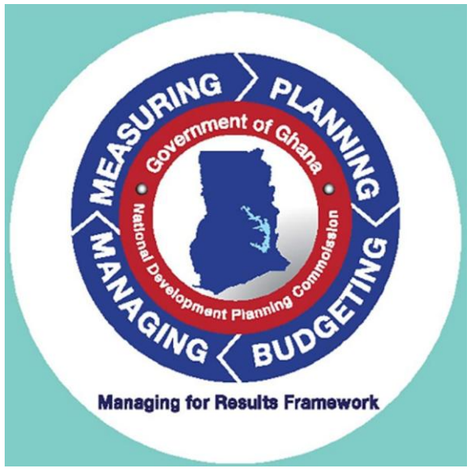

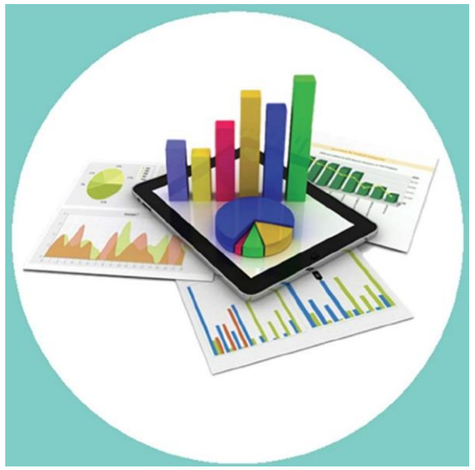

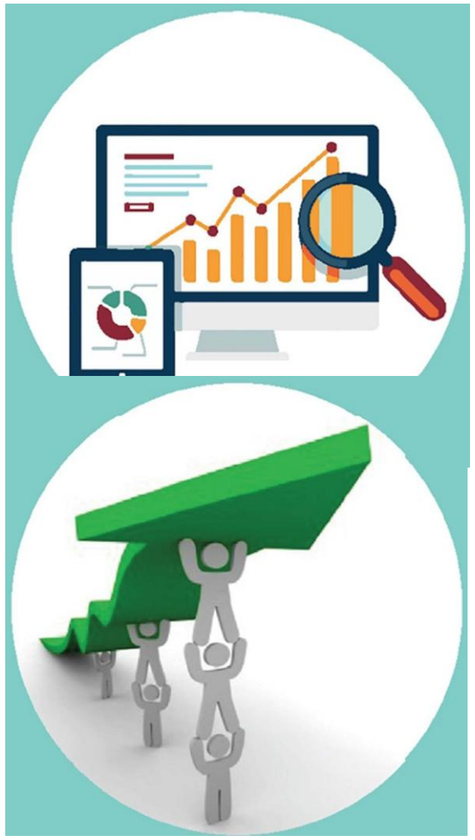

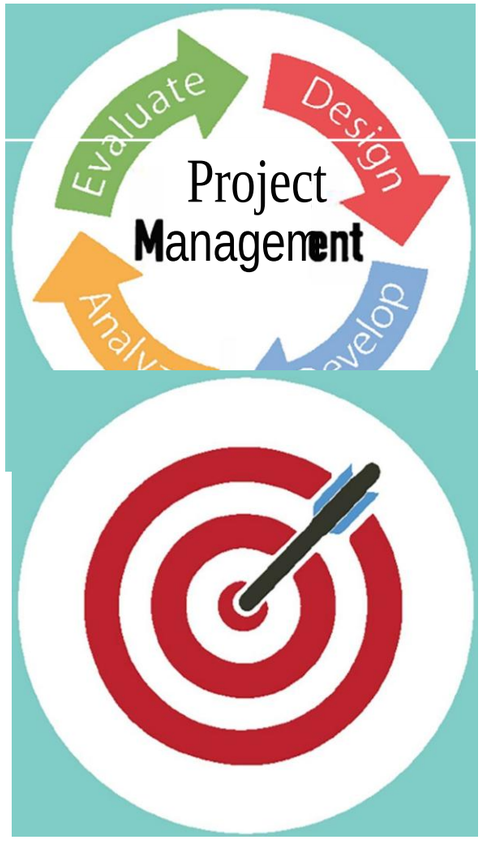

REPUBLIC OF GHANA

RESULTS FRAMEWORK 2018-2047

National Development Planning Commission

RESULTS FRAMEWORK

of the

GHANA INFRASTRUCTURE PLAN

2018-2047

The Ghana Infrastructure Plan is a
companion document of the
40-Year National Development Plan (2018-2057)

It draws substantially from the National Spatial Development Framework (2015-2035) as a critical complement to infrastructure delivery through the efficient use of land and the planning of human settlements, including public transport

ACKNOWLEDGEMENTS

As a long-term document, the Ghana Infrastructure Plan (GIP) is a framework, or a master plan, for the preparation of medium-term and annual infrastructure plans by successive governments up to 2047, 10 years before the completion of its “mother” document, the *40-Year National Development Plan.* It was prepared with the support of many individuals and institutions. The vision and commitment of both the previous and current leadership of the Commission, particularly chairmen P.V. Obeng, Prof. Kwesi Botchwey, Prof. Stephen Adei, Prof. George Gyan-Baffour, and Dr. Nii Moi Thompson, proved highly valuable from the start to the completion of the GIP.

We wish to express our profound gratitude to the members of the Commission, especially the Energy as well as Infrastructure, Spatial Planning and Human Settlements thematic committees, who rigorously reviewed the plan and provided insightful comments for its preparation and finalisation.

We also acknowledge the team of specialists made up of government experts and consultants, led by Ing. Charles K. Boakye, who brought their vast experience to the preparation of the plan. Special appreciation goes to the Ministries, Departments and Agencies (MDAs) for providing the necessary data for the Plan and participating at every stage in its preparation and completion.

Last but not least, the staff of the Commission deserve special commendation for burning the proverbial midnight oil to ensure that the contents of the plan conformed to the development aspirations of Ghanaians as outlined in the 40-Year National Development Plan, officially known as “Ghana Rising: Long-term National Development Plan of Ghana (2018-2057).

Dr. Audrey Smock Amoah
Ag. Director-General
National Development Planning Commission
Accra

October 2025

The GIP has been translated into the following frameworks:

1. Energy Infrastructure Framework
2. Transport Infrastructure Framework
3. Water Infrastructure Framework
4. Human Settlements and Housing Infrastructure Framework
5. Social, Civic and Commercial Infrastructure Framework
6. ICT Infrastructure Framework
7. Institutional Development Framework
8. Results Framework
9. Financing Framework

TABLE OF CONTENTS

RESULTS FRAMEWORK OF THE GHANA INFRASTRUCTURE PLAN **1**

1.1 Introduction 1

SECTION 1: ENERGY **2**

1.1 Electric Power 2

1.2 Renewable Energy 3

1.3 Nuclear Energy 3

1.4 Petroleum 4

SECTION 2: TRANSPORTATION **5**

2.1 Road Transport 5

2.2 Aviation 6

2.3 Maritime 6

2.4 Railway 7

SECTION 3: WATER RELATED SECTORS **8**

3.1 Water Resources Management 8

3.2 Water Supply 9

3.3 Integrated Waste Management 10

3.4 Drainage, Flood Control and Coastal Protection 11

3.5 Irrigation Infrastructure 12

SECTION 4: HUMAN SETTLEMENTS AND HOUSING SYSTEMS **13**

4.1 Human Settlements Development 13

4.2 Shelter and Housing Systems 15

SECTION 5: SOCIAL, CIVIC AND COMMERCIAL INFRASTRUCTURE **16**

5.1 Social, Civic and Commercial Infrastructure 16

SECTION 6: ICT **19**

6.1 Information and Communication Technology 19

LIST OF TABLES

Table 1.1: Risk Assessment and Mitigation Measures 1

Results Framework of the Ghana Infrastructure Plan

1.1 Introduction

Ghana aspires to move from its current status as a low-middle income country to a high-income country by 2057. The country's ambition to become a high-income country cannot be achieved without a long-term national development plan, of which the development of the nation's infrastructure forms a key component. It is envisaged that most of the infrastructure needed to accelerate economic development should be in place by 2047. Therefore, the Ghana Infrastructure Plan (2018 to 2047) has been prepared to achieve these objectives.

A robust Results framework underpins the Ghana Infrastructure Plan. The framework is a measuring tool that will enable the NDPC and MDAs measure success of the objectives, key results areas, outputs and outcomes that will be defined in furtherance of the vision of making Ghana a high- income country. A draft GIP Framework has been completed. However, it is expected that the MDAs and PPMEDs will meet to further review the report and align it to their revised sector plans.

Key Components of the Results Framework

The Results framework translates national strategic priorities for each sector into key performance outcomes, indicators; planned programmes or interventions mapped to the budget and risks and assumptions. For the purpose of measuring success, indicators are defined for each outcome or output with baseline values and targets. The baseline values and targets should enable the NDPC to demonstrate cause-and- effect relationship in terms of how the specific programmes and interventions implemented under the 30-year plan, are contributing to the achievement of the strategic priorities. The budget is in USD ($) million and the Risks and Assumptions are also indicated. The GIP Results Framework is shown in Sections 1 – 6 of this report.

Reporting of the Results Framework

Sectors contributing to the Results Framework of the GIP will be required to track and report on the results based on a cascading model. It implies that each sector will track and report its own results related to their strategic priorities. The NDPC will concentrate on tracking and reporting on the ultimate outcomes into a consolidated national performance report to show if the country is on track to achieving a high-income status.

Risks, Assumptions and Mitigation Measures

The risk assessment and mitigation framework (Table 1.1) is designed to enable the NDPC, the sectors and policy makers to anticipate key risks that could potentially undermine effective implementation of the GIP's goals and objectives. The risk assessment is accompanied by mitigation measures to remove any constraints that could frustrate the achievement of the objectives. The risk assessment framework consists of risk categories, risk assessment and mitigation measures. The risk categories have been limited to the following key areas: political and governance, macroeconomic, fiduciary, sector strategies and policies, technical design, institutional capacity and environmental, social and safeguards issues.

Since the sector teams have not been sufficiently trained on the concept of managing for results, it is anticipated that there will be several iterative processes before both the results monitoring matrix, risk assessment and mitigation framework are finalised.

Reporting on Risk and Mitigation Measures

Following the identification of the focus areas, the next step is for the sectors to subject each defined results areas to risk assessment, rating and mitigation measures. The underlying assumption is that without a risk free environment, it will be difficult to fully implement and achieve the desired GIP objectives.

Table 1.1: Risk Assessment and Mitigation Measures

Risk Category	Risk Assessment	Mitigation Measures
Political and governance	Political parties may not accept the key priority results areas and objectives defined in the GIP. They may, therefore, refuse to fully implement it	The NDPC has sufficiently canvassed support for the 40-year Development Plan of which the GIP is a sub component. The Development Plan will be submitted to Parliament for approval. And once it is approved, it will be binding on all political parties operating in Ghana.
Macro-economic	High inflation, growing debt, etc. could make it difficult for government to raise the needed capital to invest in infrastructural projects	Accelerated infrastructure development will require that the government focuses on better management of the economy and efficiently deploy financial resources.
Fiduciary	Non adherence to existing Financial management Act and the Procurement Act could frustrate the implementation of projects defined in the GIP	Government must comply with the provisions of the Financial Management and Procurement laws in order to have value for money to promote full implementation of the projects defined in the GIP
Sector Strategies and Policies	Ministries and agencies that will have the overall responsibility to implement the GIP may not fully integrate the plan in their sector plans and strategies.	The NDPC has ensured that the sectors participate fully in the process for developing the GIP. The GIP is built on key sector priorities and strategies and should be reflected in the annual budget and policy statement.
Technical Design	The GIP should not be a wish list of projects that is not adequately aligned with the 40- year LTNDP.	Bringing on board key stakeholders during the preparation of the GIP will ensure that the document reflects their strategic intentions and plans. Each GIP project must be well articulated with well defined objectives, expected outcomes and indicators
Institutional Capacity	Some sectors and agencies may not have the appropriate human and institutional capacity to implement the GIP	The NDPC will proactively consult with the sectors in order to ascertain that they have the requisite skills and adequate financial resources to implement that GIP
Environmental and Social	Complex land acquisition processes and environmental assessment procedures could frustrate the implementation of the GIP	The NDPC will put in place mechanisms to facilitate greater consultation among key beneficiaries and stakeholders

SECTION 1: ENERGY

1.1 Electric Power

Indicators	Progress Indicators/Outputs	Planned Programmes/Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Increased access and availability of electricity				
1.1 Total installed capacity of power generation plants Baseline (2016): 3,800 MW Target (2047): 50,168 MW 1.2 Total electricity generation Baseline (2017): 16,000 GWh Target 297,200 GWh 1.3 Electricity generation per capita. Baseline (2016): 348 kWh Target (2047) 5,850 kWh 1.4 Mini Hydro developments Baseline (2016): 0 Target (2047): 500 MW 1.5 Clean coal technology Baseline (2016): Nil Target (2047): 12,200 MW 1.6 Percentage of transmission losses Baseline (2017): 4.5% Target (2057): 2.5% 1.7 Percentage of distribution losses Baseline (2017): 22.75% Target (2057): 6% 1.8 System Average Interruption Duration Index (SAIDI) hours per year Baseline (2017):40 Target (2047): 10 1.9 Customer Average Interruption Duration Index Baseline (2017): 24 Target (2047): 2 1.10 Percentage of the population with access to electricity Baseline (2017):85 % Target (2047): 100 %	✓A number of Hydroelectric, LNG plants, Coal, Renewable and Nuclear plants installed. ✓Eight new mini-hydro dams developed ✓A number of coal plants installed ✓Technical and commercial losses reduced	• Construction of hydroelectric, LNG plants, coal, renewable and nuclear plants installed. • Development of 8 mini-hydro dams • Installation of coal plants • Installation of advanced metering infrastructure and automatic meter reading • Replacement of legacy credit meter with prepaid meters • Installation of customised application software	US$168,000 million	• Energy Commission to establish a division to focus on the regulation and development of coal technology, restricting to supercritical and ultra- supercritical Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation

1.2 Renewable Energy

Indicators	Progress Indicators/Outputs	Planned Programmes/Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Increased share of renewable energy in the energy mix				
1.1 Percentage of renewable energy in energy mix Baseline (2018) : 1 % Target (2047) : 18 % 1.2 Total capacity of renewable energy installed Baseline (2016): 88 MW Target (2047): 9,000MW	✓Solar, Wind, Wave & Biofuels installed to add to the national energy mix ✓370,000 energy related jobs created	• Installation of solar, wind, wave and biofuel facilities • Promotion of private sector participation • Development of manufacturing and assembly plant for renewable technologies	US$ 20 billion	• Improvement in the efficiency of production and use of wood fuels • Renewable energy to be mainstreamed into GIP • Renewable Energy Authority established to implement master plan • Promotion of local content strategies • Renewable Energy research and development (R&D) to be established. Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation

1.3 Nuclear Energy

Indicators	Progress Indicators/Outputs	Planned Programmes/Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Increased share of nuclear energy in the energy mix				
1.1 Total capacity of nuclear energy installed Baseline (2016): 0 Target (2047): 12,800 MW	✓Nuclear power plant constructed to add to the energy mix	• Construction of nuclear power plant	US$ 61,042	• Ghana roadmap for nuclear development addresses 19 nuclear infrastructure issues across 3 Phases Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation

1.4 Petroleum

Indicators	Progress Indicators/Outputs	Planned Programmes/Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Increased access and availability of petroleum products				
1.1 Total capacity of existing oil refinery expanded Baseline (2016): 45,000bpd Target (2047): 60,000bpd	✓Tema Oil Refinery expanded.	• Expansion of Tema Oil Refinery	Total - US$1,706 million	• Develop LNG FSRU infrastructure. • Sustainable exploration, development and production of oil & gas mainly by Ghanaians. • GNPC to initiate its own exploration and production business within the next 5-10 years. • National gas transmission pipeline network to be constructed in the Western, Eastern and Northern corridors. Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation
1.2 Length of new fuel piplines constructed across the country Baseline (2016): 45,000bpd Target (2047): 60,000bpd	✓New network of pipes constructed	• Construction of new national gas transmission pipeline network made up of: Western, Eastern and Northern pipeline corridors respectively.		
1.3 Total capacity of new oil refinery constructed Baseline (2018): 0 Target (2047): 60,000bpd	✓New oil refinery constructed at Takoradi	• Construction of Takoradi Oil Refinery		

SECTION 2: TRANSPORTATION

2.1 Road Transport

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved Road Network				
1.1 Length of trunk roads constructed and rehabilitated Baseline (2018): 14,874 km Target (2047): 56,600 km	✓Trunk roads constructed/ rehabilitated to facilitate the efficient movement of people and goods	• Construction of Missing Links on road network • By-Pass Development • Expansion of the Trunk Road Network (New Construction) • All regional capitals linked by multi-lane carriageway	Existing Network Improvement: US$12,566 million Expansion of Network: US$106,250 million	• Continued improvement in the environment for economic growth. • Government committed to support new and on- going sector related activities • Factors of VOC, other than those related to road condition, do not increase • Proper implementation of the transport policies adopted by Government • Government commitment to implement road maintenance management system • Government to release budget on time and as per approved • Government commitment to put in place and adhere to a National Axle Load Policy • Increased efficiency and transparency in procurement and contract management. • High and middle level Ghanaian professionals will be educated and recruited to lead in the design and supervision of construction works • The construction industry will be developed to a high international standard, to undertake a major part of the expected construction boom. • Hundreds of contractors will be meticulously trained and classified in roads and bridges, steel and building construction to achieve the targets.
1.2 Length of urban roads constructed/rehabilitated Baseline (2018): 14,500 km Target (2047): 54,600 km	✓ Urban roads constructed/ rehabilitated to facilitate the efficient movement of people and goods	• Arterial Development • Construction of Interchanges • Dualisation of Heavily Trafficked Roads • Upgrading of Collector –Distributor Roads • Improvement of Local Roads. • 1,700 km of roads in heavily trafficked urban areas widened. • Four circular roads and nine radial arterial roads constructed in the GAMA metropolis. • By-passes constructed at Kumasi, Konongo, Tamale and Bolgatanga, and Cape Coast and Takoradi.	Existing Network Improvement: US$13,250 million Expansion of Network : US$106,033 million	
1.3 Length of feeder roads constructed /rehabilitated Baseline (2018): 42,045km Target (2047): 156,700km	✓ Feeder roads constructed/ rehabilitated to facilitate the efficient movement of people and goods	• Routine and Periodic Maintenance • Minor Improvement Works • Bridge Development Works • Expansion of Network	Existing Network Improvement: US$13,829 million Total expansion of Network: US$125,164 million	
1.4 Road condition mix: (Percentage of roads in good, fair and poor condition) Baseline (2017): Good (40 %), Fair (31 %) and Poor (29%) Target (2048): Good (70 %) Fair (20 %), Poor (10%)	✓ Road condition improved to enhance efficient transportation and reduce vehicle operating cost (VOC)	• Annual Road Maintenance and Rehabilitation Program • Road Network Expansion Program • Annual National Road Condition Survey • A Traffic Signal Control System, established in major cities to manage the intermodal system	US$10 million for National Road Condition Survey	
Outcome 2: Improved Road Safety				
Indicator	**Progress Indicators/Outputs**	**Planned Programmes/ Interventions**	**Estimated Budget**	**Risks and Assumptions**
1.5 Percentage of fatalities on the road network Baseline (2017):10.1% Target (2047):	✓Road crashes and fatality rate reduced on the road network to preserve lives and property	• Road safety programmes based on best practice engineering and administrative policies • Involvement of more private sector companies in the delivery of road safety management services	US$ 68 million	• Government committed to support new and on-going sector related activities • Proper implementation of the road safety policies adopted by Government • Government to release budget on time and as per approved

2.2 Aviation

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved aviation industry to position Ghana as an aviation hub in West Africa				
1.1 Annual passenger through put Baseline (2017): 2,193,115 Target (2047): 11,538,267 1.2 Number of international carriers landing at KIA Baseline (2018): 23,257 Target (2047): 31,259	✓ High growth recorded in International and domestic air transport travels. ✓ International and domestic air transport developments spur economic growth. ✓ Reduction in cost of air travel. ✓ Increase in number of tourists' arrivals.	•Expansion of Kotoka International Airport •New international aerotropolis developed in Prampram under PPP. •New Kumasi Airport at Ankaase developed. • Upgrading of the following Domestic Airports to International Standards: Kumasi ✓ Tamale ✓ Takoradi ✓ Sunyani • Development of Cape Coast, Koforidua and Bolgatanga Airports • Development of Ho Airport • An underground sub-urban railway line, from Adenta to Accra Central constructed to link KIA and emerging airport city related service industries.	US$8,266 million	• Continued commitment of the countries to regional integration. • Continued Government commitment to institutional reforms in the Aviation sector • Government commitment toward Private-Public Partnership. • Land developments within the vicinity of airports regulated to stimulate investment in airport related service industries

2.3 Maritime

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved port efficiency				
1.1 Average turnaround time for ships Baseline (2017): Tema Port – 87 hours Takoradi Port – 51 hours Target (2047): Tema Port – 40 hours Takoradi Port 30 hours 1.2 Number of Inland Ports developed Baseline (2017): Target (2047): 1.3 Number of Shipyard and Dry-dock facility developed/redeveloped Baseline (2017): Target (2047): 1.4 Number of marine fishing landing sites constructed along coastal areas Baseline (2017):2 Target (2047):13	✓ Efficiency of operations of Tema and Takoradi Ports improved. ✓ Inland port developed to enhance transit of cargo to landlocked countries ✓ World-class maintenance facility established to support the marine and oil industries. ✓ Marine fishing landing sites constructed along coastal areas to increase fish production	• Tema Ports Expansion and Modernisation Programme • Takoradi Port Expansion and Modernisation Programme • Development of New Deep Water Ports. • Development of Boankra Inland Port with direct railway line from Tema • Redevelopment of the Tema Shipyard and Dry-dock facility into world class facility • Construction of 13 marine fishing ports, landing sites and related infrastructure	US$2,029 million US$900 million US$5,57 million US$120 million US$300 million	• Continued improvement in the environment for economic growth. • Government remains committed to support new and on-going ports projects • Continued commitment of the countries to regional integration

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 2: Improved efficiency of inland water transport				
1.5 Number of Inland water transport port developed Baseline (2017):1 Target (2047):4	✓ Inland water transport ports developed to serve as major cargo hubs for transport on the Volta Lake	• Development of the Buipe and Akosombo ports.	US$90 million	• Continued improvement in the environment for economic growth. • Government remains committed to support new and on-going ports projects • Continued commitment of the countries to regional integration
1.6 Number of long-span bridges constructed across the Volta Lake Baseline (2017):0 Target (2047): 3	✓ Three long-span bridges constructed across the Volta Lake to facilitate efficient movement of goods and passengers	• Construction of three separate long- span bridges across the Volta Lake		• Continued improvement in the environment for economic growth. • Government remains committed to support new and on-going ports projects • Continued commitment of the countries to regional integration
1.7 Number of ferry, tramping services and boat- building facilities constructed/upgraded Baseline (2017): 0 Target (2047): 12	✓ Ferry, tramping services and boat-building facilities functioning.	• Construction/Upgrading of ferry, tramping services and boat-building facilities	US$ 2.6 million	• Continued improvement in the environment for economic growth. • Government remains committed to support new and on-going ports projects • Continued commitment of the countries to regional integration

2.4 Railway

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget(USD)	Risks and Assumptions
Outcome 1: Enhanced railway network across the country				
1.1 Length of railway lines constructed/rehabilitated in working condition Baseline (2017): 123 km Target (2047): 4,007 km	✓ Railway line constructed/ rehabilitated to facilitate the movement of freight and passengers.	• Rehabilitation and Upgrading of Western and Eastern Lines • Rehabilitation and Extension of Central Line • Extension of the ECOWAS Line • Extension of Western and Eastern Lines • Development of Central Spine – Kumasi to Paga	US$28,121 million	• The Railways Act 2008 reviewed to separate the regulatory function of GRDA from its mandate of improving railway assets and promoting the development and management of the sub-urban railway systems. • Compliance with schedules and conditions precedent loans • PPP Public-Private Partnership • Efficient Monitoring by Govt. • Risk of cost overrun connected with Rail works contracts • Effective Project Management Systems • Procurement carried out in a timely manner.
1.2 Length of sub-urban railway constructed in four major cities: Accra, Kumasi, Sekondi-Takoradi and Tamale Baseline (2017): 55.1 km Target (2047): 520 km	✓ Sub-urban railway constructed in four major cities to facilitate mass transport of passengers and goods. ✓ Ghana's first underground railway line constructed from Accra-Central to Adenta.	• Construction of sub-urban railway lines in Accra, Kumasi, Sekondi-Takoradi and Tamale • Construction of 84km Tema to Akosombo railway line.		
1.3 Length of railway line constructed to link Tema-Akosombo Baseline (2017): 0 Target (2047): 84 km	✓ Railway line constructed to facilitate movement of freight northward using inland water transport		US$390 million	

SECTION 3: WATER RELATED SECTORS

3.1 Water Resources Management

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Enhanced benefits of the existing water resources infrastructure				
1.1 Volume of water resources used/withdrawn Baseline (2017): 80m³ per cap/year Target (2047): 1,025m³ per cap/year	✓ Total water resources withdrawn and used for households, irrigation and industries met	• Employ standardised approaches to map, make a dynamic inventory system, and rehabilitate existing storage facilities. • Design and implement measures in water use efficiency • Apply intermediate reuse and recycling of water resources for all storage options	10.95 Million	• Assurance of full political will in investing in water resources management • Transforming water management institutions and key partners to deal with the anticipated changes • Appropriate annual budgetary allocation • Reaching a balance of stakeholder interests with respect to preparation of plans (intersectoral coordination and linkages) • Accessing reliable data and information • Untimely and inadequate funding for a more sustainable future
Outcome 2: Developed additional water resources through discovery and expansion of new sources				
1.2 Volume of additional water resources to meet demand Baseline (2017): 5.13 billion m³ Target (2047): 48 billion m³	✓ Total additional water requirements for various uses met	• Develop multi-purpose conservancy facilities to increase storage capacities • Investigate and develop hydrogeological and groundwater base • Generate additional water resources from rainwater and flash flood harvesting • Develop natural infrastructure “natural harvesters” such as wetlands, and floodplains • Develop both national and trans boundary inter basin water transfer/diversion infrastructure schemes	52.5 Million	• Assurance of full political will in investing in water resources management • Transforming water management institutions and key partners to deal with the anticipated changes • Appropriate annual budgetary allocation • Accessing reliable data and information • Involvement and commitment of stakeholders at all levels including transboundary • Untimely and inadequate funding for a more sustainable future
Outcome 3: Improved water quality and environmental protection				
1.3 Percentage improvement in water quality of all river basins Baseline (2017): Mean Water Quality Index (WQI) of 52.5% (fairly good) Target (2047): Mean WQI of 80% (good)	✓ Water quality of river basins in good condition	• Use cleaner and environmentally friendly methods and products in all water uses notably agriculture and industry • Design wastewater treatment facilities for treatment of industrial effluent and municipal sewage and wastewater for reuse • Establish and manage buffer zones and enforce regulations to protect important and sensitive ecological areas and water sources from pollution and contamination • Arrest illegal small scale mining (galamsey)	12.8 Million	• Assurance of full political will in investing in water resources management • Transforming water management institutions and key partners to deal with the anticipated changes •A ppropriate annual budgetary allocation • Accessing reliable data and information • Involvement and commitment of stakeholders at all levels including transboundary

3.2 Water Supply

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved access to potable water for underserved population				
1.1 Number of new water supply systems constructed a. For urban water supply systems Baseline (2017):1 no. Target (2047):7 no. b. For peri urban water supply systems Baseline (2018):12 no. Target (2047):204 no. c. For small town water supply systems Baseline (2017):309 no. Target (2047):3,235 no. d. For point source systems Baseline (2018):1,448 no. Target (2047):6,221 no.	✓ New water supply systems development uniformly distributed to ensure universal access	• Development of Urban Water Supply Systems • Development of Peri-Urban Water Supply Systems • Development of Small Town Water Supply Systems • Development of Point Source Water Supply Systems	6.9 Billion	• Assurance of full political will in investing in water supply management • Appropriate annual budgetary allocation • Effective coordination of water management institutions and key partners to deal with the anticipated changes
Outcome 2: Improved service levels for existing supply areas				
1.2 Number of water supply systems upgraded a. For urban water supply systems Baseline (2017):5 no. Target (2047):42 no. b. For peri urban water supply systems Baseline (2017):1 no. Target (2047):171 no. c. For small town water supply systems Baseline (2017):313 no. Target (2047):3,881 no. d. For point source systems Baseline (2018):4 no. Target (2047):4 no.	✓ Existing water supply systems upgraded to meet demand	• Upgrading of Urban Water Supply Systems • Upgrading of Peri-Urban Water Supply Systems • Upgrading of Small Town Water Supply Systems • Upgrading of Point Source Water Supply Systems	2.1 Billion	• Assurance of full political will in investing in water supply management • Appropriate annual budgetary allocation • Effective coordination of water management institutions and key partners to deal with the anticipated changes
Outcome 3: System delivery per capita conforms to projected aggregated per capita demand of the supply area				
1.3 Ratio of system capacity to consumer population (per capita water demand) a. For urban water supply systems: Baseline (2017): 170l/c/d Target (2047): 300l/c/d b. For peri-urban water supply systems Baseline (2018):85l/c/d Target (2047): 169l/c/d c. For Small Town Water Supply Systems Baseline(2017): 43l/c/d Target(2047):140l/c/d d. For Point Source System Baseline(2018):29l/c/d Target(2047):31l/c/d	✓ Total system delivery per capita adequately meet aggregated per capita demand of the supply area	• Construction of new water supply systems to meet projected demand • Upgrading of existing water supply systems to meet projected demand	9 Billion	• Assurance of full political will in investing in water supply management • Appropriate annual budgetary allocation • Effective coordination of water management institutions and key partners to deal with the anticipated changes

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 4: Enhanced system management efficiency				
1.4 Percentage of non-revenue water losses in the water systems a. For urban water supply systems Baseline (2017): 30% Target (2047): 12% b. For peri-urban water supply systems Baseline (2017):12% Target(2047):8% c. For small town water supply systems Baseline (2017):10% Target (2047): 5% d. For point source systems Baseline (2017):2% Target (2047):1%	✓ Management of the systems show acceptable returns for water supplied	• Comprehensive design of system control mechanisms and effective design review • Design of distribution system for optimal operation pressures • Design of effective fault prompt mechanism and efficient response system	2.6 Billion	• Assurance of full political will in investing in water supply management • Appropriate annual budgetary allocation • Effective coordination of water management institutions and key partners to deal with the anticipated changes

3.3 Integrated Waste Management

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved access to sustainable sanitation				
1.1 Percentage of the urban population with access to sewerage system Baseline (2017): 3.6% Target (2047): 70% 1.2 Percentage of the rural population with access to sewerage system Baseline (2018): 0.3% Target (2047): 30% 1.3 Percentage of the urban population with access to improved on-site sanitation Baseline (2017): 11.4% Target (2047): 30% 1.4 Percentage of the rural population with access to improved on-site sanitation Baseline (2017): 8.7% Target (2047): 70% 1.5 Proportion of conveyed sewage/septage safely treated Baseline (2017): 9% Target (2047): 100%	✓ Improved access to sewerage system for population in both urban and rural areas. ✓ Improved access to on-site sanitation system for population in both urban and rural areas. ✓ Sewage treatment systems constructed and adequately maintained in urban and rural areas.	• Construction of sewerage infrastructure in densely populated urban communities in metropolitan and municipal areas. • Construction of on-site systems in sparsely populated urban and rural communities. • Construction of sewage/septage treatment facilities in urban and rural communities	11.8 Billion USD	Assumptions: • As economic class advances, households would opt for higher levels of service • Adequate water supply for sanitation systems • High level of urbanisation • Availability of high skilled personnel Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 2: Improved access to integrated waste management				
1.6 Percentage of waste separated at source Baseline (2017): 0% Target (2047): 100% 1.7 Percentage of waste collected and conveyed Baseline (2017): 60% Target (2047): 100% 1.8 Percentage of waste recovered and reused Baseline (2018): 5% Target (2047): 100%	✓ Households practicing source separation. ✓ Wastes collected and conveyed in urban and rural areas. ✓ End products derived from resource recovery and reuse.	• Provision of containers for source separation and domestic composting in high and medium income urban communities. • Packaging and award of contracts for adequate collection and conveyance. • Provision of infrastructure for landfilling, waste to energy and composting.	19.3 Billion USD	Assumptions: • Adequate public education and sensitisation • Effective private sector publication • High level of urbanisation • Availability of high skilled personnel Risks: • Political transitions • Priorities of political administrations • Appropriate annual budgetary allocation

3.4 Drainage, Flood Control and Coastal Protection

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Enhanced flood conveyance resulting from increased drainage capacities of channels				
1.1 Length of drains constructed/rehabilitated a. For primary drains Baseline: (2017): 200 km Target (2047): 1,100 km b. For secondary drains Baseline: : (2017): 150 km Target (2047): 2,500 km	✓ Flood conveyance and drainage improved to protect lives and property	• Construction/ rehabilitation of primary and secondary drainage systems • Construction of underground drainage systems • Construction of covered drains	39.5 Billion	• Assurance of full political will in investing in flood conveyance structures • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations
Outcome 2: Improved retention of significant flood upstream to attenuate flood downstream				
1.2 Land area of flood retention ponds constructed/ rehabilitated Baseline: (2017): 500 hectares Target (2047): 2,556 hectares 1.3 Volume of silt dredged from lagoons Baseline: : (2017): 100,000 m3 Target (2047): 1,000,000 m³	✓ Flood reservoirs improved to minimise flooding in order to protect lives and property ✓ Lagoons dredged to minimise flooding in order to protect lives and property	• Construction/ rehabilitation of flood retention ponds • Dredging of 20 No. Lagoons to retain significant flood when floods coincide with high tide	1.278 Billion 1.34 Billion	• Assurance of full political will in investing in flood reservoirs and dredging projects • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations
Outcome 3: Enhanced flood warning system to warn vulnerable communities against flood				
1.4 Number of flood warning stations constructed/ rehabilitated Baseline: (2017):25 Target (2047): 450 No.	✓ A national advanced flood warning system installed for flood forecasting to protect lives and properties	• Construction/rehabilitation of flood warning stations	144 Million	• Assurance of full political will in investing in flood warning systems • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 4: Improved drainage master plans for regional and district capitals				
1.5 Number of drainage master plans prepared b. For Regional Capitals Baseline: (2017): 0 Target (2047): 10 No. c. For District Capitals Baseline: (2017) 0 Target (2047): 254	✓Drainage master plans developed for regional and district capitals to guide spatial planning	• Development of drainage master plans for regional and district capitals	68.8 Million	• Assurance of full political will in investing drainage master plans • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations
Outcome 5: Improved flood risk maps for the districts				
1.6 Number of flood risk maps prepared Baseline: (2017) 0 Target (2047): 254	✓Flood risk maps developed for districts nationwide to avert settlements in flood prone zones	• Development of flood risk maps for the districts nationwide	2.16 Million	• Assurance of full political will in investing in flood risk maps development • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations
Outcome 6: Enhanced coastal disaster risk reduction and resilience				
1.7 Length of coastal zone protected Baseline: (2017): 50 km Target (2047): 120 km	✓Coastal zones protected from coastal flooding and erosion	• Set up an inter-agency group to focus on coastal management programmes • Strengthen weak regulatory and planning frameworks • Invest in coastal protection and capacity building programmes • Design and implement measures to mitigate coastal flooding and erosion	360 Million	• Assurance of full political will in investing in coastal protection development • Appropriate annual budgetary allocation • Political transitions • Priorities of political administrations

3.5 Irrigation Infrastructure

Indicator	Progress Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: Improved agricultural productivity through irrigation				
1.1 Land area developed under irrigation Baseline (2017): 221,000 hectares Target (2047): 1,043,762 hectares	✓Selected crops cultivated under irrigation for local demand and export met ✓Irrigation projects initiated and implemented	• Development of 32 irrigation projects nationwide	7.166 Billion	• Assurance of full political will in investing in irrigation development • Appropriate annual budgetary allocation • High cost of energy (fuel and electricity) • Lack of legal title to lands belonging to GIDA poses a problem for irrigation development • Encroachment on lands for irrigation schemes • Environmental degradation • High cost of farm inputs

SECTION 4: HUMAN SETTLEMENTS AND HOUSING SYSTEMS

4.1 Human Settlements Development

Indicators	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Impact: To build communities that are safe, secure, liveable and sustainable				
1.1 Percentage of households with access to functional basic services Baseline (2017):25 Target (2047):90 1.2 Number of neighbourhood parks developed Baseline (2017):5 Target (2047):50 1.3 Number of new local spatial plans and upgrading plans that meet sustainable principles Baseline (2017): 5 Target (2047):20 1.4 Number of cities readjusted to conform to a grid system Baseline (2017):10 Target (2047):25	✓ 40% growth in local economic output ✓ Land in dilapidated brownfields in urban areas utilised to meet various development needs ✓ Adaptive reuse of buildings ✓ Land use within major cities and towns maximised with comprehensive infill developments ✓ LED principles integrated in the planning and implementation of urban renewal projects	• National Urban Regeneration Programme • Development of compact cities		• No significant shifts in national priorities • Economic growth and stability in governance • Active participation of the private sector in programmes • Capacity of Local Governments to plan and implement urban renewal projects • Cooperation of land owners and traditional authorities • No significant changes in national priorities
1.5 Number of Slums profiled and mapped across the country Baseline (2017):50 Target (2047):100 1.6 Proportion of slums and shanty towns or neighbourhoods upgraded Baseline (2017):0 Target (2047):50 1.7 Percentage households in decent housing and benefitting from secure housing tenancies Baseline (2017): 25% Target (2047):65% 1.8 Proportion of households in upgraded slums and shanty neighbourhoods with access to quality basic infrastructure Baseline (2017): 10% Target (2047):50%	✓ Slums and informal neighbourhoods transformed into liveable communities ✓ Equity in housing and housing finance enhanced	• Cities Without Slums		• No significant shifts in national priorities • Economic growth and stability in governance regimes

Indicators	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Impact: To build communities that are safe, secure, liveable and sustainable				
1.9 Number of sustainable development plans prepared Baseline (2017): 10 Target (2047):50 1.10 Number of Distressed mining cities/informal industrial enclaves developed Baseline (2017): 0 Target (2047): 15 1.11 Number of developments satisfying environmental requirements Baseline (2017): 20 Target (2047): 100 1.12 Number of people employed in non-mining ventures Baseline (2017): 5,000 Target (2047):25,000 1.13 Number of new large scale industries established per annum Baseline (2017): 5 Target (2047):60	✓ Distressed mining towns and industrial enclaves developed into sustainable communities ✓ Environmental quality and life of residents improved ✓ New opportunities for economic growth and local economic diversification provided ✓ Decent housing for residents of mining towns and informal industrial enclaves provided ✓ Quality of infrastructure in distressed mining towns and informal industrial enclaves improved ✓ Policy and regulatory system for governing mining towns established.	• Revitalisation of distressed mining towns • Re-planning of informal industrial enclaves		• No significant changes in national priorities • Cooperation of traditional authorities • Cooperation of mining companies and workers in industrial enclaves • Continuous partnership with state and non-state institutions
1.14 Number of new large scale industries established Baseline (2017): 5 Target (2047):6 1.15 Number of open spaces/parks per community Baseline (2017): 0 Target (2047):100	✓ Quality of life for rural communities and small towns improved ✓ Quality of natural environment improved	• Smart Growth in Small Towns and Rural Communities Initiative		• No significant shifts in national priorities • Economic growth and stability of governance regimes • Local entrepreneurs positively respond to newly available business opportunities • Cooperation of traditional authorities • Participation of local residents in community initiatives
1.16 Percentage of preserved areas along coastlines and water bodies Baseline (2017): 5% Target (2047):25% 1.17 Number of new forest reserves created Baseline (2017): 15 Target (2047):30 1.18 Length of Green corridor networks created along transportation networks Baseline (2017): 0km Target (2047):50km	✓ Green Infrastructure Network established	• Development of Green Infrastructure Network		• No significant shifts in national priorities • Cooperation of traditional authorities • Participation of local residents in community initiatives • Continuous partnerships between government agencies, private sector and civil society
1.19 Proportion of land converted from subsistence agricultural use to commercial agricultural use at an industrial scale Baseline (2017): 250 hectares Target (2047): 5,000 hectares	✓ Areas with huge unrealised agricultural potential converted to areas of commercial agricultural at an industrial scale	• Development of Agricultural Corridors		• No significant shifts in national priorities • Cooperation of traditional authorities • Participation of local residents in community initiatives • Cooperation among state and non-state actors

4.2 Shelter and Housing Systems

Indicator	Progress Indicators /Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Impact: Housing for all by all				
1.1 National Housing Authority created	✓ Urban management and housing development improved ✓ Social capital, institutional capacity and framework to maintain slum upgrading and phasing out developed	• Formation of an Institutional or Regulatory body - National Housing Authority		• No significant shifts in national priorities
1.2 Number of new housing units completed Baseline (2017): 1,000 Target (2047): 8.84 million 1.3 Percentage of the population with access to secure housing Baseline (2017); 25% Target (2047): 65%	✓ Increased housing stock ✓ Housing units constructed for both ownership and rental	• Cities Without Slums		• No significant shifts in national priorities • Economic growth and stability in governance regimes • Continuous partnership between state and non- state institutions
1.4 Average value added to abandoned public properties Baseline (2017); 1,000 units Target (2047): 5,000 units 1.5 Number of remodelled properties for housing Baseline (2017); 500 Target (2047): 2,000	✓ Increased housing stock	• National Home Extension Improvement and Repair programme		
1.6 Percentage of parks, water bodies, etc., in relation to land area Baseline (2017); 5% Target (2047): 30% 1.7 Number of Green Belts and City Boundaries established Baseline (2017); 1 Target (2047): 10	✓ Green belts and city boundaries established	• Establishing Green Belts and City Boundaries		

SECTION 5: SOCIAL, CIVIC AND COMMERCIAL INFRASTRUCTURE

5.1 Social, Civic and Commercial Infrastructure

Indicator	Progresst Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Impact: A healthy and productive population that reproduces itself safely				
Outcome 1: Equitable access to Quality Educational Facilities				
1.1 Number of schools built and adequately distributed spatially Baseline (2017); 25 Target (2047): 175 1.2 Percentage of school-aged population enrolled in schools by gender Baseline (2017); 75% Target (2047): 100% 1.3 Number of community libraries provided per 100,000 population Baseline (2017); 50 Target (2047): 350 1.4 Availability of internet facilities to access electronic libraries Baseline (2017); 25 Target (2047): 85	✓ Availability of educational institutions as per planning standards ✓ Library services provided in each community ✓ Each region provided with a regional library of 2500 square metres	• Retrofit schools in as part of urban regeneration programme • Build new schools to replace schools under trees. • Equip schools with ICT equipment • Introduction of ICT at pre school • Provision of more SHS • Establishment of educational clusters at tertiary level starting with Accra, Kumasi and Cape Coast • Promote tertiary technical education • Construction of community libraries	**USD 750 Million**	• No significant shifts in national priorities • Stable political climate • Cooperation and support of host communities • Traditional authorities are willing to provide litigation free land for projects • Provision of adequate supply from the utility service providers • Adequate and appropriate sensitization of the populace including industry on the need to strengthen technical skills
Outcome 2: Equitable access to good quality health care				
1.5 Percentage of the population with access to quality health care Baseline (2017); 75 Target (2047): 1,000 1.6 Number of in-patient hospital beds per 1,000 Baseline (2017); 80 Target (2047): 1.7 Number of District Hospitals per 200,000 population adequately distributed spatially Baseline (2017); 165 Target (2047): 254 1.8 Availability of diagnostic facilities Baseline (2017); 24 Target (2047): 85	✓ Inequalities in access to health services reduced ✓ Regional and District Hospitals enhanced with equipment and required capacity for handling all PHC cases ✓ 1 district hospital serving 200,000 persons	•Upgrade clinics and health centres to district hospitals for the provision of PHC •Training of staff for new medical facilities •Introduction and development of telemedicine •Remote monitoring of patients •Promotion of preventive medicine	**USD 1.76 billion**	• No significant shifts in national priorities • Stable political climate • Cooperation and support of host communities • Traditional authorities are willing to provide litigation free land for projects • Provision of adequate supply from the utility service providers • Adequate and appropriate sensitization of the populace including industry on the need to strengthen technical skills

Indicator	Progresst Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 3: Adequate provision of green spaces and public parks for recreation				
1.9 Percentage of play ground/active open spaces in relation to total land area/population Baseline (2017); 5 Target (2047): 75 1.10 Square metres of public outdoor recreation space per capita Baseline (2017); 150 Target (2047): 500 1.11 Number of cultural institutions per 100,000 population Baseline (2017); 5 Target (2047): 25	✓ Attainment of average time to access to civic areas, open spaces, leisure, according to planning standards ✓ Each region with a museum of at least 500 square metres ✓ Attainment of 9 Square metres of public outdoor recreation space per person in the urban areas	• Provision of Green spaces and Parks • Provision of Community meeting halls • Promotion of electronic libraries. • Internet facilities and hot spot provision in public parks, libraries and civic facilities • Creation of public parks and green spaces in urban areas • Designation and preservation of green spaces in rural communities	**USD 264.6 Million**	• No significant shifts in national priorities • Cooperation and support of host communities • Traditional authorities are willing to provide litigation free land for projects • Effective participation of all stake holders in interventions and activities
Outcome 4: Improved Access to Judicial Services and Improved Correction Facilities				
1.12 Availability of rehabilitation centres as part of the correctional system Baseline (2017); 0 Target (2047): 50 1.13 Ratio of prison inmates per correctional facility Baseline (2017); 1:500 Target (2047): 1:95 1.14 At least 5.4 sqm. per person in single cell accommodation, and 3.4 sqm per person in shared or dormitory accommodation per prisoner Baseline (2017); 50 prisoners per cell Target (2047): 5 prisoners per cell 1.15 Adequacy of housing for prisons staff Baseline (2017); 200 units Target (2047): 1,000 units	✓ Space available per prisoner is at least 5.4 sqm. per person in single cell accommodation, and 3.4 sqm per person in shared or dormitory accommodation ✓ Availability of purpose designed correctional facilities ✓ Prisons and other custodial facilities decongested	• Reduction of persons on remand through the quick dispensation of justice • Increase in non-custodial sentencing • Construction of more correctional facilities • Programme for rehabilitation and preparation of inmates through training and education in order to reduce recidivisms • Provision of prison staff housing	**USD 262 Million**	• No significant shifts in national priorities • Stable political climate
Outcome 5: Adequate Commercial Facilities				
1.16 All communities provided with purpose designed commercial facilities Baseline (2017); X Target (2047): Y 1.17 Ratio of neighbourhood commercial centres to 5000 population Baseline (2017); 15 Target (2047): 50 1.18 Availability of office purpose designed spaces Baseline (2017); 100 Target (2047): 500	One commercial centre designed and built for population of 5,000 persons	• Redevelopment of existing markets into commercial centres • Provision of commercial centres for communities	**USD 168 Million**	• Stable political climate • Cooperation and support of host communities • Traditional authorities are willing to provide litigation free land for projects • Continuous partnership and support from the private sector

Indicator	Progresst Indicators/Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 6: An economically viable hospitality industry Created				
1.19 Number of iconic land marks and buildings created Baseline (2017); 5 Target (2047): 25 1.20 Number of hotel rooms per 100 population Baseline (2017): 0.1 Target (2047): 0.7 1.21 Actual number of hotel rooms Baseline (2017); 44,746 Target (2047): 387,246 1.22 Number of tourists arrivals Baseline (2017); 1 million Target (2047): 8 million	Historical, heritage and monumental structures identified and upgraded New landmarks identified and iconic structures built to enhance the aesthetics of major modern cities around the country Hotel accommodation increased and star rating improved Marked growth in tourism, both local and international	✓ Identify historical, heritage and monumental structures and upgrade them. **New hotel rooms to be constructed.** 5-Star – 33,250 Rooms 4- Star – 66,500 Rooms 3- Star – 116,375 Rooms 2- Star – 83,125 Rooms 1- Star – 8,313 Rooms Guests House- 24,938 Rooms	**$26.026 Billion** Details: 5-Star – $5.938 Bil 4- Star – $6.660 Bil 3- Star – $7.758 Bil 2- Star – $4.156 Bil 1- Star – $ 277 Bil Guest House– $1.247Bil	• Stable political climate • Cooperation from supporting sectors • Continuous partnership and support from the private sector
Outcome 7: Sports infrastructure developed				
1.23 Number of community sports infrastructure constructed Baseline (2017); 25 Target (2047): 125 1.24 Number of educational institutions with sports facilities Baseline (2017); 50 Target (2047): 500 1.25 Number of International sporting events hosted Baseline (2017): 0 Target (2047): 3	Black Star Stadium constructed One sports complex constructed per community One sports complex constructed per educational institution Tour du Ghana scaled up	• Towards bidding and hosting international sporting events		• Stable political climate • Cooperation from supporting sectors • Continuous partnership and support from the private sector

SECTION 6: ICT

6.1 Information and Communication Technology

Indicator	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 1: increased access to telecommunication infrastructure by people, organisations and public places				
1.1 Percentage of population with broadband access. Baseline (2016): 34.7% Target (2048): 100% 1.2 Percentage of households with broadband access at home Baseline (2017): 32.5% Target (2048): 100% 1.3 Percentage of schools with broadband access Baseline (2017): 0 Target (2048): 100% 1.4 Percentage of hospitals with broadband access Baseline (2017):0 Target (2048): 100% 1.5 Percentage of public places with broadband access Baseline (2017):0 Target (2048): 100%	National coverage of fixed and wireless broadband infrastructure and service	• Extend fibre optic network to all parts of the country, including homes, offices, communities and public places.	**USD 2,630 million** **Notes**: Cost of Fiber Optic/km based on Eastern Corridor figures = $38 million/800 km = $47, 500/km Total road network (urban, trunk and feeder roads) as at 2017 = 71,063km[1] Total fiber optic coverage alongside road networks (Airtel, MTN, NITA, Tigo, Vodafone, Google, Gridco, others)= 15, 649 km Fiber optic deficit alongside road networks (71,063km – 15, 649km) = 55, 414km Total estimated cost to get fibre optic alongside remaining road networks (urban, trunk and feeder) = 55, 414 x $47, 500 = 2,630 million (approx.)	• Availability of funds for national coverage of fibre optic infrastructure to homes, offices, communities and public places. • Affordable broadband services to the average Ghanaian • High level computer literacy
Outcome 2: ICT sector transformed into a mainstream industrial, employment and service sector				
1.6 Percentage of workforce employed in ICT sector. Baseline (2017): 0 Target (2048): 95% 1.7 Percentage of ICT devices used locally developed Baseline (2017): 0 Target (2048): 60% 1.8 Percentage of software used locally developed Baseline (2017): 0 Target (2048): 60% 1.9 Percentage of ICT experts being citizens Baseline (2017): 0 Target (2048): 80%	Number of regions with ICT parks	• Establish ICT parks in various	US$2,500 million Notes: Unit cost of ICT park based on the Tema Free Zone's figures = $ 250 million Total cost of 10 more ICT parks (1 in each region with additional 1 in Accra) = 10 x 250 million = $ 2,500 million	• Availability of reliable ICT and other infrastructures

Indicator	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
1.10 Percentage of regions with ICT incubators Baseline (2017): 0 Target (2048): 100% 1.11 Percentage of universities with ICT incubators: Baseline (2017): 0 Target (2048): 90%	✓ Number of regions with ICT incubators ✓ Number of universities with ICT incubators	• Establish ICT incubators in various regions and universities	US$800,000 Notes: Cost of establishing an ICT incubator based on Ghana Multimedia Incubator figures in June 2016 (GH¢304,500)[2] = 304, 500/43 = $76, 125 Total cost of 10 incubators (1 per region) = 76, 125 x 10 = 760, 125 = US$0.8 million (approx..) Universities will be their own cost of establishing incubators	• Availability of reliable ICT and other infrastructures
1.12 Percentage of national income from BPO services: Baseline (2017): 0 Target (2048): 90% 1.13 Percentage of workforce in BPO sub-sector: Baseline (2017): 0 Target (2048): 90%	✓ Number of regions and districts with functioning BPO centres	• Establish BPO centres in various regions and districts	= US$83 million Notes: Cost of establishing a BPO centre based on Accra Digital Centre figures as at 2016 = $ 8.3 million[4] Cost of 10 BPOs (2 in Accra) = 10 x 8.3 million = $83 million = US$83 million	• Availability of reliable ICT and other infrastructures
Outcome 3: Digital nation with smart cities				
1.14 Percentage of cities with smart city status Baseline (2017): 0 Target (2048): 100%	✓ Number of cities transformed into smart city status	• Transform cities into smart city status	= $10,000 million Notes: $ 1 billion per smart city based on India's approximation[5] Total cost = 1 billion x 10 = $10 billion	• Availability of funds and access to required ICT and related infrastructure
Outcome 4: Digitally Transformed Government				
Indicator	**Progress Indicators/Outputs**	**Planned Projects/Interventions**	**Estimated Budget**	**Risks and Assumptions**
1.15 Percentage of central Government services available online Baseline (2017): 0 Target (2048): 100% 1.16 Percentage of MDAs/MMDAs and other Government institutions with interactive/ transactional online presence including digital payments Baseline (2017): 0 Target (2048): 100% 117 Percentage of MDAs/MMDAs and other Government institutions digitally connected to the national data centre Baseline (2017): 0 Target (2048): 100%	✓ Government services and institutions digitalised	• Complete the e-Transform Ghana Projectt	No estimated among required since figures are already taken for in the e-Transform Ghana Project.	• e-Transform Ghana project completed on schedule

Indicator	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 5: Availability of funds for ICT Infrastructure Projects				
1.18 Percentage of ICT infrastructure projects funded through PPP arrangements. Baseline (2017): Nil Target (2048):	✓ PPP policy on ICT infrastructure financing implemented and reviewed alongside the every 4-year national infrastructure review and technological trends	• Develop, implement and review specific public-private partnership (PPP) policy for ICT infrastructure financing	US$0.3 million Notes: Cost of developing a new policy with stakeholder consultations: $300, 000[6]	• PPP arrangements considered attractive by local and foreign private investors
Outcome 6: Up-to-date GIS data readily accessible online				
1.19 Percentage of spatial data available online Baseline (2017): Nil Target (2048): 100	✓ Online and up-to-date GIS database and application accessible by people	• Develop and implement online GIS database and application	=US$ 4,570 million Notes: Cost of National GIS establishment in India = 2926.85 crores[7]. 1 crore = 10 million[8] 2926.85 = 292685 million Conversion rate: Rs. 64 = $1 Rs. 292685 million/ 64 = $ 4,573 million = $4,570 Million	• Availability of funds for IoT, satellite and sensor technology for regular GIS data capturing and updating
Outcome 7: Annual national statistics on ICT and other sectors readily accessible online				
1.20 Percentage of national ICT and other statistics available online Baseline (2017): Nil Target (2048): 100%	✓ ICT considered as a separate sector for national statistics ✓ Online access to national statistics on ICT and other economic sectors	• Implement online national database and portal for up-to-date statistics on ICT and other sectors	US$3 million Notes: Cost of developing a national statistic portal (back-end, front-end and statistical tools) = $300, 000 on the assumption that the application will be hosted by the national data centre and technical support from NITA[9]	• Availability of data and analytical tools

Indicator	Progress Indicators/ Outputs	Planned Programmes/ Interventions	Estimated Budget (USD)	Risks and Assumptions
Outcome 8: Ghana as a digital economy with up-to-date ICT Policies and Strategies in-line with technological trends				
1.21 Percentage of ICT contribution to GDP Baseline (2017): Nil Target (2048): 40% 1.22 Percentage of ICT Contribution to employment Baseline (2017): Nil Target (2048): >30% 1.23 Percentage of ICT contribution to export income Baseline (2017): Nil Target (2048): > 30%	✓ National and sectoral ICT policies and strategies reviewed, updated and implemented every 4 years	• Review and update national and sectoral ICT policies and strategies alongside the every 4-year national infrastructure review plan and technological trends	= US$19.2 million Notes: Cost of developing a new policy with stakeholder consultations: $300, 000[10] Total cost = $300, 000 x 8 = 2,400, 000 1 revision every 4 years = 8 revisions in the 30 year period. Total cost = 2,400, 000 x periods of revision = US$19.2 million Ministries to bear their own cost of revision their ICT strategies from their budget	• Dynamic nature of ICT and difficulty of catching up with technological trends. • Efficient and effective processes for updating ICT policies
Outcome 9: Ghana as a digital nation with up-to-date ICT laws in line with technological trends				
1.24 Percentage of ICT laws considered up-to-date Baseline (2017): Nil Target (2048): 100	✓ ICT laws reviewed and updated every 4 years	• Review and update ICT laws alongside the every 4-year national Infrastructure review plan and technological trends	US$4 million Notes: Cost estimate of revising one ICT law = $ 100,000 Total cost = 5 laws x 8 revisions x 100,000 = 4 million[11]	• Dynamic nature of ICT and difficulty of catching up with technological trends • Efficient and effective processes for reviewing and updating ICT laws

*In the absence of national statistics on ICT indicators, the baseline data are estimates from varied sources including ITU, World Bank, UN and expert opinion. Where there are no such estimates, the base- line is left blank.

1 Based on Ghana National Spatial Development Framework (2015-2035), 2015, Volume 1, p. 5-1999 and expert assessment

2 http://www.graphic.com.gh/business/business-news/incubator-centre-mtn-launch-joint-programme.html

3 https://fx-rate.net/USD/GHS/

4 http://www.moc.gov.gh/accra-digital-centre/

5 https://www.quora.com/How-much-money-does-it-require-to-build-a-smart-city;

6 Based on expert opinion

7 https://ncog.gov.in/documents/2015/Response_to_EFC_Note_July_6_2012_v2.pdf

8 https://en.wikipedia.org/wiki/Crore

9 Based on expert opinion

10 Based on expert opinion

11 Based on expert opinion