AMAJUBA

CURRENT PUBLIC TRANSPORT RECORD: PHASE 2

Issue

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ARUP

PARUK CONSULTING

Joint Venture

ArupTransportPlanning

Amajuba District Municipality

Current Public Transport Record

PHASE 2

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Amajuba District Municipality

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1. INTRODUCTION

This report presents the status quo of public transport services within the Amajuba 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, the modes operating in the area, the extent of public transport services, routes and capacity utilisation.

1.1 Background

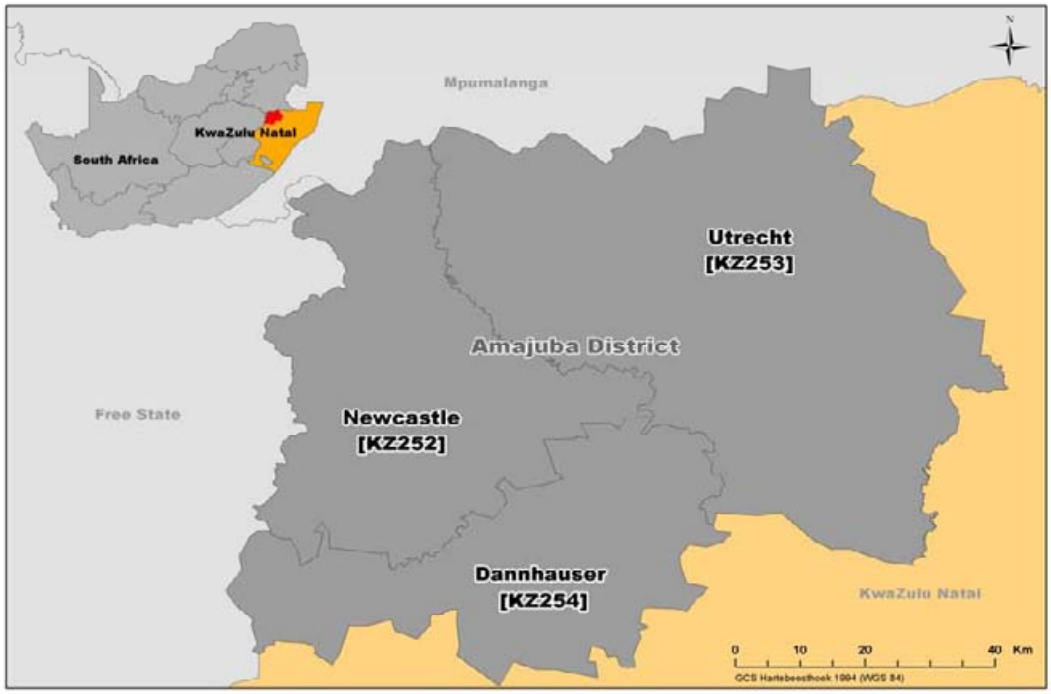
Arup SA (Pty) Ltd and Paruk Consulting Joint Venture were appointed on 23 October 2003, by the Amajuba District Municipality to carry out a Current Public Transport Record (CPTR): Phase 2 for the whole Amajuba District Municipality area including local municipalities.

1.1.1 Extent of the Study Area

The study area is Amajuba District Municipality (DC25) comprising three local municipalities and is shown in **Figure 1.1**. These local municipal areas include:

Newcastle Municipality	-	KZ252
Utrecht Municipality	-	KZ253
Dannhauser Municipality	-	KZ254

Figure 1.1: Amajuba District Municipality with three Local Municipalities



1.1.2 Demographic Information on Local Municipalities

According to the Amajuba Integrated Development Plan (IDP) of 2002, the Amajuba district comprises areas of the northern portions of the former uMzinyathi Regional Council, the former Transitional Local Councils of Dannhauser, Newcastle, Hattingspruit and Utrecht, and the Tribal Authority areas of Buhle-Bomzinyathi and Nyanyadu.

Table 1.1 shows the demographic information for Amajuba district as given by the IDP. Newcastle has the highest population with just under 290 000 people followed by Utrecht and then Dannhauser.

Table 1.1: Demographic Information per Local Municipality

Basic Facts	Statistics
Total population	410 439
Amajuba population as % of KZ	4.9%
Total population of DC25 per KZ area	KZ 252 – 287 260 (70.0%) KZ 253 – 23 929 (5.8%) KZ 254 – 99 250 (24.2%)
% of total population urbanised	57%
Age profile	<20 – 48.5% 21-60 – 47.6% >60 - 3.9%
Unemployment (%of income earning population)	40.6%

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

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) and Integrated Transport Plan (ITP) for Amajuba 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 Amajuba area and to provide Amajuba 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 Amajuba, 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 Amajuba 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:

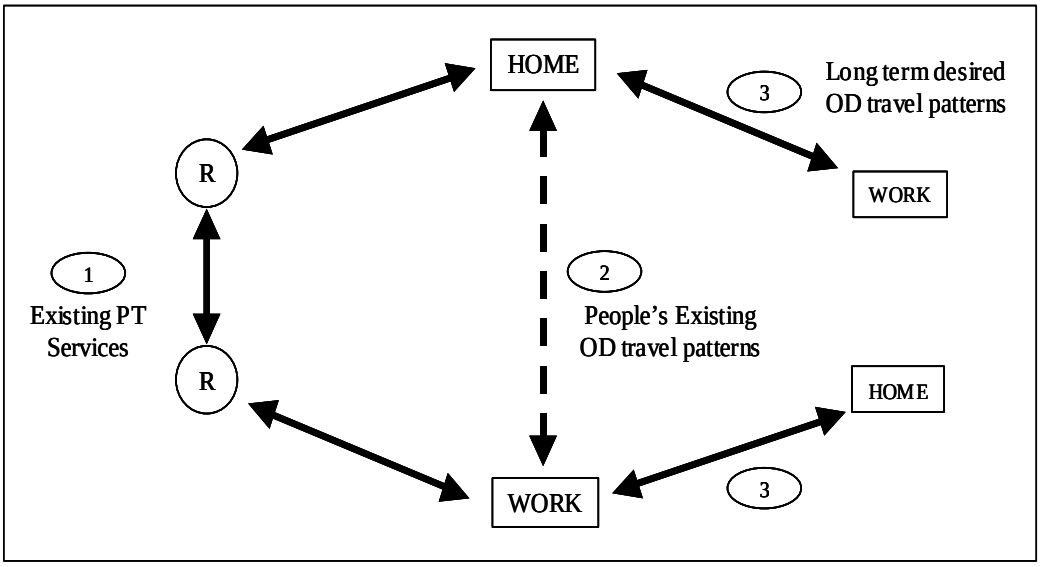
- Passenger Origin – Destination Surveys,
- Vehicle Registration, Destination and Utilisation Surveys, and
- Passenger Waiting Time Surveys.

As part of the inception meeting it was decided to conduct additional surveys to gather information on non-motorised transport between Newcastle Industrial area and Madadeni. Additional vehicle counts were also done at a pre-identified location to be able to verify the public transport movement between Newcastle, Madadeni and Osizweni.

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** 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

1.5 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 Amajuba District Municipality, the objective of the study, the scope of work to be 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

Chapters 4 – 7: Results

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

Chapter 8: Summary and Conclusion

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

Chapter 9: Approval

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

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 and reporting to the client 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 Amajuba 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

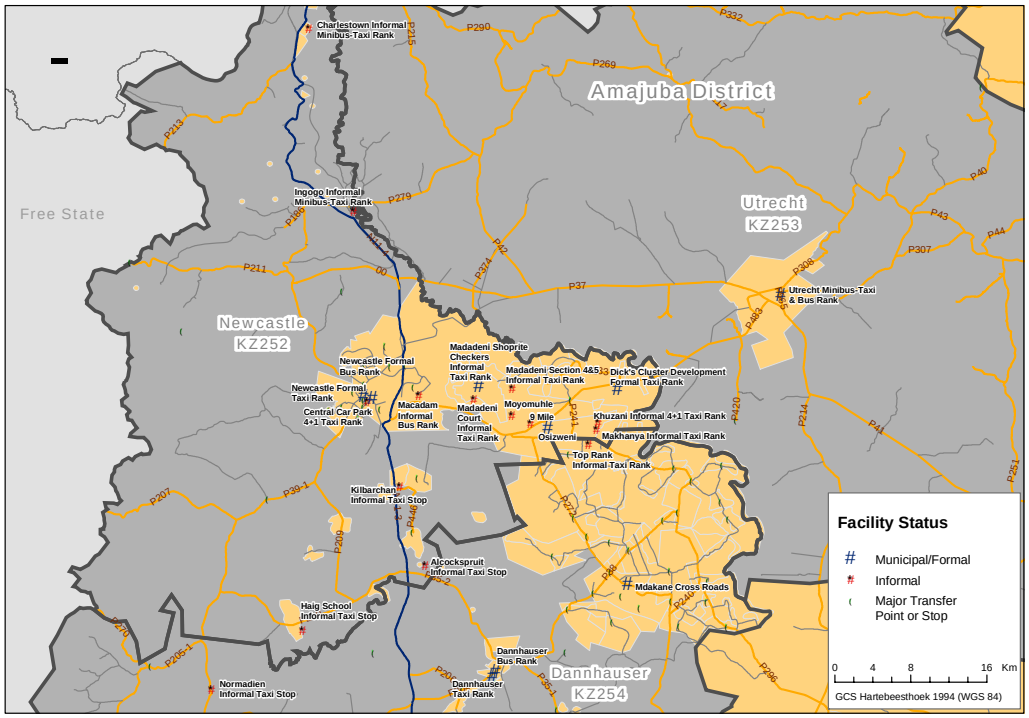
Given the NDOT guidelines and the amended Provincial guidelines for preparing the CPTR the Joint Venture set out to prepare a methodology to firstly collect all desired public transport information and secondly to disseminate and present the data to the Amajuba District Municipality. The collection of 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 Amajuba District Municipality covers the three local municipal areas of Newcastle, Dannhauser and Utrecht. In total, 24 ranking and stopping points were identified during phase 1 of the CPTR and is shown on **Figure 2.1** below.

Figure 2.1: Public Transport Facilities within Amajuba 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 Amajuba. 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 05:00 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 communication between the Minibus-Taxi Association Management and the actual drivers at the rank. 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.

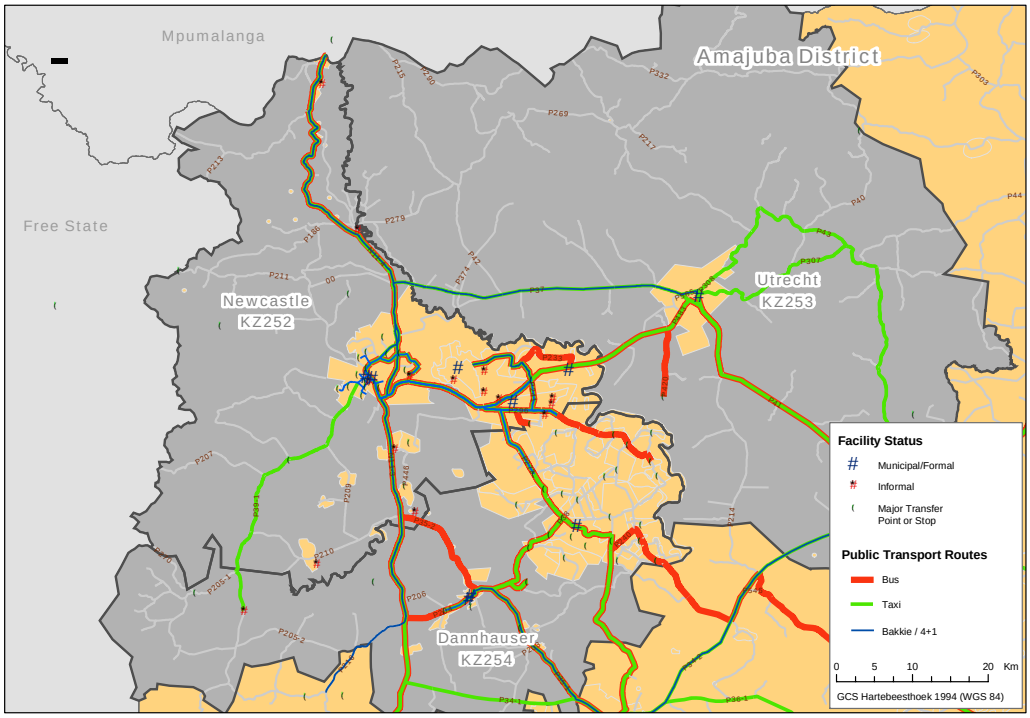
At first minibus-taxi drivers were not keen to allow surveyors to write down the vehicle registration numbers in fear of the consultants providing traffic officials with this information and possible law enforcement actions against them. This was overcome by explaining to these drivers that the information 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 comprising the following local municipalities:

Figure 3.1: Study area showing routes and nodes



3.2 Transport Modes Serving the Area

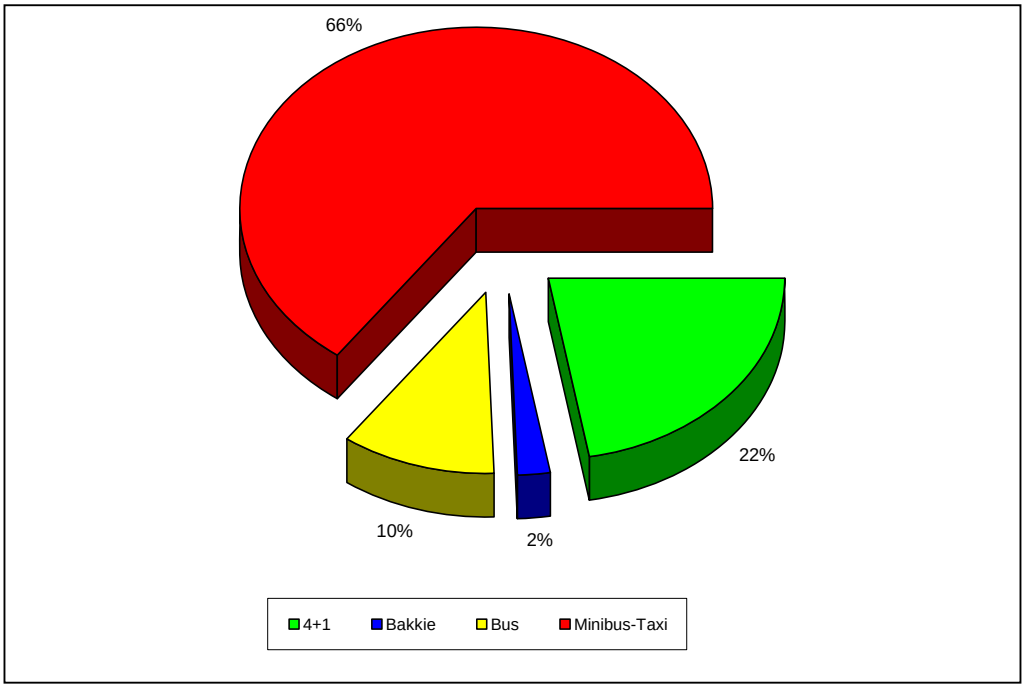
According the Amajuba District Municipality and the Amajuba Passenger Transport Forum the following modes of public transport are present and was included as part of the survey and data gathering programme:

- Minibus-Taxi,
- Bus,
- Bakkie, and
- Four plus One (4+1) Taxis include normal sedan vehicles, which operate within local designated areas. They operate on the same basis as minibus-taxi and should not be mistaken for the traditional metered taxis. ("Metered" taxis only in Newcastle).

The distribution of modes of transport can also be based on the number of passengers transported as well as the number of trips per vehicles type. For the purposes of the report the distribution was based on the number of vehicle trips and not the number of passenger trips.

Figure 3.2 represent the modes of transport based on person trips for the Amajuba 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 16 minibus-taxi ranks, 3 bus ranks, 1 minibus-taxi and bus rank combined and 4 minibus-taxi stops within the Amajuba area. There are 10 formal public transport facilities, which are municipally owned and 14 informal facilities. Bakkie transport does not operate from separate ranks but make use of existing minibus-taxi facilities within the different municipal areas. The four plus one taxi operators operate either from parking bays previously reserved for public use or from informal ranks within the Central Business District (CBD) or from an informal rank in the case of Khuzani Informal Taxi Rank in Osizweni.

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 Amajuba area. The tables are divided into the three 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 the table it can be seen that there are 9 formal and 15 informal facilities available. Only 4 of these facilities are on street, in the form of informal minibus-taxi stops and 20 off-street. 10 ranks are paved and 14 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 (Amajuba = A)
- 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: KA3042BI-**AB** (AB = Detail Operator Code as shown in **Table 3.1**)

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 (Amajuba = A)
- Type of facility – digits – 3-4 (TR = Minibus Taxi Rank)
- Number of the facility – digits 5-6 (05 = Newcastle Main Taxi Rank)
- Example: KATR05

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 (Amajuba = A)
- Number of the facility – digits 3-6 (0034 = Checkers Bus Stop)
- Example: KA0034

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: Newcastle Main Taxi Rank
Mode: Type of mode used
Destination: Volksrust
Description: via the internal road network of Newcastle and N11.

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

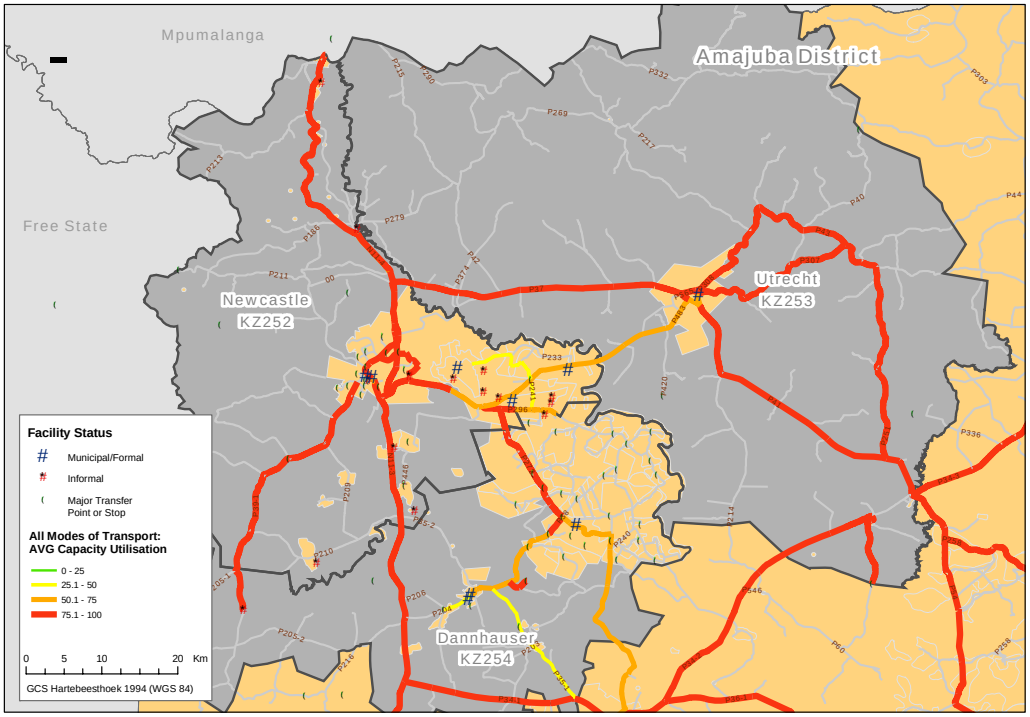
Figure 3.3 shows the average Capacity Utilisation for all modes of transport. This includes Bus, Taxi, Bakkie & 4+1. From the surveys it is clear that the Public Transport Service is operating at its limits, where most routes are utilized at an average of 100% of its Capacity Utilisation during the peak hours.

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 is 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 3.1: Operator Codes and Names

Operator Code	Bus Operator or Taxi Association	Vehicle Type
AM	AMC People Mover	Bus
BA	Bambanani Taxi Ass	Bus
BA	Bambanani Taxi Ass	Taxi
BE	Bensdorp	Taxi
BU	Buffalo	Taxi
NU	Nulindlela	Bus
CE	Cheetah Express	Bus
CH	Chipass	Bus
CO	Coocher Bus	Bus
EA	Eagle line	Bus
EN	Engogo	Taxi
IC	Inter City	Taxi
IN	Inthuthuko	Taxi
IP	Iporuk Trans	Bus
KL	Klipriver	Taxi
KW	Kwacilo Ass	Taxi
KZ	KZN Transport	Bus
KZ	KZN Transport	Taxi
MA	Masihambisane	Taxi
MD	Madadeni	Bus
MD	Madadeni	Taxi
ML	Midlands	Bus
MN	Madadeni/NewCastle	Taxi
MO	Mondlo	Taxi
MT	Mad Taxi Owners Ass	Taxi
NG	Ngcobo	Taxi
NL	New Long	Taxi
OS	Osizweni	Taxi
PH	Phembindlela	Taxi
PI	Pioneer	Taxi
PR	Private	Bus
PR	Private	Taxi
SP	Splash	Bus
SY	Simunye	Taxi
SZ	Sizwe	Taxi
TH	Thanduyise	Bus
TR	Transnat	Bus
UT	Utrecht	Taxi
VB	Verdriet Bus	Bus
VE	Vulindela Express	Bus
VR	Vryheid	Taxi
VU	Vukuzakhe	Bus
VU	Vukuzakhe	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.

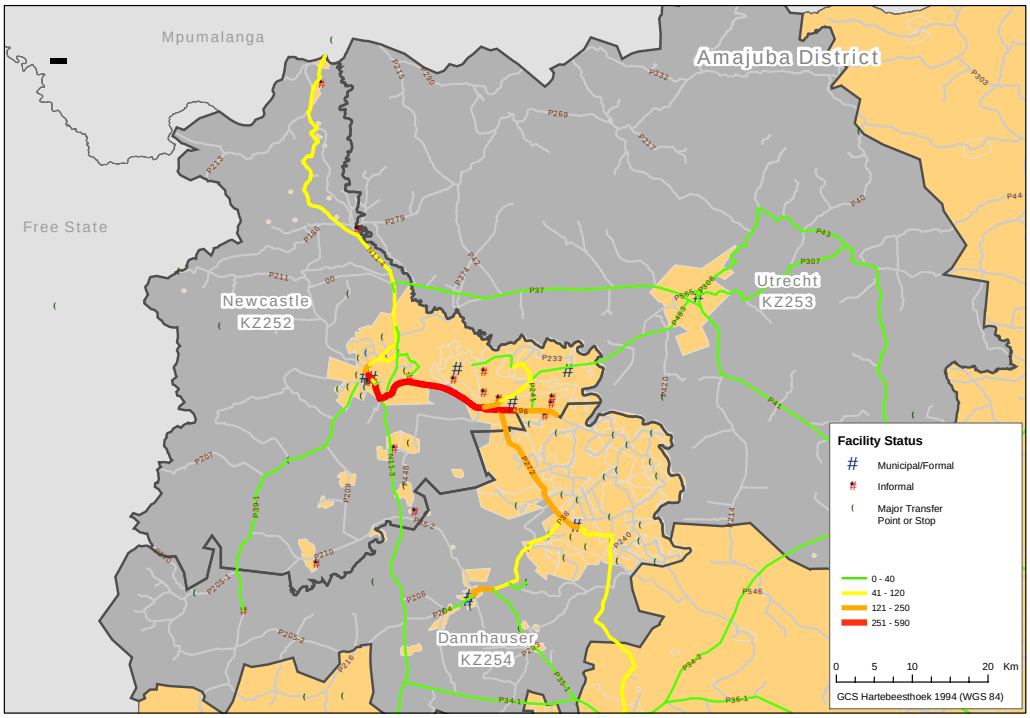
Table 4.1: Destinations served according to Minibus – Taxi Associations

No.	Facility Name	Mode	Destination
2	Osizweni Formal Taxi Rank	Minibus-Taxi	Newcastle Madadeni
3	Makhanya Informal Taxi Rank	Minibus-Taxi	Newcastle Utrecht
4	Top Rank Informal Taxi Rank	Minibus- Taxi	Mdakane
5	Khuzani Informal 4+1 Taxi Rank	4+1 Taxi	Local Osizweni
6	Dick's Cluster Development Formal Taxi Rank	Minibus-Taxi	Not in operation
7	9 Mile Informal Taxi Rank	Minibus- Taxi	Mdakane Newcastle
8	Moyomuhle Informal Taxi Rank	Minibus- Taxi	Vryheid Utrecht Mondlo Ulundi Empangeni Pongola Nongoma Swaziland
9	Madadeni Sec 4&5 Informal Taxi Rank	Minibus- Taxi	Local Madadeni
10	Madadeni Shoprite Checkers Informal Taxi Rank	Minibus- Taxi	Local Madadeni Masondeza
11	Madadeni Court Informal Taxi Rank	Minibus- Taxi	Local Madadeni Osizweni
12	Central Car Park 4+1 Taxi Rank	4+1 Taxi	Local Newcastle
14	Newcastle Formal Taxi Rank	Minibus- Taxi	Long Distance Empangeni Mondlo Nghutu Vryheid Durban Ladysmith Nkandla Pietermaritizburg Escort Dundee Johannesburg Station Standerton Volksrust Mbalenhle Ermelo Pier Retief Witbank Local Destinations Madadeni Osizweni Mdakane Kilbarchen
15	Charlestown Informal Minibus-Taxi Rank	Minibus- Taxi	Volksrust
16	Ingogo Informal Minibus-Taxi Rank	Minibus- Taxi	Newcastle
17	Normandien Informal Taxi Stop	Minibus- Taxi	Newcastle
18	Kilbarchan Informal Taxi Stop	Minibus- Taxi	Newcastle
19	Haig School Informal Taxi Stop	Minibus- Taxi	Newcastle
20	Alcockspruit Informal Taxi Stop	Minibus- Taxi	Newcastle
21	Utrecht Minibus-Taxi and Bus Rank	Minibus- Taxi and Bus	Local Utrecht Osizweni Paul Pietersburg Ngutu

No.	Facility Name	Mode	Destination
22	Dannhauser Taxi Rank	Minibus-Taxi	Durnacol Verdriet Skobren Dundee Koppie Alleen Mdakane Durban Johannesburg Station
24	Mdakane Cross Roads	Minibus-Taxi	Dannhauser Newcastle Dundee Durban Top Rank Osizweni Johannesburg Station

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

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 23 664 passengers are transported per day by minibus, which equates to an average of 12 passengers per taxi. The majority of trips take place between the urban areas of Newcastle and Osizweni.

The surveys further showed that 46.2 % of all minibus-taxis surveyed only make one trip per day. The maximum trips made by a single taxi were 22 for the 12-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 Newcastle region with lesser passenger transport in the rural areas of Dannhauser and Utrecht.

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, 5.4% of Passenger Trips originate from areas outside the Amajuba District and 22.5% of passenger trips terminate outside the Amajuba District.

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

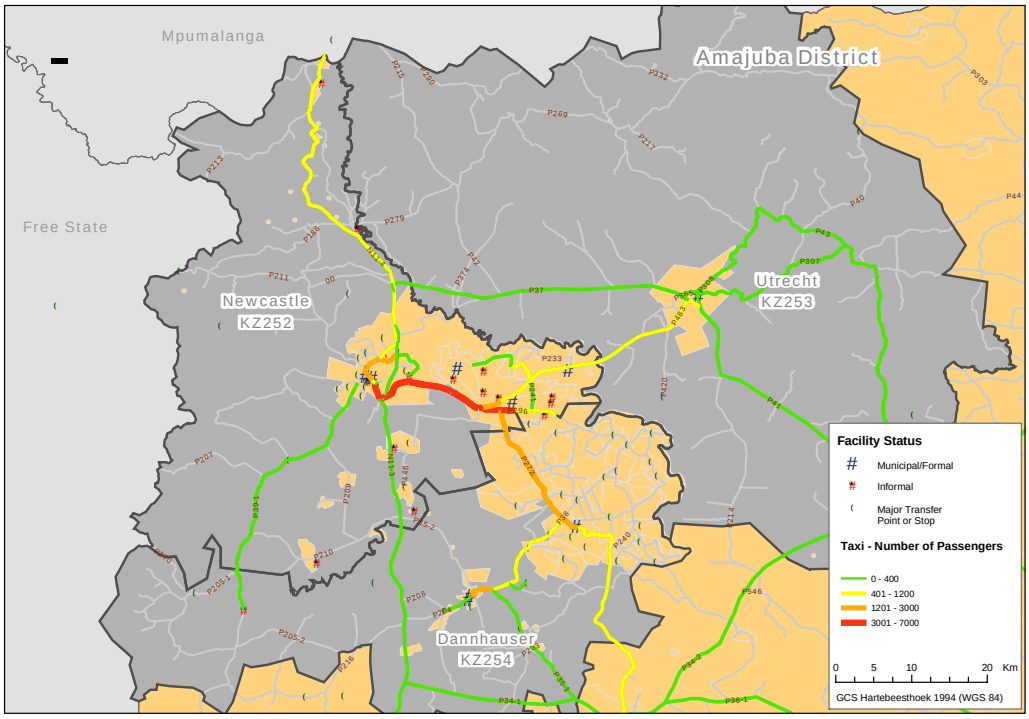


Figure 4.3 and Figure 4.4 show the AM Peak (06:30 to 08:30) and PM Peak (16:00 to 18:00) passenger volumes according to the surveys. The majority of passengers travel between the urban areas (Newcastle, Madadeni and Osizweni).

The route with the highest number of passengers is the P483 between the Newcastle and Osizweni turnoffs, and is evident for all peak periods that were analysed. During the AM peak period some 2284 passengers travel within Amajuba, 5541 passengers travel within the PM peak period.

In order to verify to number of taxis operating on the P483 between Newcastle, Madadeni and Osizweni traffic counts were done, counting only the number of taxis travelling between these areas. The results of these traffic counts are shown in **Table 4.3.**

Table 4.3: Minibus Taxi Counts versus Surveys (Location on Main road between Madadeni and Newcastle)

Time interval	Traffic Counts	Surveys
To Newcastle (06:00 – 14:00)	977	859
From Newcastle (12:00 – 18:00)	876	898

The counts clearly show that the level of accurateness of the survey is acceptable. The small percentage difference between the traffic counts and the surveys could be the result of the

distance between the location of the counts and the location of the surveys. The minibus-taxis surveys could therefore fall outside the time interval of the counts.

Figure 4.3 indicates that during the AM peak period passenger volumes are concentrated on main roads between Newcastle and Osizweni. The rural areas have less than 70 passengers per route, while routes close to Newcastle and Osizweni generally showed passenger volumes between 500 -1000 passengers per road link. The lack of public transport services to the north of Newcastle according to this figure is the result of long distance operators not operating in the AM peak hour but waiting for passengers.

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 4.3: AM Peak – Minibus-Taxi passengers

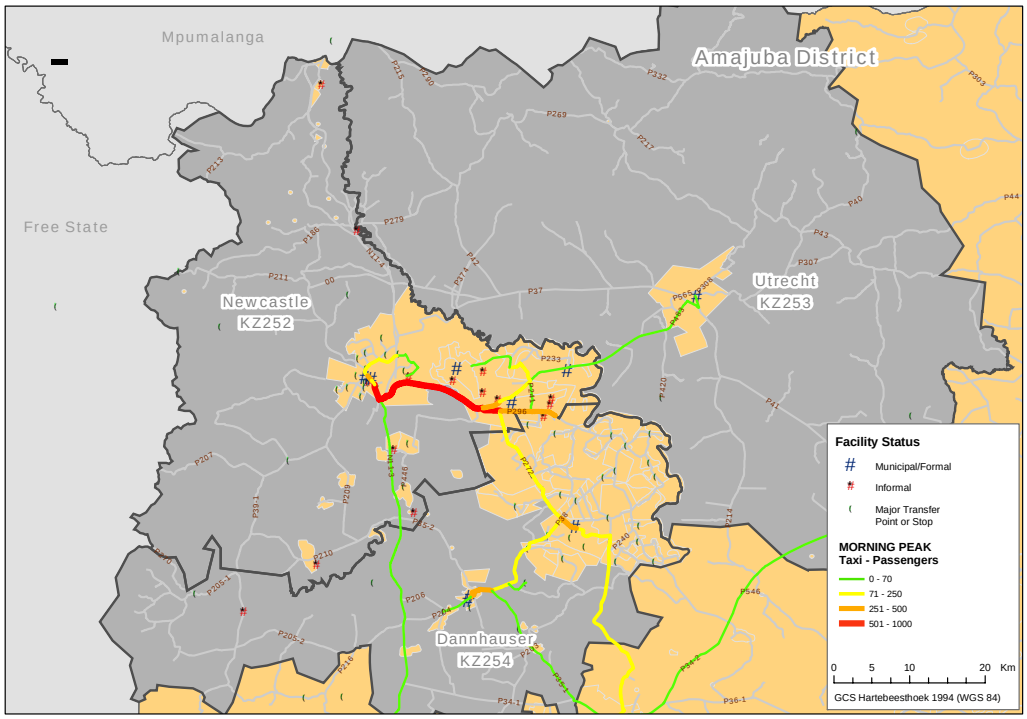


Figure 4.4: PM Peak – Minibus-Taxi

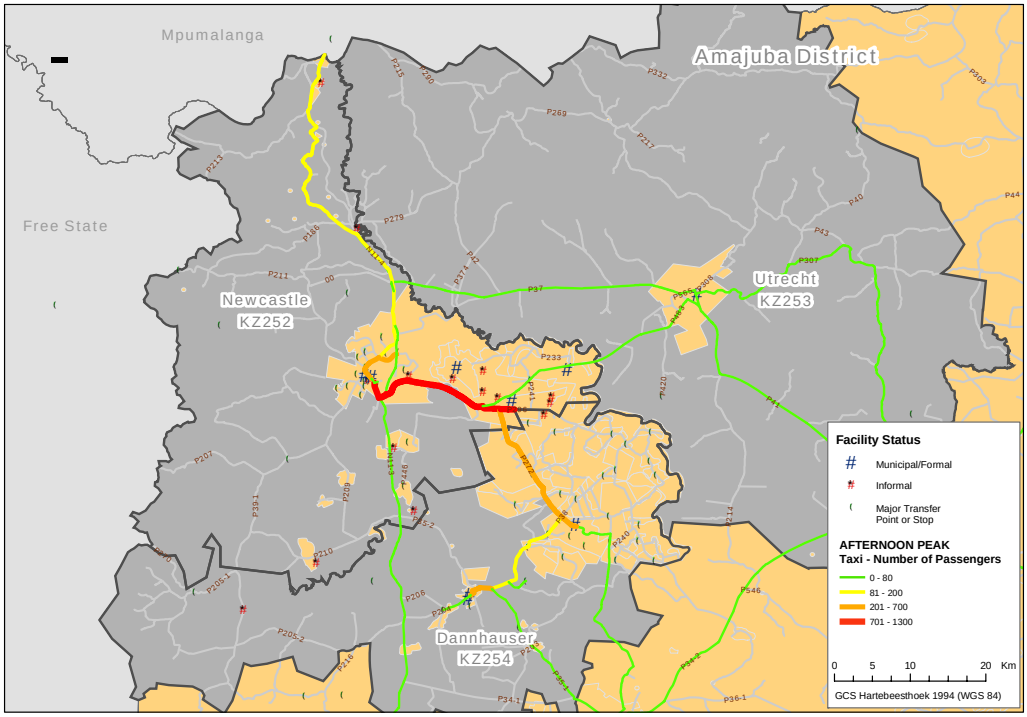


Figure 4.5 and **Figure 4.6** shows the results of the minibus-taxi surveys for each rank for passenger trips per minibus-taxi per rank/termini and the number of vehicle trips per rank respectively.

Figure 4.5: Minibus-taxi passenger trips per rank

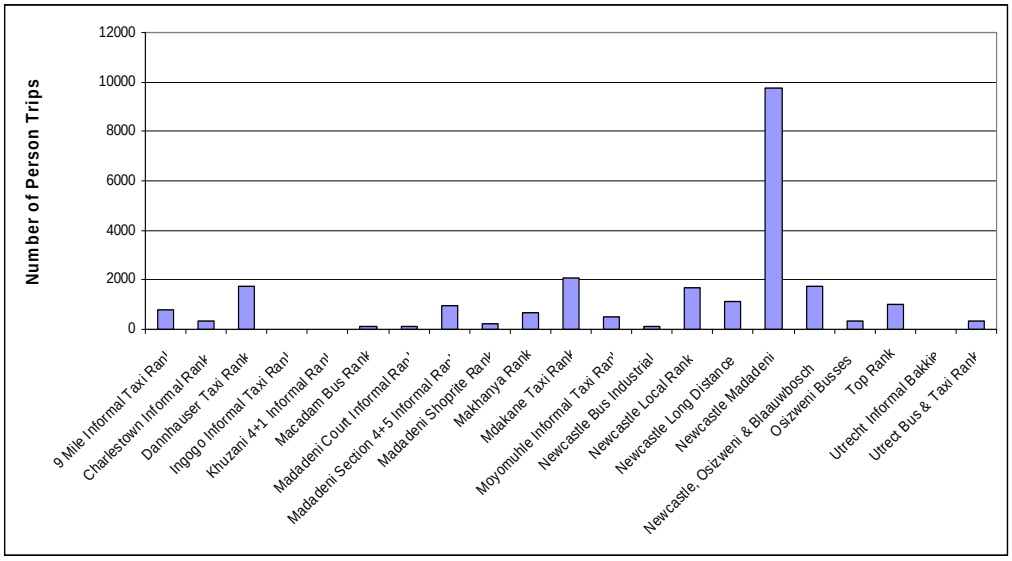


Figure 4.6: Minibus-taxi vehicle trips per rank

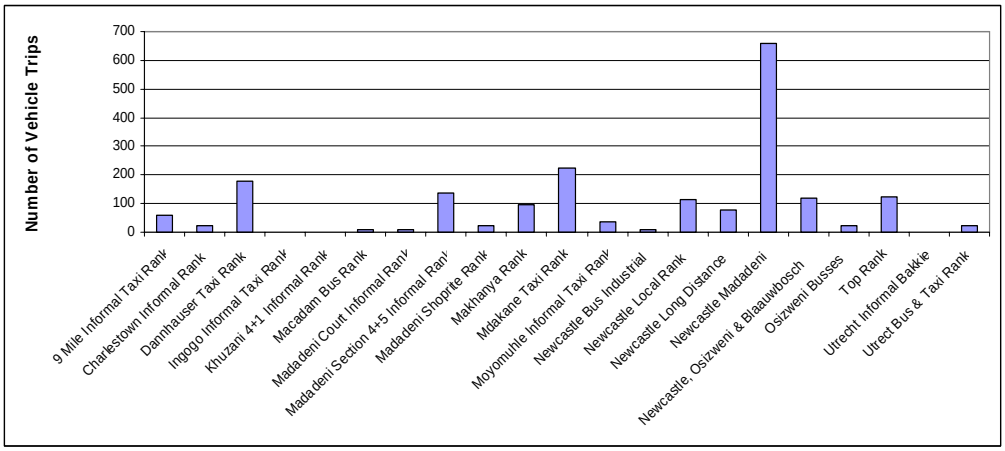
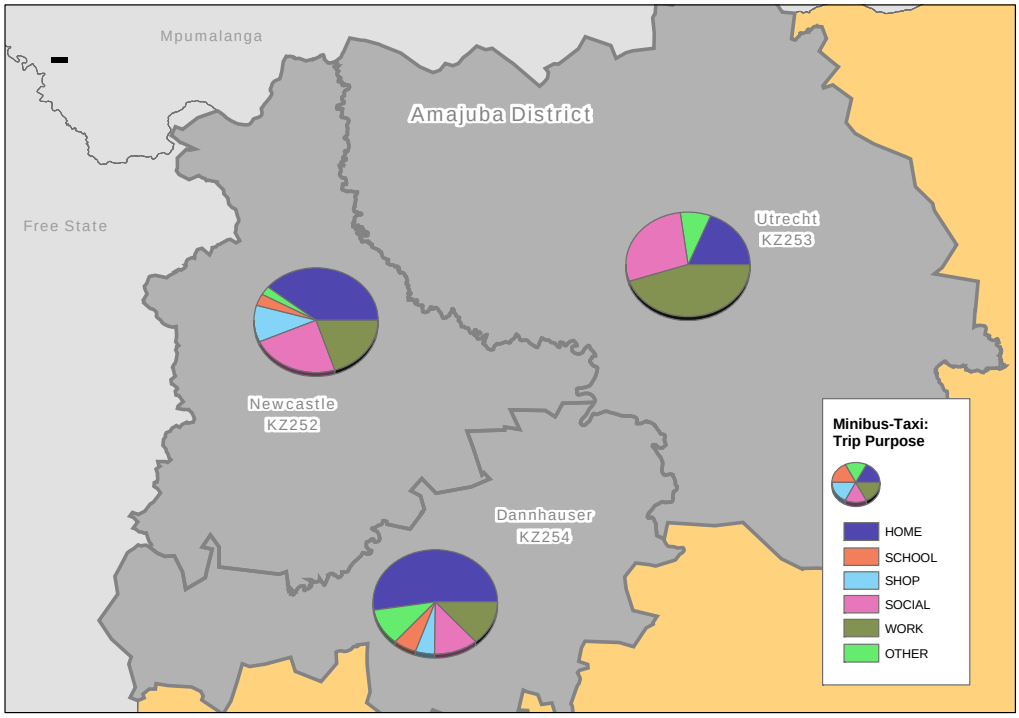


Figure 4.7 shows the Trip Purpose per area as from the Origin/Destination Surveys done for the Amajuba District.

Figure 4.7: Minibus-taxi – Trip Purpose



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 29000 (29190) 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 23 611 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 Amajuba the overall minibus-taxi service is 80 percent utilised, and excludes passengers boarding and alighting along the minibus-taxi routes. **Figure 4.8** shows the Capacity Utilisation of Taxi Vehicles per Route.

Figure 4.8: Daily Capacity Utilisation – Minibus-Taxi

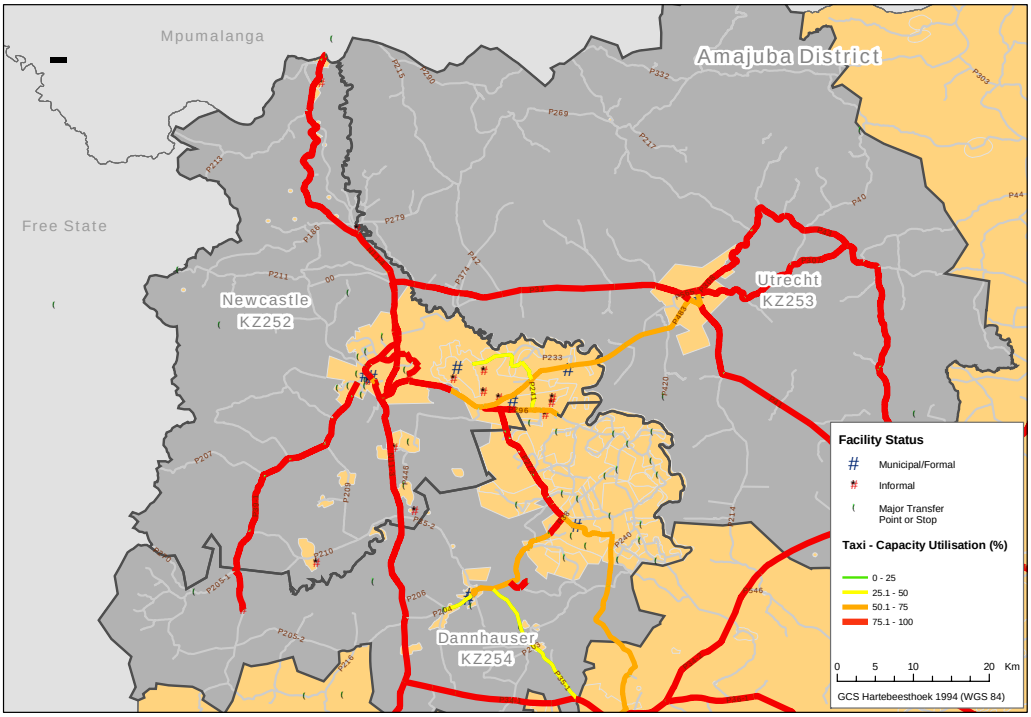


Figure 4.9 and **4.10** on the next page represent the Minibus-taxi AM Peak and PM Peak utilisation respectively. From these figures it is clear that the PM peak hour is more utilised than that of the AM peak period.

During the AM Peak period **(Figure 4.9)** the N11 proves to be the route with the highest utilisation levels (between 75 and 100 percent). Services between Newcastle, Osizweni and Dannhauser operate at an utilisation level of between 50 and 75 percent.

During PM Peak period **(Figure 4.10)** 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.

Figure 4.9: AM Peak Minibus-taxi Service Capacity Utilisation

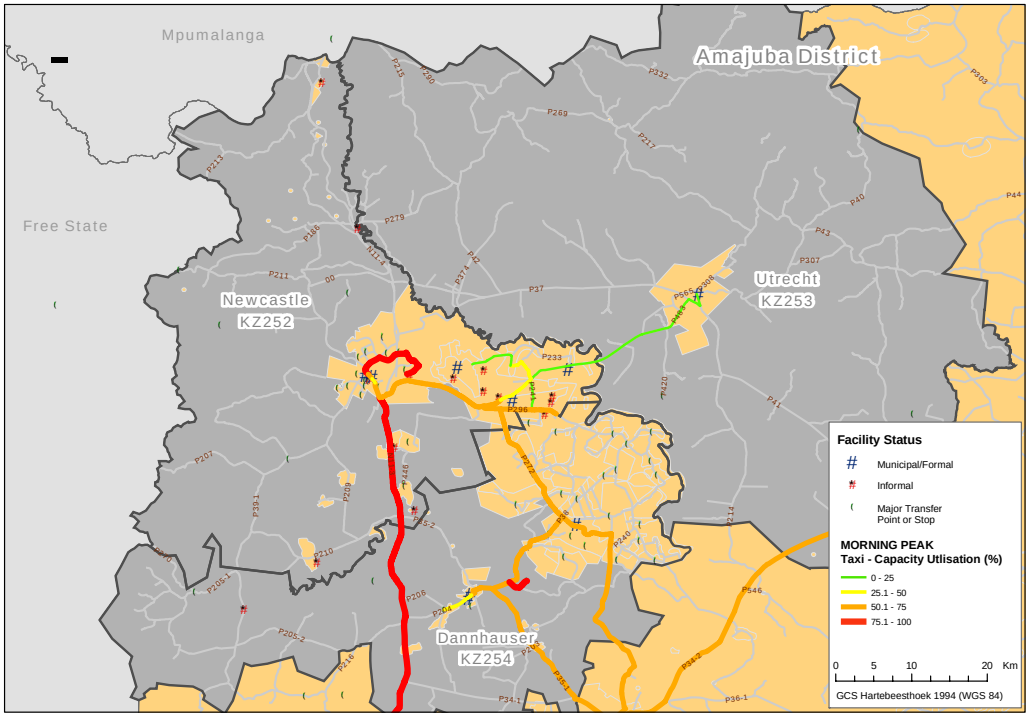
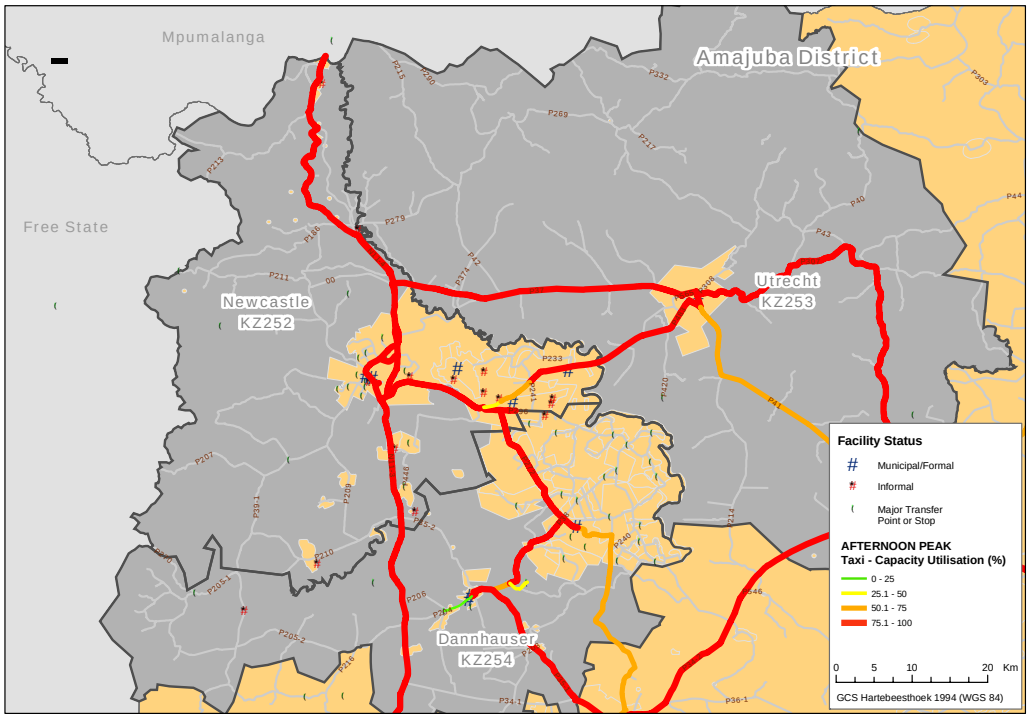


Figure 4.10: PM Peak Minibus-taxi Service Capacity Utilisation



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 8 minutes for 4+1 passengers to 14 minute for minibus-taxi and bakkie passengers. The longest waiting time surveyed for a taxi passengers were 4 hours and 13 minutes.

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

Vehicle Type	Min (min)	Max (min)	Average (min)
4+1	0	62	8
Bakkie	0	52	14
Taxi	0	253	14

On average the bus passengers wait longer than those passengers using minibus-taxi, bakkie or 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	80	10
PM Peak	Taxi	0	17	1

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.

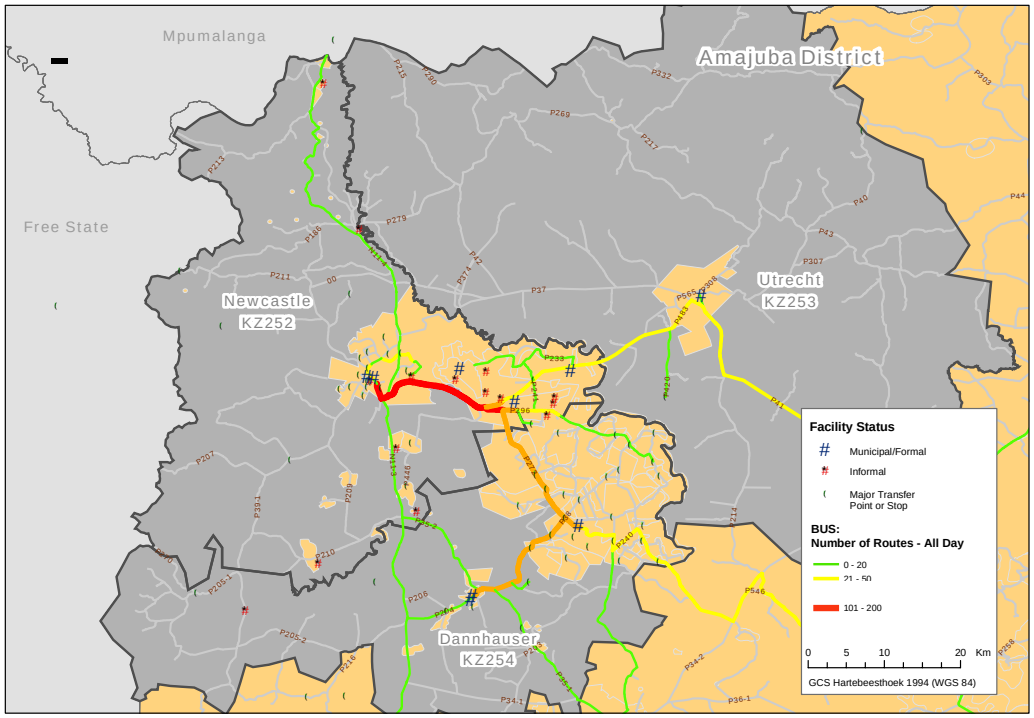
An example of a route description would be as follows:

Origin: Newcastle Main Bus Rank
Mode: Type of mode used
Destination: Madadeni
Description: via the internal road network of Newcastle and provincial road P485.

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 Amajuba District.

Figure 5.1 shows the Bus Routes in the Amajuba District

Figure 5.1: Number of Bus Trip per Route



In order to verify to number of buses trips between Newcastle and Madadeni and Osizweni on the P483, traffic counts were done, counting only the number of buses travelling between these areas. The results of these traffic counts are shown in **Table 5.3** below.

Table 5.3 Bus Counts versus Surveys (Location on Main road between Madadeni and Newcastle)

Time interval	Traffic Counts	Surveys
To Newcastle (06:00 – 14:00)	100	109
From Newcastle (12:00 – 18:00)	78	88

The counts clearly show the level of accurateness of the survey is acceptable with only a few more buses being surveyed. This maybe the result of the distance between the location of the counts and the location of the surveys and thus there could be buses falling outside the time interval of the counts.

5.2 Passenger O-D and Trip Purpose

The results of the bus survey showed that 14 406 passengers are transported per day by bus. Similar to the Minibus-taxi, the majority of trips take place between the urban areas of Newcastle and Osizweni including Dannhauser (See **Figure 5.2**).

Interestingly, 2% of all bus trips originate from areas outside the Amajuba District, where 9% of all trips terminate outside the Amajuba District, the main reason being going home. 60% of trips originate from the Dannhauser municipality. 53% of all trips also end within the Dannhauser municipality. 41% of all trips end within the Newcastle municipality.

Figure 5.2: Bus – Number of passengers – All day

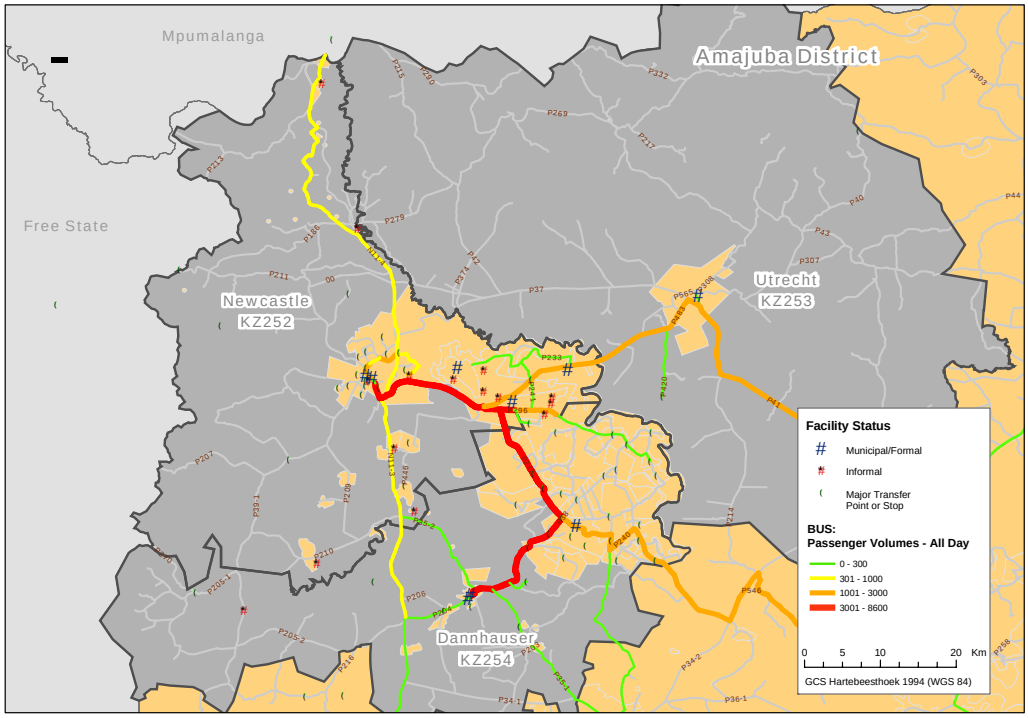


Figure 5.3 and **Figure 5.4** shows the AM Peak Passenger and PM Peak Passenger Distribution respectively. The Rank Survey information shows that most passengers travel between Newcastle, Osizweni, Mdakane and Dannhauser.

During the AM peak period it can be seen that the routes between Newcastle and Osizweni and between Dannhauser and Mdakane 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 Newcastle and Osizweni. Bus services in the AM peak from the north are mainly long distance services and therefore results in less passengers.

Figure 5.3: AM Peak – Bus Passenger Volumes

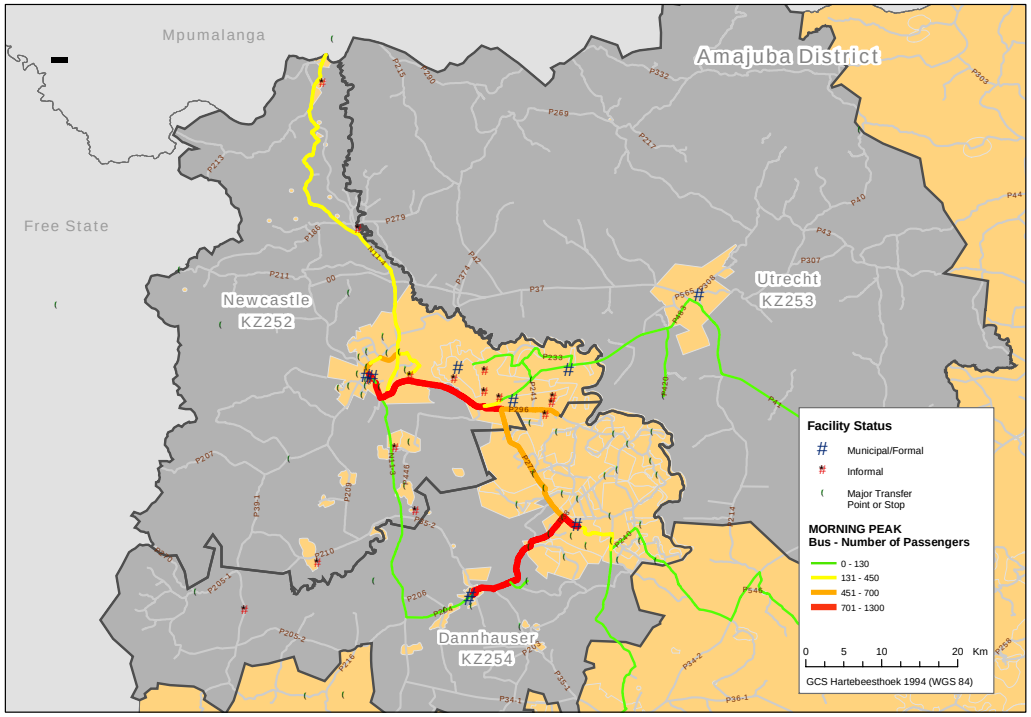


Figure 5.4: PM Peak – Bus Passenger Volumes

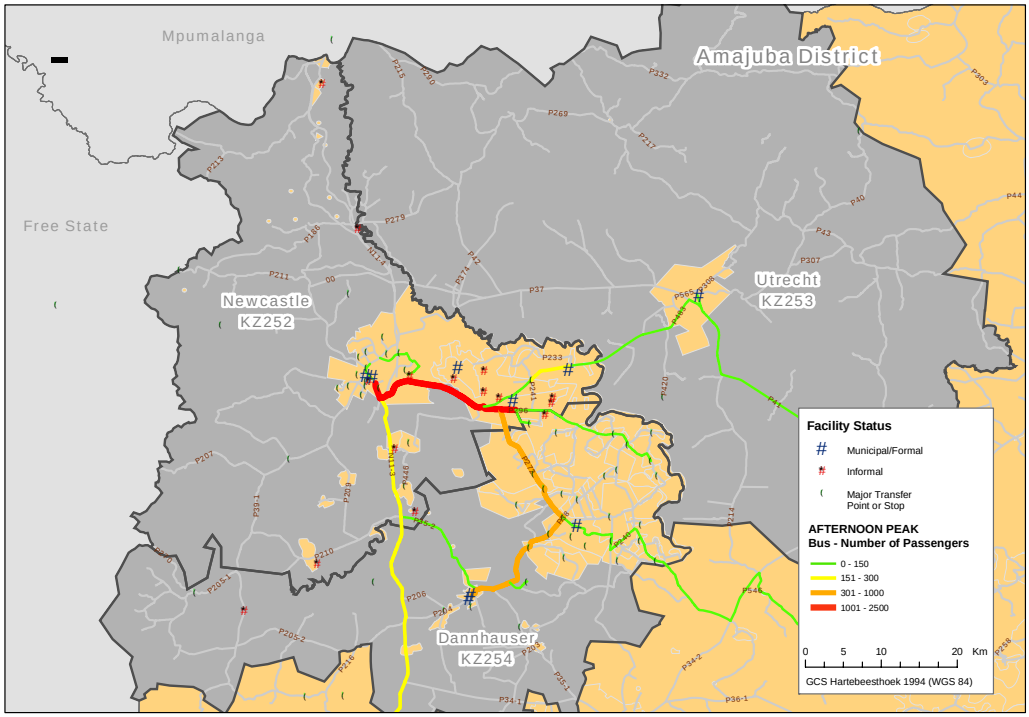


Figure 5.5 and **Figure 5.6** shows the results of the bus surveys for each rank for passenger trips per bus per rank/termini and the number of vehicle trips per rank respectively.

Figure 5.5: Bus passenger trips per rank

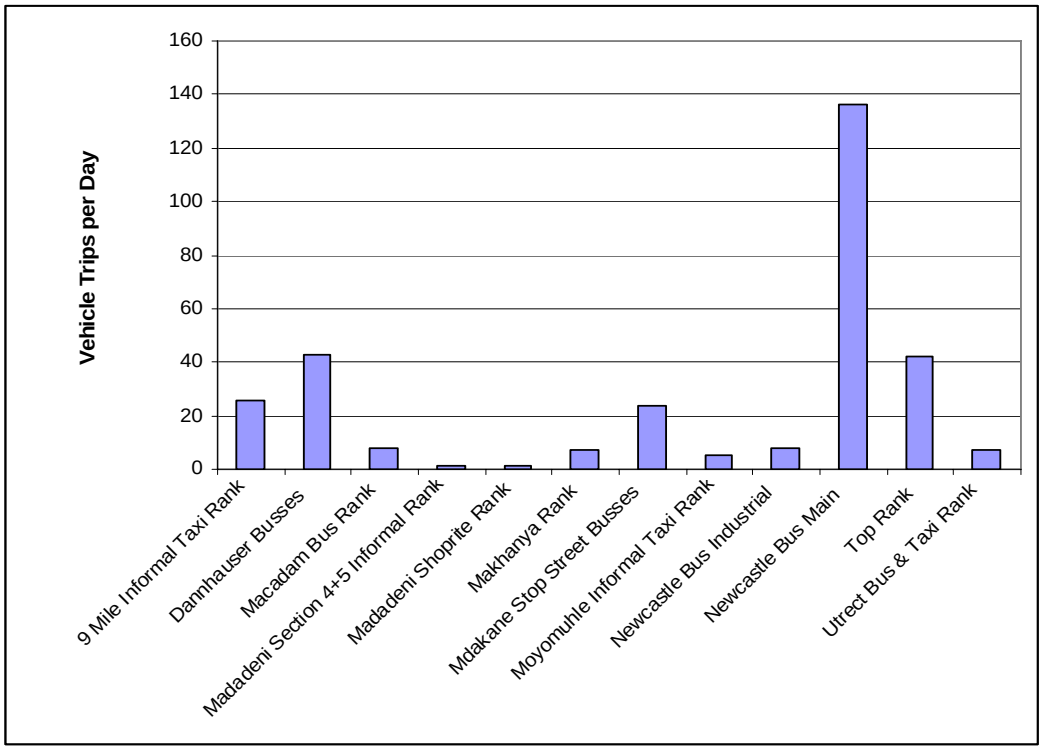


Figure 5.6: Bus vehicle trips per rank

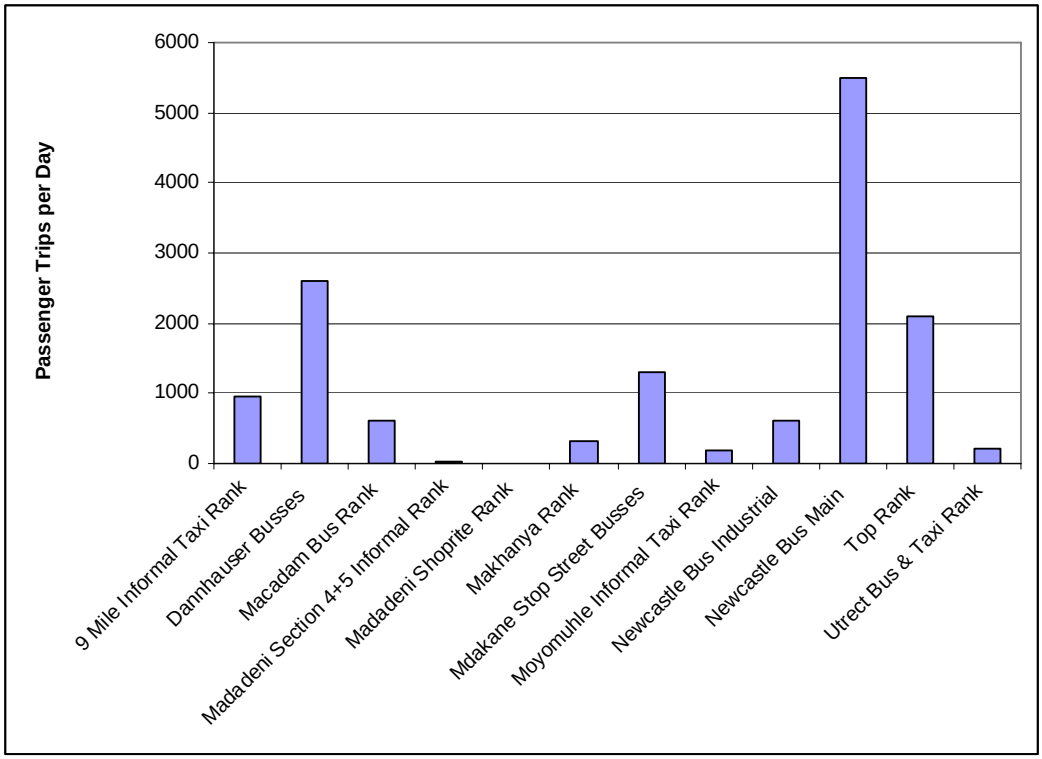
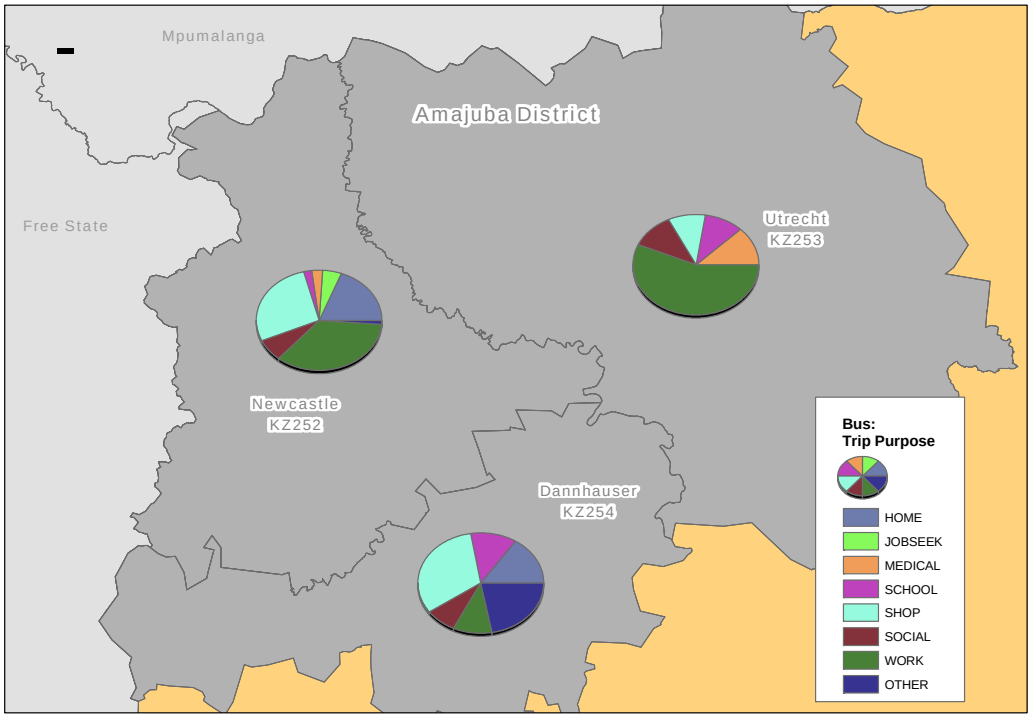


Figure 5.7 Shows the Trip Purpose per area as from the Origin/Destination Surveys done for the Amajuba District.

Figure 5.7: Bus – Trip Purpose



From the trip purpose it can be seen that the distribution for both Newcastle and Dannhauser areas were spread between the different trip purposes, while the passengers from Utrecht showed that more than 50% are using public transport for work purposes. For both Newcastle and Dannhauser areas the surveys indicated that a significant number of passengers are using public transport for shopping purposes.

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 19 041 seats with an average utilisation of 75.6%. Detailed bus utilisation figures per route are available on the GIS system. **Figure 5.8** below shows the service capacity utilisation for the bus services during a typical day. **Figure 5.9** and **Figure 5.10** shows utilisation figures for the AM Peak and PM Peak respectively. It is clear from **Figure 5.9** that the AM Peak period utilisation on the N11 route between Volksrust and Newcastle are operating at an average of between 75-100% capacity utilisation. This could be the result of the limited number of commuter buses and more long distance buses operating in this area and thus resulting in higher utilisation. More trips were counted during the AM Peak period than in the PM Peak period.

Figure 5.10, the PM Peak period utilisation, shows a different trend to that of the AM Peak period where trips operating at a capacity utlisation between 75-100% occur between Newcastle, Osizweni and Dannhauser.

Figure 5.8: Daily Bus Service Capacity Utilisation

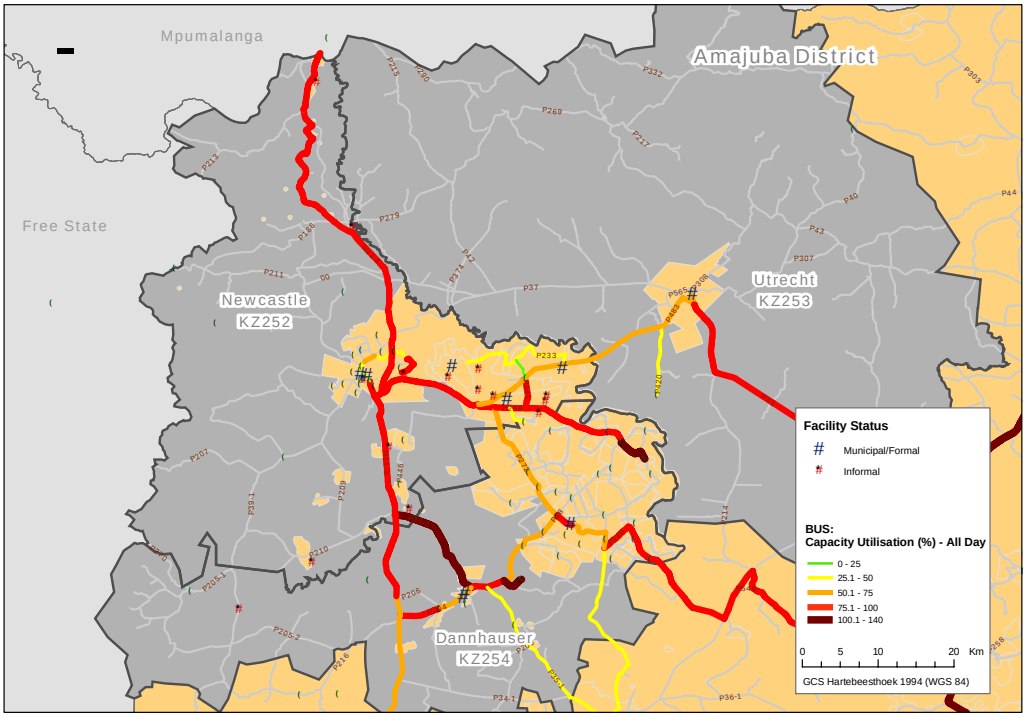


Figure 5.9: AM Peak Bus Service Capacity Utilisation

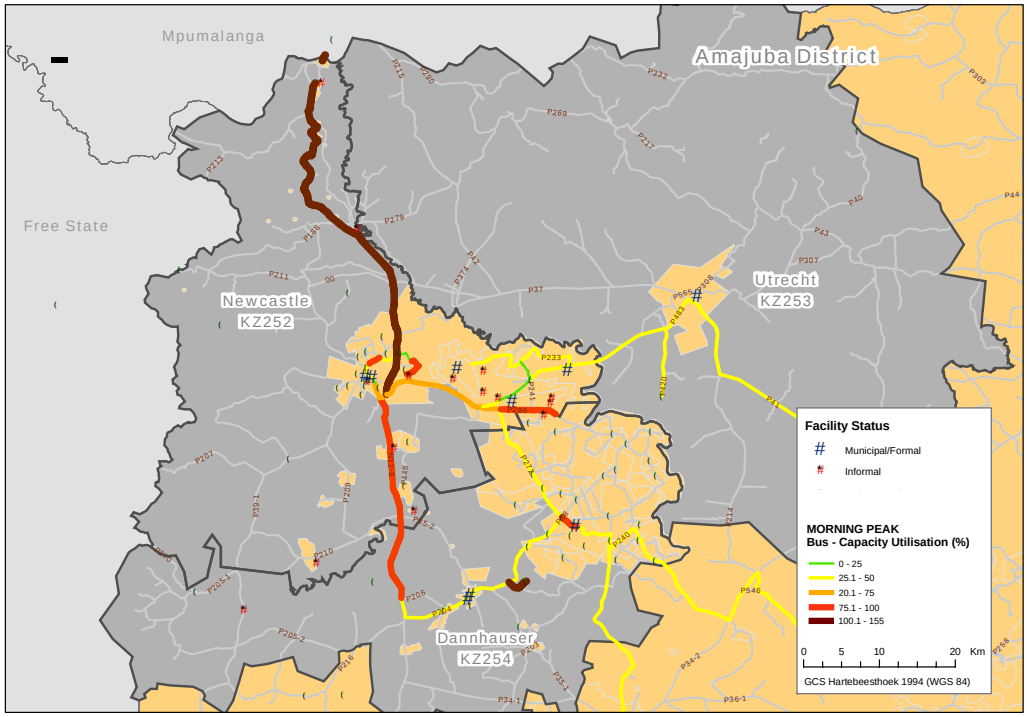


Figure 5.10: PM Peak Bus Service Capacity Utilisation

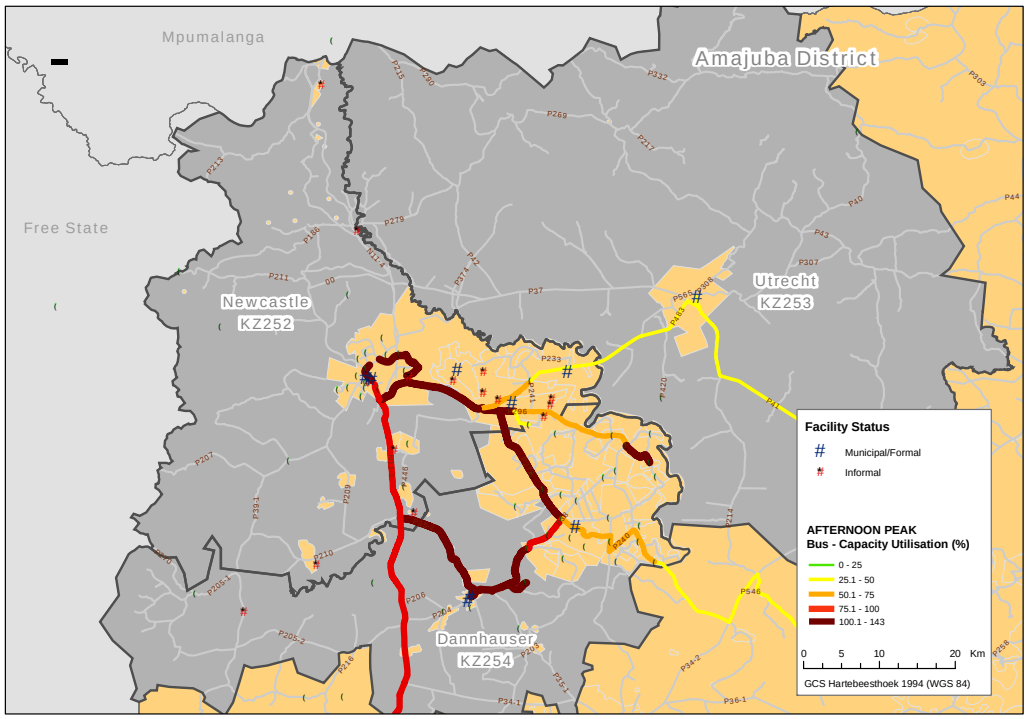


Table 5.4 in Appendix B shows the seated capacity utilisation of bus routes.

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 – All Modes of Transport

Peak Period	Vehicle Type	Min (min)	Max (min)	Average (min)
AM Peak	Bus	0	71	27
PM Peak	Bus	0	10	2

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 four 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

6.1 Description of Routes

The description of bakkie and 4+1 routes is the same as that of minibus-taxis and buses.

An example of a route description would be as follows:

Origin: Khuzani 4+1 Informal Rank
Mode: Type of mode used
Destination: Osizweni
Description: via the internal road network of Osizweni.

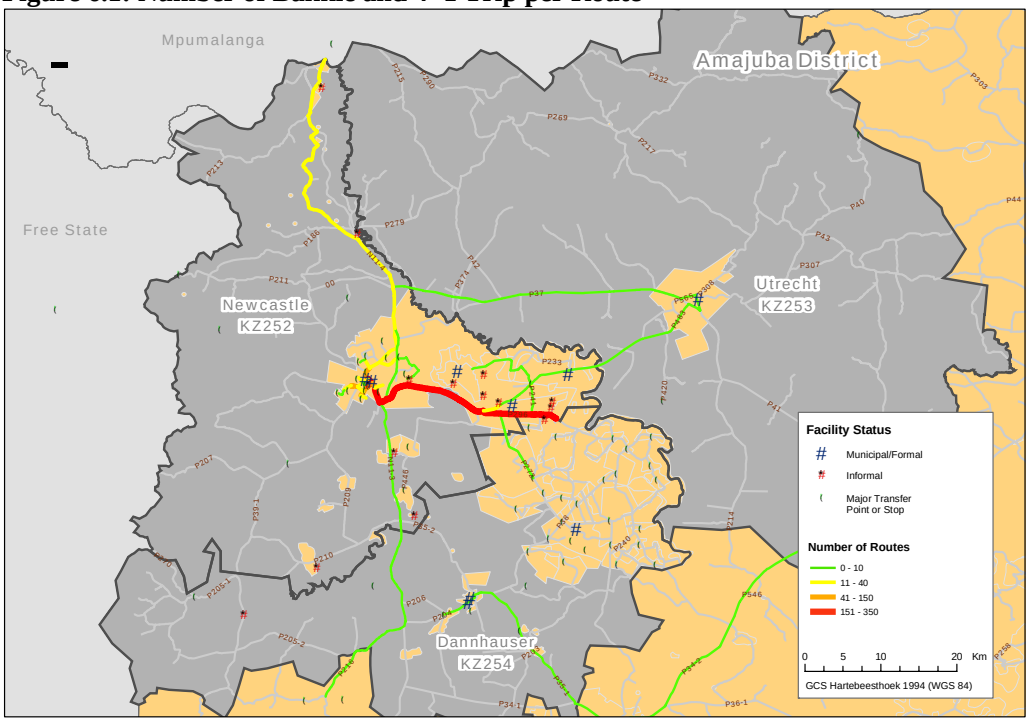
Further route details are available on the GIS and can be shown on a detailed map of the area.

6.1.1 Route Codes

Table 6.1in Appendix C provides a list of all the Bakkie & 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 Amajuba District

Figure 6.1 shows the Number of Bakkie Routes in the Amajuba District.

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



6.2 Passenger O-D and Trip Purpose

The results of the bakkie/4+1 survey showed that 2 129 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 urban areas of Newcastle and Osizweni. 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 Rank Survey information shows that most passengers travel between Newcastle and Osizweni during the morning peak. During the PM peak period it can be seen that the routes originate from within the Newcastle and Osizweni centres outwards towards Dannhauser, Utrecht and Volksrust.

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

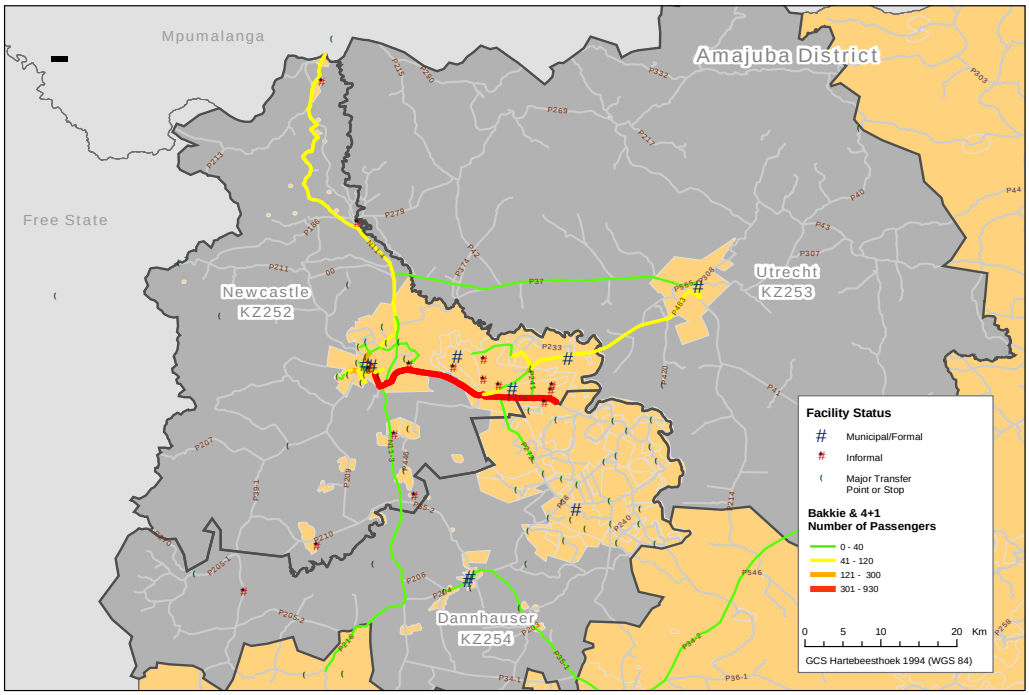


Figure 6.3: AM Peak – Bakkie/4+1 Passenger Volumes

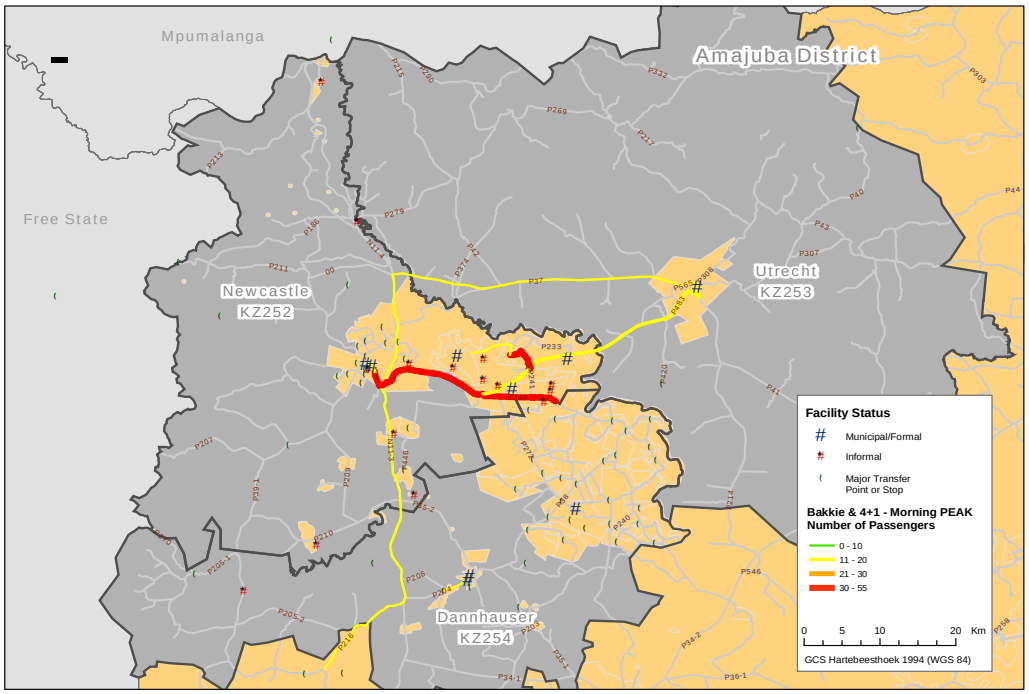


Figure 6.4: PM Peak – Bakkie/4+1 Passenger Volumes

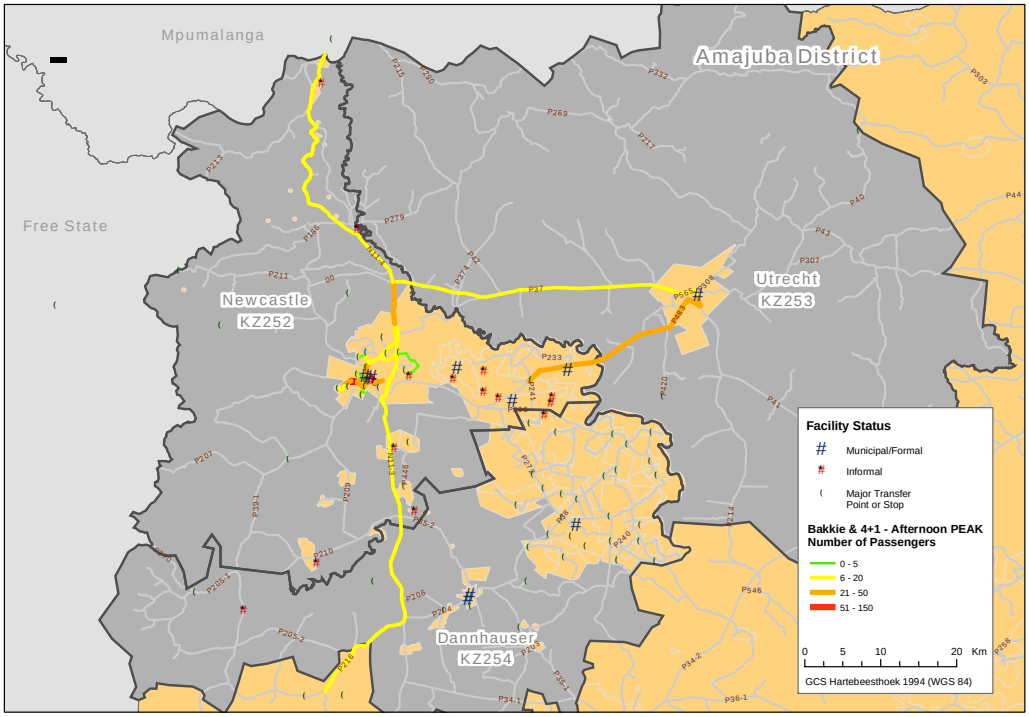


Figure 6.5 and **Figure 6.6** shows the results of the surveys for each rank for passenger trips per rank/termini and the number of vehicle trips per rank respectively. From this figure it is clear that the main 4+1 ranks are that of Central Car Park in Newcastle, Khuzani and Makhanya informal rank.

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

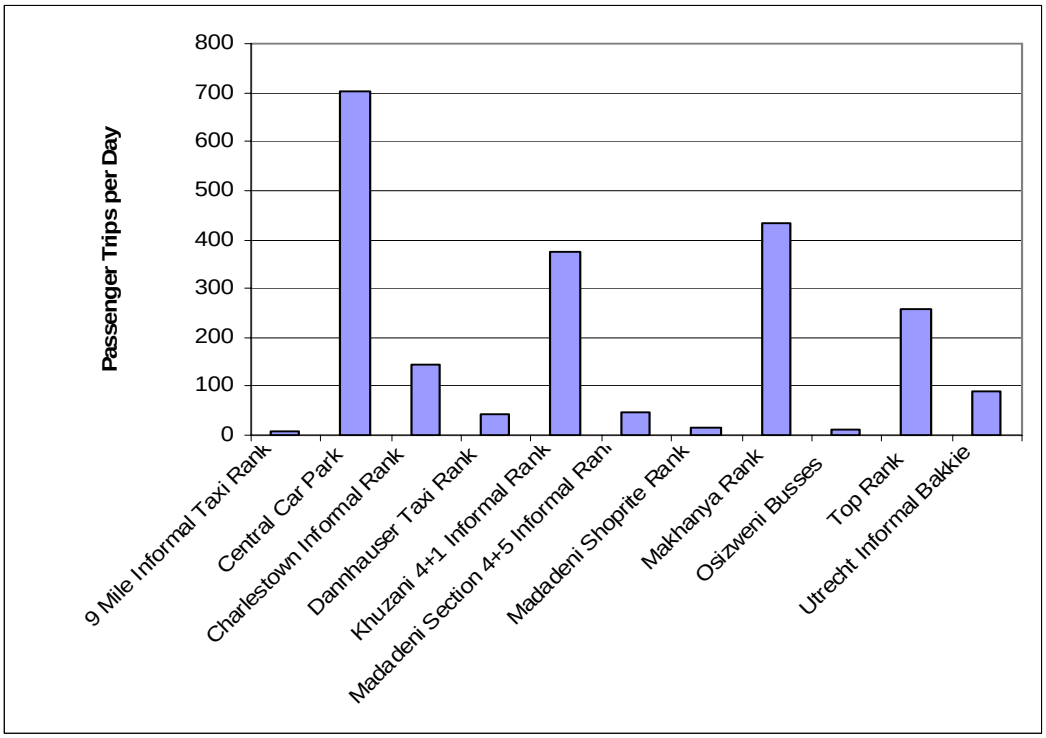
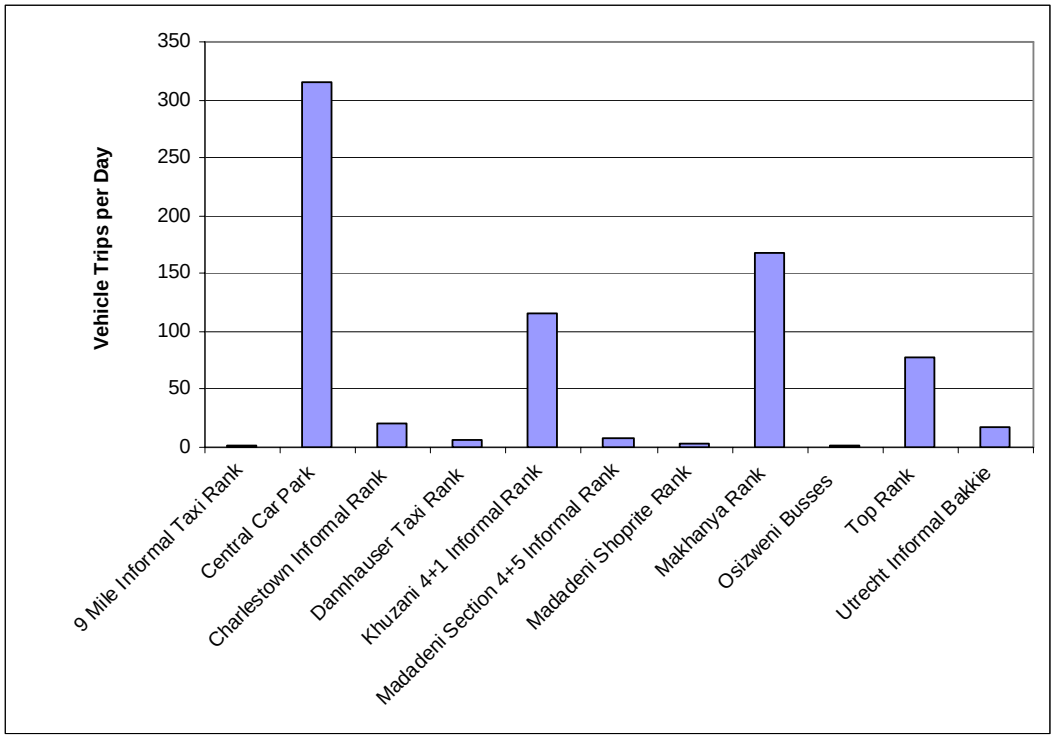


Figure 6.6: Bakkie/4+1 vehicle trips per rank per day



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 or 4+1 vehicle. Capacity was calculated as follows:

- Seated Capacity - Bakkie- 10 passengers, and
- Seated Capacity - 4+1 vehicle - 4 passengers.

Using the maximum capacity of a bakkie & 4+1 vehicles and the number of trips it was calculated that the capacity of the bakkie vehicles is approximately 700 and the 4+1 vehicles is 2 660 passengers, resulting in a combined capacity of 3 360.

The survey results on the other hand showed that the actual number of passengers transported by bakkies and 4+1 vehicles were only 2 129 for the duration of the survey. The average utilisation can then be calculated to be 63%. The lower utilisation of these modes can also be attributed to the fact that the passengers that is transported by these modes also transport large quantities of goods such as maize meal, sugar, etc thus limiting the passenger capacity of these vehicles. Detailed bakkie and 4+1vehicle utilisation per route is available on the GIS system. The capacity utilisation for bakkie and 4+1 vehicles is shown in **Figure 6.7**.

Figure 6.8 and Figure 6.9 represent the bakkie and 4+1 AM Peak and PM Peak utilisation respectively.

During the AM Peak period **(Figure 6.8)** bakkie and 4+1 services operate at utilisation levels of 25% or more. Bakkie and 4+1 services between Utrecht and Osizweni operates at utilisation higher than 75 percent.

Figure 6.9, the PM peak period, shows utilisation levels between 25 and 75 percent. Most of these services operate between Newcastle, Osizweni and Utrecht.

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

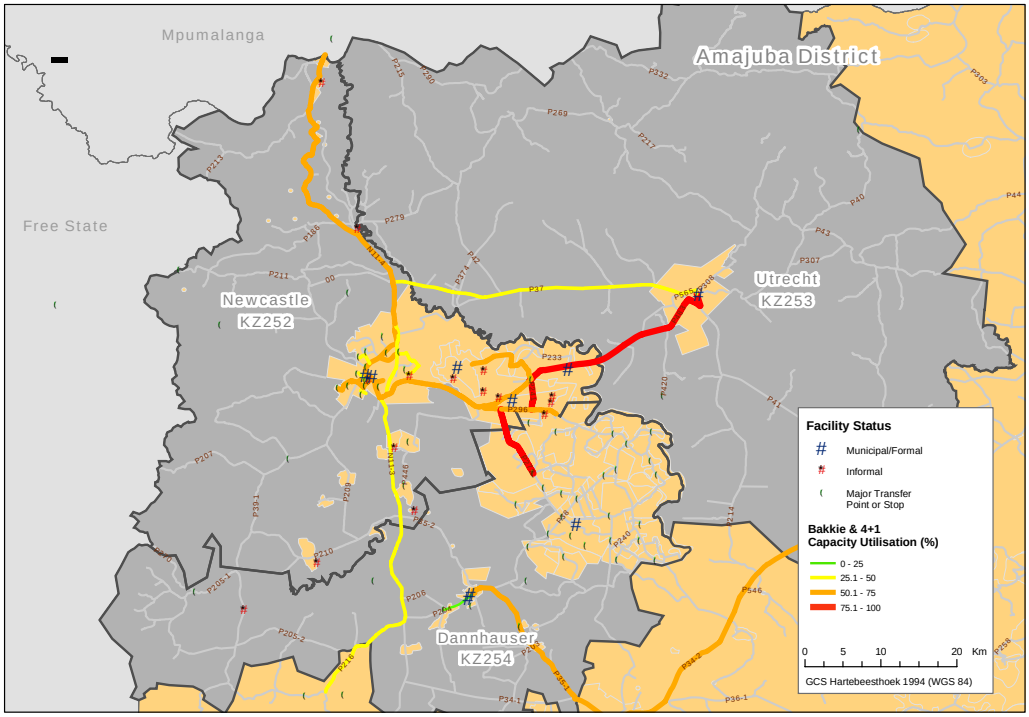


Figure 6.8: AM Peak - Bakkie/4+1 Service Capacity Utilisation

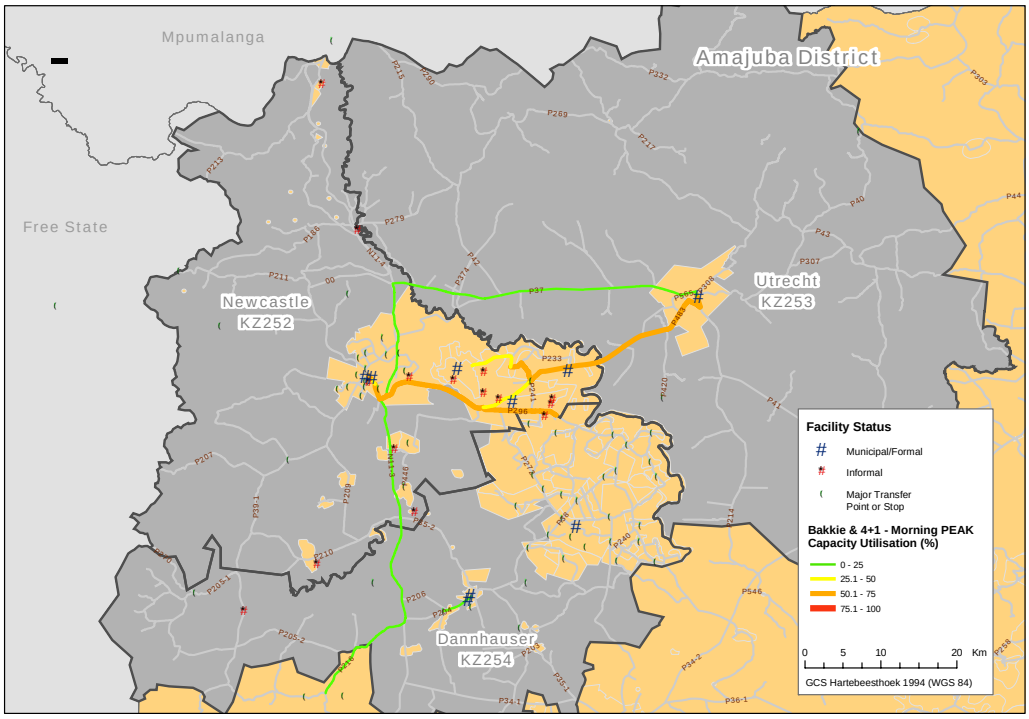


Figure 6.9: PM Peak - Bakkie/4+1 Service Capacity Utilisation

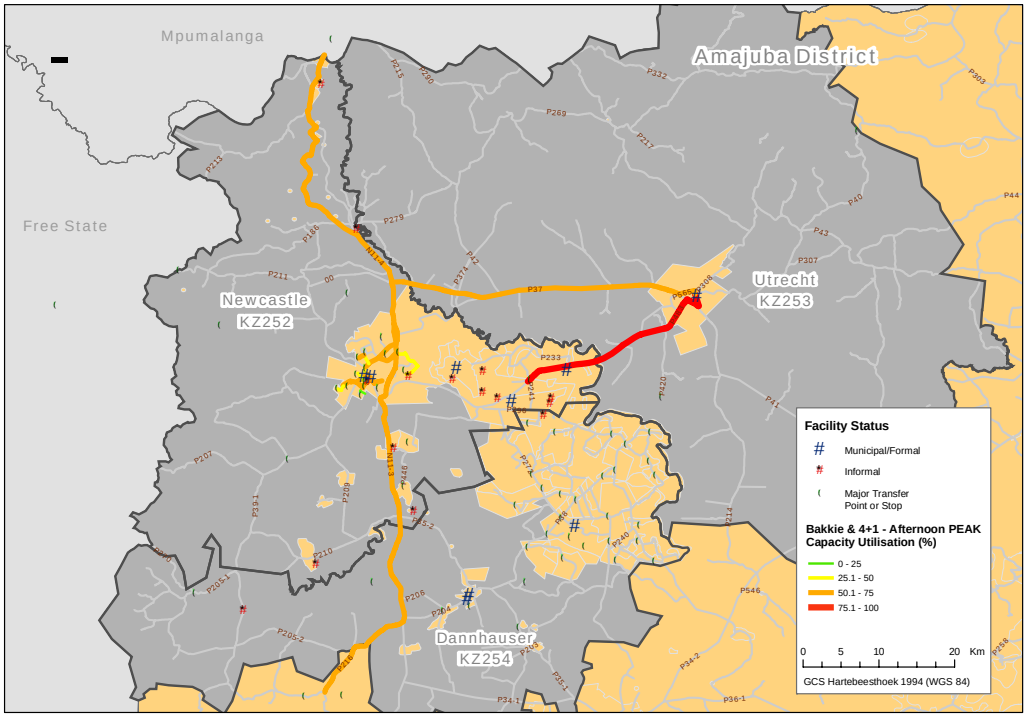


Table 6.3 in Appendix C shows the capacity utilisation of minibus-taxi routes.

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	4+1	0	60	7
AM Peak	Bakkie	1	52	14
PM Peak	4+1	0	4	1
PM Peak	Bakkie	0	3	1

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.

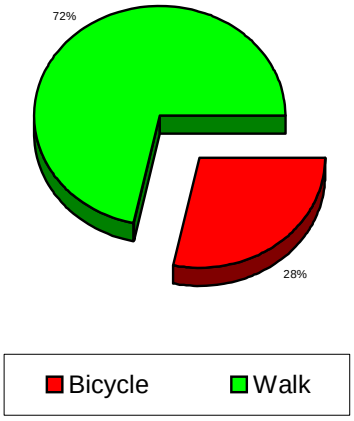
7. RESULTS - NON MOTORISED TRANSPORT

During the inception meeting it was decided that additional non-motorised surveys needs to be done at the pedestrian bridge between Madadeni township and the Newcastle Industrial area. These surveys were conducted from 06:00 till 18:00 with the following results.

7.1 Non-motorised transport mode

The survey results showed that, of the 162 people interviewed, more than 70% (116) of people interviewed were walking. **Figure 7.1** below shows the distribution between walking and using a bicycle.

Figure 7.1: Distribution of non-motorised modes



7.2 Trip Purpose – AM Peak Period

Figure 7.2 and Figure 7.3 shows the origin and destination activity/purpose for the AM peak period respectively. From **Figure 7.2** it can be seen that 70% of all people interviewed were leaving home with 18% coming from work. **Figure 7.3** also showed that 60% of all people interviewed were going to work. It can therefore be assumed that the majority of people walking between Madadeni and the Newcastle Industrial area are doing so for work purposes.

Figure 7.2 AM peak Origin Activity

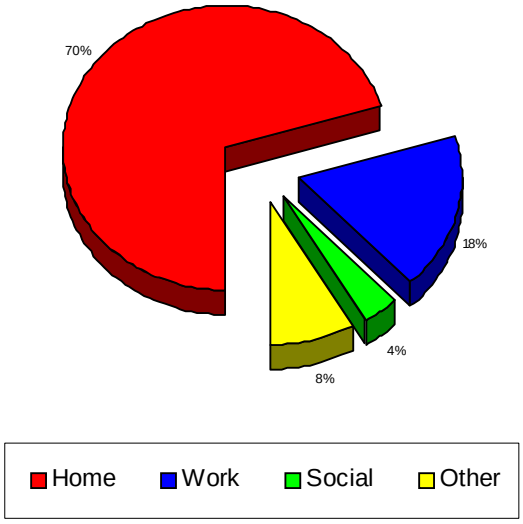
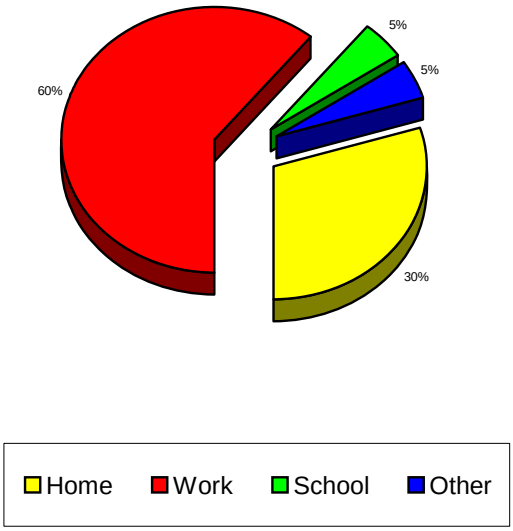


Figure 7.3 AM peak Destination Activity



7.3 Trip Purpose – PM Peak Period

Figure 7.4 below shows that 60% of all people interviewed were going to work with 30% going home. **Figure 7.5** shows that 76% of the people interview were going home in the afternoon and 15% going to work.

Figure 7.4 PM peak Origin Activity

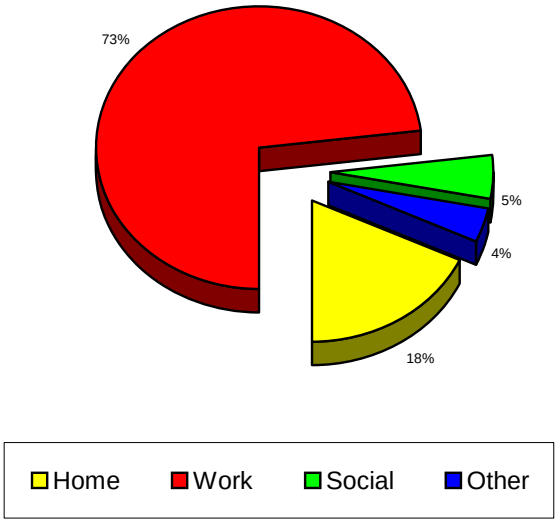
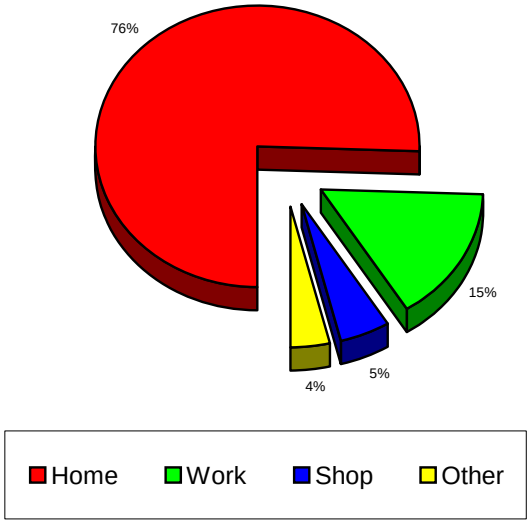


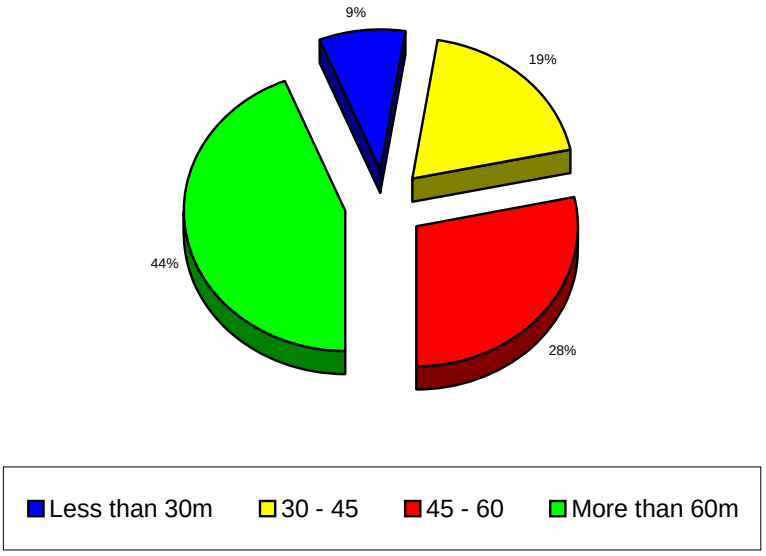
Figure 7.5 PM peak Destination Activity



7.4 Trip Duration

Figure 7.6 below shows that 44% of all trips take longer than 60 minutes. The majority of trips (47%) take between 30 and 60 minutes.

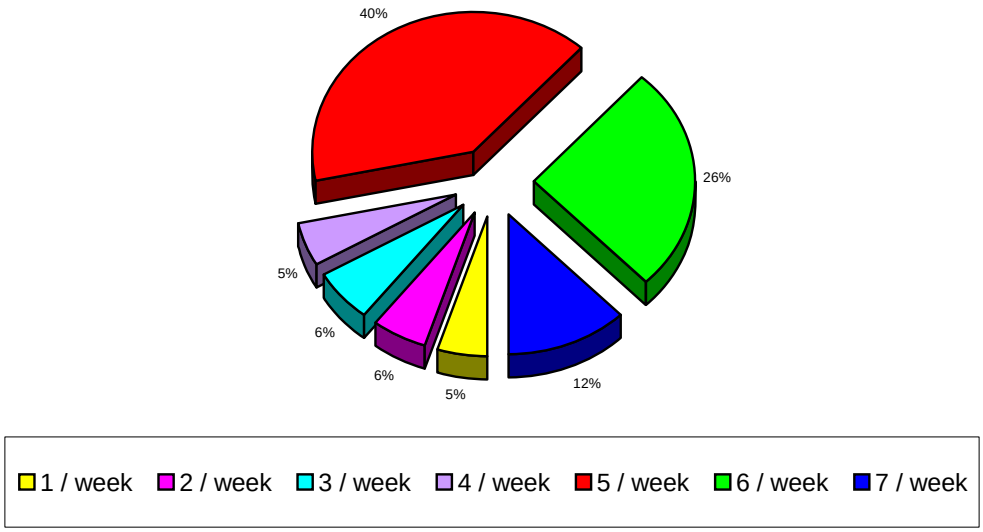
Figure 7.6 Duration of Trip



7.5 Trip Frequency

Figure 7.7 below shows that 78% of all trips were made five or more times per week. The majority of people (40%) indicated that they make the trip five times per week, with 26% six times per week.

Figure 7.7 Trip Frequency



8. SUMMARY AND CONCLUSION

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

- Approximately 66% of all public transport trips within Amajuba District Municipality are made by minibus-taxis, 22% by bus transport and the remaining 12% by bakkie and 4+1 modes;
- A total of approximately 23600 passengers are transported daily within the Amajuba area;
- 143 routes within Amajuba are served by minibus-taxis, 91 by bus and 76 routes by bakkie and 4+1;
- These routes are served from 24 public transport facilities of which 9 are formal facilities and 15 informal ranks or stops;
- 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 surveys also showed that 46% of all minibus-taxis make only one trip per day with the maximum trips for a single taxi were 22 trips;
- The major movement of public transport modes occurs between Newcastle and Madadeni/Osizweni areas;
- The average waiting time for bus passengers was 30 minutes, 14 minutes for Minibus-taxis and 14 for bakkie passenger and 8 minutes for 4+1 vehicles;
- Generally the observed waiting time during the AM peak exceeded the PM peak waiting times;

9. APPROVAL

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

Amajuba District Municipality hereby submits the Current Public Transport Record to the MEC of Transport, Mr Sbu Nedebele for approval.

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Approved by:
For Amajuba District Municipality