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CASE STUDY

ZA

2012

Low Carbon Frameworks: Transport

LAGOS BRT-LITE

Lagos, the capital of Nigeria, is one of the largest cities in the world and the largest in Africa. Traffic in the city is frequently stationary and long commutes, often of over two hours, are a common experience for residents. Public transport is dominated by largely unregulated private operators who offer unreliable and uncomfortable service, often with changeable fares and aggressive touts (ITP / IBIS, 2009; Mobereola, 2009).

Commissioned by WWF-SA from
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27 September 2012
Available at www.wwf.org.za/media_room/publications

INTRODUCTION

The Lagos Urban Transport Project was launched by the Lagos State governor in 1999, with assistance from the World Bank, to investigate the options and actions required to improve the transport system. Its remit included the development of a bus service to complement a longer-term vision for a rail-based transit system (ITP / IBIS, 2009; Mobereola, 2009). The project highlighted a need for better oversight and regulation of private operators, and for better coordination between the various government structures that influenced transport. This led to the establishment of the Lagos Metropolitan Area Transport Authority (LAMATA) in 2002, which consolidated various government functions and was granted considerable powers to undertake transport planning and implementation (ITP / IBIS, 2009; Mobereola, 2009). The development of a Bus Rapid Transit corridor has been a hallmark project of LAMATA, which adapted the high-performance BRT models seen in cities such as Bogotá to yield a simplified BRT system that was named “BRT-Lite” (Mobereola, 2009).

Information on the Lagos BRT-Lite system is limited, and no independent evaluation was identified in the course of this review. Most of the available information originates from LAMATA itself or from other project proponents, which could potentially introduce bias. This review has therefore attempted to focus on the factual information at hand, and limit the inclusion of more subjective assessments.

LAGOS BRT-LITE

Description

The BRT-Lite system was launched in 2008, operating along a 22 km corridor running radially out of the CBD on Lagos Island, crossing over a bridge to the mainland and continuing into the extended mainland areas of the city (Mobereola, 2009). This corridor had previously been a wide road with two to three mixed traffic lanes in either direction and an additional separate service road on each side, running parallel to the main roadway over much of its length (Mobereola, 2009). The BRT infrastructure consists of physically segregated lanes along 65% of the corridor length, exclusive BRT lanes marked by paint along a further 20%, and buses travelling with the mixed traffic for 15% of the route (Mobereola, 2009). This falls short of the "full BRT" specification of complete segregation (Wright and Hook, 2007), but represents a balance between budget, the need to target infrastructure for greatest operational benefit, and engineering constraints of the existing road infrastructure (Mobereola, 2009). It was constructed in the main roadway area with the parallel service lanes remaining intact. Unusually for BRT design, the bus lanes run along the outer lanes of the main roadway instead of being constructed along the median (Brader, undated). Full-specification BRT systems usually feature comfortable, enclosed stops with pre-boarding fare collection and efficient, rapid boarding from platforms that are level with the bus floor (Wright and Hook, 2007). The BRT-Lite system installed fairly simple, partly-sheltered stops between the service road and the BRT lane, with passengers stepping up into the busses. Tickets are, however, purchased at the stops before boarding (Mobereola, 2009; Brader, undated).

In common with other BRT systems (Wright and Hook, 2007), the vehicles and stations are branded and clearly identifiable. Only vehicles of the BRT-Lite system are permitted to operate in the BRT lane. Other commercial bus services are not permitted in the BRT lanes or the main mixed traffic roadway, and are restricted to operating in the service lanes (ITP / IBIS, 2009). Heavy commercial freight traffic is prohibited in the entire corridor during peak hours, in order to mitigate traffic in the reduced mixed-traffic space (Mobereola, 2009).

The system carries around 200,000 passenger-trips per weekday, and 10,000 passengers per direction in peak hour, accounting for more than a quarter of all trips along the corridor. Operating headways (the time gap between buses) on the system range from 30 seconds in peak hours to 45 seconds in off-peak, with express buses which service only selected stops (Mobereola, 2009). Long queues are sometimes encountered, with median queuing time during peak hours of 15 minutes (Mobereola, 2009; Brader, undated).

The pared-down BRT specification has allowed delivery of an operating system for USD 1.4 million per kilometre, although this was at the cost of lower performance, including average vehicle speeds of around 20 km/h (Mobereola, 2009). The Rea Vaya system in Johannesburg, by comparison, cost in the region of USD 8-10 million/km, but achieves travel speeds of approximately 28 km/h (Brader, undated). Furthermore, the system functions without an operating subsidy (Venter, undated).

Once implemented, the BRT-Lite system offered the cheapest and fastest public transport travel time along the corridor (Mobereola, 2009), with alternative modes of public transport between representative destinations being 20-130% more expensive and having 6-76% longer journey time. However, the extent of improvement is hard to ascertain, because its implementation reduced the services of pre-existing transport modes. High levels of satisfaction among BRT users have been observed, particularly with regard to safety (85%), fare (75%) and reliability (71%), although waiting times were a concern to passengers (Adebambo and Adebayo, 2009).

Implementation and enablers

The consolidation of transport planning, implementation and regulation functions into a single entity in LAMATA was a crucial enabler of the system, a process involving substantial legal and institutional restructuring. The consistent support of two successive state governors has also been identified as critical to the successes of the project (Mobereola, 2009). LAMATA's authority is not limited to bus transport, however. For example, it is currently pursuing an expansion of rail-based public transport (LAMATA, undated).

LAMATA developed the system in close cooperation with the National Union of Road Transport Workers (NURTW), the legally recognized and dominant representative of the bus sector in urban transport (ITP / IBIS, 2009). NURTW played an active role in planning and enabling the system (Mobereola, 2009). LAMATA provided the traffic management systems in the corridor, developed the stops and stations, and provided bus depot and workshop facilities. In return, the private operators, represented through NURTW structures, agreed to accept regulation and enforcement over their operations and make their own purchases of vehicles to operate on the corridor (Mobereola, 2009). In practice, 100 buses were purchased by NURTW operators, while 120 buses were bought by a state-owned company, Lagbus, and leased to private-sector operators, and 40 further buses were operated by Lagbus itself (ITP / IBIS, 2009). It is noted that NURTW is historically an organisation of drivers and staff (Mobereola, 2009), and it was not possible to determine the extent to which non-driver vehicle owners were involved in the BRT development through NURTW or other structures.

Bus operators who were not incorporated into the BRT-Lite system were not entirely barred from operating in the area, but restricted to using the service lane. This maintained some market access for those operators not included in the system and provided a buffer to absorb passenger demand in excess of the BRT-Lite system's capacity, and those still operating independently appear to have adjusted their routes to provide shorter-distance services and capture demand overflow from the BRT-Lite system. On the other hand, removing them from the main roadway served to improve the flow of mixed traffic, to the benefit of car drivers (Mobereola, 2009).

A detailed design phase was omitted from the project program, with contractors working from preliminary designs in close consultation with the designers. This contributed to the very short implementation time (15 months from concept to operation) (Mobereola, 2009).

Challenges and barriers

Difficulties that had to be addressed during the implementation of the BRT-Lite system included (Mobereola, 2009):

- Fragmentation of the existing planning, operational and regulatory roles prior to the establishment of LAMATA
- A strong informal bus and taxi sector who would have been able to resist unilateral regulatory control, but had limited resources with which to self-finance improvements in the transportation system
- Reluctance of financial institutions to provide capital for vehicle purchases

Although LAMATA considers the system to have been successfully implemented, it was not able to supply the entire demand for public transport along the corridor even after additional buses were added to increase capacity. Informal buses have continued to play a role in transport along the corridor, as noted above, and passenger surveys identify a need for additional capacity and routes (Mobereola, 2009).

The system has been criticised for inadequate maintenance and declining service since its launch, with deteriorating buses, infrastructure and travel conditions (EriOluwa, undated).

Media reports suggest that there have also been problems with incursion of private vehicles into the BRT lanes (Akinkuotu, 2012; Akoni and Olowoopejo, 2012).

Effects on GHG emissions

LAMATA has claimed that the BRT-Lite system has resulted in a 13% reduction in CO_2 emissions along the operating corridor, but no independent assessments were identified. Most passengers were previously using other forms of public transport, with only a small proportion having been attracted out of private cars (Mobereola, 2009). However, the use of newer, larger buses on the BRT corridor suggests that there would have been some level of efficiency gain from the implementation.

There does not appear to be sufficient data to infer whether the reduced cost and enhanced performance of the system stimulated greater travel demand along the corridor.

Other environmental and socio-economic effects

Marmolejo (2010) argues that LAMATA's assessment of its own success is biased by an emphasis on indicators that do not fully reflect the social development potential of a public transport system. For example, she notes that unemployed non-users of the system have not been considered as potential beneficiaries, and the evaluation therefore fails to consider whether BRT-Lite has contributed to their social inclusion. She also notes the occurrence of protests over a lack of consideration for accessibility for disabled people.

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REFLECTIONS FOR SOUTH AFRICA

The following reflections on the Lagos BRT-Lite case study are offered, which are relevant to South Africa:

A BRT project does not need to achieve "international best practice": The BRT concept need not be implemented to the highest specifications achieved internationally. It can instead be interpreted as a spectrum of bus system improvements which can be implemented to varying degrees, as appropriate to the local context (Brader, undated). The Lagos experience has shown that an effective, high-capacity BRT system can be achieved using relatively low-tech and cost-effective means.

A BRT-Lite system can succeed without operating subsidies: Through the combined effects of infrastructural and institutional system design, the Lagos BRT-Lite was able to provide improved public transport without a need for ongoing subsidies from public funds.

A consolidated transport authority is key to successful transport reform: The consolidation of governmental roles and responsibilities for regulation, enforcement, planning and operation of transport for the city was an important contributor to the successes of the Lagos BRT-Lite. It is doubtful whether an adequate level of coordination could have been maintained between the various independent authorities previously in existence.

Mediating contestations of right of way for other public transport operators:
In Lagos, existing bus services were restricted to using the pre-existing service lanes alongside the roadway. In the Johannesburg Rea Vaya BRT, a lane on the Soweto highway that was used by minibus taxis was reallocated exclusively to Rea Vaya. The taxis have been pushed back into the general traffic lanes. Taxi operators are increasingly demanding to reclaim the lane they used to occupy, and taxi commuters are obviously supportive of the demand.

Early inclusion of existing operators can encourage their cooperation and acceptance when they are well organised: The Lagos BRT-Lite development involved close cooperation between LAMATA and the NURTW, who represented the pre-existing operators. The existence of a recognised representative body was undoubtedly advantageous to this process.

REFERENCES

Adebambo, S. and Adebayo, I.T., 2009. Impact of Bus Rapid Transit System (BRT) on Passengers' Satisfaction in Lagos Metropolis, Nigeria. International Journal of Creativity and Technical Development , 1(1-3), pp.106-22.

Akinkuotu, E., 2012. Yabatech students abduct LASTMA official, injure three. Punch, 17 August.

Akoni, O. and Olowoopejo, M., 2012. Fashola "arrests" Col, Sergeant on BRT lane. Vangaurd, 17 July.

Brader, C., undated. Bus Rapid Transport in Challenging Environments. [Online] Integrated Transport Planning Limited Available at: siteresources.worldbank.org/EXTURBANTRANSPORT/Resources/341448-1296493837095/BRT_Brader_TT2011.pdf [Accessed July 2012].

EriOluwa, A.T., undated. Once Upon a BRT. [Online] Available at: www.africanoutlookonline.com/index.php?option=com_content&view=article&id=3432:once-upon-a-brt&catid=96:allcomers&Itemid=54 [Accessed August 2012].

ITP / IBIS, 2009. Lagos BRT-Lite: Africa's first bus rapid transit scheme. [Online] Integrated Transport Planning Ltd / IBIS Transport Consultants Ltd Available at: www.uitp-bhls.eu/IMG/pdf/BRT_Lite_Summary_Report_FINAL_V2.pdf [Accessed July 2012].

Marmolejo, D.D., 2010. Guidelines to Mainstream Social Inclusion in Public Transportation Evaluations. Masters' Thesis. University College London.

Mobereola, D., 2009. Lagos Bus Rapid Transit: Africa's first BRT scheme. Discussion paper. SSATP.

Venter, C., undated. Lagos goes "Lite" with BRT. Unpublished work.

Wright, L. and Hook, W., 2007. Bus Rapid Transit Planning Guide. [Online] Institute for Transportation and Development Policy Available at: www.itdp.org/microsites/bus-rapid-transit-planning-guide/brt-planning-guide-in-english/ [Accessed March 2012].

This publication is funded by The Green Trust, a partnership between WWF and Nedbank.

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Case Study: Lagos BRT-LITE

This is one in a series of case studies produced by WWF South Africa's Low-Carbon Frameworks programme that explores the shift to a low-carbon economy. We seek solutions for emitting fewer greenhouse gas emissions and enabling a flourishing South Africa, which delivers developmental outcomes and social equity.

The programme includes a focus on transport. WWF's transport project aims to provide a platform, expertise and interactive modelling to support labour, business and government in engaging with the challenges implicit in the low-carbon transition. Choices about trade-offs, sequencing of initiatives, and investment will need to be made in setting emission targets for and within the sector, and in determining how to achieve them, while yielding a flourishing economy with equity and developmental benefits. Interventions will need to REDUCE movement of goods and people; SHIFT to low-carbon modes of transport, from private to public, from road to rail; or IMPROVE energy and fuel efficiency. The project builds on previous work on a carbon budget approach to a low-carbon action plan for South Africa, and is grounded in existing initiatives in the transport sector.

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