RURAL TRANSPORTATION AND SOCIAL INCLUSION CHALLENGES AND OPPORTUNITIES: A CASE STUDY IN NORTH WEST PROVINCE – NGAKA MODIRI MOLEMA DISTRICT

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ABSTRACT

Transport planning has mostly focused on urban areas, transport infrastructural developments, and funds. These have all channeled to urban areas. However, recent research and transport plans, policies, and strategies are now incorporating rural areas into building better sustainable transport systems. One such predominantly rural area in the North West Province is Ngaka Modiri Molema District Municipality (NMMDM) which is one of the four districts within the province. Its capital city is Mahikeng which is also the provincial capital city of the North West Province. NMMDM is largely rural and is made up of eight (8) towns, twenty-one (21) townships, 198 villages, and 103 wards. The paper used secondary data sources of NMMDM and national transport plans, Acts, policies, and general literature. It focuses on transport modes that are mostly used within the district which include non-motorised transport (NMT), minibus taxis, and a subsidized bus system. It will further discuss the rural road infrastructural challenges as key components to measure the accessibility and social inclusion of users in the district. The paper then recommends potential solutions to improve rural transport and social inclusion, including amongst others, the need for more investments in rural road infrastructure, with walkways being prioritized as the majority of the NMMDM population use walking as their means of transport. It also recommends maintenance of existing infrastructure, as well as monitoring, and evaluation of all road networks in rural areas. The study further recommends transport stakeholders' participation maximization, to ensure inclusivity.

Keywords: Rural transport, Social inclusion, Infrastructure, Participation.

1. INTRODUCTION

Transport is vital in the provision of sustainable social, and economic growth and development. It is a key catalyst in addressing geographical spatial distortion and inequalities that result in the poverty gap between the low-income earners, middle income, and high-income earners. Public Transport is the core focus to provide affordable mobility for society as it has an opportunity for cross-subsidization. Over the years' transport in urban areas was a priority compared to rural transport (Chaithoo and Vebkatesh, 2010). Before 2007, the Department of Transport developed Rural Transport Strategy for South

Africa, which aim to address challenges that affect rural transport and provide opportunities for potential investment in rural areas to address socio-economic crises in the country (NDOT, 2007).

Department of Transport developed policies such as the National Transport Policy White Paper, National Transport Master Plan (NATMAP), National Learner Transport Policy, and land use and transport plans for the support of nodal and linkage development both in urban and rural areas. The aim of rural transport policies, Acts, and transport plans is to develop rural sustainable transport systems (COGTA, 2020)

This paper aims to highlight the importance of rural transportation and articulate challenges and opportunities that affect the rural transport users in Ngaka Modiri Molema District Municipality. The paper further discusses the state of NMMDM road infrastructure to identify the extent to which access to opportunities can be improved. Lastly, the paper highlights the imperativeness of social inclusion. This paper focuses only on transport modes that are mostly used within the district which include non-motorised transport (NMT), minibus taxis, and a subsidized bus system, and further assess the rural road infrastructure to measure the accessibility and social inclusion of users in the NMMDM.

1.1 Case Study Area

This paper addresses the rural transportation social inclusion challenges of Ngaka Modiri Molema Municipality District (NMMMD) and articulates key opportunities within the district. Below is the district map of Ngaka Modiri Molema Municipality District.

Source: National Government of SA (2022)

Figure 1: Ngaka Modiri Molema Municipality District map

Ngaka Modiri Molema Municipality District is one of four districts found in North West Province. The district is located in the central city (Mahikeng) of North West Province and

covers a land area of approximately 28 114 km^2. Furthermore, NMMMD comprises five local municipalities namely Mahikeng, Ratlou, Ramotshere Moilao, Ditsobotla, and Tswaing local municipality (Cogta,2020).

The district is largely rural and has a high potential for producing primary sectoral goods, such as agricultural products, most parts of the district consist of Crop Farming and Mining (Oduniyi and Tekana, 2020). There are 640 000 (67.66%) people out of 961 960 people living in poverty, using the upper poverty line definition, across Ngaka Modiri Molema District Municipality - this is 3.14% higher than the 621 000 in 2008 (Cogta, 2020 and Integrated Development Plan, 2021).

1.2 Research Objectives

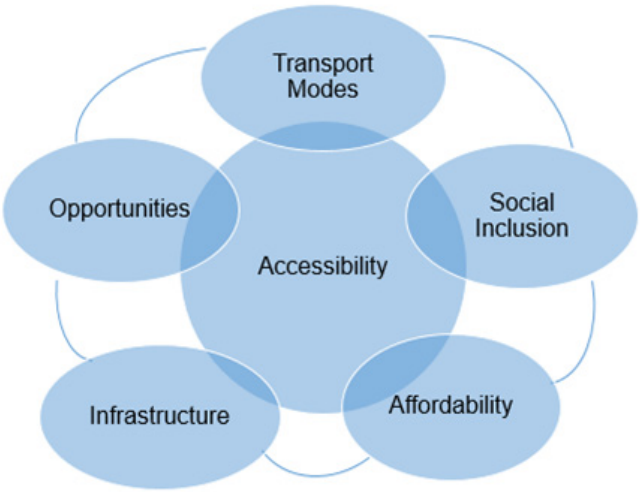
This study had three main objectives:

- To measure the rural road infrastructure status at Ngaka Modiri Molema District Municipality and the impact it has in terms of access and social inclusion.
- To explore the rural mobility challenges and their limitations in Ngaka Modiri Molema District Municipality.
- To explore how opportunities can be derived through the improvement of access and social inclusion within rural transportation in NMMDM.

The introduction of the study highlighted the case study area's geographical setting. The following structure is followed; literature review, research methodology, findings, conclusion, and recommendations of the study.

2. LITERATURE REVIEW

The below diagram which is a conceptual framework of the study indicates the inter-relationship of elements that contributes to the central factor in the provision of sustainable transport.



Source: Developed by Authors

Figure 2: Conceptual Framework

Poor access to transport in rural areas of developing countries constrains economic and social growth and development, and in turn increases poverty levels (DITP, 2019). Furthermore, poor access limits the economic proactivity of the affected geographical

spatiality population. The above conceptual framework illustrates how access is a central factor in providing transport. Accessibility ensures that every component serves its purpose. Providing roadway infrastructure for public transport (buses & taxis) without walkways, and cyclist lanes means there is the exclusion of other population groups. Furthermore, infrastructure without complementary facilities such as restrooms compromises the full potential for access and social inclusion. Public transport provides access to employment, and flexible mobility, improve individuals' performance in the labor market, and improves access to opportunities to better individuals' current circumstances. Transport infrastructure and access combination combat social exclusion and transport disadvantages (Affordability). Lack of access to transport, compromise the quality of life, a rise in affordability crises, and social inclusion concerns, especially for people with disabilities, women, and children.

Transport planning has mostly focused on urban areas (Newman and Kenworthy, 1996, Gwilliam, 2003., Khodabakhsh et al. 2015). The National Department of Transport is the highest national authority in South African transportation and as well as the guiding institution in coordinating transportation within the country, provinces, districts, and local areas. It developed and introduced Rural Transport Strategy (2007). The strategy included the rural implementation plan which has a Rural Transport Development Programme that entails key pillars of delivery namely, rural transport infrastructure, rural transport services, non-motorized transportation, safety, and regulations as well as capacity building and monitoring (RTSSA, 2007). Therefore, there are many factors that planners need to pay attention to when trying to improve access in rural areas such as enabling road infrastructure, availability of reliable alternative transport, affordable transport services, reasonable travel distances, and integrated transport and land uses. The following section discusses the in-depth factors mentioned above.

2.1 The State of Public Transport and Road Infrastructure in NMMDM

Table 1: NMMDM road network and road class lengths (km)

Road Class	Total Road Length (km)	Surfaced Roads (km)	Un-surfaced roads (km)	Surfaced Roads (%)	Un-surfaced roads (%)
National Roads	453,7	453,7	0	100,00%	0,00%
Main roads	1 887,50	533,2	1 354,30	28,25%	71,75%
secondary roads	7 453,50	929	6 524,50	12,46%	87,54%
arterial roads	3 515,60	1 558,50	1 957,10	44,33%	55,67%
Minor roads (Access and streets)	960,1	437,4	522,70	45,56%	54,44%
NMMDM Total	14270,4	3911,8	10 358,60	27,41%	72,59%

Source: (NMMDM road asset management system 2015 citied DITP, 2019)

- 100% Fully Surfaced roads.
- *Close to* 50% Surfaced roads.
- Above 50% unsurfaced roads.

Different road classifications cater for different traffic. The above table represents the road classifications within NMMDM and the Kilometers of each road network coverage. All

National Roads are surfaced (100% surfaced). The main roads are 28,25% surfaced which serves as roads that connect inter-district with inter-urban traffic, which means 71,75% (red zone) of the main roads within NMMDM are unmetalled. Secondary roads which serve as inter-connector between primary roads and major roads are also 87,54% unsurfaced. Arterial and Minor roads are also above 50% unsurfaced. All the above 50% unsurfaced roads (red) are unmetalled roads which means are gravel (Mud surface). The arterial and Minor roads are mostly used traffic roads in rural areas. However, the informal routes which are for as means of connection to formal routes are not always indicated in strategic papers.

Table 2: Definitions of road classes

Definitions:

National roads – major roads and freeways which connect major cities.

Main roads – An inter-regional road that connects the inter-district traffic and inter-urban traffic to other roads (Law Insider, 2022)

Secondary roads – "Highway which servers inter-district traffic between urban and rural centers and provide traffic connections between primary roads or major arterial highways" - Law Insider (2022).

Arterial roads – these are rural roads that feed into the provincial highways (Law Insider, 2022)

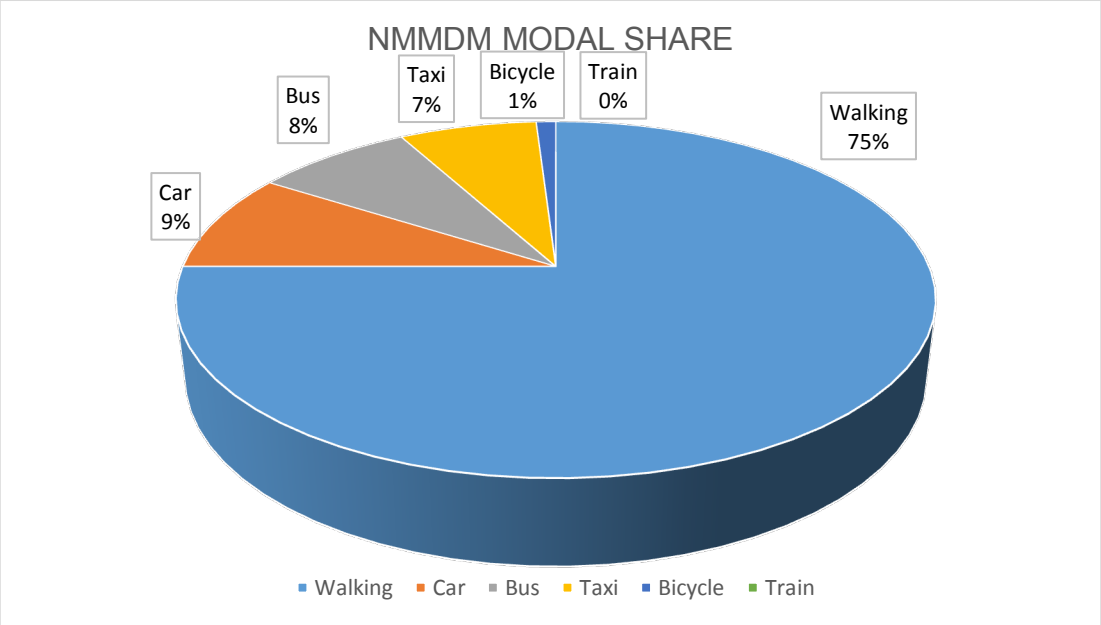
Minor roads (access and streets) – road carrying traffic that has origin and destinations in the immediate area with the main purpose of giving access to individual properties (SANRAL, 2012)

Table 3: NMMDM arterial and minor roads road network (surfaced and un-surfaced)

Excl. National Roads, main roads, and secondary roads(9 794,70 KM)				
	Surfaced Roads (km)	Un-surfaced Roads (km)	Surfaced Roads (%)	Un-surfaced Roads (%)
Total Network (km)				
4 475,70	1 995,90	2 479820	44,59%	55,41%

Data Source: DITP 2019

Table 3 only indicates the road network that has a portion of the rural access. The imperativeness of the above table is to measure the infrastructural potential mobility access. The strategic documents did not highlight any walkway infrastructural provision status. However, this table concerning the motorized transport (Minibus taxis, subsidy buses) they are mostly catered for the mobility. The table indicates that only 55,41% of networks that link rural areas routes to other routes its unsurfaced. However, the conclusion cannot be derived that the majority of the population is catered for within the infrastructure coverage presented above as Rural Transport Strategy for South Africa (2007) still urges that deep former rural homelands still lack infrastructural investment.



Source: DITP (2019)

Figure 3: NMMDM Modal Share

Ngaka Modiri Molema District Municipality Modal share indicates that the most used mode of transport is Non-Motorized Transport which is walking dominating by 75%, followed by bus use (8%) and taxi (7%). There is a rail network that is not passenger operational. Non-Motorized Transport in NMMDM includes walking, bicycles, and animal-drawn carts. The district strategic document highlight that "There is a need for provision for pedestrian walkways, bicycle and animal dawn carts" (DITP, 2019). However, the NMT is slowly gaining momentum.

2.2 The Challenges of NMMDM Rural Transport and Social Inclusion

"*Most communities in the "deep" former homeland areas are still suffering from insufficient investment in, and maintenance of rural roads and transport services. Part of the reason may be an inherent bias of IDP processes*" (RTSSA, 2007)

Rural transport has inter-relationship elements that limit the access of rural residents. Lack of infrastructure can increase the transport cost, considering infrastructure also as an influential factor of modal choice and availability. The majority of the population with NMMDM live in poverty. Using the upper poverty line definition (COGTA, 2020). Thus, there is also a high population that walks within the district. The limitation of complemental or substitute modal availability rise the fares due to lack of competition, which has the potential to reduce the fares. Market with many players competing for one customer also fought for a buy-in of customers towards their goods and services.

Lack of holistic Rural Transport Strategy for South Africa (RTSSA) 2007 attention and full capacity implementation, the strategy plans when highlighting the achievements of RTSSA since its introduction the common strategic objective is on the provision of scholar transport for learners, which extract population group and size. The complementary challenge with Non-Motorised Transport is the infrastructural provision to enhance its effectiveness within the NMMDM. Streets and sidewalks have a significant impact on people with disabilities (Vanderschuren and Nnene, 2021).

In-appropriate design and construction standards as most of the surfaced roads and public transport within the district do not enhance the Universal design standards nor enhance the Non-Motorised Transport. Surfaced roads within the districts lack walkways which leaves vulnerable persons such as people with disabilities excluded from accessing socio-economic opportunities.

Sources: Author and Boipelo Mere

Figure 4: Motlhabeng main road **Figure 5: Disaneng internal road**

2.3 The Impact of Transport on the Rural Economy

NMMDM contributed 19,75% to North West Province Gross Domestic Product (GDP) of R291 billion in 2018 increasing the share of North West from 19,10% in 2008 (IDP, 2021). NMMDM contribute 1,18% National GDP. The district is largely rural, made up of 8 towns, 21 townships, 198 villages, and 103 wards (IDP, 2021). 90% of the district population resides in traditional authority areas, which mostly are in rural villages. However, irrespective of how rural NMMDM it has key economic drivers that include agriculture, tourism, mining industry (Kalgold, Slurry, Sepheku, Lafarge, Majemantsho informal mine, Diamond informal mine) (IDP, 2021). All mentioned economic drivers need effective and efficient transport, which mostly depends on the infrastructural provision. Lastly, the district has 3 TVET Colleges and 1 University.

2.3.1 Transport Access and Affordability

Poor access to transport constrains economic and social development and contributes to poverty. Better transport services can stimulate economic activity and social improvement, leading to easier access and a virtuous circle that reduces poverty and improves the lives of poor rural residents. Improving rural people's access to essential services requires better mobility through transport infrastructure and services as well as the location, price, and quality of facilities (Starkey ed., 2002).

There are many issues faced by rural dwellers, such as:

- Long walking time to opportunities.
- Low income and high unemployment.
- Unsaved road infrastructure.
- Lack of good quality public transport services at an affordable fare.

The cost of living is a central issue in both developed and developing countries. The day-to-day travel spending, with high energy pricing, and fuel cost pushes the transport affordability issue to be a priority in transport policy space as part of the component in fighting poverty alleviation (Venter, 2011). According to StatsSA (2020), North West has the largest proportion (>50%) of persons who use taxis as the main mode of travel. However, contrary to the district level especially in the core study area involved whereby walking is the most dominant mode of transport.

3. RESEARCH METHODOLOGY

This paper used the reflective learning technique to disentangle critical gaps in the rural passenger and rural transport infrastructure in the North West Province, focusing on the case of Ngaka Modiri Molema District Municipality. The secondary data of NMMDM and National transport plans, policies, strategies, and literature were used to reflect on the status of the rural transport infrastructure and the plans set aside by the Government." Reflective Learning is a process of reflecting on all sources of knowledge that can help understand a situation, including personal sources and experience" (Fullana et al. 2016).

4. FINDINGS

4.1 Opportunities of Rural Transport in NMMDM and Importance of Social Inclusion

Transport provides people with access to opportunities, goods, and services (Goosen, 2016 Cromhout, 2016). The accessibility to transportation enhance the life opportunities of society by improving their social participation and economic status, which results in an economically productive society. Transport brings interaction within the society and enables them to participate in economic activities (be economically productive) which lead to economic growth and social development, and greatly influence society's interaction with their environment (Goosen,2016). The infrastructural adherence to Universal Design requirements on transport infrastructural construction has the potential to enhance the objective of social inclusion and flexible transport modal integrations.

Non-motorized transport continues to gain momentum within the district through the push of scholar transport objectives, the Department of Community Safety and Transport Management has managed to supply 707 bicycles to learners and 80 Animal Drawn Carts to deserving communities, statistics provided at the time of compilation of this DITP (DITP, 2019). Non-motorized transport is slowly developing considering the mode mostly used within the district which is walking. It then emphasizes the need for Non-Motorized pool investment to develop and grow the potential impact and economic benefit that NMT can bear for the society and economy.

The district has the economic potential opportunities to create jobs, and reduce poverty and inequalities that are hindering the district's growth (IDP, 2021). Transport account for R4.2 billion in the total GVA in the district municipality's economy. Which is still above what other key economic indicators are contributing, agriculture (R2.4 billion) and mining (R3.3 billion) which depends mostly on the coordination of transport networks (Cogta, 2020). Therefore, improved rural transportation and social inclusion within the district is a necessity considering the key economic drives within the district which are actively productive. Improved transport enhances access and access brings people closer to opportunities (learning, working) and facilities (Health, Education, Industries), also the improved coordination of transport has the potential to lower transport costs. Due to the shorter distance travel effect, with effective modal integration and market competitiveness.

The below table indicates a progressive indication of extending the surface road network within the district, data sourced from the Department of Public Works and Roads (DPWR). Only projects with a monetary value under total expenditure to date from previous years and an indication of several kilometers were extracted, as they do indicate the completion or/and work-in-process in monetary value, due to project phases that are accompanied by the monetary value.

Table 4: Roads that are upgrading from gravel to surface in NMMDM

Project or Programme Name	Number of Kilometers
Upgrading from gravel to surface standard of road D479 from Khunotsoana village to T-junction of N4 and Tweefontein Phase 2	27 Km
Upgrading from gravel to surface standard of road D419 from Shupingstad through villages of Kwa-ntsweng, Lekgopung to P48/1(Swartkopfontein Gate border post	31 Km
Upgrading from gravel to surface standard of road D433 from N18 to Madiba A GA Kubu through Tsunyane 16km to Manja 11km to Makouspan 7.5km	16 Km 11 Km 7.5 Km
Total Kilometres (Approximately)	>93 Km

Source: IDP (2021)

The above Table (4) indicates the extra additional surface road toward the existing Road network of Ngaka Modiri Molema District Municipality. However, the NMT is not represented within the data which reflects the possible lack of assessment of the transport infrastructural needs of the users.

Source: Boipelo Mere

Figure 6: Disaneng internal-road

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Concluding Remarks

This paper aimed to respond to the three fundamental research objectives of the study. Measuring the rural road infrastructure transport within the district in terms of access and social inclusion. The study reflected on the current infrastructure of the district and the mode that the current infrastructure dominantly caters to which is mostly motorized transport (minibus taxis and subsidy buses). The road infrastructural facilities are lacking within the districts (facilities such as restrooms at bus stops) which extends the gap among vulnerable population groups (women) and as a result, increases the gap in social inclusion.

Secondly, the rural mobility challenges in Ngaka Modiri Molema District Municipality, add to the access and mobility. The majority of the population found walking (Non-Motorized transport) as their means of transport. However, infrastructure constraints them, especially for people with disabilities as most accessible roads that move between streets and feed to other road classes are unsurfaced. Thirdly, the opportunities within the district that can be derived through improved access are full participation in economic activities as lack of access and social inclusion place people away from facilities and opportunities. Therefore, the district needs to improve its infrastructure to enhance NMT and crucially provide the infrastructure that caters to walking as a majority of the population is using walking as means of transport. Increased access can bring people opportunities. The most effective solution to the rural transport problem will involve a combination of policies and measures designed to address the wide range of constraints to access and mobility that is commonly experienced in rural areas of developing countries (Rural Transport Knowledge Base Introduction; 2001).

5.2 Recommendations

Walking is the dominant mode of transport in Africa. However, there is still a lack of safe, adequate designated walkways and a common absence of streetlights (Porter, 2020). Walking within Ngaka Modiri Molema District Municipality dominates with 75% (DITP, 2019). Therefore, there is a need for investment in providing walking lanes for pedestrians which will also include mobility for people with disability. The NMMDM needs to restructure its road infrastructure investment plan to provide mobility of access to the majority of travelers. This is crucial as Non-Motorised transport is vital in reducing negative environmental effects.

There is a need for continuous maintenance of existing infrastructure to maximize the opportunity of lowering long-term possible carrying costs. Most developed surfaced roads within NMMDM are abandoned after upgrade until they deteriorate to no value. Therefore, there is a need for continual monitoring and evaluation of the road network within Ngaka Modiri Molema District Municipality. Furthermore, to an extent the infrastructure complimentary facilities.

Furthermore, stakeholders' participation maximization is of paramount imperative, as most stakeholders are part of the process development of transport plans, and strategies without being actively involved in terms of understanding the flow of budget, budget constraints, engagements on what the users' needs are, thus they end up being compromised in the middle of the service delivery stage. "There are many stakeholders in rural transport services, with many different priorities and agendas. These stakeholders influence the provision, price, quantity, and quality of rural transport services. They should

all be included when planning and implementing transport interventions. The main players are users, operators, and regulators" (Starkey ed., 2002:2).

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