



CURRENT PUBLIC TRANSPORT RECORD

FEBRUARY 2003

ARUP
PARUK
CONSULTING

Joint Venture

uThungulu District
Municipality

**Current Public
Transport Record**

Status Quo of Public
Transport Services,
Facilities and
Infrastructure

ISSUE

uThungulu District Municipality

Current Public Transport Record

Status Quo of Public Transport Services, Facilities and Infrastructure

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FOREWORD

It is with pleasure that I present to you the uThungulu District Municipality – Current Public Transport Record (CPTR).

uThungulu District Municipality has been presidentially selected by the National Department of Transport as one of the five areas to compile a CPTR as the first step in preparing an Integrated Transport Plan to address pressing transport issues in the district. The uniqueness of uThungulu District Municipality, with its contrasting urban and rural characteristics, contributed to the challenge of preparing the CPTR.

The study, headed by uThungulu District Municipality – Planning Department, with support from all six local municipalities, appointed a professional team to undertake the project. Jointly, with the co-operation of all public transport role players and stakeholders, this exercise proved to be a valuable opportunity to understand more fully the status quo of public transport and all its components within uThungulu.

The CPTR was completed under tight control and within budget, and needless to say not without a few hick-ups along the way. We are proud to have become the first district municipality to complete the CPTR under the current legislation, guidelines and requirements.

I am proud to be part of this exercise in trying to understand the extent of public transport in uThungulu, and the future challenges to improve public transport and make it accessible for everyone in uThungulu. I look forward to the next phase in the process of preparing an Integrated Transport Plan for uThungulu and believe that uThungulu will serve as an example to other local authorities that have not yet embarked on addressing Public Transport in their area.

Yours truly,

B.B Biyela
Municipal Manager – uThungulu District Municipality.

EXECUTIVE SUMMARY

Arup SA (Pty) Ltd and Paruk Consulting were appointed by uThungulu District Municipality to prepare a Current Public Transport Record (CPTR) for the whole uThungulu District. The CPTR study for uThungulu District Municipality is one of the five presidential elected areas and was selected because of the unique characteristics of uThungulu – urban and rural where the needs for public transport are quite different.

There has been a significant change in transport planning in recent years with a shift from solely providing road infrastructure to addressing public transport in the wider context. The public transport system has also changed over the years with a change from a supply-driven public transport system to that of a demand-driven public transport system.

The NLTTA requires that every planning authority must prepare a CPTR for its area of jurisdiction. The CPTR must, by law, conform to certain national legislated requirements. This study meets the basic requirements of the guidelines for concluding the first CPTR for the uThungulu area. These guidelines are prescriptive as set out in the Department of Transport CPTR: Planning Requirements in Terms of the National Land Transport Transition Act, Act 22 of 2000.

The main reasons for preparing a CPTR are:

- To provide uThungulu District Municipality with a current record of public transport services and
- To provide a current record of facilities and infrastructure used by public transport operators.

The CPTR in turn would constitute the basis for development of:

- Operating Licences Strategy for uThungulu,
- Rationalisation Plan aimed at Subsidised Public Transport,
- Public Transport Plans if required by MEC, and
- Integrated Transport Plan for uThungulu District Municipality.

The report address the three modes of public transport in uThungulu namely:

- Bus transport,
- Minibus-taxi and Bakkie transport, and
- Metered taxi transport.

The methodology followed in completing the CPTR study included public participation and involvement of all relevant role players in gathering the required CPTR data. As far as possible local people were empowered to assist Arup – Paruk in the planning and execution of the study. Local unemployed people were sourced and trained to conduct surveys amongst bus, bakkie and minibus-taxi operators. The surveys were conducted between 28 October 2002 and 20 November 2002 at all ranks/termini.

Additional bus information was received from the various bus operators. The information received from the surveys, bus information from operators and GIS information from uThungulu District Municipality were used to code all public transport routes and facilities. The GIS system was used to prepare maps and figures relating to public transport operations from which the CPTR report was compiled.

The study revealed that approximately 19 531 public transport trips are made per day and 203 881 passengers transported within uThungulu. Bus transport contributes to 17 percent (3 230) of all public transport trips with bakkie and minibus-taxi 83 percent (16 301). Bus operations in uThungulu transport 80 042 (39%) passengers with the remaining 123 839 (61%) transported by minibus-taxi and bakkies. Metered taxi operators are confined to the Mhlatuze area only and contribute to 290 trips per day carrying almost 500 passengers.

The detailed analysis showed that public transport routes serve mainly the urban areas. This is the result of work opportunities, economic activity and population size. In general the public transport service are not fully utilised. It was determined that only in isolated cases the public transport services are operating over capacity.

1. INTRODUCTION

This is the Final Issue of the Current Public Transport Record (CPTR) study to provide the Status Quo of public transport services, facilities and infrastructure, which will constitute the basis for the development of Operating Licences Strategy, Rationalisation Plan, Public Transport Plan and Integrated Transport Plans for the uThungulu District Municipality.

1.1 Appointment

Arup SA (Pty) Ltd and Paruk Consulting Joint Venture (Arup-Paruk) were appointed on 26 August 2002, by the uThungulu District Municipality to carry out a Current Public Transport Record (CPTR) study for the whole uThungulu District Municipality area.

1.2 Scope of Services

This study meets the basic requirements of the guidelines for concluding the first CPTR for the uThungulu area. These guidelines are prescriptive as set out in the Department of Transport CPTR: Planning Requirements in Terms of the National Land Transport Transition Act, 2000 (refer 1.3.1 below).

In addition to the basic requirements, limited home interview surveys were necessary to determine the travel patterns/needs in the rural areas of uThungulu.

1.2.1 Act 22 of 2000 (NLTTA)

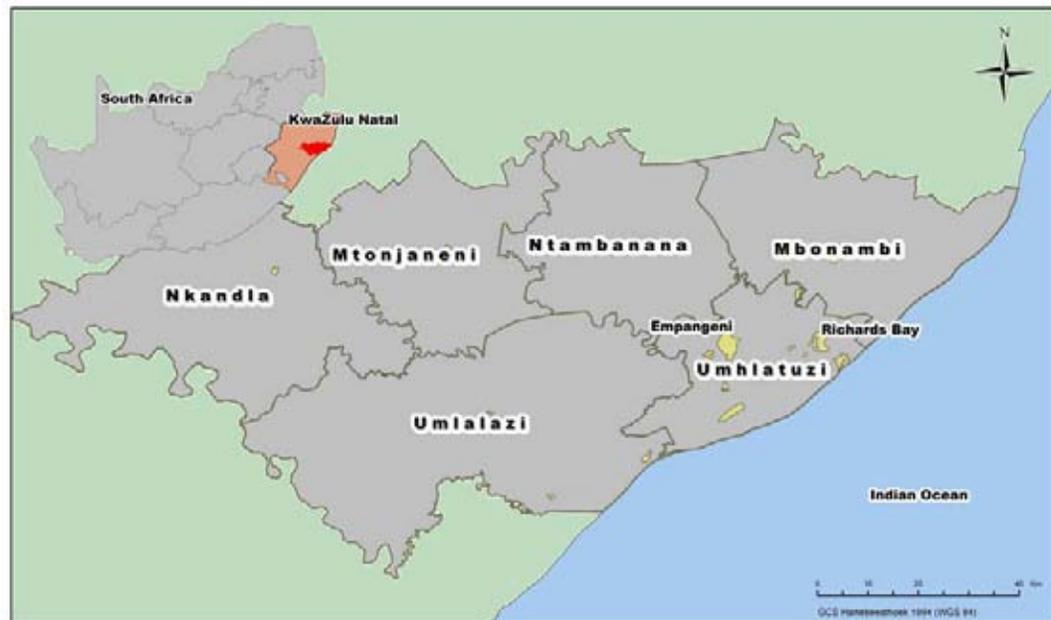
The document titled Requirements and Format for Preparation of Current Public Transport Records by Core Cities, as published in the Government Gazette on 22 May 1998 under General Notice No. 847 of 1998, as amended in terms of section 23(2) of the National Land Transport Transition Act 2000 (Act No. 22 of 2000) has been utilised as the base structure to prepare the CPTR.

1.3 Why uThungulu District Municipality?

The CPTR study for uThungulu District Municipality is one of the five presidential elected areas. The district has unique characteristics because it covers both urban (Richards Bay and Empangeni) as well as the rural (other Local Municipalities) areas where the needs for travel are quite different.

The uThungulu District Municipality comprises the following local Municipalities as shown on **Figure 1.3.1**. 'KZ281' is the code used by uThungulu District Municipality to distinguish between the different local municipalities within uThungulu District. The number allocated to each of the local municipalities is based on the provincial code given to each authority. 'Mbonambi' is the name of the particular local municipality in uThungulu with (Kwambonambi) being the main town or city within the local municipality.

- KZ 281 - Mbonambi (Kwambonambi) - Rural
- KZ 282 - uMhlathuze (Richards Bay & Empangeni) - Urban
- KZ 283 - Ntambanana (Buccanana) - Rural
- KZ 284 - Umlalazi (Eshowe) - Rural
- KZ 285 - Mtonjaneni (Melmoth) - Rural
- KZ 286 - Nkandla (Nkandla) - Rural

Figure 1.3.1: Study Area

Richards Bay and Empangeni are the main economic centres within uThungulu that provides the majority of work opportunities in the region. Each of the six Local Municipalities within the District are however unique in that they cover both urban and rural areas and therefore require special study procedure and analysis.

The following factors influence the way the study has been carried out:

- Distribution of population
- Location of employment in relation to residential areas
- Location of schools in relation to residential areas
- Existing road infrastructure
- Existing public transport infrastructure, and
- Economic activity in the region.

1.4 Definitions

The following words or expressions as set out in the Act have the following meaning:

- “Act” or “the Act” means the National Land Transport Transition Act, 2000 (Act No. 22 of 2000) as amended by the National Land Transport Transition Amendment Act, 2001 (Act no. 22 of 2001);
- “CPTR” means a Current Public Transport Record;
- “facilities” means ranks, terminals, and stations, holding areas, informal taxi ranks and holding areas and major boarding points in rural areas, for road and rail based public transport.

- “route” means the roads or railway lines that are traversed by a vehicle or train from point of origin to point of final destination or, in the case of road-based transport, where no roads are clearly demarcated, the route followed by the particular vehicle as described with reference to landmarks or beacons;
- “services” means public transport services.

The definitions as listed in Section 1 of the National Land Transport Transition Act (NLTTA), Act 22 of 2000, apply directly to the terminology used in this document.

In addition to the NLTTA list of definitions and for the purposes of this report:

- A “route” means the roads or railway lines that are traversed by a vehicle or train from point of origin to point of final destination or, in the case of road-based transport, where no roads are clearly demarcated, the route followed by the particular vehicle as described with reference to landmarks or beacons.
- A “route section” means the roads traversed between significant boarding and alighting points.
- A “terminal or rank” means a facility at the end of a route or a group of routes where passengers can board and alight. It may include a vehicle holding area.
- A “stop” means a facility within the road reserve where passengers can board and alight.
- A “holding area” means a facility for parking buses and/or taxis between peak periods to avoid dead kilometres and empty return trips. It may be incorporated in a rank or terminal.
- “Land Transport Permit System” (LPTS) means the information system developed by the national Department of Transport and used by the Operating Licensing Boards of each of the nine provinces, and containing information on the detail of operating licenses issued to public transport operators by that particular board.
- “Registration Administration System” (RAS) means the information system developed by the National Department of Transport and used by the Operating Licensing Boards of each of nine provinces, and containing information on the detail of registered mini-bus taxi Associations.
- “Route coding system and facility coding system” means the basis according to which routes and facilities are given a unique code in order to facilitate the identification of particular routes and facilities.
- LRTB – Local Road Transport Board – A former institution replaced by the Operating Licensing Board.

2. STUDY AREA AND BACKGROUND

This section provides a brief description of the study area, the different modes of public transport and a general background to the study process.

2.1 Study Area and Population

The study area is uThungulu District Municipality (DC28) comprising six local municipalities as described in Section 1 of this report. uThungulu District Municipality has the third highest population (9.08% - 762,791) in KwaZulu Natal after Durban Metropolitan Council (32,9% - 2,763,600) and Umgungundlovu (10,4% - 873,600). **Table 2.1** below illustrates the demographic data per local municipality based on figures determined by the Demarcation Board and shown in the uThungulu District Municipality's Integrated Development Plan, 2002.

Table 2.1: Demographic Data per Local Municipality

Local Municipality	Population (%)	Percentage (%)	Male (%)	Female (%)	Age Group (%)		
					0-19	20-64	64 +
Kwambonambi	96,497	12.7	46.6	53.4	52.9	42.8	4.3
uMhlathuze	196,183	25.7	48.5	51.4	45.0	52.2	2.8
Ntambanana	72,727	9.5	45.3	54.7	56.3	39.1	4.6
Umlalazi	231,023	30.3	45.3	54.7	53.5	41.6	4.9
Mtonjaneni	36,848	4.8	45.2	54.8	53.9	41.2	4.9
Nkandla	129,513	17.0	43.1	56.9	59.1	35.0	5.9
uThungulu	762,791	100.0	45.7	54.3	52.5	43.1	5.4

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

2.2 Public Transport Operators

The uThungulu region is serviced by the following modes of public transport and operators or associations where applicable:

Bus Operators

- Ikhwezi Bus Service
- Alton Coach Africa
 - Ronnies
 - Bonnies
 - Washesha
- Puma Bus Service (Wozanathi Bus Service)
- Ulundi Bus Service
- In addition to the subsidised bus services mentioned above some limited long distance (intercity) services are also available (Greyhound) but have been excluded from the study.

Minibus Taxi and Bakkie Associations

- Kwadlangezwa Taxi Association
- Nhlabane Taxi Association
- Esikhawini Taxi Association
- Kwambonambi Local & Long Distance Taxi Association
- Lot 63 Taxi Association
- Richards Bay Taxi Association
- A Rank Taxi Association
- B Rank Taxi Association
- Dlangezwa / Port Dunford Taxi Owners Association
- Nseleni Taxi Association
- Old Eshowe Road Taxi Association
- Masakhane Taxi Association
- Matshana Taxi Owners Association
- Ngwelezane Taxi Association
- Melmoth Taxi Association
- Eshowe Taxi Association
- Gingindlovu Taxi Association
- Nkandla Taxi Association

Rail Transport

- There is no rail service within the uThungulu area and has not been included in this study.

Metered Taxi Transport

- Pronto Shuttle
- Falcon Taxis
- Zululand Taxis
- Polo Taxis
- MG Taxis
- Tender Care
- Casanova Taxis
- CN Taxis
- Lina's Taxis
- Diamond Taxis

2.2.1 Reasons for Preparing a CPTR

The main reasons for preparing a CPTR are:

- To provide a current record of public transport services
- To provide a current record of facilities and infrastructure

These in turn would constitute the basis for development of:

- Operating Licences Strategies
- Rationalisation Plans
- Public Transport Plans
- Integrated Transport Plans

The utilization of the information gathered through the CPTR process is described in Notice 849 as follows:

“It is concerned with the collection of information about existing ridership volumes in relation to the supply of services quantified in the CPTR. The primary objective is to identify over- and under-supply by route and route selection so that -

- The core city can make suitable recommendations to the LRTB with regard to applications for permissions
- The LRTB can dispose of applications for permissions on the basis of sound information.
- The core city can develop strategies for the short to medium term and prioritise projects for the rationalisation and improvement of services.
- The core city can plan the preparation of tenders in the knowledge of their potential impact on other services.”

A secondary reason for preparation of a CPTR is to provide information, which can be utilised for performance monitoring of the public transport system, and to derive trends to indicate changes within the system over time.

3. METHODOLOGY

This section of the report provides an overview of the methodology followed in planning and executing the surveys and gathering the data required to prepare the CPTR. The section focuses on the available literature for uThungulu District Municipality, the stakeholder liaison and consultation process that was followed and the planning and execution of surveys. The section will further look at the development of survey forms, the procurement and training of temporary staff as surveyors and the gathering of the required data.

3.1 Literature Review

Very few existing usable reports/documents were available to assist in preparing the CPTR study. The uThungulu District Municipality – Integrated Development Plan, 2002 was used to determine the population composition of uThungulu, which was required to plan the rank surveys and rural home interviews.

The Zululand Joint Services Board: Passenger Transport Plan was used as background document to get acquainted with public transport operations in the uThungulu region. The report is however obsolete since the boundaries of the then Zululand Joint Services Board does not correspond with the new boundaries of uThungulu District Municipality.

Maps containing geographic information, boundaries, street maps and provincial roads were received from uThungulu District Municipality, uMhlathuze, Umlalazi and Mtonjaneni Local Municipalities and were used to prepare the ArcGIS and Arcview based Geographic Information System required to present public transport routes and information.

Several guidelines and government notices have been used to plan, prepare and execute the surveys, code routes and produce the CPTR report. These guidelines and government notices include the following:

- National Transport Planning Guidelines for the Implementation of the National Land Transport Transition Act – Current Public Transport Record (CPTR) – May 2002.
- Provincial Land Transport Frameworks: Regulations Relating to Planning Requirements in terms of the National Land Transport transition Act, 2000 – Government Notice No. 1004 of 24 July 2002.
- Current Public Transport Records: Planning Requirements in Terms of the National Land Transport Transition Act, 2000 – Government Notice No. 1005 of 24 July 2002.

3.2 Stakeholder Consultation and Liaison

For the study to be successful it required the full participation and co-operation of all relevant stakeholders without any exclusions. Therefore the first step in the study process was to consult and inform all relevant stakeholders of the study. This process involved providing the background to the study, the reasons for the study and convincing the stakeholders of the direct and indirect benefits of the CPTR. In this process all of the following stakeholders were consulted:

- Municipal Managers of all six Local Municipalities
- Relevant Ward Councillors
- Regional Taxi Council (UBUNYE)
- Regional Taxi Forum
- Local Taxi Associations

- Bus Operators
- Relevant Amakhosi
- Other relevant stakeholders such as Traffic Law Enforcers, etc.

3.3 Planning and Execution of Surveys

The gathering of raw data and the interpretation thereof is only as good as the level of planning and attention to detail that is afforded to the task. This exercise was a collaborative effort, making full use of the Management Team's experience and expertise.

As this is the first CPTR for the District, all requirements of the basic CPTR have been covered. The surveys focussed on the following:

- Determining the Routes Travelled by all public transport operators
- Determining the Capacity Utilisation of routes and rank facilities provided
- Determining the waiting time of passengers utilising the public transport service
- Recording the registration numbers of all vehicles used to provide a public transport service, and
- Coding of Ranks/Termini used by public transport operators and passengers.

The surveys can be divided into three main categories namely:

- Rank / Termini Capacity and Facility surveys
- Public Transport Operator surveys, and
- Limited Rural Home interviews.

The following survey forms per category were developed based on guidelines provided by the National Department of Transport. Detailed descriptions of the survey forms will follow in Section 3.4 below.

3.3.1 Rank/Termini Capacity and Facility Surveys

- Facility Inventory for Termini, Ranks and Holding Areas
- Capacity and Capacity Utilisation of Ranks and Termini for Minibus-Taxi, Bus and Metered Taxis,

3.3.2 Public Transport Operator Surveys

- User Needs and Preferences for Minibus-Taxi and Bus
- Origin and Destination Surveys for Bus, Minibus-Taxi
- Capacity and Capacity Utilisation of Minibus-Taxi and Bus operators
- On-board bus surveys during AM peak hour period, and
- Waiting Times Surveys.

3.3.3 Rural Home Interviews

- Rural Transport Characteristics (Home Interviews).

The process used to plan and execute the data gathering and capturing are described by the following steps:

- Step 1: Determine the location of the surveys. (E.g. Ranks/Termini and Wards for Rural Home Interviews)
- Step 2: Consult with relevant role players. (E.g. Local Municipal Manager, Taxi Associations, Bus Operators and Ward Councillors)
- Step 3: Procure temporary Survey Staff through Local Municipal Manager and Ward Councillors
- Step 4: Provide Training for surveyors and conduct 'dry runs' on completing the survey forms
- Step 5: Contact Local Taxi Associations to gain access to the Rank/Termini to conduct the surveys
- Step 6: Conduct 12-hour surveys (06:00 to 18:00) and provide supervision and assistance for the surveyors
- Step 7: Quality control of survey forms on a regular basis during surveys as well as after the surveys have been completed
- Step 8: Data capturing to be used within the GIS database
- Step 9: Quality control of data captured, and
- Step 10: GIS based data analysis and graphic representation.

3.4 Development of survey forms

The guidelines provided by National Department of Transport gave some guidance on the format and type of questions that needs to be included in the survey in order to obtain the required information.

Generally the survey form examples provided in the guidelines were used for the gathering of the required data with only a few amendments to the origin/destination for minibus-taxi and bus survey forms. Appendix A provides examples of the various survey forms used during the surveys.

3.4.1 Facility Inventory for Termini, Ranks and Holding Areas, (Appendix A1)

This survey form is aimed at collecting information on the available amenities at the different Ranks/Termini. Typical information that is collected through these forms includes:

- Mode of Transport operating from the rank/termini
- Status of the facility (E.g. Formal or Informal)
- Type of Service (E.g. Commuter, Long distance etc)
- Location of the facility (On-street or Off-street)
- Number of loading and holding bays
- Is the area paved or not
- Rank/Termini ownership
- Is curbing provided, and
- Condition of the amenities at the ranks.

The information was collected by the Management Team using GPS and Palm PC technology in order to get the exact location of the facility and to make sure that all the relevant information on the Ranks/Termini was collected.

3.4.2 Capacity and Capacity Utilisation of Rank/Termini for Minibus-Taxi, Bus and Metered Taxis (Appendix A2)

The collection of capacity and capacity utilisation of the ranks is aimed at determining whether the facility is being used to its capacity and whether there is any spare capacity available at the different ranks. Information that is collected includes the following:

- Number of loading and holding bays
- On a 15-minute interval basis determine the number of vehicles parked in loading bays and the number of vehicles parked in holding bays.

3.4.3 User Needs and Preferences for Minibus-Taxi and Bus, (Appendix A3)

To establish whether the facilities that are provided meet the needs of passengers making use of these facilities, it is required that user needs be determined at each rank/termini. The information gathered includes:

- Preference of transport mode (E.g. Bus or Minibus-Taxi)
- Origin of the trip
- Destination of the trip
- Trip purpose
- Frequency of the trip made
- How many times does the passenger need to transfer from one mode to another
- Time that the trip began
- Waiting based on the passenger perception
- Travel time on specified mode of transport
- Acceptability with the fares charged, and
- Satisfaction with the facilities provided at the rank/termini.

3.4.4 Origin, Destination and Capacity Surveys for Bus, Minibus-Taxi (Appendix A4)

A key component of the study is to determine the extent of public transport in uThungulu. Due to the lack of available information on minibus-taxis it is required to determine the origin and destination of each trip as well as the routes travelled. The proposed survey form was modified in order to speed up the process so as to minimise disruptions for minibus-taxi and bus operators. The information that is available from this form includes:

- Number of unique minibus-taxis and buses operating from a certain rank/termini
- Number of trips made per minibus-taxi per day
- Origin and Destination of each trip
- Number of passengers transported to and from the rank/termini
- Capacity of the public transport service that is provided and that of the rank/termini, and
- Waiting time or time spent on the rank and on the road while providing the service.

The information on bus operations in uThungulu that was received from Transnomics has been reasonably good.

3.4.5 On-board bus surveys during Peak hour periods, and (Appendix A5)

The purpose of this survey is to determine the extent of passengers boarding and alighting during the peak hour on the major public transport routes.

3.4.6 Waiting Times Surveys. (Appendix A6)

This survey is aimed at determining the time passengers wait to board the minibus-taxi or bus, as well as time passengers wait for the minibus-taxi or bus to depart from the rank/facility. The difference in waiting time between peak and off-peak will shed light on the effectiveness of the service that is provided.

3.4.7 Rural Transport Characteristics (Home Interviews), (Appendix A7)

The main purpose of conducting rural home interviews is to determine needs and concerns of passengers in rural areas where public transport is not as accessible as it is in the more built up areas. Because these trips occur less frequently and at a lower rate, it was determined to be more appropriate to evaluate their needs using the home interview survey technique.

3.5 Procurement of Temporary Survey Staff

The resources used in the execution of the surveys are critical. Arup has built up extensive experience on a number of large public transport projects, including two CPTR studies relating to the planning and execution of public transport data gathering. In this instance, temporary staff from the local areas, technical colleges, technicons and the university, were used to undertake the surveys. The minimum requirement to qualify as a surveyor were as follows:

- Minimum of grade 12
- Read and write in English
- Good communication skills to be able to explain the purpose of the surveys, and
- Unemployed.

The local municipalities and ward councillors were tasked with nominating suitable candidates for the survey. Since the start of the survey programme on 21 October 2002 a total of 148 local candidates were trained and engaged as surveyors. The geographic distribution of the surveyors were as follows:

• KZ 281 – Mbonambi	25 surveyors
• KZ 282 - uMhlathuze	31 surveyors
• KZ 283 - Ntambanana	18 surveyors
• KZ 284 - Umlalazi	24 surveyors
• KZ 285 - Mtonjaneni	22 surveyors
• KZ 286 – Nkandla	22 surveyors
• On-board bus surveys	6 surveyors

The contact details of all surveyors have been kept in a database so that they can be re-engaged at some stage in the future if the need arises. The total remuneration to surveyors is in the region of +/- R 75 000,00. On a 12-hour shift a surveyor would typically receive R30-00 for travel and R180-00 for the surveys, or R210-00 per day.

3.6 Surveyor Training

Each of the six groups of surveyors was trained within their local municipality at venues made available by the local councils. Every candidate underwent a one-day (paid) training session before commencement of the actual survey. The surveyors were briefed on the reasons for the study as background, and taught to complete the relevant forms correctly. At the end of the training, practical sessions or 'dry-runs' were undertaken to check if the surveyors fully understood the survey forms and the process of gathering the required data. The 'dry-runs' also gave the team the opportunity to select and allocate different candidates to different survey tasks that would most suit their aptitude, which in turn ensured productiveness of each surveyor.

3.7 Surveys and Survey Programme

The surveys were scheduled to commence at Bay Plaza Rank on Tuesday 22 October 2002 and to conclude on 15 November 2002. The surveys commenced on time at 06:00 with twenty-five surveyors involved in conducting the required surveys amongst minibuses-taxi and bus drivers, passengers and rank facilities.

The surveys were however short lived. The project team and surveyors were instructed to leave the rank after an emergency meeting with Richards Bay Taxi Associations at 10:00. Some of the drivers and members of the Richards Bay Taxi Association were unhappy with some of the questions being asked by the surveyors. In addition they were also opposed to registration numbers being recorded and ranks photographed. The Richards Bay Taxi Associations further implied that the information gathered through the surveys would be given to the authorities to be used at a later stage during law enforcement actions.

The programme was adjusted to incorporate the problems encountered at Bay Plaza and this resulted in the surveys being complete only on 20 November 2002. **Table 3.7.1** shows the final programme of events.

3.8 Application of the Geographic Information System (GIS)

The application of GIS techniques for the delivery of the uThungulu CPTR was a key skill requirement to ensure that all information gathered for the CPTR is incorporated in the existing GIS of uThungulu District Municipality whilst at the same time meeting the requirements of the relevant CPTR guidelines. This has been an enormous task. ESRI's ArcGIS 8.2 software was used.

3.8.1 Projection, Registration and Conversion

GIS data was received from the uThungulu District Municipality, as well as from various Local municipalities in the area. A detailed list of all data received is attached as Appendix B to the report.

Data from the uThungulu District Municipality was received as ArcView shape-files (shp-files) in GCS Cape (Gauss-Clarke - Cape Datum) Projection. Data received from the Local Municipalities was mainly in AutoCAD drawing format and had to be converted to ArcView shp-file format. All data was then projected using techniques in ESRI's ArcToolbox to GCS Hartebeesthoek 1994 (WGS84). This was done since this projection is the standard for GIS data countrywide.

3.8.2 GIS Data Capturing Techniques

The GIS Data Capturing Techniques involved the use of a Global Positioning System (GPS) and Mobile PC Technology (see Photo below) as well as manual capturing of data and coding of the GIS in order to model Capacity and Capacity Utilization, Passenger Volumes and Bus/Taxi Routes within the GIS.



The coding of minibus-taxi and bus routes, facilities and stops was done according to the proposed coding system as prescribed in the National Transport Planning Guidelines for the Implementation of the National Land Transport Transition Act – Current Public Transport Record – May 2002.

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 (uThungulu = U)
- 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 (A = Alton)
- Mode of Transport used – digit 10 (B = Bus)
- Example: KU3042BI-AB

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 (uThungulu = U)
- Type of facility – digits – 3-4 (TR = Minibus Taxi Rank)
- Number of the facility – digits 5-6 (05 = Bay Plaza Minibus-taxi rank)
- Example: KUTR05

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 (uThungulu = U)
- Number of the facility – digits 3-6 (0034 = Checkers Bus Stop)
- Example: KU0034

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 operators and Transnomics (V3), who is responsible for management and monitoring of the subsidised bus contracts in uThungulu. A number of errors were picked up, particularly with route descriptions, which resulted in an increase in the time required to code and capture the routes.

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 which in turn resulted in longer route capturing time.

4. DATA TRENDS AND CHARACTERISTICS

4.1 Facility Inventory for Rank/Termini and Holding Areas

Information on minibus-taxi and bus rank and termini facilities was collected on the same day as that of the surveys at the particular rank/termini. Using digital Video, GPS and Palm PC technology, amenities at the rank were classified according to availability of the amenity, the condition of the amenity as well as the need for certain amenities that are not available at the different ranks. **Figure 4.1.1** shows the location of each rank/termini surveyed. The CPTR guidelines require that the report address particular issues with regard to the facilities such as:

- Facility name and code
- Status of the facility (Formal or Informal Rank/Termini)
- Type of facility (Rank, Termini or Holding Area)
- Ownership and Location of the facility (On-street or Off-street), and
- Paving Available (Yes or No).

Table 4.1.1 shows the results of the surveys based on the CPTR guidelines. Photos of the rank/termini that have been surveyed are attached as Appendix C to this report. All rank/termini consist of an exact GPS location (longitude and latitude) and are linked to the detailed data available for each rank in the GIS for uThungulu. Table 1 in Appendix D provides codes for ranks/termini and bus stops. Table 2a and 2b in Appendix D provides a detailed description of ranks/termini surveyed while Table 3a, 3b and 3c in Appendix D describes the status of ranks/termini surveyed, the amenities at the ranks/termini and rank utilisation.

Table 4.1.1: Rank/Termini Facilities

Facility Name	Code	Status	Type	Ownership	On/Off-Street	Paving
BAY PLAZA RICHARDSBAY	KUTR05	FORMAL	TAXI RANK	PRIVATE	OFF STREET	YES
BAY PLAZA	KUBT01	FORMAL	BUS TERMINUS	PRIVATE	OFF STREET	YES
DONDOTHA	KUTR06	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
KWAMBONAMBI	KUTR07	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
KWAMBONAMBI MULTISAVE	KUTR08	FORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	NO
KWAMBONAMBI BAKKIE RANK	KUTR01	INFORMAL	BAKKIE RANK	MUNICIPAL	OFF STREET	NO
BUCCANANA	KUTR09	INFORMAL	BUS/TAXI RANK	MUNICIPAL	ON STREET	NO
MELMOTH RANK	KUTR10	FORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	YES
MELMOTH BAKKIE RANK	KUTR02	INFORMAL	BAKKIE RANK	MUNICIPAL	ON STREET	NO
GINGINDLOVO TAXI RANK	KUTR11	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
GINGINDLOVU BUS RANK	KUBT02	INFORMAL	BUS RANK	MUNICIPAL	OFF STREET	NO
ESHOWE MAIN TAXI RANK	KUTR12	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
ESHOWE BUS RANK	KUBT03	FORMAL	BUS TERMINUS	MUNICIPAL	OFF STREET	NO
ESHOWE BAKKIE RANK	KUTR03	INFORMAL	BAKKIE RANK	PRIVATE	OFF STREET	YES
KING DINUZULU TAXI RANK	KUTR13	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
ALTON BUS RANK	KUTR14	FORMAL	BUS TERMINUS	MUNICIPAL	OFF STREET	YES
ALTON TAXI RANK	KUTR15	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	NO
BIYELA STREET RANK	KUTR16	INFORMAL	TAXI RANK	MUNICIPAL	ON STREET	YES
OLD ESHOWE ROAD RANK	KUTR17	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
KFC INFORMAL TAXI RANK	KUTR18	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
NGWELEZANE TAXI RANK	KUTR19	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
NGWELEZANE TAXI HOLDING AREA	KUTH01	FORMAL	HOLDING AREA	MUNICIPAL	OFF STREET	YES

Facility Name	Code	Status	Type	Ownership	On/Off-Street	Paving
UNIV OF ZULULAND	KUTR20	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	NO
LAC	KUBT04	FORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	YES
B RANK LONG DISTANCE	KUTR21	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
B RANK BUS TERMINAL	KUBT05	FORMAL	BUS TERMINUS	MUNICIPAL	OFF STREET	YES
B RANK LOCAL TAXI RANK	KUTR22	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
B RANK ESIKHAWINI DES	KUTR23	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
A RANK	KUTR24	FORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	YES
LOT 63	KUTR25	FORMAL	TAXI RANK	MUNICIPAL	OFF STREET	YES
ESIKHAWINI TAXI RANK	KUTR26	INFORMAL	TAXI RANK	MUNICIPAL	OFF STREET	NO
ESIKHAWINI BAKKIE RANK	KUTR04	INFORMAL	BAKKIE RANK	MUNICIPAL	OFF STREET	NO
NSELENI TAXI RANK	KUTR27	INFORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	NO
NKANDLA RANK	KUTR28	FORMAL	BUS/TAXI RANK	MUNICIPAL	OFF STREET	YES

4.2 Capacity of Ranks/Termini

In order to determine the capacity and utilisation of the different ranks/termini 15-minute interval surveys were done during the peak hour and off peak hours. These surveys included the number of loading bays used for loading of passengers only and number of holding bays where vehicles are parked should there be no bays available within the loading area.

Table 4.2.1 shows the capacity (number of bays) for both loading and holding areas for each rank.

Table 4.2.1: Rank/Termini Facilities

Facility Name	Code	Number of Holding Bays	Number of Loading Bays
A RANK	KUTR24	20	20
ALTON BUS RANK	KUTR14	0	5
ALTON TAXI RANK	KUTR15	0	0
B RANK BUS TERMINAL	KUBT05	0	25
B RANK ESIKHAWINI DES	KUTR23	40	88
B RANK LOCAL TAXI RANK	KUTR22	0	40
B RANK LONG DISTANCE	KUTR21	20	16
BAY PLAZA	KUBT01	0	15
BAY PLAZA RICHARDSBAY	KUTR05	286	60
BIYELA STREET RANK	KUTR16	0	0
BUCCANANA	KUTR09	0	0
DONDOTHA	KUTR06	0	18
ESHOWE BAKKIE RANK	KUTR03	0	0
ESHOWE BUS RANK	KUBT03	0	0
ESHOWE MAIN TAXI RANK	KUTR12	0	0
ESIKHAWINI BAKKIE RANK	KUTR04	0	0
ESIKHAWINI TAXI RANK	KUTR26	0	0
GINGINDLOVO TAXI RANK	KUTR11	0	65
GINGINDLOVU BUS RANK	KUBT02	0	0
KFC INFORMAL TAXI RANK	KUTR18	5	2
KING DINUZULU TAXI RANK	KUTR13	18	10
KWAMBONAMBI	KUTR07	5	20
KWAMBONAMBI BAKKIE RANK	KUTR01	0	0
KWAMBONAMBI MULTISAVE	KUTR08	0	5
LAC	KUBT04	0	8

Facility Name	Code	Number of Holding Bays	Number of Loading Bays
LOT 63	KUTR25	80	10
MELMOTH BAKKIE RANK	KUTR02	0	0
MELMOTH RANK	KUTR10	58	23
NGWELEZANE TAXI HOLDING AREA	KUTH01	16	1
NGWELEZANE TAXI RANK	KUTR19	18	9
NKANDLA RANK	KUTR28	0	49
NSELENI TAXI RANK	KUTR27	0	0
OLD ESHOWE ROAD RANK	KUTR17	20	5
UNIV OF ZULULAND	KUTR20	14	2

(Ranks/Termini showing '0' loading and holding bays are informal ranks/termini)

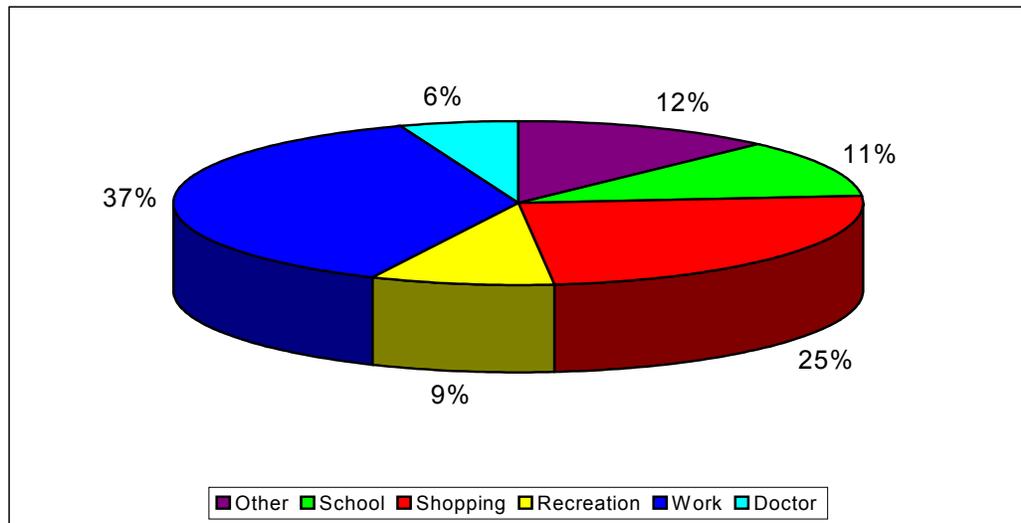
4.3 User Needs and Preferences for Minibus-taxi and Bus Surveys

The user needs surveys were conducted amongst both minibus-taxi and bus passengers. The aim of these surveys was again to determine the trip purpose as well as the trip frequency. The user needs survey was further aimed at determining the level of satisfaction with the public transport service.

4.3.1 Trip purpose

The results from the surveys at all the ranks in uThungulu compare favourably with the results of the rural household interviews. **Figure 4.3.1** shows the distribution of trips according to the purpose of the trip. Work (37%) and shopping (25%) trips were determined to be the most common trip purposes.

Figure 4.3.1: Trip purpose distribution – User Needs Surveys



4.3.2 Frequency of Travel

Part of the user needs surveys was to determine the frequency of travel and how often passengers travel either by minibus-taxi or bus. It can be assumed that the trip purpose will correspond with the frequency of travel. It is expected that work and school related trips would occur on a daily basis for 5 days per week while shopping trips will be less frequent.

The results show that 31% of passengers travel at least 5 days (work and school trips – 36%) per week and that 39% make 4 or less trips per week. **Figure 4.3.2** shows the travel frequency based on the user needs surveys.

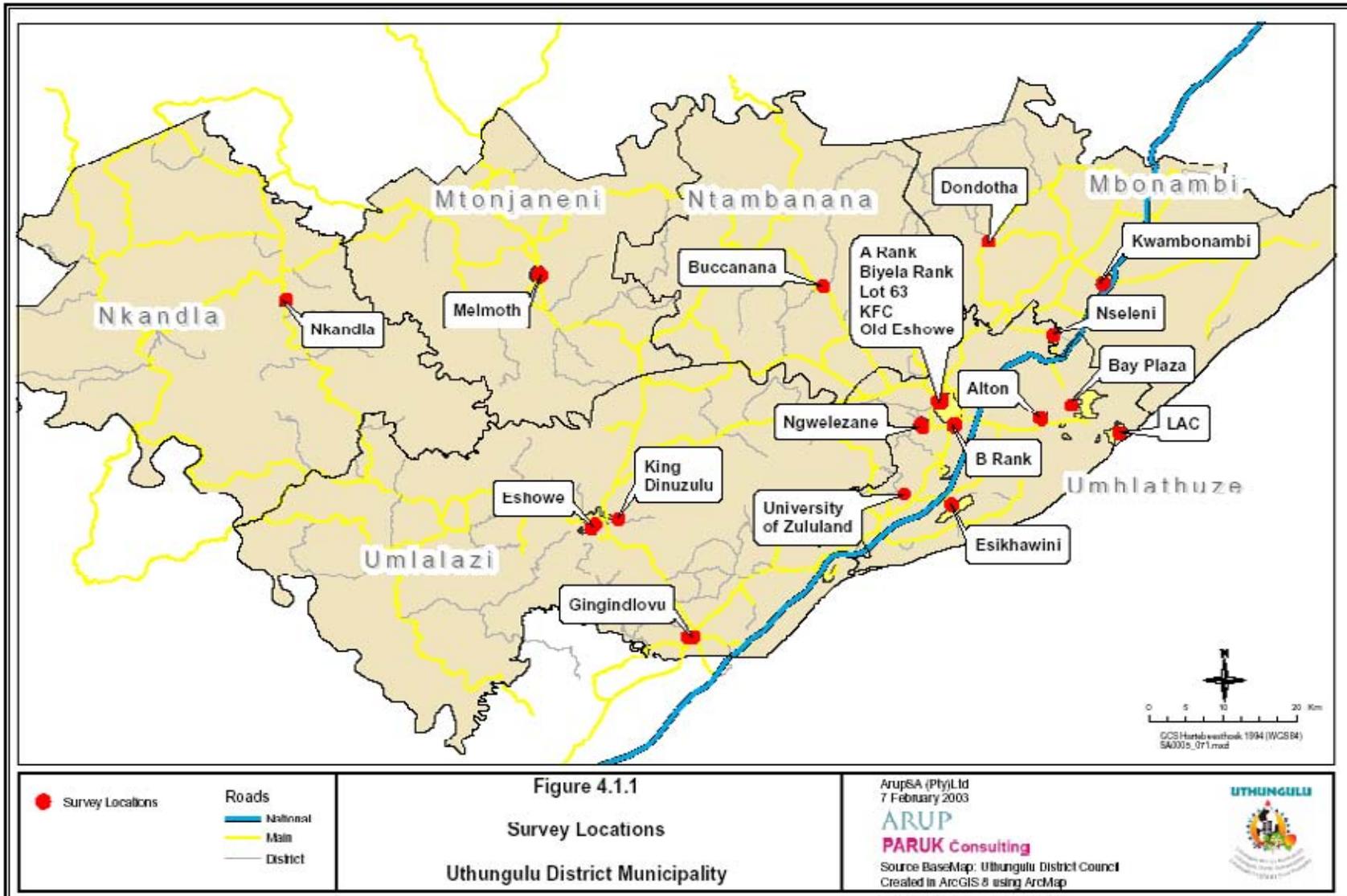
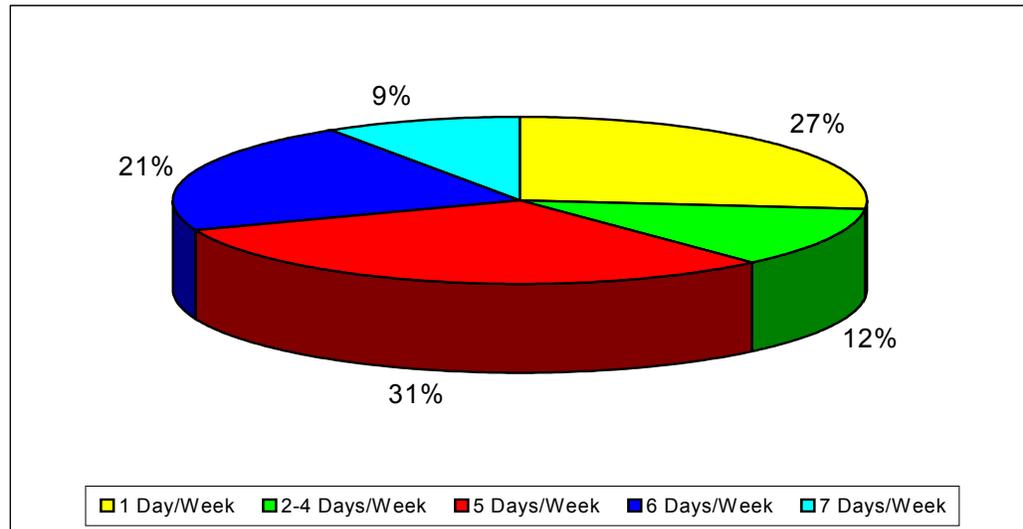


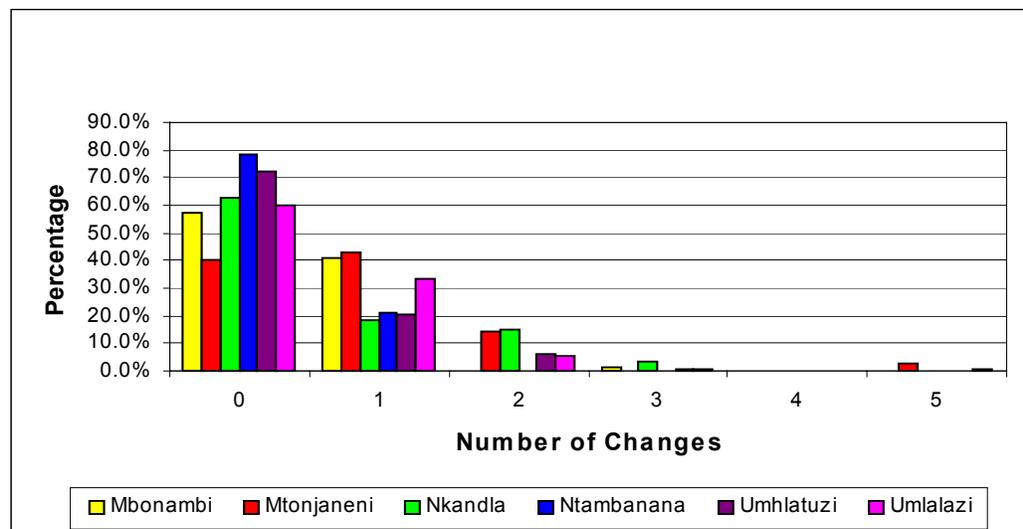
Figure 4.3.2: Travel Frequency – User Needs Surveys



4.3.3 Modal Changes

Due to the lack of proper roads, the rural nature of the population and several other factors, a large proportion of passengers use more than one mode of travel for a typical trip. In the more rural areas where accessibility is poor and the use of bakkie transport predominates in transporting passengers to adjacent towns, it can be expected that there would be more mode changes than in more urban areas. However, the user needs surveys established that the majority of passengers (62%) do not have to change mode between one origin and destination. In rural area such as Mbonambi, Mtonjaneni and Nkandla, passengers do change mode at least once. **Figure 4.3.3** shows the comparison of modal change between the different local municipalities.

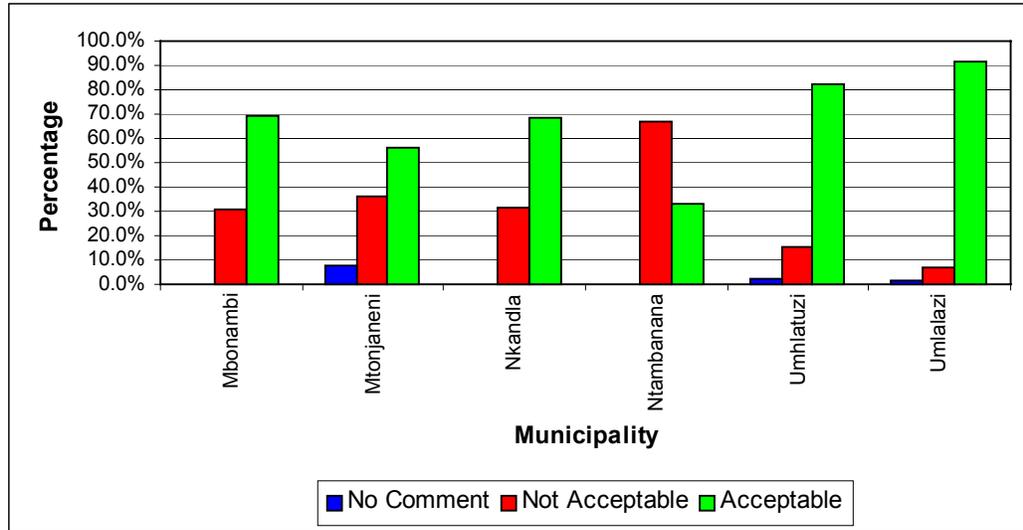
Figure 4.3.3: Modal Changes per Local Municipality – User Needs Surveys



4.3.4 Acceptability with Modal Changes

As mentioned in the previous paragraph passengers in rural areas do change mode more often than those in urban areas. The user needs surveys established that the majority of passengers in urban areas were satisfied with the number of mode changes per trip. This can be attributed to passengers not required to make any modal changes in the areas where public transport is readily available. **Figure 4.3.4** represent the level of satisfaction with the number of modal changes of passengers requiring to make one or more modal changes per trip and excludes those passengers not making any modal changes.

Figure 4.3.4: Acceptability with Modal Changes – User Needs Surveys



From this figure it is clear that, given the number of modal changes, the majority (79%) of passengers still find the number of modal changes they make acceptable. Only 18 percent of passengers find the number of modal changes unacceptable.

4.3.5 Travel and Waiting Time

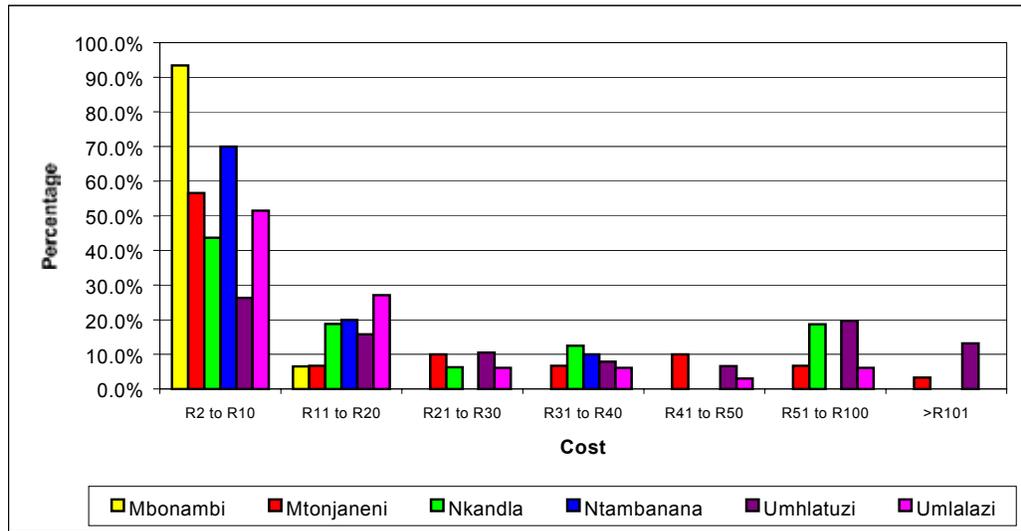
The user needs surveys showed that passengers leave home at about 5am on average. This is a result of the inaccessibility of the public transport service to the more rural service points as well as the long distances passenger have to travel to work or to the nearest town.

On average passengers travel between 30 minutes and 45 minutes per trip. It is, however, important to note that neither the surveyors nor the passengers had the ability to estimate the distance travelled in kilometres but rather estimate the distance travelled to their destination based on time. Therefore, there is no correlation between the kilometres and the time travelled. The average waiting time based on the user need surveys for long distance trips is in the region of 1hr 30 minutes and for local shorter trips, it is between 5 and 10 minutes during peak hours and about 20 minutes during the off peak period.

4.3.6 Fares per Trip and Acceptability of Fares Paid

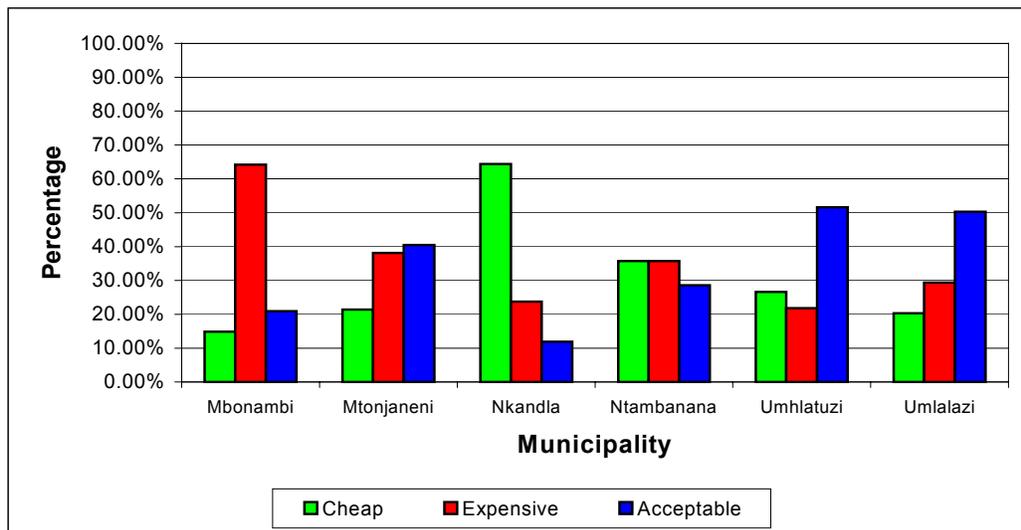
The user needs surveys showed that the average fare paid per trip ranges from a minimum of R2-00 per trip to a maximum of R205-00 per trip depending on the length of the journey. The majority of passengers indicated that they paid between R2-00 and R10-00 per trip. Passengers travelling from ranks and areas where long distance destinations are served usually pay higher fares i.e. uMhlathuze to Durban or Johannesburg. **Figure 4.3.5** shows the average fares paid per local municipality.

Figure 4.3.5: Average Fares per Trip



From the figure above it can be seen that the majority of passengers do not pay more than R10-00 per trip. The surveys showed that on average, passengers were satisfied with the fares that they pay to use public transport. Mbonambi was the only region where passengers felt that the fares were too high while Nkandla passengers believed that the fares are cheap. **Figure 4.3.6** shows that results of the surveys based on the level of satisfaction with regard to fares paid.

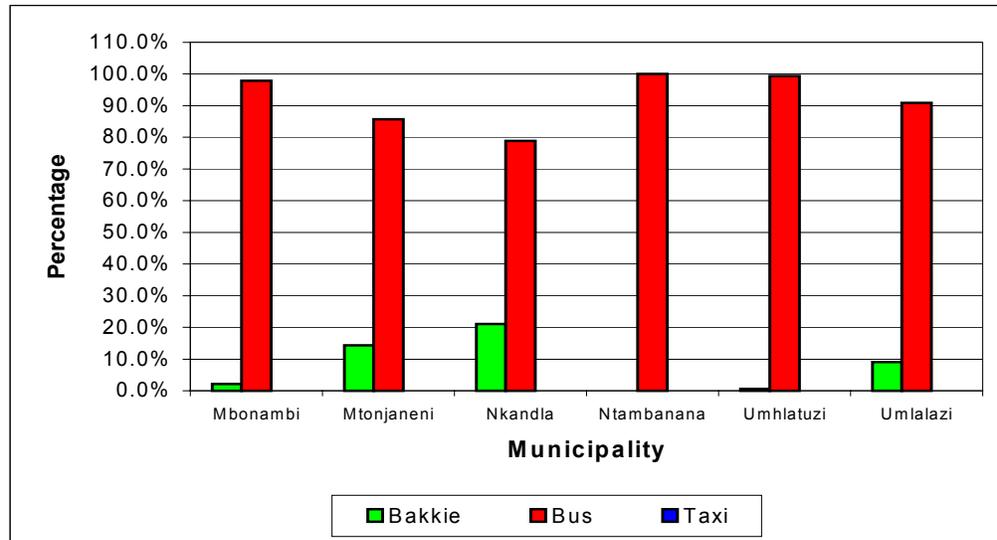
Figure 4.3.6: Acceptability with Fares Paid



4.3.7 Mode Preference and Reasons for Preferred Mode

Accessibility to public transport, and the choice of mode depends to a large extent on what services are offered. In the rural areas, access to alternative modes is limited and passengers are therefore often captive to a particular mode. On the other hand, in urban areas the mode choice is often greater. The results of the user needs surveys show that if all public transport users had a choice, 92% of all passengers would prefer to be transported by bus. **Figure 4.3.7** shows the results of the passenger-preferred mode.

Figure 4.3.7: Preferred Mode of Transport



Typical reasons given by passengers on why they preferred bus transport above that of minibus-taxi and bakkie transport include the following:

- Bus transport cheaper
- More accessible in rural areas
- More loading area for personal effects such as groceries, luggage etc.
- Lack of roadworthy vehicles for minibus-taxis and bakkies
- Less overloading of bus, and
- Longer waiting times for minibus-taxi and bakkie transport.

4.3.8 Level of Satisfaction with Public Transport Service

Part of the user need surveys was to determine the level of satisfaction with the public transport service in uThungulu. The following topics were used to determine public transport users levels of satisfaction:

- Walking Distance form Origin
- Walking Distance to Destination
- Conditions of Facilities
- Conditions of Vehicles

- Driving Habits
- Personal Safety at Rank/Termini, and
- Perception of the undersupply of public transport.

Figure 4.3.8 shows the results from the user needs surveys.

Figure 4.3.8: Level of Satisfaction



4.4 Origin, Destination and Route Capacity Surveys

The origin destination surveys combined with the mode of transport, time and number of passengers provide detail information on the daily public transport operations in uThungulu. From these surveys, Arup Paruk Consulting was able to determine the exact origin and destination of each public transport trip for the duration of the surveys. The origin, destination and route capacity surveys also provided useful information on the number of trips made per taxi per day and provided information on the number of passengers transported per trip and per day. The surveys could also be used to determine the time spent on the rank/termini facilities as well as the time spent out side the rank. Detailed discussion of the origin, destination and capacity surveys will be discussed later in the report for both minibus-taxis and bus transport respectively.

4.5 On-board Bus Surveys

On-board bus surveys were conducted along all the major bus routes in the vicinity of Richards Bay and Empangeni and exclude passengers boarding or alighting at the ranks/termini. The aim of the survey was to determine the possible effect that passengers boarding and alighting along the major public transport routes have on the utilisation of the bus service. The surveys showed that just more than 5,800 (5,875) passengers boarded and 5,665 alighted buses along those routes surveyed.

From **Table 4.5.1** it can be seen that the bus routes to and from RBM, Nseleni, Esikhawini and Meerensee (LAC) has the highest average number of passengers boarding and alighting per bus trip. The average number of passengers boarding and alighting buses along routes are 44 and 43 passengers respectively. These figures represent 67 percent of the seated capacity of buses and therefore is an important indication of the utilisation as calculated for surveys at ranks/termini. Buses leaving ranks/termini not fully utilised may show higher utilisation figures on the route because of passengers boarding and alighting along these routes.

Table 4.5.1: On-board survey results

Origin	Destination	Passengers Boarding	Passengers Alighting	Nr of Bus Trips	Average Boarding	Average Alighting
MKHIWANENI	RBM	485	377	4	121	94
NGWELEZANE	RBM	116	49	1	116	49
NSELENI	PROTEA HOTEL	112	112	1	112	112
NSELENI	RBAY HARBOUR	412	416	4	103	104
ESIKHAWINI J1	MONDI	102	103	1	102	103
ESIKHAWINI J1	LAC	100	100	1	100	100
NSELENI	LAC	759	889	8	95	111
EMKHOBOSA	LAC	81	148	1	81	148
ESIKHAWINI J1	RBM	274	287	4	69	72
ESIKHAWINI J1	CBD	338	335	5	68	67
ESIKHAWINI J1	RBAY HARBOUR	184	171	3	61	57
NSELENI	ALTON	298	335	5	60	67
HARBOUR GATE	NSELENI	103	103	2	52	52
NSELENI	CBD	140	128	3	47	43
RBAY HARBOUR	ESIKHAWINI J1	129	140	3	43	47
RBM	MKHIWANENI	43	40	1	43	40
RAIL	CBD	461	393	11	42	36
ESIKHAWINI J1	RANK	248	256	6	41	43
RBM	ESIKHAWINI J1	40	40	1	40	40
RBM	EKURNENI	39	36	1	39	36
RBAY HARBOUR	NSELENI	38	38	1	38	38
CBD	RAIL	378	252	10	38	25
CBD	VELD & VLEI	37	37	1	37	37
CBD	MANGUNI	37	36	1	37	36
LAC	ESIKHAWINI J1	34	33	1	34	33
RBM	NSELENI	97	97	3	32	32
ESIKHAWINI J1	EMKHOBOSA	32	32	1	32	32
HLONGA	EMKHOBOSA	32	32	1	32	32
NSELENI	RBM	96	94	3	32	31
RAIL	KFC	32	23	1	32	23
CBD	ESIKHAWINI J1	60	62	2	30	31
RBM	KWASIZABUNTU	21	21	1	21	21
CBD	NSELENI	61	73	3	20	24
RBM	NGWELEZANE	20	20	1	20	20
RAIL	RANK	172	155	10	17	16
RANK	RAIL	172	117	10	17	12
RBM	SHAYAMOYA	15	15	1	15	15
RANK	KWATHANGO	11	6	1	11	6
RANK	ESIKHAWINI J1	9	9	1	9	9
LAC	NSELENI	27	26	5	5	5
VELD & VLEI	CBD	4	4	1	4	4
ALTON	NSELENI	20	20	5	4	4
LAC	CBD	3	3	1	3	3
MONDI	ESIKHAWINI J1	3	2	1	3	2
TOTAL and AVERAGES		5875	5665	132	44	43

4.6 Waiting Time Surveys

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 in Appendix D provides detailed information on all waiting times captured during surveys)

The survey results showed that on average the bus passengers wait longer than those passengers using minibus-taxi transport. The results also showed that there is a difference in the waiting time during the peak and off peak period. **Table 4.6.1** shows average waiting for both bus and minibus-taxi for the AM, PM and Off-peak periods.

Table 4.6.1: Average Waiting Time – Bus and Minibus Taxis

Peak Hour	Bus Transport	Minibus-Taxi Transport
07:00 – 08:00	16 minutes	8 minutes
12:00 – 13:00	6 minutes	11 minutes
17:00 – 18:00	10 minutes	6 minutes

It is also important to look at the shortest as well as the longest waiting time experienced by passengers. **Tables 4.6.2 and 4.6.3** shows the shortest and longest waiting time respectively. Again the shortest waiting time manifests itself amongst minibus-taxi passengers with 1 minute for all peak periods compared to 1 and 5 minutes for bus passengers.

The longest waiting time however proves to be for passengers waiting for minibus-taxis. This is particularly true during the Off-peak period when minibus-taxi passengers wait up to 53 minutes for the minibus-taxi to leave. This is the result of minibus-taxis waiting for enough passengers to board the vehicle before leaving to the required destination.

Table 4.6.2: Shortest Waiting Time – Bus and Minibus Taxis

Peak Hour	Bus Transport	Minibus-Taxi Transport
07:00 – 08:00	5 minutes	1 minute
12:00 – 13:00	1 minute	1 minute
17:00 – 18:00	1 minute	1 minute

Table 4.6.1: Longest Waiting Time – Bus and Minibus Taxis

Peak Hour	Bus Transport	Minibus-Taxi Transport
07:00 – 08:00	40 minutes	30 minutes
12:00 – 13:00	22 minutes	53 minutes
17:00 – 18:00	20 minutes	28 minutes

4.7 Rural Transport Characteristics (Home Interviews)

As mentioned earlier in the report the main purpose of conducting rural home interviews is to determine needs and concerns of passengers in rural areas where public transport is less accessible.

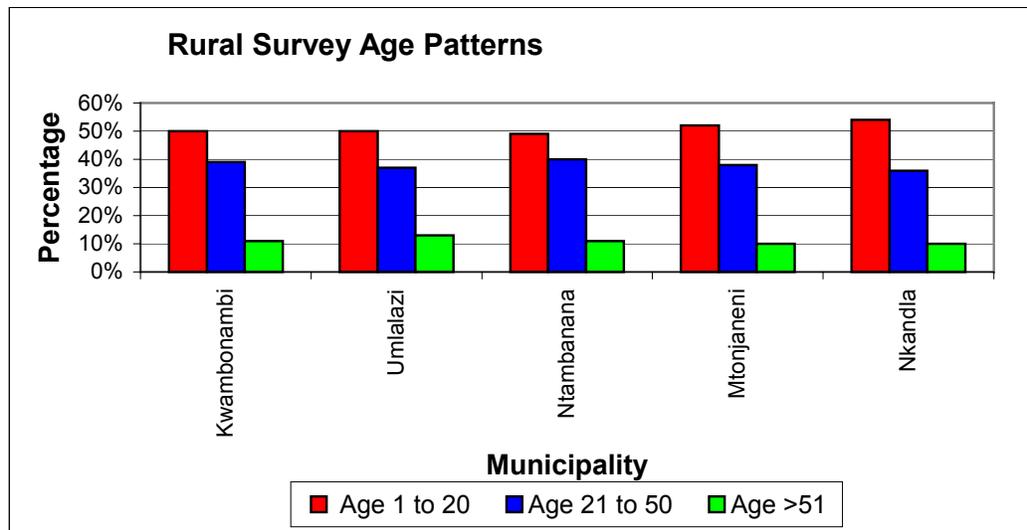
The following discussion is based on the results of the home interviews and provides background information on the population age profile, income as well as typical concerns with regard to the public transport service.

4.7.1 Population Composition

The information received from the uThungulu District Municipality – Integrated Development Plan – 2002 showed that 52.9% of the population within uThungulu District Municipality were under the age of 20.

The rural home interview provided similar results with 50.9% under the age of 20, 38.2% between 20 and 50 years and 11.0% older than 50 years. **Figure 4.7.1** shows the results of the home interviews. The categories used for the home interviews are not the same as that of the IDP figures.

Figure 4.7.1: Population Age Composition – Household surveys

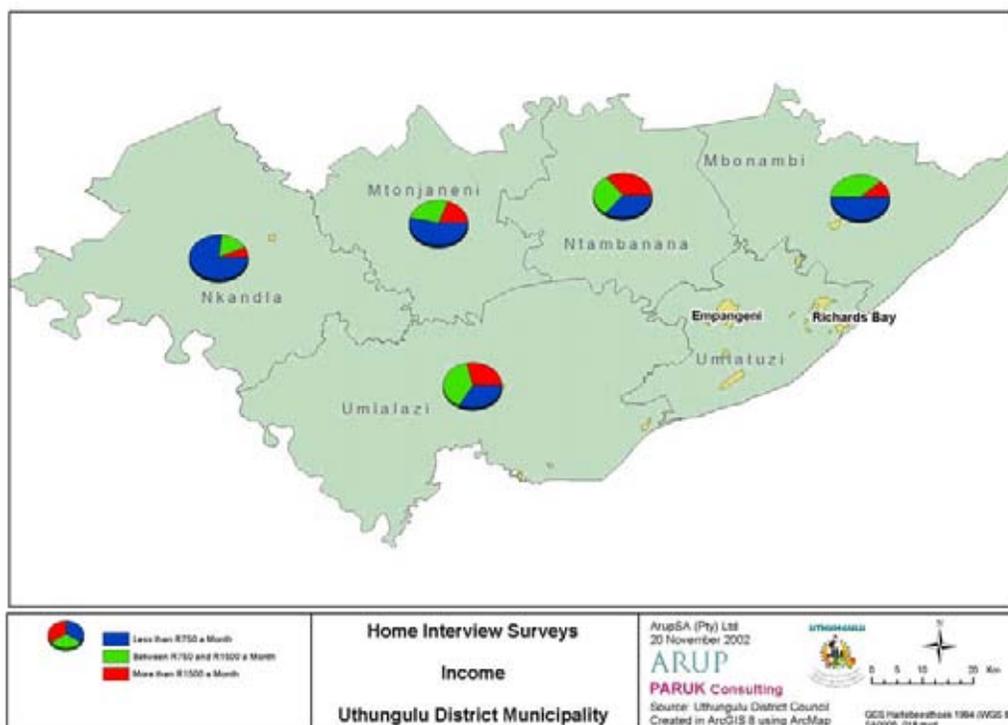


4.7.2 Household Income

With just more than a third of the population of uThungulu between the age of 20 and 50 and the rural nature of the population it is expected that the average household income would also be very low compared to the more affluent areas in KwaZulu Natal such as Durban. The household interviews showed that almost half of the rural population receive a household income of less than R750-00 per month.

Figure 4.7.2 shows the income distributions for each local municipality in the uThungulu district. It can be seen that more than half the families in Nkandla (74.8%), Mtonjaneni (52.7%) and Mbonambi (49.8%) receive a household income of less than R750-00 per month. This low-income distribution for these areas is partially a result of the lack of work opportunities when compared to the more urban areas of Eshowe, Empangeni and Richards Bay.

Figure 4.7.2: Income distribution – Household surveys



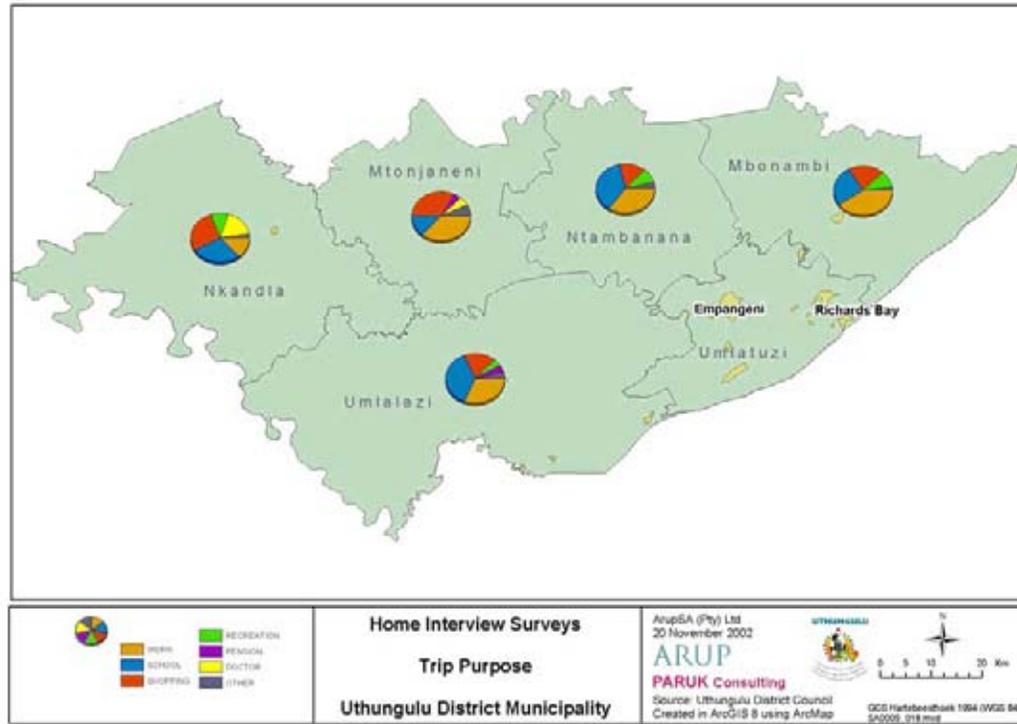
4.7.3 Trip purpose

Part of the rural household interviews was to determine the trip purpose for households for all typical trips made during a week. Almost a third (31.5%) of all households indicated that the work trip is the main trip purpose. Nkandla on the other hand indicated that only 12.6% of trips during a week are work related. This corresponds with the low household income of Nkandla as discussed previously.

School trips contributed to 28% of all public transport trips in uThungulu and this also indicates that the majority of the population is of a young age. Shopping trips also forms part of the daily public transport travel patterns of uThungulu.

The remaining public transport trips are distributed between recreational, medical, pension and other trips. **Figure 4.7.3** on the next page shows the distribution of trip purposes according to the different local municipalities.

Figure 4.7.3: Trip purpose distribution – Household surveys



5. BUS OPERATOR INFORMATION AND SURVEYS

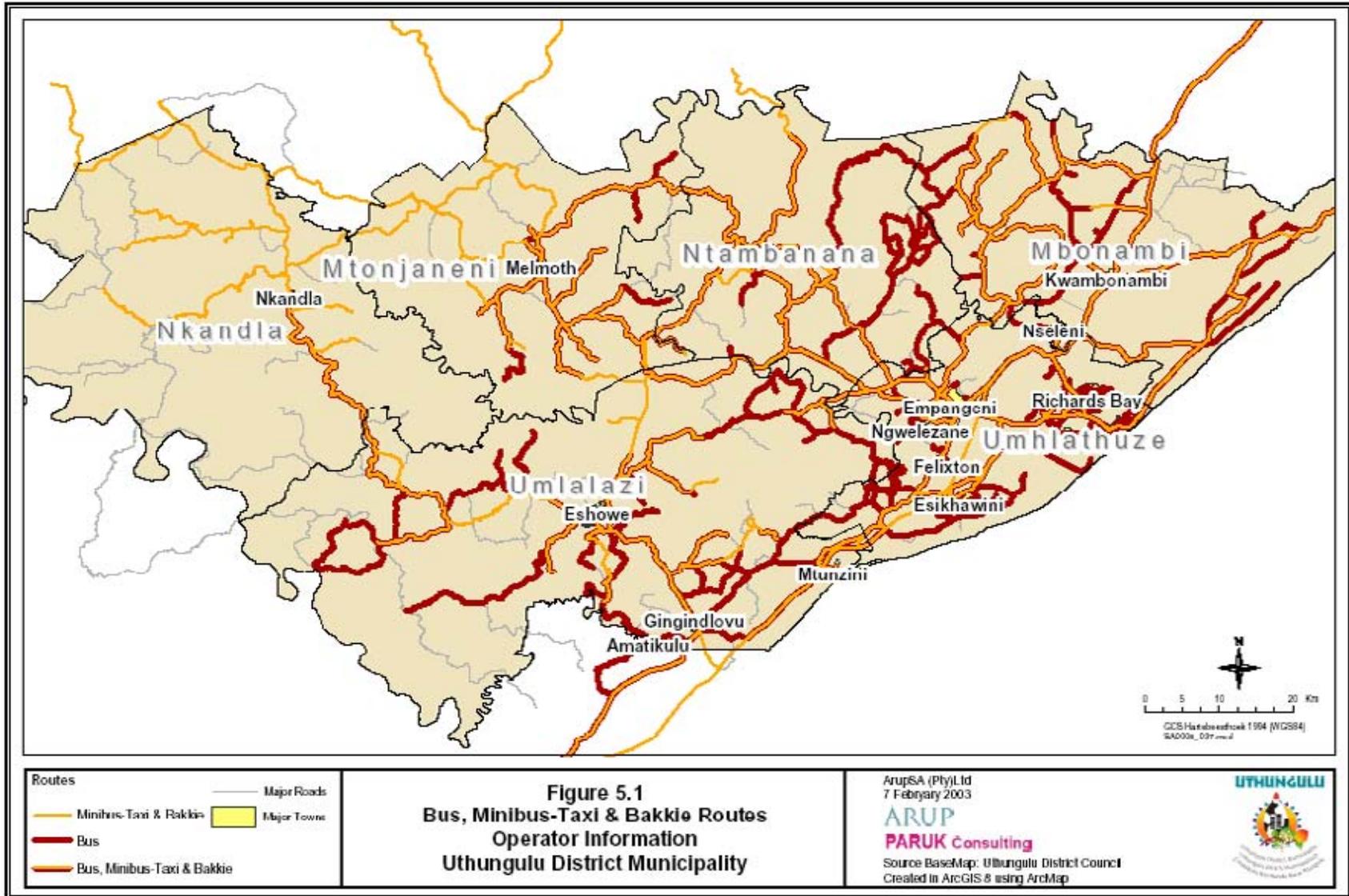
The extent of bus, minibus-taxi and bakkie routes are shown in **Figure 5.1**. From this figure it is clear that the existing public transport service covers the majority of uThungulu District Municipality. Nkandla is the only area not properly covered by either of the public transport modes. The figure further showed that most of the main routes are covered by all public transport modes. The rural areas are mostly serviced by bus and bakkie operators as can be seen in Umlalazi, Ntambanana and Mbonambi. (Table 5 and 6 in Appendix D provides bus routes and codes based on operator information and bus surveys respectively)

5.1 General Public Bus Transport Trends

The bus service in uThungulu is structured, with routes and timetables well defined. Based on the route coverage, the bus service in uThungulu covers a wider area than minibus-taxi and bakkie transport and is available to the vast majority of the population. The survey results showed that just more than 80 000(80 042) passengers are being transported by 3,230 bus trips during the 12-hour survey period. This results in an average of 25 passengers per bus. This figure only represents buses surveyed at the different ranks/termini and does not include any private bus trips (not surveyed) or services provided outside the survey hours of 06:00 to 18:00.

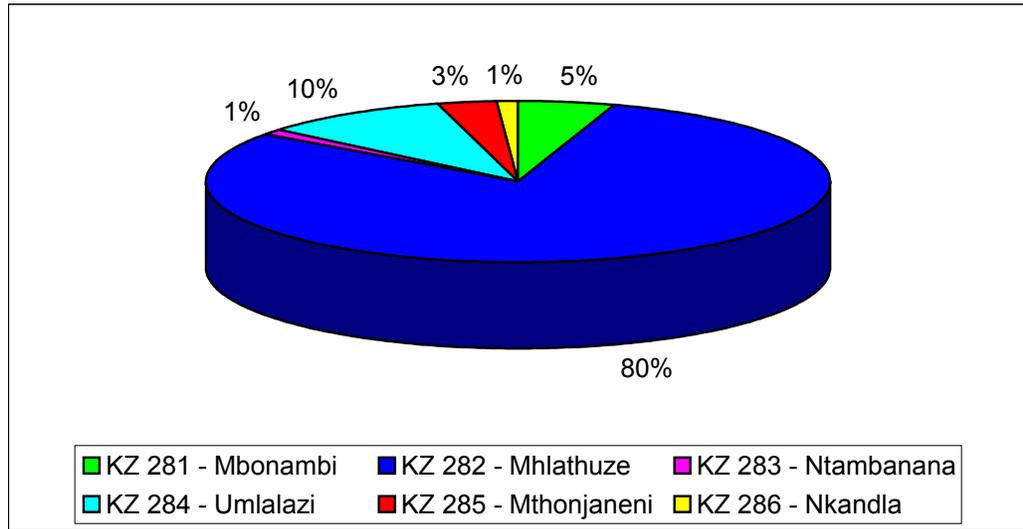
According to the information received from the Bus Operators a total number of 65 369 passengers - based on average number of passengers per trip – are transported on a typical weekday by 1 071 trips (61 per bus) between 06:00 and 18:00. The difference between the survey information and the information received from the bus operators can be attributed to the following:

- The bus surveys were carried out on a typical day in good weather conditions. The surveys do not include 'exceptional' days,
- The bus operator information has many trips which only run on certain week days (i.e. Tuesdays, Thursdays or Fridays),
- Bus surveys looked at both trips IN as well as OUT of the ranks,
- Trips arriving from and going to bus depots were included in the surveys. The bus operator information does not cater for these trips. It only shows operational trips where people are transported,
- During some surveys the same bus may have been counted servicing more than one rank during the peak period. This means that the bus was counted as in and out at more than one rank during that peak period,
- Some bus trips do not stop at the main ranks, but only pass the rank. Especially trips where there is one main origin and destination. For example trips between townships and RBM or the Harbor Industries,
- Trip start and end data should not be added because it forms one trip and not two. Thus a trip starting at a certain time and ending at another time is one trip, according to bus operators, and
- The survey information includes trips counted for a certain peak period (06:00 - 08:00) and do not include those trips starting before the peak period or ending after this peak period as given by the bus operators.



The distribution of passengers by municipality is shown in **Figure 5.1.1**. This information is based on information gathered from the different Bus Operators. **Figure 5.1.2** generated by the GIS confirms this trend, with close to 26 000 passengers travelling between Richards Bay and Empangeni during a typical day. This is the result of population distribution, public transport availability and accessibility as well as the work opportunities within the uMhlathuze region.

Figure 5.1.1: Bus Passengers per Region



From **Figure 5.1.1** it can be seen that 80 percent of all bus passenger trips in uThungulu occur within the uMhlathuze municipality with 10 percent in Umlalazi. Mbonambi further contributes 5 percent of all passenger trips. This is probably due to the fact that Kwambonambi is close to Richards Bay and Empangeni. The other more rural areas contribute almost equally to the remaining 5 percent of bus passenger trips per day.

Figure 5.1.3 and Figure 5.1.4 provides a breakdown of bus trips and number of passengers per rank respectively. This information is based on the rank surveys. Again ranks in urban areas (A-Rank, B-Rank, Bay Plaza and Esikhawini) transport the highest number of passengers with the highest number of bus trips.

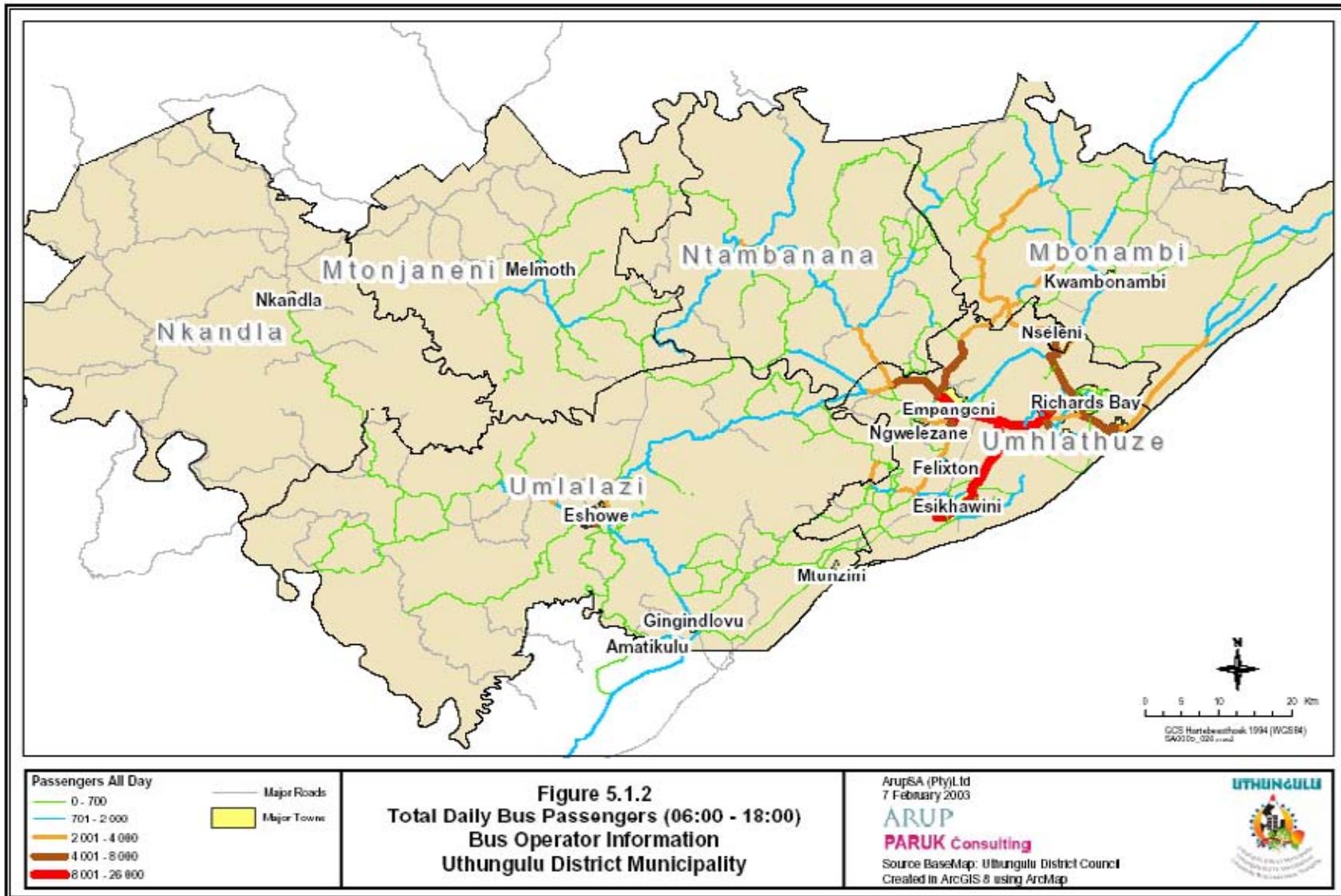


Figure 5.1.3: Bus Passenger Trips per Rank

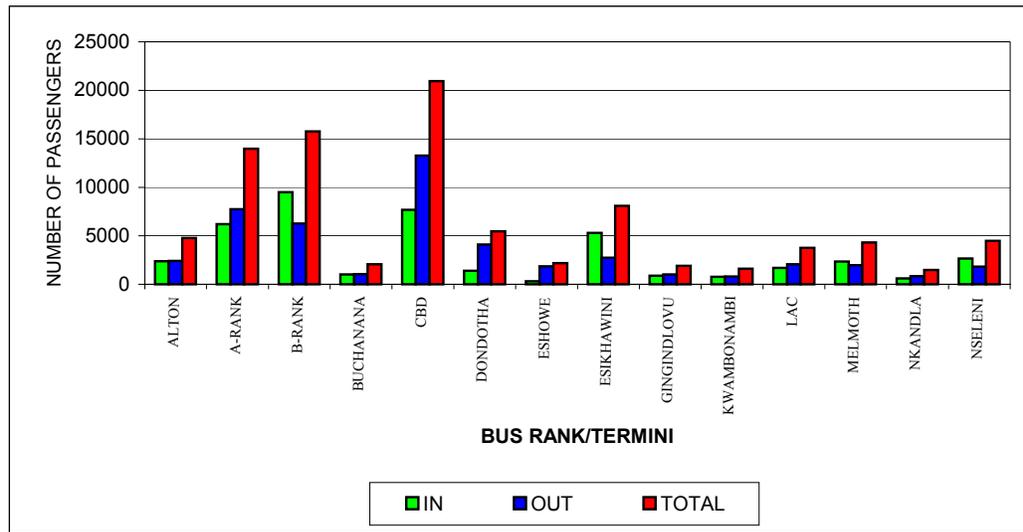
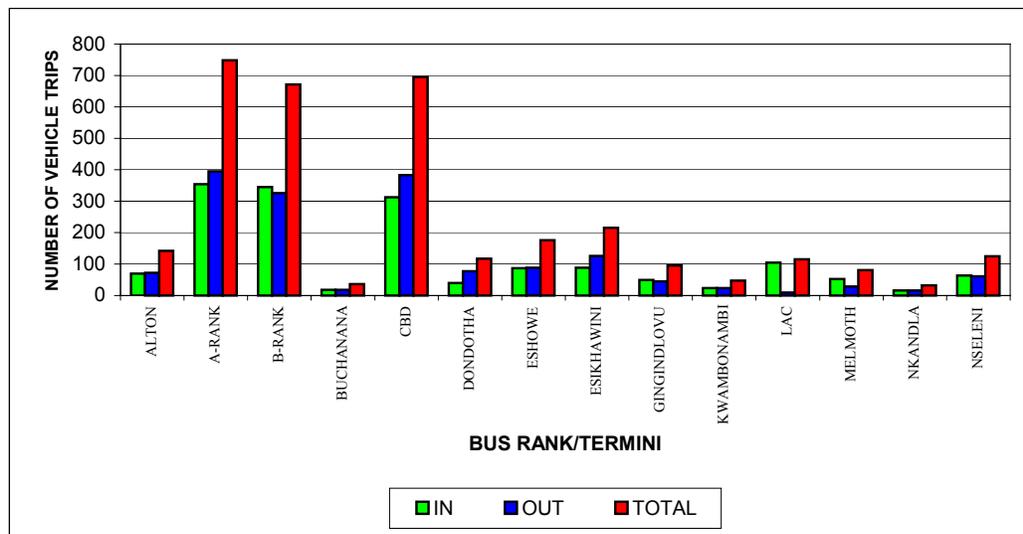


Figure 5.1.4: Bus Trips per Rank



5.2 Detailed Discussion – Bus Operator Information

This section of the report considers the frequency (number of trips), service capacity, and utilisation of the public bus transport during the morning (06:00 – 08:00) afternoon (15:00 – 17:00) and off (08:00 – 15:00) peak periods based on the information received from the bus operators. The information received is based on the monthly subsidy claims prepared for the KwaZulu Natal Department of Transport.

5.2.1 Frequency of the Service (Number of Trips)

The information received from the bus operators showed that there are 309 trips during the AM peak period (06:00 – 08:00), 230 during the PM peak period (15:00 – 17:00) and 422 trips during the Off peak period (08:00 – 15:00).

Figure 5.2.1.1 provide a map showing the total number of daily bus trips (06:00 to 18:00) for uThungulu. From this figure it can be seen that the majority of bus operations are focused around Empangeni and Richards Bay. B-Rank, in Empangeni, is the major bus origin and destination in uThungulu with most bus trips either ending at B-Rank or originating from B-Rank. The average trip length per bus trip was calculated to be 37 kilometres.

5.2.2 Passenger Movements

Figure 5.2.2.1, Figure 5.2.2.2 and Figure 5.2.2.3 shows the AM Peak Passenger, PM Peak Passenger and Off Peak Passenger Distribution respectively. The operator information shows that most passengers travel between Richards Bay, Empangeni, and Nseleni within Mhlathuze and Mbonambi. Passenger volumes are at their highest in Empangeni during the AM, PM and Off peak periods.

During the AM peak period it can be seen that all major routes leading to urban areas such as Melmoth, Eshowe and the uMhlathuze region experience higher passenger volumes. This is due to passengers travelling to urban areas to work or for shopping. Within the rural areas the PM peak period however does not have the distinct peak passenger movements as seen during the AM peak period. This is the result of the afternoon passengers movements being spread out over a longer time interval than during the AM peak period.

Empangeni is the main public bus transport hub in uThungulu with 44 percent of all bus trips going to and from B-Rank located at Empangeni Rail. The reason for this is the accessibility of B-Rank to all main provincial and national roads and the substantial rank facilities provided at B-Rank. Bus transport in Richards Bay contributes to just more than 28 percent of all public bus transport.

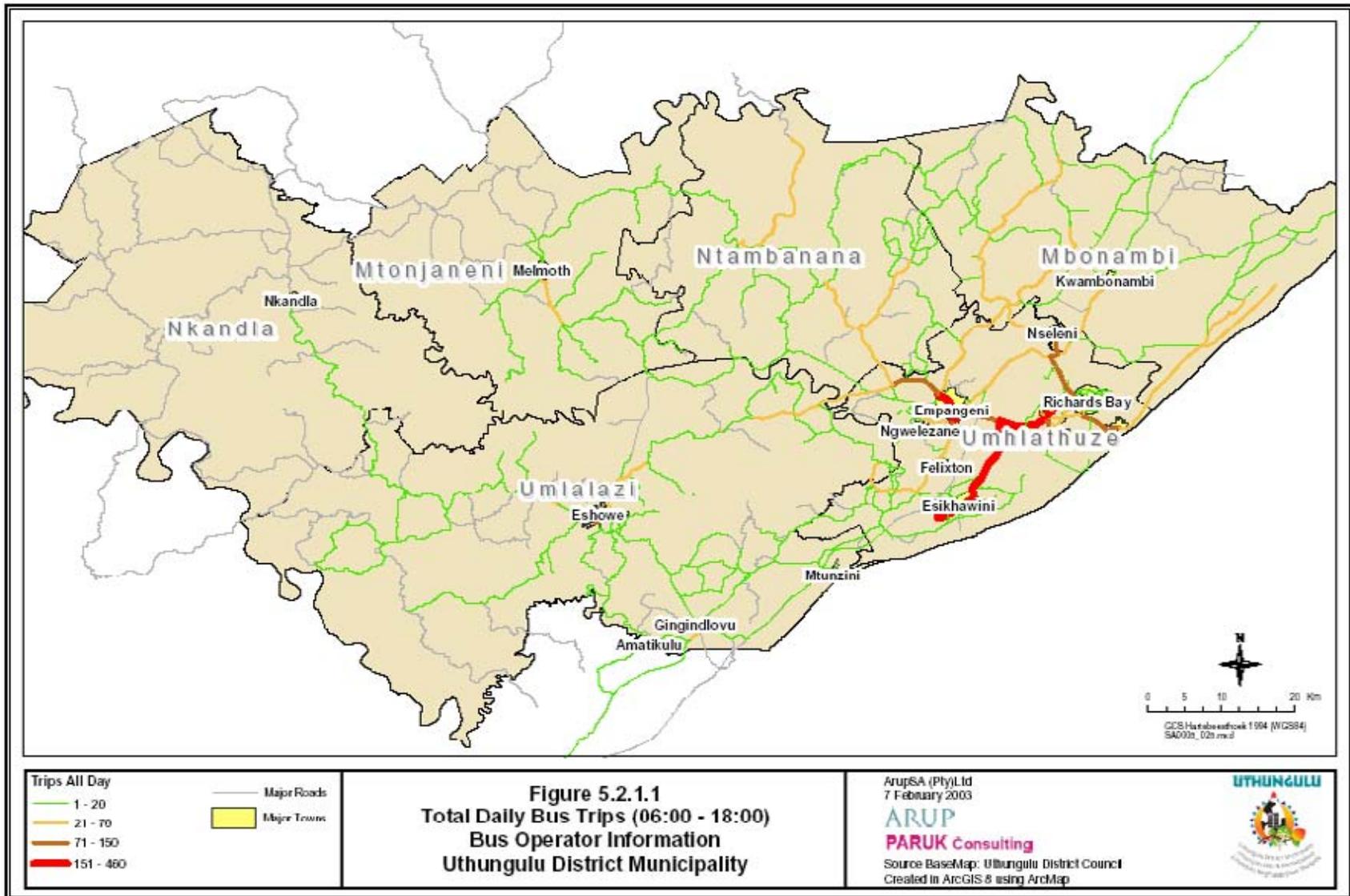
According to the Bus Operator information, 18 847 passengers travel within the AM Peak Period (06:00 to 08:00) and 14 389 passengers travel within the PM Peak Period (15:00 to 17:00). During the Off Peak Period (08:00 to 15:00) a total number of 24 884 passengers travel between the different areas. Thus more passengers travel during the morning peak than the afternoon peak. This could be as a result of passengers using alternative modes of transport during the morning peak such as Minibus-taxi's. During the Off peak period the majority of passengers travel within Empangeni and/or to Richard Bay.

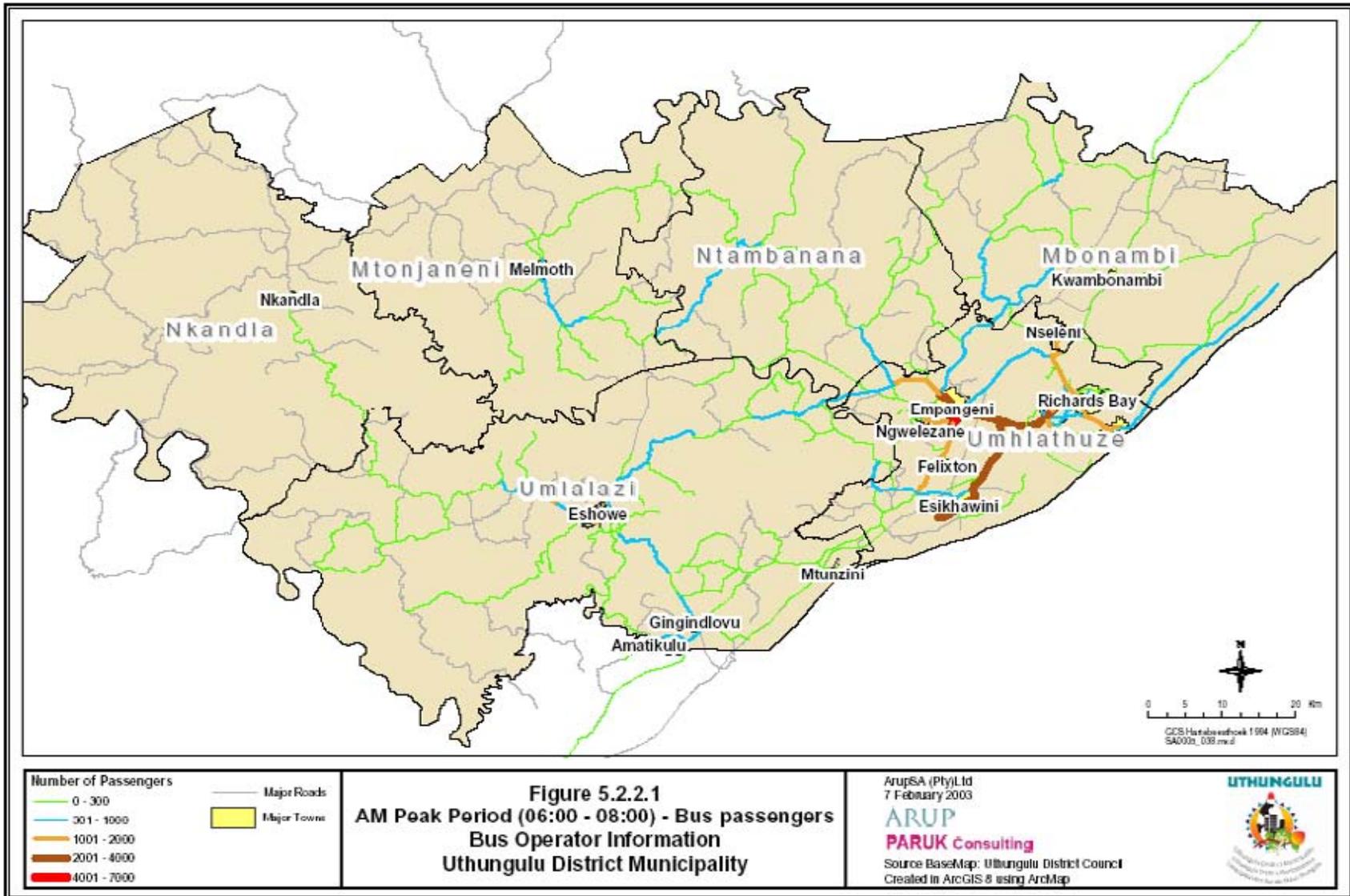
5.2.3 Service Capacity and Capacity Utilisation

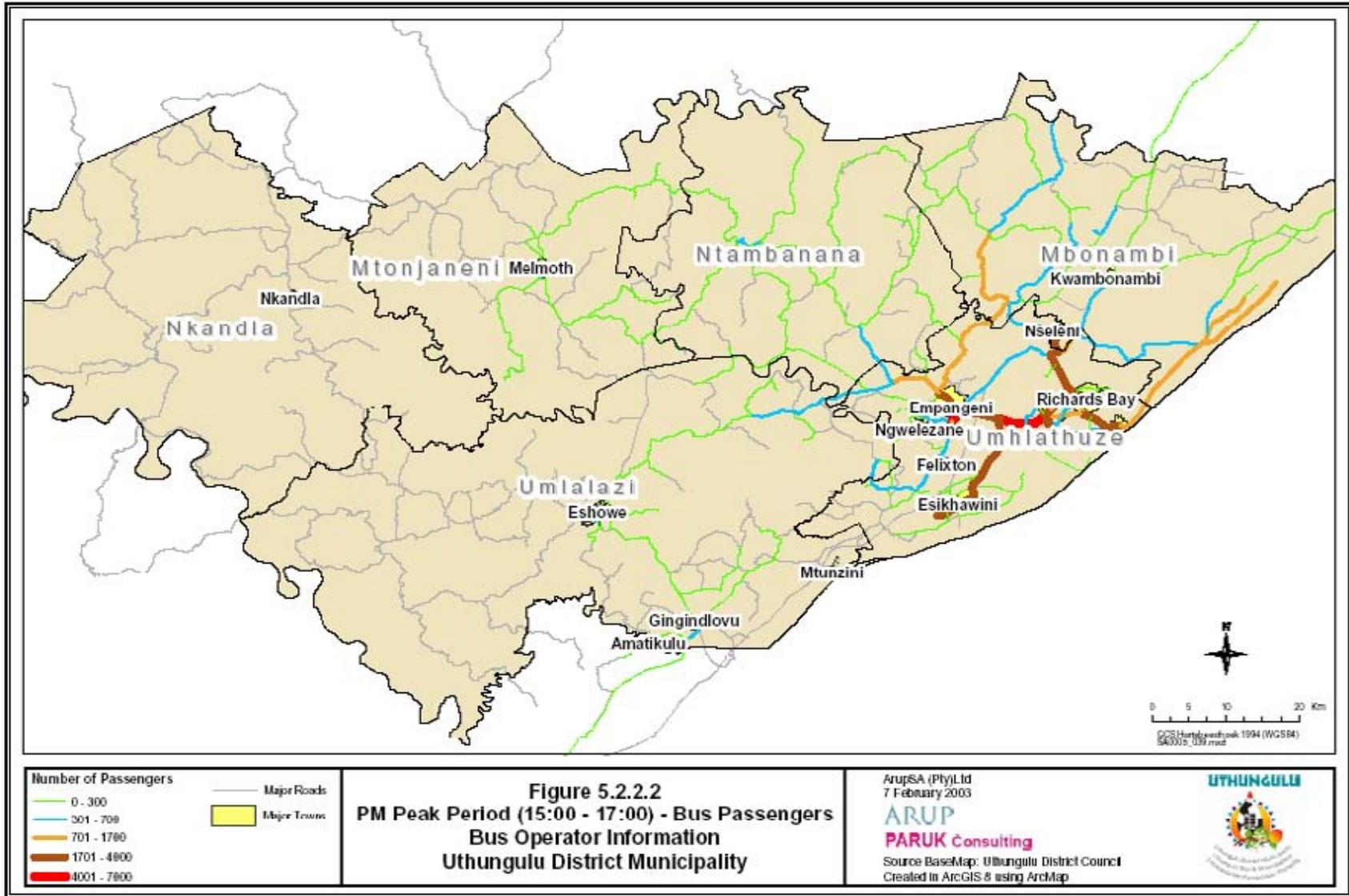
The capacity of the bus service is determined by multiplying the actual numbers of trips with the maximum capacity of a bus. Two types of capacity can be calculated namely:

- Seated Capacity - 65 passengers, and
- Crunch Load Capacity - 91 passengers (65 seated and 25 standing).

Using trip frequency both the seated and crunch load capacity can be calculated. The information received from the bus operators showed that the seated capacity of the bus service amounted to 69 615 seats with an average utilisation of 94 percent. Detailed bus utilisation figures per route are available on the GIS system. The service capacity and utilisation for the AM, PM and OFF peak period is shown in **Table 5.2.3.1** below.







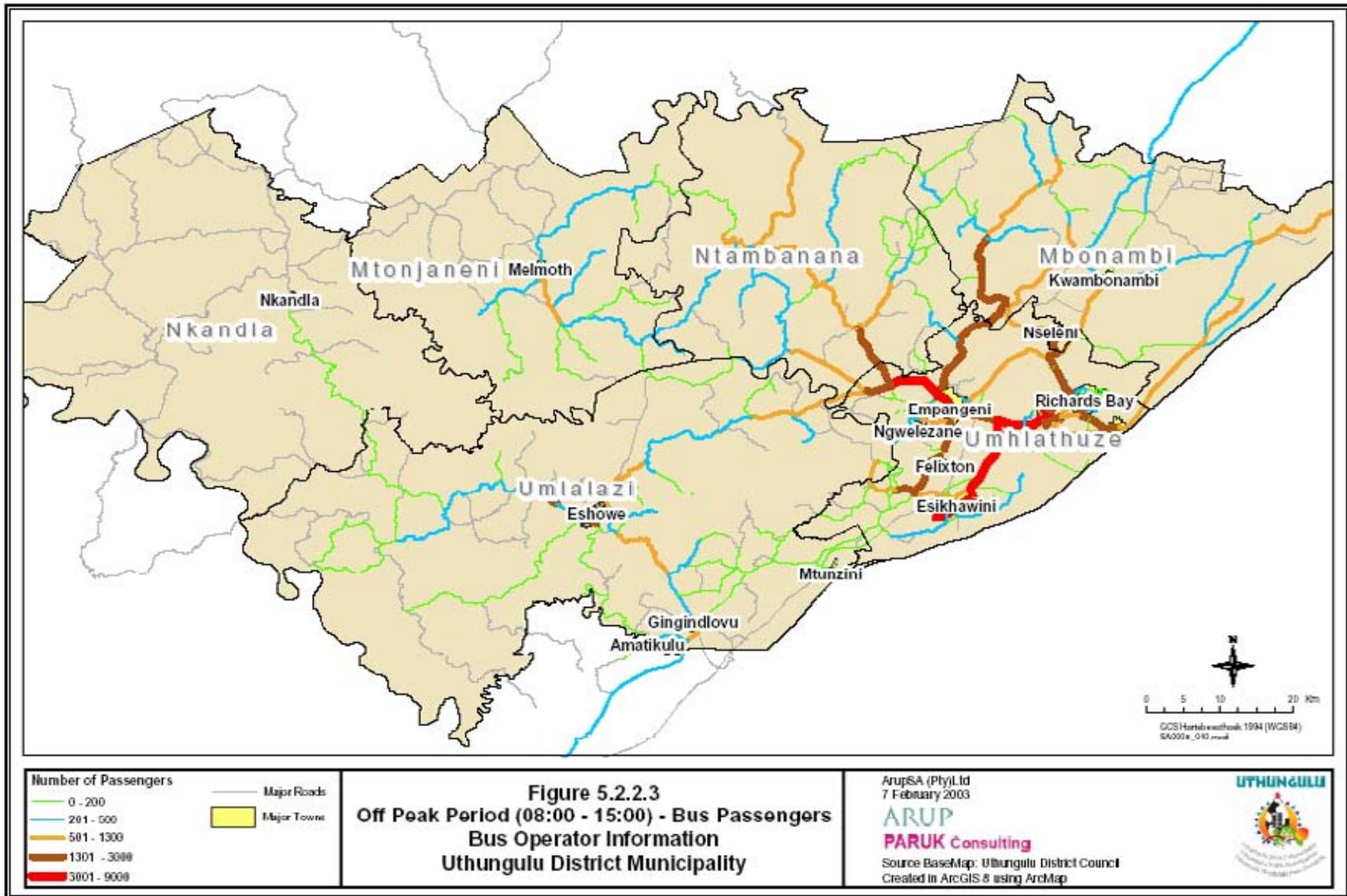


Table 5.2.3.1: AM, PM and OFF peak period bus capacity and utilisation based on bus operator information

Peak period	Vehicle Trips	Vehicle Capacity		Service Capacity		Actual Passengers	Utilisation	
		Seated	Crunch Load	Seated	Crunch Load		Seated	Crunch Load
AM (6 AM – 8 AM)	309	65	91	20085	28119	18847	93.8%	67.0%
OFF (8 AM – 3 PM)	422	65	91	27430	38402	24884	90.7%	64.8%
PM (3 PM – 5 PM)	230	65	91	14950	20930	14389	96.2%	68.7%

(The hour between 17:00 – 18:00 has not been included in the table but is shown in the total quoted in the report.)

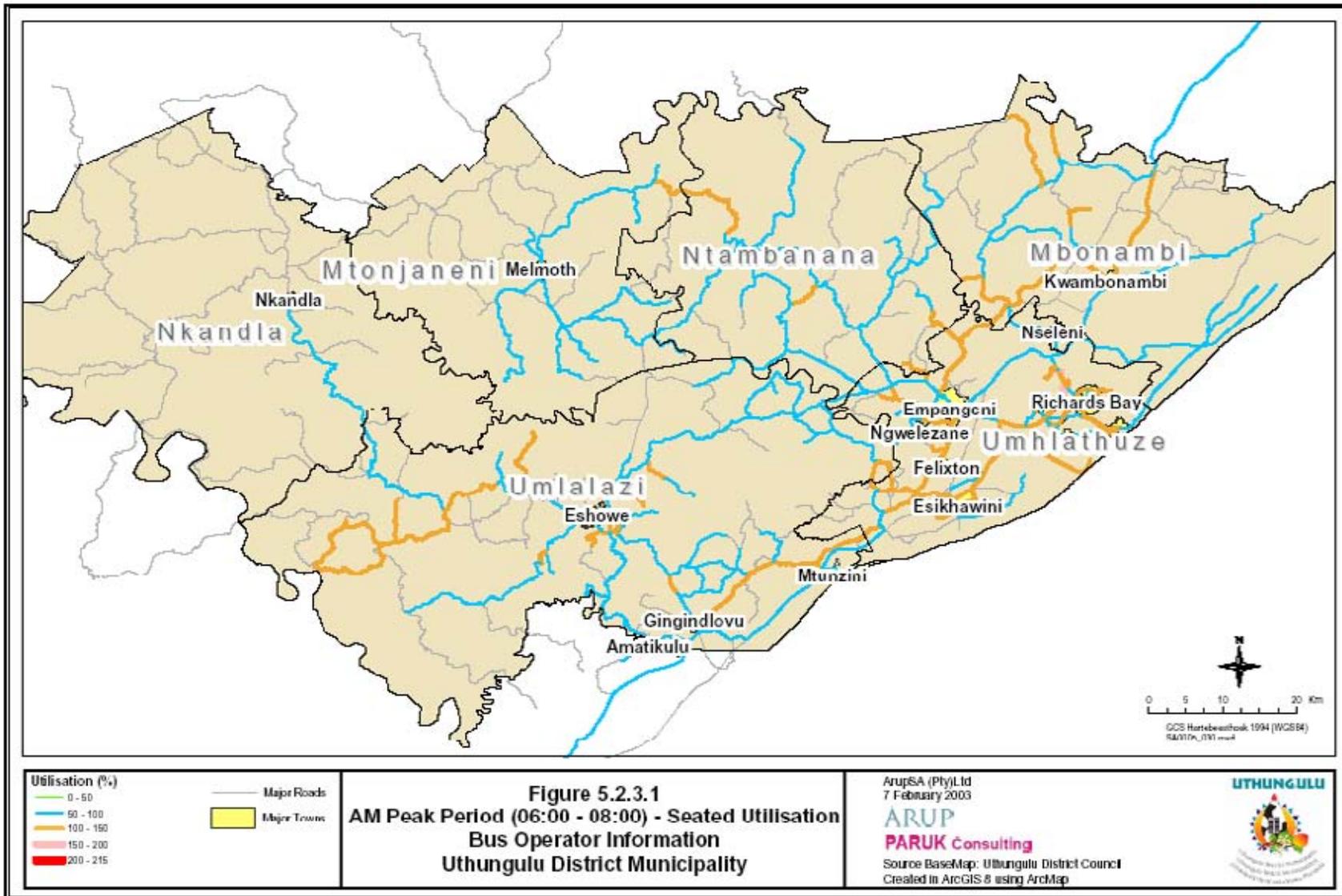
From this table it can be seen that the seated utilisation produces higher utilisation levels. Seated utilisation is normally used for trips longer than 30 minutes with crunch load utilisation used for trips with less than 30 minutes travel time.

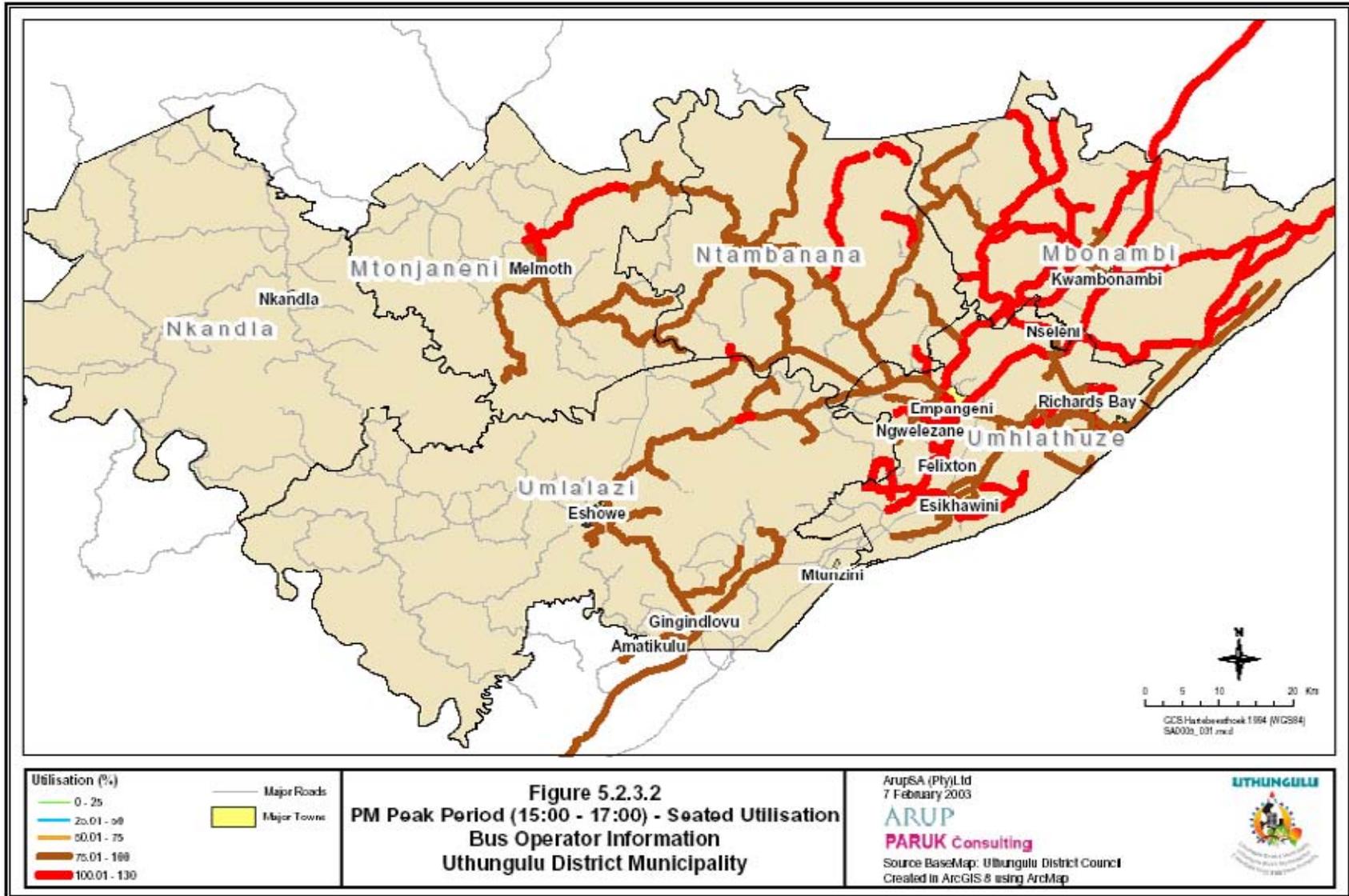
Figure 5.2.3.1, Figure 5.2.3.2 and Figure 5.2.3.3 shows only seated utilisation figures for the AM Peak (06:00 to 08:00), PM Peak (15:00 to 17:00) and Off Peak (08:00 to 15:00) respectively.

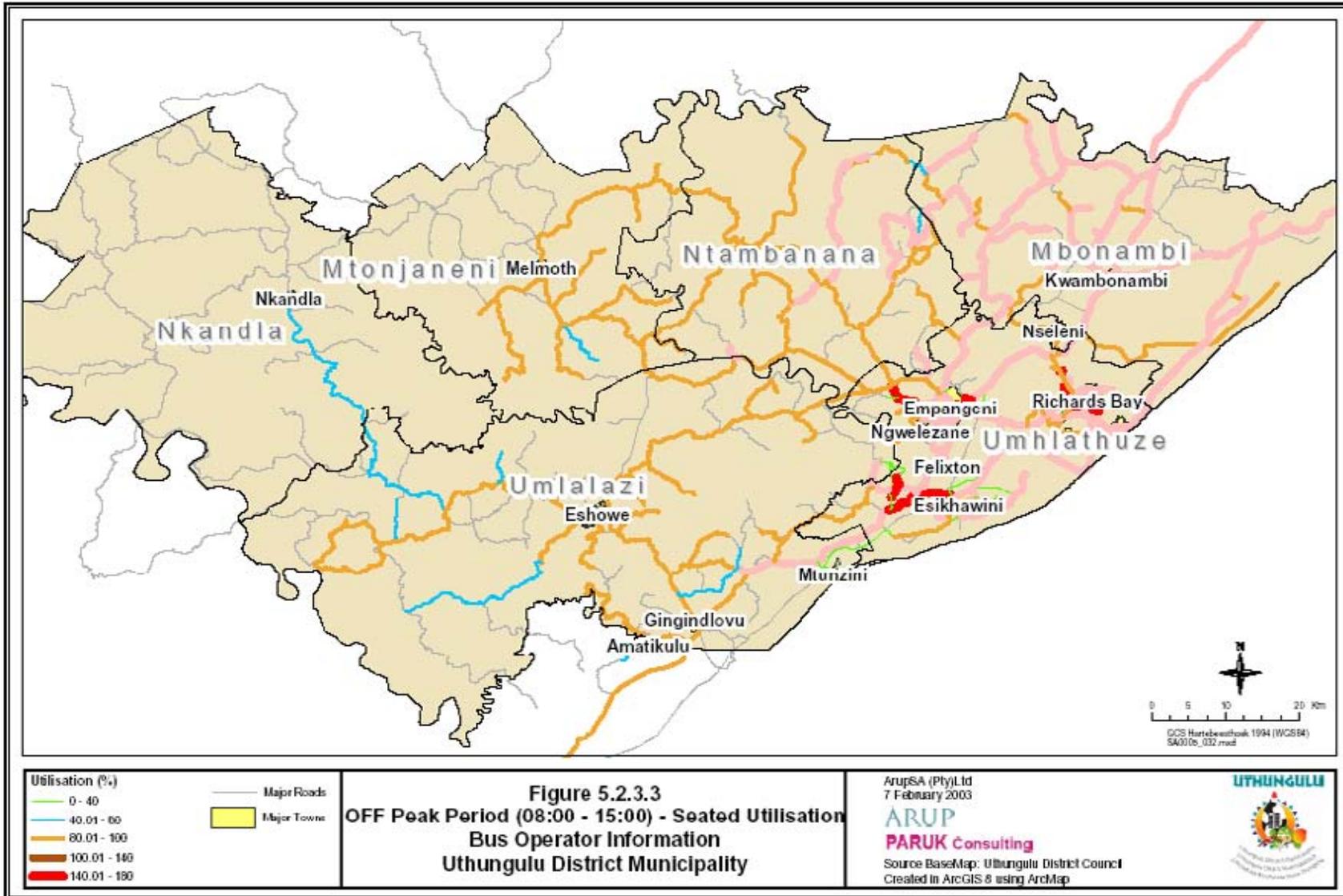
It is clear from **Figure 5.2.3.1**, AM Peak period utilisation, that a large proportion of trips have an utilisation of more than 50%. Only a few routes in Mhlatuze operate at levels of above 100% utilisation. This could be the result of the limited number of buses operating in this area and thus resulting in higher utilisation. Although during the AM Peak period more trips was counted than in the PM Peak period, the service utilisation is still high. The only route that is over utilised during the AM peak period is within Richards Bay close to the main bus termini at Bay Plaza.

Figure 5.2.3.2, the PM Peak period utilisation, shows a different trend to that of the AM Peak period where the majority of trips operate at more than 75% utilisation. The trips with the highest utilisation (>100%) again appear to be in and around uMhlatuz, with Mbonambi also showing higher utilisation figures than that of the AM peak period. Bus routes close to Esikhawini also show utilisation levels of more than 100 percent.

During the Off Peak Period (**Figure 5.2.3.3**) the majority of services show utilisation of more than 80 percent. Again some routes in uMhlatuz shows utilisation levels of more than 100%, thus indicating a lack of services during the Off peak period on certain routes.







5.3 Detailed Discussion – Bus Survey Information

This section of the report considers the frequency, service capacity, and utilisation of the public bus transport during the AM peak (06:00 – 08:00), PM peak (15:00 – 17:00) and Off peak (08:00 – 15:00) periods. The information used in this section of the report is based on the bus surveys undertaken over the period 22 October 2002 to 15 November 2002.

5.3.1 Frequency of the Service (Number of Trips)

As mentioned earlier in the report the bus surveys counted 3,230 bus trips between 06:00 and 18:00. The bus surveys further showed that the different bus operators in uThungulu made 978 trips during the AM peak period, 713 trips during the PM peak period and 1 290 trips during the Off peak period. **Figure 5.3.1.1** provides a map showing the total number of daily bus trips (06:00 to 18:00) for uThungulu. This information was extracted from the GIS system and is based on the bus survey information. From this figure it can be seen that the majority of bus operations are also focused around Empangeni and Richards Bay.

5.3.2 Passenger Movements

Figure 5.3.2.1 shows the total daily bus passengers based on the survey results. The bus passenger volumes correspond with bus trips as mentioned in the section above.

Figure 5.3.2.2, Figure 5.3.2.3 and Figure 5.3.2.4 shows the AM Peak Passenger, PM Peak Passenger and Off Peak Passenger Distribution respectively. Generally the majority of passengers travel between Richards Bay, Empangeni, and Nseleni with high passenger volumes also evident towards RBM.

During the AM peak period it can be seen that all major routes leading to urban areas such as Melmoth, Eshowe and the uMhlathuze region experience higher passenger volumes. This is due to passengers travelling to urban areas for work or for shopping. The Melmoth area also shows high passenger volumes compared to other rural areas. Within the rural areas the PM peak period however does not have the distinct peak passenger movements evident during the AM peak period. This is the result of the afternoon passengers movements being spread out over a longer time interval with passengers returning to their destination during the Off peak period.

5.3.3 Service Capacity and Capacity Utilisation

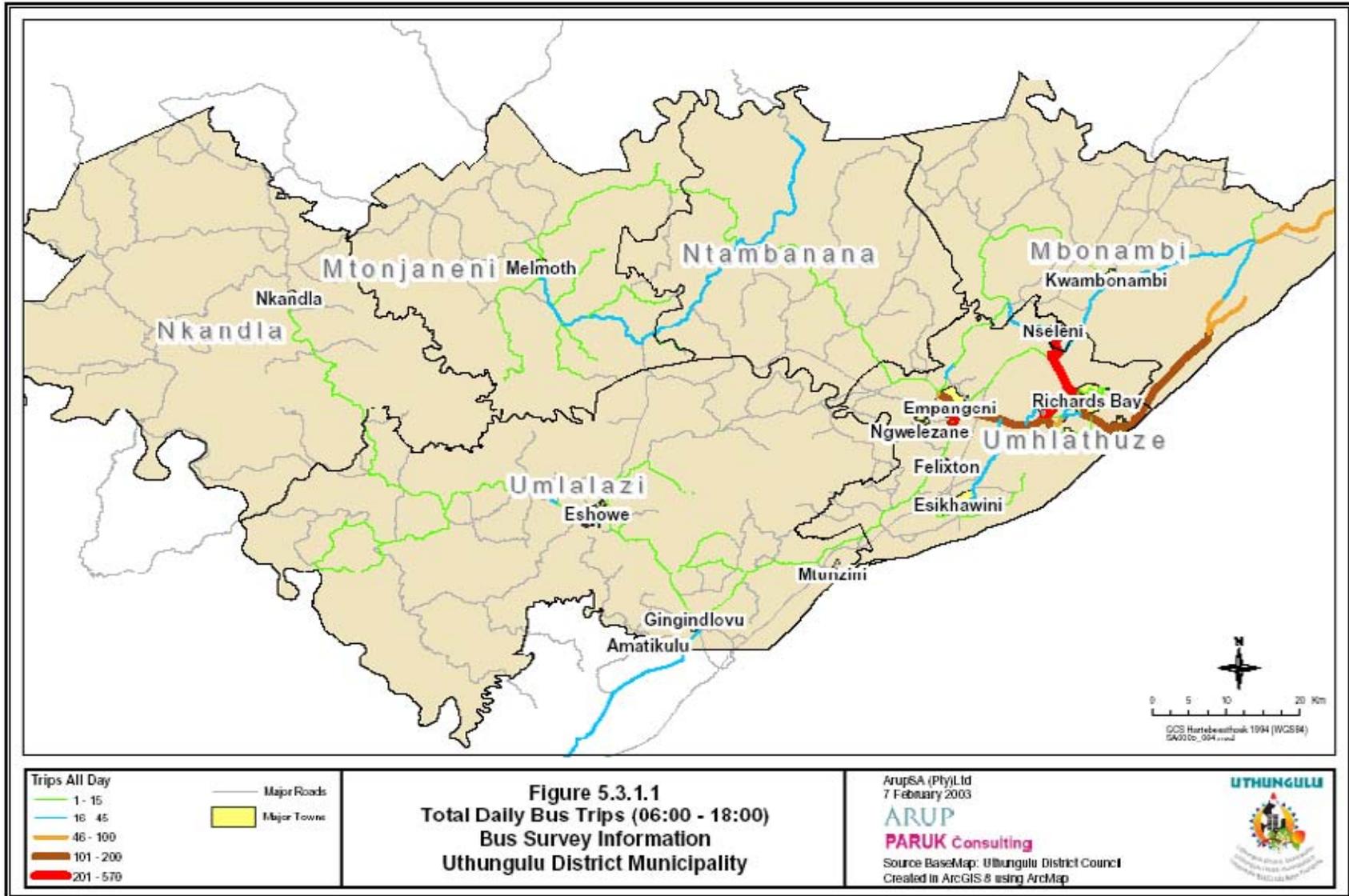
The capacity of the bus service has been described in Section 5.2.3 above. The same method has been applied to the bus survey information in determining the capacity and utilisation. Since the surveys accounted for both IN-bound and OUT-bound trips at the different survey locations the capacity and utilisation is for both directions.

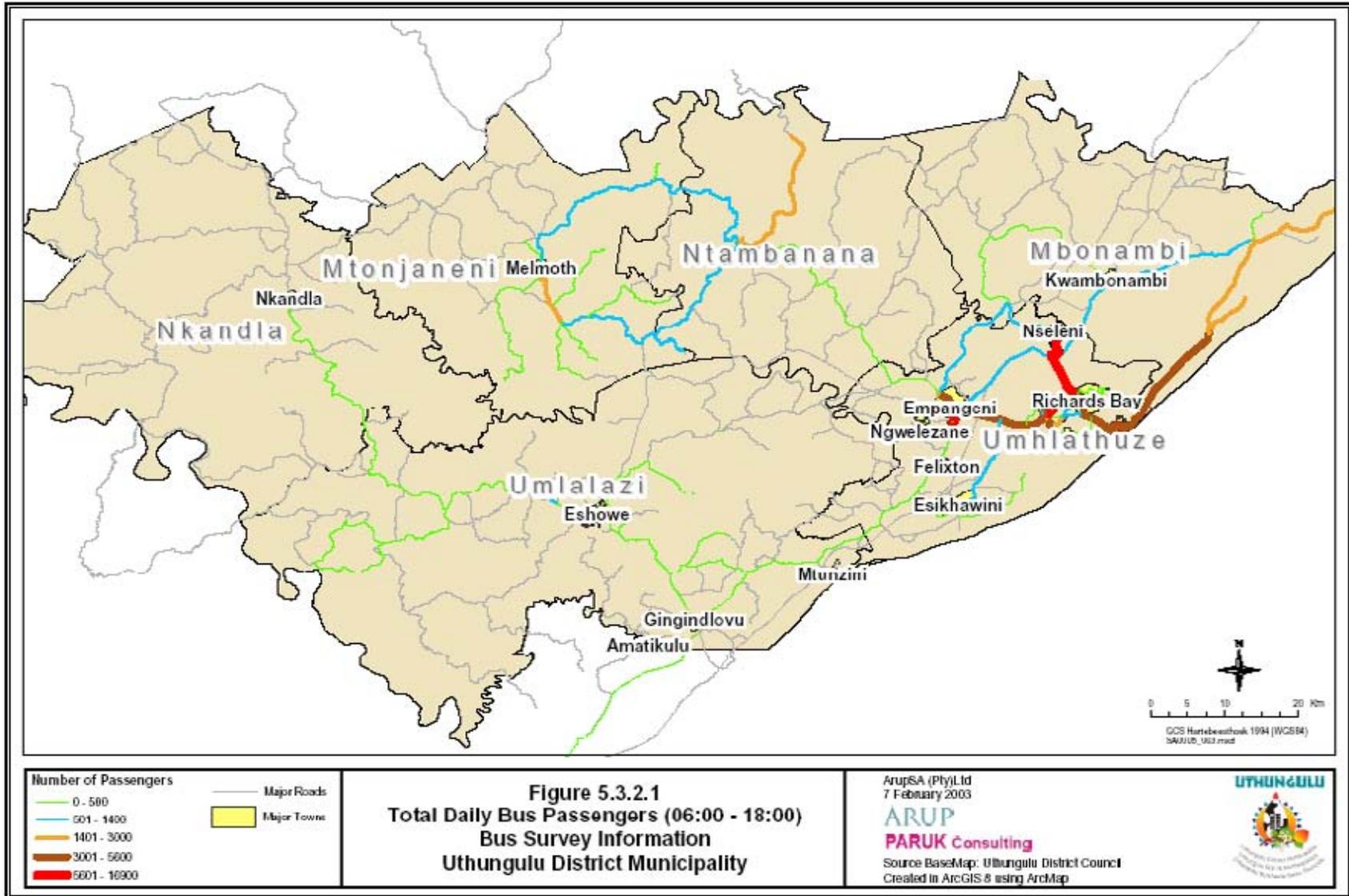
The service capacity and utilisation, based on survey results, for the AM, PM and OFF peak period is shown in **Table 5.3.3.1**.

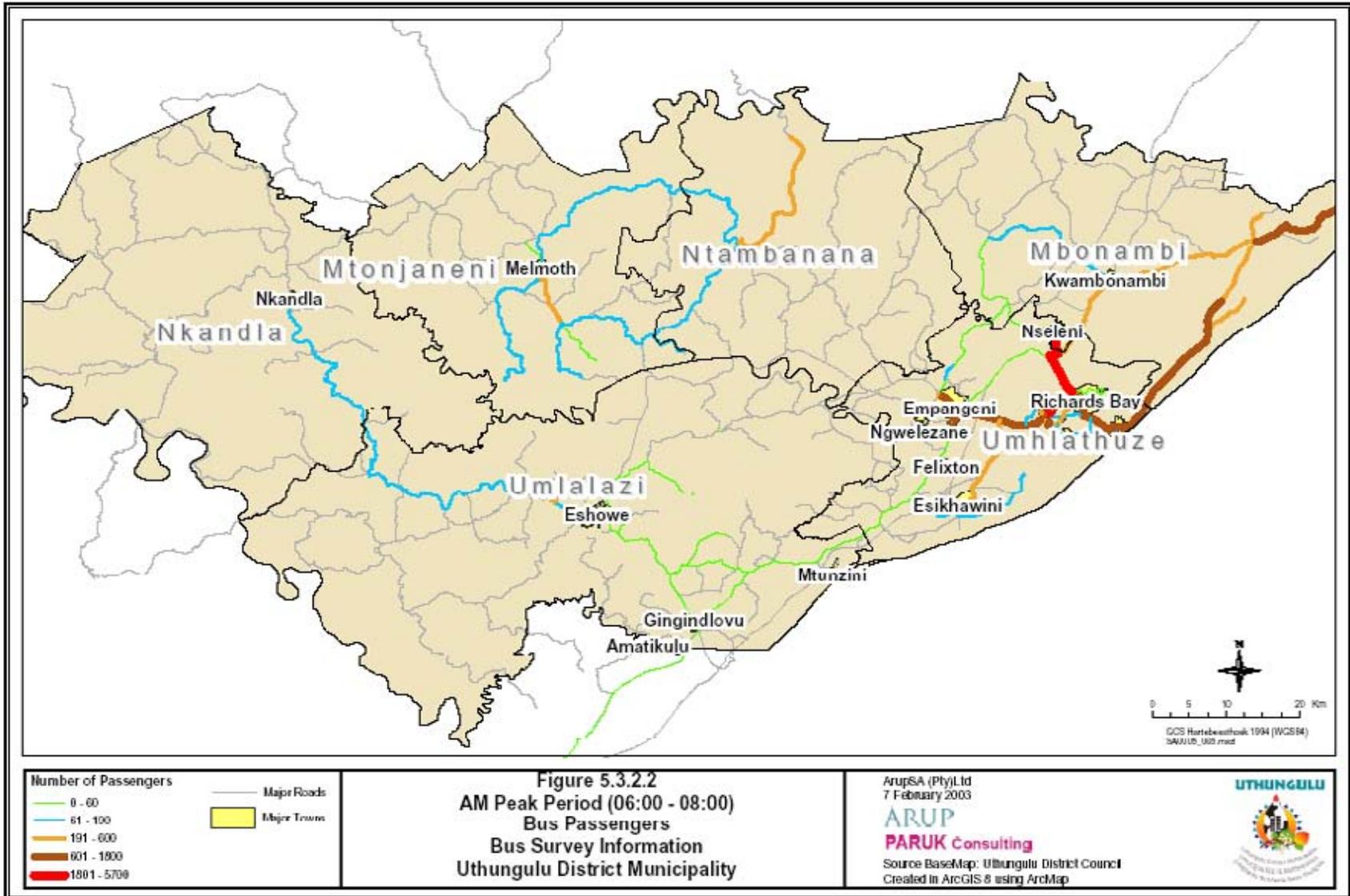
Table 5.3.3.1: AM, PM and OFF peak period bus capacity and utilisation based on survey results

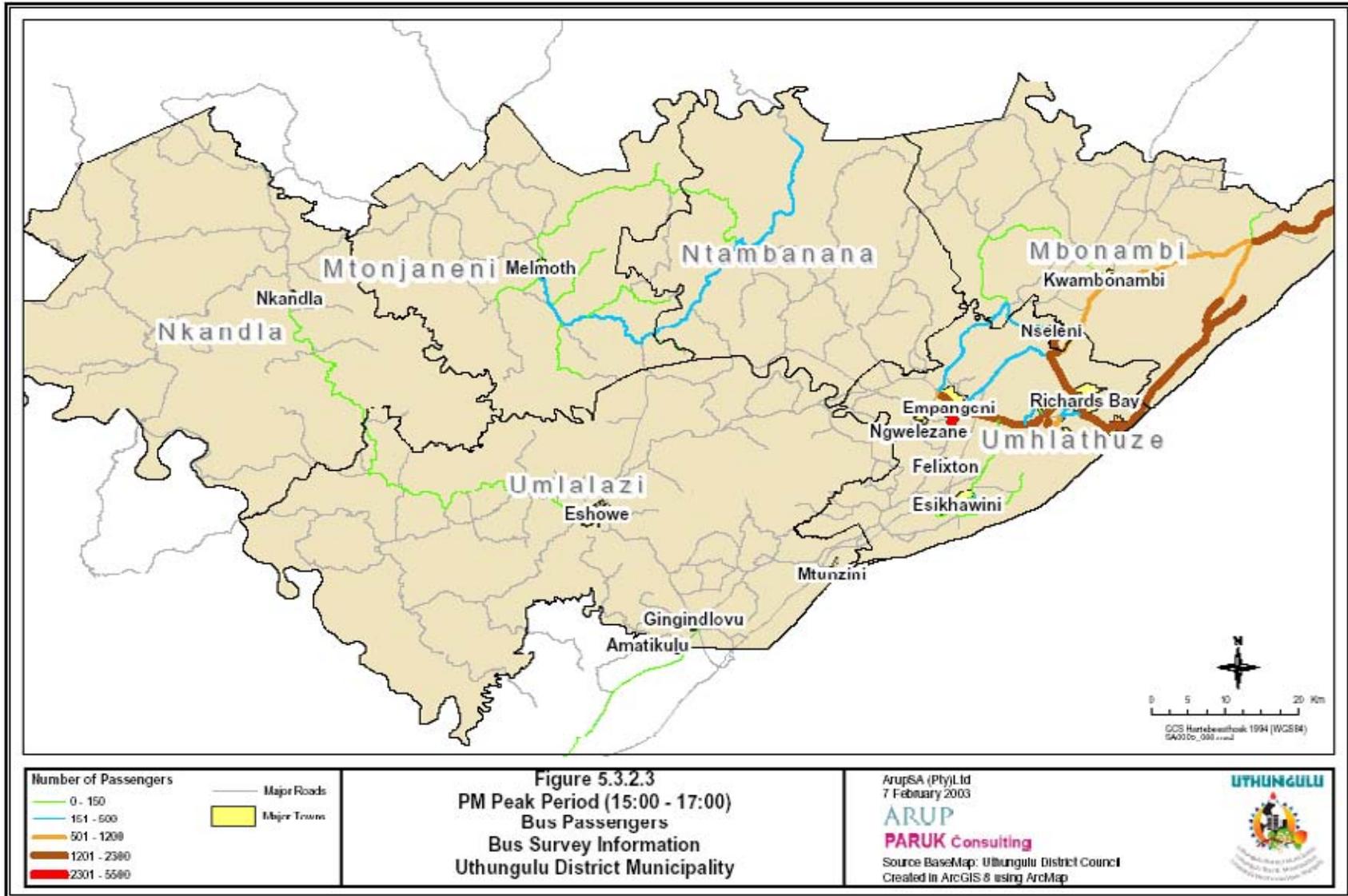
Peak period	Vehicle Trips		Vehicle Capacity		Service Capacity				Actual Passengers		Utilisation (%)			
	IN	OUT	Seated	Crunch Load	Seated		Crunch Load		IN	OUT	Seated		Crunch Load	
					IN	OUT	IN	OUT			IN	OUT	IN	OUT
AM (6 AM – 8 AM)	467	511	65	91	30355	33215	42497	46501	13313	12771	43.9%	38.4%	31.3%	27.5%
OFF (8 AM – 3 PM)	658	632	65	91	42770	41080	59878	57512	11908	14524	27.8%	35.4%	19.9%	25.3%
PM (3 PM – 5 PM)	319	394	65	91	20735	25610	29029	35854	6733	12055	32.5%	47.1%	23.2%	33.6%

(The hour between 17:00 – 18:00 has not been included in the table but is shown in the total quoted in the report.)









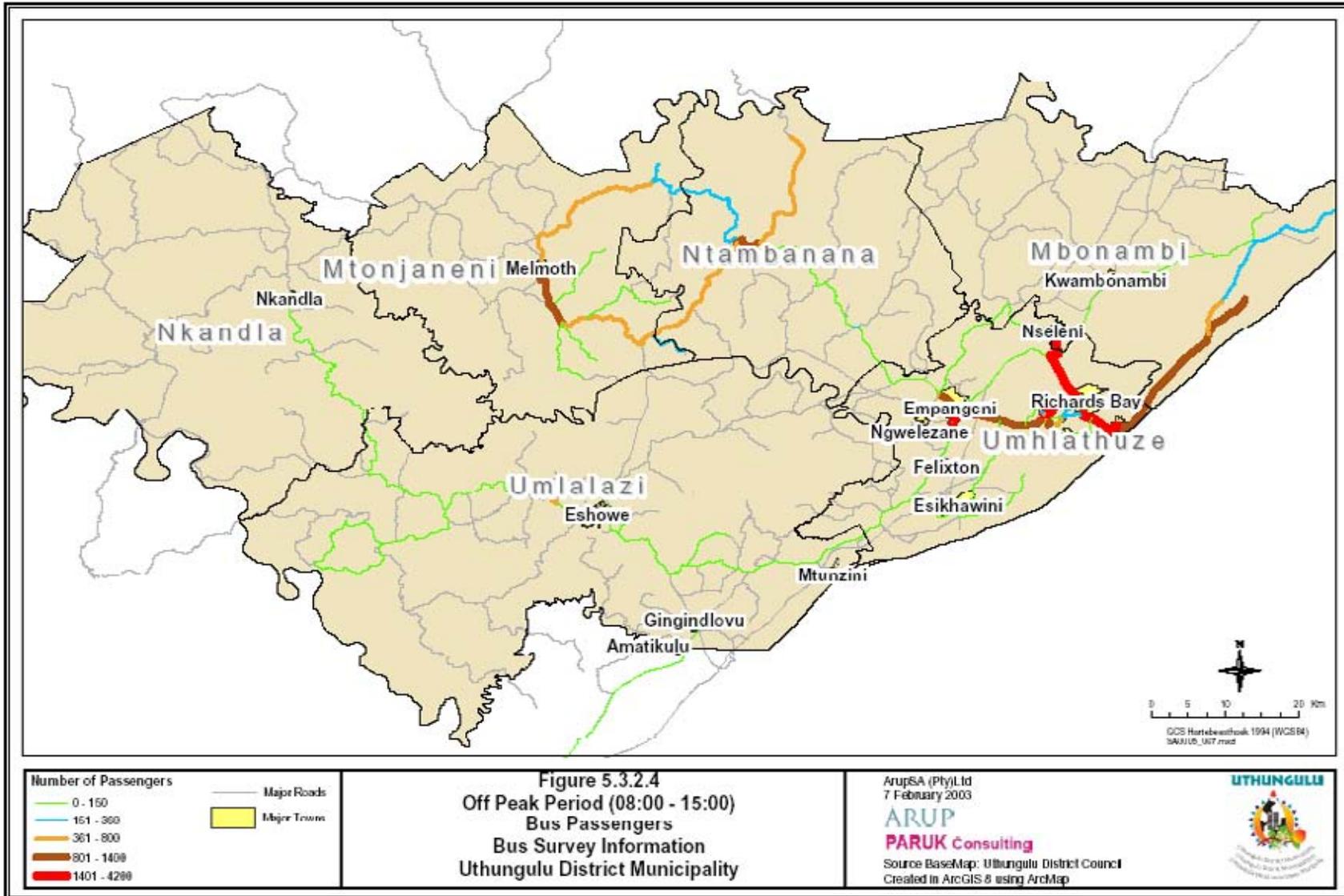
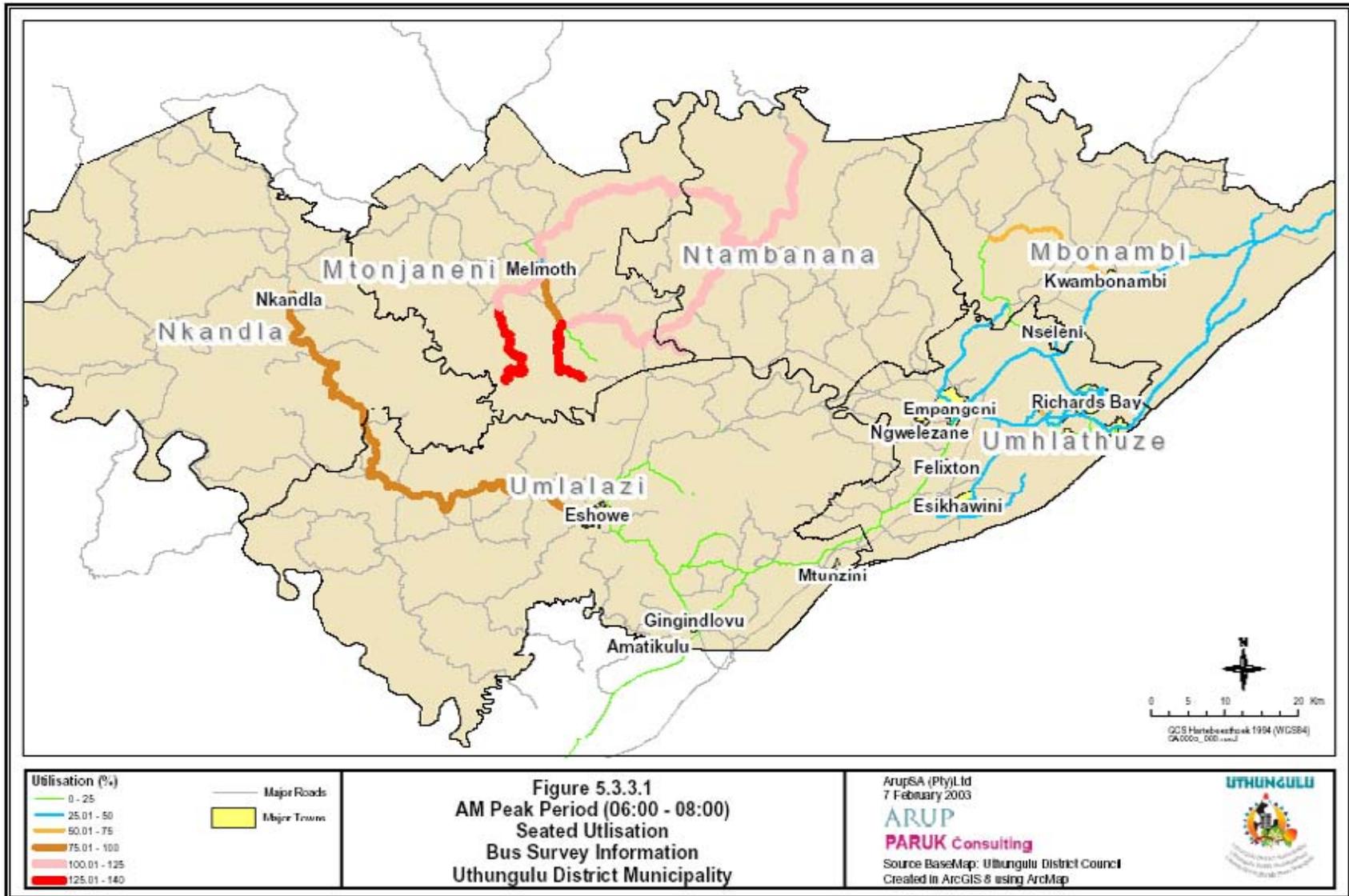


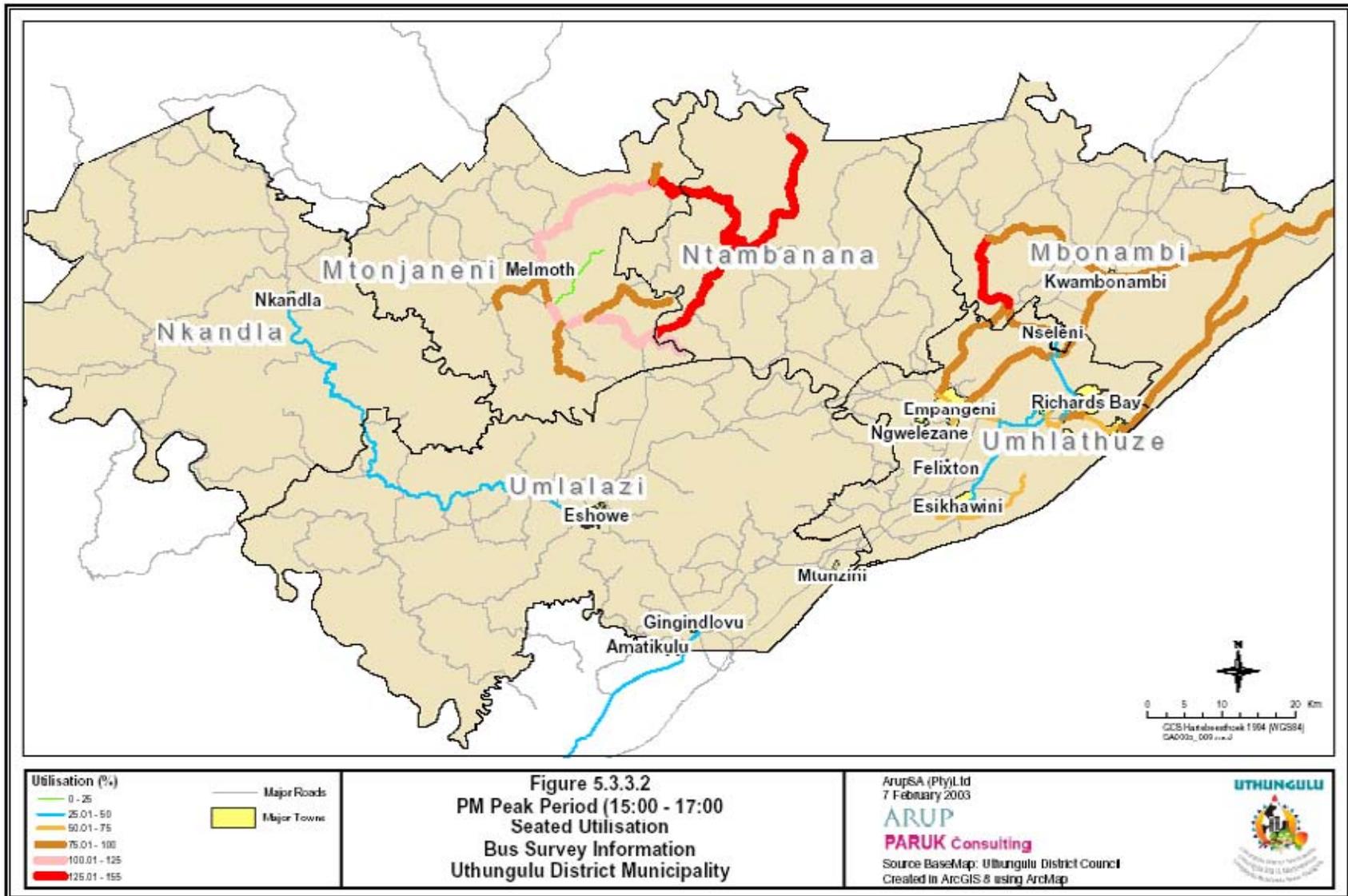
Figure 5.3.3.1, Figure 5.3.3.2 and Figure 5.3.3.3 shows the seated utilisation for the AM Peak (06:00 to 08:00), PM Peak (15:00 to 17:00) and Off Peak (08:00 to 15:00) respectively.

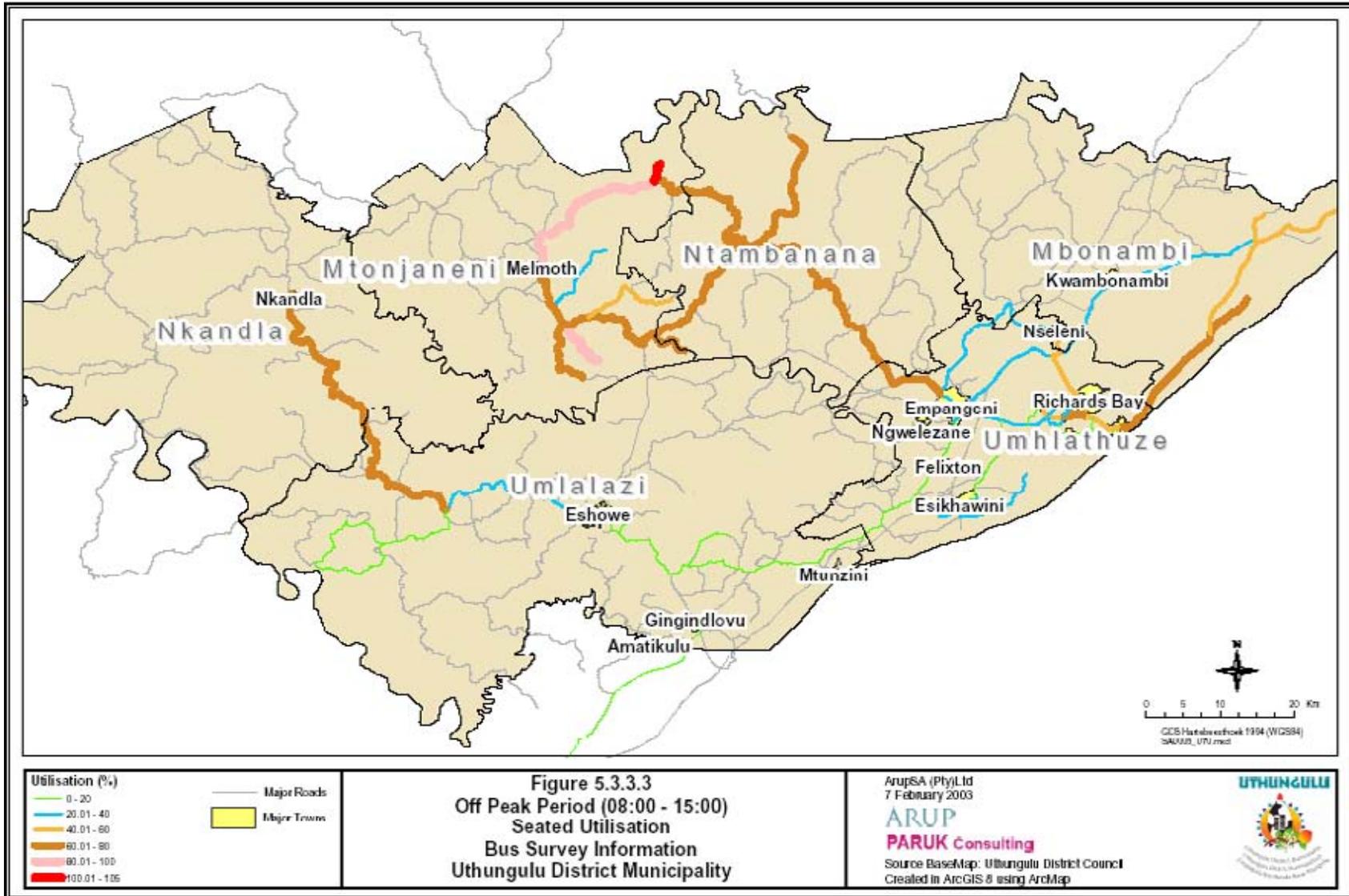
It is clear from **Figure 5.3.3.1**, AM Peak period utilisation, that a large proportion of trips have an utilisation of more than 50%. Only a few routes in and around Melmoth operate at levels of above 100% utilisation. The bus survey results for uMhlathuz shows no over utilisation of the bus services. The on-board surveys did however show that many passengers board and alight bus services along the route thus resulting in lower utilisation figures done at ranks/termini.

Figure 5.3.3.2, the PM Peak period utilisation, shows a similar trend to that of the AM Peak period where the majority of trips operate at more than 75% utilisation. The trips with the highest utilisation appear again to be in and around Melmoth and Ntambanana. Bus routes in Mbonambi also show utilisation levels of more than 75 percent.

During the Off Peak Period (**Figure 5.3.3.3**) the majority of services show utilisation of more than 60%. Some routes in Melmoth area shows utilisation levels of more than 100%, thus indicating a lack of services during the Off peak period on certain routes.(Table 7 and 8 in Appendix D provides detailed AM and PM peak period Bus Capacity and Utilisation figures respectively)







6. MINIBUS-TAXI SURVEYS

6.1 General Trends

The minibus-taxi operators in uThungulu have grouped themselves into associations as mentioned earlier in the report. The Regional Taxi Council, Ubunye Regional Taxi Council represents the minibus-taxi associations in the uMhlathuze region.

The Regional Taxi Forum also exists with members from the different taxi associations represented on the forum as well as local ward councillors, municipal representatives, representatives from uThungulu and other relevant role players. The Regional Taxi Forum is the vehicle for discussing matters of interest within the public transport industry in uThungulu.

The results of the minibus-taxi survey showed that 113 491 passengers (In – 55 584 and Out – 57 907) are transported by minibus. This corresponds to 13 843 (In – 7 184 and Out – 6 659) minibus-taxis trips during the 12-hour survey period, which equates to an average of 8 passengers per taxi. As was the case with bus transport, the majority of trips take place within the urban areas of uThungulu (i.e. Richards Bay and Empangeni). The surveys further showed that 63,7 percent of all minibus-taxis make at least two trips per day. The maximum trips made by a single taxi were 20 for the 12-hour duration of the surveys. (Table 9 in Appendix D shows the minibus-taxi routes based on surveys)

The distribution of minibus-taxi passengers for the different regions is shown in **Figure 6.1.1**. The trends are similar to those of bus operations, with the majority of passengers transported in the uMhlathuze region with lesser passenger transport in the rural areas. This again is the result of population distribution, public transport availability and accessibility as well as the work opportunities within the uMhlathuze region.

Figure 6.1.1: Minibus-taxi Passengers per Municipality

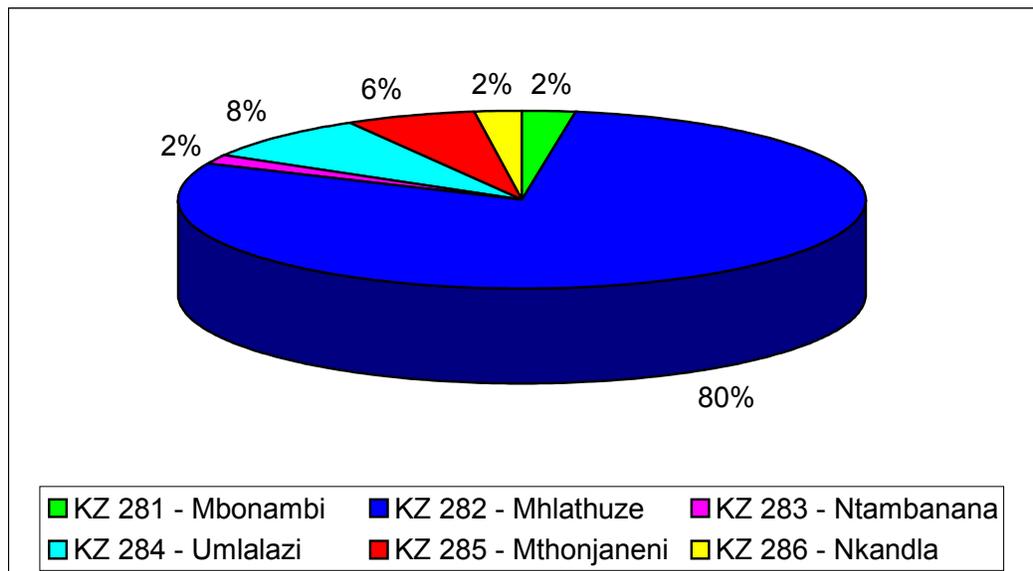


Figure 6.1.2 and **Figure 6.1.3** shows the results of the minibus-taxi surveys for each rank for passenger trips per minibus-taxi per rank/termini and the number of vehicle trips per rank respectively. **Figure 6.1.4**, generated from the GIS, shows the total passengers transported in uThungulu between 06:00 – 18:00 and is based on the surveys.

Figure 6.1.2: Minibus-Taxi Passenger Trips per Rank

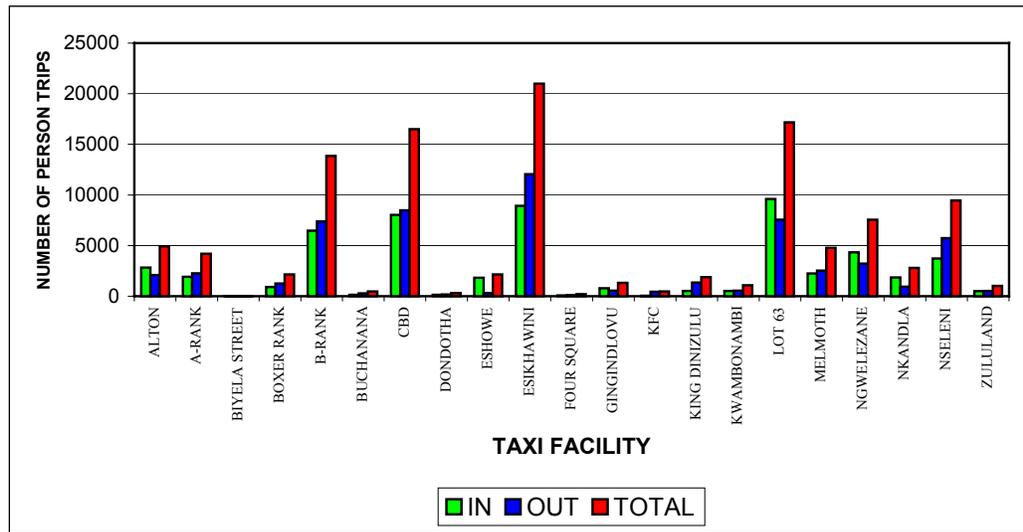
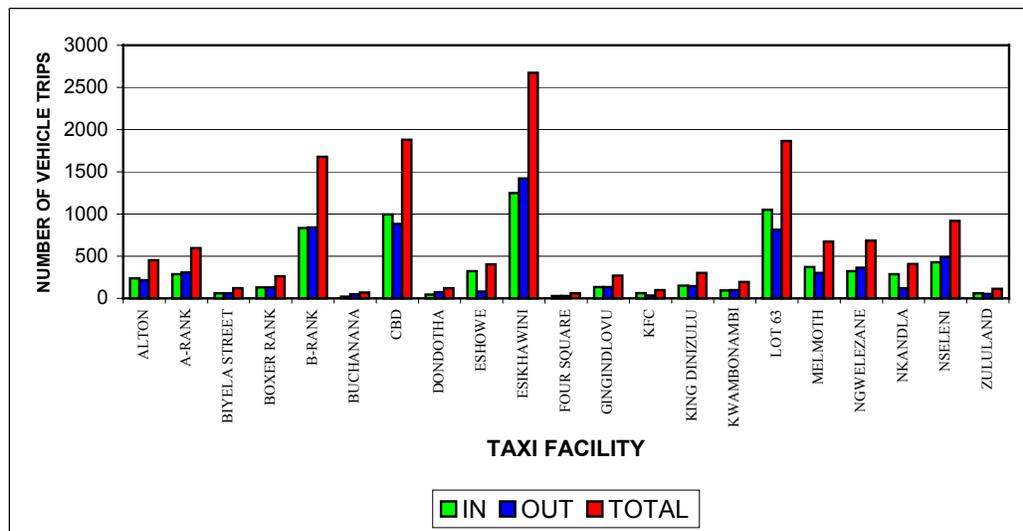


Figure 6.1.3: Minibus-Taxi Trips per Rank

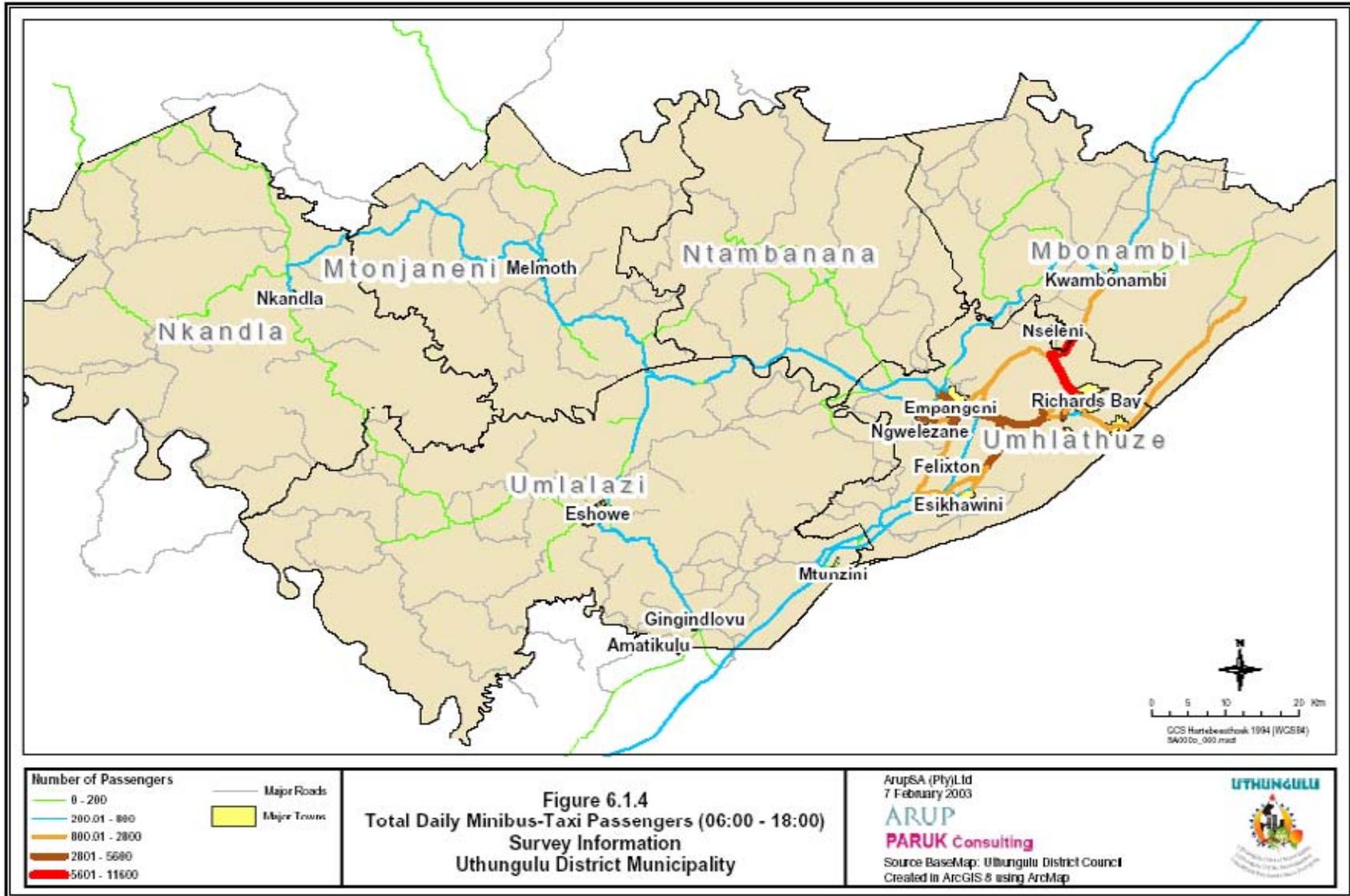


6.2 Route Utilisation

This section of the report addresses the frequency, service capacity, and utilisation of the minibus-taxi services during the AM, PM and Off peak periods based on minibus-taxi surveys.

6.2.1 Frequency of the Service (Number of Trips)

As mentioned in the section above 13 843 minibus-taxi trips were made between 06:00 and 18:00. This is significantly more than the number of trips being made by bus mode of transport. This can be attributed to the fact that much less passengers can be transported with a minibus-taxi or bakkie than a bus. The average route length of a minibus-taxi was calculated to be in the region of 40km and includes long distance operations.



The minibus-taxi surveys further showed that 2 662 trips were made during the AM peak period and 2 730 trips during the PM peak period and 7 239 during the Off peak period, by the different minibus-taxi operators in uThungulu.

Figures 6.2.1.1 shows the total minibus-taxi trips within uThungulu District Municipality. **Figures 6.2.1.2** on the other hand, shows the total minibus-taxi routes per road link for the uThungulu. This provides an indication of road usage by minibus-taxis. **Figure 6.2.1.2** clearly shows that minibus-taxi transport is mainly focussed on surfaced roads with less than 5 routes per road link in most of the rural areas served by mainly gravel roads. This information was extracted from the GIS system and is based on the surveys at the different ranks. It can be seen that the majority of minibus-taxi operations and routes are concentrated on higher order roads such as provincial and national roads. The majority of minibus-taxi routes are further focused around Empangeni, Richards Bay, Esikhawini and Mbonambi (N2 north) with the route between Melmoth and Eshowe also showing a high number of taxi routes per road link.

6.2.2 Passenger Movements

As was mentioned earlier in the report a total number of 113 491 passengers were transported during the 12 hour period with the majority of passengers travelling within the uMhlathuze Municipality.

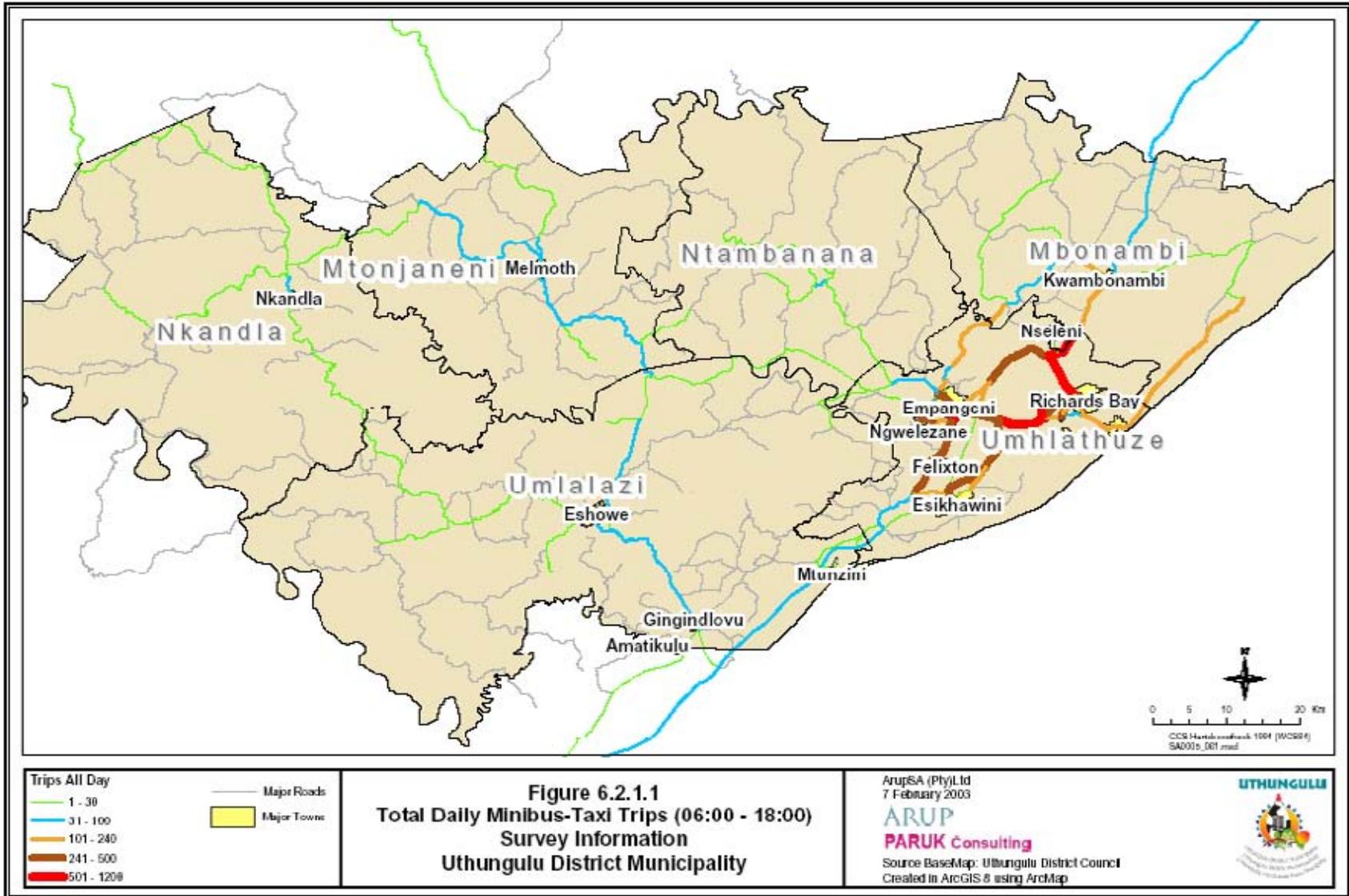
Figure 6.2.2.1; Figure 6.2.2.2 and Figure 6.2.2.3 show the AM Peak (06:00 to 08:00), PM Peak (15:00 to 17:00) and Off-Peak (08:00 to 15:00) passenger volumes according to the surveys. The majority of passengers travel between the urban areas (Empangeni, Richards Bay, Esikhawini and Mbonambi).

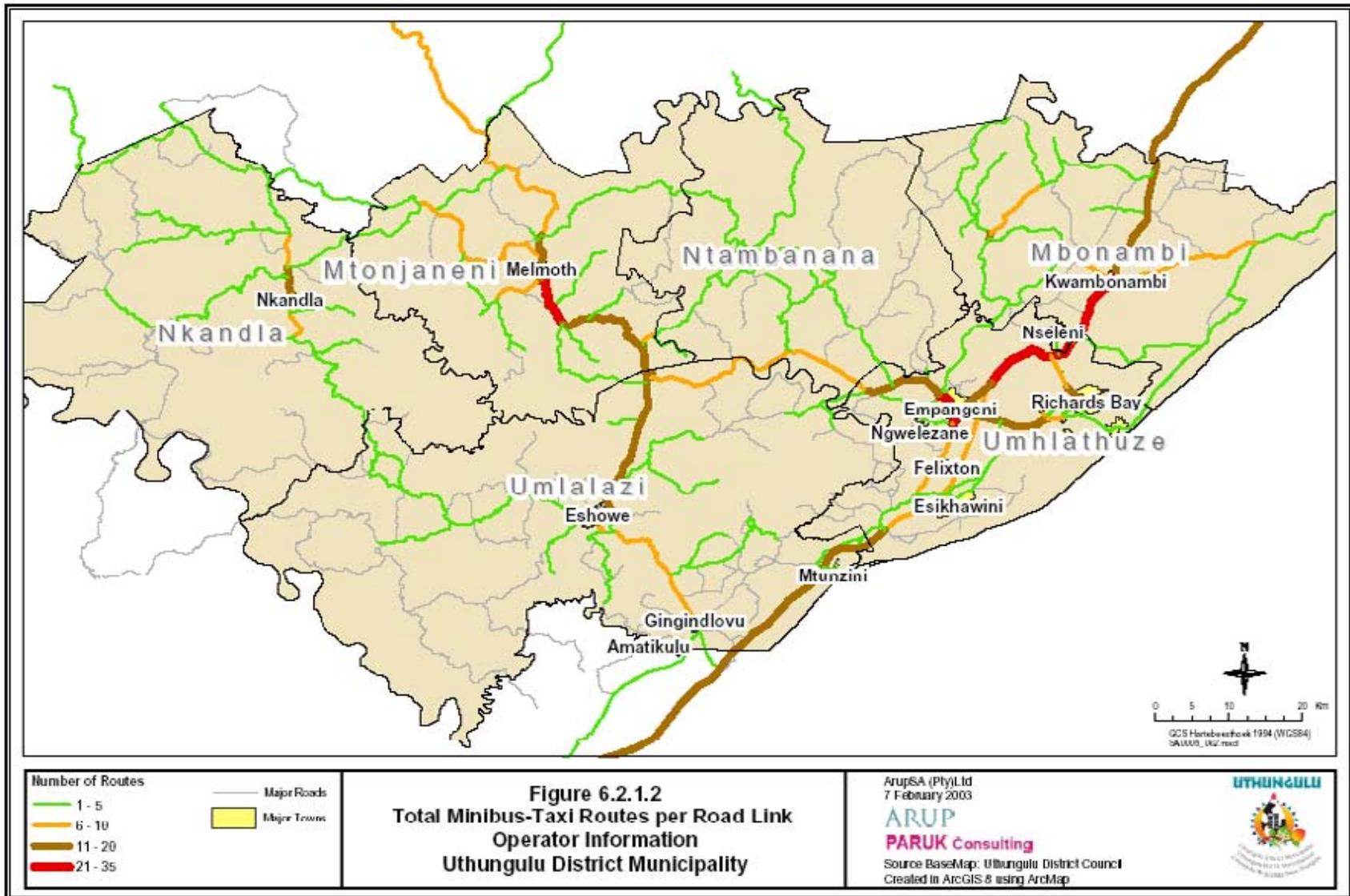
The route with the highest number of passengers proves to be the N2 between the Nseleni and Richards Bay turnoffs and is evident for all peak periods that were analysed. During the AM peak period some 20 741 passengers travel within uThungulu, 22 128 passengers travel within the PM peak period and 61 504 passengers in the Off Peak period.

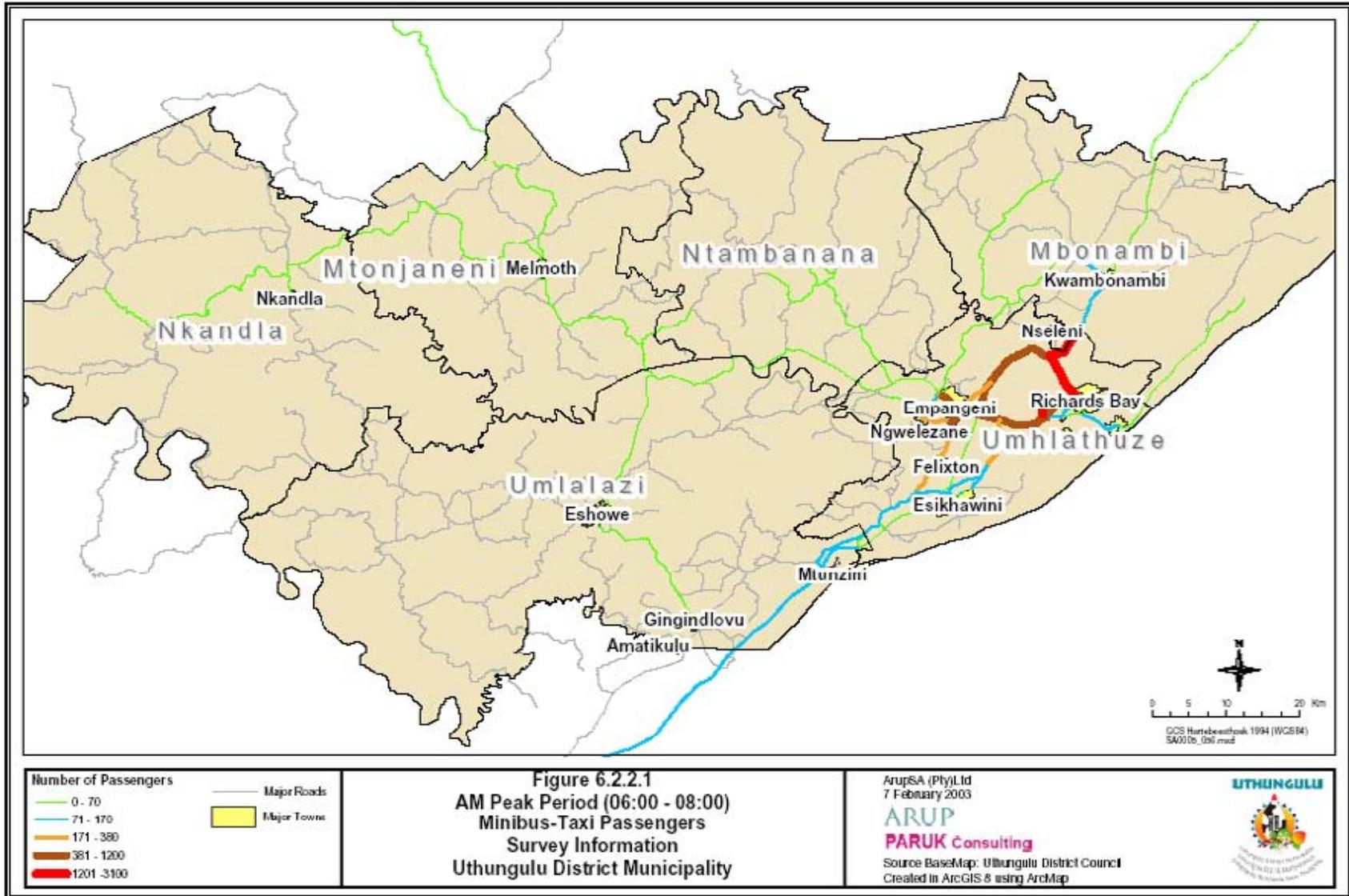
Figure 6.2.2.1 indicates that during the AM peak period passengers volumes are concentrated on main roads around Richards Bay and Empangeni. The rural areas have less than 70 passengers per route, while routes close to Richards Bay and Empangeni generally showed passenger volumes in excess of 1200 passengers per route.

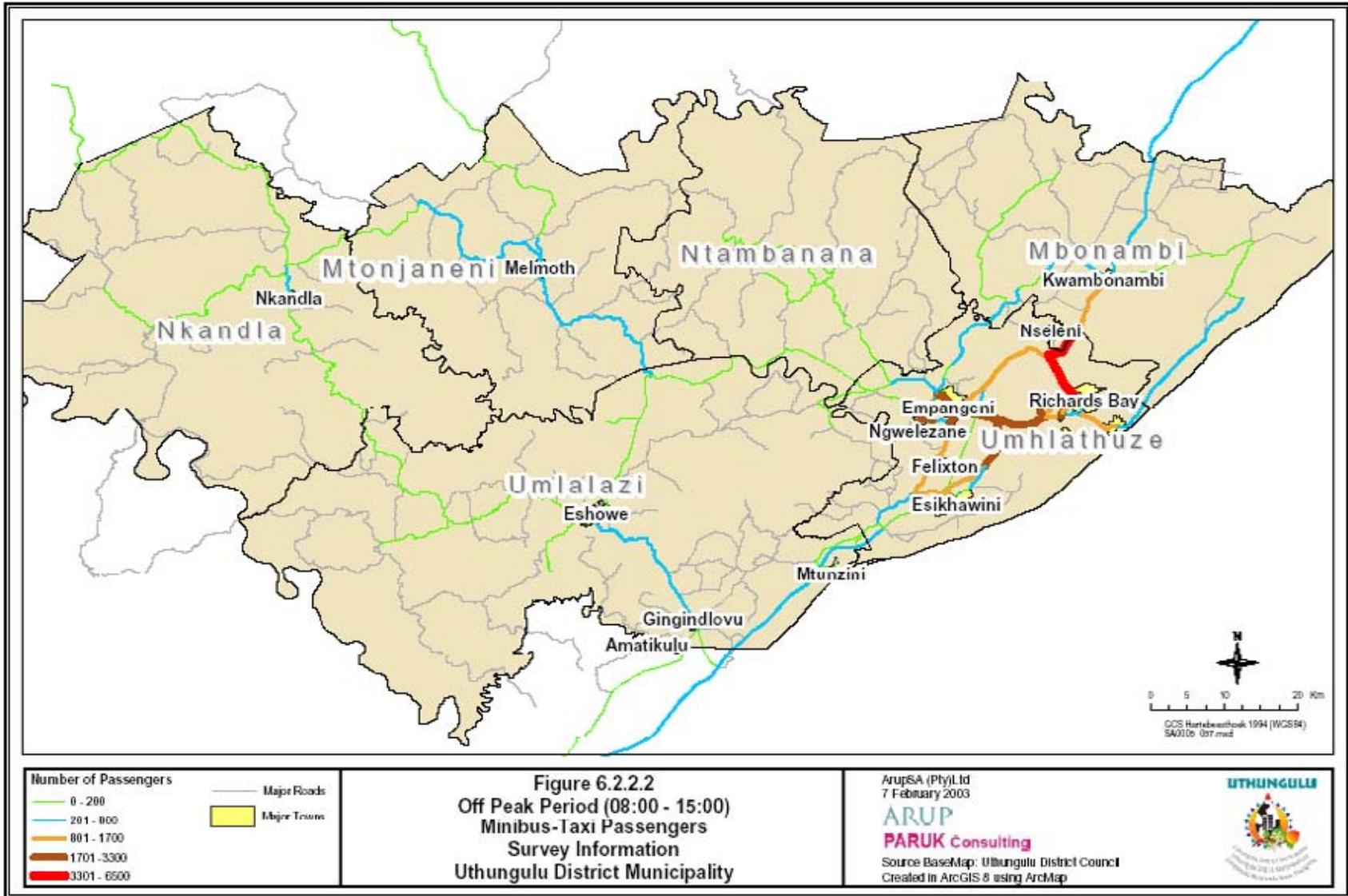
Figure 6.2.2.2 represents the passenger volumes for the Off peak period. Since the time interval for the Off peak period is more than that of the AM and PM peak period it is expected that more passengers will be included in the Off peak period analysis. On rural roads less than 800 passengers per route travel during the Off peak period whilst more than 3300 passengers travel during the Off peak period in the vicinity of urban settlements.

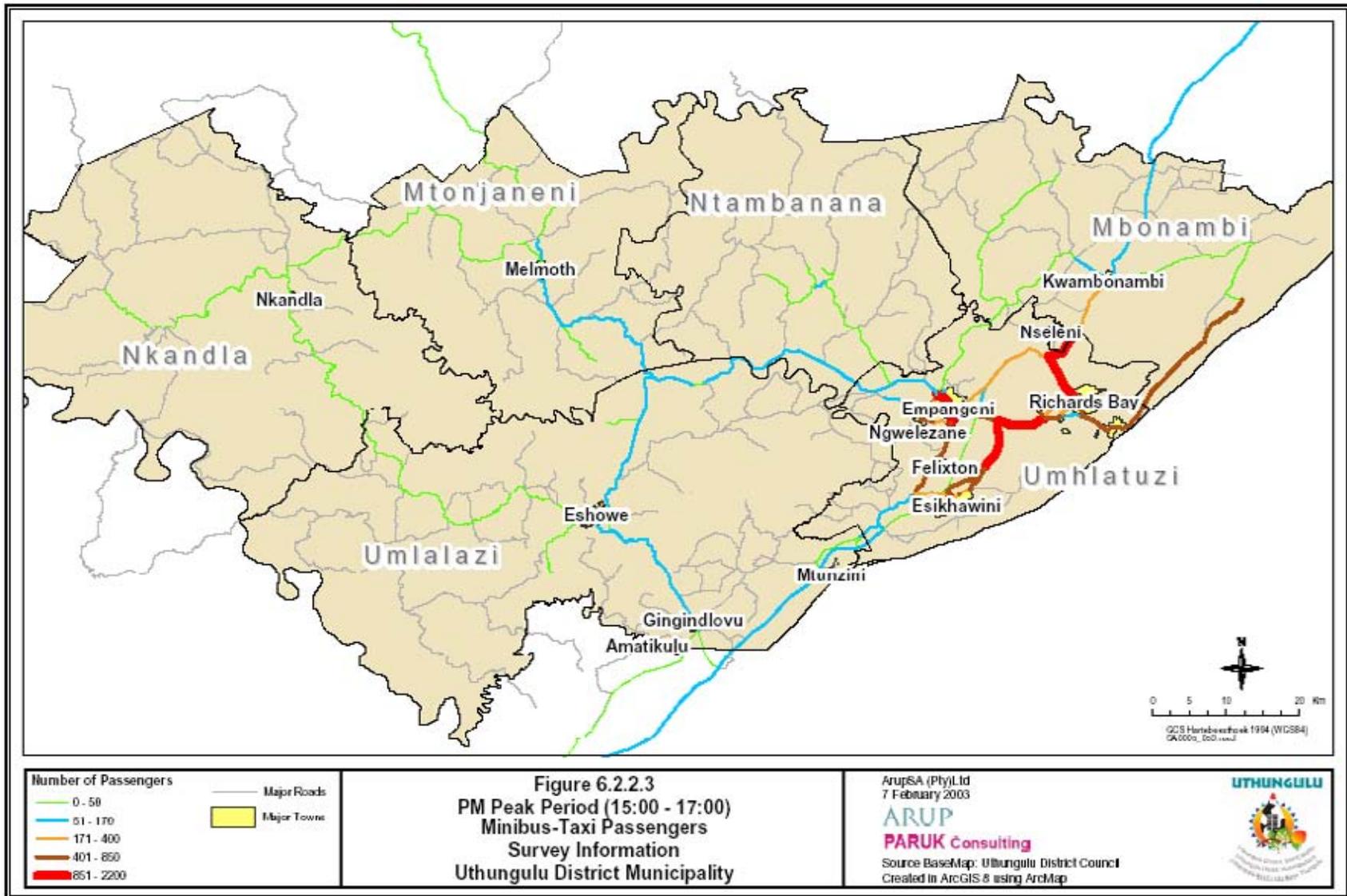
Figure 6.2.2.3 representing the PM peak period also shows the same tendency as that of the AM peak and Off peak periods, with less than 180 passengers in the rural areas and more than 800 passengers per route in urban areas.











6.2.3 Service Capacity and Capacity Utilisation

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 16 passengers. 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 221 000 (221 488) passengers. The survey results on the other hand showed that the actual number of passengers transported by minibus-taxis were only 113 491 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 uThungulu the minibus-taxi service is only 51 percent utilised, and excludes passengers boarding and alighting along the minibus-taxi routes. Detailed minibus-taxi utilisation per route is available on the GIS system and the AM and PM peak period Capacity and Utilisation is shown in Table 10 and 11 in Appendix D respectively. The service capacity and utilisation for the AM and PM peak period is shown in **Table 6.2.3.1** below.

Table 6.2.3.1: AM and PM peak period minibus-taxi capacity and utilisation

Peak period	Vehicle Trips		Vehicle Capacity	Service Capacity		Actual Passengers		Utilisation (%)	
	IN	OUT	Seated	IN	OUT	IN	OUT	IN	OUT
AM (6 AM – 8 AM)	1444	1218	16	23104	19488	9683	11058	41.9%	56.7%
OFF (8 AM – 3 PM)	3774	3465	16	60384	55440	30401	31103	50.3%	56.1%
PM (3 PM – 5 PM)	1444	1286	16	23104	20576	11193	10935	48.4%	53.1%

(The hour between 17:00 – 18:00 has not been included in the table but is shown in the total quoted in the report.)

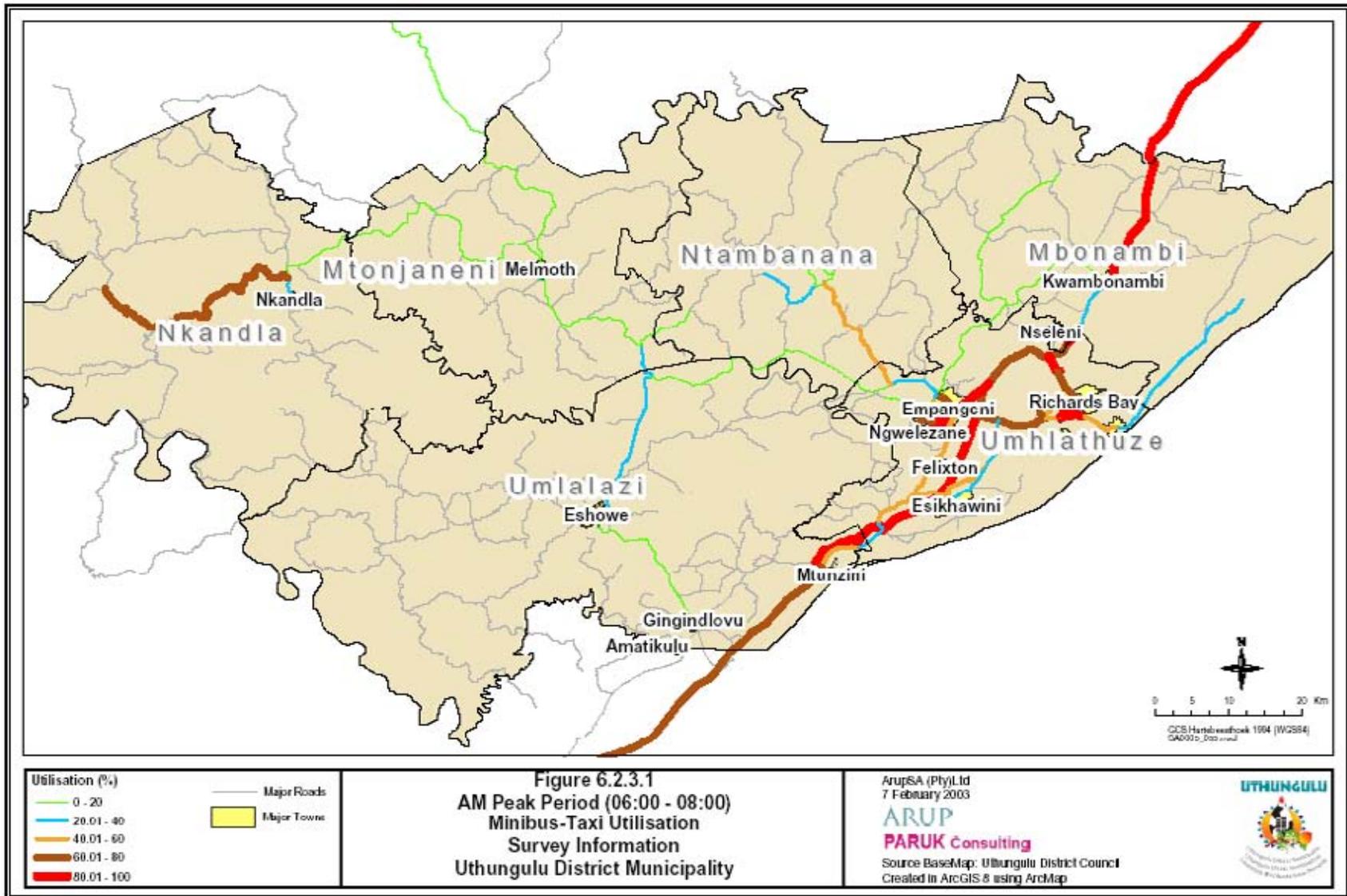
From the above figures it can be seen that the AM, PM and Off peak periods have similar utilisation levels with outbound traffic from ranks showing their highest utilisation figures.

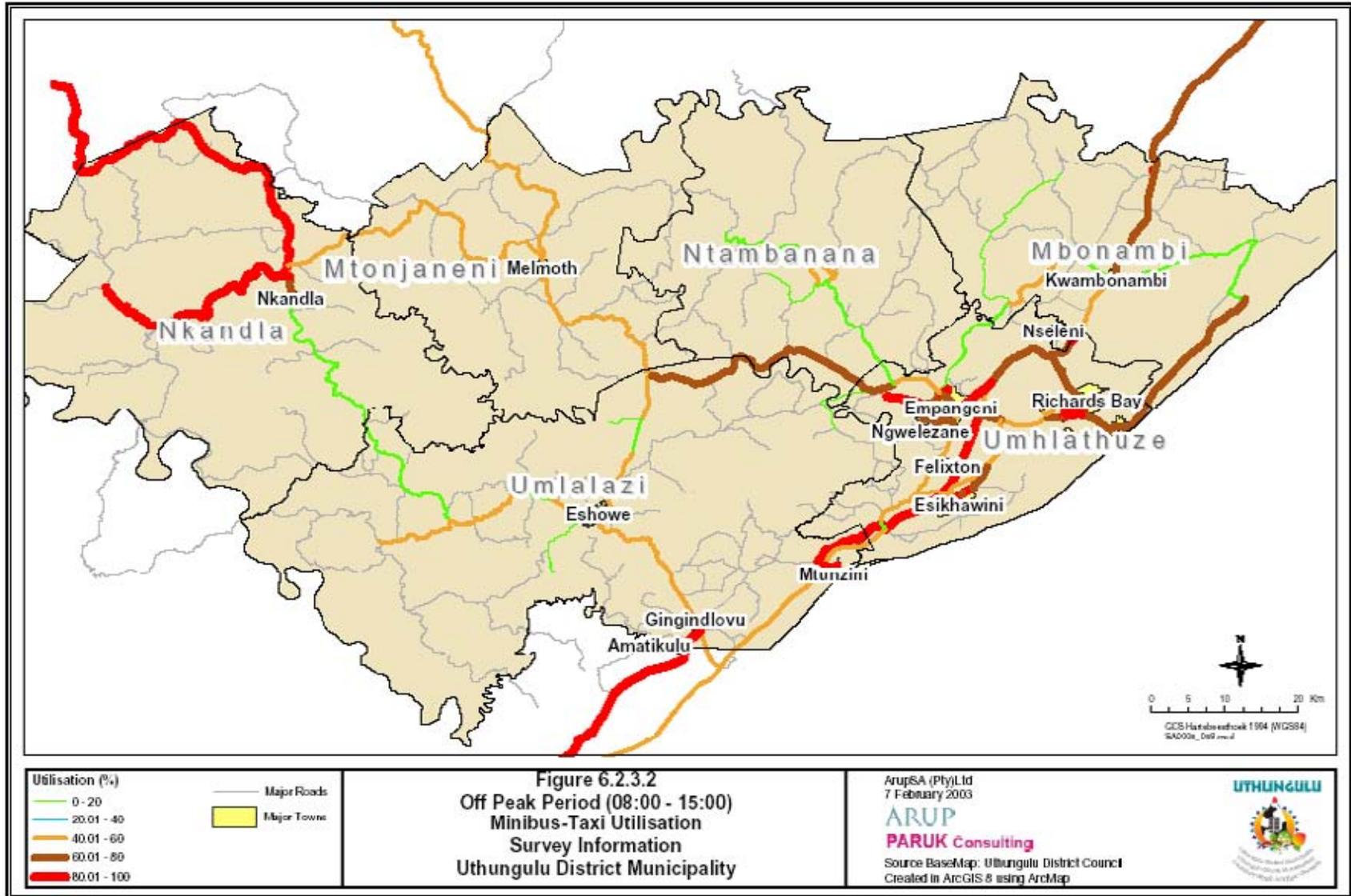
Figure 6.2.3.1, Figure 6.2.3.2 and Figure 6.2.3.3 represent the Minibus-taxi AM Peak, PM Peak and Off Peak utilisation respectively.

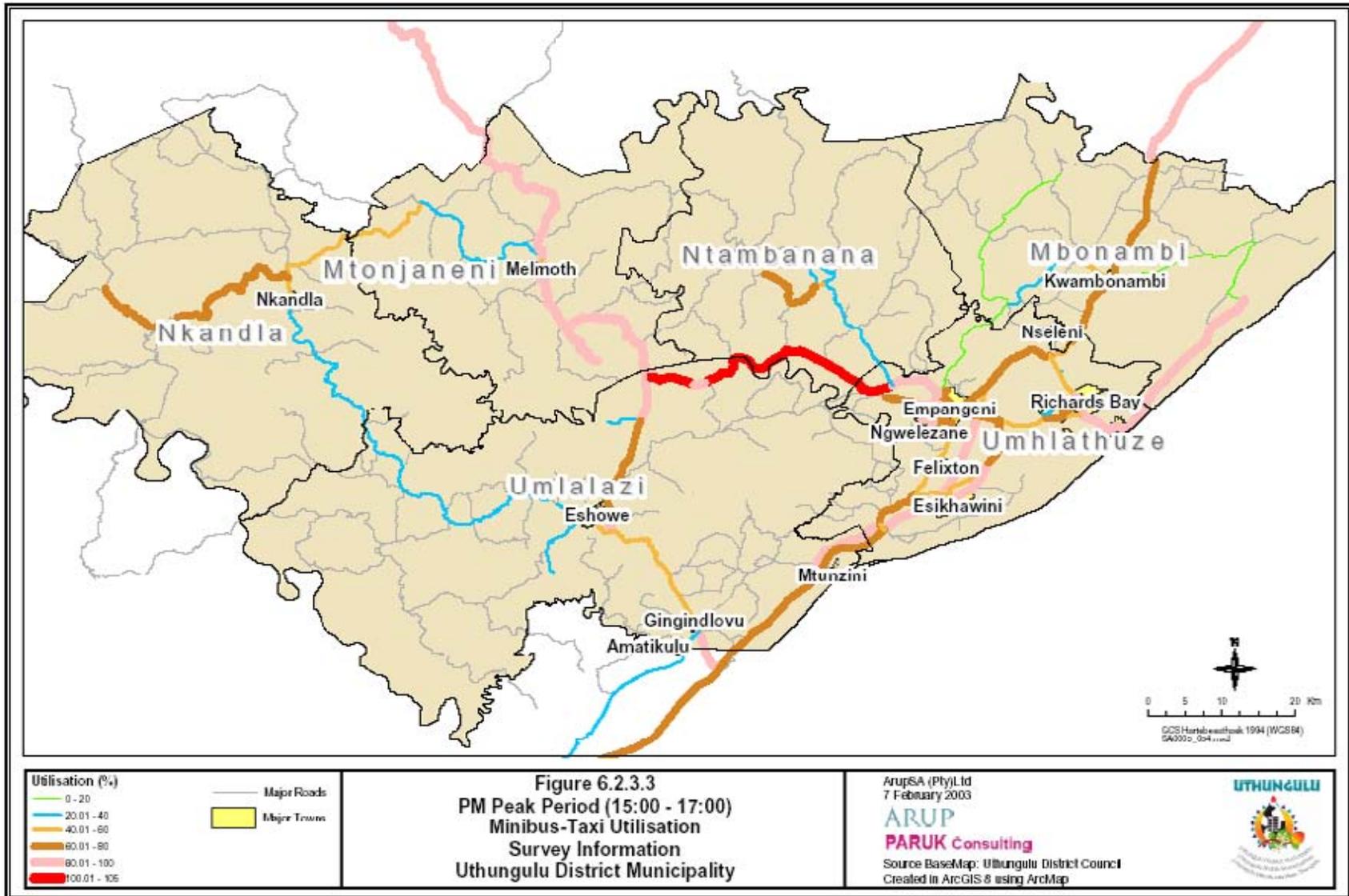
During the AM Peak period (**Figure 6.2.3.1**) there is a general trend that minibus-taxi services operate at utilisation levels of 60% or more in urban areas and lower levels in rural areas. In Nkandla the services run at an utilisation of between 60% and 80%, and is the result of a lack of public transport in Nkandla. Between Empangeni, Richards Bay and Mbonambi some routes are operating at a utilisation of more than 80%. The N2 national route proves to be the route with the highest utilisation figures.

During the Off peak (**Figure 6.2.3.2**) and PM Peak period (**Figure 6.2.3.2**) the picture looks much different than that of the AM Peak period. Utilisation figures in Nkandla during the Off peak period were between 80% - 100% and this is the result of passengers leaving Nkandla, being spread out more evenly. The PM peak period however showed that trips from Nkandla to the surrounding rural area have utilisation figures of less than 80%. Both the Off peak and PM peak period shows that most of surfaced routes in uThungulu are trips used by public transport operators while AM peak is limit to urban areas.

The provincial road between Nquileni and Empangeni (**Figure 6.2.3.3**) is the only route that has utilisation levels of more than 100 percent during the PM peak period. The other primary provincial roads and national roads all show utilisation rates of more than 80 percent. A few rural roads also show distinct increase in utilisation such as routes from RBM, around Dondotha and close to Mthubathuba just outside the study area. Minibus-taxi trips appears also to concentrate around Melmoth. These routes provide for through travel through Melmoth. High levels of utilisation, can be attributed to long distance passengers travelling to external destinations such as Ulundi, Vryheid, Johannesburg, etc







7. BAKKIE SURVEYS

7.1 General Trends

The bakkie operators in uThungulu do not belong to any associations and are seen as “illegal”. Most of the bakkie operators provide a public transport service together with the minibus-taxi operators and therefore operate as part of minibus-taxi associations. Bakkie transport is mainly concentrated in smaller towns and operates within the rural areas where no minibus-taxi or bus transport is available. Bakkie transport occurs within the following areas:

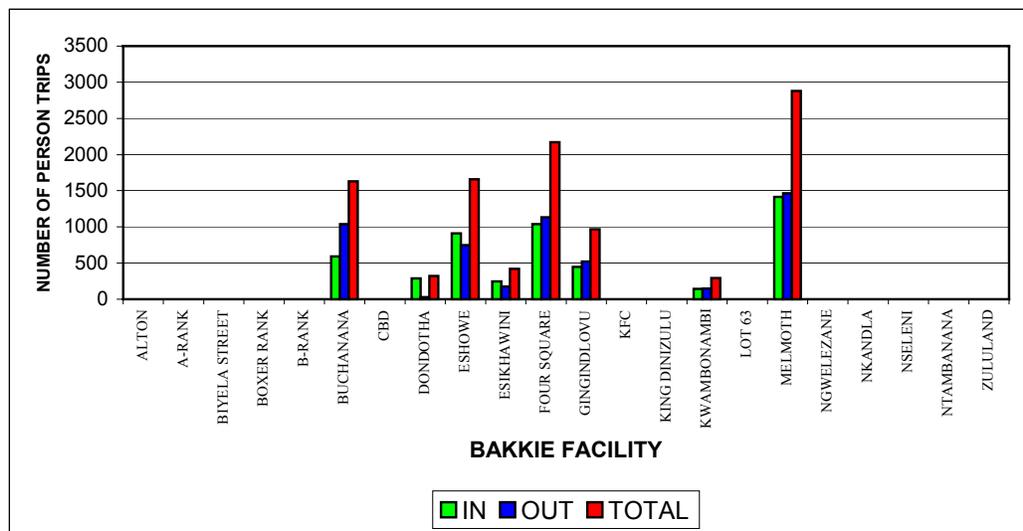
- Ntambanana
- Mtonjaneni
- Umlalazi and
- uMhlathuze.

The results of the surveys showed that 10 348 passengers (In – 5 554 and Out – 4 794) are transported by bakkies. This relates to 2 458 (In – 1 155 and Out – 1 303) bakkie trips during the 12-hour survey period, which equates to an average of 4 passengers per bakkie.

The distribution of bakkie passengers is mainly confined to Ntambanana, Eshowe and Melmoth areas. Bakkie transport in Eshowe accounts for 37 percent of bakkie passengers, 28 percent in Melmoth area, 16 percent in Buccanana with the remaining 19 percent divided between Dondotha, Esikhawini, Gingindlovu and Kwambonambi.

Figure 7.1.1 shows the passengers transported by bakkie for each rank while **Figure 7.1.2** shows the results of the bakkie trips from each rank. Several of the ranks that were surveyed do not have any bakkie transport present. The total number of passengers transported by bakkies generated by the GIS system is shown in **Figure 7.1.3**.

Figure 7.1.1: Bakkie Passengers per Rank



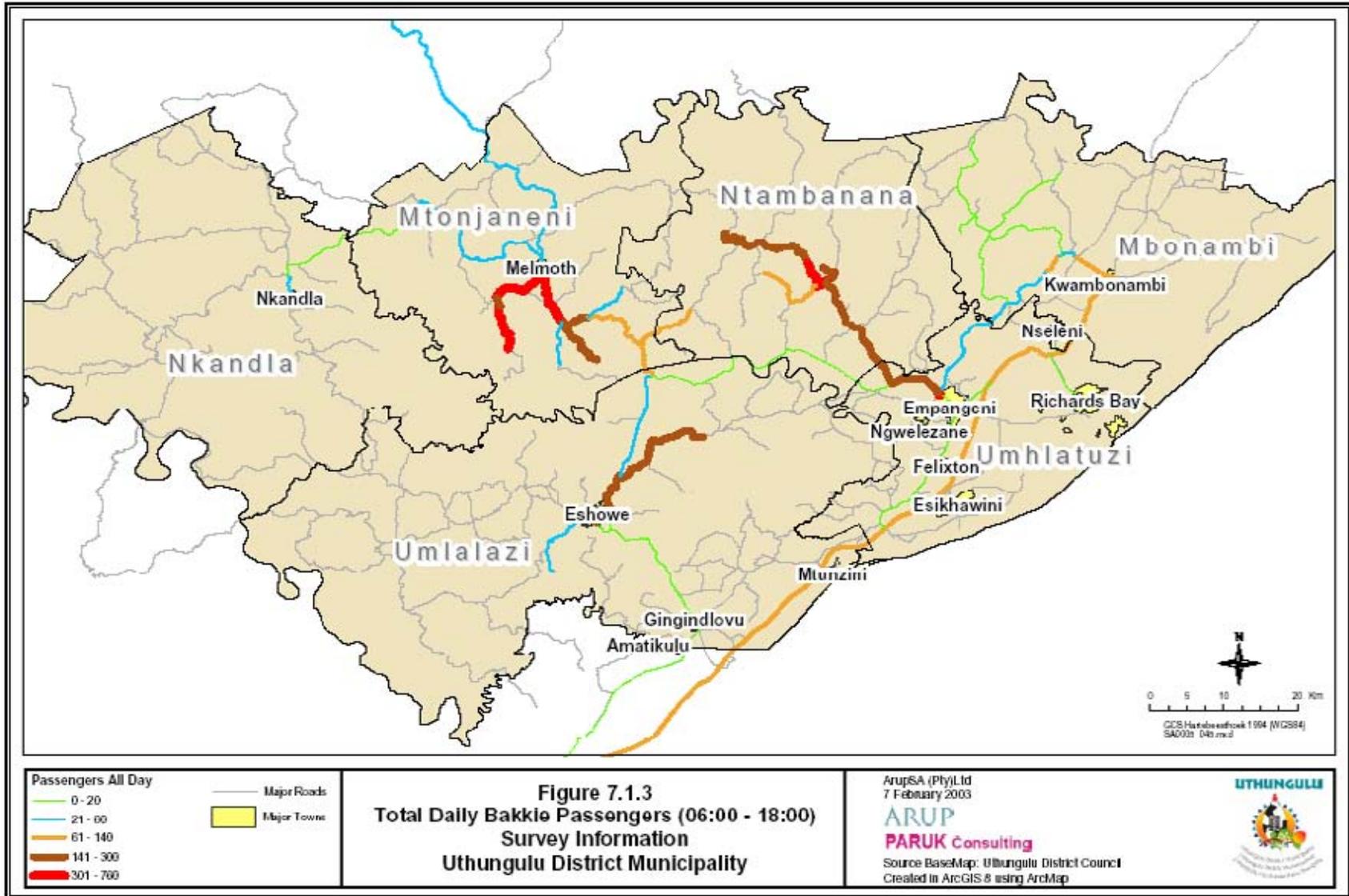
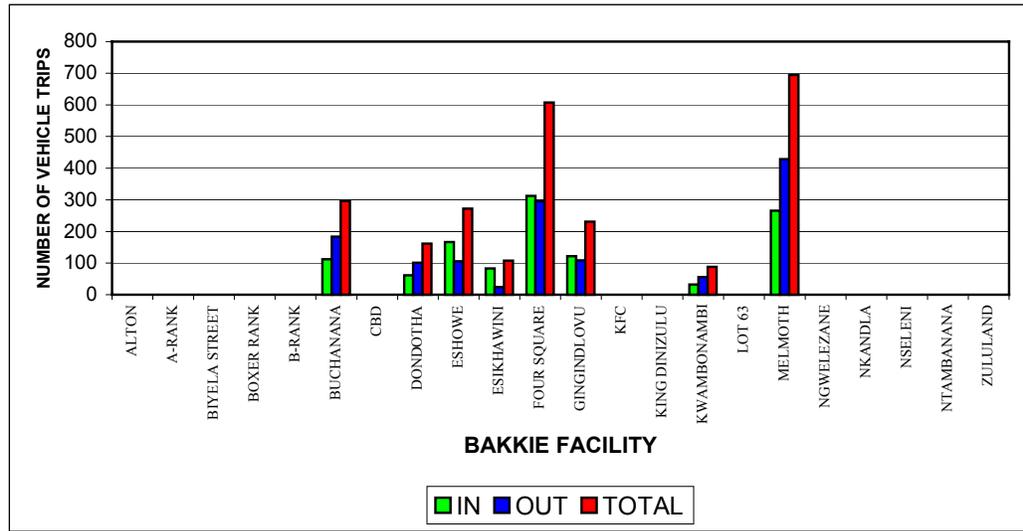


Figure 7.1.2: Bakkie Trips per Rank



7.2 Route Utilisation

This section of the report addresses the frequency, passenger movements, service capacity, and utilisation of the bakkie services during the AM, PM and OFF peak periods. The information gathered from the surveys was used to determine frequency, capacity and utilisation.

7.2.1 Frequency of the Service (Number of Trips)

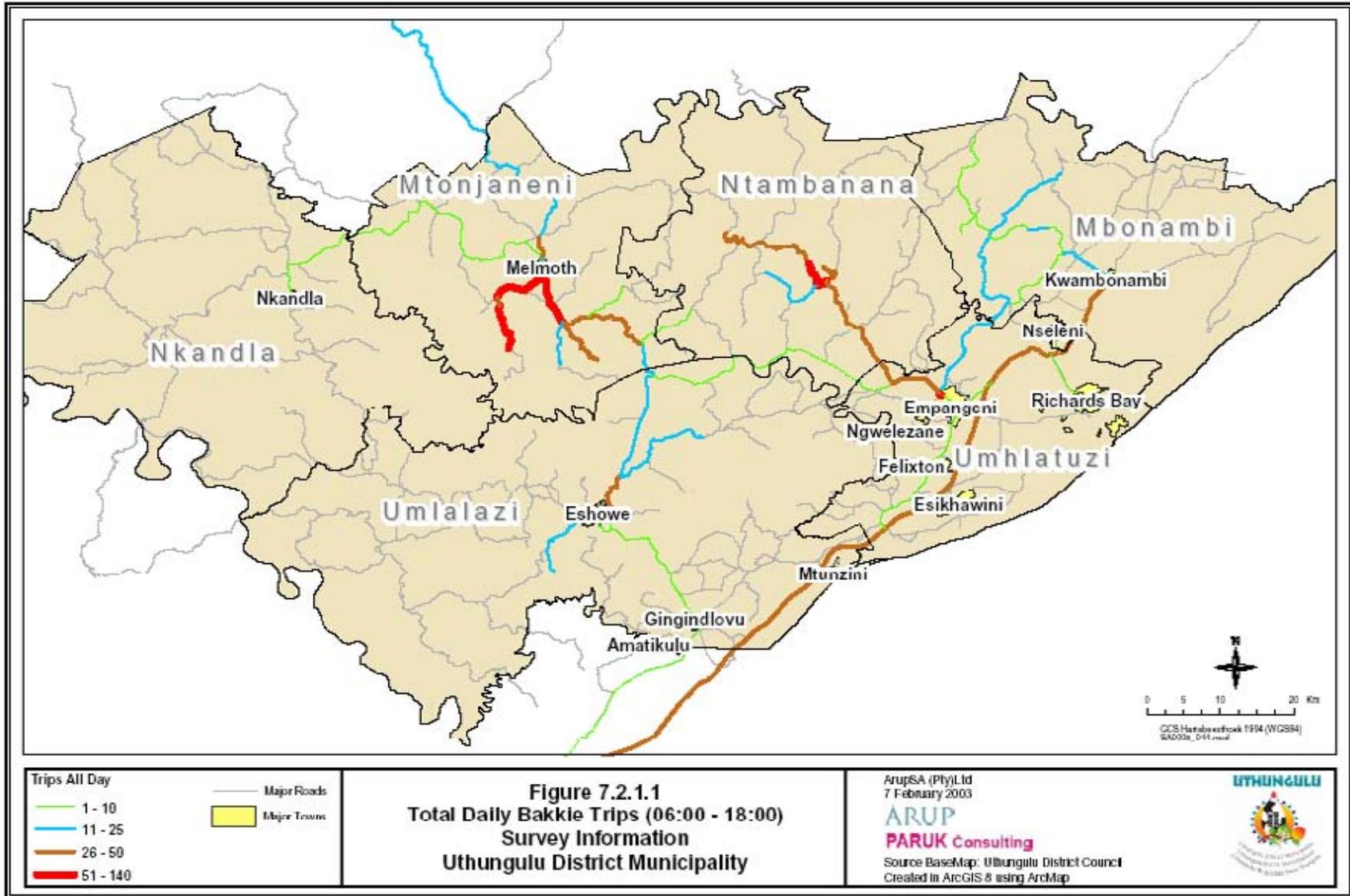
As mentioned in the previous section 2 458 bakkie trips were made between 06:00 and 18:00. The bakkie surveys further showed that 422 trips were made during the AM peak period and 420 trips during the PM peak period and 1 435 trips during the Off peak period, by the different bakkie operators in uThungulu.

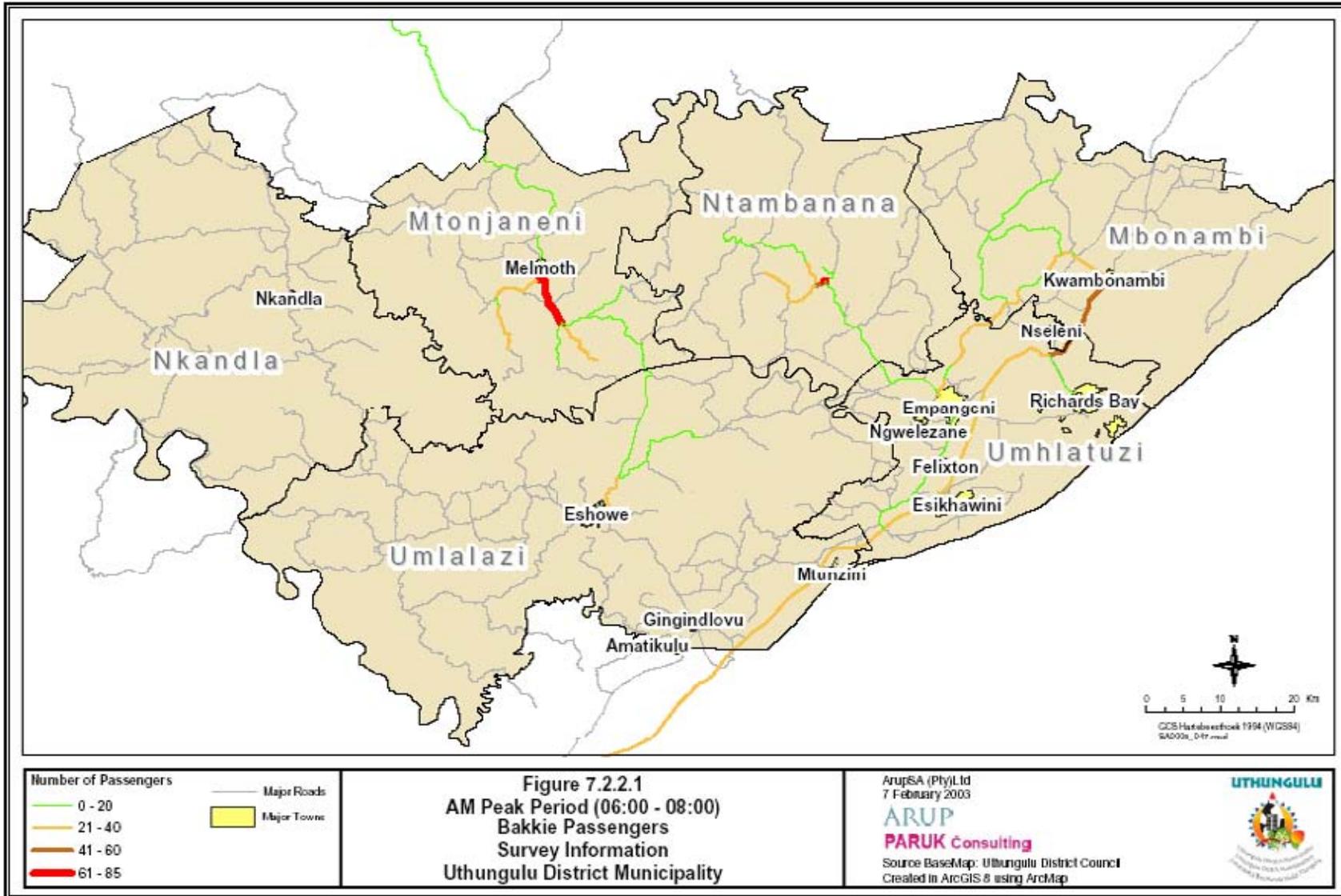
Figures 7.2.1.1 shows the total bakkie trips within uThungulu District Municipality. This information was extracted from the GIS system and is based on the surveys at the different ranks. It can be seen that a large of bakkie routes are evident within rural areas on lower order gravel roads.

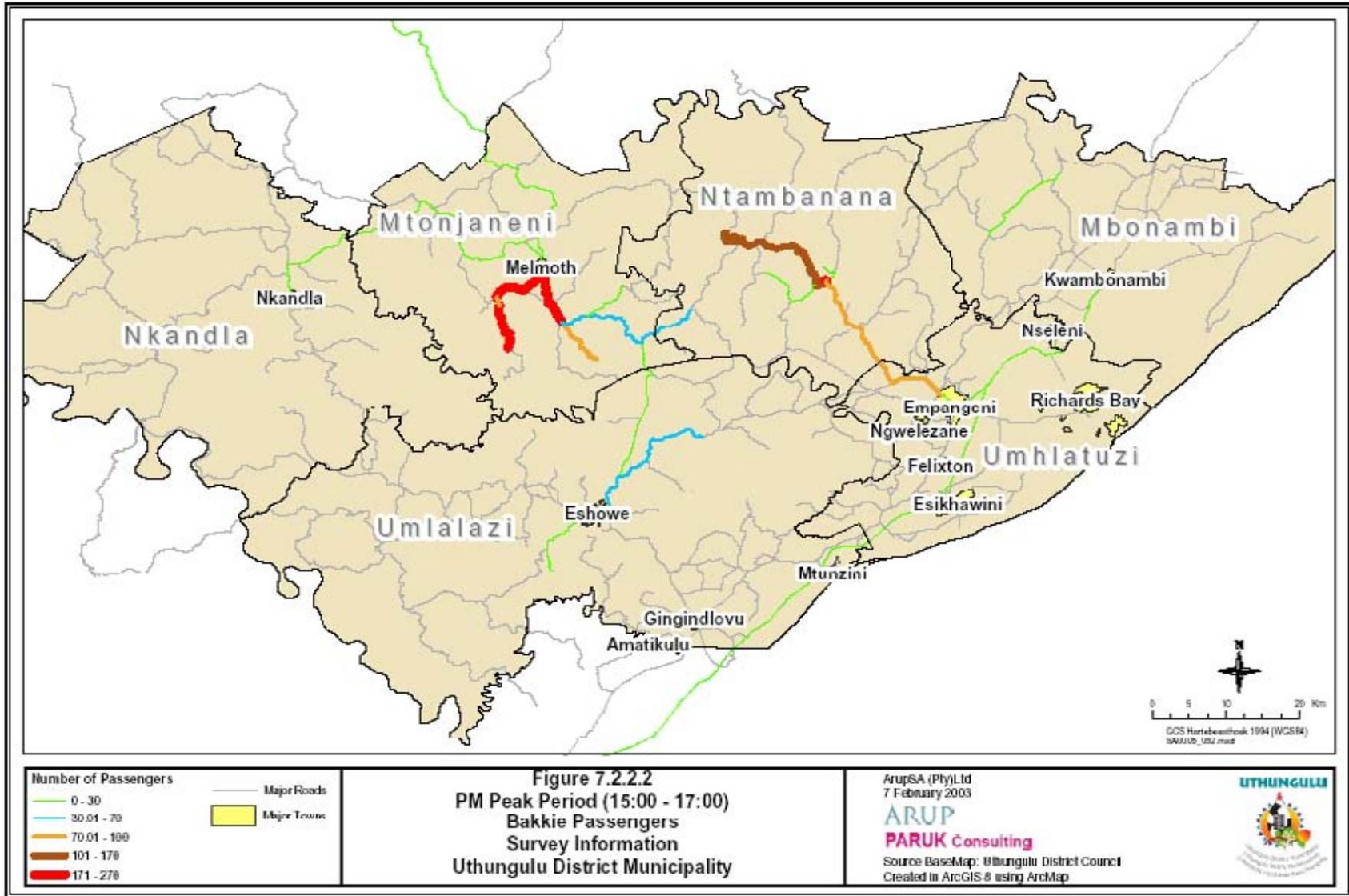
7.2.2 Passenger Movements

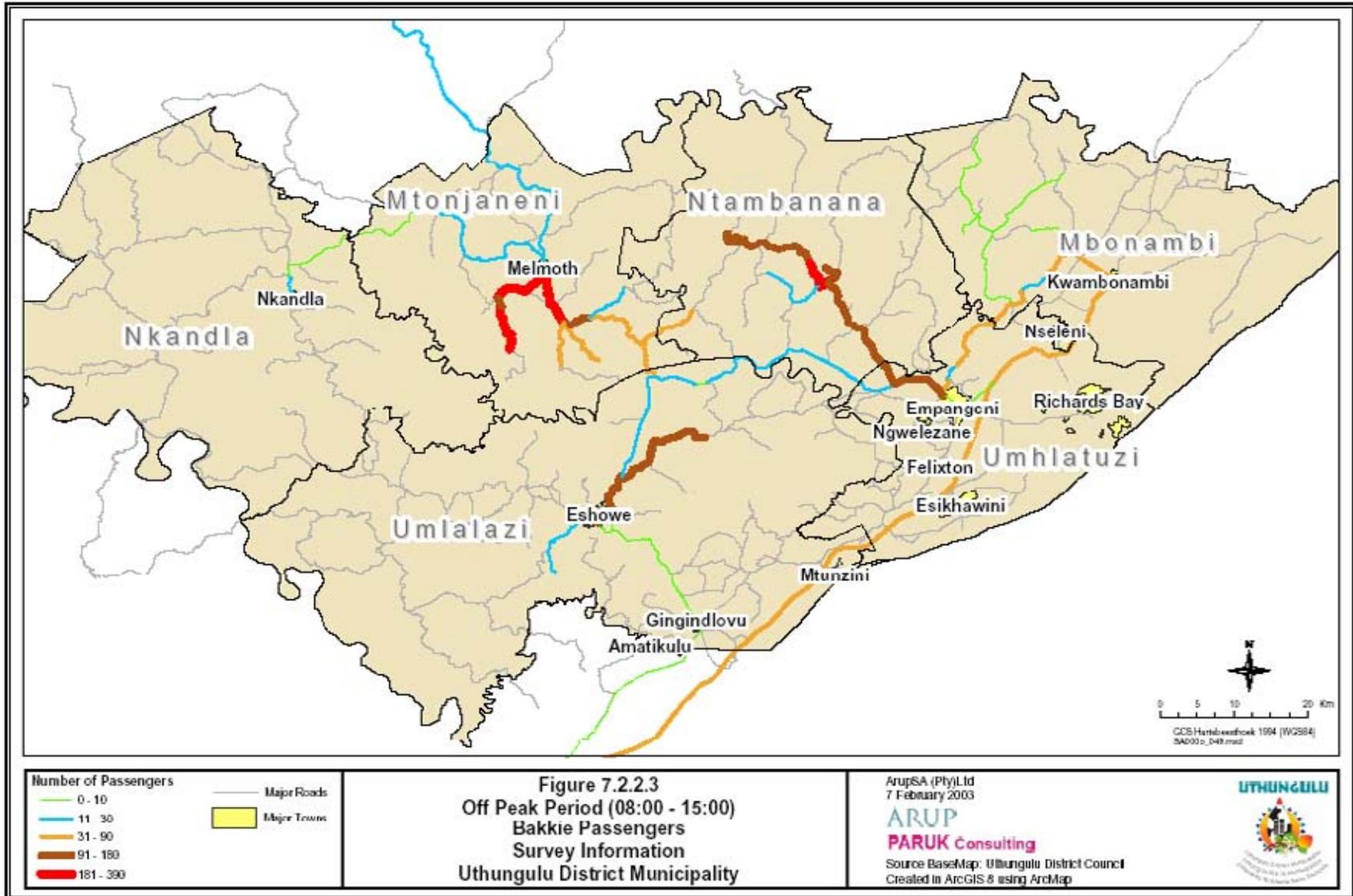
As was mentioned earlier in the report a total number of 10 348 passengers were transported during the 12 hour period. During the AM peak period some 1 808 passengers travel within uThungulu, 2 034 passengers travel within the PM peak period and 5 611 passengers in the Off Peak period.

Figure 7.2.2.1; Figure 7.2.2.2 and Figure 7.2.2.3 show the AM Peak (06:00 to 08:00), PM Peak (15:00 to 17:00) and Off-Peak (08:00 to 15:00) passenger volumes according to the surveys.









Melmoth has the highest presence of bakkie transport in uThungulu. Melmoth has its own bakkie rank which is separate from the minibus-taxi rank. **Figure 7.2.2.1**, AM peak period, shows no distinct peak passenger movements except for areas close to Melmoth. The PM and Off peak periods however have more distinct passenger movements. Routes in the vicinity of Melmoth and Ntambanana have the highest passengers movements during the PM peak period, with Melmoth, Eshowe, Buccanana and Kwambonambi featuring during the Off peak period.

7.2.3 Service Capacity and Capacity Utilisation

The capacity of the bakkie transport is determined by multiplying the actual numbers of trips with the maximum capacity of a bakkie, which was taken as 10 passengers. Using the maximum capacity of a bakkie and the number of trips it was calculated that the capacity of the bakkie service is approximately 25 000 (24 580) passengers.

The survey results on the other hand showed that the actual number of passengers transported by bakkies were only 10 348. The average utilisation can then be calculated to be 42 percent. Detailed bakkie utilisation per route is available on the GIS system.

The service capacity and utilisation for the AM, PM and OFF peak period is shown in **Table 7.2.3.1** below.

Table 7.2.3.1: AM, PM and OFF peak period bakkie capacity and utilisation

Peak period	Vehicle Trips		Vehicle Capacity	Service Capacity		Actual Passengers		Utilisation (%)	
	IN	OUT	Seated	IN	OUT	IN	OUT	IN	OUT
AM (6 AM – 8 AM)	207	215	10	2070	2150	1051	757	50.8%	35.2%
OFF (8 PM – 3 PM)	765	670	10	7650	6700	3301	2310	43.2%	34.5%
PM (3 PM – 5 PM)	173	247	10	1730	2470	723	1311	41.8%	53.1%

(The hour between 17:00 – 18:00 has not been included in the table but is shown in the total quoted in the report.)

From the above figures it can be seen that the AM, PM and Off peak periods have similar utilisation levels. Inbound bakkie transport during the AM peak period shows much higher utilisation than the outbound journey for the same peak period. During the PM peak period the outbound bakkie journey shows higher utilisation levels.

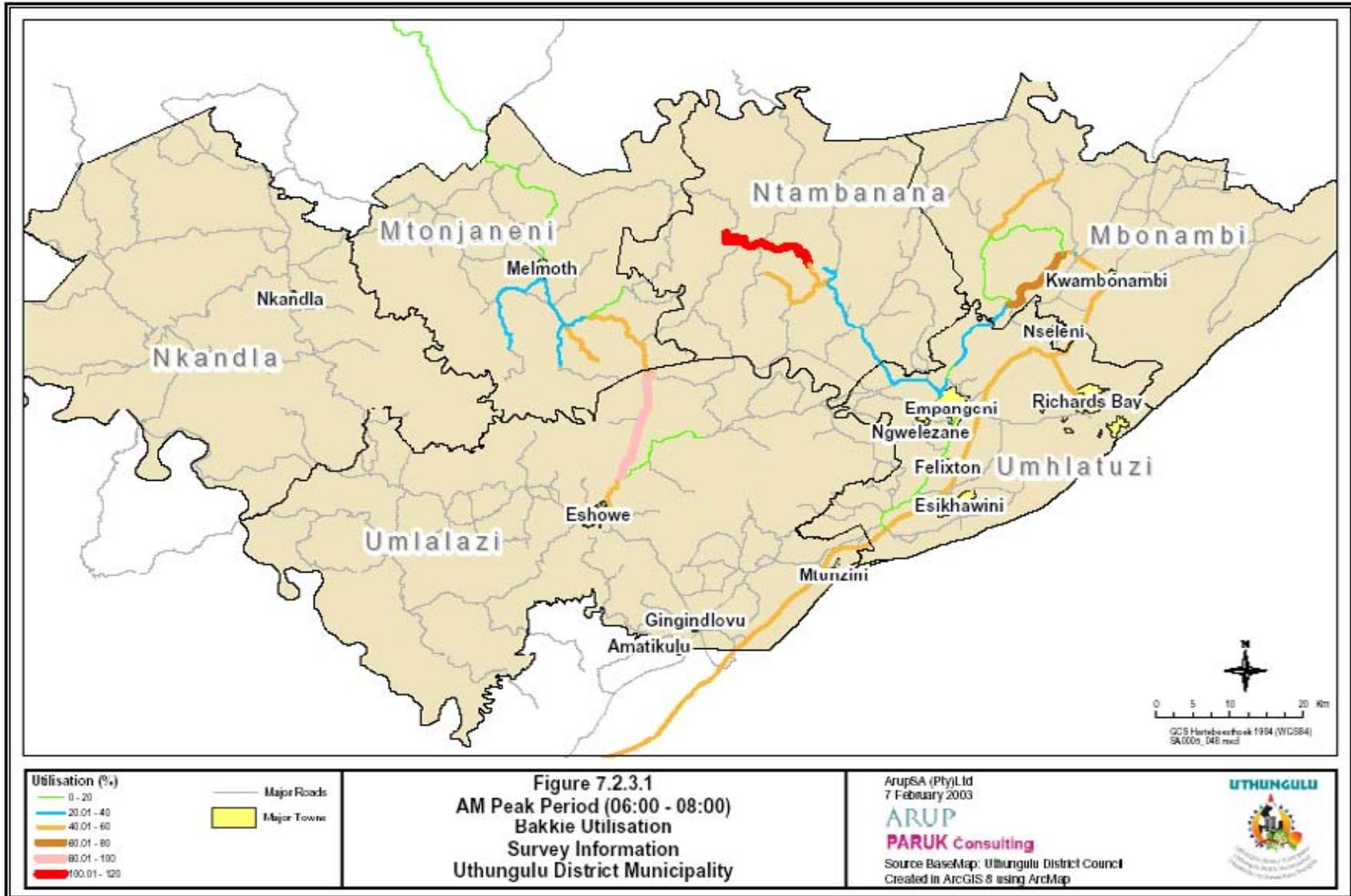
Figure 7.2.3.1, **Figure 7.2.3.2** and **Figure 7.2.3.3** represent the bakkie AM Peak, PM Peak and Off Peak utilisation respectively.

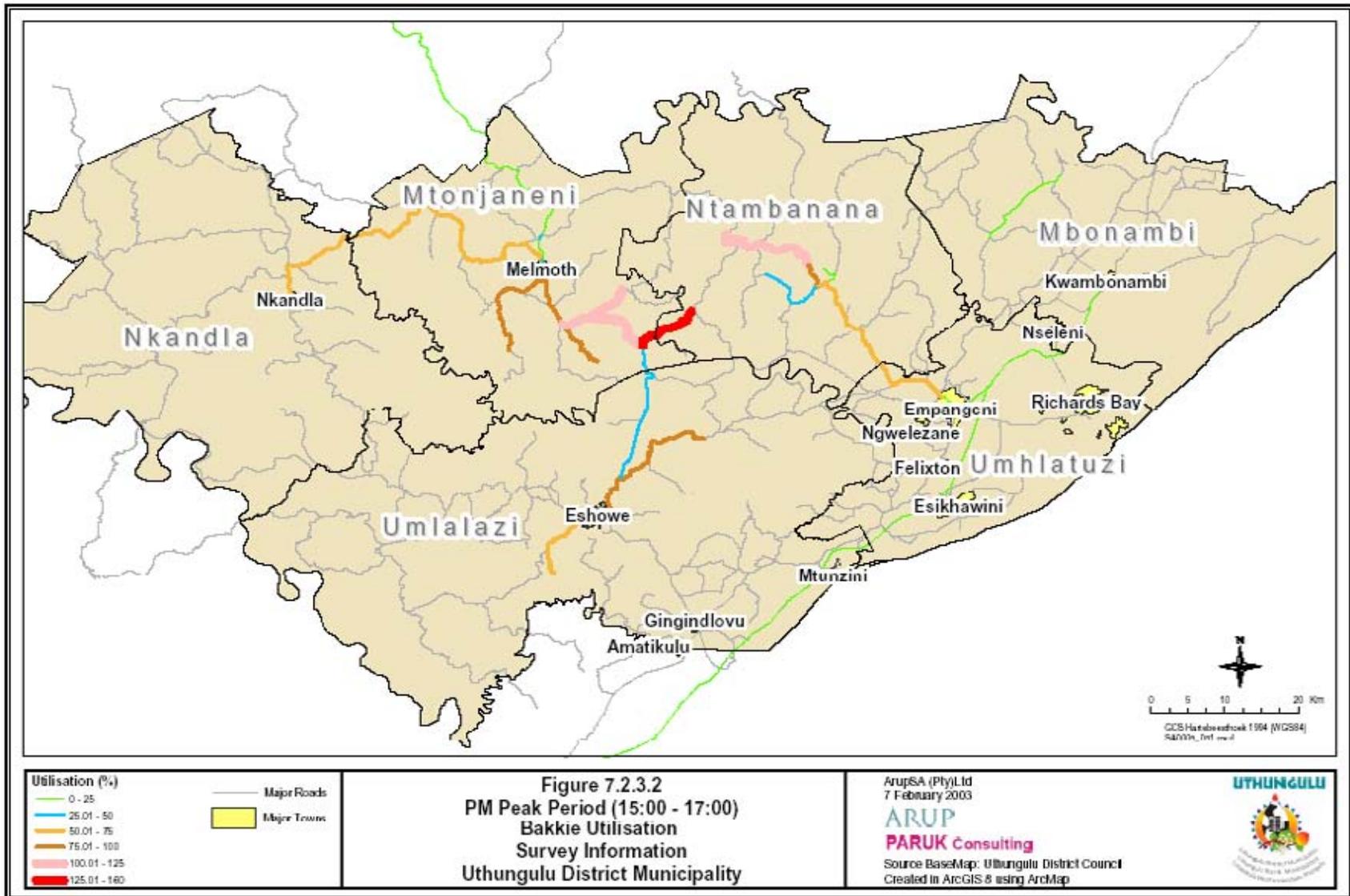
During the AM Peak period (**Figure 7.2.3.1**) bakkie services operate at utilisation levels of 40% or more. Bakkie routes close to Eshowe and Ntambanana operates at utilisation higher than 80 percent.

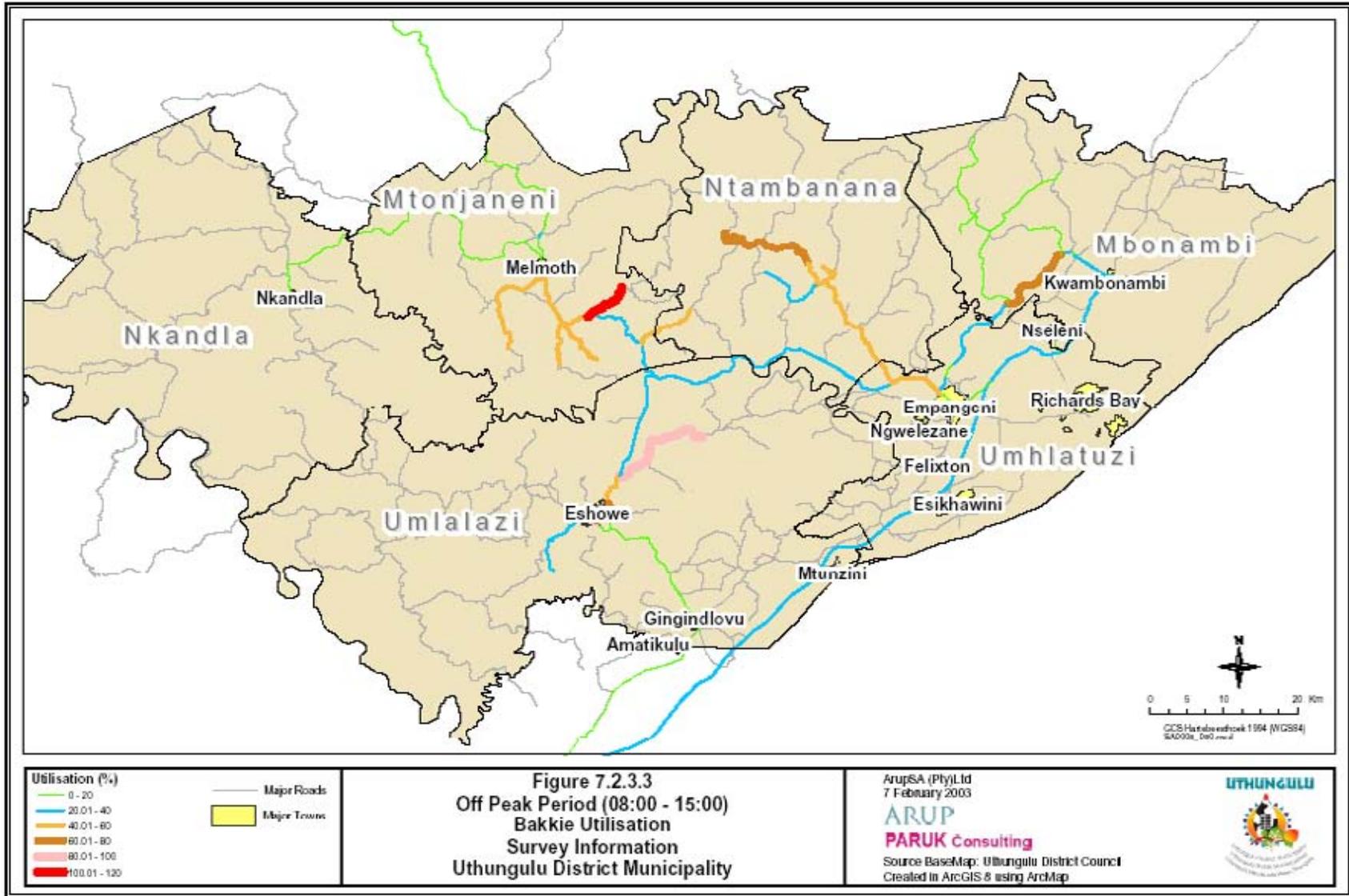
During the PM peak (**Figure 7.2.3.2**) and OFF Peak period (**Figure 7.2.3.3**) bakkie routes in rural areas show the highest utilisation levels of 100 percent or more. Utilisation levels on most routes around Melmoth and Eshowe where again between 75% and 100%. The PM peak period further showed that trips in Ntambanana also has utilisation levels of more than 100%.

Figure 7.2.3.3, the Off peak period, shows utilisation levels of more than 60 percent for most bakkie routes.

The low frequency and utilisation of bakkie transport in urban areas suggests that bakkie transport is aimed at providing a service to the rural community where other public transport is not available and the conditions of roads is less favourable for other modes of public transport.







8. METERED TAXI INDUSTRY

8.1 General Trends

Metered taxi services operate in a completely different manner when compared with the minibus-taxi industry for example. They provide a personalised service to individuals or small groups travelling together. No formal surveys were conducted amongst the metered taxis operating in the uThungulu region due to the nature of the service provided and the lack of any formal metered taxi rank facility. Instead information on the metered taxi industry was gathered through meetings with relevant metered taxi operators. It was determined that metered taxis almost exclusively operate within uMhlathuze region between Richards Bay and Empangeni with limited long distance trips outside this area.

No formal metered taxi association exists within the local industry. A metered taxi forum, the Harbour Operators Forum, was however established to attend to metered taxi operations in and around Richards Bay Harbour. This forum deals with the operations of metered taxis and entry permits to Richards Bay Harbour. The National Port Authority and Border Police are responsible for granting permits to metered taxis and other public transport operators operating within the harbour area since this area is private property and therefore falls outside the jurisdiction of the LRTB or Operating License Board.

The granting of entry permits to operate in the Richards Bay Harbour area is based on the need for public transport for both workers in the area as well as visitors to the harbour. Bus operators are mostly responsible for providing public transport for workers in the harbour area while metered taxis provide a transport service to people visiting the harbour and seamen needing to travel from the harbour to the surrounding area.

8.2 Extent of Metered Taxis Operations

As mentioned earlier in the report there are ten known metered taxi operators in uMhlathuze area with the majority of the metered taxi operators having one or two vehicles. It is estimated that there are 43 vehicles, some of them without legal public transport permits, operating in the area. According to the OLB only 33 permits have been granted to metered taxis in uMhlathuze region. This suggests that there are about 10 illegal metered taxis operating in the area.

The metered taxi operators have follow the same procedure as all other public transport operators when applying for a public transport permit. After applying for a permit the OLB will forward the application to the uMhlathuze Taxi Liaison Committee or Forum where one can object to granting the permit. When the permit is granted it allows for transporting passengers without having to travel on a fixed route.

8.3 Passenger Profile and Numbers

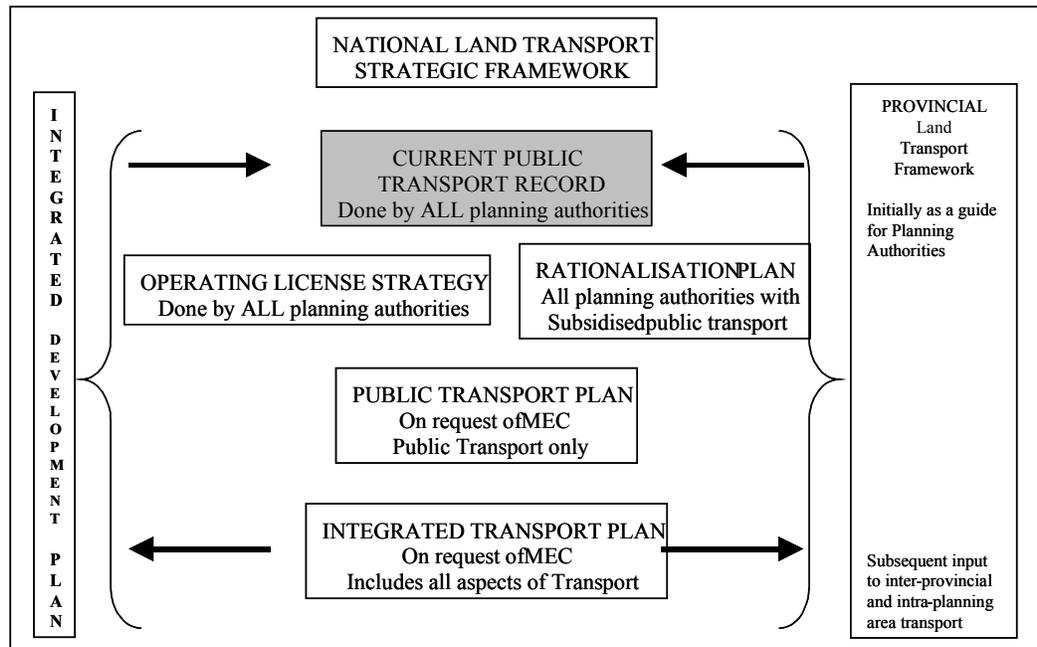
Based on discussions with metered taxi operators, it was established that the majority (90%) of passengers transported are local residents travelling to town with tourists and other passengers contributing a mere 10%.

The metered taxi industry operates on the basis of responding to a telephone call and then providing a service direct from the address of the telephone call to a given destination. Since the fare structure is based on a fixed fee from an origin to a destination and not on the number of passengers, no detailed information is available on the number of passengers transported. Based on the discussions and taking into consideration the type (sedan) of vehicles used, it is estimated that the metered taxi business transports approximately 500 passengers per day.

9. WAY FORWARD

9.1 Introduction

This report provides an overview of the status quo of public transport within uThungulu District Municipality. The detailed database and GIS on which this report is based provides more detail on the daily public transport operations in uThungulu. In order to use the CPTR as a planning and development tool, it is necessary to look at the broad framework in which the CPTR has been compiled in order to understand the importance of the CPTR in the Public Transport planning process. The diagram below provides the framework in which the CPTR is carried out and provides an indication on the way forward.



9.2 Future Strategy

In order to justify the expenditure for preparing the CPTR, it is important to continue the process and to prepare an Integrated Transport Plan (ITP) and to ensure that the available data is supplemented and updated on a regular basis. This will ensure that the ITP can be used as an effective transport planning tool from which uThungulu will be able to make informed decisions. The following packages of work should be considered:

- The CPTR should be used as a planning and decision making tool and as input for all future public transport planning in uThungulu and should be updated annually as stipulated by the guidelines for preparing a CPTR.
- The CPTR and the accompanying GIS that has been developed for uThungulu should be developed further to make it user friendly and accessible to all role players within the public transport sector to assist in the decision making process. This point is expanded upon in Section 9.3.

- The CPTR will be used as input for preparing the following documents that will eventually be used to prepare the Integrated Transport Plan (ITP) for uThungulu:
 - Operating License Strategy,
 - Rationalisation Plan aimed at subsidised public transport, and
 - Public Transport Plan if required.

9.3 GIS Data Base

Enormous effort has been spent on developing the GIS component of the CPTR. To derive maximum benefit from the GIS, it needs to be developed in such a manner that informed decisions can be made based on agreed criteria.

We are aware that Uthungulu's GIS Department has pioneered the development of a web-based interface with their Rural Water Project GIS, the purpose being to provide officials with a user-friendly tool to undertake proper planning in the rural water sector.

We understand that the tool has been developed in such a manner that the user does not require any particular knowledge of GIS or data base development. In other words the user is provided with a tool, which can be interrogated based on a set of criteria. We believe that the CPTR GIS should be developed to provide a similar interface.

10. SUMMARY / CONCLUSION

This report describes the extent of public transport including bus, minibus-taxi, bakkie and metered taxi transport in uThungulu. The report further investigates all issues relating to public transport and provides information on the process of completing the CPTR and the usefulness of the available guidelines.

In general more than 203 000 (203 881) passengers are transported on a daily basis in uThungulu. In order to transport these passengers the bus service provides for 3 230 vehicle trips per day while the minibus-taxi and bakkie industry contributes a further 16 301 vehicle trips per day. Metered taxi operations are limited to the uMhlathuze region and contribute little to the public transport service with only 500 passenger trips per day.

The preparation of the basic CPTR for uThungulu provided the opportunity to evaluate the latest guidelines and report on the usefulness of these guidelines, the reliability of the information gathered and the lessons learnt for during the exercise.

The guidelines provided by the National Department of Transport have certain requirements that need to be fulfilled. The guidelines provide the user with pro-forma survey forms and give broad guidance on the methodology for completing the CPTR. uThungulu District Municipality were one of the first local authorities to complete the CPTR under the new guidelines provided. Therefore the whole methodology, survey forms etc have not been applied in practise and it is considered appropriate to reflect and evaluate the usefulness thereof.

The bus information gathered through the bus operators was based on the monthly subsidy forecast and information sent to the Provincial Department of Transport. The passenger numbers quoted by the bus operators were based on the number of ticket sales per month. The utilisation figures calculated therefore addresses the utilisation along bus routes. The on-site surveys were undertaken on one day and only included ranks/termini. Bus operations are not bound to ranks/termini with several bus routes starting and ending outside the surveyed ranks/termini whilst some routes only run on certain days of the week. The bus surveys and formats as proposed by the National Department of Transport are not able to verify the data received from the bus operators.

The utilisation figures calculated using survey information showed much lower utilisation figures than the figures from the bus operators. The on-board surveys however showed that many passengers were boarding and alighting buses along bus routes. The average number of passengers boarding and alighting (44 and 43) along bus routes is almost 67 percent of the bus capacity and it can be argued that this passenger activity along bus routes will result in higher utilisation figures based on surveys.

Since this is the first CPTR for uThungulu District Municipality and given the time constraints to complete the CPTR before the deadline set by the National Department of Transport it was not possible to conduct any additional surveys to confirm the results of the initial surveys. The inconsistencies between the bus operator information and the information gathered through the surveys can be attributed to several reasons as discussed in the report. It is however important to identify shortcomings with regard to the methodology proposed by the National Department of Transport and make suggestions towards improving the proposed guidelines for future use by other local authorities embarking on similar studies.

The lessons learnt can be summarised as follows:

- It is important when preparing the first CPTR, for any local authority, to develop a well thought through framework and methodology keeping in mind the future use of the CPTR data that is gathered and what outputs are required for further studies,

- Available public transport data should be evaluated before hand to assist in developing survey forms, survey methodology and executing surveys. The pro-forma survey forms provided by the National Department of Transport should only act as guideline when preparing survey forms.
- Any further CPTR studies or surveys should be aimed at complimenting the existing CPTR and the second CPTR should address any inconsistencies in the data and should be used to update as well as verify the existing data.
- The proposed outputs and tables as required by the National Department of Transport to ensure unity for all CPTR's should be assessed before commencing with the study to ensure that the data that is gathered will be useful and not 'nice to have'.

More on a positive note:

- The information received from the bus operators is now available in one database that can be used and analysed electronically to verify the correctness of the information received from bus operators in paying out subsidies.
- The GIS application of the available public transport allows for the CPTR to be a useful decision making tool. In other words, the available data can assist in the prioritisation of the upgrading of routes and ranks, the granting of public transport permits and to identify areas where there is a demand and need for public transport and facilities.
- Public Transport information is easy accessible to all end users and decision makers.
- A consolidated database is available that can be compared with other regions and that can be easily updated in the future.

APPENDIX A1

FACILITY INVENTORY FOR TERMINI, RANKS AND HOLDING AREAS

(The following Questions will be answered using the Handheld PC and GPS while surveying)
Should coincide with Form 4 - Facilities - Manual

SURVEY FORM 4**FACILITY INVENTORY FOR TERMINI, RANKS AND HOLDING AREAS**

1	Name of Surveyor						
2	Date of Survey						
3	Facility Name						
	Location of Facility (town & street address)						
4	Mode of Transport	Minibus-taxi	Bus				
5	Status of Facility	Formal	Informal				
6	Type of Facility	Terminus					
		Rank					
		Holding Area					
7	Type of Service	Commuter					
		Interprovincial					
		Long Distance					
		Cross-Border					
8	Location of Facility	On-Street	Off-Street				
9	Total Number of Loading Bays						
	Total Number of Holding Bays						
	Is a formal off-loading area available	Yes	No				
10	Is Paving available	Yes	No				
11	Is curbing available at loading platforms	Yes	No				
12	Amenity	Quantity	If available, indicate condition			If not available, is it required	
			Good	Average	Poor	Yes	No
	Curbing						
	Paving						
	Shelter						
	Toilet						
	Tap						
	Seat						
	Dustbin						
	Lighting						
	Destination board						

APPENDIX A2

CAPACITY AND CAPACITY UTILISATION OF RANKS/TERMINI

APPENDIX A3

USER NEEDS AND PREFERENCES FOR MINIBUS-TAXI AND BUS

USER NEEDS AND PREFERENCES FOR MINIBUS-TAXI AND BUS

1	Name of Surveyor			
2	Date of Survey			
3	Facility Name			
4	What mode of transport are you going to use now	Minibus-taxi	Bus	Bakkie
5	Where did your trip start? (Origin)			
	Where will your trip end? Where are you going to? (Destination)			
6	What is your trip purpose?	Work		
		School		
		Shopping		
		Other, specify		
7	How often do you make this trip?	7 days/week		
		6 days/week		
		5 days/week		
		2-4 days/week		
		1 days/week		
8	How many times do you have to change from one vehicle to the next to get from your origin to destination?			
	How do you feel regarding the number of times you have to change from one vehicle to the next?	OK/ Acceptable	Not Acceptable	
9	What time do you usually start your trip / leave home	__h__		
10	How long do you wait before your taxi or bus leaves			
11	How long do you travel to reach your destination?			
	Do you feel that your travelling time is:	OK/ Acceptable	Not Acceptable	



12	How much do you usually pay for your total trip?			
	Do you think the cost of your trip is:	Cheap	OK/Acceptable	Expensive

13	What is your preferred mode of transport?	Minibus-Taxi
		Bus
		Other, specify
	Why do you prefer to use this mode?	

14	Do you have any problems with the minibus-taxi or bus service	YES	NO
	If YES, List the problems you experience:		

15	Indicate your satisfaction with the following:			
		Satisfied	Neither satisfied nor unsatisfied	Unsatisfied
	Walking Distance from home to the first boarding point			
	Walking distance from the point where you leave your transport to go to your ultimate destination (e.g. work)			
	Conditions of this facility			
	Condition of the vehicles (in terms of the trip that you are going to make)			
	Driving habits of drivers (in terms of the trip that you are going to make)			
	Personal safety and security (in terms of the trip that you are going to make)			
	Enough services (in terms of the trip that you are going to make)			

APPENDIX A4

ORIGIN, DESTINATION AND CAPACITY SURVEYS FOR BUS, MINIBUS-TAXI AND BAKKIE

APPENDIX A5

ON-BOARD BUS SURVEYS – MORNING PEAK PERIOD

APPENDIX A6

WAITING TIME SURVEYS



WAITING TIMES FOR MINIBUS-TAXI AND BUS PASSENGER SERVICES

1	Facility Name			
2	Location of Facility (town & street address)			
3	Date of Survey			
4	Mode of Transport	Minibus-taxi	Bus	Bakkie
5	Destination			
6	Time when passenger arrives at back of que	____:____ (hour:minute)		
7	Time when passenger boards minibus-taxi/bus	____:____ (hour:minute)		
8	Time when minibus-taxi/bus starts	____:____ (hour:minute)		

APPENDIX A7

RURAL TRANSPORT CHARACTERISTICS (HOME INTERVIEW)



RURAL TRANSPORT CHARACTERISTICS (HOME INTERVIEW SURVEY)

1	Name of Surveyor	
2	Date of Survey	
3	Survey area (name of town / village)	

Signature _____

4	Age Category	Number of People in Household
	0-20 years	
	21 - 50 years	
	Older than 50 years	

5	What is the total monthly household income?		
	Less than R750 / month	Between R750 to R1500 / a month	More than R1500 / month

6 To be completed for each trip purpose during a typical week							
Trip purpose	Destination	Distance between Origin and Destination	Travel Time	How many times per week do you undertake this trip	What mode of transport do you use	At what time do you typically make this trip	How much do you pay for this trip

7	Comments on how your transport situation can be improved

APPENDIX B

DETAILED LIST OF ALL DATA RECEIVED

DATA RECEIVED

Coverage	File Name	Owner	Source	Processing	GIS Type	Projection	Scale	Date	Contact Person
Roads	allroads_2002.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Line	WGS 84	Unknown	2002	Minette Reynolds
Built Up Areas	built_up.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Municipalities	catb_mun.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Old TLC	old_tlc.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Settlements	settlements.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Tribal Authorities	tribal.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
uThungulu District Boundary	uthungulu_district.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Major Towns uThungulu	uthungulu_towns.shp	uThungulu District Municipality	uThungulu	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Election Wards	uthungulu_wards.shp	uThungulu District Municipality	Electoral Board	Projection Conversion	Polygon	WGS 84	Unknown	2002	Minette Reynolds
Road Links - CPTR	allroads_2002_CPTR.shp	uThungulu District Municipality		Conversion	Line	WGS 84	Unknown	2002	Minette Reynolds
Empangeni Cadastral Plots	empangeni_cad_inside.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Polygon	WGS 84	Survey		Kevin Blakslee
Empangeni Cadastral Plots	empangeni_cad_inside_line.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Line	WGS 84	Survey		Kevin Blakslee
Empangeni Cadastral Plots	empangeni_cad_outside.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Polygon	WGS 84	Survey		Kevin Blakslee
Empangeni Road Reserve	empangeni_roads.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Line	WGS 84	Survey		Kevin Blakslee
Empangeni Street Names	empangeni_street_names.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Point	WGS 84	Survey		Kevin Blakslee
Empangeni Suburbs	empangeni_suburbs.shp	Empangeni Local Town Council	Empangeni Local Council	Conversion (dwg to shp)	Polygon	WGS 84	Survey		Kevin Blakslee
Eshowe Street Reserve	eshowe_boundaries.shp	KZ 284 Umlalazi	KZ 284 Umlalazi	Conversion (dwg to shp)	Line	WGS 84	Survey		Karen Annandale
Eshowe Street Text	eshowe_street_text.shp	KZ 284 Umlalazi	KZ 284 Umlalazi	Conversion (dwg to shp)	Point	WGS 84	Survey		Karen Annandale
Ginginglovu Cadastral Plots	ginginglovu_cadastral.shp	KZ 284 Umlalazi	KZ 284 Umlalazi	Conversion (dwg to shp)	Polygon	WGS 84	Survey		Karen Annandale
Mtunzini Cadastral Plots	mtunzini_cadastral.shp	KZ 284 Umlalazi	KZ 284 Umlalazi	Conversion (dwg to shp)	Polygon	WGS 84	Survey		Karen Annandale
Mtunzini Street Text	mtunzini_street_text.shp	KZ 284 Umlalazi	KZ 284 Umlalazi	Conversion (dwg to shp)	Point	WGS 84	Survey		Karen Annandale
Richards Bay Bus Facilities	bus_facilities_richardsbay.shp	KZ 282 Umhlathuze	KZ 282 Umhlathuze	Projection Conversion	Point	WGS 84	Survey		Adri Borman