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Umzinyathi District Municipality

Current Public Transport Record

PHASE 2

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1. INTRODUCTION

This report presents the status quo of public transport services within the Umzinyathi 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 operations in their area of jurisdiction.

The report provides information on the methodology followed in completing the project, the modes operating in the area, the extent of public transport services, routes and capacity utilisation.

1.1 Background

Arup SA (Pty) Ltd were appointed on 05 January 2004, by the Umzinyathi District Municipality to carry out a Current Public Transport Record (CPTR): Phase 2 for the whole Umzinyathi District Municipality area including local municipalities namely:

- KZ 241 – Endumeni Local Municipality (Dundee Area),
- KZ 242 – Nquthu Local Municipality (Nqutu Area),
- KZ 244 – Msinga Local Municipality (Tugela Ferry Area), and
- KZ 245 – Umvoti Local Municipality (Greytown Area).

1.1.1 Study Area

Umzinyathi District Municipality (DC 24) is located in northern Kwa-Zulu Natal. The main towns in the District are Dundee and Greytown, which are approximately 180 kilometres apart. Dundee, the administrative seat of the District, is 320 kilometres North of Durban. The District is generally accessed from the R33 from Pietermaritzburg or from the R68 off the N11.

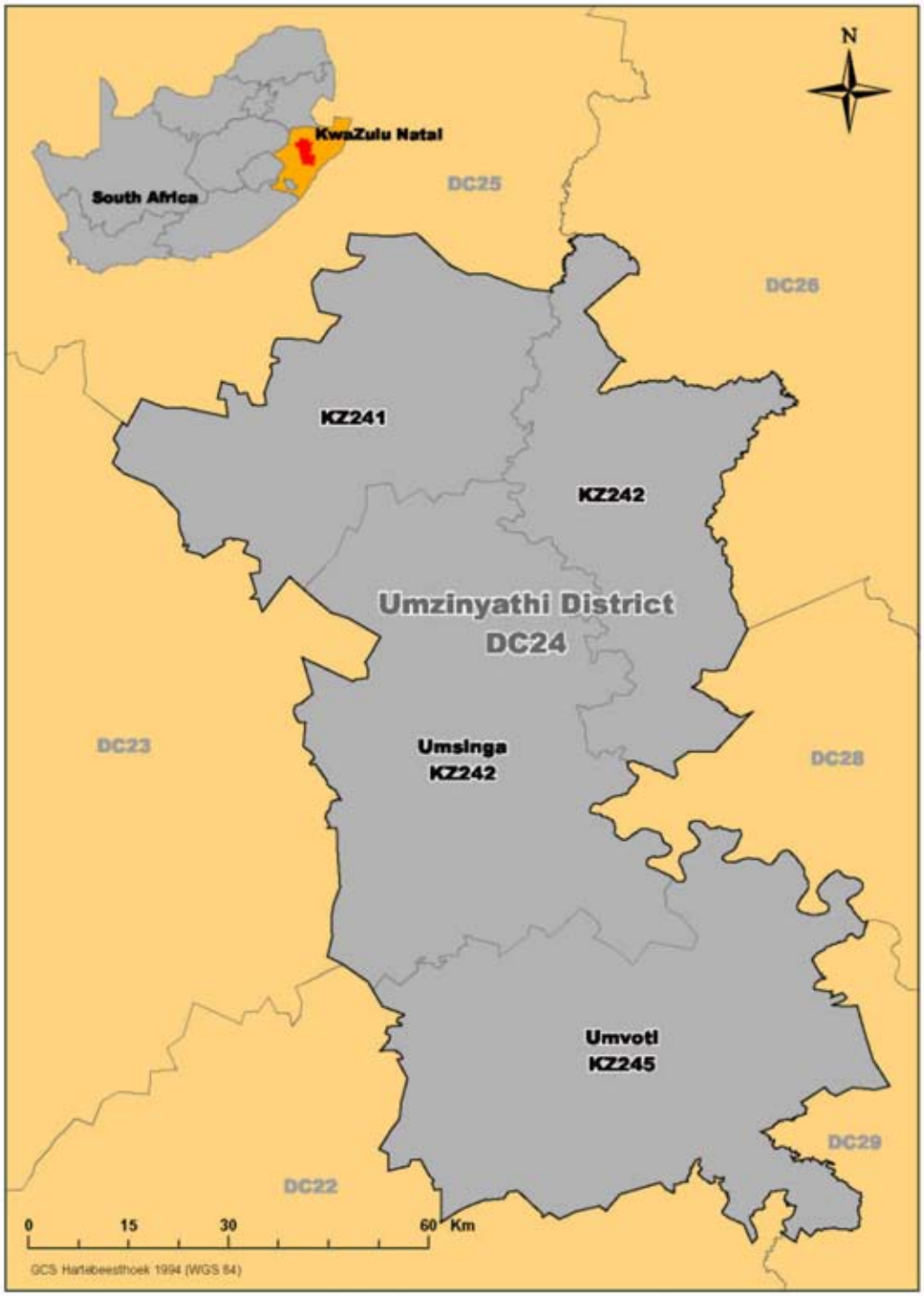
The larger towns of influence which are in close proximity to the District are Newcastle, which is 66 kilometres north east of Dundee, Ladysmith, which is 66 kilometres away and Estcourt, which is 136 kilometres away, in the Uthukela District south west of Dundee.

The main road linkages include the R33, which links the Endumeni part of the District to Vryheid; the R68 which links the Nqutu portion of the District to Babanango; the R622 and the R33, which link Umvoti to Mooi River and Pietermaritzburg respectively to the south. Umzinyathi District has a total area of 8 079 km² and comprises four Local Municipalities.

The largest Municipality in the area is Umvoti being 2 758 Km². Each Municipality has unique characteristics. For example, Msinga is almost entirely rural in nature and has a history of conflict in terms of faction fighting. Nqutu is also rural in nature but has a greater degree of agricultural activities than Msinga has. Endumeni has the most diversified economy, followed by Umvoti, which has a strong dependence on agriculture and forestry.

The study area of Umzinyathi District Municipality (DC24) comprising four local municipalities and is shown in **Figure 1.1**.

Figure 1.1: Umzinyathi District Municipality with four Local Municipalities



1.1.2 Demographic Information on Local Municipalities

Table 1.1 shows the demographic information for Umzinyathi district as given by the IDP and the Census 2001 figures.

Table 1.1: Demographic Information per Local Municipality

Basic Facts	Figures	
	IDP (1996 figures)	Census 2001
Total population	427,052	456,459
Total population of DC24 per KZ area		
KZ 241 – Endumeni KZ 242 - Nqutu KZ 244 - Msinga KZ 245 - Umvoti	44,521 (10.4%) 128,795 (30.2%) 161,341 (37.8%) 92,395 (21.6%)	51,105 (11.2%) 145,036 (31.8%) 168,037 (36.8%) 92,290 (20.2%)
Age profile < 19 years 20 – 34 years 35 – 64 years > 65 years Unspecified	 229,978 84,879 78,345 22,281 11,669	 253,942 86,669 91,715 24,133
Gender profile Male Female	 193,295 (45.3%) 233,757 (54.7%)	 200,787 (44%) 255,672 (56%)
Formal Employment (% of total population)	6.9%	7.8%

(Source – Umzinyathi District Municipality: Integrated Development Plan, March 2002 and Census 2001.)

According to the Census 2001 figures, an estimated 456,459 people live within the district, compared to the 1996 figures used in the Integrated Development Plan (IDP), which showed an estimated 427,052 people.

The population of the District is spread throughout the Municipalities. The Municipality with the highest population, based on 2001 census figures, is Msinga with 168,037 (36.8%) people, and the Municipality with the lowest population is Endumeni with 51,105 (11.2%) people.

According to the IDP there are concentrations of population around the urban areas of Dundee and Greytown. There are also higher densities in the northern parts of Nqutu and in the central and southern parts of Msinga.

1.2 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 Umzinyathi 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 Umzinyathi area and to provide Umzinyathi District Municipality with a management and decision making tool.

1.3 Scope of Work

This study meets the basic requirements of the guidelines for conducting the first CPTR for Umzinyathi, 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 Umzinyathi 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:

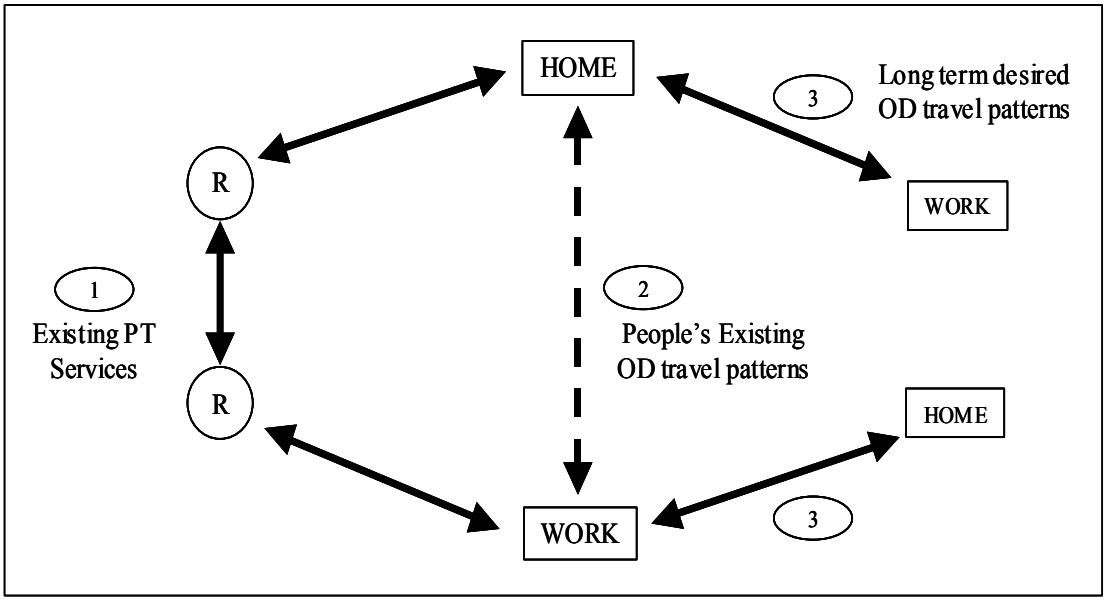
- Passenger Origin – Destination Surveys,
- Vehicle Registration, Destination and Utilisation Surveys, and
- Passenger Waiting Time Surveys.

1.4 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 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

1.5 Chapter Overview

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

Chapter 1: Introduction

This chapter focuses on general information regarding Umzinyathi District Municipality, the objective of the study, the scope of work that was 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 Umzinyathi District Municipality.

Chapters 4 – 6: Results

Chapter four to six provide information on the Modes used, Public Transport Operations within Umzinyathi and also provides a summary of existing infrastructure and facilities as discussed in the Facility Inventory Report.

Chapter 7: Summary and Conclusion

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

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 consultation and public liaison. The second stage included the development of survey forms, survey methodology, recruiting and training temporary personnel to assist with surveys. The third stage of the project focussed on the gathering, capturing and GIS conversion of public transport information. Reporting formed the final stage.

The section also 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

According to the Terms of Reference received from Umzinyathi District Municipality, the KwaZulu Department of Transport embarked on a process 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 Arup set out to prepare a methodology to firstly collect all desired public transport information and secondly to disseminate and present the data to the Umzinyathi District Municipality. The collection of data include the following:

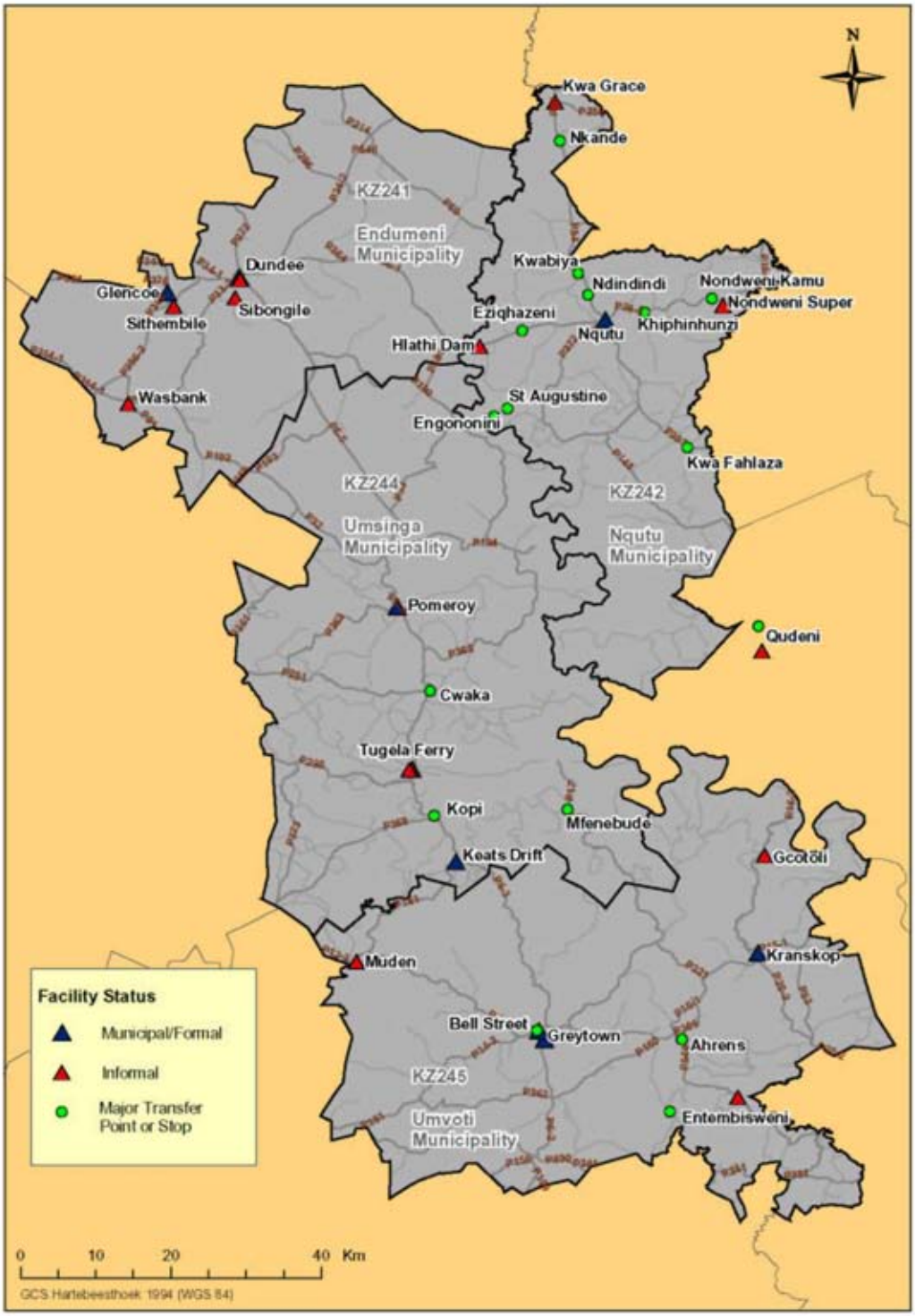
- Data collection points,
- Types of Data to be collected,
- Procurement of surveyors,
- Survey forms, and
- Data collection periods.

2.2.1 Data collection points (Ranks)

Collection of public transport information should be done at all facilities identified through CPTR Phase 1: Facility Inventory. As mentioned earlier in the report Umzinyathi District Municipality covers the four local municipal areas of Endumeni, Nquthu, Msinga and Umvoti.

In total, 42 formal and informal ranks and major transfer points (stops) were identified during Phase 1 of the CPTR and are shown on **Figure 2.1** below.

Figure 2.1: Public Transport Facilities within Umzinyathi District



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 were received from the KZNDOT and were used as a basis for the development of survey forms to be used in Umzinyathi. 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 the poor communication between the Minibus-Taxi Council and the Minibus-Taxi Associations from the Msinga Area.

The delay in collecting the data at facilities in the Msinga Area resulted in the delay in 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.

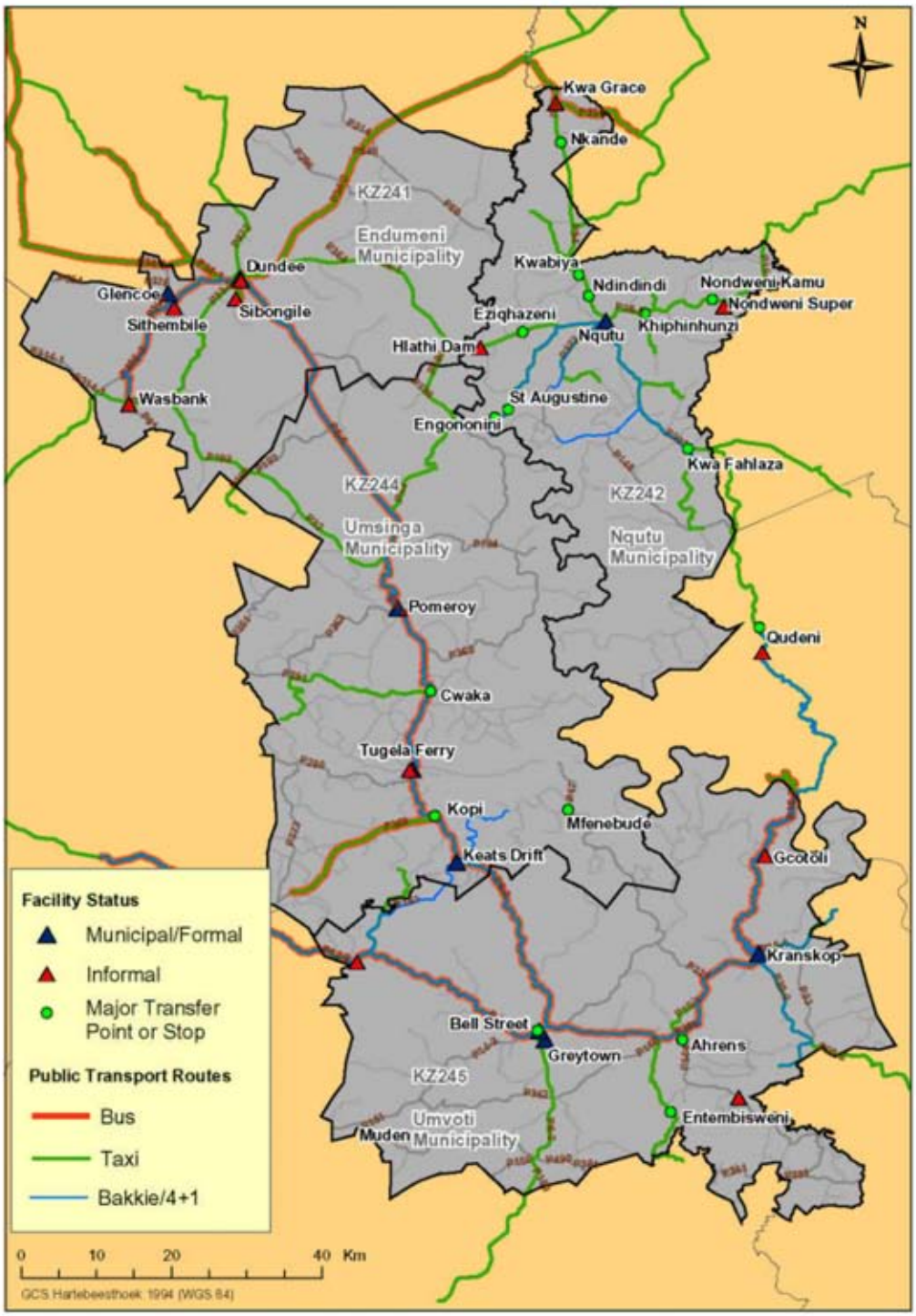
At first minibus-taxi drivers were not keen to allow surveyors to write down the vehicle registration numbers in fear of the consultants providing traffic officials with this information and possible law enforcement actions against them. This was overcome by explaining to these drivers that the information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

3. GENERAL

3.1 Description of the Area

Figure 3.1 below shows the extent of the study area with the four local municipalities including the major public transport routes and facilities:

Figure 3.1: Study area showing major routes and facilities



3.2 Transport Modes Serving the Area

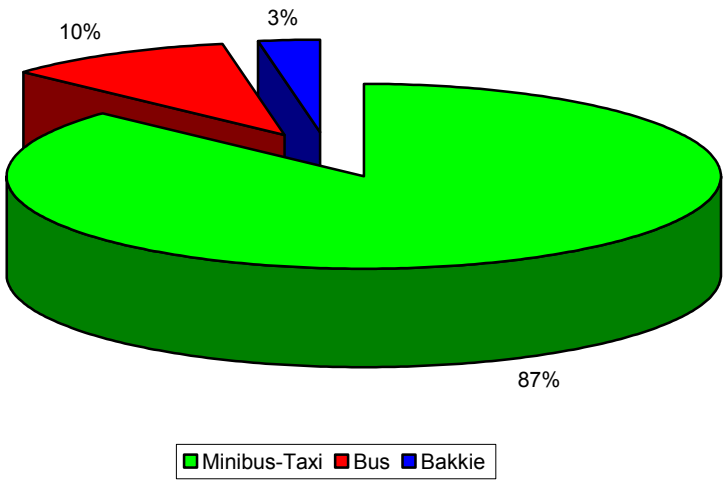
According the Umzinyathi District Municipality the following modes of public transport are present and was included as part of the survey and data gathering programme:

- Minibus-Taxi,
- Bus, and
- Bakkie.

The distribution of modes of transport can be based on the number of passengers transported as well as the number of trips per vehicles type. For the purposes of this section of the report the distribution was based on the number of passenger trips and not the number of vehicle trips. The detail discussion of the each mode deals with both vehicle and passenger trips.

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

Figure 3.2: Person Trips according to public transport mode



3.3 Inventory of Existing Infrastructure

3.3.1 Public Transport Termini

There are 23 minibus-taxi ranks, 2 bus ranks, 1 minibus-taxi and bus rank combined and 16 minibus-taxi transfer points (stops) within the Umzinyathi area. The minibus-taxi and bus ranks comprises of 10 formal rank facilities, which are municipally owned and 13 informal rank facilities. Bakkie transport does not operate from separate ranks but make use of existing minibus-taxi facilities within the different municipal areas.

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 Umzinyathi area. The tables are divided into the four local municipal areas respectively. **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.

From these tables it can be seen that there are 10 formal and 13 informal facilities available. Only 5 of these facilities are on street, in the form of informal minibus-taxi ranks and the rest of the facilities are off-street. The majority (16) of the facilities are paved and 9 public transport facilities have no paving.

3.3.2 Route Coding

The process of coding was very time consuming, as 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 (Umzinyathi = M)
- 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 = Transnat)
- Mode of Transport used – digit 10 (B = Bus)
- Example: KM3042BI-**AB** (AB = Detail Operator Code as shown in **Table 3.3**)

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 (Umzinyathi = M)
- Type of facility – digits – 3-4 (TR = Minibus Taxi Rank)
- Number of the facility – digits 5-6 (05 = Greytown Taxi Rank)
- Example: KMTR05

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 (Umzinyathi = M)
- Number of the facility – digits 3-6 (0034 = Dundee Bus Rank)
- Example: KM0034

3.3.3 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.

An example of a route description would be as follows:
Origin: Dundee Taxi Rank
Mode: Type of mode used (Taxi, Bus or Bakkie)
Destination: Newcastle
Description: via the R34 and Dannhauser to Newcastle

Further route details are available on the GIS and can be shown on a detailed map of the area.

3.3.4 Capacity Utilisation of Routes

Figure 3.3 shows the average Capacity Utilisation for all modes of transport. This includes Bus, Minibus-Taxi and Bakkie transport. From the surveys it is clear that the Public Transport Service is operating at high utilisation levels between 75% and 100%.

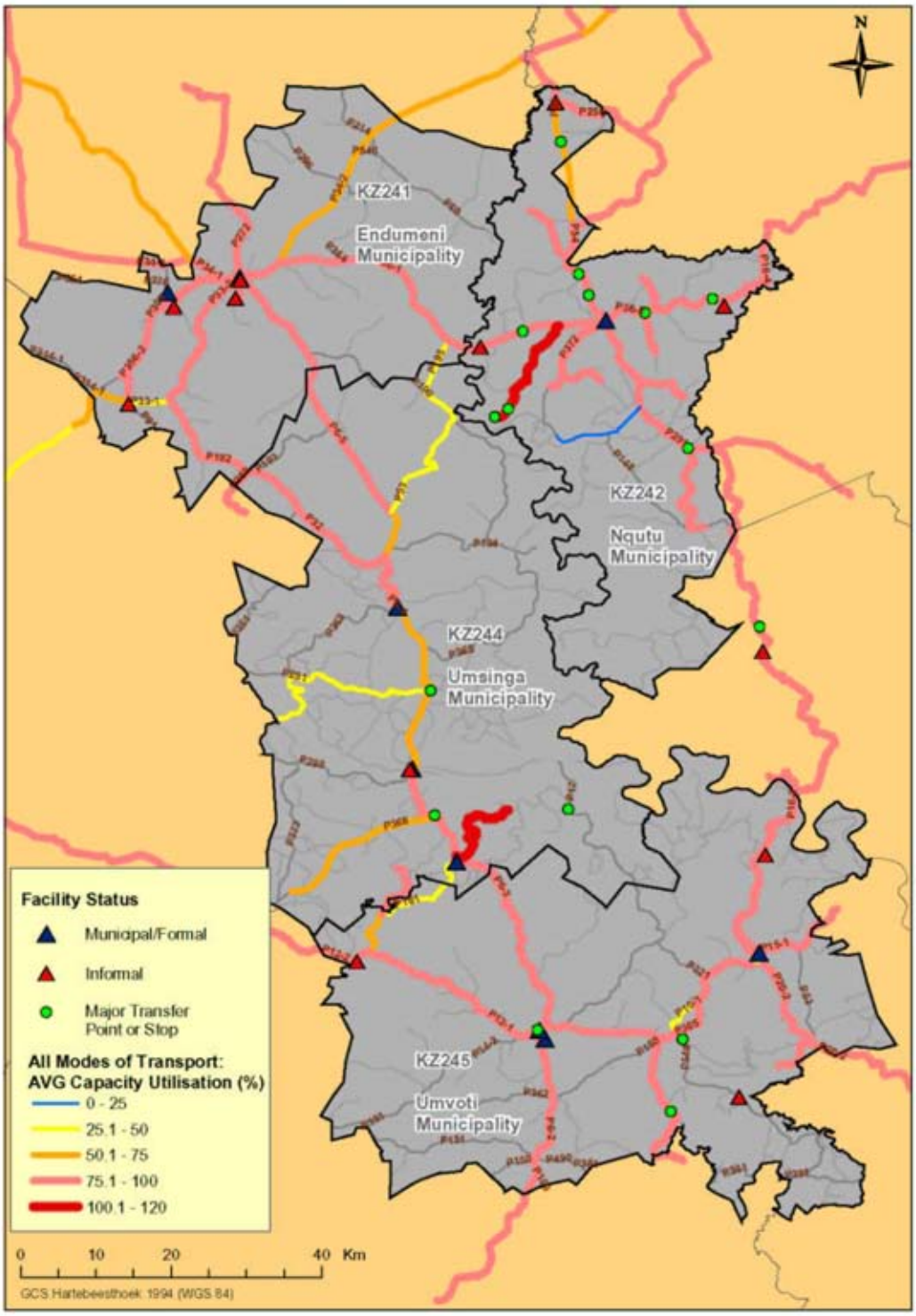
Only a few of the existing public transport routes operate at utilisation levels higher than 100%.

A breakdown of each mode of transport in the next sections of the report should provide a more detail picture of the capacity utilisation of each mode of transport. The results of the surveys are 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.

Table 3.3: Operator Codes and Names

Operator/Association	Code	Vehicle Type
BHekisizwe Taxi Association	BH	Taxi
COlta Association	CO	Taxi
DEsai Tours	DE	Bus
DUndee Taxi Association	DU	Taxi
EKuvukeni Taxi Association	EK	Taxi
EMabomvini Association	EM	Taxi
ENhlalakahle Association	EN	Taxi
EScourt Taxi Association	ES	Taxi
GAuteng Association	GA	Taxi
GLencoe Taxi Association	GL	Taxi
GReytown Bus Association	GR	Taxi
GTN Association	GT	Taxi
Immbatho	IM	Taxi
INtuthuko Taxi Association	IN	Taxi
KD Association	KD	Taxi
KEats Drift Association	KE	Taxi
KLipriver Association	KL	Taxi
KRanskop Taxi Association	KR	Taxi
LAdysmith Taxi Association	LA	Taxi
LImehill Taxi Association	LI	Taxi
MAdulaleni Taxi Association	MD	Taxi
MAphulu Association	MP	Taxi
MAtimatolo Association	MA	Taxi
MHlangani Taxi Association	MH	Taxi
MIspar Association	MI	Taxi
MOndlo Association	MO	Taxi
MUden Taxi Association	MU	Taxi
NKandla Taxi Association	NA	Taxi
NKK Association	NK	Taxi
NOndweni Taxi Association	NO	Taxi
NQutu Taxi Association	NQ	Taxi
NThuthuko Taxi Association	NT	Taxi
NYanyadu Taxi Association	NY	Taxi
PHakama Taxi Association	PH	Taxi
Phayone	PA	Taxi
PIetermaritzburg Association	PE	Taxi
PIoneer Taxi Association	PI	Taxi
POmeroy Taxi Association	PO	Taxi
Private	PR	Taxi
RIetvlei Taxi Association	RI	Taxi
SHiyama Taxi Association	SH	Taxi
TRansnat Bus Service	TR	Bus
TUgela Ferry Association	TU	Taxi
UMhlango Taxi Association	UM	Taxi
UMthonaneni Association	UT	Taxi
VRyheid Taxi Association	VR	Taxi
VUlindlela Association	VU	Taxi
Wasbank	WA	Taxi
WEenen Taxi Association	WE	Taxi

Figure 3.3: All Modes of Transport – Average Daily Capacity Utilisation



4. RESULTS - MINIBUS TAXIS

4.1 Route Description

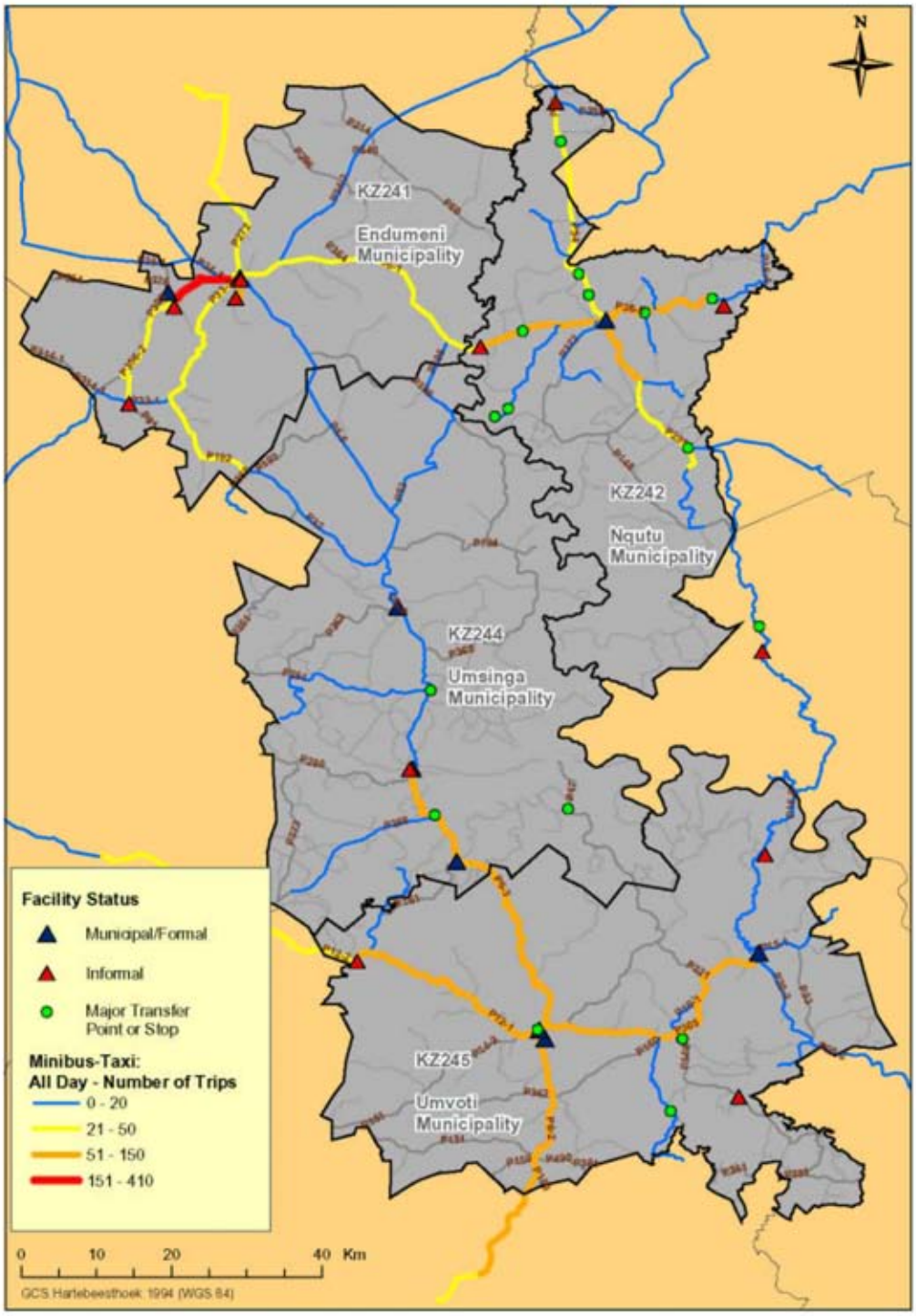
Table 4.1 shows the different destinations served. The detailed route description is shown in **Table 4.2 in Appendix A** and was determined through discussions with Minibus-Taxi Associations or based on the shortest route between an origin and destination measured by the GIS. The exact route description has not been verified as part of this study. A description of the routes is given in **Table 4.3** in **Appendix A**. **Figure 4.1** shows the Minibus-Taxi routes and estimated trips per route within Umzinyathi.

Table 4.1: Destinations served according to Minibus – Taxi Associations

No.	Facility Name	Mode	Destination
1	Dundee Taxi Rank	Minibus-Taxi	Sibongile Glencoe Ladysmith Newcastle Vryheid Pomeroy Empangeni Durban Johannesburg Ekuvukeni Lime Hill Rorkes Drift Mazabeko Nyanyadu Nqutu
2	Dundee Nkandla Informal Rank	Minibus-Taxi	Nkandla
3	Sibongile Informal Rank	Minibus-Taxi	Dundee
4	Sitembile Informal Rank	Minibus-Taxi	Glencoe Dundee
5	Glencoe Taxi Rank	Minibus-Taxi	Dundee Sitembile
6	Wasbank Informal Rank	Minibus-Taxi	Lime Hill Uitval Ekuvukeni Tholeni Douglas Dundee
7	Nqutu Taxi Rank	Minibus-Taxi & Bus	Silutshana Mosotsheni Ncepheni Mondlo Nondweni Empangeni Hlazakozi Hlati Dam Bloodriver Qudeni Zitole Fort Louis Sandlwana Dundee Durban Johannesburg Mabululwane Mbokodwe Vryheid Ulundi
8	New Nqutu Rank	Minibus-Taxi	Not in Operation
9	Nondweni Super Informal Rank	Minibus-Taxi	Nqutu
10	Hlathi Dam Informal Rank	Minibus-Taxi	Nqutu Dundee Jabavu
11	Isandlwana Informal Rank	Minibus-Taxi	Nqutu

No.	Facility Name	Mode	Destination
12	Qudeni Informal Rank	Minibus-Taxi	Nqutu Nkandla Kranskop
13	Kwa Grace Informal Rank	Minibus-Taxi	Nqutu Vryheid
14	Tugela Ferry Taxi Rank	Minibus-Taxi & Bakkie	Dundee Johannesburg Greytown Durban Pietermaritzburg Msinga Top
15	Tugela Ferry Informal Taxi & Bakkie Rank	Minibus-Taxi & Bakkie	Msinga Top Dayiswayo
16	Tugela Ferry Informal Bakkie Rank	Bakkie	Mbabane Weenen Mahlabathini Mzisho
17	Pomeroy Taxi Rank	Minibus-Taxi	Johannesburg Dundee Nqutu Greytown Tugela Ferry Pietermaritzburg Durban Ladysmith Emthaleni Mngeni Emzweni Ndanyana Uitval Mozane Mumbe Msinga Top
18	Keat's Drift Taxi Rank	Minibus-Taxi	Greytown Tugela Ferry Muden
19	Greytown Taxi Rank	Minibus-Taxi	Pietermaritzburg Kranskop Tugela Ferry Durban Maphulo Stanger Matimotolo Eshane Sevenoaks
20	Durban St Informal Rank	Minibus-Taxi	Local
21	KFC Taxi Rank	Minibus-Taxi	Mhlangane Rietvlei Muden Dalton
22	Kranskop Taxi Rank	Minibus-Taxi	Stanger Pietermaritzburg Ntunjambili Greytown Johannesburg Durban Eshowe Nkandla
23	Muden Taxi Rank	Minibus-Taxi	Greytown Weenen Keat's Drift
24	Gcotoli Informal Rank	Minibus-Taxi	Kranskop Qudeni

Figure 4.1: Number of Minibus-Taxi Trips per Route



4.2 Passenger O-D and Trip Purpose

The results of the minibus-taxi survey showed that 16223 passengers are transported per day by minibus, which equates to an average of 12 passengers per taxi. The majority of trips take place around the more urban areas of Dundee, Glencoe and Greytown.

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 Dundee region with lesser passenger transport in the rural areas of Ngutu and Greytown.

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.

Furthermore, 87,4% of Public Transport trips originate from areas within Umzinyathi District and 12,6% of passenger trips terminate outside the Umzinyathi District.

Figure 4.3 and Figure 4.4 show the AM Peak (07:00 to 08:00) and PM Peak (16:00 to 17:00) passenger volumes according to the surveys. The majority of passengers travel between the urban areas (Dundee, Glencoe and Greytown).

The route with the highest number of passengers is the R33 between the Dundee and Glencoe, and is evident for all peak periods that were analysed. During the AM peak period some 7214 passengers travel within Umzinyathi, while 8961 passengers travel within the PM peak period.

Figure 4.3 indicates that during the AM peak period passenger volumes are concentrated on main roads between Dundee and Glencoe, around Ngutu and Greytown. The rural areas have less than 20 passengers per route, while routes close to Dundee generally showed passenger volumes between 600 -1300 passengers per road link. No information is available for Msinga due to the lack of public transport information and difficulty in collect information at the main ranks in Msinga.

Figure 4.4 representing the PM peak period also shows the same tendency as that of the AM peak with high volumes around Dundee, Ngutu and Greytown areas. Less than 50 passengers travel on routes in the rural areas and between 300 and 960 passengers travel on routes closer to the urban areas.

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

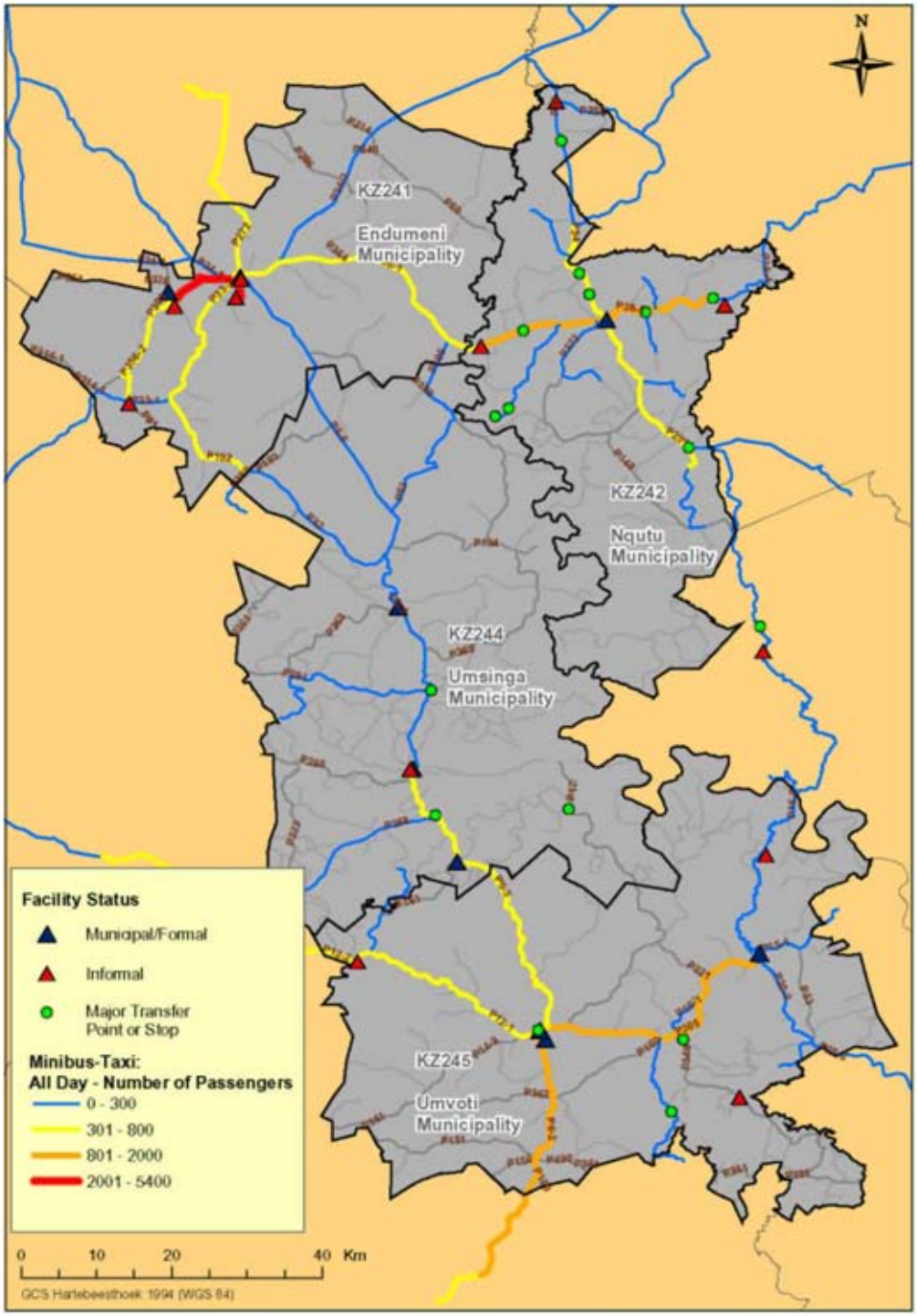


Figure 4.3: AM Peak – Minibus-Taxi passengers

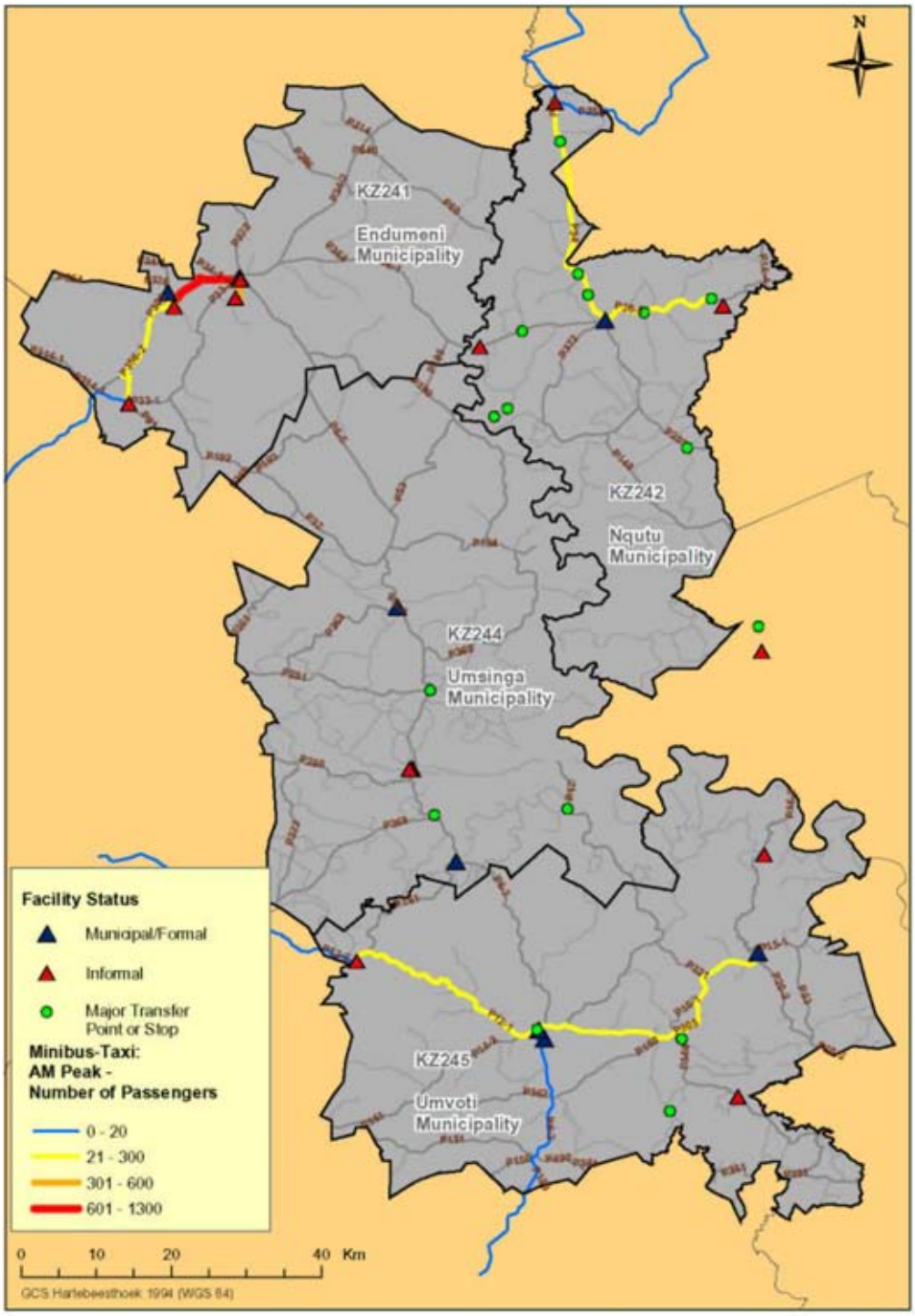


Figure 4.4: PM Peak – Minibus-Taxi Passengers

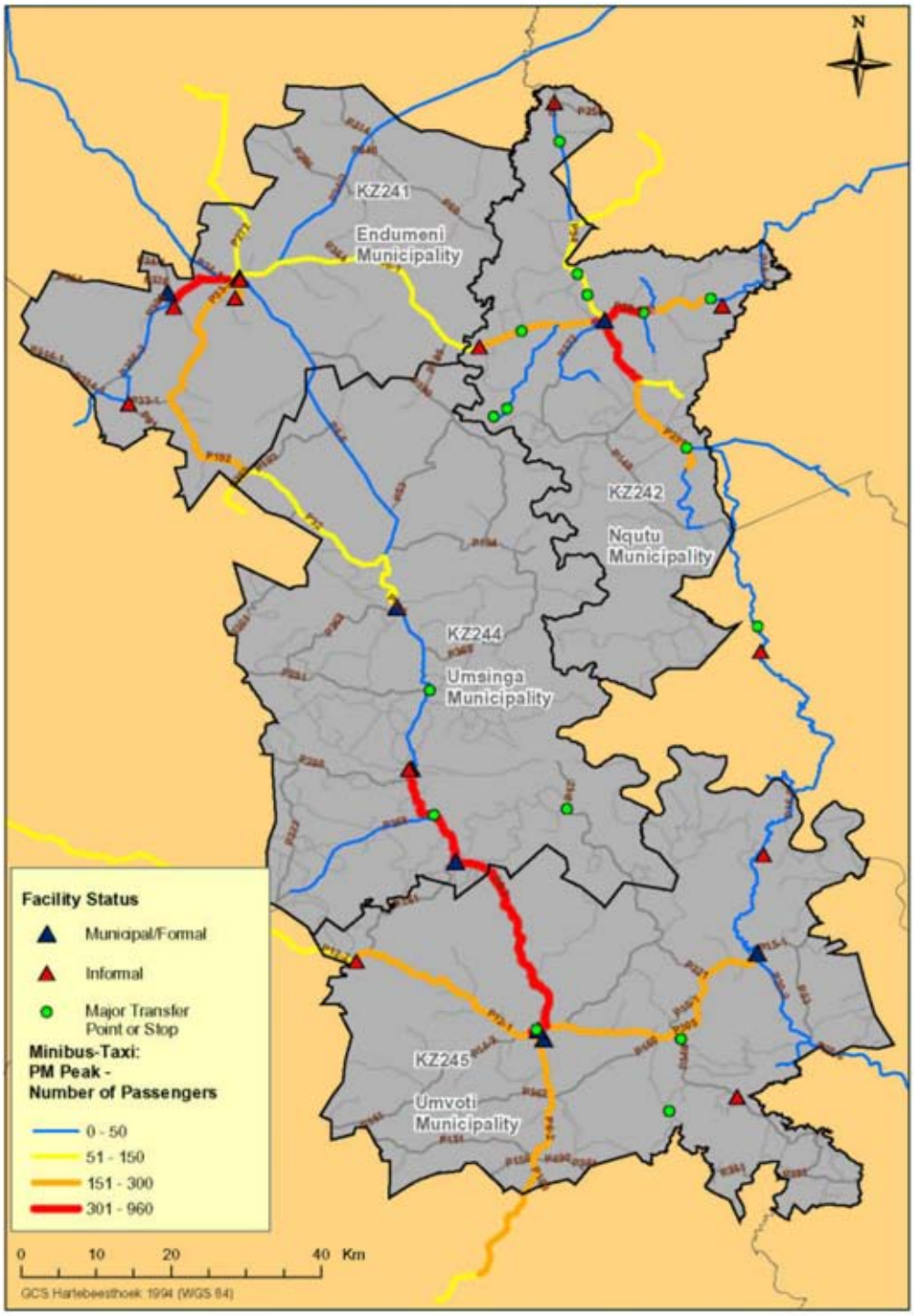


Figure 4.5 and **Figure 4.6** shows the results of the minibus-taxi surveys for each rank for passenger trips per minibus-taxi per rank/termini and the number of vehicle trips per rank respectively.

Figure 4.5: Minibus-taxi passenger trips per rank

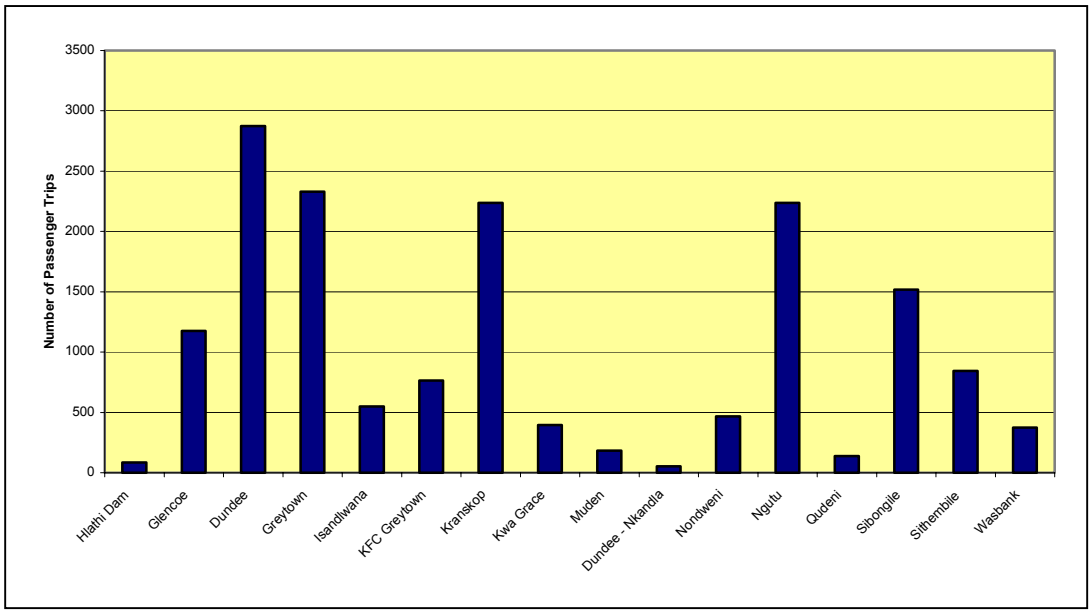
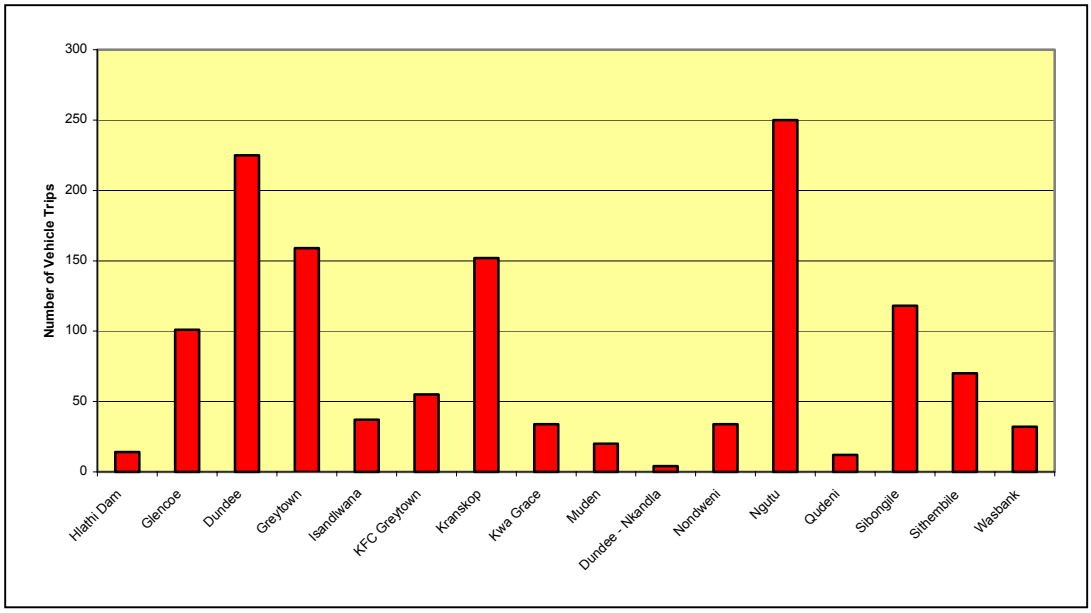


Figure 4.6: Minibus-taxi vehicle trips per rank



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 19755 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 16223 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 Umzinyathi the overall minibus-taxi service is 72 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

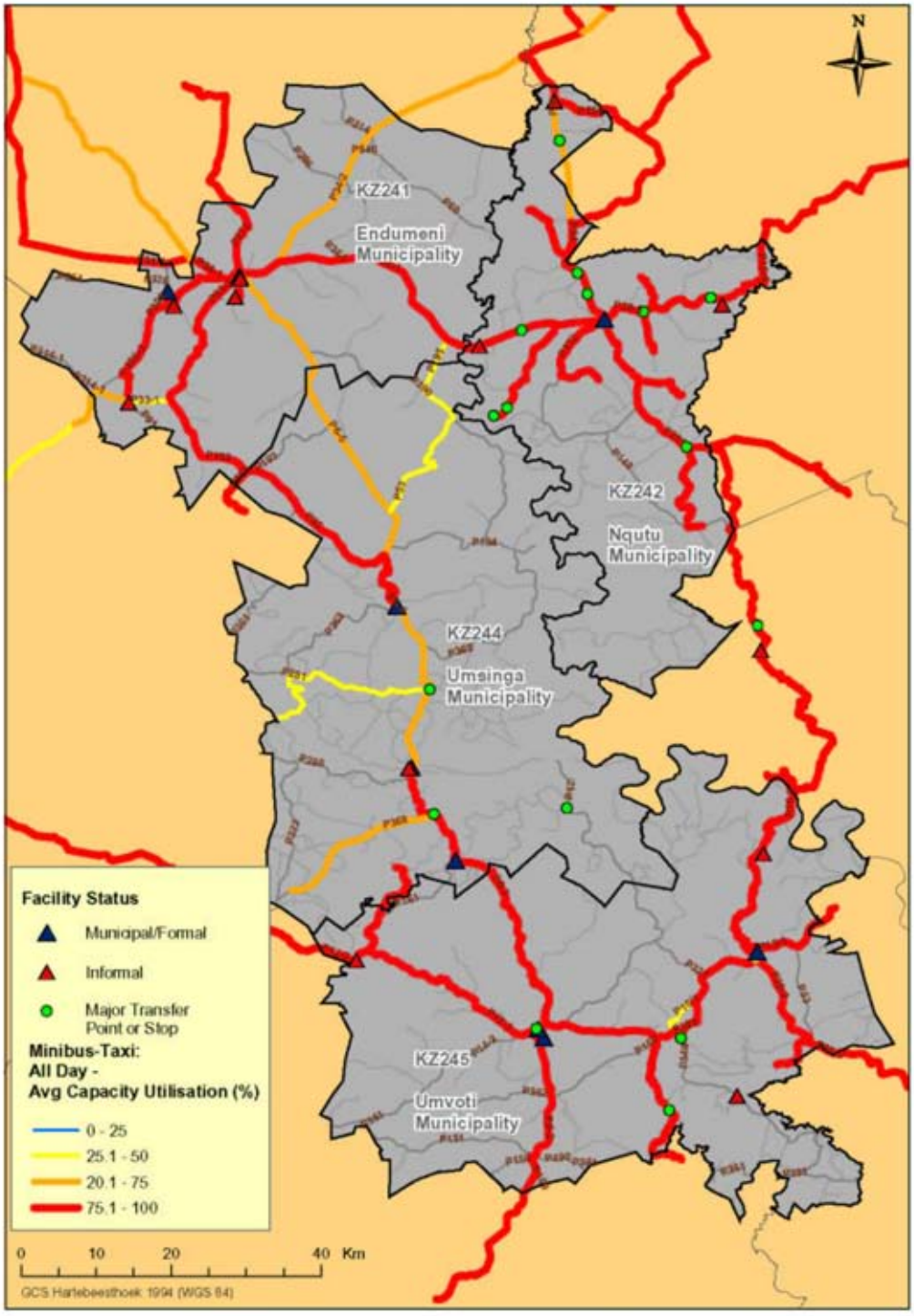


Figure 4.8 and **4.9** on the next page represent the Minibus-taxi AM Peak and PM Peak utilisation respectively. From these figures it is clear that the PM peak hour is more utilised than that of the AM peak period.

Figure 4.8: AM Peak Minibus-taxi Service Capacity Utilisation

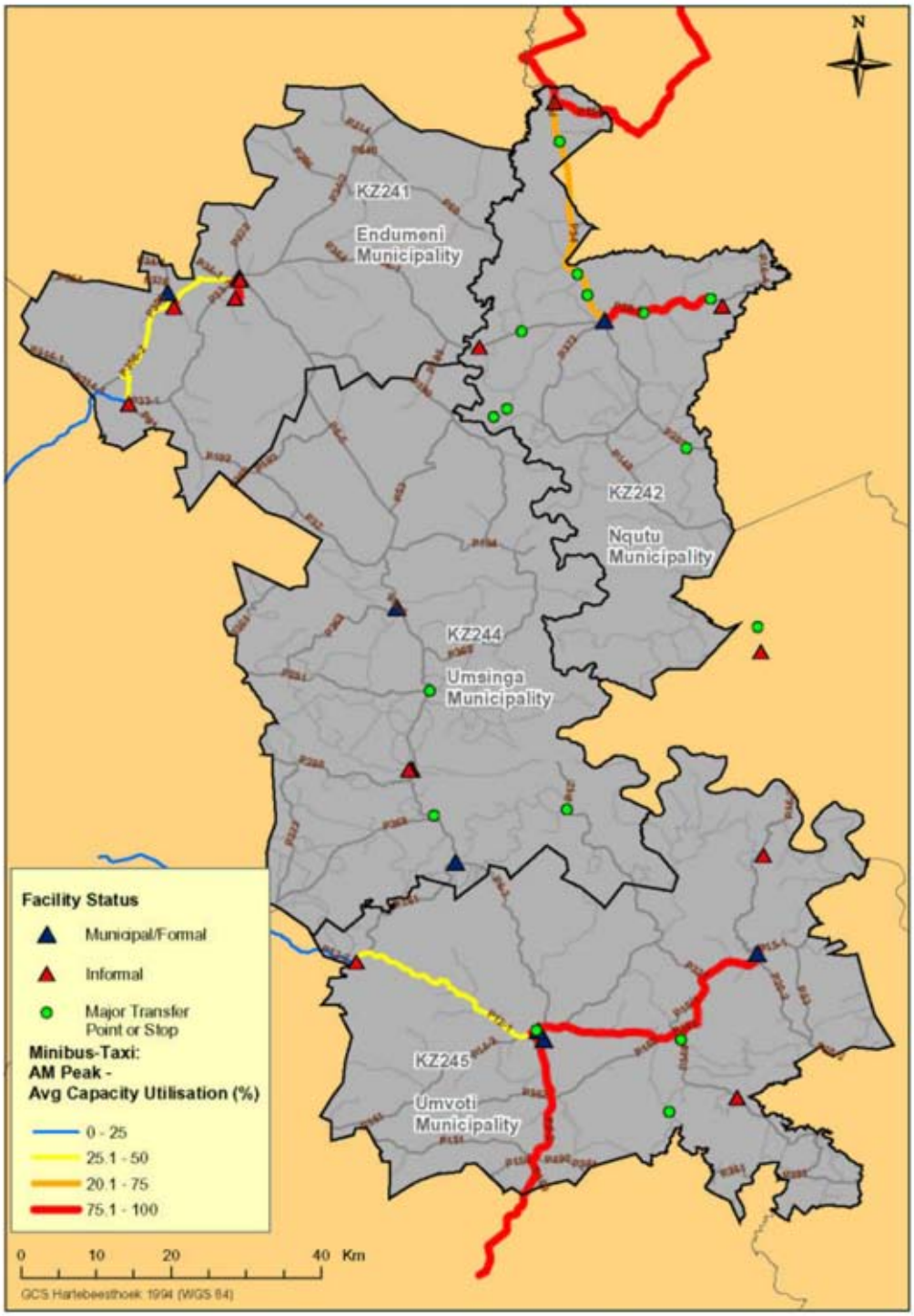
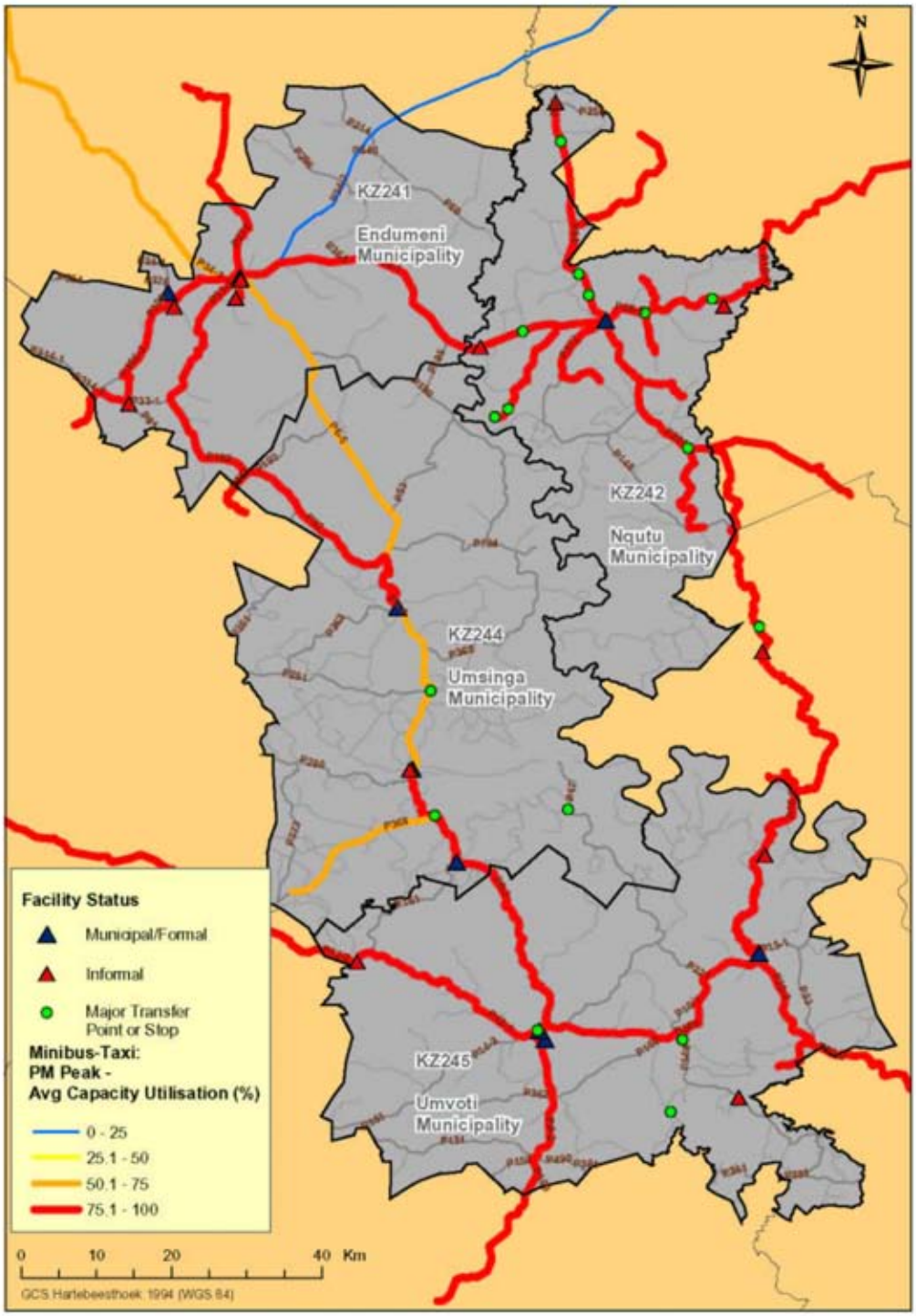


Figure 4.9: PM Peak Minibus-taxi Service Capacity Utilisation



During the AM Peak period **(Figure 4.8)** routes around Greytown and Kranskop proves to be the routes 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% throughout Umzinyathi.

The reason for the high utilisation levels during the PM peak period can be attributed to the high number of passengers wanting to travel during the PM peak period. **Table 4.4 in Appendix A** shows the capacity and utilisation of minibus-taxi routes.

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 using minibus-taxi transport is 15 minutes. The longest waiting time surveyed for minibus-taxi passengers were 3 hours and 25 minutes.

Table 4.5: Waiting Time – Minibus-Taxi and Bakkie Transport – All Day

Vehicle Type	Min (min)	Max (min)	Average (min)
Bakkie	0	45	20
Taxi	0	205	15

On average the bakkie passengers wait longer than those passengers using minibus-taxi 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: Peak Period Waiting Time – Minibus-taxi passengers

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Taxi	0	45	7
PM Peak	Taxi	0	81	17

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 are not enough passengers. Detailed waiting times per route can be found in **Table 4.7** 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 4.8 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.

An example of a route description would be as follows:

Origin: Dundee Main Rank
Mode: Type of mode used
Destination: Greytown
Description: via the internal road network of Dundee and provincial road R33.

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 Umzinyathi District. **Figure 5.1** shows the Bus Routes and the number of trips per route for the Umzinyathi District

5.2 Passenger O-D and Trip Purpose

The results of the bus survey showed that 1926 passengers are transported per day by bus. Similar to the Minibus-taxi, the majority of trips take place between the urban areas of Dundee and Glencoe including the associated rural areas (See **Figure 5.2**).

Figure 5.1: Number of Bus Trip per Route

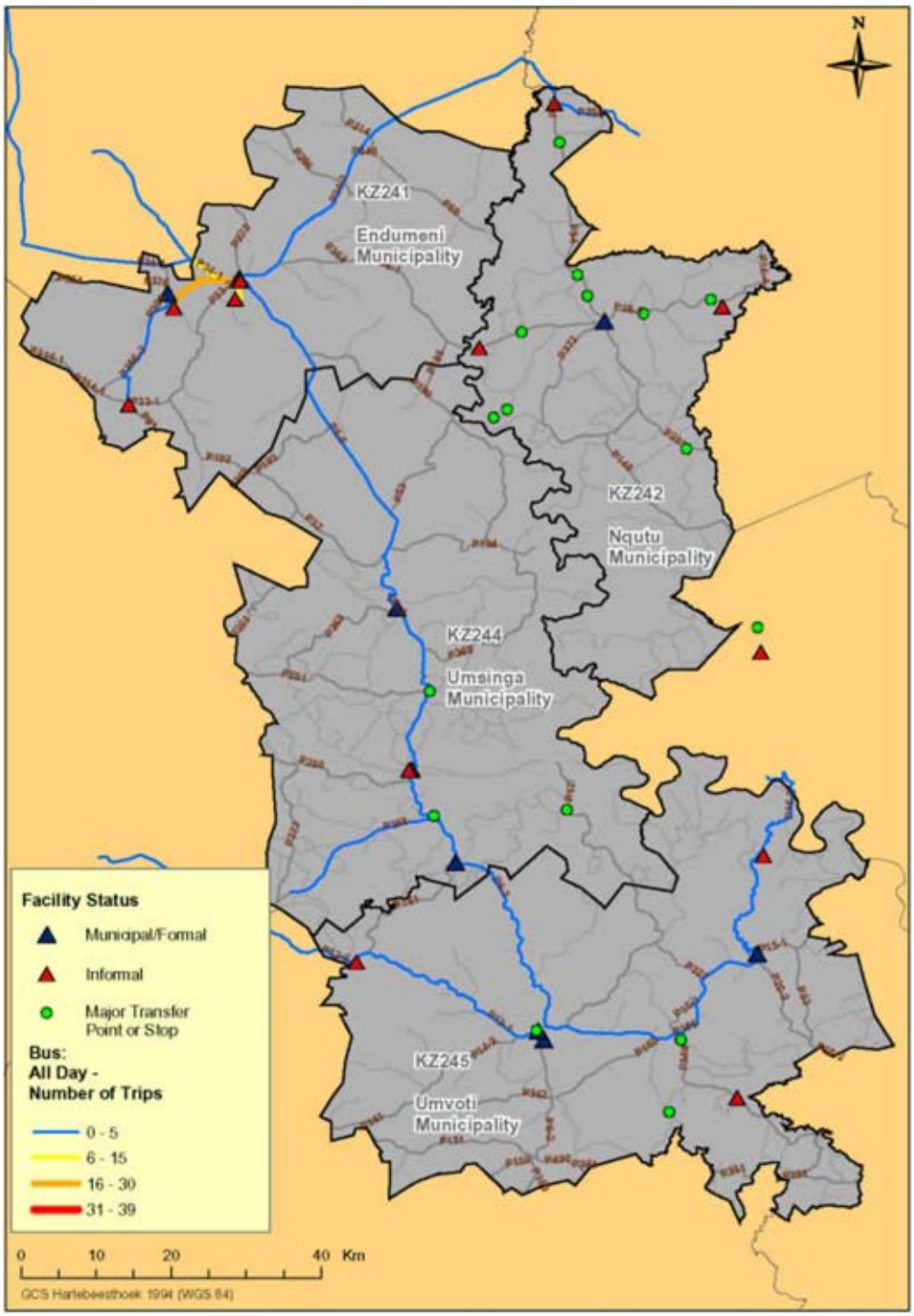


Figure 5.2: Bus – Number of passengers – All day

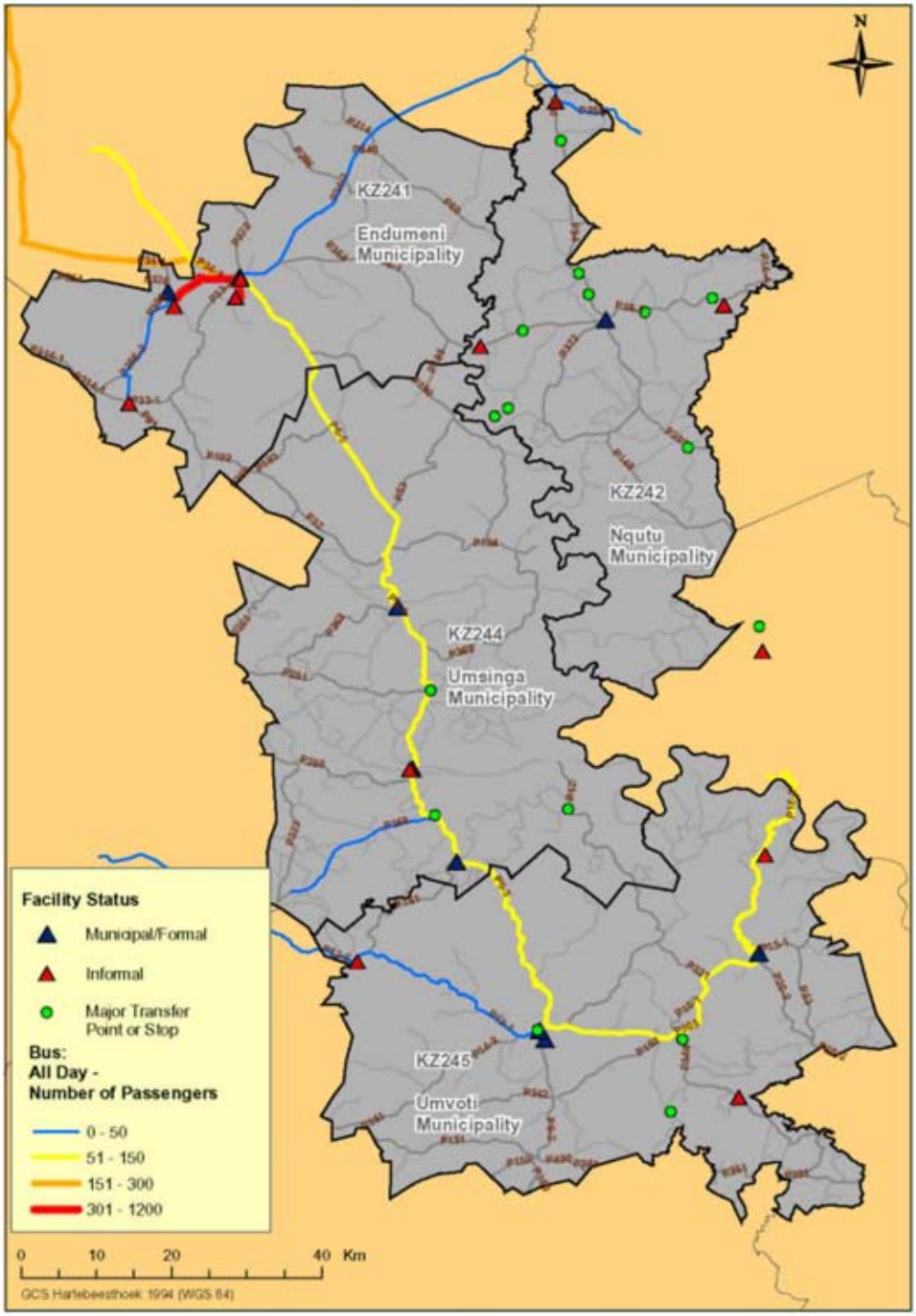


Figure 5.3 and **Figure 5.4** shows the AM Peak Passenger and PM Peak Passenger Distribution respectively. The Rank Survey information shows that most passengers travel between Dundee and Glencoe around Nqutu and between Greytown and Tugela Ferry.

During the AM peak period it can be seen that the routes between Dundee and Glencoe experience higher passenger volumes. This is due to passengers travelling to urban areas for work or for shopping.

However during the PM peak period the majority of passenger movements occur between Dundee and Glencoe and between Greytown and Tugela Ferry.

Figure 5.3: AM Peak – Bus Passenger Volumes

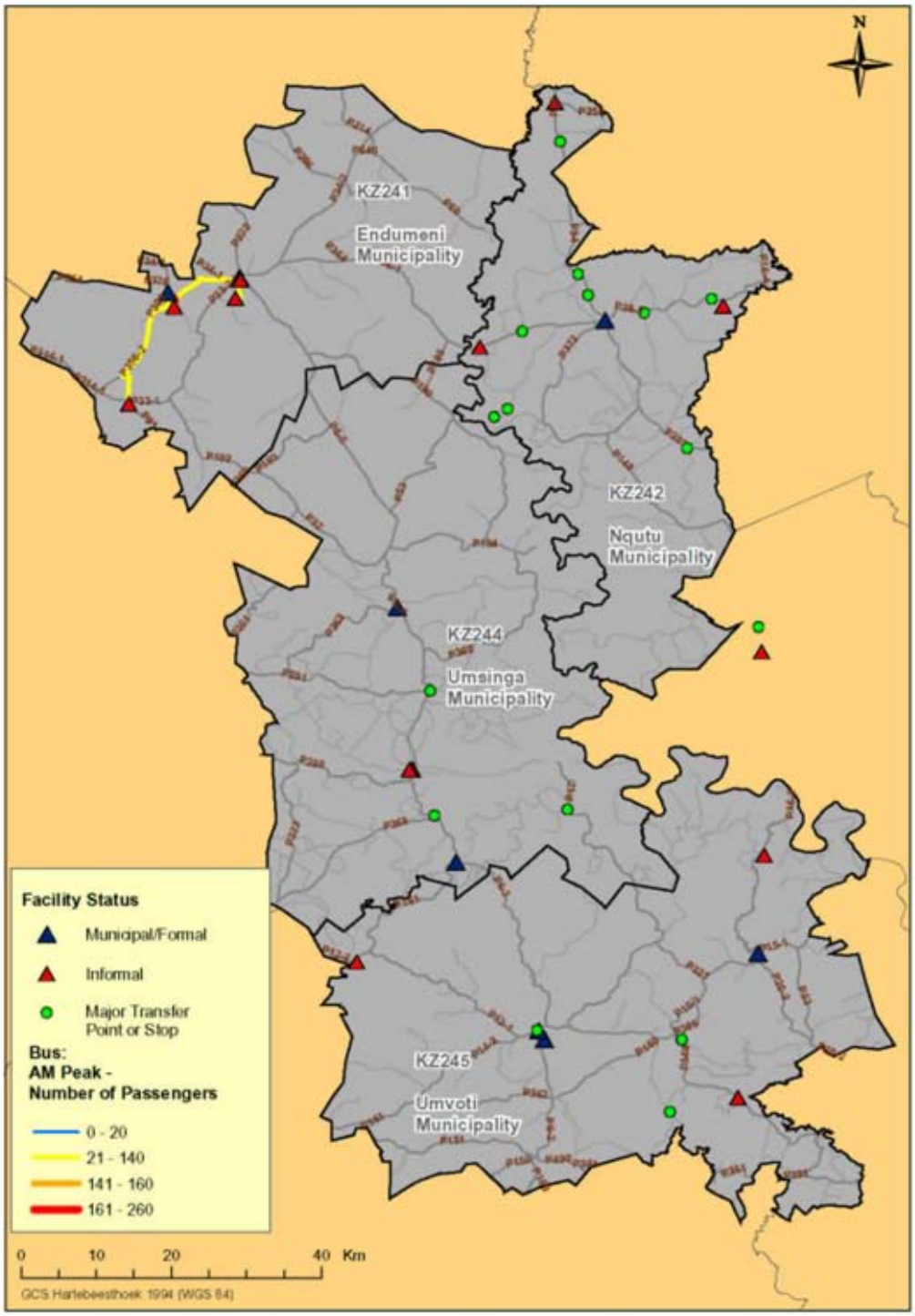


Figure 5.4: PM Peak – Bus Passenger Volumes

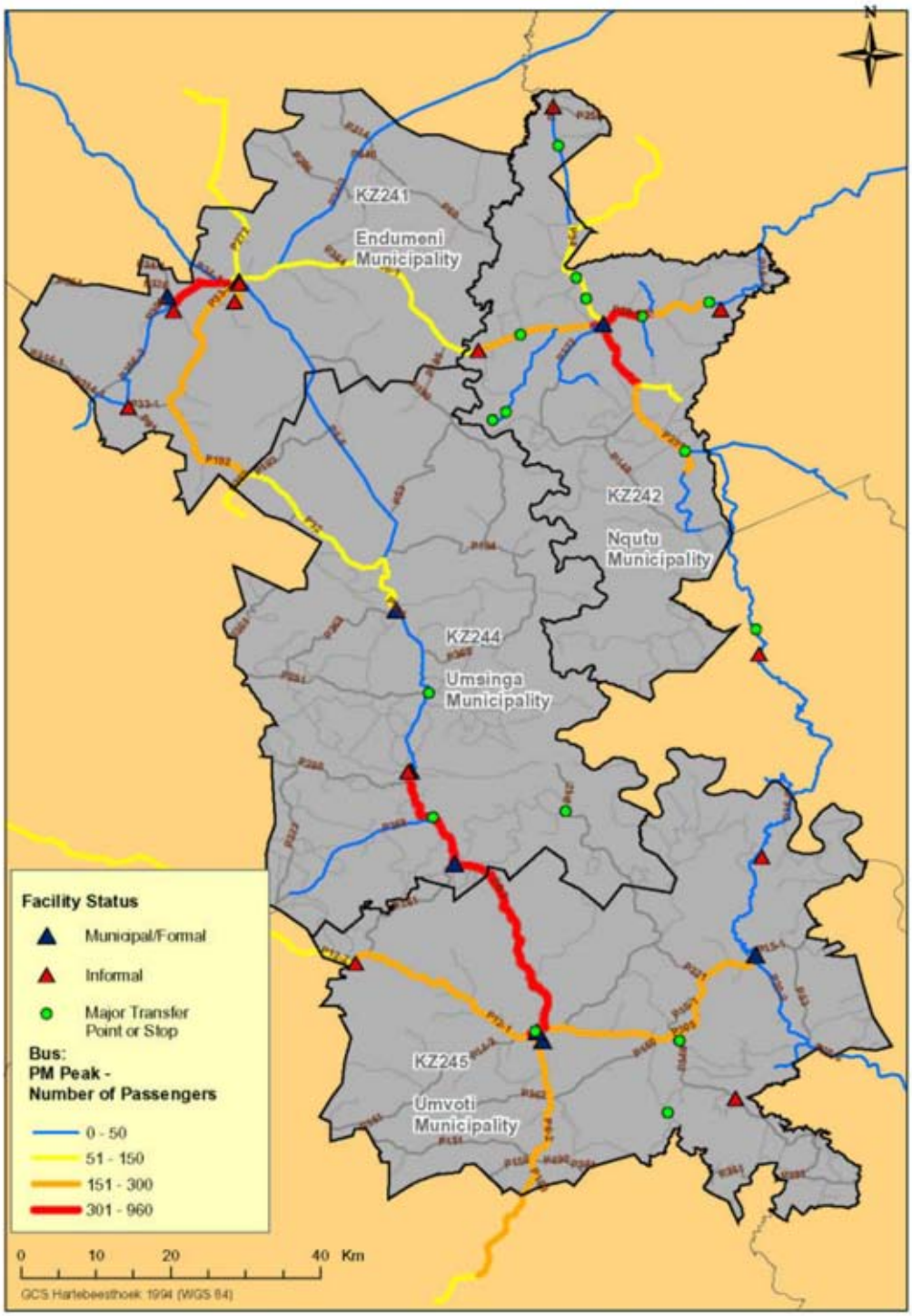


Figure 5.5 and **Figure 5.6** shows the results of the bus surveys for each rank for passenger trips per bus per rank/termini and the number of vehicle trips per rank respectively.

Figure 5.5: Bus passenger trips per rank

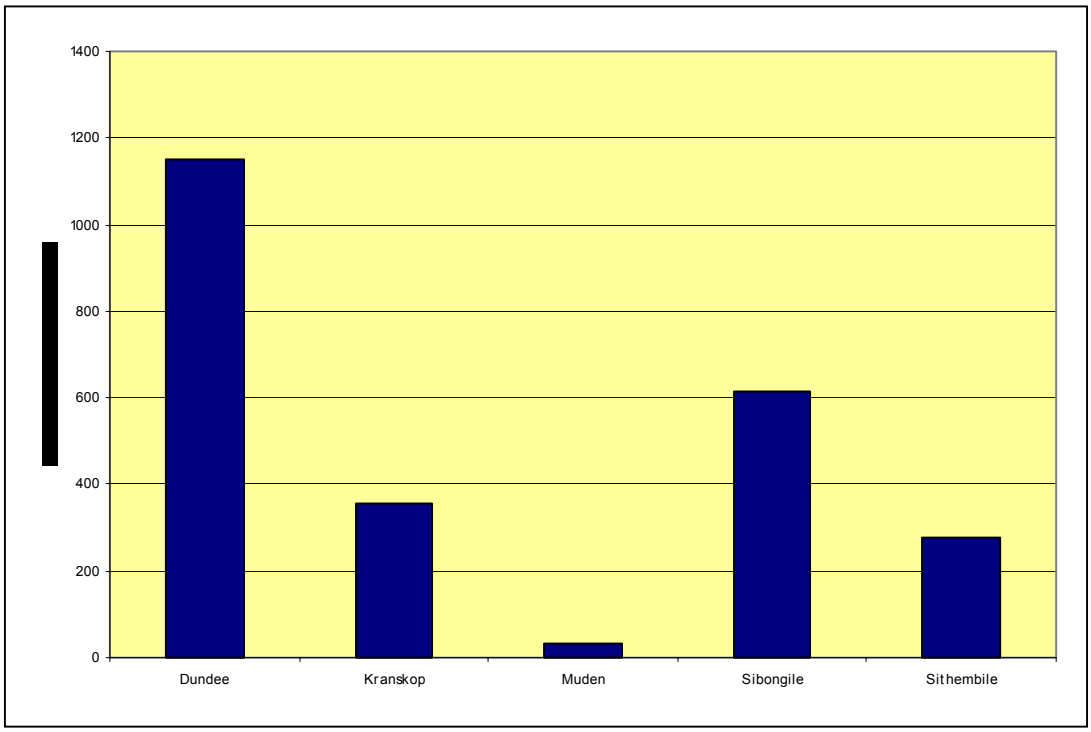
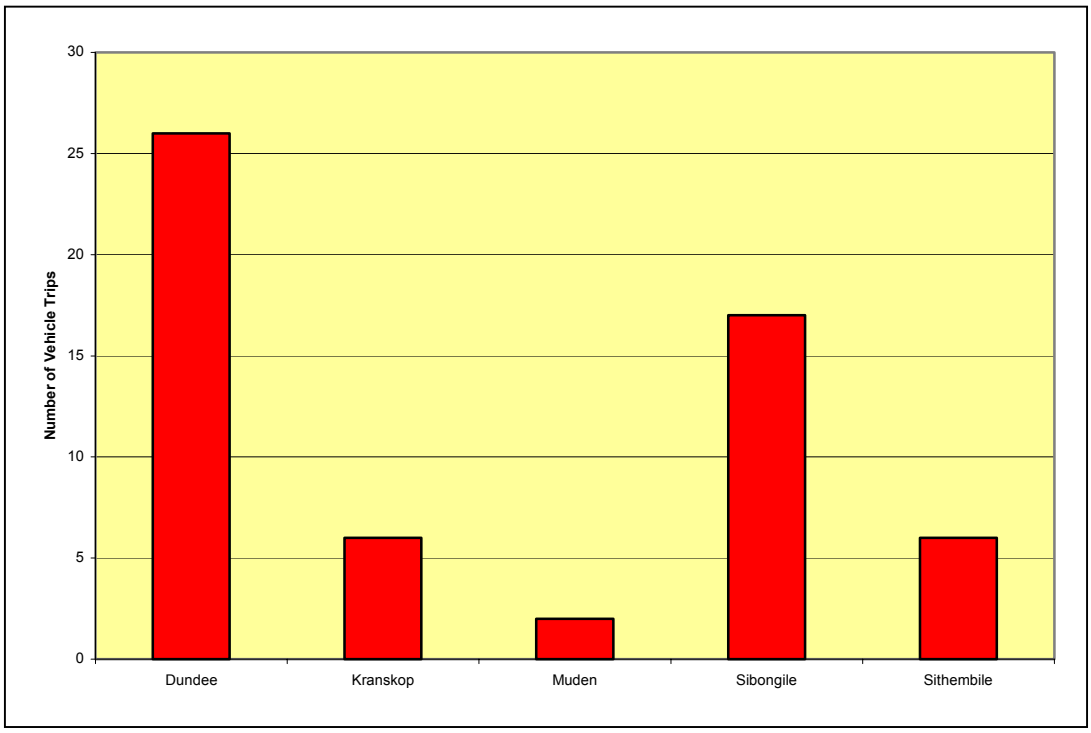


Figure 5.6: Bus vehicle trips per rank



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 proute utilisation. The information received from the surveys showed that the seated capacity of the bus service amounted to 3 420 seats with an average utilisation of 71.9%. 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 5.8** 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 is quite low with the route between Dundee and Glencoe the highest between 50-75% capacity utilisation. **Figure 5.9,** the PM Peak period utilisation, shows a different trend to that of the AM Peak period with the majority of routes having a utilisation figures of between 75 – 100%. This clearly indicates that the majority of bus passengers travel during the PM hour. **Table 5.3 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. Waiting time for bus passengers in Umzinyathi are shorter than that of other modes of public transport. The reason for the shorter waiting time can be the result of bus operators following a pre-planned schedule. Passengers arrive closer to the departure time of busses and therefore don't have to wait that long. **Table 5.4** shows the waiting times surveyed for bus passengers.

Table 5.4: AM Peak – Waiting Time – Bus Transport

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Bus	1	10	3
PM Peak	Bus	1	35	10

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 35 minutes compared to more than two hours for minibus-taxi passengers. Detailed waiting time for bus passengers per route is shown in **Table 5.5** 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.

Figure 5.7: Daily Bus Service Capacity Utilisation

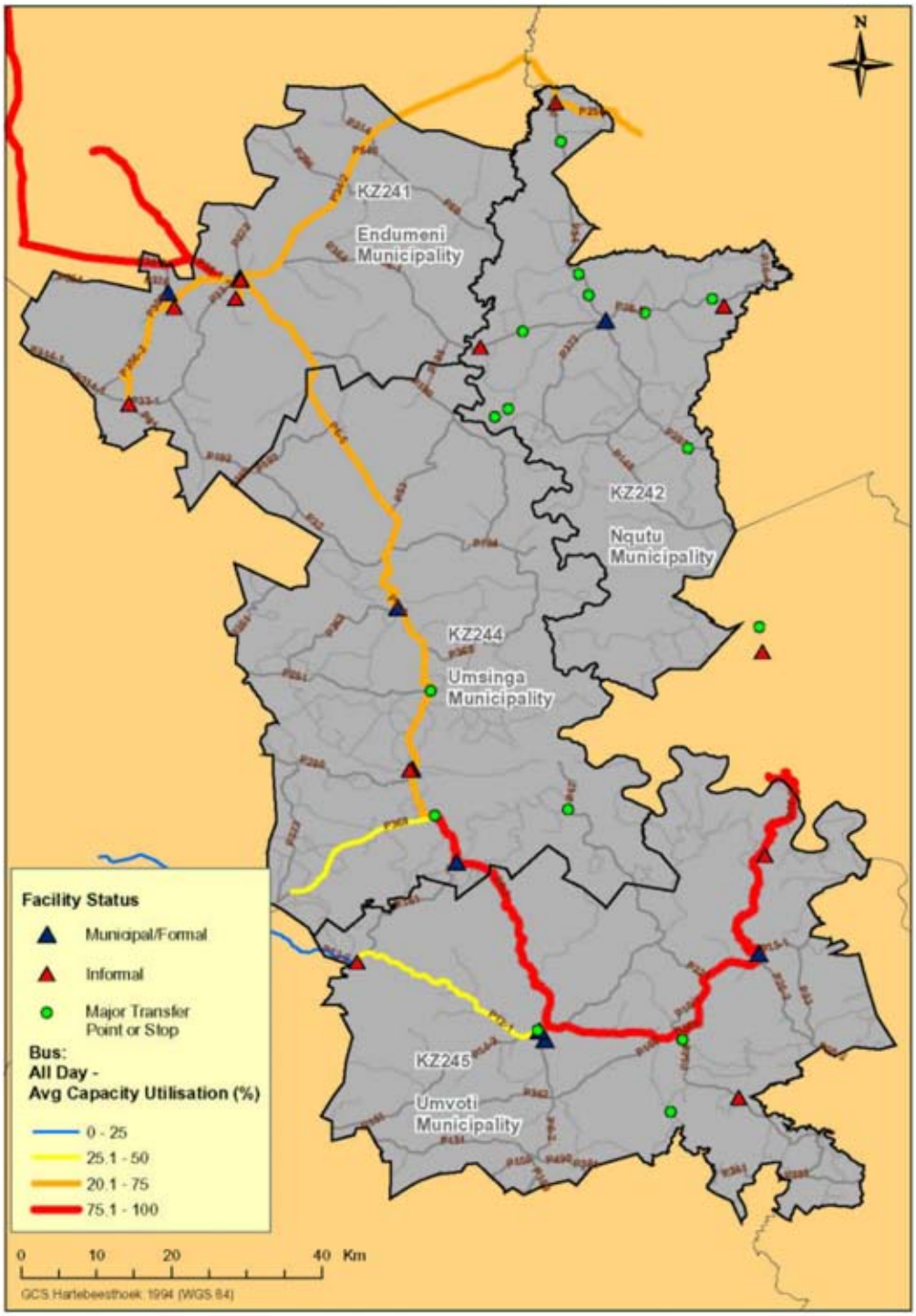


Figure 5.8: AM Peak Bus Service Capacity Utilisation

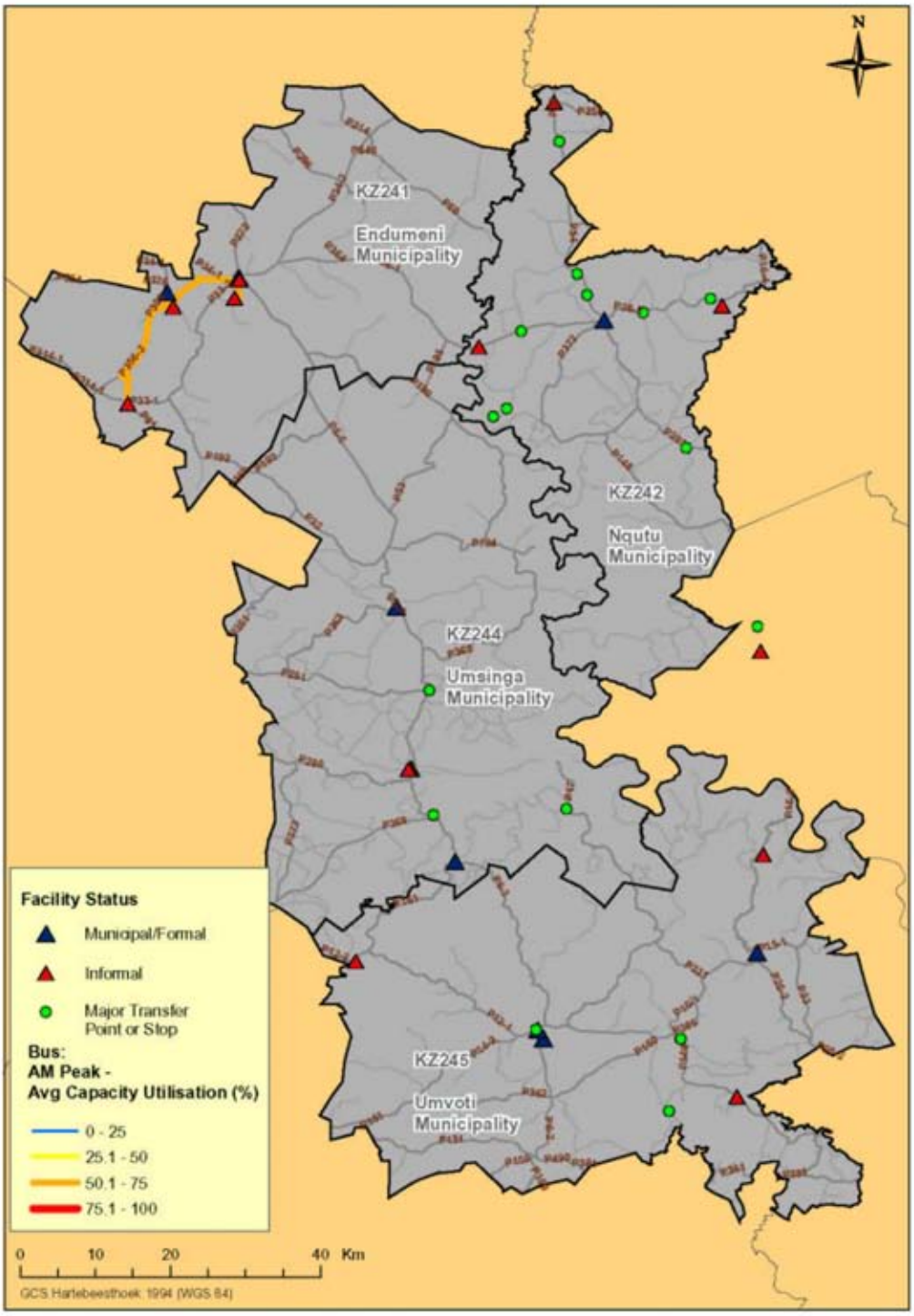
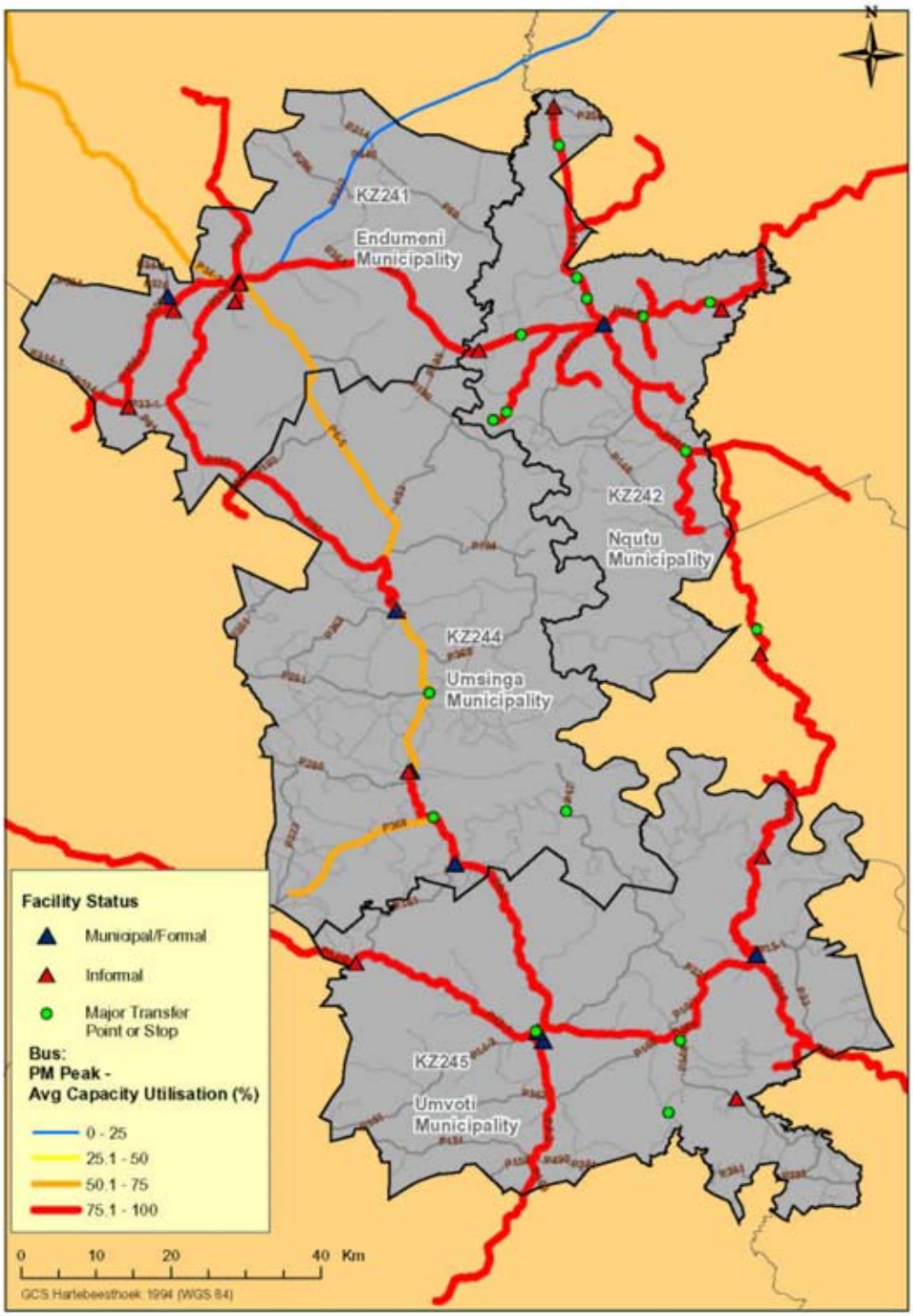


Figure 5.9: PM Peak Bus Service Capacity Utilisation



6. RESULTS - BAKKIE

6.1 Description of Routes

The description of bakkie routes is the same as that of minibus-taxis and buses.

An example of a route description would be as follows:

Origin: Greytown Rank
Mode: Type of mode used
Destination: Muden
Description: via the internal road network of Greytown onto the R74 to Muden.

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 6.1in Appendix C provides a list of all the Bakkie Routes that was identified from the Rank Surveys and **Table 6.2 in Appendix B** give a detail description of each route within the Umzinyathi District

Figure 6.1 shows the Number of Bakkie trips per Route in Umzinyathi District.

6.2 Passenger O-D and Trip Purpose

The results of the bakkie survey showed that 521 passengers are transported per day. This is significantly less than both minibus-taxi and bus passengers. The majority of bakkie trips take place around Greytown and Kranskop, Muden and around Nqutu and Nondweni. The distribution of bakkie 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 Rank Survey information shows that most passengers travel between Greytown and Muden and around Nqutu during the morning peak. During the PM peak period it can be seen that the same routes are travelled.

Figure 6.1: Number of Bakkie Trips per Route

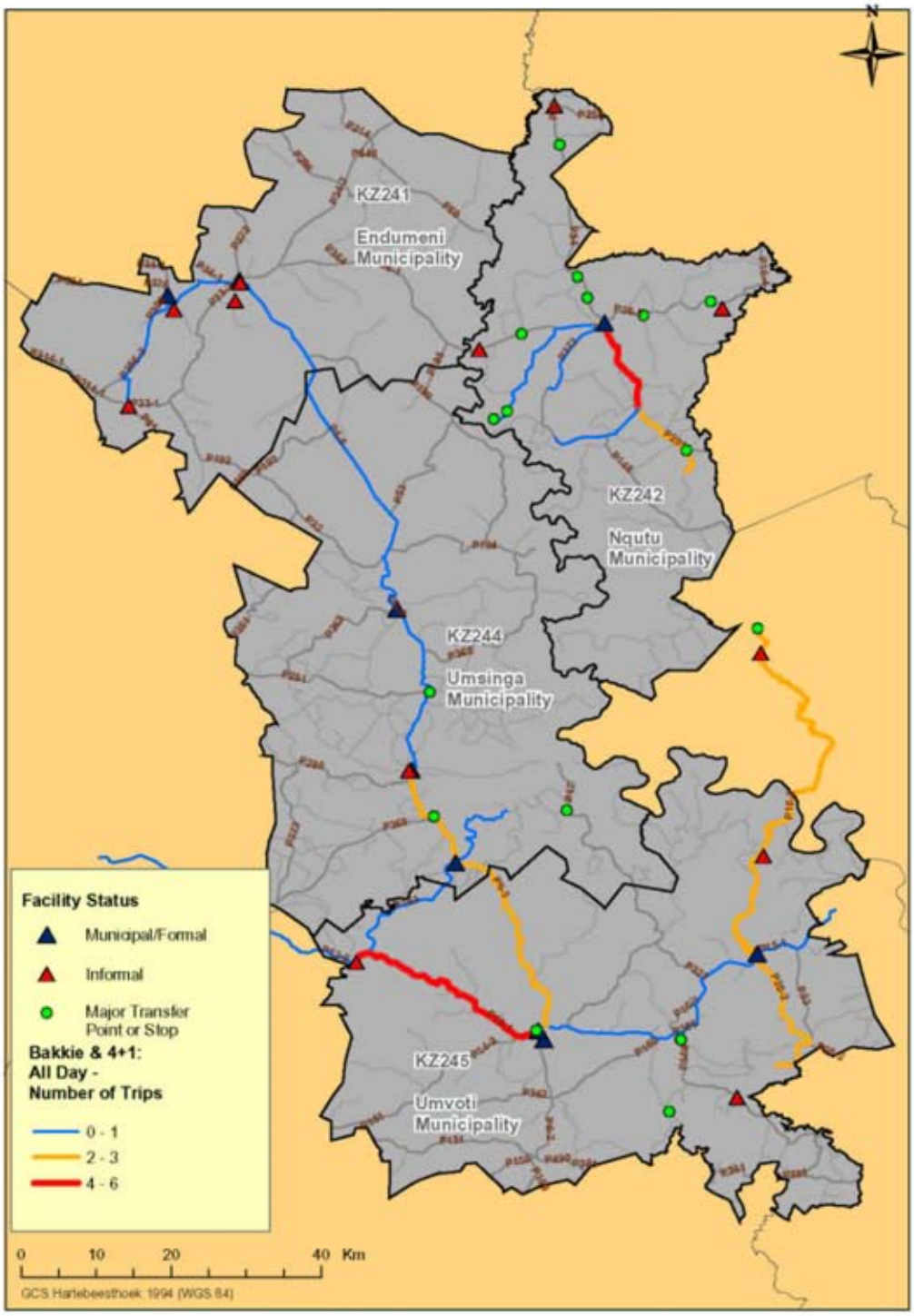


Figure 6.2: Number of Bakkie Passengers – All day

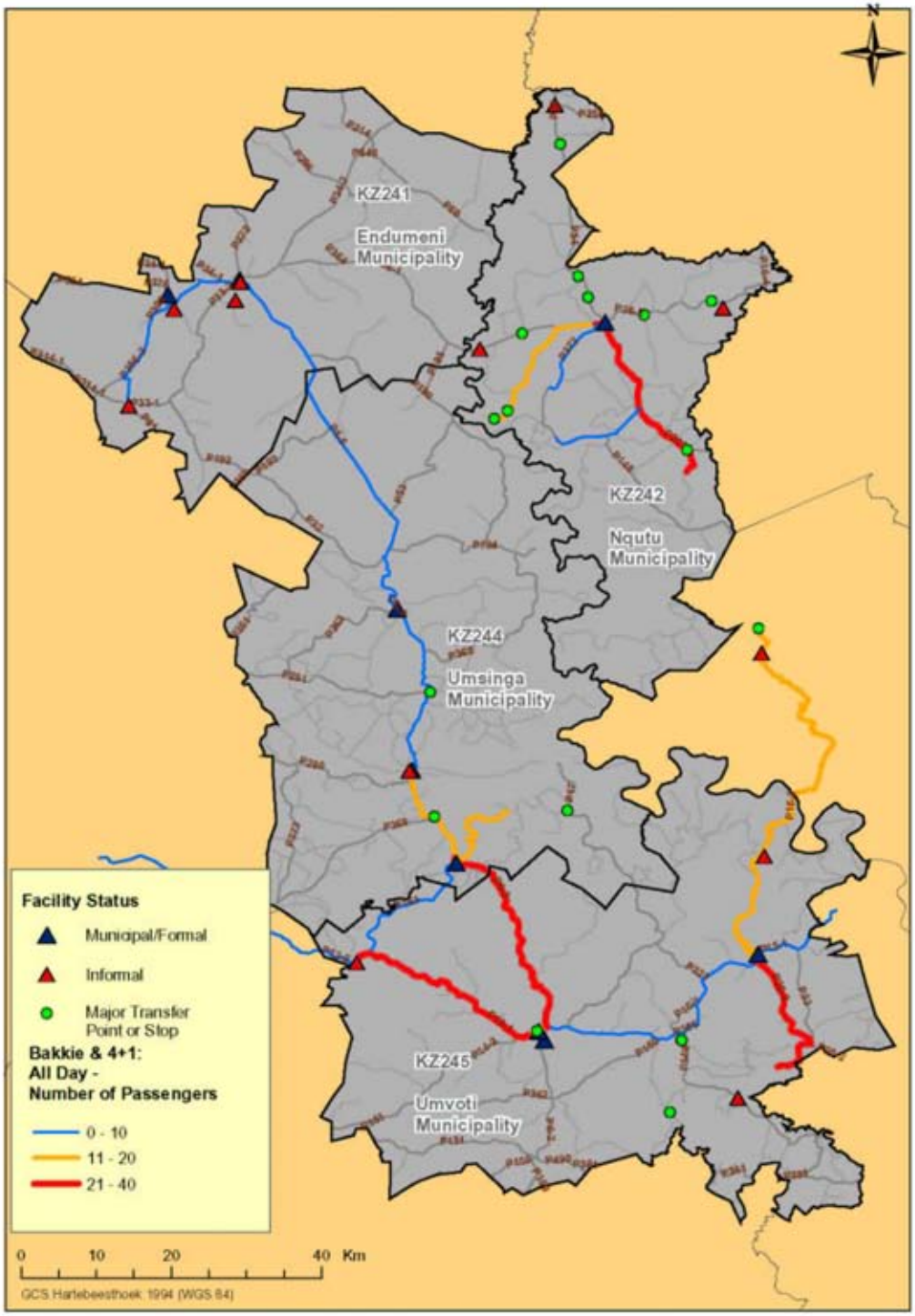


Figure 6.3: AM Peak – Bakkie Passenger Volumes

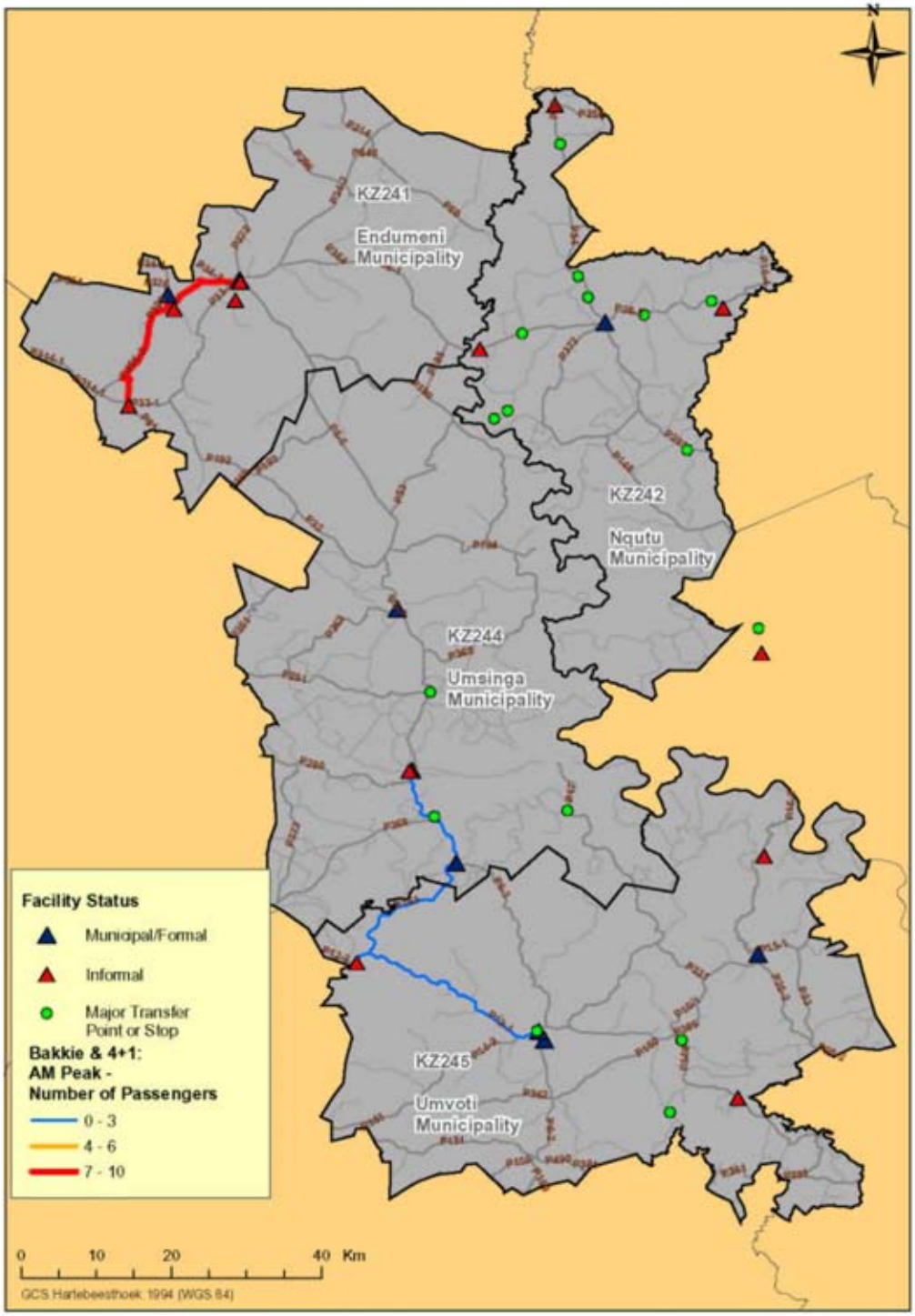


Figure 6.4: PM Peak – Bakkie Passenger Volumes

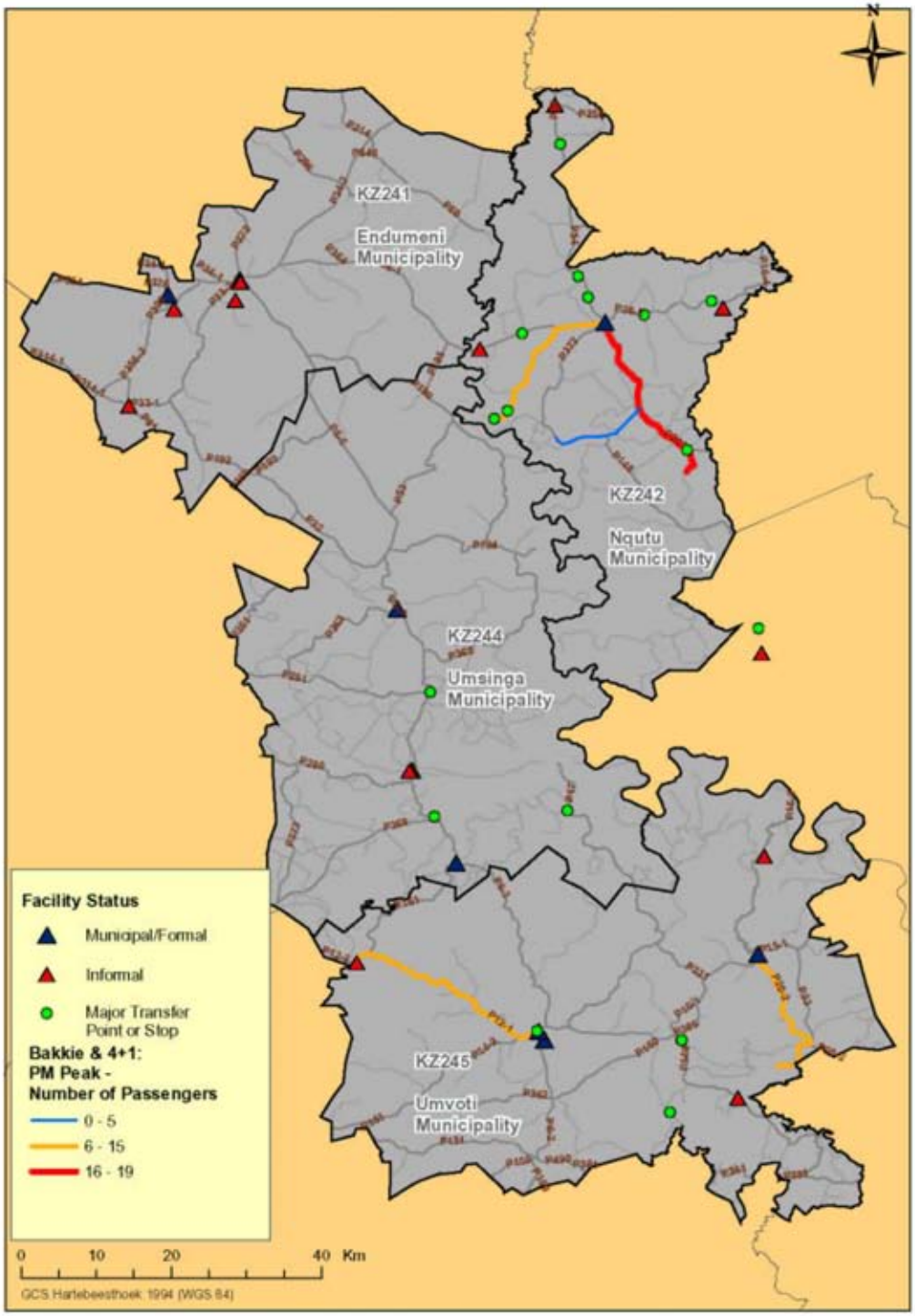


Figure 6.5 and **Figure 6.6** shows the results of the surveys for each rank for passenger trips per rank/termini and the number of vehicle trips per rank respectively. From this figure it is clear that the main bakkie ranks are that of Greytown, Kranskop and Nqutu.

Figure 6.5: Bakkie passenger trips per rank per day

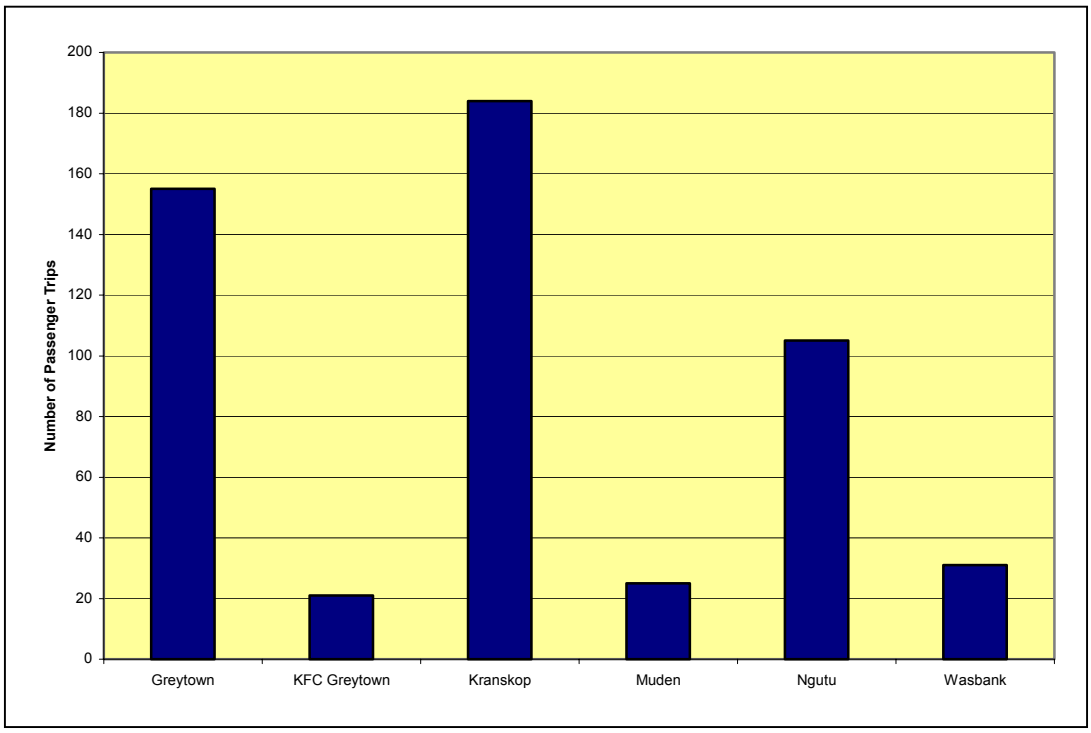
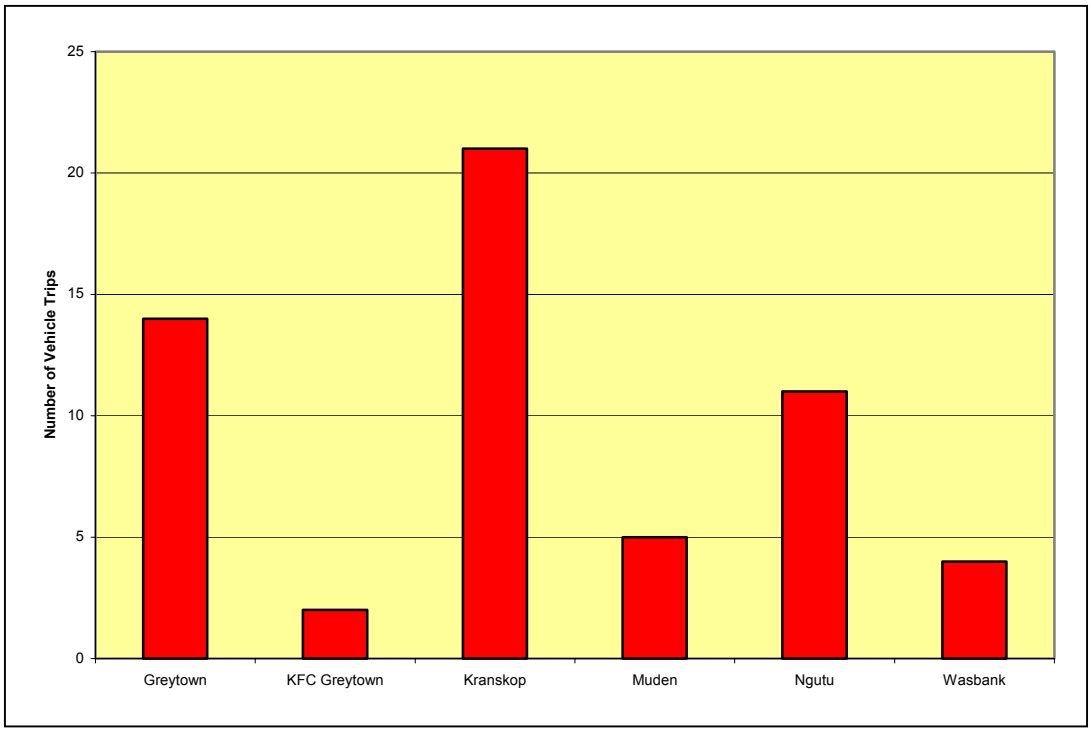


Figure 6.6: Bakkie vehicle trips per rank per day



6.3 Capacity Utilisation of Routes

The capacity of the bakkie service is determined by multiplying the actual numbers of trips with the maximum capacity of a bakkie. Capacity was calculated as follows:

- Seated Capacity – Bakkie: 10 passengers

Using the maximum capacity of a bakkie vehicles and the number of trips it was calculated that the capacity of the bakkie transport is approximately 570.

The survey results on the other hand showed that the actual number of passengers transported by bakkies vehicles were only 521 for the duration of the survey. The average utilisation can then be calculated to be 91%. The higher utilisation of these modes can also be attributed to the fact that the passengers that is transported by these modes have limited acces to other public transport modes. Detailed bakkie utilisation per route is available on the GIS system. The capacity utilisation for bakkie transport is shown in **Figure 6.7**.

Figure 6.8 and Figure 6.9 represent the bakkie AM Peak and PM Peak utilisation respectively.

During the AM Peak period **(Figure 6.8)** bakkie services operate at lower utilisation levels than the PM peak. **Figure 6.9,** the PM peak period, shows higher utilisation levels especially between Greytown and Muden and around Nqutu with between 75 and 100 percent. **Table 6.3 in Appendix C** shows the capacity utilisation of bakkie routes.

6.4 Waiting Time per Route

The waiting time for bakkie passengers are similar to the minibus-taxi passenger waiting times. The longest waiting time record was during the PM peak with 3 and a half hours. This is the result of operators waiting longer for passengers to arrive with their goods. **Table 6.4** below shows the average waiting time of bakkie 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	0	38	5
PM Peak	Bakkie	0	210	50

Detailed waiting time for bakkie passengers per route is shown in **Table 6.5** 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.

Figure 6.7: Daily Service Capacity Utilisation - Bakkie

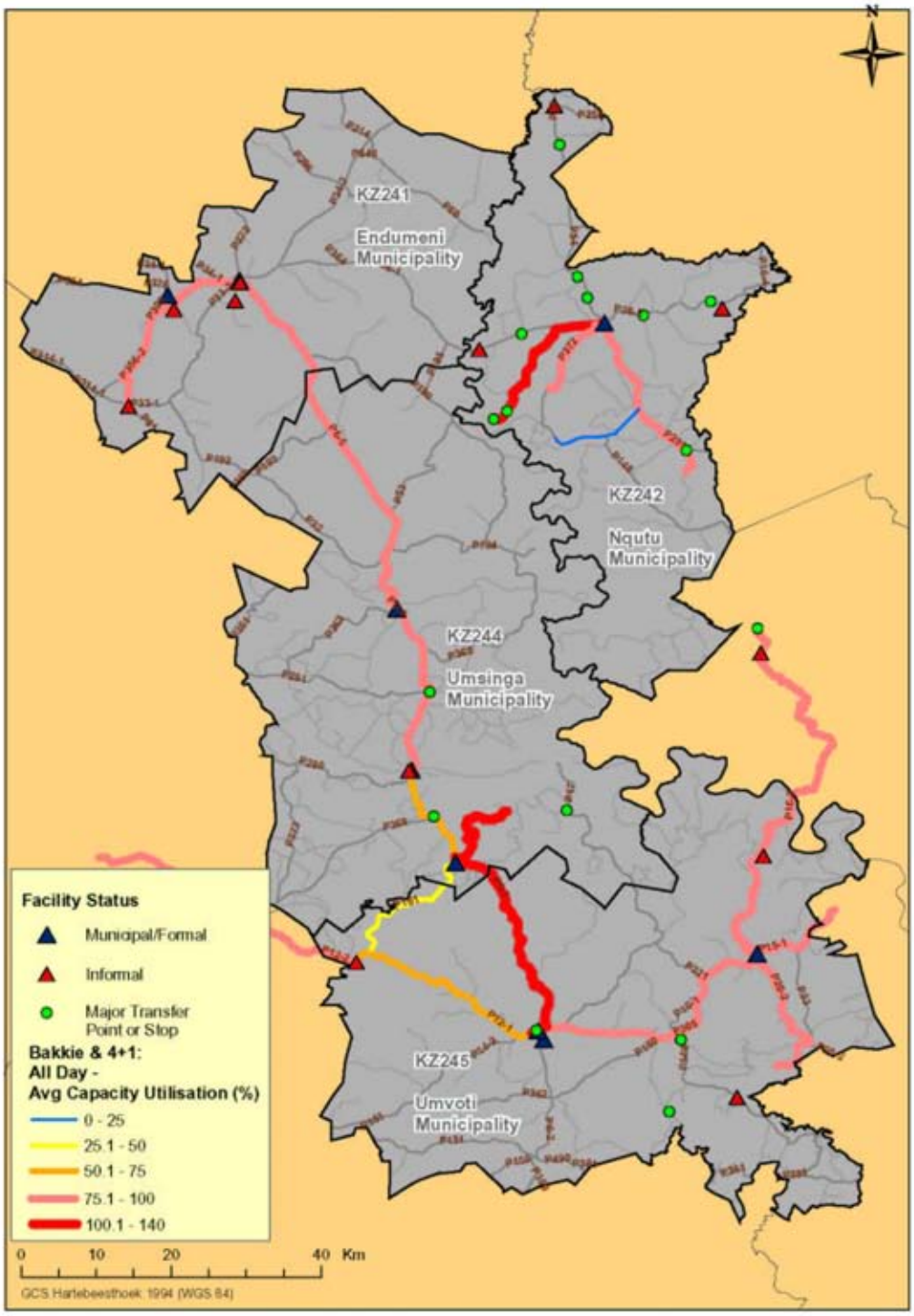


Figure 6.8: AM Peak – Bakkie Service Capacity Utilisation

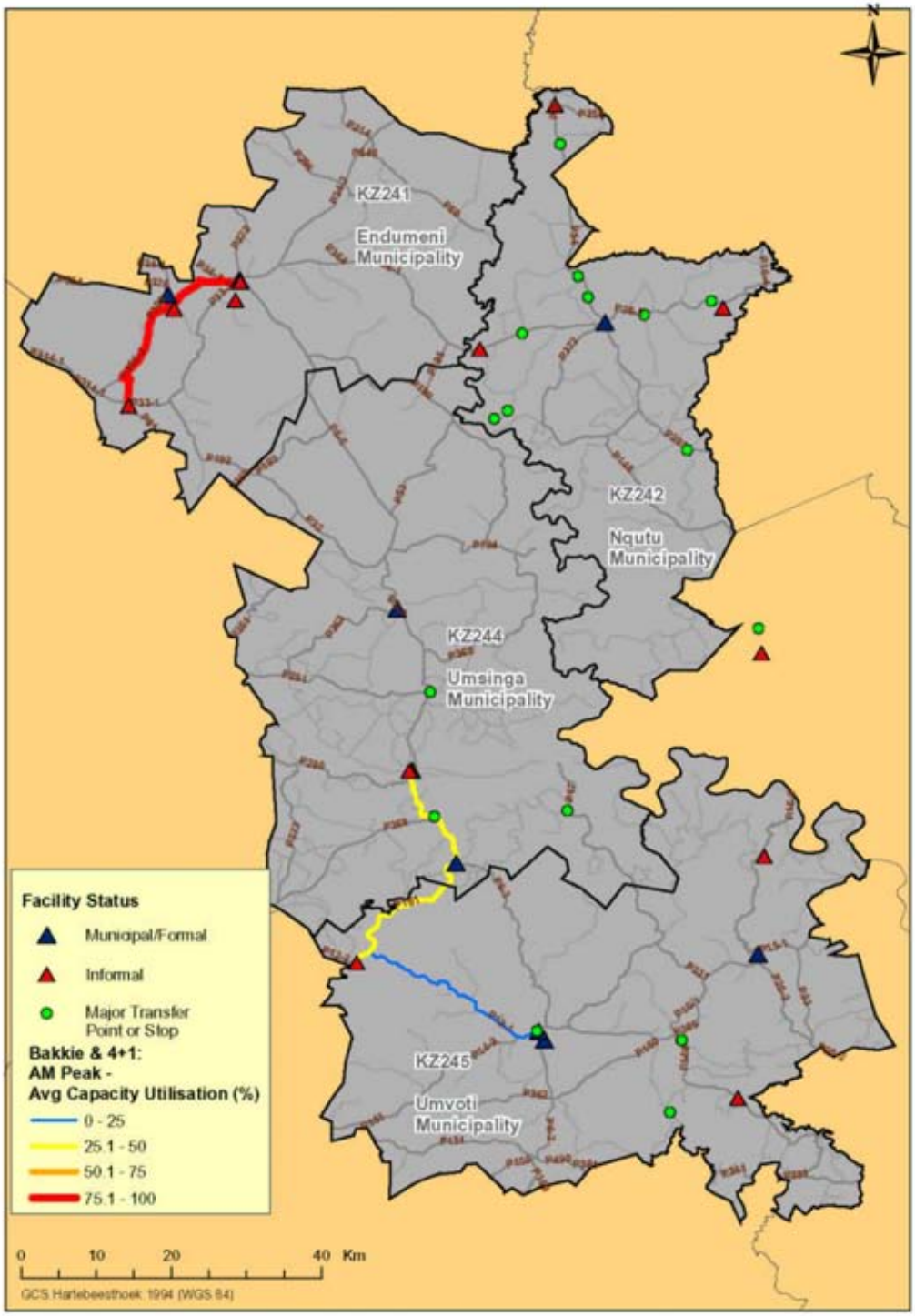
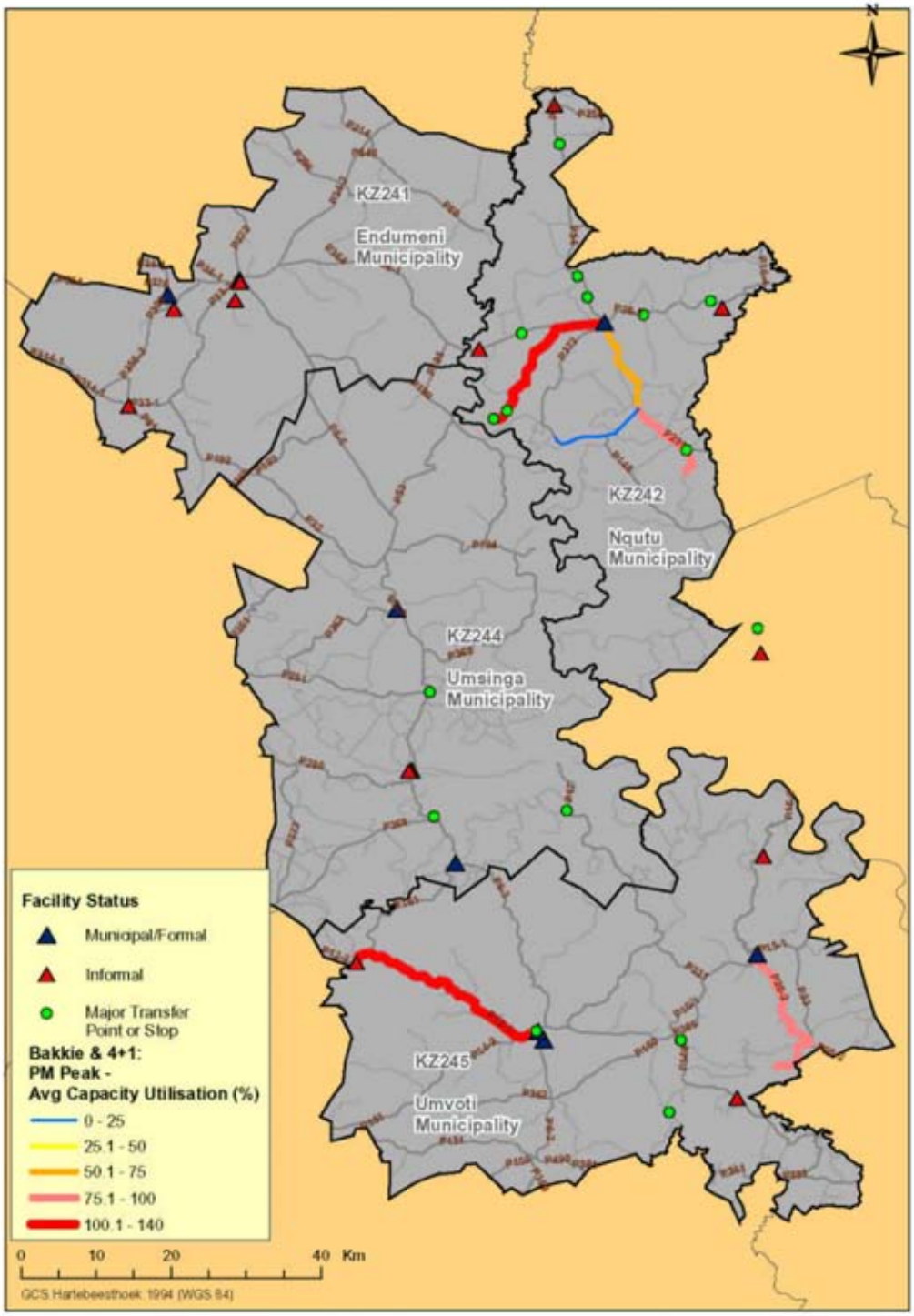


Figure 6.9: PM Peak - Bakkie Service Capacity Utilisation



7. SUMMARY AND CONCLUSION

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

- Approximately 87% of all public transport trips within Umzinyathi District Municipality are made by minibus-taxis, 10% by bus transport and the remaining 3% by bakkies;
- A total of approximately 18 700 passengers are transported daily within the Umzinyathi area;
- The public transport routes are served from 23 public transport facilities of which 10 are formal facilities and 13 informal ranks or stops;
- No surveys were done at Tugela Ferry, Pomeroy and Keat's Drift due to the lack of cooperation with the Mini-bus Taxi industry,
- 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 between Dundee and Glencoe areas;
- The average waiting time for bus passengers was 50 minutes, 15 minutes for Minibus-taxis and 20 for bakkie passengers;
- Generally the observed waiting time during the AM peak exceeded the PM peak waiting times;

8. APPROVAL

Umzinjyathi 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 Umzinyathi area. The Current Public Transport Record has been prepared based on the minimum guidelines prescribed by the National Department of Transport.

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

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Approved by:
For Umzinyathi District Municipality