

# Some Initial Thoughts on Assessing Monitoring and Evaluation of the Tshwane Metropolitan Public Transportation Intervention

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**Abstract:** Sprawled spatial patterns and fragmented infrastructure have contributed to the ineffective public transportation systems in South African cities, including Tshwane. As a response, the Bus Rapid Transit (BRT) intervention is an integral component of the Public Transport strategy meant to address this challenge. Since the onset of its implementation in 2009, scholars and other interested parties have assessed the Public Transport strategy more broadly or its components or programmes. One of the components assessed is its effectiveness with regards to addressing public transportation challenges. Some of these assessments have reported positive changes in public transport operations. However, other scholars feel that public transport challenges are still evident. Therefore, the mixed messages could be the problematic monitoring and evaluation system of this intervention, either the lack or ineffective institutionalisation of the monitoring and evaluation arrangements or its alignment to the policy aim and objectives. For this reason, this research intends to assess the monitoring and evaluating arrangements for tracking and assessing the Tshwane metropolitan public transportation intervention. This paper, however, is restricted to conceptualise such a research. To do so, we undertake a thematic summative content analysis to interrogate literature on (i.) the research physical context or setting, (ii.) the research problem, and (iii.) the research knowledge gap. Further and exclusively to the research problem analysis, the paper applies the problem tree, the theory of constraint, and trend analysis to interrogating literature on ineffective public transportation systems. This interrogation provides for conceptualising an appropriate research problem statement as well as the accompanying research purpose statement and the research questions for such a research. We also propose the research strategy, design, procedure and methods as well as established frameworks that we can use to interpret the anticipated empirical results.

**Keywords:** Public transportation interventions, Bus Rapid Transit System, Research conceptualisation, Research physical context, Research problem analysis

## 1. Introduction

As Tsotetsi and Mariette (2016) point out, South Africa has an overwhelming history of sprawled spatial settlement patterns since the 1960's during the apartheid era. These fragmented urban landscapes inhibit easy access to basic services and livelihood that are situated in the city centres. They have also contributed to ineffective intra-urban transportation in South Africa. The post-apartheid government has struggled to redress these disparities and ensure that the affected residents, mostly the Black South Africans, are drawn closer to city centres (Van Ryneveld, 2008; Thomas, 2016; Mthimkulu, 2017).

In 2007, the South African national Department of Transport released the Public Transport Strategy whose main aim was to improve transport infrastructure and transport operations. More specifically, this intervention provides for a wide public transport

network that is safe, efficient, and affordable (Jennings, 2015). By design, the Bus Rapid Transit (BRT) intervention that hit the roads of South African urban cities in 2009 – implemented in 170 cities across the world (Von der Heyden *et al.*, 2015; Global BRT Data report, 2018) – is an integral component of the Public Transport Strategy. Rahim (2014) and Ugo (2014) who have assessed this intervention have shared its positive aspects such as quality, safety, and affordability.

Other authors however – such as Van Ryneveld (2008), Siyongwana and Binza (2012), Bickford (2013), Thomas (2016), Mthimkulu (2017), and Manuel and Behrens (2018) – have argued that the BRT has several challenges that renders it unsustainable such as limited capacity, poor planning, insufficient accessibility, operational glitches, and limited stakeholder engagement. Therefore, they argue, public transport transformation remains a distant dream in South Africa. Seftel and Peterson

(2014) have argued that the foregoing implies that policy-makers and transport planners are engrossed in developing and implementing an effective, relevant, sustainable, and efficient BRT system that can remedy public transport challenges. This entails providing adequate arrangements for tracking and assessing the performance of the Bus Rapid Transit (BRT) intervention (Van Ryneveld, 2008; Arropet, 2017; Mthimkulu, 2017). Therefore, the aim of this research is to consequently assess, empirically, the appropriateness of current monitoring and evaluation arrangements in municipalities meant to track and assess public transport interventions. Ultimately, the research will then propose appropriate monitoring and evaluation arrangements. Before then, this paper merely conceptualises what (and why) such a research should pursue. It employs Wotela's (2019) approach to research conceptualisation that summons summative thematic content analysis to interrogate literature on the (i.) physical context or setting of the research, (ii.) research problem, in this case absent or ineffective public transportation interventions, and (iii.) research knowledge gap. In addition to the summative thematic content analysis, Wotela (2019) suggests applying the problem tree and theory of constraint as well as trend analysis to logically demonstrate that a research worth pursuing does exist.

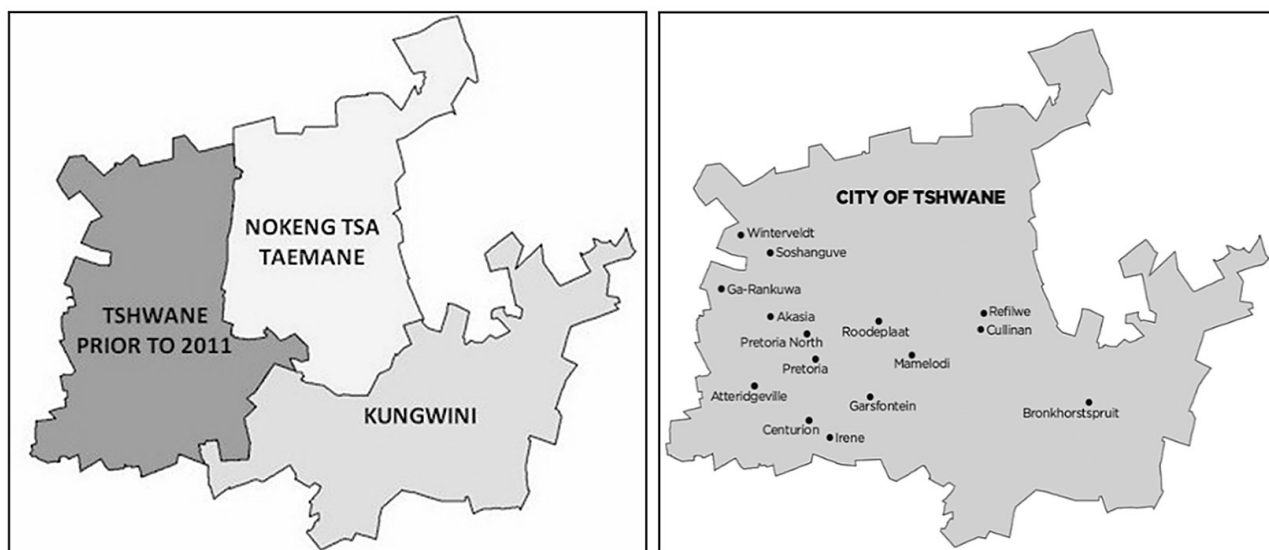
First, in Section 2, we describe the physical context or setting of the research, that is, the City of Tshwane

Municipality and its transport challenges. Second, in Section 3, we detail ineffective public transportation in urban cities and accompanying interventions. Third, in Section 4, we review past and current studies on developing and implementing interventions to address public transport challenges so that we identify the knowledge gap of such a research. Fourth, in Section 5, arising from the foregoing interrogation, we detail the research problem statement, purpose statement and research questions that such as research should pursue. Lastly, we propose the research strategy, design, procedure and methods as well as established frameworks appropriate for interpreting the anticipated empirical research results.

## 2. The City of Tshwane Municipality and its Public Transport Network

The City of Tshwane is situated in Gauteng, a north central province. In total, Gauteng Province has eleven municipalities of which three are metropolitans, that is, Ekurhuleni, Johannesburg, and Tshwane. Figure 1 shows the City of Tshwane before and after 2011. Historically, Tshwane formerly known as Pretoria – as Nunzhelele (2012) and the City of Tshwane (2016) point out – was until 1855 merely a farm called Elandspoort. In 2000, the amalgamation of various authorities that served the greater Pretoria and surrounding areas resulted in what we now call Tshwane. Further, in 2011, the City annexed Kungwini, Nokeng tsa Taemane, and Metsweding municipalities.

**Figure 1: Showing the City of Tshwane Prior (left) and Post (right) to the 2011 Re-Demarcations**



Source: City of Tshwane: Residents (2015) and Main, O. (Ed.) (2018)

In terms of span, Tshwane is the largest municipality in South Africa covering a total area of 6 368 km<sup>2</sup>. It is divided into seven regions, 105 wards, and is represented by 210 councillors (City of Tshwane, n.d.). According to Statistics South Africa (2011), Tshwane is home to 2,9 million people, predominantly (2,2 Million) Black South Africans. Further, the City boasts of a vibrant and diverse economy and contributes 26.8 per cent and 9.4 per cent to Gross Domestic Product of Gauteng Province and the country, respectively. Its main economic activities include government, finance, and manufacturing (Statistics South Africa, 2011). It is also a leader in the country's education, research, and technology sectors (Nenzhelele, 2012).

Diedericks and Joubert (2006), Hugo (2011), as well as Venter and Cross (2014) have argued that in 1961, Tshwane was the epicentre of apartheid dispensation that vigorously enforced the Group Areas Act to relocate and segregate its residents into racial zones. This necessitated the formation of dormitory settlements, mostly townships, located on the fringes of the urban centres. These peripheral settlements that have continued to grow entail a fragmented Tshwane with most of its residents located in its edges are excluded with limited access to the opportunities in and around city centres. Further, a fragmented City with perpetuated spatial exclusion is bound to have public transportation infrastructure challenges that, in turn, does not provide for convenient intra city movement. Majority of the residents endure a minimum of about 60 minutes to access to the city centre.

Despite having four (taxis, buses, private cars, and non-motorised transport) dominating modes of transport, its transportation system operates in silos and is uncoordinated (City of Tshwane, 2015; Department of Roads and Transport, 2015). This prompted Wood (2015) to call for an urgent need to integrate public transportation as a way of addressing the transportation challenges that cities are facing. According to Diedericks and Joubert (2006) as well as the City of Tshwane (2016), the thinking was that integrating public transportation systems would also redress the existing socio-economic disparities. In an attempt to do so, in November 2014 the City introduced the Bus Rapid Transit system, called "A Re Yeng", meant to integrate the dominate modes of transport and, therefore, improve mobility in the City. Levinson and colleagues (2002) as well as Tancott (2014) point out that the Tshwane

Bus Rapid Transit system was implemented after its equivalents in the Cities of Cape Town and Johannesburg.

### **3. Ineffective Public Transport Systems**

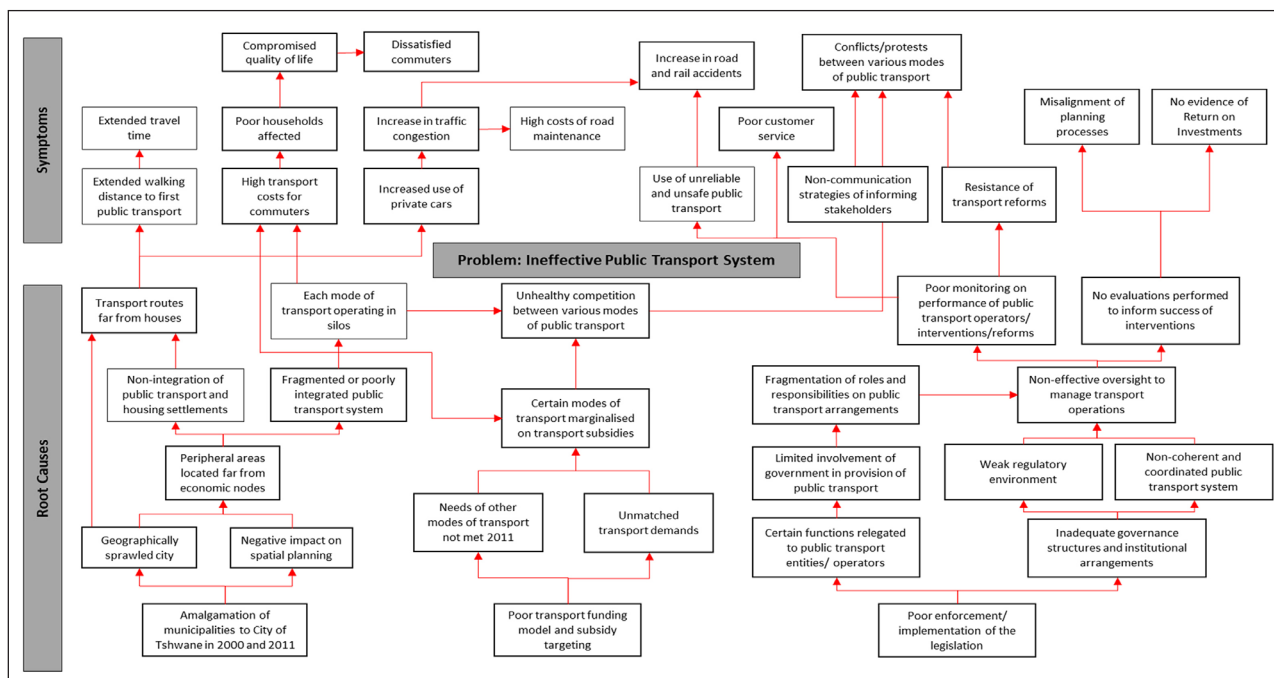
Thomas (2016) and Mthimkulu (2017) have argued that despite contemporary efforts and interventions, South Africa faces an immense backlog with regards to transforming its public transport system. We need to appreciate modern-day public policy so that we can, with authority, propose an affordable, reliable, and integrated public transport infrastructure for South Africa. However, such an appreciation requires that we interrogate the contextual and historical background to public transport systems in South Africa. Therefore, in this section, we interrogate the ineffective public transport systems problem. To be more structured, we use a problem tree to articulate the symptoms, the root causes, and consequences of the problem under study.

#### **3.1 Symptoms, Root Causes, and Consequences of Ineffective Public Transport System**

Figure 2 on the next page shows the literature supported problem tree depicting symptoms, root causes, and consequences of ineffective public transportation systems. Literature and supporting statistics demonstrate that South Africa, Tshwane included, have a public transportation problem through several symptoms. As Mthimkulu (2017) points out, ineffective public transport systems manifests as, amongst others, traffic congestion, extended travel time and costly commuter transportation. These parameters are even more amplified in Tshwane because it is geographically sprawled. According to Statistics South Africa cited in Arropet (2017), the average travel time in Gauteng increased from 32 minutes to 46 minutes between 2003 and 2013. Traffic congestion and deteriorating road infrastructure makes commuting on South African roads undesirable (Organisation for Economic Co-operation and Development, 2015; Suleman, Gaylard, Tshaka and Snyman, 2015; World Health Organisation, 2015).

A 2015 survey undertaken by the Department of Transport (2015) reveals that 70 percent of South Africans spend about 30 percent of their household income on transport. Further, none of the past and current transport interventions have lowered the cost to commuters especially low-income earners (Kruger & Luke, 2015; Thomas, 2016; Mthimkulu, 2017).

Figure 2: Showing the Problem Tree Articulating Ineffective Public Transportation Systems



Source: Authors

The list of root causes to the symptoms of ineffective public transportation that we point out in the preceding paragraph is inexhaustive. Therefore, our Figure is restricted to those that had literature support. These include the after effects of apartheid spatial planning, inadequate funding, and inadequate enforcement of legislation enforcement. As we have pointed earlier, spatially settlement patterns resulting from the apartheid governance hinder accessibility to central hubs that house major economic activities and social services (Van Ryneveld, 2008; Thomas, 2016; Mthimkulu, 2017). Further, Van Ryneveld (2008) and Bickford (2013) have argued that the transport funding model that government has been using is not aligned to the national objectives. It is obscure, uncoordinated, and does not match the transport demands. Mthimkulu (2017) cautions that government has triggered an unsafe and hazardous environment for commuters by leaving out the taxi industry in its distribution transport subsidies.

In addition to the list of root causes on the problem of ineffective public transportation, is an aspect that is critical for this research that is absent or ineffective institutional arrangements to regulate public transport systems in South Africa (Van Ryneveld,

2008). Various authors – such as Bickford (2013), Kruger and Luke (2015), Organisation for Economic Co-operation and Development (2015), and Arropet (2017) – have emphasised that the enforcement of public transportation legislation alongside the implementation of robust governance structures can assist the country to achieve its objectives. Unfortunately, as Van Ryneveld (2008) posits, South Africa has a weak regulatory environment attributable to struggling implementation, management, monitoring and performance measurement of interventions to yield the desired outcomes. Therefore, as Arropet (2017) and Mthimkulu (2017) have argued, the government should assess its current systems and its potential opportunities and then develop strategies that will provide for optimisation of the current infrastructure.

Other than the symptoms and root causes, we should also account for the consequences. Siyongwana and Binza (2012) as well as Thomas (2016) point out that the consequences of ineffective public transport systems and the accompanying ineffective monitoring and evaluation mechanisms for transport interventions include an ineffective transport sector regulation, unreliable public transport services, and resistance to reform transport services. Historically,

government has restricted its direct involvement in the provision of public transportation. Instead, it has relegated this responsibility to various private operators. Unfortunately, this entails absent or ineffective regulation of the public transport system and, therefore, making it unsafe, unreliable, inaccessible, and characterised by poor customer service. This explains why people have resorted to private vehicles (Siyongwana & Binza, 2012; Organisation for Economic Co-operation and Development, 2015; Mthimkulu, 2017).

Lastly, Van Ryneveld (2008), Bickford (2013), Arropet (2017), and Mthimkhulu (2017) have argued that absent or ineffective monitoring and evaluation of public transport interventions as well as resistance to reform it has a knock-on effect on the implementation and management of public transport systems. The question around what informs government's decision-making with regards to public transport interventions remains controversial. This is because the government is continuously reinventing the wheel rather than considering effective ways of improving public transportation. Now that we know the problem, that is, its symptoms, root causes, and consequences; let us turn our attention to understanding the solutions that have been provided thus far.

### 3.2 Addressing Ineffective Public Transport Systems: Results-Chain and -Framework for the Tshwane Bus Rapid Transit Intervention

Table 1 on the next page illustrates a partial representation of an assimilated results-framework for the Tshwane Bus Rapid Transit (BRT) intervention. We describe alignment of the key components critical for the management of a BRT intervention namely impact, outcome, output, activities and inputs.

As gathered across the various schools of thought, the ultimate impact of the BRT intervention in Tshwane is purposed on improved access to public transport and economic hubs, affordability of public transport, and safety of the public transport system (Pienaar, Van den Berg & Motuba, 2007). In steering towards the goal, the intervention should aim to achieve five outcomes that relate to (i) economic sustainability, (ii) reduced travel time for commuters (iii), reduced traffic congestion, (iv) safe and secure public transport system and (v) improved land use and urban design. These are further described below with their accompanying outputs and activities.

The first outcome, economic sustainability, entails attaining affordability and sustainability of the Bus Rapid Transit (BRT) system. As Schwenk (2002) and Carlos (2010) point out, this implies enhancing revenue collection through commuting sales and containing infrastructure and operational costs. With regard to the second and third outcomes, Schwenk (2002), Hongyanga (2013), as well as Suleman and colleagues (2015), reiterate the National Treasury's concern that roads in Gauteng Province are highly densified with a flow of approximately 700 vehicles per kilometer. Therefore, the BRT interventions aims at reducing traffic congestion through a more accommodating road network, increasing the ridership of the commuters, and constructing park-and-ride facilities to access the BRT. In turn, shortened time to accessing public transport consequently reduces travel time (Schwenk, 2002; Pienaar *et al.*, 2007; Venter *et al.*, 2017).

The fourth outcome, safe and secure public transport system, provides for good security at the stations and procuring safe and user-friendly buses (Schwenk, 2002; Knojes, 2016). The last outcome, improved land use and urban design, as implied by Venter and others (2017) calls for strategic management decisions in land use and urban design whilst conceptualising an integrated public transport system. Planners should negotiate and secure infrastructure development and densification close to the BRT network. This means creating economic activity spines, shopping centres, and key facilities along and towards the transport corridors.

Lastly, as Norad (1999), Chaplowe (2008), and the European Union Integration Office (2011) point out, we should attach the results-framework (indicators, baseline values, target values, assumptions, and risks) to each item of the results-chain to help us track and assess the intervention. Inclusion of the assumptions and risks provides for enablers and barriers beyond the control of the intervention that eventually explain the progress of the intervention towards the intended results.

## 4. Methods, Data, Findings, and Conclusions of Studies on and Evaluations of Absent and Ineffective Public Transport Systems

In Section 3, our theoretical interrogation has established that post-apartheid public transportation interventions have not effectively transformed the

**Table 1: Showing a Partial Results-Chain and Results-Framework for a Bus Rapid Transit Intervention**

Results Chain Level	Description	Indicator(s)	Data or Information Source	Baseline Values	Targets	Assumptions	Risks			
<b>Results Chain</b>	<b>Impact</b>	<b>Enhance public transport system and accessibility to livelihood opportunities</b>	% of commuters that can easily access public transport	Municipality, provincial and national departments of	BRT Company Database	BRT Company Database	<ul style="list-style-type: none"> <li>• Government provides the necessary infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Poor public transport services</li> </ul>		
			% of commuters that can easily access economic hubs	Municipality, provincial and national departments of						
			% of commuters that can easily access affordable public transport	Municipality, provincial and national departments of						
	<b>Outcome 1</b>	<b>Economic Benefits</b>	Revenue per Km	BRT company database					Revenue exceeds cost	<ul style="list-style-type: none"> <li>• Poor revenue collection affects sustainability of services</li> </ul>
	<b>Outcome 1.1</b>	Proof-of-Payment Fare Collection System	Operating labor opportunity costs	BRT company database					<ul style="list-style-type: none"> <li>• Funds available to install Proof-of-Payment Fare Collection System</li> </ul>	<ul style="list-style-type: none"> <li>• Crime occurrences</li> <li>• Vandalism</li> </ul>
	<b>Outcome 1.2</b>	Ticket or commuter card sales	Total sales made for the month	BRT company database					<ul style="list-style-type: none"> <li>• Tickets will be sold to riders</li> <li>• Commuters will use the BRT services</li> </ul>	<ul style="list-style-type: none"> <li>• Crime occurrences</li> <li>• Vandalism</li> <li>• Breakdown of machines</li> </ul>
	<b>Outcome 1.3</b>	Cost of infrastructure and operations	Total project costs	BRT company					<ul style="list-style-type: none"> <li>• Funds available for expenditure</li> </ul>	<ul style="list-style-type: none"> <li>• Budget shortfall</li> </ul>
	<b>Outcome 2</b>	<b>Reduce travel time for riders</b>	Time spent to arrive at point of destination	BRT company database, commuters					<ul style="list-style-type: none"> <li>• Infrastructure fully operational to achieve intended travel time</li> </ul>	<ul style="list-style-type: none"> <li>• Glitches in the day-to-day operations of the BRT services</li> </ul>
	<b>Outcome 2.1</b>	Increase stop locations (bus stops)	Coverage of BRT bus stops	BRT company database					<ul style="list-style-type: none"> <li>• Land available to construct infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Inability to secure land to construct stop locations</li> </ul>
	<b>Outcome 2.2</b>	Timeous bus arrivals	Accuracy of electronic real-time information displays	BRT company database					<ul style="list-style-type: none"> <li>• Infrastructure fully operational to achieve intended travel time</li> <li>• Use of exclusive lanes for buses</li> </ul>	<ul style="list-style-type: none"> <li>• Glitches in the day-to-day operations of the BRT services</li> </ul>
	<b>Outcome 2.3</b>	Reserved exclusive bus lanes	Distance of exclusive right-of-way (kms) / average and maximum bus speed (kms)	Municipality, BRT company database					<ul style="list-style-type: none"> <li>• Funds available for expenditure</li> </ul>	<ul style="list-style-type: none"> <li>• Budget shortfall</li> </ul>
	<b>Outcome 2.4</b>	Bus aligned with boarding location	Time it takes for the bus to line itself up for loading	BRT company database					<ul style="list-style-type: none"> <li>• BRT stations constructed</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase buses without critical BRT features</li> </ul>
	<b>Outcome 3</b>	<b>Reducing traffic congestion</b>	Average speed during peak hours	BRT company database					<ul style="list-style-type: none"> <li>• Private car owners will change mode of transport to BRT</li> </ul>	<ul style="list-style-type: none"> <li>• BRT may not attract more private car owners</li> </ul>
			Time spent to arrive at point of destination	BRT company database						
	<b>Outcome 3.1</b>	Increase ridership of commuters	Quantitative actual number of riders Qualitative – opinions of the service, their reasons for using it, their frequency of usage	BRT company database, commuters					<ul style="list-style-type: none"> <li>• Commuters will use more of BRT service rather than private cars</li> </ul>	<ul style="list-style-type: none"> <li>• Ridership may not increase as expected</li> </ul>
	<b>Outcome 3.2</b>	Formed park-and-ride (intermodal) facilities	Number of park-and-ride facilities within the bus route network	BRT company database					<ul style="list-style-type: none"> <li>• Land secured to build parking facilities for BRT commuters</li> </ul>	<ul style="list-style-type: none"> <li>• Municipality may not approve land use rights</li> </ul>
	<b>Outcome 4</b>	A safe and secure public transport system	% of stations with good security features % of user-friendly buses	BRT company database BRT company database					<ul style="list-style-type: none"> <li>• Company has funds to provide a secured BRT service</li> </ul>	<ul style="list-style-type: none"> <li>• Budget shortfall</li> </ul>
	<b>Outcome 4.1</b>	Visible security at stations	% of stations with CCTV cameras % of stations with security guards	BRT company database					<ul style="list-style-type: none"> <li>• Company has funds to provide a secured BRT service</li> </ul>	<ul style="list-style-type: none"> <li>• Budget shortfall</li> </ul>
	<b>Outcome 4.2</b>	Facilities for the disabled, elderly and mothers with children	% of stations with facilities for the disabled, elderly and mothers with children	BRT company database					<ul style="list-style-type: none"> <li>• BRT company purchase buses-with necessary facilities for the disabled, elderly and mothers with children</li> </ul>	<ul style="list-style-type: none"> <li>• Buses may be delivered without the agreed safety features</li> </ul>
	<b>Outcome 5</b>	<b>Improved land use and urban design</b>	Quality of public space surveys conducted	Municipality					<ul style="list-style-type: none"> <li>• Private and public sector stakeholders agree to improve land for economic growth</li> </ul>	<ul style="list-style-type: none"> <li>• Public contestation on how the land should be used</li> </ul>
<b>Outcome 5.1</b>	Distinguishable BRT stations stops	% of distinguishable BRT stations built along the corridor	BRT company database			<ul style="list-style-type: none"> <li>• Funds available to build BRT bus stops</li> <li>• Commuters easily identify BRT stops</li> </ul>	<ul style="list-style-type: none"> <li>• Budget shortfall</li> </ul>			
<b>Outcome 5.2</b>	Infrastructure development close to the transit stops	% of property developments along corridor	Municipality			<ul style="list-style-type: none"> <li>• Land secured for infrastructure development along BRT corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Municipality may not approve land use rights</li> </ul>			
<b>Outcome 5.3</b>	Infrastructure development close to the transit stops	% of property developments along corridor	Municipality			<ul style="list-style-type: none"> <li>• Land secured for infrastructure development along BRT corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Municipality may not approve land use rights</li> </ul>			

Source: Authors (2022)

lives of those living in South African urban cities especially in marginalised communities. In this Section, we interrogate past and current studies that have attempted to interrogate public transport challenges in South Africa including their accompanying interventions such as the Bus Rapid Transit (BRT). From the outset, we establish that literature on BRT interventions is still elementary in South Africa because such interventions were only launched in 2009. As a result, most of these studies focus on establishing the effectiveness of BRT interventions in addressing public transport challenges. Some have also interrogated how the intelligent transport systems have been applied in the BRT (Institute of Municipal Engineering of Southern Africa, 2014).

More specifically, Siyongwana and Binza (2012), Ugo (2014), as well as Manuel and Behrens (2018) interrogate the progress that South African cities have made in implementing the BRT and document their successes and challenges. Rahim (2014) and Ubisi (2016) have established the socio-economic effects of the BRT in various communities. Colin (2017) as well as Abejide and colleagues (2018) have interrogated the application of intelligent transport systems to improve the efficiency of public transport systems. Central to all these studies is the desire, using different approaches, to assess the extent to which the BRT intervention has transformed public transport systems to redress historic apartheid disparities in South Africa.

For us to have an idea on the research strategy, design, procedure and methods that we should employ, we reviewed the approaches that these studies employed. Four of these studies employed the qualitative research strategy, two the quantitative strategy, and one the mixed-research strategy. The qualitative research strategy, as documented, provided for understanding the social actions and behaviours of public transport commuters towards the Bus Rapid Transit (BRT) system as they narrated changes that the interventions have brought into their lives. These studies – Siyongwana and Binza (2012), Rahim (2014), Ugo (2014), Ubisi (2016), Colin (2017), Abejide and others (2018), as well as Manuel and Behrens (2018) – targeted city residents, BRT commuters, members of the taxi associations, and municipal officials. In addition, Rahim (2014) included private car owners in the target Cities and the owners of business that operate in the vicinity of the BRT. Similarly, Colin (2017) as well as Manuel

and Behrens (2018) included specialists working on these transport interventions.

The empirical research results and findings of these studies – Siyongwana and Binza (2012), Rahim (2014), Ugo (2014), Ubisi (2016), Colin (2017), Abejide and others (2018), as well as Manuel and Behrens (2018) – suggest that commuters appreciate the public transport transformation that the Bus Rapid Transit (BRT) intervention has brought. However, they point out that it is still inaccessible to most of the commuters partly because of *poor consultation* to understand the specific needs of all their potential customers (Rahim, 2014; Ubisi, 2014; Ugo, 2014; Colin, 2017). Also, *poor urban spatial and transport planning* is another cog in the BRT intervention (Siyongwana & Binza, 2012). Furthermore, the *failure to integrate the different modes of transportation* is another hurdle to the effectiveness and efficiency of the BRT's effort to improve urban public transportation (Rahim, 2014). These challenges imply that urban public transportation remains problematic despite the implementation of the BRT intervention.

Thus far, the studies that we reviewed show that they employed various research procedures and methods to understand the problems of public transportation and its interventions. None of these studies interrogated the appropriateness of monitoring and evaluation (M&E) arrangements to provide for effective implementation of the Bus Rapid Transit (BRT) interventions. This is despite Seftel and Peterson (2014) expressing concern that studies on the BRT system do not take on board M&E. Therefore, bringing on board M&E arrangements in the implementation of public transportation interventions is important, a sentiment we share with the Institute for Transportation and Development Policy (2007). Literature, for example Van Ryneveld (2008), Arropet (2017), and Mthimkulu (2017), have emphasised the need for governments to ensure that interventions are effectively monitored and evaluated to ensure that they remain within the broader policy objectives. Therefore, Bickford (2013) and Thomas (2016) are justified when they question the government's ability to empirically measure performance to inform public transport interventions. It is in this regard that this research proposes the institutionalisation of monitoring and evaluation arrangements within the Tshwane Bus Rapid Transit System that should be assisting planners and implementers to shape and improve on public

transport interventions. However, how then can we conceptualise such a study and what are some of the key considerations on how we should undertake its empirical part?

## 5. Conceptualising a Research on the Monitoring and Evaluation Arrangements for the Tshwane Bus Rapid Transit System

In this Section, we use information in Sections 2 through to 4 to conceptualise a research on the monitoring and evaluation arrangements for the Tshwane Bus Rapid Transit System. More specifically, we present our proposed research problem statement and subsequently the accompanying research purpose statement and the research questions. For completion, even though very preliminary, we also suggest an appropriate research strategy, design, procedure and methods as well as the interpretative frameworks.

### 5.1 The Research Problem Statement

Diedericks and Joubert (2006) have argued that, with an aim of forcefully moving non-White racial groups to the fringes of urban cities, the apartheid South African government established sprawled cities. Such settlement patterns are fundamental to ineffective public transportation in South African cities (Tsotetsi & Mariette, 2016). As a result, the post-apartheid government needed a policy meant to transform South African inequality challenges (Thomas, 2016). Following on this need, they developed the Public Transport Strategy in March 2007 whose aim is restructuring cities and provide an affordable, safe, and efficient public transport network reaching all corners of each city (Jennings, 2015). The Bus Rapid Transit (BRT) intervention is an integral component of the Public Transport Strategy (Von der Heyden *et al.*, 2015). The BRT is implemented in about 172 cities across the world including Tshwane following the Cities of Cape Town and Johannesburg (Global BRT Data, 2020; Tancott, 2014).

Past studies have focussed on interrogating public transport system challenges and their interventions. In doing so, they have evaluated the impact of the Bus Rapid Transit (BRT) interventions even with regards to their role in redressing socio-economic disparities. However, we learn that none of the studies have assessed monitoring and evaluation

arrangements that track and assess public transport interventions. Defined monitoring and evaluation arrangements, especially well institutionalised, are essential to track and assess the performance of interventions. Therefore, this research assesses the suitability and effectiveness of the City of Tshwane monitoring and evaluation arrangements that support the implementation of the Bus Rapid Transit intervention.

### 5.2 The Research Purpose Statement

To pursue this research, we propose interrogating the current monitoring and evaluation structures and processes meant to track and assess the implementation of the Bus Rapid Transit (BRT) intervention. Obviously, this means assessing its effectiveness with regards improving the implementation of the BRT. More specifically, we review literature to interrogate the public transport challenges faced by South African urban cities and their social economic consequences as well as the interventions, such as the BRT system, enacted to redress and improve mobility within the city. Second, we should identify measures that provide for implementing an intervention effectively. Further, we should propose institutional arrangements meant to implement, manage, monitor and evaluate the Tshwane BRT system interventions. Lastly, we then propose appropriate research strategy, design, procedures and methods as well as an interpretative framework for assessing the effectiveness of the Tshwane BRT system monitoring and evaluation arrangements. Here we elect social constructivism as the paradigm of this study because, as implied in Saunders and colleagues (2015), it will provide for generating knowledge from those that are closely associated with the Tshwane Rapid Transit monitoring and evaluation.

### 5.3 The Research Questions to Pursue

- What are the successes and challenges of the current Bus Rapid Transit intervention monitoring and evaluation arrangements?
- What is the capacity of the staff in implementing monitoring and evaluation processes in the Bus Rapid Transit intervention?
- What institutional arrangements should be in place to effectively monitor and evaluate a Bus Rapid Transit intervention?



#### 5.4 The Research Strategy, Design, Procedure and Methods to Consider

We propose employing a qualitative research strategy and cross-sectional research design to undertake our research. Further, we should use in-depth interviews to collect empirical information because we want to solicit the views of those involved in the monitoring and evaluation of the Bus Rapid Transit (BRT) system. Most studies that we reviewed in Section 4 – that is, Siyongwana and Binza (2012), Rahim (2014), Ubisi (2016), Colin (2017), as well as Manuel and Behrens (2018) – also employed qualitative research strategy and one-on-one in-depth interviews as well as focus group interviews. As mentioned earlier, only Ugo (2014) as well as Abejide and colleagues (2018) employ the quantitative research strategy and full structured interview schedules (questionnaires) to collect research data. We should also mention that Ubisi (2016) and Colin (2017) collected their empirical information through observations while Siyongwana and Binza (2012) as well as Manuel and Behrens (2018) employed document analysis.

#### 5.5 The Interpretative Framework to Consider

Apart from Manuel and Behrens (2018), most studies that we interrogated lack an explicit articulation of the interpretative framework that they employed. Manuel and Behrens (2018) employed a multiple-case study to account for factors that lead to the successes and failures of implementing the public transport strategy in three cities namely, George, Nelson Mandela Bay and Tshwane. This includes the Bus Rapid Transit (BRT) system which is an important component of the integrated rapid public transport network. The research data collection, collation, processing, and analysis was guided by analytical generalisation. Yin (2014) describes analytical generalisation as a two-step process which first proves how the findings of a case study are borne by a particular theory and then follows on using the same theory to explain findings in similar studies.

Manuel and Behrens (2018) applied two frameworks to interpret their empirical research results. The first framework assessed the successes and failures of the Bus Rapid Transit (BRT) projects in each of the three cities using accessibility, attractiveness, infrastructure, and operations. The second framework assessed the causal events associated with the successes and failures of the BRT projects.

Jointly, the frameworks may provide insight on the state of the interventions, the underlying reasons and common public transport reform challenges in various South African cities. Unfortunately, this framework cannot be applied in a single-case study as is the case with our research.

### 6. Summary and Conclusion

Whilst we acknowledge that the past and current research has addressed the various aspects of the Bus Rapid Transit intervention, none of the studies assessed the monitoring and evaluation arrangements of this intervention in any of the South African cities. This is an obvious oversight because as Seftel and Peterson (2014) have asserted, monitoring and evaluation specialists are yet to strengthen this tool to ensure the sustainability of the Bus Rapid Transit intervention. In our anticipated interrogation of the monitoring and evaluation arrangements, we will restrict our research to ascertain how the monitoring and evaluation function is organised within the City of Tshwane Bus Rapid Transit Unit to provide for how the Bus Rapid Transit intervention can be systemically monitored to measure performance and evaluated to inform its improvements and policy development where necessary. We will not assess the actual implementation of the Bus Rapid Transit intervention. The study will provide for lessons that other South African cities may implement to improve the Bus Rapid Transit system.

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