HDA
HOUSING DEVELOPMENT AGENCY
an agency of the Department of Human Settlements

How technology is driving performance to help create communities

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Housing Development Agency, South Africa

Outline

1. Brief history of the HDA
2. The Challenge
3. Organisational buy-in
4. Improving operations to deliver
5. Demonstration
6. The impact of technology

1. Brief History of the HDA

Establishment

Housing Development Agency (HDA) was established in 2009 after the enactment of the ***Housing Development Agency Act (No. 23 of 2008)*** and has been operational since the 2009/2010 Financial Year. The primary objectives of the HDA is to:

- identify, acquire, hold, develop and release **well-located** land and buildings for human settlement development;
- Facilitate housing delivery and package and design projects for human settlements development.

Our vision is to provide integrated, sustainable human settlements and security of tenure.

Initial footprint focusing on the "land mandate"

Current footprint focusing on the "developer mandate"

2. The Challenge

The need for Digital Transformation in the human settlements sector

1. With the advent of the **4th Industrial Revolution (4IR),** disruptive technologies has become a driving force behind business transformation.
2. The **Human Settlements sector** was no exception.
3. The **Minister** of Human Settlements challenged the sector to **use technology** efficiently, to deliver on its mission statement, "***to facilitate the creation of sustainable Human Settlements and improved quality of household life***."

The role of the GIS unit to implement new technologies

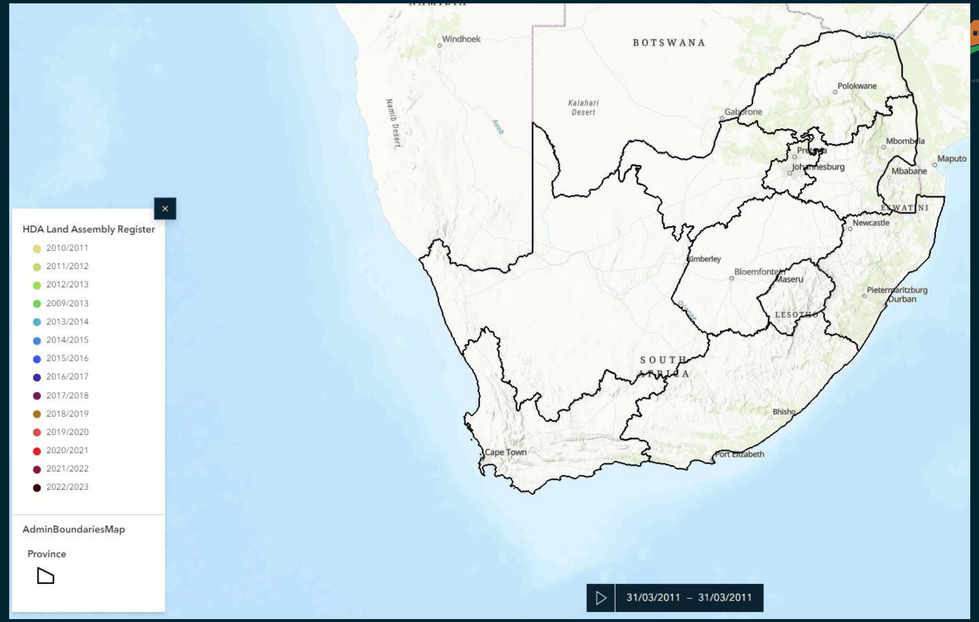
The **GIS unit** in the HDA has always been one of the units to use technology to **support decision-making**. The unit evolved significantly over time. Initially, the organisation was dependent on a service provider to provide geospatial services, to taking responsibility of:

- **mapping functions** (for land identification);
- **spatial analysis** (for spatial targeting); and
- **application development** to streamline business processes.

Land identification and property profiling

The unit identified over **900 000 ha** of land in all 9 provinces.

Property overview maps supplemented by infrastructure, ecological, geotechnical, land cover, social amenities and reports are submitted for **pre-feasibility** studies to determine whether land should be acquired, released and/or developed.

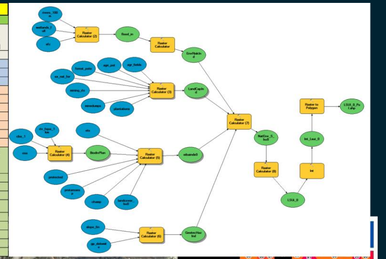


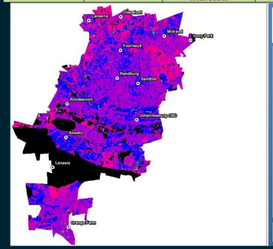
Spatial Analysis for Spatial Targeting

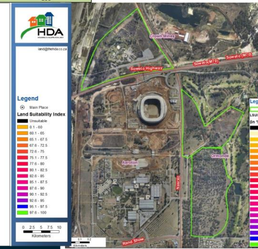
1. *National Human Settlements Land Indices (NaHSLI)*

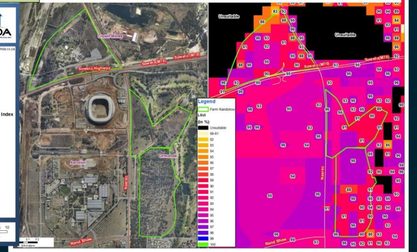
to determine well-located land

Land Suitability Index Weighting Model			
Index	**Determinants**	**Indicators**	**Weight**
Geotechnical Hazard Index	Geotechnical conditions	Slope	Slope 0-12 degrees [1]; slope 12-18 degrees [0.7]; slope greater than 18 [-100]
		Dolomite	-100
Environmental Risk Index	Flood and Inundation risk	Rivers with 100m buffer	0.3
		Wetlands with 100m buffer	0.3
		Estuarine Functional Zone	0.4
Land Capability Index	Forestry	Existing plantation	0.1
		Afforestation potential	0.3
		Natural forest	-100
	Agriculture	Existing fields irrigation	0.1
		Agriculture potential arable	0.1-0.5
	Mining	Mining rights	0.1
		Mine Dumps	-100
Ecological Infrastructure and Biodiversity Assets Index	Ecosystem threat status		Critically endangered [0.1]; Endangered [0.3]; Vulnerable [0.7]
	Biodiversity Planning	Critical biodiversity areas	0.1
		Ecological support areas	0.4
		FEPA with 1KM buffer	0.3
	Protected areas	Existing protected areas	-100
		Protected areas expansion	0.4
		Champion tree with 50m buffer	-100
	Habitat quality	Natural	0.1
		Degraded	0.7
		Water bodies	-100









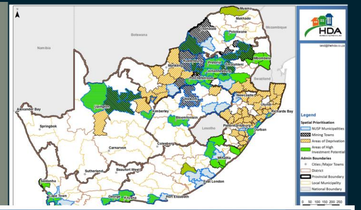
2. *Human Settlements Master Spatial Plan (HSMSP)*

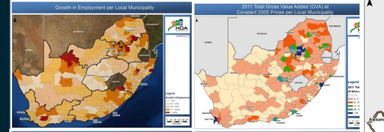
to target municipalities with the highest investment potential

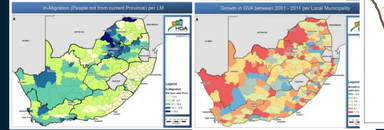
$$IP = \frac{1}{n}\sum_{i=0}^{n} a_i = \frac{1}{n}(a_1 + a_2 + a_3 + \ldots + a_n)$$

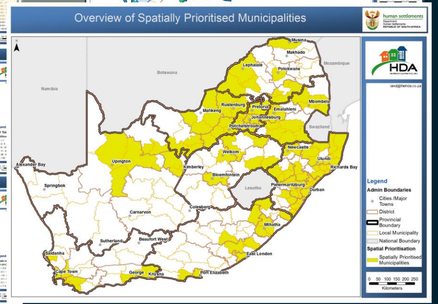
Where:

- IP = Investment Potential
- n = number of investment drivers and national programmes and/or priority initiatives
- a_i = rank of investment drivers and national programmes and/or priority initiatives **per local municipality**



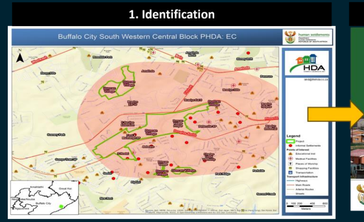


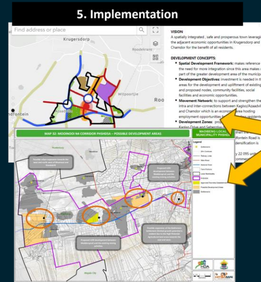


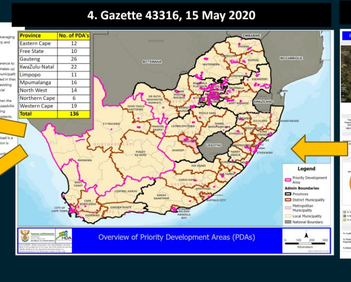


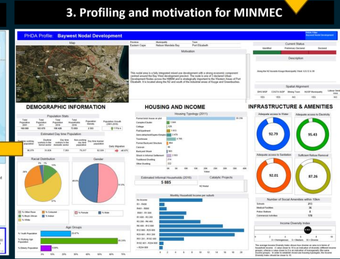
3. *Priority Housing Development Areas (PHDAs)*

to target precincts to channel funding to communities in need





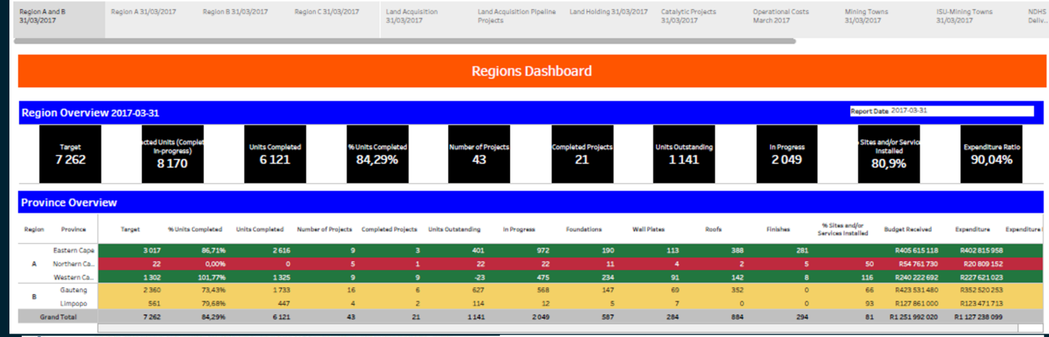


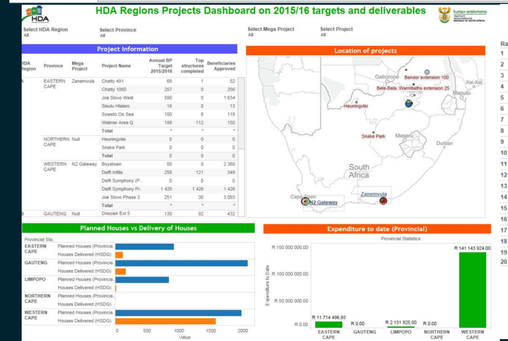


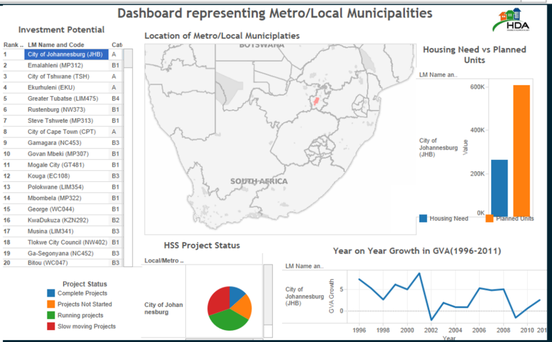
Application Development

Establish the HDA's Command Centre Dashboard to **track performance** of the performance of all departments in the organisation.

This function was later handed over to Business Intelligence (BI) Department.





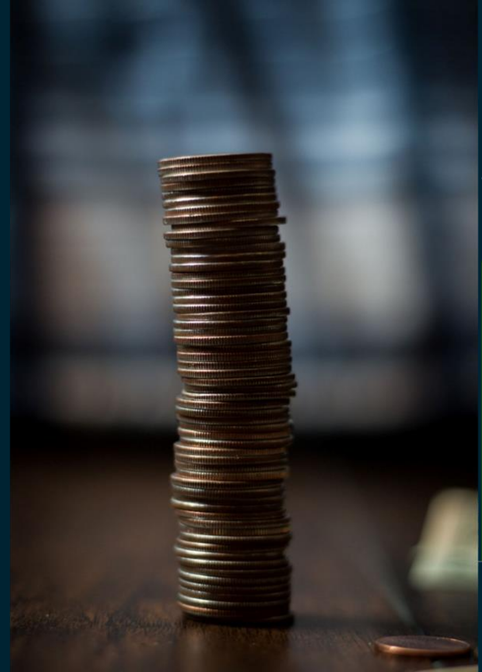


The cost of technology

1. **Technology is expensive**.

2. Funding at the HDA has made it difficult to procure new technologies due to continuous **budget cuts.**

3. Procurement processes are frustrating.



Made with VISME

New business requirements (2020)

When the HDA appointed its first **Chief Operations Officer (COO)** in 2020, he wanted to have a comprehensive overview of his portfolio. **Operational reporting** was **fragmented** and there was no accountability for overall operational performance.

Project Name	Project Type	No. of Units	Foundations	Wall Plate	Roof Level	Units Complete	Units Handed Over	2015/2016 Expenditure	% 2015/2016 Budget Spent	Title Deeds Registered	Title Deeds Received	Title Deeds On hand	Title Deeds ISSUED to date	Title Deeds ISSUED YTD	Title Deeds ISSUED Actual YTD
Delft Symphony Precinct 4&6	*BNG*	*2 377*	*2 377*	*2 377*	*2 377*	*2 377*	*2 377*			2247	2247	196	2051	17	9
Delft Symphony Precinct 1&2		*1 851*	*1 851*	*1 851*	*1 851*	*1 851*	*1 851*	*R 14 125.00*	**23.71%**	1827	1821	915	906	96	58
Delft 7-9 & Delft 7-9 Ext		**4 491**	**4 491**	**4 491**	**4 491**	**4 491**	**4 491**	R -	0.00%	3431	3431	458	2973	38	11
New Rest		**668**	**668**	**668**	**668**	**668**	**668**	R -	0.00%	0	0	0	0	0	0
Joe Slovo		**3 393**	**2 035**	**2 024**	**1 905**	**1 839**	**1 798**	**R 36 107 076.00**	**77.70%**	636	636	420	216	636	216
Boys Town	BNG	**1 392**	**503**	**503**	**503**	**503**	**503**	R 4 344 357.00	**36.54%**	492	492	492	0	491	0
Delft Symphony 3 & 5	BNG	**1 911**	**1 426**	**1 426**	**1 426**	**1 426**	**1 426**	R 66 555 177.00	**83.52%**	826	583	583	0	583	0
Delft Infill Sites	BNG	**389**	**258**	**258**	**231**	**121**	**118**	R 32 599 784.00	46.56%	0	0	0	0	0	0
TRA 6								R 3 099 209.00	94.60%						
Delft TRA 5 & 5.1															
Delft Dismantling															
Delft Symphony Precinct 7	BNG	**505**													
Delft 601															
TOTALS		**16 977**													

Province	Project Name	Annual BP Target 2015/16	Completed to date	In progress	Expenditure to Date	Beneficiary Approvals
GAUTENG	Drieziek Ext 5	130	185	92	R 17 945 677.25	432
GAUTENG	Orange Farm Ext 9	80	57	25	R 5 436 403.00	80
GAUTENG	Kanana Park Ext 2 (Weilers Farm)	381	326	49	R 28 485 642.25	381
GAUTENG	Lufheren	112	56	0	R 332 841.00	80
GAUTENG	Tudor Shaft	500	205	0	R 21 105 477.75	500
GAUTENG	Nellmapius Ext 21 & 24	500	7	0	R 720 674.85	100
GAUTENG	Eden Park West & Ext 1	177	0	0	R -	293
GAUTENG	Palm Ridge Ext 9	200	0	0	R -	2000
LIMPOPO	Disaster Housing	373	140	-	R 10 023 120.00	250
LIMPOPO	Enhanced People's Housing	100	0	-	R 0.00	40
LIMPOPO	Military Veterans	132	0	-	R 0.00	40
LIMPOPO	Bendor extension 100	240	0	-	R 0.00	0
LIMPOPO	Lephalale / Altoostyd Housing project					
LIMPOPO	Bela-Bela, Warmbaths extension 25	0	0	-	R 0.00	0

3. Organisational buy-in

Using innovation to improve business processes

1.We targeted the COO's request to manage his portfolio holistically.

2.Consider the Minister's challenge to the sector to respond to the 4IR.

3.We engaged with departments responsible for project management to understand their requirements.

4.We could define the problem at hand which is to "***use technology to improve business processes***."

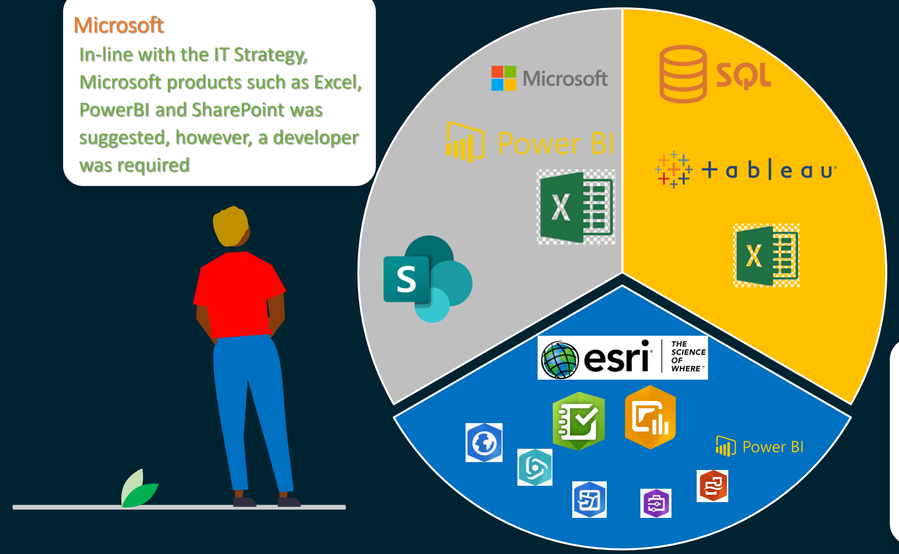
Ideating and prototyping

The units responsible for technology - GIS, IT, BI and M&E - came together to brainstorm ideas to respond to the COO's requirements.

There was consensus that the **Esri solution** would best serve the organisation and that funding would be made available for the technology.

Microsoft

In-line with the IT Strategy, Microsoft products such as Excel, PowerBI and SharePoint was suggested, however, a developer was required



SQL & Tableau

The existing application at the time, was a combination of SQL-based capturing tool, spreadsheets and Tableau dashboards, but the process was time-consuming, data intensive and not user friendly

Esri

A combination of Survey123 and ArcGIS Dashboards was presented to show how Esri technology is used and its potential to integrate other business processes and internal skills development

Approval of the Enterprise License Agreement (ELA)

Through the **Esri Framework** with **National Treasury** and **SITA** on cost containment measures on the procurement of software, service and products, the unit's motivation to enter an enterprise level agreement **(ELA)** with **Esri South Africa** was approved. This paved the way for the GIS unit in the HDA to use Esri-South Africa is its key **technology partner** in the Digital Transformation Process.

GIS Strategy

- 5-year vision aligned to MTSF
- Measurable outcomes
- Identified Esri technology as ultimate solution
- Technology focused
- Stakeholder-oriented
- Internal skills development

Regulations

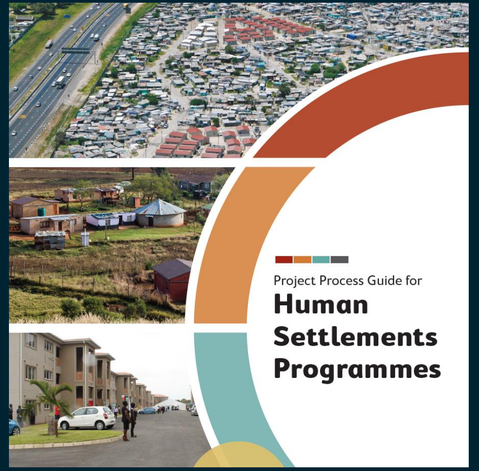
- NT-SITA-ESRI Framework gave us more leverage to implement GIS Strategy
- Focus on cost-containment measures
- Addressed red tape around procurement

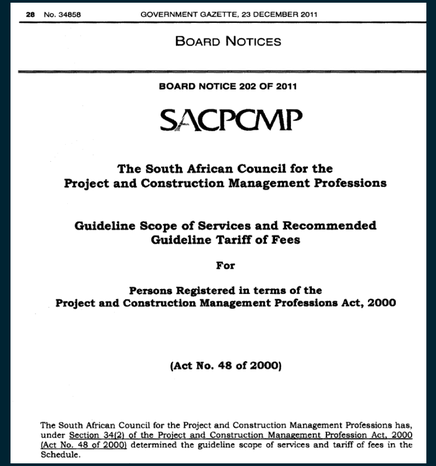
Partnerships

- Ended contract with previous SP for further cost-savings
- Opportunity to work with industry leader
- Complete digital ecosystem to cater for almost all aspects of the organization.
- Combined talents from inside and outside the organisation

Stakeholder consultation and feedback

1. We developed the **first draft** of the Project Tracking Tool in Survey123, focusing on our two main KPA's, namely the delivery of (i) **housing units** and (ii) **serviced sites**.
2. We presented this draft to all internal stakeholders.
3. The stakeholders recommended that the project tracking tool should be aligned to **industry standards**.
4. Stakeholders requested us to **track other KPA's** such as (iii) title deeds registrations, (iv) temporary residential units, (v) relocation projects, (vi) planning projects, (vii) bulk infrastructure projects, (viii) internal services, etc.




28 No. 34858 GOVERNMENT GAZETTE, 23 DECEMBER 2011

BOARD NOTICES

BOARD NOTICE 202 OF 2011

SACPCMP

The South African Council for the Project and Construction Management Professions

Guideline Scope of Services and Recommended Guideline Tariff of Fees

For

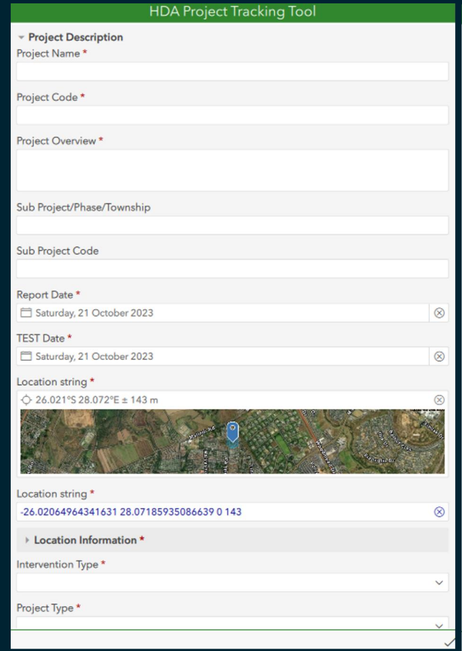
Persons Registered in terms of the Project and Construction Management Professions Act, 2000

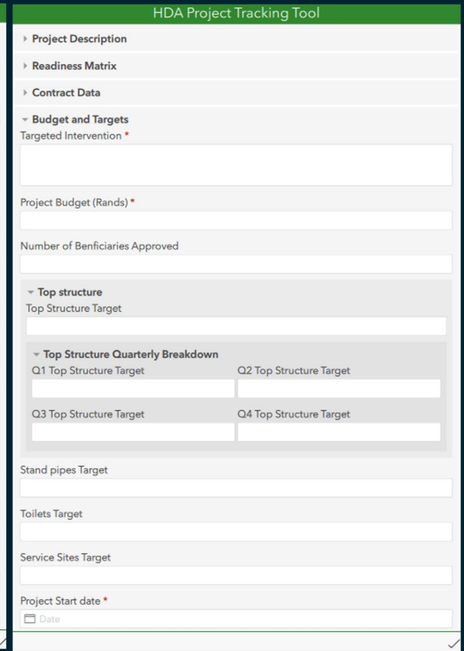
(Act No. 48 of 2000)

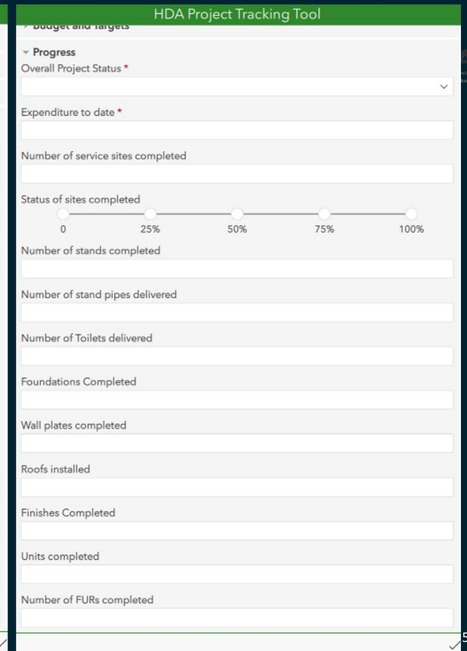
The South African Council for the Project and Construction Management Professions has, under Section 34(2) of the Project and Construction Management Profession Act, 2000 (Act No. 48 of 2000) determined the guideline scope of services and tariff of fees in the Schedule.

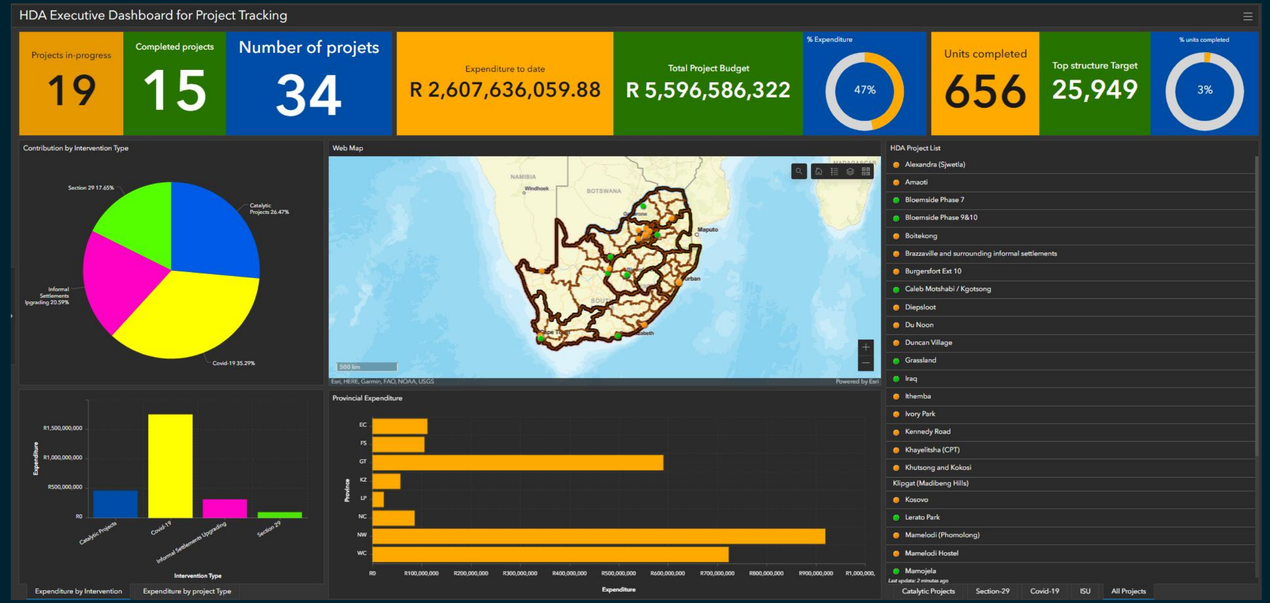
First Organisation-wide roll-out

The **Project Tracking** tool was then rolled out to accommodate most other business units in the organisation. With all the new requirements, the application started to become complicated, because it required too much user input, it required users to update (overwrite) existing records and users had to go through sections that they were not responsible for.









The first **Project Tracking Dashboard** provided a snapshot of the status quo of projects in the organization, BUT

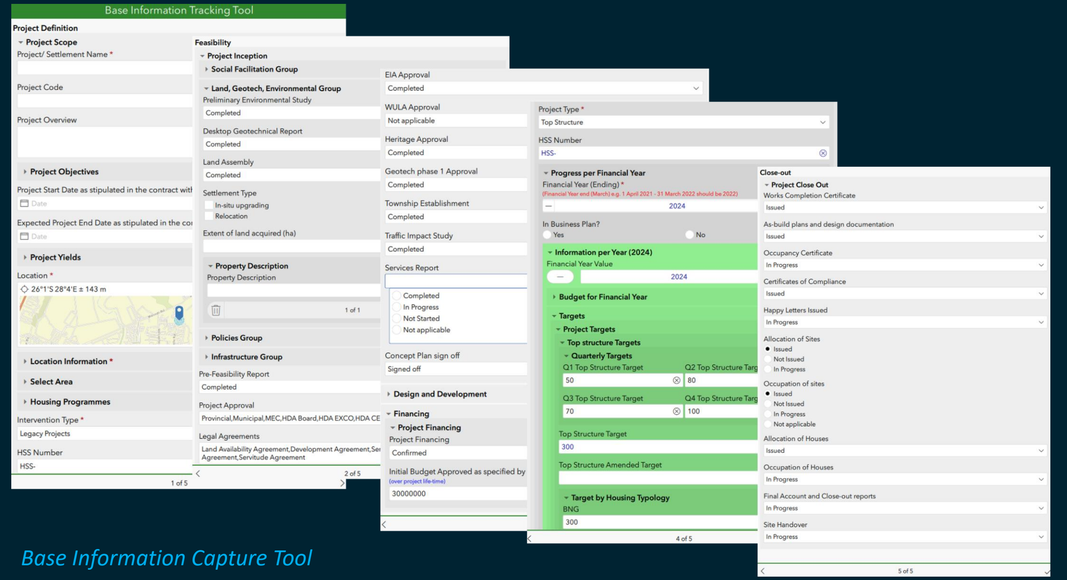
- the application started to become complicated,
- it required too much user input,
- it required users to update (overwrite) existing records and users had to go through sections that they were not responsible for.
- It could not track trends and other strategic priorirties effectively

4. Improved operations to deliver

Complex requirements, beyond the basics

In order to meet complex requirements, the HDA worked with **Esri's Professional Services** to implement **new solutions** that went over and beyond the basic functionalities of Survey123.

- This included a **more improved user experience** for data capturers by creating two surveys
- **Advanced calculations** that assisted with functions automated data capturing.



Base Information Capture Tool

ArcGIS Survey123

HDA Projects Weekly Progress Tracking Tool

You are capturing Weekly Feedback for:
Project: Palmridge Ext 9
Municipality: Ekurhuleni
Financial Year: 2024
Fin Year ObjectID:1959
Weeks Captured: 13, 18, 22, 27, 31

Progress for week

Please note: Data have been pre-populated from week number 31

Tracking week *
Tuesday, 31 October 2023

If you would like to edit the Tracking Week date of this record - click on Yes below
Important: To add a new progress record, click on the + at the bottom of the page
Alternatively, to edit this record's date, click on Yes and edit the date
Yes

Capturing for week: 31

Overall Project Status *
Completed

All information should be captured Cumulatively, i.e. year-to-date

Total value of claims submitted to date
R448,520.24
448520,24
Invalid number

Expenditure to date confirmed by Finance
R448,520.24

Expenditure to date confirmed by Finance
R0.00
0

Top Structure Progress

Foundations in progress
0

Foundations Completed
8

Wall plates in progress
0

Wall plates completed
8

Roofs in progress
0

Roofs installed
8

Finishes in progress
0

Finishes Completed
8

Number of units in progress (calculation)
(automated sum of foundations, wall plates, roofs, and finishes in progress)
0

Top Structure Units completed
Target: 8
8

Progress by Housing Typology

Project Balance
0

Overall Progress: 100%

Non Construction Deliverables

Add Photos

Add Photos

Project photos

1 of 1

SubProj_project_photos-20231015-180255.jpg

Risk and Challenges

Narratives

High level summary of project progress
Project is complete.

Signatures

Name of Capturer	Signature
Sello Tshoane	
Name of Approver	Signature

myFunctions.js

```
function diff_weeks(dt_1,yearval){
  var dt1 = new Date(dt_1);

  var d = new Date();
  var n = yearval;

  var dt2 = new Date(n.toString() + "-04-01T00:00");

  var diff =(dt1.getTime() - dt2.getTime());
  var days = diff/(1000*60*60*24);
  var weeks = Math.floor(days/7) + 1;
  return weeks;
 }

function getCapturedWeeks(arrayVals){
    return arrayVals.join(", ");
}

function getDeliveryArray(dateVals){
    //Q1 = 30 June
    //Q2 = 30 September minus (-) 30 June
    //Q3 = 31 December - 30 September
    //Q4 = 31 March - 31 December
    var arrayLength = dateVals.length;
    var months = [];
    for (var i = 0; i < arrayLength; i++) {
        months.push(toMonthName(dateVals[i]));
    }
    return months.join(",");
}
```

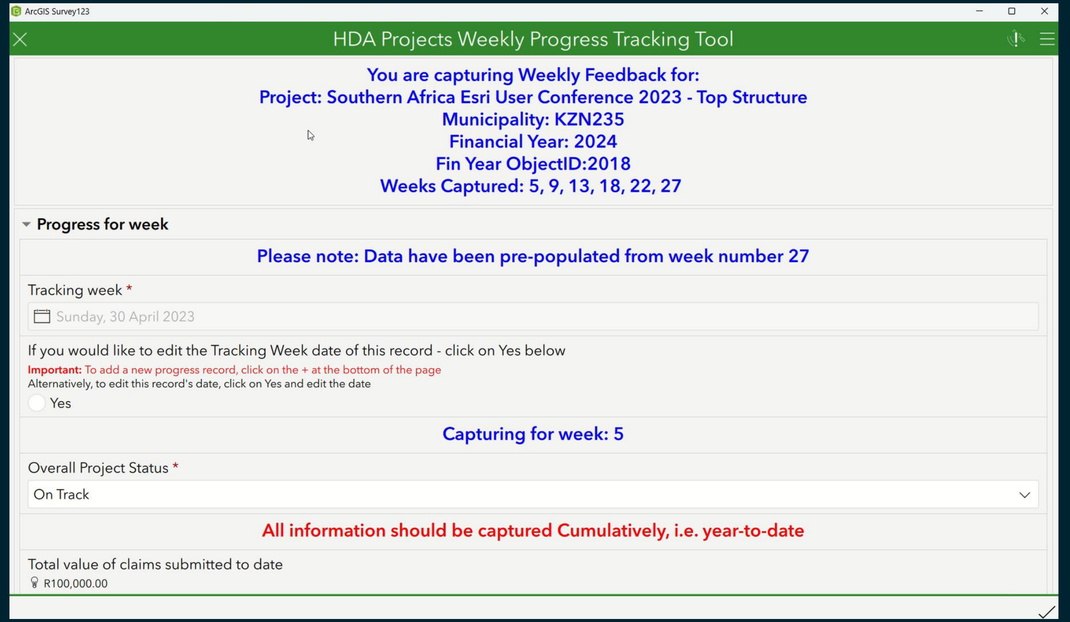
Script files: 2

functions.js

myFunctions.js

Advanced scripts to extend the standard capabilities of Survey123 such as fiscal year, and monthly and quarterly reporting

5. Demonstration



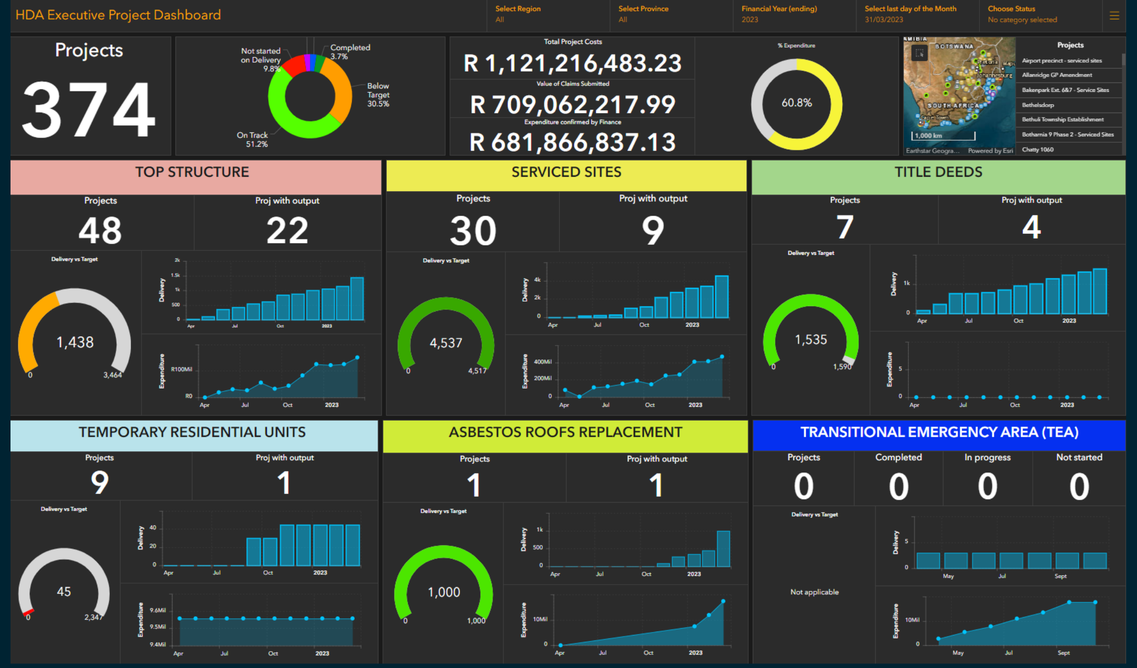
Project Capture – Survey123

Project Dashboard – ArcGIS Dashboards

Executive Overview Dashboard

Used by Executives:

1. Number of projects
2. Project status
3. Operational Expenditure
4. Monthly performance
5. Location



Provincial Performance

Used by Regional and Provincial Managers

1. Monthly and quarterly delivery
2. Expenditure
3. Comparative trends

Individual Project Dashboard

Used by Project Managers to keep track of:

1. Monthly and quarterly delivery
2. Milestones
3. Expenditures
4. Photos

Challenges and Mitigation

Reason for current performance (Challenge 1)	Recovery Plan/ Mitigation Strategy (1)
Delay in progress due to inclement weather	Contractor to supply revised programme
This project is block by Provincial Department due to the beneficiary issues.	Escalated to the Province and RM office
Lack of funding for concrete footing to support the dividing wall in semi-detached house that has been demolished, and lack of funding for houses of 8 disabled beneficiary.	Proposal submitted to province to utilise the Tranche funds.
Shortfall in funding of rectification of slabs (83 Slabs) and the demolishing of slabs (33 slabs to be demolished and rebuilt)	Draft proposal to relocate funds from the non-performing project to the performing project. To allocate additional units to the performing contractors (15%)
Some contractors are unable to purchase material on credit. No credit facility with the suppliers.	The COO's office to look at the policy see whether it can be reviewed
Contractor temporarily suspended works due to expired construction work permit. this will lead to contractor standing time costs.	Agreement with the the OHS sub-consultant must be reached soon
Lack of beneficiary approvals	Include destitute beneficaries in the project. All destitute beneficiaries will qualify for a 40m2 house. Potential of 28 benefiaries are currently awaiting approval of HSS
Termination of contract.	Procurement of new contractor.
There contractor has terminated the contract.	Appointment of Attorneys to handle the litigation procedures
The contractor was completing previously installed civil services that were damaged and adding stand connections where they were missing.	The remedial works on the damged previously installed pipes (water and sewer) and also continously fixing the flood damaged layer works to allow for paving of the roads, thus slowing down the contractors progress on site with th
Local SMMEs without capacity to deliver on time, due to cashflow constraints	To assist the contractors with paying for Materials on site, and also to pay our service providers within 14 days of reciept of invoices.
Delayed payments by the client	Finance to make payments within 14 days
• Approval of building plans continue to be an issue & contract between client and contractor expired	
Approved building plans continue to be an issue. Availability of the project team members is an issue when scheduling monthly project meetings.	

Outcomes

- **Every day**, we presented the Project Dashboards to a different province at 7:30 am.
- Project Managers used the dashboard to **present** project performance and bottlenecks if projects are not performing.
- **Other departments** such as Finance, SCM and IGR were invited as and when required.

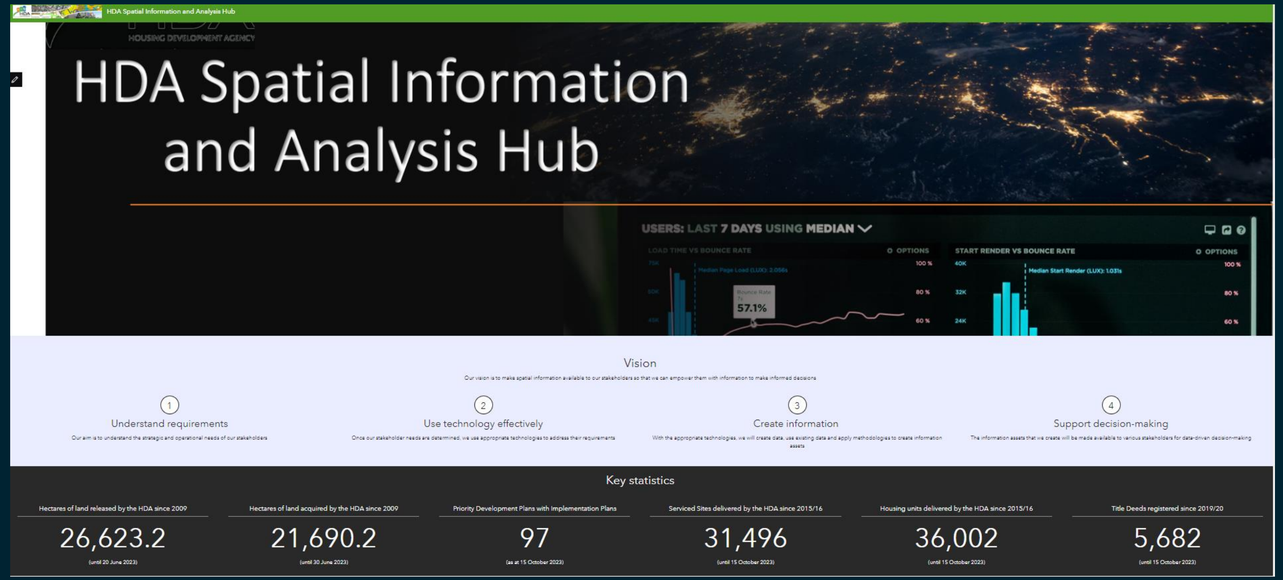
Positive

- Leadership supported technological innovation
- Data was used to support decision-making.
- Collaborative outlook
- Accountability led to improved service delivery.

Negative

- Leaders were not tech-savvy and the overall adoption rate was slow.
- Still ambiguous reporting on different platforms
- Change in leadership
- Colleagues “fear us”, because our technology is “exposing them”

Other Outcomes



Collaboration with the National Department of Human Settlements

The HDA contributes to Priority 5 of the 2019-2024 Medium Term Strategic Framework (MTSF) of the National Department of Human Settlements (NDHS). The focus is on spatial integration, human settlements and local government.

National Department of Human Settlements website

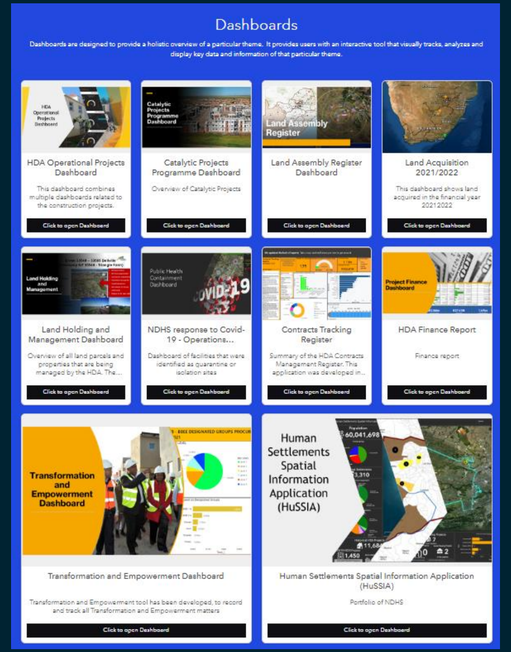
National Department of Human Settlements Information Portal (concept)

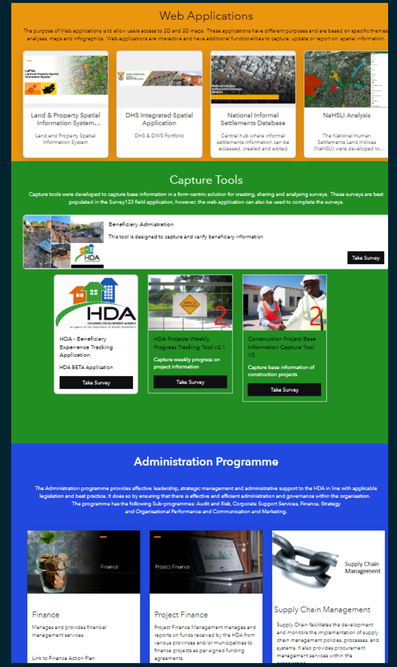
KZN Floods Disaster Management

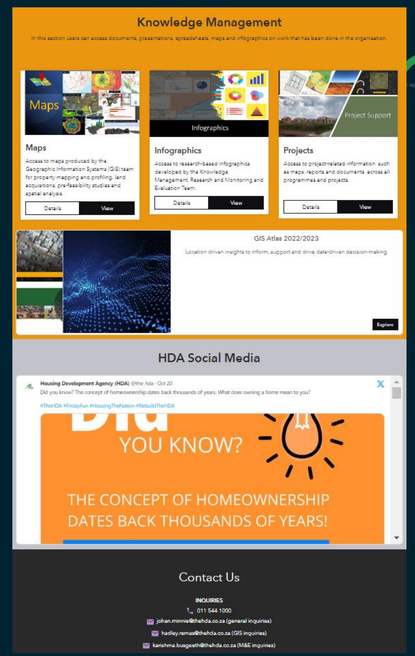
After the April 2022 Floods that devastated many parts of the KwaZulu-Natal (KZN) province, the Housing Development Agency (HDA) has been responsible for assisting in identifying and assessing suitable vacant land that affected families can be relocated to.

KZN Floods Disaster Management Website

eThekwini Floodline Vulnerability Exposure Dashboard



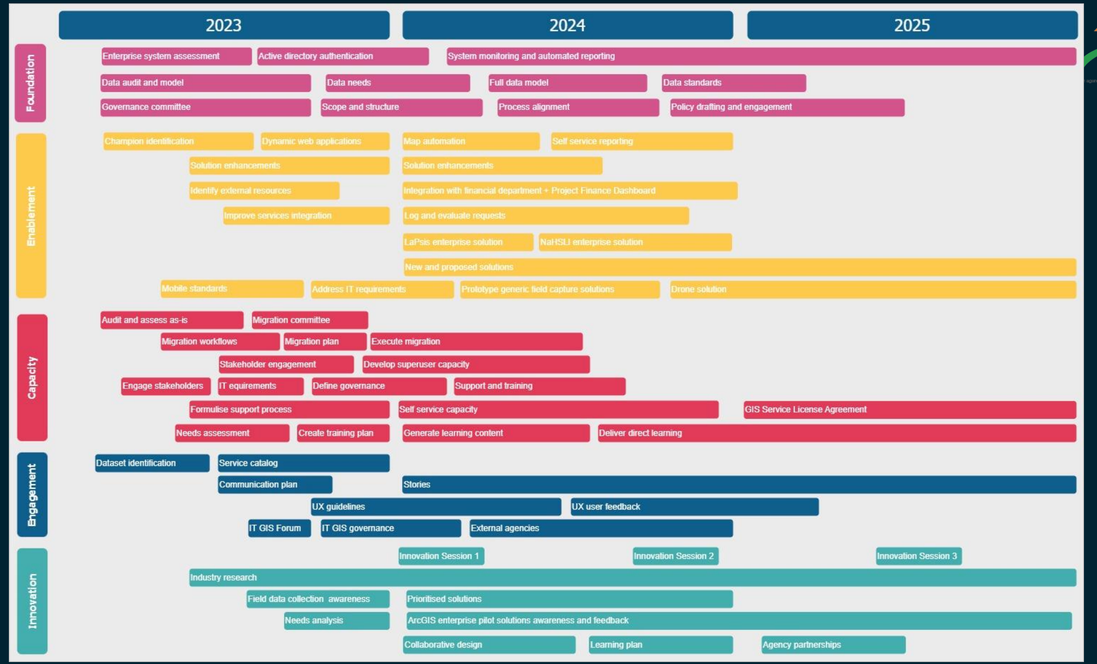




Looking ahead

The **2022/23 GIS Strategy** was developed to build on what we have achieved over the past three years. Our vision is to:

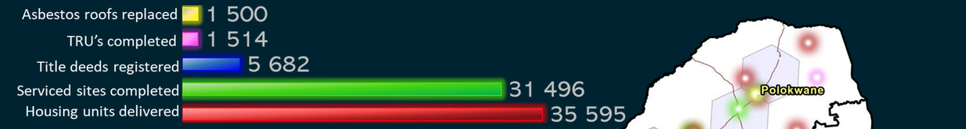
- **Improve governance** on technologies, data standards, communication and geospatial analytics.
- Develop **self-service applications** that can improve stakeholders' access to information.
- **Continuously improve** our service offering to stakeholders

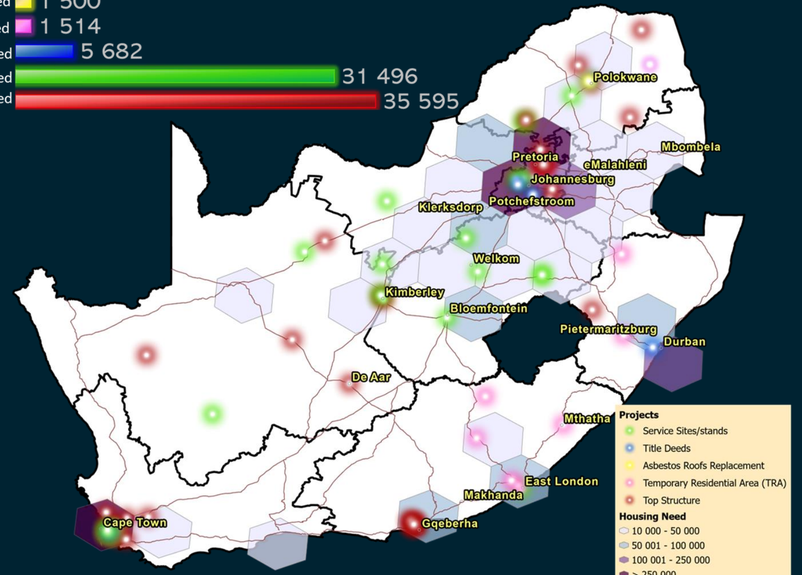


6. The impact of technology to uphold our mandate

"*to facilitate the creation of sustainable Human Settlements and improved quality of household life*”?

Improved performance



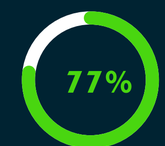


Beneficiary Experience Tracking Application (BETA)

I am closer to transport nodes

worry less and sleep better

I am proud as an owner and experience respect from friends and family



Feeling a sense of community and belonging