used at all. Important to note that discussions around the project will be mostly centered on survival issues, be them of an individual nature, for the case of residents and businesses along the corridor, or collective, for the case of overall city development.

Land acquisition is normally not funded by multilaterals or national development banks. Cities have to commit they own money to buy properties and negotiation is difficult. Important decisions include sorting out a fair price to pay, be it current market price or any price in the range before and after the BRT project has been announced. Invariably, compensation disputes end up in courts and while they are not fully settled there is the risk that the required external loans are not made available.

4.3. Overcoming funding gaps for infrastructure

Despite the fact that BRT investments are a fraction of comparable rail options (Muñoz & Hidalgo, 2013), local authorities face difficulties to fund BRT planning and implementation. City transport budgets are usually assigned to road expansion and maintenance plus covering traffic management expenditures, and there is little opportunity to redirect them to transit infrastructure.

Cities often need to find new local sources of funding for infrastructure, advance public–private partnerships for the operations, and get support from upper levels of government (regional and national) to complete funding requirements. Fresh local sources of funding, such as expanding land development value capture and vehicle property and user taxes are, naturally, not easy to approve by local elected bodies, even if authorized by law. Property taxes and land leases are among the most important source of municipal finance; expanding them requires strong political will.

It is possible to create value capture mechanisms to recover at least part of the infrastructure costs. Value capture from joint development of transit and land use is not new. The urban expansion of many cities in the second half of 1800 and early 1900 was made possible by the implementation of tram lines associated with residential developments. Some of the best most recent examples are in developed Asian cities (e.g., Tokyo, Hong Kong and Singapore) and are associated with rapid rail systems (Cervero & Murakami, 2009). There is an ongoing debate on whether BRT has impact on land use comparable to rail alternatives (Suzuki, Cervero, & Iuchi, 2013). Several studies address land use issues associated to BRT (Bocarejo, Portilla, & Pérez, 2013; Estupiñán & Rodriguez, 2008; Munoz-Raskin, 2010; Park & Catalá, 2009; Targa, 2004; TCRP, 2004). Although well documented, the potential for advancing value capture with BRT is yet to be realized.

A second source of local funding is the use of taxes or charges on vehicle property and use. Vehicle registration fees and quotas are used in some Asian cities (Zeng, 2013) to reduce the number of vehicles circulating. This has allowed, for instance, Shanghai to delay motorization by 10 years and, at the same time, to obtain funding for transit (Hao, Wang, & Ouyang, 2011). Other economic measures for transport demand management include congestion pricing and parking management. But political conditions may impose difficulties to cities outside China and Singapore to adopt such measures.

4.4. Facing legislation

Lack of adequate legislation can also prevent or make it difficult to implement BRT. Legislation can play a role in: (i) creating the adequate institutional framework for coordination among agencies; (ii) regulating the exclusive use of bus lanes; (iii) defining the tendering of transport concessions; (iv) and regulating the exclusive use of routes under a concession.

Difficulties in coordinating agencies may be overcome through the creation of unified metropolitan transit authorities. This has been suggested by India Urban Transport Policy (MOUD, without date), is in line with Transport for London, STIF (Paris) and Consorcio de Transportes de Madrid.

Regulation can also help in strengthen the legal opportunity for assigning road space to bus lanes. Lack of legislation has resulted in legal cases in India in which judges have ruled against the exclusive of use of road space by BRT (Rizvi, 2014). Legislators in the United States of America have also delayed the implementation of BRT (Barry, 2014).

Legislation is also important in allowing a contractual framework to tender public transport services to private providers. The existing legislation has a strong impact in the way projects are implemented. The legal framework set the path and forestalled difficulties for the implementation of BRT projects in Mexico and Chile (Flores Dewey, 2013).

5. Conclusion

BRT has expanded relatively fast in terms of number of cities over the last decade especially in developing cities, but not necessarily with the adequate quality and pace. Barriers to planning and implementing BRT derive from a myriad of issues. Local institutions are geared to road construction, not to transit operations. There is not enough capacity in local government and in local consultancies to face the complexity of high-performance transit projects operating on the surface.

There is also lack of alignment among stakeholders, which include potential users, businesses, land owners, administrators, politicians, existing bus operators and affected non-users. This lack of alignment causes protracted planning processes, where most of the time and energy is spend in negotiations rather than in conceiving and designing projects.

Even when presenting equivalent performance, BRT is still perceived as a lower quality mode than rail systems, as commonly presented in textbooks and industry guidelines. Rail industry is consolidated all over the planet and benefits from mechanisms favoring technical cooperation, incentives and loans. For rail manufactures, the promotion of products and solutions is a natural commercial activity.

The fact that BRT may reduce road space for cars to travel and park is often used by media, political adversaries, business, and land owners as an argument against its implementation. While BRT may impact road volumes in terms of cars per hour, it increases the capacity to move people on the surface. Advocates for non-motorized transport, may oppose BRT when planning fails to incorporate improved safety standards. This can be solved by

considering a full street concept design, inclusive of non-motorized transport requirements.

Another important planning barrier is lack of community participation. While many cities promote public hearings and disseminate project information, there is usually limited community input to project design. Projects supported by international funding tend to benefit from safeguards that foster public participation, but this is not always the case in the developing world.

Implementation is affected by optimism bias. Timelines are often unrealistic, and costs are underestimated to favor decision making. But cost escalation is as common as in urban rail systems. Projects are often rushed into inauguration due to political cycles.

Recommendations for improvements coincide with those by Muñoz and Hidalgo (2013): (i) advance national transit policy and guidelines; (ii) ensure political leadership and support; (iii) create adequate institutional framework; (iv) advance stakeholder buy-in; (v) increase the technical, legal, financial capacities (good process and project design and implementation); (vi) ensure adequate level of funding (possibly including subsidies and other sources of revenue such as congestion and parking pricing).

BRT is now part of the portfolio of solutions for integrated transport, and should not be considered in isolation of the other initiatives towards a more sustainable urban mobility at the city level. BRT in the emerging city context has been effective in advancing institutions and finance, and as a vector for larger sustainability improvements. Successful examples are vital as inspiration, but design needs to be adaptive to local conditions and constraints.

Most innovations in BRT came from the congested cities in the developing world where big challenges include the need to move high demands, and thus explore the capacity limits of the available surface space, together with important constraints like little funding to invest in public infrastructure.

Finally, implementing a successful BRT has never been – and will probably never be – an easy task!

Disclaimer

Views and opinions expressed in this paper are by the authors only and not necessarily that of the institutions they represent.

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