

Seeking to improve spatial justice - the case of rationalising the district court areas in South Africa - utilising several spatial analysis methods.

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Abstract. It is the right of every South African to have just or fair access to justice. Due to South Africa's past spatial development history the location of people versus where facilities are, is not always in balance. This paper describes work conducted for the Department of Justice and Constitutional Development during 2014 to assist the process to rationalise magisterial districts. In order to determine access to courts, some form of impact assessment is required – this paper outlines the accessibility analysis conducted in respect of the Gauteng and North West provinces (which served also as the first two provinces to be addressed). The analysis is for the most part a spatial- or geographic analysis process to map levels of access that can then be compared with proposed new magisterial district boundaries. The findings of this analysis provides overall results of accessibility as well as makes specific recommendations based on the results when compared to the proposed new magisterial districts.

Keywords: Rationalisation, Courts, South-Africa, Justice, Geospatial, Accessibility.

1. Introduction

The rationalisation of courts of which the rationalisation of magisterial districts and Divisions of the High Courts are part, is a constitutional imperative. This finds reflection in item 16 of Schedule 6 to the **Constitution of the Republic of South Africa, 1996** which states as follows:

“Every court, including courts of traditional leaders, existing when the new Constitution took effect, continue to function and to exercise jurisdiction in terms of legislation applicable to it, and anyone holding office as a judicial officer continues to hold office in terms of the legislation applicable to that office, subject to:

- 6(a) As soon as is practical after the new Constitution took effect all courts, including their structure, composition, functioning and jurisdiction, and all relevant legislation, must be rationalized with a view to establishing a judicial system suited to the requirements of the new Constitution.*

- (b) *The Cabinet member responsible for the administration of justice acting after consultation with the Judicial Service Commission must manage the rationalisation envisaged under paragraph 6(a)*”.

The right of access to courts is specifically provided for by Section 34 of the Constitution, 1996 (South Africa 1996: 11) and states the following: “*Everyone has the right to have any dispute that can be resolved by the application of law decided in a fair public hearing before a court or, where appropriate, another independent and impartial tribunal or forum.*” This by implication also has to relate to the provision of courts and their service areas. Schedule 6 of the South African Constitution dealing with Transitional Arrangements in Item 16(6) provides that as soon as is practical after the new Constitution takes effect, all courts, including their structure, composition, functioning, jurisdiction and all relevant legislation must be rationalised with a view to establish a judicial system suited to the requirements of the new Constitution (South Africa 1996: 83). This aims to rationalise the current 387 magisterial districts throughout the Republic of South Africa in accordance with the current 287 municipal boundaries with a view to align to the constitutional dispensation. The current magisterial districts are still largely based on the pre-1994 dispensation of the old RSA territory and the defunct Transkei, Bophuthatswana, Venda and Ciskei (TBVC) states and Independent Territories. The areas of jurisdiction of the magistrates’ courts and high courts were not aligned to the post-1994 constitutional dispensation. This paper addresses part of the process with regard to the aspect of feasible areas of jurisdiction aligned as far as possible to the municipal boundaries and proposes a process / methodology(ies) to determine suitable adjustment of areas. Although the rationalisation of courts’ areas of jurisdiction was contemplated to have taken place soon after the new constitution took effect, parliament and government had to enact legislation and make policies respectively to give effect to the constitutional mandate pertaining to the rationalisation of courts namely;

- The enactment of the Constitution Twelfth Amendment Act, 2005;
- The enactment of the Constitution Seventeenth Amendment Act, 2012; and
- The enactment of the Superior Courts Act, 2013

The Council for Scientific and Industrial Research (CSIR) was assigned the task of conducting an impact assessment to establish the likely consequences of the proposed changes to local communities.

2. Project objective and realities

2.1. Project purpose

As stated in the title of this paper the issue is also to improve spatial justice. In this context spatial exclusion or injustice refers to the containment or exclusion of a group from access to resources (Khan 2009) including services. Although much has changes since 1994 there is still a measure of *embeddedness* which can be observed in the growth and even creation new township/settlement areas. The objective of the proposed alignment of boundaries is to improve access

to justice for all communities served by magistrates' and high courts (to be undertaken in later phases); to ensure better co-ordination and integration of services within the three spheres of government. It is acknowledged that there may be areas where the magisterial boundaries will differ from local municipal boundaries. This project looks at the effect and impact of aligning areas within the Gauteng and North West provinces (Figure 1 illustrates the analysis extent in this project).

This project also aimed to provide recommendations based on the identified effects of these changes for areas identified by the DoJ&CD technical team. To realise the above, an analysis of the intended move to align the magisterial district courts with the provincial and municipal boundaries is necessary, taking into account the degree of hardship with respect **to access** experienced by citizens and alleviation thereof in the specific areas.

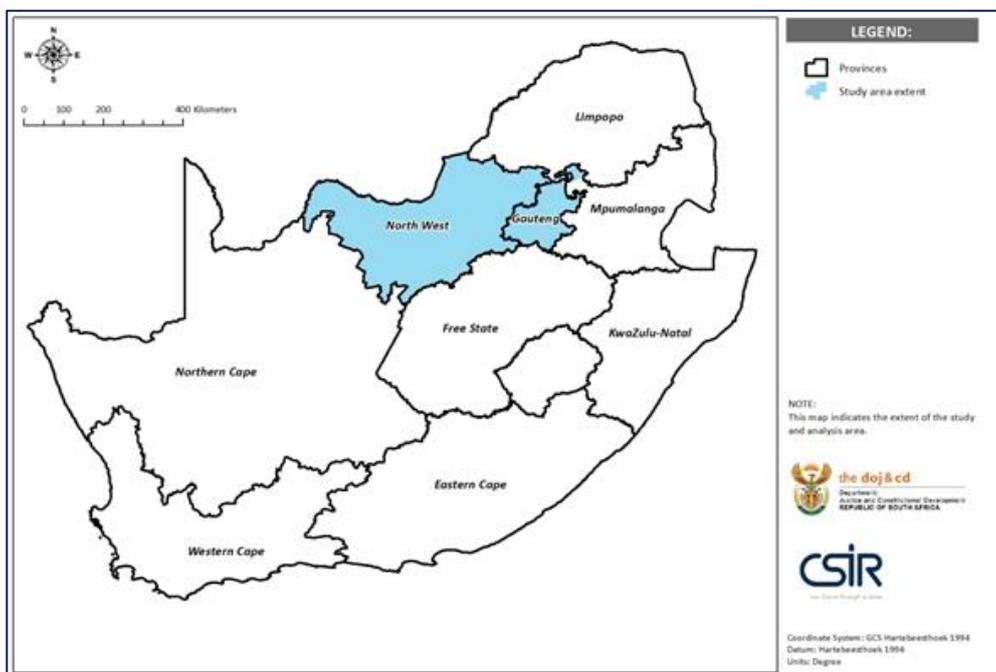


Figure 1: Study area extent – selected provinces highlighted (Maritz et al, 2014).

2.2 Scope

The main objectives of this project are to make recommendations with regard to improving access to justice in South Africa dealing with the Gauteng and North West provinces. The overall intended changes are aimed at the three main levels of courts (especially those that deal with core criminal practice). There are other specialised courts that are not the focus of the study. The focus of the court boundary alignment is on the district courts. The department has conducted several rationalisation engagements to create proposed new magisterial districts. These proposed amendments indicate the changes to magisterial districts and are the focus of analysis in this project. This phase looked at the **spatial aspect of the courts and their areas of jurisdiction**. The project mem-

bers assessed the accurate locations of courts in South Africa with their attributes, such as the name and type of the court, which consists of a main seat, sub-district(s), branch court(s) or periodic court(s). Although information was received from the department, it had to go through several iterations of inquiry and confirmation to get to a locational accuracy level suitable for geospatial analysis. Court information lists received from the department and the Demarcation Board contained errors (such as incorrect location, and missing or unused court sites). Ongoing discussions within regions also resulted in changes to this court data set.

3. Methodology

The analysis of boundary adjustments required the use of several analytical procedures to produce the required basic statistics and visual results that can be used to inform decision makers of the implications of boundary adjustments to the service areas, the population serviced and the capacity of courts. These measures all relate to physical access (distance).

3.1. Geospatial analysis

Geospatial analysis provides a distinct perspective on the world and concerns *what happens where* (De Smith et al 2014). Using Geographic Information Systems (GIS) and a process of spatial overlaying and querying data layers containing demographic information to extract the statistics required. There is essentially three core input data sets needed to undertake an accessibility analysis; two of these are base data sets required by the analysis for all key tasks.

(i) Population distribution, 2011 (latest 2011 Census): Demographic estimates at EA¹ or Small Area level, or in greater detail, were used. It is appropriate at this point to indicate that the CSIR has gone through an intensive exercise in establishing current population distribution throughout South Africa, down to a very detailed level based on a building count done by Eskom.

(ii) Transport networks (road) – newest set available. The transport network represents the potential routes people use to reach facilities.

(iii) The third GIS data type was the type of court. This was geo-referenced and provided in GIS format (shapefile) with appropriate attribute data for each facility including:

- facility name;
- facility type (i.e. Main seat, Branch court or Periodic court); and
- internal capacity or proxy thereof (using number of courtrooms as the measure).

No suitable spatial framework existed which was fine and uniform enough to be useful in view of accessibility calculations. Existing spatial frameworks are mostly administrative in nature or geared for demographic analysis which often mean that the zones vary substantially in size and shape which makes finer accessibility calculations difficult and the overall results less accurate. Figure 2

¹ Enumerator Area.

indicates the processes to create new spatial tessellation layers that was used to serve as the ‘demand and ‘supply’ surfaces and which was relevant for the geo-spatial part as well as the accessibility analysis portion. Initially the Thiessen tessellation was created for North West and Gauteng provinces, with the addition of two areas relevant to the Gauteng and North West province boundaries.

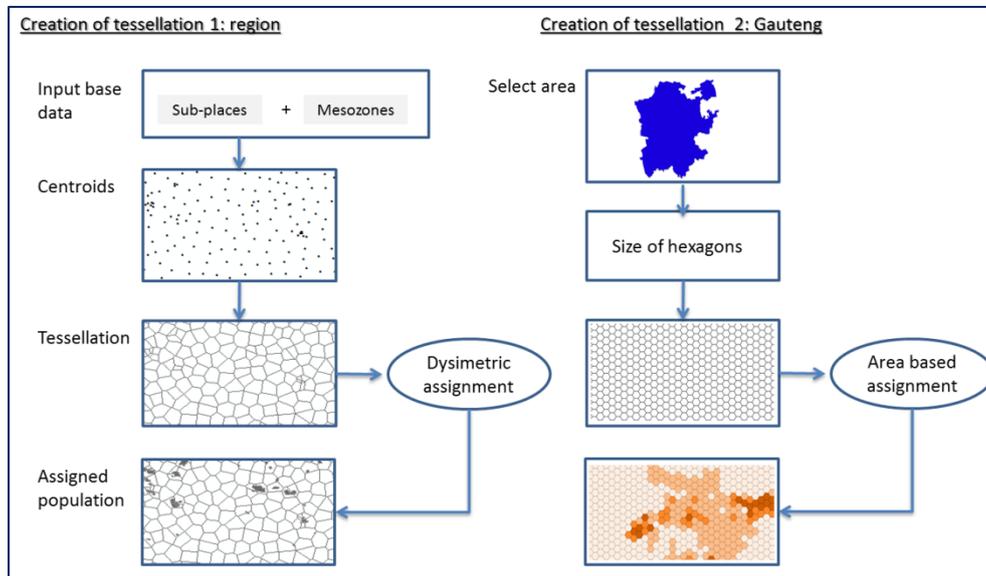


Figure 2: Creation of tessellation for both analysis datasets (Maritz et al, 2014).

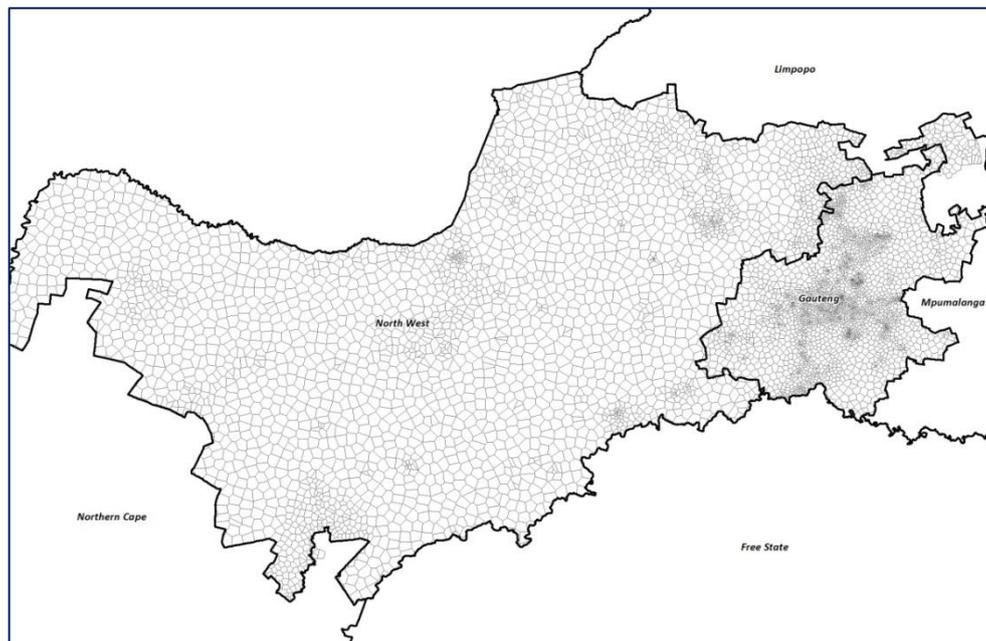


Figure 3: Regional analysis tessellation (Maritz et al, 2014).

It was decided that owing to the compactness and high population density of the Gauteng province a second much finer tessellation set was required that focused specifically on the Gauteng province; the reason is the relative closeness of DoJ

facilities in some areas as well as the need to clarify areas of concern. These areas of concern were in some cases small suburbs (or parts of suburbs).

The second tessellation set comprised a uniform zone type – hexagons which are also smaller than the regional Thiessen tessellations created (See Figure 4).

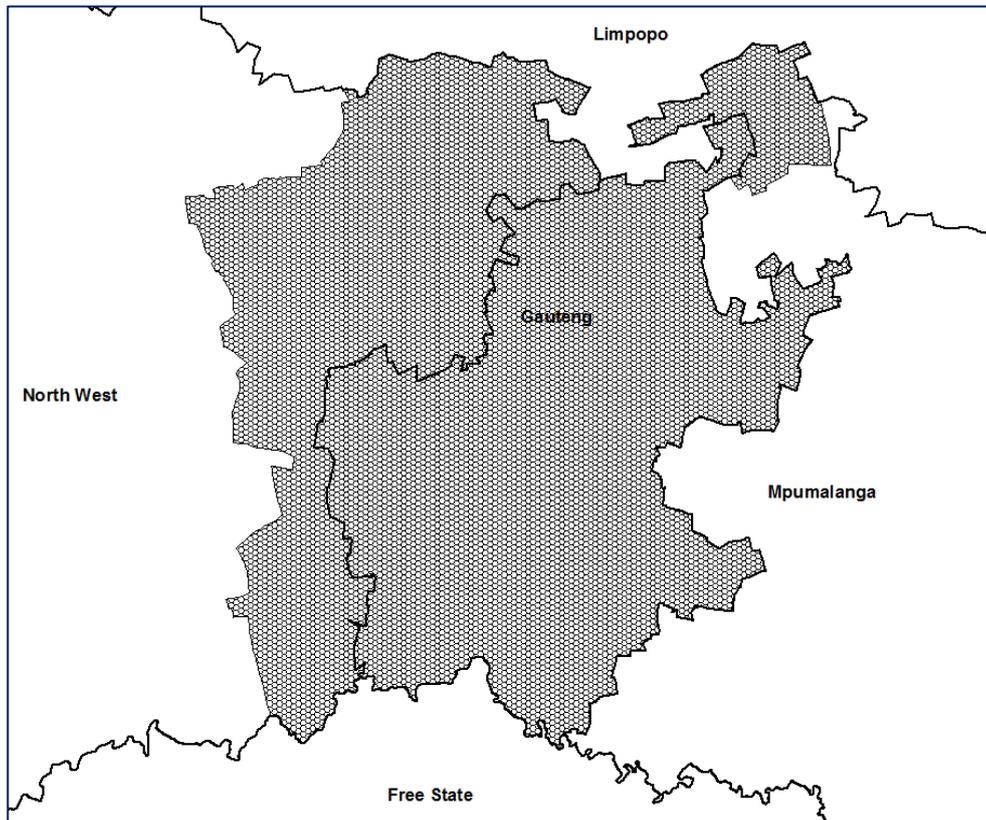


Figure 4: Gauteng province focussed tessellation (Maritz et al, 2014).

3.2. Accessibility analysis

Using interaction-analysis software the implication of boundary adjustments on service areas and average network travel distances to courts can be determined. When considering people, accessibility is about the ease with which an individual can reach an opportunity (Simmonds, 1998). Geographic accessibility to services is essential, especially when long distances must be covered, as in rural areas (Dahlgren, 2008). The analysis which matches the supply and demand of facilities and services within a defined area by making use of a movement network and is a measure of supply that goes beyond the more limited facility-provision approach that applies a ratio of facilities (supply) to demand within a fixed geographic limit or administrative unit. The use of GIS-linked interaction models allows for a far more sophisticated analysis of supply and demand, and clearly measures access distance to the closest facility irrespective of the administrative boundaries. This is a more rational approach that more clearly reflects the reality of our cities, towns and regions, as well as the generalised travel

choices made. The assumption in this case is that the facilities will be assessed from the place of residence. Although this is not true in all cases the analysis is of such a nature to enable the outputs to be used to achieve an equitable and balanced supply of facilities and services within a specified planning region – the magisterial district in this case. Jurisdiction areas of courts are however specific and form contained service areas, thus limiting the ‘choice’ of users. Two types of analyses were conducted, namely Regular Catchment Analyses and Proximity Counts. These were done for two scenarios: firstly all courts irrespective of type, and secondly just for main and branch courts excluding periodic courts.

A **Regular catchment analysis** allocates demand (population) to its closest destination (court). Therefore population from any particular Thiessen or Hexagonal polygon is allocated once. If there are two courts at equal distance from the polygon, just one (randomly selected) will be allocated the population (Green 2012). In areas where courts are closely located, it is possible that a particular court does not receive any allocation. In these cases some post-processing may be required to proportionally distribute allocated demand between courts affected in this way. A *regular catchment analysis* can be constrained in two ways: by placing maximum limits on the allocated demand and/or by limiting the maximum distance being served by a destination (court). In this analysis no constraints were imposed. Thus each court is allocated the full demand in its catchment area. This can be compared separately from this report with current caseloads to gain some understanding of the pressure or availability of spare capacity, if any². An **unconstrained regular catchment analysis** also provides information on shortest travelling distances/times from origins to destinations and the service area of each destination. These are mapped to identify areas beyond any specified maximum travelling distances. Those areas can be investigated to determine whether it is required or feasible to locate additional courts to increase accessibility to courts and possibly reduce pressure on other over-utilised courts. Regular catchment analyses were conducted, based on travel distance in kilometres.

A **proximity count** or Cumulative-opportunity measures are evaluations of accessibility with regard to the number or proportion of opportunities accessible within certain travel distance or time from a given location. on the other hand allocates the demand in origin zones within a user-specified distance from a destination to that location (Makri & Folkesson 1999). It counts or sums the demand in the defined distance zone and allocates it to the polygon. This means that the demand in a particular origin zone can be allocated to more than one destination if there is more than one destination within the specified travelling distance from the origin. It is a measure of the potential size of demand at each destination, without taking into account competition between destinations.

² Was not part of this analysis.

This information is useful to identify locations with the largest potential “markets” for locating additional services. This also served as a check to determine whether court localities did align to areas of high population proximity.

3.3. Norms and standards considered

Regarding what would be acceptable travel distances to a court, no official measure exists. For a recent study conducted for the Department of Public Service and Administration (DPSA) (Green 2012) it was agreed that 15 kilometres would be used as a guideline within the urban (metropolitan) context. For analysis at a provincial level longer travel times could be considered.

Initially various options were considered, including using the number of court cases. However, given the complexity of cases, their administration and relation to specific types of courts, it was decided to use facility size as represented by the number of courtrooms per court. This is compared with the number of people within the service area of the particular court in order to provide a simple capacity measure.

4. Analysis

The focus of the analysis was on access to justice (the courts), measured using geospatial analysis procedures combined with interaction analysis. This process produced spatial results which were interpreted in the light of access distances to facilities. Relevant statistics were also extracted to provide an indication, per magisterial district, of the following:

- Catchment areas
- Facility’s serviced population and the numbers of people within given travel distances
- Indication of extent of poorly serviced (access) areas, where applicable (identified)
- Numbers of people per court, taking closest facilities into account.

Due to the detail of the analysis it was decided, for mapping illustration and reporting purposes, to divide the overall map area into sections. The complete study area was divided into four sections (See figure 5). Gauteng, owing to the high density and concentration of settlements, was addressed separately and also divided in three parts for reporting. (See figure 6).

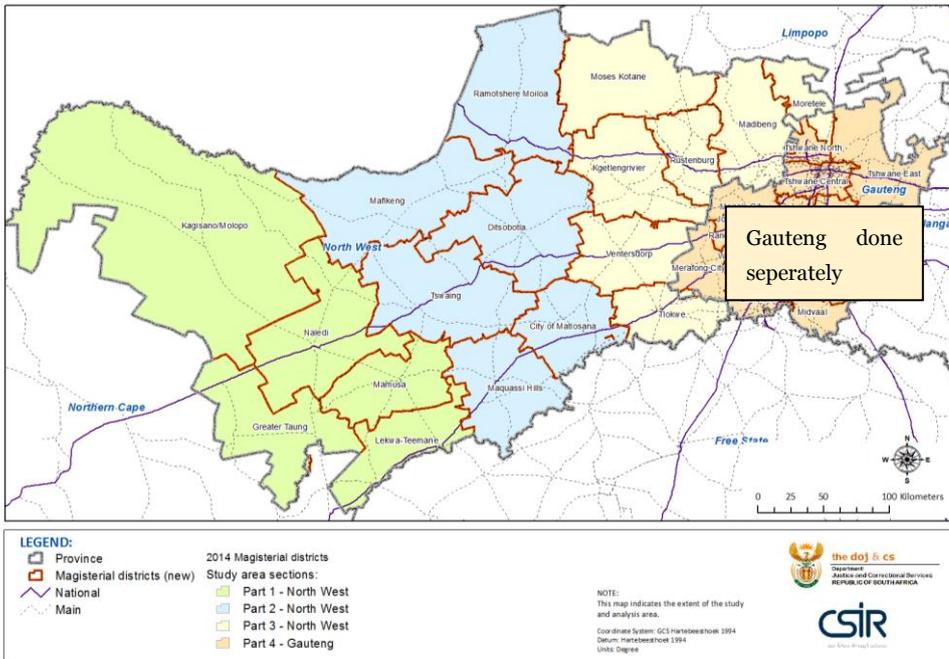


Figure 5: North West province divided into three sections (Maritz et al, 2014).

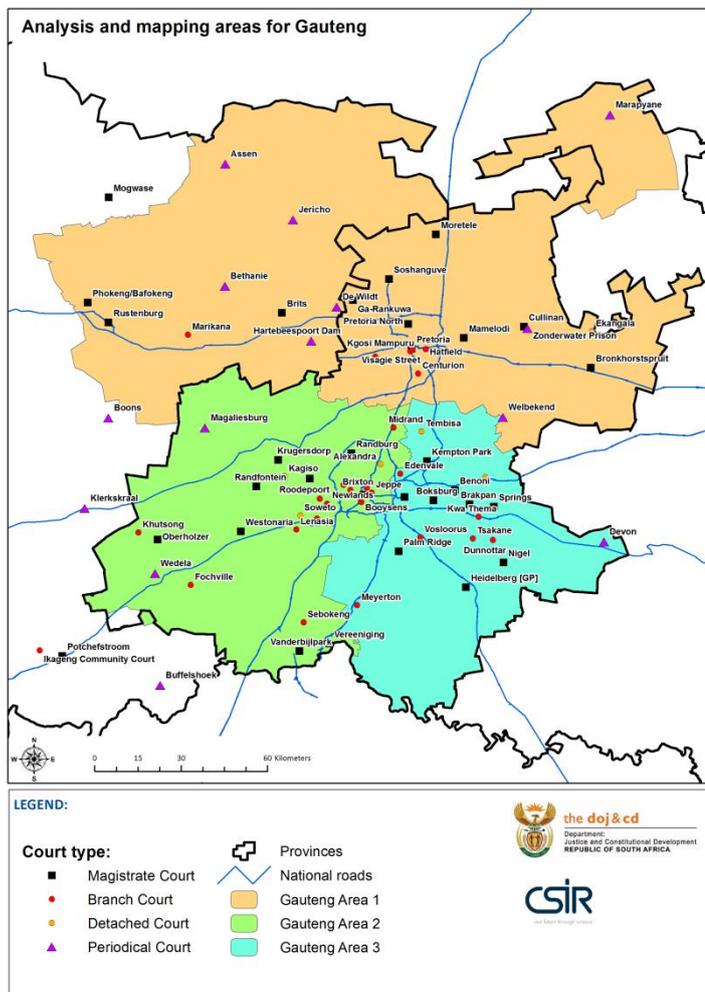


Figure 6: Gauteng province divided into three sections (Maritz et al, 2014).

For purposes of illustration the results of only one area will be used (as the process for the rest is a repeat). The area to be used for illustration is **Part 1 of the North West province**. Part 1 contains five magisterial districts and 1 sub-district. An overview of the courts within this area is presented in Table 1. (Other parts are presented in the same manner)

| Magisterial district name | Seat of the magistracy | Sub-district | Local seat | Periodic court |
|----------------------------------|-------------------------------|---------------------|-------------------|-----------------------|
| Greater Taung | Taung | | Pampierstad | Reivillo |
| Naledi | Vryburg | | | Stella |
| | | | | Setlagole |
| Lekwa-Teemane | Bloemhof | Christiana | | |
| Mamusa | Schweizer-Reneke | | | |
| Kagisano/ Molopo | Ganyesa | | | Morokweng |
| | | | | Bray |
| | | | | Piet Plessis |

Table 1: Overview of courts and magisterial districts for Part 1- North West (Maritz et al, 2014).

This section contains three main analysis components. Each extends across the complete study area and consists of the following:

- A map set indicating **population density and accessibility analysis**, taking account of all courts. but excluding periodic-service courts. Summary statistics are presented for each area (part) in question.
- Lastly, **proximity to the population** within a range of 25km was used as an additional check when compared with the court facilities. This is a useful measure to determine if population concentrations are served by, or in close proximity to, a court. Areas where there is not a good correlation might indicate where a facility intervention might be required.

4.1. Population density maps

The purpose of these maps is to indicate where concentrations of populations are present within each area. When these concentrations are compared with each magisterial district (and sub-district) boundary, it can be observed where people are within each district and in relation to the courts. This information

was compiled by using SPOT³ Building Count (also known as the Eskom dwelling layer). These are data derived from SPOT5 Satellite images and indicate the geographical position of all classifiable physical structures in South Africa (De la Rey, 2008:p33). Not all buildings are dwellings; other non-residential buildings are also included. Other ancillary data (such as the StatsSA dwelling frame points) were also used in its development (Breytenbach, A. 2008:p4). Using this data point a kernel process was run to create a density function. The result of this density function is mapped in these maps. The main purpose of these maps are to show the concentrations of settlement compared with the new proposed magisterial boundaries. Figure 7 illustrates the population density in this part of the North West province. Noticeable are concentrations around Ganyesa and Taung. For the remainder of this area the majority of settlement occurs in towns.

³ **SPOT** (Satellite for observation of Earth) is a commercial high-resolution optical imaging Earth observation satellite system operating from space. It is run by Spot Image, based in Toulouse, France.

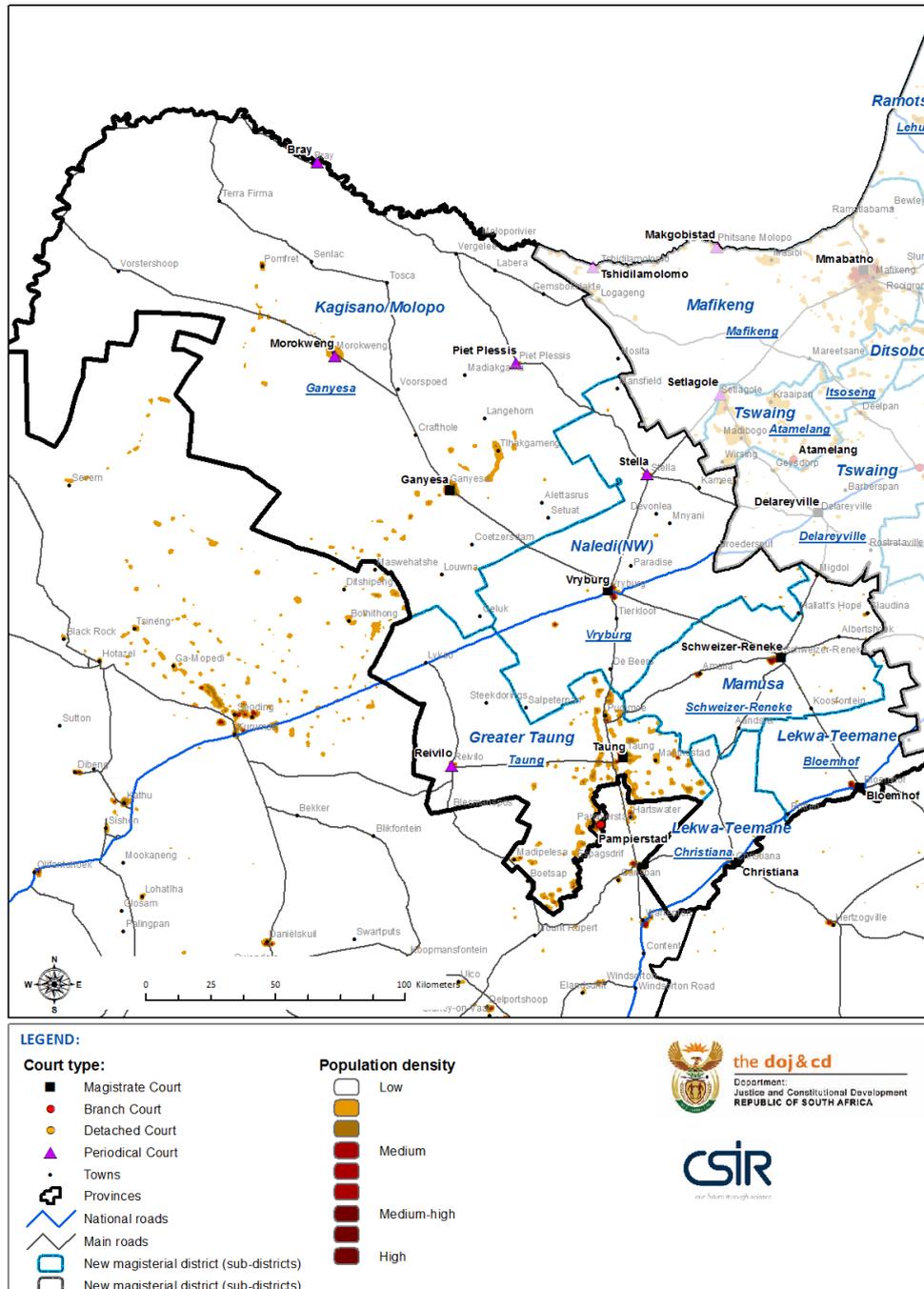
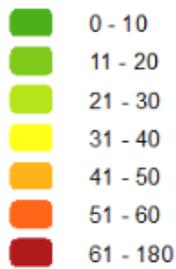


Figure 7: North West Part 1 population (settlement) distribution (Maritz et al, 2014).

4.2. Accessibility maps

Using the process described in Section 3, these maps illustrate the result of the accessibility calculations. Each cell/area is calculated in relation to courts in the area, and the closest court is identified. The colour ranges indicate the travelling time to the closest court – calculated in distance via the road network (in kilometres).

Road Distance - Km



(Example)

Two sets of accessibility analysis are calculated: one includes **all courts**, while the second excludes the **periodic courts**. As periodic courts are not “full service” courts, it is useful to see the impact on access if such courts are not present in the area. For each case summary statistics are provided indicating the cumulative populations served within different distance ranges from courts.

Currently there is no set access norm or standard with regard to geographical accessibility to justice facilities. The geographical access bands used in the following section were categorised to coincide with the norms and standards provided by the different departments, such as SAPS, Labour, SASSA, Thusong and Home Affairs facilities. A 15km access band was used, as this coincides with SASSA, Labour, Home affairs, SAPS (peri-urban) and Thusong facilities within a metropolitan context. The various access norms and standards used can be found in the document *Green, C. 2012: CSIR Guidelines for the provision of social facilities in South African settlements*.

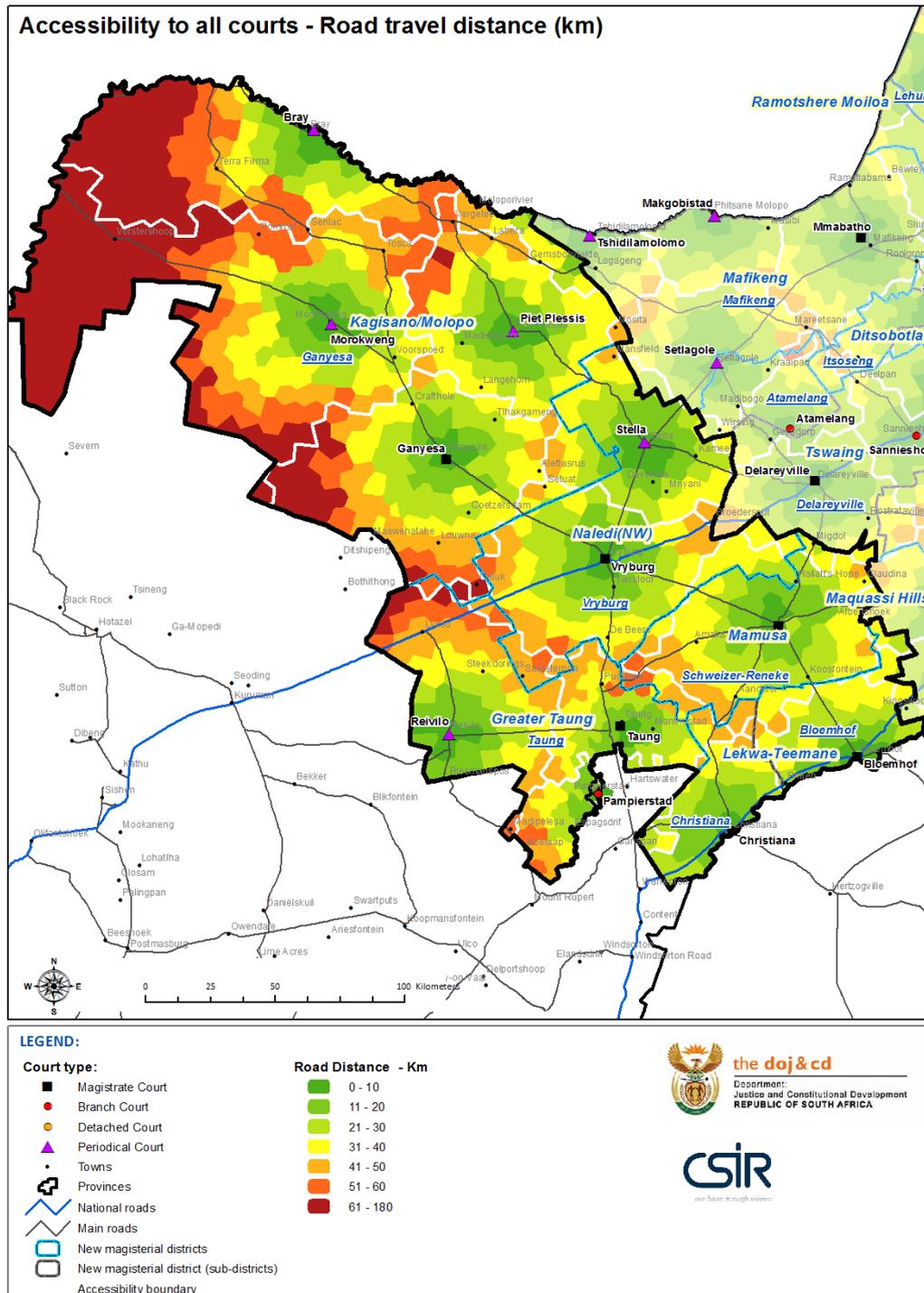


Figure 8: Accessibility to all courts (km) – part 1 of North West (Maritz et al, 2014).

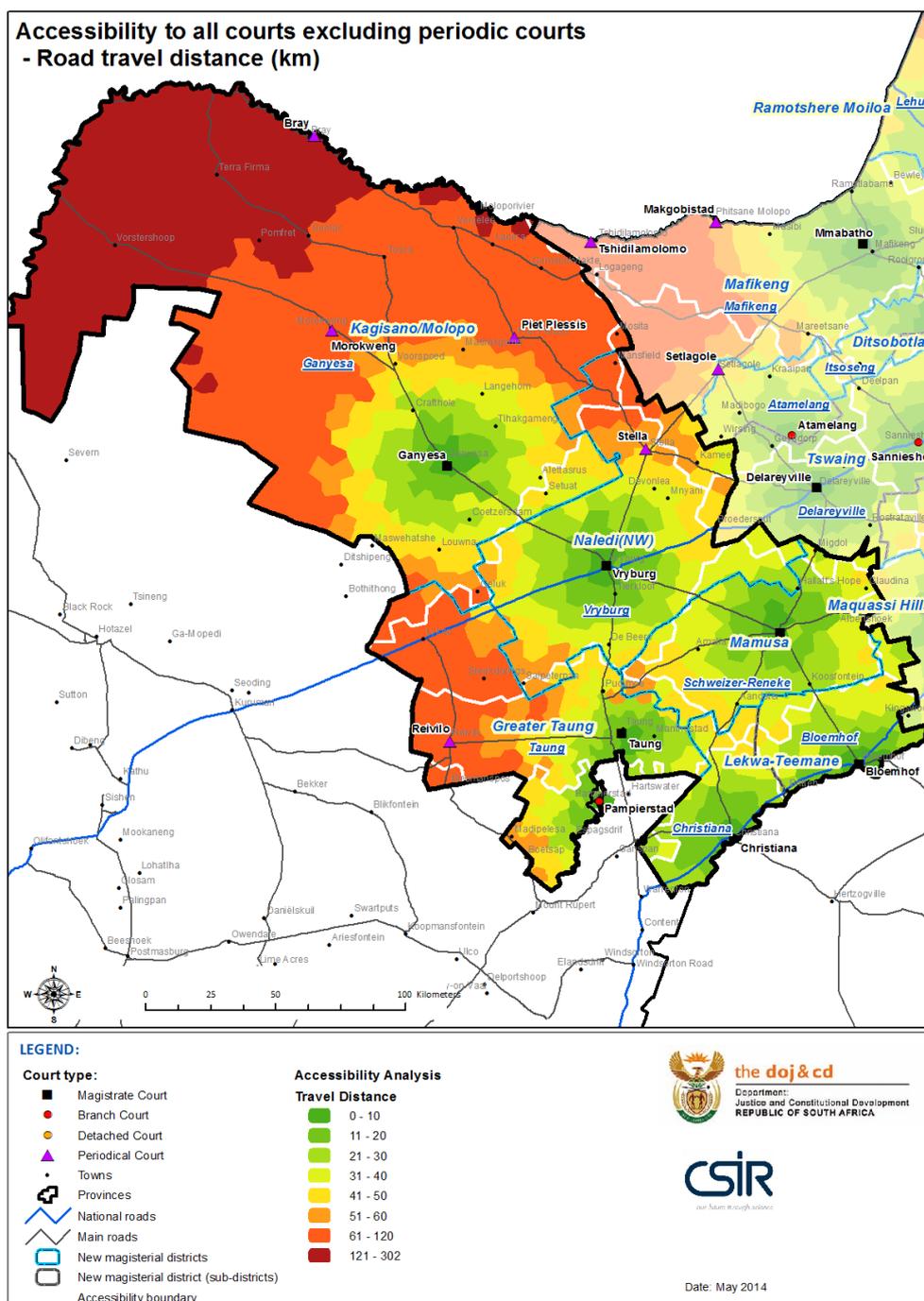


Figure 9: Accessibility to courts (km) excluding periodic – part 1 of North West (Maritz et al, 2014).

Figure 8 provides an illustration of the accessibility (in kilometres) to all courts, while Figure 9 provides an illustration of the accessibility to all courts excluding the periodic courts. Table 2 provides the cumulative percentage of the population within a number of distance bands towards the closest court facility within a magisterial district. If periodic courts are taken into account the vast majority of people in the Lekwa-Teemane and Naledi magisterial districts will have access to a court facility within 25km, while the majority of people in the Greater Taung and Kagisano/Molopo districts will be served within a 50km accessibility

band. However, without the periodic courts the Kagiso/Molopo magisterial district will have a relatively low proportion (58%) of people served within the 50km access band, resulting in 42% of people having to travel more than 50km to access a court facility. This is owing to the distributed nature of settlements in this area.

| | | | % Cumulative population served with periodic courts | | | | % Cumulative population served without periodic courts | | | |
|------------------------|------------------|--------------|---|-------|-------|-----|--|-------|-------|-----|
| MD name | Main seat | Sub-district | 0-15 | 15-25 | 25-50 | >50 | 0-15 | 15-25 | 25-50 | >50 |
| Greater Taung | Taung | | 38 | 61 | 96 | 100 | 36 | 59 | 93 | 100 |
| Kagisano/Molopo | Ganyesa | | 43 | 57 | 93 | 100 | 22 | 33 | 58 | 100 |
| Lekwa-Teemane | | | 84 | 95 | 100 | 100 | 84 | 95 | 100 | 100 |
| | Bloemhof | | 90 | 97 | 100 | 100 | 90 | 97 | 100 | 100 |
| | | Christiana | 78 | 93 | 100 | 100 | 78 | 93 | 100 | 100 |
| Mamusa | Schweizer-Reneke | | 70 | 72 | 100 | 100 | 70 | 72 | 100 | 100 |
| Naledi (NW) | Vryburg | | 82 | 87 | 100 | 100 | 72 | 75 | 95 | 100 |

Table 2: Cumulative percentage of people served per magisterial district for Part 1 of North West (Maritz et al, 2014).

The accessibility analysis, although calculated for the provinces of Gauteng and North West, was mostly applied to investigate areas or parts within a province where uncertainty remained with regard to the best alignments to the selected courts. In these cases the project team used the accessibility maps to suggest where such areas would best be served given the accessibility analysis results. The more overall results provided an indication of how the proposed districts and courts would serve the residents given the accessibility focus.

4.3. Proximity to population maps

This process is described in section 3 – it counts for each cell/zone the number of people that can be reached within a given travel distance. In this

Analysis a distance of 25 kilometres was used. Although the population is repeatedly counted for each cell/zone it indicates *concentrations of population* and is therefore a useful measure to use and to compare against the placement of courts. Where such “clusters” of populations are present in the absence of any court this could indicate an area for consideration, given court facility planning.

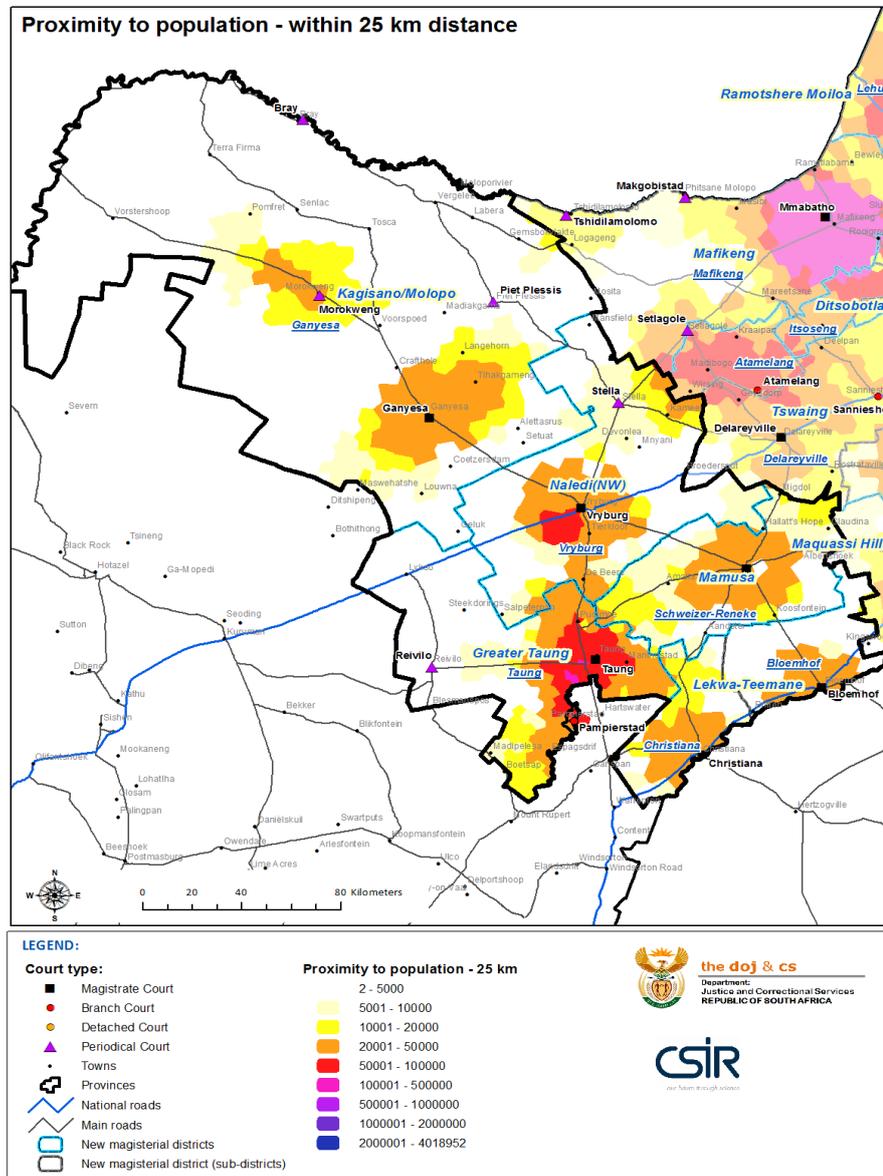


Figure 10: North West Area 1 population proximity values (Maritz et al, 2014).

This measure should not be used in isolation; other realities such as transport services, the presence of other government services, etc., should also be considered. Figure 10 illustrates several areas with a population- proximity between 20 000 and 50 000 people. Magistrates’ courts are present in all except Morokweng, where a periodic court is servicing the residents (with population proximity of >20 000 within 25km). Given the numbers of people, it might be

necessary to provide more regular services at this site. The Piet Plessis and Reiv-ilo periodic courts do not seem to have high population proximity. The Taung magistrate's court has the largest population proximity values. Overall there is not an area with a medium to high population proximity without a court.

4.4. Other issues affecting accessibility

Although the focus of this paper is on geographic accessibility, it must be pointed out that there are a number of other current local factors that influence accessibility. These are briefly highlighted:

- **Types of services offered at facilities.** In reality the services at facilities might not be the same everywhere. For an individual without the financial means this might place a burden on what he/she is able to access. If certain services are available only at the main seat of a magisterial district, for example, this might mean additional travelling for the individual.
- **Frequency of public transport.** Public transport does not operate at a constant frequency during the day. During peak transport periods transport operates at high frequency. During the day due to reduced demand less service are available. This can also affect residents wanting to access courts during the day – travel later in the day might be more problematic (diminished access).
- **Affordability.** Cost is always a factor and high transport costs can weaken access to courts, especially if such services require multiple trips. Although transport is available, access is poor if the resident cannot afford it.
- **Number of trips required** (*relates to cost also*). If a resident has to undertake a number of trips because the service cannot be offered/provided during the first trip, escalating costs mean that accessibility to courts would also reduce because it exceeds what the person is able to afford.

4.5. Spatial Integration

Apart from considering the access to courts, the issue of extent to which **other facilities** are spatially integrated with the courts was also identified for investigation. Courts do not stand alone – there is a functional relationship with several other facilities: for example, the Department of Corrections has facilities from where people must attend courts. This process of getting people to attend includes the need to physically transport people to courts and back. This also applies to police stations. Owing to the complexity of relationships (of engagement) with other facilities, this project only considered the **physical proximity** of these facilities to courts. This provides (per magisterial district) an indication of the average distribution (distance) of these facilities from courts. Where facilities are generally in close proximity to courts, it will be reflected *as good (spatial) integration*. Conversely, where facilities are in general dispersed far from a court the result will reflect poor (spatial) integration. This section will describe the process of calculating the measure of spatial integration.

To calculate this an algorithm was developed for the proximity analyses that utilised the ArcGIS ModelBuilder to combine and create the appropriate tools and modules to successfully process all the relevant magisterial districts and various facility point datasets. This first routine calculated the Euclidean distances from each court facility to all the surrounding services and amenities that were located **only within each magisterial district**. The analysis followed a hard-boundary approach with regard to the new magisterial boundaries and only considered the facilities contained therein and the distances between them, thus ignoring facilities in neighbouring districts here. Only the details of the facility of each type that was calculated to be closest will then be recorded, failing which a “not available” flag will be logged in the case where none was found. Note also that periodic courts were included in all the proximity analyses. The algorithm then proceeded to calculate the Euclidean distances from each court facility to all the surrounding services and amenities, **regardless of its being inside the magisterial district or in another district or neighbouring province**. If the closest candidate was found within 15 km it was logged. If none were found, the model then proceeded to points located at larger distances within the set maximum extent and picked the closest, but flagged it as being beyond the minimum distance. Where no feature was found at the end of this stage, a “not available” flag was logged for that particular facility in the associated court record. The Euclidean mean distances of the two routines were then averaged and combined for a district-level result. Figure 11 indicates the overall average distance per facility to courts for the North West province. Noticeably police stations tend to be located close to courts - this can also be attributed to the makeup of settlements often consisting of small towns where courts and police stations were located next to each other. Figure 12 in turn illustrates the overall average distance of these facilities to courts and presents the information thematically.

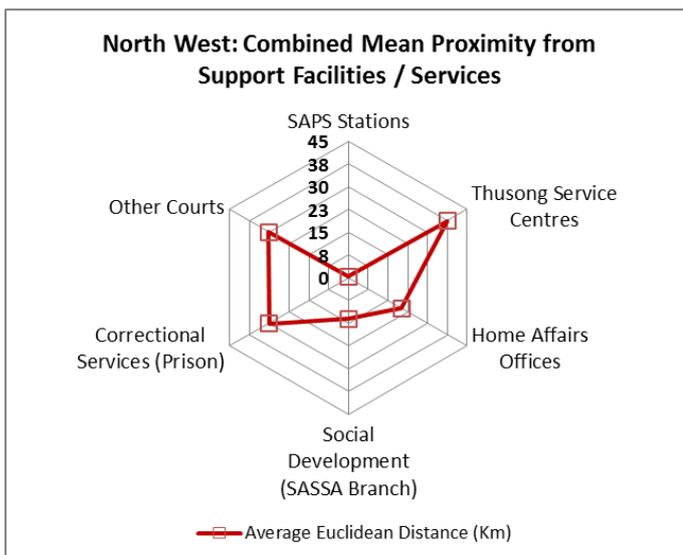


Figure 11: Spider chart indicating average distance per facility type to courts (North West province) (Maritz et al, 2014).

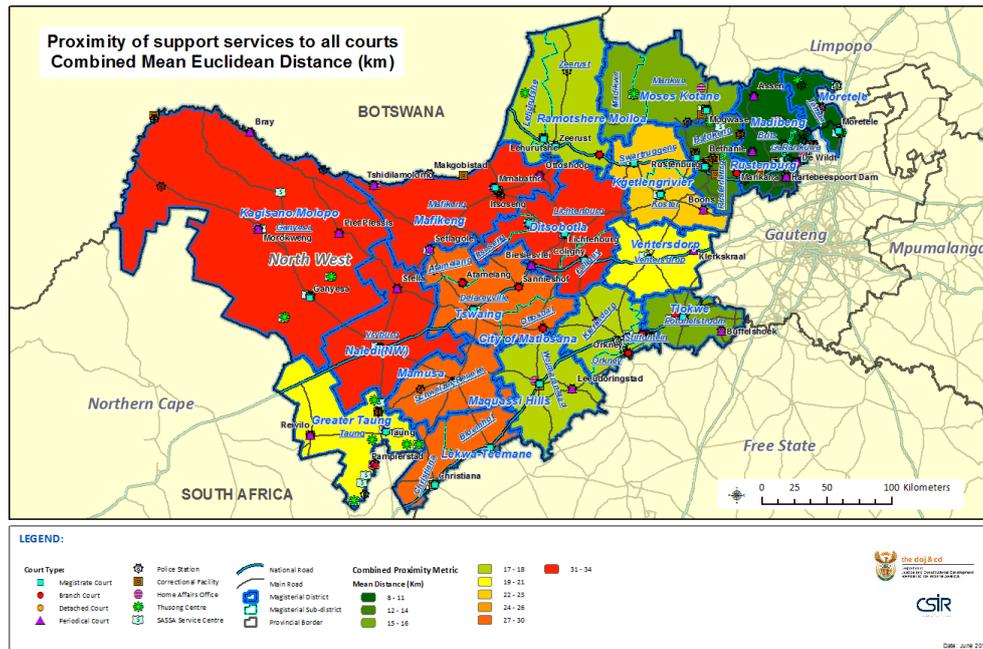


Figure 12: Average distance of facilities per new magisterial district (Maritz et al, 2014).

The purpose of this analysis was mainly to point out in which new magisterial district there might need to be a look at the practicalities related to the transport of people. The worst affected areas were also part of the old homelands where people lives in scattered low density settlements.

5. Use of spatial methods described in practice

The value of using spatial analysis measures such as described here is often affected by how their function is perceived. Also when in the overall project process, it is applied. In this case the process to identify (and spatially create) the new magisterial boundaries was undertaken by the department and preceded the accessibility analysis. This was done largely through discussions with the officials of the department and the Regional Coordinating Committees present in each province – this largely drew from the knowledge of officials working in these regions. The spatial analysis component was therefore done as a “check” and to provide inputs to areas identified as uncertain. Under different conditions such analysis would be undertaken sooner in the project as it can then be used in the discussions with officials of the various departments. Another challenge is the visualisation of the accessibility analysis results. For GIS practitioners it is normal practice to use thematic mapping to present spatial results however, it is sometimes necessary to test the effectiveness of a map in conveying the intended message. In this project the meaning of each map had to be described whenever it was presented. Care was also taken not to overload the maps with too much information.

The maps produced as part of the geospatial analysis processes served to produce results that in turn was used to convey findings, and to make suggestions regarding magisterial boundary adjustments (and to a lesser extent the location of courts). For areas where uncertainties existed, separate maps

were prepared which, while using the results of accessibility analysis, then ‘zoomed-in’ on areas. Arrows was drawn on this results map to ‘point out’ the direction of better access. This was done within the project report as well as in prepared project presentations. Figure 13 below illustrates such areas within the North West (part 1).

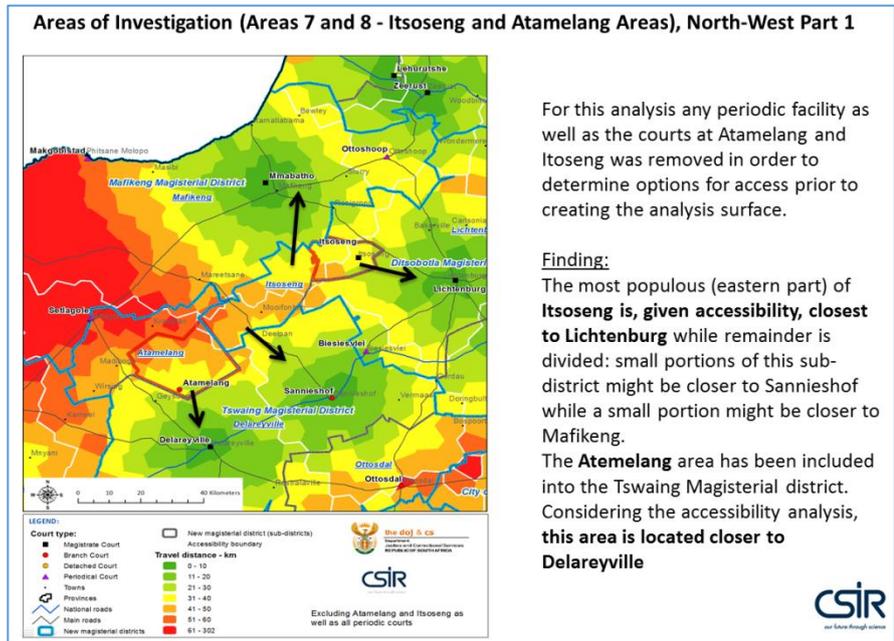


Figure 13: Results map with arrows drawn indicating closest court (Maritz et al, 2014).

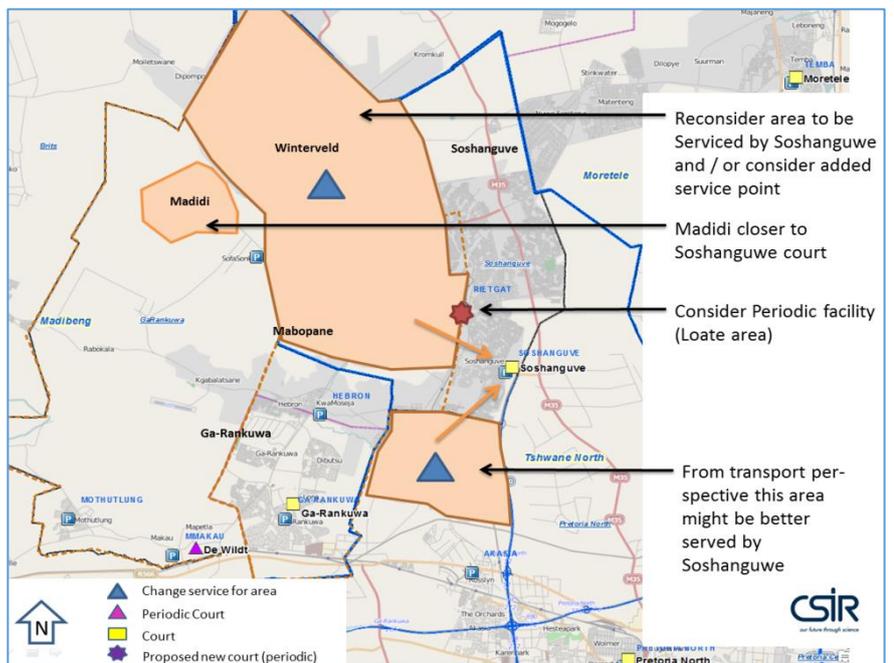


Figure 14: Schematic map drawn on standard map background (Maritz et al, 2014).

In some selected cases the results of maps were simplified through the use of more conceptual map presentations that used map-produced backgrounds but then used sketch mapping which was added to point out specific issues for a given area. Figure 14 presents an example of such a sketch map used within the Gauteng province analysis.

In this project it was important to bring the analysis findings back to the main issue namely (spatial) access to justice. Although a range of technical analysis processes took place to produce a final output, it is only the final map that is presented to decision makers (Sui et al. 2001). It was however decided that the maps that indicate the final result, namely the adjusted new magisterial districts and the court(s) that operate within it, should be presented as clearly as possible. It was decided to provide such maps in both large printed format (which were then placed at all courts) as well as online maps on the Department of Justice's own website. The maps indicated the extent of the new magisterial district, its courts and the areas served. These were also listed on the maps as indicated in figure 15.

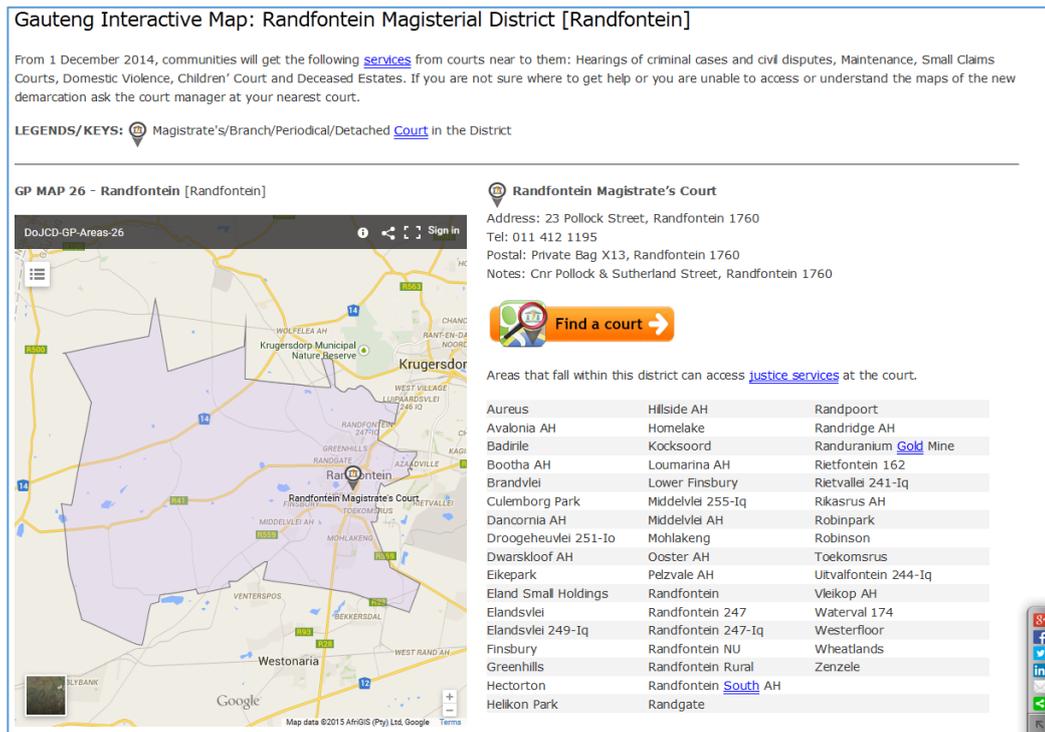


Figure 15: Final result map indicating magisterial boundary and court(s) as web map (Source: Department of Justice, website).

The three methods earlier described namely **population distribution**, **catchment area analysis** and **proximity analysis** was the only spatial analysis related to access to courts. The availability of information also limited what could be undertaken – for example using court cases or the detail makeup per court of staff etc. was incomplete. No capacity constraints could therefore be applied at the courts during the accessibility analysis.

In the end the value of this effort lies in its impact on decisions – it was therefore extremely fortunate to see the project team make changes to some areas based on the results emanating from this spatial analysis process and to see the final results reflected on final maps.

6. Conclusion

The following key conclusions can be drawn from this project.

The use of GIS linked interaction models and use of tessellated spatial framework for analysis proved useful in doing the accessibility analysis – naturally there is always a dependence on complete and accurate data in order to produce suitable results. In future it might be useful to consider additional facilities or relocating facilities to areas of high population proximity.

Reflecting accessibility to courts excluding periodic courts was valuable given the object of ‘access to justice’. It also indicated areas of possible future intervention. Demographic change needs to be tracked in order to identify areas of population growth and decline.

Using the accessibility analysis results recommendations could be made with regard to the magisterial court that would be more accessible. Changes could then be proposed regarding the boundary alignment.

Although geographic accessibility is useful to measure and propose changes with regard to magisterial districts there are also other more functional realities that can affect access – these are typically not a spatial access issue. Looking at the spatial integration measure it is clear that this is useful to detect potential transport issues, especially concerning transport or travel to courts.

Finding ways to communicate the spatial analysis results posed a problem given the complexity of some processes. Conveying results could not rely on publishing it in a report – it had to be communicated (and often explained) to stakeholders. In the end the final demarcation maps earmarked for the public could only show the court and its areas of jurisdiction.

The true value of such a spatial analysis process emerges when changes are made based on the recommendations – which happened in this project.

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