Cities that Work

International Growth Centre

CASE STUDY

The BRT and the danfo: A case study of Lagos' transport reforms from 1999-2019

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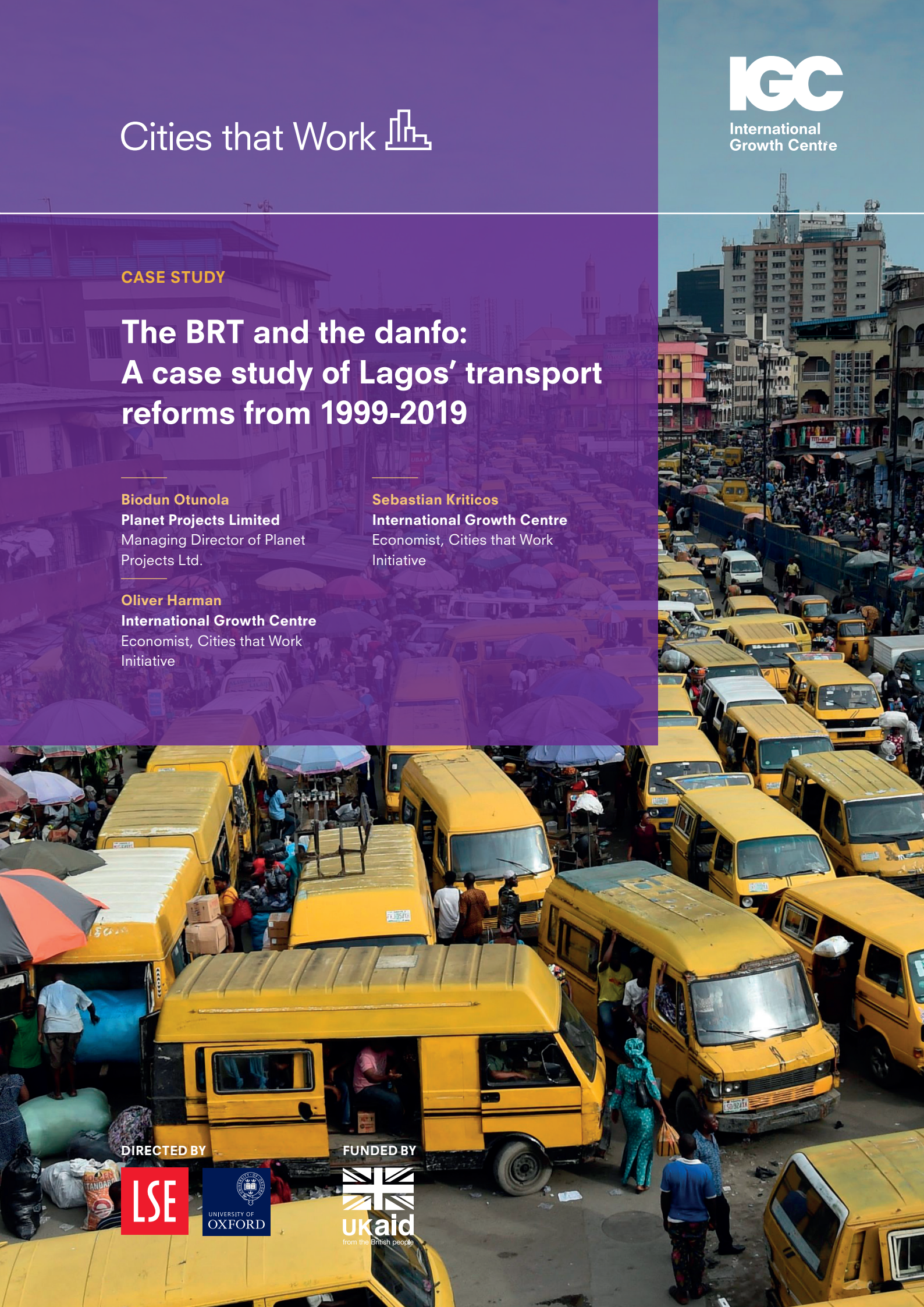

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BIODUN OTUNOLA

'Biodun Otunola is the founding Managing Director of Planet Projects Limited (PPL), a leading and fast growing Engineering, Procurement, Construction and Management (EPCM) firm, where he heads a team that provides a wide range of solutions to transport problems in Nigerian cities, across Bus, BRT, Rail, Water Transport and Traffic Engineering, over the entire value chain of Studies, Planning, Engineering Designs, Construction and Operations & Maintenance (O&M).

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In many developing cities, transportation is characterised by disorganised and largely unregulated systems where demand clearly outstrips supply. As a result, citizens are often left isolated from productive jobs and other valuable amenities of urban life. Improving the functionality of these cities is hence often rooted in making improvements to transport networks and providing reliable, affordable, clean, convenient, and safe access to urban opportunities. With improved urban mobility, firms and workers can come together to generate scale and specialisation, which in turn, fuels productivity growth.

The city of Lagos has grappled with transport challenges for many decades. As the second largest city in Africa, and the fastest growing megacity in the world, government authorities have had to meet consistent pressure to improve the quality of existing transport systems while also providing new services that can support a larger urban population.[1] In response to these demands, the Lagos State Government has made a range of large-scale investments in infrastructure and public transport over the last 20 years. Most notably, Lagos opened the first ever Bus Rapid Transit (BRT) system on the African continent in 2008. Today, the system boasts two different lines which cover over 35.5 km of track and transport over 350,000 commuters on a daily basis.[2]

The Lagos BRT and wider transport reforms have helped to transform the sprawling and unplanned city, characterised by fragmentation and heavy traffic, to a much better example of transport development for liveable and productive cities. Through these reforms, Lagos has been able to achieve reductions in travel times of up to one-third since 2008, relieving an estimated USD$240M in economic loss each year.[3] The reforms and their successes were centred around five key factors which we will discuss in this case study:

The Lagos BRT and wider transport reforms have helped to transform the sprawling and unplanned city, characterised by fragmentation and heavy traffic, to a much better example of transport development for liveable and productive cities

— **Designing organisations for differences:** Lagos undertook a radical redesign of the organisations governing transport to foster greater coordination, accountability and public participation.

— E**stablishing financial viability:** long-term success was backed by proactive plans to improve creditworthiness and financial viability of the transport sector.

— **Generating buy-in:** contextual awareness and public communication proved instrumental in gaining public support for reform.

1 Rosenthal, E. (2012) "Nigeria Tested by Rapid Rise in Population," *The New York Times*. https://www.nytimes.com/2012/04/15/world/africa/in-nigeria-a-preview-of-an-overcrowded-planet.html. Earley, K. (2016) "A Tale of Two Megacities - How Shenzhen and Lagos Are Coping with Urbanisation," *The Guardian*. https://www.theguardian.com/julius-baer-partner-zone/2016/mar/18/a-tale-of-two-megacities-how-shenzhen-and-lagos-are-coping-with-urbanisation.

2 Mobereola, D. (2009) "Lagos Bus Rapid Transit: Africa's First BRT Scheme." A SSATP Discussion Paper No 9 on Urban Transport Series.

3 Ongoing transport reforms in the city of Lagos (2018) Available at <https://www.theigc.org/multimedia/ongoing-transport-reforms-city-lagos/>

— **Demonstrating quick-wins through a project driven approach:** demonstrating positive transformations in the short-term helped secure investor and public support. With the success of each project came further stakeholder buy-in, a greater willingness to instigate wider reform, and over time, the empowerment of formal institutions.

— **Monitoring performance to meet expected standards:** Lagos has shown a clear commitment to assessing and achieving results through the BRT and subsequent reforms to improve the transport system.

The challenge of urban mobility in Lagos

Up until the year 2008, Lagos was one of the only major world cities without any formalised mass public transit system. Shared transportation was predominantly provided by a fleet of 75,000 privately operated minibus services (*danfos*) together with a smaller number of midi-buses (*molue*), tricycles popularly known as *keke napep*, motorcycle (*Okada*) and shared-taxis [4]. These informal minibuses accounted for around 69 percent of all motorised trips back in 2008[5] and were, as they still remain, characterised by their lack of safety standards, limited regulation, poor maintenance, poor security and frequent violation of traffic laws[6]. Planted on congested streets with slow speeds and highly uncertain commute times, they were not enough to truly transform the mobility and efficiency of the city

Informal minibuses accounted for around 69 percent of all motorised trips back in 2008 and were, as they still remain, characterised by their lack of safety standards, limited regulation, poor maintenance, poor security and frequent violation of traffic laws

× **High cost, low-quality service:** Almost all of the issues of the *danfo* and *molue* services are exemplified through their poor-quality infrastructure: badly maintained buses, uncomfortable seating arrangements, breakdowns, accidents, and few considerations for customers anywhere across the system. Couple this with the system's unreliability and lack of regulation, and passengers are left with a low-quality, high-cost service. Fares regularly vary depending on the time of day or even on weather conditions. For instance, passengers can pay up to nine times more between the peak hours of 6:30am-8am compared to at 9am.[7] Furthermore, many of the less profitable routes are underserviced, thus leaving many citizens behind. Without any alternative to *danfos* before 2008, traffic and transport was highly unpredictable – only serving to reinforce poverty.

× **Lack of safety and security:** Accidents and passenger safety have been a major concern of informal transport in Lagos, often because drivers engage in reckless activities such as speeding, overlapping, and

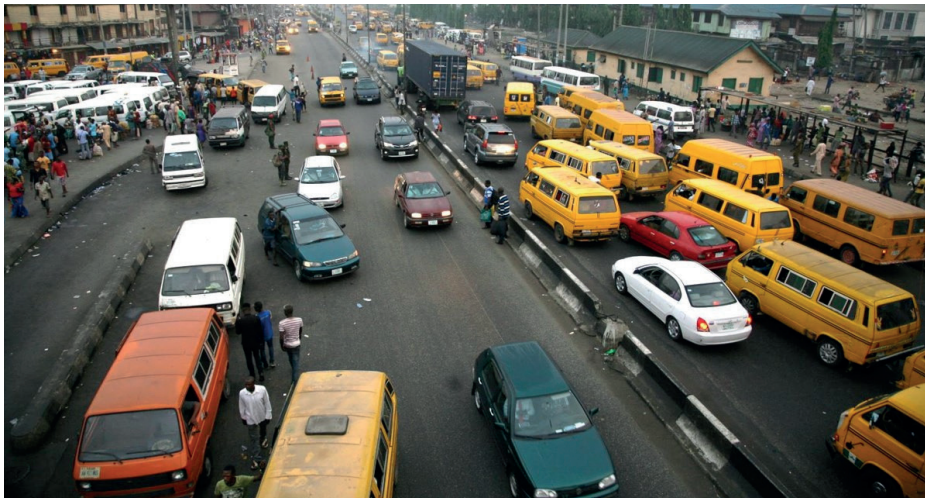
It is estimated that around 2008, there would be 2-3 accidents per week on the *danfo* system

4 World Bank. (2016) "Lagos Urban Transport Project" Project Performance Assessment Report No.: 103068 Document Date: JUN 30, 2016.

5 LAMATA. (2009) Final Report—Strategic Transport Master Plan for Lagos Metropolitan Area (Lagos: Lagos Metropolitan Area Transport Authority, 2009).

6 UN-Habitat. (2012). Enhancing urban safety and security: Global report on human settlements 2007. Routledge.

7 This figure is based on an interview with Biodun Otunola who is a transport specialist in Lagos.



Danfo minibuses congest the main road in Lagos. Image credit: Planet Projects Ltd.

indiscriminate turnings. With no training and little respect for the law, drivers regularly risk the safety of their passengers. It is estimated that around 2008, there would be 2-3 accidents per week on the *danfo* system. Security is also a major concern across the informal system as they have very limited infrastructure in terms of laybys, shelters and designated stops. At the same time, there are no trained personel to monitor and police activities on the buses, which means they often become havens for criminality – putting passengers at the risk of robbery or harassment when they travel.

- **Congestion:** The carrying capacity of the typical *danfo* and *okada* minibuses is around 14-18 people, while *molue* buses can seat 50.[8] This comparatively low carrying capacity of the *danfo*, particularly with reference to their high-occupany vehicle replacements, which can carry 30-50 passengers, means their contribution to congestion is much larger. While it is not uncommon to see informal providers cramming passengers onto buses far beyond their advised carrying capacity, this only further propogates the aforementioned issues of safety and poor-quality service.

In 2008, commuters from the residential areas in the north and west could spend over 2 hours in traffic on a one-way journey to work in the city centre each day (distances of approximately 20km).[9] At the same time, the average Lagosian was spending around 40% of their income on transport.[10] With lower income families often living far from the city centre, this higher but unavoidable cost fell disproportionately on them. It was widely recognised that improvements to public transportation and traffic management could yield significant benefits not just to transport users, but also to the city at large. However, as with most reforms, the Lagos State Government faced a number of constraints which made the challenge of revamping the transport

8 Agha, E (2016) Nigeria: Molue – Is Lagos's King of the Road Going Intro Exctinction Avilable at <https://allafrica.com/stories/201605080226.html>

9 Mobereola, D. (2009) "Lagos Bus Rapid Transit: Africa's First BRT Scheme." A SSATP Discussion Paper No 9 on Urban Transport Series.

10 Ibid. N.B. The full fare of travelling 10 kilometres to work on similar systems in many cities represents almost a third of incomes for the poorest 20% of low income households. Carruthers, R., Malise, D., and Saurkar, A. (2005) "Affordability of Public Transport in Developing Countries". World Bank

network particularly dauntingLagos needed major capital investments for the construction, maintenance and management of a new 'BRT Lite'[11] system and all of its requisite infrastructure such as rolling stock, bus terminals, and vehicle tracks. We explain the main differences between regular BRT and 'BRT Lite' in Table 1. These investments in BRT Lite would also require complementary changes to regulation, setting in place standards and frameworks such as vehicle use, safety and emissions. Initiating such major changes takes a substantial amount of time and requires strong political will to keep reform moving forwards, coordinating not just the legal and regulatory framework but also encouraging behavioural changes across society at large.

Table 1: Differences between regular BRT and 'BRT Lite'[12]

Full Systems	Lite Systems
— Specific lanes exclusively designated for BRT buses — Raised platforms and shelters with pre-boarding fare collection — Advanced technologies to manage traffic signalling & provide information — More efficient and effective but at a financial and time cost	— Partially segregated lanes for BRT buses — Have simpler bus shelters and some collection on buses — Less technological intensivity — Easier and quicker to implement but at the expense of efficieny

Despite a strong will for reform in government, there were a number of political impediments embedded in the institutional, structural, and socioeconomic foundations of the city. Notably, the Lagos State government had to take into account the interests of large and powerful groups of informal transport providers who stood to potentially lose out with reforms to the system. Weaknesses in the incumbent formal institutions for transport meant the reforms had to focus on establishing new teams and taskforces to carry out the ambitions. This meant taking on a project-driven approach that made incremental and manageable changes which could offer demonstrable results in the short-term, while looking to build up institutional capacity over the longer term on the foundation of successful projects. In the following section, we detail the process of Lagos' transport reforms and some of their key successes.

11 BRT Lite systems are not designed to meet the highest technical specifications of Bus Rapid Transit schemes which would generally entail high-speed, high occupancy vehicles. Generally, these systems aim to improve the efficiency of the system through improving reliability and frequency of the service and enhancing customer support and commercial awareness. This might include changes to the operating environment such as dedicated bus lanes, priority signals, parking controls and traffic management. Other typical changes include new fare collection and ticketing systems to enhance customer convenience and enhanced travel information, better marketing and overall customer care.

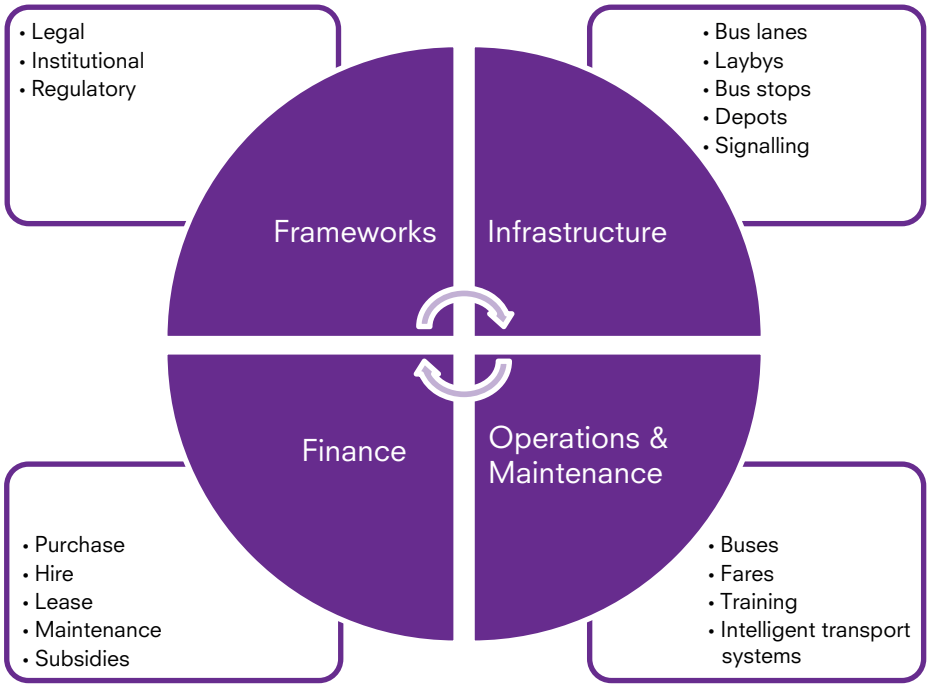
12 For more information on BRT systems see Collier, P., Glaeser, E., Venables, T., Manwaring, P., & Blake, M. (2018) *Accessing opportunities: Policy decisions for enhancing urban mobility*, Final Report, IGC online: https://www.theigc.org/wp-content/uploads/2018/05/Accessibility-04.05.18.pdf

Overcoming Lagos' transport challenge

The turn of the 21st century saw a series of landmark shifts in the Lagos State transportation strategy. Governor Tinubu (12th Governor of Lagos State 1999 – 2007) had recently been elected based on a platform of tax reform and infrastructure delivery. Over the course of his term in power, he emphasised capital spending on highly visible transport projects, such as roads.[13] These early reforms focused on making the most of the existing network, emphasising spending on maintenance and infrastructure upgrades. At the same time, the government made clear efforts to communicate the link between quality infrastructure and taxation to the public. The idea was to enhance the social contract between state and society, which played an important facilitating role for ensuing reforms in the transport sector, such as efforts to improve traffic management and compliance.

The government made clear efforts to communicate the link between quality infrastructure and taxation to the public

Figure 1: Four quadrants of transport reform



Source: 'Biodun Otunola'

Over time, however, it became clear that the existing infrastructure was not sufficient to truly transform mobility within the city. The longer-term strategy had to include the provision of a comprehensive public transport system, moving away from the reliance on private motorisation and shared *molue* and *danfo* buses. Achieving this meant going beyond just delivering the required infrastructure and towards recognising the transportation challenge as part of an integrated system, in which complementary reforms across sectors and policy areas were needed to truly modernise the coordination and delivery of transportation. These principles are summarised in Figure 1 which has been the

Over time, however, it became clear that the existing infrastructure was not sufficient to truly transform mobility within the city. The longer-term strategy had to include the provision of a comprehensive public transport system

13 de Gramont, D. (2015). Governing Lagos: unlocking the politics of reform (Vol. 12). Carnegie Endowment for International Peace.

underpinning approach for much of Lagos' transformation – simultaneously focusing on the regulatory frameworks, infrastructure, operations and maintenance, and financing of bus reforms.[14]

The process of public transport reform

Major reforms often require a shift in political strategy to enable effective change. For Lagos' transport sector, this process was largely kickstarted in 2000 with the inauguration of the Lagos State Traffic Management Authority (LASTMA). LASTMA was mandated by the Lagos State Government to improve enforcement of traffic laws, set new standards and rulings, and encourage compliance among road users. Although it initially did not include any provisions for public transport, its establishment marked a behavioural shift within politics and society that collectively strived for better performance in urban mobility.

Before LASTMA was established, there had been a wide array of local, state and federal government agencies involved in transport provision in Lagos. Most operated in siloes, with little regard for the effect their policies had on other areas of the system, or even how the decisions of other agencies affected them.[15] Furthermore, they had a tendency to over-rely on infrastructure building, neglecting the importance of traffic planning and management. A number of studies undertaken in the 1990s – such as the Lagos Mass Transit Study (LMTS) – had brought these issues to light, highlighting the fragmentation of institutional responsibilities, weaknesses in traffic management, and the lack of a cohesive strategy for the city. These studies were used as the basis to justify the establishment and responsibilities of agencies like LASTMA.

While LASTMA helped generate attention towards traffic management, there was a clear recognition that Lagos still needed a metropolitan-wide agency to encompass all matters of transport policy including and beyond traffic management. Subsequently in 2002, the Lagos Metropolitan Area Transport Authority (LAMATA) was established, taking on principal authority for coordinating inter-agency responsibilities, policies and programmes. The concept of LAMATA had previously been proposed in the LMTS and 1996 Detailed Framework for Establishment of LAMATA (DFEL). Influenced by Transport for London (TfL), the framework detailed the role, objectives, and resource requirements it would need in relation to other transport agencies.[16] The World Bank had also ardently pushed for a dedicated transport authority to be set-up. In fact, this was made a requirement for future funding of proposed transport reforms during the Lagos Urban Transport projects which began in 2000.

With LAMATA in operation, it offered the foresight and practical strategy to move Lagos out of chaos on the roads and towards a 21st century transport system

14 This diagram is based on an interview with Biodun Otunola who is a transport specialist in Lagos.

15 http://documents.worldbank.org/curated/en/758551468288333387/pdf/418330WP0UNI0A1socase0dp0501PUBLIC1.pdf

16 http://documents.worldbank.org/curated/en/758551468288333387/pdf/418330WP0UNI0A1socase0dp0501PUBLIC1.pdf

With LAMATA in operation, it offered the foresight and practical strategy to move Lagos out of chaos on the roads and towards a 21st century transport system. Through the assistance of the World Bank, LAMATA was able to finance the city's first Strategic Transport Master Plan (STMP) in 2005, which has since served as the guiding framework for all transport policies up to 2025. The plan set ambitions for the city to harness multi-modal transport, predicting that by 2025, 60% of travel should be by road, 20% by rail, and 20% by water. At the same time, LAMATA would oversee major investments in transport infrastructure including the plan's ambitions to establish 6 BRT lines, 7 rail lines, and 6 water transport routes by 2025.

LAMATA was able to finance the city's first Strategic Transport Master Plan (STMP) in 2005, which has since served as the guiding framework for all transport policies up to 2025

Table 2: Key stages of reform

Year	Lite Systems	
2000	Lagos Transport Management Authority (LASTMA) inaugurated. Lagos Urban Transport Projects begin.	Invest in the road network and enforce traffic laws and compliance.
2002	Lagos Metropolitan Transport Authority (LAMATA) inaugurated. Policy learning from World Bank.	Establish a metropolitan agency with principal responsibility to oversee and coordinate city transport policy. LAMATA would be the organisation to improve overall functionality, comfort, reliability and accessibility of the transport system.
2005	Strategic Transport Master Plan (STMP) developed through help of World Bank	Guide the development of transportation policies in the state until 2025 and set plans to diversify public transport modes including BRT, rail, and water transport routes.
2006-2007	Consultations with best-practice in other developing cities First BRT Lite lines operational State-owned company LAGBUS is launched	Policy learning was used to sensitise the powerful transport union, showing how things could be done in Lagos. This happened in parallel with the launch of the BRT and LAGBUS, which offered a safer alternative to the informal sector and new employment opportunities for workers.
2008	BRT Lite system becomes fully operational	To ameliorate the negative consequences of the disorganised, fragmented, costly, unsafe, and unreliable transport system.
2008-2017	Complimentary regulatory reforms and infrastructure investments.	Regulations have been implemented to provide for several safety standards. New technologies have been rolled-out on the bus fleet to improve customer experience, and new infrastructure such as junctions, bus terminals, shelters, and rail systems have helped improve the overall transport system.
2017-2019	Bus Reform Initiative (2017-2019)	Aims to improve the capacity and customer experience of the system through: replacement of all *danfo*s with HOVs, increased digitatisation of the network, improved transport infrastructure, and driver training.

In 2007, the first BRT Lite lines became operational and within one year the system was delivered in full and experiencing extremely high demand. A number of reforms have taken place since then, including the second wave of bus reforms ongoing since 2017. Further detail on these policies are provided in the Table 2 and the sections that follow.

The principles that underlay the effective development of the BRT and other public transport reforms focused on five key areas:

Designing organisations for differences

Delivering reform required a complete redesign of the organisations governing transport in Lagos. Significant political and financial backing from top officials played a critical role in establishing and maintaining the integrity of the ongoing governance changes.[17] The creation of LAMATA was undoubtedly an instrumental shift towards better coordination of planning, regulation and management of transport in the city. As a state government agency, it also meant that authorities were held more accountable for their performance. Finally, LAMATA's active public relations strategy and community meetings meant citizen engagement became a much stronger norm.

LAMATA took responsibility for coordinating all of the major stakeholders in the transport sector. This helped to integrate the activities of different agencies, ensuring they could cooperate effectively based on common objectives. Supporting legislation and planning strategies enshrined the particular roles and responsibilities of different agencies. It also made clear how each agency could leverage one another's distinct powers to deliver the city's plan. The following are three important examples where inter-agency coordination played a key role in the success of the BRT system:

— **Ministry of Physical Planning and Urban Development:** As representatives of the state master plan, the Ministry of Physical Planning and Urban Development were invited to sit on the BRT Steering Committee. This helped the transport authorities access the land on which they needed to make infrastructure investments. Furthermore, with proactive planning they could also utilise zoning and land-use regulations to more effectively ensure high density around the transport nodes. In turn, increased ridership on the system would likely improve the financial viability of reform.[18] Contrasting this with the policy experience in Bogota (Colombia), where the BRT was planned and built without amendments in the zoning laws around the corridor. As a result, Bogota has not been able to capture the full welfare gains from increased land values that may have been possible with the construction of their BRT system.[19]

17 World Bank. (2016) "Lagos Urban Transport Project" Project Performance Assessment Report No.: 103068 Document Date: JUN 30, 2016.

18 Collier, P., Glaeser, E., Venables, T., Manwaring, P., & Blake, M. (2018) Accessing opportunities: Policy decisions for enhancing urban mobility, Final Report, IGC online: https://www.theigc.org/wp-content/uploads/2018/05/Accessibility-04.05.18.pdf

19 Tsivanidis, N. (2018). The Aggregate and Distributional Effects of Urban Transit Infrastructure: Evidence from Bogotá's TransMilenio. Working Paper, University of Chicago Booth School of Business.

— **Lagos State Traffic Management Authority:** It was critical that LAMATA had a comprehensive role, both to support the operational systems necessary to complement spatial planning and traffic regulation, as well as, to take the responsibility for the hard infrastructure. As such, a close working relationship with the LASTMA was instrumental to ensure they committed resources to protect and improve the BRT.[20] This partnership enabled effective enforcement of rules. It also meant that there were the necessary accompanying investments such as traffic lights, signalling systems, or renewal of pinch-point areas on the road network.

— **Ministry of Public Works and Housing:** With the inauguration of LAMATA there had to be a transfer of power and control over infrastructure in Lagos. This happened in coordination with the Federal Ministry of Works and Housing who transferred control of the federal highways – in which the BRT system would operate – over to LAMATA, as well as the responsibility for financing and constructing the required infrastructure.[21]

To operate effectively, these institutions also had to improve internal capacity, ensuring they had an adequately trained and motivated staff. The recruitment of experienced international staff allowed for policy learning and the creation of a strong authority which could move the project from conception to practical delivery. Providing an adequate cadre of qualified staff as well as reorganising its functions and providing on-going skills training, has been key in ensuring the reforms were sustainable over time.

Governor Fashola (13th Governor of Lagos State 2007 – 2015), who succeeded Governor Tinubu, also placed a strong emphasis on improving the image of the transport authority to make it reflective of a modern-day institution, worthy of more positive expectations from international investors and wider society. Fashola recognised that to operate effectively, the bus system had to be staged with a strong network of trained, committed, and qualified staff including drivers, attendants, and back-office operators. Specific funds were earmarked for staff training, social support, and uniforms for the drivers, which improved career incentives and the dignity of the profession. Tax funds were also put aside for the for maintenance and operations of the BRT system which generated confidence among private investors to engage more directly in the system through public-private partnerships.[22]

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Establishing financial viability

A sustainable BRT system requires a realistic financial strategy from the outset. For the early stages of reform, the World Bank had been the principal funder, offering financial support for the technical advisory and feasibility work which took place during the Lagos Urban Transport Projects and the STMP. However, attracting the kind of capital needed to finance the hard infrastructure for the

20 Mobereola, D. (2009) "Lagos Bus Rapid Transit: Africa's First BRT Scheme." A SSATP Discussion Paper No 9 on Urban Transport Series.

21 Ibid

22 Ibid

whole system over the long-term meant the Lagos State government had to borrow more. This required demonstrating a capability to handle and repay large sums of money to potential investors.

Therefore, one of the initial intentions of the BRT Lite system was to focus on delivering results within an agreed upon budget. This was particularly relevant as the Lagos State Government was to finance the first line exclusively themselves. It was built at an average cost of just $1.7 million per kilometre. This is much lower than a similar system that has been proposed in Kampala at an estimated cost of USD$17million per kilometre. [23] Even in other cities like Bogota and Brisbane, although they have more intricate infrastructure, the BRT systems cost around $6 million per kilometre.[24]

With the BRT operational, Lagos State Government also acted as a financial guarantor for the National Union of Transport Workers (NURTW), which allowed the NURTW to attract commercial funds for the purchase and operation of 100 high capacity buses and lease of a further 120. Members of the transport union would then operate these buses on the BRT lanes, where they experienced higher rates of ridership, better service delivery, and ultimately increased revenue. With that success, the NURTW was able to pay back their loans in just two years. At the same time, the Lagos State Government began to see large increases in operational revenue through ticket sales and advertising, making the scheme widely considered as a financial success.[25]

With that success, the NURTW was able to pay back their loans in just two years

Given the positive outcomes of first stages of BRT Lite implementation, development finance institutions were much more willing to provide finance for the expansion of the BRT as part of the second phase. The principle investors were the World Bank and AfDB, who together provided the state loans of $190million and $100million respectively.[26] Over time, the full 22km BRT system in Lagos cost just USD$37.4 million to build, including the cost of stations, road partitions and 220 buses. Today, it remains financially sustainable to fund operations without subsidies from the national government.[27]

Given the positive outcomes of first stages of BRT Lite implementation, development finance institutions were much more willing to provide finance for the expansion of the BRT as part of the second phase

Encouraging buy in

During the construction of the BRT system there was intense criticism of the Lagos State Government by certain interest groups who thought they would lose out from the reforms. Private vehicle users felt threatened by the likelihood of disrupted traffic. Incumbent minibus operators felt they would be squeezed by increased competition. There was even resistance from ordinary residents of Lagos who were worried about the possibility of sunk state capital. These

23 Collier, P., Glaeser, E., Venables, T., Manwaring, P., & Blake, M. (2018) Accessing opportunities: Policy decisions for enhancing urban mobility, Final Report, IGC online: https://www.theigc.org/wp-content/uploads/2018/05/Accessibility-04.05.18.pdf

24 Ibid

25 World Bank (2016) "Nigeria. Lagos Urban Transport Project.Project Performance Assessment Report."

26 World Bank Independent Evaluation Group. "NG - LUTP-II (FY10) (P112956)

27 World Bank (2016) "Nigeria. Lagos Urban Transport Project.Project Performance Assessment Report."

concerns were taken seriously by the state and the success of the BRT can be partly attributed to systems being put in place for citizens to express their views and have them addressed.

One of the biggest challenges LAMATA faced in this regard, was communicating with the existing bus operators and convincing them to engage with the new system. The Lagos State Government therefore embarked on extensive negotiations with the politically powerful NURTW. They used these negotiations to convince union officials of the widespread benefits of a BRT system – in particular, the prospect that BRT could offer direct employment via hiring, training and renumerating existing drivers as well as indirect employment through enhancing Lagos' competitiveness. One of the key negotiating tools for the state, was that they sponsored visits for the union officials to see BRT and other bus services in other international cities, including Curitiba (Brazil) and Bogota (Colombia). Seeing how such systems had been successfully integrated with exisiting bus services elsewhere, helped to persuade the NURTW to adopt and franchise the BRT concepts locally, smoothing the later transition of existing operators into the formal system.

Seeing how such systems had been successfully integrated with exisiting bus services elsewhere, helped to persuade the NURTW to adopt and franchise the BRT concepts locally

After the first lines became operational, the following administration under Governor Fashola made further provisions to incorporate informal operators. Existing operators were encouraged to retrain their staff and it became known that the best minibus drivers would be offered a career path in the more formalised BRT system. This had the additional benefit that operators of the *moule* and *danfo* systems were incentivised to improve the overall quality of their service delivery so they could compete with the BRT Lite.

The choice of integrating the incumbent bus services rather than attempting to eradicate them proved instrumental in gaining political support for the system from local communities. Commuters maintained their flexibility of choice for shared transport systems, while some of the more isolated, non-commercial routes could still be maintained. In this way, the previous network provided a feeder, 'last mile' service to routes which the BRT did not cover.

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Demonstrating quick wins through a project-driven approach

The focus on positive incremental change was at the heart of Lagos's approach to transport reform. In particular, one of the main intentions of implementing a BRT Lite system, as opposed to a standard BRT, was to concentrate on essential gaps in infrastructure that could be targeted and addressed very quickly. These choices for where to focus resources were based on where considerable positive change could be made through relatively modest and cost-effective investments. Therefore, the investments that were undertaken, prioritised the creation of dedicated lanes, bus stops, depots and signalling infrastructure and the introduction of reliable services to customers.

To put some of these infrastructure gaps into perspective, Lagos did not have even one single formal bus stop prior to the BRT implementation in 2008. It now has approximately 260. Compared to London, where the bus system serves roughly half the number of citizens, the city has around 19,000 stops, roughly 70 times as many than Lagos. By targeting resources towards a clear need in

the city, Lagos could build bus stops and curb the irregular stopping patterns of *danfos*, demonstrating a quick improvement to congestion thanks to their reform efforts.

The BRT itself took just 15 months to go from the conception phase to having the first line fully operational. Within the first 100 days of operation, the system had carried over 9.7 million passengers and within six months of operations, it was over 29 million.[28] An evaluation by the World Bank in 2009 suggested that within a year of the operation of the BRT system, over 200,000 commuters were using it daily, with passengers enjoying a reduction of fares, journey time, and an overall increase in quality of service. Short term and regular demonstrable improvements were critical in maintaining interest in and building support for long-term reform.

Commuters queue to board the Bus Rapid Transit (BRT) in 2009. Photo credit: Pius Utomi Ekpei/AFP/Getty Images.

28 Ibid

Monitoring performance to meet expected standards

Apart from the visible successes felt by passengers on a daily basis, it was also important to measure the performance of the BRT against the desired objectives of the government, as well as the changing needs of the city. Several studies have assessed the impacts of the BRT, including both its successes and areas for improvement.

Successful outcomes of the BRT reform

- ✓ **Reduced congestion:** even though BRT buses only accounted for around 4% of vehicles on Lagos' roads in 2009, it has been estimated that across the whole transport system, average in vehicle journey times were reduced by 40% and average waiting times by 35%.[29]

- ✓ **Affordability**: The **Lagos BRT system has been able to maintain affordable fees for customers.** Following the BRT's introduction, one off fares in Lagos actually decreased by 30 percent, from 140 Naira to 100 Naira,[30] helping to bring-in low-income passenger groups. **In the Mile 12 to Ikorodu BRT corridor the average monthly spend by individuals on bus travel halved.**[31]

- ✓ **Financial Sustainability:** Operators can deliver their service without relying on financial government assistance. It is self-sustaining even with the 30% reduction in fees received by the user.[32]

- ✓ **Safety benefits:** the operation of the BRT and reduction of bad habits among *danfo* operators has contributed to a **reduction in accidents from 139 to 96 accidents per 100,000.**[33]

- ✓ **Employment:** The Lagos BRT reforms **generated 2000 direct new employment opportunities for drivers, bus conductors, ticket sellers and mechanics**. Moreover, transferring over to the formal system offered operators on the pre-existing *danfo* services a more stable, formalised career path. It is estimated that a further 10,000 jobs were indirectly

29 Mobereola, D (2009) "Africa's First Bus Rapid Transit Scheme". Sub-Saharan Africa Transport Policy Program

30 Mobereola, D (2009) "Africa's First Bus Rapid Transit Scheme". Sub-Saharan Africa Transport Policy Program

31 World Bank Independent Evaluation Group. "NG - LUTP-II (FY10) (P112956)"

32 Omole, D and Ndambuki, J (2014). Sustainable Living in Africa:Case of Water, Sanitation, Air Pollution and Energy. Sustainability 6(8), 5187 - 5202

33 World Bank Independent Evaluation Group. "NG - LUTP-II (FY10) (P112956)"

created through the operation of park and ride facilities as well as food services.[34] Some estimates indicate that there were socio-economic benefits indirectly impacting as many as 500,000 individuals.[35]

- ✓ **Environmental benefits:** the introduction of the BRT has been associated with a **reduction in CO2 emissions of 13% and GHG emissions by 20%**[36], benefits that are not only felt by users of the new system, but the wider population as well.

Areas for improvement

- × **Demand estimations:** the BRT system introduced in 2008, though laudable, became over saturated within few months of operation and faced a big issue of demand and supply mismatch. Only 100 high floor buses were initially available to the NURTW, yet it became apparent within the first year of operation that another 200 buses would be needed.[37] Responsive policymaking allowed some of this demand gap to be satisfied through leasing of buses through LAGBUS. However, at times many commuters would be stranded because the buses could not sufficiently meet the growing demand of the city, particularly at peak periods. The experience shows that the need for flexibility and contingency in plans to either upscale or downscale in reaction to demand is important.

- × **Enforcement:** enforcing traffic rules and respect for the BRT system among private vehicle users has been challenging, particularly because the system is only 65% physically segregated from the regular lanes. As a result, private vehicles are still able to drive in BRT lanes, although they are not supposed to. Poor policing over vehicles using the lanes has therefore impaired the overall speed of the system.

- × **Private car to public transport shift.** In 2009, 85% of the clientele using the BRT had transferred from previously using *danfos*, however, due to the difficulty in encouraging a private to public shift, only 6% of riders had transferred from private cars. Ensuring a high quality customer experience has since been an important focus for improvement in order to capture higher income transport users.

34 Peltier-Thiberge, N. (2015) "Lagos' Bus Rapid Transit System: Decongesting and Depolluting Mega-Cities" World Bank Group, Transport for Development Blog

35 UNHabitat (2013) "Planning and Design for Sustainable Urban Mobility: Global Report on Human Settlements 2013"

36 Peltier-Thiberge, N. (2015) "Lagos' Bus Rapid Transit System: Decongesting and Depolluting Mega-Cities" World Bank Group, Transport for Development Blog

37 Mobereola, D (2009) "Africa's First Bus Rapid Transit Scheme". Sub-Saharan Africa Transport Policy Program

Latest efforts to improve the transport system: the Bus Reform Initiative (BRI)

In response to these areas for improvement, the Lagos State Government recently embarked on an ambitious 3-year Bus Reform Initiative (2017-2019). The program is spearheaded by Governor Ambode – building on the work of his predecessors Bola Tinubu and Babatunde Fashola – and broadly aiming to enhance the customer experience and capacity of the public transport network.

Key elements of the reform include:

1. **Buses**: The replacement of all *danfos*, taking them off the street and in their place providing a fleet of 5000 new European standard HOVs and Midi-Buses which offer increased safety, reliability and comfort. 820 buses have so far been procured, 520 of which are HOVs and 300 are Midi-buses.

2. **Infrastructures**: The provision of world-class infrastructure to support the transport system. This includes: the completion of remaining BRT corridors, road and junction improvement works, as well as 954 new bus shelters and lay-bys, 13 new terminals, and 7 depots.

3. **Operations**: 60 routes will be allocated to qualified bus operating companies whose performance will be monitored against set indicators for service delivery. By allowing private operators to manage parts of the public transport network, the government hopes to improve the capacity and overall conditions of the system.

4. **Digitisation**: The increased digitisation of the network – including the collection and dissemination of real-time service information, smart ticketing and ITS-based route allocation.

5. **Staff training**: Better support and training for drivers and bus attendees, including mandatory practical courses to ensure staff are adequately certified to operate the bus services.

We provide some illustrative examples below of how the BRI is has been carried forwards in practice. For further details, we refer the reader to the appendix, where we provide project and infrastructure specifications that have been part of the reform to date, as well as pictures to showcase some of these.

Infrastructure and operational improvements as part of the BRI

The first phase of the BRI commenced in Ikeja in 2018 as critical infrastructures such as depots, terminals and dedicated stops were constructed. Such infrastructures are to be developed along all of the proposed routes of the reform initiative, covering major transport zones including Ikeja, Lagos Island, Oshodi and Abule Egba. See Figure 1 in the appendix for a map showing the full coverage of the BRI.

Opearations of the buses then commenced in May 2019 starting with a pilot on two major routes between Oshodi-Talafa Balewa Square and Oshodi-Berger. Within the first six weeks of operation, from May 2nd to June 23rd, these two

routes alone recorded a ridership volume of 84,903 and 75,554 passengers respectively, meaning there were roughly 3,700 overall passengers travelling from Oshodi per day. Managing this traffic was only made possible because of the recent construction of the Oshodi Transport Interchange, one of several new infrastructure projects that the reform iniative is putting in place.

Before Oshodi was constructed, passengers had excessive troubles trying to board buses: waiting points were undefined and unstandardized, boarding areas were typically congested, and passengers were susceptible to injuries and theft. In addition, the state of boarding areas was very poor, passengers had no shelter against harsh weather and the waiting environment was typically unclean and poorly maintained. However, the construction of the Oshodi terminal, has made the environment efficient and more comfortable for all passengers: new state-of-the-art terminals have shelters where passengers sit comfortably while they wait for their buses and designated spaces so passengers can queue in an orderly manner as they move into the bus. Moreover, the infrastructure has made a transformative difference to the management of vehicular traffic within and around the Oshodi terminal.

In parallel, the government has also made efforts to improve the flow of traffic across the city through the extensive removal of bottlenecks in the road network. Junction improvements, merge and exit lanes, roundabout modifications, and pedestrian bridges have all been key areas of focus to complement the BRI. One example is the axis connecting Lekki and Victoria Island: previously with nine roundabouts between Abraham-Adesanya and the Lekki tollgate, citizens could spend as much as three hours travelling between the centre and east of the city – a distance of only 18km.[38] Since the government removed six roundabouts, there has been a 75 percent reduction in traffic time and an estimated NRN87billion (~USD$240million)[39] saving through reduction in fuel costs, environmental costs and lost travel time.

Aerial picture of the Oshodi Transport Interchange before and after new construction work. Photo credit: Planet Projects Ltd.

Finally, the government is also opening up new routes for the BRT network such as the Oshodi-Abule-Egba corridor. The Oshodi-Abule-Egba corridor is currently one of the busiest corridors in West Africa, often experiencing huge congestion, particularly during peak periods, where journey time can increase

38 Ongoing transport reforms in the city of Lagos (2018) [Multimedia Item]. London, International Growth Centre

39 Ongoing transport reforms in the city of Lagos (2018) [Multimedia Item]. London, International Growth Centre

by as much as 400%. Construction of the BRT corridor remains ongoing, with operations planned for early 2020, at which point it is expected that the BRT corridor will carry over 300,000 passengers daily across a 13km stretch.

These efforts intend to enhance the overall quality, efficiency and reliability of the bus network, changing the public perspective and strengthening trust in the system.

In summary

The Lagos transport reforms highlight that with the right motivation, dedication and leadership it is possible to achieve striking results. Since the implementation of the BRT, the city has seen remarkable improvements across a number of indicators that impact upon the everyday lives of citizens. We summarise a few of the key highlights in the Table 3.

Table 3: Lagos's pre and post reform transport performance

	Pre-reform	Post-reform
Transport cost	Average 140 Naira	Decreased 30% - 50%
Congestion	Very high	Reduction in travel times of 40%
Greenhouse gas emissions	High	Decreased 13% - 20%
Safety	139 accidents per 100,000	Decreased 30%
Comfort levels	Low	Wide felt improvements
Other benefits	Direct & indirect employment, security of travel.	

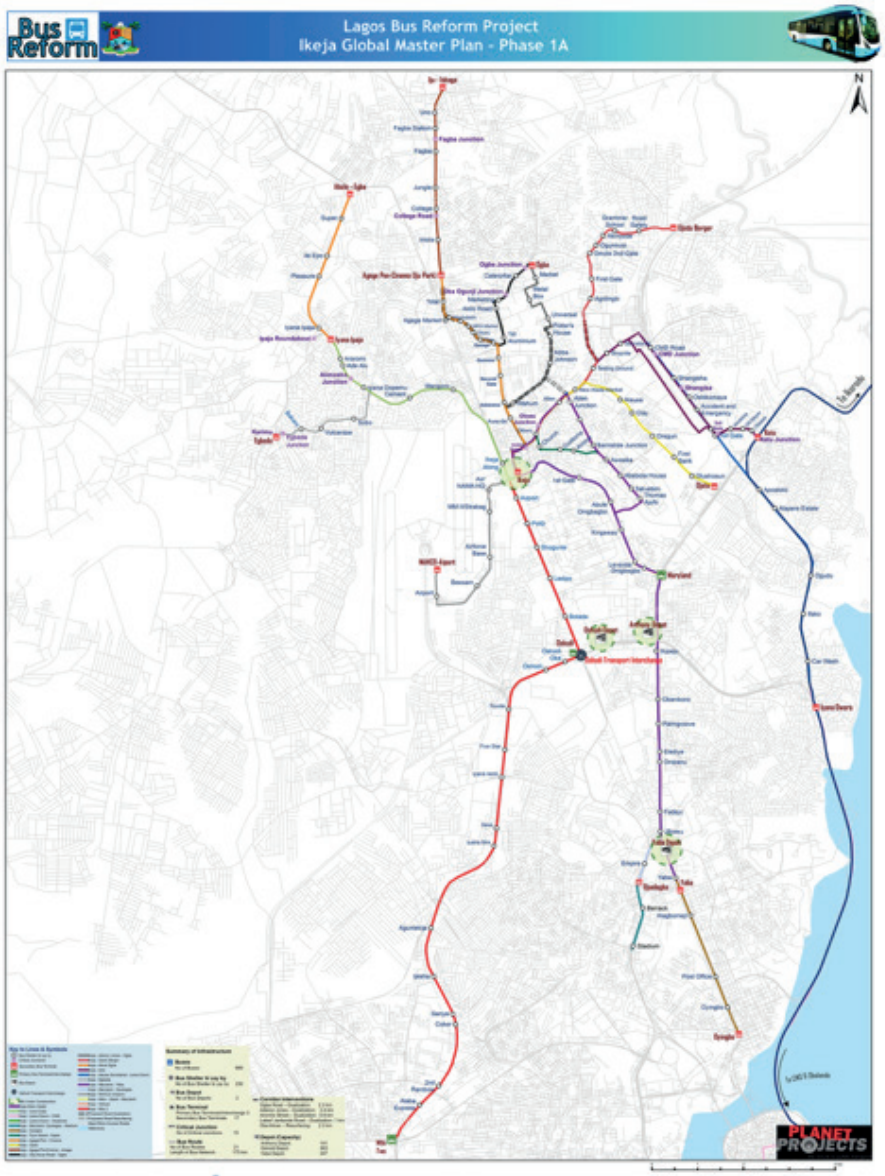
Several features of the reforms are important to consider for replication in other cities. Firstly, policy learning from abroad was combined with a strong knowledge of the city context. Solutions were tailored towards integrating society and the *danfo*-dominated network rather than excluding it from the decision-making process. Secondly, establishing a strong institutional foundation for project coordination and setting the strategic plan was critical to the long-term success of reform. Lastly, utilising the incremental approach allowed the state to make quick, cost-effective and visible wins that were witnessed by everyday citizens. These characteristics proved instrumental to the successes of the Lagos transport reforms.

Appendix

In the sections below, we provide details of the coverage and infrastructures in the Lagos Bus Reform Initiative. This information is from Planet Projects Ltd, a Nigerian company that has been closely involved in the strategic planning and implementation of various transport improvements in Lagos including the BRI.

Coverage of the Bus Reform Initiative

Figure 2: Map of Lagos Bus Reforms – Phase 1A



As part of the planning and implementation of the BRI, Lagos was divided into five strategic transport zones in which targeted solutions could be made based on the specific transport challenges of each area. These zones include:

— Zone 1A: Ikeja;

— Zone 1B: Lagos Island;

— Zone 2A: Oshodi;

— Zone 2B: Oshodi-Abule-Egba;

— Zone 3: Strategic Linkages.

Figure 2 provides a map of Phase 1 of the bus reforms initiative, showcasing the routes and locations of proposed infrastructures.

Bus specifications:

5,000 new buses (HOVs and Midi Buses) will be deployed to the public transport route to replace the *danfos*. These buses provide more comfort, with amenities like charging points and free Wi-Fi, for enhanced user experience and increased ridership. The bus specifications are shown in Table 4.

Table 4: Summary of Bus Specifications (HOV and Midi-buses)

S/No.	Bus Specifications (HOV & Midi-buses)	
1.	Configuration and Size	2-Axle Single Deck,
-		HOV: Length 12m – 13m, Width 2.4m – 2.55m Midi-bus: Length 7m – 11m, Width 2.2m – 2.4m
2.	Ground Clearance	150mm – 450mm
3.	Seating Capacity	HOV 40 - 50 Passengers, Midi-bus: 27 – 33 Passengers 2x2 Distribution, Vinyl Seat Covers
4.	Standing Capacity	HOV 30 - 45 Passengers, Midi-bus: 10 – 20 Passengers
5.	Passenger Door Numbers	2 Double Leaf Pneumatically Operated Doors Door Release Valve For Emergency Exit Manual Ramp For Wheelchair Access
6.	Passenger Door Positions	Ahead Of Front Axle Ahead Of Rear Axle
7.	Ventilation And Climate Control	Fully Air Conditioned Sliding Windows, Tinted Glasses With UV Filtering and Heat Insulation Roof Hatches with 4 opening positions and emergency exit
8.	Suspension Configuration	Air Suspension Kneeling Suspension

S/No.	Bus Specifications (HOV & Midi-buses)	
9.	Steering Configuration	Left Hand Drive with integrated power steering Steering Column with pneumatic height and titlt adjustment
10.	Braking System	Self-Adjusting Braking System (Slack Adjuster, Automatic) Drum Brake Exhaust Brake Control, Automatic Retarder
11.	Power-Plant Location	Centrally And Longitudinally Rear
12.	Engine	HOV: 5-Cylinder, In-Line, Direct Injection, Turbo-Charge, 250hp Midi-bus: 4-Cylinder, In-Line, Direct Injection, Turbo-Charged, 150hp
13.	Power-Plant Fueling	Automotive Gas Oil (Diesel)
14.	Exhaust Emission Standards And Treatments	Euro Ill, with Diesel Particulate Filter Exhaust Catalysts Fuel Cooler Centrifugal Oil Cleaner
15.	Transmission Type	Automatic 6-Speed Transmission
16.	Windscreen	Front – 2piece Green Laminated Glass [ECE-R 43] Rear – 1 Piece Green Laminated Glass
17.	Destination Signs	Electronic – LED Exterior And Interior
18.	Electrical System	Alternator – 2x 100A Batteries – 2x225AH (HOV), 2x150AH (Midi-bus), Maintenance Free
19.	Fuel Tank	Internally Coated Minimum 300 Liters Capacity with preferably 2 Filling Points Anti- Siphon Device Fitted
20.	Front Axle Rear Axle	HOV: 7 Tonnes; Midi-bus: 3 tonnes HOV: Minimum 12 Tonnes; Midi-bus: 6 tonnes
21.	Body And Flooring	Full Body Frame Insulation With Injected Polyurethane Overall Anticorrosion Treatment On Body Frame Fiberglass And Aluminum Body Flooring – Marine Plywood, 14mm Thickness Flooring Covered With Heavy Duty Synthetic Material

S/No.	Bus Specifications (HOV & Midi-buses)	
22.	Interior Accessories	1 nos. 6kg Fire Extinguisher – Driver's Compartment 1 Set Of Triangular Early Warning Device 1 Box Of First Aid Kit 4 Pieces Of Hammers For Breaking Windows In Case Of An Emergency Windscreen Roller Blind Passenger Bells With Buzzer And Warning On The Driver's Dashboard PA System Tool Box Entertainment System (Dvd and Radio) With Speakers On Parcel Rack
23.	Additional Requirements	Driver's enclosure Tropicalisation of engines minimize engine overheating issues Speed limiting device Warranty 5-years rust free on body frame Electronic Ticketing Machine ready Turnstiles at entry and exit points GPS enabled CCTV with minimum of 4 cameras for exterior and interiors views Hub odometers Customized operator logo Workshop and operation manuals 3-years warranty or 150,000km whichever comes first Provision of factory and local technical training Setup and initial managing of central workshops Provision of recommended fast moving spare part list with part numbers for 3 years with fixed prices Existing or ability to setup Bus Manufacturing Assembly Plant in Lagos, Nigeria within specified timeframe. USB charging point at all passengers' seats and In-bus Wi-Fi coverage

Lagos Bus Reforms Buses – HOV bus

Lagos Bus Reforms Buses – HOV bus

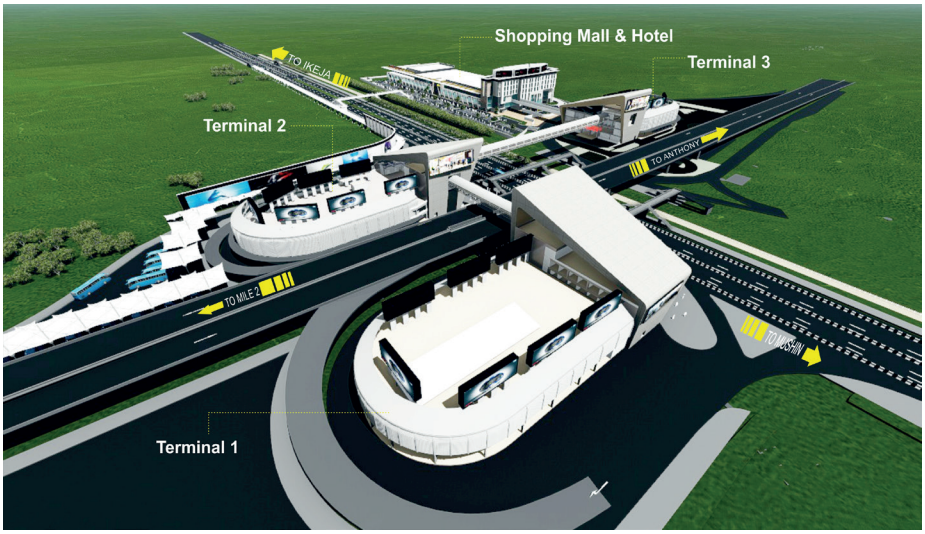
Infrastructure Projects Status

Table 2 provides a description of the various infrastructures that are included in Phase 1 of he BRI and their delivery status.

Table 5: Status of Phase 1 Infrastructure Delivery

S/No.	Infrastructure	Completed	On-going	Remaining balance
1.	Buses	820 (HOV – 520, Midi-bus – 300)	-	4,180
2.	Depots	2; Yaba & Oshodi	1; Anthony	4
3.	Bus Shelters	100	-	854
4.	Bus Terminals	3; TBS, Ikeja, Oshodi	6; Yaba, Ojota, Agege, Oyingbo, NAHCO, Ajah	18
5.	Junction Improvement Works (JIW)	-	Ongoing	-
6.	Intelligent Transport System	-	Ongoing	-

The images below provide visuals of some of the infrastructures and their associated impacts.



3D architectural plan of the Oshodi Transport Interchange

Aerial picture of the completed Oshodi Transport Interchange

Aerial picture of the Oshodi Bus Depot

Yaba Bus Terminal (currently under construction)

Yaba Bus Depot

Tafawa Balewa Square Bus Shelters

Typical Bus Station & Lay-by


Ikeja Bus Terminal – Before & After

Ikeja Bus Terminal


Waiting points (before and after)


Boarding process (before and after)


Passenger comfort during transit (before and after)


Environmental conditions (before and after)

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