

EXAMINING THE ROLE OF RAILWAY TRANSPORTATION IN THE STRATEGIC DEVELOPMENT OF RURAL AND TOWNSHIP AREAS IN MPUMALANGA

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ABSTRACT

The South African population residing in rural townships is comprised mostly of the marginalised class. The need for low-cost transportation that provides access to economic opportunities is urgent. The growing population requires more transport alternatives that will be controlled by the government and private stakeholders. The lack of transport options in rural areas has created numerous mobility inefficiencies. Therefore, the government has committed to sustainable development, so increasing railway transportation can contribute to this goal. This study is undertaken with the objective of discussing the significance of railway transportation as a transportation alternative, its potential in rural and township areas, and its contribution towards economic improvement. Through a desktop qualitative research approach, this study discusses the benefits of railway transportation in rural and township areas. This is achieved by exploiting literature from journal articles and government gazettes. Findings indicate that rail has a larger commuter capacity and offers more security and dependability than other modes of transport. The absence of competition in the railway system makes it a safer alternative compared to road transport, which can be affected by traffic volume. The study recommends prioritising rail transportation development in clustered rural and township areas to provide alternative transportation methods for the marginalised.

Keywords: Rural areas, Township areas, Railway transportation, Regional development.

1. INTRODUCTION

Access to transportation is necessary for achieving livelihoods and the functioning of societies. Historically, most of the South African population was located long distances from job opportunities, recreational facilities, and essential services such as health care, education and shopping (Walters, 2013). For most rural and township regions, it is still the norm to travel distances for some of these activities (National Household Travel Survey, 2021). From the 2003 National Household Travel Survey (NHTS) to the 2021 NHTS, a common finding is that bus and taxi services are the most accessible modes of public transport compared to railway transportation. The NHTS reveals that the South African does not satisfy the needs of the population because it is either not available or too far away to easily access (Walters, 2013). To improve on these shortfalls, South Africa must look beyond road transportation to already proven alternatives such as railway transportation. Therefore, the need for low-cost transportation that provides access to economic opportunities is urgent. The growing population requires more transport alternatives that will be controlled by government and private stakeholders. The lack of transport options in rural areas has created numerous mobility inefficiencies. Moreover, the increase in road

transportation has increased negative effects such as pollution, noise and land degradation growing likewise (Pietrzak & Pietrzak, 2019).

Rail transportation is a popular and eco-friendly means of travel for passengers journeying short to medium distances (Calzada-Infante, Adenso-Díaz & Carbajal, 2020). This mode of transport is known for its high carrying capacity, often surpassing that of other transportation options. Additionally, it generates low levels of air and noise pollution, making it a sustainable choice (Duranlar & Gergova, 2024). In addition to its environmental benefits, rail transportation is characterised by lower land usage, resilience to weather conditions, convenience, and energy efficiency (Pacacı, Cubuk, Yıldız & Karacor, 2022). It plays a vital role in the economic development of countries by facilitating trade (Tkachenko, Holub & Biletska, 2023). However, in some regions, rail transportation faces challenges due to insufficient investment and improvements, which results in lower utilization (Pacacı, Cubuk, Yıldız & Karacor, 2022).

Road transportation is strained by transporting cargo and passengers which further decreases the safety of road transport as well as an increase in external costs of transport (Pietrzak & Pietrzak, 2019). Railway transport has the potential to alleviate this pressure from road transportation. However, the South African railway system is plagued by several challenges such as dilapidated infrastructure that has over the years led to the decline of its services (Olalere & Ramdass, 2024). With the adoption of the United Nations Sustainable Development Goals (SDGs), environmentally friendly and sustainability are at the front of development initiatives. Therefore, research into how railway transportation be brought back to be the main mode of transport is important. There is a lack of studies that look at the contributions of railway transportation in rural and township areas of developing countries. Thus, this study fills this knowledge gap by examining the role of railway transportation in the strategic development of rural and township areas in South Africa. Thomas (2016) argued that to overcome some of the social and economic challenges faced by the South African population, the provision of affordable, safe, and accessible public transportation and its infrastructure is a minimum requirement. The condition of rural transport infrastructure in South Africa leaves little to be desired and reduces access to transportation (Thomas, 2016). The majority of the rural and township population is limited to the bus and taxi services which may be hindered by the available infrastructure to reach certain areas (Thomas, 2016).

The increase in population in South Africa and throughout the world means there will be a need for more people to be transported and more transport alternatives, however, if the increase in transportation is sided on fuel powered transportation methods it is an opposite of what is desired on sustainability goals. Thus, this paper attempted to argue the significance of railway transportation in rural and township areas of South Africa. Moreover, this paper aims to examine the role of railway transportation in the development of rural and township areas in the City of Mbombela Municipality, South Africa.

2. METHODOLOGY

Qualitative Secondary Analysis (QSA) represents an innovative methodological framework that empowers researchers to reanalyze existing qualitative data with the aim of addressing new research inquiries. This approach is particularly advantageous in contexts characterized by limited resources, as it capitalizes on data that has already been collected. The implementation of QSA is not only cost-effective but also efficient, facilitating the exploration of novel research questions without necessitating new data collection (Kelly, Martin-Peters & Farber, 2024). Furthermore, QSA enhances data accessibility and quality by providing researchers access to hard-to-reach or vulnerable

populations (Chatfield, 2020). It also allows for the utilization of high-quality, pre-existing datasets (Irwin and Winterton, 2012). An additional benefit of QSA lies in its capacity to facilitate the examination of longitudinal data without the constraints of time and resources that accompany primary data collection efforts (Tarrant, 2017). Scholars who employ QSA often do so to derive new interpretations and insights from existing data (Bossaller, Burns & VanScoy, 2017). The authors contend that this methodology fosters cross-validation and comparative analysis across multiple datasets, thereby enriching the research findings (Bossaller, Burns & VanScoy, 2017). Moreover, one of the compelling advantages of QSA is its ability to accommodate larger sample sizes without incurring additional data collection costs, thus effectively mitigating or even eliminating these expenses (Chatfield, 2020; Beck, 2023). QSA not only reduces the time associated with data collection but also facilitates rapid dissemination of knowledge (Rodriguez, 2021). In light of these strengths, QSA was utilized to investigate the role of railway transportation in the strategic development of rural and township areas in Mpumalanga. This approach enabled researchers to concentrate resources on data analysis rather than data collection, thereby facilitating research endeavors in a resource-constrained environment.

The implementation of QSA involved systematically gathering relevant data pertaining to the research question while assessing its suitability, sufficiency, and quality (Sherif, 2018). The systematic gathering of relevant data was conducted as follows: the researchers used the keywords of the study to search for qualitative studies that discuss the role of railway transportation towards the development of rural and township areas. The researchers used the search engine Google Scholar as it consists of several credible databases. The searches were filtered through searching strings such as “Railway transportation” + “Rural areas” + “Regional development” + “South Africa”; “Railway transportation” + “Township areas”; “Railway transportation” + “Regional development” + “South Africa”. The strings produced results of 108, 10, and 265, respectively. From the generated total of 383 publications, the researchers only focused on studies that used primary data. The new total number of publications to be assessed was 145. The researchers also selected articles based on language; only articles that are published in English and are available for open access were considered. Researchers ensured the compatibility of the original data with the research questions posed (Beck, 2023). Finally, the rigor of the study was upheld by integrating secondary data with insights derived from the analysis of selected studies, thereby contributing to the overall robustness of the findings.

3. THEORETICAL FRAMEWORK

The growth pole theory can be traced back to the works of Perroux, who defines them in relation to abstract economic space, explaining that economic spaces are made up of centers, poles from which growth can generate outside economic effects while simultaneously attracting investments (Dakoah, 1977). According to his work, a pole is a potential point of regional development and turns into a center as infrastructure and production develop. The poles of growth have been hailed for their ability to induce economic growth, create jobs and boost productivity, and in the context of adjacent rural areas, growth poles can be used as a tool to extend economic integration and economic development because economic development is inherently uneven across urban and rural areas (Debresca & Dobre, 2017).

According to Paven and Bela (2017) the factors that influence growth pole center, the following key features need to be taken into consideration. Firstly, for growth poles to be fully active, there is a need to identify active economic activity that can be used to sustain the growth, taking full advantage of local natural resources that are at disposal. This is particularly important because it trickles into the second factor which explains that this

should indirectly induce other economic activities from the growth pole. Thirdly, investment opportunities should be derived from the growth pole by decentralizing the mode of economic activity. This is important because it can be used to identify the availability of adequate resources, both physical and human resources, to regulate the sustainability and longevity of the growth pole. Finally, because growth poles are within already established hubs of economic activity, the role of government is to stimulate and support their potential until they can function on their own and be able to equitably share the proceeds procured from the growth poles.

In Mpumalanga, a predominantly rural township strategic shift towards railways as an alternative source of transport can be used to stimulate the province's growth. Although the province is the 4th largest economy of the country, and is endowed with a bounty of natural resources, thriving in the mining and the agricultural sectors, most rural areas and or townships in the province remain marginalized which means that the province cannot capitalize on the backward and forward lineages from these sectors which can ultimately reposition its regional development. Enhancing railway infrastructure could thus serve as a foundation for a functional growth pole strategy, creating jobs, improving trade efficiency, and stimulating peripheral development. The role of stakeholders such as Transnet, along with supportive government regulation, will be crucial in facilitating this transition and ensuring that rail-driven growth benefits extend beyond established urban centers.

4. LITERATURE REVIEW

4.1 Transportation in South Africa

Transportation can be described as an important instrument towards meeting the diverse needs of society and the growing requirements of its users (Pietrzak & Pietrzak, 2019). The transport sector serves as a crucial pillar of the economy; however, it has not been given sufficient focus regarding its transformation (Walters, 2013). In South Africa, transportation is characterized by high commuting costs and lengthy travel times, yet this issue has not received adequate attention in policy discussions (McKay, Duri & Gunter, 2024). The transport sector is largely described by its segregation, where the urban mode of transportation is cars and in rural and township areas the main modes of transport are foot, taxi, bus and commuter train (Thomas, 2016). Urban periphery areas, often consisting of townships and rural regions, face inadequate transportation access, which excludes them from economic participation (Nelson, 2023). Currently, public transport is viewed as unreliable and poorly integrated, primarily due to issues like overcrowding and insufficient connectivity between different modes (Gumbo & Moyo, 2020). Moreover, the road infrastructure is expected to struggle with increased traffic volume over the next three decades (Lungomesha & Ackim, 2018). This problem will drive the development of transportation which can affect land resources, water quality, air quality, and biodiversity (Department of Transport, 2024). Despite these alarming effects, the transport sector remains a potential catalyst for economic development, and job creation, and is a significant contributor to the economy (Roy, Toorani & Jasnoch, 2023). These arguments critically outline the need to understand the challenges that are faced by the South African transport sector.

4.2 Challenges of Transportation in South Africa

Transportation in South Africa faces myriad challenges that hinder economic mobility and access to essential services, particularly in rural and township areas, where high levels of poverty and unemployment persist (Kiepiel, 2023). Despite the crucial role public transport plays in promoting accessibility and economic growth, its development is fraught with

complexities. Political implications, funding constraints, and the current inadequacies of the transport system complicate efforts to enhance, expand, and improve public transport networks (Walters, 2013). The railway sector in South Africa has experienced a significant decline in both technical and managerial capacity, which poses a critical obstacle to revitalizing rail transport not only in South Africa but throughout various regions in Africa (Bouraima et al., 2023). The transition from rail to road transport for cargo has further strained the transport sector, as noted by Olalere and Ramdass (2024). This shift has resulted in heightened costs, inefficiencies, multiple stoppages, and increased traffic congestion, thereby exacerbating transportation challenges. Safety concerns within public transportation have also emerged as a significant issue, contributing to a declining number of train commuters (Passenger Rail Agency of South Africa, 2023). Similarly, the taxi industry, which has effectively monopolized transport in South Africa, faces similar safety and operational challenges (Walters, 2013). Moreover, a considerable portion of households surveyed in the 2003 NHTS reported that public transportation is prohibitively expensive (NHTS, 2003). This issue of commuting costs is echoed in more recent findings by McKay, Duri & Gunter (2024), underscoring the financial burdens placed on commuters. These challenges highlight a pressing need for investment in the transportation sector, presenting an opportunity to not only enhance infrastructure and services but also to foster greater economic mobility and accessibility across South Africa. Addressing these multifaceted issues is essential for creating a more efficient and equitable public transportation system that meets the needs of all citizens.

4.3 Economic Contribution of Railway in South Africa

Public transportation plays a crucial role in connecting individuals, particularly the working class, to employment opportunities, especially those commuting from rural and township areas to urban centers (Walters, 2013; Chakwizira, Bikam & Adeboyejo, 2018; Kgwedi, 2022). This need has notably increased the demand for road transportation, particularly within the taxi-bus industry. However, the economic potential of rail transport in South Africa cannot be overlooked, as it holds the capacity to significantly contribute to the nation's economic growth and development. Historically, South Africa's rail infrastructure has suffered from underinvestment, which has hindered its ability to serve as a catalyst for economic growth (Nkgodi, 2017; Magoiwa, 2023). The mining sector, in particular, stands to benefit from improved efficiencies in rail operations, which could generate substantial economic impacts. Enhancing the reliability and efficiency of rail services is essential for maintaining the country's economic competitiveness. Mathabatha (2015) highlights that many companies currently favour road transport due to inadequacies in rail services. By addressing these inefficiencies, South Africa could bolster its economic performance through the timely and reliable delivery of goods. Deel-Smith (2022) asserted that rail transportation is very competitive, as many railway stations are closer to the suburbs and the waiting times are shorter, meaning it gets passengers to economic centers faster compared to other modes of transportation. Furthermore, the role of transport, particularly rail, in facilitating socio-economic development cannot be underestimated. Cromhout (2016) emphasizes that substantial government investment in rail infrastructure is crucial for alleviating pressure on road transport systems. This investment is vital not only for improving transport efficiency but also for supporting broader economic development goals. Additionally, these studies collectively underscore the fundamental importance of efficient and reliable rail transport in enhancing South Africa's economic growth, competitiveness, and socio-economic development. By prioritizing improvements in rail infrastructure and operations, the country can foster better integration of regional economies, lower transport costs, and enhance access to markets, thereby contributing significantly to national prosperity.

4.4 Rural and Township Transport Infrastructure

Rural areas are often viewed as areas with low population density and are faced with challenges relating to infrastructure; Cunha, Gomes, Fernandes and Morais (2020) asserted that these areas often have limited access to services, which limits their ability to develop and attract investments. Township areas are described by Seseni (2023) as areas that were previously designated for marginalized groups; these areas are also known for socio-economic disparities and spatial segregation because of the divide that exists between them and urbanized areas. The accessibility and efficiency of transportation systems are crucial for the socio-economic growth of any region. The NHTS reveals a persistent trend: bus and taxi services are more accessible than railway services, and the least used mode of transport among households remains trains (NHTS, 2003; NHTS, 2020). This disparity is particularly evident in the rural and township areas of South Africa, where the condition of railway infrastructure has significant ramifications for economic development. The railway infrastructure in rural and township areas of South Africa faces critical challenges. George, Mokoena and Rust (2018) report that both public freight and passenger rail networks are in disrepair, suffering from maintenance backlogs, theft, vandalism, and chronic underinvestment. PRASA and Transnet, the primary operators of these networks, struggle with outdated infrastructure and insufficient resources, further exacerbating the situation (George, Mokoena & Rust, 2018).

The deteriorating condition of railway infrastructure not only affects transport efficiency but also stifles the economic development of rural and township areas. Efficient rail transport is vital for linking these regions to urban centres, thereby facilitating trade and improving access to essential services (George, Mokoena & Rust, 2018). The prevailing state of disrepair forces greater reliance on road transport, which is often less efficient and incurs higher costs. Chakwizira and Mashiri (2015) underscore the necessity for transformative policy shifts in rural transport infrastructure, stressing improvements in service provision, reliability, safety, and security. They assert that sustainable rural transport infrastructure is essential for socio-economic development and environmental preservation. Similarly, Hlotywa and Ndaguba (2017) emphasize the importance of investment in transport infrastructure for economic advancement, a principle that applies equally to railway services.

5. DISCUSSION

5.1 Developing Alternative Transportation and Recommended Strategies

The conclusion of the Covid-19 era has ushered in a resurgence of public transport usage, as people transition back to in-person work environments. This shift not only reflects a changing societal dynamic but also highlights the urgent need to rethink transportation infrastructure to safeguard against future health crises. In particular, the development of alternative transportation solutions is critical to reducing congestion on existing road networks and enhancing overall mobility. A significant oversight in current transportation planning is the neglect of the urban periphery, which includes both townships and rural areas. These regions frequently suffer from a deficiency of reliable transportation infrastructure, which severely limits residents' mobility and economic participation. The insufficiency of accessible transport options prevents individuals from reaching employment centres, educational institutions, and essential services, inhibiting their capacity for full engagement in economic activities vital for socio-economic advancement. This transportation disparity not only reinforces existing inequalities but also extends the marginalization of peripheral areas within the broader economic landscape. To foster inclusive economic growth, it is imperative to address these transportation challenges

systematically. Therefore, developing more transport alternatives, such as the addition of the passenger railway, can alleviate the pressure on road transport and, most importantly, lead to access to opportunities for communities in the City of Mbombela Municipality.

The literature review section has evidenced that enhancing railway infrastructure in South Africa's rural and township regions is essential for the country's holistic development. Addressing maintenance backlogs, investing in modern infrastructural solutions, and bolstering security measures are critical steps in boosting the economic and social well-being of these communities. Research further indicates that a well-functioning railway system in rural and township areas of Mbombela can also facilitate intermodal connectivity, allowing residents to use multiple forms of transport seamlessly, thereby expanding their access to opportunities. Mbombela is situated in a strategic location along the Maputo Corridor, which can provide more passengers for the railway that can be developed in Mbombela to connect with other regions. The development of a railway system in this township and rural areas can lead to the expansion of the railway that will be used for freight, such as coal. Therefore, investing in alternative transportation modes, such as enhancing railway infrastructure, could alleviate this burden. By capitalizing on these existing rail networks, Mbombela can develop integrated transportation strategies that not only reduce road congestion but also promote sustainable economic growth. Thus, the findings from this study underscore the critical role of railway transportation in the strategic development of rural and township areas.

5.2 Addressing Transportation Inequalities in Rural and Township Areas

Enhanced railway services can deliver substantial economic benefits. By lowering transportation costs and improving access to markets, railway infrastructure can stimulate local economic development. This aligns with regional development theory, emphasizing how infrastructure investment serves as a catalyst for economic growth and equitable regional development. Additionally, studies have shown that improved transport infrastructure can lead to increased property values, thereby providing additional revenue for local governments. The findings presented here have significant policy implications. Policymakers must acknowledge the strategic importance of railway transportation in regional development and allocate necessary resources accordingly. This entails not only financial investment but also the formulation of comprehensive policies that promote the integration of railway services with other modes of transport. For instance, developing interconnected transportation models can create efficient transit networks that enhance connectivity between urban centres and peripheral regions. The lack of railway transportation in the rural and township areas of Mbombela creates transportation inequalities, as the marginalized people have limited access to reliable and affordable public transport options. Provided the advantages of using the railway, such as low cost and accessibility, the lack of railway in rural and township areas of Mbombela hampers the ability of residents to access employment, education, and healthcare services, perpetuating cycles of poverty and social exclusion. In the City of Mbombela, the reliance on informal transportation, such as taxis, further exacerbates these challenges due to issues of safety, reliability, and affordability. Addressing these inequalities necessitates targeted investments in transportation infrastructure, especially passenger railways that prioritize the needs of rural and township communities, ensuring equitable access to opportunities and services.

5.3 Inclusive Economic Growth

Beyond economic implications, improved railway services offer significant social benefits. A reliable and affordable mode of transport can enhance access to essential services such

as healthcare and education in the City of Mbombela's rural and township areas. This is especially crucial for marginalized communities where service accessibility is inherently limited. Moreover, rail connectivity can foster social inclusion by bridging urban and rural divides, thereby promoting a collective societal composition. Railways generally present a more energy-efficient alternative to road transport and contribute to lower greenhouse gas emissions. Aligning with the Sustainable Development Goals laid out by the United Nations, improving railway infrastructure supports South Africa's commitment to reducing its carbon footprint. Additionally, integrating renewable energy sources into railway operations in the passenger railway system in the City of Mbombela Municipality could further enhance sustainability efforts. Despite its potential, the study identifies several challenges obstructing railway development in rural and township areas of Mbombela, such as deteriorating infrastructure, theft, and vandalism. Addressing these issues requires multifaceted strategies that include increased investment for modernization and stringent security measures. Collaboration between government bodies and private stakeholders within rural, township, and urban areas will be essential to developing innovative solutions and deploying resources efficiently. Implementing community-based safety programs could also serve to mitigate vandalism by fostering a sense of ownership among residents. Developing and enhancing railway infrastructure in the City of Mbombela Municipality not only addresses transportation challenges but also serves as a catalyst for inclusive economic growth. Improved rail connectivity can stimulate local economies by facilitating the efficient movement of goods and people, attracting investment, and creating employment opportunities.

6. RECOMMENDATIONS AND CONCLUSION

Based on the findings of the study, the following recommendations were developed.

- Prioritizing railway development in clustered rural and township areas to maximize impact. This approach can enhance connectivity, stimulate local economies, and improve access to essential services.
- Allocating significant resources to modernize and maintain railway infrastructure in rural and township areas. This includes upgrading tracks, stations, and rolling stock to ensure reliability and efficiency.
- Implementing robust security measures to prevent theft and vandalism. This can involve increased surveillance, community engagement, and collaboration with local law enforcement agencies.
- Developing comprehensive policies that integrate railway services with other modes of transport. Foster collaboration between local government and private stakeholders to create a cohesive and efficient transportation network.

6.1 Conclusion

This study presents robust evidence concerning the diverse benefits of railway transportation for rural and township regions in South Africa. By addressing the identified challenges and implementing the recommended strategies, railway systems have the potential to become pivotal elements in fostering economic growth, social inclusion, and environmental sustainability within these areas. Moving forward, it is essential to adopt a holistic and integrated approach to transportation planning that takes into account the needs of all communities, thereby nurturing a more equitable and prosperous society. Furthermore, the research emphasizes the critical importance of railway transportation in

the strategic development of rural and township areas in South Africa. It outlines the economic, social, and environmental benefits of improving railway infrastructure, focusing on its capacity to lower transportation costs, enhance accessibility to essential services, and contribute to sustainable development. Addressing the existing challenges in railway infrastructure is vital for unlocking these benefits and promoting inclusive growth among marginalized communities. In addition to the direct benefits of improved railway services, there are broader implications for local economies and social cohesion. Enhanced railway connectivity can stimulate local businesses by facilitating trade and commerce, thereby creating job opportunities and reducing unemployment rates in rural areas. Moreover, improved access to education and healthcare services can lead to better quality of life and increased human capital within these communities. The potential for railway systems to serve as catalysts for regional development underscores the need for targeted investments and policies aimed at overcoming current infrastructure deficits, ultimately fostering resilience and adaptability in the face of socio-economic challenges.

7. SUGGESTION FOR FURTHER RESEARCH

Further research should focus on detailed case studies and implementation plans to fully capitalize on railway transportation's capacity to drive regional development.

8. LIMITATIONS

The study's reliance on QSA introduces certain limitations. The subjective nature of qualitative analysis necessitates careful consideration of the researchers' influence on data interpretation. Additionally, the study's findings are based on existing data, which may not fully capture the current state of railway infrastructure or the specific needs of rural and township communities. Further primary research is needed to validate and expand upon these findings.

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