

Revenue Collection Enhancement Using GIS



GeoAfrika
Technologies



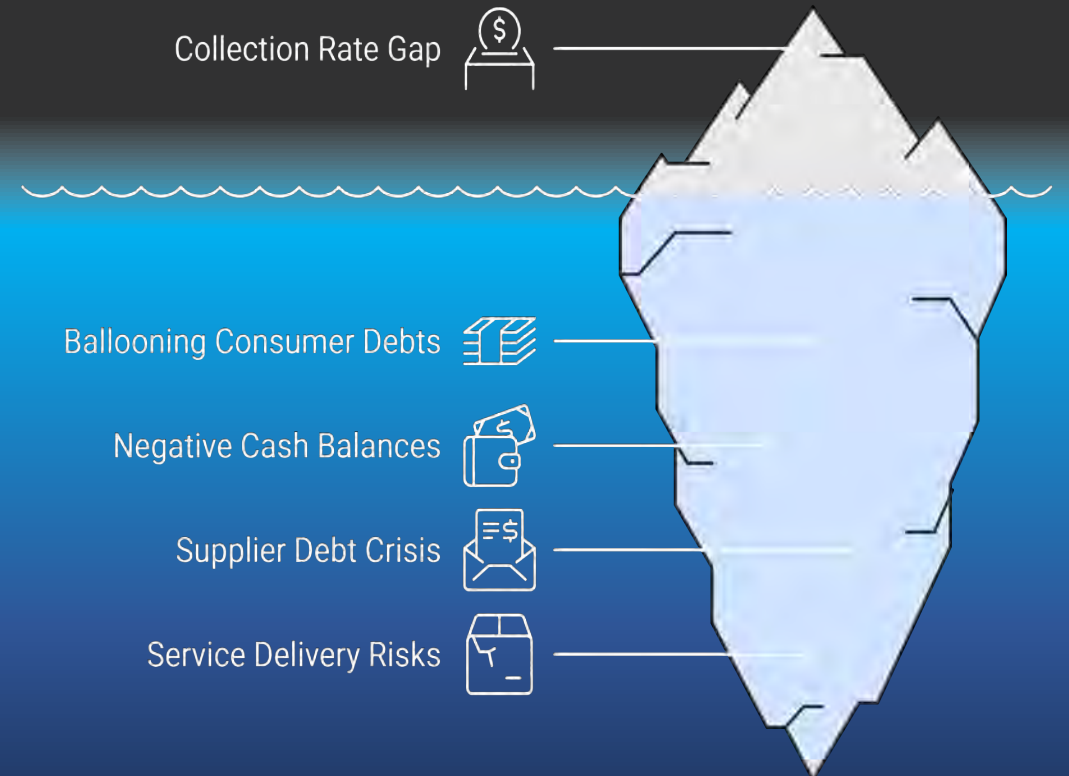
Chris Carter
30 October 2025

The State of South African Municipal Finances as at June 2025

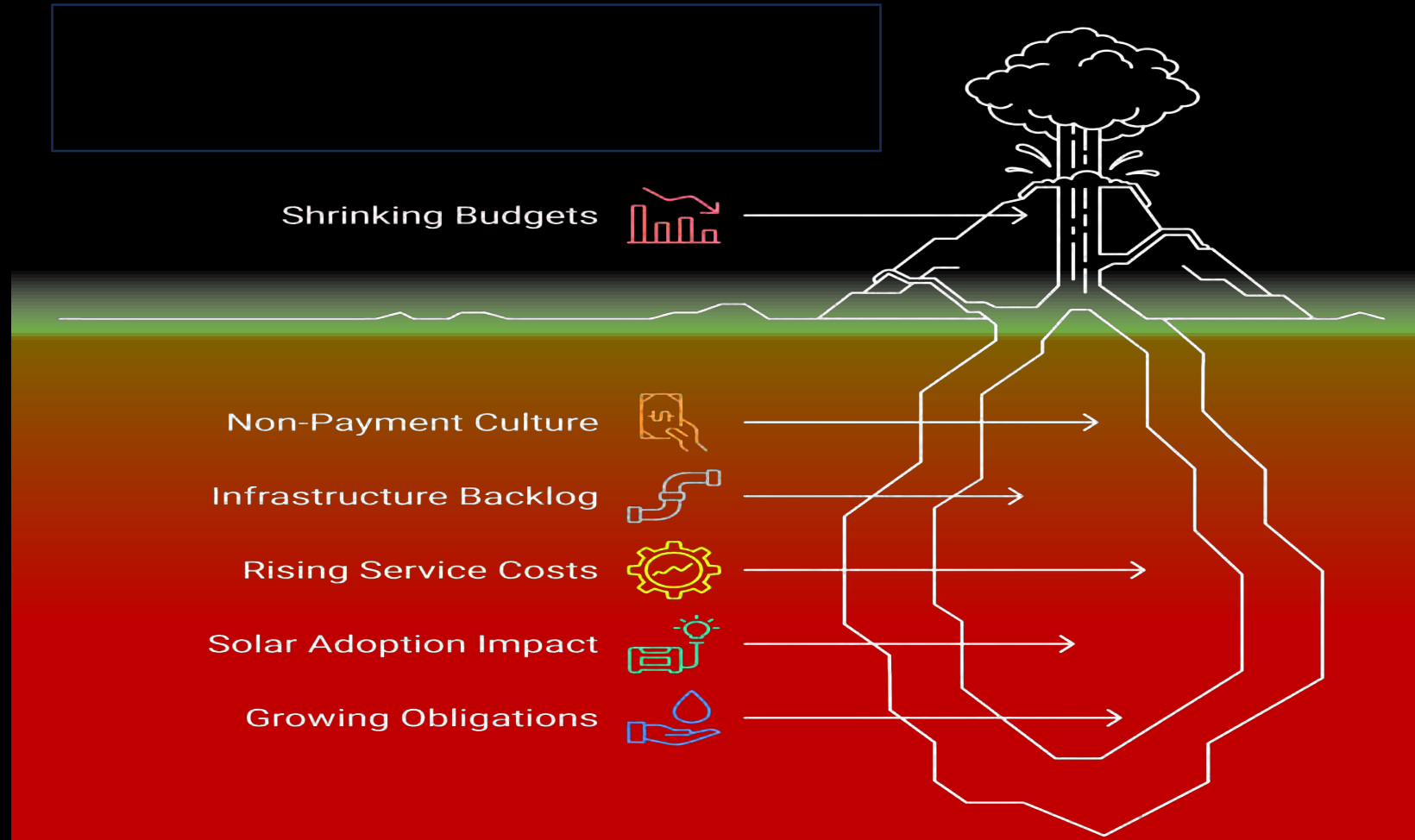


- Unpaid municipal bills in SA stand at R427 bn. R376bn is at over 90 days old. R307bn (72%) are owed by households.
- Unpaid municipal bills increased by 26% over the last year
- Municipal debt continues to increase, eg Water Boards owed over R25bn, Eskom owed over R100bn
- Municipalities are budgeting optimistically but collect far less in reality – R46bn shortfall in collections versus their projections last year

Unveiling the Depths of South Africa's Financial Distress.



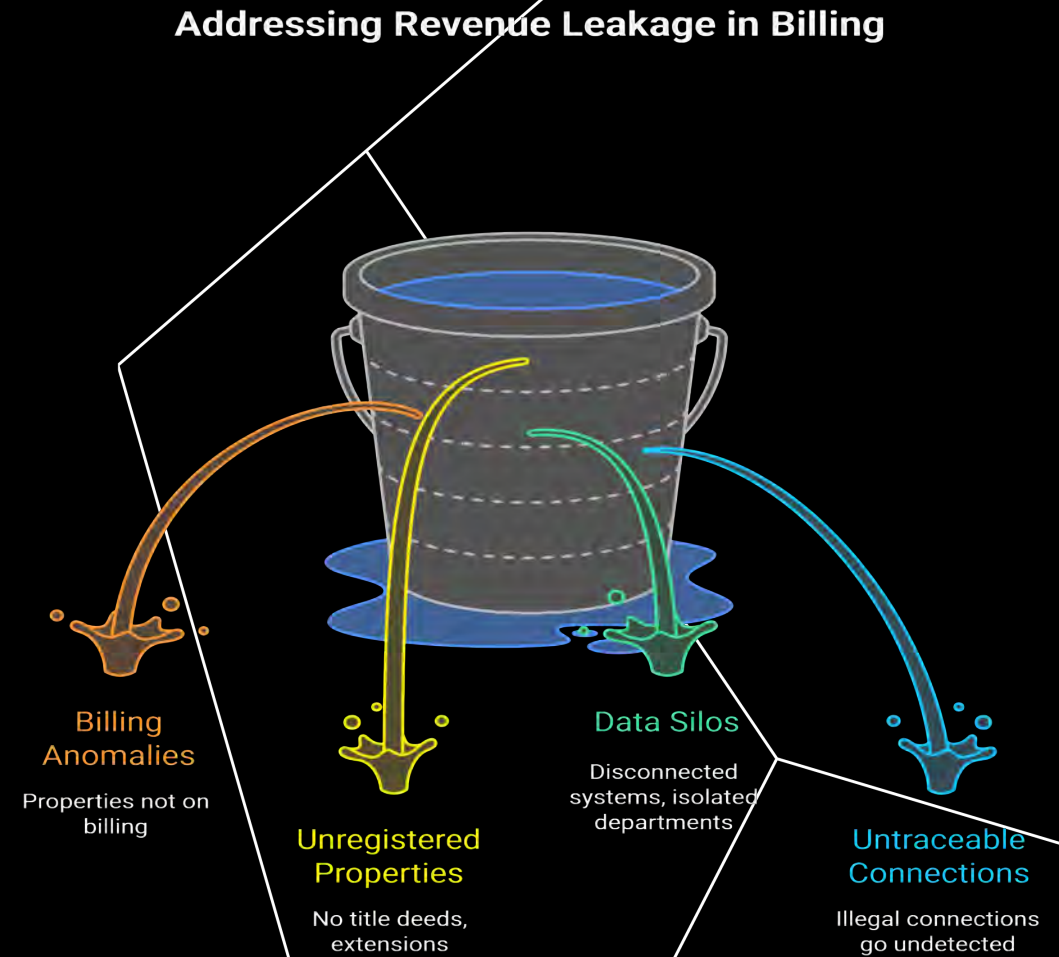
Key Factors Undermining Municipal Revenue



The Solution: GIS Technology

GIS links **location-based data (properties & infrastructure)** with **financial or administrative data (billing, valuation, zoning, licensing)** to help identify:

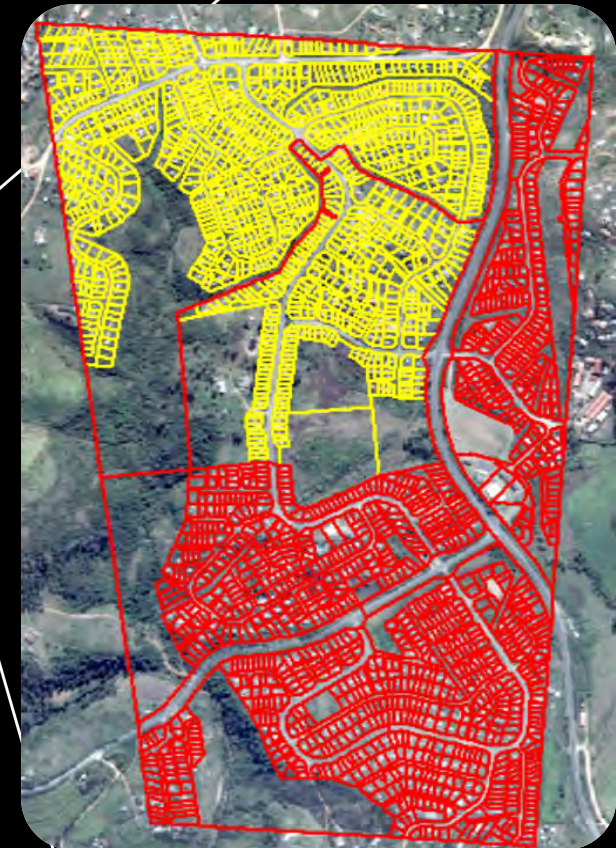
- Unregistered or undervalued properties
- Unbilled properties
- Billing leakages and revenue losses
- Spatial patterns of compliance or evasion



The Need for Accurate and Correct Property Data

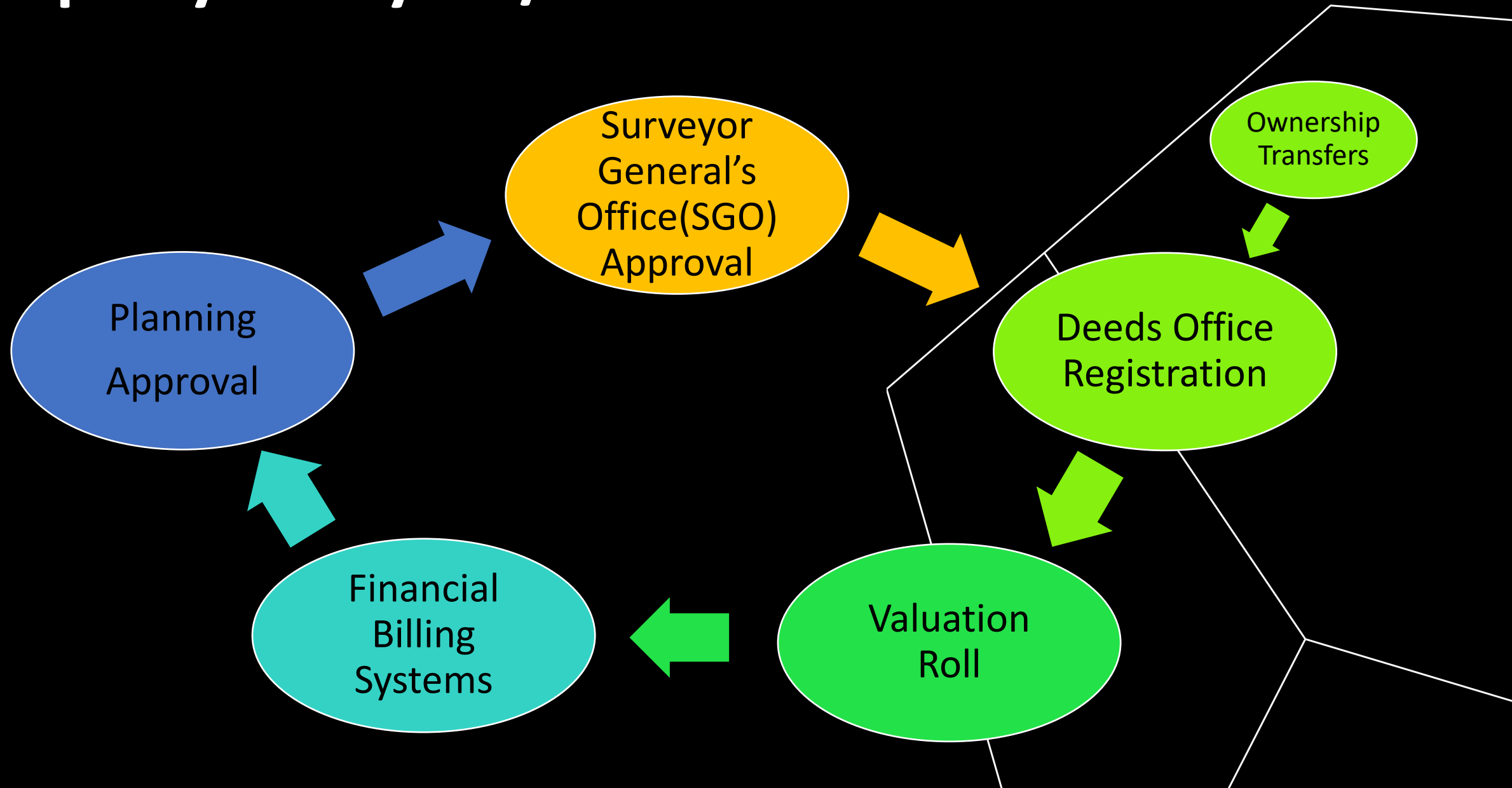
- Planning and LUMS
- Provision of Services
- Valuations
- Asset Management
- Building Management
- Street Address Management
- Billing

*ALL REQUIRE LINKAGE TO EITHER THE **SG-APPROVED**
OR **DEEDS OFFICE-REGISTERED** CADASTRAL DATA LAYERS*





Property life cycle / data maintenance



Problems with data from the Surveyor General's Offices and Deeds Office

- Spatial boundary errors in SGO data
- Property description errors in SGO data
- Properties missing in SGO data
- Ceased properties not deleted from Deeds Office data
- Properties missing from Deeds Office data



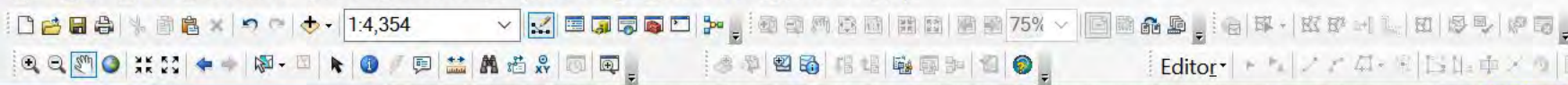
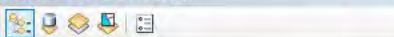


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Layers

- ☐ LandUseZoningInNewCadast
- ☐ kzn_lm_2016
- ☐ LM2011_kzn
- ☐ AllotmentTownship
- ☒ LatestCadastral
 - ☐ UmdoniLM_RegisteredCac
 - ☒ UmdoniLM_SGApprovedC
 - ☐ UmdoniLM_UnregisteredC
- ☐ OwnershipClassification
- ☒ OriginalSGODData
 - ☒ Street
 - ☒ PublicPlace
 - ☐ ParentFarm
- ☒ Erf
- ☒ FarmPortion



-29774.855 -3361698.292 Meters




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Layers	
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<input type="checkbox"/>	LM2011_kzn
<input type="checkbox"/>	AllotmentTownship
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<input type="checkbox"/>	UmdoniLM_UnregisteredC
<input type="checkbox"/>	OwnershipClassification
<input checked="" type="checkbox"/>	OriginalSGODData
<input checked="" type="checkbox"/>	Street
<input checked="" type="checkbox"/>	PublicPlace
<input type="checkbox"/>	ParentFarm
<input checked="" type="checkbox"/>	Erf
<input checked="" type="checkbox"/>	FarmPortion



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☐ LandUseZoningInNewCadast

-

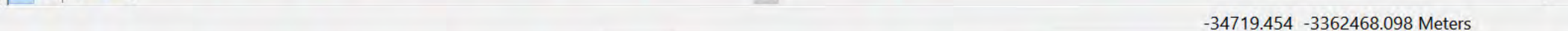
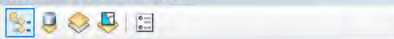


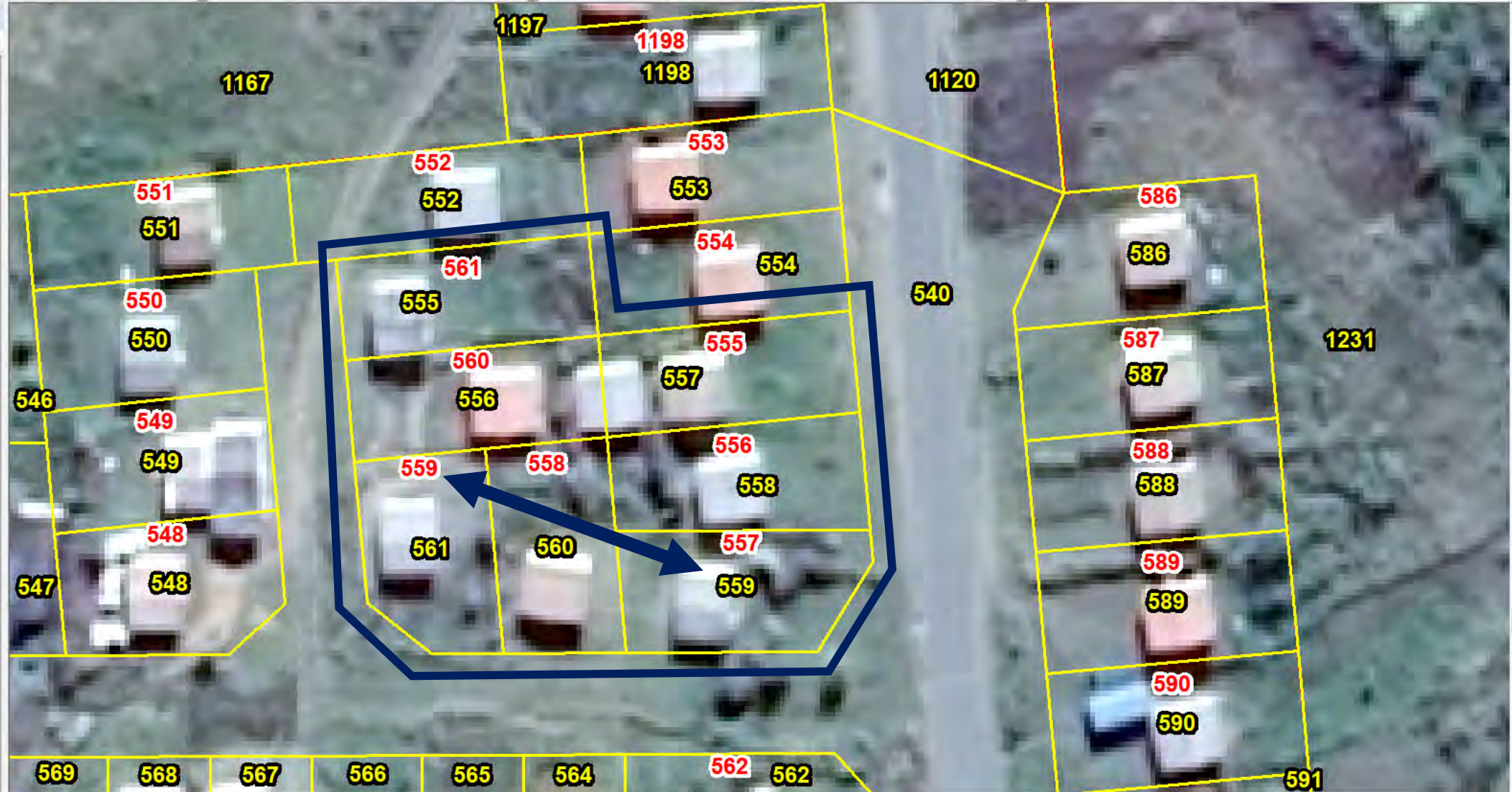


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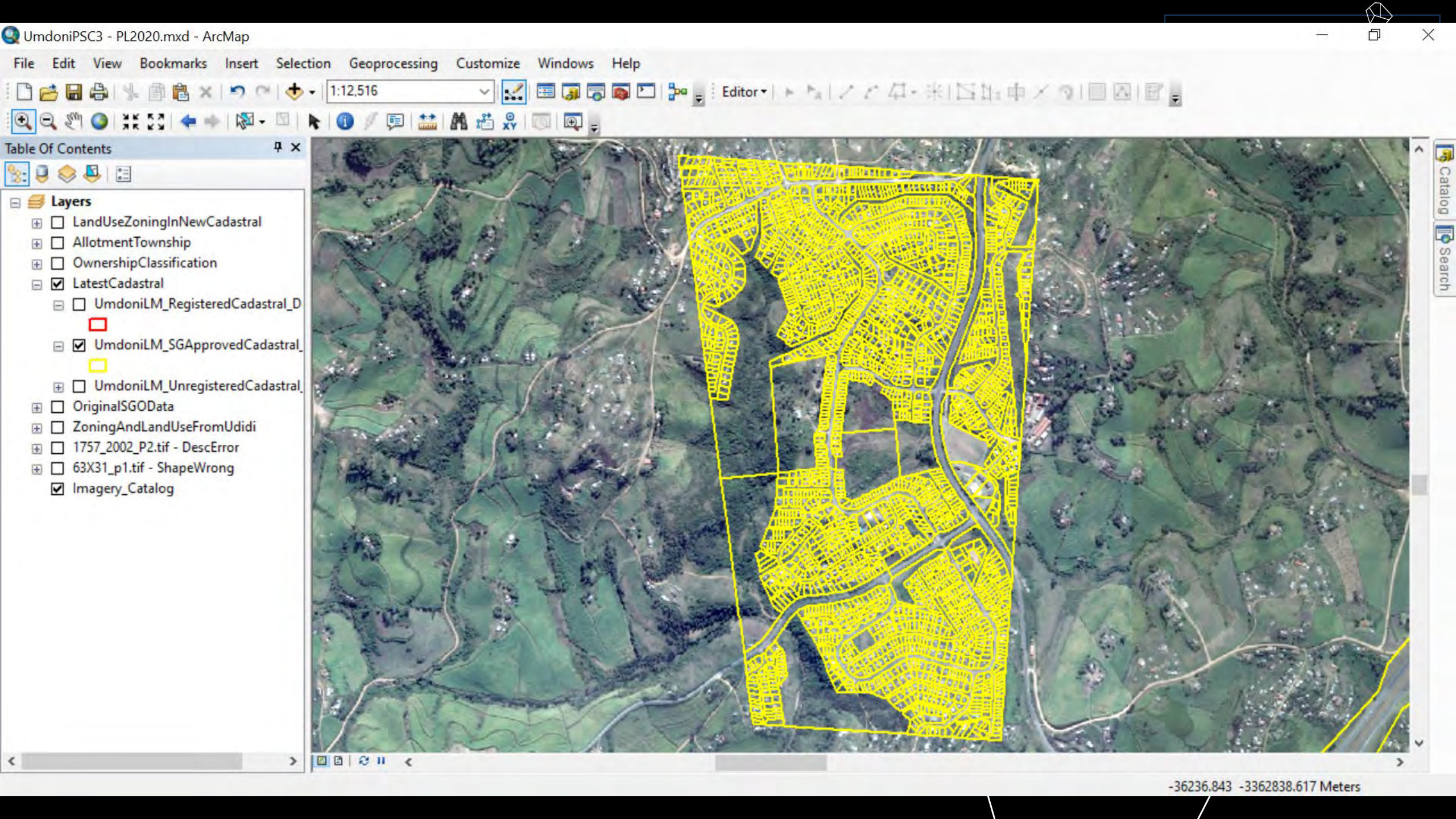
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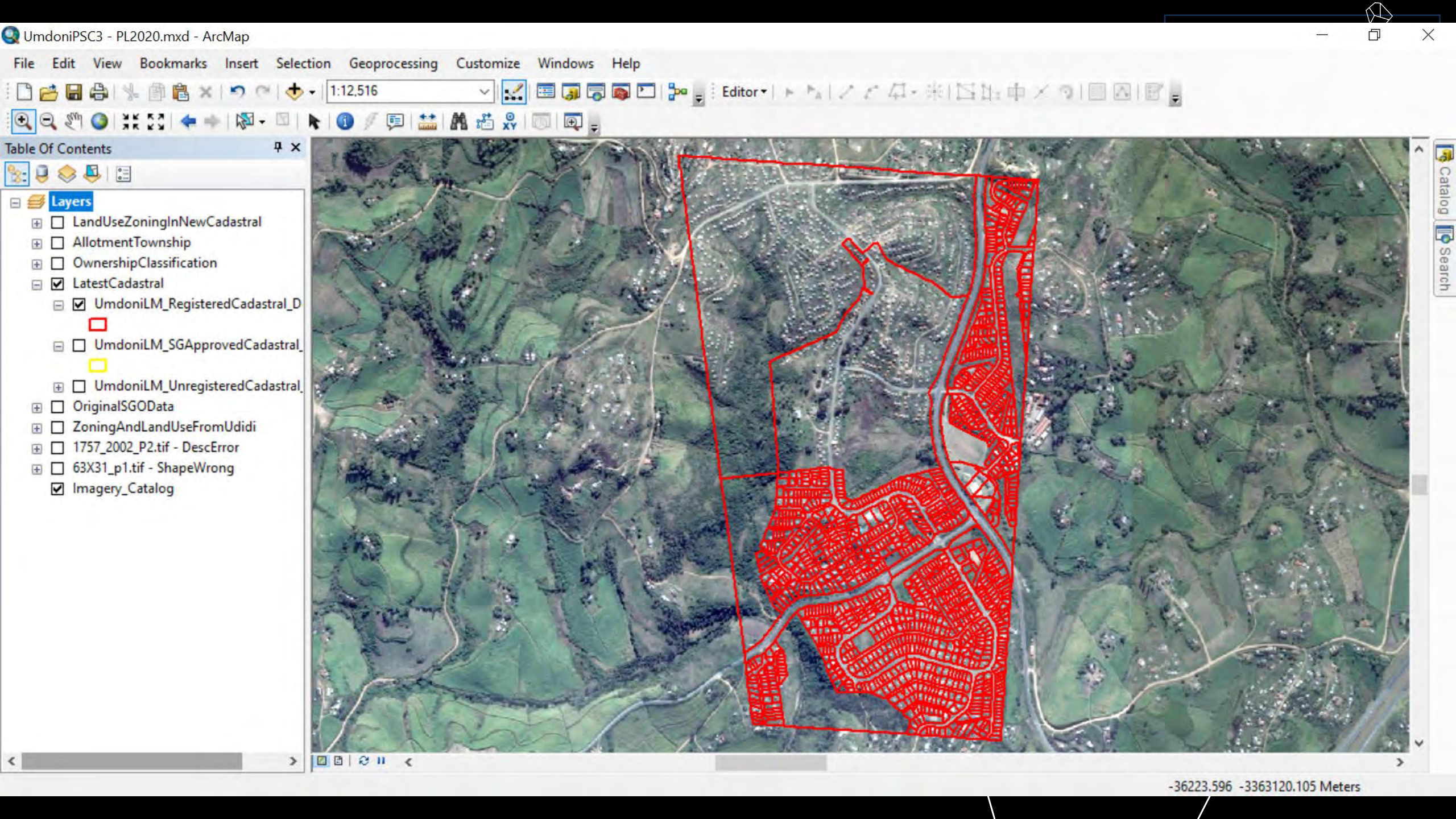
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 - ☒ Street
 - ☒ PublicPlace
 - ☐ ParentFarm
- ☒ Erf
- ☒ FarmPortion



Cadastral and ownership audit in GIS

- **Check and fix SGO GIS datasets**
 - Obtain the SGO GIS datasets
 - Obtain the scanned images of diagrams and GPs
 - Check all properties in the SGO GIS data against the SG diagrams and GPs and fix spatial boundaries errors and property description errors
- **Obtain Deeds Office ownership data and link**
 - Acquire the Deeds Office ownership data
 - Link the ownership data to the SGO data using the SG 21 digit code
- **Create registered and unregistered layers of cadastral data**
 - Move all unregistered properties into a separate GIS data layer
 - Investigate parent properties of unregistered properties and capture into the GIS





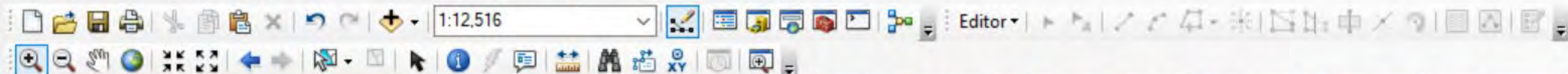
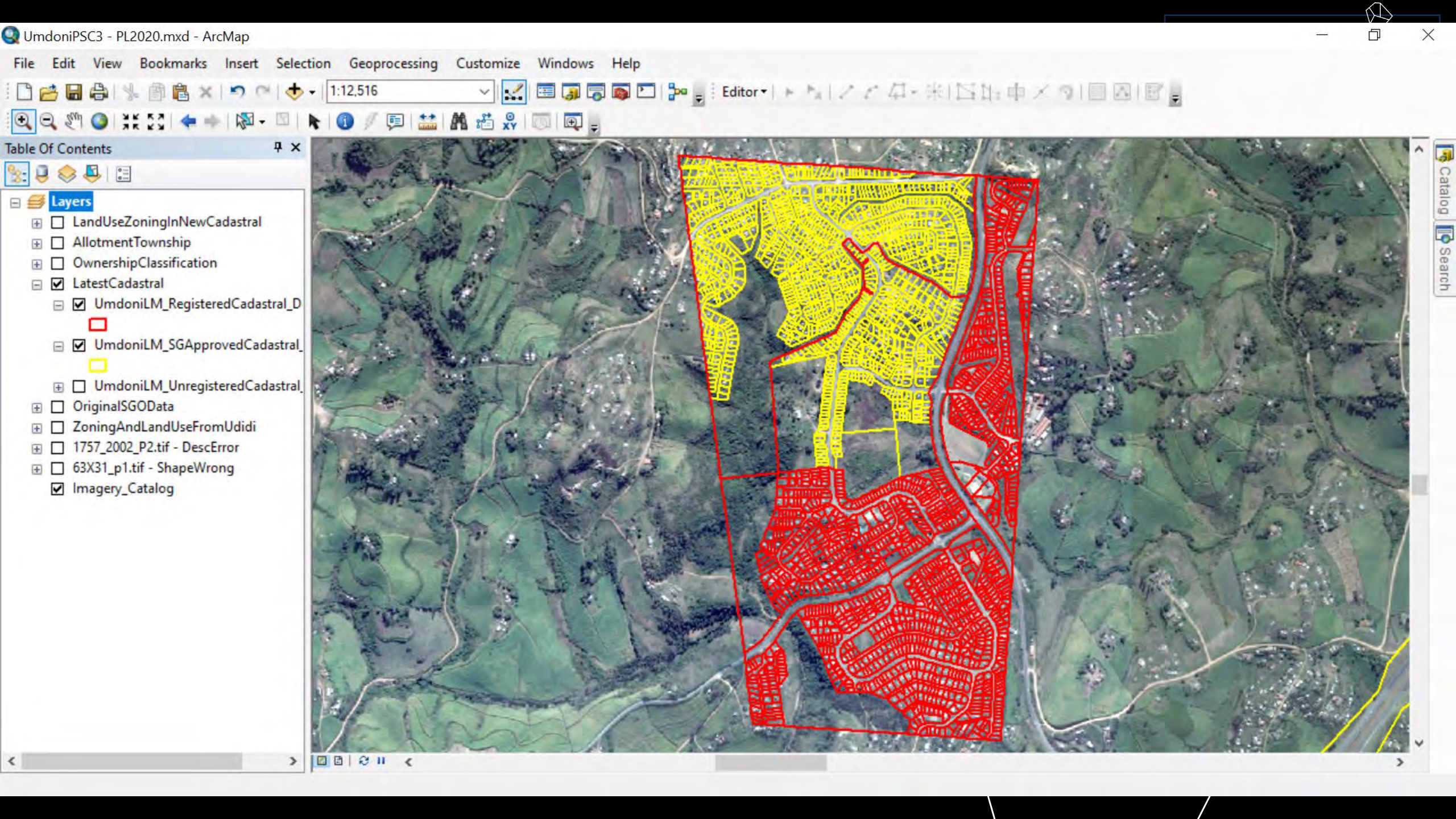
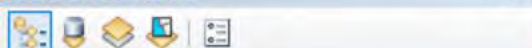
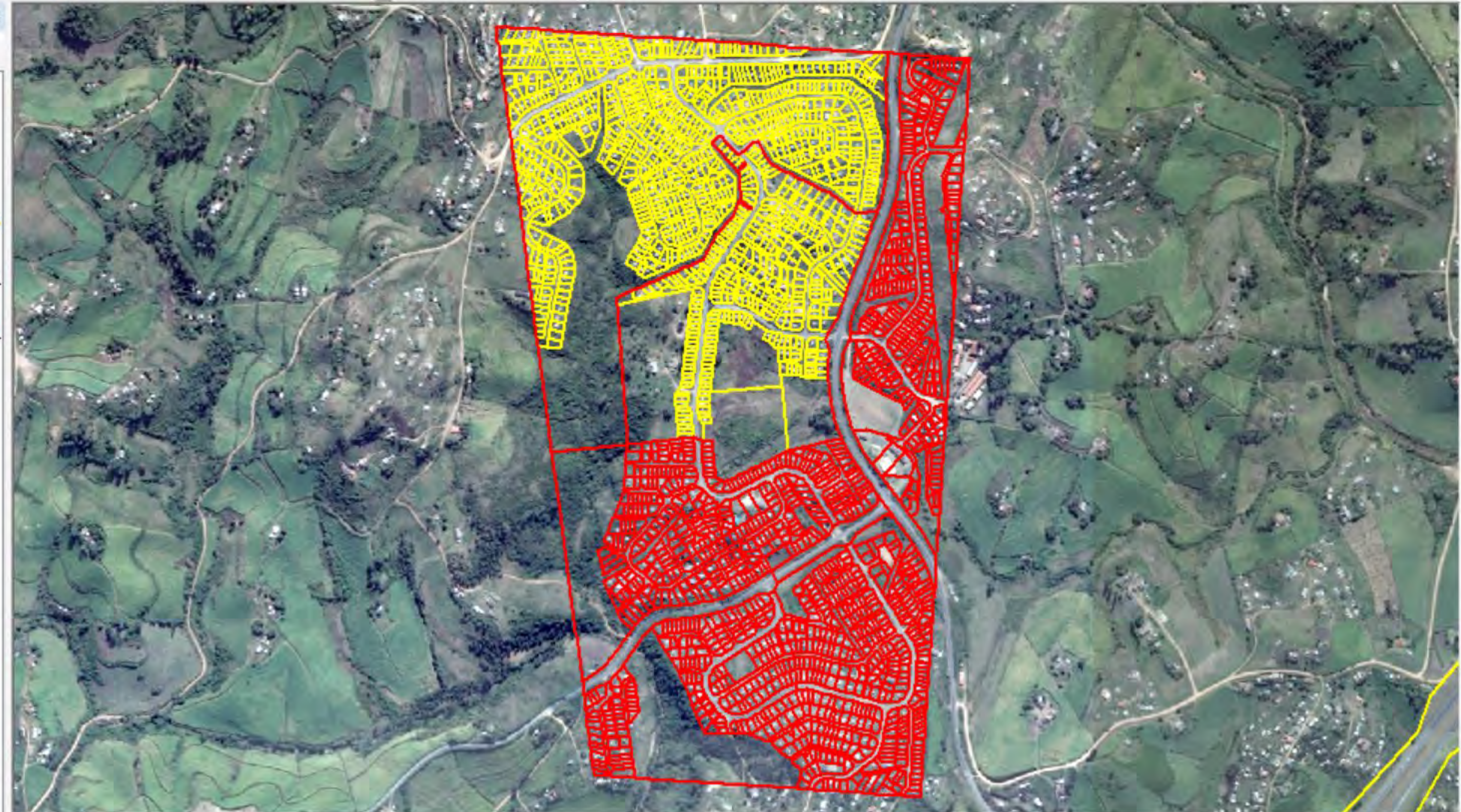


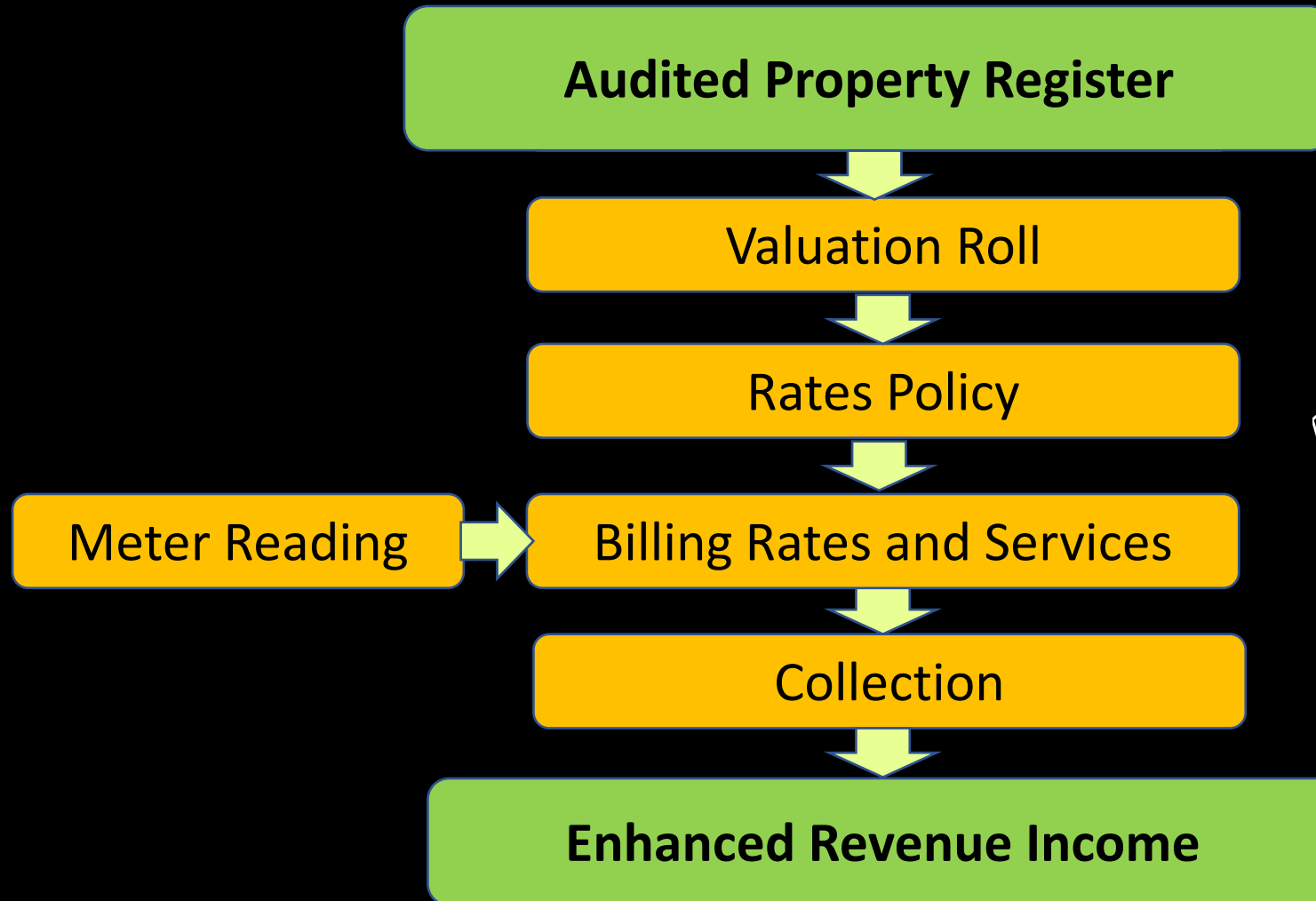
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 - ☒ UmdoniLM_SGApprovedCadastral_
 - ☐ UmdoniLM_UnregisteredCadastral
 - ☐ OriginalSGOData
 - ☐ ZoningAndLandUseFromUdidi
 - ☐ 1757_2002_P2.tif - DescError
 - ☐ 63X31_p1.tif - ShapeWrong
 - ☒ Imagery_Catalog



Revenue Enhancement



Revenue Enhancement is achieved by investigating and fixing:



- Errors and/or anomalies in the billing system:
 - Missing Properties
 - Ghost properties
 - Incorrect owner names
 - Incorrect owner contact details
 - Incorrect property values
 - Incorrect rates categories and rates tariffs
 - Services not billed for
- Government debt
 - Facilities known by names but is not linked to property description

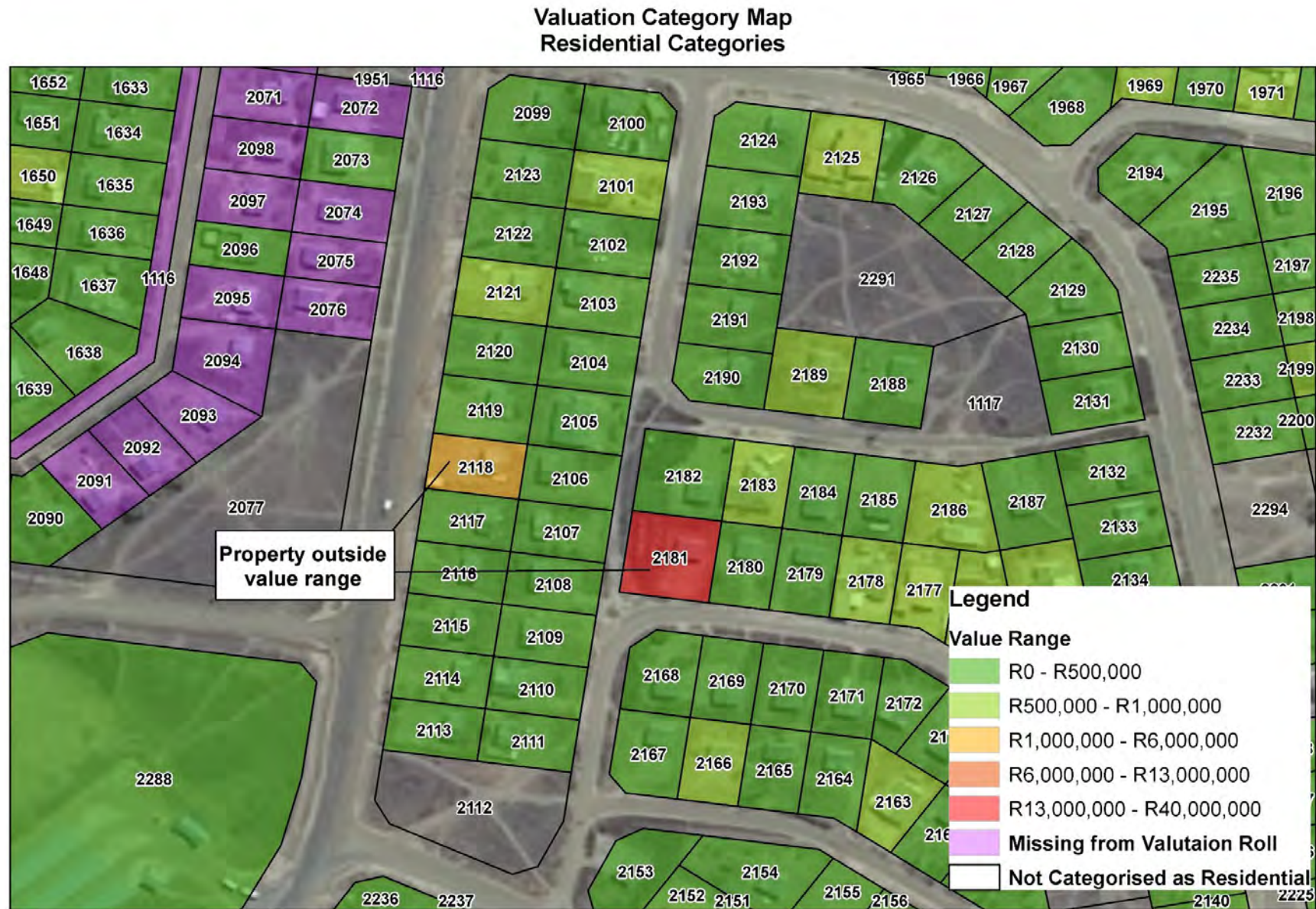
Township	Erf	Portion	FarmName	DiagramDeedNumber	Extent	RegistrationDate	Remainder	LPICode	Comment
Barkly Wes		1 0		G115/1937	4.3223h	19370115	-1	C00700010000000100000	
Barkly Wes		2 0		T35/1940	9210sqm		0	C00700010000000200000	
Barkly Wes		3 0		T35/1940	8711sqm		0	C00700010000000300000	
Barkly Wes		4 0		T35/1940	6763sqm		0	C00700010000000400000	
Barkly Wes		5 0		T35/1940	9240sqm		0	C00700010000000500000	
Barkly Wes		6 0		T35/1940	7554sqm		0	C00700010000000600000	
Barkly Wes		7 0		T35/1940	8571sqm		0	C00700010000000700000	
Barkly Wes		8 0		T35/1940	7738sqm		0	C00700010000000800000	
Barkly Wes		9 0		T35/1940	6437sqm	19771128	0	C00700010000000900000	Cancelled. Consolidated to Erf 1421 (registered)
Barkly Wes		10 0		T35/1940	5963sqm	19771128	0	C00700010000001000000	Cancelled. Consolidated to Erf 1421 (registered)

Township	Erf	Portion	Name	IDNumber	TitleDeed	RegistrationDate	PurchasePrice	Share	PurchaseDat	LPICode	Required	Comment	OwnerCateg
Barkly Wes RD	159 0		Vanzoelenslaagte Farms CC		T243/1987	19870225	Unknown		Unknown	C00700000000015900000	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	159 3		Stobo Water Boring Co Pty Ltd	196700001809	T801/1972	19720822	Unknown		Unknown	C00700000000015900003	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	159 6		Tradequick 1090 CC	199803009023	T2465/2008	20081014	R 3 002 500.00		20080815	C00700000000015900006	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 0		Rosgro Pty Ltd	97 07616/07	T4701/1997	19971203	R 80 000.00		19970325	C00700000000016000000	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 1		Tradequick 1090 CC	199803009023	T3345/1999	19991117	R 800 000.00		19990331	C00700000000016000001	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 2		Denis Wakeford Family Trust	IT209/2002	T1792/2002	20020805	R 1 700 000.00		20020709	C00700000000016000002	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 3		Nvw Familie Trust	IT78/2007	T542/2010	20100421	R 3 000 000.00		20081110	C00700000000016000003	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 4		Kd Mining Pty Ltd	198900504707	T1666/1989	19891006	Unknown		Unknown	C00700000000016000004	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	160 5		Tradequick 1090 CC	199803009023	T2464/2008	20081014	R 2 462 500.00		20080815	C00700000000016000005	<input checked="" type="checkbox"/>		Private
Barkly Wes RD	161 0		Klipdam Diamond Mining Co Ltd	199400175406	T1876/2014	20140919	R 5 805 447.00		20140704	C00700000000016100000	<input type="checkbox"/>	Consolidated into Erf 2153	Private

Registrar	Township	Erf	Portion	Number	Description	Amount	LPICode
	4 Barkly Wes RD		279 0	VA128/2010	T1360/1997	Unknown	C00700000000027900000
	4 Barkly Wes RD		279 0	OD3/1990		Unknown	C00700000000027900000
	4 Barkly Wes RD		279 1	K64/1989S		Unknown	C00700000000027900001
	4 Barkly Wes RD		280 0	VA128/2010	T1360/1997	Unknown	C00700000000028000000
	4 Barkly Wes RD		280 0	OD6/1990		Unknown	C00700000000028000000
	4 Barkly Wes RD		280 1	K64/1989S		Unknown	C00700000000028000001
	4 Barkly Wes RD		281 0	I-2790/2002C		Unknown	C00700000000028100000
	4 Barkly Wes RD		281 0	I-5187/1999C	K45/1983rm	Unknown	C00700000000028100000
	4 Barkly Wes RD		281 0	I-5187/1999C	K45/1983rm	Unknown	C00700000000028100000
	4 Barkly Wes RD		281 0	EX67/1981		Unknown	C00700000000028100000

Registrar	Township	Erf	Portion	Number	Description	Amount	LPICode
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	4 Barkly Wes		248 0	T614/1977	Schoeman David Stephanus	Unknown	C00700010000024800000
	4 Barkly Wes		248 0	B842/1992	Absa	R 60 000.00	C00700010000024800000
	4 Barkly Wes		248 0	B1608/1996	United	R 10 000.00	C00700010000024800000
	4 Barkly Wes		250 0	T533/1955	Langeveld Harry Lionel	Unknown	C00700010000025000000
	4 Barkly Wes		250 0	T483/1994	Bekker J C 62500.00	Unknown	C00700010000025000000
	4 Barkly Wes		250 0	T5679/1995	Kokt Stephen	R 85 000.00	C00700010000025000000
	4 Barkly Wes		250 0	T3192/2005	Wessels Jan Johannes	R 340 000.00	C00700010000025000000
	4 Barkly Wes		250 0	B3135/1995	Standard	R 37 000.00	C00700010000025000000
	4 Barkly Wes		250 0	B2268/1997	Standard	R 15 000.00	C00700010000025000000

Illustrating cadastral and ownership land audit in GIS

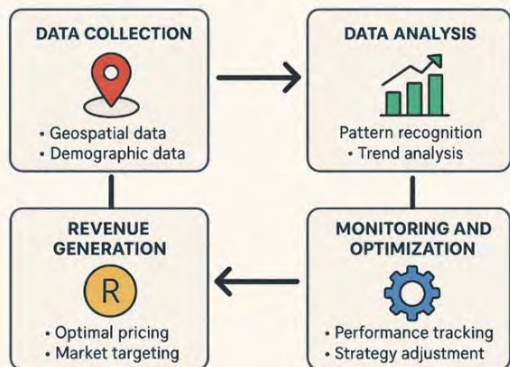


KEY RESULTS OF ANALYSIS FOR A SMALL MUNICIPALITY IN SOUTH AFRICA

Item	Number of properties	Percentage of 10,628 properties
Properties in the registered cadastral data layer that are not being billed for rates in the financial system	1,814	17.06%
Properties in the financial system being billed for rates with owner names that differ from owner names in the Deeds Office ownership database	2,373	22.32%
Properties in the financial system being billed for rates where the property tariff type differs from the land use captured	1,724	16.22%
Improved properties in the registered cadastral data layer that have active water meters which can be read, but for which the reading values are not being recorded in the financial system	628	5.9%
Improved properties contained in the registered cadastral dataset that have active water meters which cannot be read	750	7.05%
Improved properties in the registered cadastral dataset that have active electricity meters that can be read, but for which the reading values are not being recorded in the financial system	132	1.24%
Improved properties in the registered cadastral data layer that have active electricity meters which cannot be read	154	1.45%
Government facilities with a high outstanding debt greater than 90 days	12	



REVENUE ENHANCEMENT USING GIS



Thank you!

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