

KZN Department of Transport

Harry Gwala Integrated Public Transport Network

Infrastructure and Network Plan

Draft 1 | 19 March 2018



KZN Department of Transport
**Harry Gwala Integrated Public
Transport Network**
Infrastructure and Network Plan

Draft 1 | 19 March 2018

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It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number

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1 Introduction

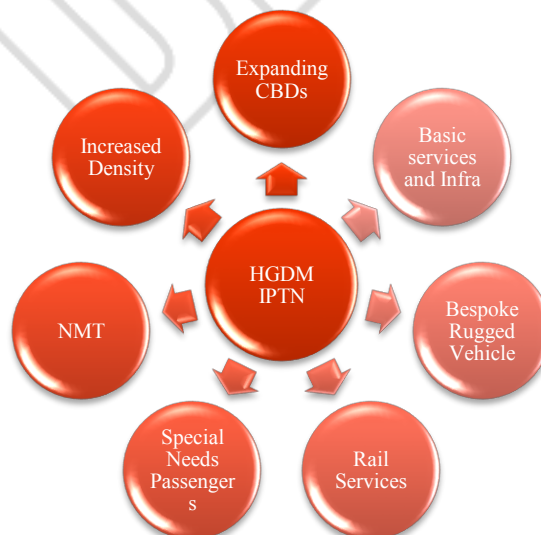
Arup (Pty) Ltd has been appointed by the KZN Department of Transport (KZN DOT) to undertake the development of the Harry Gwala District Municipality Integrated Public Transport Network (HGDM IPTN).

This infrastructure and network plan report seeks to provide an overview of the proposed system and the infrastructure that is required to support the system.

1.1 Summary of key informants

A summary of the key informants for the development of the IPTN was identified following the review of the relevant policy and planning documents. These informants will have the highest influence in the planning of the IPTN. These are as follows:

- Expansions of existing CBDs
- There is a drive for increase densities along existing corridors
- The provision of NMT facilities to public transport interchanges and between existing residential and commercial nodes
- The need to consider people with special needs in a rural context
- There is opportunity for rail service due to the presence of existing branch lines
- The need to design a bespoke vehicle that will accommodate the rugged terrain and accommodate for passengers and goods.



2 Summary of Status Quo

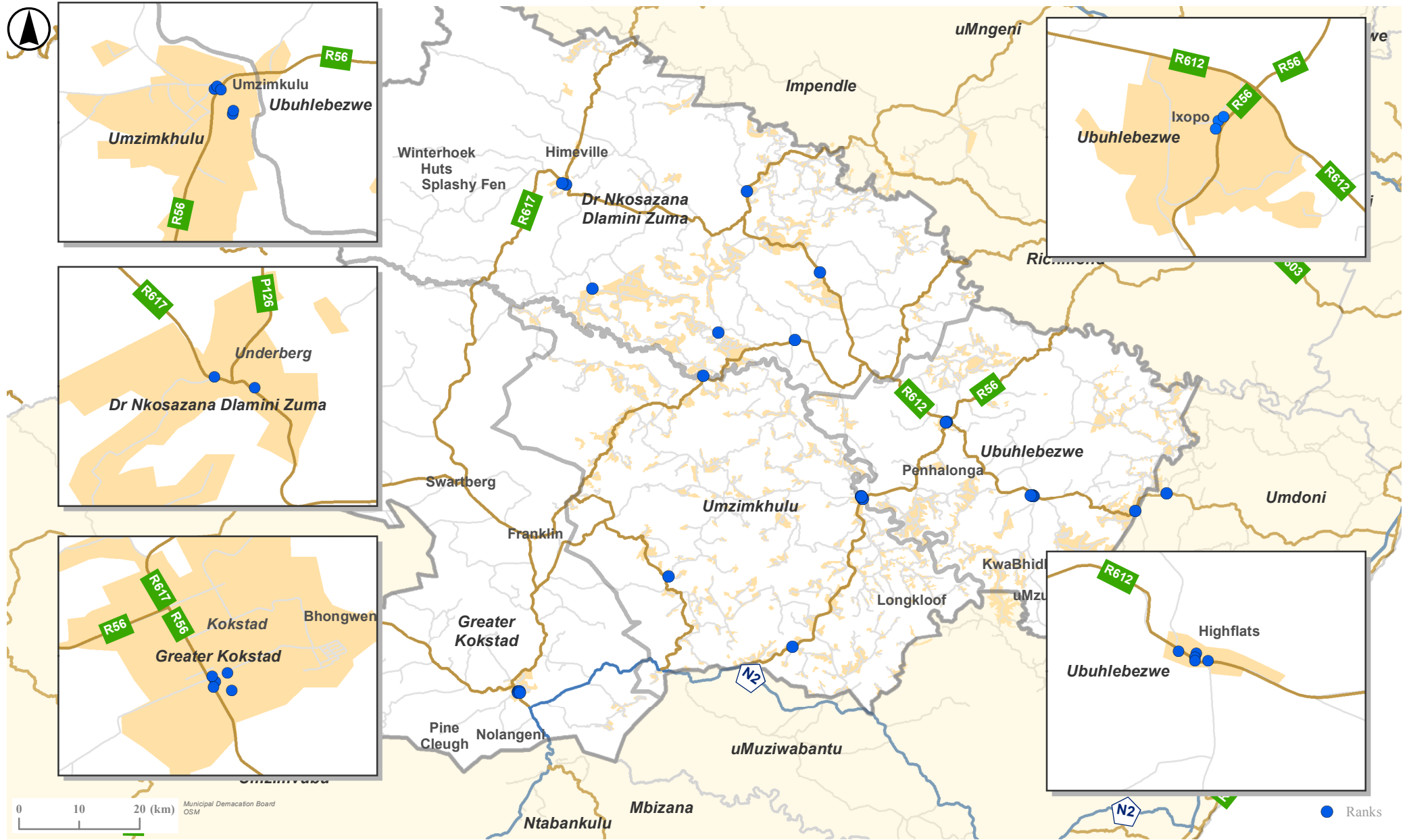
2.1 Ranks

There are about 29 formal and informal ranks in the Harry Gwala District Municipality. A list of these ranks is indicated in **Table 1**.

Table 1: List of Ranks

| Local Municipality | Town | Type | Formal/Informal |
|------------------------------|--------------------|---------------------------------------|-----------------|
| Umzimkhulu LM | Umzimkhulu | Taxi Rank | Formal |
| | | Bakkie Rank | Formal |
| | | Metered Taxi Rank | Informal |
| | | Umzimkhulu Mall Taxi Rank | Formal |
| | | Umzimkhulu Mall Bus Rank | Formal |
| | Rietvlei | Taxi Rank | Formal |
| | Sekelane | Taxi Rank | Informal |
| Riverside | Taxi Rank | Informal | |
| Ubhlebezwe LM | Ixopo | Taxi Rank | Formal |
| | | Old Bus Rank | Informal |
| | | New Bus Rank | Formal |
| | | Metered Taxi | Informal |
| | Highflats | Taxi Rank | Formal |
| | | Retail Centre Parking Area Taxi Ranks | Informal |
| Jolivet | R612/D20 Taxi Rank | Informal | |
| Greater Kokstad | Kokstad | Local Taxi Rank | Formal |
| | | Long Distance Taxi Rank | Formal |
| | | Bakkie Taxi Rank | Formal |
| | | Bus Rank | Formal |
| | | Metered Taxi Rank | Informal |
| Franklin | Taxi Rank | Informal | |
| Dr Nkosazana Dlamini-Zuma LM | Underberg | Taxi Rank | Formal |
| | | Metered Taxi | Informal |
| | Bulwer | Taxi Rank | Formal |
| | Kilmun | Taxi Rank | Formal |
| | Donnybrook | Taxi Rank | Informal |
| | Himeville | Taxi Rank | Informal |
| | Centacow | Taxi Rank | Informal |
| Creighton | Taxi Rank | Informal | |

The location of some of these ranks are illustrated in **Maps 1**.



2.2 Passenger Demand

The Inbound and outbound passenger demand within the Harry Gwala District Municipality for each of the three time periods was mapped out using GIS. Inbound in this instance refers to the number of passenger going into or towards a town (Umzimkhulu, Kokstad, Ixopo etc) and outbound refers to the number of passengers leaving a town.

The three time periods are:

- AM Peak: 06:00 to 09:00
- Midday: 09:00 to 15:00
- PM Peak: 15:00 to 18:00

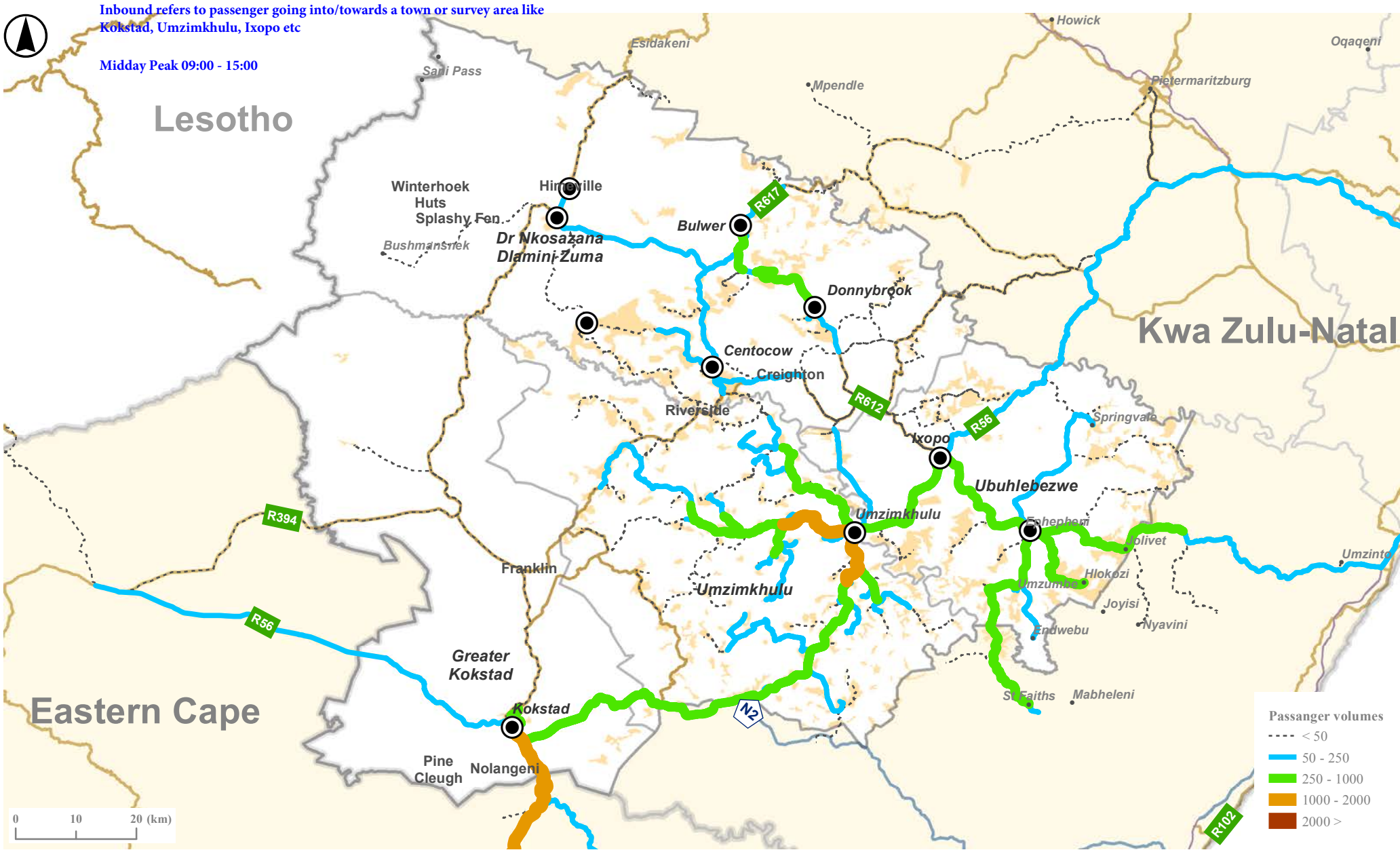
The respective inbound and outbound maps are shown in **Maps 2 to 7**. The following key trends were identified:

- There is a relatively high inbound volume into Kokstad, Umzimkhulu and Ixopo
- Very little outbound trips were recorded from the main towns during the AM peak hour. This is understandable since majority of the trips during the period would be inbound trips
- The number of outbound trips during the midday peak period is relatively high. This could be due to the fact that a high proportion of trips are educational and shopping related.
- During the PM peak period high outbound trips were noted from the all major towns. The following are some of the key movements.
 - Kokstad to Eastern Cape
 - Kokstad to local neighbouring residential areas (Shayamoya, Horseshoe etc)
 - Along the Umzimkhulu to Rietvlei corridor
 - Along the Umzimkhulu to Chancele corridor
 - Along the Ixopo to Donnybrook corridor

Map 2: Harry Gwala DM Inbound passenger volumes AM

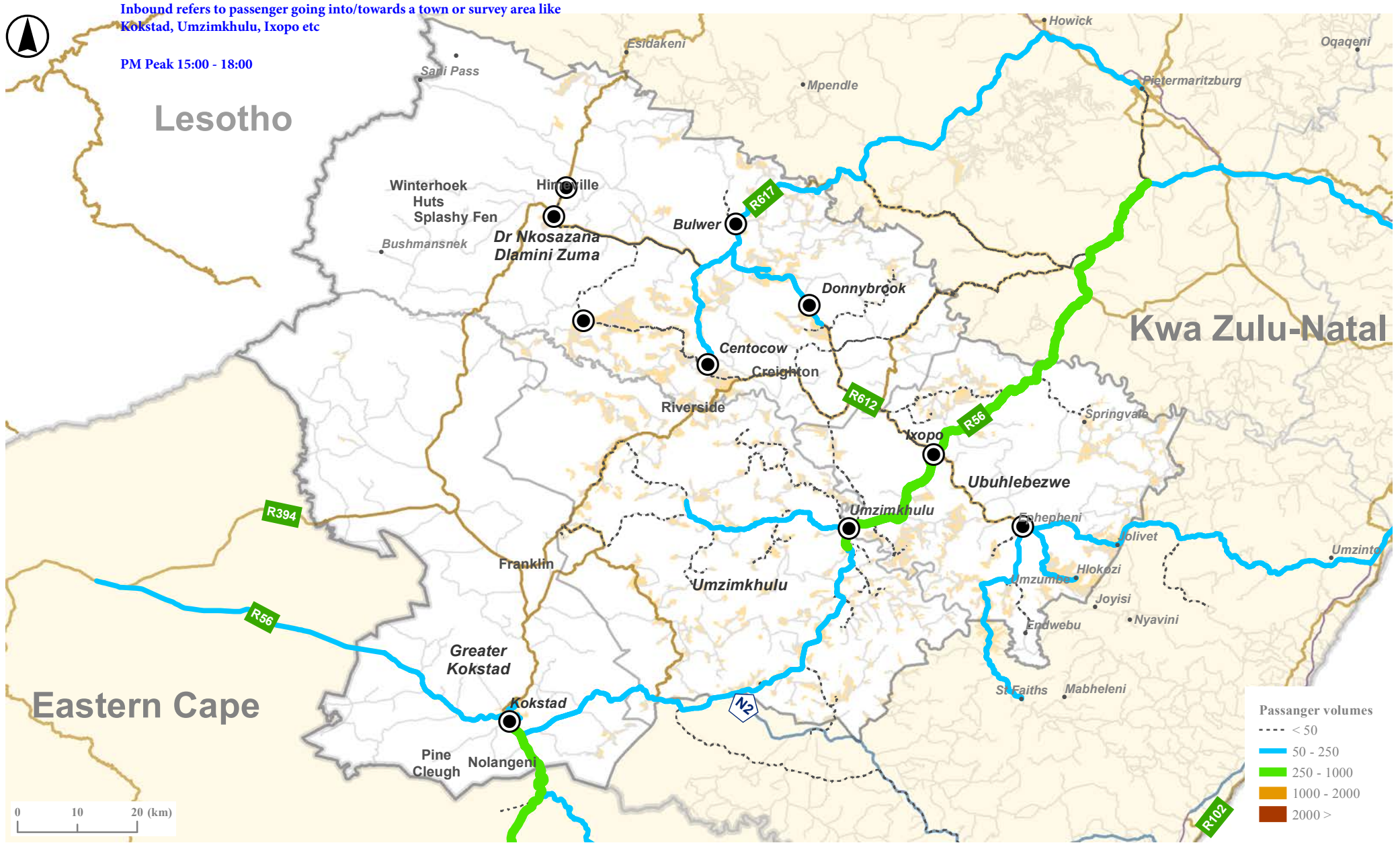


Map 3: Harry Gwala DM Inbound passenger volumes midday

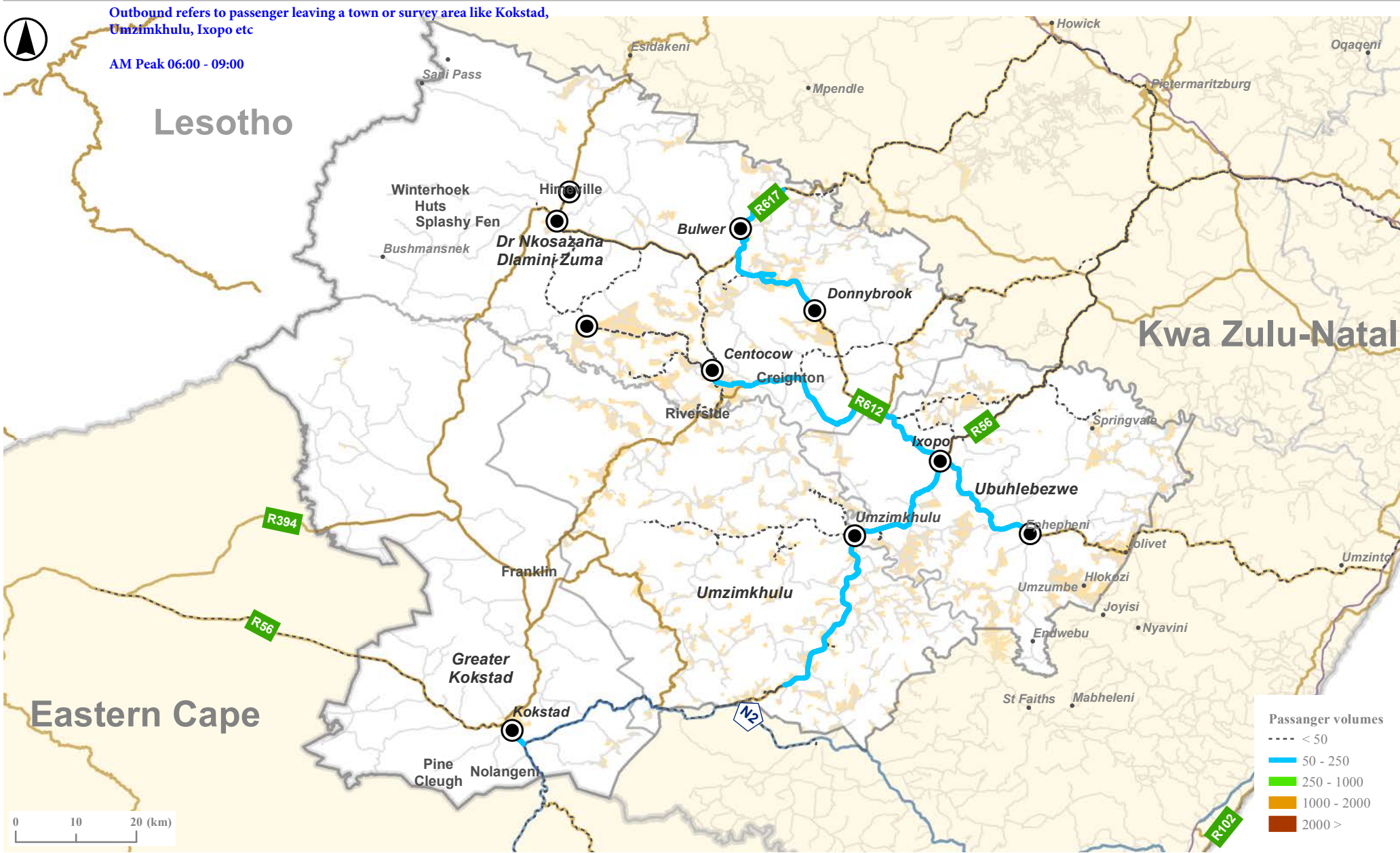


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Map 4: Harry Gwala DM Inbound passenger volumes PM

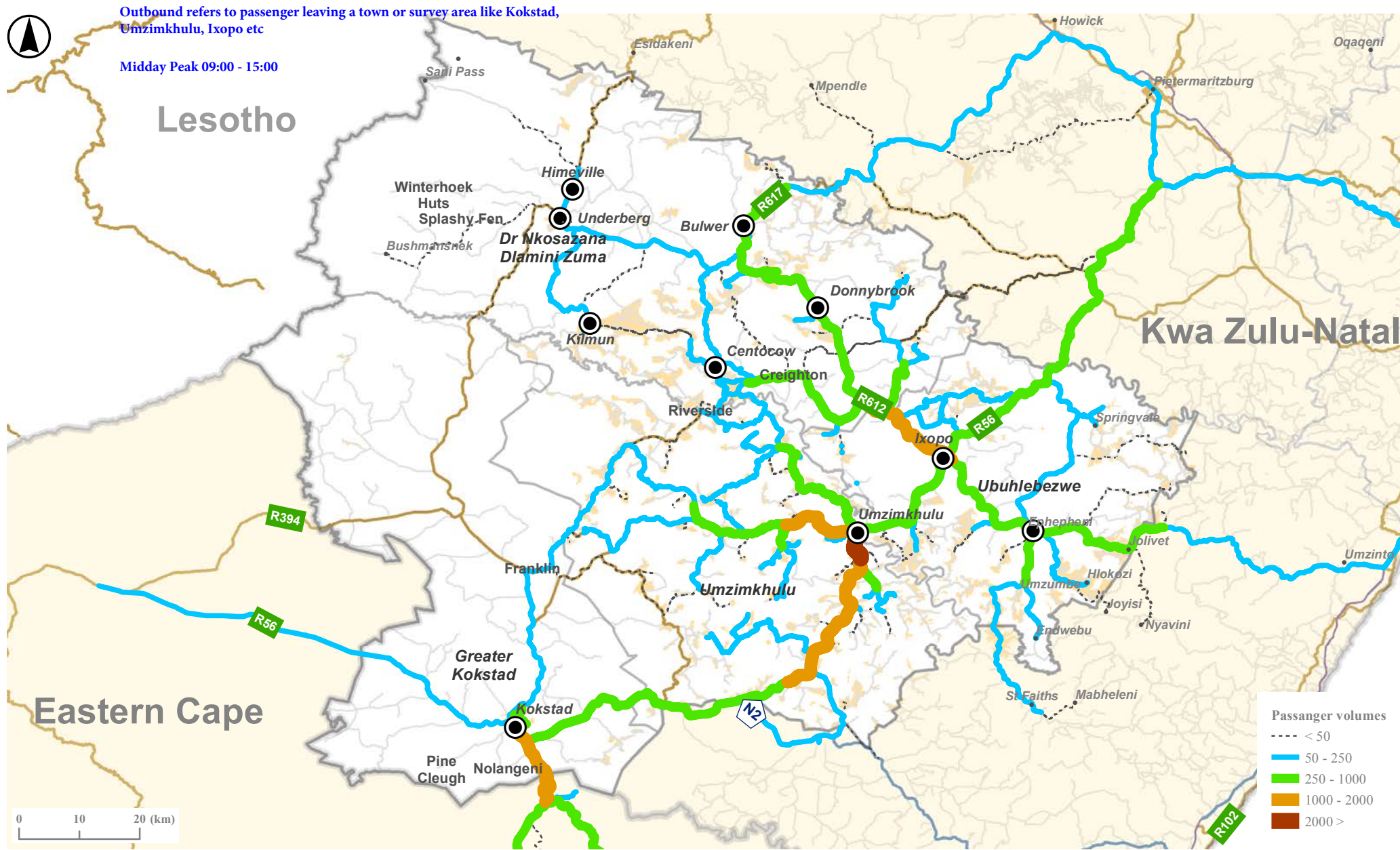


Map 5: Harry Gwala DM Outbound passenger volumes AM

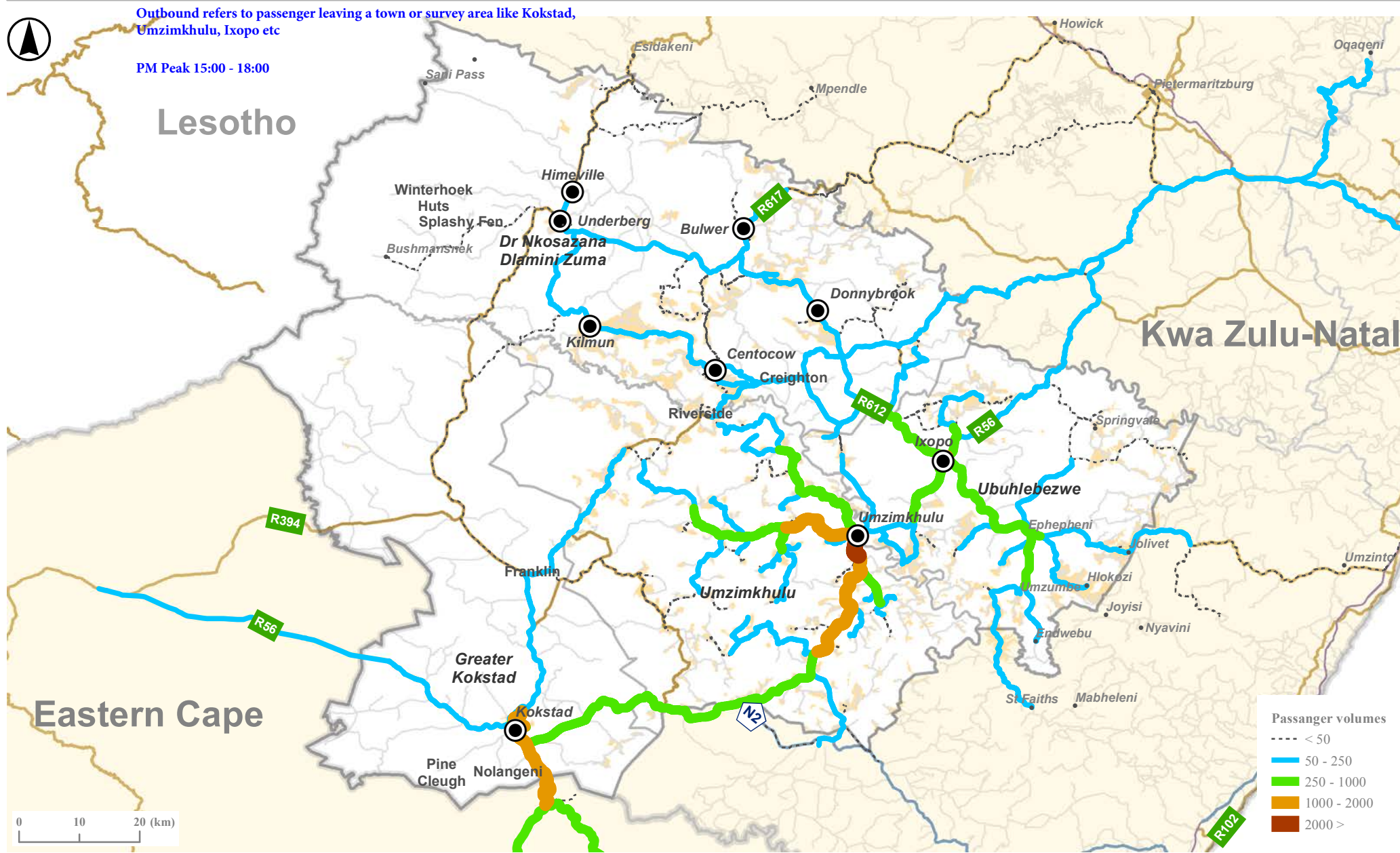


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Map 6: Harry Gwala DM Outbound passenger volumes midday



Map 7: Harry Gwala DMOutbound passenger volumes PM



3 Base Planning Maps

A set of demographics, spatial and infrastructure analysis was undertaken using GIS to determine amongst other things, the spatial density of different population groups and available infrastructure. This analysis will inform the planning decisions.

3.1 Study Area and Road Surface

Map 8 shows the extents of the district municipality whilst **map 9** show the road network in the DM distinguished between paved roads (blacktop) and gravel roads.

3.2 Settlement Pattern and Housing density

Map 10 shows the settlement pattern across the municipality and **Map 11** presents the housing density. The data indicates that the highest housing density is located around the major towns and mainly in the eastern side of the DM. The settlement patterns show that these settlements are primarily located around Umzimkhulu, Highflats Bulwer and, to an extent, Ixopo nodes. The northern western quadrant of the DM has little or no settlements.

3.3 Population Density

The population density in the DM is presented in **Map 12**. The data shows that the highest population density matches the housing density with the higher density recorded around the CBDs and, overall, the eastern side of the DM.

3.4 Scholar Density and Schools

Map 13 presents a map showing the scholar density with the location of schools in the district municipality. The data indicates that the scholar density matches the population density in the DM.

3.5 Persons with disability and Medical Facilities

A density map indicating location of persons with disabilities is presented in **Map 14**. As in the case with scholar density, the disability density map, matches the population density by and large.

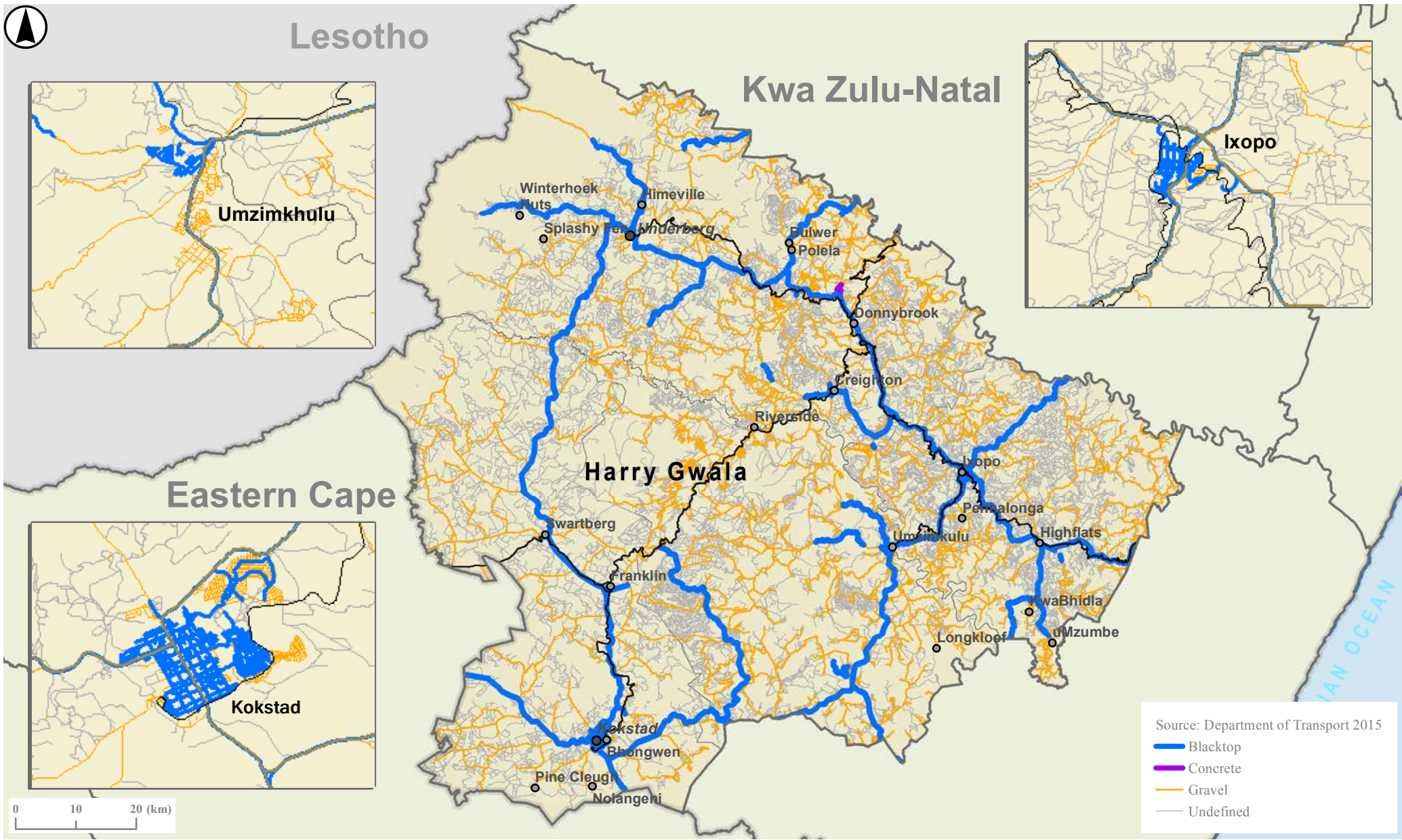
Map 15 shows the location of medical facilities with the DM.

3.6 Average Household Income and Unemployment

Map 16 illustrates the Average Annual Household Income in the DM per area. The data indicates that the higher income is recorded around the main towns such as Ixopo, Kokstad, Umzimkhulu, Creighton and Underberg.

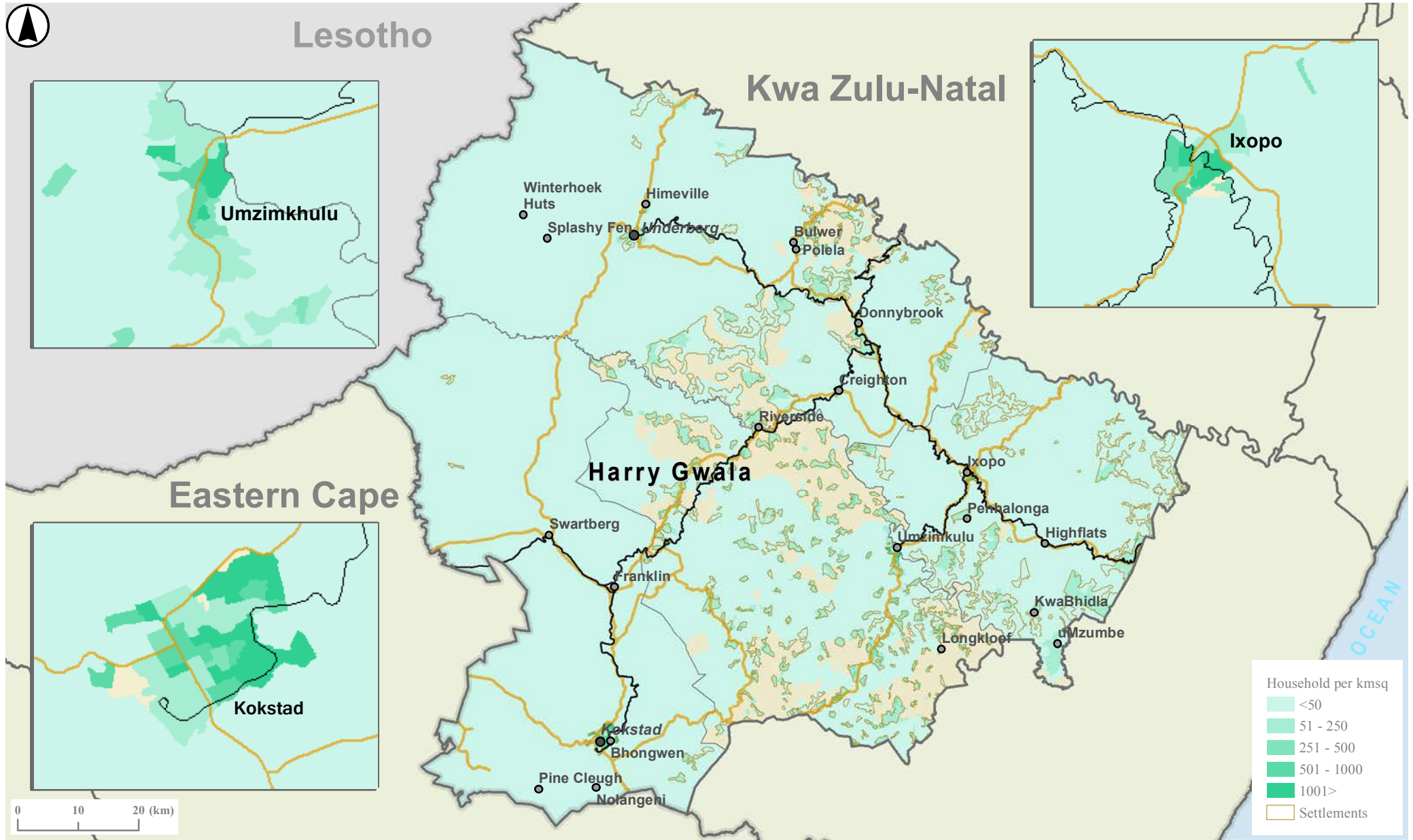


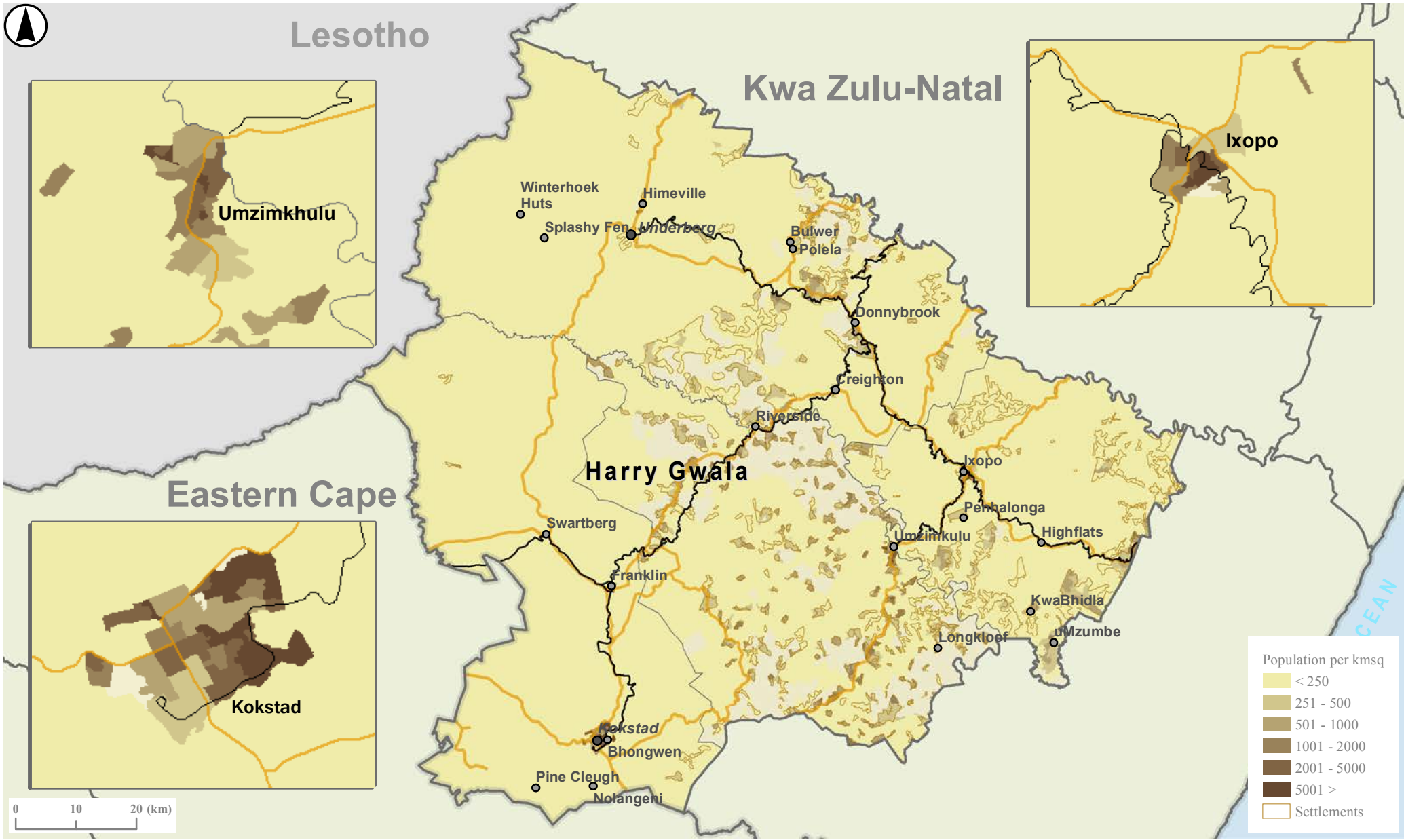
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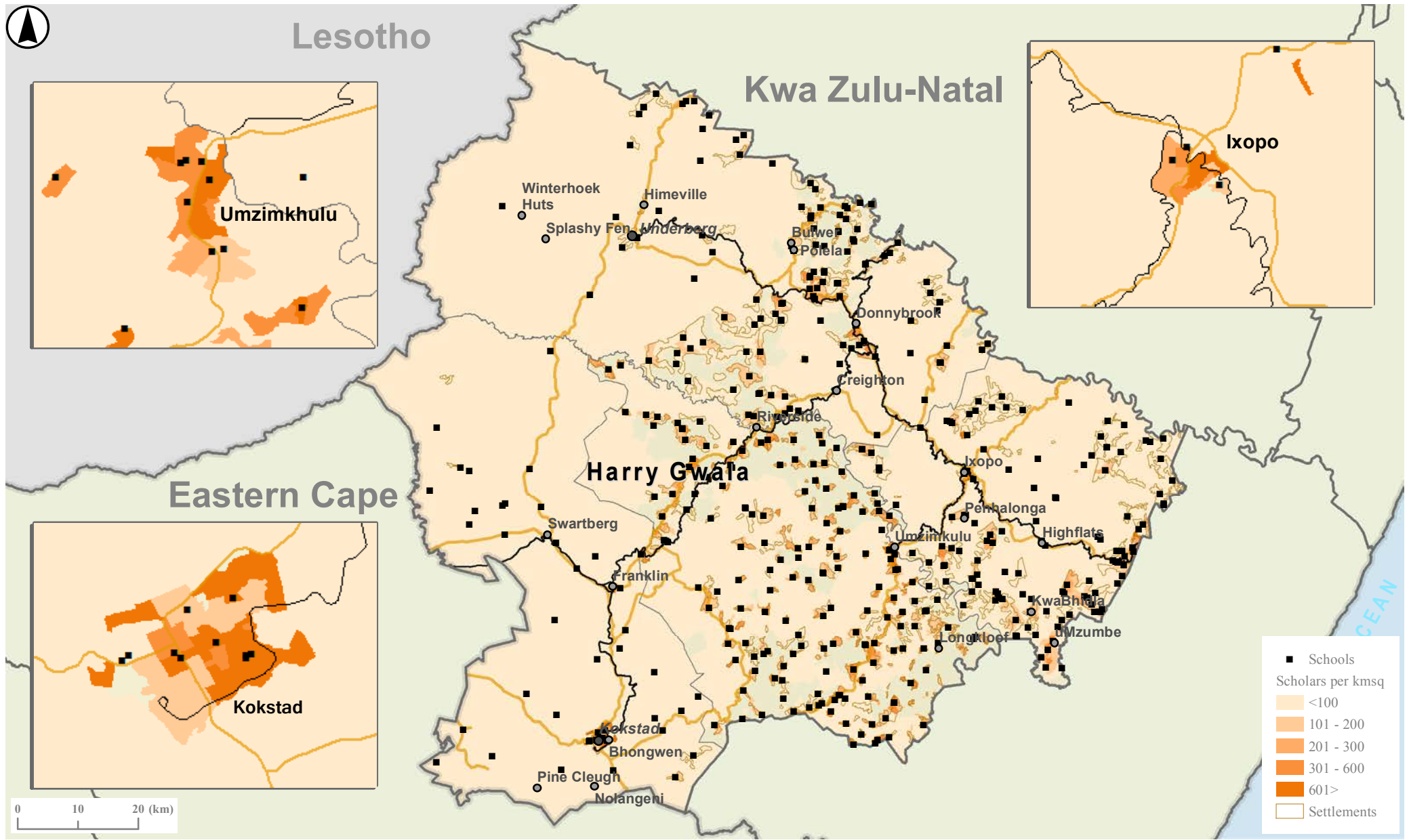


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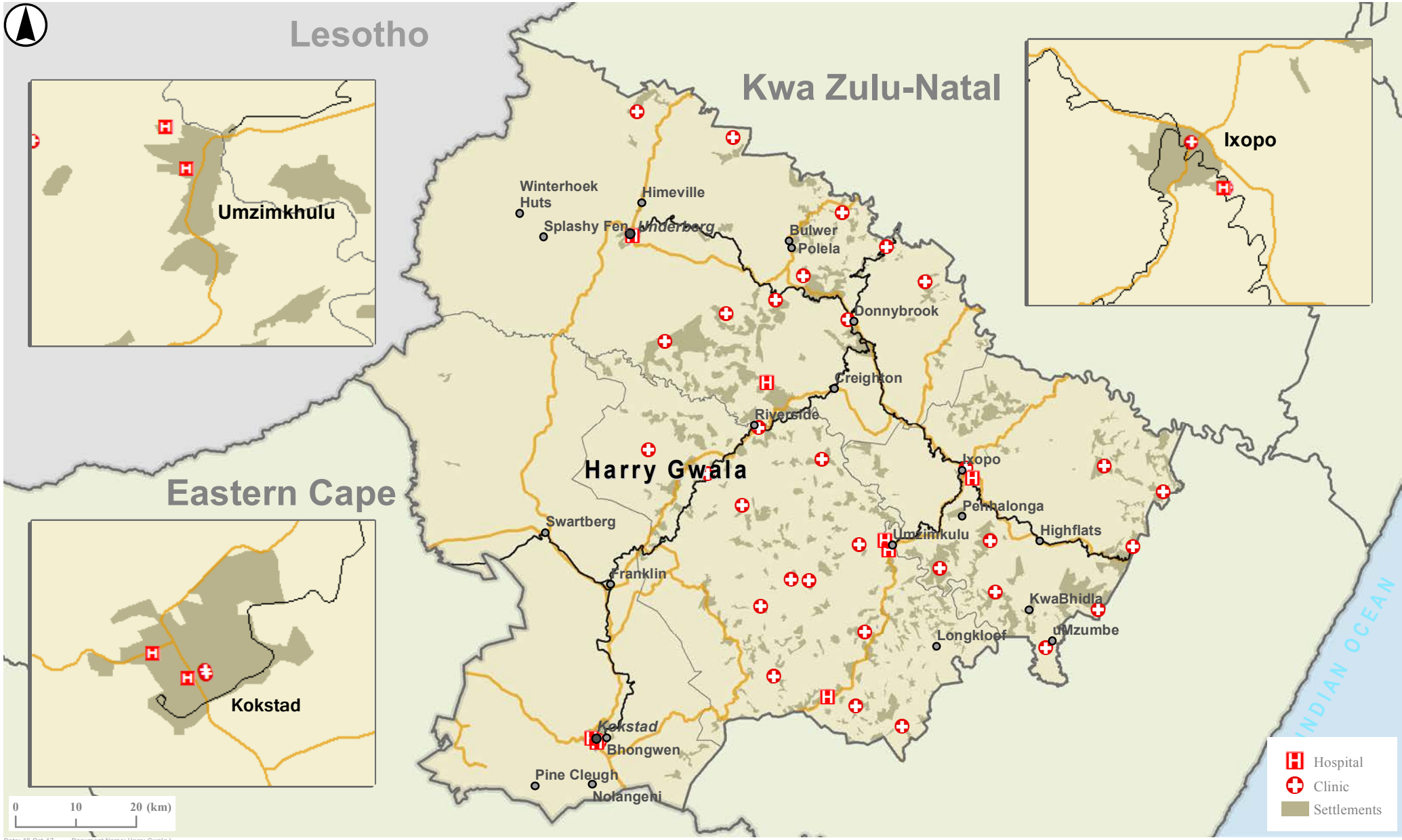




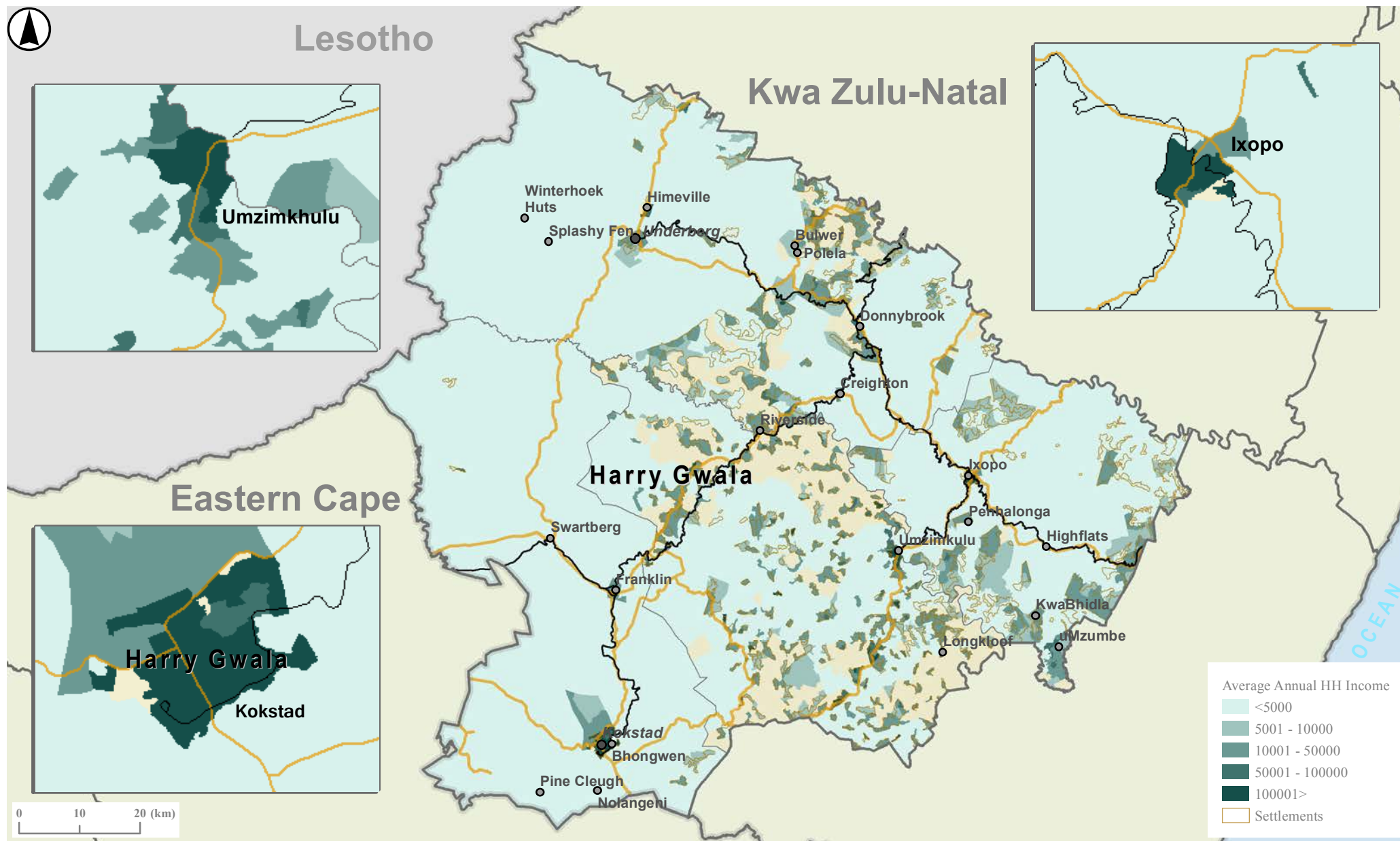


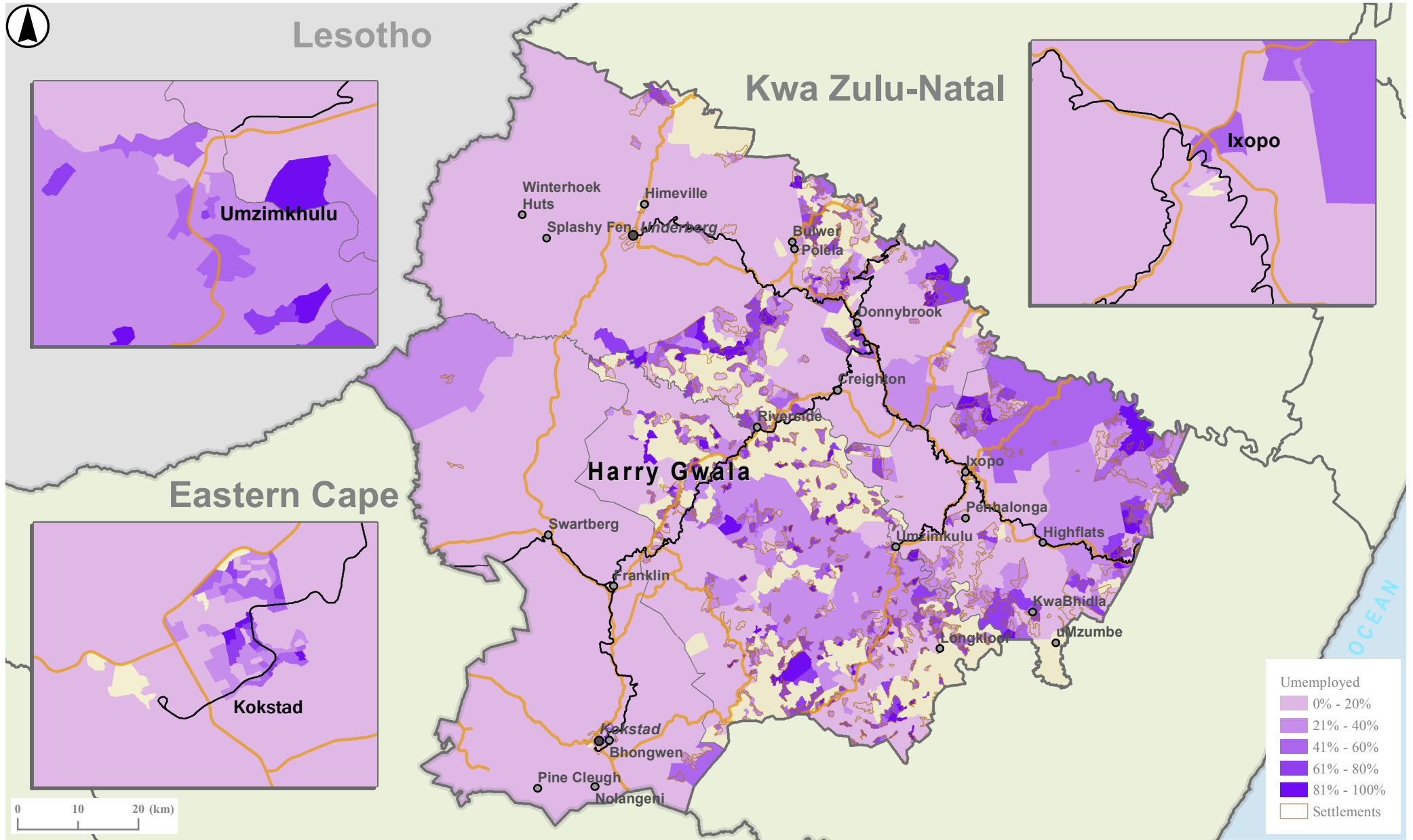
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Map 17 indicates the unemployment levels in the DM. The higher unemployment levels are located around the towns of Creighton, Kokstad and Underberg.

3.7 Rail Line

A desktop analysis was undertaken of the rail network serving the district municipality. The relevant maps showing this network is presented in **Appendix A, Map A1 to A4**.

The network map shows that all primary nodes, apart from Bulwer, and majority of the secondary nodes have the rail network serving it.

The rail line in the general east-west direction extends from Kokstad to Donnybrook and passes through Franklin, Riverside and Creighton. In addition, there is a line between Umzimkhulu and Ixopo.

In the general north to south direction the rail line extends from Underberg to Jolivet and passes through Donnybrook and Ixopo.

During discussions with the local municipalities, the Dr Nkosazana Dlamini Zuma municipal officials indicated that there is a tourist train servicing currently operational between Creighton and Riverside. In addition, research has shown that there is (was) a service that operated between Ixopo and Ncalu, which is en-route to Umzimkhulu.

4 Future Road Upgrade Plans

The future road upgrade plans for the HGDM were obtained from the KZN DOT and presented in **Map 18**. This plan shows the upgrades to existing paved roads as well as the upgrading of existing gravel road to blacktop surfaces.

The following five key corridors will be upgraded to blacktop surfaces:

- The link between Umzimkhulu and Highflats from R56 to P22-2
- The link between Umzimkhulu and Franklin via the P601
- The upgrade of the P749 north-west of Umzimkhulu
- The link between Franklin and Creighton/Donnybrook
- A ring road east of Bulwer

5 Population Growth

Using data from StatsSA, a comparison was done between the 2001 and 2011 population for each local municipality.

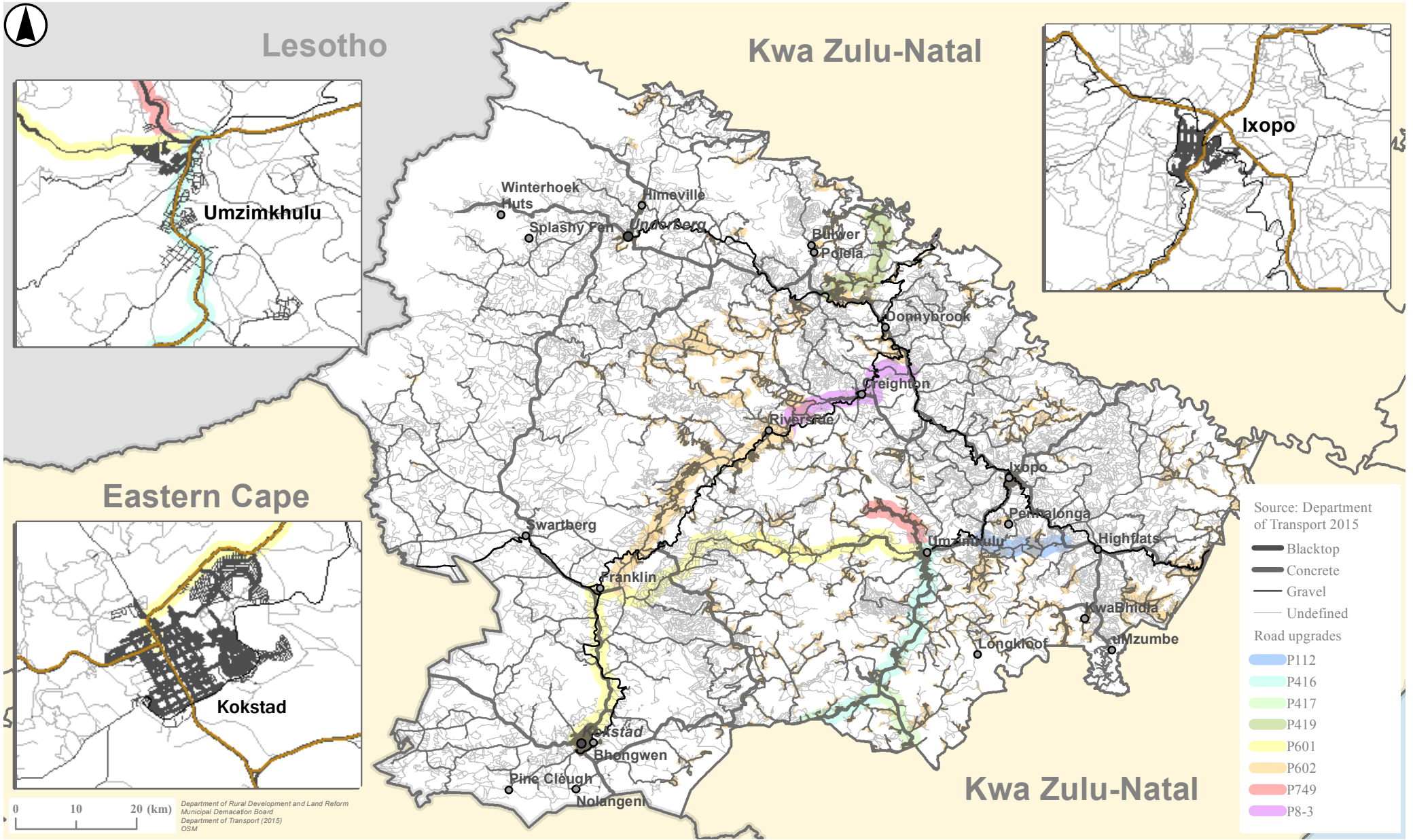
Negative population growth was experienced in Dr Nkosazana Dlamini Zuma LM and Ubuhlebezwe LM and positive growth in the remaining municipalities. Greater Kokstad LM experienced the high growth of 15.5% in the 10 year period.

Table 2: Comparison of 2001 and 2011 population (StatsSA)

| Municipality | 2001 | 2011 | Growth in 10 years |
|------------------------------|----------------|----------------|--------------------|
| Dr Nkosazana Dlamini Zuma LM | 119 406 | 113 446 | -5% |
| Ubuhlebezwe LM | 101 959 | 101 691 | -0.3% |
| Umzimkhulu LM | 174 338 | 180 302 | 3.4% |
| Greater Kokstad LM | 56 528 | 65 981 | 15.5% |
| Harry Gwala DM | 452 231 | 461 419 | 2% |

To forecast the future population, the calculated growth rate in **Table 19** was used for Umzimkhulu LM and Greater Kokstad LM, however for the remaining two LMs which showed negative growth, a growth rate of 2.5% should be considered.

Map 18: Road upgrades identified by KZN DOT



6 Vision

Vision: Back to Basics Approach

Following discussions with the KZN DOT, local and district municipalities, the public transport associations and local community and based on the number of site visits that were undertaken during the course of the data gathering it was apparent that addressing the basic public transportation needs for the area as opposed to developing an elaborate plan is the most appropriate way forward.

Basic public transport needs in this instance includes aspects such as:

- Provision of public transport interchanges in areas where informal facilities operate
- Upgrading public transport interchanges that are operating over-capacity
- Provision of public transport lay-byes and shelters at major stops
- The upgrading of existing gravel roads that carry a significant amount of public transport users
- Provision of adequate pedestrian facilities linking nodes with public transport facilities
- Identifying key public transport corridors that have the potential of operating on a schedule service

7 Conceptual System Design

The conceptual system design has been developed on the back of the following information:

- The overarching vision
- Engagement with local public transport associations
- Engagement with local municipal officials
- On-site observations
- Assessment of the base planning maps such as settlement patterns, housing density etc
- Review of local planning documents
- Assessment of the preliminary public transport survey data

The system design is based on a three-tier corridor system described as follows:

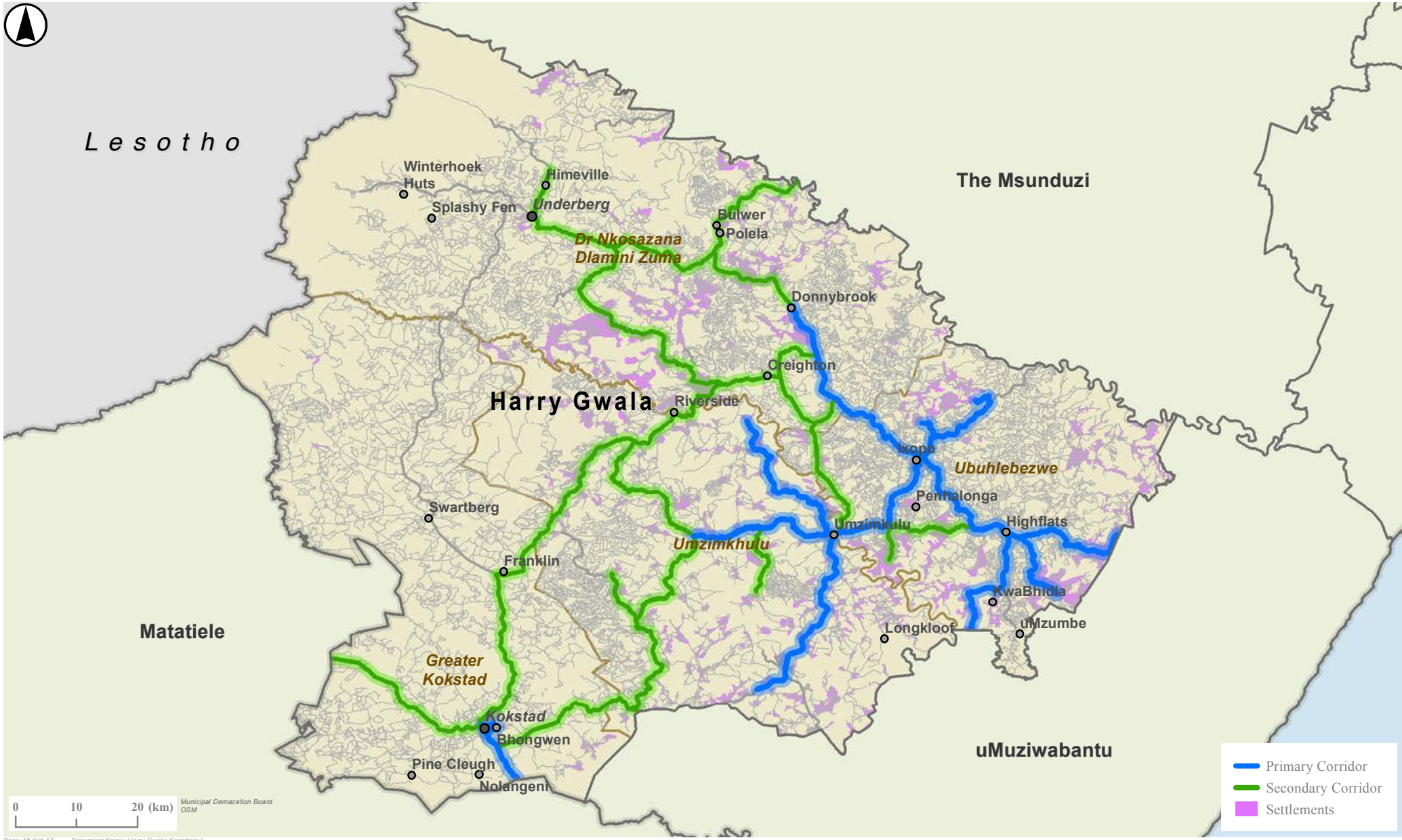
- Primary Corridors – these are the busiest public transport passenger corridors. This corridor will most likely operate with schedule services and could be subsidized. The services will operate in mixed traffic as point to point service with stops located at key locations. In certain areas, tertiary services may act as feeder services to the primary corridor.
- Secondary Corridors – these corridors are less busy than primary corridors but are relatively important. These corridors will operate as a demand driven services initially. However, in the future they may be converted to schedule services. If these corridors are located along gravel roads, the roads will be earmarked to be blacktopped. The secondary corridor will also be point to point services with stops located at key locations.
- The remaining corridors are tertiary corridors. Tertiary corridors will operate as a point to point demand driven service, with limited or no stops en-route.

Map 19 illustrates the proposed primary and secondary corridors.

7.1 Primary Corridors

There are 12 primary corridors in the study area and these are as follows:

1. Kokstad local service
2. Kokstad → Eastern Cape (N2)
3. Rietvlei R56 → Umzimkhulu
4. R 601 (from D2412) → Umzimkhulu
5. P749 (from Antioch) → Umzimkhulu
6. Umzimkhulu → Ixopo (R56)
7. Donnybrook → Ixopo (P23)
8. Lufafa/Echibini → Ixopo (R56)



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9. Highflats → Ixopo (P22)
10. P68 → Highflats
11. P73 → Highflats
12. Jolivet → Highflats

7.2 Secondary corridors

There are 13 secondary corridors in the study areas. These include:

1. Franklin (P601) → Kokstad
2. Matatiele (P609) → Kokstad
3. Ngwinjini (P750) → Kokstad
4. Franklin (P602) → Creighton/Donnybrook
5. D2412 → Umzimkhulu
6. D2466 → Umzimkhulu
7. Kwa Nokweja → Umzimkhulu
8. Creighton/Mahele (P246) → Umzimkhulu
9. P112 → Highflats
10. Himeville → Underberg
11. Bulwer → Underberg
12. Underberg → Donnybrook
13. Kilmun/Qulashe (P320) → Underberg

7.3 Vehicles

For the primary corridors, the most likely vehicles used will be either bus, midi-buses, mini bus or a combination thereof. For the secondary corridors, the mini bus will be the preferred mode of choice for these corridors.

7.3.1 Bespoke Rugged People and Goods Mover

For the tertiary corridors, a number of these areas are not easily accessible and located along gravel roads with difficult geometry. In this regard, a bespoke rugged people and goods mover that meets all the minimum SABS requirements is proposed. This vehicle specification has been developed as part of this study and combines the relative seating comfort of a mini bus taxi with the ruggedness of a bakkie. A detailed description of this rugged people and goods mover is contained in **Appendix B**. The following is a summary of the aspects that have been considered in this vehicle specifications:

- The vehicle should be able to accommodate both people and goods

- The necessary emergency exits must be provided
- The seating should be designed and arranged in the appropriate manner
- Windows for ventilation must be provided
- Ensuring that the appropriate chassis is installed on the vehicle that is able to withstand the prevailing road conditions

7.4 Passengers with special needs

In this context passengers with special needs refer to passengers that are mobility impaired and will include elderly passengers that find it difficult to walk. In this regard, for corridors that will operate schedule services, it will be recommended that a certain portion of that fleet be equipped to accommodate such passengers.

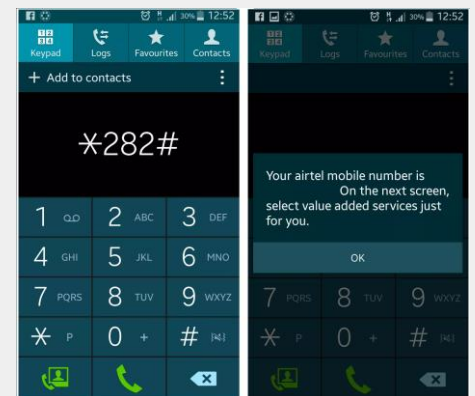
In addition, a concept is being proposed that is looking at a rural style uber service. It is common cause that a number of passengers would not have a smartphone and therefore it is proposed that this rural uber styled service operates using a combination of USSD Codes and smart phones.

7.5 Densification

In order to improve the viability of schedule services it is recommended that as part of the municipal planning process that densification is a key focus area. Densification should occur along the identified corridors. In addition, the densification of nodes within CBD could also encourage/induce non-motorised transport (NMT).

USSD Codes

Unstructured Supplementary Service Data (**USSD**), sometimes referred to as "**Quick Codes**" or "**Feature codes**", is a protocol used by GSM cellular telephones to communicate with the service provider's computers
https://en.wikipedia.org/wiki/Unstructured_Supplementary_Service_Data



8 Proposed Schedule Services

Based on the outcomes from the public transport surveys, on-site observation and the preliminary discussions with municipalities, a set of 16 preliminary schedule routes were identified. The key driver in the development of these route has been the following factors:

- Passenger demand survey data
- The CBD areas
- The location of key medical facilities in the district municipality

There are five major medical facilities in the district municipality viz. Rietvlei, Centacow, St Catherines Hospital (Hlanganani) Christ Hospital (Ixopo) and Kilmun clinic. The proposed services provide access to these facilities.

The 16 routes are as follows:

1. Rietvlei to Umzimkhulu CBD
2. Umzimkhulu CBD to Ixopo CBD
3. Chancele/Emmausi to Umzimkhulu CBD
4. Horseshoe/Bhongweni to Kokstad CBD
5. Shayamoya to Kokstad CBD
6. Mt Aylif to Kokstad CBD
7. Fairview/Christ Hospital to Ixopo CBD
8. Riverside via Creighton to Ixopo
9. Centacow to Ixopo CBD
10. Echibini to Ixopop CBD
11. Bulwer/Donnybrook to Ixopo CBD
12. Hlokozi to Ixopo CBD via Highflats
13. Jolivet to Ixopo CBD via Highflats
14. St Faiths/Mhlabashane to Ixopo via Highflats
15. Hlanganani to Bulwer
16. Kilmun to Underberg

Of these 16 routes, the following three routes have the highest demand and should be considered for the phase 1 implementation. These routes will either be operated by buses or midi-buses

- Rietvlei to Umzimkhulu CBD
- Horseshoe to Kokstad CBD
- Shayamoya to Kokstad CBD

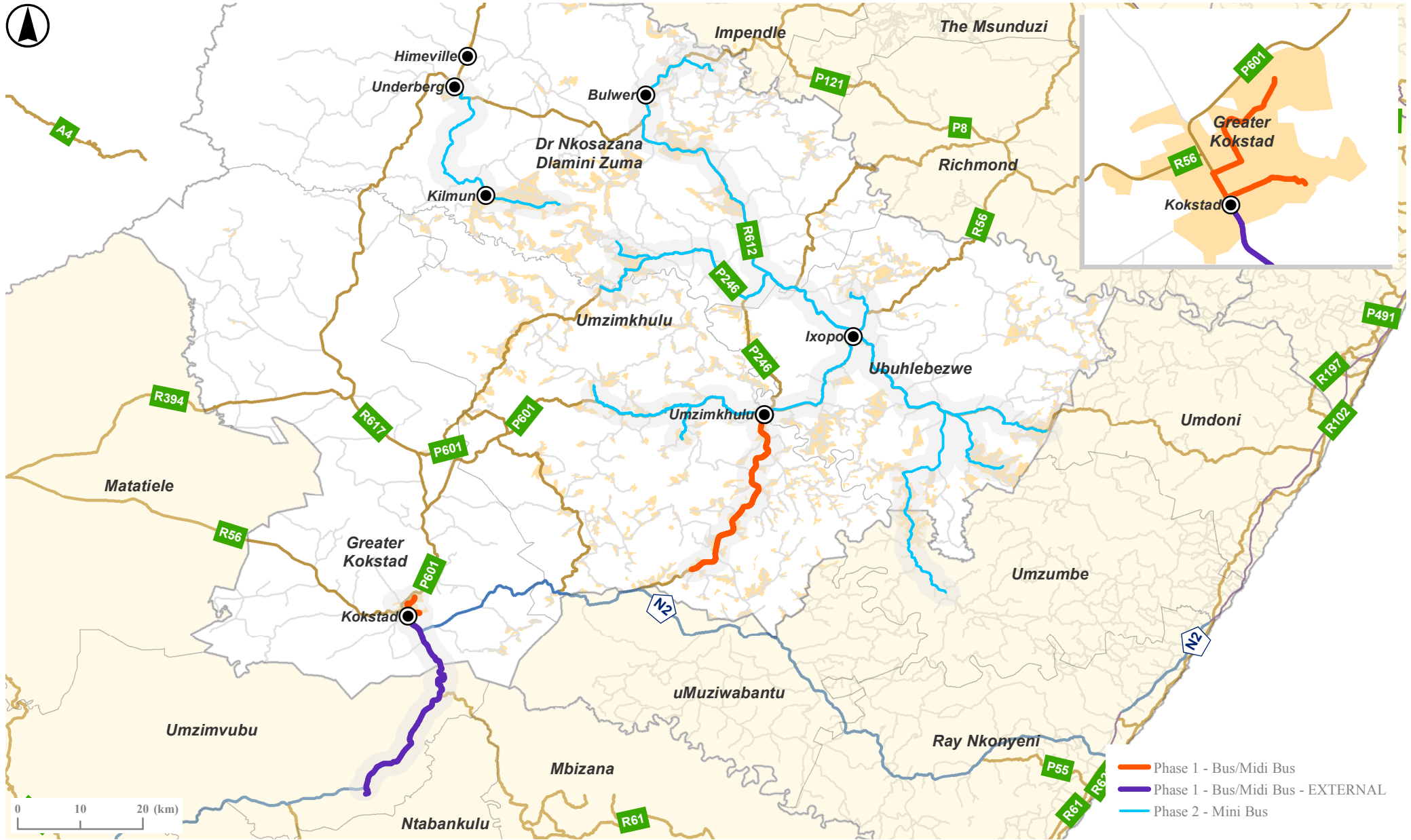
In addition, the route between Mount Ayliff and Kokstad CBD has also been identified as a phase 1 route, however it will require inter-provincial discussions and negotiations prior to implementation.

Map 20 provides an overview of the 16 routes, classifying Phase 1 and Phase 2. **Map 21** contains an indication of the Phase 3 routes which is essentially the corridors that are not listed above.

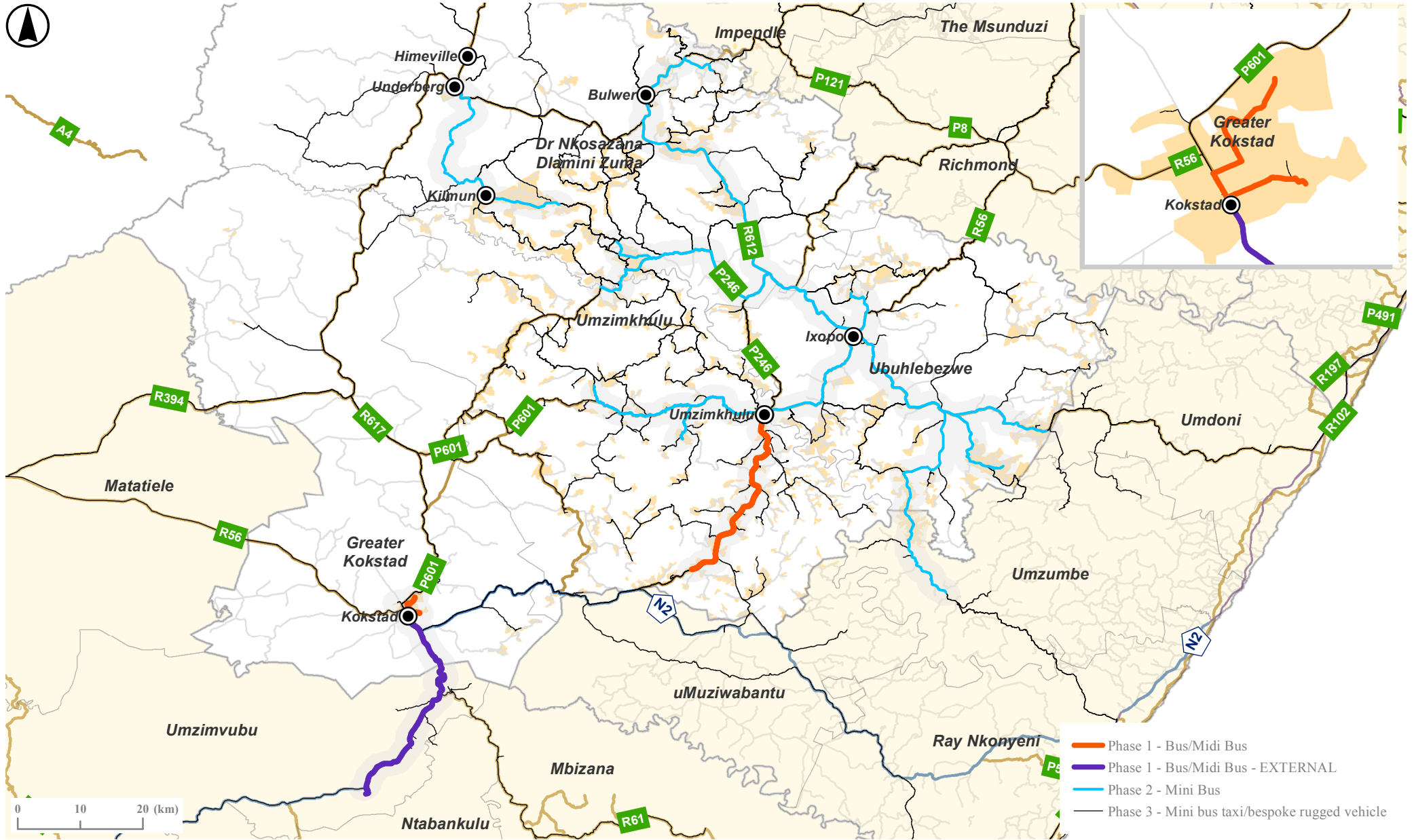
The anticipated passenger demand within a 2km catchment is for each of the phase 1 KZN routes is contained in **Appendix C**.

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Map 20: Phase 1 and 2 Proposed Scheduled Service Routes



Map 21: Phase 1, 2 and 3 Proposed Scheduled Service Routes



9 Rail Services

A high-level assessment was undertaken of the following rail corridors to determine if rail is a viable option:

- Jolivet/Highflats to Ixopo
- Ixopo to Donnybrook//Nkwezela
- Ixopo to Umzimkhulu
- Riverside to Ixopo
- Riverside to Creighton
- Franklin to Kokstad

Of these corridors, the Jolivet/Highflats to Ixopo and the Ixopo to Donnybrook/Nkwezela corridors have the highest demand. The demand along the Highflats to Ixopo corridor in fact originates from the hinterland areas and not from Highflats itself, therefore, passengers would have to interchange to a rail service. The Franklin to Kokstad CBD and Riverside to Creighton currently have a relatively low demand through the day.

Discussions with the local municipal officials and through limited site observations, it was noted that large portion of the track are in disrepair and require upgrades. Along the Jolivet to Donnybrook section, it would seem that only the rail reserve is in place and the track has been removed. In Kokstad, it would seem that the track has been removed in certain location and development may have encroached onto the reserve. The additional disadvantage rail has is that in most of the towns, the stations are located away from the core CBD areas.

Table 3: Summary of Issues

| Corridors | Issues |
|----------------------------|--|
| Jolivet/Highflats to Ixopo | <ul style="list-style-type: none"> • Demand along this corridor in fact from areas to the south, which are not located along the rail line • track uplifted in areas • Ixopo station on edge of CBD |
| Ixopo to Donnybrook | <ul style="list-style-type: none"> • Track uplifted in areas • Ixopo station on edge of CBD |
| Ixopo to Umzimkhulu | <ul style="list-style-type: none"> • Track uplifted in areas • Ixopo station on edge of CBD |

| | |
|------------------------|--|
| Riverside to Ixopo | <ul style="list-style-type: none"> • Track uplifted in areas • Ixopo station on edge of CBD |
| Riverside to Crieghton | <ul style="list-style-type: none"> • Track good condition but demand is low |
| Franklin to Kokstad | <ul style="list-style-type: none"> • Track uplifted • Encroachment on servitude • Station is on edge of CBD |

In addition, the current tourist services that operates out of Centacow is a steam train service that is expensive to operate.

It is therefore concluded that a lot of investment would be required to reinstate rail services in the area and will need considerable time to implement. Therefore, in the interim road based schedule services should commence along these corridors to build a base demand, which would then be used as the basis for a potential rail pre-feasibility or business plan study.

10 Infrastructure Requirements

10.1 Road upgrades

The KZNDOT has earmarked a number of road upgrades for the Harry Gwala District Municipality (refer to **Section 4**). An inspection of these plans against the conceptual system design clearly indicates that these road upgrade plans will support the conceptual system design.

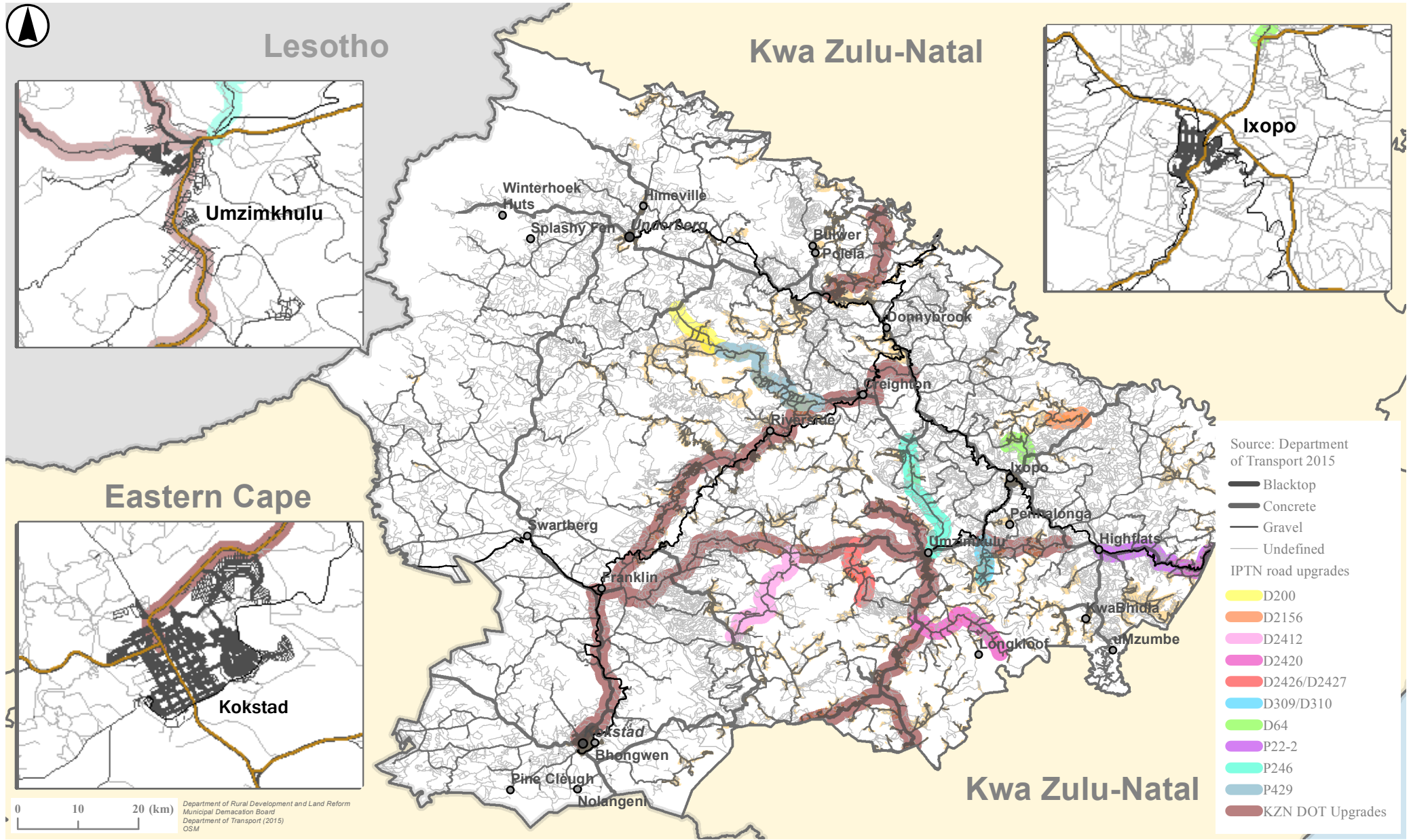
In addition to the KZN DOT plans, the following additional road upgrades, with a priority rating, are proposed:

- D2412 – between P601 and P750 - high
- P22-2 Highflats to Jolivet – high
- P429 and D200 – Centacow – high
- D64 and D2156 (Lufafa-Ubhlebezwe LM) – medium
- D2426/D2427 - medium
- P246 – Mahehle - medium
- D2420 - medium
- D2644 - medium
- D309 and D310 – KwaNokweja – low

These upgrades have been identified through the inspection of the status quo data, site visits and base planning maps. The upgrade of these roads will ultimately assist in reducing the cost of transport along these corridors by reducing the wear and tear on vehicles and reducing the round trip times, due to the higher speeds.

Map 22 illustrates the proposed road upgrades that are required as part of the Harry Gwala district municipality IPTN.

Map 22: Road Upgrades as identified in the Harry Gwala DM IPTN



10.2 Public Transport Interchanges

There are a number of public transport interchanges, both informal and formal, within the district municipality. During the site visits and survey phase of the study it was noted that whilst some areas had formal public transport interchanges, these are in fact too small to meet the demand and often PT services operate from the adjacent streets.

Considering the above, the following public transport interchanges are proposed:

10.2.1 Umzimkhulu Local Municipality

A new rank is currently being constructed in Umzimkhulu CBD.

10.2.2 Ubhulebezwe Local Municipality

Jolivet – a small rank is required at the Jolivet centre.

Ixopo – the existing rank is small and needs to be extended. One consideration is incorporating the new bus rank into the overall IPTN plan and determine if this improves the demand at the existing taxi rank. In addition, a new rank will also be needed as part of the CBD expansion.



Figure 1: Potential location for Ixopo PT rank

Highflats – the existing rank in the town is small and is primarily used as an interchange point for long-distance/regional trips. Therefore, a new rank is required in this town to serve the local trips. There is an opportunity to do a PPP to construct a suitable public transport interchange in this town.

A site was identified for a new integrated PT rank and commercial development on a 30 000m² site. The site is located at the south-east quadrant of the intersection of



Figure 2: Potential location for Ixopo PT rank

10.2.3 Greater Kokstad Local Municipality

Franklin – a small rank is required

Kokstad – some of the existing facilities in Kokstad are small and a new rank is required. There is an opportunity for a PPP to construct this rank. In addition, a new rank will also be needed as part of the CBD expansion.

For the CBD, two site location options were considered. Site Option 1 is located at the existing long distance mini bus taxi and local taxi rank site. The proposal could be to develop a high density Transit Orientated development (TOD) that includes ground floor retail, offices, PT rank, off-street parking and residential apartments. Future scheduled services will operate at street level whilst unscheduled services will be accommodated off-street within the multi-storey development.

Site Option 2 will have a similar concept and is located at the existing bus rank on Groom Street.

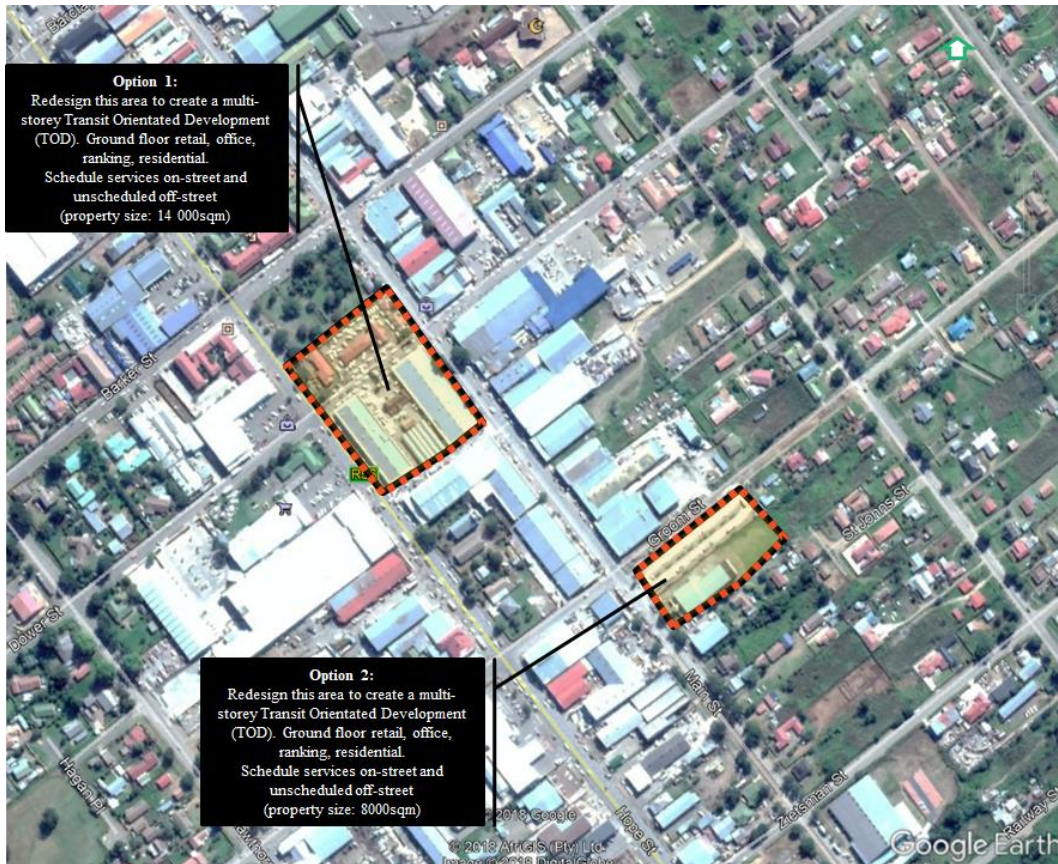


Figure 3: Potential locations for Kokstad PT rank

10.2.4 Dr Nkosazana Dlamini Zuma Local Municipality

Creighton – a small rank is required for this area

Centacow - a small rank is required outside the hospital

Donnybrook - a small rank is required. According to discussions with the local municipality, a parcel of land belonging to Transnet has been identified.

Himeville – small rank is required

Riverside – a small rank is required

10.2.5 Summary

Map 23 illustrates the location and nature of the aforementioned ranks.

Ideally all interchanges/ranks should be incorporated as part of a mixed use development to encourage the principles of Transit Orientated Development (TOD). For example, as indicated previously, the proposed rank in Kokstad could be incorporated into a new mixed use development that includes the following land uses:

Map 23: Proposed Rank Upgrades



- Retail/commercial
- Administration/offices/government
- Residential

Around each of these nodes, a high -quality pedestrian network should then be developed to link passengers to the remainder of the nodes. Elements that should be considered in the planning of pedestrian infrastructure include:

- Sidewalks on both side of the road that are at least 2m wide
- Mid-block pedestrian crossing points
- Kerb build out for pedestrian at intersections
- Traffic calming where appropriate
- Arcades or pedestrian pathways to reduce walking distance around city blocks

10.3 Major Stops

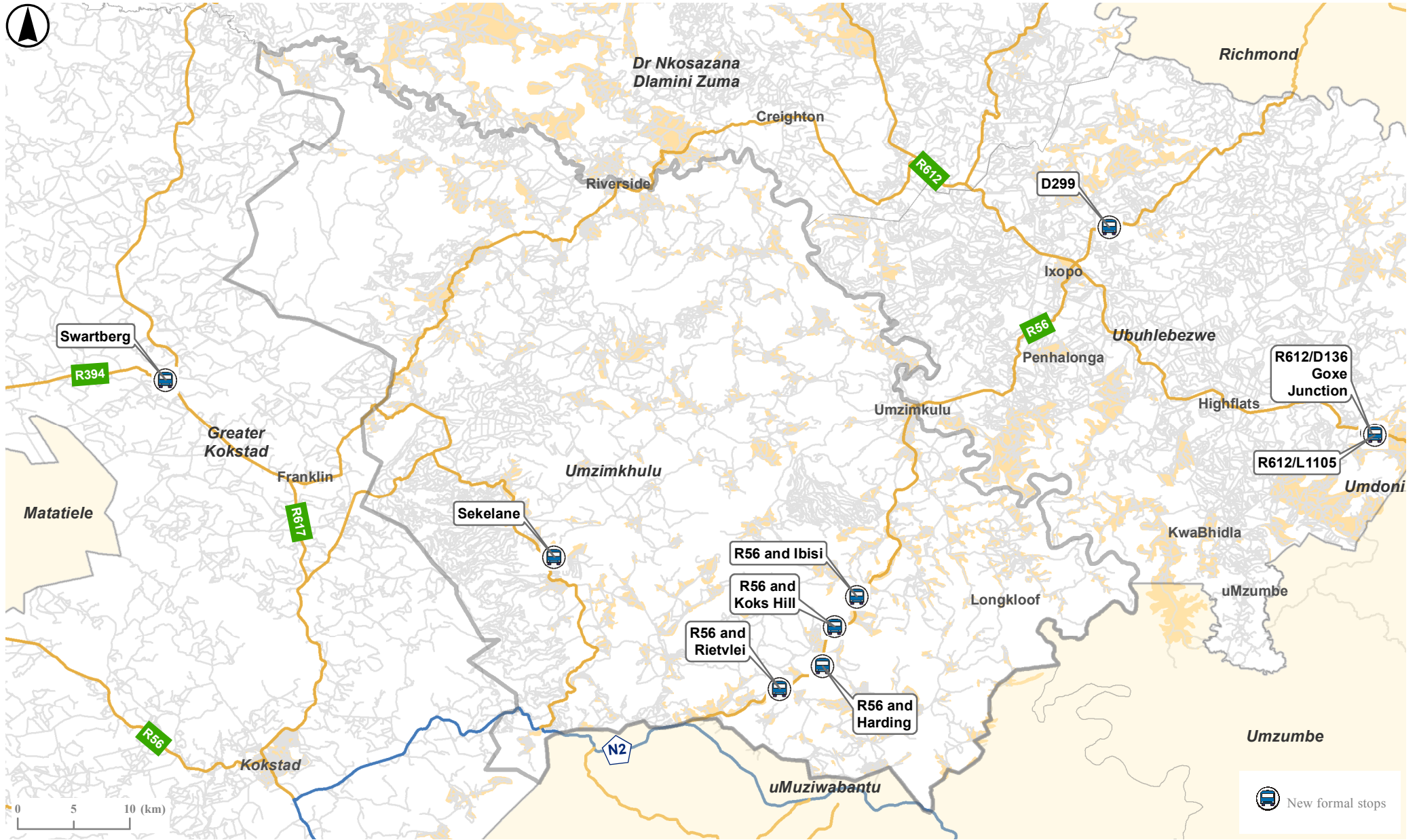
A number of settlements are located along the main roads in Harry Gwala District Municipality and as such a number of passengers tend to wait along these main roads for passing services. In discussion with the local public transport associations and on-site observations, the following locations have been identified as major public transport stops.

- R56 at Ibisi
- R56/D2416/Koks Hill
- R56/P417 – turnoff to Harding
- R56/Rietvlei
- Sekelane
- R612/D136 Goxe Junction
- R612/L1105
- Swartberg
- D299 School

Map 24 contains an illustration of the location of these stops.

At each of these stops the following infrastructure is recommended:

- Public transport lay-by along the main road or side road, whichever is appropriate
- The provision of shelters



- At stops where there is an interchange between mini bus taxis to bakkies, it is recommended that the facility on the side/minor road be taken into the verge to allow for some amount of holding.

10.4 NMT Facilities

In general, pedestrian and NMT infrastructure should be a standard requirement along all existing and new roads in the district municipality. However, in reality the roll out of this is a major endeavour and will take a number of years to complete. In this regard, it was proposed that observations be undertaken within the study area to identify those routes and corridors where it was easily apparent that there is little or no infrastructure serving a substantial pedestrian and (latent) NMT demand.

The identification of this pedestrian and NMT infrastructure was undertaken through on-site observation around existing public transport nodes and major corridors.

The list of sidewalks and NMT infrastructure below is not an exhaustive list. It is recommended that the planners and designers confirm these routes, and other potential routes in the vicinity, during the implementation stage. In addition, all new and upgraded public transport facilities should be designed in a manner that accounts for pedestrian and NMT facilities leading to it.

10.4.1 Umzimkhulu Local Municipality

- Clydesdale to Umzimkhulu CBD – widen sidewalks to 3m on both sides and widen the two bridge crossings
- R56/Rietvlei Stop (new) to Rietvlei Hospital - Provide improved paving and lighting on the pathway that currently leads from the R56/Rietvlei Stop (new) to Rietvlei Hospital.
- P246 to Umzimkhulu CBD – new sidewalk on both sides of the R56 and widening of the bridge crossing.

Refer to **Map 25 and 26**

10.4.2 Ubuhlebezwe Local Municipality

- Fairview to Ixopo CBD via R56 underpass – construction of a 3m footpath with lighting
- R612 Jolivet – the provision of a 3m sidewalk on either side of the R612 with a pedestrian barrier between roadway and sidewalk
- Mahehle to Sawmill – the provision of a formal 2m wide sidewalk along one side of the road to serve the staff working at the Sawmill

Refer to **Map 27 to 29**

10.4.3 Greater Kokstad Local Municipality

- Bhongweni/Horseshoe to Kokstad CBD along Coulter Street – the extension and upgrade of the pedestrian sidewalk on both sides of Coulter Street into the Bhongweni/Horseshoe area.

Refer to **Map 30**.

10.4.4 Dr Nkosazana Dlamini Zuma Local Municipality

- Sani Rd to Underberg CBD sidewalk – provision of a 2m sidewalk on both sides of Sani Road between the clinic and Underberg CBD.
- Bulwer CBD sidewalks – the provision of sidewalks and footpaths within the Bulwer CBD.
- St Catherines Hospital Sidewalks - provisions of sidewalk in the vicinity of the St Catherines Hospital

Refer to **Map 31 to 33**.

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Map 25: Umzimkhulu CBD Sidewalk Upgrade



Date: 31-Jan-18 Document Name: Harry Gwala Sidewalks

Map 26: Rietvlei Hospital Footpath Upgrade



Date: 16-Mar-18 Document Name: Harry Gwala Sidewalks Extra Zoom Window

Map 27: Ixopo Footpath Upgrade



Date: 16-Mar-18 Document Name: Harry Gwala Sidewalks Extra Zoom Window

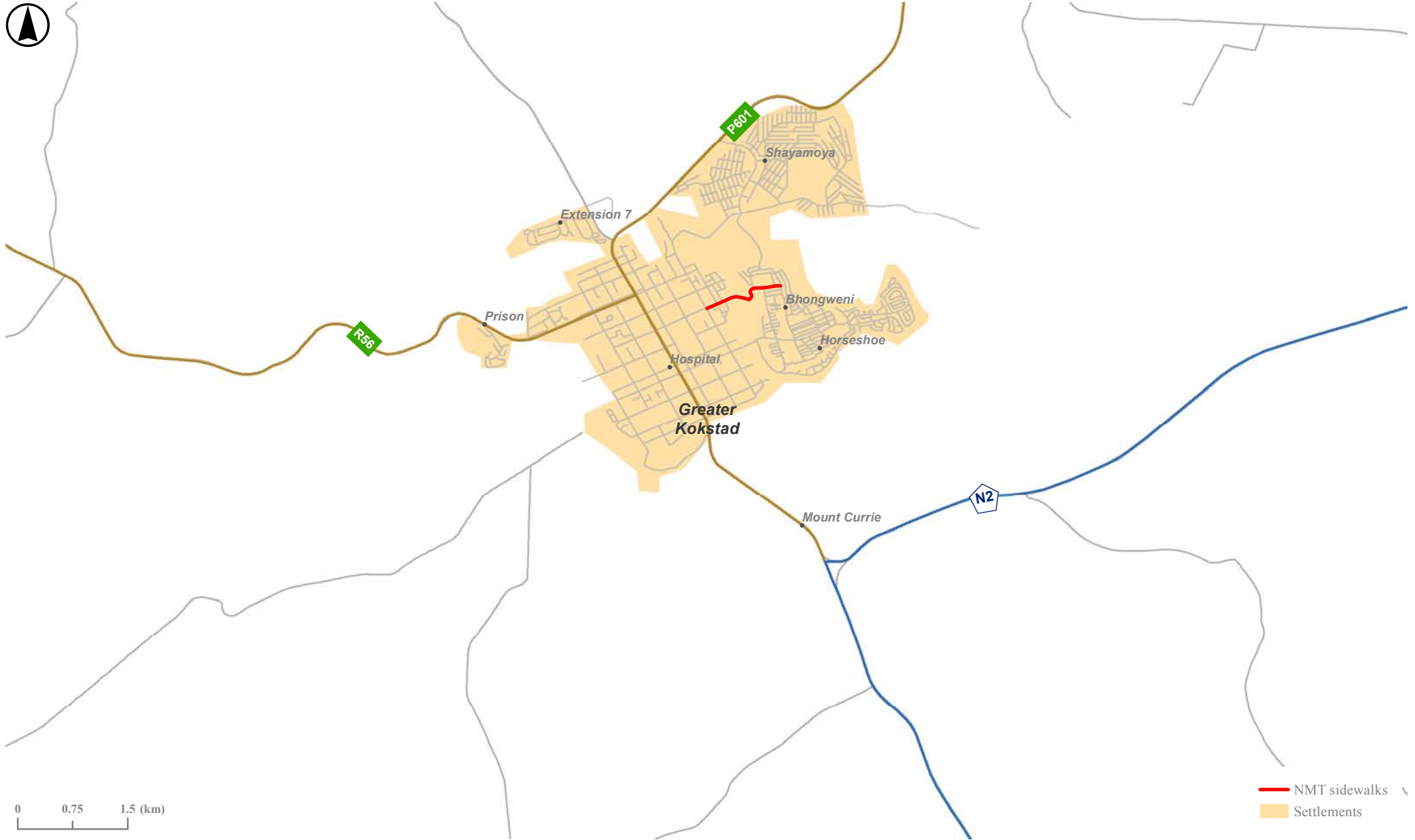


Date: 31-Jan-18 Document Name: Harry Gwala Sidewalks

Map 29: Mahele Sidewalk Upgrade



Map 30: Kokstad CBD Sidewalk Upgrade

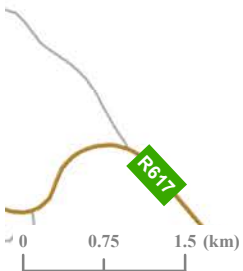
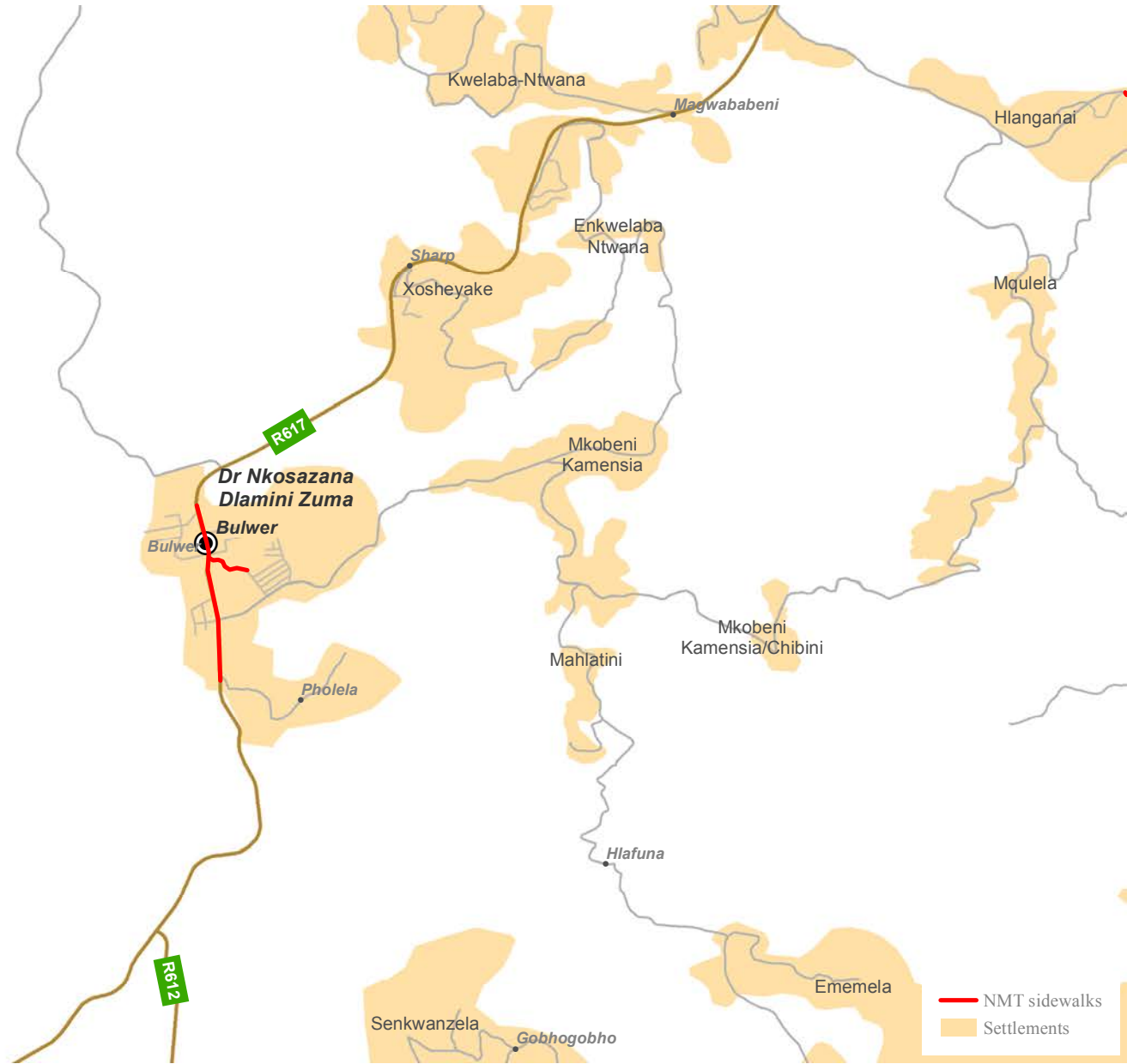


Map 31: Underberg CBD Sidewalk Upgrade



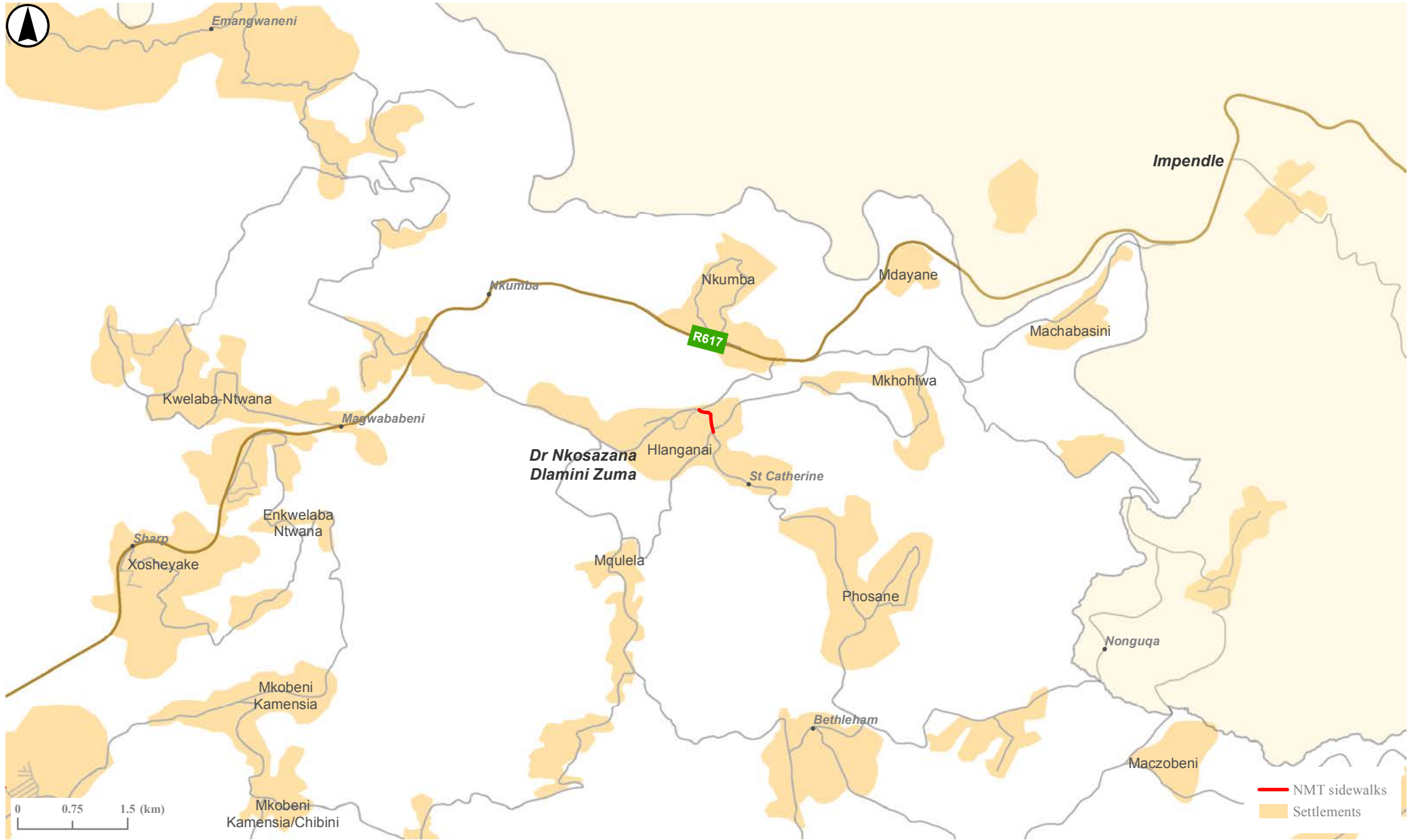
Date: 31-Jan-18 Document Name: Harry Gwala Sidewalks

Map 32: Bulwer CBD Sidewalk Upgrade



Date: 31-Jan-18 Document Name: Harry Gwala Sidewalks

Map 33: St Catherine Hospital Sidewalk Upgrade



Date: 31-Jan-18 Document Name: Harry Gwala Sidewalks

10.5 Summary of Upgrades

It is believed that infrastructure to support the IPTN should be funded, designed and implemented by each local municipality with the assistance of the district municipality, KZN DOT and other relevant provincial departments.

All the infrastructure upgrades discussed in the previous section have been assigned to the respective local municipality and summarised in **Table 4**.

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Table 4: Summary of upgrades per local municipality

| Local Municipality | Roads Upgrades | Public Transport Interchanges | Major Stops | NMT Facilities |
|---|--|---|--|--|
| Umzimkhulu Local Municipality | <ul style="list-style-type: none"> • D2412 • D2426/D2427 • D2420 | - | <ul style="list-style-type: none"> • R56 at Ibisi • R56/D2416/Koks Hill • R56/P417 – turnoff to Harding • R56/Rietvlei • Sekelane | <ul style="list-style-type: none"> • Clydesdale to Umzimkhulu CBD • R56/Rietvlei Stop (new) to Rietvlei Hospital • P246 to Umzimkhulu CBD |
| Ubuhlebezwe Local Municipality | <ul style="list-style-type: none"> • P246 • P22-2 • D309/D310 • D64 • D2156 | <ul style="list-style-type: none"> • Ixopo • Highflats • Jolivet | <ul style="list-style-type: none"> • R612/D136 Goxe Junction • R612/L1105 • D299 School | <ul style="list-style-type: none"> • Fairview to Ixopo CBD via R56 underpass • R612 Jolivet • Mahehle to Sawmill |
| Greater Kokstad Local Municipality | | <ul style="list-style-type: none"> • Kokstad • Franklin | <ul style="list-style-type: none"> • Swartberg | <ul style="list-style-type: none"> • Bhongweni/Horseshoe to Kokstad CBD along Coulter Street |
| Dr Nkosazana Dlamini Zuma Local Municipality | <ul style="list-style-type: none"> • P429 • D200 | <ul style="list-style-type: none"> • Creighton • Centacow • Donnybrook • Himeville • Riverside | | <ul style="list-style-type: none"> • Sani Rd to Underberg CBD • Bulwer CBD • St Catherine’s Hospital |

11 Summary and Conclusion

Key Informants

The scoping exercise, which included the review of local planning documents and national transport planning documents, led to the development of a set of key informants that will drive the development of this plan. The key informants include expanding CBDs, the need for basic services and infrastructure, special need passengers, non-motorised transport (NMT), bespoke rugged vehicle and densification.

Situational Analysis

There are some 30 formal and informal ranks located within the Harry Gwala district municipality. Mini bus taxis are the dominant mode of transport accounting for 65% to 70% of all trips. This is followed by midi bus taxis and bakkies. Bus and metered car taxis account for the least.

Apart from the Greater Kokstad local municipality, the temporal demand at the other three municipality indicated that majority of public transport activity occurs during the midday peak period (09:00 to 15:00) which is typical of a rural area.

The average waiting time in the district municipality, as perceived by passengers, is between 25 to 35 minutes and the average perceived journey time is approximately 40 to 50 minutes.

The main trip purpose is shopping which typically accounts for 35 to 50% of trips followed by work trips which account for 20 to 30% of trips.

Safety and comfort are the two main factors for consideration by public transport users.

The major passenger movements are:

- Kokstad local service
- Kokstad → Eastern Cape (N2)
- Rietvlei R56 → Umzimkhulu
- R 601 (from D2412) → Umzimkhulu
- P749 (from Antioch) → Umzimkhulu
- Umzimkhulu → Ixopo (R56)
- Donnybrook → Ixopo (P23)
- Lufafa/Echibini → Ixopo (R56)
- Highflats → Ixopo (P22)
- P68 → Highflats

- P73 → Highflats
- Jolivet → Highflats

Base Planning Maps

The settlement patterns shows that these are primarily located around Umzimkhulu, Highflats, Bulwer and, to an extent, Ixopo nodes. The north-western quadrant of the district municipality has little or no settlements. The housing, population and other related density maps show that the highest density are located within residential areas of the towns.

The district municipality is served by a rail network that links all the primary nodes in the area. The rail line in the general east-west direction extends from Kokstad to Donnybrook and passes through Franklin, Riverside and Creighton. In addition, there is a line between Umzimkhulu and Ixopo. In the general north to south direction the rail line extends from Underberg to Jolivet and passes through Donnybrook and Ixopo. There are currently tourist rail services operating between Creighton and Riverside and potentially between Ixopo and Ncalu.

The KZN DOT have identified a number of roads for upgrading in the district municipality. The following corridors will be upgraded to blacktop surfaces 1) Umzimkhulu to Franklin, 2) Franklin to Donnybrook and 3) Umzimkhulu to Highflats.

Vision

A vision was developed in order to create the conceptual system design. The vision was developed based on discussions with locals public transport associations and municipal officials, inspection of survey data and on-site observations. The vision of the system is “*Back to Basics Approach*”

The vision focuses on addressing the basic public transport infrastructure and services as opposed to developing an elaborate plan. To this end, the focus is on identifying infrastructure that is required to support existing public transport service providers and users and thereafter determine corridors that may be suitable for schedule services. The infrastructure includes identifying locations for new public transport interchanges, stops and roads to be upgraded.

Concept system design

The conceptual system design sees the identification of primary, secondary and tertiary corridors across the municipality. The primary corridors will be operated by either bus, midi-bus, mini-bus or a combination thereof. These services should operate on fixed schedule and could be served by other tertiary corridors/services. The primary corridors are focused around Umzimkhulu, Ixopo and Highflats in east and Kokstad in the west.

Secondary corridors will be served mini-bus and midi-bus services whilst for the tertiary corridors these could be served by the proposed rugged people and goods mover. The rugged people and goods mover vehicle specification has been

developed as part of this study and combines the relative seating comfort of a mini bus taxi with the ruggedness of a bakkie.

A *rural styled uber* concept is being proposed to serve passengers with special needs however this could be extended to serve others in deep rural areas. The concept is based on the use USSD codes and does not necessarily require a smartphone. A more detailed system framework will be required to unpack this system.

A total of 16 potential schedule service routes have been identified and are listed below:

- Rietvlei to Umzimkhulu CBD
- Umzimkhulu CBD to Ixopo CBD
- Chancele/Emmausi to Umzimkhulu CBD
- Horseshoe/Bhongweni to Kokstad CBD
- Shayamoya to Kokstad CBD
- Mt Aylif to Kokstad CBD
- Fairview/Christ Hospital to Ixopo CBD
- Riverside via Creighton to Ixopo
- Centacow to Ixopo CBD
- Echibini to Ixopop CBD
- Bulwer/Donnybrook to Ixopo CBD
- Hlokozi to Ixopo CBD via Highflats
- Jolivet to Ixopo CBD via Highflats
- St Faiths/Mhlabashane to Ixopo via Highflats
- Hlanganani to Bulwer
- Kilmun to Underberg

Of these 16 routes, the following three routes have the highest demand and should be considered for the phase 1 implementation:

- Rietvlei to Umzimkhulu CBD
- Horseshoe to Kokstad CBD
- Shayamoya to Kokstad CBD

In addition, the route between Mount Ayliff and Kokstad CBD has also been identified as a phase 1 route, however it will require inter-provincial discussions and negotiations prior to implementation.

Densification within existing nodes as well as along the proposed corridors is a key aspect of the system design and is imperative for the viability of scheduled services. This is a key component that needs to be taken forward in each individual municipalities' IDP, SDF and precinct/corridor plans.

The opportunity for rail services was investigated at a high level. It was concluded that road-based schedule services should be provided along these rail potential corridors in the interim for the following reasons:

- large portions of the rail line has been removed
- In certain areas, the rail reserve has been encroached upon
- The cost of reinstating rail line could be relatively high and may have a long lead time for implementation.
- The high operational costs

Once the road based services are established, the passenger demand on these services could be used as the basis for a rail pre-feasibility or business case study.

Preliminary Infrastructure Requirements

The KZN DOT road upgrade proposals address a number of challenges experienced in the areas and aligns with the primary and secondary corridors that are proposed. Based on the conceptual system design additional road upgrades proposals have been identified.

The analysis also identified the need for new public transport interchanges as well as upgrades to existing interchanges. New interchanges are required in Highflats, Creighton, Donnybrook, Riverside, Franklin, Jolivet, Centacow and Himeville. The interchanges in Ixopo and Kokstad require upgrades as they are small. There are opportunities for PPPs in the development of these facilities.

A number of formal public transport stops have been identified. These are located along the R56 - south of Umzimkhulu -, along the P22-2, in Sekelane and in Swartberg. These stops will consist of lay-byes and shelters.

Pedestrian sidewalks and NMT facilities have been identified along some of the main pedestrian routes in the district municipality. In the Umzimkhulu Local Municipality new and upgraded pedestrian sidewalks are required in Clydesdale (south of Umzimkhulu CBD), Rietvlei and on the northern side of south of Umzimkhulu CBD. In the Ubhlezwe local municipality, new and upgraded pedestrian sidewalks are required between Fairview and Ixopo CBD, along the R612 in Jolivet and in Mahehle. In Kokstad, new and upgraded pedestrian sidewalks should be provided along Coulter Street towards Bhongweni/Horseshoe. In the Dr Nkosazana Dlamini-Zuma local municipality, new and upgraded pedestrian sidewalks should be provided within the Bulwer CBD, in the Hlanganani area and along Sani Rd in Underberg.

12 References

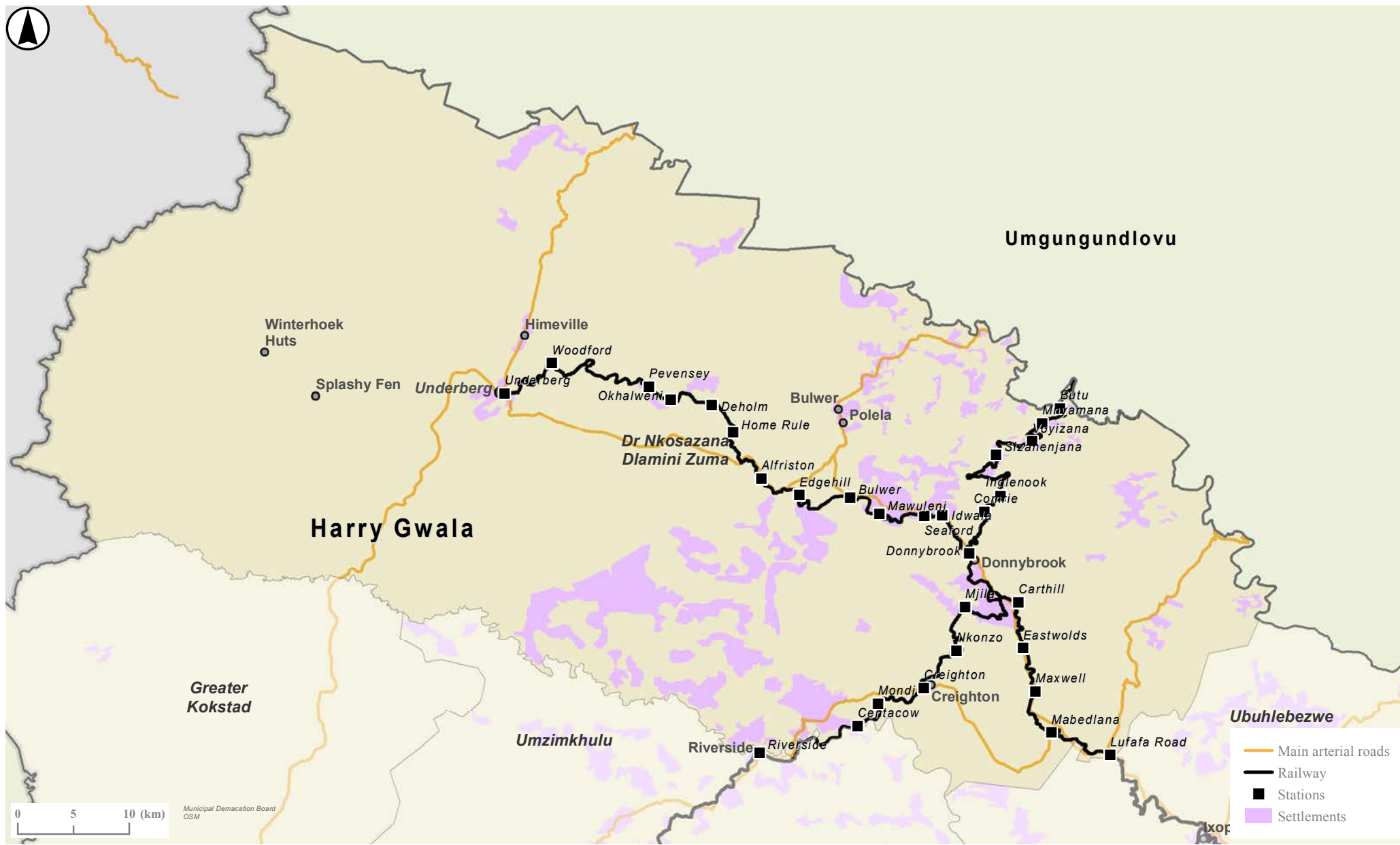
- Moving South Africa, 1998
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- Umzimkhulu LM SDF 2016
- Ubuhlebezwe LM SDF 2016
- Kwasani LM SDF 2016 (NOW DR NKOSAZANA DLAMINI ZUMA LM)
- Ingwe LM SDF 2016 (NOW DR NKOSAZANA DLAMINI ZUMA LM)

Appendix A

Rail Line Maps

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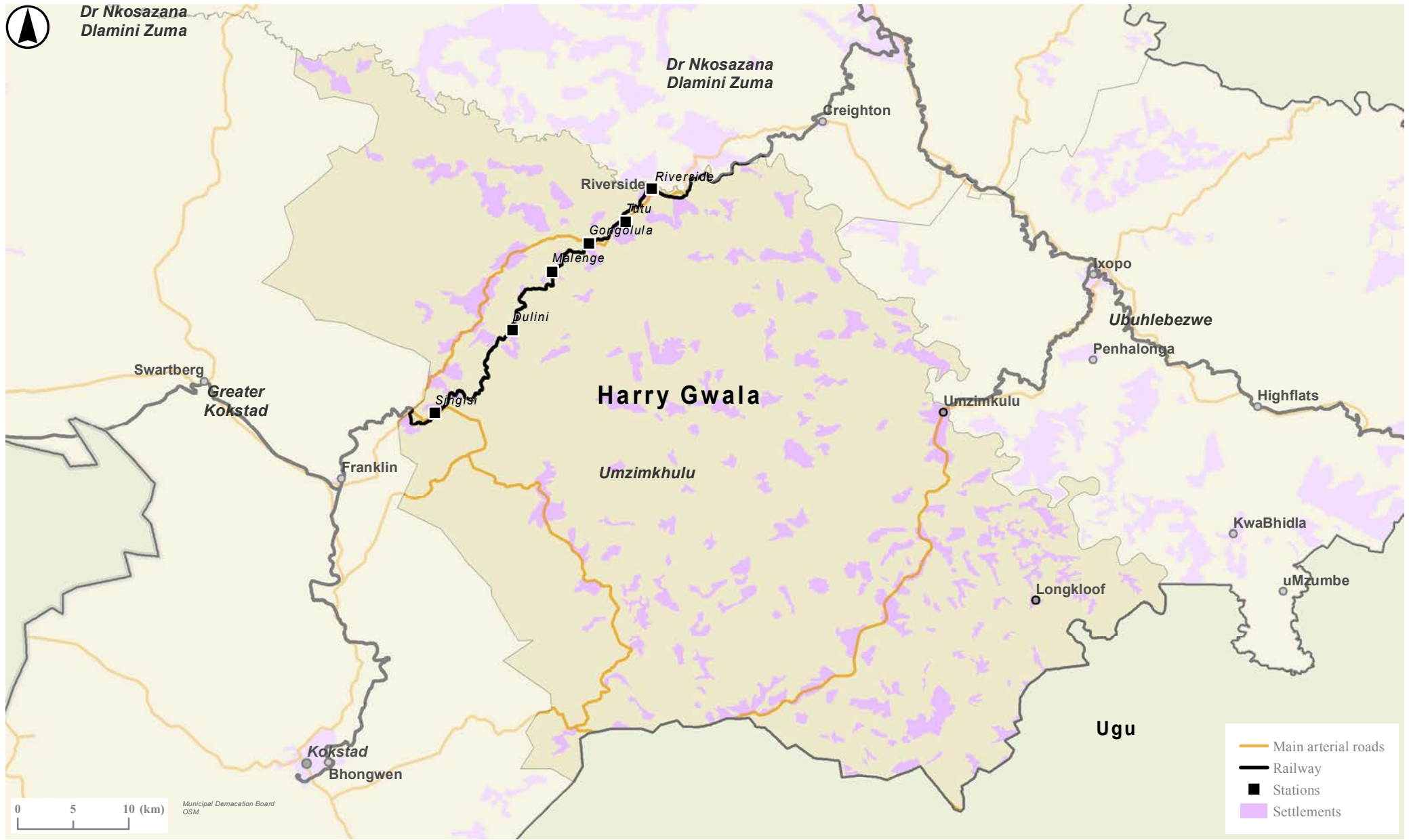
Map A1: Dr Nkosazana Dlamini Zuma Local Municipality - Rail



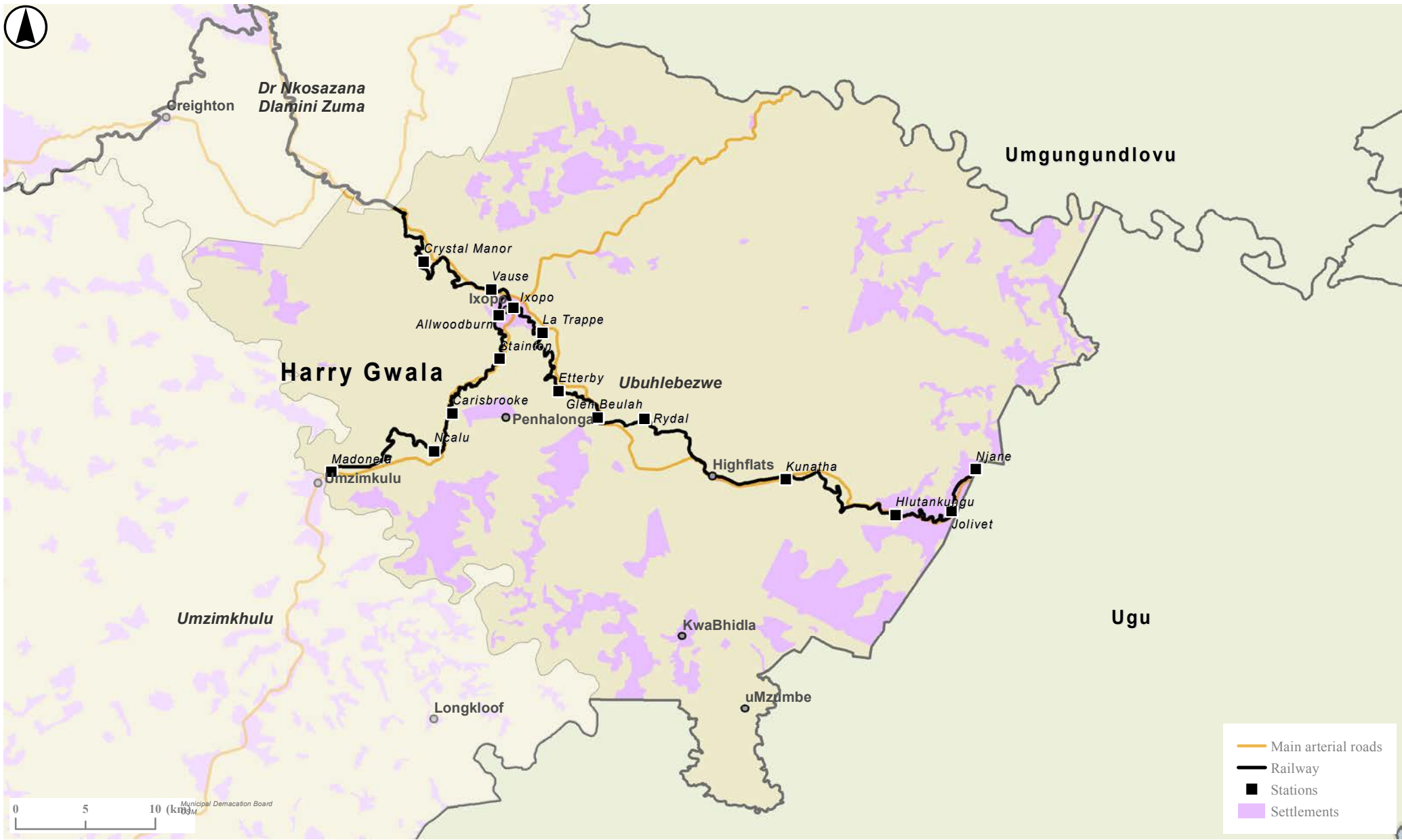
Map A2: Greater Kokstad Local Municipality - Rail



Map A3: Umzimkhulu Local Municipality - Rail



Map A4: Ubuhlebezwe Local Municipality - Rail



Appendix B

Bespoke Rugged Vehicle

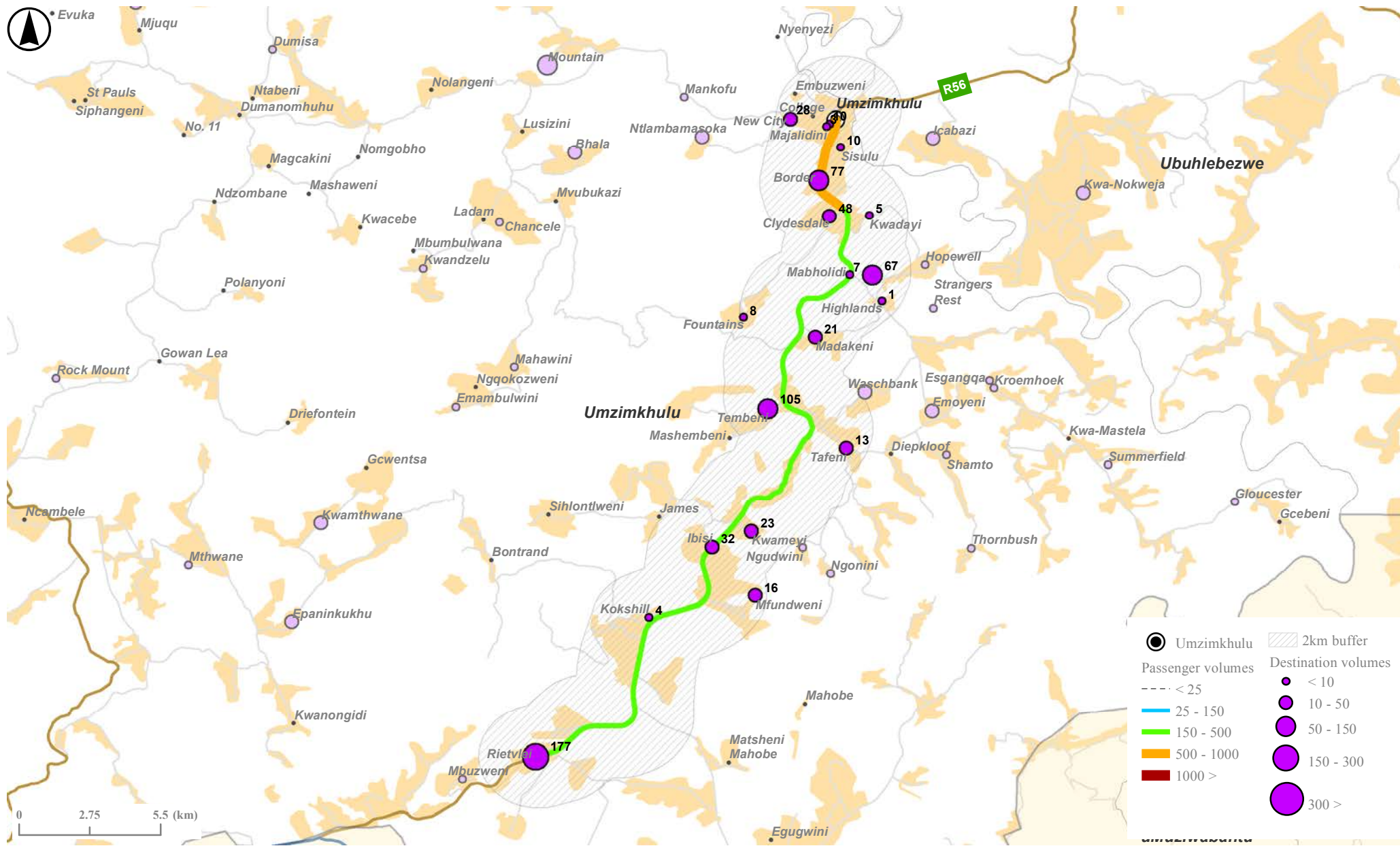
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Appendix C

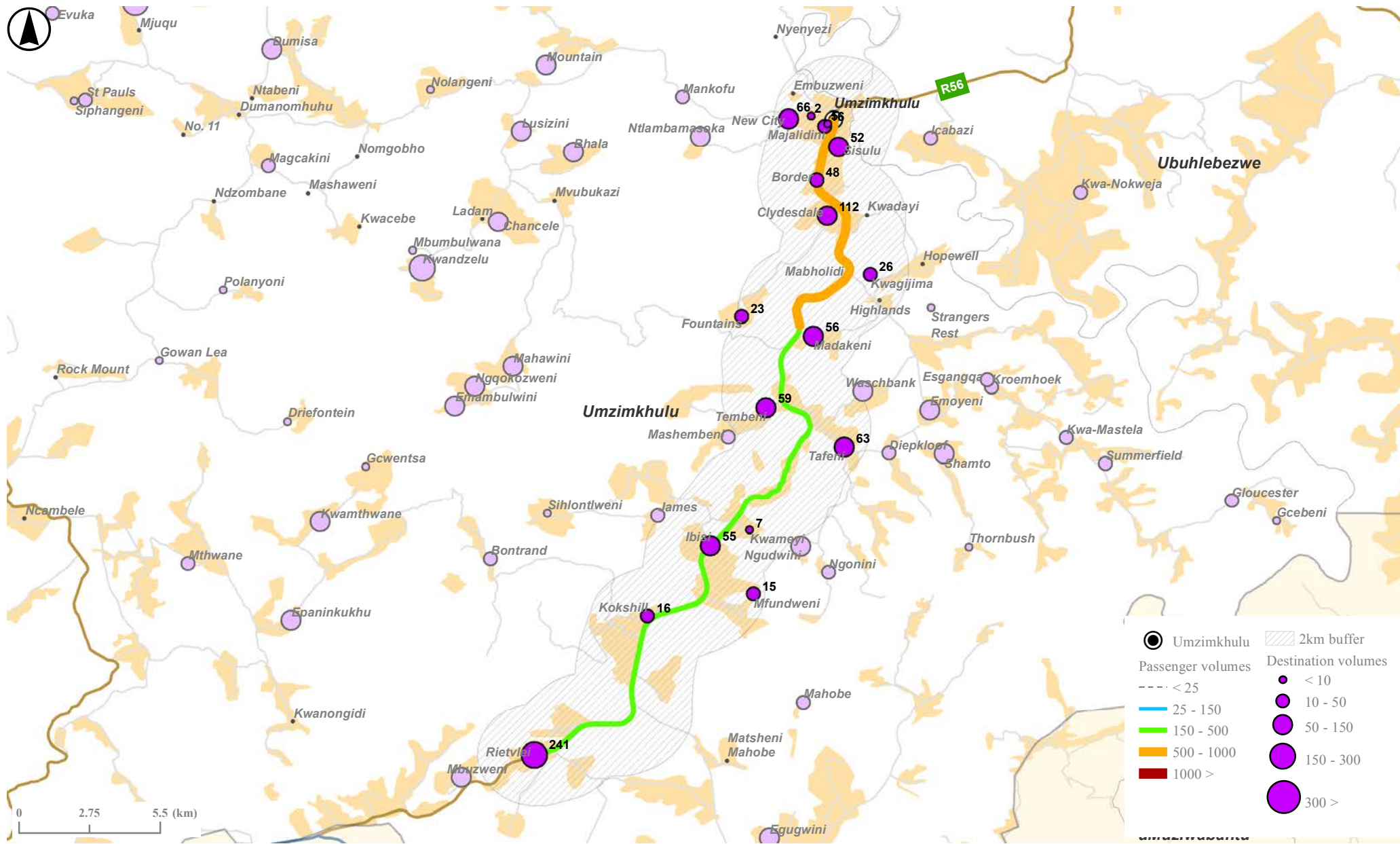
Preliminary Schedule Service Route Demand

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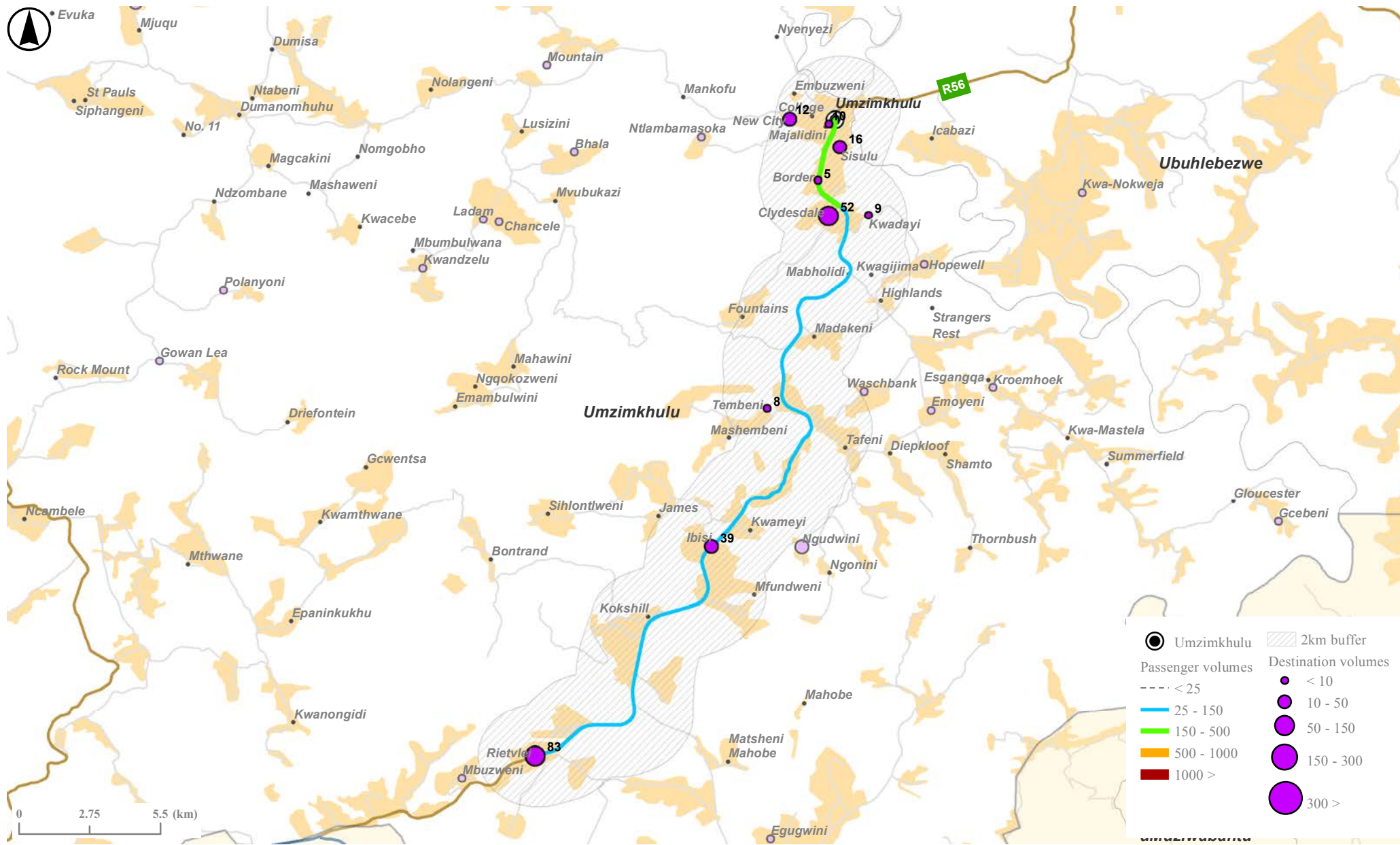
Map C1: Umzimkhulu - Rietvlei : Inbound passenger volumes AM



Map C2: Umzimkhulu - Rietvlei : Inbound passenger volumes MM



Map C3: Umzimkhulu - Rietvlei : Inbound passenger volumes PM

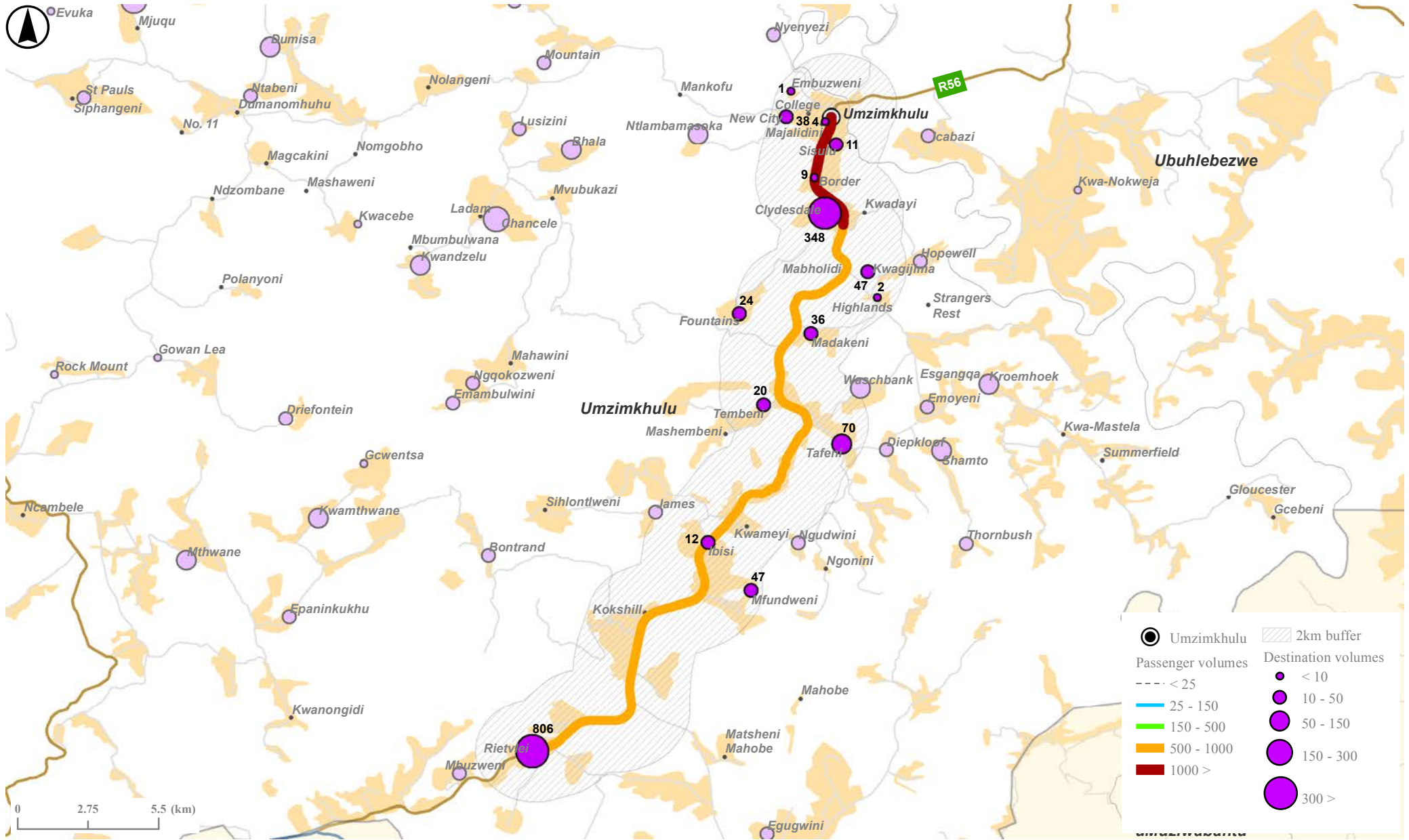


Date: 26-Jan-18 Document Name: Identified Routes

Map C4: Umzimkhulu - Rietvlei : Outbound passenger volumes AM

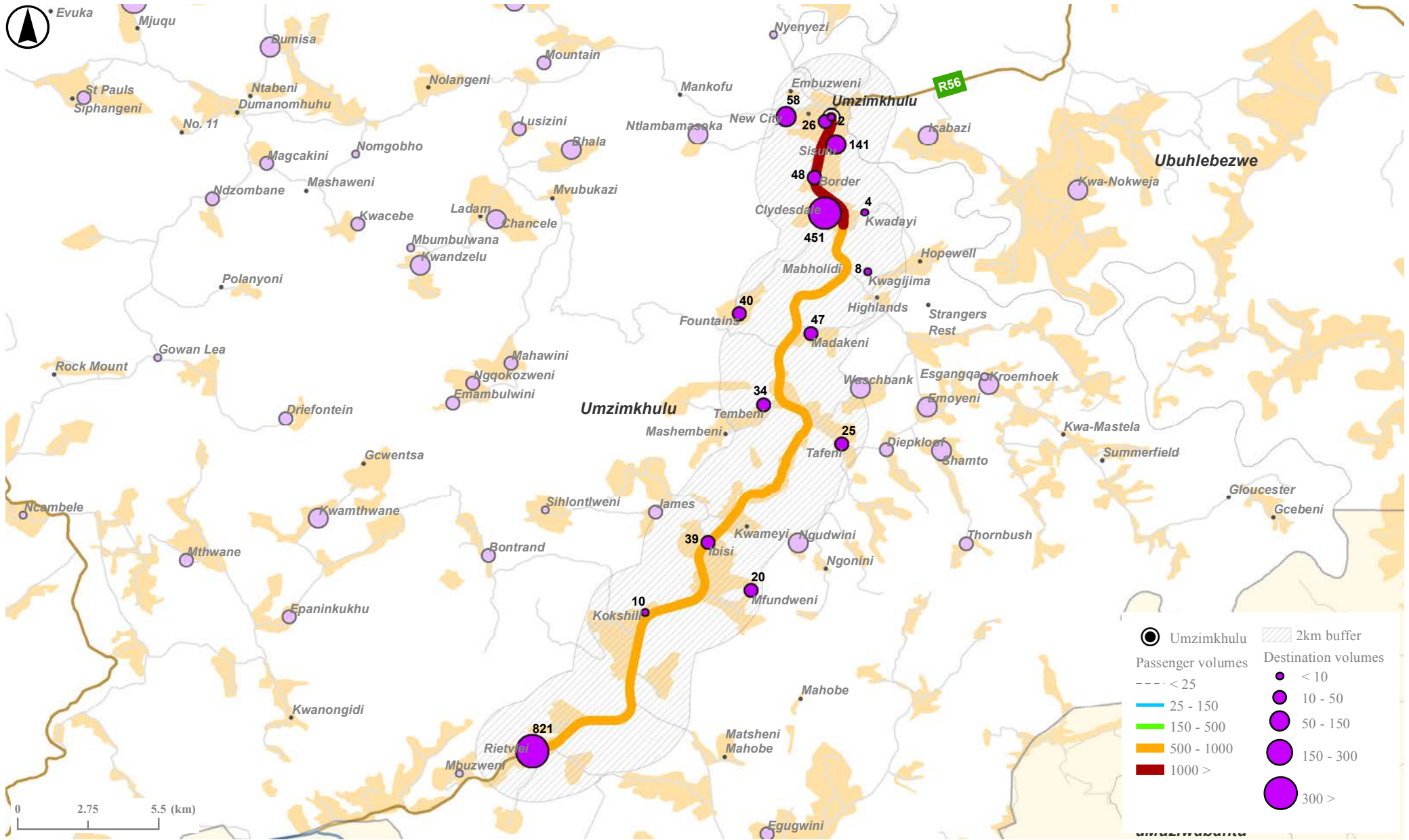


Map C5: Umzimkhulu - Rietvlei : Outbound passenger volumes midday

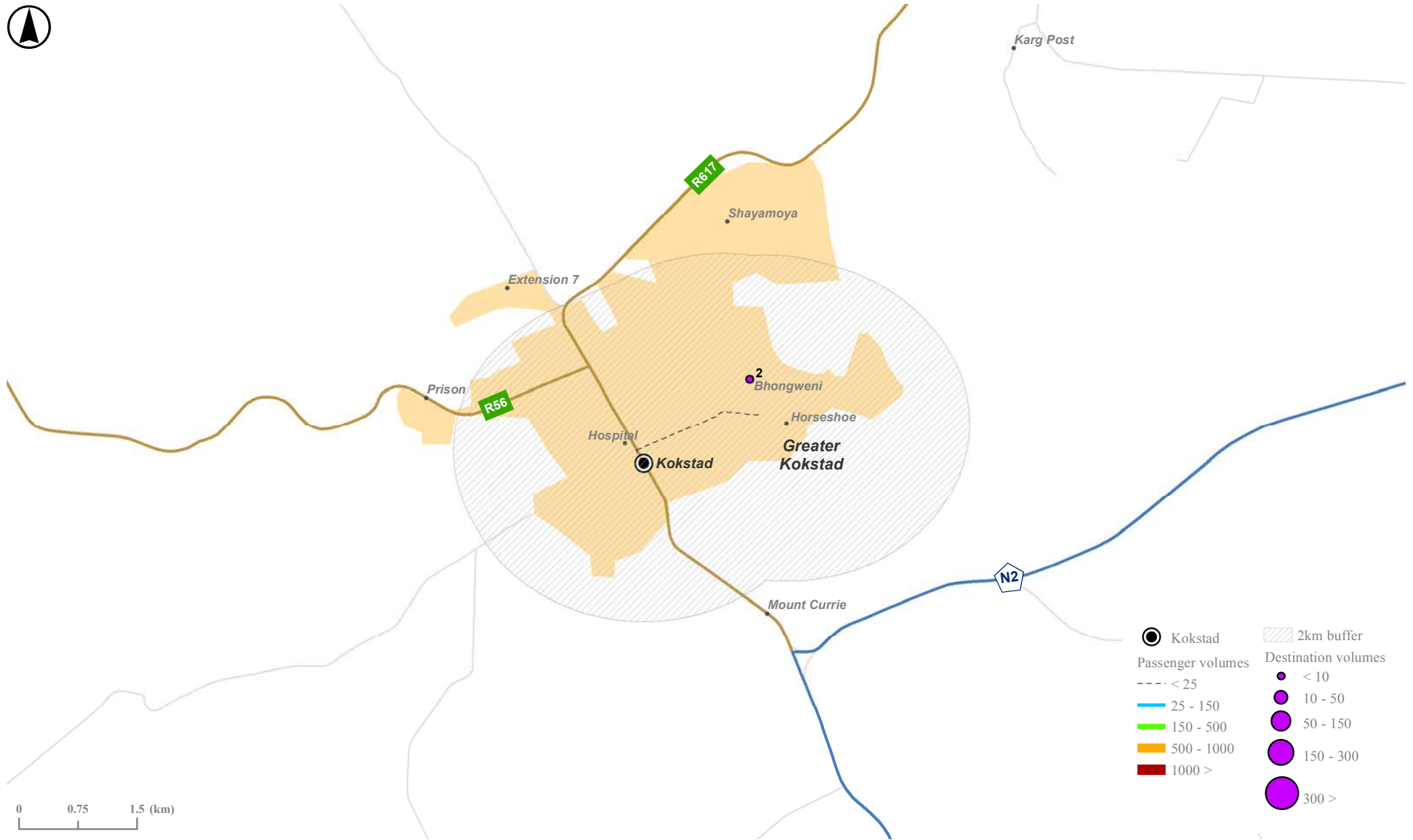


Date: 26-Jan-18 Document Name: Identified Routes

Map C6: Umzimkhulu - Rietvlei : Outbound passenger volumes PM



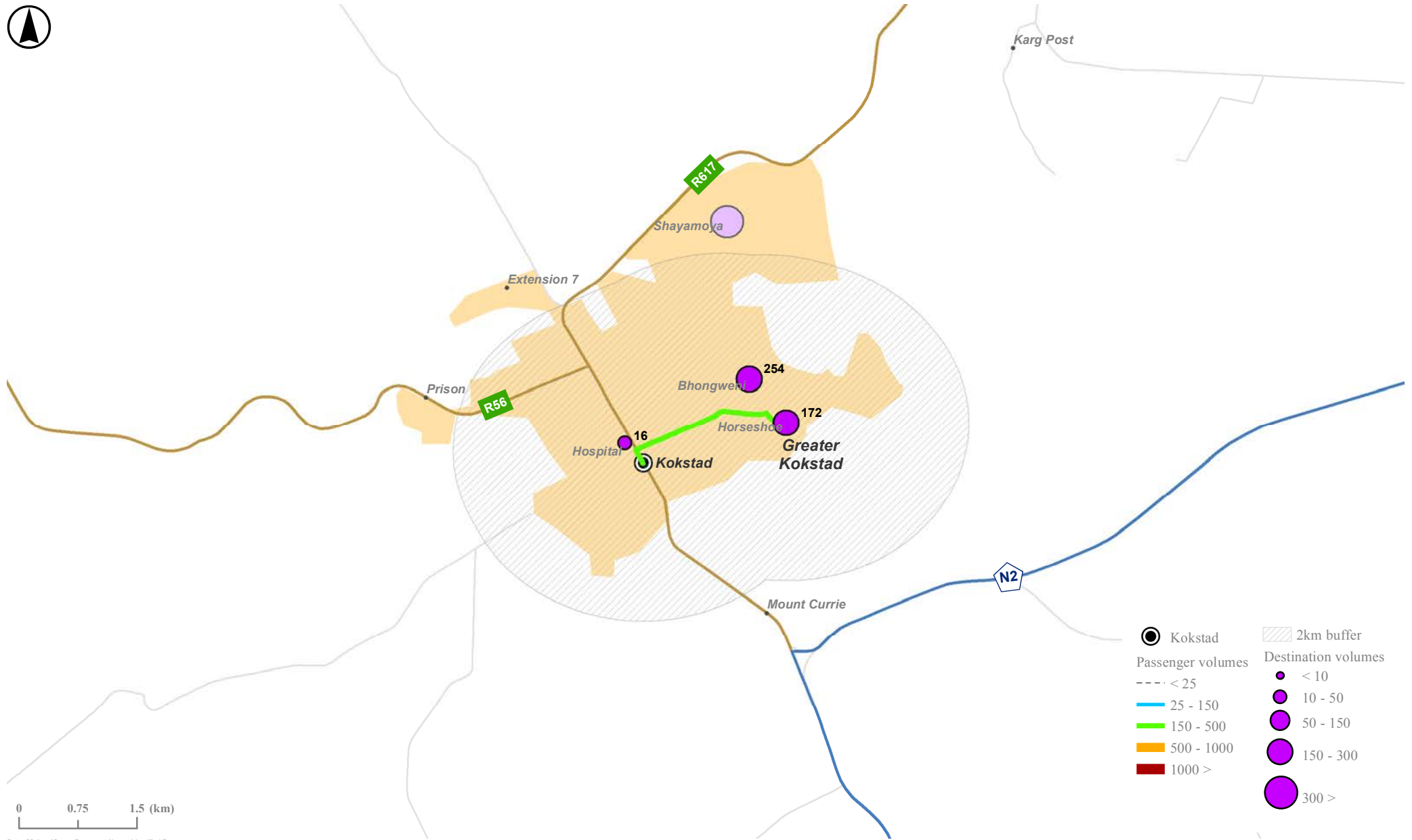
Map:C7: Kokstad - Horseshoe: Inbound passenger volumes AM



0 0.75 1.5 (km)

Date: 26-Jan-18 Document Name: Identified Routes

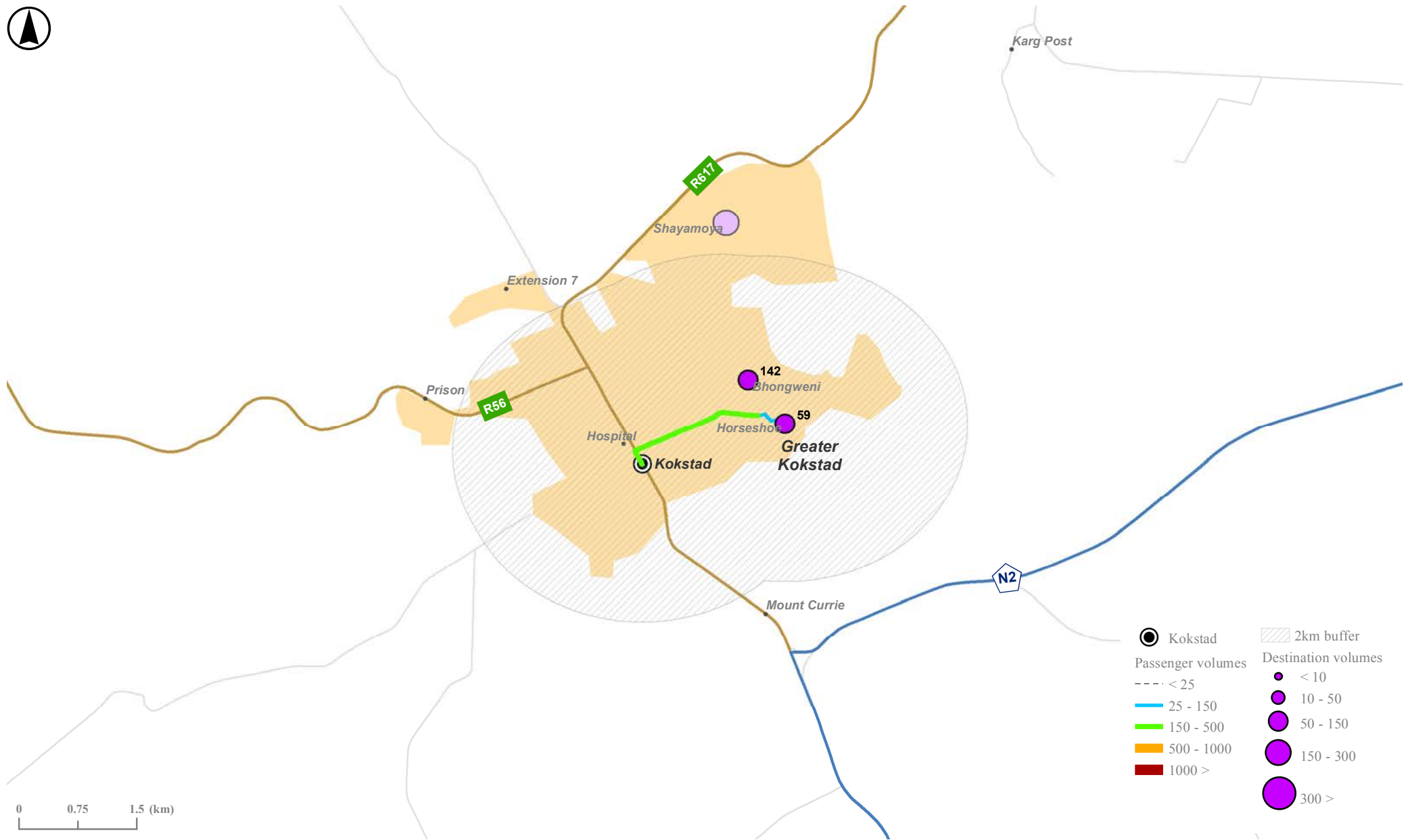
Map C8: Kokstad - Horseshoe : Inbound passenger volumes midday



0 0.75 1.5 (km)

Date: 26-Jan-18 Document Name: Identified Routes

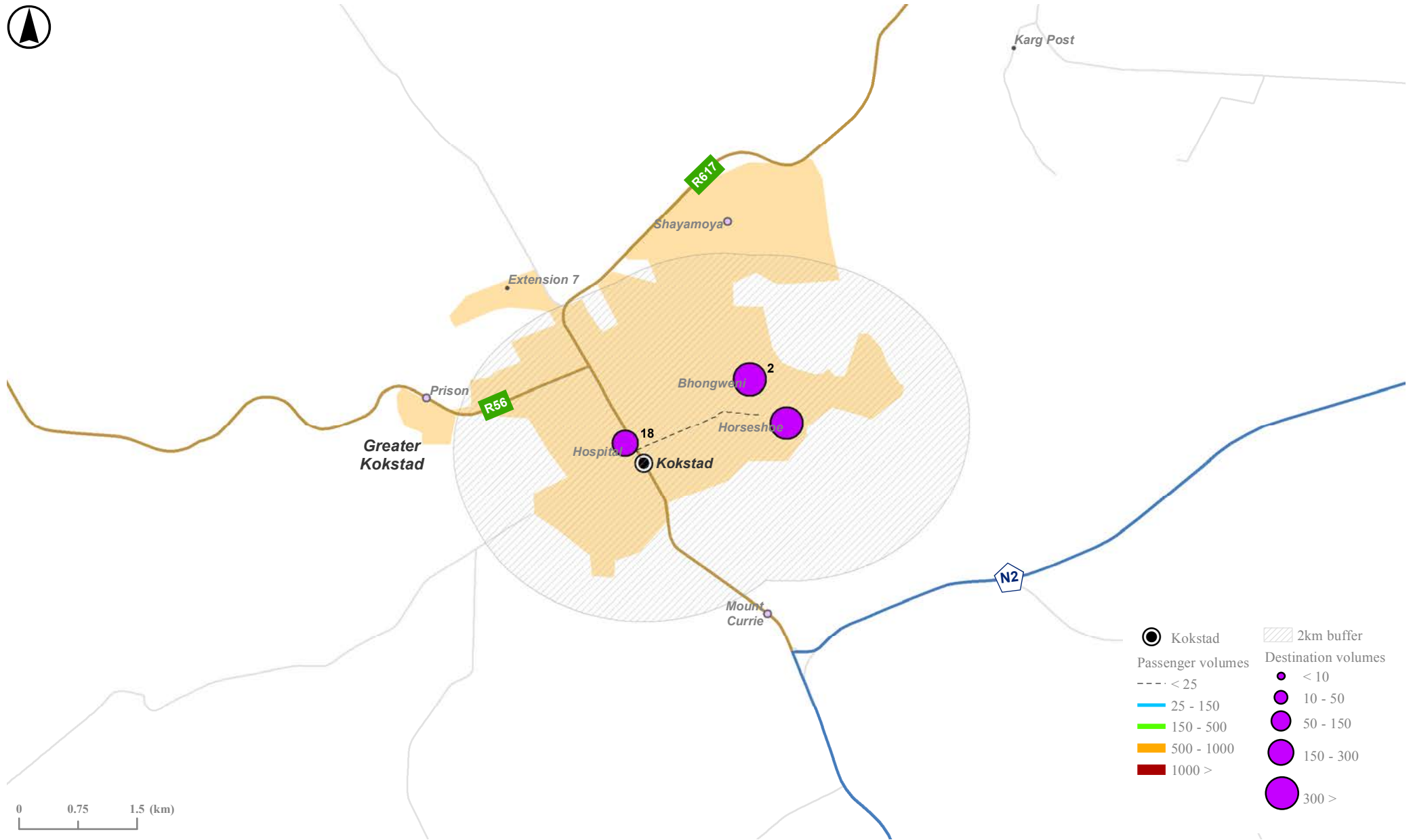
Map C9: Kokstad - Horseshoe: Inbound passenger volumes PM



0 0.75 1.5 (km)

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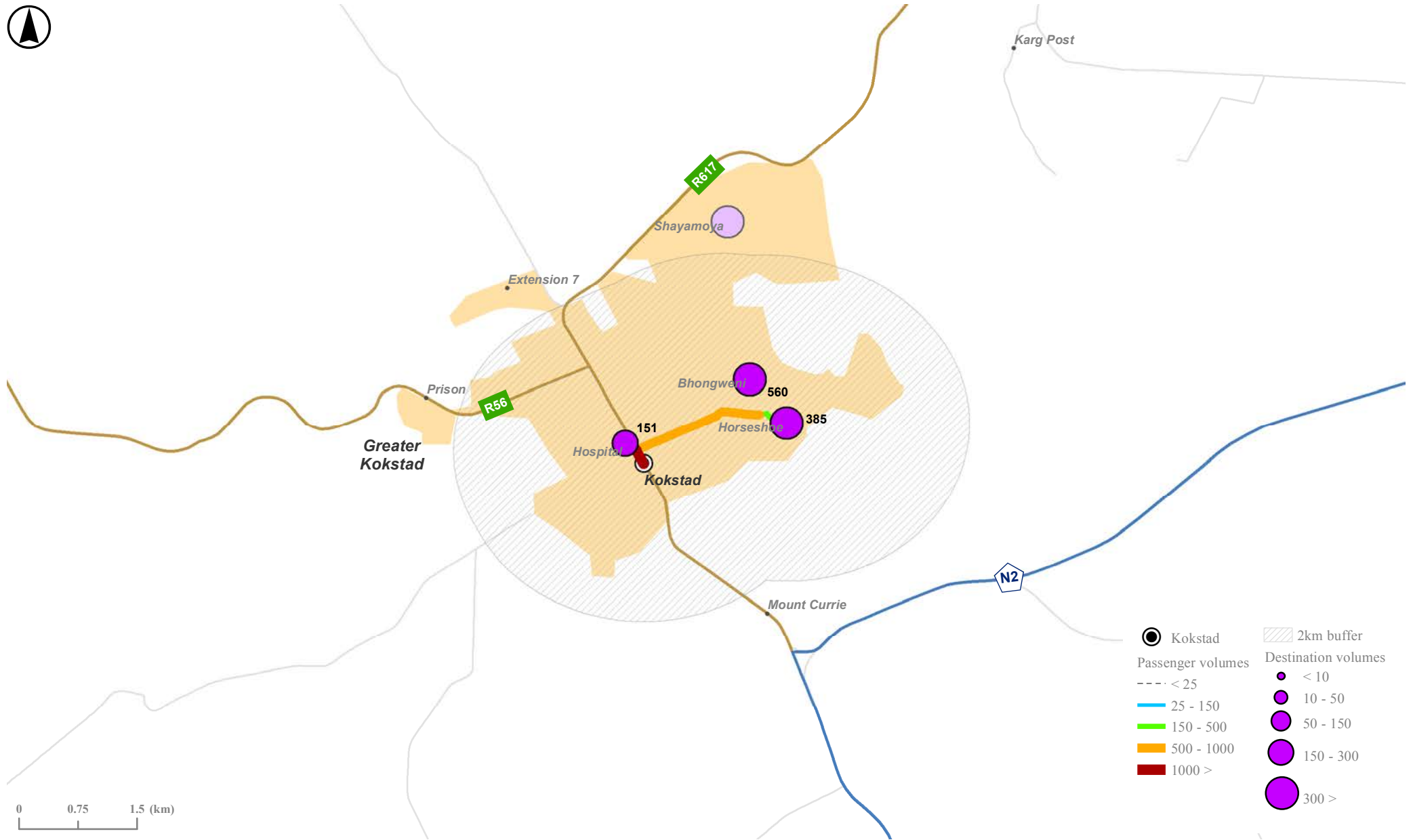
Map C10: Kokstad - Horseshoe : Outbound passenger volumes AM



0 0.75 1.5 (km)

Date: 26-Jan-18 Document Name: Identified Routes

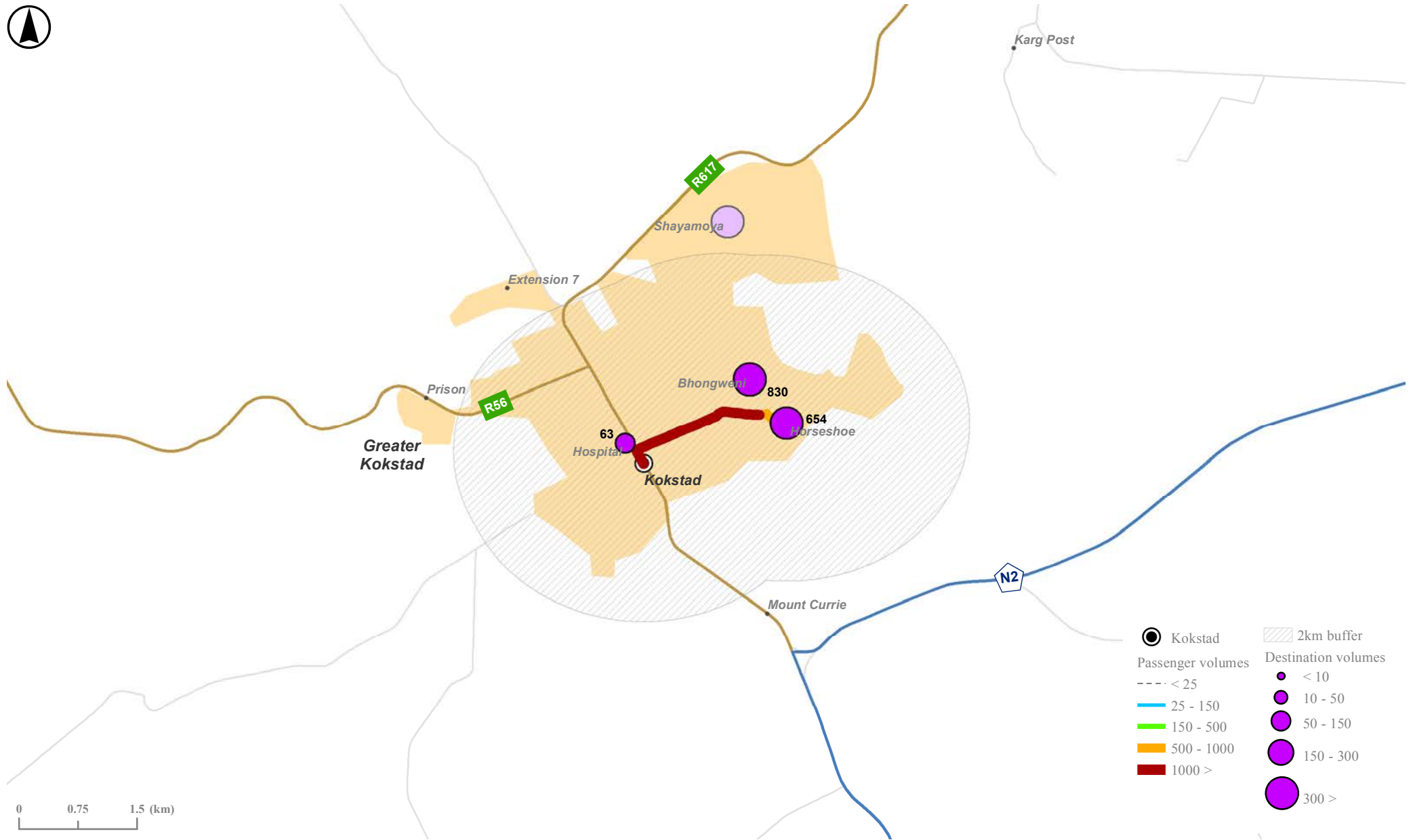
Map C11: Kokstad - Horseshoe : Outbound passenger volumes midday



0 0.75 1.5 (km)

Date: 26-Jan-18 Document Name: Identified Routes

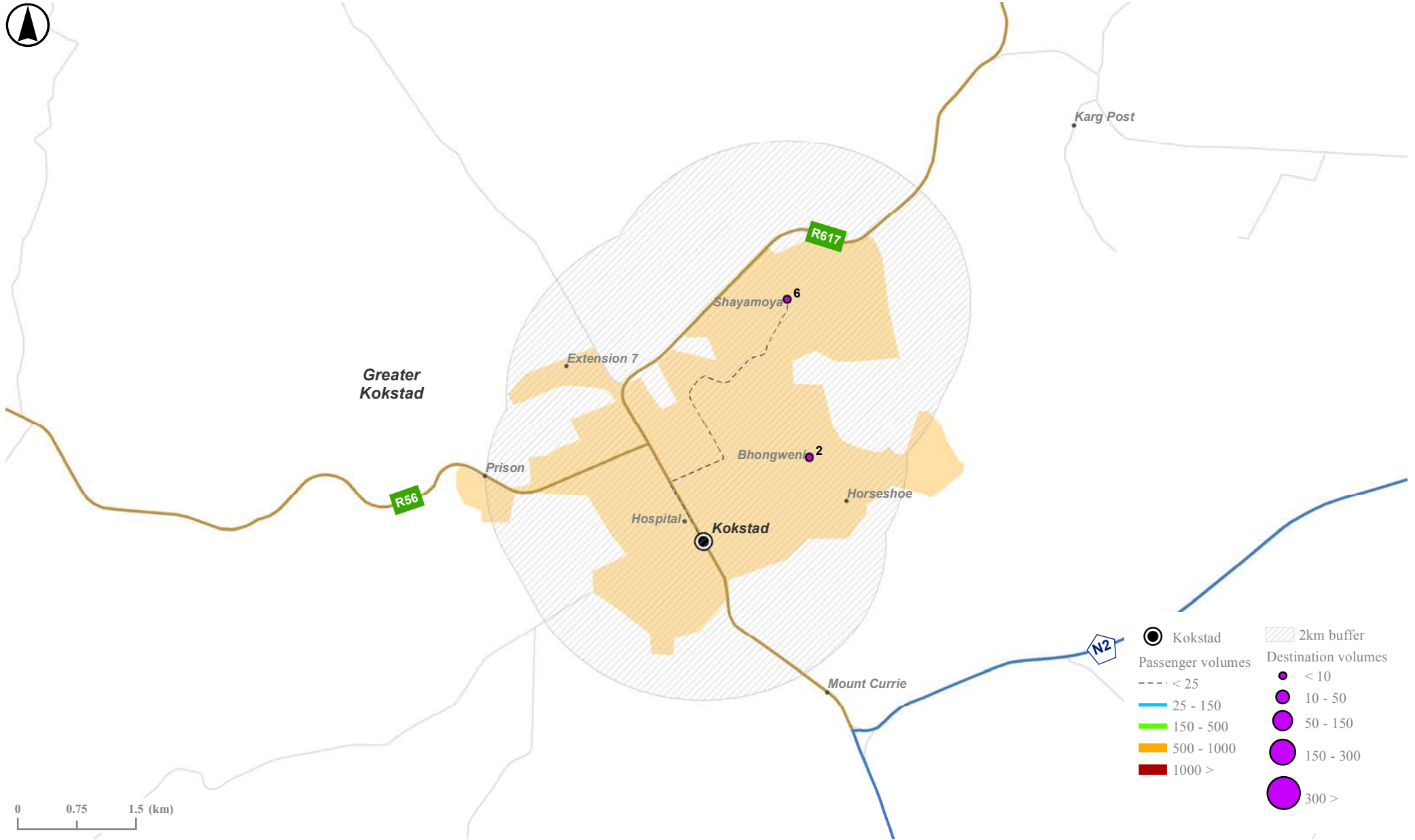
Map C12: Kokstad - Horseshoe : Outbound passenger volumes PM



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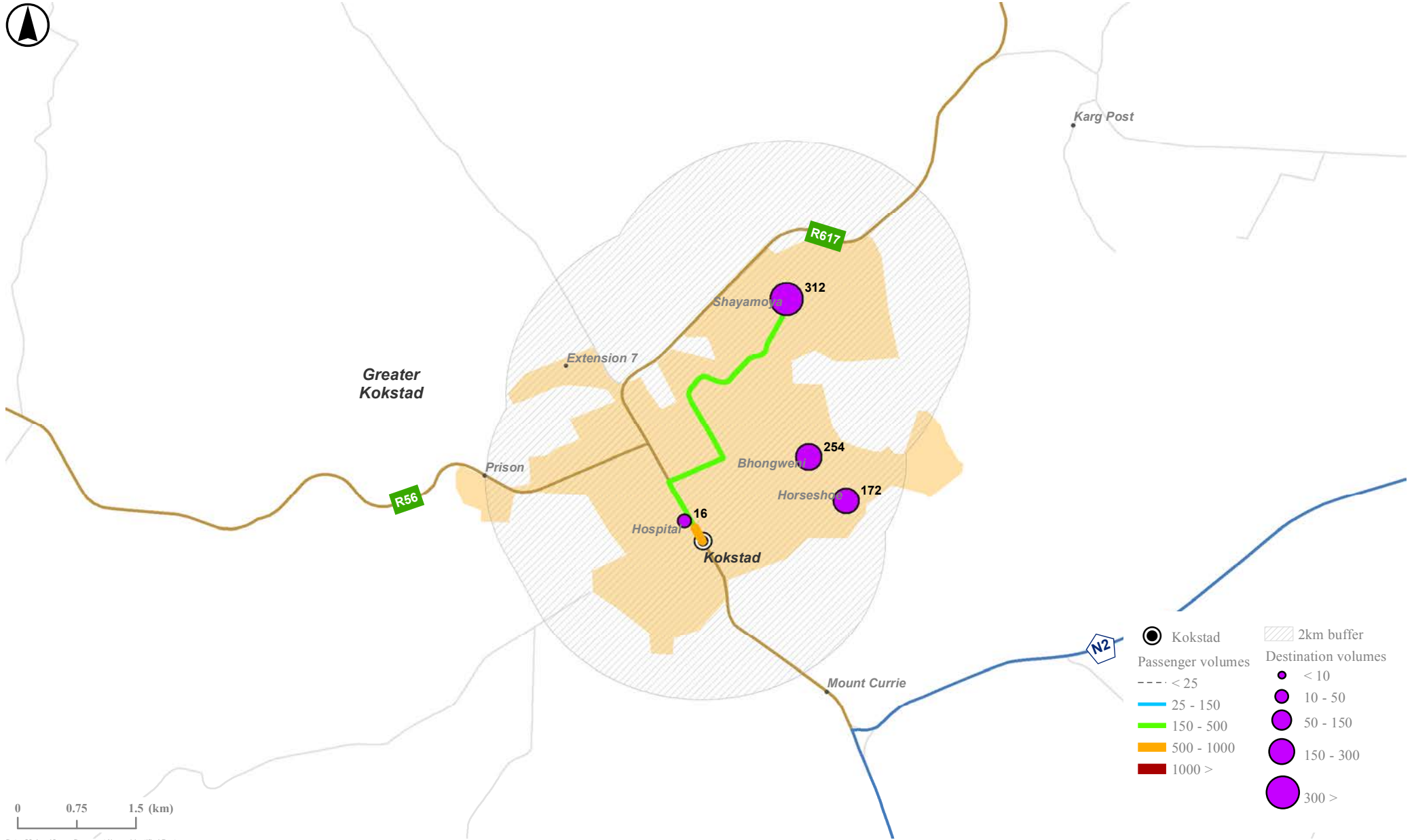
Date: 26-Jan-18 Document Name: Identified Routes

Map C13: Kokstad - Shayamoya : Inbound passenger volumes AM

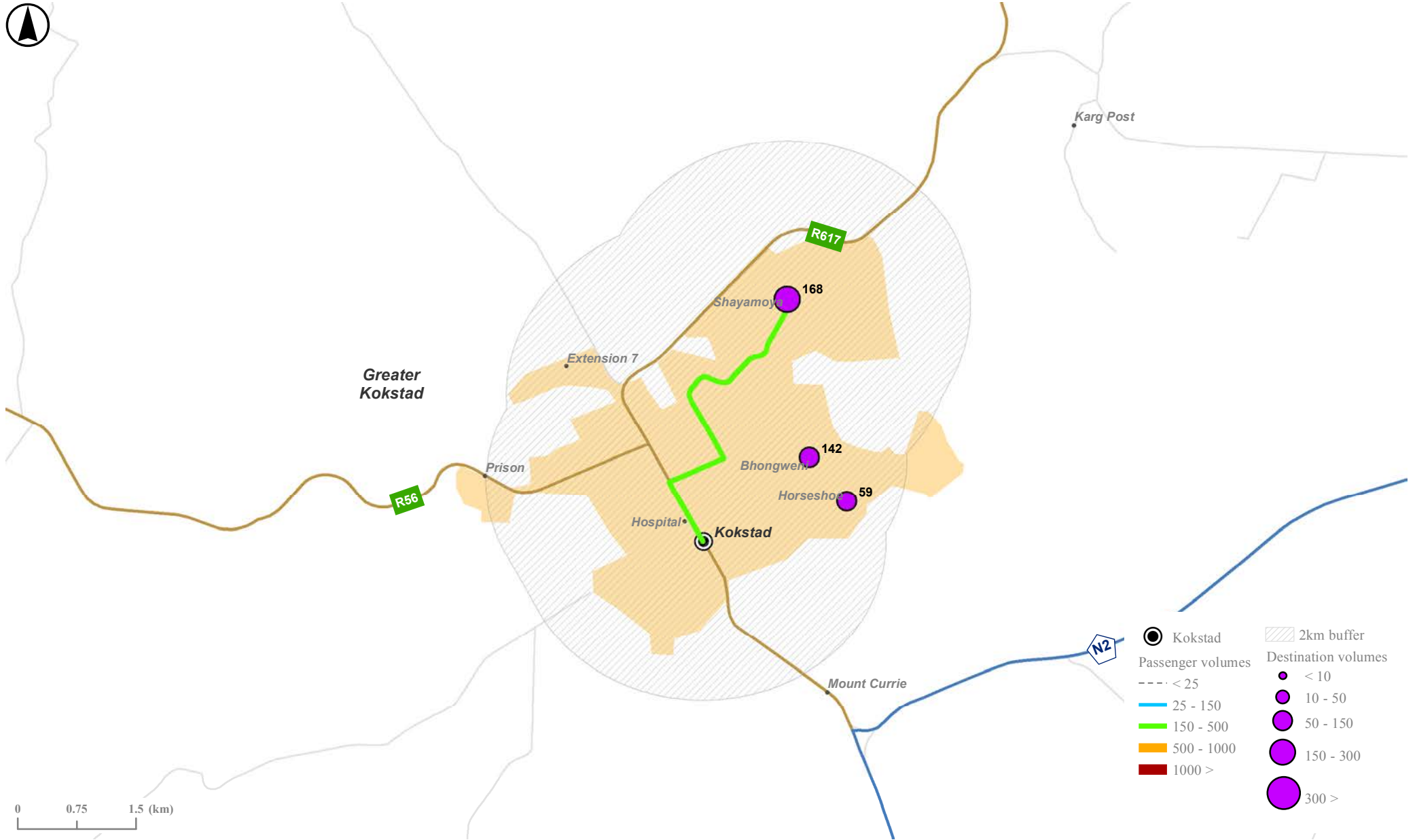


Date: 26-Jan-18 Document Name: Identified Routes

Map C14: Kokstad - Shayamoya : Inbound passenger volumes midday



Map C15: Kokstad - Shayamoya : Inbound passenger volumes PM

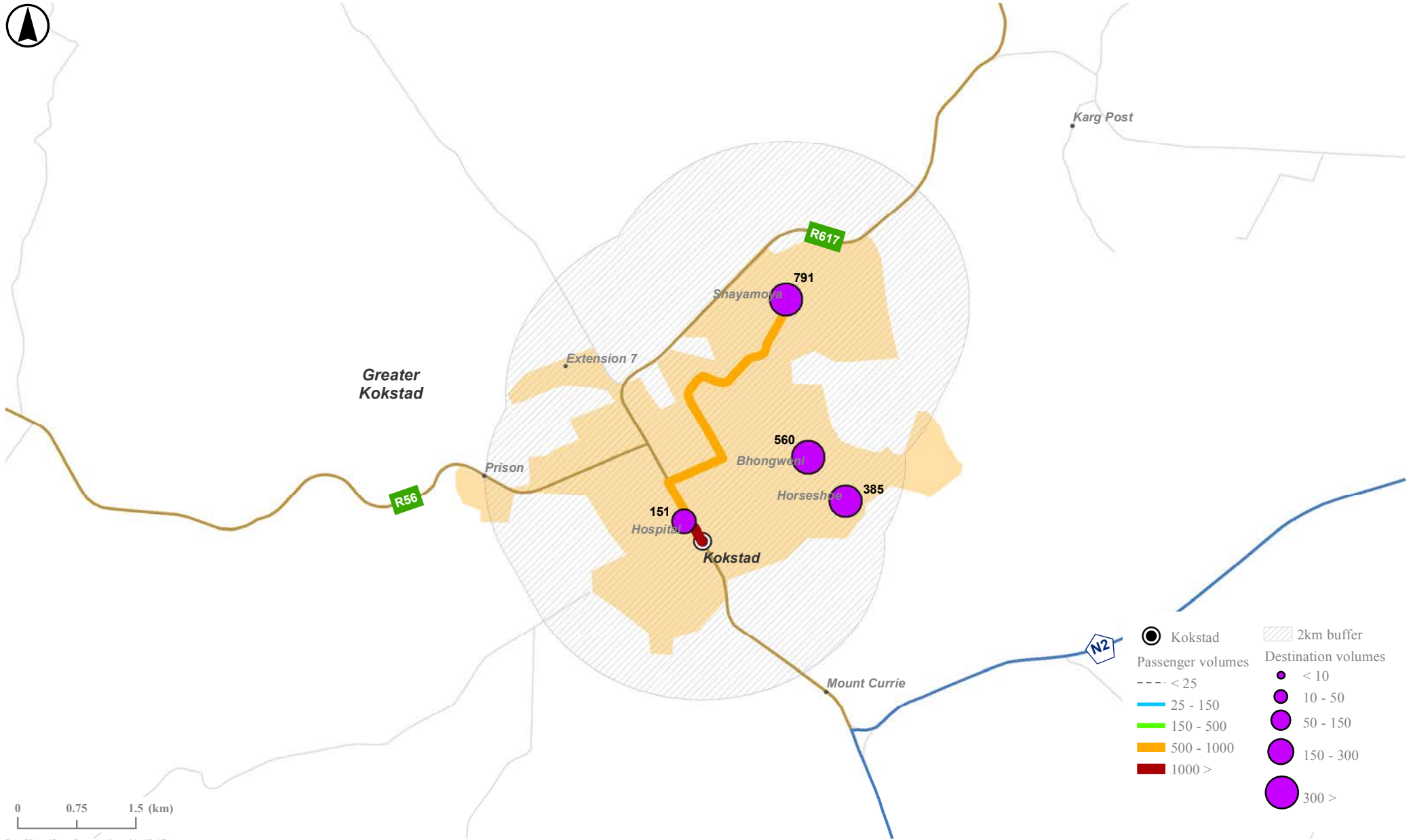


Date: 26-Jan-18 Document Name: Identified Routes

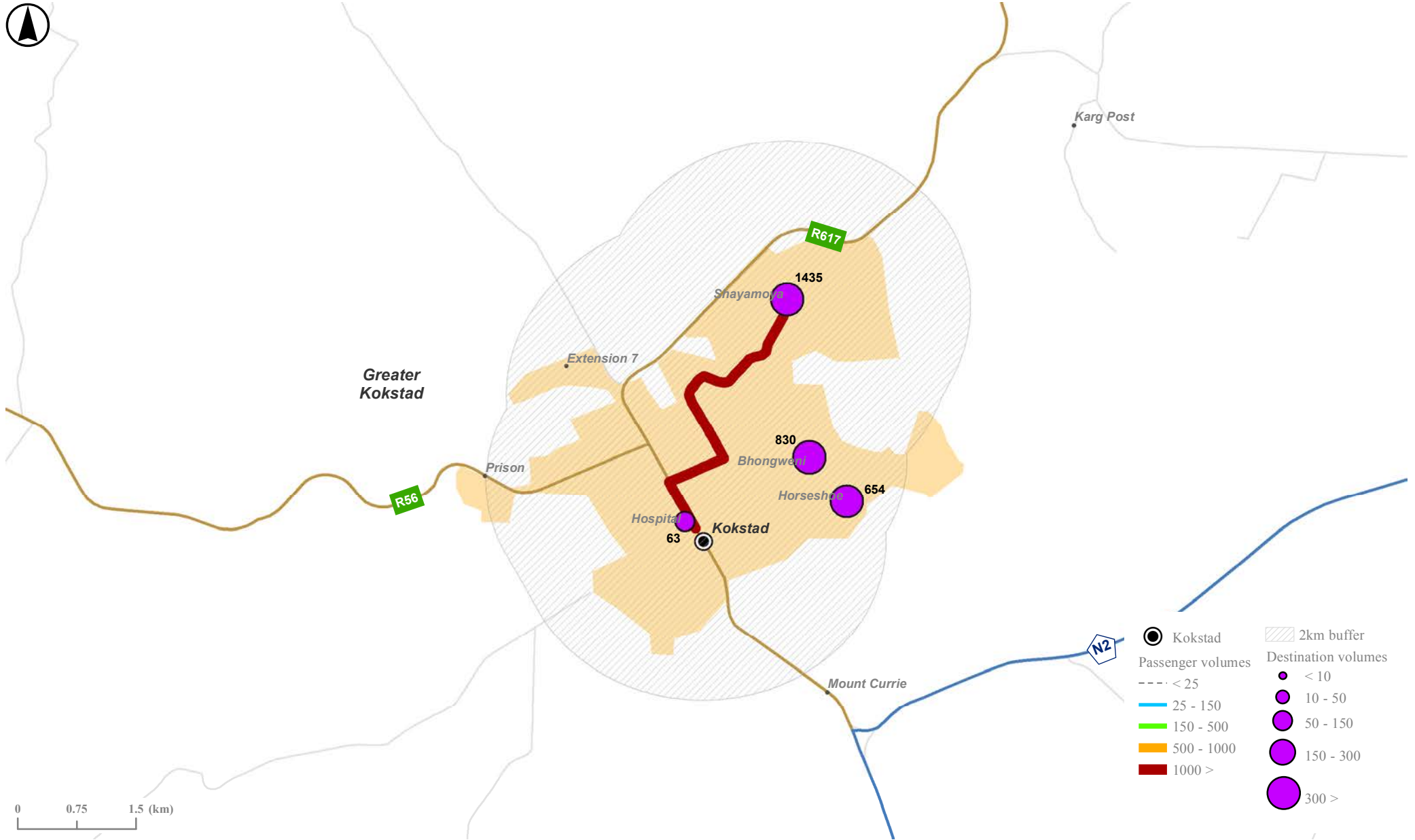
Map C16: Kokstad - Shayamoya : Outbound passenger volumes AM



Map C17: Kokstad - Shayamoya : Outbound passenger volumes midday



Map C18: Kokstad - Shayamoya : Outbound passenger volumes PM



0 0.75 1.5 (km)
 Date: 26-Jan-18 Document Name: Identified Routes