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CURRENT PUBLIC TRANSPORT RECORD: PHASE 2

Issue

December 2004

ARUP
PARUK CONSULTING
Joint Venture

ArupTransportPlanning

Umkhanyakude District Municipality

Current Public Transport Record

PHASE 2

ArupTransportPlanning

Umkhanyakude District Municipality

Current Public Transport Record: Phase 2

December 2004

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1. INTRODUCTION

This report presents the status quo of public transport services and operations within the Umkhanyakude District. The Current Public Transport Record (CPTR): Phase 2 follows the completion of the Facility Inventory Phase of the CPTR and has been based on guidelines provided as part of the tender phase and terms of reference. The National Land Transport Transition Act, Act 22 of 2000 requires that every planning authority within South Africa prepare a record of public transport facilities and operation in their area of jurisdiction.

The report provides information on the methodology followed in completing the project, and report back on the modes operating in the area, the extent of public transport services that is provided, the routes being used and service capacity utilisation.

1.1 Background

Arup SA (Pty) Ltd and Paruk Consulting Joint Venture were appointed on 9 January 2004, by the Umkhanyakude District Municipality to carry out a Current Public Transport Record (CPTR): Phase 2 for the whole Umkhanyakude District Municipality area including all the local municipalities.

1.1.1 Extent of the Study Area

Umkhanyakude District (DC27) is situated in the north-eastern part of KwaZulu Natal, extending from the Mfolozi River to the south up to the Mozambique border in the north and being bonded on the east by the Greater St Lucia Wetland Park, which encompasses the entire coastline onto the Indian Ocean. Umkhanyakude encompasses the hole of the former Uphongolo Sub region and part of the Imfolozi Sub region.

The District Municipality is a newly formed entity in terms of the recent Demarcation process and incorporates some of the poorest and most underdeveloped regions of KwaZulu Natal. The Umkhanyakude district comprises the following local municipalities as shown in **Figure 1.1**. These local municipal areas include:

KZ271 - uMhlabuyalingana Municipality,
KZ272 - Jozini Municipality,
KZ273 - The Big Five False Bay Municipality,
KZ274 - Hlabisa Municipality,
KZ275 - Mtubatuba Municipality, and
ZDMA - Encompassing Major Game Reserves and Greater St Lucia Wetland Park

1.1.2 Demographic Information on Local Municipalities

According to the Umkhanyakude Integrated Development Plan (IDP) of August 2002, an estimated 503 874 people live within the district. Some 88% of the population resides in the three local municipal areas of Hlabisa (34%), Jozini (30%) and uMhlabuyalingana (24%). **Table 1.1** shows the demographic information for Umkhanyakude district as given by the IDP.

1.2 Modes of Public Transport

According the Umkhanyakude District Municipality the following modes of public transport are present and was included in this report:

- Minibus-Taxi,
- Bus, and
- Bakkie and 4+1.

Figure 1.1: Umkhanyakude District Municipality with five Local Municipalities

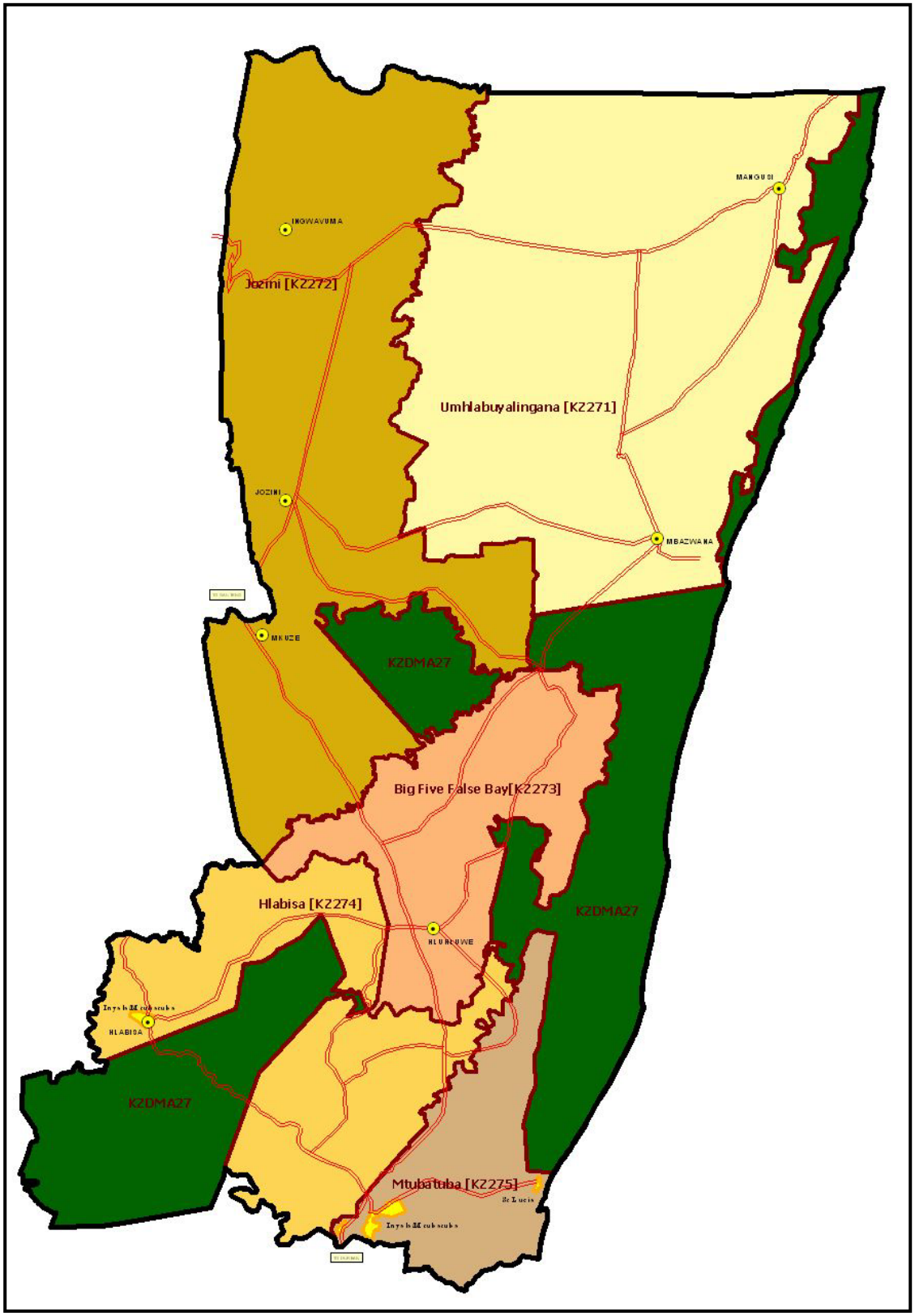


Table 1.1: Demographic Information per Local Municipality

Basic Facts	Figures
Total population	503 874
Total population of DC27 per KZ area	KZ 271 – 24% (120 929) KZ 272 – 30% (151 162) KZ 273 – 5% (25 174) KZ 274 – 34% (171 317) KZ 275 – 5% (25 198) KZDMA27 – 2% (10 094)
Age profile	<19 – 57% 20-65 – 38.8% >65 - 4.2%
Gender profile	Male – 46% Female – 54%
Unemployment (%of income earning population)	53.7%
Household Income (% of income less than R1500 / month)	81%

(Source – Umkhanyakude District Municipality: Integrated Development Plan, August 2002)

1.3 Objective

The objective of this report is to provide a record of public transport services, routes, facilities and infrastructure, which will form the basis for the development of the Public Transport Plan (PTP) for the Umkhanyakude District Municipality. The CPTR and subsequent future updates of the CPTR will also be used for performance monitoring of the public transport service provided within the area and to provide the District Municipality and Local Municipalities with a management and decision making tool.

1.4 Scope of Work

This study meets the basic requirements of the guidelines for conducting the first CPTR for Umkhanyakude, which were developed by National Department of Transport (NDOT) and amended by KwaZulu Natal Department of Transport (KZNDOT) to comply with the unique circumstances within Umkhanyakude and KwaZulu Natal.

The scope of work includes the conducting of surveys at all public transport facilities, formal and informal, among both passengers as well as public transport providers. More detail discussion on the methodology will follow in Chapter 3 of this report.

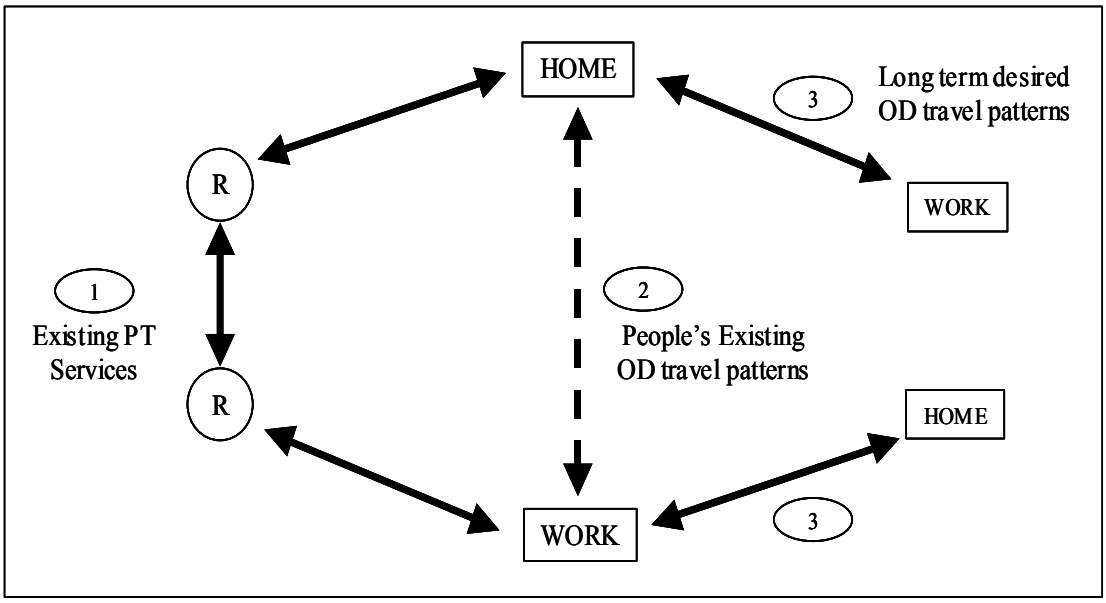
The following general surveys were conducted to gather the required information to prepare the CPTR and to provide input to the Public Transport Plan:

- Passenger Origin – Destination Surveys,
- Vehicle Registration, Destination and Utilisation Surveys, and
- Passenger Waiting Time Surveys.

1.5 Project Approach

The KZNDOT have chosen a planning approach as opposed to a data driven approach suggested by NDOT guidelines. This amendment to the National Department of Transport guidelines required a different approach to preparing the CPTR compared to other similar studies within the Province. **Diagram 1.1** below illustrates the approach proposed by the KZNDOT.

Diagram 1.1: KZNDOT Proposed Three Part Project Approach



Source: KZNDOT – Brief to Compile Current Public Transport Record

1.6 Chapter Overview

The report is divided into four chapters and can be summarised as follows:

Chapter 1: Introduction

This chapter focuses on general information regarding Umkhanyakude District Municipality, the objective of the study, the scope of work done and the study approach.

Chapter 2: Methodology

The Methodology chapter reviews the terms of reference and provides a description of the methodology followed and also focuses on problems identified during the execution of the project.

Chapter 3: General Information

Chapter three provides general information of the modes of transport used, the facilities etc. within Umkhanyakude District Municipality.

Chapters 4 – 6: Results

Chapter four to seven provide detail information on the modes of public transport used within Umkhanyakude and also provides a summary of existing infrastructure and facilities. This summary is based on the Facility Inventory Phase, which preceded this report.

Chapter 7: Summary and Conclusion

This chapter of the report provides a short summary and conclusion on the findings of the study.

Chapter 8: Approval

The final chapter of the report allows for the approval of the CPTR document by Umkhanyakude.

2. METHODOLOGY

This section of the report provides an overview of the methodology followed during the study. The project was divided into four integrated stages. The first stage focussed on the involvement all the stakeholders through a consultation and public liaison process. The second stage included the development of survey forms, survey methodology and the recruiting and training of temporary personnel to assist with surveys. The third stage of the project focussed on the gathering (surveys), capturing and GIS conversion of public transport information. The final stage of the process is reporting to the client on the finding of the surveys.

The section further considers the terms of reference and provides a more detailed discussion on the methodology. Problems encountered during the project have also been listed and discussed as part of this section of the report.

2.1 Review of Terms of Reference

The Terms of Reference received from Umkhanyakude District Municipality clearly describes the KwaZulu Department of Transport approach to provide a provincial framework for the implementation of the package of plans in a practical and consistent manner for all District Municipalities. Consultants have been appointed to assist with:

- "an analysis of planning requirements for current transport plans, an operating licence strategy, public transport plans and rationalisation strategy in terms of the National Land Transport Transition Act, 2000 and assessment of these requirements in terms of other existing or concurrent national and provincial legislation;"
- "a determination of the practical provincial and municipal implementation of planning requirements, including but not limited to the utilisation of planning in the delivery of the Local Road Transportation Board /Public Transport Board ; and ".
- "an investigation into the most cost-effective data collection and modelling methodologies to assist the Department with the practical implementation of planning requirements and development of an operating licensing strategy".

The tasks to be completed as part of the CPTR: Phase 2 has been identified as follows:

- Estimation of survey requirements,
- Development of detailed survey methodology and survey analysis,
- Estimated cost for conducting surveys,
- Briefing and training data surveyors,
- Data collection and supervision,
- Data capture and data conversion to GIS, and
- Collation of data and reporting to the District Municipality.

2.2 Description of Methodology

Given the NDOT guidelines and the amended Provincial guidelines for preparing the CPTR the Joint Venture set out to prepare a methodology to firstly collect all desired public transport information and secondly to disseminate and present the data to the Umkhanyakude District Municipality. The collection of data include the following:

- Data collection points,
- Types of Data to be collected,
- Procurement of surveyors,
- Survey forms, and
- Data collection periods.

2.2.1 Data collection points

Collection of public transport information should be done at all facilities identified through CPTR Phase 1: Facility Inventory. As mentioned earlier in the report Umkhanyakude District Municipality covers the five local municipal areas of Mtubatuba, Hlabisa, Big 5 False Bay, Jozini and uMhlabuyalingana.

There are 19 minibus-taxi ranks, 2 bus ranks and 1 minibus-taxi stop within the Umkhanyakude area. There are 6 formal public transport facilities, which are municipally owned, and 4 privately owned facilities. Bakkie and 4+1 transport does not operate from separate ranks but make use of existing minibus-taxi facilities within the different municipal areas.

2.2.2 Data to be Collected

The data to be collected should provide information on the following issues:

Vehicle Departures from Facilities:

- Passenger capacity to each destination by time period,
- Number of vehicles used to provide above capacity,
- Passenger numbers transported to each destination per time period,
- Utilisation of available passenger capacity.

Sample of Destinations:

- Average waiting time per period,
- Origin – Destination of Passenger,
- Passenger Trip purpose.

Vehicle and Passenger departures:

- Estimated occupancy,
- Association or bus company,
- Destination
- Single fare to destination
- Departure time of vehicle.

2.2.3 Procurement of Surveyors

Each local authority was requested to identify suitable persons from within the community to assist with the collection of data at the different public transport facilities. In this way certain members of the community could be empowered and money from the project would also reach the community.

2.2.4 Survey forms

Sample survey forms used on other CPTR projects were reviewed and amended where necessary. These survey forms were used then in Umkhanyakude. Slight changes to these survey forms were introduced to allow for easy capturing of public transport information.

2.2.5 Data collection periods

The collection of public transport information was limited to normal weekdays (i.e. Tuesday, Wednesday and Thursday) so as to avoid the effects of weekend commuting. The survey periods were split into ranks serving a trip production (usually residential areas) and trip attraction (usually work, shopping education etc) ranks. For trip production ranks surveys were conducted between 06:00 and 14:00 and for trip attraction ranks between 12:00 and 18:00.

2.3 Problems Identified

The problems experienced during the collection of public transport data included the lack of cooperation from several Minibus-Taxi Associations. The reason for this is a poor communication between the Minibus-Taxi Council and the Minibus-Taxi Associations. The delay in collecting the data at facilities in the Mtubatuba and Hlabisa areas resulted in the delay in preparing the report and completion of the project within the given time schedule. In general information sessions were held with representatives of most Minibus-taxi Associations to inform all stakeholders, drivers included, of the process of collecting data from both drivers and passengers.

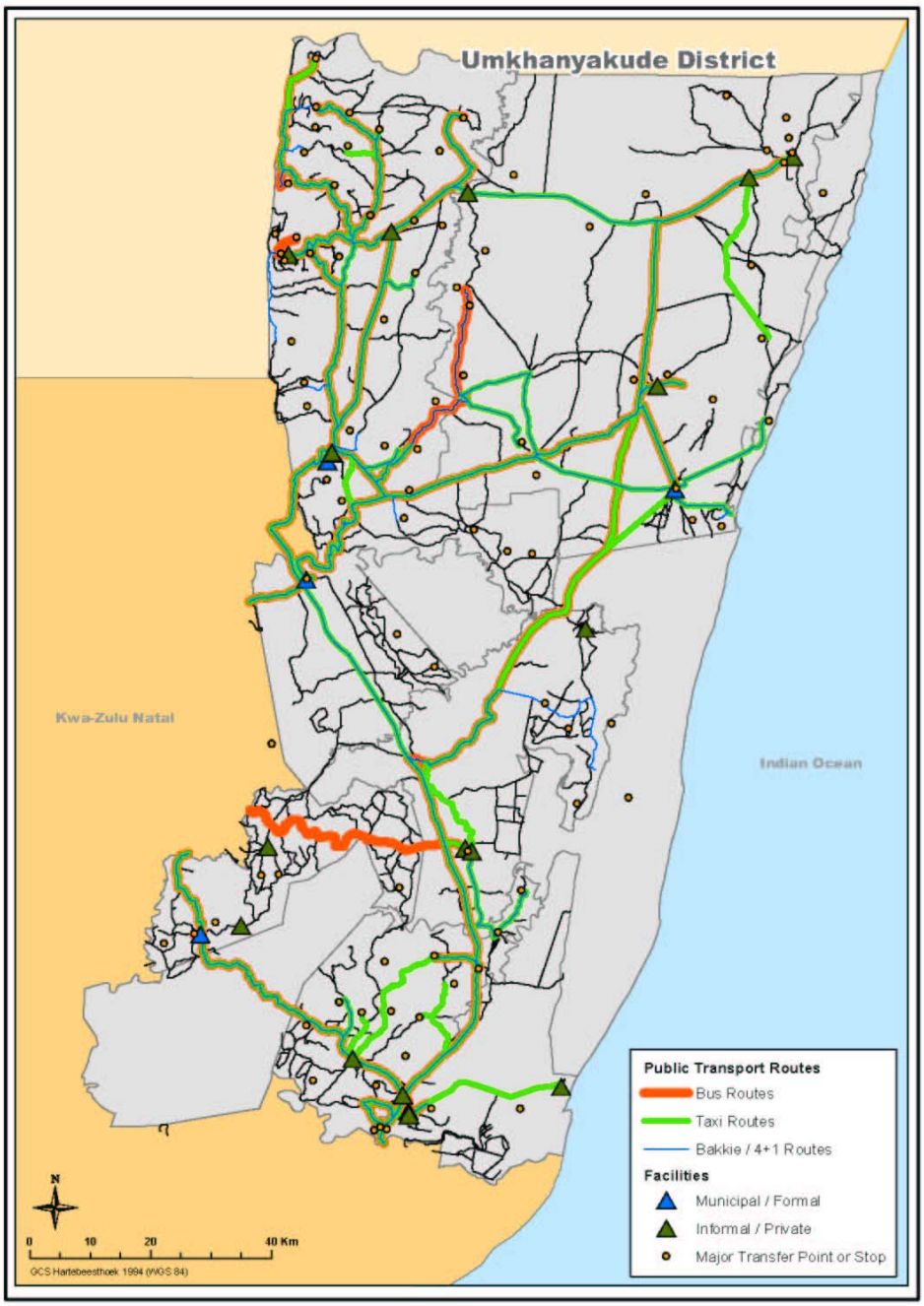
At first minibus-taxi drivers were not keen to allow surveyors to write down the vehicle registration numbers in fear of the consultants providing traffic officials with this information and possible law enforcement actions against them. This was overcome by explaining to these drivers that the information would firstly be treated as confidential and that the information would not be used for law enforcement actions. Information still needs to be collected at Mtubatuba Main Minibus-Taxi Rank as well as Hlabisa Minibus-Taxi Rank.

3. GENERAL

3.1 Description of the Area

Figure 3.1 below shows the extent of the study area comprising the following local municipalities and also provides information on the public transport routes travelled and major public transport nodes.

Figure 3.1: Study area showing Public Transport routes and ranks

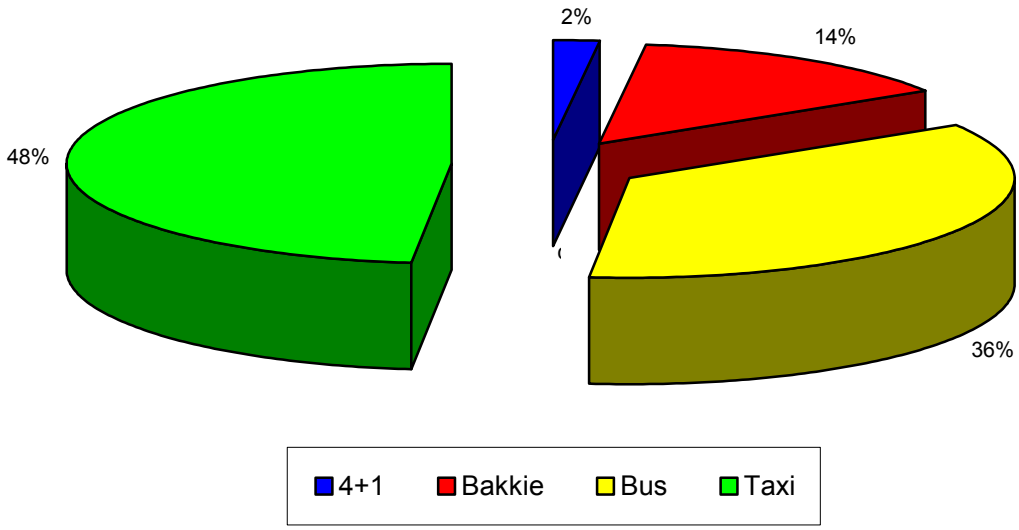


3.2 Transport Modes Serving the Area

As mentioned earlier in the report, public transport within Umkhanyakude District Municipality, are provided by Minibus-Taxis, Buses and Bakkie and 4+1. The modal split can be determined using the number of vehicles or vehicle trips used to provide the required service or the number of passengers transported per mode. For the purposes of the report the distribution was based on the number of passenger trips and not the number of vehicle trips.

Figure 3.2 represent the modes of transport based on person trips for the Umkhanyakude area.

Figure 3.2: Person Trips according to public transport mode



3.3 General Trip Purpose Information

The purpose as trips within Umkhanyakude was done as part of the Origin-Destination surveys conducted amongst the passengers utilising public transport service. Each passenger interviewed was asked the purpose of the trip. The results of the surveys are shown in **Figure 3.3**.

The majority of passengers within the urban areas of Umkhanyakude, such as Mtubatuba, Hluhluwe, Mkuze and Manguzi, indicated that their trip purpose is work and home related. The rural areas on the other hand showed that shopping and social trips were the main trip purpose.

3.4 Inventory of Existing Infrastructure

3.4.1 Public Transport Termini

There are 19 minibus-taxi ranks, 2 bus ranks and 1 minibus-taxi and bus rank combined within the Umkhanyakude area.

This section of the report is an extract from the Facility Inventory Report and provides a record of all the public transport facilities in the Umkhanyakude area. The tables are divided into the five local municipal areas respectively.

Figure 3.3: Public Transport Trip Purpose

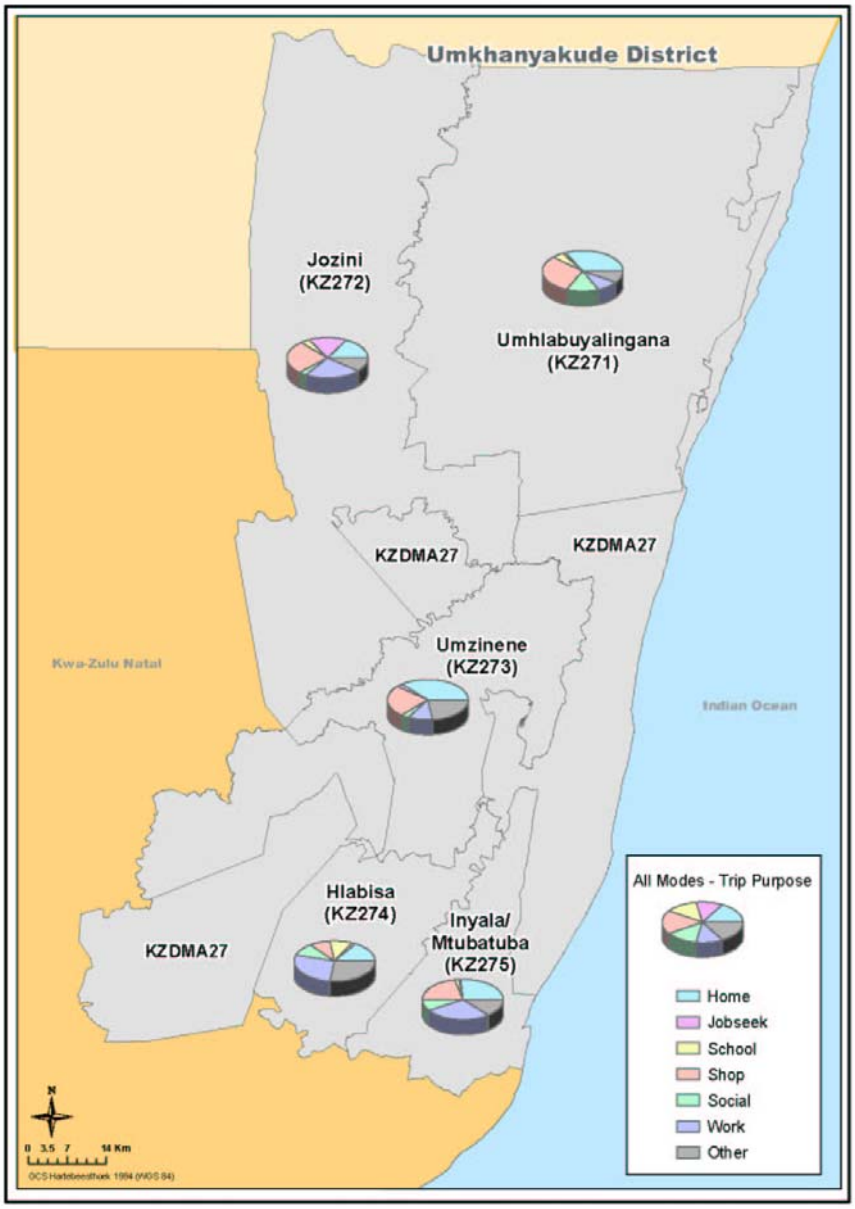


Table 3.1 in Appendix A provides a list of all the facilities, the physical location as well as the type of service provide at each facility. **Table 3.2 in Appendix A** provides a description of the facilities for the different modes of public transport.

3.4.2 Route Coding

The process of coding was a very time consuming process, since each route needs to be drawn on a map first, based on the route description information received from the minibus-taxi and bus surveys.

The required coding system further involved the numbering of each route travelled separately by minibus-taxis and buses and this highlighted duplication of routes used by both minibus-taxis and buses.

The information deemed important for the route coding is as follows:

- Province of origin – digit 1 (KwaZulu Natal = K)
- Planning area or District Municipality – digit 2 (Umkhanyakude = UK)
- Route number – digits 3-6 (3001) Starting with any number with an increment of one for successive numbers
- Direction of the route – digit 7 (Both directions = B)
- Route operated within one area – digit 8 (E = External and I = Internal)
- Operator on the route – digit 9 (T = Mkuze Bus Service)
- Mode of Transport used – digit 10 (B = Bus)
- Example: KUK3042BI-**AB** (AB = Detail Operator Code as shown in **Table 3.1**)

Table 3.1: Operator Codes and Names

Operator Code	Operator / Association	Vehicle Type
BCT	Bara City Association	Taxi
BHT	Bhambanana Taxi Association	Taxi
BNT	Bonjeni Taxi Association	Bakkie
BLB	Bulile Transport	Bus
DBT	Durban Taxi Association	Taxi
EBT	Ebovini Taxi Association	Taxi
EGT	Egujini Bakkie Association	Bakkie
EMT	EMachibini Association City Taxi Association	Taxi
EPT	Empangeni Association	Taxi
GHB	Gina Bus Service	Bus
GJT	Gunjaneni Taxi Association	Taxi
GWB	Gwaliweni Busses	Bus
HLT	Hlabisa Association	Taxi
HWT	Hluhluwe Taxi Association	Taxi
KWT	Ikwezi Taxi Association	Taxi
IGT	Ingwavuma Association	Taxi
JKB	Jakuze Busses	Bus
JHT	Johannesburg Taxi Association	Taxi
JZT	Jozini Association	Taxi
KWB	Kwajobe Busses	Bus
KGB	Kwangutshana Busses	Bus
KNT	Kwangwanase Taxi Association	Taxi
MCT	Machibini Association	Taxi
MDT	Madwaleni	Taxi
MGT	Magugu	Bakkie
MJT	Majwayiza	Bakkie
MNB	Manaba	Bus
MZT	Manguzi	Taxi
MYT	Manyiseni	Bakkie
MWB	Manzigwenja	Bus
MST	Masibambisane	Taxi
MTT	Mathayini	4+1
MET	Mbadleni	Taxi
MBT	Mbazwana	Taxi
MOT	Mboma	Bakkie
MOB	Mboza	Bus
MKB	Mkhuze	Bus
MKT	Mkhuze	Taxi
MNB	MNO	Bus
MMT	Mombeni	Bakkie
MIT	Mseleni	Taxi
TET	Mthonjeni	Bakkie
MUB	Mtubatuba Taxi Association	Bus
MUT	Mtubatuba Taxi Association	Taxi
NDB	Ndumo	Bus
NDT	Ndumo	Taxi
NGB	Ngolotshe	Bus
NGT	Ngumo	Bakkie
NAT	Nkandla	Taxi
NKT	Nkondibe	4+1
NDB	Nkondosini	Bakkie
NIT	Nkungwini	4+1
NMT	Nomathiya	Taxi

Operator Code	Operator / Association	Vehicle Type
NOT	Nongoma	Taxi
NST	Nsumo	Bakkie
NTT	Ntabayengwe	Bakkie
NYT	Nyamane	Bakkie
OPT	Ophande	Bakkie
OHT	Ophondweni City	Taxi
PBB	P/Bak Association	Bakkie
PHT	Phongola	Taxi
RNB	Ronnies	Bus
SST	Sheshi	Bakkie
SWT	Showe	Taxi
SCT	Sicelosethu	Bakkie
SGT	Sihlangwini Association	Taxi
SHT	Skhemelele	Taxi
SKT	Somkele	Taxi
GOB	Taxi-Ngwanase Owners Assoc.	Bus
TKT	Thekwini	Bakkie
THT	Tshaneni	Bakkie
UBT	Ubombo	4+1
UBT	Ubombo	Bakkie
ZMB	Zungu Motor Service	Bus

The information deemed important for the facility coding is as follows:

- Province of origin – digit 1 (KwaZulu Natal = K)
- Planning area or District Municipality – digit 2-3 (Umkhanyakude = UK)
- Type of facility – digits – 4-5 (TR = Minibus Taxi Rank)
- Number of the facility – digits 6-7 (05 = Mkuze Taxi Rank)
- Example: KUKTR05

The information deemed important for the minibus-taxi and bus stop coding is as follows:

- Province of origin – digit 1 (KwaZulu Natal = K)
- Planning area or District Municipality – digit 2 (Umkhanyakude = UK)
- Number of the facility – digits 3-6 (0034 = Checkers Bus Stop)
- Example: KUK0034

3.4.3 Route Description

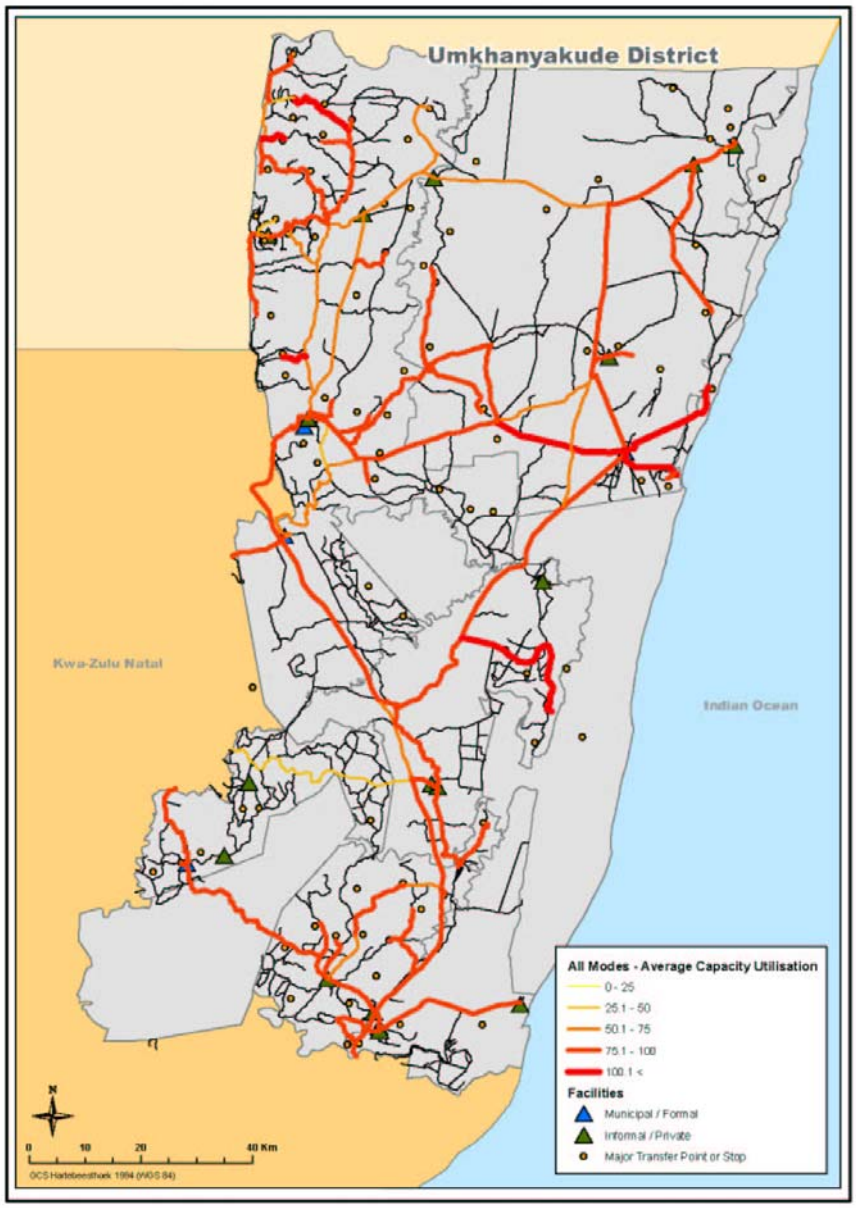
The grammatical description of routes for the purposes of the report only describes the major roads covered by the specific route. In other words the route description indicates the destination via a certain road. Further route details are available on the GIS and can be shown on a detailed map of the area if required.

3.4.4 Capacity Utilisation of Routes

Figure 3.4 shows the average Capacity Utilisation for all modes of transport. This includes Bus, Taxi and Bakkie and 4+1. From the surveys it is clear that the Public Transport Service is operating at an average of 80% of its capacity during the peak hours.

Section 4 of the report provides a detailed discussion and assessment of each mode of transport. The results of the surveys are also shown according to AM and PM **peak** periods. The AM peak period is between 07:00 and 08:00 while the PM peak period is between 16:00 and 17:00.

Figure 3.4: All Modes of Transport – Average Daily Capacity Utilisation



4. RESULTS - MINIBUS TAXIS

4.1 Route Description

Table 4.1 shows the different destinations served. The detailed route description is shown in **Table 4.2 in Appendix A** and was determined through discussions with Minibus-Taxi Associations or based on the shortest route between an origin and destination measured by the GIS. The exact route description has not been verified as part of this study.

Table 4.1: Destinations served according to Public Transport Operators

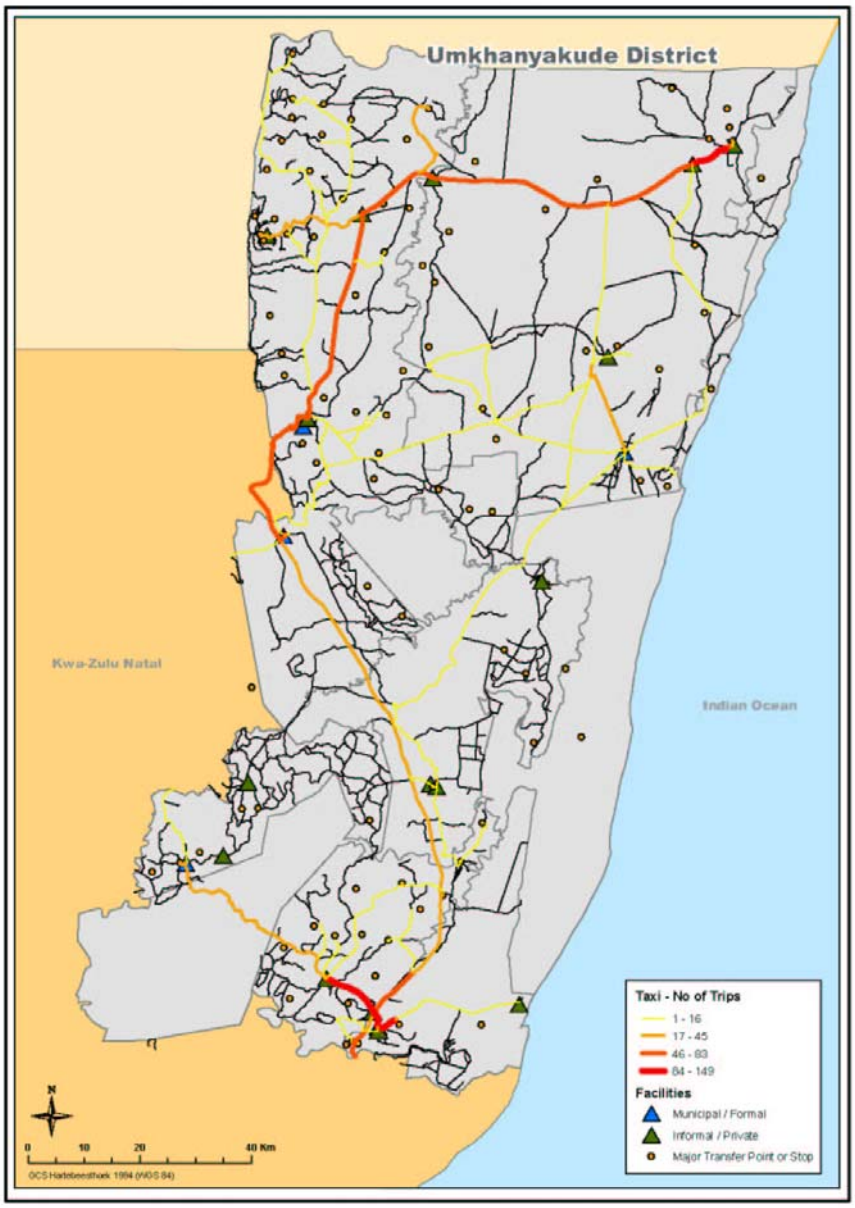
No.	Facility Name	Mode	Destination
KZ271 – Umhlabuyalingana Municipality			
1	Manguzi Taxi Rank	Minibus-Taxi	Johannesburg Durban Empangeni Jozini Skhemelele Mbazwana Hluhluwe Border Post
2	Mbazwana Taxi Rank	Minibus-Taxi	Sodwana Bay Mseleni Hospital Tshongwe Mazigonvu Mnhanwnkosi Hluhluwe Empangeni Durban Johannesburg
3	Mseleni Informal Taxi Rank	Minibus- Taxi and Bakkie and 4+1	Mbazwana
4	Thengane Informal Taxi Rank	Minibus- Taxi	Kwangwanase
5	Skhemelele Informal Taxi Rank	Minibus-Taxi	Johannesburg Durban Empangeni Jozini Kwangwanase Mbazwana Hluhluwe
KZ 272 – Jozini Municipality			
6	Jozini Taxi Rank	Minibus-Taxi, Bus and Bakkie and 4+1	Mkuze Pongola Vryheid Empangeni Durban Johannesburg Ingwavuma Kwangwanase Bhambanana
7	Bhambanana Informal Taxi Rank	Minibus-Taxi	Jozini Mkuze Kwangwanase Ndumo Pongola Durban Johannesburg Nkungwini Mbadleni Manyiseni

No.	Facility Name	Mode	Destination
8	Ingwavuma Taxi Rank	Minibus-Taxi	Mbadleni Ngwaluweni Kwangwanase Mkuze Manyiseni
9	Mkuze Taxi Rank	Minibus-Taxi	Johannesburg Durban Empangeni Mtubatuba Hluhluwe Pongola Vryheid Nongoma Ingwavuma Jozini Ubombu Bhambanana Ndumo Welkom/BFN Klerksdorp
10	Mkuze Bus Rank	Bus	Ubombu Jozini Ingwavuma Pongola Malobeni Empangeni Durban Kwanganase Mseleni Ndumo Nkangala Nyawoshana Phelindaba Mbazwana Makhathini Flats Mboza Bhambanana Manzengwenya
KZ 273 – Big Five False Bay Municipality			
11	Hluhluwe Taxi Rank	Minibus-Taxi and Bakkie and 4+1	Hlabisa Empangeni Durban Johannesburg Mkuze Mbazwana Mtubatuba Esibayeni Kwamduku Nibela Mnqobokazi Nkundusi Makhowe Emthekwini Mfekati Nomrondo
12	Huhluwe Informal Taxi Rank	Minibus-Taxi	Hluhluwe local
13	Ubuhlebuyeza Informal Taxi Rank	Minibus-Taxi	Hluhluwe

KZ – 274 Hlabisa Municipality			
14	Hlabisa Taxi Rank	Minibus-Taxi	Durban Mtubatuba Nongoma Empangeni Mpembeni Mhlwathi Hluhluwe Local Mansiya Nhlahleni Hlambanyathi Qunwane Estezi Bhaxedine Myaneni Sundwini Mgangatho Mpelenyane Mabhokisini Machibini Zibayeni
15	Mpembeni Informal Taxi Rank	Minibus-Taxi	Hlabisa Hluhluwe
16	Mhlwathi Informal Taxi Rank	Minibus-Taxi	Hlabisa Hluhluwe
17	Nkodibe Informal Taxi Rank	Minibus-Taxi	Somkele Hlabisa Mtubatuba
18	Somkele Informal Taxi Rank	Minibus-Taxi	Hlabisa Mtubatuba
KZ 275 – Mtubatuba Municipality			
19	Mtubatuba Taxi City	Minibus-Taxi	Durban Empangeni Dukuduku Monzi St Lucia Khula Village Mandini Gauteng Kwangwanase Mbazwana Hluhluwe Hlabisa Jozini Pongola Ermelo/Piet Retief Ulundi/Melmoth/Eshowe Newcastle/Vryheid/Utrecht Volksrust/Standerton Phaphasi Manandi Kwamazala Nkolokotho Mgasela Shikishela Bongumusa Ndumbeni Mxhakweni Chwebeni
20	Mtubatuba Bus Rank	Bus	Empangeni Nseleni Nongoma Hlabisa Esibayeni
21	St Lucia Taxi Stop	Minibus-Taxi	Mtubatuba Monzi Khula Village Dukuduku

Figure 4.1 shows the Minibus-Taxi trips per route within Umkhanyakude

Figure 4.1: Number of Minibus-Taxi Trips per Route



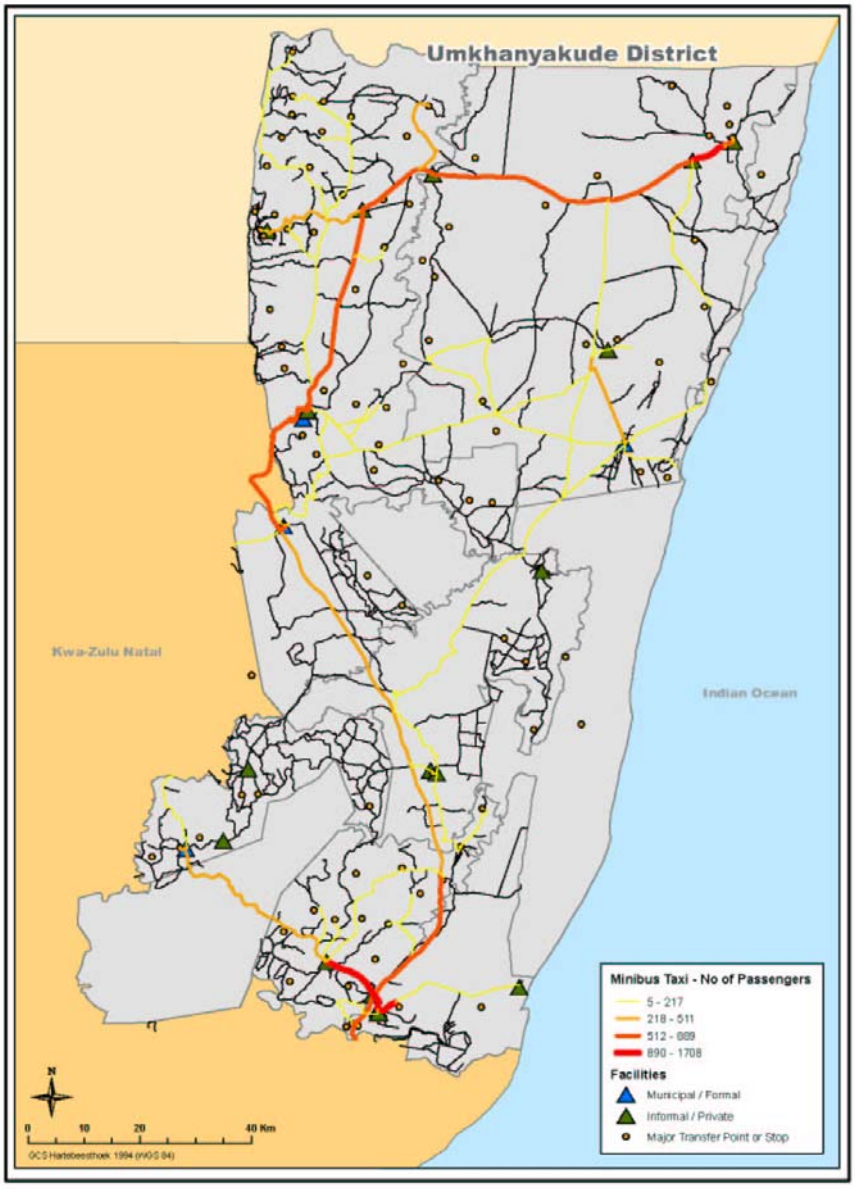
4.2 Passengers and Trips

The results of the minibus-taxi survey showed that 8393 passengers are transported per day by minibus, which equates to an average of 11 passengers per taxi. The majority of trips take place around Mtubatuba area, along the N2 towards Mkuze and around Jozini and Manguzi.

The surveys further showed that 60% of all minibus-taxis surveyed only make one trip per day. The maximum trips made by a single taxi were 18 for the 6-hour duration of the surveys. The distribution of minibus-taxi passengers for the different regions is shown in **Figure 4.2,** generated from the GIS. The majority of passengers are transported in the along the major

surfaced roads around Mtubatuba, Jozini and Manguzi regions with lesser passenger transport in the more rural areas.

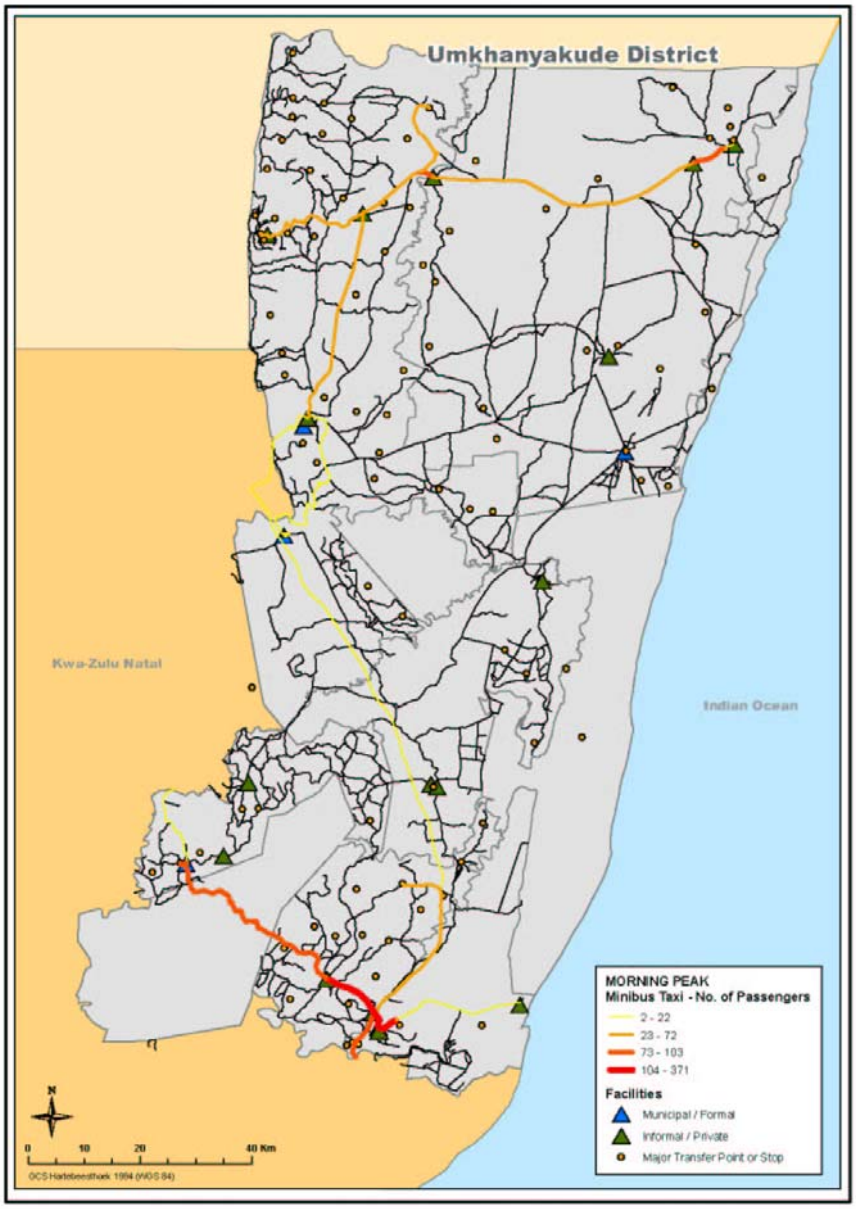
Figure 4.2: Minibus-taxi – Number of passengers - All day



An Origin – Destination matrix has also been prepared in addition to the figures below and is shown in **Appendix D** of the report. This O-D matrix is based on the trip purpose of House-Base-Work (HBW) showing all origins and destinations with house as origin purpose and work as destination purpose.

Figure 4.3 and Figure 4.4 show the AM Peak period (06:00 to 09:00) and PM Peak period (15:00 to 18:00) passenger volumes according to the surveys respectively. The majority of passengers travel between Mtubatuba and Hlabisa and around Manguzi.

Figure 4.3: AM Peak – Minibus-Taxi passengers



The route with the highest number of passengers is between Mtubatuba and Hlabisa , and is evident for all peak periods that were analysed. During the AM peak period some 1331 passengers travel by Minibus-Taxi within Umkhanyakude and 1222 passengers travel within the PM peak period by Minibus-Taxi.

Figure 4.4 representing the PM peak period also shows the same tendency as that of the AM peak, with less than 80 passengers in the rural areas and more than 700 passengers per route in urban areas.

Figure 4.4: PM Peak – Minibus-Taxi

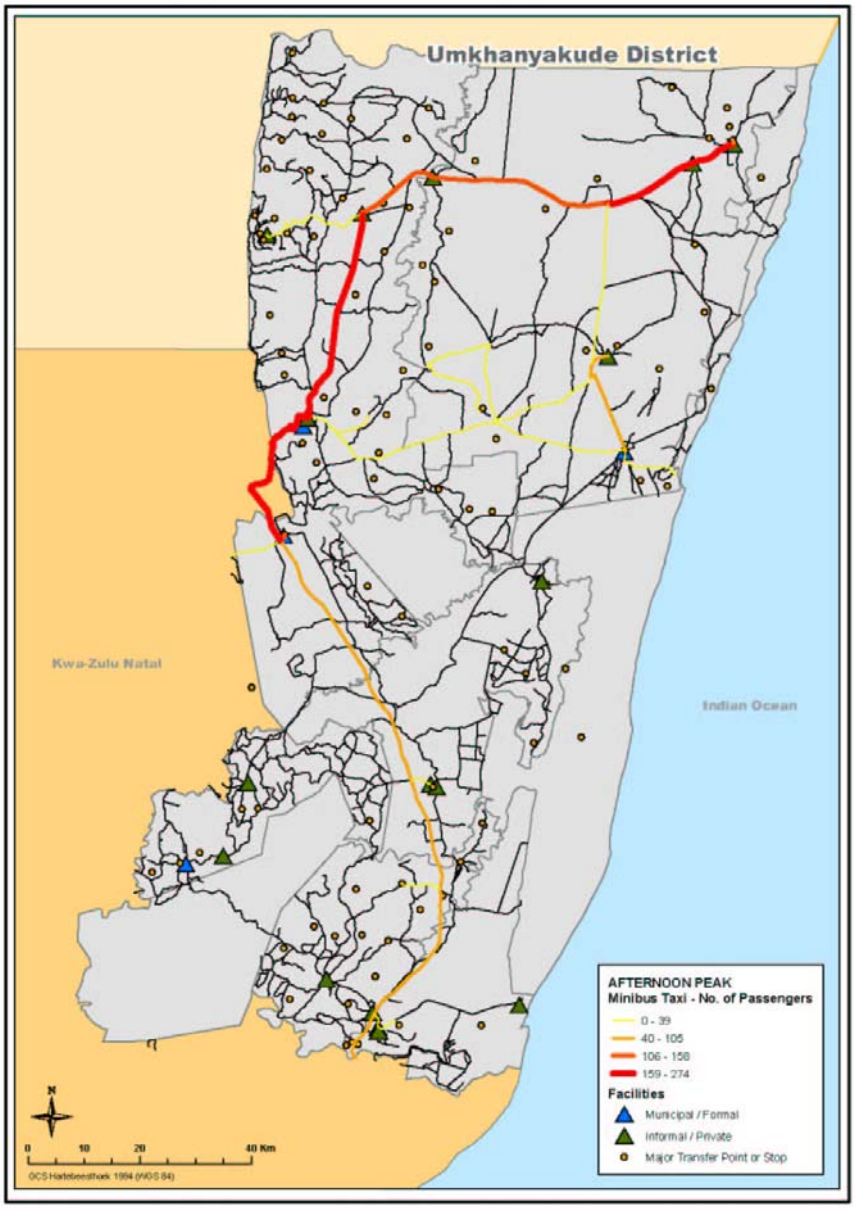


Figure 4.5 and **Figure 4.6** shows the results of the minibus-taxi surveys for each rank for passenger trips per minibus-taxi per rank/termini and the number of vehicle trips per rank respectively. From the figures it is clear that the highest number of passengers are transported from Manguzi. Thengane also shows high passenger volumes. It is however important to mention that the high volumes for Thengane is because the surveys were done during the AM peak period and therefore represents passengers going to areas such as Manguzi. The high passenger volumes at Manguzi were surveyed during the PM peak period and thus represents passengers leaving Manguzi.

Figure 4.5: Minibus-taxi passenger trips per rank

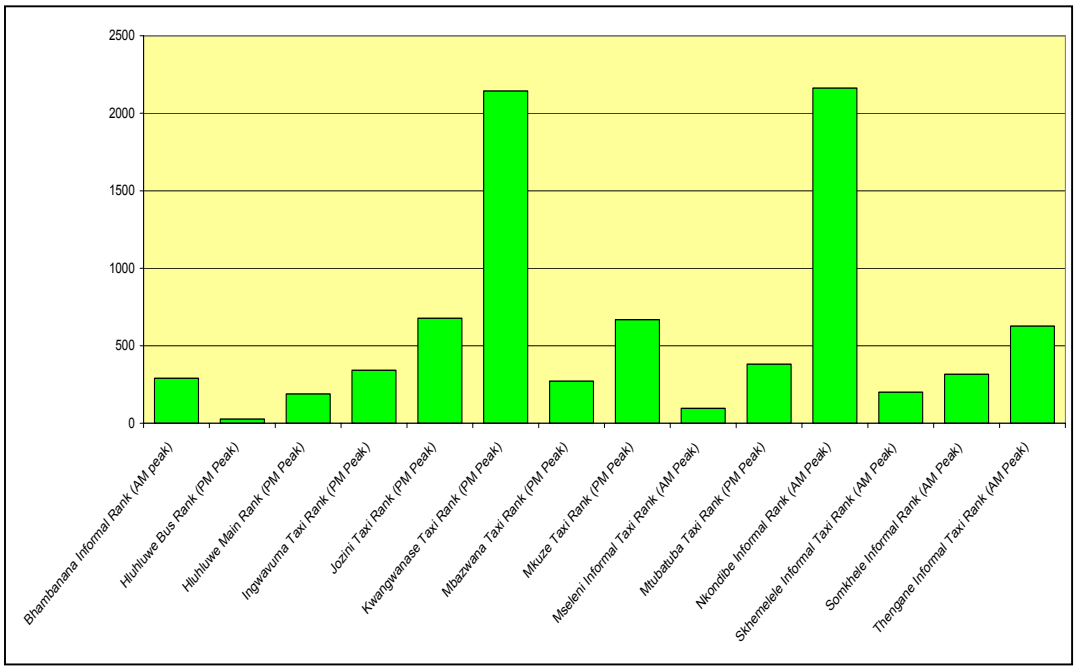
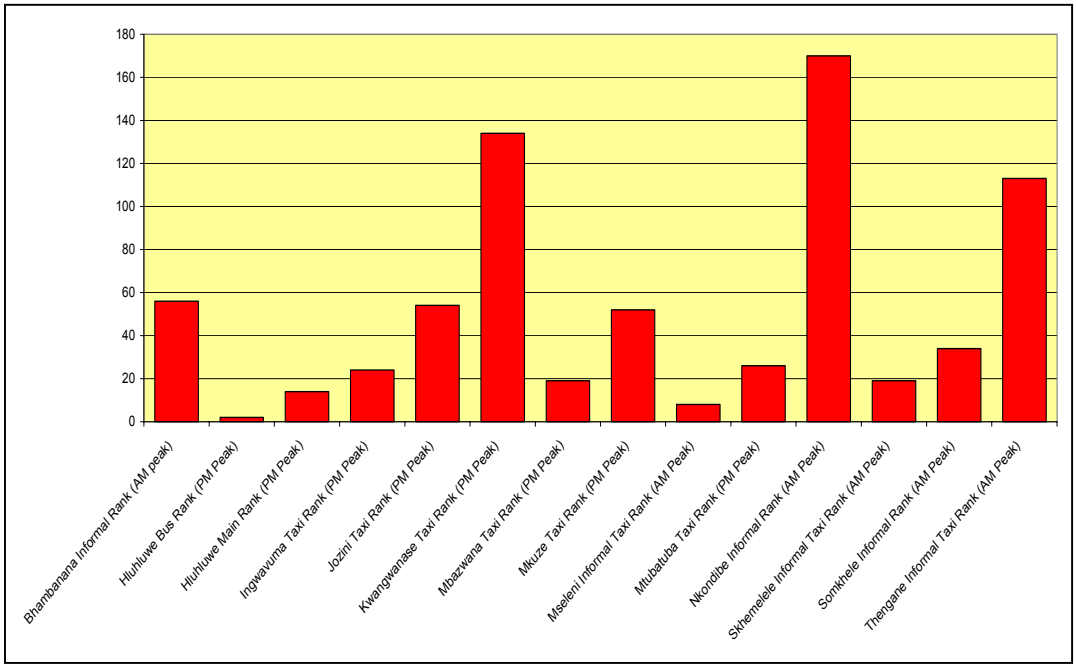


Figure 4.6: Minibus-taxi vehicle trips per rank



4.3 Capacity Utilisation of Routes

The capacity of the minibus-taxi service is determined by multiplying the actual numbers of minibus-taxi trips with the maximum capacity of a minibus-taxi. It was assumed that the maximum capacity for minibus-taxis is the same as the legal limit of 15 passengers per taxi.

Using the maximum capacity of minibus-taxis and the number of trips it was calculated that the capacity of the minibus-taxi service amount to almost 10900 (10875) passengers. The survey results on the other hand showed that the actual number of passengers transported as mentioned in previous sections by minibus-taxis were 8393 passengers. To determine the utilisation of the minibus-taxi service the actual usage is shown as a percentage of the

maximum capacity of the service. In the case of Umkhanyakude the overall minibus-taxi service is 80 percent utilised, and excludes passengers boarding and alighting along the minibus-taxi routes. **Figure 4.7** shows the Capacity Utilisation of Taxi Vehicles per Route.

Figure 4.7: Daily Capacity Utilisation – Minibus-Taxi

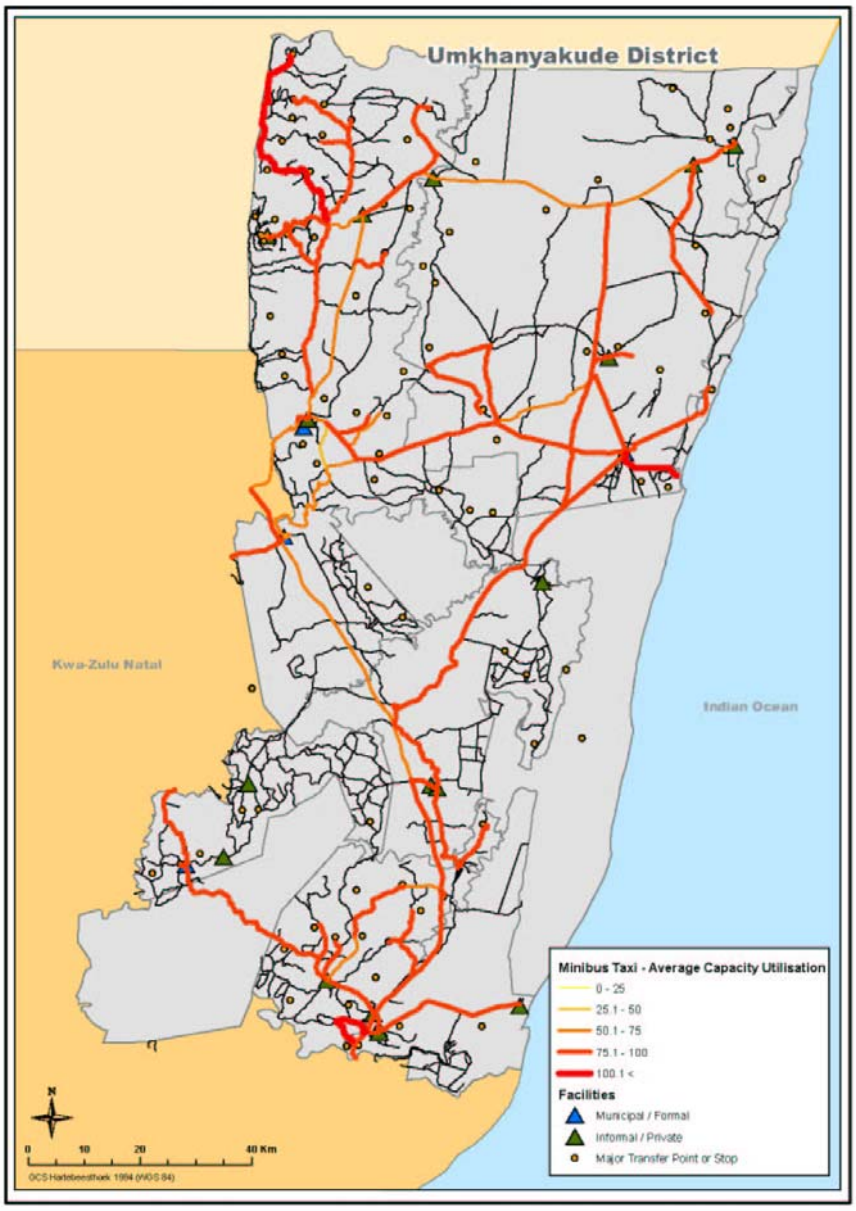


Figure 4.8 and **4.9** on the next page represent the Minibus-taxi AM Peak and PM Peak utilisation respectively. From these figures it is clear that the PM peak hour is more utilised than that of the AM peak period. During the AM Peak period **(Figure 4.8)** the road between Mtubatuba and Hlabisa proves to be the route with the highest utilisation levels (between 75 and 100 percent).

During PM Peak period **(Figure 4.9)** the picture looks much different when compared to the AM Peak period. Generally services run at utilisation levels higher than 75%.

This could be due to a lack of Bus Services, since less Bus trips was evident during afternoon peak when compared to the morning peak. **Table 4.4 in Appendix A** shows the capacity and utilisation of minibus-taxi routes. Again the major surfaced roads shows the highest utilisation levels.

Figure 4.8: AM Peak Minibus-taxi Service Capacity Utilisation

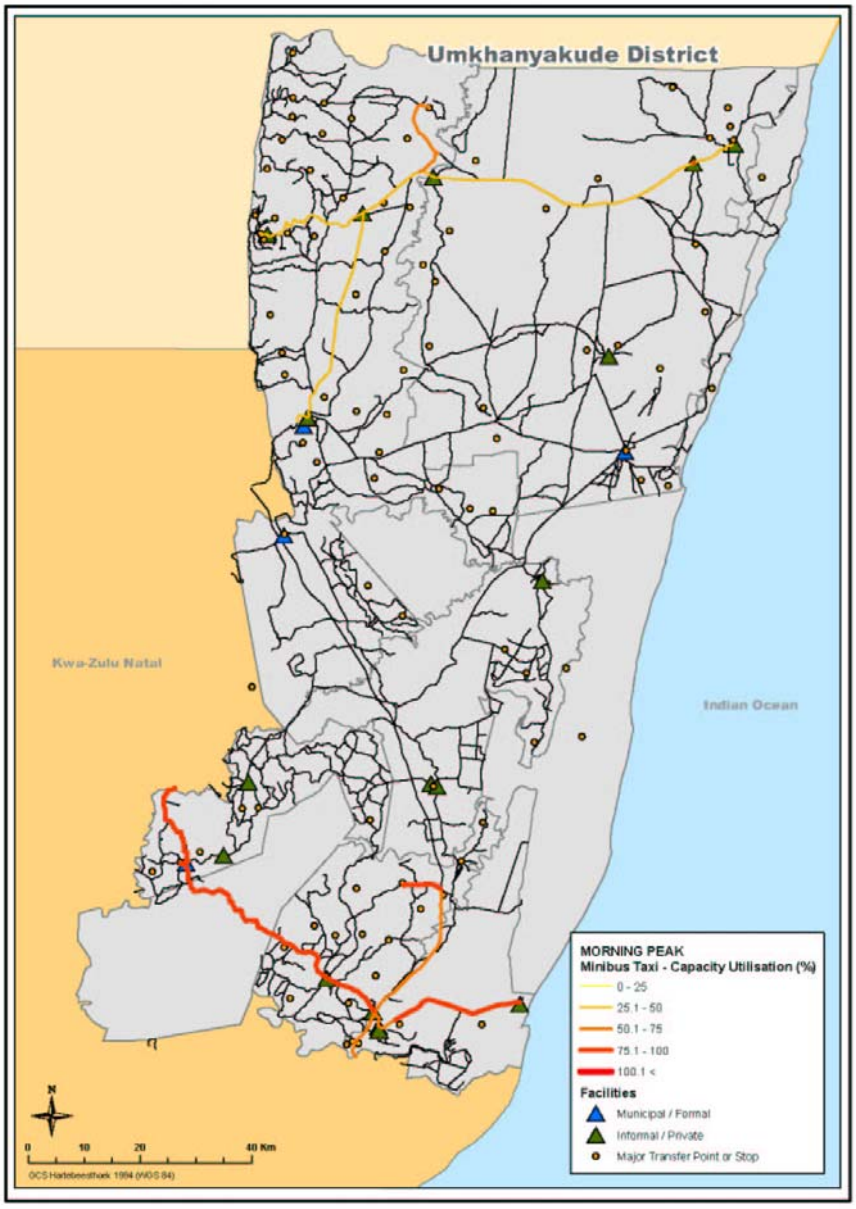
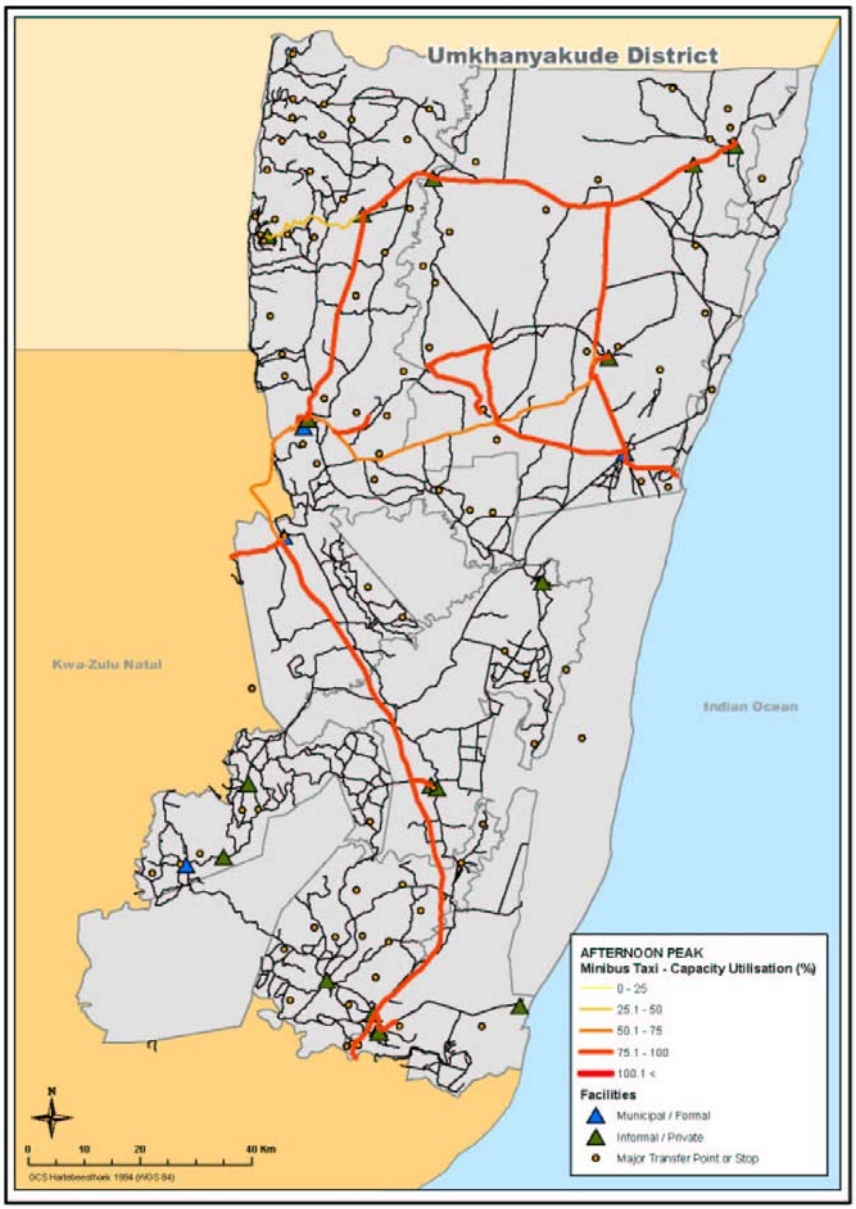


Figure 4.9: PM Peak Minibus-taxi Service Capacity Utilisation



4.4 Waiting Time per Route

Waiting time is an indication of the level of service provided by public transport operators. It is generally believed that the shorter the waiting time for passengers the better the public transport service and visa versa. Waiting time was based on the time the passenger arrived at the back of the queue of passengers going to a certain destination until the time the bus or minibus-taxi left the facility and includes time spent waiting onboard the vehicle prior to departure. **Table 4.5** shows the waiting times surveyed for a typical day for all the modes of transport except bus transport. The survey results showed that on average the waiting time for passengers varies from 1 minute to 125 minutes for minibus-taxi and bakkie and 4+1 passengers. The longest waiting time surveyed for a taxi passengers were 2 hours and 5 minutes.

Table 4.5: Waiting Time – All modes of Transport – All Day

Vehicle Type	Min (min)	Max (min)	Average (min)
Bakkie and 4+1	1	104	21
Taxi	1	125	14

On average the bus passengers wait longer than those passengers using minibus-taxi, bakkie and 4+1 transport. The results also showed that there is a significant difference in the waiting time during the AM peak and PM peak period. **Table 4.6** shows the waiting times for the AM and PM period for minibus-taxi passengers respectively.

Table 4.6: AM Peak – Waiting Time – Minibus-taxi passengers

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Taxi	0	23	19
PM Peak	Taxi	0	21	13

It is important to note that the average waiting time differs drastically during the AM and PM Peak period. The reason for the difference in waiting time can be attributed to the fact that minibus-taxi operators only makes a trip if there are enough passengers onboard to make the trip economically viable. Passengers arriving at the different public transport facilities in the morning and travelling long distance will therefore have to wait longer if there is not enough passengers. Detailed waiting times per route can be found in **Appendix A** of the report.

4.5 Terminal Capacity Utilisation

The constraint on ranks in terms of capacity and the utilisation thereof is the result of minibus-taxis holding at the rank especially during the off-peak period and not during the peak periods when most of the minibus-taxis are providing a service. It is not possible to determine the exact utilisation of rank facilities and needs to be investigated further. **Table 4.7 in Appendix A** however gives an indication of the possible rank and holding constraints based on the number of operators operating from the different facilities.

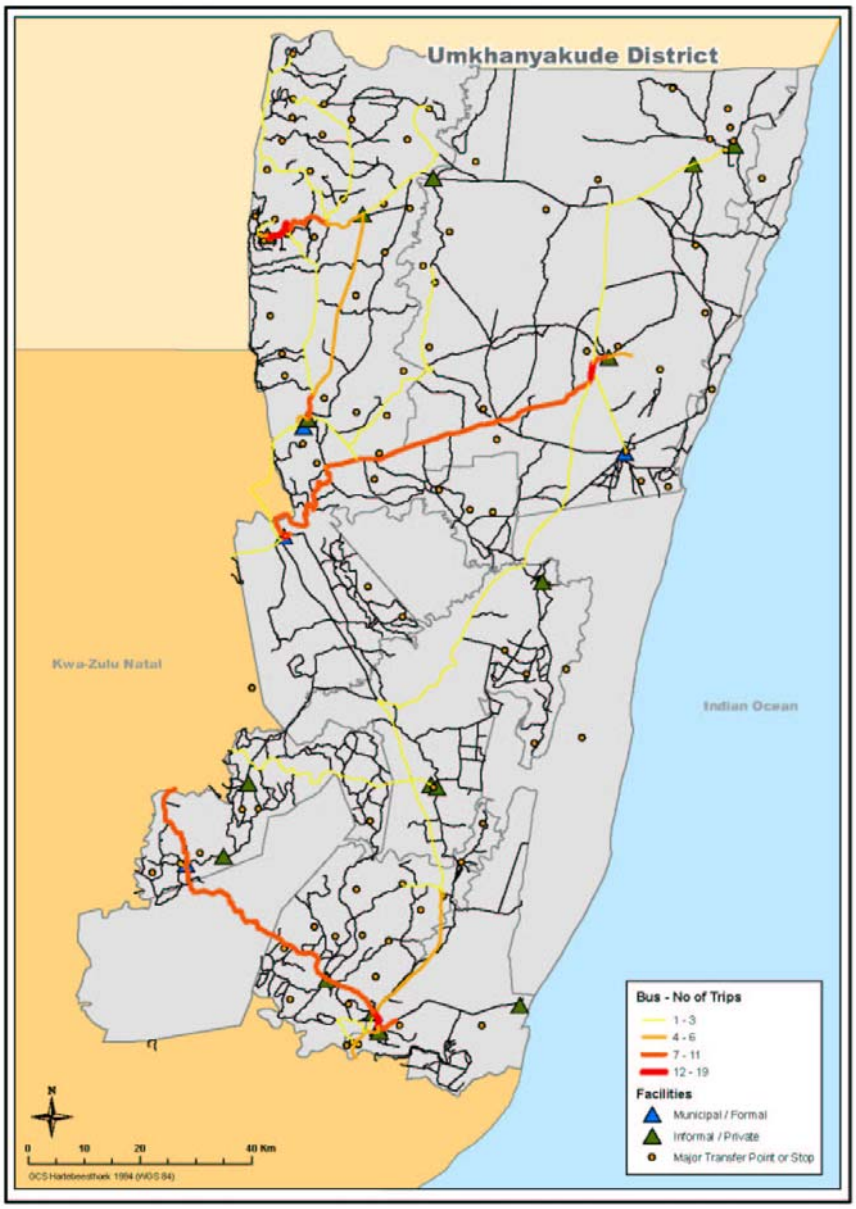
5. RESULTS - BUSES

5.1 Description of Routes

The grammatical description of routes for the purposes of the report only describes the major roads covered by the specific route. In other words the route description indicates the destination via a certain road. Further route details are available on the GIS and can be shown on a detailed map of the area. **Table 5.1 in Appendix B** provides a detail list of all the Bus Routes that were identified from the Rank Surveys and **Table 5.2 in Appendix B** gives a detail description of each bus route within the Umkhanyakude District.

Figure 5.1 shows the Bus Routes in the Umkhanyakude District

Figure 5.1: Number of Bus Trips per Route



5.2 Passengers and Trips

The results of the bus survey showed that 5291 passengers are transported per day by bus. A bit different from the Minibus-taxi, the majority of bus trips take place between the areas of Mkuze and Mbazwana, Jozini with high numbers of bus passengers between Mtubatuba and Hlabisa. (See **Figure 5.2**).

Figure 5.2: Bus – Number of passengers – All day

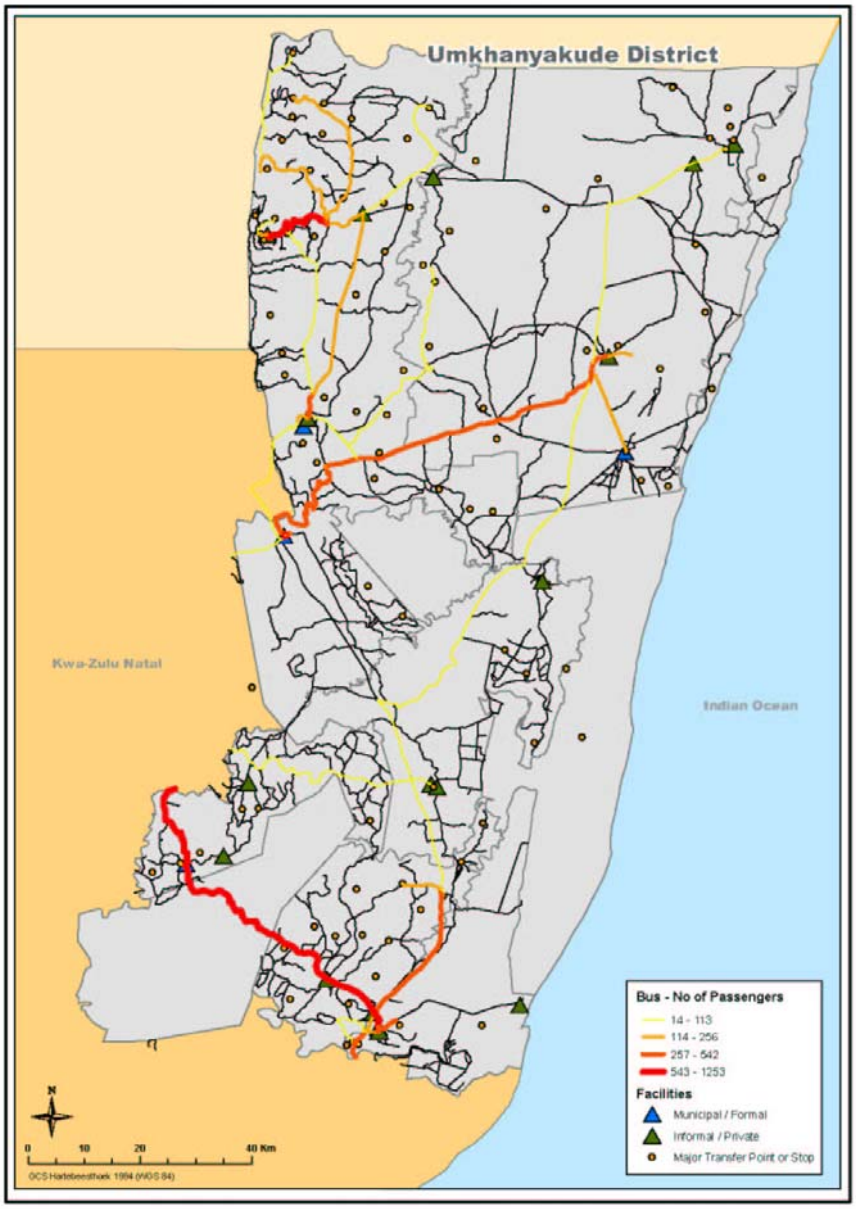


Figure 5.3 and **Figure 5.4** shows the AM Peak Passenger and PM Peak Passenger Distribution respectively. The Rank Survey information shows that most bus passengers travel during the off peak period. Both figures show low passengers volumes for both the AM and PM peak period.

During the AM peak period it can be seen that bus passengers are concentrated around Mkuze and Mtubatuba. This is due to passengers travelling to urban areas for work or for shopping. The PM peak period however showed that the majority of passenger movements occur around Hluhluwe.

Figure 5.3: AM Peak – Bus Passenger Volumes

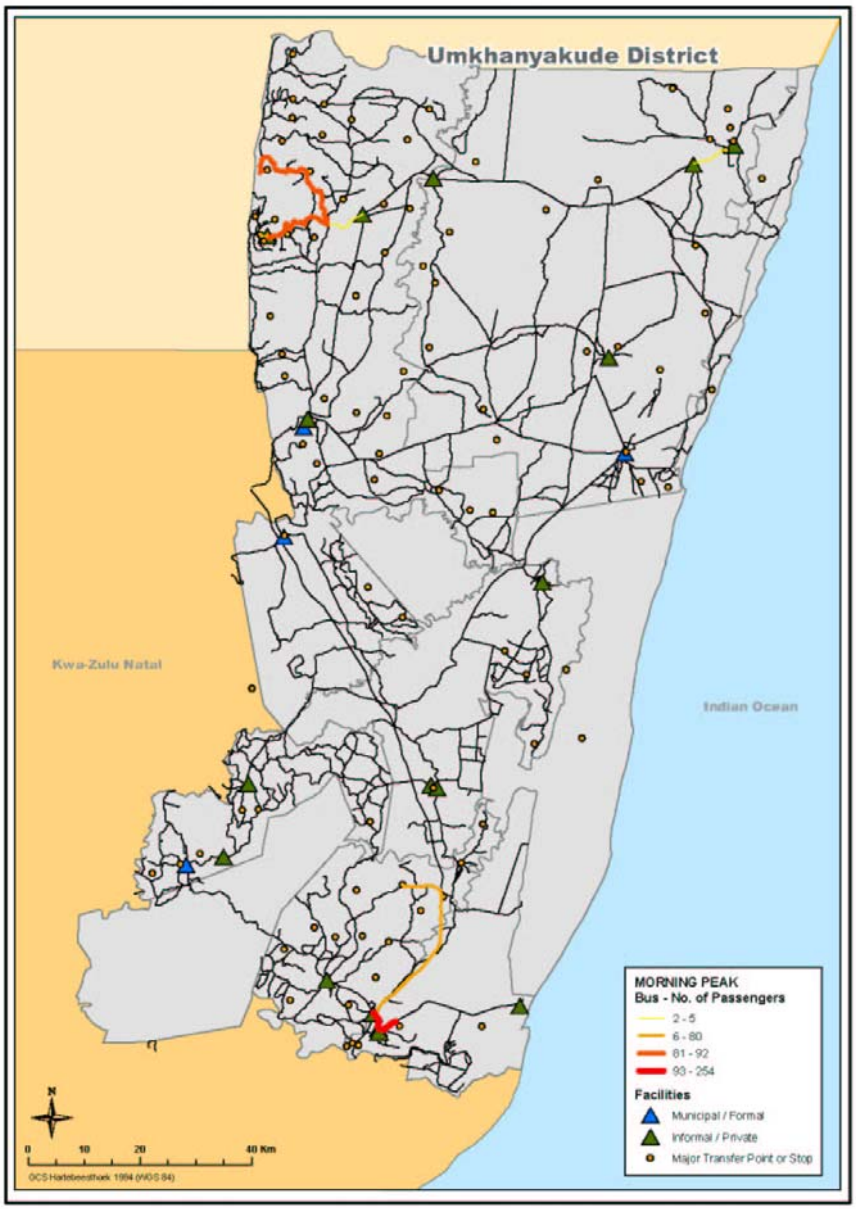


Figure 5.4: PM Peak – Bus Passenger Volumes

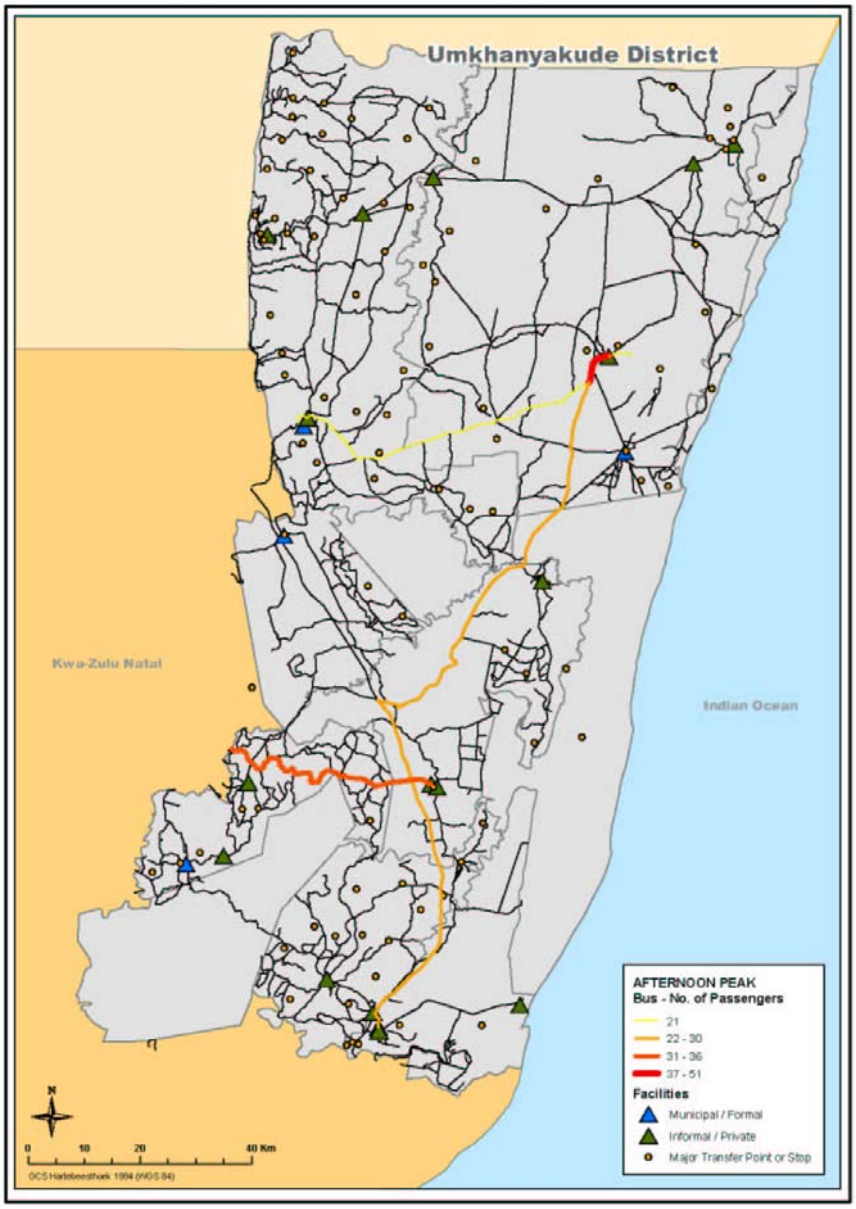


Figure 5.5 and **Figure 5.6** shows the results of the bus surveys for each rank for passenger trips per bus per rank/termini and the number of vehicle trips per rank respectively.

Figure 5.5: Bus passenger trips per rank

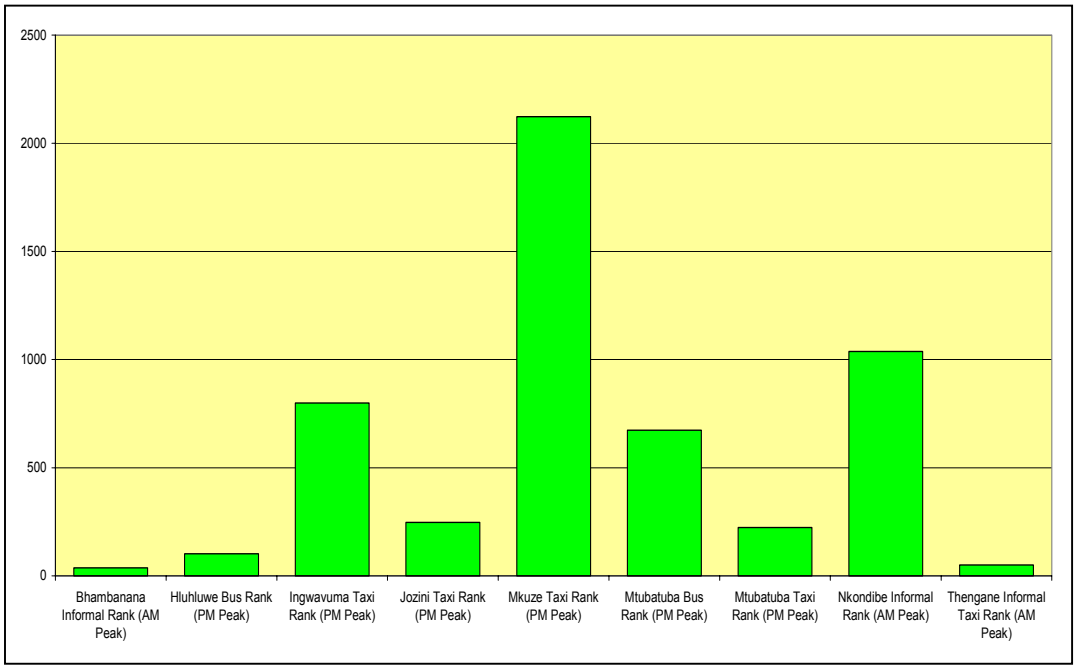
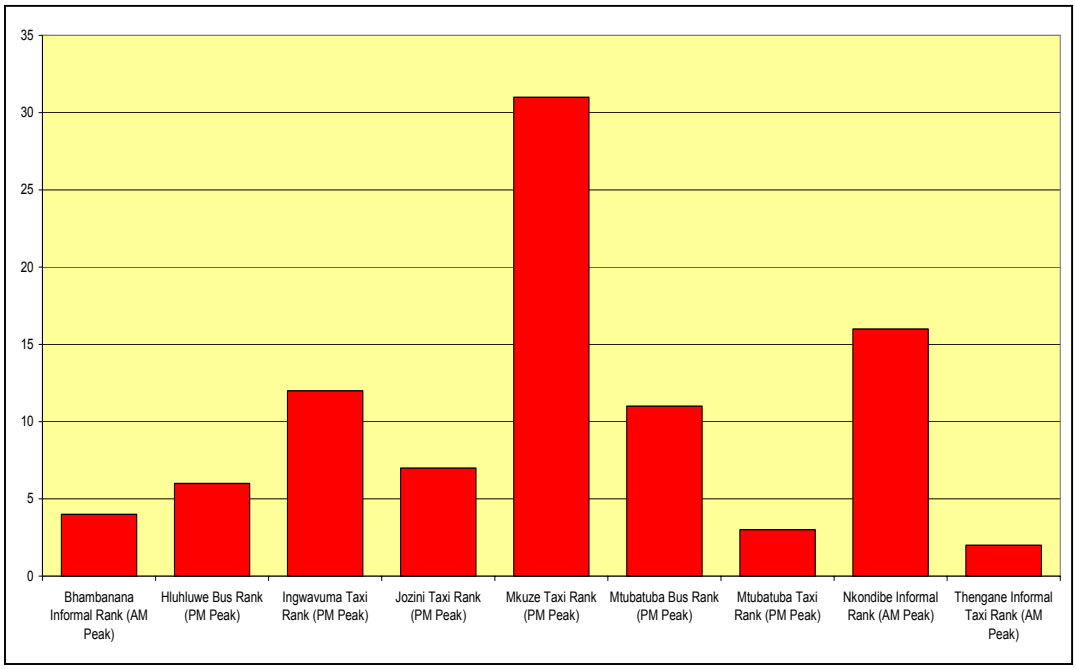


Figure 5.6: Bus vehicle trips per rank



5.3 Capacity Utilisation of Routes

The capacity of the bus service is determined by multiplying the actual numbers of trips with the maximum capacity of a bus. Two types of capacity can be calculated namely:

- Seated Capacity - 60 passengers, and
- Crunch Load Capacity - 82 passengers (60 seated and 22 standing).

For the purpose of this report the seated capacity was used to determine the route utilisation. The information received from the surveys showed that the seated capacity of the bus service amounted to 5520 seats with an average utilisation of 89%. Detailed bus utilisation figures per route are available on the GIS system. **Figure 5.7** below shows the service capacity utilisation for the bus services during a typical day.

Figure 5.7: Daily Bus Service Capacity Utilisation

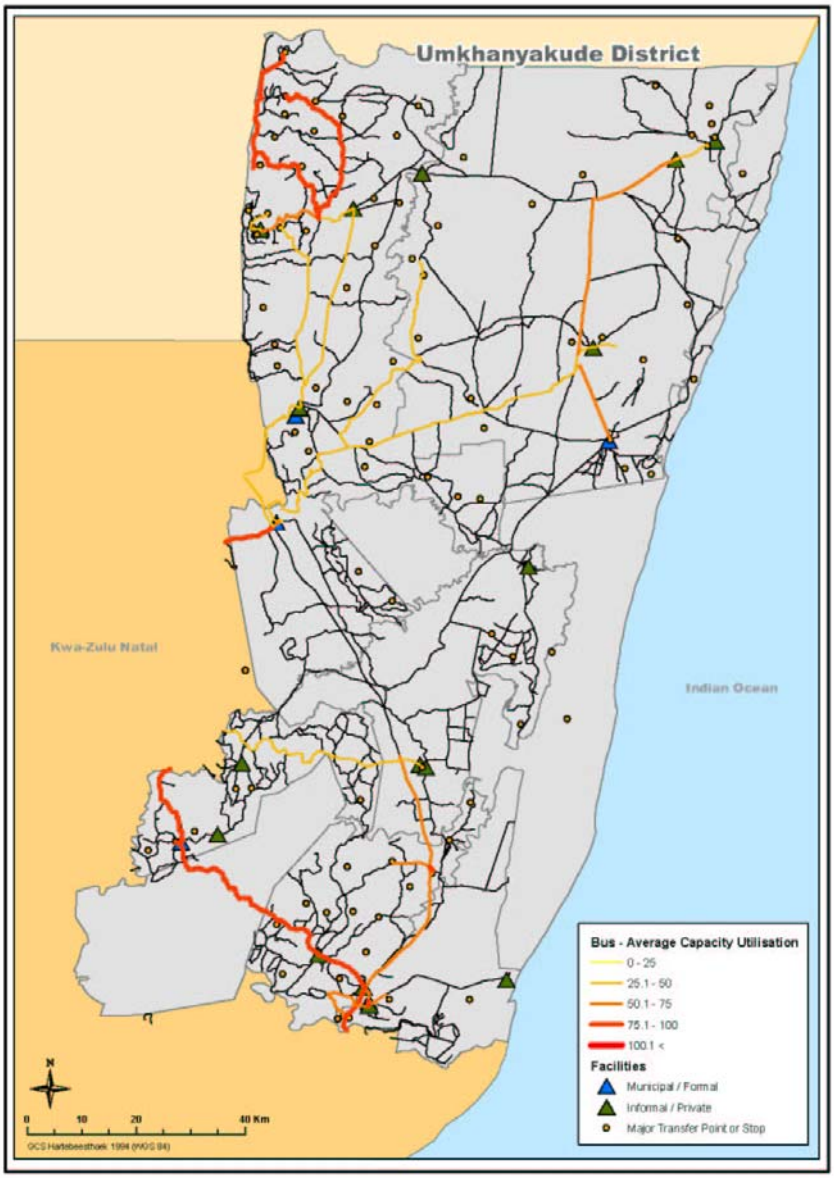


Figure 5.8 and **Figure 5.9** shows utilisation figures for the AM Peak and PM Peak respectively. It is clear from **Figure 5.8** that the AM Peak period utilisation on the N2 north of Mtubatuba is operating at an utilisation figure more than 100%.

Figure 5.8: AM Peak Bus Service Capacity Utilisation

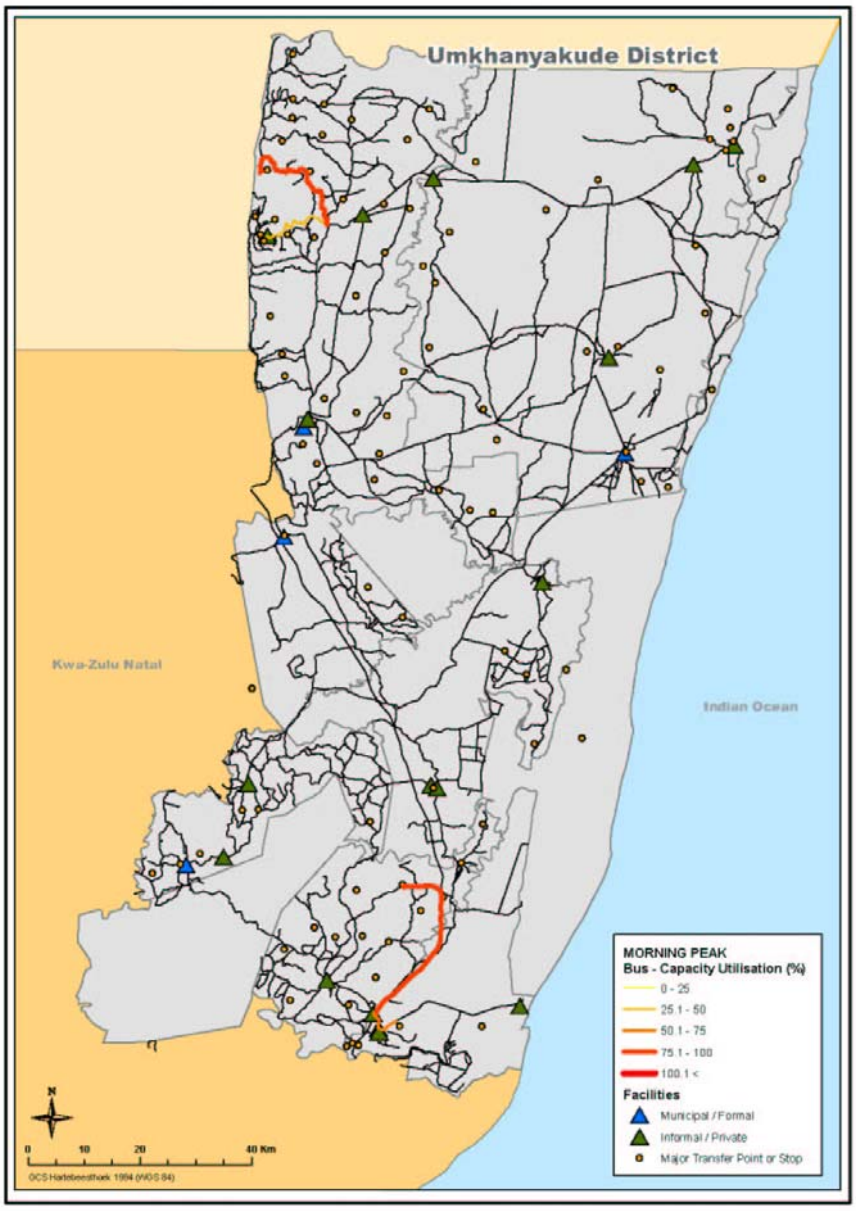


Figure 5.9, the PM Peak period utilisation, shows a different trend to that of the AM Peak period where trips operating at a capacity utilisation between 50-75% and these trips occur along the N2 and between Hluhluwe and Mbazwana.

Figure 5.9: PM Peak Bus Service Capacity Utilisation

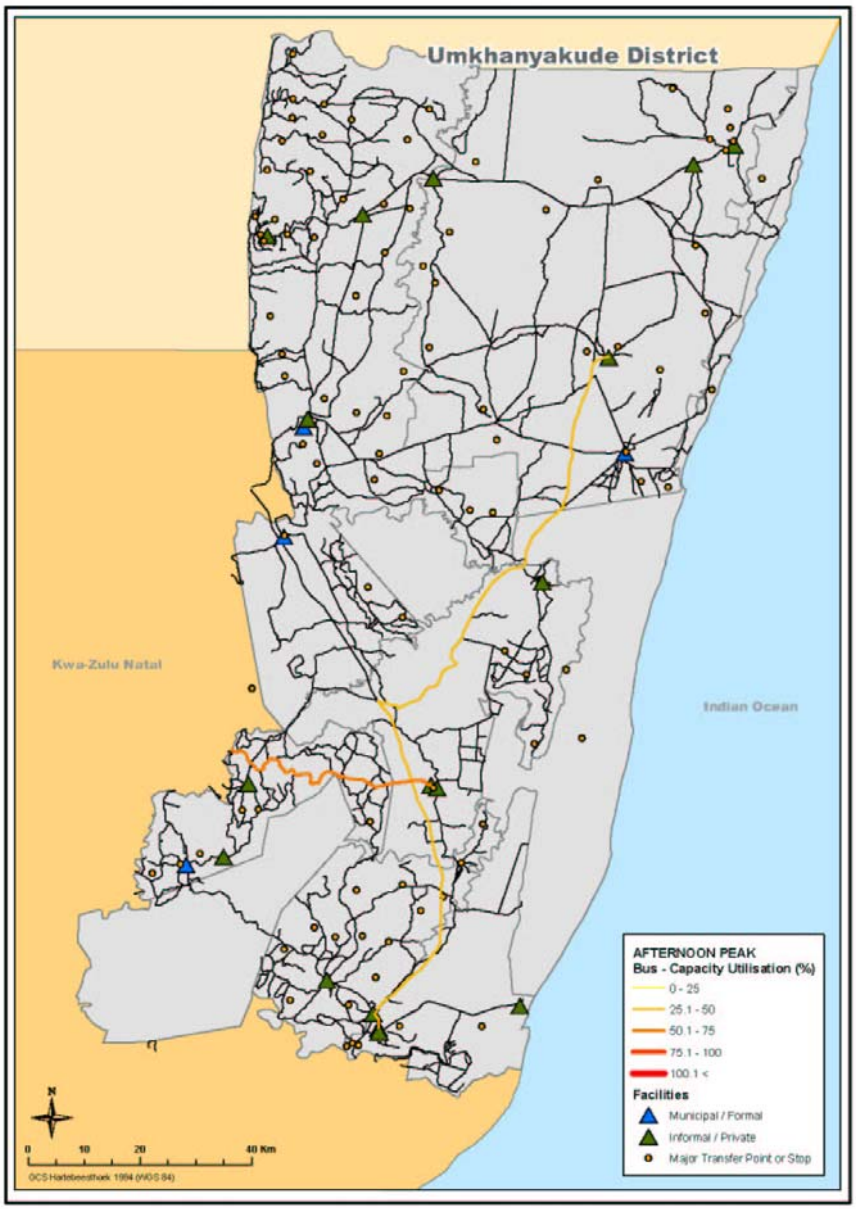


Table 5.4 in Appendix B shows the seated capacity utilisation of bus routes.

5.4 Waiting Time per Route

As mentioned earlier in the report waiting time is an indication of the level of service provided by public transport operators. Generally waiting time for bus passengers is longer than that of other modes of public transport. The reason for the longer waiting time can be the result of bus operators following a pre-planned schedule. Passengers that arrive long before

the scheduled departure time will have to wait longer for the bus to depart. **Table 5.5** shows the waiting times surveyed for bus passengers.

Table 5.5: AM Peak – Waiting Time – Bus Transport

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Bus	1	65	21
PM Peak	Bus	1	45	17

The same pattern can be seen as that of minibus-taxi passengers with bus passengers waiting longer during the AM peak when compared to the PM peak. The longest waiting time for bus passengers however is just more than one hour compared to more than two hours for minibus-taxi passengers. This can also be the result of the pre-planned schedule of bus operators. Detailed waiting time for bus passengers per route is shown in **Appendix B** of the report.

5.5 Terminal Capacity Utilisation

The constraint on ranks in terms of capacity and the utilisation thereof is the result of buses holding at the rank waiting for passengers. Discussion with the bus operators showed that buses seldom hold at facilities but rather hold at bus depots and will only be dispatched closer to the time of operation. **Table 5.6 in Appendix B** gives an indication of the number of buses operating through the bus terminals.

6. RESULTS – BAKKIE & 4+1 VEHICLES

6.1 Description of Routes

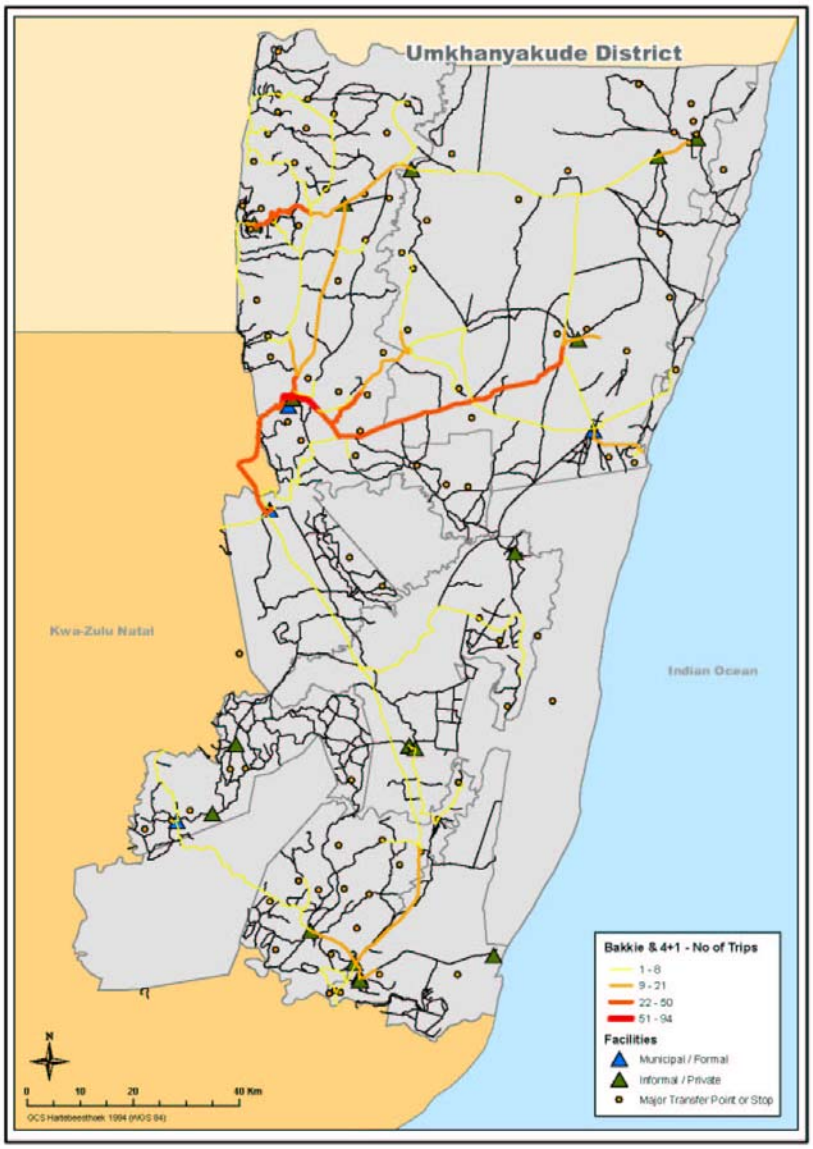
The description of bakkie and 4+1 routes is the same as that of minibus-taxis and buses. Further route details are available on the GIS and can be shown on a detailed map of the area.

6.1.1 Route Codes

Table 6.1 in Appendix C provides a list of all the Bakkie and 4 + 1 routes that was identified from the rank surveys and **Table 6.2 in Appendix B** give a detail description of each route within the Umkhanyakude District

Figure 6.1 shows the Number of Bakkie and 4 + 1 Routes in the Umkhanyakude District.

Figure 6.1: Number of Bakkie and 4+1 Trips per Route



6.2 Passengers and Trips

The results of the bakkie and 4+1 surveys showed that 2365 passengers are transported per day. This is significantly less than both minibus-taxi and bus passengers. Similar to the Minibus-taxi & bus, the majority of trips take place between the areas of Mkuze and Mbazwana. The distribution of bakkie and 4+1 passengers for the different regions is shown in **Figure 6.2**.

Figure 6.3 and **Figure 6.4** shows the AM Peak Passenger and PM Peak Passenger Distribution respectively. The survey information for the AM peak shows that most bakkie and 4+1 passengers travel around Jozini. During the PM peak period it can be seen that the routes from Mkuze carries the highest number of bakkie and 4+1 passengers.

Figure 6.2: Bakkie and 4+1 – Number of passengers – All day

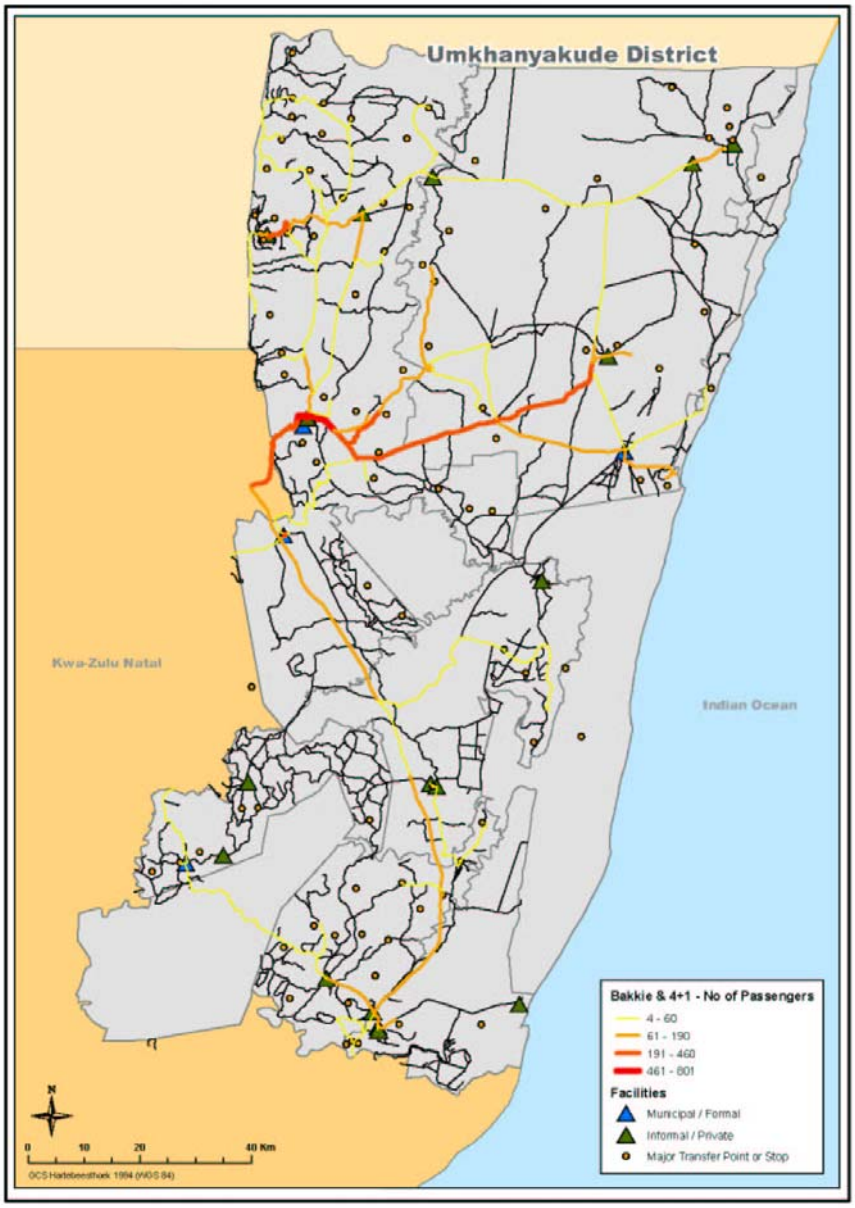


Figure 6.3: AM Peak – Bakkie and 4+1 Passenger Volumes

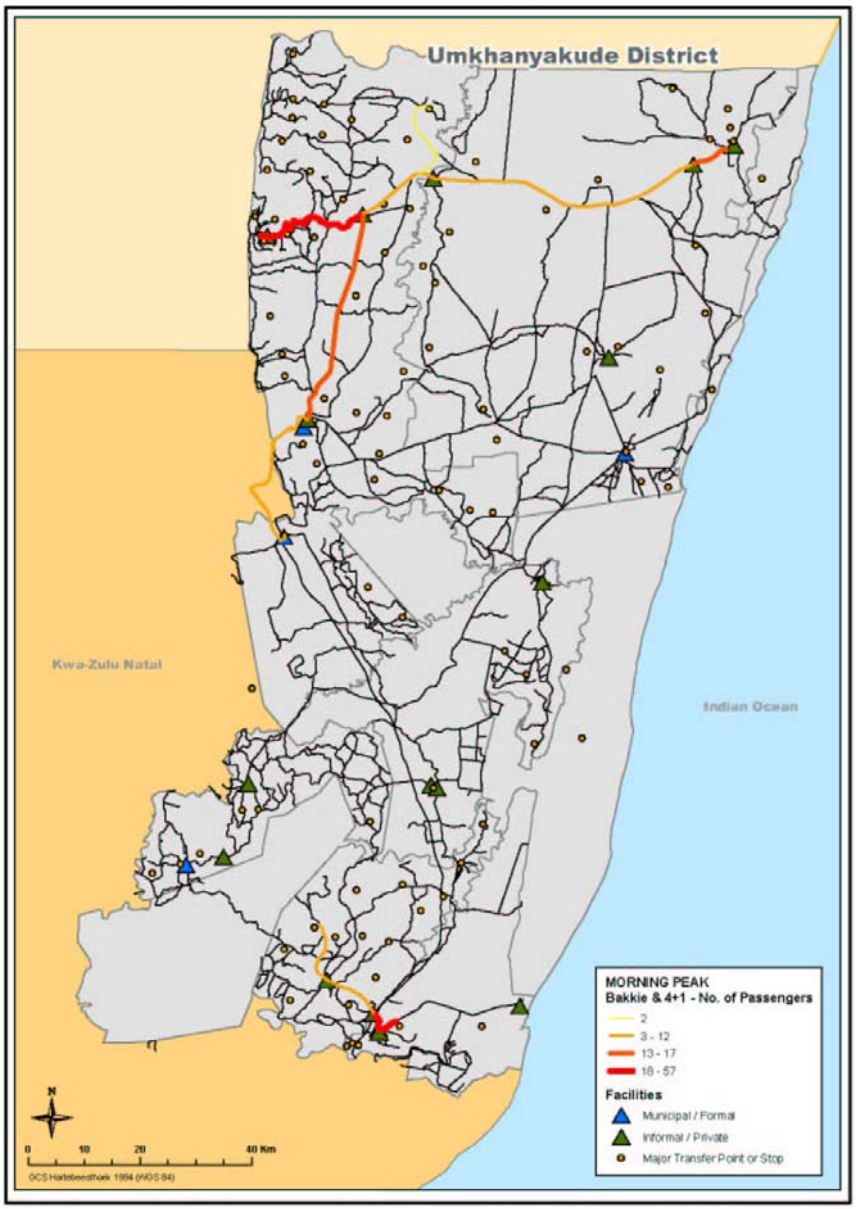


Figure 6.4: PM Peak – Bakkie and 4+1 Passenger Volumes

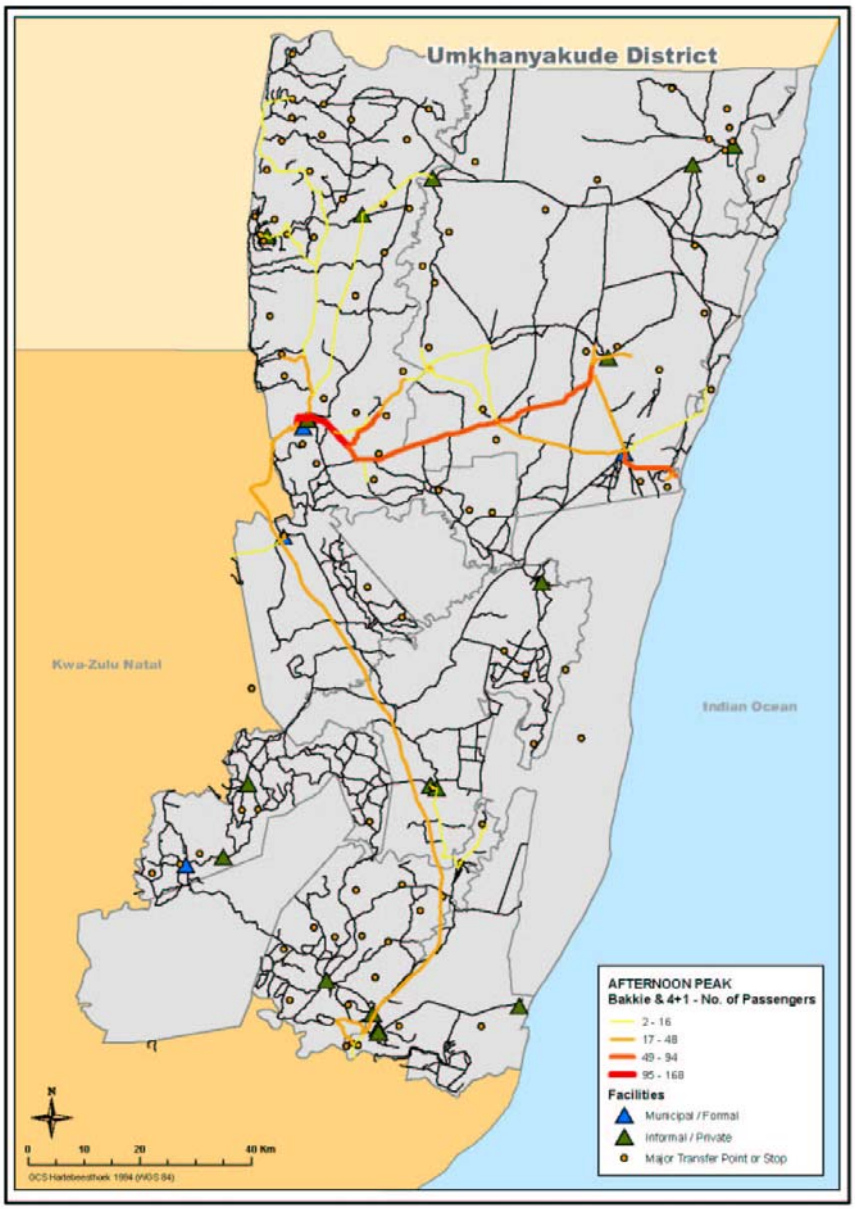


Figure 6.5 and **Figure 6.6** shows the results of the surveys for each rank for passenger trips per rank/termini and the number of vehicle trips per rank respectively.

Figure 6.5: Bakkie and 4+1 passenger trips per rank per day

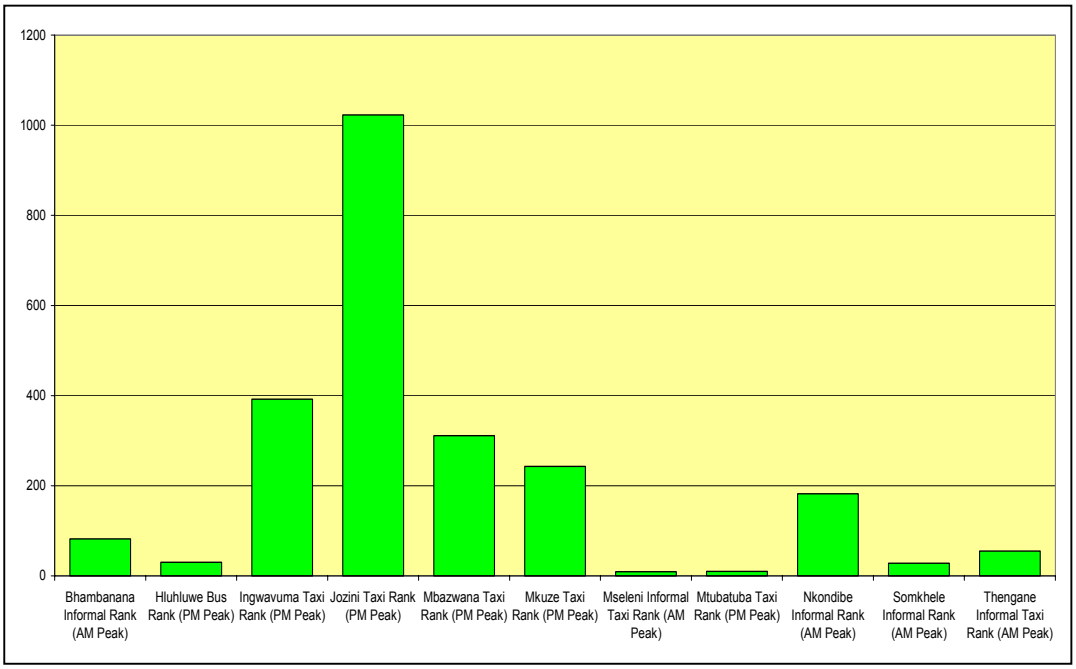
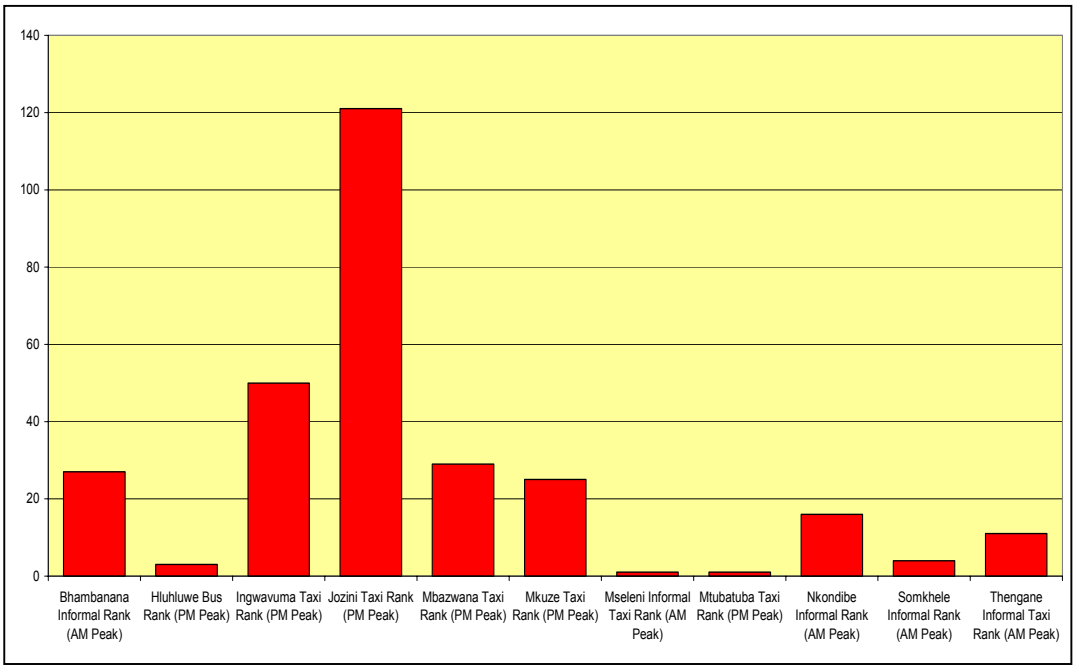


Figure 6.6: Bakkie and 4+1 vehicle trips per rank per day



6.3 Capacity Utilisation of Routes

The capacity of the bakkie and 4+1 service is determined by multiplying the actual numbers of trips with the maximum capacity of a bakkie and 4+1. Bakkie and 4+1 capacity was taken as 10 passengers. Using the maximum capacity of a bakkie and 4+1 vehicles and the number of trips it was calculated that the capacity of the bakkie and 4+1 vehicles is approximately 2880 passengers.

The daily capacity utilisation for bakkie and 4+1 are shown in **Figure 6.7.** The average utilisation can then be calculated to be 95%. The higher utilisation of these modes can also be attributed to the fact that the passengers that is transported by these modes has limited access to public transport service and therefore has to ensure high levels of occupancy.

Figure 6.7: Daily Bakkie and 4+1 Service Capacity Utilisation

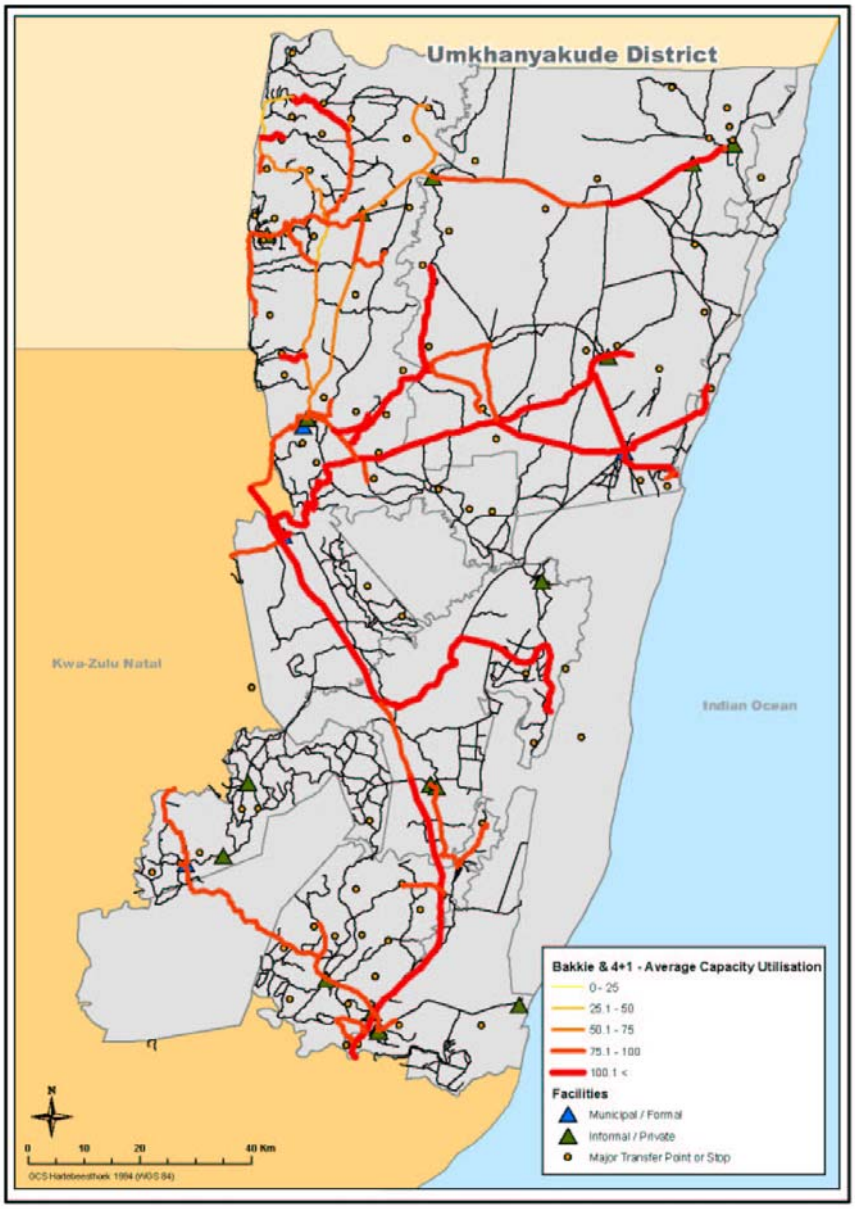


Figure 6.8 and Figure 6.9 shows the AM Peak and PM Peak utilisation respectively.

During the AM Peak period **(Figure 6.8)** bakkie and 4+1 services operate at utilisation levels higher than 100%. **Figure 6.9,** the PM peak period also shows utilisation levels higher than 100%. It can therefore be assumed that bakkie and 4+1 are usually overloaded.

Figure 6.8: AM Peak – Bakkie and 4+1 Service Capacity Utilisation

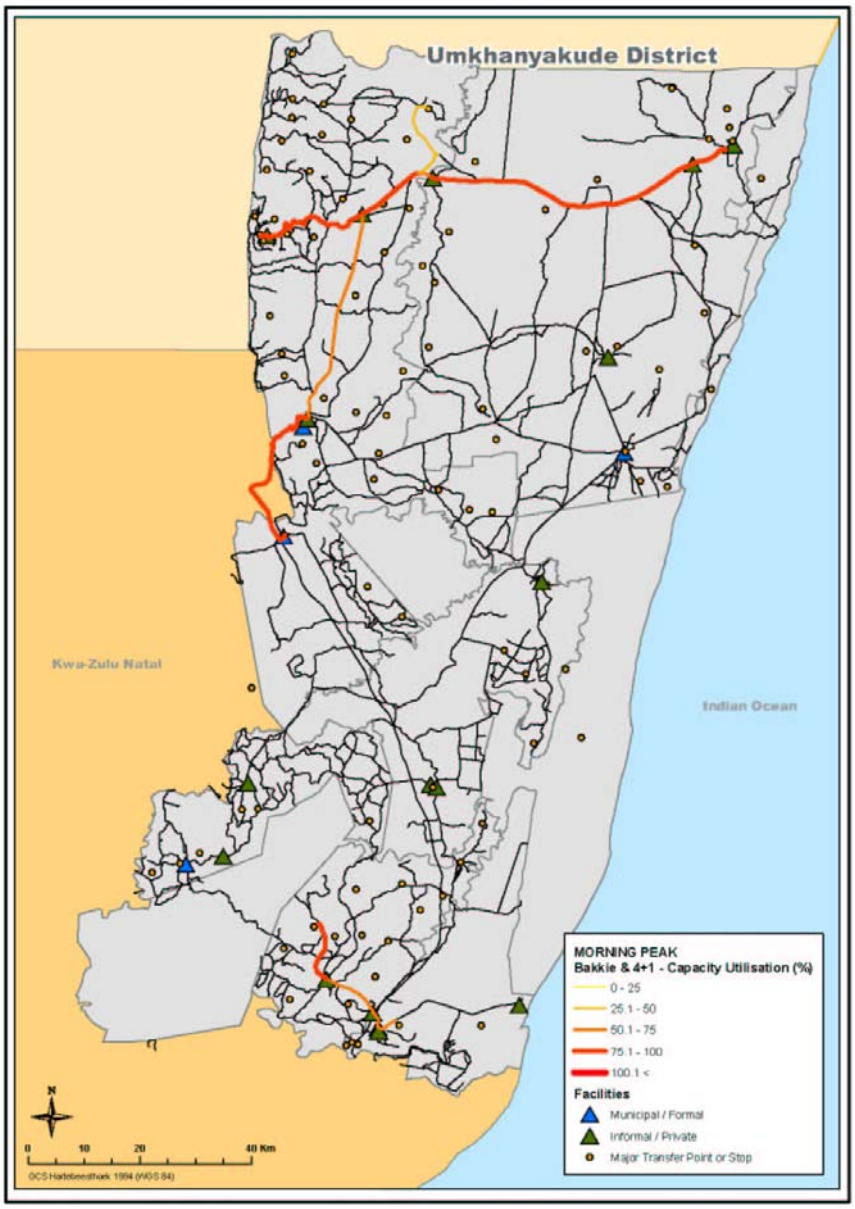


Figure 6.9: PM Peak - Bakkie and 4+1 Service Capacity Utilisation

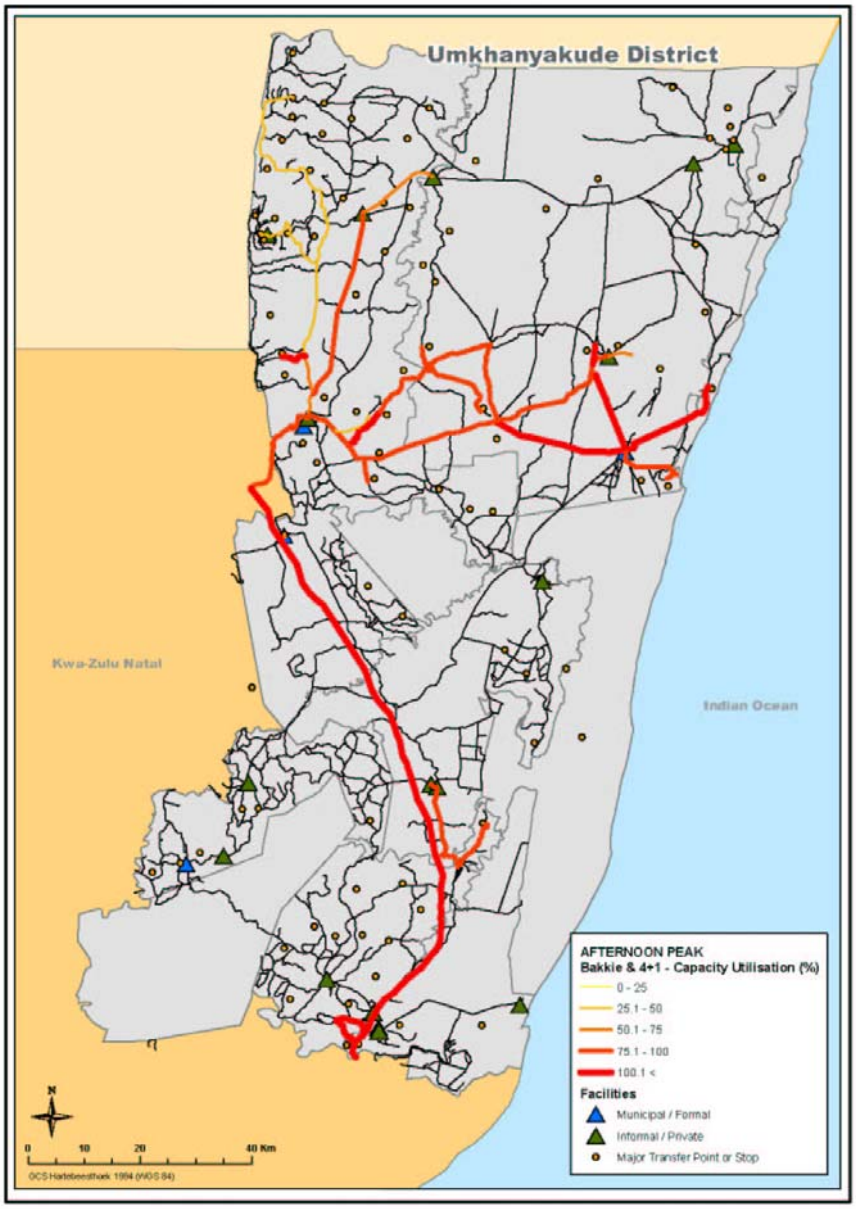


Table 6.3 in Appendix C shows the capacity utilisation of minibus-taxi routes.

6.4 Waiting Time per Route

The waiting time for bakkie and 4+1 passengers are similar to the minibus-taxi passenger waiting times. **Table 6.4** below shows the average waiting time of bakkie and 4+1 passengers for both the AM and PM peak periods.

Table 6.4: AM Peak – Waiting Time – All Modes of Transport

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Bakkie and 4+1	2	58	26
PM Peak	Bakkie and 4+1	4	82	22

Detailed waiting time for bakkie and 4+1 passengers per route is shown in **Appendix C** of the report.

6.5 Terminal Capacity Utilisation

No formal ranking facilities have been provided for these modes of transport and therefore no terminal capacity utilisation figures have been tabled.

7. SUMMARY AND CONCLUSION

The report provides information on the current status of public transport facilities in Umkhanyakude District Municipality. The following conclusions can be made based on the findings of the report:

- Based on the number of trips per transport mode approximately 62% of all public transport trips within Umkhanyakude District Municipality are made by minibus-taxis, 10% by bus transport and the remaining 28% by bakkies and 4+1 vehicles.
- Based on the number of passengers transported the picture looks somewhat different with approximately 48% of passengers using minibus-taxis, 36% buses and the remaining 16% uses bakkie and 4+1 vehicles.
- A total of approximately 14 498 passengers are transported daily within the Umkhanyakude area. This figure will however change when surveys are conducted at the two outstanding ranks;
- The public transport routes are served from 21 public transport facilities of which 6 are formal facilities and 15 informal ranks;
- No surveys were done at Mtubatuba Taxi City and Hlabisa due to the lack of cooperation with the Mini-bus Taxi industry. Future surveys at these ranks will definitely increase the number of passengers travelling per day and will also further highlight the extent of public transport services in the Mtubatuba and Hlabisa,
- The average utilisation figures determined through the surveys at all the facilities indicated that the majority of routes are more than 75% utilised with only the routes in the more rural areas utilised less than 75%;
- The major movement of public transport modes occurs around the more formal urban areas of Mtubatuba, Hluhluwe, Mkuze, Jozini and Manguzi;
- The average waiting time for bus passengers was 18 minutes, 14 minutes for Minibus-taxis and 21 for bakkie passengers;
- Generally the observed waiting time during the AM peak exceeded the PM peak waiting times;

8. APPROVAL

Umkhanyakude District Municipality, being the designated Planning Authority in terms of the National Land Transport Transition Act, Act 22 of 2000, hereby approves the Current Public Transport Record for the Umkhanyakude area. The Current Public Transport Record has been prepared based on the minimum guidelines prescribed by the National Department of Transport.

Umkhanyakude District Municipality hereby submits the Current Public Transport Record to the MEC of Transport, for approval.

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Approved by:

For Umkhanyakude District Municipality