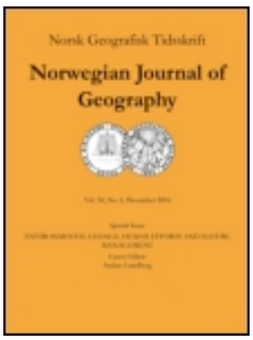

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The bus rapid transit system in the Greater Accra Metropolitan Area, Ghana: Looking back to look forward

ERNEST AGYEMANG

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The first decade of the 21st century witnessed a proliferation of bus rapid transit systems in many cities worlwide. Successful transit systems, especially in poor cities, have been lauded and presented as models for other cities to emulate. However, little attention has been given to unsuccessful transit systems, even though reasons for their failures could be beneficial to poor cities planning to invest in mass public transport. The author examines the militating factors in the demise of Ghana's first bus rapid transit system and draws useful lessons for the present and future. Qualitative data from interviews, surveys, and in-depth key informant interviews are analysed and presented in thematic narratives. They are complemented with quantitative (travel time) data. The results show that recurring traffic congestion, passengers' inadequate comfort and personal security, resistance from existing public transport operators, lack of legal status for a bus rapid transit (BRT) system, and limited advertising led to the collapse of the pilot system in the Greater Accra Metroplitan Area (GAMA). The author concludes that the success of present and future BRT systems is and will be a function of multiple stakeholder consultation and participation, privatization of day-to-day operations, promotion of multimodalism, and planning with the commuter in mind.

Keywords: *bus rapid transit system, GAMA, Ghana, public transport, thematic narrative analysis*

Ernest Agyemang, Department of Geography & Resource Development, University of Ghana, P.O. Box LG 59, Legon, Ghana. E-mail: eagyemang@ug.edu.gh

Introduction

In many developing countries, public transport provision does not seem to have kept pace with the fast-growing urbanization. Thus, disequilibrium between increasing demand and the limited supply of transport has resulted in congested central areas, poor levels of service from public transport operators, limited high-occupancy vehicles for mass transit, increases in private car use, and traffic mixes with safety implications (Agyemang 2009; Oteng-Ababio & Agyemang 2012). Consequently, urban mobility in developing countries is constrained by the lack of ease of accessibility to various parts of cities, especially for low-income earners and the vulnerable in societies, who are locked in a web of perpetual 'transport poverty' (UN-Habitat 2013). However, the negative externalities associated with urban mobility in developing countries could be minimized by the establishment of the bus rapid transit (BRT) system, which has been credited with promoting social equity, environmental and atmospheric cleanliness, and economic prosperity (IEA 2002; Wright 2002; Fouracre et al. 2003; Deng & Nelson 2011). In addition, in most developing countries the paucity of resources for embarking on large-scale rail transit projects, such as seen in the developed world, makes the BRT system a cost-effective alternative for mass transportation.

In the developing world, the BRT concept is generally believed to have started in Curitiba, Brazil. It is now ubiquitous in other South American countries, including Bogota (Columbia) and Quito (Ecuador). In Asia, cities such as Nagoya (Japan), Taipei and Beijing (China), Bangkok (Thailand), Delhi, Pune, and Hyderabad (India), Dhaka (Bangladesh), Jakarta (Indonesia), and Seoul (Korea) have either introduced or are at various stages of implementing a BRT system. Africa has not been left out of the global BRT revolution. The continent's first extant BRT system has been operational since March 2008 in Lagos (Nigeria). Currently, similar schemes are being tested in Cape Town (South Africa) (Deng & Nelson 2011), and in both Dakar (Senegal), and Dar es Salaam (Tanzania) (ITDP 2003). The growing list of cities in developing countries that have successfully implemented BRT systems have served as models for other cities that plan to invest in similar schemes.

While successful BRT systems are often highlighted (Jefferson 1996; Gomez 2004; World Bank 2004; Hidalgo et al. 2007; Lindau et al. 2010), studies of the socio-economic and operational difficulties that accompany these success stories are often lacking (Gilbert 2008). Using illustrations from a defunct BRT system in the Greater Accra Metropolitan Area (GAMA), I critically examine the socio-economic and operational challenges that emerging BRT cities in developing countries need to address to ensure sustainable BRT operations.

Literature review

Gilbert (2008) opines that in view of the limited success that has accompanied mass transit options in cities of the developing countries, the few successful ones have received tremendous recognition. They are often seen as role models for others to emulate without due assessment of their strengths and weaknesses. A few of these role models include Curitiba's BRT, which has been described as 'the world's cradle for bus rapid transit (BRT) [and] one of the most successful bus transit systems in the Western Hemisphere' (Lindau et al. 2010, 17). While Jefferson (1996) focuses extensively on the benefits of the system, including observed flow rates of 22,000 passengers per hour (in each direction), Lindau et al. (2010) praise Curitiba's unique feat of using busway corridors to direct its future growth.

Bogota's Transmilenio is another example of a successful BRT. Declared 'the world's most important urban transport project' (Gilbert 2008, 443), the Transmilenio was awarded the Stockholm Partnership Prize in 2002, and transport authorities from 37 different countries visited it during its first five years of operation. Bogota city authorities and the World Bank touted its

virtues all over the world (Gomez 2004; World Bank 2004; Hidalgo et al. 2007).

Gilbert's (2008) critical examination of Bogota's 'Miracle Cure' provides rare but practical insights into the socio-economic and operational bottlenecks that emerging BRT cities should be wary of. He notes that Bogota's success story has not been without problems. Criticisms of the system range from 'insensitive' increases in fares, controversies in the third-phase expansion, deteriorating bus stations, overcrowding and delays, insecurity, to the perceived incompetence of the central executive agency (Gilbert 2008).

Other studies of BRT planning and operational challenges in the developing countries have focused on the role of existing transport operators, and have confirmed that addressing opposition sentiments and involving existing transport operators may go a long way to ensuring the successful planning and subsequent execution of BRT systems. For example, in Bogota the deliberate policy of involving local bus companies fostered both a sense of ownership among existing transport operators and their willingness to cooperate with the new system (Gilbert 2008). Failure to do this could have resulted in 'the Quito experience', when 'the army's tanks had had to intervene to crush a strike by the bus owners who did not want to let the new system open' (Ardila-Gomez 2004, 343). Similarly, the failure of Johannesburg city authorities to involve South Africa's United Taxi Association Forum (UTAF) prior to the launch of its BRT system led to a series of mass protests. Later, a BRT bus travelling from Soweto to the central business district was reportedly fired at and a passenger and policewoman were hit by bullets. Other individuals suspected of conniving with the city officials in implementing the BRT system have suffered a similar fate (Dugger 2010).

I therefore concur with Hildago & Graftieaux's (2008) conclusion that fear of protests and unrest has caused cities to involve incumbent public transport operators in direct negotiations with existing operators (e.g. Mexico City, Lean, and Jakarta) or to give incumbents extra points in the bidding processes (or to give entry barriers to outside bidders) (e.g. Bogota, Pereira, Guayaquil, and Sao Paulo). It should be noted that longstanding cultural and behavioural factors may also impede the success of BRT systems in the developing world. This has been observed in the Indian city of Ahmedabad, where planning for the Janmarg BRT systems was fiercely opposed by religious groups whose structures fell within the proposed bus route network (Kadri 2010).

Case study of GAMA's transport system

Accra, Ghana's capital since 1877, is one of the most populated and fastest growing metropolises in Africa. According to the Ghana Statistical Service (2012), in 2010 the Greater Accra Metropolitan Area had an estimated 3.7 million inhabitants. In earlier studies, I considered that the city's growth might be accounted for primarily by rural–urban migration in response to rapid industrialization and expansion in the commercial sectors between 1960 and 1970 (Agyemang 2009; 2013).

The boom in the service sector during the late 1980s and 1990s led to further increases in the migratory flow of people into GAMA. Thus, the primacy of GAMA as an administrative, educational, industrial, and commercial hub continued to attract people from all over Ghana. By contrast, the city's public transport has been erratic and has not responded to the urbanization trend. For example, Addo (2002) notes that until the late 1980s, two state-owned bus companies – Omnibus Services Authority (OSA) and City Express Service (CES) – provided frequent, safe, and comfortable intra-urban services in GAMA. However, due to rising financial losses, mismanagement, and stiff competition from the private sector, both of the bus companies collapsed, which paved the way for private-sector transport operations, popularly referred to as *trotro*.

According to Abane (2011), *trotro* is a local Ghanaian expression meaning 'three pence', which is the fare charged for local trips in trucks (known as 'mummy trucks') in GAMA in the late 1950s and 1960s. Today, the word loosely refers to all vehicles engaged in commercial transport, including Nissan Urvans, Toyota Hiace minibuses, and the 207 series Mercedes-Benz buses (Fig. 1). Fouracre et al. (1994) explains that in GAMA the conversion of c.10,800 minibuses to intra-urban operations due to a 1989 ban on their use for inter-urban transport gave impetus to the *trotro* transport system. The *trotro* operators have unionized into very powerful groups, of which the Ghana Private Road Transport Union (GPRTU) by far is the largest (Agyemang 2009). The *trotro* transport system has had a virtual monopoly for over two decades. The *trotro* is readily available, accessible, convenient, and above all affordable, as the term *trotro* connotes.

Due to its relatively low carrying capacity of c.12–15 passengers, a *trotro* may not queue for long at terminals. As shown in Fig. 1, most *trotros* collect passengers en-route and not necessarily at specified bus terminals. Passengers are allowed to board a *trotro* and then pay their fare to the conductor, referred to in local parlance simply as the driver's 'mate'. In Fig. 1, the assistant is the man wearing a sleeveless shirt. The dynamism in *trotro* operations, as seen in the possibility for drivers to re-route through minor corridors or even drive on road shoulders during peak hours, in addition to allowing passengers to embark or disembark at any location of their choice on heavily trafficked roads despite the practice being illegal, are seen as advantages that have further popularized the '*trotro* culture' in GAMA.

In recent years the *trotro* transport system has been criticized by the general public for its poor operational and safety standards as well as for personal security issues during late evening operations. Addo (2002) found that the *trotro* transport unions had not been able to regulate effectively the behaviour of their members. Thus, drivers and their assistants could be discourteous to passengers and other road users while knowing very well that severe sanctions were rarely applied, even when reports were made to the executive members of the unions. In earlier studies, I found that some *trotro* drivers and their assistants arbitrarily increased their fares, especially during evening peak-hour journeys, after heavy downpours, or shortly after an increase in the price of fuel has been announced by the authorities; very often, this resulted in violent altercations with passengers (Agyemang 2009; 2013).

Many commuters prefer to share taxis, which may charge two or three times the *trotro* fare (Addo 2002). However, the proliferation of taxis has contributed to severe traffic congestion

Fig. 1. A white 207-series Mercedes-Benz *trotro* stopping for passengers in the Greater Accra Metropolitan Area

and environmental pollution in GAMA (Armstrong-Wright 1989; Fouracre et al. 1994). As a social policy intervention, a quasi-private bus company called Metro Mass Transit Limited (MMTL) was established in October 2003 to offer intra-city, intercity, and long-distance transport options to commuters to GAMA and beyond. In September 2005, the MMTL piloted its version of a BRT system on the 20 km 'Kimbu–Adenta' highway in GAMA (shown as the first BRT line in Fig. 2). This functioned until 2007.

GAMA's pilot BRT system was characterized by a fast, time-bound trip connection between the Kimbu terminal (in GAMA) and Adenta town in the Greater Accra Region, with Tetteh

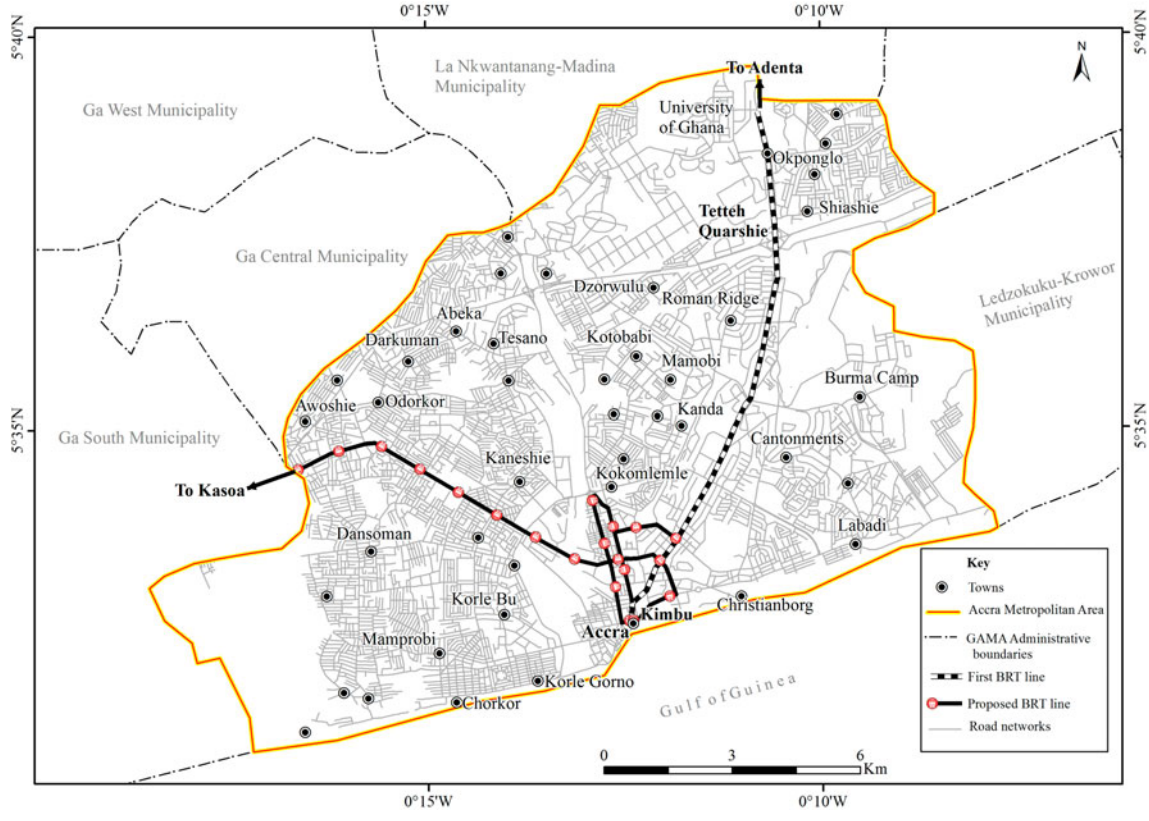

Fig. 2. The first and proposed BRT lines within the Greater Accra Metropolitan Area

Fig. 3. A wooden kiosk (opposite a NEOPLAN bus) serving as a sales point for bus rapid transit (BRT) tickets in the Greater Accra Metropolitan Area

Quarshie acting as a central transport hub and changeover point. Eight buses, four in each direction, were used in its daily operations in 2005. The buses were to set off from the depots at 15-minute intervals and drivers were expected to complete each trip in c.45 minutes. Four more buses (two at each depot respectively) were reserved for use in emergency situations such as accidents, breakdown of 'operational' buses, or during peak hour travels. Thus, 12 buses in total were designated for use in the pilot BRT system. Prospective passengers were expected to buy tickets at selected ticket booths and wait for the arrival of a bus (Fig. 3). The Department of Urban Roads delineated the outer lane of the 'Kimbu–Adenta' highway for buses only. However, compliance with the right-of-way provision was seldom enforced. The pilot BRT system enjoyed initial overwhelming success characterized by massive ridership. However, within barely two years of operation, it was replaced by a 'regular' service, which meant that the buses were permitted to collect passengers en-route upon payment of fares, in common with *trotro* operators. In view of the above description of the key operational characteristics of the mass transit in GAMA, the description BRT system' may seem inappropriate or even misleading because a 'proper' BRT system operates an 'integrated system of facilities, services, amenities, operations, and Intelligent Transportation Systems (ITS) improvements that are designed to improve performance, attractiveness to passengers, image, and identity' (Levinson et al. 2002, 1).

Furthermore, several of the main components of a 'proper' BRT, as identified in Levinson et al. (2003), the Canadian Urban Transit Association (2004), and Deng & Nelson (2011), such as dedicated bus lanes, enhanced shelters, and the application of ITS technologies are not present in GAMA's BRT. However, according to the IEA (2002), communities should be able to customize the building of a rapid transit system that meets their needs and funds. Thus, the extent of dedicated infrastructure and the level of sophistication of different systems may vary considerably.

Although the propriety of GAMA's pilot BRT system may be subject to future discussions, I have chosen to focus on factors that militated against it as well as useful lessons that could be learnt from its demise. The relevance of this focus is established by Ghana's recent adoption of an Urban Transport Project which will introduce a pilot BRT system operating between Accra's business district and Kasoa in the Central Region of Ghana.

Following the success of the pilot system in GAMA, the BRT project will be replicated in cities across the Greater Accra Region, Ashanti Region, and Central Region of Ghana. The philosophical basis and regulatory framework of the new BRT system as well as its anticipated socio-economic and environmental benefits have been thoroughly elaborated elsewhere (Nuworsoo 2006; Finn et al. 2009).

Data and methods

Qualitative data

I used primarily qualitative data from interviews, surveys, and in-depth key informant interviews carried out in 2008 in order to understand the socio-economic and operational factors that led to the collapse of GAMA's BRT.[1] Information on the day-to-day operations of the express service was generated through interviews with MMTL drivers and passengers who had participated in the pilot project. Six drivers were approached and interviewed at two major terminals at Kimbu and Adenta while their buses queued to pick up passengers. The interviews lasted 15–25 minutes on average, depending on the time of the day. Passengers were also interviewed under similar circumstances. However, the interviews proved challenging especially due to distractions from excessive noise and heat in the buses. In order to compensate for this weakness, three student researchers were employed to conduct a survey of the views of residents living in Adenta SSNIT (Social Security and National Insurance Trust) flats in Adenta town. The choice of residents in that particular housing complex for the interviews was informed by its unique location where all the out-bound BRT trips ended. In addition, the place is inhabited mostly by public and civil servants, students, business people, and market women who were the main target group of the pilot BRT system. The survey was designed to reveal information on the socio-economic and commuting characteristics of respondents, their expectations of the service, and the reasons for its collapse.

In total, 30 MMTL passengers were interviewed. Registered socio-economic characteristics of the survey respondents included gender, educational level attained, employment status, and age. The study did not consider the income status of respondents due to the assumption that given the highly-subsidized low fares charged by the BRT service affordability would not have been a determinant of a resident's decision as to whether to patronize the service.

Among the respondents, 18 were female (60%) and 12 (40%) were male. In terms of educational attainment, 2 (7%) of the respondents claimed they had not received any formal education, 3 (10%) had received basic-level education, 10 (33%) had received upper secondary school education, and 15 (50%) had

received some tertiary education. Thus, the sample population may be considered to have an educational bias.

Regarding employment status, 3 (10%) of the respondents claimed they were unemployed while 8 (27%) claimed they were still attending school. A total of 8 (27%) respondents claimed they were self-employed, while 11 (36%) stated that they were government workers. In terms of age, the respondents were asked to identify with pre-determined age groupings. In total, 4 (13%) respondents were under 20 years of age, while 6 (20%) fell within the 21–30 years age group, 9 (30%) belonged to the 31–40 years age group, and 8 (27%) were between 41 and 50 years of age. Only 3 respondents (10%) were above the age of 50 years. In addition to the surveys, information on the policy, planning, and management of the pilot BRT system was obtained through in-depth key informant interviews with a public transport policymaker, a transport development expert, and to two senior-level MMTL officials.

The results of the surveys and in-depth interviews were subjected to thematic narrative analysis and presented with the help of direct quotes. Thematic narratives have been used extensively in psychology and in other disciplines as a method for identifying, analysing, and reporting patterns (i.e. themes) within data. The method organizes and describes a data set in detail, and can also be used to interpret the data (Boyatzis 1998; Braun & Clarke 2006).

Quantitative data

In order to complement the qualitative data, quantitative data were generated through a traditional stopwatch and traffic congestion registration technique. This used a geographic information system (GIS) and Global Positioning Systems (GPS) to map prevailing traffic conditions by recording the time it took an MMTL bus to travel between the start and end nodes of each route segment on the Kimbu–Adenta highway. These geographically referenced nodes marked the location of bus stops used in the pilot BRT project.

Travel time data were recorded during the 'a.m. peak' (morning), 'off-peak' (midday), and 'p.m. peak' (late afternoon) on weekdays with different MMTL drivers in order to avoid the risk of being unduly influenced by a particular driver's driving style, as suggested by Taylor et al. (2000). With 6 trips made daily continuously for one month, a total number of 120 trips were made. The cumulative travel data were subjected to statistical analysis to determine whether the mean of a single variable differed from a specified constant using the bus company's 45 minutes per leg policy as the test value at a confidence interval of 95%. For each of the test variables, the mean and standard deviation were calculated. In the next section, the results of the analysis are discussed under various themes to identify the factors that jointly hindered the implementation of Ghana's first BRT sytem.

Results

Effects of traffic congestion

The study revealed that peak-hour recurring traffic congestion stifled the initial progress and success achieved in the pilot BRT system in GAMA. Views shared by the managers of the MMTL bus company related to poor fuel consumption patterns and an unsustainable vehicle maintenance regime that due to traffic congestion characterized the entire BRT operations. The frequent wear and tear and technical failures of the BRT buses appeared to raise the total overhead costs of maintaining them to the extent that the management found it increasingly difficult to meet their outgoings:

> When the buses are locked up in the corridor due to traffic congestion, they waste a lot of time and burn fuel inefficiently. This affects both the operational and total costs of the company. (MMTL official)

> The Yaxing buses that were primarily used for the pilot BRTS frequently developed technical faults, especially with the clutches due to the delays associated with traffic congestion. Of course, this also exposes the weakness of the buses that were used for the project but it would not have occurred in the first place if there was no incidence of traffic congestion in that corridor. At some point in time, it was realized that there was so much congestion that it became natural that there was no pilot BRTS. (MMTL official)

I also found that the unpredictability of traffic conditions in the corridor made it almost impossible for the managers to effectively plan and adhere to trip schedules. Without the aid of tracking devices such as GPS and traffic cameras to provide real-time data, the managers faced an uphill struggle to maintain regular schedules.

The results from the quantitative data confirm that the observed mean travel times, irrespective of the time of day, exceeded the allotted 45 minute per leg originally proposed by the bus company (Table 1). This means that the total travel time for each time of the day was significantly different from the allotted travel time of 45 minutes (morning $t(39) = 8.49$, $p < 0.05$; afternoon $t(39) = 11.45$, $p < 0.05$; evening $t(39) = 6.90$, $p < 0.05$). It could then be deduced that the buses spent more than 45 minutes on average per trip.

Table 2 shows that at the significance level of 0.05, travel time per period of the day (i.e. morning, afternoon, and evening) and direction (i.e. from the central business district (CBD) in Kimbu to Adenta town and vice versa) were statistically different, with mean travel times exceeding the allotted travel time of 45 minutes per trip. The only exception was in the evening, when the transit buses travelled from Adenta town to the CBD ($t(19) = 2.03$, p = ns). Thus, it was possible to have a situation where a BRT bus, for example 'Number 1', crawled in a traffic jam and ended up picking all prospective passengers who should have boarded bus 'Number 2' instead. While the first bus would have been overcrowded with passengers, the second bus would have followed virtually

Table 1. Mean travel times in the Greater Accra Metropolitan Area according to the time of day

Time of day	Mean travel time (minutes)	Standard deviation	df	T	P-value
Morning	72	20	39	8.49	0.00
Afternoon	65	11.19	39	11.45	0.00
Evening	69	21.89	39	6.9	0.00

Table 2. Mean travel times according to the time of day and direction travelled by buses between the central business district (CBD) in Kimbu (Greater Accra Metropolitan Area) and Adenta town (Greater Accra Region) (Source: field survey data)

Time of day	Buses' direction of travel	N	Mean travel time (minutes)	Standard deviation	T	Sig. (2-tailed)
Morning	CBD–Adenta	20	57	8.00	6.43	0.000
	Adenta–CBD	20	87	16.15	11.69	0.000
Afternoon	CBD–Adenta	20	66	11.90	7.83	0.000
	Adenta–CBD	20	65	10.72	8.26	0.000
Evening	CBD–Adenta	20	86	11.85	15.62	0.000
	Adenta–CBD	20	51	14.02	2.03	0.057

empty or in extreme cases would have completed the trip with an empty bus.

The following comments from a commuter are representative of passengers' initial enthusiasm for an improved transit service and the disappointment that followed due to congestion:

> I only used the Kufuor bus [MMTL buses] in the mornings and afternoons when travelling to Accra [business district] as they moved a lot faster but in the evenings I preferred to use the *trotro* instead. ... The *trotro* can use the *lungu-lungu* ways [unapproved routes through residential areas] and in no time you can get to your destination. (Petty trader and commuter)

The unwillingness of passengers to patronize BRT services for evening peak trips due to delays could be a major reason for the failure of the pilot project. This finding resonates with earlier studies by Nuworsoo (2006) and Abane (2011), who found that high levels of delays and inability to maintain any semblance of a regular schedule accounted for the limited success of high occupancy buses (as used for the pilot BRT operations) in GAMA. Alternatively, congestion might have proved advantageous for the bus company over their competitors:

> During peak hours, many prospective passengers are stranded due to the fact that most of the *trotro* drivers use shortcuts [unapproved routes through residential areas] instead of the main corridor. Owing to their limited carrying capacity, the few commercial vehicles that opt to remain in the main corridor cannot accommodate extra passengers besides their maximum carrying capacity. As such, these passengers will clamour for any available space in the express buses even if that will demand that they stand in the buses for the whole duration of the journey. By contrast, when there is no congestion these same passengers prefer to board the *trotros* because of their small sizes and the ability of their drivers to involve in all sorts of illegalities to beat traffic [queues]. (MMTL driver)

Passengers' perception of comfort and safety on buses

The significance of the passengers' perceptions of comfort, safety, and convenience on buses cannot be overemphasized. The study revealed that their perceptions were a function of gender. While most males were simply 'extra alert to not to fall victim to potential pickpockets', females would have avoided riding on a bus if they had a choice:

> I used to enjoy the express service to Legon [University of Ghana] campus. However, on many occasions, especially in the late afternoons, the bus becomes overcrowded to the extent that we are packed up like sardines … you just have to be extra alert not to fall victim to potential pickpockets. (Student and commuter)

> A friend of mine narrated her ordeal on one of those trips when she was sandwiched between two male passengers. It was terrible. She swore afterwards never to use that *soloku* [overcrowded] bus again! (Student and commuter)

> When they introduced the special buses for those of us in Adenta, my friends and I saw it as a blessing as we no longer had to be at the mercy of *trotro* drivers and their rude mates. After a while, we realized that it was no longer interesting to use the buses. After a hard day's work in the sun, you will be so tired that you cannot afford to travel back home while standing, sometimes among young men. Who knows what can happen to you? (Petty trader and commuter)

The findings from the above quotes concur with earlier studies that attributed the decline in ridership of Bogota's Transmilineo to passengers' perception of insecurity, risk of theft, and overcrowding, among other factors (Gilbert 2008).

Resistance from existing public transport operators

MMTL in general and the pilot BRT system in particular emerged in GAMA at a time when private transport operators had enjoyed decades of a virtual monopoly. A critical obstacle that needed to be overcome by MMTL was how to break that monopoly effectively, especially in the light of several unorthodox tactics employed by the private transport operators to sabotage its efforts. A representative of the management of the bus company said:

> Some *trotro* drivers deliberately slow down or stop in the middle of moving traffic to fetch passengers or allow them to alight. When traffic jams exist, they usually drive on the shoulders of the road for a while, then suddenly they forcefully and quickly join the mainstream traffic flow again, resulting in occasional crashes with our buses. (MMTL official)

The acts of gross indiscipline exhibited by the majority of *trotro* drivers have been the subject of earlier discussions (Oppong 2000; Addo 2005). However, most *trotro* drivers perceive the MMTL as belonging to the government (*abandea* in the local parlance). Agyeman-Duah (1987, 614–615) states that government property 'can be stolen, abused or destroyed with no direct consequences. The government is still considered to be a foreign entity, and too many people feel no compunction or obligation to protect its property or services'.

Furthermore, the success of the MMTL is seen as a direct threat to the revenue base of the private transport operators. I found that some *trotro* drivers and their assistants deliberately launched what may be conveniently described as psychological warfare against passengers who patronized the pilot BRT system:

> I used to enjoy the quality services introduced by the Kufuor bus. It even got better when they introduced the express service. However, it was very frustrating to listen to comments like 'misers', 'cheap side' and 'One-One Thousand' [the subsidized bus fare of 1000 Ghana Cedis, equivalent to USD 0.05 per trip in 2005] from *trotro* drivers anytime they saw you walk pass them to patronize the big buses. (Teacher and commuter)

The unpleasant repercussions of being tagged as miserly or 'cheap side' could be best understood when put into the Ghanaian context, in which 'cheap' items are perceived as inferior and of low quality. Thus, the extent to which these statements might have contributed to the dwindling ridership and subsequent collapse of the pilot BRT system in GAMA is clear.

Lack of facilities at bus stops

The study revealed that the lack of facilities to ensure the convenience and comfort of prospective passengers also contributed to making the BRT service an unattractive option. However, no arrangements were made by the bus company to provide shelters against the vagaries of the weather for passengers at the main BRT terminal at Kimbu, nor were any seats provided for prospective passengers to sit on while awaiting the arrival of buses. Thus, having to queue under the baking sun for buses that had erratic arrival times must have tempted most prospective passengers to opt for a *trotro* instead:

> They asked us to buy tickets and wait for a little while. However, the buses could be delayed ... mostly in the late afternoons but sometimes in the mornings as well. Unfortunately, there were no seats to sit on while waiting. So if you got tired what did you do? You advised yourself! (Civil servant and commuter)

Since the pilot BRT system was characterized by irregular schedules, there was a need for some sort of shelter for clients who chose to wait. This would have made the BRT service an attractive transport option for commuters.

Overcoming the trotro *hail-and-ride and rerouting culture*

The study showed that some passengers did not fully understand the BRT policy of stopping only at designated bus stops. The disparity between this service and the consumers' expectation of a flexible door-to-door service experienced when using the *trotro* occasionally led to fierce arguments between the drivers and their passengers:

> The drivers and their mates occasionally fight with passengers, especially when the latter insist on alighting at locations that are convenient for them. This bad attitude made some of us lose interest in using the Kufuor bus. (Student and commuter)

The following comments from a bus driver and two aggrieved female passengers further highlight the conflicts that characterized the strict adherence to the 'station–terminal only' policy practised by the drivers of the pilot BRT system:

> I can vividly recount several instances when my colleague drivers and I have been at the receiving end of unprintable insults from aggrieved passengers who felt we needed to stop exactly at a location of their choice … but I was only doing my job. (MMTL driver)

> I am a trader who buys goods in bulk from Agbogloshie and Kantamanto [markets] for retail. When I get to my destination, I expect the drivers to at least consider my heavy luggage and allow me to stop close to my shop. If the driver decides to take me to the next stop, how does he expect me to carry my heavy load back to the shop? (Petty trader and commuter)

> Many of us who use the Kufuor bus are petty traders and market women. However, you have to beg them [the conductors] to help you offload your luggage. Some of them were so rude, especially when your luggage is a bit heavy. (Trader and commuter)

Adequate user surveys had not been conducted prior to the pilot BRT system. Such surveys could have assisted the MMTL to serve the individual needs of users. The responses from the aggrieved passengers highlighted the lack of understanding by commuters of a time-bound BRT service and how they could use it. Moreover, the unwillingness of BRT drivers and conductors to assist passengers, especially traders to offload their luggage, may have had the undesired effect of dissuading them from patronizing the buses. This favoured *trotro* operators, whose conductors were perceived as more helpful in offloading heavy luggage.

The findings reinforce the belief that Ghanaians have generally become accustomed to the *trotro* culture, as found in an earlier study by Abane (2011), who explains the continuous dominance of the GPRTU in the country partly by the proximity of *trotro* terminals to the homes (and shops) of commuters. It should be pointed out that the continuous dominance of the GPRTU and the *trotro* operations in GAMA is not a function of the quality of service delivery or the safety and comfort afforded to passengers. The informal public transport operators simply serve as 'gap fillers' (Cervero 1998) following decades of neglect by the state to provide formal public transport for urban dwellers. Thus, their dominance is explained primarily by the absence of better alternative transport modes. In recent years, the use of motorcycle taxis, locally referred to as *okada*, has surfaced to help to fill in the gap between the demand and supply of public transportation.

Inadequate publicity for the BRT project

The study revealed that the limited publicity and advertisement in printed and electronic media to herald the official launch of the pilot BRT project could have contributed to much of the misunderstandings and frustrations of passengers. This factor could also have accounted for the operational difficulties faced by the bus crews:

> A public launch was done to highlight the pilot BRTS to the people of Accra [GAMA]. Besides this, no major advertisements were done in the printed and electronic media. It is therefore reasonable to expect that most passengers were oblivious as to what that particular service was all about, their rights and responsibilities as passengers, as well as other operational characteristics such as the arrival and departure times of the pilot BRTS buses and the approved bus terminals. (MMTL official)

Given the BRT system's unique operational features, the importance of adequately informing the travelling public, who were generally used to the *trotro* operations, could have proven useful in ensuring the success of the BRT service:

> The average Ghanaian traveller may have become used to the so-called 'trotro culture' of boarding and disembarking at his or her doorstep regardless of the inconvenience it causes other road users. Therefore, adequate publicity and education of the travelling public is needed to change that attitude. Regarding the pilot BRTS, it appears the publicity was just not enough. (Transport planning expert)

Lack of an enabling environment

A number of exogenous factors conspired against the successful implementation of GAMA's first BRT system. The first factor was the lack of any legislative instrument or bye-laws to ensure utmost protection for exclusive use of the busway by BRT system buses. As noted in the following quote from a transport official, the simple act of a quasi-private bus company putting a number of buses in a corridor and naming it the 'BRT system' may not necessarily have rendered it as such:

> My department was only tasked to mark some segments of the Kimbu–Adenta highway as 'bus only'. However, without recourse to any legislative instrument, it meant that the traffic police could not intervene to ensure strict compliance of the ROW [right of way] directive by other motorists. Therefore, it was only a matter of time before the so-called 'pilot BRTS' collapsed. (Public transport official)

Besides the lack of legal status for the service, the assertion by the public transport official highlights another important finding, which is the inadequate coordination among different actors in public transport delivery in the city. In order to ensure the success of a BRT, the cooperation among various actors, including policymakers, city authorities, law enforcement agencies, technocrats, researchers, and bus operators is required. Hence, the failure to bring all of these actors on-board might have contributed to the demise of the pilot BRT system in GAMA.

The second and third exogenous factors relate to limited investments in transportation infrastructural development and poor spatial planning in GAMA. The boom in car ownership in GAMA since the 1980s, when Ghana adopted neoliberal policies (Yeboah 2000; 2003; Grant 2009), has not been in tandem with investments in transport infrastructure. As a consequence, GAMA's road network is woefully inadequate to ensure enough driving space for its existing fleet. This has been compounded by the lack of east and west corridors (Tamakloe 1993; Addo 2002). Therefore, any policy that seeks to limit motorists' access to portions of the existing road network marked as a right of way (ROW) exclusively for BRT system buses would require more than just the presence of the traffic police to ensure compliance, especially during peak hours. In order not to inconvenience other motorists, the city authorities need to invest in the construction of extra lanes. However, due to GAMA's present poor spatial planning system occasioned primarily by the lack of complete ownership of lands by the state, the construction or expansion of roads have been daunting tasks. While the state has compulsorily acquired portions of land known as 'state lands' and also exercised management functions over other lands known as 'vested lands', there are large tracts of lands referred to as 'customary lands', which are owned by local chiefs, families, or clans. Customary lands are usually sold freehold to private individuals (Brobby 1991; Larbi 1994; Odame 1996). Thus, in order to avoid any conflicts, city authorities have had to pay huge amounts of compensation to private property owners whose properties are demolished to make way for road constructions or expansions. The huge compensation costs usually discourage the state from accessing credit facilities from the World Bank and other donors to start the construction of new roads or to expand existing ones.

Difficulties in day-to-day operations

While MMTL's managers and drivers tried their best to maintain a quality service to their patrons, it appears that inevitable human errors might have undermined the pilot BRT project. Such errors included occasional delays in the managers issuing tickets to the drivers, inadequate monitoring, arriving late for work, driver's failure to comply with new BRT rules, and the poor driving attitude of some drivers:

> The Adenta project [pilot BRT system] collapsed due to delays at the [company's] head office in the issuance of tickets for the smooth conduct of business. Again, monitoring and supervision of the service were just not adequate. I must admit that a few of us [drivers and conductors] occasionally reported late for work. (MMTL driver)

> My problem with the whole arrangement was our inability to pick up passengers simply because they stood at the 'wrong' place. (MMTL driver)

> Some of us opted to allow passengers to board [at the 'wrong' places] so that they could pay the conductors later when the buses reached the designated ticket booths. However, management disapproved of this due to allegations of theft of funds [by drivers]. (MMTL driver)

> Some of our drivers did not drive fuel-efficiently enough and they caused many avoidable accidents. Occasionally, some of them pilfered funds. We therefore set up the Inspection Unit within the Internal Audit Department to randomly check the driving crews as well as to inspect the tickets of passengers to ensure their validity. (MMTL official)

Furthermore, more recently the extent of corruption and embezzlement of funds involving workers and officials of the MMTL appears to have increased considerably (*Daily Graphic* 2013a; 2013b; *Ghana Today* 2013). While the arrest of culprits may suggest that perhaps the proactive measures put in place by MMTL are yielding dividends, it also suggests the extent to which the diversion of large amounts of monies into private pockets might have contributed to the demise of the BRT system and the generally abysmal performance of the MMTL in recent years.

Towards a successful bus rapid transit system: lessons from the past

The purpose of my study was to provide useful insights into how to ensure a successful BRT system in poor cities that are planning to implement a BRT. In order to achieve this, I placed emphasis on factors that led to the demise of Ghana's first BRT project, which was introduced by MMTL. The results showed that recurring traffic congestion, passengers' perceptions of

inadequate comfort and personal security, resistance from existing public transport operators, lack of a legal status for BRT, and limited advertising led to the collapse of the pilot BRT project in GAMA. In the light of this finding, I recommend that a number of changes are made, primarily targeted at BRT policymakers and city authorities in Ghana, although stakeholders in other jurisdictions could benefit from them too.

I recommend that local city authorities need to be adequately empowered to pass and enforce laws that will guarantee the exclusive use of ROW by licensed BRT operators. There is also a need to provide the traffic police unit with adequate resources to enforce strict compliance with the ROW, especially during peak-hour trips. This should ensure that the BRT buses comply with trip schedules, as there will be no traffic congestion to delay their movements.

Further, I recommend that existing transport operators in Ghana, notably the GPRTU, need to be incorporated in the planning and implementation of the BRT system in a form of private-public partnership to ensure the smooth take-off of the project. To this end, the government could assist them in procuring soft banks loans to buy new high-occupancy buses for use in the new pilot BRT project. In addition, the public sector should build and maintain infrastructure for use of the service. Beyond this, it is crucial to ensure that the actual day-to-day operation of the BRT system is organized by the private transport operators while the appropriate state agencies at the district assembly level plan and supervise the project. Earlier studies of the positive effects of involvement of existing operators support this assertion (Ardila-Gomez 2004; Gilbert 2008; Hildago & Graftieaux 2008; Dugger 2010). The involvement of existing operators would not only ease needless tensions, but also foster a sense of ownership among drivers and would ultimately ensure optimum work output. I also recommend that operators of the service should be paid according to the distances they travel rather than passenger volume. This would ensure adequate motivation for drivers, balanced distribution of bus routes, and compliance with planned trip schedules to avoid delays. Further, while the operators earn an operating profit, the government may also provide limited subsidies to maintain low fares for commuters.

In the case of GAMA, in order to avoid unhealthy competition between the BRT system and the remaining *trotro* operators, it should be possible to create a multimodal system of main and feeder lines in densely settled districts and in the more dispersed areas of GAMA. While the main lines are served by the former, the latter could concentrate on collecting passengers on the feeder lines. This would provide a versatile form of public transportation with the added flexibility of catering for various access needs and an unlimited range of locations throughout GAMA.

Finally, in order to attract and maintain high levels of ridership, sustained and massive advertisements in printed and electronic media are required. Related to this, initial test rides could be offered freely to commuters as a feedback mechanism to improve service quality. Later on, passengers could be charged single fares to travel seamlessly throughout the entire BRT system.

Toilets and limited retail facilities could be introduced within the main bus terminals, depending on the availability of funds. PA (public address) systems and LED (light-emitting diode) displays providing travel information in both English and other languages spoken in Ghana would prove useful for informing and educating travellers, and promoting the BRT system in Ghana.

In addition to refresher courses on defensive driving, drivers of future BRT buses should have good customer-relations skills. A deliberate policy should be in place to properly care for the safety and comfort of the vulnerable in society, including women, children, the elderly, and those who are physically challenged. In order to encourage patronage by the vulnerable in society and to address properly their 'transport poverty', there is a need to integrate and promote non-motorized transport (NMT). Dedicated pedestrian walkways and bicycle lanes should be provided as an integral component of the BRT system. This would not only promote ease of access for the majority of people who are already used to walking, but in addition to the health benefits they would derive, GAMA would benefit from reduced energy use, minimization of greenhouse gas emissions, and significant pollution reduction, which would enhance the sustainability of the urban environment. To this end, adequate measures should be put in place to prevent recalcitrant traders from encroaching on pavements meant for NMT, and adequate lighting and security should be provided for the users.

Note

1 With the exception of the quotes from MMTL officials, the transport planning expert, and the public transport official, I was responsible for translating all of the quotes from interviewees.

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