ENVIRONMENTAL MANAGEMENT FRAMEWORK FOR THE UMGUNGUNDLOVU DISTRICT MUNICIPALITY: Infrastructure Specialist Report

Institute of Natural Resources

ENVIRONMENTAL MANAGEMENT FRAMEWORK FOR THE UMGUNGUNDLOVU DISTRICT MUNICIPALITY

INFRASTRUCTURE SPECIALIST REPORT

Prepared For

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1. INTRODUCTION

The infrastructure assessment component of the Umgungundlovu Environmental Management Framework (EMF) investigated the extent of available infrastructure services in the Umgungundlovu District Municipality (UMDM). Five infrastructure services were investigated:

- Water Services,
- Sanitation Services
- Road Networks
- Electricity Distribution Networks
- Solid Waste Collection Services

While the EMF presents an assessment centred on environmental sensitivities, the inclusion of an infrastructure assessment relates to the environment in two specific ways. Firstly, the lack of infrastructure services indicates likely unmitigated impact on the natural environment in terms of pollution impact on land or water resources for example. The other being the lack of infrastructure services indicates planning priorities for addressing these in a sustainable manner.

2. APPROACH TO MAPPING INFRASTRUCTURE SERVICES IN THE UMDM

The approach to mapping the infrastructure services included the acquisition of accessible data from municipal and infrastructure service providers and utilities. This was conducted through extensive engagement with various gate keepers of infrastructure data including workshops and meetings.

The data was then assessed in terms of the coverage and condition assessment information obtained. The mapping sources of information included the following:

- Water: Umgeni Water, UMDM Water Services Authority – consultants for the Water Services Development Plan update and UMDM GIS Shared Services
- Roads: Strategic Infrastructure Projects (SIP 2) from Department of Transport sub-consultant and UMDM GIS Shared Services
- Sanitation: UMDM Water Services Authority – consultants for the Water Services Development Plan update and the UMDM GIS Shared Services
- Electricity: Eskom
- Waste Services: UMDM GIS Shared Services, UMDM Waste Services

There integration of these layers of data with predominantly current datasets, makes this assessment valuable for sustainable infrastructure planning. The data accessed is the most currently available data for infrastructure services planning such as the Water Service Authority Water Service Development Plan (WDP) updates and the data used of for the 2017/2018 UMDM IDP and SDF revisions. However, there are data gaps due to the inconsistent availability and lack of information provided by district infrastructure planning officials. These are detailed below in the assumptions and limitations.

Classification of service provision

In order to rate the level of infrastructure service present, each infrastructure service was assigned a constraint score from 1 (low) to 4 (high). High sensitivity indicates low service provision and low sensitivity indicates high service provision.

Sensitivity/Score		Water Services Areas	Electricity	Roads	Sanitation	Waste Collection Areas
Very High	4	No water schemes present and no planned improvement	No distribution network	No road network/ Dirt roads	No sanitation	0-200 households
High	3	Combination of no formal water schemes/ and constrained water service	Constrained Distribution Network	Outside of buffer to access main roads	No Sanitation, use Septic Tanks, VIPs	200-400 households
Moderate	2	Constrained but planned improvements to water services	Slightly Constrained	Within district road buffer access	N/A	400-600 households
Low	1	Good condition, no constraint to water services	Unconstrained Distribution Network	Within National and district road buffers	Waterborne sanitation	>600 households

3. MAIN FINDINGS OF SERVICE PROVISION

The infrastructure assessment has revealed that 36% of the district has a low infrastructure sensitivity indicating high infrastructure service provision. Low service provision is experienced in atleast 27% of the UMDM area. The high service provision is distributed unevenly across the UMDM and specifically in the KFAs (See Figure 3). The district spatial distribution of these services across the UMDM is shown in Figure 2.

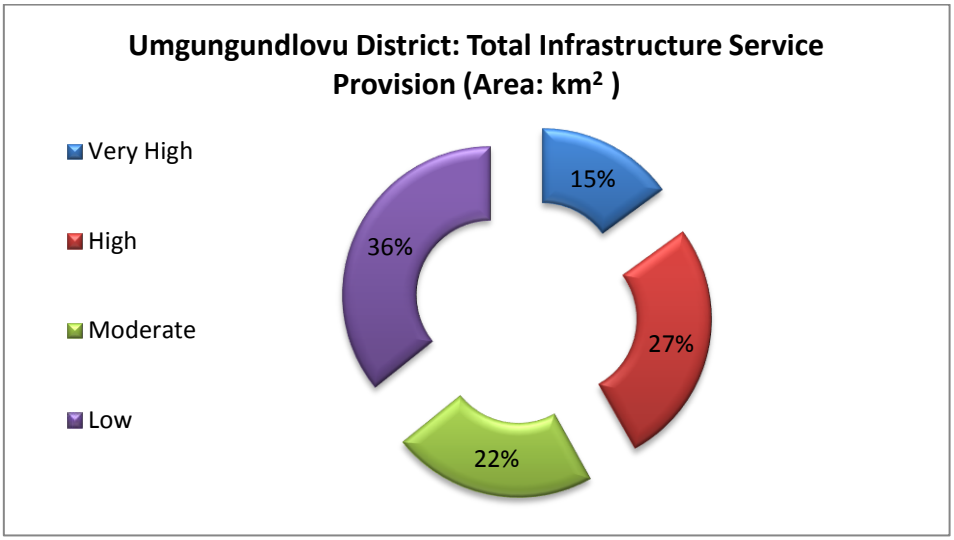

Figure 1: Total Infrastructure Service Provision in the UMDM total area

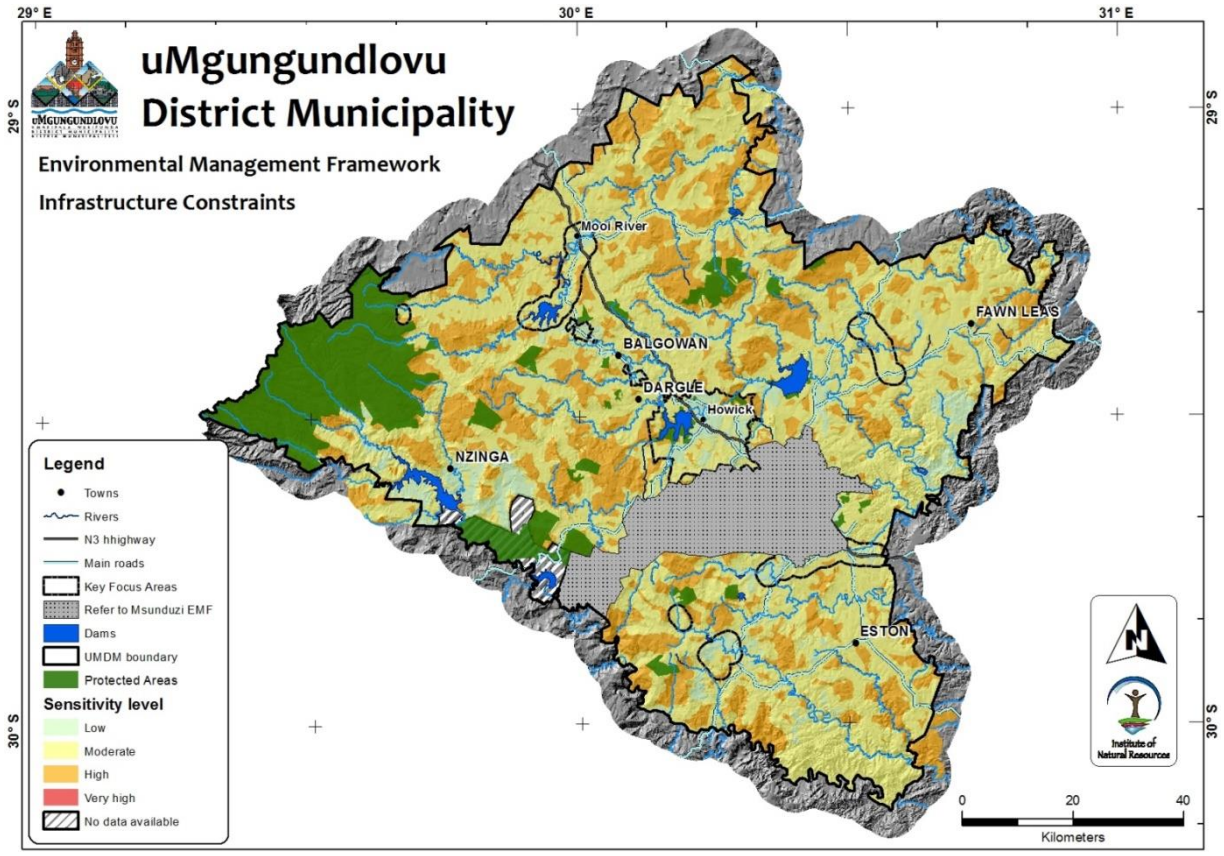

Figure 2: Combined Service Infrastructure Map

The combined service provision shown in Figure 2 shows the distribution across of services as per the following criteria shown in the table below.

SENSITIVITY LEVEL	THRESHOLD
Very High	**0-1 Infrastructure Services Present** Infrastructure Service extent assessed include water, sanitation, electricity, roads, water services. If only one of these present it would indicate a very high sensitivity and therefore a very high constraint to development and on the environment by virtue of the impacts caused by lack of services eg. watercourse pollution
High	**2-3 Infrastructure Services Present** Infrastructure Service extent assessed include water, sanitation, electricity, roads, water services. If only two of these are present it would indicate a high sensitivity and therefore a high constraint to development and on the environment by virtue of the impacts caused by lack of services.
Moderate	**3-4 Infrastructure Services Available** Infrastructure Service extent assessed include water, sanitation, electricity, roads, water services. If only 3 of these are present it would indicate a moderate sensitivity and therefore a moderate constraint to development and on the environment by virtue of the impacts caused by lack of services.
No/Low Constraint	**4-5 Infrastructure Services Present** Infrastructure Service extent assessed include water, sanitation, electricity, roads, water services. 4 of these are present and indicates a low sensitivity and therefore a low constraint to development and on the environment by virtue of the reduced impacts caused by lack of services.
Protected Area	Bulk infrastructure services present to support the sustainable management and utilisation of the Protected Area and established in accordance with the Protected Area Management Plan.

The comparative status of service levels in the Key Focus Areas is shown in Figure 3. The KFAs with the highest service provision include Nottingham Road and Richmond. While most of the area of Cleopatra is characterised by low service provision.

	Key Focus Areas (KFAs)								
	Midmar/Howick	Richmond - Indaleni	Newhanover - Wartburg	Mooi River - Springrove	Byrne	Cleopatra	Lidgetton	Nottingham Road	Camperdown - Baynesfield
Very High	22%	31%	10%	30%	3%	0%	15%	77%	23%
High	25%	31%	43%	43%	49%	20%	48%	23%	41%
Moderate	32%	30%	24%	17%	38%	9%	37%	0%	27%
Low	21%	8%	23%	9%	10%	71%	0%	0%	9%
	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 3: Key Focus Areas comparison

The individual infrastructure services i.e. water services, roads, electricity, sanitation, waste services are shown below according to their individual extent across the district.

The electricity and road networks are the most extensive across the district. Significant areas of the district lack waterborne sanitation. Potable water is lacking in most of the district where water schemes and piped water to households are lacking. Waste services are constrained in the district. There are 5 landfill sites, with the Msunduzi New England Road Landfill reported at handling over 80% of the districts waste. Proposed plans to develop a district landfill site aims to address this issue.

4. Water service

High water service areas are found within the uMshwathi, Richmond and Mkhambathini LMs. High service areas were scored based on the priority to refurbish already existing infrastructure. The Richmond, Mkhambathini and uMshwathi LMs proved to be the high services areas as existing infrastructure in these areas were not under significant pressure as compared to those located within certain city centres. Hence refurbishment priority associated with infrastructure was a very low priority. Therefore areas with low service are constrained by the either the lack of a water scheme and therefore reticulated potable water or have boreholes and other non-potable water sources. These water serviced areas determination is on the current Water Services Development Plan update process and therefore represents a high confidence level of water service distribution in the district.

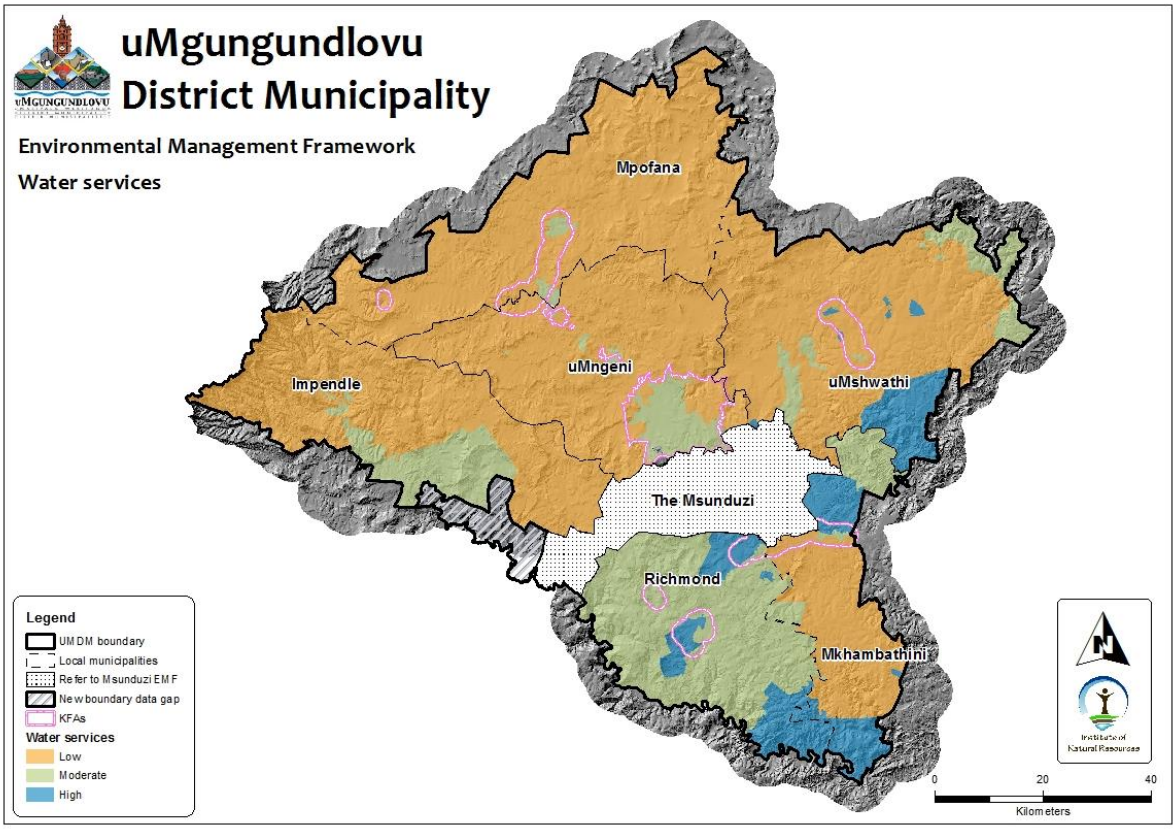

Figure 4: Water Services in the UMDM

5. Electricity services

High electricity service areas were scored according to the level of constraint on the distribution lines. Distribution lines which had no constraints were spread over all LMs. A significant amount of these high electricity service areas were found within all Key Focus Areas besides Cleopatra. High service areas were also located within the CBDs of LMS as well suburban residential areas (Figure 5).

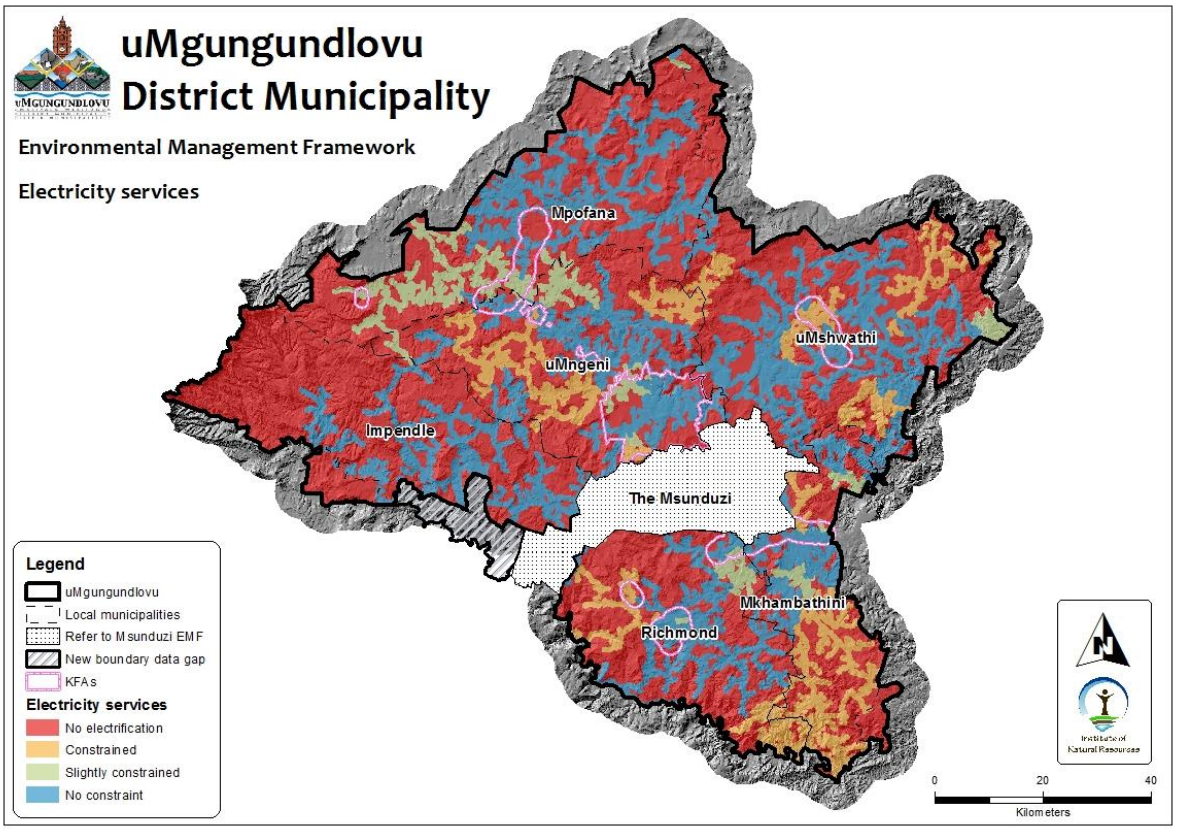

Figure 5: Electricity Services in the UMDM

6. Sanitation services

As shown in Figure 6, high sanitation service areas are found within the Mpofana, uMngeni, Richmond, Mkhambathini and uMshwathi LMs. High sanitation areas are almost always located with the city centres (CBD) of each one of the above mentioned LMs. The majority of high sanitation service areas are found within Key Focus Areas. This is expected as waterborne sanitation was allocated the highest score, which is the dominant sanitation type within the KAFs in which these service areas are located. High service areas were associated with existing Waste Water Works (WWW) as high waste services areas were located around WWW.

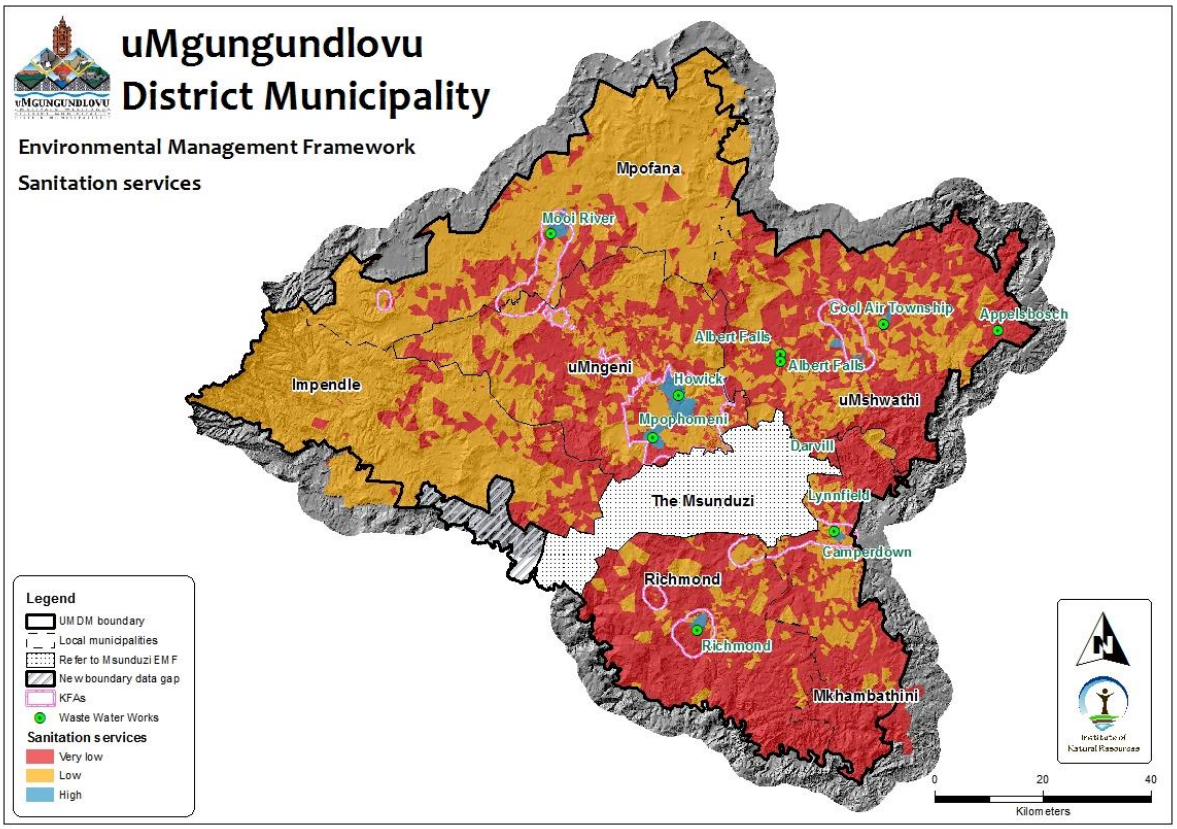

Figure 6: Sanitation Services in the UMDM

7. Waste service

High waste collection service areas are found within the Mpofana, uMngeni and Impendle LMs. Within these LMS, these high service areas are found within the Mooi-River – Spring Grove, Nottingham Road, Howick – Midmar Key Focus Areas. All high service areas have landfill sites within the above mentioned LMs. The waste service infrastructure shown indicates a the need for greater waste collection services across the District.

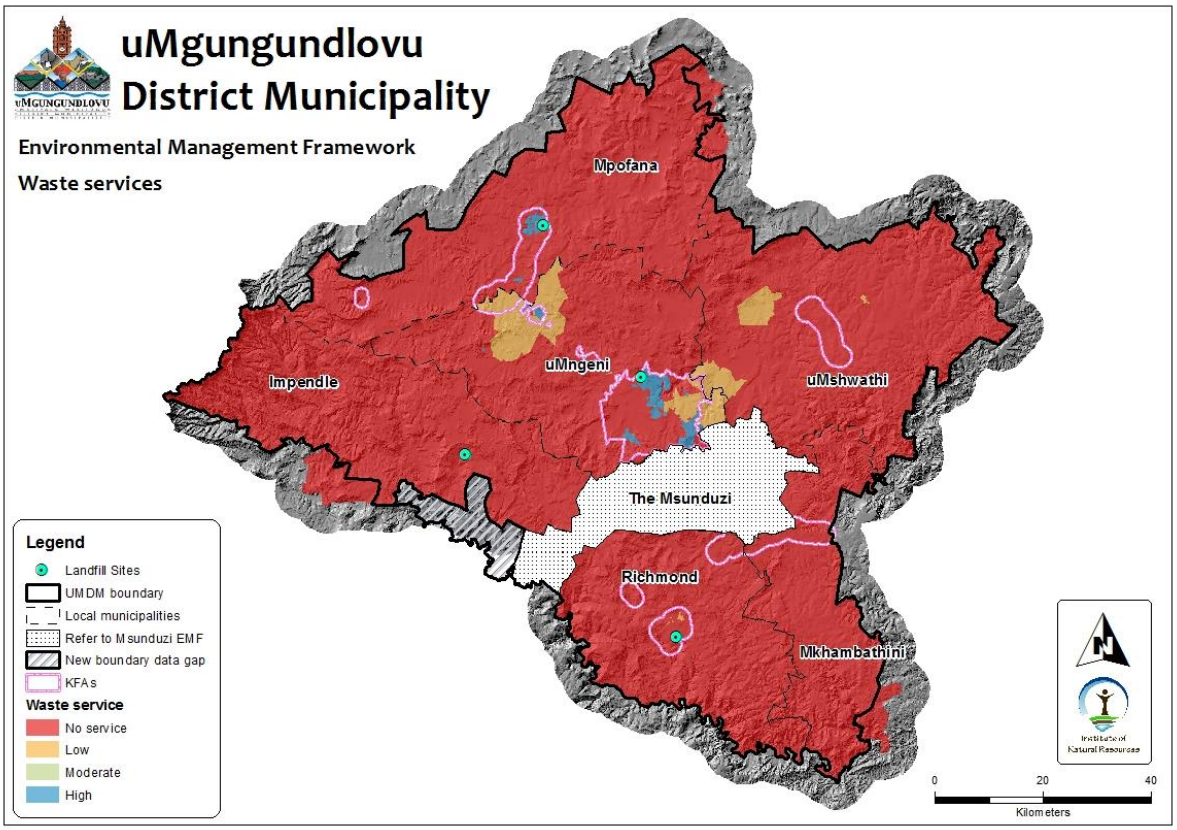

Figure 7: Waste Services in the UMDM

8. Road Network

The uMDM presents with high road network coverage including national and provincial road networks. However, low road network coverages are identified in the northern half of the district in the Umgeni, Impendle and Mpofana LMs. Proximal gravel or blacktop access to district or national road network show some constraint. Road infrastructure condition and extent studies are conducted as part of Municipal Infrastructure Grant recommended projects such as the Rural Roads Assets Management System (RRAMS) Project. The Umgungundlovu DM is understood to be conducting this but key RRAMS officials have not provided the requisite data to interrogate or display this data. This remains a data gap that can address a more complete picture for the road network extent and condition in the district.

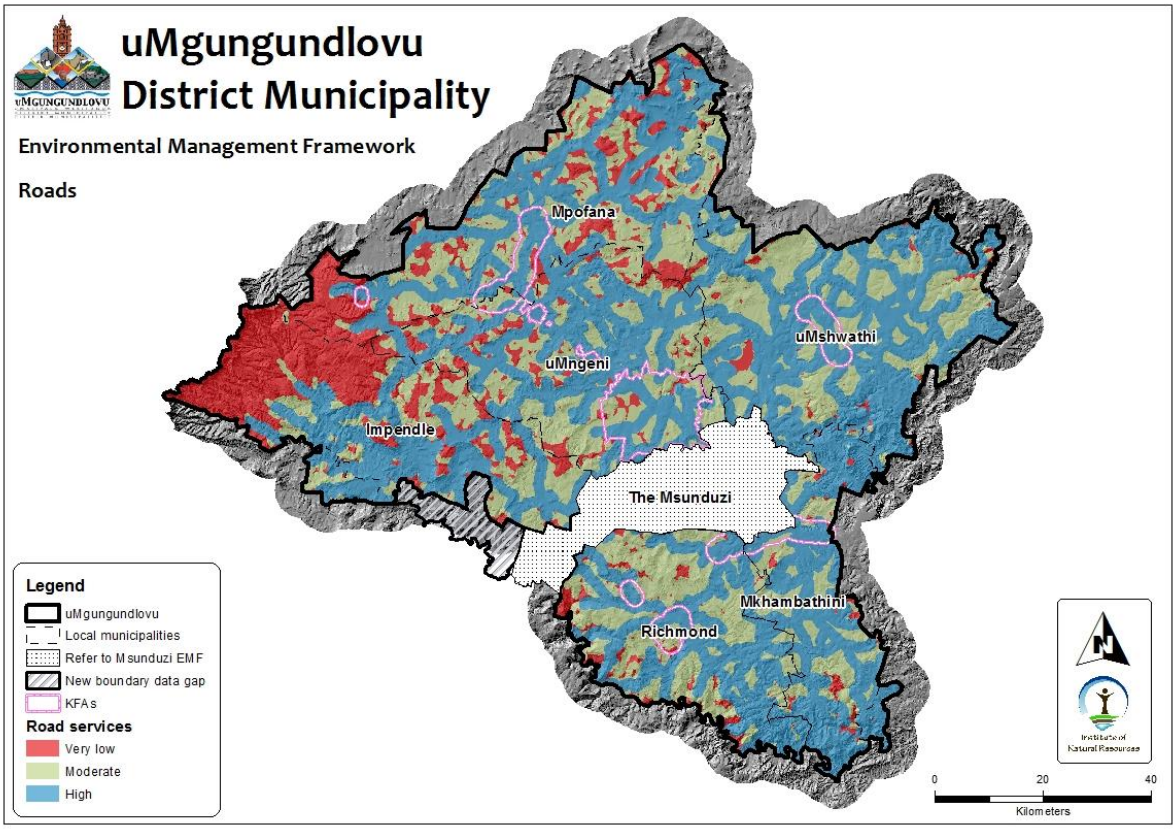

Figure 8: Road Network in the UMDM

ASSUMPTIONS AND LIMITATIONS

- There is a data gap as the new district boundary area around Impendle has not had accessible or developed data from the district municipal data sources. However, the Water Services Authority and Umgeni Water have provided the updated boundary water service areas. Notably, the old district boundary layer used for the assessment included more areas than the new, so extra depth of data gathering has overall been accomplished.

- It is not the intention to recreate district level infrastructure integration and planning in this report or in the EMF. However, the aim is to flag areas of infrastructure lack that can be addressed in a sustainable and coordinated manner in developing access to these services.

- The road network data is lacking the Rural RAMS project dataset. This is a current dataset of all the roads in the district. For updating purposes for this layer in the EMF should the data be made available post-EMF finalisation, the data source is the DoT and UMDM Transport Infrastructure services. The roads layer was instead built with the roads layer for the UMDM SDF 2014 and the SIP2 2017 data layers.