# THE EFFECT OF POOR RECONCILIATION BETWEEN SURVEYOR-GENERAL DATA (SPATIAL) AND DEEDS REGISTER INFORMATION ON MUNICIPAL BUDGETS

by

**Pieter-Hendrik Venter**

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A dissertation submitted in fulfilment of the requirements of a master's degree in Real Estate by research

in the Department of Construction Economics

Faculty of Engineering, Built Environment and Information Technology

University of Pretoria

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**SUMMARY**

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| Degree: | A dissertation submitted for the degree of Master of Science in Real Estate. |
| Keywords: | Municipal budget, valuation roll, property register, *Municipal Property Rates Act*, geographical information system, Chief Registrar of Deeds, Chief Surveyor-General |



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## ABSTRACT

The Chief Surveyor-General study in 2011, identified a discrepancy between the Chief Surveyor-General and the Chief Registrar of Deeds. Considering these two governmental institutions as custodians of property registers within South Africa, the red flags raised by this study prompted the notion to determine the extent of the effect on the municipal budget. The study extends the understanding of developing property registers while indicating the influence of an incorrectly developed property register on the valuation roll, and the intern influence on the municipal budget. The goal is to determine the importance of a multidisciplinary approach in compiling a property register as the base information to develop a valuation roll. The focus was to draw a correlation between the *Chief Surveyor-General Act* and the *Chief Registrar of Deeds Act*, to emphasise the main similarities that can be used as a multidisciplinary approach. An in-depth study was conducted on the actual Acts governing the local government and how these Acts can assist local government to reach an objective of more accurate budget development. Property registers and valuation rolls were the focus. The analysis was conducted on 23 municipalities with an approximate property count of 1.8 million. The total value was calculated to be R2 trillion value over the sample. A combined methodological approach determined the statistical differences between the data sets and interviews. The aim was to obtain plausible solutions and application/practical flaw identification. For the statistical analysis, the deeds data, surveyor data, and valuation roll data were cross-linked to determine the differences among the three data sets. This presented the monetary influence of properties that cannot be rated in the currently implemented valuation rolls. The qualitative information determined the professionals' (13 respondents) actions, how the Acts are interpreted, and identified practical solutions. The statistical analysis recognised ample discrepancies between the deeds data and the surveyor data. The main concern was that the differences between the valuation roll— two data sets specified an enormous loss of income in the 23 municipal areas. The interviews deduced a 45/55 split among




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the professionals on how the statutes are interpreted and the observation of the multidisciplinary approach among the professionals. Training is required, and the change is imminent.

The study contributes to knowledge:

- Drawbacks and solutions when a multidisciplinary approach is applied were identified.
- A correlation between the *Chief Surveyor-General (Chief Surveyor-General) Act* and the *Chief Registrar of Deeds Act* was drawn.
- It was identified that municipalities have budgetary concerns owing to flawed valuation rolls because of poor reconciling in the property register development phase.
- A framework was developed to limit the mistakes in the property register while improving the valuation roll and the valuation data.



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## RESEARCH OUTPUTS

**Journal articles**

Municipal budgets: The necessity of a multidisciplinary approach.



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## DECLARATION

I, Pieter-Hendrik Venter, declare that the dissertation, which I hereby submit for the degree of M.Sc. Real Estate at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

## ETHICS STATEMENT

The author, whose name appears on the title page of this dissertation, has obtained, for the research described in this work, the applicable research ethics approval.

The author declares that they have observed the ethical standards required in terms of the University of Pretoria's Code of Ethics for Researchers and the Policy Guidelines for responsible research.

Signature

**Pieter-Hendrik Venter**

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01 March 2023



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The opinions expressed are those of the author and do not necessarily represent any named organisation or person or governmental organisation.



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# CHAPTER 1: BACKGROUND

## 1.1 Introduction

The South African Government is divided into three spheres: the national, provincial, and local government (Education and Training Unit, 2010). The duties of the national government include that various departments promote and administer the adherence and enforcement of the Bill of Rights. Government comprises various departments that may implement laws and policies. This sphere represents each province. The Department of Provincial and Local Government handles the national coordination of provinces and municipalities, as indicated by the education and training unit.

The provincial government may implement provincial laws and a provincial Constitution. This civil servant section of government includes nurses and teachers. The provincial Member of the Executive Council and the Department of Local Government coordinate, monitor, and support municipalities in each province, as revealed by Education and Training Unit. Each province is divided into smaller local governments or municipalities providing services to the public. From a national government observation, the local government can represent the micromanagement team.



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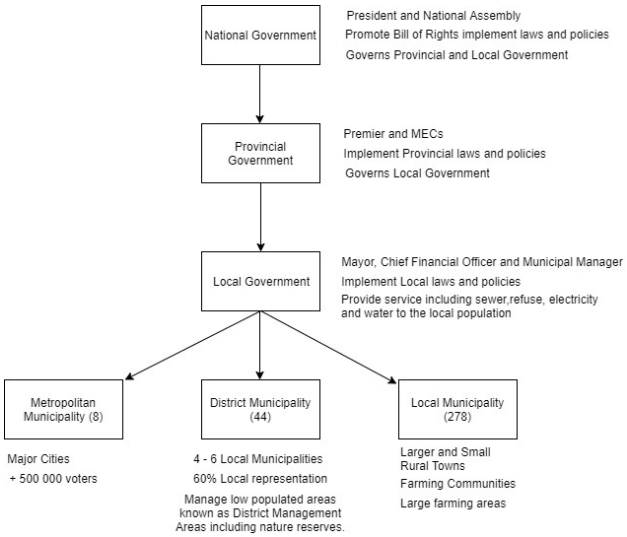


**Figure 1.1: Hierarchy of the South African Government (Adapted from Education and Training Unit, 2010 and Western Cape Government 2022: Online)**

This study focused on local government and the economic influence on properties and provincial and National Budgets.

The Cambridge Dictionary (2020: Online) defines a municipality as “a city or town with its own local government, or the local government itself”. A municipality is considered an organ of the state, exercising a legislative right in the local spheres of government (Municipal Systems Act, 2000). According to the South African Local Government Association (2015), a municipality is a government entity administrating cities and municipalities—also called local government. South African Local Government Association further suggests that municipalities can be divided into three types. These types are metropolitan, district, and local municipalities (South African Local Government Association, 2015).

The Local Government. *Municipal Structures Act 1998* (*Act No 117 of 1998*), stipulates that municipalities should be split into three categories, such as A, B, and C. An A-category municipality should comprise a high population density, have an intense movement of goods and people, demonstrate extensive development, and have multiple business and industrial nodes. Considering this category, A will be



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the metropolitan municipalities. The *Municipal Systems Act (Municipal Systems Act) 1998*, however, is unclear on the actual features of the category B and C and only indicate these municipalities are the opposite of category A municipalities. Further research indicated that local municipalities comprise low-populated areas rurally located with less than 500 000 voters (Education and Training Unit, 2010). It is further stipulated that district municipalities comprise four or six local municipalities and share the development and service delivery with local municipalities, as opposed to metropolitan municipalities attending to service delivery and development individually.

The Local Government Finances and Budget Guide (2019) pronounces that municipalities can provide better work and living areas if they effectively manage their financial situation. If a municipality provides improved services, it would be observed as the "vision" of the municipality. This "vision" would be impossible with the mismanagement of the municipal budget. This municipal budget includes the operating budget portraying the income from rates payers—not limited to property rates and tax only, but inclusive of income from other municipal services ( Local Government Finances and Budget Guide, 2019).

Stats SA (2018) signifies that the revenue from property rates and tax between June 2017 and June 2018 encompasses 19% of the total municipal operating budget (Operating income)—the third largest income of this budget. This changed in 2019, when the total income from property rates decreased to 17%, with the government grants increasing from 23.5% to 25% (Stats SA, 2019).

The problem statement can be understood by considering the observation of the national government on this matter. The Department of Cooperative Governance and Traditional Affairs manages municipal governance. Cooperative Governance and Traditional Affairs must improve cooperative governance across the three spheres of government, cooperating with traditional leadership institutions. They must ensure that provinces and municipalities conduct their service delivery and development functions effectively. According to Cooperative Governance and Traditional Affairs (2019), one of the main influences on a municipal budget is an



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incomplete valuation roll originating from a property register not compiled adequately. An incomplete and incorrect valuation roll triggers a ripple effect, influencing the provincial and national government budgets.

*What are a valuation roll and a property register? What is the difference between the two?* A property register is a list of all the properties within the municipal area. A valuation roll is a legal document comprising property information (including values) of rateable properties within the municipal boundary (*Municipal Property Rates Act*, 2004:36).

A valuation roll comprises a property register with a value and category that can obtain taxes from the rateable properties. According to Cooperative Governance and Traditional Affairs (2016), it is the municipality's responsibility to provide the data to the valuer; however, the valuer still needs to verify all entries in the property register (Cooperative Governance and Traditional Affairs, 2019). It is a timeous exercise to identify the shortcomings of property registers; municipalities do not embrace the skills in the office to maintain such registers.

A study by the Chief Surveyor-General (2011) confirms discrepancies between 17% and 24% of the Register of Deed's data (registered properties) and Surveyor-General data (spatial cadastral data). These two data sets should be compared to determine the actual, registered properties, which should be included in the valuation roll for rating. The deeds might include non-existing properties; the Surveyor-General data would provide plausible solutions. The Surveyor-General data would include a fair number of unregistered properties that should be excluded from the valuation. The deeds would provide the registered properties that should replace the unregistered parcels.

This study aimed to determine the influence of such discrepancies on the municipal operating budget if not reconciled correctly. The influence can either demonstrate an overstated budget reflecting more income or an understated less income from property rates. The study aimed to provide a systematic framework or guideline supporting the *Municipal Property Rates Act,* using a geographical information system to produce legal market-related valuation rolls. Such a guide should help



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local government to establish a proper scope of work in the tender process while helping to generate accurate operating budgets and stable income.

Before continuing to the background, the study defines crucial keywords obtained from the Acts scrutinised.

## 1.2 Definition of terms

The meaning of words changes according to place, time, and disciplinary application, therefore, defining the crucial keywords should be the highest priority. Ample definitions form the core of the study and aim to portray such definitions according to the actual source.

It is essential to understand the definitions stipulated in the Local Government. *Municipal Property Rates Act 2004* (Act 6, 2004) to establish the foundation of reasons for reconciliation, crucial in developing a property register:

> *"owner"- (a) in relation to a property referred to in paragraph (a) of the definition of "property", means a person in whose name ownership of the property is registered;*
>
> *(b) in relation to a right referred to in paragraph (b) of the definition of "property", means a person in whose name the right is registered;*
>
> *(c) in relation to a land tenure right referred to in paragraph (c) of the definition of "property", means a person in whose name the right is registered or to whom it was granted in terms of legislation; or*
>
> *(d) in relation to public service infrastructure referred to in paragraph (d) of the definition of "property", means the organ of state which owns or controls that public service infrastructure as envisaged in the definition of "publicly controlled",*
>
> *provided that a person mentioned below may for the purposes of this Act be regarded by a municipality as the owner of a property in the following cases:*
>
> *(i) A trustee, in the case of a property in a trust excluding state trust land;*
>
> *(ii) an executor or administrator, in the case of a property in a deceased estate;*
>
> *(iii) a trustee or liquidator, in the case of a property in an insolvent estate or in*



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*(iv) a judicial manager, in the case of a property in the estate of a person under judicial management*

*(v) a curator, in the case of a property in the estate of a person under curatorship;*

*(vi) a person in whose name a usufruct or other personal servitude is registered, in the case of a property that is subject to a usufruct or other personal servitude;*

*(vii) a lessee, in the case of a property that is registered in the name of a municipality and is leased by it; or*

*(viii) a buyer, in the case of a property that was sold by a municipality and of which possession was given to the buyer pending registration of ownership in the name of the buyer;*

*"permitted use", in relation to a property, means the limited purposes for which the property may be used in terms of –*

*(a) any restrictions imposed by –*

*(i) a condition of title;*

*(ii) a provision of a town planning or land use scheme; or*

*(iii) any legislation applicable to any specific property or properties; or (b) any alleviation of any such restrictions;*

*"person" includes an organ of state;*

*"prescribe" means prescribe by regulation in terms of section 83;*

*"property" means—*

*(a) immovable property registered in the name of a person, including, in the case of a sectional title scheme, a sectional title unit registered in the name of a person;*

*(b) a right registered against immovable property in the name of a person, excluding a mortgage bond registered against the property;*

*(c) a land tenure right registered in the name of a person or granted to a person in terms of legislation; or*

*(d) public service infrastructure;*



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*"property register" means a register of properties referred to in section 23;*

*"protected area" means an area that is or has to be listed in the register referred to in section 10 of the Protected Areas Act;*

*"Protected Areas Act" means the National Environmental Management: Protected Areas Act, 2003;*

*"publicly controlled" means owned by or otherwise under the control of an organ of state, including –*

*(a) a public entity listed in the Public Finance Management Act, 1999 (Act No. 1 of 1999)*

*(b) a municipality; or*

*(c) a municipal entity as defined in the Municipal Systems Act;*

*"public service infrastructure" means publicly controlled infrastructure of the following kinds:*

*(a) national, provincial or other public roads on which goods, services or labour move across a municipal boundary;*

*(b) water or sewer pipes, ducts or other conduits, dams, water supply reservoirs, water treatment plants or water pumps forming part of a water or sewer scheme serving the public;*

*(c) power stations, power substations or power lines forming part of an electricity scheme serving the public;*

*(d) gas or liquid fuel plants or refineries or pipelines for gas or liquid fuels, forming part of a scheme for transporting such fuels;*

*(e) railway lines forming part of a national railway system;*

*(f) communication towers, masts, exchanges or lines forming part of a communications system serving the public;*

*(g) runways or aprons at national or provincial airports;*

*(h) breakwaters, sea walls, channels, basins, quay walls, jetties, roads, railway or infrastructure used for the provision of water, lights, power, sewerage or similar services of ports, or navigational aids comprising lighthouses, radio navigational aids, buoys,*



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*beacons or any other device or system used to assist the safe and efficient navigation of vessels;*

*(i) any other publicly controlled infrastructure as may be prescribed; or*

*(j) rights of way, easements or servitudes in connection with infrastructure mentioned in paragraphs (a) to (i)*

*"rate" means a municipal rate on property envisaged in section 229(1)(a) of the Constitution;*

*"rateable property" means property on which a municipality may in terms of section 2 levy a rate, excluding property fully excluded from the levying of rates in terms of section 17;*

*"rebate", in relation to a rate payable on a property, means a discount granted in terms of section 15 on the amount of the rate payable on the property;*

*"reduction", in relation to a rate payable on a property, means the lowering in terms of section 15 of the amount for which the property was valued and the rating of the property at that lower amount;*

*"register"—*

*(a) means to record in a register in terms of (i) the Deeds Registries Act, 1937 (Act No. 47 of 1937); or (ii) the Mining Titles Registration Act, 1967 (Act No. 16 of 1967); and (b) includes any other formal act in terms of any other legislation to record- (i) a right to use land for or in connection with mining purposes; or (ii) a land tenure right;*

In the *Deeds Registries Act 1937* (*Act 47 of 1937*), as amended, the following definition is fundamental:

*"Deeds registry" means –*

*When used in relation to immovable property, the deeds registry which serves the area where the property is;*

*When used in relation to any deed or other documents, any deeds registry in the republic in which that deed or other document is register or registrable;*

*When used in relation to the register, the deeds registry of wish he is in charge …*

*"Diagram" means - A diagram signed by a person recognised by law as a land surveyor, and which has been approved or certified by a Surveyor-General or other officer*



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*empowered under any law so to approve or certify a diagram and includes a diagram or a copy thereof prepared in a Surveyor-General's office and approved or certified as, or a diagram which has before the commencement of this Act been accepted for registration in a deeds registry or Surveyor-General's office;*

*"Erf" means - every piece of land registered as an erf, lot, plot or stand in a deeds registry, and includes every defined portion, not intended to be a public place, of a piece of land laid out as a township, whether it has been formally recognised, approved or proclaimed as such;*

*"General plan" - means a plan which represents the relative positions and dimensions of two or more pieces of land and has been signed by a person recognised by law as a land surveyor, and which has been approved, provisionally approved or certified as a general plan by a Surveyor-General or other officer empowered under any law so to approve, provisionally approve or certify a general plan, and includes a general plan or copy thereof prepared in a Surveyor-General's office and approved, provisionally approved or certified as, or a general plan which has at any time, before the commencement of this Act, been accepted for registration in a deeds registry or Surveyor-General's office;*

*"registered" means registered in a deeds registry;*

*"registrar" means a registrar of deeds appointed under this Act, and, when used in relation to any deeds registry means the registrar in charge of that deeds registry; and when used in relation to a document means the registrar in charge of the deeds registry in which that document is registered or registrable or intended to be used or filed;*

*"Township" includes –*

*a group of pieces of land, or of subdivisions of a piece of land, combined with public places and are used mainly for residential, industrial or similar purposes, or are intended to be so used;*

*any combination of such groups suitable for registration in one register;*

*any area of land registered or recognised at the commencement of this Act in a deeds registry as a township if a general plan thereof is filed in that deeds registry or in the office of the Surveyor-General concerned; and*

*any township established, approved, proclaimed or otherwise recognised as such under any law.*



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Essential definitions were obtained from the *Land Survey Act 1997* (*Act 8, 1997*).

> *"Deeds registry" means a deeds registry as defined in the Deeds Registries Act, 1937 (Act No. 47 of 1937), and when used in relation to any mining title includes the Mining Titles Office; (xx)*
>
> *"diagram" means a document containing geometrical, numerical and verbal representations of a piece of land, line, feature or area forming the basis for registration of a real right and which has been signed by a person recognised under any law then in force as a land surveyor, or which has been approved or certified by a Surveyor-General and includes a diagram or copy thereof prepared in a Surveyor-General's office and approved or certified as such, or a document which has at any time, prior to the commencement of this Act, been accepted as a diagram in a deeds registry or Surveyor-General's office in the Republic or in any such office situated in any area which became part of the Republic at the commencement of the Constitution, 1993; (v)*
>
> *"erf" means any piece of land registered as an erf, lot, plot or stand in a deeds registry, and includes a stand or lot forming part of a piece of land laid out as, but not proclaimed, a township, or a portion of such erf, stand or lot; (x)*
>
> *"general plan" means a plan which, representing the relative positions and 35 dimensions of two or more pieces of land, has been signed by a person recognised under any law then in force as a land surveyor, or which has been approved or certified as a general plan by a Surveyor-General and includes a general plan or a copy thereof prepared in a Surveyor-General's office and approved or certified as such or a general plan which has, prior to the commencement of this Act, been lodged for registration in a deeds registry or Surveyor-General's office in the Republic or any area which became part of the Republic at the commencement of the Constitution, 1993; (iii)*
>
> *"land surveyor" means a person registered as a professional land surveyor in terms of the Professional and Technical Surveyors' Act, 1984 (Act No. 40 of 1984), and whose name is entered in the register referred to in section 7(4)(a) of that Act; (xiv)*
>
> *"local authority" means a local government body referred to in section 1 of the Local Government Transition Act, 1993 (Act No. 209 of 1993);*
>
> *"owner", in relation to land, means the person registered in a deeds registry as the owner of such land, and includes.*

With the keywords of the study defined, an understanding exists of why the study was conducted. The background of the study's importance is next addressed with



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the understanding of the technical meaning of the words clarified. The background provides information on the statutes used and previous issues identified by the government.

## 1.3 Background

South Africa comprises 278 municipalities, categorised by the Constitution into three categories (GCIS, 2019). The categories include eight metropolitan municipalities, 44 district municipalities, and 226 local municipalities. The local government implemented the *Municipal Property Rates Act 2004* (*Act No. 6 of 2004*) as amended on 18 August 2014/28 November 2014; the *Municipal Systems Act No. 32 of 2000*; the *Municipal Finance Management Act,* as amended 1 July 2008 to guide municipalities.

The *Municipal Systems Act 2000* was promulgated to "provide for the core principles, mechanisms, and processes to enable municipalities to move progressively towards the social and economic upliftment of local communities, providing access to affordable essential services" (Municipal Systems Act, 2000). The *Municipal Finance Management Act* was promulgated to "secure sound and sustainable management of the financial affairs of municipalities and other institutions in the local sphere of government; to establish treasury norms and standards for the local sphere of government; and to provide for connected matters" *(* Municipal Finance Management Act*, 2003*).

The *Municipal Property Rates Act* was implemented to regulate the power of the municipality to impose rates on property within the municipal boundary (Municipal Property Rates Act, 2004). Section 2(1) of the *Municipal Property Rates Act 2004* provides that "A metropolitan or local municipality may levy rates on property in its area". Properties within the municipal boundary specified by the Municipal Demarcation Board of South Africa should, therefore, be included in the municipal valuation roll.



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An accurate and complete valuation roll is required as this forms the base or property rates and tax that determine a large part of the revenue generated by a municipality. This is to reduce the influence on National Budgets in equitable shares to municipalities. According to Section 215 of the Constitution (1993), a municipality needs to provide a budget to indicate where funding will come from and how the deficit will be funded. The budget needs to demonstrate the income and expenses of the business (*Cambridge Dictionary*, 2020, budget). If the estimated rates revenue is miscalculated, showing more rateable property than registered, the budget is overstated with less disposable revenue and is, therefore, incorrect. If fewer registered properties are rated, the municipality loses revenue—the influence of provincial and national government budgets increases. These budgets are under immense pressure, with limited or no additional funding. An accurate valuation roll leads to a ripple effect throughout the entire government. Such ripple effect starts with local government through the district, followed by provincial and ends at the national government/treasury.

Not all records owned by the South African Government could be reconciled with the spatial cadastral Surveyor-General data (Surveyor-General, 2011). A 24% discrepancy between government-owned, and 17% privately-owned land, was calculated. All data sets used included 5,972,949 deeds records versus the 7,560,616 spatial records, indicating a 1,587,667 mismatch among data sets. The total discrepancy was calculated at 21% (ibid, 2011).

The data from the Surveyor-General and deeds office (DO), therefore, form the core departing point when compiling a municipal valuation roll for rating. Such influence on all 278 municipalities could have a tremendous effect on developing a proper budget for the use/spending of the municipalities.

## 1.4 The rationale of the research

South Africa comprises 278 municipalities. A study by the Surveyor-General confirmed a substantial percentage discrepancy between the deeds registry's data and spatial data. An influence on the proposed budget of the municipality is,



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therefore, imminent. This influence should be based on the three primary incomes of a municipality, indicating electricity sales (27%), grants and subsidies (25%), property rates (17%), and others (including water sales, refuse removal, sewer and sanitation and ample smaller services) (31%) (Stats SA, 2019).

Although the property rates income is only the third largest income of the municipal budget, government expenditures are being limited or cut in certain instances because of increasing pressure from failing state-owned entities (Mboweni, 2019). Considering the income stream of R98.2 billion, electricity sales were R26.5 billion or 27%; grants and subsidies, R24.7 billion or 25%; rates and tax R17.1 billion or 17%. Other municipality services generating income include water sales of R8.6 billion or 9%; sewerage and sanitation of R3.6 billion or 4% and refuse removal of R 3.0 billion or 3%.

The other income of R14.8 billion, or 15%, is obtained from fines, contributing to R1,3 billion. Other charges include their facilities, such as recreation centres and sports grounds. These include the rental facilities and equipment amounting to R873 million (Stats SA, 2019). Revenue generated from property rates is a high priority, considering the income streams.

All income should be appropriately managed for a municipality to reach the intended “vision”. Certain disciplines must be considered in determining the influence of poor reconciliation on the municipal budget. These include understanding the deeds register information under the governing Acts, the mass valuation methods, and employing a geographical information system.

The combined use of the three core disciplines should be considered, producing a more accurate municipal valuation roll. This valuation roll is implemented to determine the property rates and tax for each registered property within the municipal boundary. A municipal valuation roll is ever-changing, and the alliance of the deeds registry and a geographical information system is fundamental to portraying the most accurate income from property rates and tax.



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## 1.5 Problem statement

A message from the South African Auditor-General (A-G) reports depicts dismal prospects for local government and their ability to “accountability for financial and performance management” (Channing, 2019:525). According to the A-G (2019), municipalities’ financial health deteriorates because of financial non-management. The main concern limiting the effectiveness of property tax administration in most developing countries is poor record-keeping. Similar studies in India confirm a formal count of properties for the tax as a major handicap in the accurate estimation of property tax potential (Channing, 2019:527). The author concludes that municipal financial sustainability is determined through accurate data.

With the linking of cadastral information with the deeds register, a discrepancy of 24% among data sets was calculated as stipulated by the Cooperative Governance and Traditional Affairs study conducted in 2011. It is vital to understand that if proper reconciliation is not conducted, the municipal budget will be over- or understated. Such discrepancies will harm determining the municipal budget. A solution to these discrepancies will be time-consuming, resulting in losing revenue. Legislation (Municipal Property Rates Act,2004) prohibits backdated inclusions of properties omitted from the roll. The potential income for that period is, therefore, lost. It can take one to two years to be rectified. According to the Constitution (1993), the roll should not be conducted materially and unreasonably, prejudicing national economic policies.

Reconsolidating the two data sets should be a critical task for the appointed valuation company. This should be conducted before property valuations in a municipal area, because of its possible financial influence on the proper budget determination. Verifying the entries is the function of the valuer and their geographical information system team, although the municipality should provide the data. It was established in some municipal areas that property register reconciliation was conducted inaccurately, therefore, generating less income for the valuation roll (Cooperative Governance and Traditional Affairs, 2019).



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Inaccurate data from SG and the Deeds Registry offices result in an inaccurate valuation roll which inturn has detrimental effects on municipal budgets and affects both the residents and the local authorities.

## 1.6 Research questions

The research questions are:

1. What is the influence of poor reconciliation on the total value of a municipal valuation roll and the influence of such a roll on the municipal operational budget?
2. What is the importance/application of a geographical information system and deeds data in developing a property register and a valuation roll?
3. How should the valuer and the geographical information system team collaborate in compiling the property register, and applying property knowledge and spatial knowledge?
4. How could municipalities limit the mistakes on valuation rolls, applying the correct legislation and tendering procedures?

## 1.7 Research Philosophy

Bajpa (2011) explains that research philosophy deal with development, nature and the source of knowledge. Dudovskiy (2022) translates this statement as the belief about the ways to collect, analyse and use data about a specific phenomenon. Guba and Lincoln (1994) indicated that both qualitative and quantitative data can be utilised in any research paradigm. They further conclude that questions of method are secondary to questions of paradigm, which should define the belief system of the investigator. They stipulate that not only should the method choice determine the paradigm but also the ontologically and epistemologically ways should be considered.



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**The ontological question:**

Guba and Lincoln (1994) indicate that the question here should be “what is the form of nature of reality and therefore, what is there that can be known about it.” In other words, this question is considered with what exists. The question of what the effect could be on a municipal budget if reconciliation between two datasets is not conducted properly would be the ontological question including the four research questions.

**The epistemological question:**

This question is considered with knowledge itself and the methods of figuring out the truth. The question as per Guba and Lincoln (1994) would be what can be known, and what is the relation between the informed and the to-be-informed. The researcher focused on being objective and finding relationships between data to prove the impact and also obtain facts about why this impact would happen.

**The methodological question:**

Guba and Lincoln (1994) explain that this question will indicate how to-be-informed would obtain information to answer/prove the beliefs. The researcher focused on finding answers to the epistemological questions by focusing on measurable and observable facts such as data analysis and surveys distributed among professionals.

**Positivism Philosophy**

Considering the questions and approach the researchers considering the real world should be considered as a positivist approach. Smelser and Baltes (2001) defines positivism as laws that are tested against collected data. In other words, knowledge should be gained through structured observations and measurable facts. The research in the study relies on observations and facts that exist as such a conclusion can be made that a strong reliance on the positivism paradigm exists throughout the study.



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## 1.8 Research aims and objectives

The study aimed to determine the influence of an over/under municipal valuation roll on the municipal budget. The study focused on the correct ways of reconciling the two data sets in developing a valuation roll. The study included how municipalities could use legislation to ensure more accurate property registers for rating—concluding changes to tender documentation and service level agreement, ensuring more sustainable and accurate budget planning.

**Commented [PP1]:** Okay what the examiner want you to do is to replace abbreviations with the actual words. The argument is that, if they are too many, then the reader might have to go back and forth to understand your story.

The research objectives were to:

1. Identify the drawbacks when employing a multidisciplinary approach, causing confusion
2. Explain why there is a difference between spatial data and deeds data
3. Record the extent of a flawed valuation roll on the budgetary determination and fund allocation within the municipality
4. Develop a framework of proper reconciliation, limiting the mistakes on a valuation roll, therefore, limiting the budgetary influence on a municipality

## 1.9 Research paradigm

The study implemented a combination of qualitative and quantitative research. A combined approach is to establish the solutions to the proposed question through a statistical approach; information is obtained by interviewing professionals working in the industry. A combined approach should be considered as quantitative research could only portray the influence of the difference between the data sets, therefore, the existence and the degree of the difference. This research cannot answer the 'why?', 'how?' and 'who?' of the research. The qualitative research approach should analyse the real-world issues, why they exist, how can they be limited and who should be held responsible for the rectification. The research aimed to identify drawbacks, explain the difference, understand the influence and develop a framework; therefore, statistical data and professional interviews were the best methods to address findings practically.



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When applying the quantitative approach, a statistical method would determine the difference between deeds data, Surveyor-General data, and valuation roll. This should indicate improper reconciliation's influence on a municipal budget. The remaining question will be answered through interviews and theoretical observations. It is impossible to measure the plausible answers to the research questions statistically. This section aimed to respond to: The importance of geographical information system data and deeds data in developing a property register*; How should a geographical information system team and a valuer collaborate when compiling property registers? How could municipalities limit mistakes on valuations with legislation and tendering procedures?* A more in-depth analysis of the multiple research approach is identified in Chapter 3: RESEARCH DESIGN AND METHODOLOGY, of this research. This section clarifies the exact approach and observation on choosing qualitative and quantitative data analysis.

## 1.10 Importance of the research problem

The public's observation of municipalities is 'grim'—synonymous with incompetence, mismanagement, corruption, and leaching. Property rates and taxes provide for 17%, calculating R15.7 billion of the total South African municipal budgets. The study explains the importance of an accurate, reconciled valuation roll. This could assist the municipality in planning a more accurate budget concerning property rates and taxes.

## 1.11 Limitations, delimitations, and assumptions of the study

The study relied on information obtained from the Surveyor-General from the concluding spatial data update from 2011 to 2017. The material differences could be inflated because of the older data sets. Other data were obtained from the Lexis® WinDeed website and the DO, used by valuers to determine the total registered properties within the municipal boundaries. Such data sets date from 2016 to 2019 because of valuation at a set date, according to the Municipal Property Rates Act of



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2004. The date was not later than 2017, with only one data set dating to 2014, determining the implementation of the present roll improvement.

The influence of poor reconciliation was calculated at the mentioned dates, indicating the discrepancies among data sets in the past; correction might have been conducted on implemented valuation rolls. For the study and considering the statutes, the valuation roll was accepted as correct because the process is governed by legislation, and the roll should also be a legal document.

Participation from governmental institutions was limited in this study because of the sensitivity of the subject—employees fear losing their credibility and work. This confirms the limited correspondence and reactions from such employees. The private sector was, therefore, consulted for information, such as private companies and government departments, including the DO and the Surveyor-General, to obtain as much data as possible about the research area. A geographical limitation was experienced, representing data from nine provinces with only one participating municipality in a province. Two municipalities were represented in a province—the study adhered to instructions to keep all provinces and municipalities anonymous. Rounded totals and percentages were used. The study was conducted over two years.

Literature limitations exist, owing to the strong governmental focus of the study and limited literature on the Municipal Property Rates Act and property tax in larger Africa. With restricted peer review, literature and actual research in the field available, therefore, the study relied on governmental writing only, available from the websites and some gazetted information. The information was obtained from the relevant departments and, where necessary, some third-party sources were used.

## 1.12 Structure of report

This study comprises the following five chapters:



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Chapter 1: This chapter provides an introduction and overview of the study objectives on the influence of poor reconciliation between Surveyor-General data (spatial data) and deeds register information on municipal budgets.

Chapter 2: This chapter comprises the literature review of the study topic. The chapter is structured into five parts. First, the study observed property rates and taxes in other countries, such as Europe, India, Africa, and the Southern African Development Community countries. The second part includes the sections regarding legislation from the highest governing Act (the Constitution) to promoting the *Administrative Justice Act*. The third part includes property registers and valuation rolls, involving the legislation on property registrations and property registers. In this part, the research focused on the valuation side with a brief discussion of mass valuation techniques. The fourth part encompasses a geographical information system, including the legislation regarding surveying and typical data and information obtained from geographical information system data. The fifth part identifies how the two disciplines can be reconciled while promoting just and equitable valuation rolls.

Chapter 3: This chapter summarises the applied methodology of the study. The study employed a combination approach, using quantitative and qualitative methods. This chapter identifies why both methods were applied, the ethical consideration, the research design, sampling, data collection, and analysis, including data validity.

Chapter 4: This chapter comprises two sections. First, the researcher employed data, showing the differences between deeds data and Surveyor-General data and the influence poor reconciliation could have on the municipal operating budget. The second section includes data from interviews with mass valuers, geographical information system specialists, and surveyors. The analysis is conducted per the research question. The aim was to address the questions by applying qualitative and quantitative methods. The information is from a statistical perspective and flow into practically applying interviewees to identify specific concerns.



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Chapter 5: This chapter comprises the conclusion and plausible solutions to limit the influence on municipal budgets while providing guidelines for municipalities to limit risk during a project of this nature.



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# CHAPTER 2: LITERATURE REVIEW

## 2.1 Introduction

This literature review chapter is divided into three sections. The sections are identified using the following keywords: Surveyor-General data refers to the geographical information system part, while deeds register refers to the property part. Last, the municipal budgets refer to the income projection to produce day-to-day services. *How do these three parts influence/complement one another?*

Property rates have existed since the dawn of civilisation. According to Carlson (2005), wealth was calculated by the land owned and the proceeds from the land. These taxes were disbursed based on the yield from the harvests. Property tax is a levy, imposed primarily upon land and buildings (McLure, 2020). The local government uses such taxes as revenue rather than the national government to produce a public service. Governments and countries have various rules and regulations regarding property taxes. Some are rated on the land, whereas others are rated on land and building, with extreme cases on the land and building and the business and equipment (McLure, 2020).

South Africa differs little in implementing property rates and taxes from the rest of the world. Property rates are the third largest income (17%) acquired by the local government. If this income is calculated incorrectly, the local authority can lose millions of needed revenues for public services (Stats SA, 2019). Considering the vision of local government, this section of revenue is essential to generate a well-run and liveable environment for all ratepayers.

All sources should determine a just and equitable system to obtain rates and taxes considering such revenue's (property tax) critical role in sustaining the local municipality. Tax can be collected only from the beneficiary of such property and should also be governed by an Act or policy to control the local authorities, ensuring property owners are not overtaxed. South Africa is rated as a country with the best legislation. It is vital to understand the pertaining Acts and other legislation that may



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affect obtaining such property tax. Such tax is obtained from a register with values allocated to each entry known as a property register. The governing Act, known as the *Municipal Property Rates Act 2004*, guides local authorities in implementing such a register and inclusion in the register.

The main challenge when developing a property register is reconciling the DO data and the Surveyor-General data. Studies by the Chief Surveyor-General in 2011 indicate a 26% discrepancy between the two data sets. The influence on the proposed budget could be enormous when considering a 26% discrepancy.

This chapter provides a literature review on the application and the principles of governing legislation, using DO (Valuer input) and Surveyor-General (geographical information system input) data. This involves merging two disciplines to develop a more accurate register for property rates and tax. To answer the research questions an understanding is needed of how property rates and taxes in other countries are obtained, observing the obstacles to draw a rationale in the South African property rates and tax system.

## 2.2 Frameworks

Research frameworks are considered an integral part of a research study to justify why the study is conducted and to explain the design of the study. Two types of frameworks exist including a Theoretical Framework and Conceptual Framework. This section aims to start with the Theoretical Framework followed by the Conceptual Framework to dedicate the logic behind the study.

### *2.2.1 Theoretical framework*

Reflecting on the problem statement indicating that, inaccurate data from SG and the Deeds Registry offices result in an inaccurate valuation roll which inturn has detrimental effects on municipal budgets and affects both the residents and the local authorities, the researcher opted to consider a system approach as part of the framework.



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To investigate the phenomenon by applying the systems approach the researcher based the theoretical application on the fact that a municipality should be considered a large business managed by integrating policies and cross-pollinating departments. In other words, when considering Figure 2.1 the study will consider if the impact if symbiosis between the SG Data and the Deeds Register data does not exist, and how this will implicate the symbioses between the Property Register and the Valuation Roll as well as the Valuation Roll and the Municipal Budget. If symbioses between datasets and departments are disturbed it will impact the sustainably of service delivery and the municipality to function as a whole considering the findings by the Auditor-General (2005) stipulated mismanagement exist due to poor service delivery from service providers.

Furthermore, the researcher aimed to prove that a multidisciplinary approach should be considered to promote symbioses between the datasets to promote further symbiotic relationships between other departments and data sets. The theory is based on the findings by Mohamed, Mnguu, Mwatawala and Mandara, (2020) who observed a 77% increase in property rates and tax when Geographical Information Systems were employed, and Franzsen and McCluskey (2017) confirmed that spatial information is key when developing valuation rolls. They further stipulate that land registration is equally significant in the development of accurate valuation rolls.

### *2.2.2 Conceptual Framework*

The conceptual framework that forms the cornerstone of the study is stipulated in Figure 2.1. As shown in Figure 2.1 the two initial data sets are vital in the development of other data sets that form the base of property rates and tax which contribute 17% to the municipal budget. If the municipal budget is not developed correctly, it will have an impact on the local authority as well as the ratepayers.

Hlongwane and Nzimakwe (2018) confirm that a statement by the Auditor-General stipulated that the mismanagement of the municipal budget leads to financial crises in the municipality that implicates the service delivery. Imuezerua and Chinomona (2015) confirm that when a budget is implemented correctly the effectiveness of



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service delivery will increase and this will lead to the generation of a growing economic climate within the municipal area. Considering these two statements it is confirmed that the initial data have an impact on the economical sustainability of the municipality and the ratepayers.

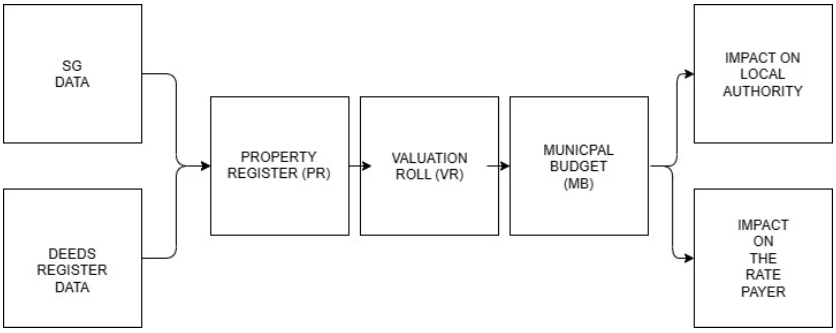


**Figure 2.1: Conceptual framework (Designed by authors)**

In essence, developing an incorrect property register will lead to an over/under-stated valuation roll that will have a negative impact on the municipal budget. The rates and tax is based on the value and the category obtained in the valuation roll that should reflect all registered properties in the municipal boundary.

Referring to Figure 2.1 emphasis should be placed on a structured approach however it would be futile to start with the data ending at the budget that portrays the actual loss. Considering the abovementioned to grasp the concept of the study it would be fair to explain this by focusing on the statutes guiding the actual process.

The Constitution of 1996 of South Africa stipulates that a municipality must provide a well-managed living area that promotes economic growth and section 229 of the same statutes confirms that a municipality must have a budget. In the same section, it also confirmed that revenue can be created from property rates and tax. Ample statutes govern Local Municipalities, however, the study will focus only on the Municipal Systems Act (No. 32) of 2000, the Municipal Property Rates Act (No. 6) of 2004 and the Municipal Finance Management Act (No. 52) of 2008 that should



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be red simultaneous. These statutes form the guidelines for the implementation of property rates and tax and enforce the necessary data needed in the development and maintenance of property registers and valuation rolls.

Although the compulsory output data is stipulated by the statutes, limited guidance is obtained regarding where/what data should be obtained, thus lacking a specific reference to reliant resources. The statutes do stipulate registered properties, that can only be obtained from the Chief Registrar of Deeds as a primary data source. The information obtained from the Chief Registrar of Deeds should be sufficient to develop a property register, that will later form part of the valuation roll, however, the data and registration process needs to be understood before the data can be used. The Deeds Registries Act (Act 47) of 1937 governs the processes of registration and recordkeeping of any property movement within the boundary of South Africa. The data that should be included in a property register include the ownership, sizes and purchase price, and other owner details excluding any indication of location. This act refers to the Chief Surveyor-General that has to identify the actual property boundary and the location of each property in conjunction with the Land Survey Act (Act 8) of 1997. These two acts should be simultaneously considered as they both enforce record-keeping focusing on property movements.

Considering the finding by the Chief Surveyor-General in 2011 as well as Franzen and Olima (2003) that data is incomplete, it could be identified where the issue arises by scrutinising the statutes with the possibility of identifying the gaps and grey areas.

## 2.3 Rates and taxes in other countries

It is crucial to understand how this practice is conducted in other countries before analysing the South African rates and tax legislation. A rationale must be drawn on the advantages and disadvantages of property tax implementation. This could



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clarify issues and solutions in applications. The research considered Europe, India, and Africa, investigating their application or interpretation of rates and tax systems.

Europe is analysed owing to the strong influence of Europe, the United Kingdom, and the Netherlands on South African laws. Solutions could be obtained from these countries that could fit in with the South African legal system with ease. India should be considered owing to the complicated nature of property identification and the difficulty of mapping the populated areas. Having a strong British undertone law system might clarify what could be changed or prevented. The African tax information was scrutinised to obtain plausible solutions and identify similar concerns. This could point to the solution to African content rather than a first world, often difficult to implement.

### *2.3.1 Europe, India, and Africa as a continent*

Almy (2001:8) conducted a survey on property tax systems in Europe and confirmed that property tax is easy to administer and difficult to avoid in the larger European content. Revaluation should be frequent to provide fair values during economic growth or inflation. A property tax system should, therefore, include notions of fairness, uniformity, and equity.

Property tax is an important and crucial revenue source for local governments in developing and developed countries (Bahl, Mathur, Thakur, & Aksha, 2009). Entry 49 of the State List of the Constitution (1993) presents the rates and tax levy framework and defines how the valuation should be conducted (Bahl, et al., 2009:8). The basis of the property rates system is similar to the South African system, as both countries are former British colonies. The foundation of governing laws might, therefore, be based on the British system.

According to Franzsen and McCluskey (2017:29), “property taxes are levied in all the African countries, except Burkina Faso and Seychelles”. It is a constitutionally guaranteed income source for certain countries, levied by the local or national government. The property tax system is under-exploited in most African countries.



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It is inadequately administrated. Justification lacks that colonial heritage or tax level can clarify these underperformances.

Considering these countries, the author decided that a tabular approach would be the best to determine the differences between the countries (Table 2.1). The main reason behind the understanding of how property rates and tax is levied in other countries is to determine if they have a more effective approach, identify their approaches, and establish the drawbacks. This allowed establishing if similar issues exist in South Africa while finding plausible solutions from implemented systems.



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**Table 2.1: Rates and Tax Systems in Europe, India, and Africa**

| Variable | Location | | |
|---|---|---|---|
| | **Europe (Focusing on the UK and Netherlands)** | **Asia (Focusing on India)** | **Africa (Focusing on Zambia, Angola, Ghana, Congo and Kenya)** |
| Economy | Developed | Developing | Developing |
| Legal Process | Appeal court<br>formal and informal appeals | Magistrate's offices<br>Courts | Appeal boards<br>Courts<br>Magistrate's offices |
| Valuation | Valuation models – focusing on the three valuation methods<br>Market-related | Similar to South Africa, only 8% to 19% of the actual market value | Country depending<br>Cost less depreciation<br>Lower than the actual value by 80% |
| Drawbacks | Combined systems approach<br>Land building split<br>Real right valuation<br>Cadastral exclusions | Discrimination rating structure<br>No property registers<br>Understaffed<br>Not trained | Limited resources<br>Untrained personnel<br>No complete property registers<br>Owner identification difficult |



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| | | | |
|---|---|---|---|
| Collection | National government<br>Local government<br>Post office<br>Banks<br>Electronic system | Local government<br>manual system difficult to obtain owners | Local government<br>Manual system and difficult to deliver information |
| Enforcement | Auctions<br>Frozen bank accounts<br>Unpaid is personal debt<br>Imprisonment<br>Bankruptcy | Containing Acts<br>Penalty clauses<br>Act application in areas is different | No strict application of laws<br>Fines<br>Interest<br>Defaulters list |
| Properties rates | Almost 100% | 37% Of all properties and 47% fall part of the tax net | Not all to as low as 6% and the highest being 45% |

Source: Adopted from Almy (2001:8 -70: Franzsen, 2003:7-47; Bahl et al., 2009:34; Zang et al., 2013:39-58)



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Considering Table 2.1, the South African property tax legislation demonstrates similar traits as the three areas analysed. The most important aspect of the European analysis is that the interlinking of stakeholders makes a difference in tax collection. The importance of property registers and a geographical information system is indicated, although errors remain. With the information from India, without a property register and limited cadastral mapping, limited tax is collected; however, if the laws are implemented correctly, the taxpayer must pay. South Africa deviates as laws are unenforced, limited property information exists in ownership, and cadastral information lacks. The aforementioned is a strategic reason limited property tax is obtainable.

Understanding the African concept and problem areas of property tax clarifies various concerns regarding India and Europe. A reason in the three areas is maintaining a register of the properties; however, for Africa, such record-keeping is limited to a few countries. Two identified problems include law enforcement and the shortage of professionals. Limited referral is made to professionals and law enforcement in India and Europe. Professionals are restricted in most parts of Africa, influencing property tax implications. This receives secondary priority because of other work requirements. For law enforcement, not all systems can be linked. Poor administration could exploit the law to obtain the needed rates and taxes. The taxation and property tax system implementation throughout Africa is similar to the South African property tax laws. European countries colonised the larger African continent. These countries include Brittan, Belgium, France, Italy, Spain, and Portugal. The governing countries implemented their own laws. Most of the legislation implemented by the British is still used as a base in the decolonised countries, with 18 African countries under British colonial rule.

According to the scrutinised information, a correlation exists between a geographical information system and property registers. From the aforementioned countries, poor reconciliation between a geographical information system and deeds data will affect taxable properties, implicating the budget. With this confirmed, the study focused on the five Southern African Development Community countries



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as a final resort to determine how valuations are conducted in the neighbouring countries.

### *2.3.2 Southern African Development Community*

The Southern African Development Community was established on 17 August 1992. Fourteen countries from member states hold a population of 200 million-plus (Franzsen, 2003:1). The study focused on five countries with similar British colonial history, historic links, and economic ties—part of the British Commonwealth. These countries include Botswana, Lesotho, Namibia, South Africa, and Swaziland.

A crucial factor for property tax comparison is law similarities. The Roman-Dutch common law, with some indigenous law, governs the five countries (Franzsen, 2003:5-6). The governmental tiers are similar to South Africa, having three tiers, whereas the remainder of the countries have two tiers because they are smaller. They further explain that similar property tax rates in these five countries can be traced attributable to British occupation; however, noticeable differences mostly reflect land ownership and tenure rights.

With reference to Table 2.2, the substantial difference between the countries is the property ownership type. Ownership type is the foundation of the property tax system because the owner or occupiers are liable for property tax payments. Difficulty in obtaining the owner is indicated because of improper documentation and inadequate record-keeping, hindering equitable property tax application.

The tax base and the method are strongly associated, considering that the taxable influences the method. As shown in Table 2.1, property tax in most countries is based on land and building, except in Swaziland and Namibia, where the tax can be rated on the land or the building and a combination of both. The cost method and comparison method in all cases is the approach to valuation. In the South African property tax system, the value was determined only on the land; the land and building values were split. This changed in 2004 when the Municipal Property Rates Act was implemented, directing that the property tax value should include the whole property.



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In most countries, professionals should conduct this assessment; however, Botswana disobliges the registered value for such a valuation roll. property register completion is similar to the way it is conducted in South Africa. Crucial information includes the owner's name and the minimum value. This is a prerequisite, as most taxes cannot be obtained if nobody is held liable.

In Table 2.1, the property tax value list could be adjusted for three to five years in most countries. In South Africa, this was adjusted in 2014, granting extension for metros (one year) and local municipalities (two years). The legal objection and appeal processes in the five countries are similar (Table 2.1). These processes involve the local court and appeals board—then the High Court. This is because the Roman-Dutch common law forms the base of the legal system in all countries.



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**Table 2.2: Southern African Development Community country property tax system comparison**

| Variables | Location | | | | |
|---|---|---|---|---|---|
| | **Botswana** | **Lesotho** | **Namibia** | **South Africa** | **Swaziland** |
| **Land Policy** | Freehold properties | No Freehold All land held by the King | Freehold properties | Freehold properties | 99-year Leasehold |
| **Taxpayer** | Owner of Land | Owner by lease or allocation or licence | Owner of Land occupier regarding council property | Owner of rateable land | Owner of rateable land |
| **Tax base** | Capital value - Land and building | All improvements over or under land | A municipality can decide - land, building, both, and on both but separately | Land and building | Either value of land, improvement, or a combination of the total valuation of the property |
| **Method(s) of assessment** | Assess land and improvements separately. The sum is the rateable value | The value of buildings must be the replacement cost | Land = Market value Improvements in replacement cost menu depreciation | Market value - Comparable sales or income calculations | Market value - comparable sales or income calculations |
| **Assessment** | Valuation officer - Not qualification prescribed | The minister appoints valuers responsible for the Act | A fit and proper person as a valuer | Registered valuers | Valuer from panel of valuers |



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| | | | | | |
|---|---|---|---|---|---|
| **Valuation roll** | Three values per property | Must contain the legal description, value, size, owner and occupier | Show total value and separate values | Detailed value for each property and property information (Size, description, owner etc) | Must contain value, zoning nature of use, improvements, and improved property information |
| **Valuation cycle** | Maximum 5 years | 3 Years | Maximum 5 years | 4-5 Years (May be extended) | Maximum 5 years |
| **Objections and appeal** | Local Valuation Court then High Court | Land Tribunal with the option to settle | Local Valuation Court then High Court | Valuation Appeal Board, then High Court | Local Valuation Court then High Court |
| **Enforcement** | • Interest on arrears<br>• Transferor remains liable<br>• "The occupier can be held liable"<br>•"Councils may take possession of unoccupied land" | • Interest on arrears<br>• "Civil action in a magistrate's court, by sequestration"<br>• Clearance certificate required | •Interest on arrears<br>•"Conveyancer's certificate before a formal transfer will be registered"<br>•Seizure and public sale | • Interest on arrears<br>•"Clearance certificate required before any formal transfer"<br>• "Seizure and public sale" | • Interest on arrears<br>•"Clearance certificate required before any formal transfer"<br>• "Seizure and public sale" |



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| | | | | | |
|---|---|---|---|---|---|
| **Issues** | •"Lack of capacity of government valuers to prepare proper valuation rolls"<br>•"Lack of comparable market/sales evidence"<br>• "Exemption of low-cost housing"<br>•"Political interference when councils want to enforce the law"<br>•Low collection rate | •"Extending the coverage ratio to peri-urban areas"<br>•"Extension of rates to other municipal and urban councils"<br>•"Lack of capacity to properly assess land"<br>•"Lack of funds and resultant poor services"<br>•Collection of current and arrear rates | •The introduction of a land tax on commercial farmland<br>•"The reliance on surpluses on trading services as a subsidy"<br>•"The valuation of sectional title schemes"<br>•The circumvention of conveyancer's certificates<br>•Collection of current and arrear rates | •The diversity of tax bases<br>•The responsibility for valuation quality control<br>•"Municipal rates (i.e., property tax) policies"<br>•The lack of proper taxpayer education<br>•"Setting of tax rates, differential tax rates and rate-capping" | •"The wide range of possible tax bases"<br>•"The collection of current rates and rates in arrears"<br>•"Outdated local government legislation, making it difficult to enforce rates legislation" |

Source: Adopted from Franzsen, (2003:7-47)



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Similarities include the interest rate on arrears, considering the legal procedures of enforcing property tax. Property may not be transferred if the tax is not paid up to date. Some of the severest implications include civil action and sequestration of the owner, according to the Lesotho policy. In other countries, the property can be taken and sold at a public auction.

Table 2.2 signifies considerable concerns. Inadequate data keeping is an extreme hindering factor. Owner and land occupier record-keeping are outdated and sometimes incomplete. Limited funding and tax under-recovery also influence the total system.

Franzen (2003:12) identified a negative aspect as low-cost housing is exempt from rates and taxes. This could create a non-payment culture among the ratepayers. A lack of education, public and official tax payments, and incorrect valuations hinder the income from property tax. This includes implementing and applying the legislation.

The Southern African Development Community countries employ similar tax systems, entertaining comparable concerns. A lack of property tax collection and incomplete data sets involve implementing a proper property list to be taxed. A rationale among the concerns and applying the governing Acts should be assessed.

Globally, legislation forms the foundation of property tax systems, with the concrete difference among implemented Acts. This study, therefore, focused on the governing Act's security as the base of the South African property tax system.

This study observed the legislation's involvement, identifying the Acts' influence on the property tax system, assessing the direct Act governing property tax procurement, and evaluating property valuation conduct. Affected departments with a crucial function in developing the property tax system were examined.



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## 2.4 Legislation/governing Acts

Legislation is defined as “a law or a set of laws suggested by a government and made official by parliament” (*Cambridge Dictionary*, 2020: Online). According to the Judicial Learning Center (2019), laws protect general safety, ensuring that the rights of citizens are safeguarded against abuse from people, organisations, and the government. These laws are implemented to guide individuals when implementing processes, ensuring that it is conducted justly and equitably.

South Africa, similar to other countries, has diverse Acts refer to Figure 2.2. The Constitution (1993) forms the highest governing or supreme Act, followed by the legislative Acts. Regarding the legislative literature review, the legislations are observed, beginning with the Constitution of the Republic of South Africa. The Constitution governs the local government and its powers. This is followed by assessing additional legislation, focusing on local government Acts. These include the *Municipal Property Rates Act No. 6* of 2004, as amended; the *Municipal Systems Act 32 of 2000*; the *Municipal Finance Management Act 56 of 2003*, as amended. Additional analysed Acts include the Promotion of *Administrative Justice Act 3 of 2000* and the *Promotion of Access to Information Act 2 of 2000*. The Acts were scrutinised. The sections are portrayed to realise their interlinking and mutual support.



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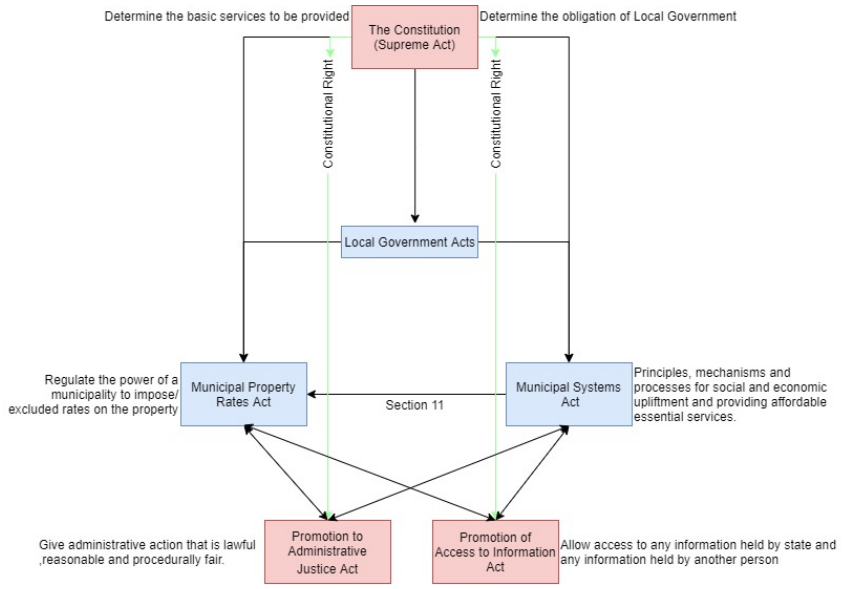


**Figure 2.2: Governing Acts and interlinking (Adapted from Education and Training Unit, 2010 and Western Cape Government 2022: Online)**

The legislation forms the foundation for legally developing a valuation roll. The obligations of the parties within the Act's parameters are identified. This section aims to supply directions on municipalities' conduct to limit errors in the valuation roll. Guidance is provided in establishing tender procedures. This must assist municipalities experiencing erroneous conduct of tasks. These tender procedures also explain property register development, guiding developing and implementing of these registers as a foundation.

### *2.4.1 The Constitution*

The Constitutional Court approved the Constitution of the Republic of South Africa on 4 December 1996, effective on 4 February 1997 (SAGovernment, 2020). The Constitution concerned Chapter 5 of the interim Constitution (Act 200, 1993). The Constitution was constructed over two years, forming an integration of ideas from citizens, civil society, and political parties, with the contributors being represented by the constitutional assembly and external stakeholders. The aim of constructing



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the Constitution was to have an Act representing the collective wisdom of the South African citizens arrived at by general agreement (SAGovernment, 2020).

The South African Constitution "is regarded as the world's leading example of a transformative constitution, and the most admirable Constitution in the history of the world" (Sunstein, 1999:123). All other legislation is subservient to the South African Constitution. It is, therefore, imperative to understand the municipalities' obligations according to the Constitution, describing their operations to fulfil these obligations.

Chapter 7: (Local Government) Section 152 (1) categorises the objectives of the local government. These objectives include:

> *(a) to provide a democratic and accountable government for local communities;*
>
> *(b) to ensure the provision of services to communities in a sustainable manner;*
>
> *(c) to promote social and economic development;*
>
> *(d) to promote a safe and healthy environment; and*
>
> *(e) to encourage the involvement of communities and community organisations in the matters of local government*

According to Section 152 (2), "A municipality must strive, within its financial and administrative capacity to achieve the objectives set out in Subsection (1) (South Africa, 1996)". A municipality should, therefore, provide services to the public within its demarcated boundary—requiring funding. *Where and how does a municipality obtain revenue to generate services?*

Chapter 13 of the Constitution engages the government's financial matters at a national, provincial, and local level. Section 214 (1)(a) stipulates that *"an Act of Parliament must provide for the equitable division of revenue raised nationally among the national, provincial and local spheres of government"*. This section explains the 25% of grants and subsidies forming part of the municipality's total income.

Section 214 and Section 215 should be perused in combination. Section 215 stipulates, *"National, provincial and municipal budgets and budgetary processes must promote*



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*transparency, accountability and the effective financial management of the economy, debt and the public sector".*

Section 215(2)(c) specifies "*that budgets in each sphere of government must show the sources of revenue and the way in which proposed expenditure will comply with national legislation".*

According to 215(3)(b) *"proposals for financing any anticipated deficit for the period to which they apply".*

Budgeting is, therefore, an essential part of the management and maintenance of all sectors of the local government. Budgetary influences from erroneously projected rates and taxes will display extreme deficits, with no additional strategy for funding the loss. The Constitution, under the heading "Municipal fiscal powers and functions" Section 229(1)(a) asserts:

*"a municipality may impose rates on property and surcharges on fees for services provided by or on behalf of the municipality".*

The supreme Law of South Africa (1993), therefore, allows the municipalities to impose rates and taxes on the property.

Section 229(2) indicates that:

> *"The power of a municipality to impose rates on property, surcharges on fees for services provided by or on behalf of the municipality, or other taxes, levies or duties— (a) may not be exercised in a way that materially and unreasonably prejudices national economic policies, economic activities across municipal boundaries, or the national mobility of goods, services, capital or labour; and (b) may be regulated by national legislation".*

The section legalises the largest income of 27% of electricity sales obtained by the municipality when supplying this service to the residents, and Section 229 (2) allows the municipality to raise rates and tax on property in their jurisdiction. With the highest Act allowing for rates and tax on property, the researcher will aim to scrutinise the most relevant Acts about property registers and valuation rolls. First, the municipal system and budget regarding rates and taxes were analysed. It is essential to understand the sections of the *Municipal Systems Act*, focusing on property rates and taxes.



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### *2.4.2 Municipal Systems Act*

Local Government. *Municipal Systems Act 2000* (Act 32, 2000), as amended, was promulgated "to provide for the core principles, mechanisms, and processes to enable municipalities to progress towards the social and economic upliftment of local communities, providing access to affordable essential services". The *Municipal Systems Act 2000* further defines a municipality's legal nature, the administrative structures, how municipal controls and functions are exercised, implements a framework for the core planning processes, and specifies performance management, and resource mobilisation.

Rights and Duties of the municipal councils or Section 4 of the *Municipal Systems Act* remarks that *"The council of a municipality has the right to (a) govern on its own initiative the local government affairs of the local community; (b) exercise the municipality's executive and legislative authority, and to do so without improper interference".*

Part (c) conditions that the municipality *may "finance the affairs of the municipality by- (i) charging fees for services; and (ii) imposing surcharges on fees, rates on property and, to the extent authorised by national legislation, other taxes, levies and duties".* This section identifies the source for the remaining income, generated by the local municipality; it is, therefore, generated by implementing service fees, rates and taxes, and additional levies.

Section 11 of the *Municipal Systems Act 2000* concerns the executive and legislative authority of the municipality. Considering property rates and tax, Section 11(3) announces:

> *A municipality exercises its legislative or executive authority by:*
>
> *a) developing and adopting policies, plans, strategies and programmes, including setting targets for delivery; …*
>
> *f) providing municipal services to the local community; …*
>
> *h) preparing, approving and implementing its budgets;*
>
> *i) Imposing and recovering rates, taxes, levies, duties, service fees and surcharges on fees, including setting and implementing tariff, rates and tax and debt collection policies; …*



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The order of the subsections of Section 11 of the *Municipal Property Rates Act 2004* is specified systematically. The first part attends to the duties and liabilities of the municipality (3 a-g) and the financial part (3 h-n) of the operations. Budgeting, followed by rates and taxes, directly affects each other. If Section (3)(i) is not conducted accurately, it will affect Section (3)(h) regarding budgeting. This observes what the influence of poor reconciliation will be on the municipal budgets when generating the property register and forming the valuation roll.

Sections 12 and 13 of the *Municipal Property Rates Act 2004* approach the legislative procedures and publications of bylaws. The importance of these sections is discussed under the section about the Municipal Property Rates Act, as this forms part of developing the property register and the valuation roll; however, a municipality has the right and privilege to implement bylaws if conducted according to the procedures displayed in the *Municipal Property Rates Act 2004*. Section 74 to Section 75A, approaching the service tariffs, is also considered. They refer to implementing fair and equitable tariff policies and promoting sustainability.

The last imperative section of the *Municipal Property Rates Act 2004* in Section 118 engages the restraint on transferring property:

> *(1) A registrar of deeds may not register the transfer of property except on production to that registrar of deeds of a prescribed certificate- (a) issued by the municipality or municipalities in which that property is situated; and (b) which certifies that all amounts that became due in connection with that property for municipal service fees, surcharges on fees, property rates and other municipal taxes, levies and duties during the two years preceding the date of application for the certificate have been fully paid.*

This section, therefore, ensures that all municipal-owned debt is paid before property transfer. This also enables the municipality to keep track of any owner changes within the municipal demarcation to rate the new owners. Before scrutinising the Municipal Property Rates Act, an understanding of the municipal budgets and financial management is crucial. The study aimed to signify their influence on municipal budgets, therefore, requiring knowledge and an assessment of the *Municipal Finance Management Act*.



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### *2.4.3 Municipal Finance Management Act*

Local Government. *Municipal Finance Management Act 2003* (Act 56 of 2003) was endorsed:

- *to secure sound and sustainable management of the financial affairs of municipalities and other institutions in the local sphere of government;*
- *to establish treasury norms and standards for the local sphere of government; and*
- *to provide for matters connected therewith. (Municipal Finance Management Act, 2003).*

According to National Treasury (Online:2015), the Municipal Finance Management Act aimed to:

> *… modernise budget, accounting and financial management practices by placing local government finances on a sustainable footing in order to maximise the capacity of municipalities to deliver services to communities. It also aims to put in place a sound financial governance framework by clarifying and separating the roles and responsibilities of the council, mayor and officials.*
>
> *The Municipal Finance Management Act is required by the Constitution, which obliges all three spheres of government to be transparent about their financial affairs. It also forms an integral part of the broader reform package for local government, as outlined in the 1998 White Paper on Local Government.*

The *Municipal Finance Management Act* informs on how the budget is determined and in what way the Municipal Property Rates Act can be entangled into the budgetary requirements.

A budget is defined as "… a formal statement of estimated income and expenses based on future plans and objectives" (Shaun Conrad, 2021: Online).

The *Municipal Finance Management Act 2003* refers to a "budget year", which "means the financial year for which an annual budget is to be approved in terms of section 16(1)". The *Municipal Finance Management Act 2003* further defines that:

> *"budget-related policy" means a policy of a municipality affecting or affected by the annual budget of the municipality, including-*



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*(a) the tariffs policy which the municipality must adopt in terms of section 74 of the Municipal Systems Act;*

*(b) the rates policy which the municipality must adopt in terms of legislation regulating municipal property rates; or*

*(c) the credit control and debt collection policy which the municipality must adopt in terms of Section 96 of the Municipal Systems Act;*

*Municipal Finance Management Act* refers to the *Municipal Property Rates Act* and *Municipal Systems Act* to form part of the budget development, according to this definition of the budget-related policy. Section 16(1) of the *Municipal Finance Management Act 2003* stipulates that a municipality must approve a budget for each financial year before the start of that financial year. Part (2) of this section indicates the budget should be discussed at least 90 days before the start of the financial year, and part (3) demonstrates this may include the appropriation of capital to be spent, but not over three financial years. An incorrect prediction, therefore, influences the budget and the future planning of a municipality. The following can be directed: *What does the Municipal Property Rates Act have in common with the Municipal Finance Management Act and budgeting?*

As explained in Chapter 1, a percentage of the municipal budgets comes from rates and taxes on property in the municipal area. Section 17(1) of the *Municipal Finance Management Act* focuses on the annual budget matters and documents, stipulating:

> *An annual budget of a municipality must be a schedule in the prescribed format— (a) setting out realistically anticipated revenue for the budget year from each revenue source: (b) appropriating expenditure for the budget year under the different votes of the municipality; (c) setting out indicative revenue per revenue source and projected expenditure by vote for the two financial years following the budget year; (d) setting out— (i) estimated revenue and expenditure by vote for the current year; and (ii) actual revenue and expenditure by vote for the financial year preceding the current year; and a statement containing any other information required by section 215(3) of the Constitution or as may be prescribed.*

A certain direction, therefore, exists that the municipal budgets should be tabled with policies including the tax policies, such as the municipal property rates and tax



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tariffs and related tariffs forming part of the income. These include water and electricity and additional service tariffs.

At this stage of budgeting, the Municipal Property Rates Act holds an enormous function. This is when property tax income based on the municipal valuation roll is determined to calculate future budget income. The municipal property tax tariff schedules determine the municipal valuation roll values and categories. *How should a budget approval be approached to ensure effectiveness?*

Section 24(1) indicates that:

> *(1) The municipal council must at least 30 days before the start of the budget year consider approval of the annual budget.*

Approval of the budget requires additional resolutions must be adopted, including:

*(i) imposing any municipal tax for the budget year; [rates policy];*
*(ii) setting any municipal tariffs for the budget year;*
*(iii) approving measurable performance objectives for revenue from each source and for each vote in the budget;*
*(iv) approving any changes to the municipality's integrated development plan; and*
*(v) approving any changes to the municipality's budget-related policies*

Policies must be approved with the budget. The property register and the values and categories are, therefore, high-risk areas. Erroneous entries could harm municipal sphere development. An accurate property register is essential. Considering the municipal budgets and the influence of property rates and taxes, the Municipal Property Rates Act should be scrutinised. This leads to understanding how this Act can enforce insignificant influence on how a budget should be developed to portray completeness and correctness-driven outcomes.

### *2.4.4 Municipal Property Rates Act*

Local Government. *Municipal Property Rates Act 2004* (Act 6, 2004), as amended, was promulgated to regulate the power of a municipality to impose property rates. The *Municipal Property Rates Act 2004* permits the municipality to exclude certain properties from the rating. The *Municipal Property Rates Act 2004* also supports the municipality in implementing fair and transparent exemption systems and reductions



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and rebates through rating policies. An imperative element of the *Municipal Property Rates Act 2004* specifies fair and equitable property valuation, permitting objections and appeals to amend such erroneous values.

It is essential to note the definitions under 1.2 to understand the foundation of reasons reconciliation is crucial in developing a property register. The definitions guide the researcher in identifying properties to be included in the property register. 'Registered', 'person', 'owner', or 'holder of rights must be considered when compiling the register. The Municipal Property Rates Act focuses on property registers in Chapter 2, Part 5, Section 23 (Municipal register of properties), guiding property registers.

> *23 (1) A municipality must draw up and maintain a register regarding properties within that municipality, consisting of Part A and Part B.*
>
> *(2) Part A of the register consists of the current valuation roll of the municipality, including any supplementary valuation rolls of the municipality prepared in terms of Section 78.*
>
> *(3) Part B of the register must specify which properties on the valuation roll or any supplementary valuation rolls are subject to –*
>
> *(a) an exemption from rates concerning Section 15;*
>
> *(b) a rebate on or a reduction in the rate concerning Section 15*
>
> *(c) a phasing-in of the rate concerning Section 21; or*
>
> *(d) an exclusion referred to in Section 17(1)(a),(e),(g),(h) and (i)*
>
> *(4) The register must be open for inspection by the public during office hours. If the municipality has an official website or another website available to it, the register must be displayed on the website.*
>
> *(5) A municipality must at regular intervals, but at least annually, update Part B of the register. Part A of the register must be updated in accordance with the provisions of this Act relating to the updating and supplementing of valuation rolls.*

This section of the *Municipal Property Rates Act 2004* (Part 5) conditions that the municipality keeps a register of properties within the municipal boundary. It provisions that the register should be maintained annually with supplementary



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valuations. A crucial register inclusion involves entry categories. This would help identify rate and tax-exempted properties, enabling budget estimates. property register development should include properties within the municipality and determine the property's rating. Properties should be rated according to categories with the rates policy as determined by the municipality. This should follow the *Municipal Systems Act*. According to Section 15 of the *Municipal Property Rates Act 2004*, owner categories, owners, and property categories should be involved.

Section 8(1) of the *Municipal Property Rates Act 2004* stipulates these categories. The municipality may determine the categories based on the property, permitted property use, or a combination of both. Section 8(2) specifies the categories, such as residential, industrial, business and commercial, agricultural, mining, state-owned enterprises, public service infrastructure, public benefit organisations, and additional categories approved by the minister. Section 8(3) itemises vacant land.

This section of the *Municipal Property Rates Act 2004* signifies that property use or permitted use should be considered when developing a property register. Vast knowledge of the municipal areas and property use nodes is critical in developing a property register.

Section 23 leads to these questions: *Should all properties within the municipality be included in the property register? Does this involve only those registered properties?* Section 24(1) of the *Municipal Property Rates Act 2004* conditions that the owner must pay a levied property rate. *If an unregistered property is rated, who will be responsible for levies?* This section of the *Municipal Property Rates Act 2004* concludes that the property register must include all registered properties, supporting the property definition, referring to a registered person.

*How does the property register fit in with the valuation process?* According to previous analysed sections, the property register forms the base of the valuation roll. If the property register is inadequately maintained from the start, it will influence conducting of the valuations, affecting the roll value.



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Section 30 of the *Municipal Property Rates Act 2004* pronounces that all properties within the municipality must be valued. The municipality identifies properties to be levied. The register should, therefore, support the valuation roll. This induces the following question: *What content should the valuation roll present?*

Section 48 explains the content of the valuation roll. Section 48(2) stipulates the requirements to be reflected in the roll, including:

> *(a) The register or other description of the property;*
>
> *(b) The category determined in terms of Section 8 in which the property falls;*
>
> *(c) The physical address of the property;*
>
> *(d) The extent of the property;*
>
> *(e) The market value of the property, if the property was valued;*
>
> *(f) The name of the owner; and*
>
> *(g) Any other prescribed particulars.*

The aforementioned sections lead to this query: *Why should there be concern regarding the influence of poorly reconciled property registers if the Municipal Property Rates Act defines the information to be included in the property register?*

First, a valuation roll is valid for a specified period (Section 32 of the *Municipal Property Rates Act 2004*). Metropolitan municipality rolls are valid for four years; local municipalities' rolls are valid for five years. The opportunity exists to extend the validity by another year for metropolitan municipalities and two years for local municipalities. Extensions can be allowed only with the consent of the Member of the Executive Council of the local government in a province.

An erroneously reconciled property register involves a more extended period to be corrected. Mistakes cannot be fixed immediately after they are identified. There are procedures to be followed to rectify these errors. According to the *Municipal Property Rates Act 2004*, processes will involve public inspection of the valuation roll. This allowance for adjustments was also regularly implemented as property



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trade. Change of ownership, new buildings, consolidations, and subdivisions are ongoing processes. According to Section 23, the register should be adjusted and maintained.

The valuation roll is provided for public observation under Section 49 of the *Municipal Property Rates Act 2004*. The roll must be available for public inspection for 30 days and published in the provincial Gazette. It should also be advertised for two weeks. Owners should inspect and object against errors, including omitted properties or other matters regarding the property, the category, valuation, or owner name. Section 50 of the *Municipal Property Rates Act 2004* remarks that any person, including the municipal council, may inspect and object and call the objection reasons aforementioned.

Sections 51 to 53 imply that the process should follow the objection period. After completing this process, the municipal valuer should consider the objections and evidence. The valuer should adjust or add information to the valuation roll according to the decisions. Changes over 10% require written reasons addressed to the municipal manager. These 10% adjustments will also be presented to the valuations appeal board to determine adjustments, confirmed by market evidence. If the objector is dissatisfied with the outcome, they have the right (sec. 54) to appeal the outcome. The matter will then be presented to the appeals board. The process is time-consuming; the municipal budgets may be implicated excessively. Objections and appeals are backdated to implementation (sec. 55) of the valuation roll; therefore, it might distort the budget.

Considering this part of the *Municipal Property Rates Act 2004,* it is established that mistakes can be rectified. According to Chapter 8, valuations rolls should be updated regularly. This chapter also involves maintaining and updating the property register. Section 77 stipulates that a municipality must regularly (annually) update its valuation roll by causing-

> *(a) a supplementary valuation roll to be prepared, if Section 78 applies; or*
>
> *(b) the valuation roll to be amended, if Section 79 applies.*



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property registers cannot be static information; they should instead be observed as ever-changing data. This data must be updated regularly. This section of the *Municipal Property Rates Act 2004* allows for updates on the property register and the valuation roll if the following applies, considering Section 78(1): A supplementary valuation regarding any rateable property-

*(a) incorrectly omitted from the valuation roll;*

*(b) included in a municipality after the last general valuation;*

*(c) subdivided or consolidated after the last general valuation;*

*(d) of which the market value has substantially increased or decreased from any reason after the last general valuation;*

*(e) substantially incorrectly valued during the last general valuation;*

*(f) that must be revalued for any other exceptional reason;*

*(g) of which the category has changed; or*

*(h) the value of which was incorrectly recorded in the valuation toll because of a clerical or typing error.*

These subsections allow for adjustments to a valuation, considering if the property adheres to the criteria. *What will the influence be on the proposed budget?* Under Section 78(4), a timeline is stipulated, divided into two parts, indicating events after the general valuation and mistakes not rectified during the general valuation roll.

According to Section 78(4), Subsections (a), (e), (f), and (h) may be included only in the valuation roll on the first day of the month following the notice; however, if a property was undervalued as stipulated in Subsection (e), the correction should be made on the date the mistake was included in the roll. For Subsections (b), (c), (d), and (g), the changes may be conducted on the date it registered in the DO or on the date the event occurred.

The budget will be influenced if properties are omitted from the roll. If it is brought to the municipality's attention, it may not be backdated to implementation. The



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revenue is lost for that period. Erroneous valuations also affect the budget by losing revenue and an additional burden of owing money to the ratepayer.

The *Municipal Property Rates Act 2004* explains that the onus is on the municipality to maintain the register and stipulate property valuations in the property register. *What is the function of the public in compiling the valuation roll or property register?* During objection, appeal, and updating of the valuation roll, the public has a minor function. The public should inform the municipality if a property was omitted or erroneously included. The public does not always fulfil this role as, mostly, the ratepayer believes the municipality should ensure all properties are included in the roll. If properties are omitted, the ratepayers need to inform the municipality and prohibit repercussions.

According to the *Municipal Property Rates Act 2004*, inspections are optional; however, Section 41 provides for the municipal valuer and team to inspect a property during working hours and to obtain information from the owner. According to Section 42 of the *Municipal Property Rates Act 2004*, the municipal valuer may request information from the owner/occupier or managing agent of the property. This involves information that will assist the municipal valuer in valuing a property. Some municipalities include a questionnaire when notices of a new roll are distributed. Such a questionnaire help obtain property information from the owner; however, these questionnaires are seldom returned to the municipality or the valuer. The owner might believe the municipality or valuer will misuse the information provided. According to Section 44, the municipality may not disclose any data obtained, enforcing Sections 41 and 42 of the *Municipal Property Rates Act 2004*.

According to the aforementioned sections of the *Municipal Property Rates Act 2004*, it is observed that an inadequate reconciled property register will harm the municipal budgets. The valuation roll is developed from the property register. It is concluded that rectifying erroneous actions is time-consuming. The revenue income for a certain period might be lost because backdating could not be conducted. The municipality's responsibility is to develop and maintain a property register with limited assistance from the public.



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The owners occasionally refuse to provide information pertaining to the property during inspections. The *Promotion to Administrative Justice Act 2000* (Act 3, 2000) and the *Promoting Access to Information Act 2000* (Act 2, 2000) should, therefore, be considered for clarity on the public's role in collaborating with the municipality in maintaining a property register or valuation roll. Transparency exists regarding property register development.

This section elaborates on the literature review, including administrative justice and access to information. This encompasses the governing Acts, identifying sections forcing public cooperation.

### *2.4.5 Promoting Access to Information Act*

The *Promoting Access to Information Act 2000* (Act 2, 2000) was constructed to enforce the constitutional rights of access to information held by the state or a person; however, this Act was also developed to protect the rights of the information controllers.

Section 11 of the *Promotion of Access to Information Act 2000* pronounces that a requester must be granted access to a record of a public body when following procedures of the *Promotion of Access to Information Act 2000*. Access to such records may, therefore, not be refused, besides the stipulations in Chapter 4 of the *Promotion of Access to Information Act 2000*. This section grants easy access to any public record unless the information is privileged or may harm the third party, impair their safety, or cause financial damage. Any information can be obtained from the public to maintain transparency towards the citizens. According to Section 50 of the *Promotion of Access to Information Act 2000*, a requester must be granted access to any record of a private figure if:

> *(a) that record is required for the exercise or protection of any rights;*
>
> *(b) that person complies with the procedural requirements in this Act relating to a request for access to that record; and*
>
> *(c) access to that record is not refused in terms of any ground for refusal contemplated in Chapter 4 of this Part*



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The public must allow the valuer access to certain information regarding the property, considering these sections of the *Promotion of Access to Information Act* and Sections 42 and 43 of the *Municipal Property Rates Act 2004*. The information about a property should, therefore, be provided to the valuer or the municipality. This Act also hinders the participants' disclosure of such information obtained to an involved third party. Such information can ensure administrative justice regarding the property register and the valuation roll. Appeal boards may also request information from the objector, who then must supply such.

### *2.4.6 Promotion to Administrative Justice Act*

The *Promotion to Administrative Justice Act 2000* (Act 3 2000) was promulgated to enforce the right to lawful, reasonable, and procedurally fair administrative action and the right to document reasons for administrative action as contemplated in Section 33 of the Constitution. According to Section 33(1) and (2) of the Constitution, everyone has the right to administrative action. Such action must be lawful, reasonable, and procedurally fair. Those whose rights have been harmed by administrative action must provide documented reasons; (3) requires national legislation to be enacted to give effect to those rights and to:

- *provide for the review of administrative action by a court or, where appropriate, an independent and impartial tribunal;*
- *impose a duty on the state to give effect to those rights;*
- *promote an efficient administration;*

*Item 23 of schedule 6 to the Constitution provides that the national legislation envisaged in Section 33(3) must be enacted within three years of the date on which the Constitution took effect.*

*AND IN ORDER TO—*

- *promote an efficient administration and good governance; and*
- *create a culture of accountability, openness, and transparency to the public administration or in the exercise of a public power or the performance of a public function, by giving effect to the right to just administrative action.*



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*The Promotion to Administrative Justice Act* accommodates Sections 50 and 78 of the *Municipal Property Rates Act 2004*, where a person can object to an error in the valuation roll. This includes properties omitted from the valuation roll because of an incomplete property register. A primary focus of the *Promotion to Administrative Justice Act 2000* is to create a culture of accountability, openness, and transparency. The *Promotion to Administrative Justice Act 2000* only considers the local municipality and the public. This section indicates that administrative justice can only be reached if all participants act transparently and supply evidence.

Section 3 of the *Promotion to Administrative Justice Act* considers procedurally fair administrative action, influencing any individual:

> *(1) Administrative action which materially and adversely affects the rights or legitimate expectations of any person must be procedurally fair.*
>
> *(2) (a) A fair administrative procedure depends on the circumstances of each case.*
>
> *(b) In order to give effect to the right to procedurally fair administrative action, an administrator, subject to subsection (4), must give a person referred to in subsection (1)- (i) adequate notice of the nature and purpose of the proposed administrative action;*
>
> *[Sub-para. (i), previously para. (a), renumbered by s. 46 of Act 42 of 2001.]*
>
> *(ii) a reasonable opportunity to make representations;*
>
> *[Sub-para. (ii), previously para. (b), renumbered by s. 46 of Act 42 of 2001.]*
>
> *(iii) a clear statement of the administrative action;*
>
> *[Sub-para. (iii), previously para. (c), renumbered by s. 46 of Act 42 of 2001.]*
>
> *(iv) adequate notice of any right of review or internal appeal, where applicable; and*
>
> *[Sub-para. (iv), previously para. (d), renumbered by s. 46 of Act 42 of 2001.]*



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*(v) adequate notice of the right to request reasons in terms of section 5.*

*[Sub-para. (v), previously para. (e), renumbered by s. 46 of Act 42 of 2001.]*

*(3) In order to give effect to the right to procedurally fair administrative action, an administrator may, in his or her or its discretion, also give a person referred to in subsection (1) an opportunity to-*

*(a) obtain assistance and, in serious or complex cases, legal representation;*

*(b) present and dispute information and arguments; and*

*(c) appear in person.*

Affected persons, therefore, have the right to administrative justice by appointing a provisional and appearing in person, providing evidence of why administrative justice was not adhered to. Administrative justice is an integral part of the property register. administrative justice is not served to the ratepayer if numerous properties are excluded from the property register—also if unregistered properties are included. If the information is not provided to the local authority, administrative justice will not be delivered.

Considering various legislation, the statutes interlink and support one another in certain aspects. The Constitution governs the rights of government while protecting the public's rights. While the research focused on sections, such as the Municipal Property Rates Act property register and valuation roll, the *Municipal Systems Act* demonstrates the legal route to implementing a policy. Such policy includes the property rates, determining the rating in rand. *The Promotion of Access to Information Act* allows the local government to request information from the public and governmental institutions to compile an accurate register. This Act forces the local government to inform the public while being transparent in all aspects. The *Promotion to Administrative Justice Act* enforces administrative justice for all. A property register should be comprehensive and exact to ensure equality for all



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property owners and taxpayers. This section guides the municipality in developing a valuation roll. This information should also guide tender development.

Emphasis is on property registers and their critical function in developing municipal budgets following legal guidelines. When an Act is included in developing a property register, accurate theoretical knowledge of property registers and other supporting legislation is provided. It is, therefore, essential to define property registers to maintain such registers, referring to legislation (deeds).

The following section informs on the importance of deeds data in developing a property register, providing insight into how the DO maintains property registers. The research would, therefore, obtain a good indication of property knowledge/data used in developing a valuation roll. This section focuses on the importance of deeds information in developing a property register and how the valuer and the geographical information system team can apply this knowledge.

## 2.5 Property registers and valuation roll

Valuation is defined as the act or the process of appraising a property, therefore, the estimate or determination of the market value of a thing/property (Merriam-Webster, 1996). According to the International Association of Assessing Officers (IAAO) (2013), appraisal involves an estimate of value, particularly of the value of a property. Considering these two definitions, clear valuing or appraising is the process of applying or determining the worth or capital value of a property.

According to the *Municipal Property Rates Act 2004* Section 30, all properties should be allocated a market-related value and should be reflected in the valuation roll. The basis of a valuation roll comprises a property or land register. Without this base data, property identification and determining value would be impossible consistent with the idiom and proverb “you must learn to crawl before you can walk” it would be wise first to understand a property register, followed by value and methods, and last, a valuation roll.



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Internet searches for property registers avail several alternative words, such as land register, land registry, and property registry. According to the Cambridge Dictionary (2020), a property register comprises an official list of details about land or buildings kept in a land registry. Land should not just be the dirt covering the earth's surface, but it should include improvements above and below the land (Manthorpe, 2000). The author defines a land register in some jurisdictions as an immovable property register, indicating the ownership of any real right in deeds registers. A register of deeds can be defined as the government official registering real estate documents (Business Dictionary, 2020). Such a deeds registrar verifies property and mortgage ownership of houses (or improvements) and lands in official record books. It can also be called a recorder of deeds.

According to the *Municipal Property Rates Act 2004*, Section 23 of the Act, Part A and B define a property register. Part A defines the roll and supplementary functions as actions on the property—rateable or exempt. *What if the municipality does not hold Part A of the valuation roll? How can Part A be created?* The answer to these questions is in the definition of register, referring to the *Deeds Registries Act 1937*. This Act stipulates how a deed or land register should be maintained and included in the deeds register. An understanding of the Chief Registrar of Deeds data is crucial in developing a register of property. Cooperative Governance and Traditional Affairs (2016) indicates that if a municipality does not have a valuation roll, it should undertake a complete land audit, verifying properties within its demarcated boundaries with the latest deeds download.

### *2.5.1 Chief Registrar of Deeds and data*

According to the South African Government (2020), the DO registers, manages and maintains a property registry in South Africa. They are further responsible for keeping copies of antenuptial contracts. The information kept by the DO includes:

- “The registered owner of the property”
- “All the conditions affecting the property”
- “Any interdicts and contracts regarding the property”
- “The purchase price of the property”



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- “The rules of a sectional title scheme”
- “A copy of the sectional title plan”
- “A copy of the Antenuptial contract, deeds of servitude, mortgage bond, erf size, erf number, and township name” (SAGovernment, 2004)

The aforementioned information is obtainable from the Chief Registrar of Deeds, supporting a property register. According to Section 23 of the *Municipal Property Rates Act 2004*, such a register should similarly be maintained and managed by the municipality. This information can be obtained by supplying either owner names or identification numbers or the township name or erf number; however, a street address cannot serve as property identification. According to the *Promotion of Access to Information Act*, the DO provides this information with a customary fee structure.

*What guidelines do the Deeds Registries Act 1937 (Act 47 1937) provide on how a property register should be maintained and managed?* Referring to the definitions in Section 1.2 the fundamentals of the Act have been established. The analysis of the relevant section in the Act can now be addressed.

Section 3(a) of the *Deeds Registries Act 1937* stipulates the duties of the registrar must take charge to preserve all records before the commencement of this Act or may become, after such commencement, records of any deeds registry regarding which he has been appointed. Section 3(b) reveals that the registrar may reject the registration and that the registrar must examine the documents before rejecting them; *“3(c) register grants and leases of land lawfully issued by the government, and 3(d) attest or execute and register deeds of transfer of land and execute certificates of title to land.”* Other sections include registration and cancellation of mortgage bonds, notarial ties, servitudes, leases, and anything that may affect the property. This section indicates the duties of keeping a register of all properties in the country, specifying all owners and any legal endorsements to such properties.

The powers of the registrar are explained in Section 4 of the *Deeds Registries Act 1937*, and its conditions that the registrar can conduct rectifications, copies can be



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produced, and request to obtain certified copies to replace illegible or unserviceable properties. Under Section 6, deeds may be cancelled only upon court order.

Section 10 of the *Deeds Registries Act 1937* regulates the fees, the documentation, the manner, the methods, and the qualification to change a deed or the information on a deed. This includes the manner of identification of a natural person, the condition of how changes may be made, and how this information can be obtained. The latter complies with the *Promotion of Access to Information Act* and enforces transparency. It can be conducted from the discussed section that all properties should be registered—any affecting feature/endorsements should be in the document.

As per Section 13, a deed has been registered as soon as the registrar signs the documents; however, if the registrar's signature is omitted from the document or any endorsement, the property is still registered. It can still be signed by or treated as an omission. Regarding this section, a property can be registered only when approved and signed by the registrar. All properties in the register should, therefore, be included in the municipality property register, developing the valuation roll.

When considering the sections in the *Deeds Registries Act 1937*, all documents should be presented in hard copies. At this stage, all documents are submitted by hand to the DO. As required, hard copies must be submitted.

New movements in the space of the DO promulgated the *Electronic Deeds Registration Systems Act 2019*. The *Deeds Registries Act 1937* provides electronic deeds registration, considering legislation regulating electronic communication and transactions, providing for connected matters (South Africa. *Electronic Deeds Registration Systems Act 2019*). Section 2(1) of the Act indicates that:

> *2. (1) The Chief Registrar of Deeds must, subject to the Electronic Communications and Transactions Act, develop, establish and maintain the electronic deeds registration system using information and communications technologies for the preparation, lodgement, registration, execution and storing of deeds and documents.*



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Implementing the aforementioned might save time while allowing the register to be altered with electronic documents instead of hard copies that need to be scanned. This again might pose some risk regarding submitting confidential/legal documents electronically; however, Section 2(2) of this Act affirms that:

> *(2) In achieving the objectives contemplated in subsection (1), the Chief Registrar of Deeds may, after consultation with the Regulations Board referred to in section 9 of the Deeds Registries Act, issue directives for—*
>
> *(a) the functional requirements of the electronic deeds registration system;*
>
> *(b) the technical specifications for the electronic deeds registration system; 25*
>
> *(c) the specifications for the interface between the electronic deeds registration system and any party interfacing in the system which will be authorised to access the electronic deeds registration system;*
>
> *(d) the standards governing the information security of the electronic deeds registration system; 30*
>
> *(e) the operation of the electronic deeds registration system;*
>
> *(f) the processing of deeds and documents using the electronic deeds registration system;*
>
> *(g) the secure retention and subsequent production of deeds and documents, or any other electronic records, which may be pertinent to the registration of rights in the deeds registry or that may be required for the administrative or legal proceedings that must be complied with by users interacting with the electronic deeds registration system; and*
>
> *(h) any other matter specifically provided for in this Act.*



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Implementing the *Deeds Registries Act 1937* can save time and might allow more accurate property register development. Human handling and errors, however, will remain. Regarding the advantages and disadvantages of an electronic system, the following should be considered, as indicated in Table 2.3:

**Table 2.3: Advantages and Disadvantages of an Electronic Deeds System**

| Advantage | Disadvantage |
|---|---|
| More accurate capturing | Hacking and fraud |
| Electronic data for easy handling | System downtime |
| Access to more information | Training cost |
| Faster document handling | Plausible over costing |
| More accurate registry | |
| More accurate registry | |

Source: Adopted from the South African Government (2019)

The *Electronic Deeds Registration Systems Act 2019* (*Act 19 2019*) was approved recently; therefore, this study focused on the system employed by professionals.

The *Electronic Deeds Registration Systems Act 2019* does not refer to a property's location—it merely refers to the erf numbers and property descriptions, lacking a physical address. No actual indication of the location of a property is stipulated in a title deed. The *Electronic Deeds Registration Systems Act 2019* refers to diagrams from the Surveyor-General in Section 43 as follows:

> *(1) If a defined portion of land has been surveyed and a diagram thereof has been approved by the Surveyor-General concerned, the registrar may, on written application by the owner of the land accompanied by the diagram of such portion, the title deed of the land, any bond thereon and the written consent of the holder of any such bond, issue a certificate of registered title regarding such portion, as nearly as practicable in the prescribed form;*
>
> *(2) In registering the certificate, the registrar shall endorse on the title deed that it has been superseded by the certificate regarding the land described in the certificate and on the certificate that the land described is mortgaged by the bond and shall make such endorsements on the bond and such entries in the registers as shall clearly indicate that the land is now owned by the certificate and is subject to such bond.*



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*(3) This section shall also apply where two or more defined portions of a piece of land have been surveyed, and the diagrams thereof approved: Provided that each of such portions shall be described in a separate paragraph in the certificate.*

*(4) No defined portion of a piece of land shall be mortgaged until the owner thereof has obtained a certificate of registered title regarding such a portion under this section.*

This section observes that the Registrar of Deeds should collaborate closely with the Surveyor-General to identify properties and locations. The diagram can be used as proof of the property's existence, its size, and its specific location in the demarcated municipal area. This diagram will also indicate endorsements that might affect the property and its use. The most important part of this section stipulates that no piece of land can be mortgaged until a registered title is obtained. A property bears no value if not registered with the DO. Such property can, therefore, not be used as security for a bid.

This section focuses on developing the property register and locating the property for valuation. This is followed by register development and the *Municipal Property Rates Act 2004* guidelines on property registers. If this foundation of a municipal valuation roll is understood, the focus is shifted to property location and identification in the municipal area, converging on the Surveyor-General information and the Act.

### *2.5.2 Register development and maintenance*

It is essential to peruse and understand the *Municipal Property Rates Act 2004* and the *Deeds Registries Act 1937* when developing a property register. It is a clear conclusion that the registrar should record all property movements in South Africa. These registers should include sales, a change of ownership, and affiliated endorsements. Property removal from a deeds register can be removed only through a court order. The foundation of a property register can be developed through deeds registry information. The DO in the province holds all data on registered properties and owners. The deeds registry is governed by law; therefore, it is a valid source of reference in developing a property register.

Property information from the *Municipal Property Rates Act 2004* should be evaluated and applied, as this is a valid source. Section 23 of the *Municipal Property*



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*Rates Act 2004* affirms a municipality must establish and maintain a property register, employing previous and supplementary valuation rolls. The *Municipal Property Rates Act 2004* is vague concerning the absence of a valuation roll in developing a property register. This lack of guidance was conquered concerning the *Deeds Registries Act 1937*; It suggests obtaining a complete list of registered properties in the municipal area. According to Section A, previous and supplementary rolls should be combined to develop a register. This collective roll should be compared with the deeds registry to determine the valuation roll's completeness and correctness.

Part B of the register must identify properties subjected to rate exemption, receiving a rebate or reduction. According to Section 17, these should be excluded. The required information can be acquired from previous valuation rolls; however, data should be verified when conducting new valuations. Chapter 4 discusses this process as part of the crucial development of the valuation roll's foundation.

Section 78(a) to (c) of the *Municipal Property Rates Act 2004* affirms updating a valuation roll annually; this may also include the property register. These sections directly refer to property change and information rather than property use. These sections include valuation roll omissions, inclusions, subdivisions, and consolidations after the last general valuation. The property ownership change should also be included. The relevant information should be provided by the deeds registry, as property cannot be registered without the registrar's consent.

The two Acts should be implemented consecutively, considering property register development and maintenance. A comprehensive understanding of these Acts is, therefore, crucial. The deeds registry structures the foundation to develop and maintain a complete and correct property register, justifying a valuation roll. A clear understanding of a property register and where to obtain the required information to instigate compiling a valuation roll is needed.



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### *2.5.3 Valuation roll*

A valuation roll is a legal document comprising property information—including values—of rateable properties within municipal boundaries (*Municipal Property Rates Act 2004*). The valuation roll is the foundation of the property rates and tax, contributing 17% of the budgetary income of the municipality. *How do the deeds contribute to developing valuation roll? Does the deeds registry comprise all the information that should be included in the valuation roll?*

In response to the aforementioned questions, Section 48 of the *Municipal Property Rates Act 2004* stipulates the contents of a valuation roll. Section 48(2) specifies that for each valuation roll entry, the following should be reflected: description, physical address, extent, market value, owner, and other information.

According to the *Deeds Registries Act 1937*, only Subsections a, d, and f of Section 48(2) can be attained from the deeds registry; in rare cases, Subsection c can also be obtained. The property register or billing information is normally provided in this section. The information is not limited to the aforementioned and includes additional property-related information, such as the selling price, sale date registration, and registered bond amount.

Section 48 concludes that the valuation roll should comprise all properties within the municipal demarcation identified in Section 30 of the *Deeds Registries Act 1937*. This section stipulates that if a municipality intends to levy property rates, it needs to valuate all properties in the municipality. Section 30 refers to rateable property, agreeing with Section 7 of the *Municipal Property Rates Act 2004*. All properties in the municipal area must, therefore, be included with the name of the owner. Registered properties should then be incorporated into the valuation roll. According to the tax definition, the landowner or long-term tenants can only pay tax.

The major difference between a property register and a valuation roll is that a valuation roll should include properties with owners only. The property register should incorporate all properties within the municipal boundaries. The information that should be disclosed in a valuation roll should be considered; four of the



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compulsory field information can be provided by the deeds data. The property register concerns category and valuation.

The additional section is imperative in identifying the owner. Tax accounts must be sent to such owners. The question of how tax is determinant, and the amount taxed is addressed. The subsequent section advises on the categories and valuation methods.

### *2.5.4 Categories and valuation methods*

When observing a property, the actual use indicates the method to determine the market value. The actual use of the property, therefore, needs to be identified. Simultaneously, the property should be categorised and valued. According to *Municipal Property Rates Act 2004*, consultation is critical in understanding the law's requests concerning the compulsory fields. The *Municipal Property Rates Act 2004* defines a category as:

- Property-related, indicating property categories determined in Section 8
- Concerning property owners, signifying an owner category, as determined in Section 15(2).

Section 15(2) of the *Municipal Property Rates Act 2004* considers the categories based on the property owners, which may affect the way the property should be rated. The owner might be a state-owned or a non-profit organisation exempt in most cases. This section seems more important based on the rebate section of the *Municipal Property Rates Act 2004* rather than the actual property category.

Section 8(1) stipulates that the municipality may establish the categories based on the property, the permitted use, or a combination of the two. Permitted use is defined as the limited purpose of property use concerning restrictions of the title conditions, town planning or land use scheme provisions, and any legislation applicable to a property.

According to this section, the actual use should be valued; therefore, inspections should confirm such use. Similar to the property's intended use, the town planning



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or land use scheme should affect the property value. The category and property use will confirm the valuation method. Section 8(2) requires the municipality to include the categories observed in Table 2.4 in the municipal jurisdiction.



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**Table 2.4: Categories according to Section 8 and plausible valuation approaches**

| Category (property) | Valuation method |
|---|---|
| Residential | Direct comparable |
| Industrial | Income capitalisation approach |
| Business and Commercial | Income capitalisation approach |
| Agricultural | Direct comparable and replacement; cost less depreciation |
| Mining | Direct comparable and replacement; cost less depreciation |
| State-owned | Depending on the actual use |
| Public service infrastructure | Direct comparable and replacement; cost less depreciation |
| Public benefit organisation | Depending on the actual use |
| Multiple-use properties | Depending on the actual use |
| Any other category determined by the minister | Depending on the actual use |

Source: Adopted from the South African Government 2004

The *Municipal Property Rates Act 2004* lacks a valuation definition; however, summarises the considerations. Section 45(1) affirms that properties must be valued under standard valuation practices, methods, and standards. The International Valuations Standards Council (2013:17) identifies valuation approaches as three methods based on economic principles and price equilibrium. These involve anticipating benefits and substitution.

These methods include the market, income, and cost approaches (International Valuation Standards Council, 2013:18-19). Based on several South African court cases, the methods have conformed to be the direct comparable method (market approach), income capitalisation method, land residual techniques, and the depreciated replacement cost valuation methods (Jonker, 2015:72). Table 2.4 specifies these valuation approaches, identifying each category and the most appropriate.

*Should the valuer conduct one-on-one valuations? Should all property be inspected?* The valuations include all properties within the municipal boundary; therefore, this is a relevant exercise.



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In identifying the valuation approaches, Section 45(2) indicates that physical inspection is optional. It stipulates that any comparative, analytical system or technique may be applied. These include aerial photography and Computer-assisted Mass Appraisal systems or techniques. This section informs a more mass valuation approach, saving time when conducted correctly. It evaluates aerial photography to identify areas if correctly interpreted. The *Municipal Property Rates Act 2004* supports an application, such as a geographical information system.

According to Section 45(3) (*Municipal Property Rates Act 2004*), with limited market information in determining a market value regarding the three approaches, a value might be applied through a mass valuation system or technique; however, this must be approved by the municipality after a property consultation with the municipal valuer, determining if the circumstances allow for such an application.

The category and valuation to be included in the valuation are intertwined and can be considered simultaneously; the actual use should determine the category and the valuation method. Specific valuation methods should be applied, including a Computer-assisted Mass Appraisal method or technique.

According to Section 45 of the *Municipal Property Rates Act 2004*, the understanding that one-on-one valuation is timeous and almost impossible when conducting a valuation roll, mass appraisal systems and techniques should be clarified. The following questions are addressed: *What is a mass appraisal? What forms the base of a mass appraisal? How can this system be applied? What data should be used in such a system?* The subsequent section responds to these questions.

### *2.5.5 Mass valuation/appraisal methods or techniques*

*What is a mass appraisal?* Mass appraisal intends to develop appraisal models applied to a group of properties in a cadastral. This was to produce value estimates for all properties in the group or an area. These appraisal models can be verbal, algebraic statements, or they may be elaborate systems of mathematical equations that can handle quantities of data that could not be analysed in another database.



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The first step of mass appraisal is a specification. The specification is theoretical or speculative, determining the valuation approach to be followed (Gloudemans & Almy, 2011:5). This is conducted based on the property characteristics with a considerable influence on property values.

According to the IAAO (2013) and the Royal Institute of Charted Surveyors (Guerin, 2019), mass appraisal skills can only be obtained by mastering single-property appraisal skills. Single-property appraisal has limited use in the mass appraisal application, applied to specialised properties only. It is difficult to value with modelling or is too few to develop a model for. Modelling finds its origin in a single-property valuation that forms the base of the information and application of such a module. Gloudemans and Almy (2011) confirm the aforementioned, indicating that single-property appraisal can defend assessed values on appeal. This single-property valuation should also apply to specialised property valuation. These valuation approaches require market research.

Regarding the definition of a mass valuation approach, the foundation of the model development relies on similar single one-on-one property valuation methods. A mass valuation approach, therefore, conforms to Section 45 of the *Municipal Property Rates Act 2004*, indicating valuation standards to be applied. A model cannot value all properties. It should be approached in a single-property valuation situation.

The common denominator between mass appraisal and single-proper valuation is that they present economic analysis exercises. “It is a representation of logical, systematic methods for collecting, analysing and processing data to produce intelligent, well-reasoned value estimates” (Gloudemans & Almy, 2011:6). In understanding the base and the drive of mass valuation, the history or evolution of this approach is critical for the data and the data sources.

The historic background of mass appraisal dates to the 16th century, when King Gustav Wasaf from Sweden created the first property register used for property taxation (Milevski, 2009). Although some research demonstrates that the first mass application dates to 1896, the author explains that the first technical assessment



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system was adopted in 1934; IAAO conducted the first publication on mass valuation systems in 1937. During this period, ample development was directed. In the 1950s, introducing computers transformed the mass appraisal industry. During this period to the mid-1970s, numerous manuals were written; this mass appraisal was also put into operational use.

Milevski (2009) indicates that Computer-assisted Mass Appraisal was introduced in the mid-1970s when the systems advanced technologically. The system became more cost-effective. It was also in this era that multiple regression analysis was first introduced to mass appraisal. During this period up to 1990, the Computer-assisted Mass Appraisal valuation evolved with the expansion of computers and in-house computer applications. During the later period, networks allowed for linking among databases, tax systems, and other database systems. The Internet and the World Wide Web allowed interlinking between Computer-assisted Mass Appraisal, geographical information, and tax administration systems.

Computer-assisted Mass Appraisal was later called automated valuation models because of its application in various spheres of property valuation (Gloudemans & Almy, 2011:18). Automated valuation models are similar to Computer-assisted Mass Appraisal models; the main difference is the flexibility of specifying a date that can be current. They indicate that automated valuation models in the private sector can be split into several main categories:

- Price indexing models: updates the last sales price by employing a repeat-sales method
- Hedonic models: involve multiple regression analysis neural work models
- Tax assessed value models: this is an assessed value, factored for change in market condition from the valuation date
- Hybrid models: these are a blend of various models

Issues of automated valuation models include the following (Gloudemans & Almy, 2011:18-19):



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- The hit rate (the percentage of properties that an automated valuation models can value in an area depends on the homogeneous nature)
- Accuracy (the measured percentage of value estimates that fall within 10% of the selling price)
- The technology might threaten professional acceptance by conventional valuers

Computer-assisted Mass Appraisal models and automated valuation models hold advantages and disadvantages; however, any application in property valuations has flaws—'garbage in, garbage out'. Considering mass appraisal, the following question: *How can this system be applied?*

The property tax system is explained in three steps (Dornfest, Kenyon, & Almy, 2008:35):

> *It identifies and links taxable subjects (taxpayers) and objects taxable property) [therefore, identifying ratepayer and identify rateable properties].*
>
> *It produces tax assessments [determining a value on property based on the specific method].*
>
> *It collects taxes.*

It is confirmed that a geographical information system would be crucial with Computer-assisted Mass Appraisal and automated valuation models (Milevski, 2009:12). Geographical information systems were applied in the 1990s; such a system is being used to combine property registers and keep all needed information in one system. Gloudemans and Almy (2011) explain that the required information includes a fiscal cadastre (all properties from the record system) and the valuation system. This will form part of the assessment component. The system also demonstrates who needs to be billed and where the billing must be sent. This is similar to what the *Municipal Property Rates Act 2004* dictates—referring to a property register and previous valuation rolls; however, an element not indicated in the *Municipal Property Rates Act 2004* is a fiscal cadastre. In identifying what forms part of the mass valuation process, some note that data and data maintenance is the main foundation of the system, determining the accuracy of the model and valuations.



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### *2.5.6 Data for mass valuation*

Considering a computer-based analysis, data accuracy and consistency are crucial in determining the outcome and correctness. The consequent sections, Market data, Property characteristic data, Spatial data, and Legal and administrative data, from the main data applied in a mass valuation system (Gloudemans & Almy, 2011:91 -94):

#### 2.5.6.1 Market data

The data comprise sales, income, expenses, and costs, forming the valuation foundation depending on the method applied. The model accuracy will, therefore, be implicated if data are erroneously collected.

#### 2.5.6.2 Property characteristic data

The data comprise specific property information, such as building, land, information, and location. The building component can include the building size, use, quality and condition, age, design, amenities, and other structures. A date is not always available in the South African market because of deficient record-keeping. The land data will comprise the land size, utilities' shape, and additional site improvements. The location data includes the market area, neighbourhood, area amenities, external nuisances, and access—the last two can be identified physically or spatially.

#### 2.5.6.3 Spatial data

The spatial data comprise digital and hard-copy maps—mostly used to determine objections' geographical relationships and additional affecting features. These attributes include political boundaries, market areas, neighbourhoods, roads, rivers, lakes, and fabricated features.

#### 2.5.6.4 Legal and administrative data

Legal and administrative data include the legal description, property owner name, address, assessment status, allowable exemption, prior values, and appeal history.



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These data are not part of the valuation process but are used to notify the owner and generate bills. The aforementioned data should be considered in a mass appraisal—linked to the *Municipal Property Rates Act 2004*.

Considering the legal data following Section 48(2), market data as the foundation of valuation determination links to Section 46(1)—market value to be applied. The property characteristic data will determine the property information, such as the use and the sizes of improvements—corresponding to Section 8(2), focusing on the property category and the valuation method. Section 45(2) also refers to the spatial data where aerial photography may be used. The referral to spatial information and the integrated use in mass valuation applications are regarded with limited importance considering the *Municipal Property Rates Act 2004.* The Act refers to mass valuation systems, which might include a geographical information system forming part of the process.

Property valuation can be observed as science, where location is crucial in valuing a property. The spatial location is vital to property data. Regarding the deeds records and record-keeping information, the subsequent section essentially defines property registers, elaborating on register maintenance, and referring to legislation. The focus is on the Surveyor-General, dictating a geographical information system and Surveyor-General data capturing. This section informs on the Surveyor-General data significance in developing a property register. The chapter provides insight into property registers maintained by the Surveyor-General.

The reader should indicate spatial knowledge/data and how the valuer can employ the data when compiling a property register. A correlation is depicted on differences between the two property registers and how this might affect the municipal budgets. A geographical information system and its function must be apprehended in the mass valuation sphere. Insight is provided on how his discipline can help with the valuation process.



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## 2.6 Cadastral information and geographical information system

Considering the *Municipal Property Rates Act 2004* and the broad explanation of Computer-assisted Mass Appraisal / automated valuation models, the focus is on the data employed to determine valuations. Considering the data obtained from the Chief Registrar of Deeds would be in text or attribute in a file with no indication of the location or spatial reference, except for the physical address included in the data, as observed from the *Deeds Registries Act 1937*. Computer-assisted Mass Appraisal and automated valuation models rely on cadastral information and a geographical information system—the importance of the specific location and other influences that might affect the property value as observed from the mass valuation analysis in Section 2.4.5 of the study. This applies to properties within the jurisdiction of the municipal borders.

When defining a concept regarding a mass appraisal, the legal concept should be considered, concluding with the practical section. The succeeding section focuses on the definition of cadastral information and the law in South Africa. Geographical information system use and definition are discussed.

### *2.6.1 Cadastral information*

Considering the American and European descriptions of important data, they refer to a juridical cadastre or a fiscal cadastre. A cadastre can be defined as an official record of landowners and the amount and value of the land they own, used for calculating the tax owned (*Cambridge Dictionary*, 2021). Regarding the definition, a cadastre is only a list of property records that could be similar to a property register. The difference between a juridical cadastre or a fiscal cadastre is imperative.

“A juridical cadastre is an official record of land parcels and their attributes, including boundaries and tenure for legal purposes” (Whittal & Barry, 2014). The author defines “fiscal cadastre as an official record of values of land parcels and their improvements for fiscal reasons—often called the valuation roll”. The function of a fiscal cadastre forms the property taxation foundation, critical for service delivery. A



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short historical overview of the origin of the cadastre below might inform the spatial part of the term.

Administrative measures for efficient collection of tax date to 4000BC with maps engraved on tablets (Blachut, 1975). The Romans were known for their administrative talent and efficiency. They introduced the land register in their territories, assuring adequate tax collection. The Egyptians further refined this land records system, offering some protection to the land user. This, therefore, was the start of the fiscal (taxation) and juridical (description and owner) cadastre (Blachut, 1975). In this era, the Egyptians tied permanent points on the ground to properties—not only by property descriptions. Blachut (1975) confirms recognition of this process throughout history, presenting examples of mapping and surveying. The term cadastre was coined in 1807 when a law was passed in France, setting the foundation for the Napoleonic Cadastre, comprising 1444 articles. Blachut (1975) lists the most prominent features of the Napoleon Cadastre:

- Introducing the land parcels as the basic land unit on which the cadastral system is built up
- “Precise and uniform surveying, mapping, and valuation of the properties country-wide, constituted the operational principle of the Napoleonic Cadastre.” “In the registers, the size, nature, value, and the name of the owners of properties were recorded”
- This uniform system was to cover the whole empire
- Public use of the survey records and maps.

Considering the aforementioned, a clear reference can be made to the spatial part of a cadastre and its geographical importance. In geographical terms, the “cadastre of a country is its register of property titles, usually managed by government agencies” (Intergovernmental Committee on Surveying and Mapping, 2021). Information accurately describes the location of a parcel of land, including the boundary lines, legal description, and ownership. It is, therefore, concluded that a cadastre is a legal document that could display the owner, but mostly focuses on the boundaries and the specific geographical location of the property.



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The Chief Surveyor-General is the governing body legally responsible for maintaining cadastral information in South Africa. Understanding the functions of the Chief Surveyor-General and the governing Act on surveying is crucial—the magnitude of this is presented in the *Deeds Registries Act 1937* where the Act refers to the Surveyor-General data.

This section presents a rationale for the two Acts and their interlinking, influencing the property register. Detailed knowledge of the Chief Surveyor-General functions will form a foundation for perceiving electronic formats, such as diagrams (cadastral plan) and general plans (cadastral map).

### *2.6.2 Chief Surveyor-General and data*

Insight into applying a specific government body is advised when evaluating its functions and the legislation governing the entity. As aforementioned, the Chief Surveyor-General focuses on the land parcel of property registration in South Africa. Cadastral surveying is the branch of surveying concerned with the survey and demarcation of land, defining land parcels for registration in a land registry (Chief Surveyor-General, 1998). Professional land surveyors can exclusively undertake cadastral surveying under the *land and property identifiers 1997 (Act 8, 1997).*

*What are the functions of the Chief Surveyor-General?* According to Section 3 of the *land and property identifiers 1997 (Act 8, 1997)*, the Chief Surveyor-General will be in charge of cadastral survey and land information services in the Republic of South Africa and, subject to the Act, shall –

> *(a) promote and control all matters connected with those surveys and services;*
>
> *(b) conduct such cadastral survey-related research as required;*
>
> *(c) take charge of and preserve the records of all surveys and operations which do not form part of the record of an office of a Surveyor-General and which were conducted before the commencement date of this Act;*
>
> *(d) prepare, compile and amend such maps and other documents as required;*



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*(e) supervise and control the survey and diagrammatic representation of land purposes of registration in the deeds registry; and*

*(f) regulate the procedure in each Surveyor-General's office and determine how the Act shall be conducted.*

*(2) Any land surveyor employed in the office of the Chief Surveyor-General may if authorised thereto by the Chief Surveyor-General, perform any specific act or task which may be performed concerning this Act or any other law by the Chief Surveyor-General.*

This section identifies functions related to all property boundaries. The Chief Surveyor-General is the higher-ranking body for property location and mapping. This governmental body is as crucial as the Chief Registrar of Deeds regarding properties and registers. The focus is on Sections 3(b) and 3(d), where the Chief Surveyor-General could discern cadastral surveys. The Chief Surveyor-General should, therefore, survey any land as requested if registered with the DO (or not).

Following the explanation of the Chief Surveyor-General functions, the Surveyor-General powers and duties are analysed. The focus is on the actual duties that should be performed to ensure a legal description and location are allocated against each property in a land parcel with boundaries. Section 6 of the *land and property identifiers 1997 (Act 8, 1997)* explains the duties as follows:

*(a) take charge of and preserve the records pertaining to surveys of land which were, before the commencement of this Act, preserved as records in the Surveyor-Generals office and which, after the commencement, become records of that office;*

*(b) before any registration is affected in the deeds registry, examine and approve or provisionally approve all general plans and diagrams prepared under this Act and, when applicable, are under any statutory consent in so far as the layout is concerned*

*(c) on the diagram of any piece of land –*

*(i) define the geometrical figure representing any portion of that land, transferring which has been registered in a deeds registry, and deduct the numerical extent of that portion;*



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*(ii) define the geometrical figure representing any portion thereof for which a certificate of township title or registered title has been issued under the Deeds Registries Act, 1937 (Act 47 of 1937), and deduct the numerical extent of that portion; and*

*(iii) define the geometrical figure and make the endorsements regarding any servitude or lease over that land surveyed in term of this Act and registered in a deeds registry;*

*(d) cancel or amend under any law any general plan or diagram,*

*(e) prepare, certify and issue, as the request of any person and on payment by that person of the prescribed fees, copies of diagrams, general plans and other documents filed in his or her office and available to the public, and copies of general plans and diagram, registered in a deeds registry in the province concerned,*

*(f) compile and amend such cadastral plans as required.*

The duties of a Surveyor-General are similar to the functions deeds registrar; however, Section 3(c) is crucial in this Act. All properties in the deeds register must be surveyed and kept up to date regarding sizes after subdivisions and consolidations. Some unregistered/future properties, such as townships, should also be surveyed for future registration.

The Chief Registrar of Deeds and the Chief Surveyor-General should collaborate closely, as the process cannot continue without approval from the other. The information obtained from the Chief Surveyor-General is as important in developing a valuation roll and a property register as the deeds information. It might be insightful and a first step in developing an accurate property register when the Chief Surveyor-General and the Chief Registrar of Deeds data are compared. *How can this data be confirmed and approved?* Section 16 of the Act dictates that a diagram or general plan must be prepared and signed by the land surveyor.

Section 17, the land and property identifiers 1997 stipulates that the Surveyor-General should approve no diagram of any surveyed land registered in a deeds registry unless a survey is conducted on the total property. A title deed must be created, or the old deed must be endorsed. All properties registered in the DO



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should, therefore, have a diagram of the specific property. The linking of the two data sets will assist in identifying differences between the two offices; however, the focus should be on Sections 16 and 17, as Section 19 of the same Act allows for properties with no title deeds to be surveyed and recorded. This allows for unregistered property to be included in the Chief Surveyor-General register, which can confuse identifying properties that should be actively registered with the DO. It, therefore, encourages more reasons for linking the two data sets.

The question emerging from the aforementioned:

*What information can be obtained from the Chief Surveyor-General data, and how could this be helpful in valuing the property?*

The *land and property identifiers* do not dictate the data that should be included in the diagrams; however, it stipulates that all data will be prepared under the Act but with prescribed limits of constancy, according to Section 15. The diagram is the registerable document prepared by the land surveyor (Chief Surveyor-General, 1998). The following information is essential to be displayed in the diagram:

- The unique name of the property
- Property sketch or illustration
- The boundary description listing all the corner beacons and details of curvilinear boundaries
- Corner beacons description
- A table listing the numerical data of the boundaries
- The property area
- A unique reference number

The aforementioned essential information can be obtained from the diagram, confirming the DO information. The property boundaries and layout, the exact location, and the corner descriptions are vital. Similar to a diagram, a general plan presents the same information but of multiple properties in a township extension. Before elucidating how this data can help in the valuation process, data definitions and examples must be understood.



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Most of the South African law systems are based on British colonial Acts, and similarities can be identified across countries that formed part of the British colonial, such as Australia. The Intergovernmental Committee on Surveying and Mapping (2021) explains that a cadastral map is considered the foundation of the cadastral plan (or survey plan). A registered/licensed surveyor produces this by accurately measuring and recording each property's boundaries. "This occurs when a new land parcel is created—each new survey produces a new survey plan. Because of this, each plan is static in time, representing the shape and status of the cadastre at the time of the survey."

The *land and property identifiers 1997 (Act 8 1997)* stipulates that all properties should have a diagram, or a general plan as defined in Section 1.2, before the property can be considered legally compliant under this Act. In observing the diagram (Figure 2.3), the location of a specific property is crucial. The property and location of amenities might affect the value of the property. The specific property can be allocated to the deeds register entry, allowing categorising taxing of the specific property and owner. The property size can, therefore, be confirmed by identifying the physical address.



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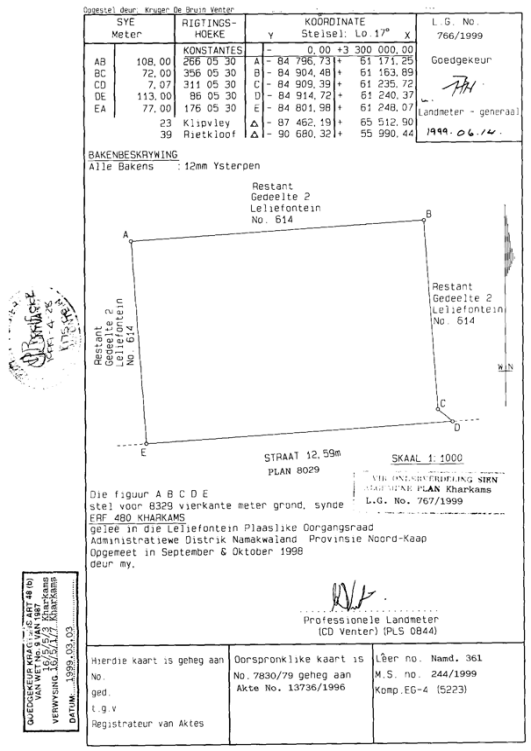


**Figure 2.3: Diagram of a surveyed single property (Chief Surveyor-General, 2021: Online)**

The diagram (Figure 2.3) signifies information about a specific property, observing the definition of a general plan.



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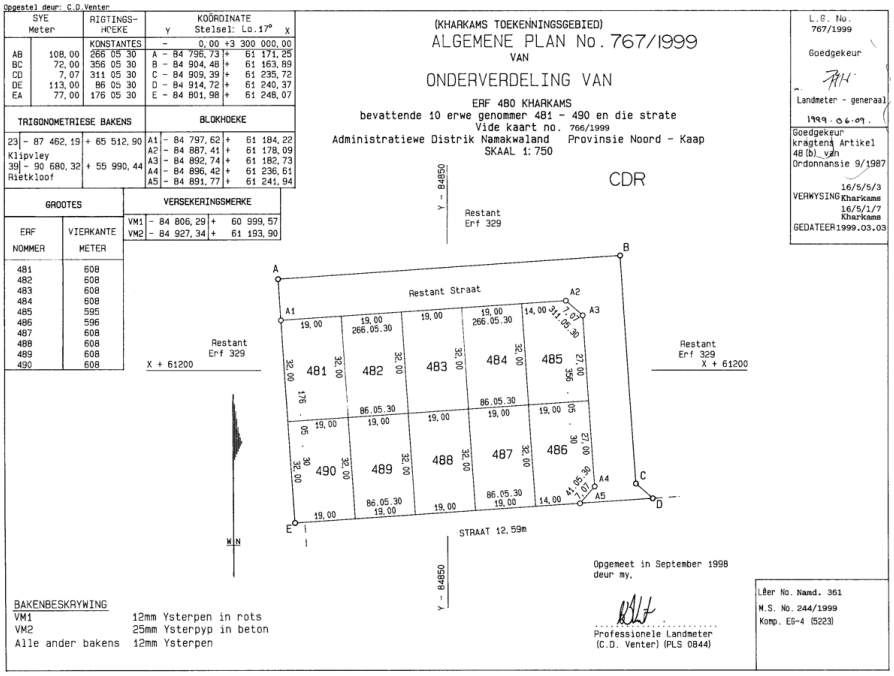


**Figure 2.4: General plan and a subdivision plan (Chief Surveyor-General, 2021: Online)**

This general plan offers information on multiple erven. Bulk information can be obtained in a search. Cadastral surveying defines the granted land. Should the owner wish to sell part of that property, the cadastral surveyor must partition such land. The Cadastral Surveyor's services are needed each time a boundary beacon is established or replaced. The Cadastral Surveyor and the conveyancer collaborate to record ownership in a public register, marking and recording the boundaries. These records ensure the owner's rights against false claims—all people know who owns what. This information can assure a more accurate property register in obtaining property taxes.

*How can these hard-copy and scanned paper maps assist in computer-based* Computer-assisted Mass Appraisal / automated valuation model*?*

As with the Computer-assisted Mass Appraisal / automated valuation models, the ready availability of computers and the need to work with large datasets are also



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available in an electronic format. The Chief Surveyor-General (1998) stipulates the functions expressed by the DO:

- Scans all approved documents document to protect the only legal copies from damaging and manual use, providing an efficient online service to the DO and the public
- Maintain a spatial database of surveyed real rights, providing a powerful device for the macro-planning environments
- Provide access to spatial data that can improve public service delivery by eliminating costly duplication in capturing and maintaining spatial data

With these added functions—not stipulated in the Act—a conclusion is that electronic data are accessible to the public. The Chief Surveyor-General refers to spatial data and electronic information simultaneously. These terms are omitted in the Act and other surveying research. Safe Software (2021) explains that “spatial data are also known as geospatial data—a term used to describe any data containing information about a specific location on the earth's surface”. Spatial data comprises information about the location of a property—it comes in various formats, displaying diverse information about a specific location. The most common way spatial data are analysed and processed is by A geographical information system. These programs or geographical information systems help users to display and understand spatial data (Safe Software, 2021). Management, manipulation and customisation, analysis, and creation of visual displays assist users, typically employing multiple spatial datasets, comparing or combining them. This data should form part of the Computer-assisted Mass Appraisal / automated valuation models —obtained from the surveying governing body directly.

Understanding how property data are obtained, regulated, and managed in South Africa leads to conclusions. If two data sets from the highest-ranking governmental bodies are compared, completeness can be achieved; however, this must be assisted by programs, to manipulate, and analyse large data. Accordingly, Computer-assisted Mass Appraisal and automated valuation models employ a geographical information system as a base. It is, therefore, important for this study



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to understand a geographical information system and evaluate how it supports property valuation, specifically municipal valuations, and the *Municipal Property Rates Act 2004*.

### *2.6.3 What is a geographical information system?*

A geographical information system should respond to regular spatial questions (Heywood et al., 2006:3). Spatial data can answer these questions. These include information regarding nearby filling stations, nearby doctors or pharmacies, directions to a place, and the travelling time to a meeting. These specific queries can only be responded to with a spatial connection or location between one or two points. *What inquiries does a geographical information system solve about location, patterns, trends, and conditions based on property and property valuations?*

- Location: property location from schools and shopping centres that may have value influence and the location is from rivers and freeways,
- Patterns: purchase patterns and selling rates in a suburb may include crime location within a city,
- Trends: development movements of a city and the purchase decisions considered in the location,
- Conditions: transport accessibility, the location of the airport or bus terminal and warnings against loud noise pollution,
- Implications: location from the busy streets might affect residential value in purchase decisions.

If these queries receive responses, it determines more accurate value-adding or affecting features. These questions can be used in detecting and analysing trends and patterns. Defining a geographical information system is one of the most difficult parts—several definitions exist (Heywood et al., 2006:18). The authors define a geographical information system with the following three components:

A geographical information system is a computer system with software allowing access to data, manipulating, analysing, and displaying data in usable formats. A geographical information system employs spatially analysed data, allowing



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management and analysis tasks on the varied data. The definition indicates the components of a geographical information system. Goodchild (1997) provides a further summarised definition of geographical information system:

- “Geographical information is information about places on the earth's surface”
- “Geographical information technologies include global positioning systems , remote sensing, and geographical information systems”
- geographical information systems involve computer systems and software
- A geographical information system may hold diverse manifestations
- “A geographical information system is exploited for a vast variety of applications”
- “Geographical information science is the science behind geographical information system technology”

These two definitions identify a geographical information system as a computer-based system, focusing on representing specific features on the land surface at a specific location of a feature. In an uncomplicated explanation, a geographical information system can help the valuer identify the location of a property. It can also help to identify certain features of that property; however, not all data can be true. The data used should emanate a reliable resource. Concerning South Africa, the Chief Surveyor-General should hold the most accurate data. Considering the definitions and the location aspect offered by the geographical information system—*how can actual data be allocated to a specific property? What data can be used and how can that data be represented and used in* Computer-assisted Mass Appraisal *valuation?*

To answer the aforementioned questions, the geographical information system applications must be observed, followed by the data and how it could benefit a mass valuation application.

### *2.6.4 Geographical information system applications*

*What are the areas of geographical information system application?* Goodchild (1997) explains five main sectors where the geographical information system is crucial. These applications include utility companies, the transport industry, the



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agricultural industry, forestry, and most important property. Considering the applications, all would have a significant function in property valuation. The study explains all applications in depth; however, it focuses on the property section.

#### 2.6.4.1 Property

According to Goodchild (1997), no specific geographical information system application exists in the property industry; however, the application relates to property, such as farming, forests, and utilities—on a specific property owned by a person, a legal entity, or a government. Further research established that the property industry employs *parcel information*. Parcel information can be defined as all the documents, maps, and information that depict rights and interests in land (Von Meyer, 2004:5). This data includes information, such as owner, seller, legal description of the extent of the land, any included or excluded rights and uses, restrictive covenants in subdivisions, and describe the setbacks and sizes of homes or other structures. The data also includes the land value, improvements, address, and property tax amount.

Before discussing the land parcel model, according to the explanation by Von Meyer, it would be important to consider the data sets that can be obtained in the geographical information system and what the plausible relevance would be in the valuation process. After the data sets are scrutinised, the explanation of this property data model must be assumed to know how the data can be interlinked.

### *2.6.5 geographical information system data types*

A geographical information system uses spatial data. Spatial data or geospatial data comprise specific information about a location on the earth's surface. geographical information system data present one of the most important data sets in the display of specific features established on the earth's surface (Flowerdew & Martin, 2005:275). This data should be obtained from reliable sources, producing accurate and trustworthy data. Data can be obtained from governmental bodies at a low-cost or for free. Most geographical information system data can be collected using



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various methods, such as global positioning system devices, digitising hard-copy maps, and analysing aerial photographs, to obtain information on an area.

A geographical information system can include census, statistical, topographical, boundary, place information, and land use data (Flowerdew & Martin, 2005). These data sets can display vast amounts of information that can be used when developing property registers and valuation rolls. Flowerdew and Martin (2005) further remark that, when using these geographical data, all information can be stored about a specific area or location, displaying any data captured to that specific point. This data may indicate future information, past information, or current information. Data may comprise anything from the rainfall in an area to the water or electricity consumption per erf. Considering the diverse information from these data sets, the user should know geographical information system data drawbacks and restrictions.

Common geographical information system data concerns involve data quality, accuracy, and source information (Flowerdew & Martin, 2005:279). This can affect the quality of the output data. These obstacles should be considered, according to the authors:

- Data age
- Diverse object definitions
- Source document quality
- Data coverage
- Location recording errors
- Attribute recording errors

Considering the aforementioned, the geographical information system is the most important data used. A geographical information system can represent a visual, specific location with additional relevant information. According to Flowerdew and Martin (2005), a geographical information system can display large volumes of data spatially and realistically. Understanding the data involves how it can be displayed and used with a deed property register.



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Maps have at least two dimensions of the earth's surface, based on latitude and longitude (Clarke, 2003:72). A geographical information system comprises three data types, indicating attribute (2.6.5.1), vector 2.6.5.2), and raster data 2.6.5.3).

#### 2.6.5.1 Attribute data

Attribute data are information appended in tabular format to spatial features (Dempsey, 2013). Attributed data may present any location information, including dates, names, characteristics, or conditions. This definition is confirmed by Clarke (2003), explaining that attributed data reflects a measurement or a value of a feature, used as label categories, usually in a table format. This is the most basic but the most informative data in a geographical information system. Table 2.5 presents an extract of how attribute data can be displayed through geographical information system software. Table 2.5 represents the property description, the location in X and Y coordinates, and the property size. Other information not displayed includes the date of acquisition and the owner and the date the information was captured. The data in Table 2.5 is an extract of how the Chief Surveyor-General can present these data, with some slight edits for a better display.



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**Table 2.5: Attribute data table extract**

| FID | SGKEY | TOWNSHIP | PROPDESC | REM | PTNO | PROPNO | VALUATIONT | AREA | PERIMETER | HECTARES | ACTIVE | COMMENTS | X_COORD | Y_COORD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | T0IR00000000006400188 | WITKOPPIE 64-IR | 188/64-IR | | 188 | 64 | | 132137 | 1559.618 | 13.214 | yes inv | | 77194.02430 - | 2894356.77925 - |
| 1 | T0IR00000000006400224 | WITKOPPIE 64-IR | 224/64-IR | | 224 | 64 | | 1738 | 168.621 | 0.174 | | | 77683.67465 - | 2891916.01705 - |
| 2 | T0IR00380000017300000 | BARTLETT AH EXT 3 | 173 | | 0 | 173 | | 16274 | 514.532 | 1.627 | yes inv | | 75256.09645 - | 2896065.67015 - |
| 3 | T0IR00000000006400189 | IR | | | 189 | 64 | | 175452 | 2639.624 | 17.545 | yes inv | | 74602.04010 - | 2894531.18625 - |
| 4 | T0IR00380000015700000 | BARTLETT AH EXT 2 | 157 | | 0 | 157 | | 1754 | 238.966 | 0.175 | yes inv | | 75723.43785 - | 2896231.67765 - |
| 5 | T0IR03410000058800000 | JET PARK | | | 0 | 588 | | 28408 | 796.05 | 2.841 | yes inv | | 77113.6152 - | 2894750.20375 - |
| 6 | T0IR00000000008300699 | KLIPFONTEIN 83-IR | 699/83-IR | | 699 | 83 | | 16704 | 661.302 | 1.67 | yes inv | | 75043.0098 - | 2895691.78250 - |
| 7 | T0IR00380000017500000 | BARTLETT AH EXT 3 | 175 | | 0 | 175 | | 19451 | 579.275 | 1.945 | yes inv | | 75139.44100 - | 2895868.10130 - |
| 8 | T0IR00380000017200000 | BARTLETT AH EXT 3 | 172 | | 0 | 172 | | 24761 | 956.558 | 2.476 | yes inv | | 75395.43885 - | 2896060.22525 - |
| 9 | T0IR00000000006400125 | WITKOPPIE 64-IR | 125/64-IR | | 125 | 64 | | 61709 | 1295.28 | 6.171 | yes inv | | 77678.19605 - | 2892846.83510 - |
| 10 | T0IR00000000006400114 | WITKOPPIE 64-IR | 114/64-IR | | 114 | 64 | | 40535 | 928.772 | 4.053 | yes inv | | 77324.93265 - | 2893554.21715 - |
| 11 | T0IR00000000006400225 | WITKOPPIE 64-IR | 225/64-IR | | 225 | 64 | | 4213 | 297.777 | 0.421 | | | 77441.80950 - | 2892002.77380 - |
| 12 | T0IR00380000010000000 | BARTLETT AH EXT 2 | 100 | | 0 | 100 | | 20130 | 578.128 | 2.013 | yes inv | | 76028.58020 - | 2895549.02680 - |
| 13 | T0IR00000000006400007 | WITKOPPIE 64-IR | 7/64-IR | | 7 | 64 | SU | 1491195 | 5462.621 | 149.119 | yes inv | | 76187.25960 - | 2894794.82885 - |
| 14 | T0IR00380000017000001 | BARTLETT AH EXT 3 | 1/170 | | 1 | 170 | AG | 52241 | 1286.245 | 5.224 | yes inv | | 75434.60000 - | 2895785.53295 - |
| 15 | T0IR00000000006400257 | WITKOPPIE 64-IR | 257/64IR | | 257 | 64 | | 54437 | 1858.332 | 5.444 | yes inv | | 77562.18700 - | 2892429.00035 - |
| 16 | T0IR00000000006400197 | WITKOPPIE 64-IR | 197/64IR | | 197 | 64 | | 9403 | 1510.57 | 0.94 | | | 77262.61745 - | 2893727.84015 - |
| 17 | T0IR00000000006400258 | WITKOPPIE 64-IR | 258/64IR | | 258 | 64 | | 451926 | 3717.437 | 45.193 | yes inv | | 77236.55000 - | 2893029.73810 - |
| 18 | T0IR00000000006400253 | WITKOPPIE 64-IR | 253/64IR | | 253 | 64 | | 851106 | 3631.599 | 85.111 | yes inv | | 73830.52005 - | 2893144.43285 - |
| 19 | T0IR00000000006400260 | WITKOPPIE 64-IR | 260/64IR | | 260 | 64 | | 115861 | 1995.282 | 11.586 | yes inv | | 76205.77725 - | 2890246.69015 - |
| 20 | T0IR00380000010800000 | BARTLETT AH EXT 2 | 108 | | 0 | 108 | NR | 18687 | 553.884 | 1.869 | yes inv | | 75056.14880 - | 2895540.01250 - |
| 21 | T0IR00380000013400000 | BARTLETT AH EXT 2 | 134 | | 0 | 134 | NR | 23141 | 607.944 | 2.314 | yes inv | | 75234.57245 - | 2895693.17860 - |
| 22 | T0IR00000000006400069 | WITKOPPIE 64-IR | ERF 0069005 (SIEN 0320000 | | 69 | 64 | AG | 1267098 | 23814.165 | 1267.099 | yes inv | | 75567.33025 - | 2891507.0669 - |
| 23 | T0IR00000000006400126 | WITKOPPIE 64-IR | 126/64-IR | | 126 | 64 | | 22786 | 638.431 | 2.279 | yes inv | | 76964.37325 - | 2892265.91895 - |
| 24 | T0IR00380000010900000 | BARTLETT AH EXT 2 | 109 | | 0 | 109 | | 20244 | 573.283 | 2.024 | yes inv | | 74934.84975 - | 2895541.61695 - |

Source: Adopted from the Chief Surveyor-General (2022)



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If attribute data are unrelated to a specific area, the information would not be spatial data but a table with data linked to a spatial location—if a common denominator existed.

*How can this attribute data be displayed in geographical information system software?* This shifts the focus to two data types—Vector data and Raster data.

#### 2.6.5.2 Vector data

Vector data in the geographical information system format, comprise “points, lines, or polygons. At its simplest level, vector data comprises individual points stored as coordinate pairs, indicating a physical location in the world” (Romeijn, 2020: Online). “These points can be joined in a particular order to form lines or linked into closed areas to form polygons”. “These data are useful for storing and representing discrete boundaries, such as borders or building footprints, streets and other transport links, and location points”. Clarke (2003:99) confirms this definition by indicating that vector data present a basic building block representing geographic features. Figure 2. indicates the three types of vector data, explained as follows:

- Points can indicate the location of important landmarks (hotels) in an area or plausible affecting features
- Lines can indicate a network (electricity supply lines), road network, electricity network, or the location of a railway or a river
- Polygon (areas- forest/agricultural) is an area feature representing a farming area (land type), a lake, or a building footprint. The polygon is also used to find the location of an erf or a farm and to a larger extent, municipal, provincial, and country boundaries



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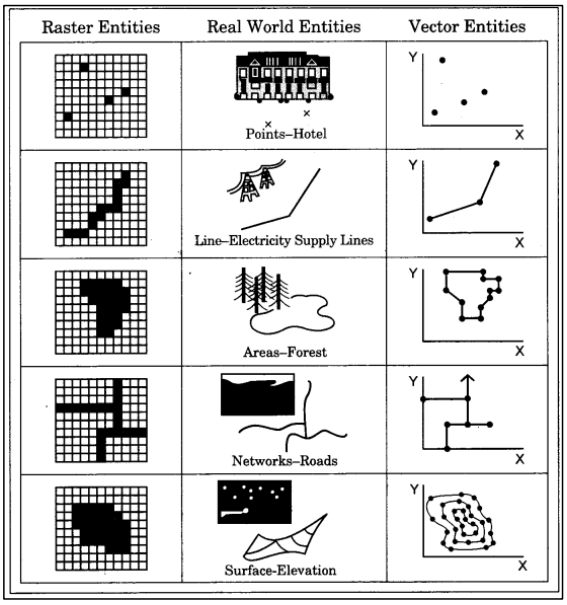


**Figure 2.5: Raster and vector spatial data (Heywood et al., 2006:78)**

### 2.6.5.3 Raster data

Raster data represents “the world as a surface divided into a regular grid array or cells—where each cell has an associated value” (Romeijn, 2020: Online). Digital photographs are “an example of a raster dataset where each cell—called a pixel, corresponds to a particular colour value”. “When transferred into a geographical information system setting, the cells in a raster grid can represent other data values, such as temperature, rainfall, or elevation”.

According to Clarke (2003), these data are represented as pixels, each standing for a value. Figure 2. presents raster data in a grid form. Similar information can be displayed on a map compared to vector data. This should also be considered a more robust way of displaying or storing data. Vector data might provide a more explicit representation of the size and feature. Raster data can also include hard-copy maps and aerial photographs. Figure 2. presents the vector and raster data in one frame. Figure 2. presents point data as the trees—the grey lines represent the streets—brown polygons represent the erf boundaries, and the aerial photograph



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represents the raster data. Each vector data has an attribute allocated to the specific point, line, or polygon, showing information, such as tree type, street name, or erf number.

**Figure 2.6: Polygons, lines, points, and raster images are separate layers integrated into one map (Olson, 2020: Online)**

Figure 2. displays geographical information system data assisting the property register and the valuation roll development. This development is from a valuation perspective and identifies property to be included in the valuation roll, ensuring completeness and correctness. The parcel data model should be observed and developed to assist in the easy displaying of urban geographical data.

### *2.6.6 Parcel data model*

The importance of parcel data was observed during a tornado disaster in the United States of America. The influence of the disaster had to be calculated (Von Meyer, 2004). This data identified the properties and families affected by the tornado. Except for identification, this data allowed hundreds of volunteers to navigate the unfamiliar area while identifying covered area locations as some landmarks that could have been lost in the disaster. *Can this data promote completeness and correctness in a valuation roll?*



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To answer the question, parcel information must be understood. Parcel information is called documents, maps, and information indicating rights and interest in land (Von Meyer, 2004). These data include the deed information, the owner, the seller, the legal description, and any rights affecting the property. These data also include information from land value, land improvements, addresses, and property tax amounts (Von Meyer, 2004).

Von Meyer (2004) explains that parcel information involves more than just evidence regarding land—it focuses on what land is used for, involving decisions pertaining to land. It should include information about value, ownership, land use, zoning, addresses, and legal descriptions. Considering the information in parcel data, the data can assist significantly in developing a valuation roll. According to Section 48(2), the information can populate the valuation roll with the needed material. The parcel data can provide five of the seven compulsory parts of the roll.

Parcel data was developed in the United States to detect settlements and define and detect ownership patterns (Von Meyer, 2004). These parcels can be observed from aerial photography; this had a function in developing geographical information system parcels; however, this was not the only reason for developing parcel data—hidden from the surface of the land parcel data is infrastructure information, such as water, electricity, and natural gas (Von Meyer, 2004). Parcel data contain critical information supporting the economy. It forms the heart of first-world countries' economies. Not only should parcel data be used in first-world economies, but also in the poorest nations. Property is owned and developed in these areas; therefore, this will help to improve the economy.

It provides records of identifying property and owners, providing the banks with a sense of the location of their security. The system assists with ownership movement or value record-keeping. Considering the South African system, the deeds register keeps a record of the owners and selling prices of the land but may lack knowledge of the location or the address of the land. The Surveyor-General must demonstrate the exact location and boundaries of the land, therefore, identifying the property. Considering the Surveyor-General's position, all land parcels should have a



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diagram, enabling geographical information system mapping. All data about the property can, therefore, be linked to a specific location, identifying value-affecting features.

Von Meyer (2004) explains that maps present a geospatial language, allowing science data to share a common language. If a map is developed properly, it may signify ample information. The author uses an example of a study of disease breakouts mapped, and a study of weather patterns mapped using two languages. When combined in a single map, it might demonstrate a picture of how weather patterns influence disease outbreaks.

With this explanation of geographical information systems and parcel data, it can be concluded that data can be used and displayed on one map to determine a specific pattern that might affect a different pattern. Property valuation involves the location of a residential suburb from the central business district, influencing the values of the property moving closer to the central business district (Ward, 2016: interview). Ward (2016) further explains this can also be compared with crime movement from the central business district to the suburbs, to identify a correlation. These variables are considered during property valuations.

The study concludes that the importance of parcel data is that the data can be used daily to determine property information. The local government can use the data to plan. The data can be disintegrated into smaller areas; a national or provincial level need not be considered as the data can be cut to the local government area and be applied in the same way, but on a micro-scale.

Geographical information system parcel data are layers of varied data, portraying pictures of a specific area. Figure 2. demonstrates how the parcel data can be layered to display various scenarios. Figure 2. displays hydro data; this data concern water movement, combined with rainfall and surface terrain to display plausible flooding areas and favourable areas for specific crops. The second schematic presents a land parcel data model displaying property data. This section displays the administrative area property, address, restriction, owners, and tax with specific service networks.



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The parcel data contain the four geographical information system data types, specific locations in points, networks for roads, electricity, and sewer as line data, provincial/municipal boundaries, erf suburb boundaries, and erf boundaries as polygon data, and aerial photography raster data. These data sets can demonstrate the features in locations of an area, affecting a specific location similar to Figure 2..

Ample data can be displayed or saved as attributes to help promote the completeness and correctness of a property master and the valuation roll. This data, on a location base, display specific affecting features to be considered in the Computer-assisted Mass Appraisal modelling process in determining the value on a mass scale. This parcel data can also help determine if the calculated values are consistent throughout the valuation roll (digital or hard-copy maps).

The geographical information system data (Chief Surveyor-General) can, therefore, be interlinked with property data (Chief Registrar of Deeds)—they can be used with each other. Both governmental entities have similar property registers (minor differences) that can develop a valuation roll. Both a geographical information system and deeds information are crucial in developing a valuation roll. Considering Computer-assisted Mass Appraisal, the valuer and geographical information system team should closely collaborate to ascertain the best outcome; however, *how can the two disciplines be reconciled to ensure the outcome accuracy further?* The subsequent section focuses on reconsolidating the two data sets and if the reconciliation will limit the influence on the municipal budgets. The focus is on the publication and guidelines provided by the government and the potential drawbacks when conducting this reconciliation.



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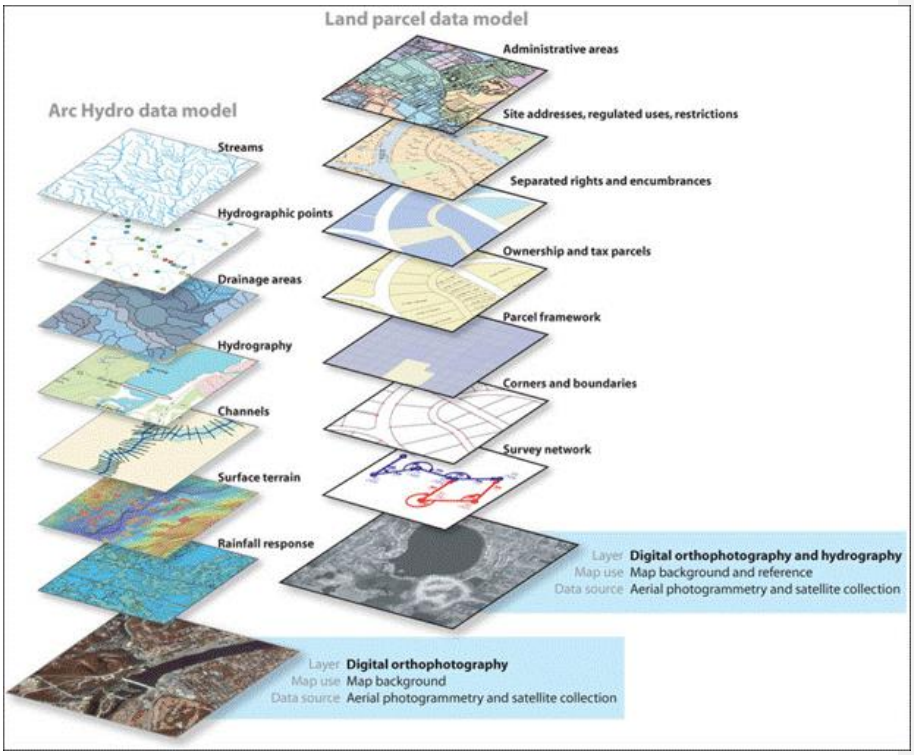


**Figure 2.7: Schematic of various types of layers in geographical information system (Olson, 2020: Online)**

## 2.7 Reconciliation of the two disciplines

Considering the Acts governing the departments, it is concluded that the various departments' data can be interlinked, using a common denominator—the property/ property description. The two main Acts, the Chief Registrar of Deeds and the Chief Surveyor-General—should be considered when reconciling the two disciplines. The Chief Surveyor-General should survey all land parcels on the earth surface within the boundaries of South Africa. The Chief Registrar of Deeds should ensure maintaining a property register for all properties in South Africa. A connection, therefore, exists between the two departments, as one demonstrates the exact boundaries and the other the information about the specific property.



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A more accurate valuation roll can be developed if the two disciplines are reconciled. The words *just* and *equitable* concern Section 229 of the Constitution, which should be enforced to impose rates and tax on a property; however, this should be just and equitably applied. All properties should, therefore, be equally included in the valuation roll. If any properties are omitted from the valuation roll, the *just* and *equitability* regarding fair practice failed. The aim should be to prepare a constitutionally correct valuation role.

This section demonstrates how reconciling the two disciplines should limit harm to the municipal budgets. Legislative matters can encourage a multidisciplinary approach to conducting a valuation roll. It may supply some guidance concerning a geographical information system and valuer teamwork while informing reconciling the two disciplines.

### *2.7.1 Government publications on reconciliation of deeds and Survey-General data*

*If the two disciplines are reconciled, will this reconciliation yield a more accurate valuation roll?* The *Municipal Finance Management Act* and writings on the Municipal Regulations on a Standard Chart of Accountants should be regarded. An understanding is required of municipality budget regulation and reporting. In determining the influence on municipal budgets with poor reconciliation between the two datasets, it should be considered how the budget is monitored and reported.

The Municipal Standard Chart of Accounts “provides a uniform and standardised financial transaction classification framework” (Hattingh, 2015). “This means that the Municipal Standard Chart of Accounts prescribes the method (the how) and format (the look) that municipalities and their entities should use to record and classify expenditures (capital and operating)”. These include “revenue, assets, liabilities, equity, policy outcomes, and legislative reporting”. The Municipal Standard Chart of Accounts is a “proudly South African” project, researched by the National Treasury. This research is based on municipal practices, reporting outcomes, policy implementation, and review.



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The Municipal Standard Chart of Accounts was implemented as part of the *Municipal Finance Management Act* on 22 April 2014, based on Section 216 of the Constitution, prescribing measures to ensure transparency and expenditure control in each governmental sphere. The aim was to standardise reporting, with each municipality reporting on its budget in its own format. The long-term observation here is to include financial and non-financial data. Sometimes the specification of information is required for coordination and reporting (Treasury, 2014). This will improve the function of local government in the broader national framework and linkage to other government functions.

The Municipal Budget and Reporting Regulations gazetted in 2009 provided "for the formalisation of the norms and standards to improve the credibility, sustainability, transparency, and reliability of municipal budgets" (Treasury, 2014). The prescribed budget formats supply the framework for identifying the categories of municipal financial and non-financial information in developing municipal budgets.

The main objective is to align budget information with that captured when implementing the budget. The Municipal Standard Chart of Accounts is, therefore, promoting the interlinking of data throughout the municipality to determine the budget. This will help in reporting on the budget regarding this research, specifying the revenue obtained from property rates and taxes, forming 17% to 19% of the total income of local government. Emphasis on the importance of an exact valuation roll should again be stipulated. *How will this interlinking be possible?*

The main precept of the Municipal Standard Chart of Accounts is requiring a municipality to employ adequate information technology and infrastructure systems to process the prescribed system solutions (Treasury, 2014). "Information technology is defined as the science and activity of using computers and other electronic equipment to store and send information" (Cambridge Dictionary, 2021). Considering this aim of the Municipal Standard Chart of Accounts, data linkage should be conducted with various computer systems, interlinking with a unique identifier code.



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Considering the data sets that should develop a property register, most are available in an electronic format. Such data can be linked to a registered property according to the Chief Registrar of Deeds. Intern, this property data can be linked to a specific location through the Chief Surveyor-General data. The common link here is a specific property uniquely owned and located.

Further integration of property information may include electricity and water accounts, property rates and tax accounts, zoning information, building plans, housing departments, and property transfers. These can all be linked to a unique property. The Municipal Standard Chart of Accounts interlinking of data will assist in developing an accurate property master and valuation roll, beneficial for all departments within the local government sphere. The intercommunication between departments could yield correct reporting and accurate data. This data would also be available for reporting and query-solving while promoting economic growth within a municipality. Delays will be eliminated, affecting property clearances and valuations. This could lead to improvised development. *What are the potential benefits of data interlinking?*

The National Treasury specifies the potential benefits of added key objectives of the Municipal Standard Chart of Accounts (Treasury, 2014:5) (Table 2.6).

**Table 2.6: Municipal Standard Chart of Accounts objectives and plausible valuation roll outcome**

| Municipal Standard Chart of Accounts objective | Valuation roll benefit |
|---|---|
| Improved data quality and credibility | More accurate valuation roll |
| Achieve greater levels of standardisation | Easy integration and appropriation of a new valuer |
| “Develop uniform data set critical for the 'whole -of-government' reporting” | Integration of all local government departments to obtain information to better value determination |
| “Standardisation and alignment of the 'local government accountability cycle' by regulating not only the budget and in-year reporting formats but also the annual report and annual financial statement formats” | Interlinking with the billing system to determine the influence of a new valuation roll on the budget to demonstrate if the budget will expand or shrink on the values. Determine a more accurate reflection of the rating in rand |



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| | |
|---|---|
| "Creation of the opportunity to standardise key business processes with the consequential introduction of further consistency in the management of municipal finances" | Inter-departmental linking of data specifies to determine if the categorisation of data is correct (Town planning and valuation roll) |
| "Improve transparency, accountability, and governance through uniform recording of transactions at posting account level detail | Ensure just and equitably of the valuation roll |
| Enabling deeper data analysis and sector comparisons to improve financial performance" | Analyse inter-departmental property issues and information to better accuracy of the property master |
| "Standardisation of account classification to facilitate mobility in financial skills with local government and between local government departments and other spheres and the private sector and to enhance the ability of local government to attract and retain skilled personnel" | Application and understanding of inter-departmental processes used in local government will streamline the process and limit errors. This will also ensure skill transfer and assist in the understanding of queries on a property register or valuation roll. Future integration will become easier |

Source: Adopted from Adapted from Treasury (2014:5)

Municipalities should have information technology systems to interlink data from departments, promoting improved operations and transparent municipalities. Linking and reconciling the Surveyor-General and the deeds data would benefit the municipality. More accurate valuation rolls will be acquired, improving the budget while facilitating accurate, Municipal Standard Chart of Accounts-compliant revenue predictions.

Table 2.6 explains the objective according to the Municipal Standard Chart of Accounts writing, with the benefits provided in the adjacent column. Table 2.5 demonstrates the benefits of the interlinking of data and how this can improve the completeness and correctness of a property master and a valuation roll. Interlinking will ensure an equitability roll, as required by the Constitution. After confirming the benefits of reconciling the Chief Registrar of Deeds and Chief Surveyor-General data sets, further observations will identify the benefits. This includes how reconciling the two datasets can apply to property rates and tax systems.



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### *2.7.2 Employing a multi-discipline approach and applications*

The Chief Surveyor-General data, the physical diagram, the geographical information system data obtained from the surveyor, and the linking of the Chief Registrar of Deeds data are detailed in previous sections. Common linking would, therefore, present the property information. The United Kingdom must be observed, as South African systems are based on British principles. The information linking the two data sets is founded on the property information, such as the erf and portion number and township description.

According to Wyatt and Ralphs (2003), geographical information system in mapping, presents the starting point for several geographical information system implementations in local government and the private sector. Geographical information systems accelerated developing land and property management over the past few years. Most end-users observe a geographical information system as a mapping tool only; however, the application is more informative and analytical. The important feature that needs to be realised is that maps are indispensable devices used to understand and interpret geographical patterns and relationships between features of the built environment. Conventional 2D maps display the geographical location of a property. It seldomly presents property-related data, such as address-based data, complicating a link between the two datasets (Wyatt & Ralphs, 2003).

Linking between the map/geographical information system data and property data was realised in the UK, developing a single address database to index the land and property (Wyatt & Ralphs, 2003). The dataset was developed to adhere to the British Standard of describing the property (BS7666) to link the two datasets to form a master map property identifier. South Africa was a former British colony; therefore, the property systems are based on British systems. BS7666 defines a land parcel as a Basic Land and Property Unit (Wyatt & Ralphs, 2003).

According to BS7666, the basic land and property unit should have a unique property reference number, a spatial reference, and one or more Land and Property Identifiers. The land and property identifiers are the address of the basic land and



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property unit in a standard format, uniquely identifying the basic land and property unit concerning the street addresses (Wyatt & Ralphs, 2003:119 -122). The need for a standard format was identified in the European spatial community and was proposed by the INSPIRE (Infrastructure for Spatial Information in the European Community) directive (Bertha & Kocsis, 2011). The authors believe that, with the availability of numerous electronic data sets, a standard way of using data should be developed. They further indicate this standard should eliminate duplicates, promote accessibility, and support seamless integration.

Within the South African property registries, the Chief Surveyor-General defines the land and property identifiers—also known as the 21-digit key/land and property identifiers CODE/Surveyor-General code. This code can be generated through the unique township number, erf number, and portion number and can be considered a form of standardisation of data.

Data set reconciliation was prioritised as a challenging process. A lack of data led to mismatches—mostly in areas where limited street information was available and in the rural areas with missing property descriptions (Wyatt & Ralphs, 2003). These concerns were prioritised, involving the local government to integrate electoral and tax, planning, and street numbering data. After these data were integrated, it formed the foundation for taxation, electoral registration, and address points. Maintaining the data are of high priority because of daily movements on the properties, which must be documented and updated. With reconciliation, a larger, accurate data set can be developed, indicating all property/area information on a specific site pinpointed to an erf. Understanding how the reconciliation evolved and how this was driven by the private and governmental sectors, integration of the exact reconciliation between land registration and property registration must be observed.

According to Wyatt and Ralphs (2003), successful market economies depend on the national system for secure land ownership and property where all working and living in a country can have confidence. This is confirmed by (Mahoney et al., 2007:1) that a land registration system is crucial for economic development and promotes the openness and accessibility to information that will promote accuracy.



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They further stipulate that private land ownership promotes economic growth as it would encourage entrepreneurial instinct and that a property register of movements in the economy will drive such instinct. In some countries, land transaction exceeds the daily stock exchange. A proper land registration system would, therefore, be the foundation of economic growth. A land register will be the answer, encompassing the records of ownership and the details of the land parcel. Such a land register will help manage the property to indicate the owner's rights, the value, and the actual use of the property.

The data base will include the registration of deeds, the title (this refers to the Chief Registrar of Deeds), and the title plan (this refers to the Chief Surveyor-General). According to Wyatt and Ralphs (2003), the main concern is that data are not always standardised, limiting data linking. Bertha and Kocsis (2011) confirm that data were not standardised, as ample divergences, no harmonisation, and duplication of data exist. These issues will influence the completeness of the property register; however, this concern has been processed in South Africa. The Chief Surveyor-General and Chief Registrar of Deeds-prescribed formats require data specifications displayed in the registries of a property. This enables the data to be manipulated to create unique identifiers.

Wyatt and Ralphs (2003) indicate the importance of reconciling the two registries and of how this can benefit property spheres, including local government. The completed reconciliation of the two data sets and called the land information system.

A land information system is considered a framework that integrates using aerial/satellite data and ground-based, observed data to develop land surface models (Kumar, et al., 2006). They further indicate that a land information system is considered a valuable method for land surface researchers and other interdisciplinary users. The data can be captured, stored, manipulated, analysed, and displayed. These data are best used to manage cities, plan developments, and manage the infrastructure while displaying environmental concerns and values of properties. The authors list seven qualities of the data:

- The land information system is crucial in planning and developing devices



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- Forms the land market foundation
- Forms a spatial unit, documenting human affairs
- Supports the property tax assessment
- It can be aggregated and disaggregated
- Can be subdivided or merged according to ownership
- Collectively, the data structure is a contiguous mosaic of legal interests.

Data set links to add property data, indicating various affecting features and outcomes. Reconciling the two data sets for valuation rolls is, therefore, immensely important. The data—consistent with a typical land information system—will help with the valuation process, ensuring the accuracy of values and categorisation, while identifying the property. The question remains: *How can this reconciliation promote the accuracy of the property register?*

Wyatt and Ralphs (2003) refer to a legal cadastre (containing the ownership and other legal info) and a fiscal cadastre (containing values and property information), indicating that they should be linked to allocating an owner to a property who can pay the tax. They also denote a multipurpose cadastre, linking the aforementioned cadastres with other data, such as development controls, planning history, and selling prices. This linking can signify the property specification that should be included in a valuation roll. By linking the data, a property master would merely be generated master; however, mismatches of property data might first be resolved to develop a valuation roll.

The Chief Registrar of Deeds, therefore, may only demonstrate historic and active properties; the Chief Surveyor-General may demonstrate both historic and active properties, including future planned properties. This can cause a mismatch in the linking process, displaying property not currently registered or registered historically. It would be beneficial to analyse the data, understand the shortcomings, know the data source origin, clean, and amend the date to develop an accurate valuation roll from the property master.

Awareness of other countries, implementation of similar systems, and the outcomes could progress the accuracy of the data reconciliation (Wyatt & Ralphs, 2003).



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a) The Swedish Government combined geographical information system data and property information to determine boundary area changes. The data were applied as part of the market value established for property rates and taxes.
b) According to the literature, the Scottish land information system was developed as a 'one-stop-shop' for easy and affordable access to a wide range of property information in certain areas. As per the ScotLIS (2022) the date includes property description, owner details, securities and charges against the property and other burdens and responsibilities.
c) In Singapore, the national government combined all property information to develop a national land information system, creating ownership, and transaction history while combining land use and transport information.
d) On the North American continent, Canada and the USA, reconciled the two disciplines to promote property valuations for tax and provided comparable evidence for valuation and a clear definition boundary for neighbourhood development used in mass valuations.

Most property and land information were used to develop more accurate data sets to determine property tax. This information also benefits other government spheres simultaneously. The beneficial proceeds, therefore, sprout from the two disciplines and can limit the harm of a poor valuation roll on the budget, as sufficient data can be used in the land information system; however, drawbacks with this data must be considered while identifying plausible solutions.

### *2.7.3 Drawbacks*

Data comes with errors—the plausible errors must be identified beforehand by employing such data. Technology is used to analyse data; therefore, the data sets can be enormous. The maintenance and upkeep of the data are not conducted properly (Wyatt & Ralphs, 2003). It is challenging to retrieve historical data, because of the mediocre quality and the lack of maintenance. The data system is developed project-specific, realising the potential benefit in other spheres.



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The property sector developed sophisticated systems displaying digitised data that can be used to further accuracy. Property information concerns not only computer systems but includes issues, such as humans, information, commercial, and even legislative barriers and confidentiality constraints. Cost, time, and skill should be regarded when implementing information management systems; these are the pillars of project success.

Information management concerns surfaced during geographical information system implementation in the built environment. These effects can be categorised into three main categories with three subcategories (Wyatt & Ralphs, 2003):

- “Data quality and liability”
- “Data access”
- “Data standards”

This subsequent section summarises the three main issues while describing such categories as the three influencing subcategories.

#### 2.7.3.1 Data quality and liability

Wyatt and Ralphs (2003) identify the three subjections under “data quality and liability as measuring data quality, errors in land and property data input, analysis and display, and the liability for data integrity and misuse of data”. This section focuses on geographical information system data implementation. The author elaborated on concerns, such as uncertainty, scale, resolution, and geographical precision. These aspects affect the ways of interpretation and data use.

- Measuring data quality

Geographical information system data must be understood, considering accuracy, lineage, completeness, and Consistency. With accuracy, the spatial location and spheroid applied are crucial to identify the exact location of the data (Wyatt & Ralphs, 2003:312-314). Accuracy should not only focus on positional accuracy, but should also include attribute accuracy, temporal accuracy and logical consistency (Thapa, 1992:835). The accuracy of the collected data and the collection must be



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understood. Concerning the lineage (history) Thapa (1992) explains that it refers to the description of the source material from where the data was obtained. The data history and the reason for developing the data are vital (Wyatt & Ralphs, 2003:314-316). The source used and steps taken to digitise the data are decisive.

Regarding completeness, knowledge of the data covering a national level, a provincial level, or a local level is crucial, as all parcels must convey. Consistency focuses on data consistency, such as measurement units, property descriptions, and collection period (Wyatt & Ralphs, 2003:314-316). Thapa (1992) confirms this statement and adds that all definitions, and selection criteria, mapping rules should be presented initially. Using digitised building data obtained from aerial photography would be senseless because they are years apart. The data will, therefore, not demonstrate the correct building on a specific date. The data currency is imperative, demonstrating its market relevance. Former sales data cannot apply to determine day values but the growth of a market.

Measuring quality affects the result and should be considered cautiously. Data should be accurate, complete, consistent, and recent to determine a property master and valuation roll. The consequent section describes land and property data input errors.

- Land and property data input errors
- Land and property data input errors involve measurement factors applied. The collection errors are explained rather than the actual measurable errors (Wyatt & Ralphs, 2003:316-319). Thapa (1992:839) explains that numerous errors can exist in data and could have an enormous effect on the application of the data. This could lead to the questioning of the integrity of the valuation roll and the data used.
- A positional, attribute, and temporal errors are included here.

A positional error can be identified as a shift of, for example, two metres from the digitise building on the geographical information system versus the actual location. For attribute errors, the height indication of a building can be overstated or understated. For temporal errors, the time factor of the data is crucial, such as when



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the data were collected two months before the date, lacking some newly developed properties.

- The liability of data integrity and misuse of data

Wyatt and Ralphs (2003:321-324) explain that the amounts of data linked to the larger property data source complicate determining the liability if any problems arise in the data. It becomes difficult to understand and determine which department should fix the data with no indication as to who included the data in the master set. Only factual data by trusted professionals should be displayed.

#### 2.7.3.2 Data access

Legal issues influence geographical information, as there might be copyright issues and protection legislation, including data use and display (Wyatt & Ralphs, 2003). Data is a tradeable commodity and can have serious monetary repercussions if used without the consent of a creator. This section includes data access, data ownership, intellectual property rights, data protection, privacy, and confidentiality.

The owner should be notified when employing the data, especially if it is not publicly obtainable, such as the Chief Surveyor-General data—especially considering the geographical information system.

These data are safe regarding privacy and confidentiality of concealing personal information and if it is used for the property; however, with Chief Registrar of Deeds data, more personal information is displayed in ownership, street addresses, and postal addresses. This data should be used not to influence the rights of the persons based on local legislation, such as the *Protection of Personal Information Act* implemented in 2020. Another affecting feature is that considerable data are indicated as intellectual property by a company; if the data are to be used, proper consent must be obtained, or the data should be purchased from the owner to use it legally. Data should be used professionally and with caution not to implicate the integrity of the data and the users.



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#### 2.7.3.3 Data standards

Data standards include geographical data, the standard of describing data, and the standards for land and property data. Wyatt and Ralphs (2003:335-337) indicate that the government and the public sector have digitised substantial data. This collection and digitisation of data led to the development of land information systems. The most important part of this data capturing is regular maintenance while capturing the data in standardised formats for the integrated use of all property spheres.

Considering the standardisation of data, references to properties should be standardised to include the consistent spheroids of a geographical information system and the actual displaying of data. In the South African Surveyor-General data, a standard system WGS 84 is used to indicate the location of a specific property. Documenting data is important, using specific terminology, specific measuring units, restrictions, and prices. This will allow standardised data, understood by any property professional or nonprofessional. Wyatt and Ralphs (2003) stipulate that the main problem in linking the property to geographical information system data is caused by the lack of standardised methods. This includes the representation of rights, the actual use, the street address, the property description, and the typical legislative measures.

This section confirms that integrating data sets will promote the correctness of the data and the product; however, caution should be taken when data are employed or integrated. If incorrect data are applied during a process, it might harm the project outcome. Data should be researched and scrutinised before applying to the intended project. The conclusion is, therefore, that poor reconciliation of deeds and Surveyor-General data can harm developing a valuation roll and a property master. This harm can be caused if the data are not correctly understood, used, and scrutinised.



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## 2.8 Chapter summary and conclusion

The study established that the data sets can be interlinked and complement each other, furthering accuracy. The *Municipal Property Rates Act 2004* Section 45 indicated that physical inspection is optional, stipulating that any comparative, analytical, and other systems or techniques may be used, including aerial photography and Computer-assisted Mass Appraisal systems or techniques. This section informs a more mass valuation approach, saving time when conducted correctly. It evaluates aerial photography to identify areas if correctly interpreted.

The *Municipal Property Rates Act 2004* favours an application, such as a geographical information system. Although the *Municipal Property Rates Act 2004* does not enforce geographical information systems in inspections, this system will help identify and categorise the data according to property if no inspection occurs. Property rating will be more accurate if a geographical information system is used to obtain the permitted and actual use of a property. Geographical information systems also form the base of a Computer-assisted Mass Appraisal model, allowing for valuation accuracy according to property. Reconciling the two data sets will aid in the valuation roll accuracy and the number of properties displayed on the valuation roll. *How will this reconciliation help with these correct properties to be billed?*

Considering that the Chief Registrar of Deeds data should form the starting point of the valuation roll, it can be concluded that all properties registered or historically registered can be provided by the property register. The Chief Surveyor-General data should display all properties registered or that would be registered. A property register can be developed, displaying all property data—historic, current, and future. Reconciling two property registers should, therefore, yield a more accurate reflection of all the properties within the municipal boundaries; however, with the combined datasets, a true reflection of the actual billable properties is still impossible. A risk could arise where unregistered and inactive properties are included in the property master list. Prudent knowledge should be applied to clean



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the data sets to obtain an actual property register of all billable properties, enabling valuation roll.

This section stipulates the importance of reconciling the two disciplines. It can add value to the property register and the municipal budgets. It can be further concluded that the geographical information system and valuation team should collaborate to share property knowledge and resolve property register inconsistencies. Ample legislation exists, indicating the data types, the validity, and how it should be legally kept up to date. The main factor here is that the data can interlink and help the municipality obtain a better product. This will support the legislation.

The subsequent Section (Chapter 3) elaborates on the research design and methodology, followed by the data analysis in Chapter 4.



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# CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

## 3.1 Introduction

Systematic research is a device to ascertain progress in most science fields, forming the cornerstone of scientific progress (Marczyk et al., 2005). The authors define the researcher's purpose in responding to questions and acquiring new knowledge. “Researchers should attempt to reduce the complexity of problems, discover the relationship between seemingly unrelated events, and improve human life”.

A multidisciplinary approach was followed to explore the plausible influence of poor reconciliation between the Chief Registrar of Deeds and Chief Surveyor-General data on the municipal budget. It was, therefore, crucial to employ a qualitative and quantitative approach to obtain a better understanding of municipalities and professionals’ challenges. This was also needed to conduct a statistical analysis on the influence of the valuation function of the DO and Surveyor-General data. These two research methodologies were implemented to address these objectives:

- Analyse statistics to determine the influence of poor reconciliation on the total value of a municipal valuation roll and the influence of such roll on the municipal operational budget
- Determine how the combined use of the two disciplines can minimise the negative influence on the budget and produce a more just and equitable property master and valuation roll
- Establish drawbacks and issues experienced with implementing valuation rolls
- Determine if legislation can promote the effective and accurate implementation of rolls
- Establish if a tender process could be used with legislation to govern the outcomes and the accuracy of developing a valuation roll.



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Accomplishing the objectives would simplify the understanding of the Acts, demonstrate the correlation between two scientific disciplines, and find a systematic way to reduce financial loss created by poor craftsmanship and a lack of knowledge.

The following Section (3.2) aims to define the two methodologies applied (3.2) while summarising the study concerning the report structure (3.9), ethical consideration (3.3), research design, samples in (3.4), data collection instruments (3.5) the procedure of data collection (3.6), data analysis (3.7) and the validity of the data (3.8).

## 3.2 Research design and research methodologies

The research design allows the researcher to focus on the research methods most suitable for the study to succeed. Marczyk et al. (2005) explain that the research design should refer to the plan used to examine the question of interest and refer to diverse ways to resolve research questions.

A scientific research method should display elements, such as an empirical approach, observation, questions, hypotheses, experiments, analysis, conclusion, and replication (Marczyk et al., 2005). The scientific method is strongly based on the empirical approach. The scientific approach is evidence-based, relying on direct observation and experiments while acquiring new knowledge (Kazdin, 2003).

Marczyk et al. (2005) confirms that, in this approach, decision-making relies on direct observation and experiments. Evidence can be collected through quantitative and qualitative approaches. This study employed a combination of both research paradigms—quantitative and qualitative methodologies.

The research design and research methodologies entail qualitative and quantitative methods. The combined approach would yield statistical information regarding the influence of poor reconciliation on municipal budgets while informing on the actual drawbacks and solutions obtained by practising professionals. To realise the combined approach, an understanding of the individual research designs is



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imperative. This should include the advantages and disadvantages of the research design.

### *3.2.1 Quantitative*

Quantitative research is defined as a study using “statistical analysis to obtain findings; the key features include formal and systematic measurement and statistics” (Marczyk, et al., 2005). This research design can be divided into two types of research, indicating “descriptive research” and “inferential research”, depending on the question directed (Sukamolson, 2007). The main difference between the two types is that “descriptive research” focuses on describing a specific situation, whereas “inferential research” attempts to explain the situation; “descriptive research” is merely a description of what is revealed by present data; “inferential research” predicts or infers extensive data.

According to Sukamolson (2007), quantitative research is employed when providing an answer to ‘how many?’ (numerically); it also answers the first question of ‘what will the influence be?’ therefore, quantifying the influence in numbers.

*What is the influence of poor reconciliation on the total value of a municipal valuation roll and the influence of such a roll on the municipal operational budget?*

In response, the study analysed actual data, indicating the influence. The research design for quantitative research, therefore, focused on ‘descriptive research. Existing data were compared to obtain a result indicating the influence of poor reconciliation. This data determined the percentage of mismatched data, linking a monetary value affecting the budget. The final analysis and display of the data were conducted with assistance from the University of Pretoria Statistical Department. The data comprise public and private data, with limited private data because of an inaccurate display of actual information that could have been edited. All valuation roll and deeds information are available from municipalities; the Chief Surveyor-General offices provided the Surveyor-General data. The data represent varied valuation periods because of the phase of the *Municipal Property Rates Act's 2004* implementation. This aspect did not influence the study outcome as the focus was



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not on proving incorrect valuations but on specific properties' inclusion in a valuation roll. The geographical information system data present the same date and time close to the roll date.

Sukamolson (2007) explains that quantitative research should not be applied to explore a problem in depth. In developing a hypothesis/theory, it should not be used in complex studies. It cannot indicate the meaning of particular events and circumstances. The qualitative method was applied in this study to enable responses to the research questions.

### *3.2.2 Qualitative*

Qualitative research can be defined as a study that does not quantify its "results through statistical summary or analysis; typically, interviews and observations are used without a formal measurement" (Marczyk et al., 2005). When considering the differences between qualitative and quantitative research, Sukamolson (2007) explains that qualitative research allows for a more in-depth study of the phenomenon; it allows the researcher to develop a theory or hypothesis; it allows for unexpected variables to emerge. This method allows the researcher to investigate the meaning of a particular event or circumstance.

Considering the three remaining questions focusing on the importance of data application and combination: *should a multidisciplinary approach be considered, what was the success of such an approach, and how could mistakes be limited by implementing legislation?* The best approach indicated a qualitative research design.

Professionals in the field could answer these questions. They informed more on the problems experienced and how legislative measures were applied to improve the quality of a valuation roll. The questionnaire demonstrates 23 questions that could be divided into three sections. The first section focused on the deeds data. The second question focused on geographical information system data. Legislative matters and a combined method approach were the focus of the final question. The



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questionnaire aimed to inform on the drawbacks and plausible solutions, providing a general understanding of the roles of the two registrars.

Two research approaches demonstrate the importance of a combined approach. The study's main aim was to understand municipal budgets and to formulate plausible causes and solutions for this challenge. The combined approach of sampling and data collection are explained to understand the sample size and how it was applied. It also indicates how the data were collected; however, considering the sensitivity of the study, ethical considerations should be addressed before the discussion of sample sizes and data collection.

## 3.3 Ethical consideration

Ethical consideration is one of the essential elements in scientific research attributable to its implication for the participants and the organisational data. Several organisations, such as the Committee on Publication Ethics, promote ethics in research studies, agreeing that ethics should be an integral aspect of the research. Ethics should, therefore, remain at the forefront of the study (Enago Academy, 2020). Bell, Bryman, and Harley (2019) stipulate these 10 crucial points related to ethics in research:

- Research participants should never be subjected to harm
- The dignity of research participants should always be prioritised
- The participants should give full consent before the study
- The privacy of research participants should be protected
- Confidentiality of the research data should be ensured
- All participants, individual or organisational, should be anatomy
- Dishonesty and overemphasis on the study's objectives must be avoided
- Any affiliations and conflicts of interest should be declared
- All research communication should be conducted with honesty and transparency
- Misleading information and representing primary data findings in a biased way must be avoided



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These items present the foundation of how the research was conducted. The research focused on governmental institutions where all data should be transparent and available to the public; however, sensitivity regarding individuals and stakeholders was observed as a priority. The research was based on qualitative and quantitative methods; therefore, participant identities were withheld.

The study intention was disclosed during personal interviews—confidentiality agreements between all parties. The participants remained anonymous because of their employment in the government and the private sector. The valuation profession is a small community, and the implications for the participant are inevitable. Information obtained in this study can also lead to other companies using the findings to discredit opponents and harm their reputations.

The municipalities and individuals' information and names were withheld using their data and intellectual property. This information was invisible, as it would form a direct link to private companies. The data must be displayed at a provincial rather than area-specific level. All data not publicly available were used only when consent was granted by the company supplying the data to the study. Data was used to determine the influence. The specific research data are, therefore, omitted, promoting anonymity.

The University of Pretoria provided ethical clearance. This was needed because of the multi-methodological approach in the research, including interviews and data that might be sensitive. Information sensitivity was, therefore, highly prioritised while applying ethical considerations in the study.

## 3.4 Sampling

A sample is defined as a set of actual data sources obtained from a larger population of data selected (Given, 2008). The writer explains that the first step of obtaining a sample would define the actual population that should be used and the second is the selection of the actual sample. The importance of sampling in a study is to have an effective method of research, which would otherwise be costly and time-



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consuming considering the larger populations. The cost of obtaining all the Chief Registrar of Deeds data would be costly. Comparing this to the total population of Chief Surveyor-General data would be excessively time-consuming. Obtaining information from all municipalities would be difficult. Considering this, the study identified the data population— actual professionals working in the industry and the Chief Registrar of Deeds data, Chief Surveyor-General data, and valuation roll data from the 226 local municipalities. The study sample included 23 municipalities' information and 13 interviewees.

Sampling should allow the researcher to apply the outcome of the sampling to the entire population, allowing the research to predict an outcome based on the entire population of data. The two types of sampling methodologies are probability sampling and non-probability sampling. Probability sampling requires that every member of a population will have an equal chance of being used (Given, 2008). The writer further explains that non-probability sampling is considered a common technique where the researchers use their judgement to select a sample.

It can, therefore, be concluded that the study focused merely on non-probability sampling because of the specialised nature of the research. The nature of the research was to determine a difference between the highest sources of property registrations. *If so, what influence would this have on the income at the local governmental level?*

Probability sampling yielded no results, as most of the population did not understand the subject; therefore, the study focused on a specific type of individual from which to obtain the information. The population considered for the Chief Registrar of Deeds, Chief Surveyor-General and valuation roll data were selected randomly from the population of 226 municipalities, where data would be obtainable. The sampling was conducted to have 10% of all municipalities present and represent two municipalities in each province. Data had to be obtained from various private and government institutions to prohibit common errors from one entity. The 13 interviewees were selected as the custodians of the valuation rolls used in the sample and additional experts in the municipal valuation profession.



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According to Ebeto (2017), non-probability sampling comprises six sampling designs, indicating quota, accidental, judgemental, expert, snowball, and modal instant sampling. The study focused on expert- and quota sampling. Expert sampling focuses on obtaining information from experts in specific fields; information collection focuses on the individual or a group of respondents. Expert sampling is a better way to construct individuals' observations. These people are experts in a certain area.

This study was founded on the opinion of experts employed in the direct field. This enabled an understanding while drawing a rationale of the concerns in developing a property register, understanding, and obtaining plausible solutions. The study further informs on the knowledge and understanding of how the experts separate the bodies governing the registers and how these bodies can collaborate to improve the property registers.

The statistical study aimed to conduct quota sampling. According to Ebeto (2017), this sampling allows the researchers ease of access to the sample population. The data scoring would be at the researcher's convenience. The data sample should determine the influence on municipal budgets. The study aim, therefore, was to hold data from all nine provinces, representing one municipality in each province. Privately obtained data provided by companies are not public. The data for the specific requirements were costly.

This sample provides a fair reflection of the plausible influence in municipalities when comparing data sets. Concerning sample selection, Section 3.5 observes the data collection procedures, followed by the data analysis in Section 3.7.

## 3.5 Data collection and instruments

The significance of data collection is inaccurate and systematic data collection is critical in scientific research (Abawi, 2014). Data collection allows for the collection of information about the study objectives. The research type determines the



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methods to include data review, observation, questioning, measuring, or combining these methods.

This was a desktop study employing primary- and secondary data. The data types are defined as primary data being information obtained directly by the researcher; secondary data comprise information indirectly obtained and can include published or unpublished work (Rabianski, 2003:43).

For most of the literature review, the study focused on secondary data. This included journals, Internet sources, publications, and academics. The study relied on governing statutes to find subject guidelines. When considering the data analysis, the primary data were obtained with a questionnaire; the secondary data included published valuation rolls, deeds data obtained from individual companies or governmental institutions, and Surveyor-General data obtained from the Surveyor-General offices. The latter was analysed experimentally through mathematical and statistical analysis when comparing the data sets.

The instruments used included the numerous Acts, governing local municipalities, focusing on the *Municipal Property Rates Act 2004*. The data obtained from various sources were analysed by using geographical information system software and other MS Office programs to assist with the linking of data. A four-part questionnaire, comprising 23 questions, helped identify the participants' knowledge, plausible drawbacks, and plausible solutions to limit the discrepancy in reconciliation.

## 3.6 The data collection procedure

The data collection procedure should be a systematic approach, following the flow of measurements (Bhandari, 2021). The procedure should include operationalisation, sampling, standardising procedures, and creating data management plans, explained as follows:

- Operationalisation: the abstract conceptual ideas need to become a measurable observation
- Sampling: defining a population and identifying the group providing the data



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- Standardising procedures: includes presenting the data collection standard ensuring data reliability and consistency
- Creating data management plans includes information protection and data storing.

Concerning the literature review, data were systematically obtained starting at the property rates and tax on a macro scale focusing on other continents and moving towards a more micro understating of the Southern African Development Community countries. This in-depth focus on legislation governing property rates and tax in South Africa is crucial to understand. Further research focused on applying legislation regarding property registrations and property registers in South Africa, concluding with information on a multidisciplinary approach to developing property registers.

For the qualitative research method, the goal was to develop an instrument in a set of 23 questions directed to the experts to obtain more in-depth knowledge of the drawbacks and plausible solutions when developing a valuation roll. The data are captured in a standardised form to be analysed; a rationale can be drawn from the observation. All data were obtained through electronic communication involving online meetings and telephonic interviews.

For the quantitative analysis, the data were obtained in numerous formats with the roll data, deeds data, and geographical information system data. These were analysed, and common denominators were developed before the experimental analysis. The data were in an operationalisation format, allowing measurements. The sample size was identified to include all nine provinces, with at least one municipality. Concerning data management, all are stored and safeguarded because of the study's sensitivity. The procedure design observes how the data were analysed.



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## 3.7 Data analysis

“Data analysis is defined as cleaning, transforming, and modelling data to discover information” that can be used for decision-making or predictions (Johnson, 2021). Data analysis involves extracting useful information, action, and a conclusion prediction. The study aimed to use the data to draw a rationale to identify the issues when developing a property register to produce a property valuation roll. This study followed a quantitative and qualitative data analysis approach.

Quantitative data analysis is a numbers-based approach; the data can be converted into numbers without losing meaning (Jansen & Warren, 2020). This analysis measures the difference among groups, assesses relationship variables, and evaluates a hypothesis. The quantitative data analysis, therefore, focuses on presenting the difference among three data sets, indicating the valuation roll, deeds, and geographical information system data. This should measure its influence on the municipal budgets if the data are not prepared properly. This data may also assess a hypothesis; material differences between the data sets could affect the budget.

Qualitative data analysis aims to respond to questions concerning an identity—what individuals observe about incidences (Seers, 2012). This analysis can address why something happens the way it does; however, this analysis can be overwhelming because of the copious quantities of data to be analysed. Care should be taken in a mixed-method study on the ways the data are presented.

The study aimed to analyse qualitative data to obtain a better understanding of why certain phenomena in the study field accrue and how this can be limited. Interaction with experts in the field informed how reconciliation may reduce financial influences on governmental budgets.

The combined data analysis approach proved the hypothesis while determining the problem’s extent and solving the problem statement. The validity, reliability, and replicability of the data determined the accuracy of the responses. *How did this form part of the study?*



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## 3.8 The validity of data, reliability, and replicability

The reliability and validity of data are concepts used to evaluate the quality of the research, indicating how well a method, technique, or test, measures something (Middleton, 2021). Reliability demonstrates the consistency of measurement, whereas validity measures the accuracy of a method.

*How can validity and reliability be ensured?*

Middleton (2021) explains that validity can be ensured by choosing the measures and using a suitable sampling method. The study aimed to use a sample across the nine provinces with at least one municipality. This objective depended on the availability of the data that could be obtained. The data used are governed by various legislative writings obtained from the departments. As legislation governs this conduct, the valuation rolls should reflect the situation. The interview question was standardised to assure consistency; questions arising from the interviews were proposed to the other candidates, ensuring questions are consistent.

Reliability was ensured by consistently applying the methods and standardising the research conditions (Middleton, 2021). The data used might, therefore, differ in the framework, as valuation rolls are only conducted every four to five years; the data used formed the base for that period to ensure an accurate analysis of the differences among the three data sets. Linking the 2015 valuation roll to the 2018 deeds data cannot ensure an accurate representation. A risk exists of new properties being included in the specific municipal area. The outcome could portray a skewed conclusion on the influence. They were linked using the same method throughout the experiment, relying on secondary information from the governing bodies.

Interviews focused on the consistency of the questions and responses from the experts in the field. The aim was to interview experts in diverse fields and compare the responses. The final step observed similarities in the responses to understand the drawbacks better and find solutions.



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The study's goal was to produce a reliable and valid outcome on the influence of poor reconciliation between the title deeds information and the Surveyor-General data. The justification involved producing plausible answers on how this influence can be limited.

## 3.9 Summary of methodology

This chapter provides insight into the ‘how?’, ‘what?’, and ‘why?’ of the study. The chapter informs on the study approach, setting the base for the data analysis. It explains how the data were collected, what data were collected, and why the data were collected. This section identifies a multidisciplinary approach; the study attempted to address questions not solely answered by the quantitative study. Crucial information is obtained through qualitative research, leading to a more accurate assumption of possible solutions. The combined methodology allowed for obtaining statistical information on the influence size, providing expert insight into real-world problems while suggesting solutions.

The subsequent section aims to apply the identified methodologies in responding to the questions, forming the study base. The results should be addressed according to the applied method. This should be conducted step-by-step to limit confusion while identifying the ‘dos’ and ‘don’ts in reconciling the two disciplines.



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# CHAPTER 4: DATA ANALYSIS AND DISCUSSION OF RESULTS

## 4.1 Introduction

This section aims to respond to the research questions, realising the research objectives. The analysis was conducted structurally to analyse the data and present the findings per question, applying the qualitative and quantitative methods. As stipulated in Chapter 3, the combined data analysis approach should help prove the hypothesis, determine the extent of the problem, and suggest plausible solutions to solve the problem statement. The validity, reliability, and replicability of the data determined the accuracy of the responses.

The study aimed to determine the influence of an over/understated municipal valuation roll on municipal budgets. The study focused on the correct ways of reconciling the two data sets in developing a valuation roll. Legislation could be used to ensure more accurate property registers for rating. Plausible incorporations in tender documentation and service level agreements were identified, ensuring more sustainable and accurate budget planning. The research objectives were as follows:

1. Identify the drawbacks when employing a multidisciplinary approach, causing confusion
2. Explain why there is a difference between spatial data and deeds data
3. Record the extent of a flawed valuation roll on the budgetary determination and fund allocation within the municipality
4. Develop a framework of proper reconciliation, limiting the mistakes on a valuation roll, therefore, limiting the budgetary influence on a municipality

In response to the objectives, the focus was on the direction of the data analysis to respond to these four questions, forming the base of the study:



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1. What is the influence of poor reconciliation on the total value of a municipal valuation roll and the influence of such a roll on the municipal operational budget?
2. What is the importance/application of a geographical information system and deeds data in developing a property register and a valuation roll?
3. How should the valuer and the geographical information system team collaborate in compiling the property register, and applying property knowledge and spatial knowledge?
4. How could municipalities limit the mistakes on valuation rolls, applying the correct legislation and tendering procedures?

The research topic is sensitive; therefore, the conclusions can affect persons or government institutions involved. The aim was to represent the information accurately, refraining from harming any person or institution. Concerning Question 1, therefore, all information is presented numerically, with no indication of the province or municipality that might be implicated. The differences are presented numerically, indicating percentages only and no property count.

Considering the questions and the title “

THE EFFECT OF POOR RECONCILIATION BETWEEN SURVEYOR-GENERAL DATA (SPATIAL) AND DEEDS REGISTER INFORMATION ON MUNICIPAL BUDGETS

The question is addressed in a specific sequence to illustrate a valuation roll and property register development. This would limit the influence on the budget and implementing the correct legislative matters.

Considering the aforementioned, the influence of poor reconsecration between two data sets and their influence on the municipal budgets was determined. Although the study refers to these two data sets only, the valuation roll is included as the base to determine the influence of poor reconciliation on the budget.

This section comprises a short statutory analysis, aiming to extract the sections of the six most important statutes addressing the title of the research. This is followed



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by a quantitative and qualitative research analysis. Quantitative research focuses on analysing data. Data include the Surveyor-General data, deeds, and the published municipal valuation roll to determine the differences and the plausible influence of reconciliation on the municipal budgets. The qualitative research focused on the specific questions directed at the interviewees.

## 4.2 Statutory review and analysis

Considering the statutes analysed in Chapter 2, the study represents only the most important section of the most relevant statutes. When considering the Constitution, a municipality may pose rates on properties within its legal demarcated area according to Section 229 (2) of the Constitution (1996). Rates must be just and equitable according to the same statute. Considering the section of the country's supreme statute, the governing legislation focusing on property rates and tax was analysed. The most relevant statute solely focuses on property rates.

Local government: *Municipal Systems Act 2000* (Act 32, 2000) allows the municipality to rate property and impose rates and tax on a property. The order of the subsections of Section 11 of the Act is specified systematically. The municipality has specific liabilities and financial obligations delegated as part of Section 11. Section 11 (h – j) focuses on the importance of the budget and implementing the correct measures to ensure a respectable budget. The municipality needs to improve performance by implementing measures to ensure effectiveness. With this section of the Act, implementing these measures, the incorrect reconciliation could be checked under this section of the Act.

Local government: *Municipal Finance Management Act 2003* (*Act 56 of 2003*) confirms how budget-related policies should be dealt with. This includes the rates policy, other tariff policies pertaining to property, credit control, and debt collection. With the *Municipal Finance Management Act* indicating the monetary income in municipalities and how it should be obtained, the *Municipal Property Rates Act 2004* has an enormous function in budget determination. An accurate property register is



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essential. Considering the municipal budgets and the influence of property rates and taxes, the *Municipal Property Rates Act* should be scrutinised.

Local government. *Municipal Property Rates Act 2004* (*Act 6, 2004*) Section 23 stipulates that the municipality keeps a register of properties within the municipal boundary. Its provisions that the register should be maintained annually with supplementary valuations. A property register development should include properties within the municipality, determining the property's rating. Properties should be rated according to categories in the rates policy as determined by the municipality. This should follow the *Municipal Systems Act*. Section 48 of the valuation roll the content. Section 23 and Section 48 indicate a connection between the property register and the valuation roll because of the registered owners on the roll. The register includes the property category and extent. The foremost difference between a property register and a valuation roll is that the valuation roll displays specific properties' value in the property register.

The *Municipal Property Rates Act 2004* explains that the onus is on the municipality to maintain the register and stipulate property valuations in the property register. *What is the function of the public in compiling the valuation roll or property register?* During objection, appeal, and updating of the valuation roll, the public has a minor function of informing the municipality if a property was omitted or erroneously included. The public does not always fulfil this position as, mostly, the ratepayer believes the municipality should ensure all properties are included in the roll. This, however, rarely happens concerning omitted properties and incorrect owners. Although the public has some responsibilities, the main onus is with the municipality; therefore, the importance of a carefully reconciled property register and in the end a valuation roll should reflect an accurate budget. *How and where is a property register obtained?*

The two main sources of property data include the Chief Registrar of Deeds and the Chief Surveyor-General, therefore, the governing Acts of the two departments were analysed. According to Sections 3 and 4 of the *Deeds Registries Act 1937* (*Act 47 of 1937*), the registrar should upkeep all information influencing any property in its



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jurisdiction. This information includes the change of ownership; a property record obtained from this governing body should always demonstrate the owner and their information. No property may be cancelled or removed from the registry without a court order. The registrar should display all properties in the property registry.

The base of a property register can be obtained from the register of the deeds. This origin should be complete and correct considering the Act; however, this might pose additional complications, such as properties that might not have been archived from the deeds registry. Some properties in the register became inactive and all properties should be kept in the registry. These properties should be excluded or archived in the property register as they have no owners. These properties have either been consolidated, subdivided, or excised. *How does this tie in with the Chief Surveyor-General governing Act?*

Section 3 of the *land and property identifiers 1997 (Act 8 1997)* portrays that the Chief Surveyor-General should be considered the highest-ranking body with property location, mapping, and boundaries. The Chief Surveyor-General must approve consolidations and township developments before registration at the DO. Section 3(e) confirms this conclusion—the Chief Surveyor-General should supervise and control the diagrammatic representation of the deeds registry entries. The Chief Surveyor-General should, therefore, confirm the correctness of the diagram and the land parcel while defining the boundaries. The Chief Registrar of Deeds keeps a record of additional information, such as owner details and purchase price.

Considering the integration of the statutes focusing on the Chief Registrar of Deeds and Chief Surveyor-General, a conclusion can be drawn that if all the Acts are not understood or scrutinised, it will lead to a negative implication on the municipality and the municipal budget. This interlinking of statutes should conclude that a multidisciplinary approach is crucial. Considering the situation in Europe with almost 100% obtainment of rates and tax, the linking of disciplines bears fruit in developing their property register and later the municipal budgets. The following section



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analyses the influence this will have on the property register, valuation roll, and municipal budget.

## 4.3 What is the influence of poor reconciliation on the total value of a municipal valuation roll and the influence of such a roll on the municipal operational budget?

Commented [PV2]: Update with objectives rather than question. Confirm the linking in text to objectives.

The aim of this section as stipulated by the question is to help reach objective 3 to record the extent of a flawed valuation roll on the budgetary determination and fund allocation within the municipality.

To respond to this question, an understanding of the actual data valuation roll, Chief Registrar of Deeds and Chief Surveyor-General data indicate when linked. South Africa comprises 278 municipalities, categorised by the Constitution into three (GCIS, 2019). These categories include eight metropolitan municipalities, 44 district municipalities, and 226 local municipalities. The local government implemented the *Municipal Property Rates Act 2004* (*Act No. 6 of 2004*) as amended 18 August 2014/28 November 2014; the *Municipal Systems Act* No. 32 of 2000; the *Municipal Finance Management Act*, as amended 1 July 2008 to guide municipalities. Considering municipal data that could be analysed, the study obtained sample data from all provinces in South Africa and two municipal valuation rolls in each province.

Considering the aforementioned, 10% of the 234 municipalities analysed should adhere to the *Municipal Property Rates Act 2004*. Approximately 1.8 million properties were analysed; this number was provided by the valuation roll. The total value of the valuation rolls combined was calculated to comprise R2 trillion.

The research relied on the information obtained from the stakeholders. The data acquired included the valuation roll, the original deeds information, and the Surveyor-General data. The study analysed the general valuation roll, excluding any supplementary valuation rolls to determine the influence on monetary value. Such value is indicated in percentage rather than the number of properties to ensure the anonymity of municipalities and professionals.



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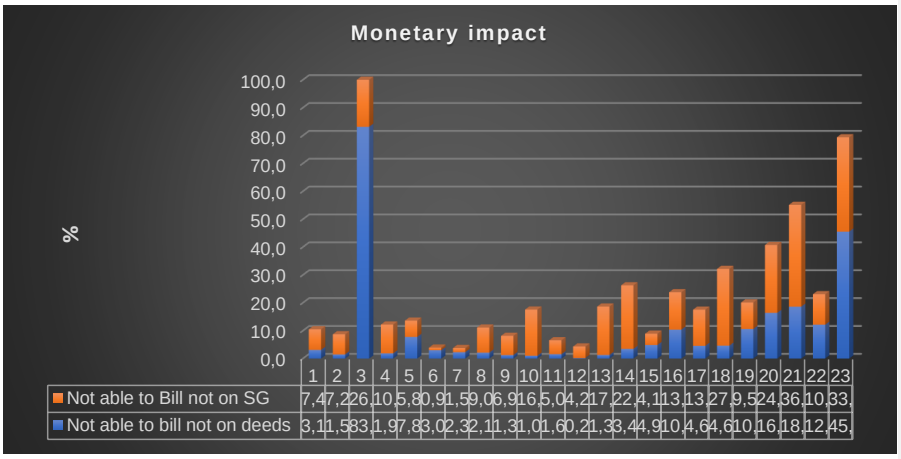


**Figure 4.1: Monetary influence of valuation roll versus deeds and survey-general information**
**Source:** Research findings (2022)

Figure 4.1 demonstrates the analysis confirming the differences between the valuation rolls, Chief Registrar of Deeds, and Chief Surveyor-General; therefore, a monetary influence will also be evident. The data should be considered two-fold; one based on the Chief Registrar of Deeds data and the other, based on the Chief Surveyor-General data.

The Chief Registrar of Deeds data indicate a minimum mismatch of 0.2% and a maximin miss-match of 83.1%. The mean calculated over the 23 municipalities was 10.5% with a standard deviation of 18.6% and a median of 3.4%. With these indicators, the conclusion confirms an average miss-match of 10.5% between the valuation roll and Chief Registrar of Deeds data. This demonstrates a 10.5% over/underestimated valuation roll, with the municipality displaying a loss of 10.5% of the rates and tax income.

Considering the Chief Surveyor-General data, a minimum mismatch of 0.9% exists with the maximising set sitting at 36.5%. The mean was calculated as 13.7% with a median of 10.3% and a standard error of 10.3%. According to the data displayed in Figure 4.2, 10.3% of the properties on the valuation roll cannot be identified in a geographical location. With the differences proved statistically, further information from the practising professionals is required.



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The first set of questions were directed at the 13 interviewees to determine a general understanding regarding the linking/importance of valuation roll in the municipal environment, and how this link to the budget. The questions also demonstrated the knowledge and general understanding of the data used in the initial stages of developing the property register. Figure 4.2 indicate the four questions posed to the 13 candidates focusing on the general data and influence understanding. The question for this section will be addressed per question referring to Figure 4.2 and the actual findings.

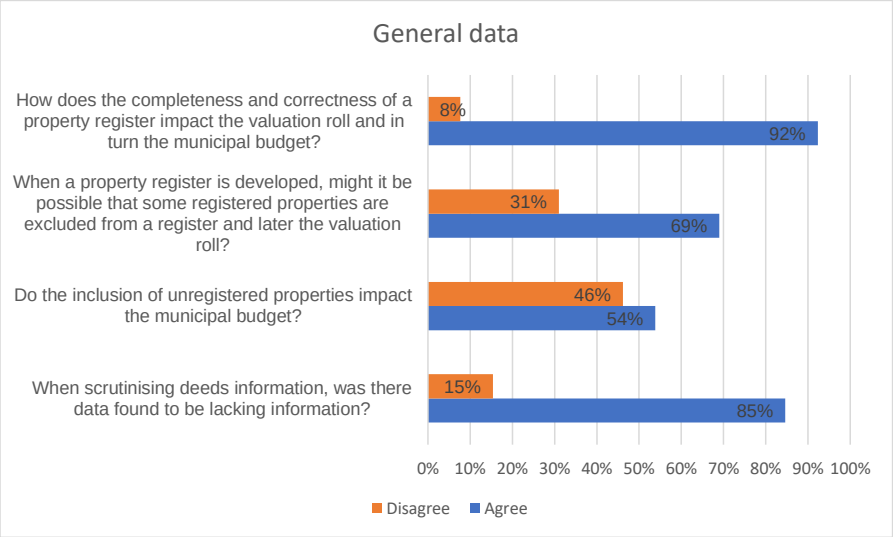


**Figure 4.2: General data and influence understanding questions**

**Source:** Research findings (2022)

### *4.3.1 How does the completeness and correctness of a property register influence the valuation roll and the municipal budget?*

Property rates and taxes contribute 17% to 19% to the local municipal budget (Stats SA, 2019). The response to the above question was synonymous with 92% of the interviewees agreeing to the property register affecting the valuation roll and influencing the budget (Figure 4.2). The remaining 8% believed an influence might



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be corrected during a later stage if the mistakes were indicated by the ratepayer, the municipality, or the A-G.

The municipal budget is divided into four sections where the property rates comprise 17% to 19% of the income; therefore, it is detrimental to the day-to-day operations of the municipality if collected partially. Not all of the interviewees were aware of the high percentage of the valuation roll contributed to the operational budget.

#### *4.3.2 When a property register is developed, might it be possible that some registered properties are excluded from a register and later the valuation roll?*

Considering the outcome in Figure 4.2, 69% of the interviewees agreed that when a property register is developed some registered properties could be excluded from the property register. The remaining 31% believed that the municipality should maintain the property register and that the municipal version should form the base of the valuation roll; 69% of the professionals agree with the analysis in Figure 4.1.

Considering Section 23 of the *Municipal Property Rates Act 2004,* the municipality must draw up and maintain a property register. If the valuation roll is outsourced, the onus shifts to the service provider to upkeep such a register. According to the definition of a register in the *Municipal Property Rates Act 2004*, the register should be recorded concerning the *Deeds Registries Act 1937* (*Act No.47 of 1937*).

#### *4.3.3 Does the inclusion of unregistered properties affect the municipal budget?*

The outcome of this question is alarming; 46% agreed that including unregistered properties in the valuation roll will not influence the budget, as sometimes these properties are proposed for future registrations and could be rated; however, 54% opposed the inclusion and stipulated that unregistered properties cannot form part of the valuation roll but of Section B of the property register. They believed that including such properties will lead to an overestimation of the proposed income rates. Considering the analysis in Figure 4.1, the unregistered properties included



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will affect the budget, alarming that only 46% of the interviewees agree with these statements.

Section 24(1) of the *Municipal Property Rates Act 2004* remarks that the owner should be liable for the payment of the rates and tax of the property. *With the inclusion of unregistered properties, no owner can be identified, and as such who will pay the rates raised?* In response, the unregistered properties should not form part of the valuation roll but should be included in part B of the property register, as indicated by Section 23 of the *Municipal Property Rates Act 2004*.

#### *4.3.4 When scrutinising deeds information, did the data lack information?*

When this question was directed to the interviewees, contradicting responses were received. According to Figure 4.2, 15% of the interviewees disagreed that the deeds information could lack information. They observe that when a bulk download is conducted, the data should be relied on as supplied by a third party. Conversely, the remaining 85% acknowledged that ample information lacks when obtaining deeds information. They included long-term lease information and consolidations and subdivisions of property to confirm their responses.

Considering the *Deeds Registries Act 1937* (*Act No.47 of 1937*), a register should be maintained to indicate the registered and historic properties. Registering a property takes some time confirming that the deeds information would lack information. The request referring to the information required from the DO should receive the highest priority.

#### *4.3.5 Findings*

Figure 4.1 demonstrates the monetary influence on the municipal budget. This outcome confirms the study by the Surveyor-General in 2011, identifying a mismatch between deeds and spatial records. The figure further confirms that a monetary influence on the municipal budget will exist owing to either an overstated or an understated valuation roll.



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In monetary terms based on the findings in Figure 4.1, R180 billion of property values could not be established on the Chief Registrar of Deeds. The Chief Surveyor-General data portray R200 billion of property values that could not be geographically identified. The implication on the budget is that R2 billion of revenue could be lost considering the mismatched data.

The *Municipal Finance Management Act 2003* aimed to modernise the budget, accounting, and financial practices in the municipality to optimise the municipal service delivery with better sustainable budgeting procedures. Again, considering the outcome in Figure 4.1, discrepancies exist between data sets and an implicated budget; therefore, failure to adhere to the *Municipal Finance Management Act*, is unjust and unfair, according to the Constitution.

The professionals have a good understanding of the importance of the valuation roll and the influence it might have on the municipal budget, as observed in question 4.2.1. They are well aware of discrepancies among data sets. Limited referral to the *Municipal Systems Act* and *Municipal Finance Management Act* was observed in the professionals' answers for budgeting. Section 11 of the *Municipal Systems Act* deals with the preparing and approving of the budget. From Section 24 of the *Municipal Finance Management Act*, it is evident that the budget depends on imposing rates and setting a tariff based on the values of the roll.

A flawed valuation roll where reconciliation between the Chief Registrar of Deeds and Chief Surveyor-General data was not conducted properly will have a detrimental effect on the municipal budget, the vision, and the actual day-to-day services offered by the municipality.

Focusing on the effect of the budgetary implication of poor reconciliation, the Municipal Standard Chart of Accounts regulations could ensure that the property register and valuation roll be developed properly, therefore, limiting the influence on the municipal budget. This can be enforced only by an inter-departmental willingness to approach the valuation roll with a multidisciplinary outlook.



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## 4.4 What is the importance/application of a geographical information system and deeds data in developing a property register?

The main objective of this section is to explain why there is a difference between spatial data and deeds data to correlate with objective 2.

The property register forms the base data when developing a valuation roll. Considering the *Municipal Finance Management Act* and *Municipal Systems Act*, the importance of the municipal budget and its correctness are stipulated. The *Municipal Property Rates Act 2004* defines a property register in Section 23. All three of the Acts should be considered subject to the Constitution of South Africa, which has strict writing on the duties and operations of municipalities. If these duties are not adhered to, the LM might be run unconstitutionally. The effect of this can be detrimental to the municipality and the ratepayer within the LM boundary.

Cooperative Governance and Traditional Affairs (2019) raised concerns about incomplete valuation rolls owing to lacking property registers. A Chief Surveyor-General study in 2011 identified a mismatch between the Chief Surveyor-General and Chief Registrar of Deeds of 17% to 24%. A difference between the two property registers will affect the valuation roll and municipal budget. Referring to Figure 4.3 and Figure 4.5 there is a material difference between the two property registers and the valuation roll.

The importance of the two datasets should be considered as they form part of the data obtained from the Chief Registrar of Deeds and Chief Surveyor-General considered the highest hierarchy with property registers. Figure 4.1 presents the monetary implication of poor reconciliation on the municipal budget; therefore, it would be important to understand why the data sets should be used in combination.

Figure 4.3 demonstrates the percentile mismatches between the valuation rolls and the Chief Registrar of Deeds and Chief Surveyor-General data. The same data for



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Figure 4.1 was used; however, the study aimed to determine the size of the mismatch and later determine the reason for the mismatch.

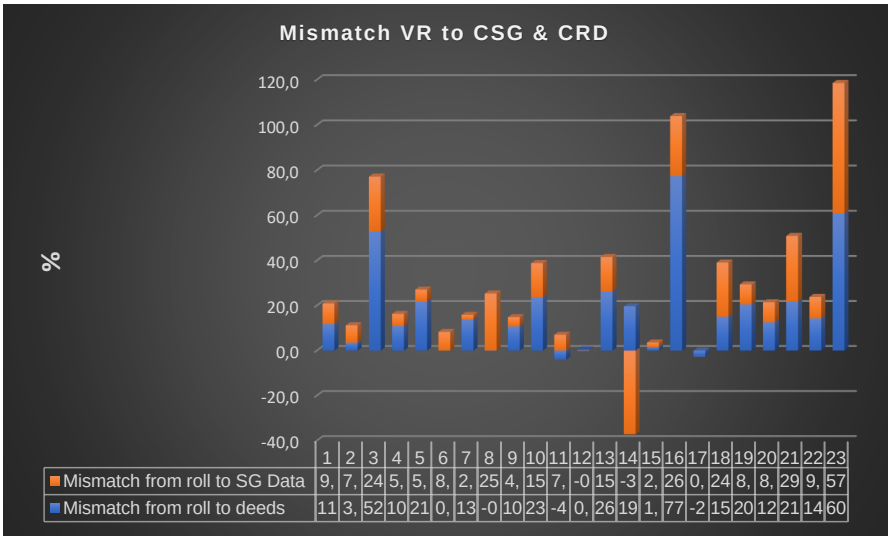


**Figure 4.3: Data mismatch between the valuation roll and deeds register and Chief Surveyor-General data**

**Source:** Research findings (2022)

Comparing the valuation roll with the Chief Registrar of Deeds a minimum of -4% and a maximin miss-match of 77.3% was observed. The mean calculated over the 23 municipalities was 17.9% with a standard deviation of 20.5% and a median of 13.7%. The data demonstrate that sometimes there are less Chief Registrar of Deeds data compared to the valuation rolls, indicating sample unregistered properties in the valuation rolls. The study established that some data sets were incomplete and that a margin of error will exist because properties trade daily; however, the margin of error should not be as excessive or equal to zero as stipulated in the findings. This conclusion was drawn based on Section 3 of the *Deeds Registries Act 1937*, specifying the duties of keeping a register of all properties in the country, indicating all owners and any legal endorsements to such property.



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When linking the Chief Surveyor-General data to the valuation rolls, a minimum mismatch of -37.2% exists, with the maximum being 57.7%. The mean was calculated as 11.2% with a median of 8.9% and a standard deviation of 16.8%. Considering the findings in Figure 4.3, a margin of error should be allowed owing to the movements in property registrations; however, zero and higher percentile mismatches are incorrect, implying the valuation rolls' completeness and correctness. Section 3 of the *land and property identifiers 1997 (Act 8 1997)* stipulates that all properties in the deeds register must be surveyed and kept up to date regarding sizes after subdivisions and consolidations. Some unregistered/future properties, such as townships, should also be surveyed for future registration.

Further mismatches were identified between the Chief Surveyor-General and the Chief Registrar of Deeds which can explain the differences between the two governing Acts. One allows for future registration to be mapped and the other only allows for historic and current properties to be held in a register.

Considering the observation, 13 professionals were interviewed to observe their opinions and struggles, actively working/creating property registers and valuation rolls. The outcome of the questions is explained in Figure 4.4 below.



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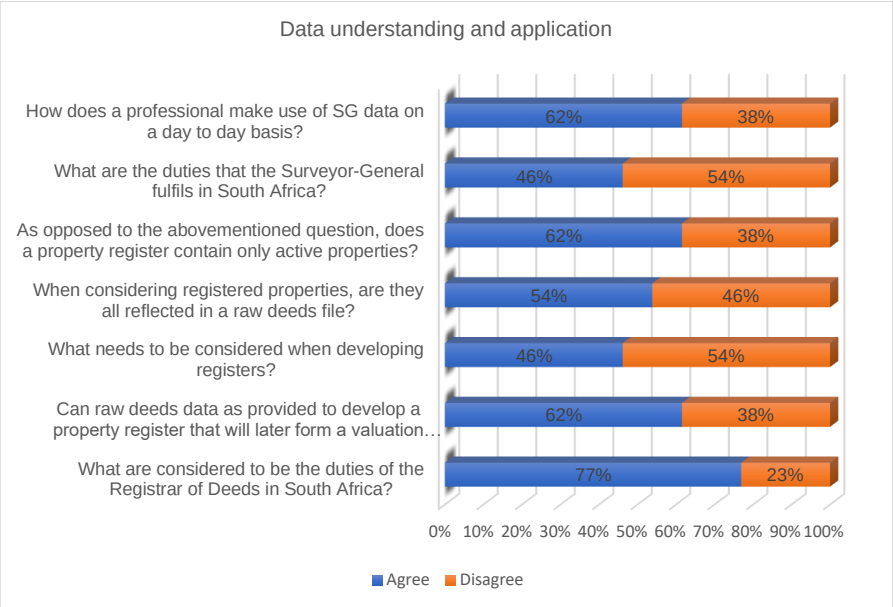


**Figure 4.4: Data understanding and application questions**

**Source:** Research findings (2022)

### *4.4.1 What are the duties of the Registrar of Deeds in South Africa?*

This was included in the set of questions to ensure a better understanding of the knowledge of the interviewees regarding the Chief Registrar of Deeds and its purpose. Seventy-seven per cent of the interviewees agreed that the registrar of deeds must keep a register of each property within the South African boundary. The remaining 23% believed that the Chief Registrar of Deeds processes transfer of properties and needs to supply registration documents. They are correct but did not know that the registrar of deeds should develop and maintain a property register of each property in the country according to Section 3 of the *Deeds Registries Act 1937*. This could also form the foundation for the municipalities to maintain a property register following Section 23 of the *Municipal Property Rates Act 2004*.



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### *4.4.2 Can raw deeds data be provided to develop a property register that will later form a valuation roll?*

Sixty-two per cent of the professionals agreed to the deeds data as the base for developing a property register. They believed that data cleaning should be conducted as the bulk information does not always include all information. The remaining 38% of the interviewees reasoned that the deeds data can be used as-is to develop property registers and valuation rolls.

Figure 4.3 demonstrates that datasets—six, eight, 12, and 15, were direct implementations of the deed's records, therefore, no differences were noted. These data were also provided by the same interviewees. According to the first question, the Chief Registrar of Deeds must keep a register of historic properties and active properties. By using the deeds as received from the Chief Registrar of Deeds, a significant risk exists to include unregistered properties in the valuation rolls. This will affect the budget, as the historic properties cannot be billed.

### *4.4.3 What needs to be considered when developing registers?*

This question yielded interesting additional information on how property registers should be developed. The concerning part is that 54% of all participants indicated that the deeds can be the property register or that the municipality needs to provide this under Section 23; however, 46% agreed that numerous sources should be used, including Chief Registrar of Deeds and Chief Surveyor-General data. This includes previous valuation rolls and current billing files.

The actual rationale that could be drawn from the 46% was that the property registers should be developed using diverse data sources to ensure completeness and correctness as required by the Constitution. The property registers and valuation rolls should be considered with the *Municipal Systems Act*, *Municipal Finance Management Act* and *Municipal Property Rates Act.* This leads to employing the financial data and previous roll as part of the process.



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#### *4.4.4 When considering registered properties, are they all reflected in a raw deeds file?*

The answers to the question are almost an equal split between the professionals. The professionals agreed with the aforementioned questions, somewhat contradicting their answers; 54% indicated that not all registered properties are included in the deeds files and 46% agreed that all properties in the deeds register should be registered.

valuation rolls should only demonstrate registered billable and property registers comprising all properties within the municipal boundary. The deeds information includes historic statistics. Some professionals directed a combined approach; however, one concern stipulated was the availability of municipal data.

#### *4.4.5 As opposed to the aforementioned question, does a property register hold only active properties?*

The outcome was similar to this outcome 4.3.1.2. Sixty-two per cent indicated that a property register cannot be registered properties only and will include historic; 38% indicated that a property register should demonstrate only registered properties.

According to the promulgating Acts, such as the *Municipal Property Rates Act 2004*, the *Deeds Registries Act 1937* and the *land and property identifiers*, a rationale can be drawn that all properties in the municipal boundary should be included in a property register. The registered and active properties should form part of the valuation rolls only.

#### *4.4.6 What duties does the Surveyor-General fulfil in South Africa?*

The majority (86%) of the interviewees observed that the Chief Surveyor-General must develop Surveyor-General diagrams and identify the location and boundaries of the properties; however, only 46% understood the importance of the Chief Surveyor-General and that they are similar to the Chief Registrar of Deeds, maintaining a property register. The remaining 54% did not know that the Chief



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Surveyor-General had to also maintain a property register and perform other duties affecting the Chief Registrar of Deeds's decisions.

The *Land Survey Act 1997(8)* (s.3) stipulates that the surveyor should ensure all properties in the deeds register are surveyed and kept up to date regarding sizes after subdivisions and consolidations. Some unregistered/future properties, such as townships, should also be surveyed for future registration.

#### *4.4.7 How does a professional use Surveyor-General data day-to-day?*

When this question was presented to the professional, the intention was to obtain a more in-depth understanding of the applications supplied by the Chief Surveyor-General, used in developing the valuation rolls; 62% use Surveyor-General diagrams and some of the cadastral information supplied by the Chief Surveyor-General; 38% use the electronic geographical information system as part of the mass valuation process when valuing properties.

Some noted that of the 38% only 30% use a geographical information system as part of the property register and valuation roll development. These interviewees are also the only professionals applying Computer-assisted Mass Appraisal valuations. The two governing Acts of the Chief Registrar of Deeds and Chief Surveyor-General correspond and complement each other. They are both property registration-related Acts and are interwoven. The smaller percentile of the professionals uncovered a more effective property register and valuation roll development approach.

#### *4.4.8 Findings*

Property register development is one of the most important parts of advancing a valuation roll and determining a municipal budget. The *Municipal Property Rates Act* and *Municipal Systems Act* refer directly to a property register, which should be just and equitable. These statutes are enforceable under the Constitution (1996) hammer on fairness. If this is not conducted properly, the municipality might be operating unconstitutionally.



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The importance of a geographical information system/Chief Surveyor-General data and deeds data when developing a property register should be crucial to limit mistakes in the prevailing municipal valuations roll. Improved accuracy will limit the influence on the municipal budget and better planning can be conducted on a more exact budget.

Figure 4.3 portrays despair regarding the analysed data. Huge differences between the highest-ranking property registries and the valuation rolls/property registers exist. The disturbing part is that the difference could be excessive and, in some cases, zero can also be incorrect. The conclusion is a material difference among the three data sets.

While analysing the responses from the interviewees and comparing them to the findings in Figure 4.3, the importance of understanding geographical information systems and deeds information should receive the highest priority when developing property registers. The challenge is that most interviewees intend to cut costs when developing property registers; therefore, they do not employ all available methods. Directly interpreting the Act and shifting the onus to the municipality to provide the information is crucial in the inadequately developed property registers.

*What is the importance/application of a geographical information system and deeds data in developing a property register?* The Chief Surveyor-General and the Chief Registrar of Deeds governing statutes portray similar functions, which should assist the municipality/contractors to develop a property register more accurately when used combined. The next section discusses how the two disciplinaries could collaborate to limit mistakes.

*Why is there a difference between spatial data and deeds data?* A difference between the two data sets exists owing to the Chief Registrar of Deeds including historic and current records only in the register, whereas the Chief Surveyor-General should have historic, current, and proposed properties in the register. This will relate to differences as sometimes proposed properties would be included in the Chief Surveyor-General data but should still be presented as active, leading to a data miss-match.



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## 4.5 How should the valuer and the geographical information system team collaborate in compiling the property register, and applying property knowledge and spatial knowledge?

Discrepancies between data do exist if a multidisciplinary approach is not followed as per Figures 4.1,4.3 and 4.5. When answering this research question the researcher will aim to identify the drawbacks when employing a multidisciplinary approach, causing confusion as per objective 1.

The *Municipal Property Rates Act 2004* refers to terminologies, such as registered owners' rating categories obtained from the actual use, zoning, or a combination of the two. The importance of property location identification and owner identification should be used parallel.

The *Municipal Property Rates Act 2004* lacks a valuation definition; however, summarises the considerations. Section 45(1) affirms that properties must be valued under standard valuation practices, methods, and standards. The International Valuations Standards Council (2013:17) identifies valuation approaches as three methods, based on economic principles and price equilibrium. These involve anticipating benefits and substitution.

In identifying the valuation approaches, Section 45(2) signifies that physical inspection is optional. Any comparative, analytical system and technique may be applied. These include aerial photography and Computer-assisted Mass Appraisal systems or techniques. This section informs a more mass valuation approach, saving time when conducted correctly. It evaluates aerial photography to identify areas, if correctly interpreted. The Act supports an application, such as a geographical information system, forming one of the most important sections of Computer-assisted Mass Appraisal valuations.

To indicate the importance of the collaboration between a valuer and a geographical information system team, the Chief Registrar of Deeds and Chief Surveyor-General



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data were compared to identify differences between the two registers and what the general opinion is of the professionals working with the data.

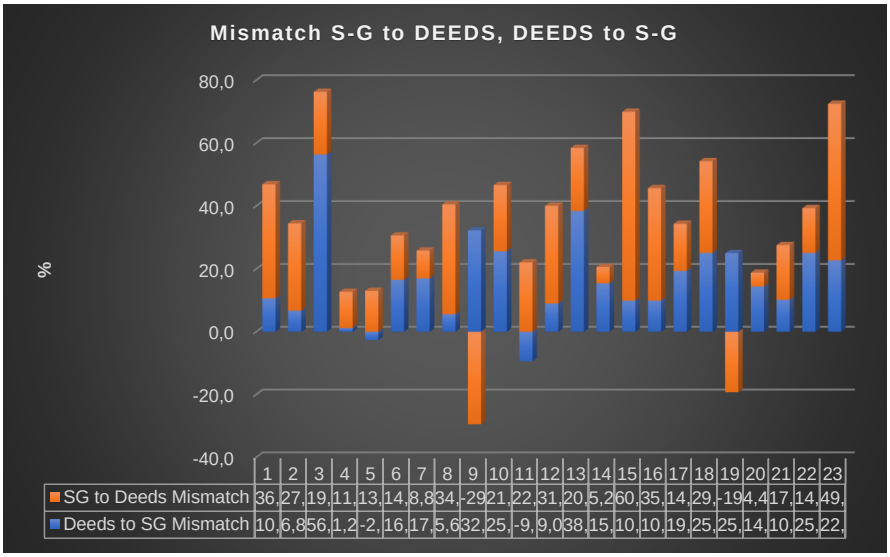


**Figure 4.5: Chief Registrar of Deeds and Chief Surveyor-General data mismatch**

**Source:** Research findings (2022)

To stipulate if a geographical information system team is needed when developing property registers and valuation rolls, differences between the two highest-ranking should be identified. Figure 4.5 displays an enormous difference between the two data sets. This was one concern risen by Cooperative Governance and Traditional Affairs in 2019. When the Chief Registrar of Deeds data were linked to the Chief Surveyor-General data, the largest miss-match was 56.4% and the lowest was a 1.2% difference. The average difference was calculated as 16.7% and a mean of 15.45%. The smaller differences were obtained in areas where the property market is not that active. The assumption can be made that a difference, to this extent, can implicate the property register to have an incorrect number of properties of 16%. This can then be translated to a 16% over or under the estimated budget.

When considering the promulgating Acts, the difference between the two data sets stipulates that 16% of the properties on the deeds cannot be geographically identified. If the property cannot be identified, it cannot be valued or categorised.



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The Chief Surveyor-General data were linked to the Chief Registrar of Deeds data, with a similar presentation. The highest miss-match was 60% and the smallest was 4.4%. The average was calculated to be 19.2% with a median of 19%; 19% of the Chief Surveyor-General data are unregistered as it does not link to a Chief Registrar of Deeds record; therefore, the property is surveyed and geographically identified, but it could not be included in the valuation roll as there would be no owner.

With the aforementioned analysis, considering the definition of a property register, the valuer and geographical information system team must collaborate to develop a property register. With teamwork, it would be possible to reconcile the two datasets and construct a combined property register with limited discrepancies.

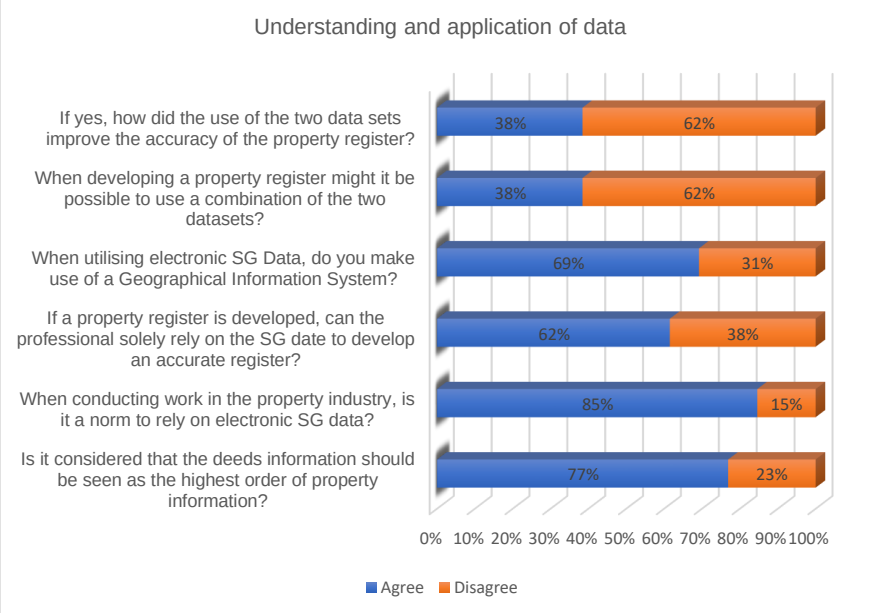


**Figure 4.6: Data understanding and application questions**

**Source:** Research findings (2022)



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### 4.5.1 *Should the deeds information be observed as the highest order of property information?*

Seventy-seven per cent of the professionals confirmed that the Chief Registrar of Deeds data should be in the highest order of the property information. The remaining 23% indicated that Chief Surveyor-General data should receive the highest priority. When developing property registers, the *Municipal Property Rates Act 2004* stipulates all registered properties should be included. The *Chief Registrar of Deeds Act* is clear that all properties should be held in a register, including historic and active properties. Considering the answers of the professionals, the best starting point for developing property registers should be the Chief Registrar of Deeds data.

### 4.5.2 *When conducting work in the property industry, is it a norm to rely on electronic Surveyor-General data?*

The interviewees rely on the Surveyor-General data to identify the properties; 85% of the interviewees indicated that they use electronic Chief Surveyor-General information; however, only 45% of the 85% use actual geographical information system database information. The remaining 15% use general plan information and Surveyor-General diagrams; 15% lack access to geographical information system teams and find it necessary to use a geographical information system if the municipality does not have this service.

The prevailing *Chief Surveyor-General Act* stipulates that all properties within the South African boundary should be surveyed before any registration in the Chief Registrar of Deeds. The location, boundaries, and sizes of each property should be stipulated in a Chief Surveyor-General diagram and kept in a property register to limit duplication. This register will also ensure that a property is mapped for an easy location.



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#### 4.5.3 *If a property register is developed, can the professional rely on the Surveyor-General data solely to develop an accurate register?*

The responses to this question clarify the observation of the municipal valuer in the South African municipal valuation industry; 69% indicated the inability to solely rely on the Chief Surveyor-General data; 31% indicated using the Chief Surveyor-General data as provided. An additional observation was that of the 69% only 30% sensed that a combination use should be applied. The remainder of the respondents firmly considered a geographical information system as a secondary device used for property identification.

Considering the promulgating *Chief Surveyor-General Act*, the risk of depending on the Chief Surveyor-General data only will include proposed properties that might not be registered yet. This will overestimate the potential income, implicating the budget with funds not obtained from the rates payer. Only 30% of the interviewees agree to a multidisciplinary application as the best practice. Most interviewees indicated they use Surveyor-General diagrams and do not refer to a geographical information system.

#### 4.5.4 *When using electronic Surveyor-General data, do you use a geographical information system?*

A slight contradiction was established among the interviewees' responses to this question; 69% stipulated that they use a geographical information system; 31% do not use geographical information systems as a device; 31% rely solely on previous work by other professionals; 69% of the valuers use geographical information systems to its full potential.

The Chief Surveyor-General develops the geographical information system data under the *promulgating Act* while adhering to the same rules, generating a Surveyor-General diagram. Because geographical information systems is a young discipline, older professionals do not anticipate the need as they have been formerly developing valuation rolls with ample data. The younger generation interviewees



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agree that the previous way of developing property registers and valuation rolls is time-consuming and that a geographical information system is more effective.

#### *4.5.5 When developing a property register, might it be possible to use a combination of the two datasets?*

Concerning the previous question and responses, it can be concluded that the younger generation valuer is more prone to using a multidisciplinary approach; 38% indicated that such an approach is more accurate. No participant could, however, determine why accuracy would increase, but most agree that a geographical information system will aid in the accuracy of the values and property identification. The remaining 62% of the interviewees did not oppose a multidisciplinary approach; they indicated that time constraints and the cost of a geographical information system team mostly hinder them from using geographical information systems or a geographical information system team.

Considering the observations, the two Acts Chief Surveyor-General and Chief Registrar of Deeds have similarities, such as all properties should be held in a register regardless of their status. All properties should also be mapped and revealed in a diagram. The two Acts allow no property registration without consent from both registrars. A multidisciplinary approach would, therefore, enhance the accuracy of the property registers and later the valuation roll, limiting the influence on the municipal budget.

#### *4.5.6 If yes, how did the two data sets improve the property register's accuracy?*

The question was aimed at 38% of the interviewees; however, it was also directed at 62% if they would concur. The general agreement among interviewees was that the Surveyor-General data will help to identify unregistered properties; however, 62% were not interested in proposed properties not yet registered. They perceive that a property register does not need to include proposed properties; 38% agree that the futuristic perspective should be followed where all historic, proposed, and active properties should be included in the property register. The multidisciplinary



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approach would benefit the municipalities by linking the two data sets and building a complete property register.

Referring to the prevailing Acts, a multidisciplinary approach should be best practice when property registers are developed. This should be conducted by reconciling the two data sets. Linking the Chief Surveyor-General and the Chief Registrar of Deeds data should determine the differences. The properties and owners can be geographically identified. This will also identify the proposed and the historic properties. The difference, as indicated in Figure 4.5, can be resolved and narrowed by commenting on all properties and a historic/futuristic description for each non-rateable property.

### *4.5.7 Findings*

*How should the valuer and the geographical information system team collaborate in compiling the property register, and applying property and spatial knowledge?* The *Municipal Property Rates Act 2004* does not enforce a geographical information system and inspecting a property for municipal valuations. It stipulates that standard valuation methods should be applied and that a Computer-assisted Mass Appraisal application is acceptable.

All the professionals interviewed bear knowledge concerning the Chief Surveyor-General and Chief Registrar of Deeds; however, a definite shortcoming exists in understanding the actual Acts, governing the two bodies. They reason that Chief Registrar of Deeds information should be considered the highest-ranking data owing to the data obtained. They agree that data can be linked in both cases—property data with unique linking abilities.

Figure 4.5 demonstrates the differences between the two data sets. This was confirmed by some professionals agreeing with a multidisciplinary approach. They reflected that the data should be reconciled to develop a more complete property register. They indicated that the two Acts should not be perused together but separate to obtain a coupling idea of property registrations. This reasoning is



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accurate as the Chief Surveyor-General cannot register property without the Chief Registrar of Deeds input and contrariwise.

The conclusion is that the valuer (Chief Surveyor-General data knowledge) and the geographical information system team (Chief Surveyor-General data knowledge) should collaborate to develop a property register and a valuation roll. The combined specialities will aid in developing a completed register, including historic, current, and proposed properties. This will only adhere to the definition of a property register that should include all properties in a municipal boundary.

Both data sets will form a crucial part of developing an accurate valuation roll; however, the geographical information system will aid in the Computer-assisted Mass Appraisal valuation approach. This will help with identifying, categorising, and strategising the information used in a Computer-assisted Mass Appraisal system. Considering the future and applying Computer-assisted Mass Appraisal across the globe, the movement towards a more automated valuation application will force the recon between the two disciplines.

Municipal Standard Chart of Accounts guidelines are, therefore, clear on integrating information technology systems interlinking data from all spheres of the municipal area. The Municipal Standard Chart of Accounts compliance is moving towards an exclusively electronic approach in administrating a municipality. Directing municipalities in a more electronic environment will allow for tracking and limiting mistakes while identifying training areas. *How could municipalities limit mistakes when developing property registers and valuation rolls?* The next section clarifies the plausible solutions.

## 4.6 How could municipalities limit the mistakes on valuation rolls, applying the correct legislation and tendering procedures?

The above-mentioned findings concluded these mistakes exist in the data as well as in the municipal budgets. This section will aim to obtain solutions to assist municipalities to limit mistakes on valuation rolls. By obtaining a solution the



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researcher will be able to develop a framework of proper reconciliation, limiting the mistakes on a valuation roll, therefore, limiting the budgetary influence on a municipality concluding objective 4.

With the abovementioned findings in questions, 4.4.1 to 4.4.7, ample differences among professionals were identified. This includes differences in opinion on developing property registers and user data preferences. The understanding of the governing Acts also implicates the accuracy of the property register and the valuation roll. This alludes to the municipal budget if the reconciliation is incorrectly conducted.

Acts should be considered when a valuation roll for rating purposes is developed. Neither do the prevailing Acts stipulate any means of how accuracy could be guaranteed, nor do they guide the valuer specifically on how to conduct the work. An Act is not there to provide a working way, it is merely a guide on how to lawfully adhere to compiling property valuations.

The *Municipal Systems Act*, *Municipal Finance Management Act*, and *Municipal Property Rates Act* have clear indications of conducting ratings and valuations; however, the interviewees did not always know the extensive influence a poorly developed valuation roll has on developing a municipal budget. The municipal stakeholders are not always informed while relying on the contractors' professional opinions. They alleged that sometimes the opinions of the appointed contractors differ.

Establishing the importance of the property register and the discrepancy in these registers leads to the question: *how can a municipality limit the mistakes made by property valuers?* This section aims to assist the municipality to manage the contractor better and to ascertain more accurate work. Six questions were directed to the same 13 interviewees to obtain additional assistance on this matter.



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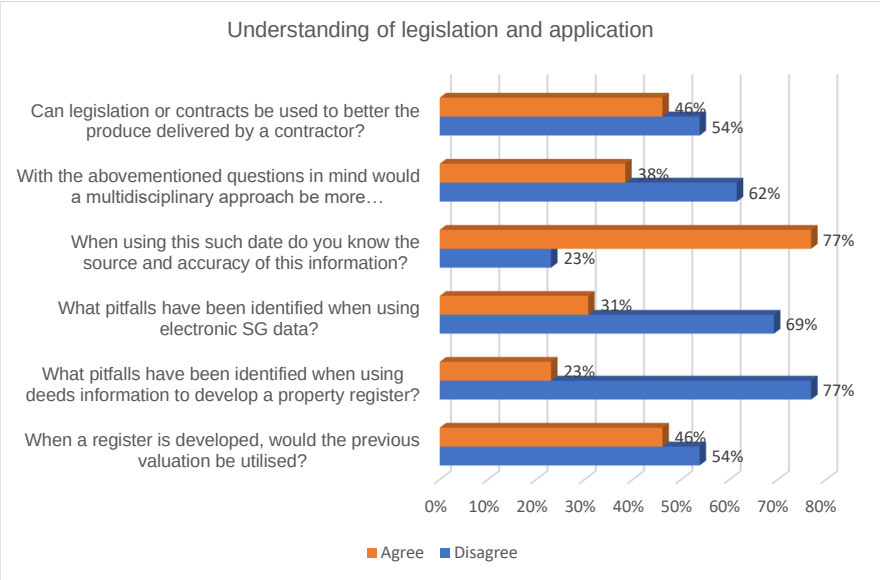


**Figure 4.7: Legislation understanding and application questions**

**Source:** Research findings (2022)

### *4.6.1 When a register is developed, how would the earlier valuation be used?*

The question was directed to understand how previous work is used in developing a new property register and valuation roll. Forty-six per cent of the interviewees indicated that the previous information can be used, but care should be provided not to consider the information as correct. They considered that information, such as property register and valuation roll, should be checked against the deed's information. The concerning part is that 54% of the interviewees indicated that the previous information can be used as it is provided by the municipality. They believe that the *Municipal Property Rates Act 2004* is governing the works, therefore, it should be accurate.

Considering all the aforementioned questions and Figure 4.1 and Figure 4.3, profound caution should be exercised when previous information is used. Errors in the data exist and should be addressed in a manner not to disadvantage the municipality and influence the budget and the constitutional obligation. The *Municipal Property Rates Act 2004* is clear that deeds should be obtained when a



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roll is being prepared; proper valuations practice should be applied, including professionalism.

#### *4.6.2 What constraints have been identified when using deeds information to develop a property register?*

The majority (73%) of the interviewees agreed that the information received from the DO should not be accepted as complete with a fair number of issues owing to registration delays. They were further of the opinion that the deeds data should be respected as the ultimate base data to use when developing property registers, but should be cleaned beforehand. This process is to identify all properties that should be valued and to discard all other historic properties that could not be billed. One other concern identified is that registered leases are not always portrayed in the bulk deeds information. A small percentage of the majority indicated that the best practice would be to use various data sources, including Chief Surveyor-General, previous valuation rolls, and property registers. They also indicated that the deeds are unavailable at the municipalities owing to contractors not providing the actual deeds information.

The minority 23% agree that the deeds information should be envisioned as accurate, with limited mistakes. They shared the opinion that the deeds data are expensive to obtain and revert to more cost-effective third-party information. Sometimes, they relied on the old deeds information they could have obtained from the municipalities. They remarked that the source data and dates of the data have never been confirmed.

#### *4.6.3 What difficulties were identified when using electronic Surveyor-General data?*

The difficulties identified by 69% was that the Surveyor-General data should be used carefully as the data are not complete, lacking the needed information to develop a valuation roll. They stipulated that the Surveyor-General data includes unregistered properties that could be proposed or historic. In some areas, that will implicate the valuation roll negatively. They also stipulated that the information from



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the deeds should be linked to the Surveyor-General data to obtain information, such as owners and registered sizes. When this is conducted, mismatched data are identified with size errors. They consider this a time-consuming and costly exercise.

Thirty-one per cent of the interviewees believed that the Surveyor-General data can be a property register and can develop a property register as-is, attributable to the conformity to the surveying laws and that all property must be allocated a boundary. The interviewees bear knowledge of including proposed stands; however, they believe this can help with revenue enhancement.

#### *4.6.4 When using this data, do you know the source and accuracy of this information?*

This question relates to the deeds and the Surveyor-General information. Seventy-seven per cent indicated that they knew where the data came from; 23% indicated that they were unsure of the data source; however, when the question was directed where and how it would adhere to the Act, the interviewees responded with care. They could not confirm whether the data was obtained from a direct source or a third party. The minority indicated that if the source information was unavailable, they would not trust the data.

Fifty-five per cent of the 77% indicated that the data obtained from the municipalities should be considered accurate; however, the remaining 45% indicated that the data should be re-assessed with new information; 23% observed that the data provided by the municipality should be used with care and vetted and compared to other known sources. They believed that data provided by the municipalities are sometimes incomplete, owing to service providers not supplying the full spectrum of data/work.

#### *4.6.5 Considering the aforementioned questions, would a multidisciplinary approach be more acceptable to develop a property register?*

Considering all the questions directed regarding the Chief Registrar of Deeds and Chief Surveyor-General data, the interviewee responses were interesting. Thirty-eight per cent indicated that a multidisciplinary approach should be considered.



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They alleged that this would allow the team to develop a more accurate property register, reflecting on the valuation roll that will be more accurate.

Sixty-two per cent indicated that a multidisciplinary approach would have a limited influence on the accuracy of a property register. The majority observed that the Act refers to using Chief Registrar of Deeds information and not Chief Surveyor-General information. They did not realise the necessity of the multidisciplinary approach to developing a property register. 62% remained focused on using Chief Surveyor-General data because of cost concerns.

Considering the two Acts and applying a Computer-assisted Mass Appraisal valuation system, a multidisciplinary approach is crucial. This will help to develop an accurate property register.

#### *4.6.6 How can legislation or contracts be used to improve the product delivered by a contractor?*

The aim was to determine if the interviewees would propose any adjustments to the legislation or contracts. The research aimed to draw a rationale about the responses, grouping them into two similarity groups. Forty-six per cent of the interviewees indicated that legislation changes will assist in conjunction with contractual changes. The reason for requesting legislative changes was that contractual deviations could be optional. They further indicated that penalties, timeframes, and data handovers should be included in the legislation. Conversely, they indicated that concerning contracts, penalty types should be stipulated, compulsory geographical information system application, duration audits, and compulsory quality assurance by other valuers before implementation.

The remaining 54% indicated that most of the aforementioned proposals should be optional owing to time constraints and the monetary values of the valuation rolls; however, they recognised that Cooperative Governance and Traditional Affairs should act more on the nonconformity of valuers and develop a list of professionals incorrectly conducting missions. They observed that if legislation adheres to it, it will



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limit the issues and implications of the municipal budget. They contemplated that penalties should be optional and be conducted at the municipalities' discretion.

### *4.6.7 Findings*

*How could municipalities limit the mistakes on valuation rolls, applying the correct legislation and tendering procedures?* The professionals interviewed had similar opinions about how municipalities could limit mistakes in developing property registers.

Considering previous data, they observed that the data should be analysed and compared to their data to determine the discrepancies and approach this before completing the property registers. The minority believes that a multidisciplinary approach would limit mistakes, whereas the majority observed that a governing Chief Registrar of Deeds approach will be the best. It was established that a multidisciplinary approach should be ample evidence to demonstrate that this could limit discrepancies and help develop a more complete property register and valuation roll.

Some adjustments to the *Municipal Property Rates Act 2004* and service level agreements signed by the service providers are imminent. The professionals indicate that penalties, clauses, compulsory inclusion of a geographical information system, and audits on work should be conducted. Some also remarked that the importance of enforcing the Acts and the service level agreements is lacking on the municipal level.

The study established that the professionals disagree concerning how the rules and regulations should be implemented. *Are the stricter requirements not better for promoting accuracy or do the less strict rules open the door for more grey-area applications?* It can be concluded that the guidelines should be stricter for effortless application and for addressing non-compliant behaviour.



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## 4.7 Chapter summary and conclusion

The findings from the quantitative and qualitative data confirmed relative findings. According to the quantitative data, ample discrepancies exist among the data sets. A larger number of properties were excluded from the property register and the valuation roll, influencing the municipal budget owing to incomplete data. It was further established that discrepancies exist between the Chief Registrar of Deeds, and Chief Surveyor-General data as indicated by Cooperative Governance and Traditional Affairs (2019). It was proven that the findings by Cooperative Governance and Traditional Affairs are accurate and that these differences implicate the valuation roll and property register accuracy.

The main reason for this mismatch is that two data custodians of property information exist, and the registers are not always corresponding. The UK merged the two data sets; having a multidisciplinary dataset demonstrates collecting 100% rates and tax on property. As stipulated in a multidisciplinary approach (2.7.2) to developing a property register and valuation roll a standard format of data should be identified. It is, for this reason, the European countries can tax all properties. Although the South African data can be linked, no actual standard data format for the Chief Registrar of Deeds and Chief Surveyor-General exists. According to the multidisciplinary approach, the two departments should determine a standard format for data while reconciling the entire data set to develop a federal property register/cadastre with all the needed property information needed to develop a property register.

The importance of this multidisciplinary approach was tried and evaluated in several countries with similar systems to South Africa; however, the difficulties identified in 2.7.3 are corresponding to the data analysis. Data access is limited/costly; the data quality and accuracy cannot be confirmed; the data standards differ; misuses of data. The communal problem observed in the larger governmental sphere is that cross-pollination of departments is limited, with each keeping its data undisclosed. This internal concern existed in the case studies countries, such as USA and Canada, Scotland, and Sweden.



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According to the qualitative data findings, two tiers of professionals exist, indication conventional professionals and the minority as modern professionals. It was established that ample training is required in all the statutes governing the municipality for the professionals to understand the interlinking. These statutes and interpretations should also be directed, professing excessive concerns. Knowledge of a limited understanding of the statutes will not assist with enforcing the legal rights of the ratepayer and the municipality. This is a specific concern in India and other African countries where accountability is uncompelled. Some noted that punishment in European counties can be harsh; however, the systems linked to the government reach sufficient departments and service providers. The South African urban areas could adhere to an international system; however, the rural areas demonstrate diverse concerns.

A need for modern applications exists and this must be enforced by the higher governmental departments. Assistance by enforcing rules and regulations should form part of these governmental institutions. The theoretical research confirms sufficient guidelines, statutes, objectives, and departments to minimise the influence on a municipal budget. Implementing this might present a challenge for reasons, such as a lack of knowledge and support, and understaffing. Implementing Municipal Standard Chart of Accounts will demonstrate an improvement. The subsequent chapter discussed the findings and recommendations, followed by suggested supplementary research, focusing on more specialised areas.



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# CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

## 5.1 Introduction

The municipal budget is crucial in the day-to-day municipality proceedings, providing goods and services for the local inhabitants. The budgetary income is derived from three main income streams:

- Electricity sales
- Subsidies
- Rates based on a municipal valuation roll

The municipality generates income from one product only, developed internally or by acquiring a professional's services. The product is known as a valuation roll, derived by allocating market value to all registered properties within the municipal boundary. This study established a multidisciplinary approach to develop a more accurate property register, forming the base of the valuation roll. This does not necessarily improve the accuracy of the values generated; it limits the exclusions from a municipal valuation roll to control the adverse effects on an municipal budget.

The research objectives are (Chapter 1):

5. Identify the drawbacks when employing a multidisciplinary approach, causing confusion
6. Explain why there is a difference between spatial data and deeds data
7. Record the extent of a flawed valuation roll on the budgetary determination and fund allocation within the municipality
8. Develop a framework of proper reconciliation, limiting the mistakes on a valuation roll, therefore, limiting the budgetary influence on a municipality

This chapter is divided into five sections. Section 5.1 contains the introductory review of the findings; Section 5.2 discusses each objective while evaluating the



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extent to which it has been achieved; Section 5.3 proves the concluding remarks on the findings; Section 5.4 confirms the practical implications of the study; Section 5.5 recommends future studies.

## 5.2 The realisation of study objectives

### *5.2.1 Identify the drawbacks when employing a multidisciplinary approach, causing confusion*

Implementing a multidisciplinary approach when combining a property register and later valuation roll indicated micro-obstacles; however, when observing the macro indicators, the main concerns are legal knowledge, modern applications, and the Municipal Standard Chart of Accounts compliance. All the professional interviewees were knowledgeable about the Chief Surveyor-General and Chief Registrar of Deeds; however, a definite limitation was reflected regarding understanding the actual Acts governing the two bodies. The combined specialities will aid in developing a completed register that will include historic properties, current properties, and proposed properties.

A modern application, such as Computer-assisted Mass Appraisal valuations, is considered a futuristic dream. A lack of information/specialists/time prohibits a full application of Computer-assisted Mass Appraisal analysis in the municipal sphere. This hinders a multidisciplinary approach to be followed at full capacity.

The Municipal Standard Chart of Accounts reflects implemented guidelines. The professionals adhere to the basic requirements set by these guidelines. In most cases, it was identified that the stakeholders within the municipality do not communicate or allow for data exchanges, owing to several reasons, such as non-payment.

### *5.2.2 Explain why there is a difference between spatial data and deeds data*

The Chief Surveyor-General and the Chief Registrar of Deeds governing Acts portray similar functions that should assist the municipality/contractors in developing



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a property register more accurately when used in combination; however, if the governing Acts are not understood and perused together, applying and using the data will be conducted incorrectly. The Chief Surveyor-General data register will comprise a full data set of historic, current, and future property information. The Chief Registrar of Deeds register may only include historic properties and current properties. This represents the difference between the two data sets. Some observed that the linking of this data to the Chief Registrar of Deeds demonstrates that a fair number of future properties replaced the registered properties in the Chief Registrar of Deeds data set. The data on both should be considered complete, with an overstatement of either historic or future records; therefore, excluding current billable records that can be fixed by a proper reconciliation of the two data sets.

### *5.2.3 Understand the extent of a flawed valuation roll on the budgetary determination and fund allocation within the municipality*

The analysis in Figure 4.1 demonstrates the differences among the valuation rolls, Chief Registrar of Deeds, and Chief Surveyor-General data. A monetary influence will, therefore, also be evident. In monetary terms based on the findings in Figure 4.1, R180 billion of property values could not be established on the Chief Registrar of Deeds. The Chief Surveyor-General data portray R200 billion of property values that could not be geographically identified. The implication on the budget is that R2 billion of revenue could be lost considering the mismatched data; this was calculated over 23 municipalities only. The influence of the 278 municipalities could display adverse conditions. Revenue loss will have a detrimental implication on the municipal budget. With an over/understated budget, providing better work and living areas within the municipal boundary, as indicated by the Local Government Finances and Budget Guide in 2019, will be impossible. The vision, as set out by each municipality, will, therefore, be implicated with the excessive loss in potential revenue.



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### *5.2.4 Develop a framework of proper reconciliation, limiting the mistakes on a valuation roll, and budgetary influence on a municipality*

Previous data should be analysed and compared to fresh data to determine the discrepancies and deal with them before completing the property registers. A multidisciplinary approach to enforcement would limit mistakes; however, this comes at a cost that might pose an additional issue; if this is conducted correctly and kept up-to-date, future costs should be reduced attributable to data cost savings. A proposed framework would include the combined use of the Chief Surveyor-General and Chief Registrar of Deeds data when developing a property register. The reconciliation of the two data sets should be considered with advisory comments, indicating property exclusion. The best practice would be to have three types of data sets, indicating historic, current, and proposed data, complete with comments on identifying property replacements. An accurate valuation roll can now be developed with limited influence on the municipal budget.

## 5.3 Conclusion

Under-performing municipalities were observed in the AG reports. Limited municipalities obtained clean audits. Although funding malmanagement is one of the most implicated sections of these audits, a critical indication is an inability of obtaining the needed revenue from taxpayers.

Considering the multiple Acts governing local government, national government and governmental institutions led to confusion and incorrect implementation of the Acts. The main aim of a property register is to ensure the municipality knows the exact number of properties in its jurisdiction. This will allow the municipalities to budget for future planning and to determine if current services are sufficient. Considering the vision of the municipalities, a budget is the core of any business; a municipality is a large service-providing business.

Three main income streams affect the budget, indicating electricity, government grants, and rates and tax. Government grants are the only income not linked to a



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property or a specific property owner. Most services provided to the local inhabitant are linked to a geographically located property. A multidisciplinary approach in developing a property register should be a high priority to improve revenue collections.

A distinct understanding of the Chief Registrar of Deeds and Chief Surveyor-General promulgating Acts demonstrates that combining the two data sets and reconciling the differences would allow for limited mistakes in property identification. This will allow for identifying historic non-rateable properties, current rateable properties, and future rateable properties. By identifying the three property types, a more accurate valuation roll can be generated, demonstrating an actual reflection of rateable properties, which will reflect a more accurate budget. This approach should be limited to underestimated or overestimated valuation rolls as the reconciliation would have cleared those concerns.

Chief Surveyor-General data use would also improve the valuations of the valuation roll, attributable to the ability to identify users, display value implication features, and interlink this information with a Computer-assisted Mass Appraisal valuations system. The electronic data will also ensure uncomplicated record-keeping and updating of municipal data, ensuring the municipality supplies an accurate property register and valuation roll. The valuations team will focus on the valuations rather than property register development.

Legislation and contracts must change to enforce liability, work quality, and data handovers. Without contracts and limited legislative measures, the municipal budgets will remain deficient and municipal services will continue to deteriorate.

## 5.4 Practical application

The study attempted to obtain an understanding of how two disciplines can limit the negative influence on the valuation roll and the budget. The need to understand if a multidisciplinary approach would aid municipalities in obtaining the revenue to oversee the day-to-day municipal intended services. This relies on the



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understanding of how to develop a property register correctly. As indicated by a Cooperative Governance and Traditional Affairs study, several differences between Chief Registrar of Deeds and Chief Surveyor-General data exist; the aim was to prove this in an academic study and to determine the reasons for these differences.

The aim was also to determine the influence of these variances on the monetary value of the budget. The study proved that differences exist and that the influence on the budget should be a high priority to address. The plausible revenue loss owing to poor reconciliation is tremendously high considering the small sample and the number of properties. If this value loss would be extrapolated over all municipalities, the revenue loss will be dismal.

The study further aimed to address the obstacles when applying a multidisciplinary approach. The study provides guidelines on how to address these concerns through the governing Acts. It demonstrates how the Acts interlink and affect one another. The local government can, therefore, address the issues identified with the service providers and enforce specifications in the endorsed contracts with the service providers. It would furthermore identify plausible legislative solutions and time allocation issues, proposed or incorporated into municipal contracts.

Although this study aimed to address specific poor reconciliation concerns and their influence on the municipal budget, additional concerns can be identified and should be researched. The subsequent section stipulates plausible future research.

## 5.5 Recommendations for future research

Following the preceding discussion above, future research can be conducted to improve the knowledge of municipalities regarding property registers and valuation roll. Considering the understanding of how the Acts function, further studies could include: (i) timeframe allocation for developing property register and actual data needed; (ii) service level agreement development to enforce a multidisciplinary approach and layout guidelines for plausible service providers; (iii) linking department analysing all Chief Registrar of Deeds and Chief Surveyor-General data



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to develop property register data indicating the status of the property; (iv) identifying training shortages for governmental staff to allow them to identify the roll challenges and the work conducted by the service provider; (v) plausible development of a national property register department, advancing and hosting the property register and geographical information system data, corresponding with the data to date: (vi) how to incorporate unregistered ratepayer into the valuation roll without affecting the municipal budget; (vii) practical application of a multidisciplinary approach when developing a property register, valuation roll, and corresponding layers. Local governments could request a multidisciplinary approach for developing the property registers and valuation rolls and allocate sufficient time for progressing the registers until further research is conducted.

Considering the foundation of the South African Acts being of British colonial descent, it will be possible to obtain valuable solutions from how they developed their federal layers and registers. It could be wise to consider how first-world countries undertake to develop the registers. A similar strategy could be applied with improvised changes to suit the needs of the uniquely South African property situation. Developing and implementing a hybrid approach, accommodating the property owner solutions within the urban and rural spheres of local government, engaging various ratepayers and property ownerships.

When considering the main problem statement, what could the detrimental effect be on the municipal budget if a multidisciplinary approach between Property Valuation Experts and Geographical Information System Experts are not applied? It can be confirmed that a multidisciplinary approach is key for the development of Property Registers, Valuation Rolls that end up forming a part of the Municipal Budgets. It was clearly stipulated in the data analysed that a tremendous amount of income is lost due to poor reconciliation between the Chief Registrar of Deeds data and Chief Surveyor-General data since properties cannot be located spatially or are not registered.



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# APPENDICES

## Appendix A: Ethics Clearance

Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

6 April 2022

Reference number: EBIT/257/2020

Mr P Venter
Department: School for the Built Environment
University of Pretoria
Pretoria
0083

Dear Mr P Venter,

**FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY**

Your recent application to the EBIT Research Ethics Committee refers.

Approval is granted for the application with reference number that appears above.

1. This means that the research project entitled "The impact of poor reconciliation between Surveyor General Data (Spatial) and Deeds Register Information on Municipal Budgets " has been approved as submitted. It is important to note what approval implies. This is expanded on in the points that follow.
2. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Research Ethics Committee.
3. If action is taken beyond the approved application, approval is withdrawn automatically.
4. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.
5. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

**Prof K.-Y. Chan**
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY



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## Appendix B: Questionnaire

The following question will be proposed to different professional persons:

Deeds Data questions

1. What are the duties of the Registrar of Deeds in South Africa?
2. Can raw deeds data be provided to develop a property register that will later form a valuation roll?
3. When scrutinising deeds information, did the data lack information?
4. What needs to be considered when developing registers?
5. Should the deeds information be observed as the highest order of property information?
6. When considering registered properties, are they all reflected in a raw deeds file?
7. As appose to the aforementioned question, does a property register hold only active properties?
8. What constraints have been identified when using deeds information to develop a property register?
9. Does the inclusion of unregistered properties affect the municipal budget?
10. When a register is developed, how would the earlier valuation be used?

Surveyor General Data questions

1. What duties does the Surveyor-General fulfil in South Africa?
2. How does a professional use Surveyor-General data day-to-day?
3. When conducting work in the property industry, is it a norm to rely on electronic Surveyor-General data?
4. What difficulties were identified when using electronic Surveyor-General data?
5. If a property register is developed, can the professional rely on the Surveyor-General data solely to develop an accurate register?
6. When using electronic Surveyor-General data, do you use a geographical information system?
7. When using this data, do you know the source and accuracy of this information?

Combined use questions

1. When a property register is developed, might it be possible that some registered properties are excluded from a register and later the valuation roll?
2. When developing a property register, might it be possible to use a combination of the two datasets?
3. If yes, how did the two data sets improve the property register's accuracy?
4. Considering the aforementioned questions, would a multidisciplinary approach be more acceptable to develop a property register?
5. 5. How does the completeness and correctness of a property register influence the valuation roll and the municipal budget?
6. How can legislation or contracts be used to improve the produce delivered by a contractor?



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