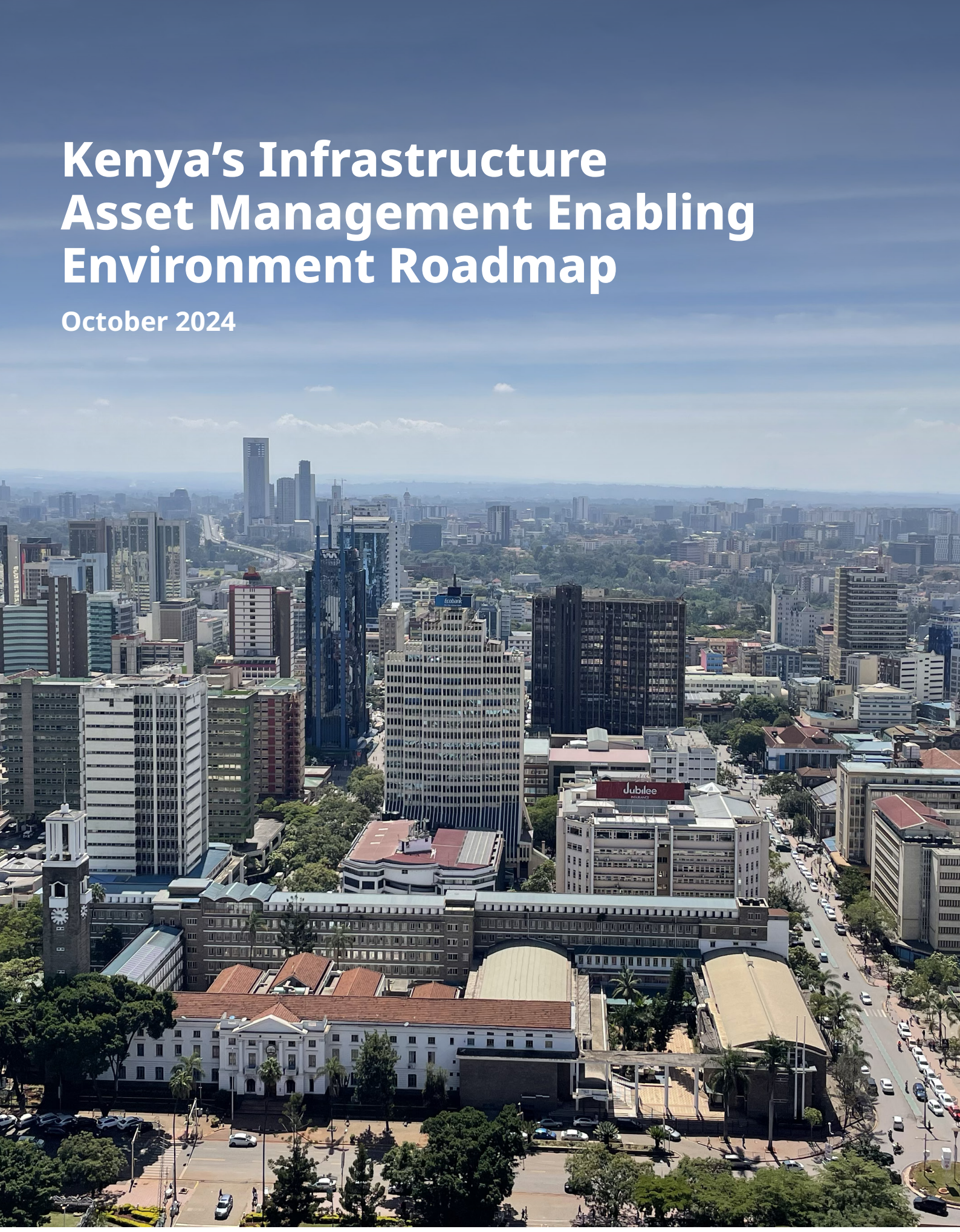
Kenya's Infrastructure Asset Management Enabling Environment Roadmap

October 2024



REPUBLIC OF KENYA

STATE DEPARTMENT FOR PUBLIC WORKS
Public Works Makes Kenya Work

UNOPS

United Nations | Department of Economic and Social Affairs

UNCDF | Impact Capital for Development

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For further information regarding the United Nations Infrastructure Asset Management Capacity Development collaboration, refer to the available resources at: **https://financing.desa.un.org/capacity-development/topics/infrastructure-asset-management**

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List of Abbreviations

AFD	Agence Française de Développement
AfDB	African Development Bank
AMAP	Asset Management Action Plan
AMP	Asset Management Plan
BETA	Bottom-up Economic Transformation Agenda
BoQ	Bills of Quantities
BORAQS	Board of Registration of Architects and Quantity Surveyors
CAT-IAM	Capacity Assessment Tool for Infrastructure Asset Management
CIDP	County Integrated Development Plans
CIMES	County Integrated Monitoring and Evaluation System
CPD	Continuous Professional Development
EBK	Engineers Board of Kenya
EE	Enabling Environment
EIA	Environmental Impact Assessment
e-NIMES	Electronic National Integrated Monitoring and Evaluation System
GIS	Geographic Information System
IAM	Infrastructure Asset Management
IAM EE	Infrastructure Asset Management Enabling Environment
IFMIS	Integrated Financial Management Information System
ILO	International Labour Organization
KEBS	Kenya Bureau of Standards
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KIP	Kenya Institute of Planners
KURA	Kenya Urban Roads Authority
M&E	Monitoring and Evaluation
MDA	Ministries, Departments and Agencies
MTEF	Medium Term Expenditure Framework
MTP	Medium Term Plan
NCA	National Construction Authority
NEMA	National Environment Management Authority
NIMES	National Integrated Monitoring and Evaluation System

NPMF	National Performance Management Framework
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PCI	Public Corporation and Institution
PDF	Project Development Fund
PEFA	Public Expenditure and Financial Accountability
PFM	Public Finance Management
PIM	Public Investment Management
PIT	Project Implementation Team
PMO	Project Management Office
PPAD	Public Procurement and Asset Disposal
PPF	Project Preparation Facility
PPP	Public-Private Partnership
PPRA	Public Procurement and Regulatory Authority
QA	Quality Assurance
QC	Quality Control
RBM	Results-Based Management
SAMP	Strategic Asset Management Plan
SDGs	Sustainable Development Goals
SOP	Standard Operating Procedure
TWG	Technical Working Group
UN	United Nations
UNCDF	United Nations Capital Development Fund
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNICEF	United Nations International Children’s Emergency Fund
UNOPS	United Nations Office for Project Services

Foreword

Infrastructure Asset Management (IAM) is essential for achieving sustainable, resilient and accessible development that leaves no one behind. Adopting a systematic approach and a structured methodology to managing the entire life cycle of assets, enables IAM at both national and sub-national levels maximum infrastructure investments, ultimately improving community services for future generations.

The Government of Kenya is committed to optimizing public investments for sustainable infrastructure development to improve quality of life, economic growth and livelihoods for all citizens. The increasing demand for robust, supportive infrastructure underscores the importance of asset management. This is vital across sectors including energy, water and transport, acknowledging that both tangible and intangible assets are the cornerstone to socio-economic advancement and resilience at both national and sub-national levels. Therefore, through effective planning, delivery and management of our infrastructure portfolio, we aim to accelerate progress toward achieving our national development targets.

Kenya's vision is focused on building a more sustainable and resilient middle-income society by putting in place sustainable infrastructure asset development and management as a core driver of a sustainable economy. This approach acknowledges that effective IAM has the potential to enhance the service life of assets, prolong their operational life and safeguard investment returns. This report outlines adaptive strategies for infrastructure investment and management that are designed to anticipate and mitigate future uncertainties.

A key component of our strategy involves the protection and preservation of Kenya's physical and institutional infrastructure system. This approach will facilitate national progress along a trajectory of sustained growth aligned with Kenya's Bottom up Economic Transformation Agenda (BETA) Policy. The integrated BETA economic model, which comprises both economic and social development policies, highlights the importance of infrastructural planning and development as key drivers in promoting economic growth and alleviating poverty.

This report is the culmination of a collaborative effort between the UN Office for Project Services (UNOPS), the UN Department of Economic and Social Affairs (UN DESA) and the UN Capital Development Fund (UNCDF), in conjunction with national and county government institutions. These collaborative efforts mark a significant milestone in identifying and addressing IAM priority needs, hence proposing strategic solutions aimed at furthering achievements on the Sustainable Development Goals (SDGs) as well as climate action and inclusion initiatives across all levels of government in Kenya.

This comprehensive enabling environment for infrastructure asset management roadmap has been developed following an in-depth analysis of national policies, legislative frameworks, broad multi-sectoral consultations and extensive participatory workshops. It aims to present a strategic action plan that promotes sustainable IAM practices in Kenya. The Government of Kenya is committed to implementing prioritized areas that have been identified. We extend our gratitude to UNOPS and the dedicated partners UN DESA and UNCDF for their invaluable support provided in developing this roadmap, which has resulted in the following outcomes:

- Greater understanding of the significance of, and how to implement IAM practices and toolkits to promote sustainable, resilient and inclusive development;

- Enhanced capacity to design and implement an improved national policy and regulatory and legislative framework for IAM at both national and county government levels;

The roadmap also outlines necessary institutional interventions aimed at improving the enabling environment at the national and sub-national levels. The identified interventions are strategically aligned with Kenya's national development goals to advance progress towards the SDGs as outlined in the 2030 Agenda and Kenya's BETA economic model.

This roadmap emphasizes actions that will provide more opportunities for investment for Kenya's future, presenting substantial, evidence-based recommendations that serve as a foundation for investments and partnerships with external agencies in our development initiatives.

Mr. Joel P. L. Arumonyang, CBS.
Principal Secretary
State Department for Public Works

Executive Summary

Introduction

Kenya recognizes infrastructure development as an enabler for sustained economic development. The Kenyan government is working to intensify national and regional connectivity through water, road, rail, port, energy and fibre-optic infrastructure to achieve socio-economic transformation in the country, enhance Kenya's competitiveness and facilitate cross-border trade and regional integration. The government is committed to enhancing its asset management practices and has put in place a number of supporting structures, including policies, legislation, systems, and financial and human resources, with the goal to maximize the value of public infrastructure asset investments and leverage them to support sustainable development for generations to come.

Roadmap Overview

It is against this backdrop that the UN Office for Project Services (UNOPS), in collaboration with the UN Department of Economic and Social Affairs (UN DESA), the UN Capital Development Fund (UNCDF) and State Department for Public Works within the Ministry of Lands, Public Works, Housing & Urban Development, undertook an assessment of the Infrastructure Asset Management Enabling Environment (IAM EE) in Kenya. The assessment identified key capacity gaps based on the analysis of national IAM strengths and challenges. Based on this analysis, a strategic IAM EE roadmap was developed, proposing clear targets and actions to advance the country's public asset management practices. The roadmap aims to address the lack of sustained and systematic strategies, policies and actions at the national and local government levels to ensure infrastructure assets support inclusive, resilient, affordable and sustainable essential public services over their lifespan.

Key Strengths

Kenya has a well-defined and comprehensive planning framework that provides strategic long-term development direction and guides the identification of goals, objectives and priorities for public infrastructure. This framework is supported by clearly defined roles, responsibilities and ownership of strategic planning responsibilities across national and local government entities.

National spatial frameworks and plans integrate long-term development with climate adaptation considerations. These are supported by an asset management policy that defines acquisition, use, operation and maintenance (O&M), disposal and risk management. As well, Kenya's national infrastructure sector plans are strategically aligned with international agendas, including the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) and the Paris Agreement on climate change. This ensures infrastructure development supports broader global commitments.

Advancements to strengthen infrastructure delivery structures were identified, including: revising building codes and standards to address emerging issues; developing monitoring and evaluation (M&E) guidelines for projects; and creating public investment management guidelines for project identification and preparation. Additionally, the established procurement policy, law and regulations promote transparency and openness, overseen by the Public Procurement and Regulatory Authority (PPRA), and formal capital planning processes are supported by procurement plans and development budgets.

Established institutions, such as the Board of Registration of Quantity Surveyors and Architects

(BORAQS), the Kenya Institute of Planners (KIP) and the Engineers Board of Kenya (EBK), regulate and licence industry professionals. As well, partnerships with the National Construction Authority (NCA) and National Environmental Authority (NEMA) support the enforcement of standards and continuous professional development. This is complemented by collaborations with universities to promote professionalism and safety standards in the built environment. A notable advancement is the national building maintenance policy, which provides a roadmap including standards, training and legal frameworks for infrastructure preservation and rehabilitation.

Key Challenges

The assessment identified significant infrastructure planning challenges that impede effective IAM in Kenya. A primary concern is the inadequate integration of asset management and life cycle planning into current policies, plans and budgets. This is further affected by the absence of Strategic Asset Management Plans (SAMPs) to define national asset management objectives. There is also a need for a framework to transition from cash-based to accrual accounting systems for improved public financing management. Decision-making often prioritizes new acquisitions rather than adopting a life cycle management approach, and there is a need to improve stakeholder engagement and community participation during infrastructure planning.

Additionally, enforcement mechanisms to control and regulate spatial and urban development are lacking. The implementation of existing frameworks is limited by the absence of a centralized geographic information system (GIS) and a lack of available geospatial data as well as current land use, zoning, environmental and demographic trends. Moreover, current processes lack asset management plans and strategies to support effective IAM practices, and more effective use of available data would enable future planning that ensures asset sustainability and resilience.

Key infrastructure delivery challenges include a lack of mandated comprehensive feasibility studies and environmental and socio-economic impact studies. There is also a need to identify financial mechanisms for O&M before project implementation to ensure adequate project planning and alignment with national objectives. Institutional gaps include the duplication of roles, insufficient technical capacity and inadequate resources across implementing agencies, resulting in project approval delays and lengthy procurement processes. Additionally, there is insufficient consideration of long-term renovation, retrofit, repurposing and decommissioning in the design process, and inadequate site monitoring and reporting lead to construction risks.

The assessment revealed a need to prioritize and systematize maintenance activities across sectors, moving from reactive to proactive maintenance strategies supported by dedicated budgets. There is also a need to plan and develop Asset Information Management Systems (AIMS) to ensure the availability of accessible, reliable data to support effective, evidence-based IAM. Establishing regular, structured inspections and monitoring for end-of-service life assessments is also essential to enhance the sustainability and efficiency of public infrastructure management. This strategic shift would not only improve operational effectiveness but also ensure infrastructure management aligns with international best practices and sustainability objectives.

Key Recommendations

The roadmap action plan includes key priority recommendations for advancing IAM EE in Kenya:

- Mainstreaming IAM in all policies and plans
- Integrating asset management data to decision-making processes, supported by completing, updating and automating all asset registers
- Mainstreaming climate change and adaptation into IAM policies and plans

- Strengthening enforcement of development control guidelines
- Collecting, analyzing and documenting all asset data, including geospatial data
- Developing and institutionalizing asset management plans (AMPs) and strategies
- Enforcing implementation of Circular No. 16 of 2019 on Public Investment Management (PIM) Guidelines for National Government and its Entities, especially regarding undertaking feasibility studies, risk and cost benefit analysis
- Enhancing technical capacity in public service through capacity building and recruitment processes
- Establishing permanent multi-disciplinary project implementation committees
- Simplify procurement processes and mainstreaming e-procurement to reduce delays while ensuring transparency accountability, and value for money
- Incorporating environmental and socio-economic impact studies, financial, hazard and risk information, and end-user needs in the design process
- Ensuring all infrastructure project designs include plans for long-term O&M, and enhancing financial resources allocation for O&M by identifying sustainable funding mechanisms
- Enhancing financial resources and enforcement mechanisms for auditing and inspection of construction projects
- Developing and implementing an Asset Information Management System (AIMS)
- Establishing standard operating procedure (SOP) and guidelines for decommissioning of infrastructure assets and enforcing end-of-service life processes

The roadmap will support the implementation of initiatives aimed at enhancing the IAM EE in Kenya. This includes targeted actions to address policies, processes, institutional arrangements, funding management, knowledge management, data management, stakeholder engagement, and monitoring and reporting. The roadmap is centred around four analyzed capacities: (1) IAM, (2) SDGs, (3) Climate Action, and (4) Inclusion. This document aims to guide the preparation and implementation of joint programmes between government and partners, with emphasis on accelerating the mobilization of finance through evidence-based concept notes and proposals to promote sustainable IAM in Kenya.

Project Overview

Infrastructure Asset Management

Infrastructure lies at the heart of sustainable development, shaping the quality of life, economic opportunities and resilience of communities worldwide. For many developing countries, large-scale investments offer a once-in-a-generation opportunity to modernize critical infrastructure systems. However, underinvestment and lack of skills to properly manage these public assets can severely impact or even regress progress made towards sustainable development. Research indicates that over 90 per cent of the Sustainable Development Goals (SDGs) could be accelerated through more resilient, sustainable and inclusive infrastructure. At the same time, the growing number of risks and challenges stemming from climate change, urbanization, fiscal pressures and natural disasters also strengthen the case for more strategic and effective management of the infrastructure assets countries own and those they plan to invest in.

Recognizing these challenges, the United Nations has spearheaded efforts to strengthen the capacities of local and national government officials to promote resilient and data-driven Infrastructure Asset Management (IAM) through innovative tools and global knowledge-sharing initiatives. Since 2017, the IAM team at the UN Department of Economic and Social Affairs (UN DESA), the UN Office for Project Services (UNOPS) and the UN Capital Development Fund (UNCDF), in collaboration with other UN-system entities and with a diverse global team of experts, has worked with public-sector officials from around the world to more effectively plan, organize, deploy, maintain and dispose of infrastructure assets. By introducing practical tools based on best practices and high industry standards, our whole-of-government approach to IAM improves coordination within and among governments, communities and stakeholders, fostering more integrated and sustainable development.

Globally, the UN IAM team has provided on-site technical assistance to Bangladesh, Costa Rica, Kenya, the Lao People's Democratic Republic, Uganda, Nepal, Somalia, the United Republic of Tanzania and The Gambia. Further activities are being planned to scale up the initiative in support of the 2030 Agenda. Similarly, UN DESA and UNCDF, with the support of UNOPS, published in 2021 'Managing Infrastructure Assets for Sustainable Development: A Handbook for Local and National Governments'.[1] The Handbook offers detailed instructions and illustrative examples on how to apply new asset management tools, lessons learned in their application, and deep dives into related issues including managing data, introducing crisis resilience and creating an enabling environment. This publication is currently available in 10 languages, including all six official UN languages.

UN Support for Promoting Sustainable Infrastructure Asset Management in Kenya

As part of the UN initiative to promote effective IAM, the UN IAM team has been implementing a comprehensive project in Kenya since 2022. This initiative, funded by the UN Peace and Development Fund, aims to strengthen the capacity of local and national governments to enhance the resilience, accessibility and sustainability of their infrastructure assets in support of the 2030 Agenda for Sustainable Development.

On 24 and 25 October 2022, UN DESA led online training sessions on the basic tenets of IAM for 50 finance, engineering and procurement officers from nine counties in Kenya, which included Bungoma, Kakamega, Kisumu, Laikipia, Makueni, Migori, Nakuru, Nandi and Uasin Gishu. During

these sessions, public officials were also sensitized on the foundations of the toolkit found in the UN Handbook on IAM, including guiding material on climate vulnerability assessments and building effective asset management information systems.

Following the training, diagnostic field assessments of asset management practices were conducted in the nine participating counties using a diagnostic tool with 14 sections. Assessments of all nine counties highlighted the need to prioritize efforts in Asset Inventory Data, Asset Performance, Asset Management Information Services, Levels of Service and Operational Planning. The counties consistently showed notable advancements in procurement, though further work is required to enhance transparency and integrate asset information into key systems for broader accessibility and usability. During this stage, detailed asset management profiles were developed in collaboration with local governments to identify and address priority local needs along with potential quick wins and areas of future intervention.

Three workshops were designed and delivered in Kenya between 2022 and 2024. The first provided introductory training for 100 county officials on adopting the UN toolkit for effective IAM, held in Naivasha from 5 to 8 December 2022 in collaboration with the Kenya Council of Governors (KCG). The training included deep dives on asset data and climate resilient asset management, and participants committed to designing and implementing multi-year Asset Management Action Plans (AMAPs) in their respective governments. Draft AMAPs were developed during the workshop, addressing critical infrastructure needs with a focus on sectors such as medical equipment and health facilities, solid waste management, water supply and street lighting. Key challenges identified in the AMAPs related to incomplete asset registers, lack of dedicated asset management teams and insufficient mainstreaming of asset management into broader county planning. Priority actions outlined in the AMAPs included automating asset registers, developing policies and creating specialized asset management units.

The second workshop, delivered in collaboration with the KCG, took place in Mombasa from 16 to 18 May 2023 and was attended by 25 central and local government officials. This workshop aimed to increase the capacity of newly appointed central and local government officials to implement effective asset management practices with a whole-of-government and asset life cycle approach.

The third workshop, held in Naivasha from 24 to 27 June 2024, was implemented as a Training of Trainers (ToT) in partnership with the Kenya School of Government (KSG). During the sessions, 21 KSG officials examined lessons learned from the UN DESA-led IAM capacity development initiative and engaged in peer-learning activities, such as studying case studies on the application of the UN IAM toolkit across nine counties in Kenya. The workshop also facilitated the identification of key elements and actions to help KSG institutionalize the UN IAM content into its training curricula for national and local public officials, ensuring the sustainability and broader dissemination of IAM principles.

Further on-site technical assistance was provided by the UN IAM team and KCG to all nine participating counties to finalize their AMAPs and identify and address potential implementation bottlenecks.
A key impact derived from the IAM project in Kenya is also the inclusion of priority actions identified in the AMAPs in each County Integrated Development Plan (CIDP) 2023-2027. This shows the counties' commitment to institutionalizing asset management principles in the long term. Overall, the CIDPs include concrete calls to action to improve asset information services and performance through automation processes and revised policies.
For example, in Bungoma County, the UN IAM Handbook materials were used to define the county's asset management policy and framework, illustrating the practical adoption of the toolkit.

The final phase of the project focused on creating an effective Infrastructure Asset Management Enabling Environment (IAM EE) by addressing policy constraints and aligning key policy, regulatory and institutional factors at the national and local levels. This phase included UNOPS-led IAM EE gap assessments, involving over 20 consultations with key stakeholders. This culminated in a national validation workshop delivered in Naivasha from 25 to 27 June 2024 in collaboration with Kenya's State Department for Public Works. The event was attended by over 30 participants, including representatives from national government ministries, departments and agencies, state enterprises, development partners, funders, universities, civil society and the private sector. Participants discussed, validated and prioritized key capacity gaps, supporting the development of Kenya's IAM EE roadmap presented in this report. In addition to supporting economic, social and environmental sustainability, this collaborative effort emphasized the importance of fostering trust between communities and the government, underscoring the transformative potential of well-managed public infrastructure assets.

Introduction

Infrastructure Asset Management (IAM) is essential to achieving sustainable, resilient, accessible and inclusive infrastructure development. This report is the culmination of a three-year partnership between the UN Office for Project Services (UNOPS), the UN Department of Economic and Social Affairs (UN DESA), and the UN Capital Development Fund (UNCDF), in close collaboration with the State Department for Public Works within the Ministry of Lands, Public Works, Housing & Urban Development, to identify and propose solutions to address IAM priority needs at national and local government levels in Kenya.

Using the UNOPS Capacity Assessment Tool for Infrastructure Asset Management (CAT-IAM), and through an extensive stakeholder consultation process, this assessment aimed to achieve the following outcomes:

1. A greater understanding of the importance of and how to implement IAM practices and toolkits for sustainable, resilient and inclusive development
2. Enhanced capacity to design and implement an improved national policy and regulatory and legislative framework for IAM at the national and local levels

The Infrastructure Asset Management Enabling Environment (IAM EE) Gap Assessment supports the identification and analysis of strengths, challenges, opportunities and solutions for national and local government IAM practices. A strategic roadmap for addressing the eight enabling environment capacities for IAM was developed with targeted action plans across the infrastructure life cycle to improve public asset management policies, guidelines and regulations with clear targets, timelines and roles and responsibilities across government levels.

The roadmap also defines institutional interventions required to enhance the national and local enabling environment for IAM. These interventions are aligned with Kenya's national development objectives to advance progress towards the Sustainable Development Goals (SDGs), the Paris Agreement on climate change and gender and inclusivity goals. The proposed roadmap prioritizes actions to provide more opportunities for investment in Kenya's future, offering impactful, evidence-based recommendations to improve the national enabling environment for IAM.

The outputs of the IAM EE Gap Assessment are delivered in a participatory manner. Through a comprehensive consultation process and an IAM EE validation workshop, inputs and validation were provided by key stakeholders from ministries, departments, agencies, development partners and banks, academia, civil societies and private sector organizations involved in Kenya's built environment industry.

This joint programme was piloted in Kenya, The Gambia, the United Republic of Tanzania, Nepal, the Lao People's Democratic Republic and Costa Rica between 2022 and 2025.

Country Overview

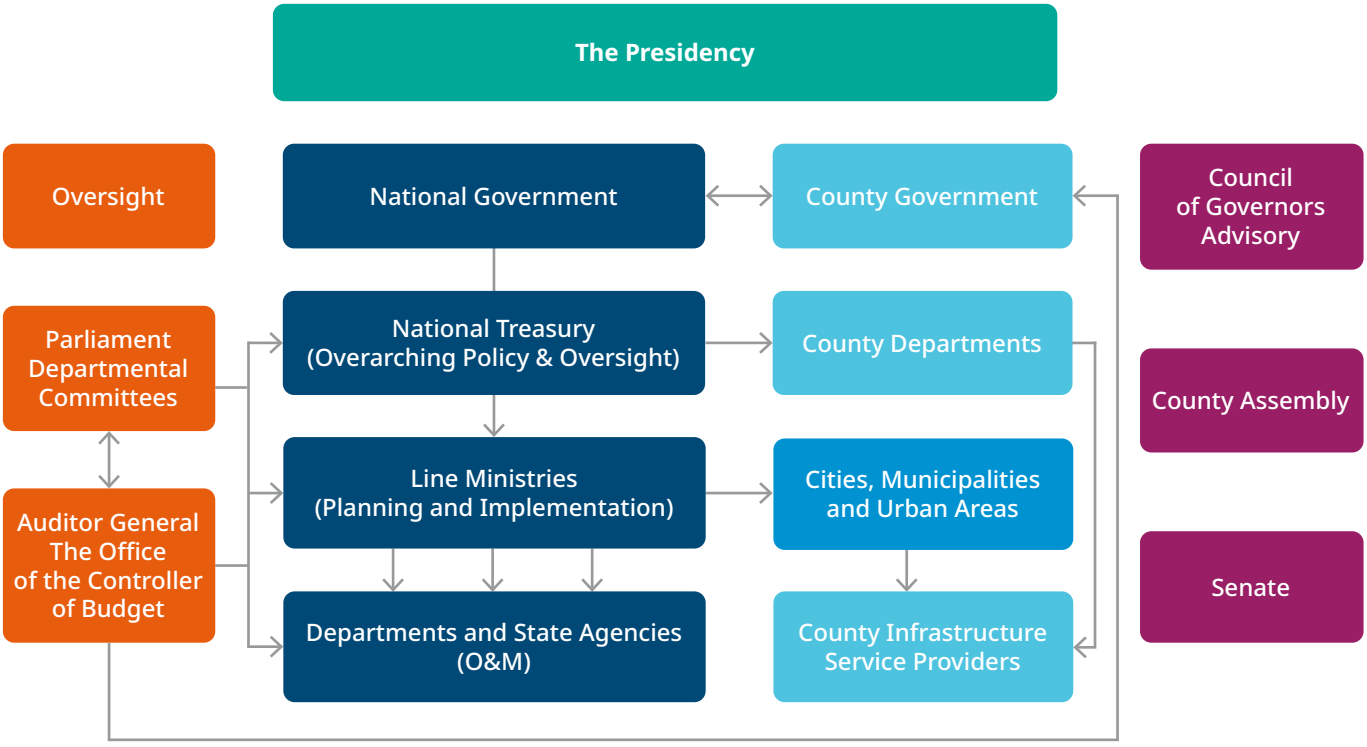
Kenya recognizes infrastructure development as an enabler for sustained economic development, as shown in Kenya's long-term development blueprint Kenya Vision 2030[2] together with the Sessional Paper No. 10 of 2012 on Kenya Vision 2030.[3] According to the 2024 Budget Policy Statement,[4] development of critical infrastructure is key to economic growth and a key enabler to implementing the Bottom-Up Economic Transformation Agenda (BETA).

The Kenyan government is working to intensify national and regional connectivity through water, road, rail, port, energy and fibre-optic infrastructure to achieve socio-economic transformation in the country, enhance Kenya's competitiveness and facilitate cross-border trade and regional integration. Within the 2024-2025 financial year, the government has planned investments in key infrastructure sectors, including water, roads, energy and housing. However, Kenya, like other African countries, has an infrastructure-financing gap, estimated by the World Bank in 2018 at US$2.1 billion annually.

The growing number of risks and challenges associated with climate change, public health crises and advances in digital technology make the case for effective Infrastructure Asset Management (IAM) more compelling than ever. IAM can improve the capacity of local and national governments to undertake sustainable, resilient, accessible and inclusive infrastructure development and ensure public infrastructure investments adequately serve communities. Effective asset management helps "make cities and human settlements inclusive, safe, resilient and sustainable", according according to SDG 11 (Sustainable Cities and Communities), and is key to building local capacity for SDG financing, as called for in the Addis Ababa Action Agenda.

The Kenyan government is dedicated to advancing its IAM capabilities. To this end, it has implemented a comprehensive framework that includes relevant policies, legislative measures, systems, and strengthening the allocation of financial and human resources. Kenya's primary objective is to optimize the returns on public investment, thereby enabling assets to contribute to sustainable development for future generations. The institutionalization of IAM practices at all levels of government reflects a strategic and intentional approach by the Kenyan government to realize these aims.

Kenya's Institutional Framework



Building climate-resilient infrastructure assets is central to good asset management. Climate change is increasingly threatening global socioeconomic development and environmental sustainability. In Kenya, climate change has led to more frequent extreme weather events, including prolonged droughts, irregular and unpredictable rainfall, increased flooding and rising temperatures. As a developing country, Kenya has a low adaptive capacity and high vulnerability to climate change. The country's Climate Change (Amendment) Act, 2023[5] provides for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low-carbon development for sustainable development. Thus, the importance of building climate-resilient infrastructure assets cannot be overstated for Kenya. Climate-resilient asset management enhances the reliability of service delivery, increases asset life, reduces the need for costly retrofits and reduces the risk of assets becoming prematurely obsolete. In addition, climate-resilient assets can accommodate or quickly recover from disruptions caused by severe climate events or chronic climate stresses, reducing the likelihood of a damaging or irreversible impact.

Kenya has a well-defined and comprehensive planning framework that provides strategic long-term development direction and guides the identification of goals, objectives and priorities. Some key strategic documents include: Kenya Vision 2030, implemented through successive five-year Medium Term Plans (MTPs); the current government's development manifesto, the Bottom-up Economic Transformation Agenda (BETA); County Integrated Development Plans (CIDP); and the SDGs. There is horizontal and vertical coordination across the different levels of government (national, county, city/municipalities) and also across different agencies within the same sectors. Although the government does not formulate and implement explicit Strategic Asset Management Plans (SAMPs) that aid in identifying and establishing long-term goals and objectives, infrastructure asset needs are well identified within the strategic planning process.

Kenya's Strategic Planning Framework

The government is in the process of enhancing the collection and use of asset data to improve its asset management practices. The National Assets and Liabilities Management Department, under the Directorate of Public Investment and Portfolio Management at The National Treasury, developed an Asset and Liability Management Policy (2020),[6] Asset and Liability Management Guidelines (2020)[7] and an Asset and Liability Reporting Template (2023)[8] to be used by all national government entities.

The functions of spatial planning are allocated between national and county governments. Kenya has various policies and regulations that guide spatial planning, including: the Kenya National Spatial Plan 2015-2045;[9] the National Land Use Policy (2009);[10] Sessional Paper No. 1 of 2017 on National Land Use Policy;[11] and County Spatial Planning Guidelines.[12] The government also has clear guidelines on the project preparation process, as contained in the Circular No. 16 of 2019 on Public Investment Management (PIM) Guidelines for National Government and its Entities.[13] Kenya also has a National Integrated Monitoring and Evaluation System (NIMES) and a Kenya National Monitoring and Evaluation Policy (2022).[14] As a result, all project documents must have a clear M&E framework with clear outputs and timelines.

Delivery of government projects is mainly undertaken by the respective government agencies. Project implementation guidelines provide for the formation of project implementation committees charged with overseeing project implementation and reviewing progress to ensure sound project management, including quality and sustainability.

Most government agencies also have project management offices (PMOs) for planning, monitoring and evaluating all major infrastructure projects. The government applies best practices in project management, but there have been challenges with time and cost overruns as well as risk management.

Kenya has a strong procurement law through the Public Procurement and Asset Disposal Act (2015, Revised Edition 2022)[15] that supports transparency and openness in the procurement of public infrastructure projects. There is also a National Public Procurement and Asset Disposal Policy (2020)[16] and Public Procurement and Asset Disposal Regulations (2020).[17] The Kenya Bureau of Standards (KEBS) assures material quality through standardization.

Kenya's national building codes and standards ensure quality design, maximize operational life, and promote social welfare, environmental, health, safety and risk considerations in the design of infrastructure assets. The draft National Building Code, 2022[18] makes specific provisions for sustainable design practices, including energy efficiency and thermal comfort and the use of renewable energy sources. In addition, professional associations such as the Board of Registration of Architects and Quantity Surveyors (BORAQS), the Engineers Board of Kenya (EBK) and the Kenya Institute of Planners (KIP) regulate and licence professionals in the built environment. They also conduct periodic evaluations for universities to ensure curricula are up to date with current technologies and best practice.

Construction of government infrastructure projects is usually in line with the set building standards and codes. Contractors whose services are procured according to public procurement laws and regulations normally undertake construction work. Project management teams monitor project implementation, quality control (QC) and project signing off. To ensure technical and financial capacity, the National Construction Authority[19] has the mandate to register and accredit local and foreign contractors. However, there is a high incidence of occupational accidents.

Maintenance needs for existing infrastructure assets are identified during the strategic planning phase. The Sessional Paper No. 2 of 2015 on National Building Maintenance Policy[20] reiterated that maintenance of buildings and related infrastructure was regarded as a peripheral activity and was carried out in an ad hoc manner with inadequate record-keeping and low budgetary allocation and prioritization. This has resulted in a backlog of maintenance works that are expensive and difficult to address and deteriorating investments that are uneconomical and unsustainable. The inadequate maintenance and management of assets is attributed to insufficient financial resources and a lack of standards and guidelines. There are also gaps in disposal or decommissioning of assets, such as buildings and equipment that reach end of life.

Assessment Objective

Through the collaboration of project partners and government institutions, this assessment has the objective to enhance the resilience, accessibility and sustainability of infrastructure assets at the national and local levels in developing countries in support of the 2030 Agenda.

Using the UNOPS Capacity Assessment Tool for Infrastructure Asset Management (CAT-IAM), this assessment aimed to achieve the following outcomes:

- Greater understanding of the importance of and how to implement IAM practices and toolkits for sustainable, resilient and inclusive development
- Enhanced capacity to design and implement an improved national policy, regulatory and legislative framework for IAM at the national and local levels

Roadmap Overview

Capacity Assessment Tool for Infrastructure Asset Management (CAT-IAM)

The Infrastructure Asset Management Enabling Environment (IAM EE) roadmap was developed using UNOPS CAT-IAM. The tool supports partners in identifying and assessing key capacity gaps in IAM through gathering evidence on their capacity to plan, deliver and manage infrastructure systems. CAT-IAM assists partners in developing strategies to address these gaps, improving their ability to make informed decisions throughout the infrastructure life cycle management of public assets.

The objectives of CAT-IAM are to:

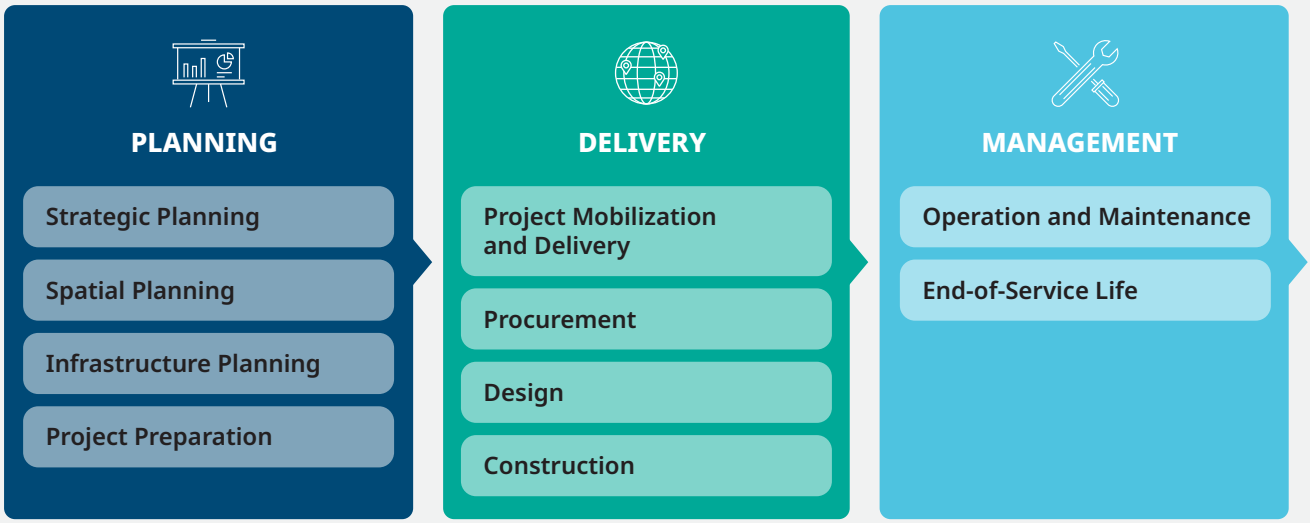
- Create a common language and framework for infrastructure capacity development
- Identify capacity gaps or challenges faced in the planning, delivery and management of infrastructure systems
- Support the identification of potential solutions to build capacity
- Create a pipeline of programmes and projects to build capacity for the partner government
- Show progress against a measured baseline

The tool was developed by a team of UNOPS engineers, architects and urban planners with expert inputs for legal, financial and institutional issues.

Roadmap Framework

The IAM EE roadmap presents a comprehensive framework considering the infrastructure life cycle, recognizing the importance and interdependence of three distinct phases: planning, delivery and management. The complete framework includes 3 Phases, 10 Stages, and 8 enabling environment indicators through the completion of 94 questions (*see Figure 1*).

Figure 1: CAT-IAM Framework



Phase 1: Planning

The analysis begins with the government's planning processes to provide insights into the policy and legislative frameworks, human resources and processes that support the identification of strategic development goals and visions. The phase includes four stages: strategic planning; spatial planning; infrastructure planning; and project preparation.

Phase 2: Delivery

This phase considers the government's capacity to deliver infrastructure projects by analyzing how it undertakes the stages of: project mobilization and delivery; procurement; design; and construction. Effectiveness in this phase ensures infrastructure assets have a long operational life while meeting sustainability, resilience and inclusion targets.

Phase 3: Management

The analysis in this phase assesses the government's capacity to manage infrastructure assets to ensure maximum value for investments that meet operational and user needs. It includes two key stages: operation and maintenance (O&M) and the end-of-service life of infrastructure assets.

The stages within each of the above phases are assessed using the relevant enabling environment indicators. These are illustrated in Figure 2 and defined in Table 1.

Figure 2: The 8 enabling environment indicators

Table 1: Definition of the 8 enabling environment indicators

Indicators	Definitions
Policies, Laws and Regulations	Policies, laws and regulations support infrastructure development throughout the infrastructure life cycle and provide the framework for how infrastructure is planned, delivered and managed across upstream and downstream governance levels. Policies that set targets act as: statements of intent; building codes and standards to control quality; health, safety and welfare regulation; and environmental protection requirements.
Institutional Arrangements	Institutional arrangements are the public institutions or governing bodies responsible for the strategic planning of infrastructure and ensuring coordination mechanisms between infrastructure sectors to support the country's vision for infrastructure development.
Processes	Processes are the set of interrelated or interacting activities that transform inputs (e.g., laws, policies and regulations) into outputs. It is important to translate policies into actionable and clear processes for developing, reviewing, updating or validating decisions related to infrastructure planning, delivery and management.
Funding and Financial Management	Funding capacity is necessary to secure funds through external funding or revenue collection for infrastructure projects. Financial management ensures adequate spending on capacity and resource allocation for O&M. Both are important to ensure the successful operation of the assets, return on investment and long-term service delivery.
Knowledge, Technical Capacities and Resources	Human knowledge and technical capabilities are necessary to plan, deliver, manage, operate and maintain infrastructure. Governments and the private sector should use and develop the appropriate knowledge, technical expertise, resources and technologies to ensure infrastructure is developed and operated effectively. This includes the strength of the education system to support relevant knowledge and technical capacity, from primary school through to professional qualifications and trades.
Data Management	Data management is the collection, organization, integration, analysis, validation and dissemination of data to support evidence-based decision-making for infrastructure assets.
Stakeholder Engagement	Stakeholders are individuals or organizations that can affect, be affected by, or perceive themselves to be affected by a decision or activity. A wide range of stakeholders should be included in the planning, delivery and management of infrastructure to ensure the population's needs are met, benefits are equitably shared, and no one is left behind.
Monitoring and Reporting	Monitoring and reporting involve having the right policies, tools and processes in place to facilitate data gathering and use and information sharing to support informed strategic decision-making and optimize infrastructure asset performance.

Roadmap Development Process

The development process for Kenya's IAM EE capacity assessment is based on eight key steps (*see Figure 3*):

Step 1: Assessment initiation

The first step of the assessment determined the purpose, scope and objectives of examining Kenya's capacity. It involved building the CAT-IAM experts team and identifying resources, research methods and timelines to accomplish the assessment.

Step 2: Stakeholder management and process mapping

This step determined Kenya's government institutional arrangement structure and the relevance of each national and local institution in relation to their key roles and responsibilities within infrastructure development and management of public assets.

Step 3: Multi-stakeholder partnerships

This participatory step engaged representatives from key government institutions, private sector organizations, development partners, academia and civil society, who formed the project's technical working group (TWG). The TWG obtained the best available data and expert knowledge and assessed the enabling environment for IAM in the country.

Step 4: Desktop review and interview process

The desktop review and interview process were completed by collecting, documenting and assessing Kenya's IAM from different sources to:

1. Understand IAM in the country context
2. Gather information to guide the assessment based on the CAT-IAM questionnaire
3. Identify and prioritize the country's strengths and challenges to plan, deliver and manage public infrastructure
4. Assess existing opportunities to improve asset management in the country
5. Propose a strategic roadmap with clear action plans to enhance resilience, accessibility and sustainability of IAM in the country

The project team collected and reviewed national policies, legislation, regulations, the national development plan, strategic plans and national visions, among other documents, as presented in Table 2. For the full list of documents consulted, see References.

Figure 3: Roadmap methodological process

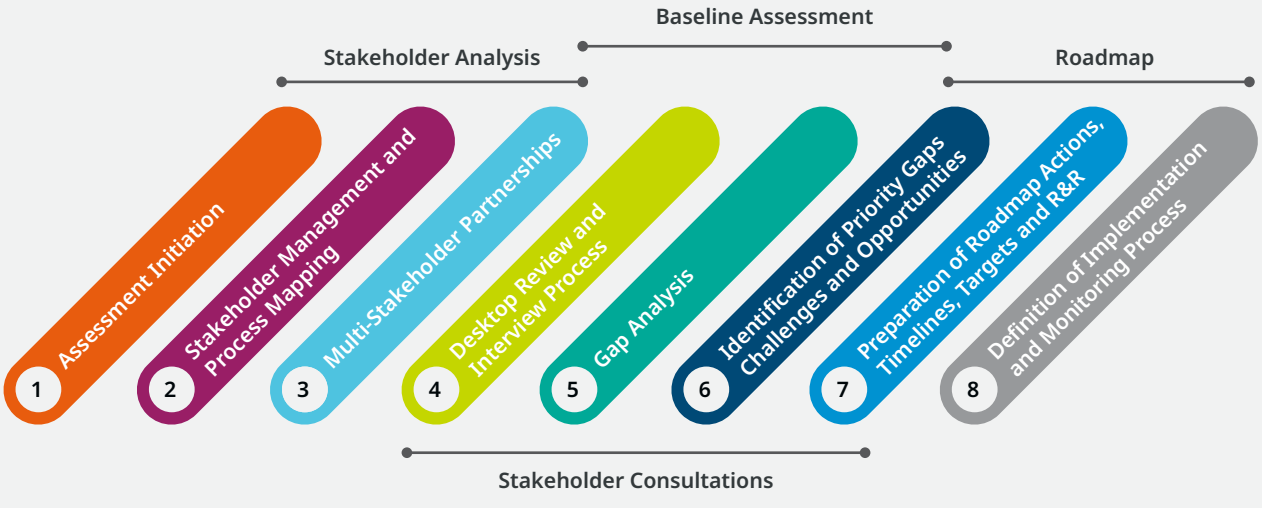


Table 2: Statistics on the data collected for the IAM EE assessment

	**23**	Ministries, departments, agencies, and organizations represented in the Technical Working Group
	**24**	Individual stakeholders consulted
	**30+**	Policy documents reviewed

The key stakeholder interview process consisted of 23 consultations conducted with stakeholders from national and local government institutions, the private sector, development partners, and academia, among others. Stakeholders shared their insights and views on Kenya's strengths and challenges by responding to the 94 questions in the infrastructure planning, delivery and management phases. For a full list of key stakeholders consulted, see **Annex C**.

Step 5: Gap analysis

The CAT-IAM Tool was used to analyze the collated information and identify capacity-related strengths and challenges throughout the infrastructure life cycle. This facilitated the identification of enabling environment gaps to improve IAM in the country context.

Step 6: Identification of priority gaps, challenges and opportunities

The progress achieved on the assessment and baseline assessment results were presented to key stakeholders in June 2024 at the 'Kenya validation workshop on enhancing the enabling environment for infrastructure asset management.' Key stakeholders' feedback was collected during the validation workshop and incorporated into this report.

Step 7: Preparation of roadmap actions, timelines, targets and roles and responsibilities

The technical team prepared a strategic roadmap with an action plan to address identified priority issues. The results were supported by information provided by the TWG from the consultation process and validation workshop.

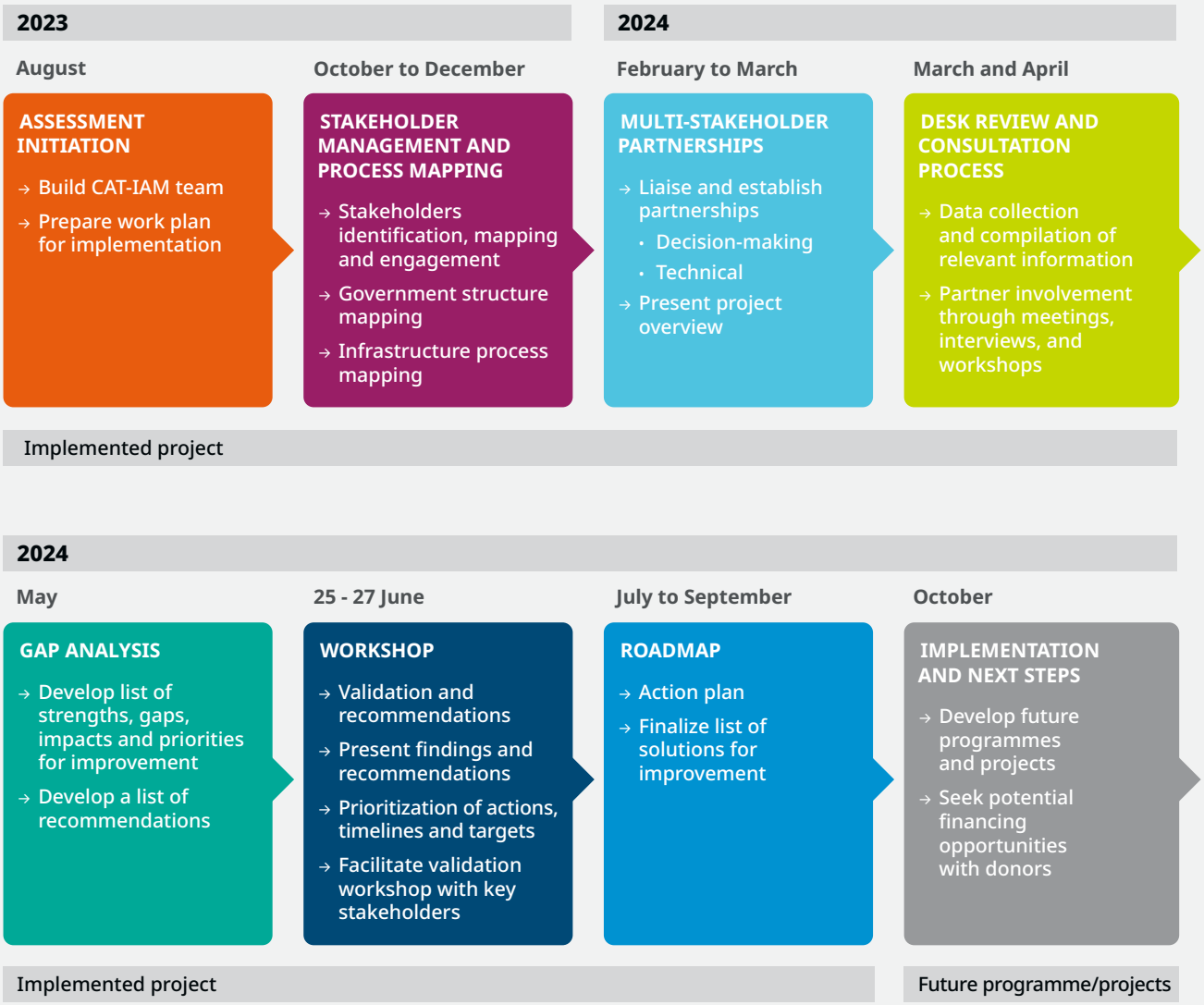
Step 8: Definition of implementation and monitoring process

Based on further discussions with the implementing partners, the technical team will use the prioritized list of action plan items to draft a technical assistance plan for future programmes and projects.

To achieve the objective presented above, this assessment considered a life cycle IAM capacity approach, including planning, delivery and management phases. This underpins the country's national development priorities by addressing four analyzed capacities: IAM through the eight enabling environment indicators; sustainable development through the SDGs; climate action through the Paris Agreement on climate change; and inclusive development through action to enhance the lives of women, girls and vulnerable groups. The technical team, in close collaboration with the TWG, conducted this work in 2023 and 2024 (*see Figure 4*).

The remainder of this report is structured based on the CAT-IAM framework, following the three phases of infrastructure planning, delivery and management and their respective stages. The report presents the strengths and challenges identified in each section, highlighting their relation to the four analyzed capacities.

Figure 4: Roadmap timeline



Assessment Findings

This section provides a summary of the assessment findings, organized by the three phases: planning, delivery and management. This is further divided into ten stages (*see Figure 5*). The text references scoring in the CAT-IAM Tool results, which is presented on a rating scale from 0 to 5.

In the context of Kenya's national IAM EE, the assessment revealed varying levels of advancement across the life cycle phases. The Planning and Delivery phases achieved higher mean ratings of 2.65 and 2.98 respectively. These ratings reflect strengths including: significant progress in policy and legal frameworks; strategic development aligned with national goals; clearly defined institutional structures; revised building codes and standards; and robust procurement laws. However, several capacity gaps still challenge advancement, such as: delays in enacting policies; inadequate human technical capacity; limited stakeholder participation; lack of forward planning; and insufficient asset data to inform operation and financial planning.

In contrast, the Management phase has an overall lower mean rating of 1.66, indicating significant capacity gaps in long-term management. These gaps include: limited budgetary allocations for O&M activities; and insufficient planning for long-term renovation, retrofit, repurposing and decommissioning of assets (*see Figure 6*).

Furthermore, considering the 10 stages of the life cycle of infrastructure assets, Kenya has significant strengths in Strategic Planning (2.91) due to a well-defined and comprehensive strategic planning framework that provides strategic long-term development direction. Project Preparation (3.00) was also an area of strength, largely due to clear project implementation structures and guidelines for Public Investment Management (PIM) to guide the project preparation process. There are also strengths in Procurement (3.38), mainly attributed to strong procurement law.

Figure 5: Roadmap phases and stages

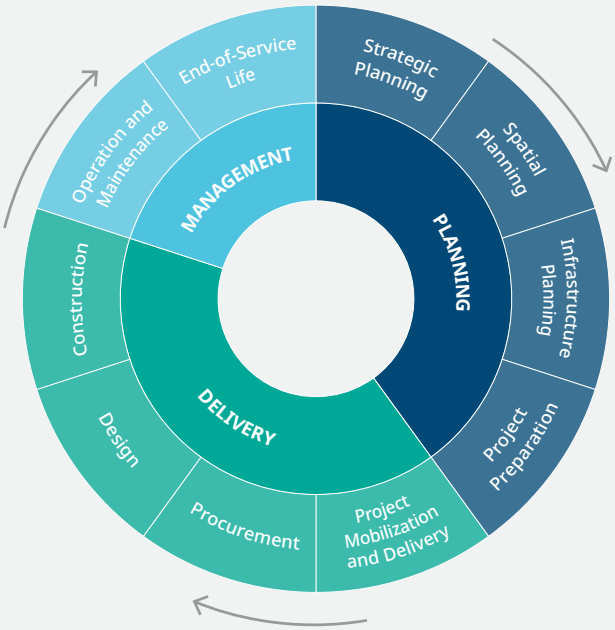
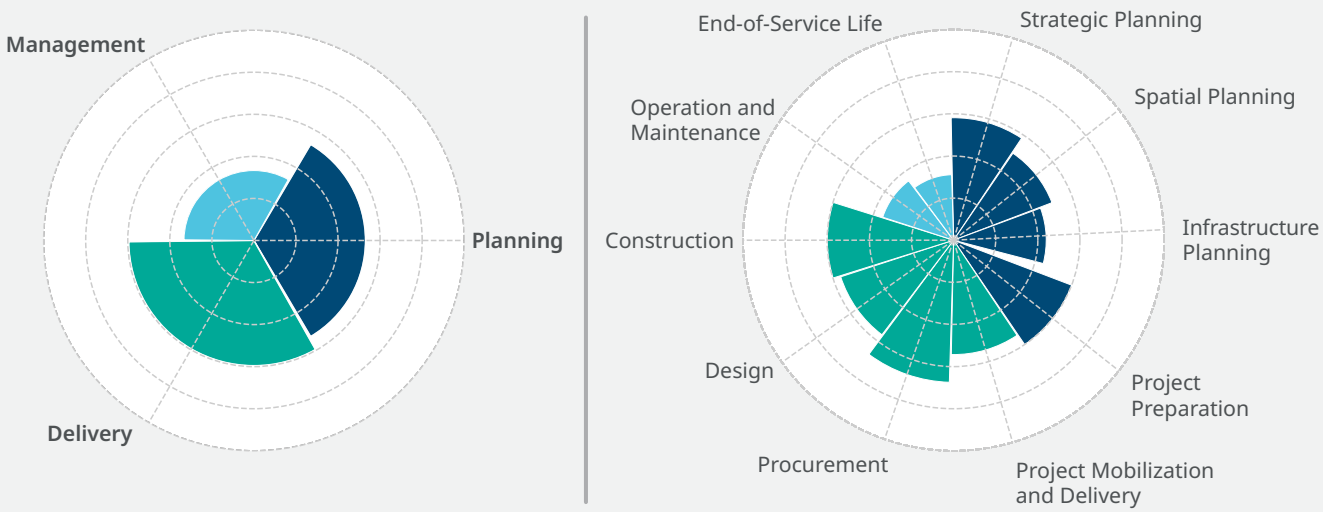


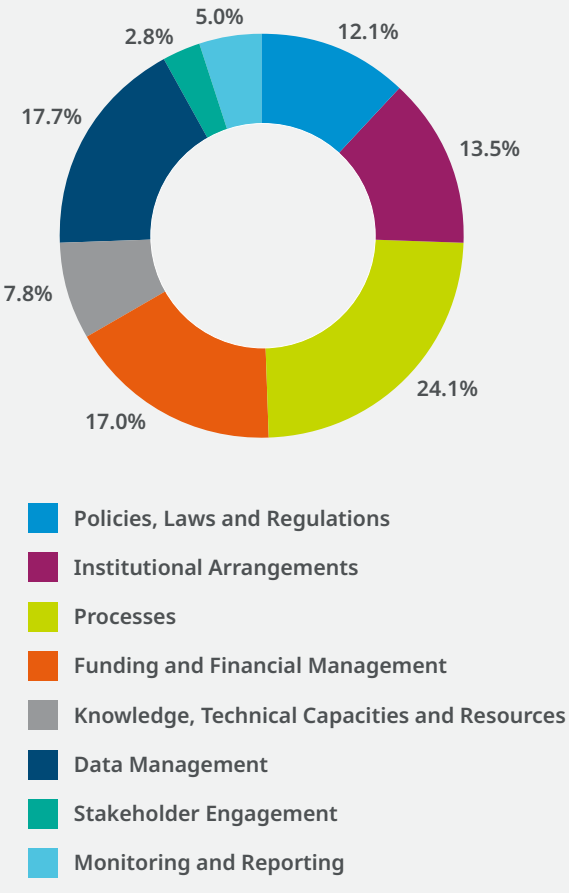
Figure 6: Baseline assessment results



The country showed average performance for the stages of Spatial Planning (2.50), Infrastructure Planning (2.20), Project Mobilization and Delivery (2.71), Design (2.82) and Construction (3.00) of projects. The major weaknesses related to: outdated and non-centralized geographic information system (GIS) databases; lack of asset management plans (AMPs); weak links between IAM and decision-making; and time and cost overruns in project implementation. The notable weaknesses were in operation and maintenance (O&M) (1.77) and End-of-Service Life (1.56) stages, mainly due to lack of maintenance plans (most maintenance is reactive), inadequate budgetary resources for maintenance, and limited asset decommissioning and disposal.

Assessing the enabling environment indicators, those that presented the most challenges for Kenya were: Processes (24.1 per cent of the total number of challenges); Data Management (17.7 per cent); Funding and Financial Management (17.0 per cent); Institutional Arrangements (13.5 per cent); and Policies, Laws and Regulations (12.1 per cent). The least number of challenges were found in: Knowledge, Technical Capacities and Resources (7.8 per cent); Monitoring and Reporting (5.0 per cent) and Stakeholder Engagement (2.8 per cent).

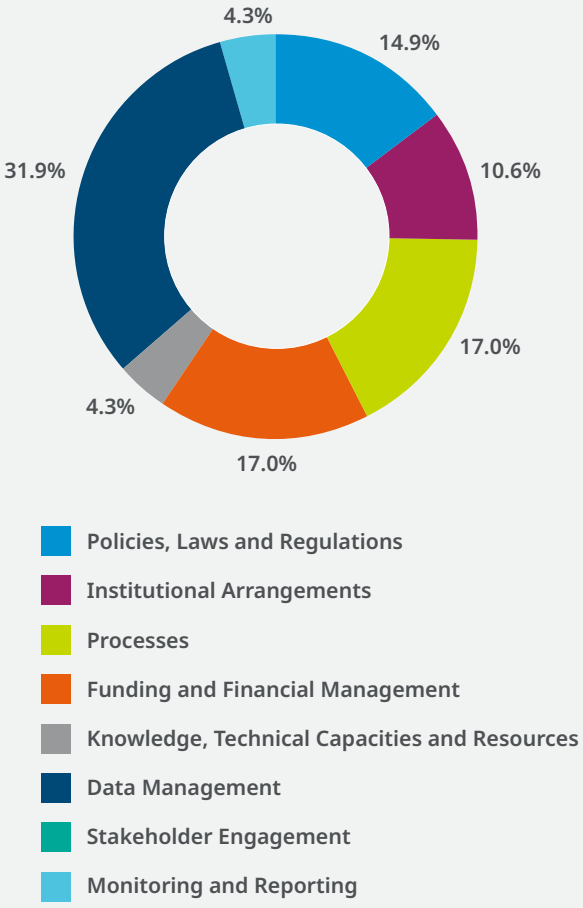
Figure 7: Distribution of assessment challenges based on EE indicators results



Planning

The planning phase considers the government's planning processes to support the identification of strategic development goals and visions. Assessing the enabling environment indicators, those that posed the most challenges for Kenya were: Data Management (31.9 per cent); Processes and Funding and Financial Management (both 17.0 per cent); and Policies, Laws and Regulations (14.9 per cent). The least number of challenges were found in Institutional Arrangements (10.6 per cent); Knowledge, Technical Capacities and Resources and Monitoring and Reporting (both 4.3 per cent).

Figure 8: Distribution of planning challenges based on EE indicators results



Strategic Planning

This stage assesses how effectively infrastructure planning is aligned with long-term national and local plans, objectives and goals that can be achieved through efficient and effective IAM. Effective strategic planning supports decision-making to ensure sustainable, resilient and inclusive infrastructure systems.

Policies, Laws and Regulations

Kenya has a well-defined and comprehensive strategic planning framework that provides strategic long-term development direction and guides the identification of goals, objectives and priorities. The country's broad development vision is contained in Kenya Vision 2030, which is implemented through five-year medium term plans (MTPs). The country is now implementing the Fourth Medium Term Plan (2023-2027). The current government's development manifesto, the Bottom-up Economic Transformation Agenda (BETA), also identifies priorities. All investment priorities by ministries, departments, state agencies, and county governments must be aligned to Kenya Vision 2030, the MTP and the BETA.

The identification of investment priorities (including assets) is provided in individual sector reports, which are consolidated into the Budget Policy Statement and financed through the development budget. Notably, the Policy on Asset and Liability Management in the Public Sector[21] and accompanying guidelines[22] promote the alignment of asset management with national objectives. The Policy focuses on accountability, effective management, overall life cycle integration, proper acquisition, disposal, and timely monitoring and reporting mechanisms.

Institutional Arrangements

There are institutional arrangements in place that clearly define roles, responsibilities and ownership across national, sub-national and local governments to facilitate the delivery of strategic and asset management objectives and plans.

The State Department for Planning has the mandate to develop the country's planning documents, and the government structure enables clear identification of roles and responsibilities across the agencies charged with strategic planning. Asset and liability management is led by the National Treasury, which periodically issues circulars and guidance on asset management to aid in asset identification, integration of infrastructure systems, and creation of administrative boundaries on asset management.

There is horizontal and vertical coordination across the levels of government (national, county, city/municipalities) and also across agencies within the same sectors. For example, the roads and transport sector is overseen by several state agencies with clear mandates. However, there are still gaps in the transfer of some asset management functions from the national government to county governments (as prescribed in the Sixth Schedule of the Constitution of Kenya) and from county governments to the cities and municipalities. As well, asset inventories are largely manual and the identification of assets owned by different government agencies has not been completed. The Auditor General periodically prepares audit reports meant to provide unbiased input to ensure good practice, resource optimization and alignment with strategic IAM objectives. However, without an effective mechanism to follow up on implementation of audit recommendations, most recommendations recur in subsequent years due to inaction.

Processes

Three aspects of process were assessed: (i) existence of an overall organizational strategic planning process to formulate and implement a Strategic Asset Management Plan (SAMP) that helps identify and establish long-term goals and objectives, effectively contributing towards achieving national and sub-national strategic objectives; (ii) how effectively the long-term strategic planning process supports the identification of asset needs, incorporates coordination and integration of infrastructure systems across various government levels, and identifies administrative boundaries to ensure service delivery aligns with sustainable growth, resilience and inclusivity; and (iii) whether the strategic planning process establishes performance and service level targets for infrastructure systems that contribute to achieving national and sub-national development objectives.

The government does not formulate and implement explicit SAMPs, but infrastructure asset needs are well identified within the strategic planning process. These needs are contained in sector reports, which inform the budget policy statement and the Medium Term Expenditure Frameworks (MTEF) programme-based budgets. Needs are also identified in departmental and ministerial strategic plans, which are included in development budgets and procurement plans. Identification of infrastructure needs begins with a review of previous performance of assets and service delivery, focusing on challenges and gaps that can be addressed within the next strategic period. The process establishes performance and service level targets for infrastructure systems, but not for all assets.

Funding and Financial Management

No notable challenges were found regarding funding for strategic planning. Government agencies allocate funds from the annual budget to support strategic planning activities. The adequacy of funding depends on budget priorities, resource constraints and competing demands across departments and projects. The major challenge found was regarding the use of the cash accounting basis for assets instead of the accrual basis.

Knowledge, Technical Capacities and Resources

The government has the necessary knowledge, technical capacities and resources for strategic planning. The planning function is housed in the State Department for Planning, with technical planning officers seconded to all ministries, departments and agencies (MDAs).

Data Management

The government is in the process of enhancing the collection and use of asset data to improve its asset management practices. The National Assets and Liabilities Management Department developed asset management policies and guidelines as well as an asset and liability reporting template[23] to be used by all government entities. Asset registers are automatically uploaded into the Integrated Financial Management and Information System (IFMIS) at acquisition. The policies, guidelines and template provide information on the type of data to be collected and used and the specific roles of each stakeholder. However, at the ministerial/departmental level most infrastructure assets data is not comprehensive enough to inform operational and financial planning. For example, data on asset condition and performance is not regularly collected for most assets, and most sectoral data is fragmented and housed across departments.

Stakeholder Engagement

Stakeholder engagement occurs in the development of other strategic planning documents that enable the identification of priority investments as per constitutional provisions. However, there is no clarity on what constitutes adequate participation, the nature of the participation that meets the constitutional threshold, or the most effective mechanisms for public participation.

Monitoring and Reporting

Kenya has a National Monitoring and Evaluation Policy (2022)[24] that clearly outlines the need to have monitoring and evaluation (M&E) processes in place to achieve national objectives. The Policy prioritizes the need to harmonize M&E systems for all public projects, programmes and policies at all governance levels. The main challenge found was limited consideration of the life cycle of the asset, putting greater emphasis on acquisition.

The National Integrated Monitoring and Evaluation System (NIMES) was developed to ensure real-time reporting and to strengthen and fast-track the development of M&E reports at the national and local levels. The e-NIMES/e-CIMES[25] are electronic versions of NIMES. MTPs and County Integrated Development Plans (CIDPs), along with various strategic plans and indicators, are uploaded and their implementation tracked with achievements reported on a visual dashboard in real time. NIMES is embedded in the National Performance Management Framework (NPMF) for public sector reforms and is therefore a core pillar of the government's Results-Based Management (RBM) system. NIMES tracks the implementation of Kenya Vision 2030 through its MTPs and the SDGs.

Figure 9 shows that the Strategic Planning stage has an overall rating of 2.91. This is supported by the strengths and challenges listed in Table 3, which are addressed in the proposed roadmap action plan in Table 14.

Figure 9: Strategic planning results

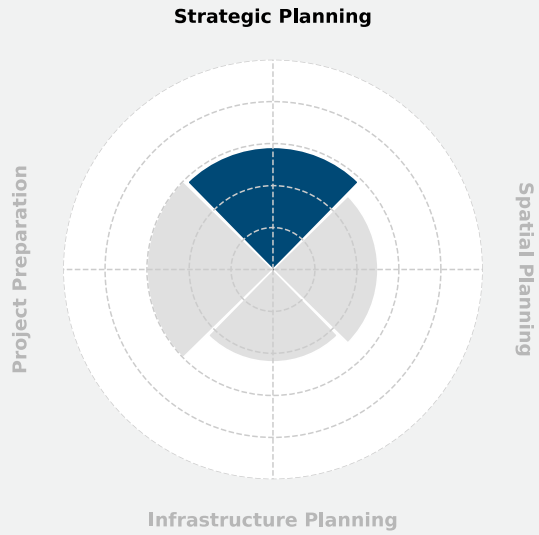


Table 3: Strategic planning - Summary

Strengths	Challenges
→ Well-defined and comprehensive planning framework that provides strategic long-term development direction and guides the identification of goals, objectives and priorities → Asset management policy provides for a life cycle approach to asset management (including acquisition, use, O&M, disposal and risk management) → Clear mandates, roles, responsibilities and ownership of strategic planning functions across each government entity (horizontally and vertically) → Established mechanisms for asset needs identification in the strategic planning process (e.g., National Treasury circulars and guidance on asset management that aid in asset identification, integration of infrastructure systems, and creation of administrative boundaries on asset management) → The government has the necessary knowledge, technical capacities and resources for strategic planning	→ Inadequate mainstreaming of asset management and life cycle planning in policies, plans and budgets → Absence of SAMPs to define national asset management goals → Lack of clear policy and legislative frameworks for transitioning from cash basis to accrual accounting → Climate adaptation is not incorporated into policies and plans → Insufficient implementation of asset management life cycle approach in decision-making processes - focus is mainly on new acquisitions → Lack of forward planning for future user demand, asset needs and balancing sustainability and resilience → Roles and responsibilities for asset management are not fully transferred across the various levels of government → Inadequate and outdated data to inform infrastructure system performance and levels of service delivery → Inadequate use of data in identifying infrastructure gaps or informing strategic planning, leads to project plans divergence and misaligned priorities → Ineffective public participation in strategic planning

Spatial Planning

This stage evaluates the systematic and strategic process of organizing and managing the allocation of physical space within a specific region, area or jurisdiction, with a focus on environmental, social and economic considerations. Comprehensive spatial planning fosters sustainable, resilient and inclusive infrastructure development.

Policies, Laws and Regulations

The government has developed various spatial planning policies, laws and legislative frameworks aimed at supporting sustainable, resilient and inclusive development of urban and rural areas. Kenya's National Spatial Plan 2015-2045[26] provides an integrated framework for spatial planning for balanced and sustainable national development. The plan provides a crucial link between physical and economic planning and defines the general trend and direction of spatial development for the country as a whole. The National Land Policy (2009)[27] provides the framework and vision that guide the long-term spatial development of Kenya. As well, Sessional paper No. 1 of 2017 on National Land Policy[28] aims to provide a legal, administrative, institutional and technological framework for optimal utilization and productivity of land-related resources in a sustainable and desirable manner at national, county and community levels.

The County Spatial Planning Guidelines (2018)[29] were prepared to address the various challenges county governments were facing in the implementation

of their spatial planning mandates and functions. Challenges included: lack of a common approach in spatial planning; inadequate institutional capacity; inadequate human capacity; inadequate allocation of financial resources to undertake planning functions; and poor coordination of planning between national and county governments.

Institutional Arrangements

The functions of spatial planning are allocated between national and county governments. As per the Fourth Schedule of The Constitution of Kenya (Part 1, Articles 21 and 32), the national government is responsible for formulating general principles of land planning and coordinating the planning by counties, and for capacity building and technical assistance to the counties. Planning at the national level includes developing spatial planning policies, strategies and guidelines applicable throughout the country as well as preparing the National Spatial Plan. Under Part 2 of the Fourth Schedule (Article 8), county governments are responsible for county planning and development. Counties are expected to: formulate county-specific policies, strategies and guidelines; prepare and implement county rural plans and urban spatial plans; undertake research on spatial planning within their area of jurisdiction; and participate in preparing regional spatial development plans. Currently, 14 county spatial plans have been developed.

Processes

The assessment evaluated if the spatial planning process follows international best practices and the extent to which the government manages land use and zoning requirements through regulation, permits and penalties for non-compliance within identified zones. It was found that the government follows international best practice guidance and standards by benchmarking to identify best practices from other countries. These best practices informed the country's National Spatial Plan.

Land zoning in Kenya is categorized into four categories: commercial; residential; agricultural; and industrial. There are challenges in urban areas, where land use does not conform with existing land zoning subdivision and building regulations. This has led to high levels of planning informality, urban decay and deteriorating public health standards. In some urban areas, residential developments have emerged without access to basic infrastructure such as water and sanitation, roads and storm water drainage.

Furthermore, the Sector Plan for Infrastructure 2018-2022[30] and Fourth Medium Term Plan 2023-2027[31] underscore that the process of land acquisition, including compensation and the resettlement of disputes, significantly obstructs the progress of infrastructure projects. These challenges have led to delays and, in some cases, the stalling of critical development projects, escalating the costs for both public and private investments.

Data Management

The government collects geospatial data through a combination of field surveys and data acquisition from government agencies, utilities and third-party providers. Data collected includes: land use and zoning information; geographical features; climatic data; population demographics; and environmental factors. However, the data is not regularly updated to reflect changes in land use, zoning regulations, environmental conditions and demographic trends. Most government agencies lack a centralized database or GIS platform to efficiently store and manage geospatial data, making information sharing across departments and regions difficult. The Fourth Medium Term Plan acknowledges these challenges and highlights the need to strengthen digitalized land registration systems to ensure transparent and accessible data facilitating effective land use, tenure and dispute resolution processes.

Monitoring and Reporting

Effective monitoring and reporting for spatial planning considers aspects including outcomes against targets, influencing national and international conditions and addressing unauthorized development activities. This was found to be minimal in Kenya, with an unstructured

and siloed, project-based approach along with enforcement that lacks follow through.

Figure 10 shows that the Spatial Planning stage has an overall rating of 2.50. This is supported by the strengths and challenges listed in Table 4, which are addressed in the proposed roadmap action plan in Table 14.

Figure 10: Spatial planning results

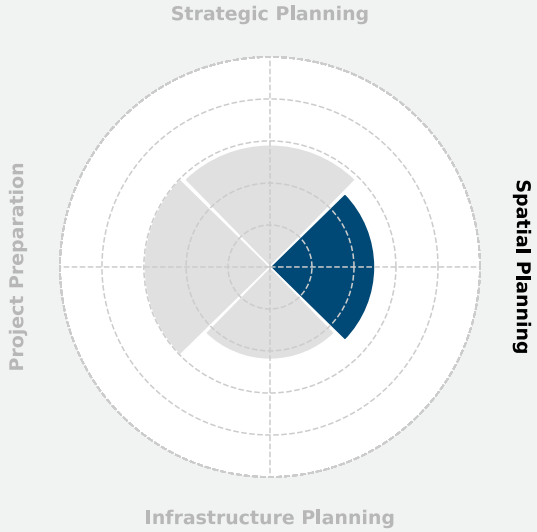


Table 4: Spatial planning - Summary

Strengths	Challenges
→ Existing National Spatial Plan (2015-2045) and National Land Use Policy (2009) provide spatial planning frameworks for long-term development → National Spatial Plan (2015-2045) integrates climate adaptation and mitigation aspects → The Constitution of Kenya defines and allocates functions between national and county governments → County spatial plans guide infrastructure development	→ Lack of implementation and enforcement mechanisms to control and regulate spatial and urban development → Land use and zoning plans in urban areas do not always conform to national regulations → Lack of coordination to transfer assets and responsibilities between different levels of government → Legal frameworks for spatial and urban planning are disjointed, hindering integrated infrastructure planning approach → Land acquisition, compensation and resettlement dispute processes significantly obstruct the planning and delivery of infrastructure projects → Inadequate human resource capacity and allocation for spatial planning → Geospatial data is not regularly updated to reflect changes in land use, zoning regulations, environmental conditions and demographic trends → Lack of centralized GIS database in most government agencies → Lack of geographical and climate data analytics for addressing social safeguards and environmental needs

Infrastructure Planning

This stage evaluates the infrastructure planning process, and specifically how infrastructure projects are integrated, identified and prioritized to align with and support strategic plans. The assessment considers how actions to improve service delivery through IAM are identified and included in the planning process.

Policies, Laws and Regulations

Kenya has a national Policy on Asset and Liability Management in the Public Sector (2020)[32] that considers IAM from a life cycle perspective, but the policy has not been fully implemented as most MDAs do not have complete asset management systems. The Sector Plan for Infrastructure 2018-2022[33] clearly provides that infrastructural priorities should be aligned to the national development policy agenda (Kenya Vision 2030), the 2030 Agenda and the Paris Agreement as priorities. However, this results in a bottleneck in project preparation and implementation due to the requirement to validate adherence to the goals. In addition, disaster preparation plans are lacking, which necessitates a clear need for preparation of the disaster preparedness plans, which are vital for averting and mitigating the effects of disasters on project implementation.

Institutional Arrangements

Roles and responsibilities are clearly outlined across national government agencies and between national government and sub-national government units. The central role of infrastructure planning is undertaken by the State Department for Planning, with planning officers seconded to all Ministries and departments. Ministries have clear mandates regarding infrastructure planning, which are delegated to their departments and agencies. For example, the roads sector is overseen by several national agencies with clear mandates: the Kenya Roads Board is responsible for the Road Maintenance Levy; the Kenya Urban Roads Authority (KURA) oversees urban roads in cities and municipalities; the Kenya National Highways Authority (KeNHA) manages national trunk roads (Class S, A and B); the Kenya Rural Roads Authority (KeRRA) oversees primary connecting roads (Class C); and county governments are responsible for county roads (Class D and below). The same approach applies to sectors such as water, sanitation and energy.

Processes

The government has reviewed technical codes and standards to respond to emerging issues and challenges and align to international best practice. The National Building Regulations (NBR)[34] were revised in 2015, replacing the 1968 Building Code that had been in use since the colonial era. The NBR 2015 encourages innovation in use of materials and methods applied provided they meet functional requirements and performance standards.

The assessment also considered whether IAM plans are developed from the asset management strategy and objectives, as well as how effectively IAM is factored into decision-making when considering infrastructure options (acquisition, renovating, retrofitting, repurposing and decommissioning). The government does not prepare annual or periodic AMPs, and IAM is not adequately factored into decision-making due to inadequate data on asset demand forecasts, asset condition, asset performance and O&M needs. Decisions to acquire assets are guided by infrastructure needs identified in strategic planning documents. There are no clear standard operating procedures (SOPs) that guide decision-making on renovating, retrofitting, repurposing and decommissioning assets.

Funding and Financial Management

Funding for infrastructure planning is factored into the budgetary provisions for the MDAs, with planning led by the National Treasury and the State Department for Economic Planning. The budgeting process is driven by the MTEF defining the overall resource ceiling. MDAs identify their infrastructure spending priorities, and the amount allocated for

infrastructure planning is determined by the size of the overall resource envelope.

Knowledge, Technical Capacities and Resources

It was assessed whether Kenya has the necessary technical capacity and resources to ensure sustainable, resilient and inclusive long-term infrastructure planning. It was found that the government has inadequate internal capacity to carry out the demand and risk analysis needed for infrastructure planning, and that in some cases consultants are hired on a short-term basis to support project preparation and implementation.

Data Management

Asset data is partially collected at the institutional level to inform the IAM planning process, but most asset data is incomplete and is not centralized. For example, some agencies under the Ministry of Roads and Transport cannot access data collected by other agencies. There are no data management guidelines to guide data collection and analysis across MDAs.

Stakeholder Engagement

Formal stakeholder engagement mechanisms have not been adequately incorporated into the infrastructure planning process. Most infrastructure projects engage stakeholders only when it is a requirement, for example in conducting feasibility studies and validating environmental impact assessments (EIA) reports. The Sector Plan for Infrastructure 2018-2022[35] confirms the lack of stakeholder engagement in an asset's life cycle, and notes that gender and inclusion is not adequately mainstreamed.

Monitoring and Reporting

The Kenya Evaluation Guidelines (2020)[36] guide infrastructure planning activities and M&E departments are required to recommend necessary adjustments to align with project goals. However, the monitoring and reporting approach is not well aligned with a life cycle planning approach.

For example, at the infrastructure planning stage the O&M of some assets is not adequately considered. Monitoring reports are normally made publicly available and shared transparently.

Figure 11 shows that the Infrastructure Planning stage has an overall rating of 2.20. This is supported by the strengths and challenges listed in Table 5, which are addressed in the proposed roadmap action plan in Table 14.

Figure 11: Infrastructure planning results

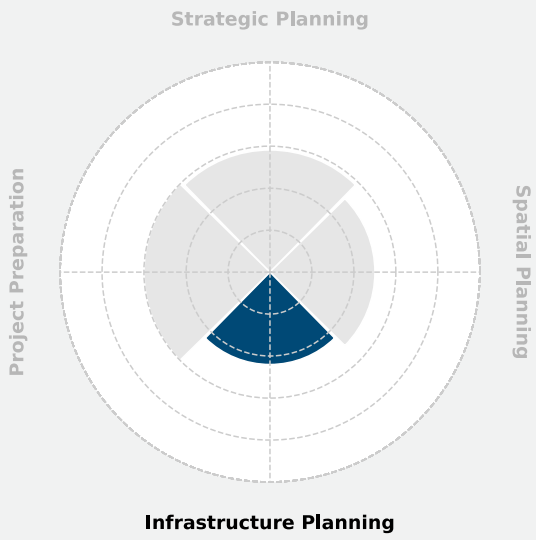


Table 5: Infrastructure planning - Summary

Strengths	Challenges
→ The Policy on Asset and Liability Management in the Public Sector (2020) that considers IAM from a life cycle perspective → The Sector Plan for Infrastructure (2018-2022) is aligned to the 2030 Agenda and the Paris Agreement → Clear roles and responsibilities horizontally (across national government agencies) and vertically (between national government and sub-national government units) → Revised building codes and standards to respond to emerging issues and international best practices (e.g., NBR (2015)) → Funding allocation for infrastructure planning is driven by the MTEF in alignment with the priorities identified by MDAs → Clear M&E guidelines to support continuous monitoring and evaluation of projects → Project information monitoring and reporting is commonly publicly available	→ Lack of AMPs and strategies → Fragmented implementation of plans and inadequate coordination between planning agencies → Inadequate consideration of asset management factors in decision-making (e.g., asset forecast demand, condition, performance, O&M practices, and climate-related aspects) → Lack of data management guidelines across various sectors → Unconsolidated data on national infrastructure development (e.g., information is available at institutional levels) → Limited stakeholder engagement for infrastructure planning → Monitoring and reporting approach is not well aligned with a life cycle planning approach

Project Preparation

This stage determines whether appropriate mechanisms are in place to prepare individual infrastructure projects for financing and implementation, in line with the strategic planning process at the national, regional and local levels. A holistic approach to project preparation includes programmatic, environmental and socio-economic analysis, and ensuring an asset is supported throughout its life cycle.

Policies, Laws and Regulations

The government has guidelines that require the infrastructure project preparation process to take into consideration life cycle cost-benefit analysis, including: feasibility studies; demand; risk; financial analysis; and social and EIAs. There are clear guidelines on the project preparation process, as contained in the Circular No. 16 of 2019 on PIM Guidelines for National Government and its Entities.[37] The circular provides guidance on: project identification and conceptual planning; project pre-feasibility and pre-appraisal; project feasibility and appraisal; project selection for budgeting; project implementation, monitoring, evaluation and reporting; and project closure, sustainability and ex-post evaluation. The guidelines promote transparency in project management, control and accounting for costs associated with public projects. The guidelines include: demand and risk analysis; identification of key assumptions; technical aspects; human resources; environmental and social aspects; and institutional aspects.
As per the Sector Plan for Infrastructure 2018-2022, it is also required that cost-benefit analyses and EIAs are undertaken for infrastructure project selection. However, in practice, the challenge persists in effectively implementing cost-benefit analyses, which are primarily conducted for large infrastructure projects, especially those financed by development partners or investors.

Institutional Arrangements

Roles, responsibilities and ownership are defined and implemented across the government to support the project preparation process. Circular No. 16 of 2019 on PIM Guidelines for National Government and its Entities provides guidance on the roles and responsibilities of all stakeholders involved in PIM. Accounting officers are appointed to oversee the project preparation process, including the appointment of a project committee. The committee: reviews pre-feasibility and feasibility studies and provides recommendations; identifies risks and mitigation measures; ensures project alignment with the national agenda and goals, and recommends the mode of financing and changes to project design.

Processes

There are clear processes for capital planning and prioritization of investment in infrastructure projects. There is a formal capital planning process through the national PIM Guidelines,[38] MTPs and budgets, and specifically the national development budget. Government entities prepare procurement plans to provide the list of asset-related acquisitions, and the PIM guidelines provide a clear framework of identifying and prioritizing investments. However, not all infrastructure projects are defined, classified and prioritized for investment by taking into account the life cycle cost-benefit analysis. In addition, project appraisal and fiscal risk management do not adequately incorporate risks associated with climate change and natural disasters.

Funding and Financial Management

The government has established various financing mechanisms to support the project preparation process, ensuring infrastructure projects are adequately planned and ready for implementation. These mechanisms include: dedicated project development funds (PDFs), such as those under public-private partnership (PPP) models; project preparation facilities (PPFs); and ordinary governmental budgetary allocations. However, in some cases funders or investors provide financial support for project preparation activities, such as financing feasibility studies.

For some infrastructure assets, potential financial mechanisms are identified for operations, maintenance, upgrades and ongoing management before securing funds for implementation. For example, the Roads Maintenance Levy Fund finances the maintenance of roads infrastructure. However, the adoption of dedicated financial planning for O&M funds is not uniformly implemented across all sectors, presenting significant challenges during the operational lifespan of assets.

Knowledge, Technical Capacities and Resources

The various government levels have the necessary technical capacity and resources to carry out effective and efficient project preparation. According to the PIM guidelines, project preparation should be conducted using internal capacity or with support from other government agencies. External resources are only sourced when internal capacity is inadequate. However, most donor-funded projects provide technical assistance and financial resources to support the project preparation process and build capacity.[39]

Data Management

Project data is not adequately collected, analyzed and used to support the project preparation process. For example, information on hazards and impact assessments is not readily available. The available data is fragmented and is not compiled or automated to be user friendly.

Stakeholder Engagement

The requirement for stakeholder engagement and public participation is established in Kenya's constitution. However, there is limited stakeholder engagement during the project preparation stage of infrastructure planning. Where public participation does occur, the inclusivity and effectiveness of the engagement may be lacking. The Sector Plan for Infrastructure 2018-2022 underscores the necessity

of addressing these shortcomings by emphasizing the need for gender mainstreaming and the involvement of disadvantaged groups during project implementation processes.

Monitoring and Reporting

Along with NIMES, guidelines and standards were developed in 2009 for the preparation, appraisal, and monitoring and evaluation of development projects. These provide the necessary TA to officers responsible for project planning, preparation and appraisal at all levels. The Kenya National Monitoring and Evaluation Policy (2022)[40] also supports knowledge and technical capacity. As a result, the existing M&E frameworks outline that all public projects are required to have clear outputs and timelines.

Figure 12 shows that the Project Preparation stage has an overall rating of 3.00. This is supported by the strengths and challenges listed in Table 6, which are addressed in the proposed roadmap action plan in Table 14.

Figure 12: Project preparation results

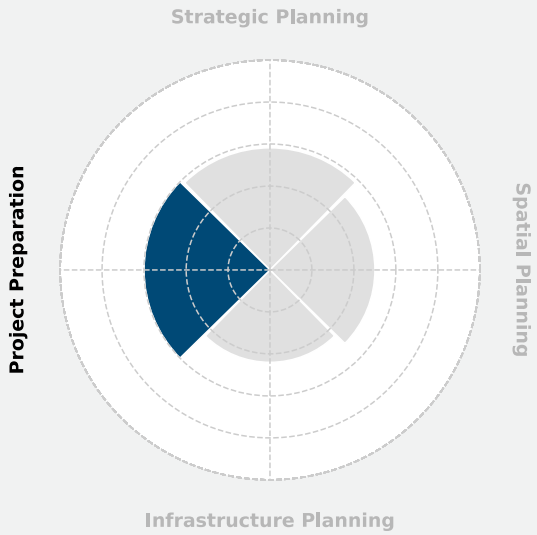


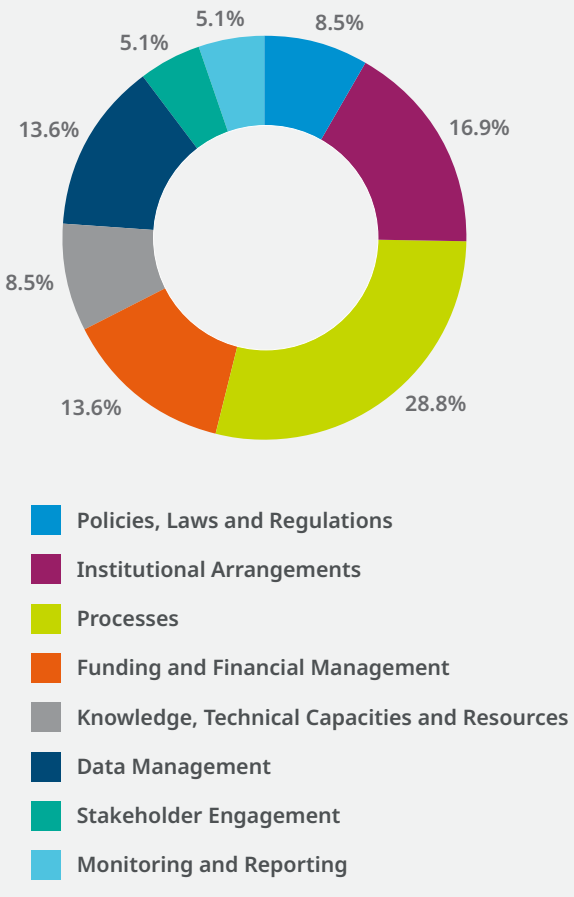
Table 6: Project preparation - Summary

Strengths	Challenges
→ PIM guidelines detail: project identification and conceptual planning; project pre-feasibility and pre-appraisal; project feasibility and appraisal; project selection for budgeting; project implementation, monitoring, evaluation and reporting; and project closure, sustainability and ex-post evaluation → The Sector Plan for Infrastructure reinforces the need to undertake cost benefit analyses, including EIAs for all infrastructure projects → PIM guidelines outline the roles and responsibilities of all stakeholders involved in public investment management → A formal capital planning process through procurement plans and development budgets → National Monitoring and Evaluation Policy (2022) and NIMES provide a clear M&E framework with clear outputs and timelines	→ Lack of comprehensive feasibility studies and environmental and socio-economic impact studies across various government projects → Inconsistent undertaking of demand, risk and cost-benefit analysis in project planning (e.g., only undertaken for big infrastructure projects) → Inadequate funding for the project preparation process → Identification of potential financing mechanisms for O&M before implementation of projects is not done for all assets → Inadequate technical capacity to support the project preparation process, often resulting in reliance on external consultants (e.g., in some cases the funders or investors provide TA or consultants) → Project data is not adequately collected, analyzed and used to support the project preparation process → Inadequate stakeholder engagement during the project preparation process

Delivery

The delivery phase considers the government's capacity to deliver infrastructure projects by analyzing how it undertakes project mobilization and delivery, procurement, design and construction. Assessing the enabling environment indicators, those that posed the most challenges for Kenya were: Processes (28.8 per cent); Institutional Arrangements (16.9 per cent); Funding and Financial Management and Data Management (both 13.6 per cent). The least number of challenges were found in: Policies, Laws and Regulations and Knowledge, Technical Capacities and Resources (both 8.5 per cent); and Stakeholder Engagement and Monitoring and Reporting (both 5.1 per cent).

Figure 13: Distribution of delivery challenges based on EE indicators results



Project Mobilization and Delivery

This stage considers how resources to deliver infrastructure projects are mobilized to ensure quality while meeting sustainability, resilience and inclusion targets. This includes determining the time frame, technical team, governance arrangement, processes and funding mechanisms needed to successfully deliver an infrastructure project and ensure long-term success and positive impacts for communities and the environment.

Institutional Arrangements

The government roles, responsibilities and ownership are well defined for project mobilization and delivery to ensure project quality and sustainability targets are met. As per the Public Procurement and Regulatory Authority's (PPRA) Manual for Procurement and Management of Projects (2009),[41] project implementation committees are charged with overseeing project implementation and reviewing progress to ensure sound project management, including quality and sustainability. Most government agencies also have project management offices (PMOs) to oversee the planning, monitoring and evaluation of all major infrastructure projects.

Processes

PMOs apply project management best practices through technical teams to manage mobilization, delivery and M&E for infrastructure projects. Accounting officers and project implementation teams (PITs) are responsible for project management, including: project team mobilization; delivery (including cost, quality and timeliness); identification of risks and mitigation measures; and stakeholder engagement.

The National Building Code (2022)[42] includes measures for addressing specific risks associated with health and safety as well as provisions for sustainable building strategies. However, the extent to which sustainability, resilience and inclusivity

practices are considered during project mobilization is unclear. There are also challenges regarding time and cost overruns[43] as well as risk management. It was estimated that 87 per cent of Kenya's public sector projects experience time delays, while 48 per cent suffer cost overruns.[44] Additionally, the traditional departmental structure of the government has proven to be less effective and is not well-suited for efficient project management. Occasionally the government creates a separate entity to manage projects, but there are challenges with decision-making and capacity as some team members are deployed on a part-time basis but with substantive responsibilities and no decision-making power.

Funding and Financial Management

The government requires that sound financial project management mechanisms be in place to ensure the successful delivery of infrastructure projects. This includes: oversight of financial expenditure; utilization of past project spending data; and provision of contingency funding for programme and project delivery. Financial project management is considered mostly for externally financed projects and may not be applied to government-financed projects, and contingency funding, handled by the National Treasury, is not project specific. For example, a challenge identified is that the government is expected to provide financial resources to resettle displaced persons, but inadequate budgetary allocation for resettlement sometimes causes project implementation delays.

Knowledge, Technical Capacities and Resources

The government has the technical capacity, skills, tools and resources to ensure the delivery of sustainable, resilient and inclusive infrastructure projects. When needed, consultants are hired to support the delivery of infrastructure projects. The PIM guidelines provide for the establishment of various committees to ensure the delivery of infrastructure projects. This includes the Project Implementation Committee as well as the Public Finance Management Standing Committee responsible for monitoring, evaluating and reporting on project implementation, including timely delivery, budget and design specifications.

Data Management

Project data is collected and utilized during the mobilization and delivery stages to support downstream asset management. This includes data on: project documentations; design and construction processes; material specifications; and technical team assembly. However, data on performance monitoring mechanisms and O&M strategies is not sufficiently incorporated into the design processes.

Monitoring and Reporting

The Project Implementation Committee closely monitors project implementation to ensure targets are met. However, the assessment found that project delays are common. This indicator also considers how stakeholder requirements are considered as part of monitoring and reporting. Although public participation is addressed in the Kenya Draft Policy on Public Participation[45] and a Public Participation Bill (2016),[46] challenges to implement these measures persist, including at the project mobilization and delivery stage. These challenges include: the absence of standards; ineffective coordination mechanisms; inadequate coordination among providers; ineffective inclusion of special interest groups; citizen apathy; and inadequate funding.

Figure 14: Project mobilization and delivery results

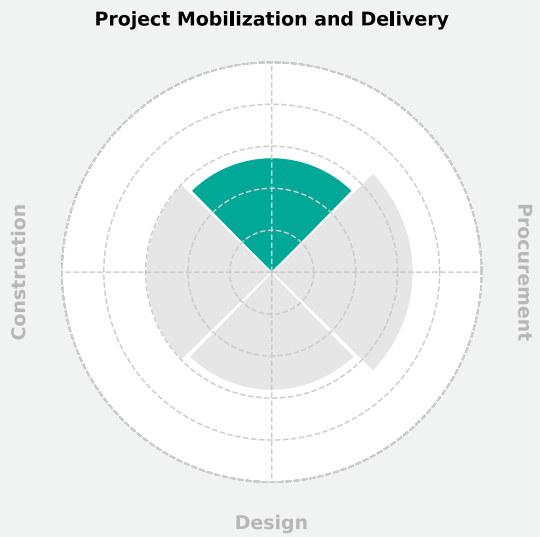


Figure 14 shows that the Project Mobilization and Delivery stage has an overall rating of 2.71. This is supported by the strengths and challenges listed in Table 7, which are addressed in the proposed roadmap action plan in Table 14.

Table 7: Project mobilization and delivery - Summary

Strengths	Challenges
→ Clear roles, responsibilities and ownership for project mobilization and delivery → Established dedicated Project Implementation Committees to oversee the implementation of projects → PMOs conduct planning, monitoring and evaluation of all major infrastructure projects → Government has the technical knowledge, skills, tools and resources under PMOs, public corporation and institutions (PCIs) and public finance management (PFM) Standing Committee	→ Lack of long-term project implementation committees/teams for effective project mobilization and delivery (e.g., employees deployed on a part-time basis but with substantive responsibilities and no decision-making power) → Inadequate planning and alignment with project objectives lead to poor project mobilization and delivery → Inadequate financial project management mechanisms to ensure the successful delivery of infrastructure projects, such as utilization of past project spending data and provision of contingency funding for projects unforeseen circumstances → Delays in the approval process hinder project execution → Inadequate risk management results in unforeseen challenges during project delivery → Data on performance monitoring mechanisms and O&M strategies is not sufficiently incorporated into the design processes → Insufficient human technical capacity relying on consultants to support delivery process → Inadequate data for decision-making and project implementation due to inaccessible and unutilized past project data → Inadequate monitoring and reporting on project completion for future O&M and decision-making

Procurement

This stage assesses how services, labor and materials are sustainably procured to ensure quality infrastructure assets are delivered and managed and have a long operational life with minimal costs. This includes the selection process, compliance with regulations and project specifications, and aspects including managing labor and construction contracts.

Policies, Laws and Regulations

Kenya has policies, legal frameworks, regulations, forms and guidelines that support transparency and openness in procurement for public infrastructure projects. There is strong procurement law through the Public Procurement and Asset Disposal Act (2015, Revised Edition 2022),[47] the National Public Procurement and Asset Disposal Policy (2020)[48] and the Public Procurement and Asset Disposal Regulations (2020).[49] The preferred method of tendering is through an open and competitive tendering method, and alternative tendering methods are used only if allowed under the Act and if the conditions in the Act are met.

Institutional Arrangements

The PPRA provides oversight to ensure compliance to existing policies, acts, and regulations as well as transparency and accountability in the procurement process. There is a requirement for procuring entities to obtain a minimum of three quotes for products and services to ensure a competitive price is offered. Value for money is normally ensured through market surveys (in urban centres), but this cannot be done for infrastructure projects and cost estimates are done by government agencies.

Processes

Structures are in place to ensure transparency and fairness in the tendering process, including: publishing tenders; providing the same tender documents to all bidders; including general guidelines for evaluation criteria in the standard tender document;[50] and giving all bidders a minimum of seven days to prepare their bids.

Financial bids must fall within the budget and the lowest evaluated bidder is the one considered. Tender committees, including tender opening committees and tender evaluation committees, are formed to undertake the various roles within the tendering process. However, from a regulator's point of view, there are significant accountability challenges and enforcement gaps. This is because the role of sanctioning is spread across institutions with inadequate collaboration and coordination, hampering effective implementation.

Processes to accredit and select firms that possess the necessary technical knowledge, competencies and capacity to deliver projects are well defined and enforced. Procuring entities are required to align criteria to their needs, which is mostly done correctly. However, procurement processes are usually lengthy[51] and sometimes cause delays in project implementation.

There are structures and processes in place to regulate and control the quality, performance, use and availability of imported and local construction materials and consider environmental and social aspects. The government has established standards for construction materials, including cement, steel and timber, that outline the minimum requirements for use in construction. The quality of imported materials is checked by the Kenya Bureau of Standards (KEBS),[52] and inspection and acceptance committees are in place along with new standards for major construction materials as of 2022. KEBS conducts periodic market surveillance to ensure materials offered for sale meet the standards and that non-complying products are removed from the market for destruction. Locally produced goods must adhere to standards according to the equivalent standards body. All complying products are awarded the Standardization Mark, the Diamond Mark of Quality and (for imported products) the Import Standardization Mark. The Anti-Counterfeit Authority has a mandate to combat counterfeit materials in the market, though there are some gaps in enforcement.

Knowledge, Technical Capacities and Resources

The government has inadequate knowledge, technical capacity and resources to effectively undertake and manage all infrastructure procurement activities. It is noted by the PPRA[53] that inadequate human resources, especially in technical areas, affect effective implementation of planned activities regarding procurement oversight. The PPRA also noted that optimum human capital and financial resources are required for successful implementation of the strategic plan. In addition, it was noted by one stakeholder that the procurement system is well suited for supplies but not for infrastructure projects.

Data Management

Procurement data and information are not adequately captured, used, updated, published and made available. Most government agencies do not have centralized digital procurement records to support the procurement process. PPRA manages an electronic database for recording all procurement activities, but data entered into the procurement portal[54] is not complete or comprehensive and not all awarded contracts are included.[55]

It was also noted that contract files have major gaps. As document management processes in Kenya are largely manual, there is significant data loss caused by poor collection, storage, transfer and archiving of critical project information, hindering key decision-making processes.

Monitoring and Reporting

There are systems and structures in place to support procurement monitoring and reporting, contractual adherence, compliance, and sanctions of contracting firms. This ensures transparency, accountability, integrity, quality and performance delivery. PITs in the procuring entities monitor and report on project implementation to ensure projects are implemented as planned.

For example, the PPRA reviews bills of quantities (BoQ) and tender documents and assesses whether the project was delivered as required. The PPRA uses a checklist to prepare and submit a report to the procuring entity identifying gaps and recommendations. The report is usually shared with relevant agencies for enforcement and sanctions. However, because of limited budgetary and resource capacity, PPRA only samples about 200–250 projects each year.

Figure 15 shows that the Procurement stage has an overall rating of 3.38. This is supported by the strengths and challenges listed in Table 8, which are addressed in the proposed roadmap action plan in Table 14.

Figure 15: Procurement results

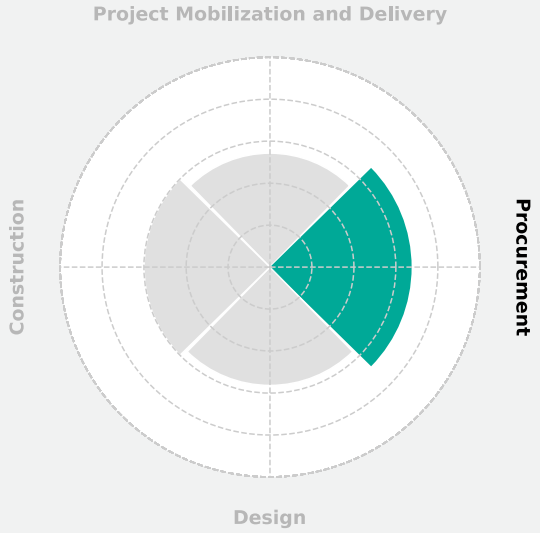


Table 8: Procurement - Summary

Strengths	Challenges
→ Public Procurement and Asset Disposal Act (2015, Revised Edition 2022) ensures transparency and openness in procurement of public infrastructure projects → PPRA provides oversight to ensure compliance to existing policy, acts and regulations as well as transparency and accountability in the procurement process → Clear evaluation criteria for selection of firms that consider the technical and financial capabilities of bidders → Established structures and standards to ensure imported, and local construction materials adhere to standards as per KEBS	→ Ineffective enforcement of procurement law, particularly regarding sanctions and degazettement of suppliers - as the role of sanctioning is spread across various institutions → Inadequate collaboration and coordination across the various agencies, which hampers effective procurement processes → Abnormally low bids affect work quality and disregard engineers' estimates → Lengthy procurement processes cause project delays → Quality of materials assurance issues regarding material testing, certification, technical capacity and implementation → Insufficient financial resources for regulatory bodies and oversight institutions → Inadequate procurement oversight due to technical and financial challenges → Inadequate compilation, storage and use of procurement data and reports, leading to inefficiencies (e.g., costs, timelines and delivery) → Lack of monitoring and reporting on procurement and contractual adherence

Design

This stage considers how the infrastructure design process leads to long-term operational performance, reduced maintenance needs, and safe and functional services for end users. Effective design translates programme needs into the drawings and technical documents necessary for procurement and construction to successfully deliver an infrastructure asset.

Policies, Laws and Regulations

Kenya has national building codes and standards that ensure quality design and maximize operational life. These promote social welfare, environmental, health, safety and risk considerations in the design of infrastructure assets. Recent policy reforms include the development of the National Building Regulations (2015),[56] replacing the 1968 Building Code. The Regulations are used in conjunction with the National Building Maintenance Policy for Kenya (2013),[57] the Built Environment Bill, 2019[58] and the Building Surveyors Act, 2018[59] to bring accountability, adherence to standards and professionalism in the built sector. The draft National Building Code (2022)[60] makes provisions for sustainable design practices, such as energy efficiency and thermal comfort and the use of renewable energy sources. However, the challenge remains in addressing the effective implementation, compliance and suitability of the available codes and standards.

Institutional Arrangements

Roles, responsibilities and ownership are defined and implemented across the government. State entities have been established to undertake compliance, approvals and quality control (QC) and quality assurance (QA) in the design process during project delivery, supporting enforcement and compliance to industry standards. County governments have been legally empowered to approve designs and technical drawings from building consultants before infrastructure projects begin.

Processes

The government requires the design process to include environmental and socio-economic impact assessments, financial, hazard and risk analyses, and end-user needs. The PIM guidelines provide for undertaking feasibility studies and EIAs. These are a requirement for externally funded projects and large government-financed projects, but are not always done for smaller projects financed through the government budget.

The government mandates designers to incorporate sustainable design practices that minimize downstream O&M costs. The draft National Building Code (2022) makes provisions for sustainable design practices, including energy efficiency and thermal comfort, sustainable building design strategies, and the use of renewable energy sources. However, compliance with these requirements is uncertain. Planning for long-term renovation, retrofit, repurposing and decommissioning of assets is not undertaken for all projects, but is mostly done for projects financed by funders or investors as part of the project appraisal requirements.

Other sectoral-level efforts have aimed at promoting sustainable practices in the construction industry, supported by funders and investors. For example, the World Bank has been supporting the identification of alternative materials and different technologies through pilots, as well as the development of a construction materials map showing where to source materials. As well, UN-Habitat and partners provided training in sustainable design principles and energy efficiency in Nairobi in 2014.[61]

Knowledge, Technical Capacities and Resources

The government has skilled personnel to effectively undertake infrastructure designs that ensure an asset's long operational life and quality. However, capacity is insufficient, particularly for technical roles such as engineers, architects and quantity surveyors.[62]

Professionals in the built environment are regulated and licensed by professional associations such as the Board of Registration of Quantity Surveyors and Architects (BORAQS), the Engineers Board of Kenya (EBK) and Kenya Institute of Planners (KIP). Universities are periodically evaluated to ensure curricula are up to date with current technologies and best practices and to assess facilities and student-lecturer ratios. Universities also receive feedback from industry professionals. BORAQS works closely with universities that offer courses on the built environment to standardize the curriculum and ensure quality. BORAQS works in partnership with the National Construction Authority (NCA)[63] and EBK to promote professionalism and standards and enhance safety in the built environment.

Data Management

Asset design data and project information is not adequately managed (collected, used, updated and published) to effectively inform and support the upstream planning processes for new infrastructure projects. This is due to the lack of centralized, accessible and digitalized data for decision-making. Data is also not adequately managed to inform and support the downstream operations, maintenance and management processes. Data and information not readily available includes: asset identification and classification; technical design specifications; operational and performance data (e.g., expected lifespan and capacity); and maintenance requirements (e.g., plans and strategies).

Stakeholder Engagement

Despite the constitutional requirement for public participation, it was observed that stakeholder engagement is generally not conducted in the design stage. Public consultation often takes place only when explicitly demanded, such as during an EIA process.

Figure 16 shows that the Design stage has an overall rating of 2.82. This is supported by the strengths and challenges listed in Table 9, which are addressed in the proposed roadmap action plan in Table 14.

Figure 16: Design results

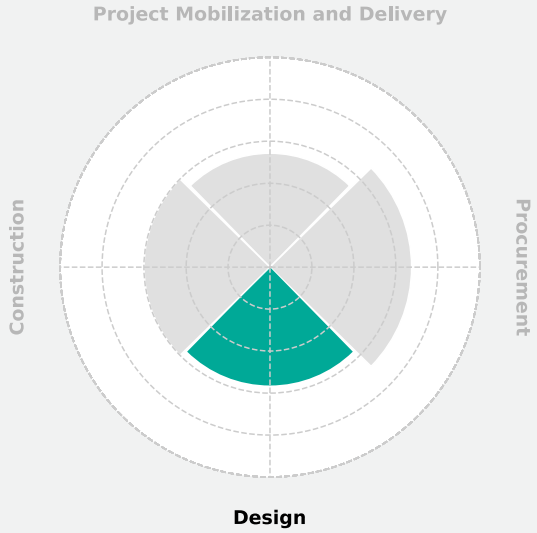


Table 9: Design - Summary

Strengths	Challenges
→ Existing National Building Regulations (2015) and draft National Building Code (2022) provide an updated building code that considers quality, maximizing useful life, environmental, health, safety and risks → The National Building Code (2022) makes specific provisions for sustainable design practices, including energy efficiency and thermal comfort, sustainable building design strategies, and the use of renewable energy sources → Dedicated state entities that ensure compliance, approvals and QC and QA in the design process (e.g., role of county governments to approve building designs) → Clear processes for regulating and licensing architects, quantity surveyors and engineers → Government has skilled personnel available to effectively undertake infrastructure designs → Technical professional associations evaluate, regulate and approve academic curricula → Universities promote professionalism and standards and enhance safety in the built environment	→ Lack of compliance with design codes and infrastructure standards → Building code lacks guidance and procedures for climate change factors such as floods, storms and extreme weather → Lack of consideration for long-term renovation, retrofit, repurposing and decommissioning plans of assets within the design process → Lack of compliance and enforcement of environmental and socio-economic impact studies, financial, hazard and risk information, and end-user needs information across various projects → Funding constraints lead to scope reductions and lower-quality designs → Insufficient human technical personnel in the public service → Use of outdated technology in training technical professionals → Inadequate state laboratories lead to outsourcing of material testing → Inadequate management of asset design data and project information → Inadequate stakeholder engagement during the design stage

Construction

This stage assesses how infrastructure assets are constructed to ensure a long operational life with minimal negative impact on local communities and environments. It considers key legislations, available knowledge, risk management, and health and safety measures, as well as inspections to ensure the accuracy and quality of assets.

Policies, Laws and Regulations

The Sector Plan for Infrastructure 2018-2022[64] shows clear improvement in regulating construction policies, and there are institutional reforms to support the development of the local construction industry. The NCA recently developed the National Construction and Demolition Waste Management Strategy and Implementation plan for Kenya, aligned with the Kenyan National Solid Waste Management Strategy developed by The National Environment Management Authority (NEMA). The strategy advocates for and provides guidance on the adoption of a circular economy model in the construction industry, which will help mitigate the environmental effects of construction and demolition waste in both rural and urban centres.

In terms of occupational safety and health, there is a draft National Occupational Safety and Health Policy (2024)[65] that aims to significantly sustain continual development and implementation of the National Occupational Safety and Health systems and programs to reduce incidences of work-related accidents and diseases. In addition, it seeks to give a framework for equitable compensation to those who suffer physical injuries and contract occupational diseases. Kenya has also ratified various International Labour Organization (ILO) Conventions on occupational safety and health, key among them: ILO Convention No 155 (Occupational Safety and Health Convention, 1981); ILO Convention No. 187 (Promotional Framework for Occupational Safety and Health Convention, 2006) and; ILO Convention No. 161 (Occupational Health Services Convention, 1985). As well, SDG 3 (Good health and well-being) and SDG 8 (Decent work and economic growth) touch on occupational safety and the health of workers.

Institutional Arrangements

According to the PIM guidelines, the Public Finance Management Standing Committee is responsible for monitoring, evaluating and reporting on project implementation progress. Government project management teams, each led by a project manager, oversee project implementation, quality control and project signing off. However, based on the Sector Plan for Infrastructure 2018-2022, there is a clear duplication of roles by various implementing agencies in the construction industry that leads to a lack of coordination for public works projects.

Processes

There are mechanisms within government for project construction site inspections, monitoring, QC and QA, and post-construction compliance approval. Government project management teams monitor project implementation and QC through site visits and project signing off. Additionally, contractors are required to conduct physical visits for inspections and clarification on emerging issues. A significant challenge noted in this process is the frequency of inspections, which is often constrained by limited budget provisions.

Government construction projects usually align with the established building standards and codes. Construction work is normally undertaken by contractors whose services are procured according to public procurement laws and regulations. Both the Sector Plan for Infrastructure 2018-2022 and The National Building Code (2022) provide for adopting building materials adapted to the climate and local context. However, it is not clear to what extent these are implemented.

Knowledge, Technical Capacities and Resources

The government has technical expertise, especially for engineers, architects and quantity surveyors.

However, the capacity is inadequate to meet industry demand and the government often relies on consultants to oversee and supervise project implementation. The Sector Plan for Infrastructure 2018-2022 cites shortages of technical personnel to manage projects and high rates of personnel turnover as key challenges in the construction environment.

To ensure the technical and financial capacity of contractors, the NCA registers and accredits local and foreign contractors. The NCA publishes a 'Register of Contractors' containing the specifics of construction firms, including the class of works and category for which the firm is registered. It also accredits and certifies skilled construction workers and construction site supervisors to ensure those participating in trades have the necessary skills, though there have been some weaknesses in enforcement. The NCA also offers Continuous Professional Development (CPD) to all registered and accredited construction workers. As per the NCA Regulations 2014,[66] CPD is a mandatory requirement for contractors, not only to build capacity in the industry but also to ensure successful licence renewal applications. This ensures contractors are able to work with emerging methods and technologies. However, legal and contractual challenges arising from arbitration and contractual issues with contractors were cited as factors affecting project implementation.[67]

Data Management

During the construction stage, asset data, project information and technical project documentation are not adequately managed (collected, used, updated and published) to support future O&M of assets. Data and documentation are not collated, centralized or digitalized for ease of access, use and decision-making, which results in incomplete construction work and project realization.

Stakeholder Engagement

Despite constitutional provisions for stakeholder engagement and public participation in government decision-making, stakeholders are not adequately involved in the construction process to address issues and concerns that arise during construction.

Figure 17 shows that the Construction stage has an overall rating of 3.00. This is supported by the strengths and challenges listed in Table 10, which are addressed in the proposed roadmap action plan in Table 14.

Figure 17: Construction results

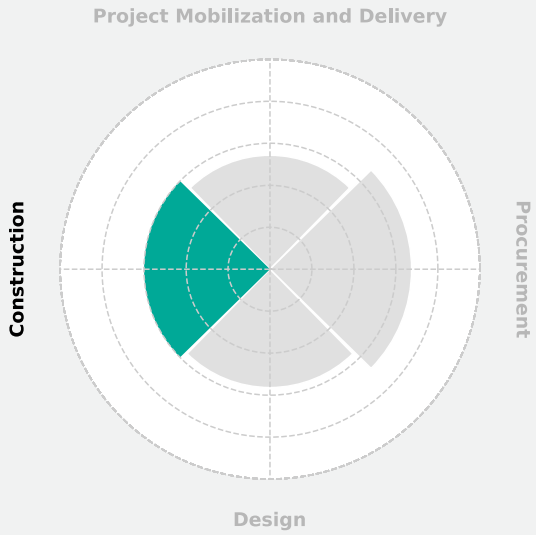


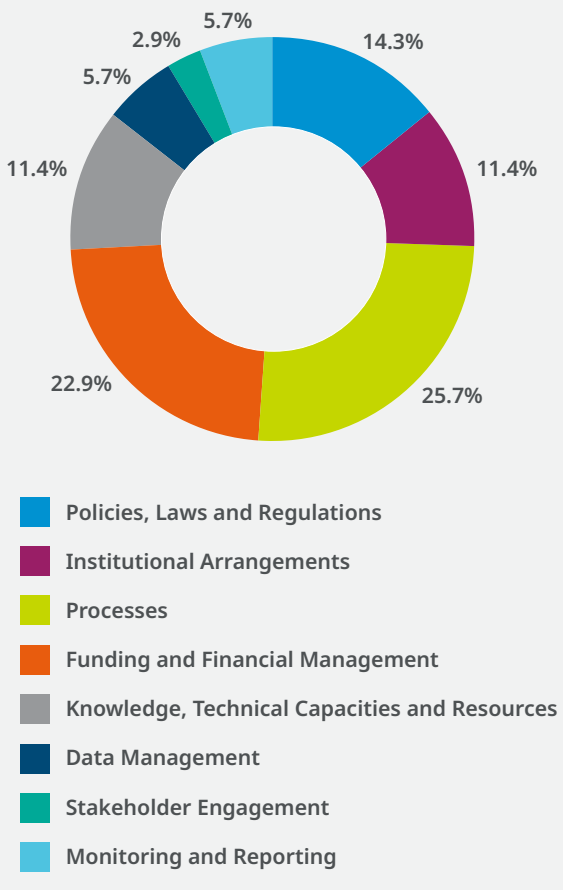
Table 10: Construction - Summary

Strengths	Challenges
→ The Sector Plan for Infrastructure (2018-2022) shows clear improvement in regulating construction policies → The National Construction and Demolition Waste Management Strategy and Implementation plan aims to mitigate the environmental effects of construction and demolition waste in both rural and urban centres → The Draft National Occupational Safety and Health Policy (2024) aims to significantly sustain continual development and implementation of the National occupational health and safety (OHS) systems and programmes to reduce incidences of work-related accidents and diseases → Project management teams conduct site visits and monitor project implementation, QC and project signing off → The government has technical expertise, especially for engineers, architects and quantity surveyors → The NCA has a mandate to register and accredit local and foreign contractors. It also accredits and certifies skilled construction workers and construction site supervisors → The NCA offers CPD to all registered and accredited construction workers	→ Low adherence to construction codes results in low quality of assets, cost overruns and safety hazards → Lack of institutional coordination due to duplication of roles by various implementing agencies in the construction sector → Weak enforcement of OHS standards → Ineffective contract management and coordination processes during construction disputes → Incomplete general specifications for works, leading to inconsistent application of codes and standards across projects → Project cost overruns and timeline delays are commonly attributed to poor designs, need for modifications, low capacity of the construction contractor and/or technical modification requests due to corruption → Inadequate adoption of EIA recommendations → Inadequate auditing and inspection due to budgetary constraints → Insufficient human capacity leads to personnel shortages, high turnovers and reliance on consultants for construction management → Lack of technical documentation and asset data management results in incomplete construction work and project realization → Inadequate stakeholder engagement during construction → Inadequate and limited site monitoring and reporting leads to construction challenges (e.g., building collapses, illegal constructions and occupational accidents)

Management

The management phase considers the capacity of the government to manage its infrastructure assets to ensure maximum value for the investment. Two key stages are considered: operation and maintenance; and the end-of-service life of infrastructure assets. Assessing the enabling environment indicators, those that posed the most challenges for Kenya were: Processes (25.7 per cent); Funding and Financial Management (22.9 per cent); Policies, Laws and Regulations (14.3 per cent); Institutional Arrangements and Knowledge, Technical Capacities and Resources (both 11.4 per cent). The least number of challenges were found in Data Management and Monitoring and Reporting (both 5.7 per cent) and Stakeholder Engagement (2.9 per cent).

Figure 18: Distribution of management challenges based on EE indicators results



Operation and Maintenance

This stage considers how service delivery is supported through infrastructure asset operation and maintenance (O&M), with a particular focus on critical assets. Effective maintenance and monitoring ensure level of service and operational performance requirements are met throughout an asset's life cycle.

Policies, Laws and Regulations

The Sessional Paper No. 1 on National Building Maintenance Policy for Kenya (2013)[68] supports the operation and maintenance activities of infrastructure systems by: setting levels of service and performance requirements; identifying and mandating O&M planning; and providing direction on appropriate levels of maintenance funding for critical infrastructure systems. The Sessional Paper No. 2 of 2015 on National Building Maintenance Policy[69] reiterated that maintenance of buildings and related infrastructure was regarded as a peripheral activity and was carried out in an ad hoc manner with inadequate record-keeping and low budgetary allocation and prioritization. This has resulted in a backlog of maintenance works that are expensive and difficult to address, with deteriorating investments that are uneconomical and unsustainable. The inadequate maintenance and management of assets is attributed to insufficient financial resources and lack of standards and guidelines.

The Policy provides a roadmap for addressing effective restoration, preservation, rehabilitation and refurbishment in the built environment, as well as for setting standards, training employees, and financing legal and institutional frameworks. However, policy implementation has been a challenge without adequate budgetary provisions for maintenance. For public buildings, there are no maintenance provisions in the current contracts as the project implementation process ends at handover of the building to the owner. A maintenance SOP manual is also lacking.

Institutional Arrangements

The roles, responsibilities and ownership across national and local governments to effectively operate, maintain and manage infrastructure assets are well defined, though there are some cases of overlapping roles. The national government is responsible for regulation, funding allocation and control, and policy development relating to infrastructure development. County governments and sub-national units are responsible for implementation, community engagement and zone promotion. However, some assets have not been fully transferred from the national government to county governments or from county governments to cities and municipalities. This poses a challenge for asset management, especially as the mandate for O&M is not clear.

Processes

Maintenance needs for existing infrastructure assets are identified during the strategic planning stage. Some newly acquired assets, such as roads, incorporate the life cycle approach with clearly identified maintenance needs and financial resources provided through the creation of specific funds. However, other assets, such as buildings, lack provisions for maintenance in their contracts, with projects typically concluding at handover period and only accounting for construction costs. Consequently, maintenance for buildings is often undertaken as a peripheral activity, characterized by its low budgetary allocation and prioritization.

Currently, the government does not prepare formal AMPs or Asset Management Action Plans (AMAPs) and lacks a comprehensive maintenance management strategy. Maintenance activities are generally informed by condition surveys, with prioritization driven by considerations such as resource availability. For example, newer roads are often prioritized for upkeep while deteriorating roads may be left unattended, exacerbating their condition. Similarly, in housing, priority is frequently given to properties occupied by senior officials.

The inspection, monitoring and auditing of infrastructure assets are undertaken to a limited degree. In some cases condition surveys are conducted to support future planning, particularly for roads, although these are not carried out regularly. For buildings, inspections of existing infrastructure are minimal, with limited input into future renovation planning. Most maintenance actions are reactive, addressing immediate or emerging needs rather than being part of a proactive strategy.

In terms of financial and emergency planning to address sudden or catastrophic loss of infrastructure services and ensure the resilience of critical assets, there is a national contingency fund established by the Kenyan constitution and operationalized by the Public Finance Management Act, 2012.[70] This fund provides support to all sectors during emergencies or disasters. It is administered by the Cabinet Secretary of Finance and is a consolidated fund, not specific to any sector. However, in most cases the contingency fund is insufficient.

Funding and Financial Management

Financial information related to infrastructure is not adequately recorded, analyzed or used to support effective financial management. For example, infrastructure asset valuations are rarely conducted, mainly due to a lack of technical and financial capacity. Asset valuations have not been carried out for housing infrastructure. Public housing rents remain low, having last been reviewed in 2001, and attempts to update rents have faced resistance. As a result, the revenue generated is insufficient to meet maintenance needs. Land rates and rents have also not been updated for some time due to the absence of asset valuations, although depreciation data is available.

While financial information is transparently reported in budget reports, the current funding mechanisms and financial management processes do not adequately assess, justify, mobilize or secure

sufficient budgets for infrastructure maintenance needs. This includes evaluating current maintenance costs and planning for future requirements to ensure the desired level of service delivery. Although the government makes provisions for maintenance within the MTEF budget, this is not aligned with the actual maintenance needs, leading to an inadequate maintenance budget.

Knowledge, Technical Capacities and Resources

The government has skilled personnel to effectively undertake O&M activities to ensure long-term operational performance, however, capacity is insufficient. According to the Sector Plan for Infrastructure 2018-2022, there is an evident capacity shortfall attributed to a lack of technical personnel and high turnover rates in technical governmental roles across most sectors, further exacerbating these capacity challenges and impacting the efficiency and sustainability of infrastructure management.

In support of effective O&M, the government has considerable knowledge, capacity and resources for planning, developing and maintaining an asset information management system (AIMS). Nonetheless, fund mobilization and technical capacity are inadequate for its effective deployment, requiring assistance to transition from paper-based to digital systems across most sectors. Consequently, the development of AIMS is often procured or supported through financing mechanisms by development partners and other external funders.

Data Management

Some infrastructure data is collected but is inadequate to support the demand, life cycle and financial management of infrastructure assets. The Assets and Liabilities Management Directorate at the National Treasury has rolled out an asset management module under IFMIS. Some government agencies, such as those overseeing the roads sector, have implemented automated asset management systems. However, most asset registers for ministries and departments are still manual and paper based. While the Fourth Medium Term Plan for Kenya Vision 2030[71] states that 80 per cent of national and county government services are recorded in digital form (including development of information management systems for transport, irrigation and drainage, and health sectors), there are no records on effectiveness of the asset management systems.

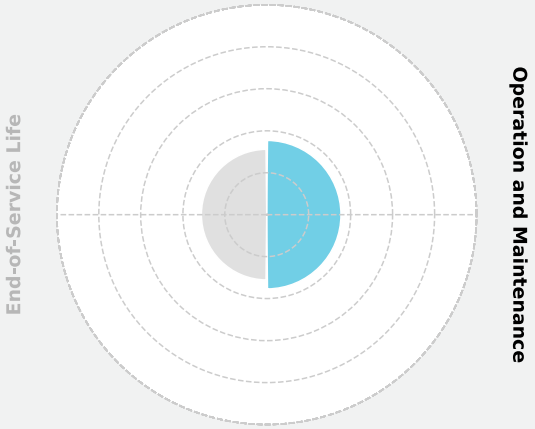
Stakeholder Engagement

There are mechanisms in place for stakeholders to provide feedback on their experience of level of service and ensure continued alignment with their needs. The Kenya Public Sector Complaints Handling Guide (2016)[72] provides the legal basis and a complaint handling framework. The Commission on Administrative Justice was established pursuant to the provisions of Article 59 of the Constitution under Section 3 of the Commission on Administrative Justice Act (Cap.102A of the Laws of Kenya). In addition, there are complaint-raising mechanisms in most government agencies, such as through complaints boxes where stakeholders can provide anonymous feedback. However, there is no proper mechanism for customer relations management and some customers have to travel from far-away counties to Nairobi to resolve issues.

Monitoring and Reporting

Monitoring and reporting of infrastructure O&M is not adequately done, particularly regarding: asset functional service and lifespan; operational efficiency and repurposing; alignment of maintenance strategies and plans; safety and quality; value appreciation and long-term sustainability; and resilience, accessibility and inclusion of systems. For some assets, such as roads, conditional surveys are identified to assess asset condition, though not regularly. Based on the National Monitoring and Evaluation Policy (2022),[73] public institutions have multiple and different reporting requirements which are

Figure 19: Operation and maintenance results



also uncoordinated. This leads to fatigue within reporting institutions, resulting in delays in M&E report preparation, launch and dissemination.

Figure 19 shows that the O&M stage has an overall rating of 1.77. This is supported by the strengths and challenges listed in Table 11, which are addressed in the proposed roadmap action plan in Table 14.

Table 11: Operation and maintenance - Summary

Strengths	Challenges
→ The National Building Maintenance Policy (2015) provides a roadmap for addressing maintenance needs, including standards, training and legal frameworks for infrastructure preservation and rehabilitation → A national contingency fund, established under the Public Finance Management Act, exists to support sectors, including infrastructure, during emergencies or disasters → Improvement in asset management systems, such as rollout of an asset management module under IFMIS and automated systems in some government agencies → Legal frameworks and mechanisms, such as the Kenya Public Sector Complaints Handling Guide and complaint mechanisms in government agencies, allow stakeholders to provide feedback on service levels	→ Outdated O&M policies and guidelines → Undefined roles and responsibilities for O&M of assets, resulting in overlap of functions across different levels → Lack of sectoral AMPs and AMAPs → Lack of maintenance plans and strategies across sectors (e.g., reliance on ad hoc maintenance rather than proactive) → No provisions for maintenance of assets in the current contracts, as project implementation process ends at handover (e.g., buildings) → Inadequate funding allocation for maintenance mechanisms (user fees and levy mechanisms yet insufficient) → Maintenance manuals do not incorporate climate change vulnerability → Insufficient contingency funds for emergencies and sudden/ catastrophic losses → Inadequate and inconsistent technical capacity for O&M (e.g., maintenance, inspection and monitoring) → Inadequate and limited resources for planning, developing and maintaining an AIMS → Inadequate inspecting, monitoring and auditing of infrastructure assets to inform O&M → Inadequate mechanisms for mechanism for customer relations management → Uncoordinated M&E reporting requirements

End-of-Service Life

This stage assesses activities essential to maximizing infrastructure asset investments, ensuring they remain functional and aligned with user needs. This includes renovation, retrofitting, repurposing and decommissioning, as well as responsible dismantling and material recycling to support new asset development.

Policies, Laws and Regulations

There are legal frameworks in place to support the processes of renovation, retrofitting, repurposing and decommissioning. These are aimed at ensuring the sustainability, adaptability, functionality and continuity of service delivery for public assets. Institutional and organizational policies provide a foundation for managing asset renovation, with guidelines for the disposal of public assets established through key circulars issued in 1958 and 2003. The Public Procurement and Asset Disposal Act (2015, Revised Edition 2022)[74] further outlines comprehensive methods for asset disposal, including public auction, competitive tendering, and transfer to other public entities. The Act mandates public bodies to develop annual asset disposal plans and requires valuation of assets prior to disposal, ensuring transparency and accountability. Additionally, proceeds from asset disposals must be accounted for in accordance with legal provisions.

However, the current policies may not fully address the evolving needs for adaptability and sustainability in asset management. Moreover, gaps in implementation persist, as evidenced by a significant number of public assets, such as buildings and equipment, that have reached the end of their life cycle without being appropriately decommissioned or disposed of.

Institutional Arrangements

The roles, responsibilities and ownership are defined, with the primary role of user departments to acquire and manage the assets. However, there are instances of overlap and lack of clarity on the roles and responsibilities for certain assets between state departments, agencies and counties. This ambiguity has impacted key infrastructure assets, particularly the roads, health facilities and energy sectors.

Processes

There are limited performance review processes to determine when optimum asset performance is no longer achieved and asset renewal or decommissioning is required. The lack of documented SOPs for decision-making around asset renewal or decommissioning creates further inefficiencies. While some informal indicators, such as the frequency of breakdowns and escalating maintenance costs, are considered, these are not consistently applied or formalized.

There are well-defined processes in place aimed at minimizing environmental and social impacts. NEMA provides comprehensive guidelines for the disposal of hazardous materials, outlining standards for the removal, transportation and disposal processes to support the management of material handling, recycling and reuse. Specific frameworks in place include: e-waste guidelines;[75] National Guidelines on Safe Management and Disposal of Asbestos;[76] and wastewater treatment protocols. Furthermore, the government has ratified international conventions governing material handling and recycling. However, implementation of these policies remains inconsistent.

Funding and Financial Management

Financial mechanisms that consider financial viability and capital investment requirements to support end-of-service life are limited to a few assets with maintenance funds in place, such as the Road Maintenance Levy and Water Sector Trust Fund. Most public assets lack integrated financial planning that accounts for both maintenance and end-of-service life capital investment requirements.

Knowledge, Technical Capacities and Resources

Knowledge management within government structures remains a significant challenge, particularly regarding technical and financial capacity to evaluate the requirement for planning and implementation of service life extension. This is hindered by low professional staff capacity, inadequate budgetary allocations and inadequate coordination among government agencies.

Data Management

Infrastructure asset data is not well managed (collected, analyzed, used, updated and documented), making it challenging to identify and evaluate the need for renovation, retrofitting, repurposing and decommissioning of assets. Some data is collected but is inaccessible, inconsistent and fragmented. For example, asset condition data is typically recorded in binary terms (working or not working) without deeper insights into condition or longevity.

Stakeholder Engagement

Mechanisms for stakeholder engagement to identify end-of-service life needs are not in place. Stakeholders are consulted in some cases. For example, if public houses have reached their end-of-service and need to be decommissioned, the occupants are informed about the decision but are not involved in the decision-making process.

Monitoring and Reporting

Monitoring and evaluation guidelines are in place but there are gaps in implementation. For example, there are no periodic and structured inspections for public buildings to identify and select the considered renovation, retrofitting and decommissioning process. Most inspection visits are reactive. This is also a result of inadequate technical and financial capacity.

Figure 20 shows that the End-of-Service Life stage has an overall rating of 1.56. This is supported by the strengths and challenges listed in Table 12, which are addressed in the proposed roadmap action plan in Table 14.

Figure 20: End-of-service life results

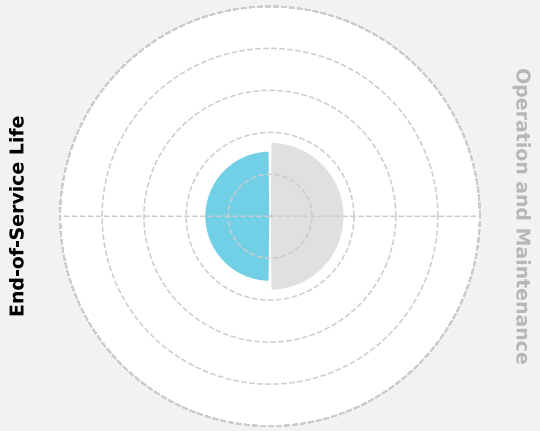


Table 12: End-of-service life - Summary

Strengths	Challenges
→ The Public Procurement and Asset Disposal Act (2015, Revised Edition 2022) provides clear and transparent guidance on asset disposal → Existing guidelines from NEMA provide well-defined processes and guidelines for dangerous materials, e-waste and wastewater treatment, demonstrating a commitment to minimizing environmental and social impacts	→ Policies and regulations do not adequately address adaptability and sustainability → Lack of comprehensive SOPs and guidelines for decommissioning and disposal across various sectors → Unclear roles and responsibilities across national, sub-national and local governments → No clear processes for determining when asset performance is no longer optimal, guided by cost-benefit analyses and specific sector guidelines → Ineffective enforcement of end-of-service life procedures (e.g. e-Waste guidelines and National Guidelines on Safe Management and Disposal of Asbestos) → Financial mechanisms that consider financial viability and capital investment requirements to support end-of-service life are limited → Inadequate funding for the asset decommissioning process, especially for recycling and safe disposal → Inadequate technical and financial capacity to evaluate the requirement for planning and implementation of service life extension → Inadequate and inaccessible data to identify and evaluate the need for renovation, retrofitting, repurposing and decommissioning of assets → No mechanisms for stakeholder engagement regarding identification of end-of-service life needs → No periodic and/or structured inspections, monitoring and reporting for end-of-service life assessment

Identification of Priority Capacity Gaps

The following priority capacity gaps were identified as a result of the extensive consultation process and validation workshop inputs provided by the technical working group (TWG) and based on the results described in this report. The prioritization has been done by the UNOPS technical team and may include subjects not addressed in this report due to mandate, cost and/or timeline constraints. However, UNOPS aims to provide further support to the State Department for Public Works to take ownership and create action plans to address the identified issues.

Table 13: Priority capacity gaps

PLANNING	Strategic Planning	• Inadequate mainstreaming of asset management and life cycle planning in policies, plans and budgets • Absence of Strategic Asset Management Plan (SAMP) to define national asset management goals • Inadequate climate adaptation consideration into policies and plans • Asset registers are not updated and not all procuring entities have automated management systems • Inadequate use of data in identifying infrastructure gaps or informing strategic planning leads to project plans divergence and misaligned priorities
	Spatial Planning	• Ineffective enforcement of development control and zoning regulations at both national and local levels • Inadequate human resource capacity and allocation for spatial planning • Ineffective, fragmented and outdated geospatial and climate hazard data hindered by outdated methodologies, tools and lack of implementation processes
	Infrastructure Planning	• Absence of asset management plans (AMPs) and strategies • Inadequate policy and processes implementation hinder comprehensive life cycle analysis of infrastructure projects • Inadequate coordination in implementation of infrastructure plans between planning agencies • Inadequate consideration of asset management in decision-making (e.g., asset forecast demand, condition, performance, operation and maintenance (O&M) practices, and climate-related aspects)
	Project Preparation	• Inadequate feasibility studies and environmental and socio-economic impact studies across government projects due to inadequate financial and human capacity • Inconsistent undertaking of demand, risk and cost-benefit analysis in project planning • Inadequate funding for the project preparation process • Ineffective identification of potential financing mechanisms for O&M for projects • Inadequate technical capacity to support the project preparation process (e.g., reliance on external consultants)

DELIVERY	Project Mobilization and Delivery	• Absence of sustainable project implementation committees/teams for effective project mobilization and delivery • Inadequate planning and alignment with project objectives lead to poor project mobilization and delivery • Delays in the approval process hinder project execution • Inadequate risk management results in unforeseen challenges during project delivery • Inadequate technical capacity to support project mobilization and delivery • Inadequate data for decision-making and project implementation due to inaccessible and unutilized past project data
	Procurement	• Ineffective enforcement of procurement law, particularly regarding sanctions and degazettement of suppliers • Quality of materials assurance issues regarding material testing, certification, technical capacity and implementation • Abnormally low bids have a detrimental impact on the quality of work, with disregard for the engineer's estimate • Lengthy procurement processes causing project delays • Inadequate procurement oversight due to technical and financial challenges • Inadequate compilation, storage and use of procurement data and reports, leading to inefficiencies (e.g., costs, timelines and delivery)
	Design	• Lack of compliance with design codes and infrastructure standards • Institutional mismanagement and inadequate technical capacity result in poorly designed projects • Insufficient emphasis on long-term renovation, retrofit, repurposing and decommissioning plans of assets within the design process. • Environmental, socio-economic, financial and risk impact studies and inclusion of end-user needs information are not undertaken for all projects as per the Public Investment Management (PIM) guidelines • Low budget allocation for projects constrains the scope and quality of project designs • Weak management of asset design data to inform and support future infrastructure projects • Inadequate stakeholder engagement during the design stage
	Construction	• Low adherence to construction codes results in low quality of assets, cost overruns and safety hazards • Deficiencies in the implementation of occupational health and safety (OHS) regulations • Ineffective contract management and coordination processes during construction disputes • Project cost overruns and timeline delays are commonly attributed to poor designs, need for modifications, low capacity of the construction contractor and/or technical modification requests due to corruption • Inadequate adoption of environmental impact assessment (EIA) recommendations • Inadequate auditing and inspection due to budgetary constraints • Absence of technical documentation and asset data management results in incomplete construction work and project realization

MANAGEMENT	Operation & Maintenance	• Outdated O&M policies and guidelines • Undefined roles and responsibilities for O&M of assets • Insufficient maintenance plans and Asset Management Action Plans (AMAPs) for sectoral assets • Inadequate maintenance funding and allocation mechanisms (i.e., user fees and levy mechanisms are insufficient) • Insufficient contingency funds for emergencies and sudden/catastrophic losses • Inadequate and limited maintenance data, financial resources and technical capacity for planning, developing and maintaining an Asset Information Management System (AIMS) • Inadequate and inconsistent technical capacity for O&M (e.g., maintenance, inspection and monitoring) • Inadequate and inaccessible asset data on O&M and end-of-service life stages • Underutilization of inspection and monitoring and evaluation (M&E) reports for planning
	End-of-Service Life	• No established standard operating procedures (SOPs) and guidelines for decommissioning across various sectors • Unclear roles and responsibilities across national, sub-national and local governments • No defined procedures for determining when asset performance is no longer optimal • Ineffective enforcement of end-of-service life procedures (e.g., e-waste guidelines and National Guidelines on Safe Management and Disposal of Asbestos) • Inadequate funding for asset decommissioning process, especially for recycling and safe disposal

Proposed Roadmap Solutions

This section presents a strategic roadmap with proposed solutions to address the prioritized capacity gaps identified in this report. It is based on the detailed assessments conducted across various governmental entities in Kenya. The roadmap presents the detailed relationship between the prioritized issues, proposed solutions, outcomes, target dates, action plan and organizations involved (*see **Table 14***). The roadmap also considers the relationship and influence of the identified issues and solutions through addressing the four analyzed capacities: 1) infrastructure asset management, through the eight enabling environment indicators; 2) sustainable development, through the SDGs; 3) climate action, through the Paris Agreement on climate change; and 4) inclusive development, through action to enhance lives of women, girls and vulnerable groups (*see **Annex A***). For further information regarding the SDGs proposed (*see **Annex B***).

Table 14: Proposed roadmap action plan

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
PLANNING	Strategic Planning	Inadequate mainstreaming of asset management and life cycle planning in policies, plans and budgets	Mainstream infrastructure assets management in all strategic planning policies and plans	Strategic planning policies and plans that are responsive to asset management needs	June 2027	1. Undertake gap analysis of policies, plans and budgets to determine where updates are required.				National Treasury and Economic Planning	All Ministries, Departments and Agencies (MDAs)
						2. Update all strategic policies, guidelines and plans to ensure alignment and inclusion of asset management and life cycle planning					
		Absence of Strategic Asset Management Plans (SAMP) to define national asset management goals	Develop and implement comprehensive SAMPs across all sectors	Establish SAMP and asset management guidelines to guide effective infrastructure management	June 2028	1. Assess the condition and remaining useful life of assets and identify asset needs and required levels of service delivery for all critical assets.				National Treasury and Economic Planning	All MDAs
						2. Prioritize assets according to condition of assets and remaining useful life					
						3. Define levels of service for critical assets					
						4. Map service delivery to asset management needs (acquisition, maintenance and disposal) to identify gaps in assets and service delivery					
						5. Prepare a SAMP					
		Inadequate climate adaptation consideration into policies and plans	Mainstream IAM into the national and local climate change adaptation policies and plans	Climate-responsive infrastructure asset management systems and practices are mainstreamed	June 2027	1. Identify climate issues that can be supported by better asset management				Ministry of Environment, Climate Change and Forestry	All MDAs
						2. Incorporate asset management into climate change adaptation policies and plans					
		Asset registers are not updated and not all procuring entities have automated management systems	Establish a system for maintaining up-to-date, comprehensive asset registers and ensure the implementation of automated management systems	Reliable, up-to-date and accessible asset registers that enhance infrastructure management and decision-making across all public institutions	June 2028	1. Identify critical assets and create a plan to update asset inventory based on asset criticality.				National Treasury and Economic Planning	All MDAs
						2. Undertake surveys to collect asset data such as location, condition and maintenance needs					
						3. Prepare and update asset registers (accrual basis as being spearheaded by National Treasury) based on asset criticality					
						4. Automate the asset registers					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
PLANNING	Strategic Planning	Inadequate use of data in identifying infrastructure gaps or informing strategic planning, leads to project plans divergence and misaligned priorities	Link asset management data to decision-making processes to ensure alignment between planning and asset management needs	Informed decision-making based on accurate asset data, leading to improved asset management practices	June 2027	1. Use asset data to inform infrastructure asset management decisions (whether to acquire, maintain existing assets or dispose of assets)				National Treasury and Economic Planning	All MDAs
						2. Prepare SOPs to integrate IAM into strategic decision-making					
	Spatial Planning	Ineffective enforcement of development control and zoning regulations at both national and local levels	Strengthen enforcement of development control guidelines through regular audits and penalties for non-compliance	Controlled and regulated development, especially in urban areas, leading to more sustainable infrastructure growth	June 2026	1. Develop guidelines for imposition of penalties and fines for zoning infringements				State Department for Lands and Physical Planning	County governments
						2. Establish a framework for development control and enforcement					
						3. Enhance technical, human resources and financial capacity to undertake periodic site visits					
		Inadequate human resource capacity and allocation for spatial planning	Undertake capacity needs assessment and enhance capacity through recruitment and training of physical planners to ensure adequate human capacity in government agencies	Sufficient qualified physical planners within government agencies, improving spatial planning outcomes	June 2027	1. Identify departments/agencies most underserved by physical planners				Ministry of Public Service, Performance and Delivery Management	All MDAs, county governments
						2. Hire and deploy more physical planners for underserved departments, agencies and counties					
		Ineffective, fragmented and outdated geospatial and climate hazard data hindered by outdated methodologies, tools and lack of implementation processes	Regularly collect, update and document geospatial data using current methodologies, ensuring data accuracy and usability	Up-to-date, accurate geospatial data that enhances infrastructure planning and decision-making	June 2028	1. Enhance the technical and financial capacity of the Department of Surveys, State Department for Lands and Physical Planning				State Department for Lands and Physical Planning	County governments
						2. Fast-track the digitalization of all land records and processes					
						3. Collect and update geospatial data and climate hazard using recent methodologies					
						4. Consolidate and document geospatial data for easy access and use, including reporting to address social safeguards and environmental needs.					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
PLANNING	Infrastructure Planning	Absence of asset management plans (AMPs) and strategies	Develop and institutionalize AMPs and strategies that provide a clear roadmap for managing national assets across infrastructure sectors	Effective AMPs and strategies are adopted and implemented	June 2028	1. Individual MDAs to prepare AMPs for critical assets based on SAMP.		■		National Treasury and Economic Planning	All MDAs
						2. Incorporate direction from AMPs into infrastructure planning and budget preparation process	■				
		Inadequate policy and processes implementation hinder comprehensive life cycle analysis of infrastructure projects	Update processes to ensure life cycle analysis is integrated into all project planning and decision-making, as per PIM guidelines	Enhanced asset management practices for sustainable infrastructure development	June 2027	1. Undertake review of policies and processes to identify gaps that hinder life cycle analysis	■			National Treasury and Economic Planning	All MDAs
						2. Prepare guidelines for life cycle analysis of asset management to address gaps	■				
						1. Enhance technical and financial capacity to undertake life cycle analysis		■			
		Inadequate coordination in implementation of infrastructure plans between planning agencies	Centralize infrastructure planning by establishing a National Infrastructure Coordination Unit to minimize overlaps and better prioritize infrastructure spending	Established National Infrastructure Coordination Units	June 2027	1. Build capacity for the Assets and Liabilities Directorate to undertake central infrastructure planning	■			National Treasury and Economic Planning	All MDAs
						2. Develop guidelines/process to facilitate infrastructure planning coordination between agencies		■			
						3. Sensitization training and rollout	■				
		Inadequate consideration of asset management in decision-making (e.g., asset forecast demand, condition, performance, operation and maintenance (O&M) practices and climate-related aspects)	Adopt a life cycle analysis approach, incorporating costing, demand analysis, condition, performance, O&M practices, and climate-related aspects into infrastructure planning and funding processes so that infrastructure plans respond to asset management needs	Infrastructure plans that respond to asset management needs, enhancing sustainability and resilience of assets	June 2028	1. Identify critical asset needs from SAMP	■			National Treasury and Economic Planning	All MDAs
						2. Forecast demand for critical assets depending on current status of existing assets	■				
						3. Incorporate asset life cycle cost assessment		■			
						4. Develop infrastructure plans that align with SAMP and asset management needs.		■			

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
PLANNING	Project Preparation	Inadequate feasibility studies and environmental and socio-economic impact studies across government projects due to inadequate financial and human capacity	Mandate that comprehensive feasibility studies and environmental/ socio-economic impact assessments are undertaken for all major projects	Comprehensive feasibility studies and environmental and socio-economic impact studies are undertaken for all major projects	June 2027	1. Enhance technical and financial capacity to undertake comprehensive feasibility studies and environmental and socio-economic impact studies				National Treasury and Economic Planning	All MDAs
						2. Define enforcement mechanisms such as not funding projects that do not meet the requirements					
						3. Update and enforce PIM guidelines that require comprehensive feasibility studies and environmental and socio-economic impact studies to be undertaken for all projects					
		Inconsistent undertaking of demand, risk and cost-benefit analysis in project planning	Enforce the implementation of Circular No. 16 of 2019 and PIM guidelines to ensure demand, risk and cost-benefit analyses are conducted for all major projects across government institutions	Consistent undertaking of demand, risk and cost-benefit analysis for informed and efficient project planning	June 2027	1. Adoption of policy requirements, development of processes and capacity building, training and awareness creation on PIM Guidelines				National Treasury and Economic Planning	All MDAs
						2. Undertake demand analysis, risk analysis and cost-benefit analysis as per the Guidelines					
		Inadequate funding for the project preparation process	Secure adequate funding for the project preparation stage, including feasibility studies and impact assessments	Streamlined project preparation process that ensure adequate planning and funding for infrastructure projects	June 2027	1. Put in place a project preparation unit to identify project preparation needs				National Treasury and Economic Planning	All MDAs
						2.Enhance funding for project preparation based on prioritized needs					
		Ineffective identification of potential financing mechanisms for O&M for projects	Identify and plan for potential financing mechanisms for O&M by life cycle cost analysis in project preparation	Planned budgetary resources for ongoing O&M activities ensuring the long-term sustainability of assets	June 2027	1. Conduct life cycle cost analysis				National Treasury and Economic Planning	All MDAs
						2. Identify potential financing mechanisms for O&M					
						3. Incorporate funding mechanisms for O&M in project documents for all projects and ring fence O&M funds					
		Inadequate technical capacity to support the project preparation process (e.g., reliance on external consultants)	Build and enhance technical capacity within government agencies to support project preparation	Adequate technical capacity within government institutions to manage and prepare project preparation effectively	June 2027	1. Identify critical gaps in technical capacity				Ministry of Public Service, Performance and Delivery Management	All MDAs
						2. Prioritize gaps according to risk (financial, technical, etc.)					
						3. Plan activities to address identified gaps					
						4. Implement the best option to support the project preparation process					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Project Mobilization and Delivery	Absence of long-term project implementation committees/teams for effective project mobilization and delivery	Establish permanent multi-disciplinary project implementation committees	Well-defined roles and responsibilities for efficient project mobilization and delivery	June 2027	1. Establish roles and responsibilities for project mobilization and delivery committees/teams				Ministry of Public Service, Performance and Delivery Management	All MDAs
						2. Establish stand-alone project management departments to undertake project mobilization and delivery in respective ministries and departments in line with expected roles and responsibilities					
		Inadequate planning and alignment with project objectives lead to poor project mobilization and delivery	Establish mechanisms for improved alignment to prevent cost overruns and timeline delays (e.g., payment of contractors, disputes with contractors over quality of work, etc.)	Timely completion of projects within budgeted costs and quality targets	June 2027	1. Undertake a scoping survey of all government projects to identify weaknesses in project delivery (e.g., delays in payment of contractors and disputes with contractors over quality of work)				State Department for Public Works	All MDAs
						2. Identify measures to address the weaknesses					
						3. Develop SOPs and project delivery guidelines to address the weaknesses					
						4. Put in place enforcement mechanisms to ensure timely delivery of projects					
						5. Monitor and report on the implementation of projects to identify any recurring delays					
		Delays in the approval process hinder project execution	Develop SOPs that provide guidance on the project approval processes	Streamlined project approval processes for efficient and timely project approval processes	June 2027	1. Develop SOPs that provide guidance on approval process				State Department for Public Works	All MDAs
						2. Train and sensitize project managers on new procedures/processes.					
		Inadequate risk management results in unforeseen challenges during project delivery	Prepare a comprehensive risk management strategy and framework for infrastructure projects	Robust risk management frameworks to mitigate unforeseen project risks	June 2027	1. Consult with project managers and project approval staff to identify project risk categories				State Department for Public Works	All MDAs
						2. Develop risk management framework and SOPs					
						3. Develop risk management strategy					
						4. Implement risk management strategy					
						5. Incorporate risk management into project planning					
						6. Train and sensitize project managers on new procedures/processes.					
						7. Monitor and report to identify emerging risks, and update mitigation measures against the emerging risks					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Project Mobilization and Delivery	Inadequate technical capacity to support project mobilization and delivery	Build technical capacity and recruit technical officers to support project mobilization and delivery across sectors, including construction (engineers, architects, quantity surveyors)	Sufficient skilled technical officers to support efficient project mobilization and delivery	June 2027	1. Recruit more technical officers into civil service (engineers, architects, quantity surveyors) with clear terms of service				Ministry of Public Service, Performance and Delivery Management	All MDAs
		Inadequate data for decision-making and project implementation due to inaccessible and unutilized past project data	Enhance the collection, documentation, and utilization of project data to inform future infrastructure projects	A centralized project data repository that improves decision-making and project outcomes	June 2027	1. Identify the required project data and possible collection methods				State Department for Public works	All MDAs
						2. Develop guidelines and procedures for collection, synthesis and documentation of project data					
						3. Develop a project data repository to store all available project data and reports in an accessible and useful manner					
						4. Roll out data repository and train and sensitize project managers					
	Procurement	Ineffective enforcement of procurement law, particularly regarding sanctions and degazettement of suppliers	Strengthen the enforcement of procurement laws to address non-compliance and sanctioning of firms and suppliers	Strict adherence and transparency of procurement systems that ensure value for money and prevent corruption	June 2027	1. Revise and issue regulations to include specific penalties and fines				National Treasury and Economic Planning	PPRA, EACC, DCI, KISM, Judiciary
						2. Provide refresher training to procurement officers on Public Procurement and Asset Disposal (PPAD) Act					
						3. Enforce implementation of PPAD Act of 2015 section XVI on offences and sanctions					
		Quality of materials assurance issues regarding material testing, certification, technical capacity and implementation	Enhance technical and financial capacity for testing and certification of materials (locally produced and imported) to ensure quality standards are met	Adequate compliance and enforcement of materials quality standards and processes	June 2030	1. Undertake analyses to identify key areas of concern in each of the following areas: - testing - technical capacity - implementation				KEBS	PPRA, MDAs
						2. Create task group to review materials and testing standards					
						3. Update testing standards and related documentation					
						4. Develop plan to increase technical capacity (staff, facilities, equipment, etc.)					
						5. Develop and implement QA/QC guidelines					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Procurement	Abnormally low bids have a detrimental impact on the quality of work, with disregard for the engineer's estimate	Review procurement procedures and guidelines to prevent the acceptance of unrealistic bids (e.g., firms/suppliers qualification selection criteria) and assess technical and financial bids separately	Reliable project cost estimates and higher-quality work outcomes	June 2027	1. Review past bids to identify areas of major concern				National Treasury, and Economic Planning, PPRA	All MDAs
						2. Enhance market surveys to provide reliable estimates of project costs					
						3. Enhance the role of technical personnel in estimation of project costs					
		Lengthy procurement processes cause project delays	Simplify procurement processes and mainstream e-procurement to reduce delays	Procurement systems that are responsive to asset management needs	June 2027	1. Review the procurement process and structure to identify major causes of delay				National Treasury and Economic Planning	PPRA, All MDAs
						2. Update procurement guidelines and mainstream e-procurement processes					
						3. Implement new process and monitor					
		Inadequate procurement oversight due to technical and financial challenges	Enhance the technical and financial capacity of the PPRA for better oversight	Improved and effective procurement oversight to ensure compliance and accountability	June 2027	1. Establish procurement oversight units in public entities with qualified staff				National Treasury and Economic Planning, PPRA	All MDAs that perform the procurement function KISM
						2. Enhance capacity of procurement officers through capacity building initiatives					
						3. Enhance budgetary support to PPRA to enable it to effectively undertake procurement oversight					
		Inadequate compilation, storage and use of procurement data and reports, leading to inefficiencies (e.g., costs, timelines and delivery)	Develop a comprehensive procurement data repository to ensure accessibility and use of past data	Establish a procurement data repository that improves project efficiency, oversight	June 2027	1. Identify required procurement data needs				National Treasury and Economic Planning, PPRA	All MDAs
						2. Collect, synthesize and document all procurement data					
						3. Automate the procurement data repository					
	Design	Lack of compliance with design codes and infrastructure standards	Implement and enforce all codes and standards	Full compliance with building codes and standards	June 2027	1. Develop SOPs and enforcement mechanisms to support the implementation and enforcement of building codes and standards				State Department for Public works	All MDAs

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Design	Institutional mismanagement and inadequate technical capacity result in poorly designed projects	Build technical design capacity and recruit skilled professionals across all government sectors	Increased technical capacity within institutions, leading to better-designed infrastructure projects	June 2030	1. Recruit more technical officers into civil service (engineers, architects, quantity surveyors) with clear terms of service				Ministry of Public Service, Performance and Delivery Management	All MDAs
		Insufficient emphasis on long-term renovation, retrofit, repurposing and decommissioning plans of assets within the design process.	Establish mandatory requirements stipulating that project designs demonstrate the integration of whole-of-life costing and other critical design considerations, ensuring project modalities are compared and selected based on life cycle costing analysis	Well-maintained infrastructure with extended lifespans and maximized value for money	June 2030	1. Identify use and disposal considerations in designing assets				State Department for Public works	All MDAs
						2. Undertake life cycle costing of design alternatives to minimize life cycle cost and maximize service life					
						3. Select designs that best align with optimal life cycle cost and service life					
		Environmental, socio-economic, financial and risk impact studies and inclusion of end-user needs information are not undertaken for all projects as per the PIM guidelines	Mandate and enforce undertaking of environmental, socio-economic, financial and risk impact studies for all projects	Resilient and sustainable infrastructure that meets the needs of stakeholders and end users	June 2027	1. Identify key issues regarding weak adoption and enforcement of the requirements				State Department for Public works	All MDAs
						2. Develop and implement mechanisms for enforcing the environmental, socio-economic, financial and risk impact studies, climate impact studies, and inclusion of end-user needs requirements					
		Low budget allocation for projects constrains the scope and quality of project designs	Appropriately cost projects, considering the cost and quality of the project, and provide adequate budgetary resources for implementation	Detailed and well-costed project budgets to ensure appropriate design in terms of scope and quality	June 2027	1. Prepare well-costed and detailed project budgets that show impact of cost reductions to asset life cycle cost				State Department for Public works	All MDAs
						2. Ensure adequate cash flow management to support project operations					
		Weak management of asset design data to inform and support future infrastructure projects	Create physical design asset data repository to support upstream planning processes	Well-maintained and utilized design data repository	June 2027	1. Define requirements for data repository (e.g., structure, data needed to be captured, accessibility)				State Department for Public works	All MDAs
						2. Collect, synthesize and document all project design data and information and create an automated data repository					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Design	Inadequate stakeholder engagement during the design stage	Develop and implement a stakeholder engagement plan and strategy	A stakeholder engagement strategy and plan are adopted and implemented, ensuring better alignment of project designs	June 2028	1. Develop a stakeholder engagement framework for the design phase				State Department for Public works	All MDAs
						2. Develop a stakeholder engagement plan					
						3. Prepare and implement a stakeholder engagement strategy and plan					
	Construction	Low adherence to construction codes results in low quality of assets, cost overruns and safety hazards	Enforce strict compliance with construction codes by conducting frequent audits and penalties for non-compliance	Improved quality of constructed assets and enhanced safety during construction processes	June 2027	1. Enhance inspection audits and put in place strict penalties to ensure compliance to the construction codes				State Department for Public works	All MDAs
		Deficiencies in the implementation of occupational health and safety (OHS) regulations	Implement the Occupational Safety and Health Policy (2024), focusing on the continual development of safety systems and reducing work-related accidents and diseases	Reduced occupational hazards and improved workplace safety standards across construction projects	June 2026	1. Conduct risk assessment to identify major health and occupational hazards in construction				Ministry of Labour and Social Protection	All MDAs
						2. Develop a regulatory framework including of proposed punitive measures to be taken for infractions					
						3. Propose mitigation measures for health and occupational hazards					
						4. Implement mitigation measures for health and occupational hazards					
		Ineffective contract management and coordination processes during construction disputes	Establish contract management units with qualified engineering, finance and legal personnel as well as proper documentation	Contract management units are operational, supported by frameworks for alternative dispute resolution mechanism	June 2027	1. Establish robust contract management units in each public entity				State Department for Public works	All MDAs
						2. Develop and implement an Alternative Dispute Resolution (ADR) framework and guidelines					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
DELIVERY	Construction	Project cost overruns and timeline delays are commonly attributed to poor designs, need for modifications, low capacity of the construction contractor and/or technical modification requests due to corruption	Establish operational Project Implementation Committees tasked with monitoring and approving construction progress, and revision and timely approval of variation requests	Improved project execution, reducing deviation between approved project budget and actual expenditure and maximizing quality and value for money of projects	June 2028	1. Public entities to put in place permanent project implementation units/committees				State Department for Public works	All MDAs
						2. Ensure design takes into consideration findings from feasibility and EIAs to minimize the likelihood of design reviews					
						3. Identify sources of cost overrun and mitigate against them (e.g., close monitoring of implementation of project to ensure timely delivery)					
		Inadequate adoption of EIA recommendations	Enforce the PIM guidelines that require incorporation of EIAs findings into all infrastructure projects, ensuring environmental concerns are addressed during the construction process	Resilient and sustainable infrastructure development	June 2027	1. Identify key issues from EIAs that have implications for construction				State Department for Public works	All MDAs
						2. Incorporate the key issues into construction					
		Inadequate auditing and inspection due to budgetary constraints	Increase financial resources for auditing and inspection of construction projects to ensure compliance and QA	Adequate funding for project oversight and improved compliance with project standards	June 2027	1. Identify sources of financing for inspection and audit of projects				State Department for Public works	All MDAs
						2. Ensure hiring of competent construction supervisors					
		Absence of technical documentation and asset data management results in incomplete construction work and project realization	Establish construction asset data repository to store, manage and update technical documentation	Up-to-date construction asset data repositories are mainstreamed, maintained and utilized to inform future planning	June 2027	1. Define requirements for data repository (e.g., structure, data needed to be captured, accessibility)				State Department for Public works	All MDAs
						2. Collect, synthesize and document all construction data and information					
						3. Create an accessible data repository					
						4. Automate the data repository					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
MANAGEMENT	Operation & Maintenance	Outdated O&M policies and guidelines	Update existing policies and guidelines on asset maintenance (e.g., Maintenance Policy (2015))	Updated Maintenance Policy aligned with current best practices	June 2027	1. Revise and update the maintenance policies and plans				State Department for Public works	All MDAs
						2. Develop SOPs for maintenance of assets					
						3. Adopt protocols to ensure implementation of maintenance policies and SOPs					
		Undefined roles and responsibilities for O&M of assets	Establish an institutional framework for O&M to define the roles and responsibilities of all actors and improve coordination and service delivery (e.g., transfers from national governments to county government and from county governments to city boards and municipalities	Developed O&M framework and improved coordination across government institutions	June 2027	1. Review existing roles and responsibilities of all actors in O&M based on updated maintenance policies				National Treasury and Economic Planning	All MDAs
						2. Develop institutional framework for O&M with clear roles and responsibilities					
		Insufficient maintenance plans and AMAPs for sectoral assets	Develop sector-specific asset maintenance and management action plans, starting with critical infrastructure	Establish and implement maintenance plans and AMAPs for all critical assets for more sustainable asset management practices (e.g., shift from reactive to proactive)	June 2027	1. Identify O&M needs for all infrastructure assets				National Treasury and Economic Planning	State Department of Public Works, All MDAs
						2. Identify inspection, monitoring and audit requirements (e.g., type of inspection, inspection frequency, etc.)					
						3. Prepare O&M plans for all infrastructure assets, starting with critical assets					
						4. Incorporate inspection, monitoring and audit requirements into maintenance plans					
		Inadequate maintenance funding and allocation mechanisms (i.e., user fees and levy mechanisms are insufficient)	Increase financial resources allocated for O&M through sustainable funding mechanisms	Adequate funds and financing are provided and used for the maintenance of infrastructure assets, leading to better upkeep and prolonged asset life	June 2027	1. Identify financing needs for O&M for the entire life cycle of the asset				National Treasury and Economic Planning	All MDAs
						2. Review existing sources to determine effectiveness of collection and gaps, revise tariffs and enhance collection efficiency					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
MANAGEMENT	Operation & Maintenance	Insufficient contingency funds for emergencies and sudden/catastrophic losses	Enhance the contingency fund to adequately cover sudden and catastrophic losses	An adequate National Contingency Fund is maintained to finance emergencies/ catastrophes	June 2026	1. Assess the extent to which the contingency fund has financed emergencies and identify gaps				National Treasury and Economic Planning	All MDAs
						2. Increase budgetary allocations to the contingency fund					
		Inadequate and limited maintenance data, financial resources and technical capacity for planning, developing and maintaining an Asset Information Management System (AIMS)	Allocate financial resources to develop and maintain a centralized AIMS	Public institutions use AIMS for an effective asset management and planning	June 2028	1. Document asset data to be incorporated in the AIMS				National Treasury and Economic Planning	All MDAs
						2. Define requirements for the AIMS					
						3. Identify financing needs and sources for the AIMS					
						4. Develop the AIMS					
						5. Train staff on AIMS and implement					
		Inadequate and inconsistent technical capacity for O&M (e.g., maintenance, inspection, monitoring, etc.)	Enhance technical capacity by recruiting and training more technical officers for O&M functions	Increase number of qualified technical O&M officers across regions	June 2027	1. Recruit more technical officers into civil service (engineers, architects, quantity surveyors) with clear terms of service				Ministry of Public Service, Performance and Delivery Management	All MDAs
						2. Develop and deliver training to increase capacity					
		Inadequate and inaccessible asset data on O&M and end-of-service life stages	Incorporate comprehensive asset data, including O&M and end-of-service life information, into AIMS	Up-to-date and accessible O&M and end-of-service life data available in AIMS, improving decision-making and life cycle management	June 2027	1. Collect, synthesize and document all O&M and end-of-service life data and information, and update and maintain AIMS				National Treasury and Economic Planning	State Department of Public Works, All MDAs
		Underutilization of inspection and monitoring and evaluation (M&E) reports for planning	Incorporate findings from inspection and M&E reports into O&M planning processes	Enhanced linkage between M&E processes and infrastructure maintenance planning, improving overall asset management strategies	June 2027	1. Develop M&E reporting guidelines				State Department for Public works	All MDAs
						2. Identify O&M needs from inspection and M&E findings					
						3. Inspect assets according to guidelines					
						4. Incorporate the O&M needs into maintenance plans					

Phase	Stage	Priority issue	Solution	Outcome	Target	Actions	Short-term (1–3Y)	Med-term (3–5Y)	Long-term (5–10Y)	Leading organization	Other organizations involved
MANAGEMENT	End-of-Service Life	No established SOPs and guidelines for decommissioning across various sectors	Develop and document SOPs and guidelines for decommissioning of infrastructure assets	SOPs and guidelines for decommissioning of infrastructure assets	June 2027	1. Identify asset decommissioning needs and gaps				State Department for Public works	All MDAs
						2. Develop SOPs and guidelines for decommissioning of infrastructure assets					
						3. Implement, monitor and report on decommissioning of assets					
		Unclear roles and responsibilities across national, sub-national and local governments	Develop an institutional framework with clearly defined mandates for decommissioning processes across all levels of government	Establish formal institutional framework for decommissioning of public projects	June 2027	1. Review existing roles and responsibilities of all actors				National Treasury and Economic Planning	All MDAs
						2. Identify areas of overlapping roles and unclear mandates					
						3. Develop institutional framework with clear roles and responsibilities					
		No defined procedures for determining when asset performance is no longer optimal	Develop SOPs for assessing asset condition and performance based on cost-benefit analyses and sector-specific guidelines	Standard procedures for asset condition assessment are implemented, guiding decisions on when to rehabilitate, replace or decommission assets	June 2027	1. Identify criteria for assessing condition and performance of asset				National Treasury and Economic Planning	All MDAs
						2. Prepare and document SOPs and guidelines for determining asset condition and performance					
		Ineffective enforcement of end-of-service life procedures (e.g., e-Waste guidelines and National Guidelines on Safe Management and Disposal of Asbestos)	Strengthen enforcement of end-of-service life regulations, including processes (e.g., demolition of buildings with asbestos)	Compliance with end-of-service life processes to ensure safe and regulated asset decommissioning	June 2028	1. Identify gaps in enforcement, such as lack of financial resources and systems for recycling and safe disposal				State Department for Public works	All MDAs
						2. Put in place measures to address the gaps, such as provision of financial resources, putting in place systems and processes for end-of-service life processes, etc.					
		Inadequate funding for asset decommissioning process, especially for recycling and safe disposal	Enhance financial resources for asset decommissioning process, especially for recycling and safe disposal	Adequate funding is available for asset decommissioning, enabling safe and environmentally responsible recycling and disposal practices	June 2028	1. Identify financing needs for asset decommissioning process, especially for recycling and safe disposal				State Department for Public works	All MDAs
						2. Identify sources of financing and provide financial resources for asset decommissioning process					
						3. Put in place mechanisms and structures for an asset decommissioning process, especially for recycling and safe disposal					

Annex A - Roadmap Analyzed Capacities

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
PLANNING	Strategic Planning	Inadequate mainstreaming of asset management and life cycle planning in policies, plans and budgets	Mainstream infrastructure assets management in all strategic planning policies and plans	Policies, Laws and Regulations	1.4, 2.a, 5.c, 9.1, 11.a, 11.b, 12.2, 13.2, 15.9, 16.6, 17.1, 17.14	Integrate climate resilience and sustainability into policy frameworks, ensuring all infrastructure plans are robust	Ensure equitable representation and active participation of women and marginalized groups in the planning processes
		Absence of Strategic Asset Management Plans (SAMP) to define national asset management goals	Develop and implement comprehensive SAMPs across all sectors	Policies, Laws and Regulations	6.4, 7.1, 7.b, 9.1, 9.4, 9.a, 11.a, 11.b, 11.1, 11.2, 11.6, 13.1, 15.9, 16.6, 16.7, 17.17	Mainstream climate-responsive asset management prioritizing ecosystems and biodiversity conservation	Promote gender-responsive planning ensuring leadership participation and perspectives of underrepresented groups in needs
		Inadequate climate adaptation consideration into policies and plans	Mainstream IAM into the national and local climate change adaptation policies and plans	Policies, Laws and Regulations	1.5, 13.1, 3.d, 10.3, 11.b, 11.5, 12.2, 13.1, 13.2, 13.b, 15.9	Ensure all infrastructure management incorporates adaptive strategies to address climate vulnerabilities and resilience-building measures	Incorporate the impacts of climate change on women, Indigenous Peoples and vulnerable communities, emphasizing community-based adaptation initiatives
		Asset registers are not updated and not all procuring entities have automated management systems	Establish a system for maintaining up-to-date, comprehensive asset registers and ensure the implementation of automated management systems	Data Management	9.4, 10.2, 11.1, 12.6, 15.1, 15.9, 16.6, 17.17	Integrate climate risk data into asset registers to identify and manage high-risk assets, promoting climate-resilient infrastructure	Implement gender-sensitive data collection practices to ensure disaggregated data on asset usage and needs
		Inadequate use of data in identifying infrastructure gaps or informing strategic planning leads to project plans divergence and misaligned priorities	Link asset management data to decision-making processes to ensure alignment between planning and asset management needs	Data Management	11.1, 11.2, 16.7, 11.6, 13.1, 16.10, 17.16	Use of climate-related data to guide strategic planning, prioritizing areas most vulnerable to climate impacts	Promote transparent data-sharing and inclusive data governance that encourages diverse stakeholder participation in decision-making process
	Spatial Planning	Ineffective enforcement of development control and zoning regulations at both national and local levels	Strengthen enforcement of development control guidelines through regular audits and penalties for non-compliance	Processes	11.a, 11.b, 11.2, 11.3, 16.3, 12.2, 16.6	Integrate environmental and climate resilience considerations into zoning regulations to safeguard ecosystems and promote sustainable land use	Ensure women and marginalized groups have equitable representation in decision-making processes to address diverse needs in land development

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
PLANNING	Spatial Planning	Inadequate human resource capacity and allocation for spatial planning	Undertake capacity needs assessment and enhance capacity through recruitment and training of physical planners to ensure adequate human capacity in government agencies	Knowledge, Technical Capacities and Resources	4.7, 8.3, 9.a, 11.3, 17.9	Incorporate training on climate risk assessment and environmental sustainability into the capacity-building programmes to integrate climate adaptation strategies effectively in spatial planning	Promote gender equality by providing targeted training and capacity-building opportunities for women in spatial planning roles
		Ineffective, fragmented and outdated geospatial and climate hazard data hindered by outdated methodologies, tools and lack of implementation processes	Regularly collect, update and document geospatial data using current methodologies, ensuring data accuracy and usability	Data Management	9.1, 11.a, 11.b, 11.3, 17.16, 17.7	Identify and mainstream climate-related changes in real time, enhancing adaptive capacity in spatial planning	Ensure gender-disaggregated data is used to inform spatial planning and facilitate targeted interventions that address the needs of women and other vulnerable groups, ensuring no one is left behind
	Infrastructure Planning	Absence of asset management plans (AMPs) and strategies	Develop and institutionalize AMPs and strategies that provide a clear roadmap for managing national assets across infrastructure sectors	Policies, Laws and Regulations	9.1, 10.2, 13.2, 12.2, 17.1	Align asset management strategies with national climate action plans, including embedding climate risk assessment in asset management planning and systems	Ensure asset management frameworks are inclusive and reflect the needs of diverse populations
		Inadequate policy and processes implementation hinder comprehensive life cycle analysis of infrastructure projects	Update processes to ensure life cycle analysis is integrated into all project planning and decision-making, as per Public Investment Management (PIM) guidelines	Policies, Laws and Regulations	5.5, 8.4, 9.4, 11.b, 13.1	Integrate life cycle environmental impacts into infrastructure planning to enhance climate resilience and adaptation strategies	Promote gender-responsive processes by incorporating women and other underrepresented groups' perspectives
		Inadequate coordination in implementation of infrastructure plans between planning agencies	Centralize infrastructure planning by establishing a National Infrastructure Coordination Unit to minimize overlaps and better prioritize infrastructure spending	Institutional Arrangements	11.a, 11.b, 17.14, 17.16	Facilitate interagency knowledge and data sharing on climate impacts to strengthen adaptive capacity	Foster inclusive institutional arrangements that ensure participation of diverse stakeholders to achieve more coordinated and equitable infrastructure planning
		Inadequate consideration of asset management in decision-making (e.g., asset forecast demand, condition, performance, operation and maintenance (O&M) practices, and climate-related aspects)	Adopt a life cycle analysis approach, incorporating costing, demand analysis, condition, performance, O&M practices, and climate-related aspects into infrastructure planning and funding processes so that infrastructure plans respond to asset management needs	Processes	9.1, 11.b, 12.2, 13.1	Promote climate data-driven strategies to inform future asset demand and operations to sustain climate-related stresses and variability	Ensure decision-making processes are informed by diverse groups creating user-driven solutions

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
PLANNING	Project Preparation	Inadequate feasibility studies and environmental and socio-economic impact studies across government projects due to inadequate financial and human capacity	Mandate that comprehensive feasibility studies and environmental/socio-economic impact assessments are undertaken for all major projects	Processes	11.a, 11.b, 11.5, 12.2, 13.2, 15.4, 15.9	Embed climate vulnerability assessments within project feasibility studies to ensure assets are resilient to environmental risks	Include gender-specific analysis to address the unique effects on women and marginalized groups
		Inconsistent undertaking of demand, risk and cost-benefit analysis in project planning	Enforce the implementation of Circular No. 16 of 2019 and PIM guidelines to ensure demand, risk and cost-benefit analyses are conducted for all major projects across government institutions	Processes	3.d, 9.4, 11.b, 11.5, 13.1, 13.2, 13.b	Integrate climate risks into project planning to anticipate, mitigate and enhance adaptive capacity to climate impacts	Incorporate user-sensitive analysis to evaluate the project's impact on women, children and vulnerable groups to promote equitable benefits and minimal socio-economic impacts
		Inadequate funding for the project preparation process	Secure adequate funding for the project preparation phase, including feasibility studies and impact assessments	Funding and Financial Management	1.5, 9.a, 10.2, 11.b, 13.1, 17.3	Allocate funding for feasibility studies to include climate vulnerability and proactive identification of climate risks and adaptation needs	Allocate funding for impact assessment to address the needs of vulnerable groups throughout the project life cycle
		Ineffective identification of potential financing mechanisms for O&M for projects	Identify and plan for potential financing mechanisms for O&M by life cycle cost analysis in project preparation	Funding and Financial Management	9.a, 11.1, 17.3	Integrate disaster vulnerability funding into budgets and contingency funds to support long-term climate adaptation	Ensure financing plans include provisions for gender-sensitive O&M strategies, particularly accessing and benefiting from infrastructure services
		Inadequate technical capacity to support the project preparation process (e.g., reliance on external consultants)	Build and enhance technical capacity within government agencies to support project preparation	Knowledge, Technical Capacities and Resources	4.7, 8.3, 9.a, 17.9	Embed climate adaptation and resilience planning in capacity building programmes, aligned with national climate priorities	Encourage inclusive training that enhances technical skills across diverse demographic groups
DELIVERY	Project Mobilization and Delivery	Absence of sustainable project implementation committees/ teams for effective project mobilization and delivery	Establish permanent multi-disciplinary project implementation committees	Institutional Arrangements	9.1, 5.5, 10.2, 11.b, 13.1	Consider incorporation of individuals with expertise in disaster vulnerability and climate resilience in committees to promote sustainability in project design and execution	Ensure equal representation of men and women in project implementation committees
		Inadequate planning and alignment with project objectives lead to poor project mobilization and delivery	Establish mechanisms for improved alignment to prevent cost overruns and timeline delays (e.g., payment of contractors and disputes with contractors over quality of work)	Processes	9.1, 11.b, 13.1, 17.14	Align project plans with climate adaptation goals, accounting for environmental risks to avoid delays due to unforeseen climate impacts, and implement regular environmental impact reviews	Ensure project objectives align with the diverse needs of communities to prevent disparities during mobilization and delivery

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
DELIVERY	Project Mobilization and Delivery	Delays in the approval process hinder project execution	Develop SOPs that provide guidance on the project approval processes	Processes	9.1, 9.a, 11.b, 13.1	Mainstream climate vulnerability and resilience measures into SOPs	Establish inclusive approval process by involving representatives from diverse community groups
		Inadequate risk management results in unforeseen challenges during project delivery	Prepare a comprehensive risk management strategy and framework for infrastructure projects	Processes	9.1, 13.1, 13.2, 16.7	Integrate climate data and disaster preparedness measures in risk management frameworks	Ensure risk management frameworks consider the vulnerabilities of all community members
		Inadequate technical capacity to support project mobilization and delivery	Build technical capacity and recruit technical officers to support project mobilization and delivery across sectors, including construction (engineers, architects, quantity surveyors)	Knowledge, Technical Capacities and Resources	4.7, 9.a, 17.17	Ensure capacity-building efforts equip teams with the skills needed to address climate risks	Encourage the recruitment of women and underrepresented groups into technical roles to foster a diverse and inclusive workforce
		Inadequate data for decision-making and project implementation due to inaccessible and unutilized past project data	Enhance the collection, documentation and utilization of project data to inform future infrastructure projects	Data Management	9.a, 12.2, 13.1	Assess the effects of climate change and vulnerability on past projects to improve planning and response strategies in current projects	Establish gender-disaggregated data to inform project decision-making and ensure concerns of women and marginalized groups are treated equitably
	Procurement	Ineffective enforcement of procurement law, particularly regarding sanctions and degazettement of suppliers	Strengthen the enforcement of procurement laws to address non-compliance and sanctioning of firms and suppliers	Policies, Laws and Regulations	10.3, 12.7, 16.3	Establish procurement mechanisms to prioritize suppliers that adhere to environmental standards and contribute to sustainable procurement	Promote fair and transparent procurement processes, ensuring all suppliers are held to the same standards and incentivize the inclusion of diverse suppliers, including those led by women and marginalized groups.
		Quality of materials assurance issues regarding material testing, certification, technical capacity and implementation	Enhance technical and financial capacity for testing and certification of materials (locally produced and imported) to ensure quality standards are met	Processes	11.c, 12.2, 17.7	Invest in the resilience of materials to climate change to contribute to long-term sustainability	Ensure quality assurance processes incorporate gender-inclusive practices, such as equal opportunities for technical roles; and promote local sourcing and capacity-building for suppliers from underrepresented communities
		Abnormally low bids have a detrimental impact on the quality of work, with disregard for the engineer's estimate	Review procurement procedures and guidelines to prevent the acceptance of unrealistic bids (e.g., firms/suppliers qualification selection criteria,) and assess technical and financial bids separately	Processes	9.1, 12.7, 16.7	Integrate climate resilience criteria in bid evaluations to ensure supplies can meet sustainability standards	Implement transparent criteria for bid evaluations: (1) ensuring procurement processes do not discriminate against small or minority-owned businesses; and (2) include requirements that promote fair labor practices and gender equality in supplier qualifications

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
DELIVERY	Procurement	Lengthy procurement processes causing project delays	Simplify procurement processes and mainstream e-procurement to reduce delays	Processes	9.1, 12.7, 16.7	Incorporate disaster vulnerability risk analysis in contract management processes; and establish procurement mechanisms to expedite response to climate-related emergencies	Promote accessibility in procurement/e-procurement systems, ensuring women and underrepresented groups can participate
		Inadequate procurement oversight due to technical and financial challenges	Enhance the technical and financial capacity of the PPRA for better oversight	Knowledge, Technical Capacities and Resources	9.a, 16.6, 17.1	Include disaster vulnerability training in capacity development programmes	Enhance community leadership, participation and guardianship by incorporating women into planning, procurement, design, O&M committees
		Inadequate compilation, storage and use of procurement data and reports, leading to inefficiencies (e.g., costs, timelines and delivery)	Develop a comprehensive procurement data repository to ensure accessibility and use of past data	Data Management	9.a, 13.1, 17.7	Use procurement data to assess climate-related risks in historical projects, improving future planning and resilience	Encourage procurement gender-sensitive data analysis to identify and address specific challenges faced by underrepresented communities
	Design	Lack of compliance with design codes and infrastructure standards	Implement and enforce all codes and standards	Policies, Laws and Regulations	9.1, 11.4, 13.2	Integrate climate-resilient design standards into infrastructure codes and continuous updating of codes to reflect evolving climate risks and adaptation needs	Integrate accessibility and inclusivity of vulnerable and disadvantaged groups into infrastructure codes and facilitate public awareness campaigns to enhance understanding and compliance with standards across various demographics
		Institutional mismanagement and inadequate technical capacity result in poorly designed projects	Build technical design capacity and recruit skilled professionals across all government sectors	Institutional Arrangements	9.a, 9.1, 17.7	Incorporate disaster vulnerability training into capacity development programmes, and incentivize a holistic approach to technical design that includes climate adaptation and mitigation strategies	Enhance community leadership, participation and guardianship by incorporating women into planning, procurement, design, operation and maintenance committees
		Insufficient emphasis on long-term renovation, retrofit, repurposing and decommissioning plans of assets within the design process.	Establish mandatory requirements stipulating project designs demonstrate the integration of whole-of-life costing and other critical design considerations, ensuring project modalities are compared and selected based on life cycle costing analysis	Processes	12.2,12.4, 12.5	Integrate climate vulnerability into life cycle design to ensure assets are resilient to environmental stresses over time	Establish life cycle design processes that are responsive to the needs of marginalized communities

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
DELIVERY	Design	Environmental, socio-economic, financial and risk impact studies and inclusion of end-user needs information are not undertaken for all projects as per the PIM guidelines	Mandate and enforce the undertaking of environmental, socio-economic, financial and risk impact studies for all projects	Processes	4.a, 4.7, 11.a, 11.b, 11.5, 12.2, 13.1, 13.2, 15.9	Mandate climate risk analysis in impact studies to identify risks and mitigation strategies	Ensure impact studies include how projects affect women and marginalized groups; and facilitate participation of diverse groups in the design stages to capture a broad range of needs and perspectives
		Low budget allocation for projects constrains the scope and quality of project designs	Appropriately cost the project, considering the cost and quality of the project, and provide adequate budgetary resources for implementation	Funding and Financial Management	11.c, 13.1, 17.17	Incorporate disaster vulnerability funding requirements in budgeting for infrastructure assets' resiliency	Incorporate gender-responsive budgeting to ensure financial resources address the needs of women and other vulnerable groups and promote equitable benefits for all
		Weak management of asset design data to inform and support future infrastructure projects	Create physical design asset data repository to support upstream planning processes	Data Management	9.a, 13.1, 17.7	Use climate vulnerability and resilience data to inform design climate-resilient infrastructure practices for future projects	Collect and analyze gender-sensitive data to identify how infrastructure projects affect diverse groups
		Inadequate stakeholder engagement during the design stage	Develop and implement a stakeholder engagement plan and strategy	Stakeholder Engagement	6.b, 10.2, 13.1, 16.7, 17.17	Facilitate stakeholder discussions on climate risks and adaptation strategies to ensure design plans incorporate local environmental insights	Promote equal representation and active participation, ensuring all voices are considered in the design stage
	Construction	Low adherence to construction codes results in low quality of assets, cost overruns and safety hazards	Enforce strict compliance with construction codes by conducting frequent audits and penalties for non-compliance	Policies, Laws and Regulations	3.9, 8.8, 9.4, 11.6, 12.2	Integrate climate-resilient standards within construction codes to ensure all projects can withstand climate impacts, and regularly update codes to reflect advancements in sustainable construction practices	Promote inclusive enforcement of construction codes, ensuring contractors adhere to standards that safeguard all workers; and advocate for fair working conditions and access to safety resources
		Deficiencies in the implementation of occupational health and safety (OSH) regulations	Implement the Occupational Safety and Health Policy (2024), focusing on the continual development of safety systems and reducing work-related accidents and diseases	Processes	3.9, 8.8, 5.5, 13.1	Ensure occupational health policies include training on climate-related risks, such as extreme weather conditions, to protect workers' health and safety	Promote safe working conditions in the construction industry, including unique needs of women, to protect workers' health and safety

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
DELIVERY	Construction	Ineffective contract management and coordination processes during construction disputes	Establish contract management units with qualified engineering, finance, and legal personnel and proper documentation	Processes	9.1, 10.2, 11.b, 16.7	Establish adaptive contract terms to respond to climate impact	Ensure contract processes are transparent and accessible, with equal opportunities for all involved parties, including small and minority-owned businesses
		Project cost overruns and timeline delays are commonly attributed to poor designs, need for modifications, low capacity of the construction contractor and/or technical modification requests due to corruption	Establish operational Project Implementation Committees tasked with monitoring and approving construction progress, and for revision and timely approval of "variation requests"	Processes	9.1, 13.1, 17.17	Involve individuals with experience in disaster vulnerability assessment in the review process	Engage women and marginalized groups in design review processes to ensure projects meet diverse community needs
		Inadequate adoption of EIA recommendations	Enforce the PIM guidelines that require incorporation of EIA findings into all infrastructure projects, ensuring environmental concerns are addressed during the construction process	Processes	3.9, 11.6, 12.4, 13.2	Assess potential climate impacts and identify mitigation measures	Ensure EIAs include diverse perspectives, especially from vulnerable communities, and are accessible and understandable, fostering inclusivity and public trust
		Inadequate auditing and inspection due to budgetary constraints	Increase financial resources for auditing and inspection of construction projects to ensure compliance and QA	Funding and Financial Management	2.a, 9.a, 17.1	Incorporate disaster vulnerability funding requirements in budgeting for infrastructure assets' resiliency	Incorporate gender-responsive budgeting to ensure financial resources address the needs of women and other vulnerable groups and promote equitable benefits for all
		Absence of technical documentation and asset data management results in incomplete construction work and project realization	Establish construction asset data repository to store, manage and update technical documentation	Data Management	9.a, 11.6, 12.2, 13.1	Ensure construction data repository and documents are updated to inform future projects' O&M and management to enhance climate adaptation strategies and infrastructure resilience	Establish gender-sensitive data management practices to capture diverse perspectives during construction stage

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
MANAGEMENT	Operation & Maintenance	Outdated O&M policies and guidelines	Update existing policies and guidelines on asset maintenance (e.g., Maintenance Policy (2015))	Policies, Laws and Regulations	9.4, 12.2, 13.2, 17.14	Integrate climate resilience into O&M policies and promote sustainable maintenance practices that address long-term environmental challenges	Incorporate provisions that prioritize the needs of all community members, women, persons with disabilities and other vulnerable groups into future updated O&M policies
		Undefined roles and responsibilities for O&M of assets	Establish an institutional framework for O&M to define the roles and responsibilities of all actors and improve coordination and service delivery (e.g., transfers from national government to county governments and from county governments to city boards and municipalities)	Institutional Arrangements	5.5, 10.2, 11.a, 16.7	Facilitate cross-institutional collaboration to streamline climate-responsive practices	Promote equitable distribution of roles within O&M, ensuring diverse groups, particularly women and minority communities, are represented in leadership and decision-making positions
		Insufficient maintenance plans and AMAPs for sectoral assets	Develop sector-specific asset maintenance and management action plans, starting with critical infrastructure	Processes	9.4, 11.a, 12.2, 17.14	Prioritize adaptive maintenance plans and strategies that enhance asset sustainability and resilience under climate risks	Ensure action plans are developed inclusively, with input from local communities, to reflect a comprehensive view of asset needs and priorities
		Inadequate maintenance funding and allocation mechanisms (i.e., user fees and levy mechanisms are insufficient)	Increase financial resources allocated for O&M through sustainable funding mechanisms	Funding and Financial Management	6.b, 9.a, 13.1, 17.17	Incorporate disaster vulnerability funding requirements in budgeting for O&M of infrastructure assets	Incorporate gender-responsive budgeting to ensure O&M activities address the needs of women and other vulnerable groups and promote equitable benefits for all
		Insufficient contingency funds for emergencies and sudden/ catastrophic losses	Enhance the contingency fund to adequately cover sudden and catastrophic losses	Funding and Financial Management	1.5, 13.1, 17.3	Allocate contingency funds specifically for climate-related emergencies to ensure disaster preparedness	Ensure contingency funding mechanisms consider diverse community needs
		Inadequate and limited maintenance data, financial resources and technical capacity for planning, developing and maintaining Asset Information Management System (AIMS)	Allocate financial resources to develop and maintain a centralized AIMS	Funding and Financial Management	2.a, 9.4, 12.2, 13.2	Ensure AIMS integrates climate data to forecast impacts and enhance adaptive capacity across asset portfolios	Facilitate training for women and other marginalized groups to use and benefit from the AIMS
		Inadequate and inconsistent technical capacity for O&M (e.g., maintenance, inspection and monitoring, etc.)	Enhance technical capacity by recruiting and training more technical officers for O&M functions	Knowledge, Technical Capacities and Resources	5.5, 9.a, 13.1, 13.b	Incorporate disaster resilience and climate adaptation training into O&M programmes to prepare technical staff for environmental challenges	Promote gender equality in technical roles by providing capacity building opportunities for women in built environment sector

Phase	Stage	Priority Issue	Proposed Solution	EE Indicator Influenced	Potential SDGs Targets Influenced	Climate Considerations	Inclusion Consideration
MANAGEMENT	Operation & Maintenance	Inadequate and inaccessible asset data on O&M and end-of-service life stages	Incorporate comprehensive asset data, including O&M and end-of-service life information, into AIMS	Data Management	9.4, 11.6, 12.2, 13.1	Include data on climate vulnerability and resilience for all assets to support informed decision-making on asset maintenance and life cycle planning	Collect and analyze disaggregated data to address the specific needs of different demographic groups
		Underutilization of inspection and monitoring and evaluation (M&E) reports for planning	Incorporate findings from inspection and M&E reports into O&M planning processes	Monitoring and Reporting	4.7, 9.a, 12.2	Leverage M&E data to identify climate risks and inform O&M planning for resilient infrastructure	Ensure that M&E reports are accessible to diverse stakeholders and promote transparency and inclusivity in how data is used for planning
	End-of-Service Life	No established SOPs and guidelines for decommissioning across various sectors	Develop and document SOPs and guidelines for decommissioning of infrastructure assets	Policies, Laws and Regulations	3.9, 9.4, 12.4, 12.5, 12.6	Mainstream climatic vulnerability and resilience into SOPs to minimize environmental impacts throughout the end-of-service life stage	Ensure decommissioning procedures are inclusive and involve local communities to mitigate socio-economic impacts
		Unclear roles and responsibilities across national, sub-national and local governments	Develop an institutional framework with clearly defined mandates for decommissioning processes across all levels of government	Institutional Arrangements	10.2, 11.a, 16.7, 17.17	Promote intergovernmental coordination on climate-resilient decommissioning to ensure consistent climate adaptation practices	Establish inclusive frameworks to ensure local voices are considered in decision-making on decommissioning processes
		No defined procedures for determining when asset performance is no longer optimal	Develop SOPs for assessing asset condition and performance based on cost-benefit analyses and sector-specific guidelines	Processes	9.a, 9.1, 9.4, 12.2, 13.1	Establish processes to identify when climate-related deterioration makes continued operation unsustainable	Establish assessment criteria to gather inputs from diverse stakeholders to inform whether assets performance meet user needs
		Ineffective enforcement of end-of-service life procedures (e.g., e-waste guidelines and National Guidelines on Safe Management and Disposal of Asbestos)	Strengthen enforcement of end-of-service life regulations, including processes (e.g., demolition of buildings with asbestos)	Processes	3.9, 8.8, 12.4, 12.5	Promote sustainable practices in asset renovation and decommissioning to reduce ecological impact	Encourage fair labor practices and safe working conditions for all workers involved in end-of-service life processes; and engage with community members to address potential health and safety concerns associated with decommissioning activities
		Inadequate funding for asset decommissioning process, especially for recycling and safe disposal	Enhance financial resources for asset decommissioning process, especially for recycling and safe disposal	Funding and Financial Management	2.a, 9.a, 12.5, 13.1	Incorporate potential disposal funding requirements in budgeting for resilient infrastructure assets	Ensure resources are available for safe disposal practices that protect vulnerable communities

Annex B - List of SDGs enabled by IAM

SDGs	Sub-SDG
	1.4 Ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance 1.5 Build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters 1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions
	2.4 Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality 2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries
	3.6 Halve the number of global deaths and injuries from road traffic accidents 3.9 Substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination 3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks
	4.7 Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development 4.a Build and upgrade education facilities that are child, disability, and gender-sensitive and provide safe, non-violent, inclusive, and effective learning environments for all

SDGs	Sub-SDG
	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life 5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws 5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels
	6.1 Achieve universal and equitable access to safe and affordable drinking water for all 6.2 Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations 6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally 6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity 6.5 Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate 6.6 Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes 6.a Expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies 6.b Support and strengthen the participation of local communities in improving water and sanitation management
	7.1 Ensure universal access to affordable, reliable and modern energy services 7.a Enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology 7.b Expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support

SDGs	Sub-SDG
	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead 8.5 Achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value 8.7 Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor, including recruitment and use of child soldiers, and by 2025 end child labor in all its forms 8.8 Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment 8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all
	9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for allDevelop quality, reliable, sustainable infrastructure 9.4 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities 9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States
	10.2 Empower and promote the social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status 10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard 10.4 Adopt policies, especially fiscal, wage, and social protection policies, and progressively achieve greater equality 10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes

SDGs	Sub-SDG
	11.1 Ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums 11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons transport systems 11.3 Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries 11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage 11.5 Significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations 11.6 Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management 11.7 Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities 11.a Support positive economic, social and environmental links between urban, per-urban and rural areas by strengthening national and regional development planning 11.b Substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials
	12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries 12.2 Achieve the sustainable management and efficient use of natural resources 12.4 Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment 12.5 Substantially reduce waste generation through prevention, reduction, recycling and reuse 12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle 12.7 Promote public procurement practices that are sustainable, in accordance with national policies

SDGs	Sub-SDG
	13.1 Strengthen resilience and adaptive capacity to climate-related hazards 13.2 Integrate climate change measures into national policies, strategies, and planning 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning 13.b Promote mechanisms for raising capacity for effective climate change- related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
	14.1 Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution 14.2 Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans 14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS
	15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements 15.2 Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally 15.3 Combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world 15.4 Ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species 15.9 Integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts
	16.5 Substantially reduce corruption and bribery in all their forms 16.6 Develop effective, accountable and transparent institutions at all levels 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels 16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements

SDGs	Sub-SDG
	17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection 17.3 Mobilize additional financial resources for developing countries from multiple sources 17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress 17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed 17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all Sustainable Development Goals, including through North-South, South-South, and triangular cooperation 17.14 Enhance policy coherence for sustainable development 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries

Annex C - List of Consultations

No.	Full Name	Functional Title	Organization
1	Babati Mokgethi	Urban Development Officer	African Development Bank (ADB)
2	Willocquet Bertrand	Country Director	Agence Française de Développement (AFD)
3	Gikonyo Gitonga	Managing Director	Axis Real Estate Ltd/Institution of Engineers
4	Kamau Joseph Kinani	Managing Director	Cykka Works Ltd
5	Evelyn Otieno	Urban Specialist	European Investment Bank (EIB) Regional Hub
6	Juliet Chelimo	Programme Manager	European Union (EU)
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8	Stephan Fox	Attache Infrastructure Sector	European Union (EU)
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