

# INTEGRATED PUBLIC TRANSPORT NETWORKS IN RURAL KWAZULU-NATAL

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## ABSTRACT

It is well known that improving mobility for rural communities can provide a better quality of life and reduce poverty. This is emphasized in the National Department of Transport's Rural Transport Strategy for South Africa, (2007) which highlights the fact that "*Rural poverty is pervasive and difficult to address. Improving mobility can reduce poverty by facilitating communities to social services and facilitate their participation in political and economic activities.*" Urbanisation does not solve all our problems with regard to job creation and poverty alleviation. Rural living provides many opportunities for individuals and communities such that they have a dignified lifestyle with the ability to support themselves through subsistence living and agriculture. A key aspect to enhancing the quality of life of rural communities is to ensure that good quality and cost-effective transport is available. This allows individuals to exploit job opportunities that are a distance away or to provide access to markets for products and services. This public transport study is being carried out in this context ensuring that the mobility needs of the people and communities in three District Municipalities in KwaZulu-Natal are met efficiently and effectively.

This paper discusses the methodology undertaken when preparing the conceptual designs for an Integrated Public Transport Network (IPTN) in three District Municipalities in KwaZulu-Natal. The outcome of which ensures that through the provision of an integrated public transport network, employment opportunities and economic growth is stimulated in rural communities.

*Key Words: Rural, Public Transport Networks, Integrated KwaZulu-Natal*

## 1. INTRODUCTION

The KwaZulu-Natal Department of Transport (KZN DoT) demonstrates their contribution of leading transport into the future through their mandate to "*maximize the contribution of transport to the economic and social development goals of our country by providing fully integrated transport operations and infrastructure.*" This mandate is, in part, being carried out within the rural districts of KwaZulu-Natal (KZN) through the development of an Integrated Public Transport Network (IPTN).

The IPTN project is unique not only in its approach to solving the challenges of rural public transport but through the integration of all levels of government. The IPTN approach integrates governmental policy with the needs of the rural communities and the status quo of the public transport services, as shown in Figure 1. The project identified that in order for a rural public transport system to be successful none of these aspects are able to stand

alone. All three components are needed to work together, in support of each other, to develop an IPTN.

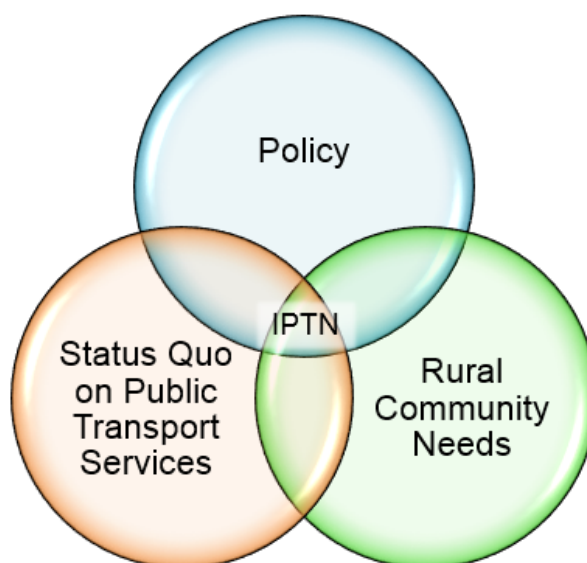


Figure 1: Integration Spheres of IPTN

## 1.1. Background

The National Department of Transport's Rural Transport Strategy for South Africa, (2007) estimated that 50% of South Africa's population live in the rural regions of the country. The Rural Transport Strategy further estimated that 72% of this portion of the population is considered to form part of the low to no income groups (Department of Transport, 2007). As a result, close to three-quarters of the rural population is public transport (PT) captive, whereby the only option to travel a lengthy distance to a desired destination is via PT. Mobility thus proves to be the foundation of social and economic development within the rural regions of South Africa. It opens doors to job opportunities, education, growth and dignified living. It is therefore key for PT to provide mobility to all rural communities of South Africa. Not only is PT required, but the service itself should be effective and efficient in order to improve service delivery.

KZN is estimated to have 54% of its population living in rural communities. These rural communities are sparsely located, leading to wide spread, low density living. This in itself poses a transport challenge in terms of reaching each community whilst still offering frequent services at an affordable cost. The geographical layout of these communities results in decentralised passenger trips. It is therefore key to understand that the access requirements vary immensely from one rural community to the next. An integrated mobility system, considering multiple modes of PT, is therefore required to provide access to the rural communities within KZN based on their specific needs.

## 1.2. Problem Statement

At present the public transport system within rural KZN relies largely on informal services or facilities and is not well integrated to function as a sustainable and equitable transport system. The result is that transport is infrequent, unscheduled and relatively expensive

(not just for the commuter, but for the state as well in terms of subsidies). The quality of the PT system is also considered to be poor with regards to comfort and safety.

### 1.3. Aim of this paper

A public transport system which caters for the specific needs of rural communities, whilst still providing an efficient and reliable service is not common in South Africa. The aim of this paper is to discuss the unique approach undertaken when preparing the conceptual designs for an IPTN in three District Municipalities (DM) in KZN, in the hope that some of these principles can assist when looking at PT in other rural areas of South Africa.

## 2. POLICY

The IPTN project presented a key challenge in terms of multi-level government engagement. The levels of government involved in the IPTN project included KZN DoT (Provincial), DMs and Local Municipalities (LM), as shown in Figure 2.

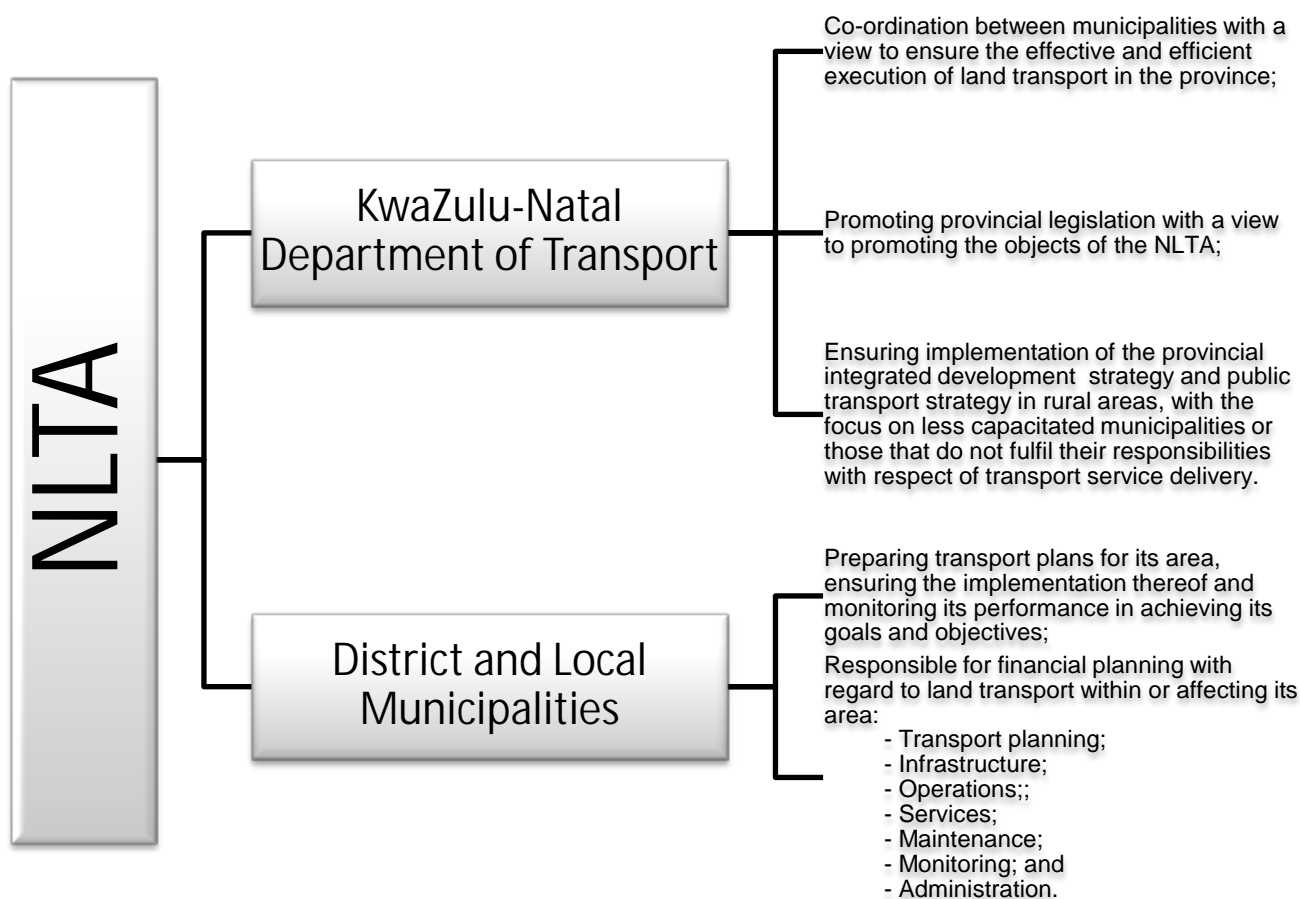


Figure 2: Spheres of Government

The National Land Transport Act, 2009 (NLTA) stipulates the responsibilities of each sphere of Government. These responsibilities are developed in such a way that the various spheres of Government are to engage with one another through the design and implementation of integrated development projects. However, it has been found that this engagement is difficult if not managed correctly.

Existing forums, such as the Rural Road Transport Forum, present opportunities for the various spheres of Government to interact by attending to the existing challenges within the rural transport system. The IPTN project was able to take this multi-sphere Government integration one step further by involving all spheres with the design process of the IPTN.

The project objectives included the conceptual design of an IPTN together with bankable business plans, showing capital expenditure, operational costs, passenger revenue and subsidy requirements, which can be used by the District Municipality to seek funding and commence implementation. It was key to establish a Project Steering Committee (PSC), involving all spheres of government, in order to integrate the input and opinions of all parties involved. The PSC created a platform, enabling the DMs and LMs to be key information providers and take ownership of the project. Once a sense of ownership has been developed, succession of responsibility has been created and the project is sure to be taken forward into implementation by the DMs and LMs. The process of handing over responsibility would also lead to skills transfer from the current project drivers to the DMs and LMs in order to ensure the technical knowledge is in place to continue with the implementation of the conceptual design. The early involvement of District and Local Government will result in a much easier hand over process of the conceptual phase from KZN DoT to the detailed design and implementation phase to the DMs.

### **3. RURAL COMMUNITY NEEDS**

As stated in the National Department of Transport's Rural Transport Strategy for South Africa, (2007), mobility improves the quality of life, leading to poverty reduction and sustainable living. The first phase of developing an IPTN involved sourcing information in order to gain a thorough understanding of the current rural PT needs within the rural communities. A demand questionnaire was designed to evaluate the current rural PT system in both a quantitative and qualitative manner. The IPTN is to be designed for the people, thus their direct input provided the design team with insight relating to the access challenges experienced in KZN rural living. The questionnaire addressed quantitative matters, including total travel time on PT, efficiency and frequency of the current rural PT system and desired destinations of trips originating from each community. The qualitative section of the questionnaire addressed factors such as safety, comfort and convenience. The communities' PT needs were further evaluated in terms of access to basic needs, namely health care, education, places of work, social and governmental services and commercial needs.

The South African Bill of Rights states that "*Everyone has the right to a basic education, including adult basic education*" and "*Everyone has the right to have access to health care services, including reproductive health care.*" Access to these needs should thus not be limited by an insufficient rural PT system. The demand questionnaire was able to categorise communities in terms of their accessibility to PT. This process resulted in identifying areas with limited to no access to PT and unpacking why this is the case. Figure 3 indicates the ranges of access to PT into which communities were categorised.

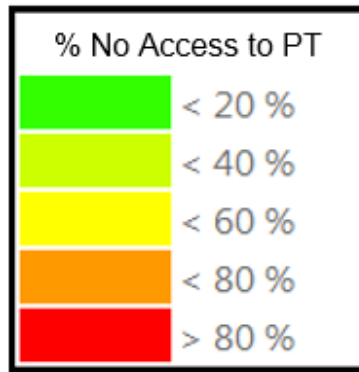


Figure 3: Legend for PT Access from KZN Rural Communities

Due to the vast range of activities occurring within the various rural communities, a general PT demand could not be assumed. As a result, the demand analysis considered all communities within each DM. A sample size of community members was interviewed in order to understand the specific PT needs of each and every community in each DM. The analysis resulted in close to 15 000 questionnaire feedbacks from over 670 communities from the three DMs in KZN.

To ensure a sense of community ownership and buy-in, the process of stakeholder engagement is critical as the design of a conceptual IPTN involves a countless number of stakeholders. Together with the various spheres of Government involved on the IPTN project a number of stakeholders were included in the PSC, namely, traditional leaders, taxi associations, subsidised bus operators and the business chamber. Engagement throughout the entire project with all stakeholders was key, both for feedback regarding the various aspects of the conceptual IPTN and buy-in of the conceptual IPTN. The success of a PT network is only measured by the number of passengers utilising the network. Stakeholder engagement was therefore used to gain support for the IPTN project from the highest level of the National Department of Transport to the local community members.

The questionnaires revealed that 21% of the community members surveyed, within the three DM's in KZN, do not have access to public transport. The surveys focused on the current access to basic needs via public transport, including health care facilities, places of education and work and the market place. The demand surveys resulted in 38% of community members not having public transport access to health care facilities, while 18% of the community members do not have access to places of education and work. A total of 22% of community members surveyed do not have access to the market place via public transport. More than 50% of the surveyed community members who indicated that they have access to public transport described the current service as infrequent and inefficient. The current public transport users make use of minibus taxis, buses and non-motorised transport. Feedback from the questionnaires indicated that the integration of these modes is currently not available, and further promoted the need for an IPTN.

#### 4. STATUS QUO OF PUBLIC TRANSPORT SERVICES

An investigation of the status quo on PT services within the rural DMs was used to better understand the existing PT system and identify areas of improvement. The districts' Current Public Transport Records (CPTR) were used for this investigation. These records included the detailed information on both PT facilities and PT routes.

A significant challenge was encountered through the process of obtaining PT information. Many sources were involved in obtaining existing data for the rural transport systems, which resulted in long waiting periods before receiving the requested data. The Geographic Information System (GIS) data for the rural regions of KZN was outdated. The GIS data was key to the analysis and design of the IPTN, therefore the data was captured on site in order to provide KZN DoT with a complete, updated GIS data set for the three DMs involved in the IPTN project.

The PT facilities are envisaged to function as key nodes for PT integration. An analysis of the CPTR was therefore conducted in order to determine the frequency of vehicles along PT routes, the PT facility utilisation and the integration capacity of PT facilities.

The geographic location of the PT routes in relation to the communities of the district was also investigated. It was key for this project to gain a thorough understanding of the distances and conditions of the current rural PT routes. These routes were therefore travelled and captured by means of Geographic Information Systems (GIS). Important features along these PT routes were also recorded. Such features included PT stops, pedestrian crossings, sidewalks, traffic calming and road signs.

Due to the sparse locations of communities, it was also important to identify the means by which the people travel to the nearest PT stop. The IPTN is to incorporate alternate modes of transport, which are currently in use in the rural communities, in order to extend the PT system further than the traditional PT modes (i.e. minibus taxis and buses). These key findings formed part of the integrated approach of the PT system.

## **5. INTEGRATED PUBLIC TRANSPORT NETWORK**

The initial design phase of an IPTN for the rural DMs of KZN requires three tasks, namely data collection, processing and analysis. Due to the project's approach aiming to survey every community within the three DMs, these tasks would require large amounts of resources and time. In order to fast track the initial phase, innovative technology was used to aid in reducing the number of resources and time spent on these tasks. The data capturing phase, consisting of rural community surveys, was conducted using electronic trimble units. These trimble units were utilised as they reduce the survey capturing time and eliminate room for human error on site.

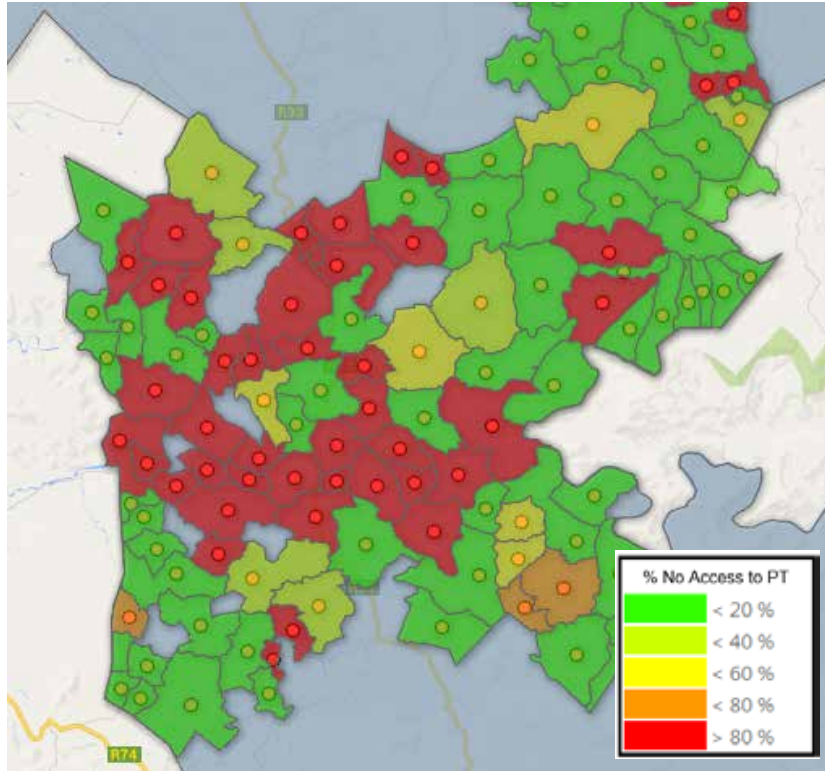


Figure 4: Access to PT displayed within Community Boundaries

Due to the large amount of data which needed to be processed and analysed for the demand and supply surveys, a web interface was developed to process and analyse all the captured data. The interface is secured by login credentials, made available to authorised persons allowing them to monitor the projects progress. The interface was also designed to provide graphical outputs which could be used in the conceptual design process, as well as feedback to stakeholders. Figure 4 illustrates the community boundaries within a DM and indicates each community’s access to public transport by means of the legend discussed in Section 3. Further qualitative aspects of the communities’ demands were displayed as dashboard reports as indicated in Figure 5.

**Question10. Please evaluate, public transport in your area : Safety of services**

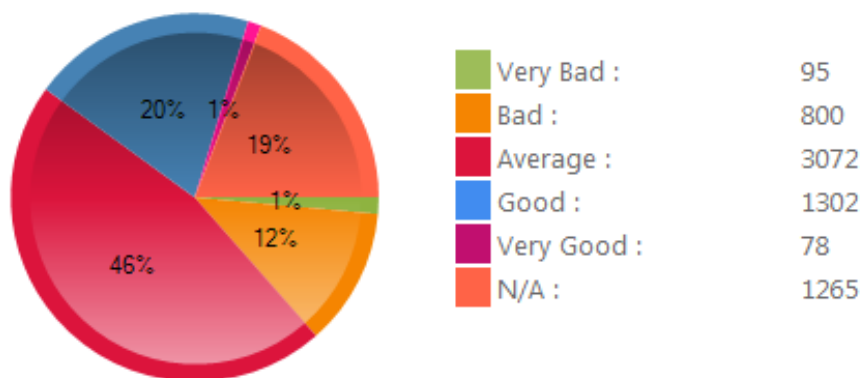


Figure 5: Dashboard Reports

The IPTN interface system is developed to enable ease of access to information for the Department and set a benchmark from which to measure the future impact of the proposed IPTN. Future analyses could therefore be used as an evaluation of the IPTN and how service delivery has improved the lives of the rural community members. The system has been developed to allow the Department to expand the conceptual designs into other DM's within KZN and into other Provinces as the need arises.

The IPTN project is driven by the integration of stakeholder engagement, needs of rural communities, PT modes, facilities and routes, the rural KZN landscape and technology, as



Figure 6: IPTN Integration Factors

shown in Figure 6. When merging the outputs of these factors, a platform for a fully integrated transport system can be developed. The IPTN is designed to address the transport needs of the rural communities by providing access to basic amenities, to promote education, social development and sustainable lifestyles. The IPTN opens up links to economic nodes, in order to boost the DMs' economic growth. Finally, the IPTN provides mobility to all.

## 6. CONCLUSION

The Integrated Public Transport Network project presented a unique opportunity to integrate rural public transport with stakeholder engagement and innovative technology. The success of a rural public transport system is only possible through the full support of all stakeholders involved, and as such stakeholder engagement is key throughout the planning, design and implementation of the project.

The holistic integrated approach to this project addressed the needs of rural communities within local and district municipalities and unlocked access to social development and economic growth opportunities, thus ensuring a brighter future for all.



## **7. RECOMMENDATIONS**

In order for the IPTN to be implemented successfully, continuous stakeholder engagement with community members, District and Local Municipalities and Provincial Authorities is recommended throughout the detailed design and implementation phases. It is further recommended that the IPTN should focus on providing a public transport service which the community members will want to use and incorporate into their daily lives.

A detailed survey of available public transport, together with community requirements is recommended for studies in similar areas to ensure that gaps in the availability of public transport, matched with community needs can be identified and resolved.

## **8. BIBLIOGRAPHY**

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