Implementing Bus Rapid Transit in eThekwini: Challenges, Lessons and Opportunities

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ABSTRACT

The process of implementing a policy often highlights concerns about its relevance and viability, which were not anticipated during its development. This article considers how mechanisms can be sought for maximising the benefits, as well as mitigating the negatives of the policy framework during its implementation. A number of South African cities have either planned or implemented Bus Rapid Transit (BRT) systems, in an attempt to provide affordable, reliable and safe public transport to address the spatial patterns inherited after apartheid, as well as to provide economic benefits. This article outlines the process that the eThekwini Municipality went through in adopting a BRT system; highlighting some of the interventions that have been implemented to mitigate possible negative aspects. It provides some lessons, both for policy-making and implementation – particularly the need for policy to be relevant to the local context and for ongoing costs to be factored into the initial project plans.

Keywords: Bus Rapid Transit, BRT, eThekwini Municipality, public transport, integrated transport, local government, density, policy implementation, transport costs.

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INTRODUCTION

> *South African transport history is composed of various instances of adoption of latest transport technology before sudden and complete replacement by more modern innovations* (Wood, 2015: 571).

An important aspect of redressing the legacy of apartheid in South Africa involves addressing its spatial legacy. Numerous approaches have been used to tackle the segregated and sprawling patterns of South African cities, such as attempts to decentralise job-creating industry into outer-lying areas; providing increased transport infrastructure; introducing public transport systems, or densifying inner cities to create living opportunities closer to places of employment (South African Cities Network (Institute for Transportation and Development Policy (ITDP), 2007; SACN, 2011; Gauteng City-Region Observatory (GCRO), 2015). These approaches have their advantages and disadvantages, proponents and detractors. Many have been short-lived fads, whilst others have enjoyed a more persistent focus (Pillay and Seedat, 2006; Seftel, 2014; Wood, 2015).

Local government has played a central role in this regard, using the powers and functions provided to it under Schedule 4B and 5B of the Constitution Act 108 of 1996 (Republic of South Africa, 1996), such as land use planning, locating the development of new housing and the provision of transport infrastructure and public transport services. All have attempted to address the apartheid city's segregated residential patterns, characterised by the location in remote areas of designated black, coloured and indian settlements. In addition, local government has an important role in driving economic development within its jurisdiction. This includes service provision, as well as developing local opportunities for job creation and poverty reduction, so as to ensure inclusive economic growth (Bannister and Sutcliffe, 2015).

This article outlines the process eThekwini has been through in implementing a public transport strategy in the city, which would address the spatial implications of apartheid policies and build the local economy. The authors will demonstrate that implementing any new policy brings both challenges and complications, which need to be carefully managed and mitigated. The way in which the city is aiming to increase its economic viability and sustainability, despite the shortcomings of the chosen transport system and its technology, will also be discussed.

BACKGROUND

The eThekwini Municipality was formed in 2000, bringing together six local substructure authorities and one transitional metropolitan substructure (Marx and Charlton, 2002). These areas were combined because they worked as an interdependent functional unit, as required by the Local Government Municipal Demarcation Act 27 of 1998 (Republic of South Africa, 1998). Merging different geographical areas required more than just establishing a single

administrative entity, however: it also required action to address the impact on the city of apartheid planning, which led to '[...] high costs in travel arrangements for the poorest of the poor, long distance commuting between places of work and residence, increased dependency by the rich on motorised transport, overwhelming subsidisation of the public transport system, pollution, high accident and mortality rates, increase in insurance premiums and motor accident claims' (Khan, 2014:184).

One of the measures for addressing these challenges involved a revision of the city's transport system, so as to create an efficient and effective public transport network (Aucamp and Shaw, 2001). The initial strategy – the Fundamental Restructuring of Durban's Public Transport System (FRDPTS) project – was developed in the early 2000s. This made use of the extensive rail network in the municipality, augmented by bus and taxi services to feed into the rail system at key points (Aucamp and Shaw, 2001). The eThekwini Municipality also took up the opportunity provided by the National Land Transport Transition Act (NLTTA) 22 of 2000 (Republic of South Africa, 2000) to establish its own transport authority (Khan, 2014). The institutional basis provided by the transport authority, together with the framework created by the FRDPTS, aimed at creating an integrated transport system, thus allowing for a seamless, multi-modal, single-ticketing public transport system across the municipality (Aucamp and Shaw, 2001).

The municipality could not fund the transport strategy alone, however, and therefore required the provision of financial support from national government. The hosting of the 2010 FIFA World Cup presented an ideal opportunity in this regard. The National Department of Transport (NDoT) then called for funding proposals from the host cities, for the creation of transport systems that would not only meet their World Cup requirements, but also lay the basis for viable transport systems for the cities thereafter (Khumalo, 2007). In an interview conducted by the authors, Dr Michael Sutcliffe, previous Municipal Manager of eThekwini Municipality, stated that the strategy had been presented at various points to the NDoT as being the city's public transport strategy of choice (Sutcliffe, 2015a). However after 18 months of unsuccessful engagement between the Municipality and the NDoT, a meeting was held between the Director General of NDoT and the City Manager of eThekwini. At this meeting, the Director General conceded that she had been misled by her officials, as their opinions differed on what strategy the Municipality should choose: some supported the integration of all modes (and particularly the use of conventional bus and rail), others, the sole approach of using large capacity buses synonymous with bus rapid transit (BRT) (Sutcliffe, 2015a). Despite this concession, it was by then too late for the NDoT to fund the first phase of the municipality's proposed system to be in time for the FIFA World Cup. Eventually, eThekwini had little choice but to adopt the NDoT's preferred approach and to develop a BRT system, despite having grave concerns about the ongoing costs that would be incurred (Sutcliffe, 2015a).

ROMANCING THE RAPID BUS SYSTEM

As a starting point, it is important to examine how and why the predisposition towards implementing a BRT system came into South African transport policy. Lloyd Wright, an international specialist, was invited by the NDoT to host a series of workshops on the topic in Johannesburg, Cape Town, Tshwane and eThekwini (Wood, 2015). Although the concept was not entirely new to South Africa, he introduced the zero-subsidy BRT at the Southern African Transport Conference in 2006 (Wood, 2015). Many of the motivations for implementing BRT in South Africa centred round its purported success in South America, in Colombia (Bogota) and Brazil (Curitiba) in particular (Wood, 2015, Bickford, 2015; Adewumi and Allopi, 2013). In 2006 and 2007, many municipalities went on fact-finding missions to these countries. Based on their findings, many undertook to develop BRT systems (Bickford, 2015). The Transmillio system in Bogota was very attractive and appeared to offer a complete solution, in that its direct operating subsidy was effectively zero and the ridership was on the increase throughout the first five years of operation (Bickford, 2015). During this period, it not only restructured public transport and changed expectations in the city, but contributed significantly to the rebuilding of Bogota through providing affordable, reliable and safe public transport (Adewumi and Allopi, 2013). South African policy-makers believed that the same result could be achieved back home (Adewumi and Allopi, 2013; Bickford, 2015; Wood, 2015), seeming to discount the differences between South Africa's city structures, city densities and social variations and those of Colombia, including access to low-cost capital for the provision of the infrastructure itself.

BRT systems appeared to be the panacea for all that was wrong with South African cities - a treatment sold on exaggerated claims and often with unclear demonstrable value. As Sutcliffe (2015a) indicated, after fifteen years of implementing Reconstruction and Development Programme (RDP) housing projects on inexpensive land, South African cities had made little progress in densifying cities. The transport engineering solutions were increasingly being viewed as a way of knitting divided cities together and addressing mobility. The rapid expansion of BRT across many cities (Across Latitudes and Cultures – Bus Rapid Transit (ALC-BRT), 2015) provided the basis upon which the system could be introduced in South Africa, without carrying out the usual due diligence requirements for such major policy decisions. Thus, a general admiration for the BRT concept, based on the mistaken belief that it would solve the country's transport problems, resulted in a new direction for public transport policy, which is outlined further below.

NDOT'S POLICY EVOLUTION

The National Department of Transport's Public Transport Strategy of 2007 (NDoT, 2007a) was implemented through the framework of the Transport Action Plan (NDoT, 2007b). The underlying principle of the latter is to speed up transport plans through maximising the use of existing transport infrastructure and accelerating the implementation of governmental economic and sustainable development policies (NDoT, 2007b). Phase 1 of the Transport

Action Plan outlines Integrated Rapid Public Transport Network (IRPTN) projects in twelve cities and six districts (NDoT, 2007b). The IRPTN strategy includes the following goals:

- 85% of a municipality's residents' being within 1km of an IRPTN by 2020
- extended hours of operation
- peak frequencies of between 5-10 minutes and off-peak frequencies of between 10-30 minutes
- full special-needs and wheelchair access
- safe and secure operations monitored by a Control Centre
- integration with feeder services, including walking/cycling and taxi networks
- electronic fare integration to allow passengers to transfer between modes
- upgraded modal fleet, facilities, stops and stations (NDoT, 2007b).

While the required features of the IRPTN system are highly commendable, they also highlight the difficulty of balancing high specifications, with the affordability and sustainability of the implemented system going forward. Not only is a high-specification system more expensive to develop, but in the longer term, it will incur greater costs and be more difficult to sustain.

BUS RAPID TRANSIT

BRT is a highly specialised bus system, which aims to provide a high-quality, rapid, mass transport system (Institute for Transportation and Development Policy, 2007). It is characterised by a number of features, although not all of these are necessarily present (ITDP and GIZ, 2014). These features include grade separation, ie providing separate and dedicated BRT lanes so that buses do not become impeded by traffic congestion (Institute for Transportation and Development Policy, 2007). BRT also requires bigger buses, allowing for the carriage of a greater number of passengers[4] (ITDP, 2007). There is also an emphasis on the need to provide a high quality of service, including

- high levels of maintenance
- ease of boarding
- quality stations with passenger facilities including toilets and good security both on the bus and at the stations (ITDP, 2007; EMBARQ, n.d,).

[4] A standard bus can carry around 80 people, but the dedicated BRT lanes allow buses with capacities of up to 200 persons per bus (ITDP and GIZ, 2014).

Bus services should be frequent, with low wait-times (ITDP, 2007). Other features include

- electronic fare collection
- modal integration, including integrated ticketing, allowing passengers to easily transfer between modes
- integration with pedestrian, cycling and other transport routes (ITDP, 2007).

In reality, many systems do not demonstrate all of the above features (ALC-BRT, 2015).

There are numerous benefits to BRT systems. They result in a reduction in the number of vehicles on the road (Institute for Transportation and Development Policy, 2007): one BRT bus can replace almost three buses or ten taxis and therefore can significantly reduce the number of vehicles in the road during peak hours (ITDP and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 2014). In addition, according to EMBARQ (2013), if operating at full capacity, BRT buses have lower operating and capital costs per passenger. Furthermore, the dedicated right of way lanes mean that BRT buses are less likely to be delayed by peak-hour congestion and can therefore offer commuters a faster trip. The above factors, together with increased efficiencies in numbers, mean reduced greenhouse effects and less congestion for other drivers. Fewer vehicles, dedicated lanes and improved training for drivers reduce accidents and fatalities. And, because BRT stations allow for faster passenger loading, buses can move more people in a given time period, than a greater number of smaller vehicles would be able to do (EMBARQ, 2013).

BRT systems, like other efficient, effective, reliable and cost-effective transport systems, have the potential to transform our cities. This phenomenon, commonly known as transit-oriented development (TOD), involves increasing levels of development around transit hubs and stations (SACN, 2014; ITDP and GIZ, 2014). As a result of the increased density around transport nodes, nearby residents are able to access transport easily, because they have less distance to cover between home and transport. Additionally, businesses clustered around the nodes can attract a higher number of employees, who are able to commute to work at a lower cost, in less time and with greater reliability. For municipalities, this increase in density means higher land values and increased rates. In order for the system to be successful, however, greater management and levels of service are required (SACN, 2014). Should land use and zoning systems allow, these nodes can become mixed-use developments, improving living and working conditions in areas that may not have previously enjoyed such development opportunities (SACN, 2014).

The economic sustainability of a BRT system is closely dependent on its ability to carry a sufficient volume of passengers, so as to justify the bigger buses, level of service and dedicated right of way (SACN, 2014; Naude, 2015). Passenger numbers are closely related to residential densities. These are not nearly as high in South African cities, as in South America, however (Naude, 2015). BRT is useful in moving large numbers of passengers between two points (effectively replicating a train). Yet, like a train, its movement patterns are very inflexible, as it has to adhere to the dedicated, right-of-way lanes. Passengers therefore have to change more frequently, unless their destination begins and ends at the

two points. Evidence suggests that South African passengers are reluctant to stand for their journey, however (Nicolai and Weiss, 2008): when all the BRT seats are occupied, they would rather wait for the next vehicle to arrive. The implication is that buses may not be able to reach their target capacity.

Importantly, before a costly BRT system – and indeed, any new policy is implemented – a full understanding of the upfront and ongoing costs is required, based on realistic assumptions about issues such as potential densities; passenger values and the trade-offs they will make: for example, between waiting time, a seated journey and the distance they are prepared to travel to access a system such as rail or BRT. As noted by Nicolai and Weiss (2008: 559): 'Unfortunately, many – if not most – of those [BRT] studies have been used deliberately to provide arguments for pre-determined opinions and intentions instead of providing rational figures for neutral analysis. Many interest-groups have tried to compare apples with oranges in order to promote or to oppose some project in the public discussion'. Furthermore, because many South African cities implemented BRT systems only on a partial basis for World Cup purposes, the broader networks were neither fully planned, nor properly costed. As a result, BRT systems were implemented without a thorough understanding of the considerable cost of a comprehensive system across the whole city. Furthermore, because the process was politically driven, unaffordable routes were selected to ensure they linked to areas where the poor were currently living, and where the working classes should be living (Sutcliffe, 2015a). The system thus requires further, careful consideration in the South African and eThekwini contexts.

IS BRT THE SOLUTION TO SA'S BIG CITY TRANSPORT PROBLEMS?

> *Our message to other cities is to really focus on ensuring that your fare structure, fares and fare collection methods must be aligned to your public transport promise and strategy and not try follow international best practice or fancy systems (Seftel and Peterson, 2014:805).*

Many BRT systems implemented in South Africa have focused more on the quality of the initial service provided, rather than on long-term sustainability (Seftel and Peterson, 2014). Key to the latter is the volume of passengers who will use the system. For example, the Rea Vaya BRT system in Johannesburg aimed to transport 40 000 passengers per day (Seftel and Peterson, 2014). However, by November 2013, only 19 000 daily passenger trips had been recorded. More recent figures point to approximately 10 000 commuters in the Johannesburg corridors who could use the BRT system (Seftel, 2015, cited in Maatu, 2015). In comparison, the mini bus taxi (MBT) industry in Johannesburg transports over 1 million passengers; and the Gautrain 48 000; per day (Maatu, 2015). Whilst bigger buses facilitate the transportation of high volumes of commuters between particular points; and dedicated lanes, which allow buses to travel fast, help to avoid traffic congestion, statistics suggest (StatsSA, 2014) that the BRT was an expensive solution for problems that were not

necessarily a priority for most South African commuters. What then, are the main issues that face passengers, to which public transport must respond?

The National Transport Survey of 2013 (StatsSA, 2014) provides a useful insight into commuting patterns in eThekwini. Just over half of the city's work commuters use public transport (54%). The majority (41%) use MBT transport, followed by 36% in private vehicles (either passengers, or drivers). Only 7% use the bus, 5% the train and 11% walk all the way to work. Given that average train travel costs are almost half those for MBTs (StatsSA, 2014), it is important to understand why it is that passengers do not use rail. Of the factors influencing their mode of travel in eThekwini, 32% of households prioritised travel time, compared to 22.9% of households who listed travel costs as the most important (StatsSA, 2014). Most commuters in eThekwini (53%) live beyond a 15 minute walk of a train station. Although thirty five percent of respondents felt that they could not easily access the train, the primary reason for not using the train related to level of service (39%). Problems included overcrowding (70%), concerns about personal safety on the walk to the station (58.5%), the punctuality of the service (55.5%) and travel time (54.9%). However, when on the train, safety was a lesser concern (only raised by 25.2%) and facilities on the train and station were an issue for only 37%. Train fares were the least of commuters' problems (StatsSA, 2014). Similarly, the Survey showed that most eThekwini commuters do not use bus services, because even though they are relatively accessible, the service levels are poor (37% attribute non-usage to poor service levels, whilst 26% say that buses are inaccessible). Those that do use buses note that the primary problem is overcrowding (50,6%) followed by security (47.3%) and poor facilities (46%) at bus stops (StatsSA, 2014).

The eThekwini Current Public Transport Record (CPTR) (eThekwini, 2004) reflects the findings of a comprehensive research study of public transport across the entire eThekwini Municipality. Although more than a decade has passed, it is still the most recent record of public transport provision within the municipality[5]. The CPTR noted that in 2004, the city had approximately 130 MBT associations, servicing some 1700 single-direction unscheduled routes. There were approximately 60 bus operators or bus owners' associations which held licences to service 1600 routes. The licensed routes for MBT and Bus services reached 90% and 80% respectively of the total population who were within a 15-minute walking distance of each service (eThekwini, 2004).

THE ETHEKWINI SOLUTION TO NDOT'S REQUIREMENTS

As directed by the NDoT, eThekwini revised its public transport strategy to provide an integrated rapid public transport network that would ensure that 85% of the city's population would have access to scheduled public transport services (eThekwini, 2014). The resulting Go!Durban strategy involved the planning and design of a public transport network

[5] There is no current updated CPTR for the city. A proposed update was stalled in 2014.

system that incorporated and integrated all modes of transport – including non-motorised transport (eThekwini, 2014). As a continuation of the FRDPTS, Go!Durban retained rail as the main transport mode along the corridors it served and where the passenger numbers supported rail as the desired mode (eThekwini, 2014). This was the case for the north-south rail corridor linking Bridge City in the north to Umlazi in the south. Some corridors experienced direct competition between some of the proposed road-based routes that arose from the demand modelling exercise, and the service and capacity that rail could provide. This was permitted on the basis that the implementation plan would ensure a sufficient demand for meeting the operational passenger requirements for both services; and that it would negate any competition for passengers that might occur. The problematic nature of this assumption, is evident in the Rea Vaya experience, however, where passengers shifted from rail to BRT, rather than from mini bus taxis to BRT (Maatu, 2015).

Essentially, Go!Durban presents a wall-to-wall strategy with a network of nine public transport corridors (eThekwini, 2014). This comprises an integrated package of rail and rapid bus trunk routes with dedicated right-of-ways, feeder and complimentary services infrastructure. Construction is currently underway on the first phase, which is due to be complete in 2018 (eThekwini, 2014). In addition to being a transport programme, Go!Durban affords the city an opportunity to facilitate and direct the re-structuring of land-use and development to improve the overall travel efficiency for commuters within the metro. It also improves connectivity and develops a more compact and connected city to reverse some of the effects of apartheid spatial planning (eThekwini, 2014). The costs of the Go!Durban system are significant, however. From the authors' personal analysis of operational costs in 2015, using as a source an internal document of the eThekwini Municipality (Goba, 2012), the financial deficit between the fare income and the operating costs will be an under-recovery of three to four times the income. Based on the experience in other South African cities, during the transition period until the system has matured, we expect the under-recovery is expected to be closer to an under recovery of six times the income.

INCREASING POLICY VIABILITY

Now that the decision about what type of BRT system to select has been made and eThekwini is some way down the line with regard to implementation, the focus needs to move towards how best to increase the benefits and viability of the Go!Durban system. Attention should be paid to how to grow the ridership, as well as ensuring that minibus taxis complement, rather than compete, with the service. Achieving these objectives is largely dependent on ensuring sufficient population density and mixed land use around the transport nodes and along corridors (Naude, 2015).

Naude (2015: 370) notes that a number of policy trade-offs need to be made between

- spatial restructuring
- optimising economic growth

- recouping capital costs versus improving operational sustainability
- generating income for the fiscus
- creating more equitable accessibility patterns.

As many of the above are in direct conflict with one another, difficult decisions will have to be made. Naude (2015: 370) concludes that it is simply not possible to get value from all of these, but instead an 'optimal mix of desired outcomes' is needed.

Cooke and Behrens (2014) have analysed the relationship between public transport and land use characteristics, proposing that three land use characteristics (urban density, land use mix and polycentrism) have the greatest impact on the quality, viability and efficiency of public transport (Cooke and Behrens, 2015). Urban density has a direct impact on the ridership of public transport. The choice of mode of travel is dependent on ease of access: where nodes can be densified, a greater number of passengers will be able to access the node with greater ease. Density is not independent of location, however, neither is density *per se* a good determinant of urban transport success. On the contrary, uniform density throughout a city may even have a negative impact on transport, through exacerbating congestion and increasing negative externalities (Cooke and Behrens, 2014). The concept of 'density articulation' refers to the strategic location of areas of higher density (Cooke and Behrens, 2015). This not only reduces the need for feeder services, but also has a higher impact on public transport than would gross density alone.

During the 2000s, eThekwini moved its low-income housing strategy away from simply building on the cheapest available land, towards identifying areas which were close to the high priority Public Transport corridors (Sutcliffe, 2015b). A number of different housing options were also introduced, including semi-detached units and single-storey walk-ups. The private sector was also expected to dedicate at least 10% of their housing projects to the 'Gap Housing' market (Sutcliffe, 2015b). In 2010, the South African Cities Network (SACN) released a research report on creating and capturing value around transport nodes, noting that municipalities must be proactive and creative in the way they direct and facilitate development around these nodes (SACN, 2011). The research showed that while infrastructure was an important component, issues such as land availability and appropriate development rights were as important – indeed vital. They also noted the need for making trade-offs between value-creation and capture (SACN, 2011).

In reviewing the potential for BRT systems to change land-use and accessibility systems in South African cities, Naude (2015:368) notes that in order to gain the benefit of transport investments, 'pre-existing real estate fundamentals' should be in place. These include a buoyant property market and highly sought-after locations. Where these factors are not present, development benefits are less likely to be realised. eThekwini's nodes were chosen with the above in mind (eThekwini, 2014). Whilst it is difficult for cities to introduce land-banking options on any scale, eThekwini began doing so and has also investigated ways in which state-owned land could be used to accommodate transport and housing options (Sutcliffe, 2015b).

RESULTS

At the time of writing, the Go!Durban system is still under development and its level of ridership and ongoing operating costs are still not clear. Nonetheless, the eThekwini Municipality has been tracking the land-use changes, as well as the development that has taken place around the under-construction BRT stations. Although an in-depth study would be needed in order to analyse more fully the pre-BRT and current developments, indicative information shows that the rate and scale of development around the nodes has indeed increased; also that the BRT project has already yielded results in densifying and creating new housing typologies around the transport nodes (Esteves, 2015). Developers in the Pinetown and New Germany central business districts (CBDs) have expressed interest in converting currently under-used parking facilities into entry level accommodation units (Esteves, 2015). There has also been an intensification of commercial and office facilities in proximity to Go!Durban stations in New Germany (Esteves, 2015).

To increase densities, as well as the mix in land-use, along the C3 route, 18 opportunity areas have been identified by the Municipality, all with close proximity to the stations (eThekwini, 2014). These consist of twelve greenfield and six brownfield sites[6], a total of 45ha in size (eThekwini Municipality, 2015a). The potential exists for an estimated 2220 new housing units on greenfield sites, and 1170 on brownfield sites, representing 3390 housing units in total. If taken up fully, and assuming an average rateable value of ZAR 200 000 per unit, a further R678 million investment will be made within the area. Moreover, an additional 78 700m^2 of commercial/light industrial opportunities could be realised (eThekwini Municipality, 2015a). Although there is no guarantee that the private sector will take up these development opportunities, initial indications have been very positive, with a number of current and potential property owners showing interest (Esteves, 2015).

The process of reducing parking requirements in proximity to the IRPTN trunk corridors has already been initiated. The resulting wall-to-wall plan has allowed an advance reduction of parking requirements, in order to facilitate more intense land use developments and higher densities ahead of the provision of IRPTN infrastructure (eThekwini, 2014). The city has also begun to target certain properties for rezoning, to facilitate development opportunities in proximity to stations (Esteves, 2015).

LESSONS

The rollout of BRT in eThekwini has highlighted a number of valuable lessons for the implementation of policies in general, and in the economic development and transport sectors in particular. The first lesson relates to outlay. Whilst it provides significant benefits to passengers and the broader city, the move from the current public transport system to

[6] 'Greenfield development' refers to development on open, undeveloped land, whereas 'brownfield development' refers to development on land that has already had some form of construction or development on it.

BRT involves multiple and compounding challenges, which drive capital and operating costs upwards. The former should be carefully weighed in relation to the opportunities BRT provides and those it takes away.

Costs are not restricted to capital and operational expenses. It appears that in all cities implementing the BRT system, concession-making with the taxi industry has required a significant outlay – both to buy out taxis from existing routes and to pay them for their involvement on an ongoing basis. As a result, costs have escalated enormously (Sutcliffe, 2016). An integrated transport strategy requires that all role-players play a major part in improving the quantity – and particularly the quality – of the transport service, to improve the accessibility and choice of mobility modes. Therefore, the three main modes of public transport, ie buses, trains and minibus taxis, all require urgent attention to bring them into the integrated strategy and reduce the potential for conflict. In the case of BRT, for example, agreements were made in 2014 with the taxi industry on how they would co-operate and be involved in the system (Sutcliffe, 2016). Some two years on, whilst massive investment has been made in delivering the transport infrastructure, relatively little has been done about ensuring that the taxi industry is seamlessly integrated into operations (Walters, 2013). This is just one of many potential areas of conflict. Each requires careful analysis and intervention to ensure that the BRT strategy does not become a once-off investment in infrastructure, which fails to be rolled out into a more integrated strategy. Bringing commuter rail services into the equation, for example, provides another area of potential conflict: it is vital to ensure that single ticketing systems (and even subsidies) become a reality.

The move from unscheduled, to scheduled services throughout the system will require a significantly higher fleet size, as well as staffing and driver numbers, in order to cope with peak requirements. Furthermore, shifting from a profit-driven, to a passenger-focused approach, involves increasing hours of operation so as to provide service at 'unprofitable' times of the day, as well as improving vehicle conditions and conditions of service for drivers. Strengthening safety and security will require an increase in staffing requirements, resulting in higher operating costs. Ensuring that accessibility becomes fully universal and compliant across the full system will also result in a rise in infrastructure, fleet and operating costs. Lastly, a greater oversight of the system will require a higher staff complement to monitor and oversee the quality of service. In return, however, passengers will get the benefits of a well-managed system; faster travel times; reliability and predictability. There will be broader health benefits through lower carbon emissions; travelling will be safer and accident rates in general will drop. The entire city will benefit from lower congestion rates. These are long-term, broader societal benefits that will contribute towards a more just and equitable society. Furthermore, the economic benefits of reduced travel costs and reduced travel time will contribute to the economic growth of the city.

In general though, a sole focus on BRT will be unaffordable for the municipality in the long-term. Rather, there is a need for a far more flexible model that allows for an integration of all modes, together with human settlements. Furthermore, the BRT implementation experience highlights the danger of being influenced by 'international best practice'. The

transfer of the South American system to local conditions was not analysed critically, or realistically, nor were patent differences recognised in the built environment. Cost appraisals were overly optimistic. As a result, decisions that were made will have significant long-term financial implications for the Municipality, despite the fact that a large portion of the costs can be directly related to key decisions made by national government departments.

In mitigation, other than providing important lessons for policy development and implementation going forward, there is the potential to reap rates income and broader employment benefits as a result of the increased development around the BRT nodes, thus enhancing local economic development within eThekwini. The increased development also serves to densify the city and address the spatial legacy of apartheid. In addition, users of the BRT service will be provided with a high-quality transport service, reduced travel times, lower pollution levels and fewer road accidents.

CONCLUSION

The Go!Durban BRT system implemented by eThekwini Municipality differs significantly from the Municipality's originally envisaged public transport system, due to technological biases, conditions imposed in public transport grants by national government and weak political and administrative leadership in addressing demands made by the taxi industry. This has resulted in the implementation of a less flexible, higher cost system, which will have to be paid for by the Municipality on an ongoing basis. However, implementing any policy is an imperfect process and always involves elements that were not and/or could not have been, foreseen. The implementation of BRT within eThekwini has therefore been a valuable experience: one which has emphasised the need to acknowledge and accept the consequences of decisions made; to leverage value from the positives; mitigate the negatives and to change what can be changed.

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