

PAPER 4

INFRASTRUCTURE MANAGEMENT TURNAROUND STRATEGY DEVELOPMENT AT THE ETHEKWINI METROPOLITAN MUNICIPALITY

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ABSTRACT

The metropolitan region of eThekwini, which includes the city of Durban and surrounding towns, is one of South Africa's largest metropolises and home to 4 million residents. The custodian of the city's R500 billion Rand portfolio of economic and social infrastructure is the eThekwini Metropolitan Municipality (EMM), which has a workforce of approximately 24,000 staff. The EMM has in recent years faced several major challenges and setbacks. Ageing infrastructure, rapid population growth, and natural disasters combined with a lack of integrated long-term planning, poor investment decision-making, and ineffective internal processes and practices have profoundly impacted service delivery performance. This has resulted in social and environmental failures, stifled investment, and disgruntled residents.

This paper provides a case study of how the metropolitan municipality through its Chief Strategy Officer initiated a process to develop a city-wide strategy to restore infrastructure services, prevent further decay, and sustain infrastructure services over the long term to protect the well-being and

prosperity of its residents. The paper explains the methods used to diagnose the infrastructure management maturity of the EMM by accredited assessors against a globally recognised best-practice framework. The key findings of the independent assessment are highlighted. The use of the baseline findings to develop a city-wide turnaround strategy is explained and the outcomes summarised.

Conclusions and recommendations highlight lessons learnt in the process that may be useful guidance for other municipalities trying to bring about positive changes to infrastructure management practices in their own organisations.

INTRODUCTION

Rapid population growth, the lack of integrated long-term planning, poor investment decision-making, and poor internal processes and practices have profoundly impacted the service delivery performance of the infrastructure in the metropolitan region of eThekwini affecting all business and citizens. This has been exacerbated by the July 2021 civil unrest and April 2022 floods, which have caused extensive damage to infrastructure, exacerbating transportation challenges and hampering access to essential services. The destruction of infrastructure and businesses and deterioration of public facilities are perpetuating a cycle of deterioration and are straining the municipality's already fragile economy.

The municipality faces a daunting task of rebuilding and reinforcing its infrastructure to withstand the state of deterioration and to avert future disasters. However, with limited resources and ongoing economic challenges,

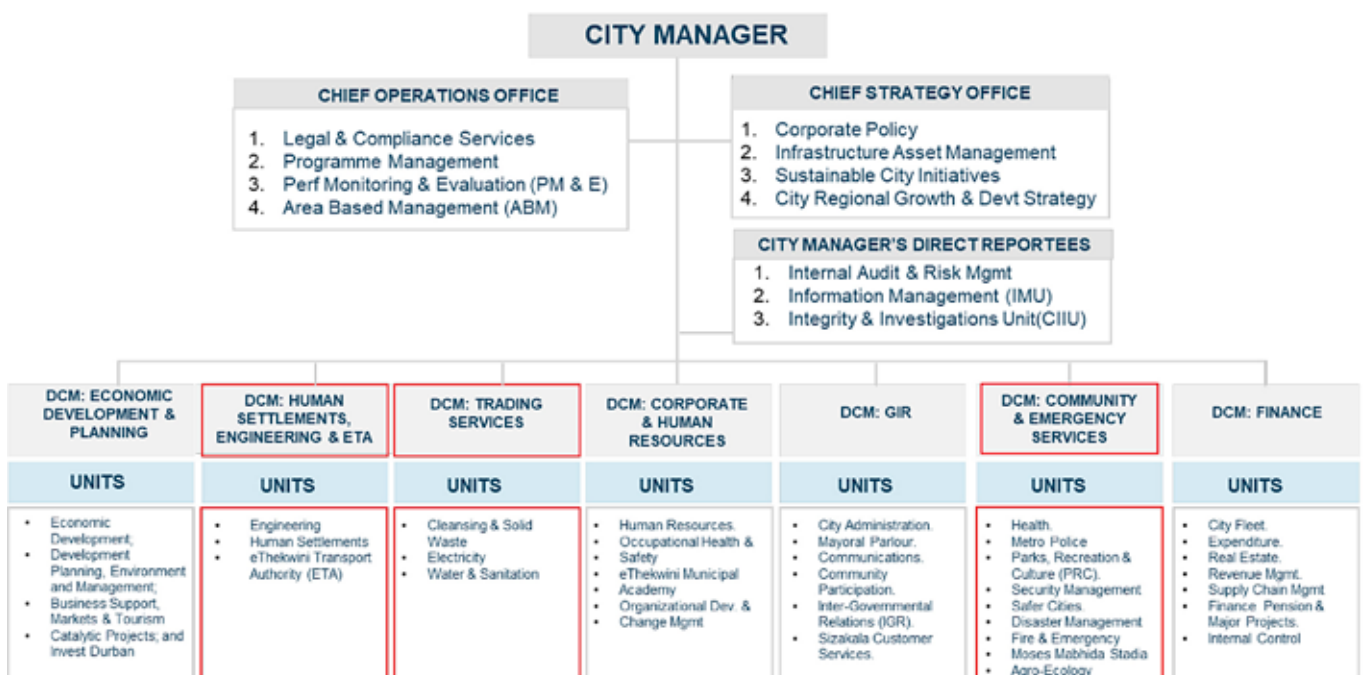


FIGURE 1: City Business Units assessed (highlighted in red)

TABLE 1: IAM Maturity Rating Scale

Scale	Description	Definition	Maturity Characteristics
0	Innocent	The organisation has not recognised the need for this requirement and/or there is no evidence of commitment to put it in place	
1	Aware	The organisation has identified the need for this requirement, and there is evidence of intent to progress it	Proposals are under development and some requirements may be in place. Processes are poorly controlled, reactive and performance is unpredictable.
2	Developing	The organisation has identified the means of systematically and consistently achieving the requirements, and can demonstrate that these are being progressed with credible and resourced plans in place	This is a transition state. Processes are planned, documented (where necessary, applied and controlled at a local level or within functional departments, often in a reactive mode but could achieve expected results on a repeatable basis. The Processes are insufficiently integrated, with limited consistency or coordination across the organisation.
3	Competent	The organisation can demonstrate that it systematically and consistently achieves relevant requirements set out in ISO55001	This involves a formal documented Asset Management System element is measured reviewed and continually improved to achieve Asset Management Objectives.
4	Optimizing	The organisation can demonstrate that it is systematically and consistently optimizing its Asset Management proactive, in line with the organisation's objectives and operating context	This is 2nd transition state.
5	Excellent	The organisation can demonstrate that it employs leading practices and achieves maximum value from the management of its assets in line with the organisation's objectives and operating context.	This is a dynamic and context sensitive state, so evidence must include demonstration of awareness of benchmarking positions against similar best in class organisations and that, in both Asset Management practices and Asset Management Results (value realisation) there are no known improvements that have not already been implemented

this task is fraught with difficulties. Immediate investments are necessary to repair damaged infrastructure, restore existing essential services to acceptable levels, and fortify infrastructure against future floods. Moreover, there is a pressing need for transparency and accountability in government spending to ensure that resources are allocated efficiently and effectively. Without decisive action, the infrastructure of the EMM risks further decay, undermining the well-being and prosperity of its residents.

Global practice shows that infrastructure management practices and processes lie at the heart of managing large asset-intensive organisations such as cities. The eThekweni Chief Strategy Officer (CSO) implemented an independent assessment of the EMM's infrastructure management practices and processes in order to identify organisational improvement needs to strengthen the organisation in three key areas:

- 1) Investment decision-making.
- 2) Operational efficiency and effectiveness.
- 3) Long-term organisational sustainability.

Independent internationally certified assessors were commissioned to conduct a diagnostic of the maturity of current infrastructure management practices across 17 of the city's business units with direct responsibility for managing infrastructure. The assessment formed the baseline for identifying gaps in processes, practices, and data and to was used to inform the development of improvement plans. The assessed business units are shown in the figure below.

METHODOLOGY

The Global Forum for Maintenance and Asset Management (GFMAM) framework (1) coupled with the Institute of Asset Management (IAM) maturity rating system were used as a best-practice international framework. Globally certified assessors were used to benchmark the 17 business units against the internationally recognised best practice framework and the ISO55001 asset management standard (2), which also form the basis of the best practice documented in the South Africa National Treasury's Cities Infrastructure Delivery and Management System (CIDMS) (3).

The assessment included a deep-dive assessment of six key infrastructure management business functional areas across the 17 business units:

- 1) Strategy and Planning (policy & strategy alignment, demand planning, lifecycle management planning)
- 2) Investment decision-making (budgeting, capital, renewal, maintenance decision-making)
- 3) Lifecycle delivery processes (procurement, design, construction, maintenance, disposal)
- 4) Organisation & people enablers (structure, skills, capacity, leadership, culture)
- 5) Data & Information enablers (data, information management, information systems)
- 6) Internal risk and review process enablers (risk management, performance management, infrastructure accounting, stakeholder management)

The maturity rating scale used is shown in table 1.

FINDINGS

The assessment gave a city-wide view of current maturity and the practice and process gaps that need to be closed by senior management to attain a level of maturity appropriate for the organisation. The outcomes are shown in the table below.

The assessment identified process, practice and data gaps that require management attention within each business unit. However, it became clear that many of the gaps were common across the business units and needed to be addressed in a whole-of-city approach rather than independently within each unit. The key cross-cutting issues that were identified are highlighted below for each infrastructure management business functional area. It should be noted that these gaps are fairly typical within large infrastructure intensive organisations globally and are not unique to the EMM. Municipal officials in South Africa are likely to recognise many of these gaps and challenges in their organisations.

Infrastructure strategy and planning gaps and challenges:

1. The strategic objectives of the city executive are not cascading coherently through to resource allocation and operational activities resulting in poor execution against strategy.
2. Information of the current and projected future infrastructure service

TABLE 2: Summary outcome of maturity assessments

Subject Group	1 AM Strategy & planning	2 AM Decision-making	3 Lifecycle Delivery Activities	4 Asset Knowledge Enablers	5 Organisation & People Enablers	6 Risk, Review & Continual Improvement	AVERAGE
eThekweni Water & Sanitation	2.20	2.40	2.55	2.25	2.20	2.33	2.36
eThekweni Electricity	3.00	2.60	2.73	2.50	2.80	2.89	2.77
City Fleet	2.20	2.60	2.36	2.00	2.60	2.22	2.33
Human Settlements	2.20	1.60	2.32	2.00	1.90	2.33	2.13
uShaka Marine World	2.40	2.20	2.64	2.00	2.80	2.56	2.49
eThekweni Transport Authority	2.40	2.20	2.50	2.00	1.90	2.33	2.28
Cleansing & Solid Waste	2.20	2.20	2.45	2.00	2.40	2.22	2.28
Real Estate & Virginia Airport	2.10	1.80	2.20	2.13	2.00	2.11	2.08
Information Management Unit	2.21	2.20	2.77	2.13	2.20	2.50	2.41
CES Cluster	2.35	2.25	2.39	2.00	2.25	2.25	2.25
International Convention Centre	2.75	2.85	3.36	2.13	3.15	2.97	2.87
Engineering	2.06	2.43	2.67	2.43	2.49	2.45	2.47
Supply Chain Management	2.30	2.00	2.67	2.38	2.30	2.44	2.39
Chief Strategy Office	2.45	2.55	2.85	2.50	2.40	2.69	2.57
AVERAGE	2.34	2.28	2.60	2.18	2.39	2.45	2.41

performance for customers is not adequately available within the city and is not effectively being used to inform and influence strategic decision making and budgeting at the city level.

3. The asset management objectives of the city are not clear leading to each business unit prioritising its resources independently and resulting in a misalignment of planning and execution.
4. The city's budgeting process is very short-term (3-year) focused and is not aligning fund allocation with the long-term (10-year) investment needs to addresses economic growth, social needs and aging existing infrastructure in a balanced manner.

Infrastructure asset management decision making gaps and challenges:

1. There is no city framework to make defensible decisions on maintenance and infrastructure renewal spending across the city's entire asset portfolio. This is resulting in reactionary decision-making after the failure of infrastructure that has consequential damages that are very costly.
2. There is no operations and maintenance (O&M) decision-making framework to guide decisions on prioritising O&M activities and resource allocation leading to a reactionary fire-fighting concept of operations that cannot keep pace with the maintenance needs across the city.
3. Poor upfront capital project planning (scoping, costing and delivery readiness) and the lack of a visible long-term (10-year) project pipeline is having a negative knock-on effect on long-term budgeting and the delivery of infrastructure.
4. The city does not have a mature project prioritisation process that can deal with the situation where the needs are much greater than the available funding. Project funding allocation is largely prioritised on an immediate urgency basis rather than at a portfolio level with inadequate consideration of the long-term economic and social risks of unfunded projects being deferred to later years.

Lifecycle delivery gaps and challenges:

1. There is a lack of consistent process in the city to manage the physical blueprint and history of infrastructure including plans, project management information, as-built drawings, operational manuals, spatial data, and asset history data. There are pockets of excellence in the city tied to the efforts of individuals, but accurate and up-to-date information on

infrastructure is difficult to access and is not readily available.

2. There is no consistent way to contract different types of resources, suppliers and contractors in different operational contexts such as highly specialist work, making resourcing time-consuming and delaying the delivery of services.
3. There are a multitude of supply chain management process issues that were identified that result in delays and unintended outcomes that are impacting the ability to deliver according to plan. These processes require an improvement and automation of the supply chain management workflow with increased visibility and access to the process stage, underlying artefacts and decision-making records.
4. There is a lack of a standardised framework for project delivery within the city that has structured process, defined stage gates and defined information needs for different types of projects.

Infrastructure management information gaps and challenges:

1. There are inadequate data standards to guide technical teams across different business units and across different teams within business units with managing infrastructure planning, design and maintenance data in a standardised way.
2. Workflow processes within the city are largely manual and resulting in process delays and an increased data management burden to manage artefacts.
3. There is a lack of management information that provides visibility of the performance of infrastructure management. This includes the performance of customer service quality (e.g. reliability and availability of services), infrastructure performance (e.g. condition, age, reliability), and the performance of the management system of the organisation in achieving its infrastructure asset management objectives (e.g. asset management process performance, infrastructure manager performance).
4. There is a lack of integration between information systems that support infrastructure management business processes. There is disconnect between the information systems used for infrastructure asset accounting, infrastructure construction, and maintenance with poor data linkages between these systems leading to lack of a single source of truth of infrastructure extent, value, location and performance.

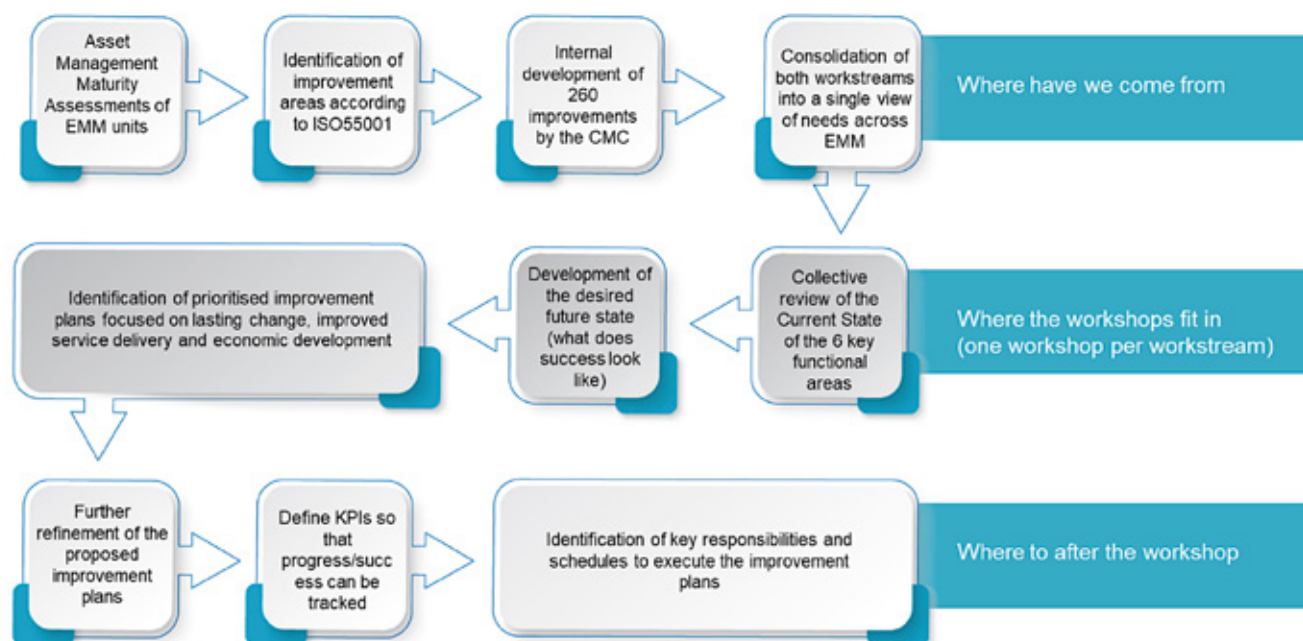


FIGURE 2: Strategy development process

Organisation and people gaps and challenges:

1. Infrastructure Asset Management based on the ISO55001 standard and the relevance of its underlying processes for the effective management of a large infrastructure intensive organisations is poorly understood in the city, particularly with strategic decision makers but also with technical managers in infrastructure-based units and corporate support units. Infrastructure asset management is widely mistakenly perceived as either the practice of accounting and control of infrastructure assets or the management of the maintenance of infrastructure and seen as someone else's responsibility. The concept of infrastructure asset management being the coordination of all activities within the organisation to create value from assets is very new to the EMM. Support units in finance, governance, supply chain management, human resources, information technology, have only recently started to realise the importance of their role in effective infrastructure asset management.
2. Given the need for process improvement across multiple business units and across different levels of the organisational hierarchy, a structured and centralised approach to change management is required.
3. Training needs were identified to strengthen infrastructure management practices and close capability gaps related to infrastructure planning, budgeting, accounting, delivery, operational control and maintenance management. The training needs ranged from awareness training at the political and executive leadership level, at management level, technical professionals, and operational staff at the coalface of operations.

Risk and review gaps and challenges:

1. The city's performance management framework does not adequately address infrastructure management processes and therefore does not adequately support the continuous improvement of infrastructure management practices across the organisation.
2. There are inadequate measures of performance to monitor and drive continuous improvement in infrastructure management practices, including measures of performance of service delivery, management system performance, and the performance of the infrastructure assets.
3. The city's engagement with its stakeholders and communication of how the city is currently performing and how it is expected to perform in future

(over the next 10 years) is modest resulting in a low level of trust between the city and its stakeholders.

STRATEGY DEVELOPMENT

The independent assessment was coupled with further insight from the City's own introspection and factfinding lead by the eThekweni Capital Management Committee that identified 260 burning issues that city officials believed needed to be dealt with to improve service delivery.

It was clear that there were many interrelated issues covering internal processes, governance, planning and data and that required attention to turn around the current situation to a more effective city. To develop a coherent whole-of-city turnaround strategy, six workshops were scheduled with participants from all the city's units including: economic development & planning; corporate & human resources; governance; and finance. Each workshop addressed one of the 6 infrastructure management business functional areas and was chaired by an Executive Director of one of the city's units. The workshop process is outlined below:

The six thematic workshops involved over 145 senior managers from across the city and were facilitated to develop one infrastructure management turnaround strategy for the EMM. These workshops were important to get a consensus view from the city's technical administration of the root cause of the problems in the city, to identify and agree the desired future state, and to agree what needs and can be done to turn the situation around. Understandably many of the issues were sensitive in the politicised municipal governance environment and the technical officials demonstrated courage and commitment to get to the root cause of many issues holding effective service delivery back.

The workshop outcomes were consolidated into 14 improvement projects across the six workstreams with an Executive Director from one of the city's units leading each workstream. A governance structure for this programme was put in place through an updated Asset Management Policy that was approved by Council. The consolidated improvement programme is shown in table 3.

To support the implementation of the improvement plans, a Change Management Plan, Communications Plan and Training Plan was developed to enable the EMM to drive infrastructure asset management forward and

TABLE 3: Consolidated improvement programme

Consolidated Improvement Programme / Actions	
Workstream 1:	Strategy & Planning
Programme 1:	Develop IAM foundation documents (asset management policy, strategic asset management plan, business unit asset management plans, integrated tactical asset management plan aligned to the budget)
Programme 2:	Update the IAM Policy
Programme 3:	Develop a roadmap and annual calendar that links planning and budgeting
Programme 4:	Develop a change management process to drive implementation raising IAM leadership and awareness
Workstream 2:	IAM Decision Making
Programme 5:	Develop the capital projects decision-making framework (full lifecycle)
Programme 6:	Develop the operational projects decision-making framework (full lifecycle)
Workstream 3:	Lifecycle Delivery
Programme 7:	Unlock delivery issues (short, medium & long term)
Workstream 4:	Asset Information
Programme 8:	Development of the optimal dashboard content
Programme 9:	Develop IAM data and system performance standards
Programme 10:	Develop an IAM data and information integration schema
Workstream 5:	Organisation & People
Programme 11:	Develop a communication campaign (strategy and plan) driving internal and external communication for the projects
Programme 12:	Develop and implement a revised training framework (competency framework)
Workstream 6:	Risk & Review
Programme 13:	Develop the performance management baseline
Programme 14:	Review and amend existing performance management framework

achieve the organisation’s objectives. Examples of the campaign collateral are show below:

It was critical for the EMM to establish the foundational elements of the turnaround strategy quickly to establish a platform for other improvements be to be implemented. These included:

- 1) Updates to the Asset Management Policy to provide the mandate and governance framework for implementation of the improvement plans.
- 2) The development of the city’s first Strategic Asset Management Plan (SAMP) that provides a single city-wide view of the expected performance of infrastructure-based services over the next 10 years given the strategic context of the city including a growing population, a backlog in existing services, deferred maintenance, aging infrastructure and limited financial resources.
- 3) The preparation of 1st-generation Asset Management Plans for 17 business units to link individual business unit investment needs with projects and unit budgets over the next 10 years.
- 4) The preparation of an integrated tactical Asset Management Plan for the city that enables the city-wide prioritisation of long-term capital expenditure against quantified asset performance needs, identified city infrastructure-based risks while remaining within the funding limitations of the city. This is to ensure the city gets the best long-term return on investment from its available budget. This plan also ensures that the prioritised 10-year investment plan is executable and that the future performance outcomes are predictable and visible.

To support a city-wide approach to investment needs analysis and budgeting, it is essential to get a 10-year view of the capital project pipeline for both new infrastructure and the renewal of existing infrastructure. A visualisation dashboard of the city’s 10-year infrastructure project pipeline was initiated and is under development to centralise information, improve visualisation and help prioritise the pipeline and ensure that the projects had the strategic impact that the city desires. This assists the city to visualise its project pipeline over time, across different units and spatially to ensure that the investments were being made in

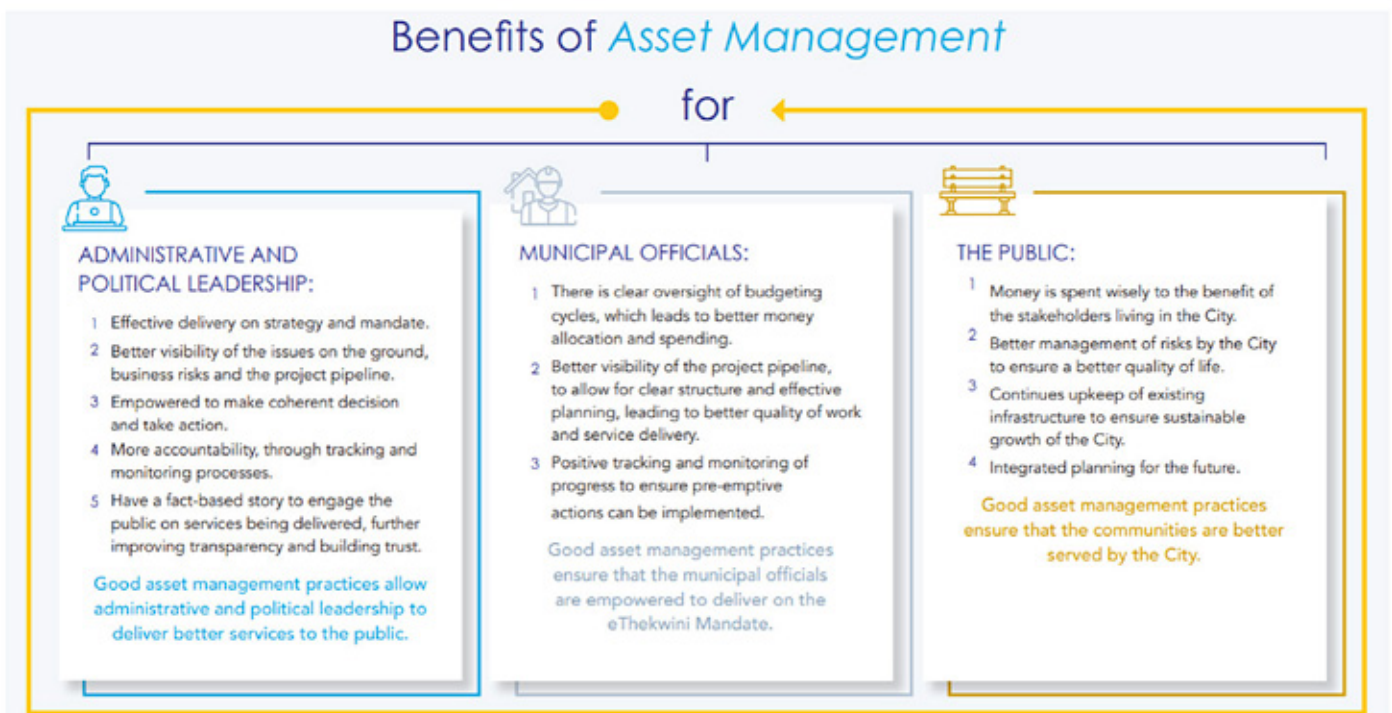


FIGURE 3: Communications collateral to support change management

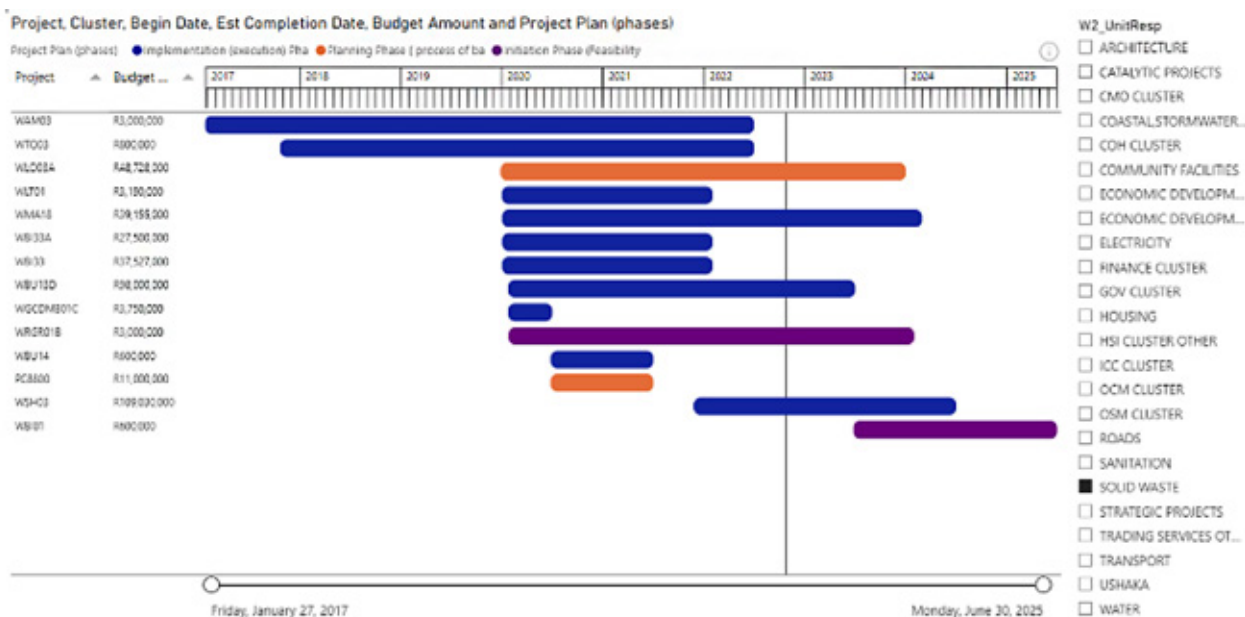


FIGURE 4: Progress dashboard of the 10-year project pipeline (under development)

the strategic investment zones and aligned with the strategic priorities. An example of this shown below:

CONCLUSIONS

The metropolitan region of eThekweni is one of South Africa's largest metropolitan cities with 24,000 employees serving 4 million people. To align 17 business units across the city into a single integrated development strategy underpinned by an integrated and prioritised long-term budget requires significant change from the current practices and processes. The challenge for the city's officials has now shifted from trying to identify the

root causes of poor service delivery to executing the turnaround strategy. The city has some way to go to demonstrate success in the execution of the strategy, but a number of lessons have been learnt in the process to date and are shared with other similar organisations who may benefit from them.

Lessons learnt 1: Conduct an independent whole-of-city diagnostic of infrastructure management maturity. Large asset intensive organisations are process and data intensive. Inconsistency in business objectives, process and data across business units results in incoherent execution of strategy and reduces the organisation's ability to achieve its strategic

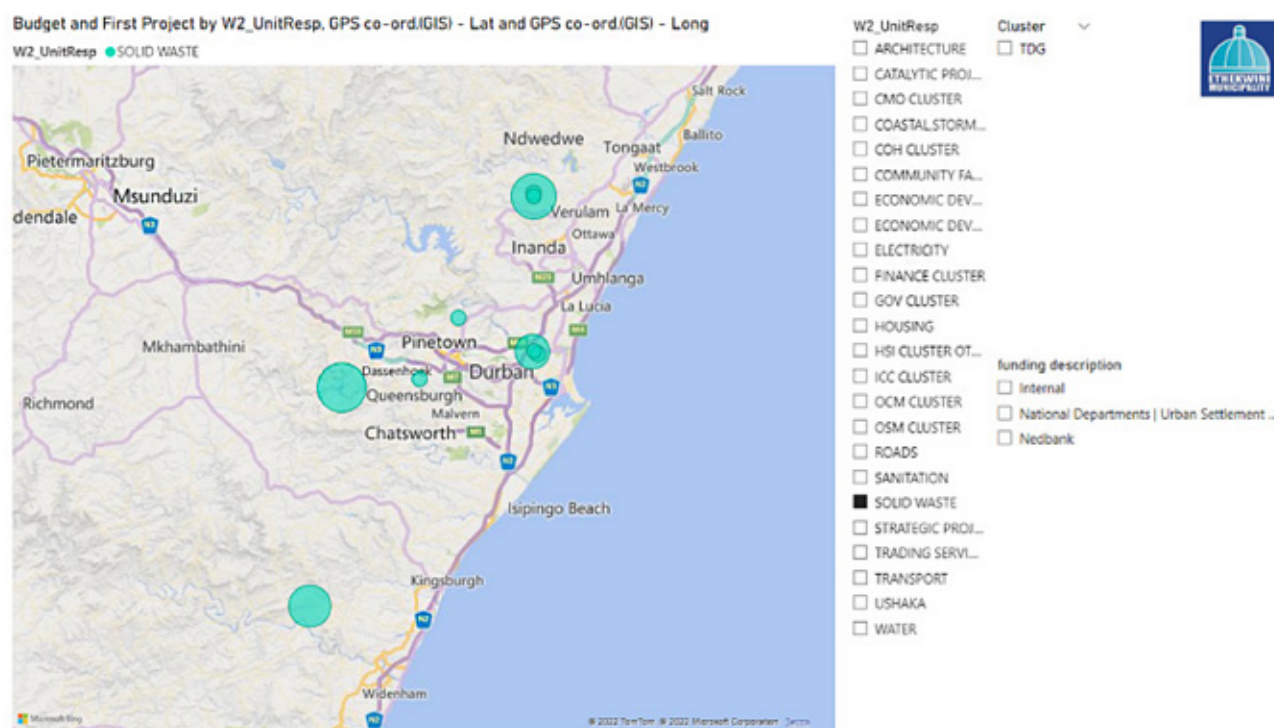


FIGURE 5: Spatial dashboard of the 10-year project pipeline (under development)

objectives with the resources it has available. Given the cross-cutting nature of the organisational improvements, consensus and commitment is needed to drive change and close identified gaps. An independent assessment by accredited assessors using a recognised international framework removes institutional bias, enables benchmarking against international best practice, and enables repeatable reassessments to monitor and drive continuous improvement.

Lessons learnt 2: Lead through a centralised management structure. A mandated structure is needed to oversee and give coordinated effect to the infrastructure asset management policy, identified improvement plan, legislative requirements, and directives from National Treasury and other spheres of Government.

Lessons learnt 3: Put the essential building blocks in place to embed the basic principles. Bringing about change takes time and reaching higher levels of maturity typically takes several years, with some business units advancing more rapidly than others. Foundational elements provide the platform for business units to take action and drive continuous improvement in a coordinated manner. Foundational elements for the EMM included: the Infrastructure Asset Management Policy that provides mandate and governance to the implementation of best practice; the Strategic Asset Management Plan (SAMP) that provides clarity of the linkage between the organizational strategy and the infrastructure asset management objectives and the expected future outcomes at a strategic level; business unit tactical Asset Management Plans (AMPs) that demonstrate the link between planned investments and future performance outcomes for each business unit. In a large organisation with many business units such as the EMM, an integrated city-wide AMP that prioritises investments and resource allocation between units and asset classes within the available funding limits is essential.

Lessons learnt 4: Include executive leadership, support units, strategic units and operational units. Cities are asset intensive organisations and infrastructure-based services form a significant part of the value created for customers. Corporate support units such as finance, governance, supply chain management, human resources, information technology, etc. all contribute to the effective operation of the infrastructure intensive organisation, and it is critical that these corporate support units understand the role they play in infrastructure management and contribute to driving process and data improvements. To ultimately drive improvement and change at a city-wide level as described above, it is critical to get endorsement from executive leadership, including the City Manager and Mayor.

Lessons learnt 5: Provide sufficient capacity to execute. Infrastructure asset management improvements typically require change to process and data that touches a great number of staff in the organisation. Sufficient capacity is needed to coordinate improvements and bring about positive change, typically from technical resources that have constrained capacity. A centre-of-excellence model where a core group of dedicated officials with advanced training is established to drive change and provide support capacity is more effective than relying on voluntary resourcing from business units.

RECOMMENDATIONS

The turnaround strategy developed by the EMM is the start of the journey to building a more sustainable and effective city to the benefit of its citizens and businesses. The city will need to make a commitment to the improvement plan and allocate adequate resources to keep momentum in bringing about the desired changes. Alignment across

the business units is critical for success and the office of the Chief Strategy Officer will need to play an important coordination role to execute well.

Other cities with similar challenges may benefit from the strategic and structured approach taken by the EMM and from the lessons learnt by the EMM on their journey of improvement.

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