



The Commuting Paradigm Drift and Shift in Gauteng Province, South Africa: Transport Dimensions and Implications

James Chakwizira^{1*}, Peter Bikam¹, Thompson A. Adebeyejo²

¹Department of Urban and Regional Planning, University of Venda, Thohoyandou, South Africa

²Department of Urban and Regional Planning, Ladoké Akintola University of Technology, Ogbomoso, Nigeria

*Corresponding author E-mail: jameschakwizira@gmail.com ; james.chakwizira@univen.ac.za

Abstract

South Africa's extreme "spatial fragmentation, with large numbers of poor people dependent on public transport living far from the urban core, poses a severe challenge for access to work" [1]. The "2003 National Transportation Survey [2] revealed that about 24 percent of workers in Gauteng spend more than an hour travelling to work, with 31 percent of households spending more than 10 percent of their income on transport" [3]. "South African cities are evolving in the direction of being more multimodal or polycentric, which makes it more difficult to provide an efficient public transportation system" [4, 5]. This paper based on a desktop survey and insights from key stakeholders confirm that commuting paradigm drifts and shifts manifest themselves in Gauteng as traffic congestion, long commuting trips, high commuting costs, spatially extensive and a sprawled transportation network system. To respond to the multiple transport dimensions and implications, the paper recommends that a repertoire of practical, innovative strategies and measures be implemented such as expanding the bus rapid transport (BRT) Rea Vaya beyond the current phases, expanding the Gautrain line as well as the implantation of transit orientated development (TOD) as part of converting Gauteng province into a smart transportation and commuting region in South Africa.

Keywords: *Commuting, Constraints, Spatial Fragmentation, Transit Orientated Development, Strategies*

1. Introduction

The Oxford Dictionary defines a drift as "a continuous slow movement from one place to another". On the other hand, a shift is defined as "a slight change in position, direction, or tendency". The concept of commuting drift and shift in Gauteng relates to the constrained commuting situation, which has slowly responded to interventions aimed at reversing commuting constraints in the region. Commuting times for people of colour in South Africa are longer than for other South Africans. The "average travel time nationally for people of colour commuting was 48 minutes in 2003, compared with 30 minutes for others" [6]. The "longest travel times are in metropolitan areas, where generally commuters average 35 minutes and people of colour commutes 59 minutes". "Train and bus trips had the longest travel times with an average of 87 minutes and 68 minutes" respectively [2]. In "South Africa, nationally the percentage of public transport users making transfers during their journey declined from 26.5% in 2003 to 17.1% in 2013" [2]. However, "less flexible services, such as rail, require a much higher level of inter-modality, with 42.4% of train users making at least one transfer during a journey" [7]. In 2013 nearly "15% (14.4%) of passengers had to wait more than 15 minutes for their first public transport trip, an increase of 4.4% in metropolitan areas since 2003". Accessing "mobility is also more difficult for passengers, as illustrated by the increase in the time taken to walk to the nearest taxi, bus or train stations" [2]. In 2013, over a "fifth (22.4%) of households had to walk for more than 30 minutes to get to the taxi rank or to the train station, compared to 17.6% (to taxi rank) and 17.4% (to train station) in 2003" [2, 4, 5, 6, 7]. This suggests a "need to provide a more comprehensive feeder system

of mini-bus taxis serving the trunk-type mode, so that fewer passengers must walk considerable distances to access public transport as well as implementing a raft of upgrades to the BRT *Rea Vaya*, Gautrain rapid rail system together with TOD up-scaling" [8]. Aside from the "concerns about modes of transportation, the key concern is with the integration of transport modes and networks. Some progress has been made with the formal systems and frameworks of integration – for example, the National Land Transport Act (2009) which has introduced Public Transportation Integration Committees – but more work is needed to ensure effective integration" [3]. "Emerging spatial and transport design challenges have the capacity to either deepen spatial divisions or equally integrate spaces and places" [8]. It is therefore important that these "spatial and transport transformation options and levers be tackled so that spatial mismatches, fragmentation and transport distortions are corrected" [6]. Figure 1 presents a graphical illustration of commuting paradigm drift and shift challenges and opportunities in Gauteng.

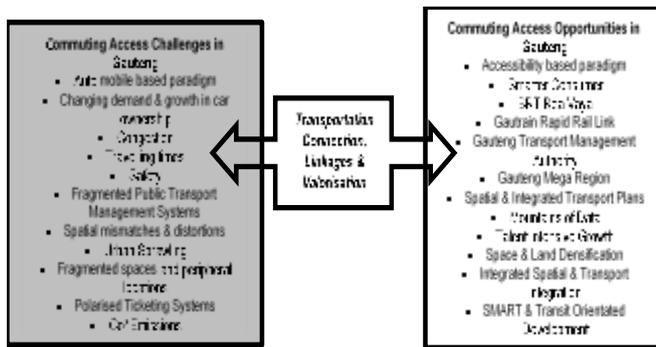


Figure 1: Commuting access paradigm drift and shift challenges and opportunities in Gauteng province

1.1 Aim of the Paper

This paper examines the emerging commuting paradigm drift and shift in Gauteng Province, South Africa with a view to developing a set of interventions aimed at reducing commuting constraints in the province. The aim of the paper is achieved through answering the following key questions:

1. What are the dimensions of commuting constraints occurring in the study area?
2. What are the commuting implications of the existing urban transport inefficiencies in Gauteng province, and;
3. How can the transportation drifts and shifts challenges be addressed to reduce the commuting constraints in Gauteng province.

2. Materials and Methods

2.1 Case Study Approach

A mixed-use study approach was used, in which both primary and secondary quantitative and qualitative data and information was collected, coded, ordered, classified and analysed through a thematic approach. The strengths, weakness, opportunities and threats (SWOT) analysis also assisted in further unravelling the commuting constraints dimensions and policy implications in the study area.

2.1 Case Study Description

Figure 2 is an illustration of the “geographical location of Gauteng province in relation to other provinces in South Africa” [6]. The selected case study places are shaded and represent areas in which detailed research was undertaken.

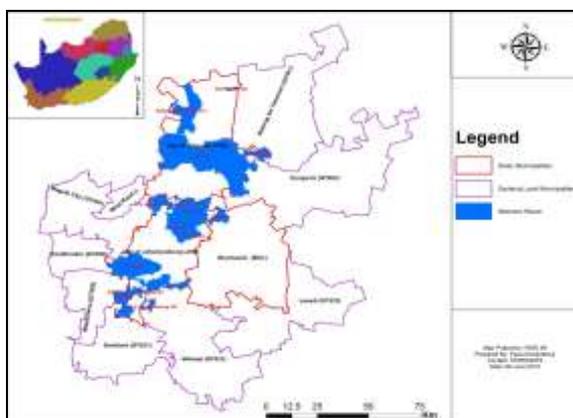


Figure 2: ‘Gauteng province and adjacent local municipalities’
Source: “Derived from municipal demarcation board” [9]

From Figure 2, we can deduce that the “selected study areas are spread between Tshwane (Pretoria), Johannesburg and Ekurhuleni metropolitan cities in Gauteng” [6].

3. Literature Review: the Multiple Dimensions of Commuting Constraints

According to “Anable” [10]; “Golledge and Stimson”, [11], in a “study concerning constraints to commuting, it is important to unpack the commuting paradigm drift and shift” via the following:

- “Resource constraint: This “entailed discussing areas” were significant “transport infrastructure and services investment are required or areas with deficit/backlogs”;
- “Safety constraint: This “included investigating and discussing” the issues that from a “safety point of view i.e. crime, accidents and congestion preventing commuters from having access to public transportation”;
- “Infrastructure constraint: This “component of the investigation centred” on studying “roadway capacity, accidents, demand supply of transport and route alternatives in Gauteng” [6].

Consequently, the commuting paradigm drift and shift constraints can either be:

1. “Spatial/physical constraints”: The “study investigated” the degree of peripheralisation and marginality of people to areas of socio-economic centres, which could be because of development corridors and fragmented location of land use.
2. “Economic constraints”: The “investigation took into consideration” the cost of public transportation which could be a constraint to commuting in view of public buses, minibuses, metro-rail fares, cost of fuel for moving from one destination to the other, etc.
3. “Social constraints”: It “was necessary to study” how social problems could be a constraint to commuting. This could be in the sense, that a family with many children or a child headed family head and “the physically challenged etc. could be a constraint to commuting”.
4. “Legal and policy constraints: To understand the role policy and legislation play in promoting or constraining commuting in Gauteng i.e. relevant legislation like the National Land Transport Act 5 of 2009; National Roads Traffic Act 1998 No. 8 of 1988, The National Credit Act 2005 for collection of tolls etc. were studied to see areas of application to this research” [6].

4. Results and Discussion

4.1 Transportation Population Dynamics and Realities

The “Gauteng region is a rapidly urbanizing region. The South African population has grown by more than 15% between 2001 and 2011” [6, 12, 13, 14]. Within the same period, “Gauteng has grown 30% during this period. Tshwane’s (Pretoria) population growth exceeds that of the Gauteng region at 36% between the same periods having the second highest growing population after the City of Johannesburg” [6, 12, 13, 14]. Figure 3 shows the percentage population growth, comparing 1996 -2001 and 2001 - 2011 periods.

car ownership results in reduced travel times, reduced speed, increased congestion and accidents etc. This stage is a result of rapid urbanisation, motorisation and industrialization” [6]. Once the “private car tipping point” has been reached, “a search for solutions and innovation begins” [6, 16, 21]. “Solutions that are generated in this regard shift” from a “transport” per se “orientation and are instead broadened” to incorporate “mobility” “dimensions as critical components of a total commuting response” [6]. Under this scenario, the “focus is no longer on private car motorisation and enhancement of movement for private car users but on facilitating mobility and access to points of interest on space for all residents or citizens of an area” [24]. The “focus is on promoting mobility lines and systems that ensure better mass movement of commuters” [6]. In this scenario, “it is clearly understood that problems of motorisation cannot be solved alone through constructing more highways, expanding roadway capacity, building new freeways etc.” [6]. Instead “alternatives such as BRT, high speed trains, trams, car sharing, integrated transport and measures to promote integrated mobility are central to answering the commuting question” [5]. The overall thread that “ties the commuting solution is that a transformative understanding that recognises integrated transport planning and the need for a mobility mind-shift (i.e. covering the full life cycle of the transport sector and industry including related sectors and industries) as well as incorporating curriculum review in Universities and Institutions that teach courses on transportation constitutes an important intervention area that should be prioritised by policy makers, practitioners and transportation stakeholders” [6].

6. Conclusion

This paper has presented and reviewed the commuting paradigm drift and shift in Gauteng province, South Africa. In any case, the transport commuting constraints dimensions and slow changes to the commuting constraints reversal and implications have been discussed. “Commuting constraints and opportunities require the application of innovative commuting solutions if catalytic, sustainable and transformative commuting travelling experiences are to be achieved” [6]. To reverse the “spatial mismatches, apartheid spatial legacy and constrained urban transport systems and patterns in South African cities as represented by Gauteng province cities, policies and measures geared towards making it more expensive for people and freight companies to use their cars and trucks on the roads and move them onto other modes of transport should be keenly investigated and explored” [6, 26, 27]. This is “despite reforms to the planning system, colonial and apartheid legacies still structure spaces across different scales.” [6, 21, 22, 23, 24, 25, 26, 27]. However, there is a “growing awareness and acknowledgement that transport and land use are mutually dependent” [6, 24, 27], “transport investment alone will not automatically generate spatial restructuring”.

Acknowledgement

The authors acknowledged University of Venda, Research and Innovation Directorate, Capacity Building and Development Grant as well as the Council for Scientific and Industrial Research (CSIR) for funding that made this work possible.

References

- [1] Bertraud A and Richardson HW. (2004). Transit and density: Atlanta, the United States and Western Europe. In Richardson H, Bae C. 2004. *Urban Sprawl in Western Europe and the United States*. London: Ashgate, p. 293–310
- [2] Department of Transport (2005). *National Travel Survey, 2004*: p. 1-20
- [3] Financial and Fiscal Commission (2014) *Understanding Housing Demand in South Africa*, Midrand, South Africa
- [4] Statistics South Africa (2008) *Income and Expenditure of Households 2005/2006, Analysis of Results*, Pretoria, Government Printers, p. 1-45
- [5] Chakwizira J. (2007) *The Question of Traffic Congestion and Decongestion in the Greater Johannesburg Region*. In *Proceedings of the Southern African Transport Conference (SATC)*, p. 499-511.
- [6] Chakwizira J (2016) *Access and Constraints to Commuting in Gauteng Province, South Africa*: p. i-ii.
- [7] StatsSA (2014). *South African National Household Travel Survey*: p. 1-109
- [8] UN-Habitat (2013) *Planning and Design for Sustainable Urban Mobility: Global Report on Human Settlements 2013*, Earthscan, London
- [9] Municipal Demarcation Board, (2015). www.demarcation.org.za
- [10] Anable, J. (2005). Complacent car addicts or, aspiring environmentalists? Identifying travel behaviour segments using attitude theory. *Transport Policy* 12: p. 65–78.
- [11] Golledge, R.G., Stimson, R.J., (1997). *Spatial cognition, cognitive mapping, and cognitive maps*. In: Golledge, R.G., Stimson, R.J. (Eds.), *Spatial Behavior: A Geographic Perspective*. The Guilford Press, New York
- [12] GCRO (Gauteng City-Region Observatory). (2011). *Quality of Life in the Gauteng City-Region: 2011 findings. Results from the ‘Quality of Life’ sample survey of residents of the Gauteng city-region*.
- [13] Wilkinson P. (2006). *Transit-oriented development: a strategic instrument for spatial restructuring and public transport system enhancement in South African cities? Proceedings from the 25th Southern African Transport Conference, Pretoria, 10–13 July 2006*, pp. 223–233.
- [14] Statistics South Africa (2011) *Census 2011*; p. 1-88
- [15] Gauteng Department of Public Transport, Roads and Works (DPTRW), (2013). *25-Year Integrated Transport Master Plan, Draft Plan*: p. 1-134.
- [16] Moodley GY, Meintsma J, van Tonder MA, Kuppan SA and Baker SM. (2009). eThekweni municipal-wide household travel survey: travel behaviour findings. *Proceedings (pp. 135–143) of 28th Southern African Transport Conference, Pretoria, South Africa, 6–9 July 2009*
- [17] Arthur D. Little and UITP (International Association of Public Transport). (2014). *The Future of Urban Mobility 2.0*. Online available at www.adl.com/FUM2.0
- [18] StatsSA (2013). *General Household Survey*. Pretoria: Re-public of South Africa.
- [19] Sustainable Energy Africa (SEA). (2006). *State of Energy in South African Cities*: p. 1-188.
- [20] IBM Corporation (2010). *The globalization of traffic congestion: IBM 2010 commuter pain survey*. Technical report, 2010: p. 1-6.
- [21] NPC (National Planning Commission). (2011). *National Development Plan*: p. 260.
- [22] SACN. (2014). *From Housing to Human Settlements: Evolving Perspectives*: p. 3.
- [23] Williams, J.J. (2000). “South Africa: Urban Transformation”, *Cities*, 17(3): p. 167-183.
- [24] Bertolini L. (2012). *Integrating mobility and urban development agendas: a manifesto - disP - The Planning Review, Volume 48, 2012 - Issue 1*: p. 16-26
- [26] Bertaud, A. (2008). *International comparisons: spatial development and poverty*, paper presented to the International Urban Development Workshop, World Bank, 9-10 April, Brummeria, South Africa.
- [27] Behrens R and Grey P. (2013). *A case for smarter city growth: A strategic analysis of Cape Town’s phase 1a BRT system and its supporting land use environment*. *Proceedings from the 32nd Southern African Transport Conference (SATC), Pretoria, 8–11 July 2013*.