STRUCTURE PLAN FOR GREATER ACCRA METROPOLITAN AREA

MONITORING & EVALUATION FRAMEWORK

COWI

in association with

MAPLE CONSULT
MANAGEMENT PLANNING & ENVIRONMENT

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A Structure Plan for the Greater Accra Metropolitan Area
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MONITORING & EVALUATION FRAMEWORK

TABLE OF CONTENTS

Table of Figures

1 INTRODUCTION

This document is the Monitoring and Evaluation (M&E) Framework for the GAMAPLAN2040. A M&E framework, distinct from an M&E plan, outlines the key components of an M&E system. It provides a high-level view of what can and should be monitored and evaluated, why and how. It suggests quantifiable indicators that may be used to track progress towards achieving the goals and objectives, identifies possible data sources, when and how data may be obtained, and responsibilities for each indicator. A M&E plan, on the other hand, is a detailed document that operationalizes the framework by specifying the practical details of how monitoring and evaluation will be conducted, including timelines, responsibilities, data collection methods, and analysis procedures. While the framework sets the broader structure, the plan offers a more granular roadmap for implementing M&E activities.

Monitoring and evaluation serve distinct yet complementary functions. **Monitoring activities** track the progress of activities. They allow for ongoing assessment of whether inputs, activities, and outputs are on track. **Evaluation activities** assess the success and impact of the plan over a specific period. They contribute to evidence-based decision-making.

Monitoring and Evaluation may be conducted at **multiple scales**. Because GAMA is a large and complex metropolitan area, with multiple levels of governance, it is important that the M&E process engages stakeholders at all relevant scales and produce disaggregated results at all these scales. From larger to smaller, these scales are: Ghana, the three RCCs with MMDAs in GAMA, GAMA, Spatial and Investment Concept zones, MMDAs, MMDA subareas, centres, corridors, local plan areas and neighbourhoods.

"Indicators" are the core elements of an M&E system. Indicators are specific, measurable, and observable variables (also called "metrics") that are used to assess progress or results. They provide evidence of whether planned activities are being implemented as intended and whether desired outcomes or impacts are being achieved. Indicators are essential for tracking and measuring the success of the plan and its elements. There are several types of indicators:

- **Input Indicators** measure the resources invested in the plan.
- **Output Indicators** measure the direct results of plan activities
- **Outcome Indicators** measure changes in behaviour, knowledge, or attitudes resulting from plan outputs.
- **Impact Indicators** measure the long-term effects or broader changes in the community or target population.

The indicators identified in this document are those that have been used in other similar plans in other countries. Thus, they have been reality-tested. Nevertheless, our indicators, -like all indicators-, have their weaknesses, so they should be periodically reviewed and adapted to ensure they are and remain relevant and effective in the context of the GAMAPLAN. It should be noted that the indicators may serve the measured multiple goals and objectives, not just the one they fall under.

2 BACKGROUND

2.1 National Level

Monitoring at the national level is usually carried out by a central planning agency. NDPC is the institution mandated to periodically assess the overall progress and impact of the NDPF. The Commission has produced APRs since 2003 mainly by collating and harmonising the monitoring results from the sectors, regions and districts to report on progress made in achieving the policy objectives of the NDPF. It involves the definition and selection of core national indicators and the establishment of performance reporting systems at the sector and district levels. The APRs have been the main source of information on selected national outputs and outcomes. Further, the APRs have provided useful information to guide various government policy reviews and decision-making processes as well as providing important inputs to various evaluations conducted in the country.

2.2 District Level

MMDAs are mandated to prepare their development plans and monitor their implementation. The specific monitoring responsibilities carried out by various bodies at this level are also discussed in Chapter Seven. The basis for monitoring at this level is the district specific indicators and the core indicators disaggregated from the national level. Each MMDA produces quarterly and annual progress reports from the monitoring exercises using a prescribed format provided in the District M&E Guidelines. Copies of these reports are sent to NDPC through the Regional Planning Coordinating Units (RPCUs). The results from the core district indicators are reported in the national APR. The quarterly and annual progress reports from monitoring of development interventions in the district are indispensable sources of information for the:

- Review and formulation of evidence-based district policies and decisions.
- Identification of the most effective district programmes and projects and best practices.
- Determination of inequalities and areas requiring greater attention in the district.
- Programme and Project Levels

Monitoring the implementation of projects and programmes is critical because the results are transmitted to the higher levels discussed above. The focus of monitoring exercises at this level is usually on programme or project goals and objectives. This usually involves assessment of the quality and timeliness of the production of outputs, identification and correction of problems and ensuring that benefits and services are accessible to the intended target groups. Monitoring at this level may also consider other aspects as discussed in Table 3.2.

Benefits from programme and project monitoring include:

- Building and enforcing partnership and ownership of the project or programme.
- Learning valuable lessons.
- Using lessons to effect changes and improve project or programme planning and decision making.
- Using project results to enhance transparency and accountability.
- Better goods and service delivery from programme or project implementation.

2.3 Data sources and collection

GAMAPLAN authorities and stakeholders should put in place the data collection and organization procedures necessary to collect, clean, and ensure the accuracy and integrity of all indicator data sets.

Standardized data collection tools should be developed to efficiently and effectively collect GAMAPLAN indicator data. Detailed guidelines should be developed for each data collection tool and consolidated within an M&E Operations Manual. The manual should be updated regularly and serve as a reference for all data collectors. It should also be used to train staff in data collection to ensure that those collecting the data understand the steps required, and to ensure the highest data quality.

There are five primary categories of data that serve to populate the indicators in this M&E framework. Firstly, administrative and operational data provide insights into the day-to-day functioning. Secondly, data already provided in the four-yearly MDA and MMDA medium-term development plans contributes a strategic perspective, aligning with broader developmental objectives. Thirdly, data from the decadal population and housing census activities adds a demographic layer, enhancing the understanding of key population and housing dynamics. Fourthly, geospatial data from online mapping platforms like Google Earth and OpenStreetMap brings a spatial dimension. Lastly, valuable sector-specific data sourced from respective ministries offers a deep dive into the individual sectors.

2.3.1 Administrative and operational data

Administrative data routinely gathered by various agencies during their operations is the most easily collected type of data and is likely to be collected relatively frequently, including daily, weekly, monthly and quarterly. The challenge associated with administrative data lies in persuading the agency to share it with the GAMAPLAN M&E Unit. Some sources of administrative data that is useful to GAMAPLAN M&E include:

- MMDA for number of development applications, permits, violations.
- vital statistics agencies for births and deaths.
- school system for student enrolment and performance.
- hospitals for out and inpatient admissions, diagnoses and treatments.
- tax assessor for plot characteristics and vacant plots.
- public housing authorities for public housing units.
- business directories for types of firms and economic activity.
- police departments for number/type/location of crimes, and police calls.
- real estate agents for sales, market values, neighbourhood sales patterns.
- environmental protection agency for air and water quality data.
- fire departments for fire incidents and response times.
- water and energy utilities for consumption data.
- national communication authority for dynamic cell phone locations

2.3.2 Medium Term Development Plans

The national development planning system in Ghana, managed by NDPC, is both an important source of GAMAPLAN's M&E data and a monitoring tool. The planning system includes the formulation of medium-term development plans (MTDP) at national, MMDA and district (MMDA) levels that establish the country's

development goals, strategies, and priorities. MTDPs are prepared by all 32 MMDAs in GAMA, the three regional coordinating committees (RCCs) that overlap GAMA, all ministries, departments and agencies (MDAs). These plans address various sectors, including the economy, education, healthcare, infrastructure, and more.

Importantly, the plans are formulated using a participatory approach, engaging the private sector, civil society, and local communities in the process.

The MTDPs include M&E systems which can and should be tapped for GAMAPLAN M&E. M&E results are reported in annual progress reports (APR) that show the progress toward development goals and targets. MTDPs also include action plans that should be updated to include the actions specified in the GAMAPLAN action plan.

M&E plans in MTDPs are similar, but do not necessarily include the same indicators. Some indicators that may be typical of M&E plans are:

- LAND
  - number of births and deaths registered.
  - maternal mortality ratio (institutional)
  - number of development applications
  - number of applications that met all the requirements
  - number of applications that were approved

- MOBILITY
  - percentage of road network in condition

- ENVIRONMENT
  - number of environmental disasters: flood, fire drought
  - disasters affecting a community
  - effects of disasters
  - disaster prone areas recognised
  - number of rainstorm cases recorded

- ECONOMY
  - number of new and business establishments
  - number of new jobs created.

- INFRASTRUCURE
  - number of clinics
  - number of health centres
  - number of maternity homes
  - percentage of population with access to basic drinking water

- percentage of communities covered by electricity.
- the proportion of population with access to improved sanitation
- Net enrolment

At the district level, M&E plans are monitored and evaluated by the Metro Planning Coordinating Unit (MPCU) of the MMDA, the National Development Commission and the Regional Co-ordinating Council. The MPCU determines whether planned activities are being undertaken. And although project implementing agencies may have similar monitoring functions, the MPCU's monitoring role supersedes all.

The M&E systems include implementation monitoring of individual projects through Monthly or Quarterly Field Visits and Monthly or Quarterly Review Meetings.

MMDAs are subject to performance reviews to determine the status of the implementation of the plan, its achievements, challenges, constraints to implementation, key issues/gaps associated with the planned objectives and targets, and its implications towards the development. The review is based on the Medium-Term National Development Policy Framework, targets set by the MMDA as well as departmental reports and the Annual Progress Reports. The review has been presented for four development dimensions: economic development, social development, environment, infrastructure and human settlements, and governance, corruption and public accountability.

2.3.3 Population and Housing Census (GSS)

The GHANA Population and Housing Census, conducted every ten years, is one of the best sources of data for GAMAPLAN M&E, primarily due to its compilation of demographic and housing characteristics of a population within a specific geographic area (enumeration areas). Another strength lies in the consistency of its data over time, as census questions tend to remain largely constant across different years. This dataset covers population size, composition, distribution, age, gender, ethnicity, education and employment. Housing-related data, including types, conditions, and occupancy rates. Moreover, the census also includes data on infrastructure related to water supply, sanitation, solid waste management and more. Personal economic indicators including job and income data further enrich the dataset.

Most importantly, the census collects data at an extremely fine spatial grain, pinpointing the GPS coordinates of all structures. While the data at the structure level was not released for the 2021 census, its potential application is noteworthy. If made available, such granular data would facilitate analyses at the level of individual urban blocks and street segments, providing unparalleled insights into local trends and challenges. Currently, GSS only shares aggregated data at the enumeration area level, limiting cross-tabulations of data variables.

Despite the census being conducted every ten years by the GSS, which may pose challenges for real-time monitoring within the context of GAMAPLAN, its value remains substantial for plan review and evaluation, and its planned future dates 2030 and 2040 are suitable for this task. The potential changes in enumeration areas introduce an additional layer of complexity, making spatial comparisons more challenging. However, recognizing these nuances is essential for leveraging the census data effectively in urban planning endeavours.

2.3.4 Geospatial data from online mapping platforms

Geospatial data from online mapping platforms like Google Earth and OpenStreetMap are valuable because they are kept current, easily available online, are used throughout the world, offer a collaborative and customizable framework. The collaborative nature of OpenStreetMap, where individuals contribute to mapping efforts globally, ensures a dynamic and frequently updated dataset, reflecting real-time changes in the environment. Google Earth offers high-resolution satellite imagery and has a 3D visualization feature. OpenStreetMap includes a wide range of elements or features, such as roads and highways, footprint and location of buildings, land-use categories, natural features such as rivers, lakes, forests; points of interest such as schools, hospitals, parks, restaurants, and other amenities; public transportation infrastructure including bus stops, train stations, and public transit routes; amenities such as schools, hospitals, churches, mosques; cycle paths and footpaths.

2.3.5 Other

Other data sources can be used, such as cell phone data. Cell phone data was recently used in the analysis described in the report Ghana | Routine Mobility Analysis 2020-2022 (authored by the Flow minder Foundation partnership with GSS and Vodafone Ghana, under the Data for Good partnership program. The program aims to integrate mobile phone data into the production of national statistics. While this program is still in its infancy, we expect that it may develop into a GSS capability to estimate the location and mobility of people on a daily, weekly, and monthly basis.

3 ACTION MONITORING

GAMAPLAN's implementation actions may be monitored with a tool based on the action matrix provided in the Implementation Plan (IP). The IP — based on GAMAPLAN's vision, goals, objectives — includes over 800 actions that, when implemented, are expected to achieve the objectives, goals and vision.

To make the IP matrix a tool for monitoring the implementation of the actions, all implementers should follow these steps:

- read entire action matrix, focusing on assigned actions;
- accept the indicated responsibility for assigned actions;
- enter own estimated budget associated with the action;
- enter proposed month-dates for action start and completion;
- submit the IP to the lead implementer.
- The implementer will then review inputs from key partners and secondary partners and fix the estimated budget and timeline and enter it into the excel matrix tool (Figure 1).

Figure 1: Tool for monitoring implementation plan actions

	ACTION MONITORING TOOL GOAL X | OBJECTIVE X.X | ACTION X.Xa	PERIOD	BUDGET	Actors			Time period																											
				MMDA	LUSPA	MWH	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040									
1.00	**A region of diverse and integrated centres and corridors**																																	
1.2	Establish sub-regional identities and centers							p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	c										
1.2a	Prioritise centres for local area planning …	S	20	3	2	1		p	p	p	p	c																						
1.2b	Ensure zoning supports & encourages walkable development	S	30	3	2				p	p	p	p	c																					
1.2c	Develop a GAMA-wide map of street frontage conditions in all centres	S	5	3	2	1					p	p	p	p	p	p	c																	
1.2d	Support the creation of new and upgrading of existing public spaces …	S	8	3	2									p	p	p	p	p	p	p	p	p	p	c										

Source: COWI

The monitoring tool tracks progress of actions over time. Cells may be populated with codes representing planned start; actual start; progressing, stalled, planned completion; and actual completion. These indicators provide a comprehensive view of the process, allow stakeholders to compare planned timelines with actual performance. Cells may be colour coded using conditional formatting to visually highlight the status of each indicator, for example:

- Planned Start (p) = Blue, because it is associated with planning and the beginning of a process;
- Actual Start (S)= Green, because it signifies progress and the initiation of an activity;
- Planned Completion = Orange, because it a warm colour that can be associated with the later stages of a plan or project;
- and Actual Completion (c) = Purple, because it represents the achievement of goals or completion, blending the stability of blue and the energy of red.

The monitoring tool also summarizes the status of actions under each objective and can summarise the status of implementation by goal. This provides a high-level view of implementation action performance.

A comments column is provided for notes to document reasons for delays, changes in plans, or any other relevant information. This documentation can be valuable for post-project analysis and reporting.

MMDAs should take the lead in action monitoring. The 32 MMDAs are the key stakeholders and beneficiaries of GAMAPLAN. They are designated the lead responsible actors for 360 actions, the first partner for 111 actions, and second partner for 28 actions. Accordingly, they should be responsible for monitoring most of the GAMAPLAN actions.

4 VISION, GOAL AND OUTCOME MONITORING

This section provides the M&E framework for monitoring and evaluation of the GAMAPLAN Vision and its 20 goals. It provides about 50 indicators, grouped under goals, which are in turn grouped under the five vision statements. Indicators under one goal may also relate to other goals. Indicators are based on and grouped by GAMAPLAN's five Vision statements and twenty goals. Indicators also relate to some -but not all- of the objectives.

Most indicators are based on potentially available data, although some are based on data known to be available. As new technologies and data resources emerge, the list of indicators source be updated.

Each indicator is described and detailed in a table. The table provides the:

- indicator's name
- indicator level (input, output, outcome)
- unit of measurement (number, percentage);
- disaggregation (such as spatial/geographic and demographic);
- baseline (initial value of the indicator);
- target value or the desired or expected value of the indicator at a point in the future;
- data source, or where the data comes from, such as surveys, reports, organisations;
- frequency of data collection or reporting;
- responsible parties for collecting and updating the data

For M&E of the GAMAPLAN, the **disaggregation of indicators** is crucial. It involves breaking down broader metrics into more specific components to gain a more detailed understanding of the various factors at play. This process allows for a more nuanced analysis of the metropolitan area's characteristics and can inform targeted interventions and policies. Spatial/geographic disaggregation is needed by MMDA, subarea, local plan areas, and neighbourhoods. It is also needed for individual corridors. Demographic disaggregation is needed for factors such as age groups, gender, socio-economic groups. Transportation disaggregation is needed by modes of transportation (public transport, private vehicles, walking, cycling). Housing disaggregation is needed by house type, tenure type.

In some cases, multiple indicators are proposed under each indicator heading to provide a comprehensive understanding of the thing being measured. The first indicator typically serves as a status indicator, quantifying the current state with numerical values, such as the number of people in an area, or the percentage of people in an area. The second indicator often functions as a measure of change, capturing shifts over time, such as the percentage change in indicator 1 (percentage of change in the number of people in an area in ten-year, rate or percentage change in the percentage of people in areas over ten years. This dual-indicator approach is employed to enhance the accuracy and depth of monitoring and evaluation efforts, allowing for a nuanced analysis of trends.

Presented below is the **list of indicators** incorporated into this framework. These indicators are further detailed under the following thematic headings: spatial governance, land, accessibility, mobility and connectivity, environment, and infrastructure.

1) SPATIAL GOVERNANCE

- Indicator 1: Change in census enumeration areas
- Indicator 2: Change in MMDAs numbers and boundaries
- Indicator 3: Number and boundaries of local plans
- Indicator 4: Number of neighbourhoods identified with set boundaries
- Indicator 5: MMDA engagement in GAMAPLAN
- Indicator 6: MDA engagement in GAMAPLAN

2) LAND

- Indicator 7: Managed urban growth
- Indicator 8: Spatially targeted public investment
- Indicator 9: Number of urban centres in GAMA
- Indicator 10: Infill or productive use of vacant and underused plots
- Indicator 11: Progress in addressing slums and informal settlements
- Indicator 12: Commercial Corridor Development Index
- Indicator 13: Affordable Housing
- Indicator 14: Homelessness Reduction
- Indicator 15: Housing (Type) Diversity
- Indicator 16: Number of housing units
- Indicator 17: New development type and location
- Indicator 18: Neighbourhood Satisfaction with Housing

3) ACCESSIBILTY, MOBILITY AND CONNECTIVITY

- Indicator 19: Collaborative land use and transport planning process:
- Indicator 20: Commute Mode Share
- Indicator 21: Vehicle Kilometres/hours travelled
- Indicator 22: Household vehicle ownership
- Indicator 23: Walkability
- Indicator 24: Reduced traffic congestion
- Indicator 25: Public Satisfaction with transport infrastructure
- Indicator 26: Access to public transport

4) ECONOMY

- Indicator 27: Overall economic success of GAMA
- Indicator 28: Manufacturing Output and Value Addition:
- Indicator 29: Employment in Manufacturing in GAMA
- Indicator 30: Trade Volume and Value
- Indicator 31: Investment Flows
- Indicator 32: Employment Rate
- Indicator 33: Income Inequality (Poverty)

- Indicator 34: Entrepreneurship and Business Ownership
- Indicator 35: Housing affordability
- Indicator 36: Evidence of community engagement

5) ENVIRONMENT

- Indicator 37: Progress toward creating a Green.GAMA.GRID
- Indicator 38: Number of revitalised parks-squares-open spaces
- Indicator 39: New parks, trails, sidewalks and open space
- Indicator 40: Flood prone areas protected or people relocated

6) INFRASTRUCTURE AND SERVICES

- Indicator 41: Access to public infrastructure and services
- Indicator 42: Share of people owning ICT devices/accessing internet
- Indicator 43: Household investment in solar energy projects
- Indicator 44: Health Outcomes
- Indicator 45: Access to health facilities
- Indicator 46: Educational Outcomes
- Indicator 47: Access to schools

4.1 Spatial Governance

Spatial governance refers to the planning, management and regulation of particular geographic or spatial areas. This concept is relevant at multiple geographic (or spatial) scales (or levels) including — from the smallest to the largest — enumeration areas, local neighbourhoods, local plan areas, subdistricts, districts, investment levels, GAMA, the three regions, and the whole county.

Because spatial governance entities change, and their change has a wide-ranging impact, it is important to monitor this change. Changes in spatial governance boundaries at any scale can impact the plan's goals, objectives, actions - and even the Monitoring and Evaluation (M&E) framework itself. Consequently, it is crucial to monitor changes at all scales. The following indicators are proposed for this purpose.

Indicator 1. Change in census enumeration areas

Indicator 1	Number of new enumeration areas
Indicator 2	Percent change in the number and areas or EAs
Indicator Level	Outcome
Method	Count the number of EAs in the GIS attribute tables. Use GIS to compare shapefiles of enumeration areas in 2030 and 2040 PHCs to those in 2021
Disaggregation	MMDA, local plan areas, neighbourhoods
Units of Measure	Number, percent change
Primary Data Source	Population and Housing Census (PHC) EA shapefile maps
Frequency	2030 and 2040 PHC
Responsible Parties	GSS and LUPSA

Baseline	3214 existing enumeration areas in 2021
Target 1	Minimise EA changes. Align EAs with boundaries of MMDAs, LPAs and neighbourhoods

Over time, in response to shifts in population distribution, census authorities have increased the number of enumeration areas or changed their boundaries. However, these alterations pose challenges when attempting to compare data across different censuses, resulting in less accurate results. Looking ahead to the 2030 and 2040 census rounds, the Ghana Statistical Service (GSS) may contemplate incorporating measures to ensure backward compatibility with the 2021 enumeration area footprints.

Furthermore, in the event of new enumeration area boundaries being delineated, careful consideration should be given to aligning them with the boundaries of MMDAS, local area plans, and neighbourhoods. This strategic alignment not only contributes to the accuracy and reliability of census data but also fosters a more coherent and comprehensive understanding of demographic trends within the specified geographic entities.

Indicator 2. Change in MMDAs numbers and boundaries

Indicator 1	Number of MMDAs changed
Indicator 2	Percent change in the number and areas of EAs
Indicator Level	Outcome
Method	Count the number of EAs in the GIS attribute tables; Use GIS to compare shapefiles of MMDAs in each period
Disaggregation	MMDA
Units of Measure	Number of MMDAs; Number of MMDAs affected by changed MMDA boundaries
Primary Data Source	Ministry of Local Government
Frequency	Annually, 4-yearly, 2030, 2040
Responsible Parties	Ministry of Local Government, GSS
Baseline	32 existing MMDAs in GAMAPLAN area in 2021
Target	Consistency and backward compatibility in MMDA boundaries

Over time, the number and boundaries of MMDAs in Ghana, particularly in GAMA, have changed as a result of shifts in population density. While these changes were likely made to enhance spatial governance, they have made it harder to compare MMDAs in different census years. Consequently, the comparison of time-series data aggregated at the district level has become challenging, rendering it less reliable and precise. In addition, any change in an MMDA boundary will have a knock-on effect on local plan areas, neighbourhood areas, and enumeration areas. If MMDA boundaries are changed, stakeholders may consider building in a way to ensure backward compatibility with the 2021 MMDA footprints.

Indicator 3. Number and boundaries of local plans

Indicator 1	Number of GIS-delineated local plan boundaries
Indicator 2	Percent change in local plan numbers and boundaries
Indicator Level	Output
Method	Number of local plan areas identified by MMDAs.
Disaggregation	MMDAs
Units of Measure	Number identified local plan areas with GIS shapefiles.
Primary Data Source	MMDA Reports; LUSPA reports

Frequency	Annually or as needed.
Responsible Parties	MMDAs/LUSPA
Baseline	N/A. GAMAPLAN includes five local plan areas, all in KoKMA. Other MMDA's may have LPAs but these were not shared with the planning team.
Target	At least one new GIS-delineated local plan area in each MMDA

Local planning is part of the three-tier LUPSA planning system, and the preparation of local plans is essential to the implementation of GAMAPLAN. But it appears that most MMDAs lack existing GIS-delineated local plan areas (although they may have local plans in different formats or on paper). In addition, local plan boundaries are not always aligned with the boundaries of neighbourhoods. As LUSPA collaborates with MMDAs in formulating future local area plans, it becomes imperative for MMDAs to carefully identify and align these local plan boundaries to neighbourhoods. This is crucial for fostering greater coherence and enhancing the overall effectiveness of the planning initiatives.

Indicator 4. Number of neighbourhoods identified with set boundaries

Indicator	Number of neighbourhoods identified with set boundaries in GIS
Indicator Level	Output
Method	Neighbourhoods should be identified as part of the local planning process. The starting point might be the community boundaries that are identified in the PHC. In some cases, neighbourhood boundaries may overlap two or more MMDAs. Boundaries are identified using shapefiles of MMDAs, showing local plan areas and neighbourhood boundaries.
Disaggregation	MMDA, local plan areas
Units of Measure	Numbers of identified neighbourhoods.
Primary Data Source	MMDA Reports; MMDA shapefiles
Frequency	Annually
Responsible Parties	LUPSA, MMDAs
Baseline	GAMAPLAN identified 28 neighbourhoods within the five local plan areas in KoKMA.
Target	All MMDAs areas subdivided into neighbourhoods with justifiable boundaries.

GAMAPLAN supports establishing clear neighbourhood boundaries as a setting for neighbourhood planning and for practical administrative purposes. Clear neighbourhood boundaries define the neighbourhood identity, support good planning and delivery of services, help ensure that development meets the needs of residents. Local planning process should include the delineation of neighbourhood boundaries. Identifying neighbourhood boundaries involves incorporating historical, geographical, social, and administrative factors, along with community input and social and cultural characteristics. Note that neighbourhood boundaries are not universally agreed upon, and planners must consider the nuanced perspectives of different stakeholders.

Indicator 5. MMDA engagement in GAMAPLAN

Indicators	MMDA engagement in GAMAPLAN
Indicator Level	Input
Definition	The extent of MMDA engagement in GAMAPLAN implementation: fully, partially, or not engaged.
Disaggregation	MMDA

Units of Measure	Number of MMDAs fully, partially and not engaged
Primary Data Source	MMDA Reports; LUSPA reports
Frequency	Annually
Responsible Parties:	LUPSA, MMDAs
Baseline	N/A. LUSPA has some records of the extent of MMDA engagement in the GAMAPLAN formulation process.
Target	All 32 MMDAs fully engaged

MMDAs play a key role in translating GAMAPLAN into actionable initiatives at the local level. Their involvement ensures that overarching GAMAPLAN goals align with local needs, fostering community support and reducing conflicts during implementation. The extent of local authorities' engagement may be measured through: (i) participation rates in GAMAPLAN actions, (ii) the adoption of metropolitan plan policies in local regulations, (iii) allocation of resources to plan-aligned initiatives, (iv) progress in plan implementation; (v) collaboration with neighbouring authorities, and (vi) including GAMAPLAN monitoring in DMTDP monitoring system.

Indicator 6. MDA engagement in GAMAPLAN

Indicator	MDA engagement in GAMAPLAN
Indicator Level	Input
Definition	The extent of MDA engagement in GAMAPLAN implementation.
Disaggregation	None
Units of Measure	Number of MDAs fully, partially, and not engaged. Annual budget allocated towards GAMAPLAN initiatives. Percentage of planned infrastructure projects completed in GAMA. Evidence of alignment of existing policies to GAMAPLAN goals. Frequency of meetings between MMDAs and GAMAPLAN authority. Extent to which data related to plan implementation is shared.
Primary Data Source	MDA Annual Reports
Frequency	Annually
Responsible Parties	MDAs
Baseline	N/A. LUSPA has some records of the extent of MMDA engagement in the GAMAPLAN formulation process, including attendance at formal consultations.
Target	At least all 18 MDAs in implementation plan fully engaged.

National level ministries, departments and agencies (MDAs) are crucial for metropolitan plan implementation as they bring specialized expertise and resources. Their engagement ensures alignment between metropolitan and national development priorities. Collaboration with MDAs enhances the efficiency of resource allocation, facilitates policy coherence, and supports the achievement of broader national goals within the metropolitan context.

4.2 Land

VISION STATEMENT: WE VALUE OUR LAND. We have limited our expansion, guided growth, and created compact centres and surrounding neighbourhoods where mixed land use and higher density support walking, cycling, and public transport. Our vacant and under-used plots are infilled and redeveloped, and we have improved slums and reduced blight.

To fulfil this vision, GAMAPLAN sets forth two goals. Goal 1 "A region of diverse and integrated centres and corridors," envisions vibrant and interconnected urban hubs, fostering a harmonious blend of commercial, residential, and recreational spaces. Goal 2 "Decent, Inclusive, and Affordable Housing," aims to create a housing landscape that is not only economically accessible but also socially inclusive, ensuring that all residents of GAMA have access to quality housing options. Each goal is accompanied by specific objectives that collectively contribute to the realization of these overarching aspirations.

The following sets out the objectives under each goal and the indicators for achieving the goal and the objectives.

4.2.1 GOAL 1: A region of diverse and integrated centres and corridors

This goal has six objectives. In order of importance, these are: 1.3 promote inclusive, mixed-income neighbourhoods; 1.2 focus future growth and density in and around existing and new centres; 1.1 establish sub-regional identities and centres; 1.4 Promote infill or productive use of vacant and underused plots and reduce blight and stagnation; 1.5 Address slums, informal settlements, and disadvantaged neighbourhoods; 1.6 Promote good building design in new and infill development and enhance the unique characteristics of centres and neighbourhoods; 1.7 Strengthen neighbourhood commercial areas; and 1.8 Increase access to quality fresh foods and wellness opportunities.

Potential indicators to measure progress toward an achievement of the goal and objectives are as follows.

Indicator 7. Managed population growth (in accordance with spatial development and investment concept map)

Indicator 1	Share of population in spatial development and investment level zones
Indicator 2	% change in indicator 1 (or change in share of population in spatial and investment level zones)
Indicator Level	Outcome
Method	(I) Total the number of people enumerated in EAs in each of the four spatial development and the protected area level zones and compare these numbers with number in previous census.
Disaggregation	4 spatial development and 1 protected area levels
Units of Measure	Percent change (rate of growth)
Data Source	GSS Population and Housing Census
Frequency	2030 and 2040
Responsible Parties	GSS, LUSPA
Baseline	See Figure 2 (2021 census data)
Target	Increase in population and population growth rate in priority zones. No growth in protected areas.

GAMAPLAN aims to shape and steer future population growth and built-environment expansion by allocating investments based on prioritized levels within the spatial development and investment concept map (Figure 3). At the forefront is level 1, concentrating on core areas, followed in descending order of priority by levels 2 (inner core) and level 3 (outer core). Within these delineated zones, the government actively advocates

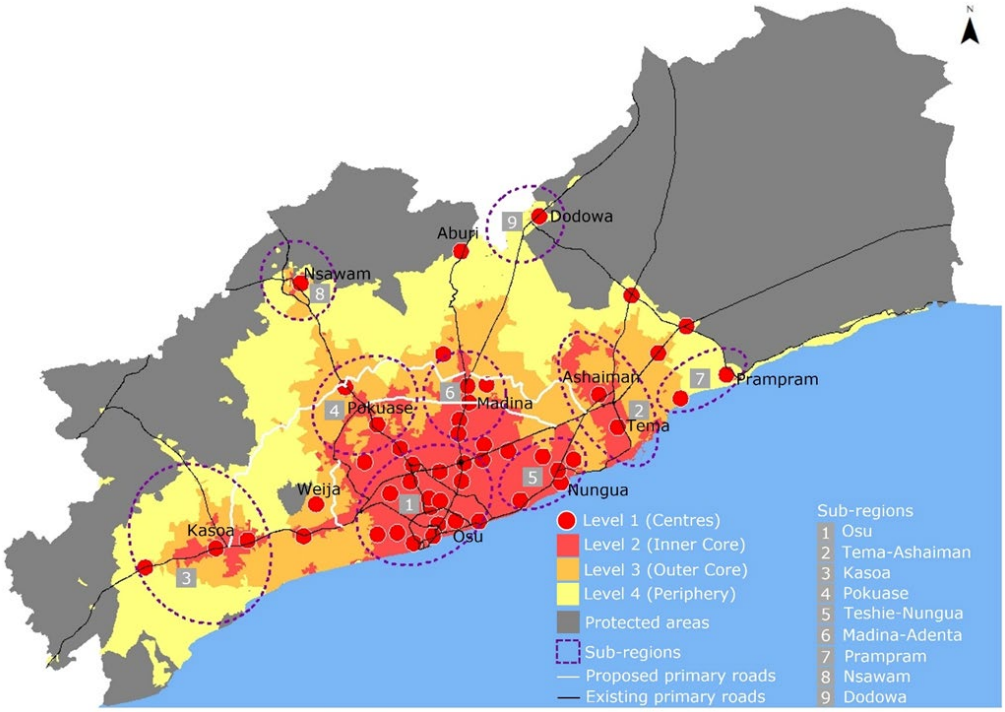
for land-use policies and investments that encourage higher population densities and the development of mixed-use spaces, fostering the establishment of vibrant and cohesive neighbourhoods. Level 4 (periphery) is designated for policies and investments that bolster agriculture, preserve natural resources, and facilitate open-space activities, including initiatives aimed at supporting the agricultural industry. Lastly, protected areas are demarcated as zones where any form of development or redevelopment is strictly prohibited, safeguarding their natural state and ensuring their preservation. This comprehensive approach ensures a balanced and sustainable development strategy, aligning with GAMAPLAN's overarching goal of fostering thriving communities while safeguarding essential natural assets.

Figure 2: Baseline 2021

	Population 2021	% share of GAMA Population	Area (sqkm)	% share of GAMA Land	Population Density (ppkm2)
Level 1 (centers)	1,047,000	16.9	153	3.7	6,850
Level 2	2,593,000	41.7	360	8.7	7,203
Level 3	1,453,000	23.4	550	13.4	2,642
Level 4	758,000	12.2	777	18.9	976
Protected Area	360,000	5.8	2280	55.3	158
GAMA	6,214,000	100.0	4121	100.0	1,508

Source: COWI

Figure 3: Spatial Development and Investment Concept Map



Source: COWI

Indicator 8. Spatially targeted public investment

Indicator 1	GHC public investment by spatial zone
Indicator 2	GHC public investment per area spatial zone area.
Indicator Level	Outcome
Method	Total the value of all planned public sector investments in each spatial development and protected area level zones.
Disaggregation	4 spatial development and 1 protected area levels
Units of Measure	Ghana Cedis (GHC)
Data Source	MMDA and MDA Medium Term Development Plans
Frequency	4-year MTDP periods
Responsible Parties	NDPC supported by MDAs and MMDAs
Baseline	N/A
Target	(I) Per capita and (ii) per area investment in zones in accordance with priority level

In support of spatial development and investment concept map, GAMAPLAN advocates for the strategic prioritization and targeted allocation of public investments within established urban areas, aiming to shape growth patterns and mitigate the expansion of urban sprawl. An effective method for assessing and overseeing these investments is using Medium-Term Development Plans (MTDPs). These plans meticulously document and track the projected value of investments over the designated four-year planning period, offering a valuable tool for evaluating the impact and efficacy of public spending on urban development.

Indicator 9. Number of urban centres in GAMA

Indicator 1	# GAMA proposed centres assessed by MMDAs
Indicator 2	# centres established
Indicator 3	# centres with local area plans
Indicator 4	# centres receiving targeted investments
Indicator Level	Input - output
Definition	Creation of urban centres includes centre identification, developing centre-specific local plans, and investing in centres.
Disaggregation	MMDA
Units of Measure	Number
Data Source	MMDA annual reports and MTDPs MMDA GIS shapefiles of confirmed centres
Frequency	Annually, 4-yearly with MTDP
Responsible Parties	MMDAs, LUSPA
Baseline	N/A
Target	50 centres

GAMAPLAN advocates creating strong urban centres throughout GAMA. It provisionally identifies 50 urban centres with high potential for population growth and investment (level 1 of the spatial development and investment concept in Figure 3). However, the MMDAs have not yet officially endorsed the suggested locations and sizes of these centres. By leveraging local insights and involving input from community stakeholders, the MMDAs should undertake a thorough review process in which they should confirm, adjust, or potentially reject the proposed existence, location and size of these centres. The importance of centres to GAMAPLAN warrants detailed monitoring of several indicators including number of GAMAPLAN proposed

centres assessed by MMDAs, number centres established, number with local area plans, and number receiving targeted investments.

Indicator 10. Infill or productive use of vacant and underused plots

Indicator 1	# and % of vacant and underused plots
Indicator 2	# and % of vacant and underused plots with plans
Indicator 4	# and % of vacant and underused plots developed or used
Indicator Level	Input and output
Definition	Identify the total number of vacant and underused plots in an area. Quantify the number of planning and development permits issued annually in that area. Divide the number of permits by the total number of plots. Underused plots
Disaggregation	MMDA, local plan areas, neighbourhoods
Units of Measure	Number and Percentage
Data Source	MMDA development permits. MMDA annual reports and MTDPs
Frequency	Annual MMDA reports and 4-yearly with MTDP
Responsible Parties	MMDA, LUSPA
Baseline	N/A
Target	100% of vacant/underused plots identified, planned, and productively used.

Monitoring the number and percentage of vacant urban plots is crucial for informed urban planning and sustainable development. This data is essential for identifying areas for development. Additionally, it plays a key role in shaping housing policies, addressing shortages, promoting affordable housing, identifying green spaces, and managing potential safety and security risks associated with undeveloped land.

Indicator 11. Progress in addressing slums and informal settlements

Indicator 1	# slums/informal settlements
Indicator 2	Population in slums/informal settlements
Indicator 3	# slums/informal settlements with upgrading/relocation plans
Indicator 4	# slums/informal settlements with plans being implemented
Indicator Level	Input and output
Definition	UNHABITAT defines (I) a slum as "a contiguous settlement where the inhabitants are characterized as having inadequate housing and basic services" and (ii) a slum household as" lacking one or more of the following indicators: a durable housing structure; access to clean water; access to improved sanitation; sufficient living space; and secure tenure". An informal settlement is a residential area developed spontaneously and without formal planning or authorization from government authorities.
Disaggregation	MMDA, local plan areas, neighbourhoods
Units of Measure	Number
Data Source	MMDA annual reports and MTDPs
Frequency	Annual MMDA reports and 4-yearly with MTDP
Responsible Parties	MMDA, LUSPA
Baseline	45 slums (to be verified by MMDAs)

Target	0 slums

The proposed indicators are a crucial metrics for assessing progress in addressing the persistent challenge of slums and informal settlements. Firstly, the count of slums and informal settlements provides a baseline measure, offering insights into the extent of the issue. The metric of the population residing in these areas further elucidates the human impact and vulnerability associated with such living conditions. Concurrently, tracking the number of slums and informal settlements equipped with upgrading or relocation plans signifies a commitment to comprehensive solutions. Finally, the indicator of actual implementation of these plans reflects tangible progress on the ground.

Indicator 12. Commercial Corridor Development Index

Indicator 1	Corridor score on corridor development index (CDI)
Indicator 2	% change in CDI for each corridor
Indicator Level	Outcome
Definition	See below.
Disaggregation	GAMA, MMDA, Individual corridors
Units of Measure	Number and % change in number
Data Source	MMDA annual reports and MTDPs
Frequency	Annual MMDA reports and 4-yearly with MTDP
Responsible Parties	MMDA, LUSPA
Baseline	N/A.
Target	High and increasing CDI for all corridors

Commercial corridors in GAMA contribute to its overall functionality, vibrancy, and economic health. Many commercial corridors offer a diverse range of retail stores, restaurants, and service providers, contributing to the local economy by generating income, providing jobs, and attracting customers. GAMAPLAN advocates that these corridors be strengthened through effective planning, development and management. Given the complexity of factors, a commercial corridor development index is proposed as an indicator. The corridor development index may include quantification of business numbers, types, revenues, jobs, vacancy rates, and new openings; physical measures such as new development numbers, building areas, plot coverage, building heights; and mobility factors such as sidewalk foot traffic, and number of walk-ins into businesses along the corridors.

4.2.2 GOAL 2: Decent, inclusive and affordable housing

This goal has three objectives: 2.1 construct new and upgraded affordable units; 2.2 provide special housing for seniors, special health needs and others; 2.3 address homelessness and street children.

Potential indicators to measure progress toward an achievement of the goal and objectives are as follows.

Indicator 13. Affordable Housing

Indicator 1	Ratio of median free-market price of a housing unit and the median annual household income
Indicator 2	Ratio of the median annual rent of a housing unit and the median annual household
Indicator Level	Outcome

Definition	Affordable housing refers to residential units that are priced within financial reach of households with moderate or low incomes. The concept aims to ensure that housing options are accessible to a broad spectrum of the population, particularly those who may face financial constraints.
Disaggregation	MMDA, local plan areas, neighbourhoods
Units of Measure	Number
Data Source	MMDA annual reports and MTDPs
Frequency	Annual MMDA reports and 4-yearly with MTDP
Responsible Parties	GREDA, MMDA, Ministry of Housing, LUPS
Baseline	Unavailable
Target	At least 20% of total housing units meet affordable housing criteria.

Affordable, secure, safe, and suitable housing is essential if the physical and mental health of individuals is to be maintained. Unsuitable housing due to location, overcrowding, tenure insecurity can have serious health impacts. Unaffordable housing is an issue for many low-income households and may lead to difficulty affording food, healthcare, and other basic necessities. Affordable housing supports physical and mental health and is an important social determinant of health and wellbeing.

Housing price and rent to income ratio provide a good measure of housing affordability. In a responsive and efficient housing market, the range of housing prices and rents should respond to all sections of the population and reach the lowest segments. Access to adequate housing means that housing expenditures do not take up an undue portion of their income. Data should be collected from several sources including public housing authorities, housing finance institutions, real-estate agencies, NGOs. Affordable housing refers to residential units where the cost of rent or mortgage payments, along with utilities, does not exceed a certain percentage of the household's income. A common benchmark is that housing costs should not exceed 30% of a household's gross income, but this may vary by neighbourhood.

Indicator 14. Homelessness Reduction

Indicator 1	# of homeless people.
Indicator 2	# and % of homeless people in shelters
Indicator Level	Input and Outcome
Method	Track the homeless population over time by partnering with homeless shelters, MMDAs and NGOs to conduct regular counts and assessments of homelessness.
Definition	Homelessness is a social issue where individuals or families lack a stable place to live. It can result from economic challenges, job loss, mental health issues, and more. Homeless individuals may stay in shelters or on the streets.
Disaggregation	MMDA, local plan areas, neighbourhoods
Units of Measure	Number and Percentage
Primary Data Source	MMDA annual reports and MTDPs
Frequency	Annual MMDA reports and 4-yearly with MTDP
Responsible Parties	Ministry of Gender, Children and Social Protection; Ministry of Worlds and Housing
Baseline	80,000 (60,000 < age 18)
Target	Zero by 2040

Addressing and reducing homelessness is not only a matter of social justice but also makes practical sense for the well-being of individuals and the overall health of neighbourhoods. It requires a comprehensive,

multi-faceted approach involving housing initiatives, supportive services, and community engagement. Monitoring homelessness is a fundamental step in creating effective, evidence-based solutions, promoting accountability, and fostering a comprehensive and compassionate response to this complex social issue.

Indicator 15. Housing (Type) Diversity

Indicator 1	Housing Type Diversity (HDI)
Indicator Level	Outcome
Disaggregation	MMDA, local plan areas, neighbourhoods, EAs
Units of Measure	Index
Data Source	GSS Population and Housing Census. PHC 2021 question H01 provides housing type using 13 types.
Frequency	2030 and 2040
Responsible Parties	GSS, LUSPA, MMDAs
Baseline	See below (Figure 4)
Target 1	A high HDI. Note that acceptable house types are separate house (Detached), Semi-detached house, Flat/Apartment. Less acceptable units are compound house (rooms) and living quarters attached to office/shop. Unacceptable units are huts, tent, metal container, kiosk/poly kiosk, wooden structure, and uncompleted building.
Target 2	MMDA planning departments may also identify the appropriate mix, such as: Single-family homes: 30% Duplexes/Triplexes/Quadplexes: 20% Townhouses: 25% Small apartment buildings: 15% Accessory dwelling units (ADUs): 10%

Figure 4: Example of baseline dwelling type mix by enumeration areas

Enumeration Area Location	EA code	Population	Population density (sqkm)	Persons per house	House total	Single detached (%)	One storey detached (%)	Multiple storey detached (%)	Single semi detached (%)	One storey semi detached (%)	Multiple storey semi detached (%)
Ashaley Botwe	315200118	558	332.2	1.7	327	93.3	0.6	0.0	0.6	0.0	0.0
La	312200033	6088	3580.9	20.2	301	67.8	15.3	0.0	0.0	2.0	0.0
Parakuo	322200201	1067	9532.8	3.6	297	80.1	3.0	0.0	0.0	0.0	0.0
Cantoment	312200203	1768	462.6	3.0	596	87.2	6.4	0.0	0.0	0.0	0.0
Sahara (Dansoman)	305200207	864	123.5	2.0	431	95.8	0.9	0.0	0.2	0.0	0.0
Adenta (SSNIT)	315200251	658	707.3	2.0	325	98.5	0.0	0.0	0.0	0.0	0.0
Airport Residential	316200902	408	679.5	2.0	202	99.0	1.0	0.0	0.0	0.0	0.0
Accra New Town	309200059	381	12644.3	22.4	17	100.0	0.0	0.0	0.0	0.0	0.0
Regimanuel Gray Estate	322200303	291	11568.7	4.4	66	75.8	0.0	0.0	0.0	0.0	0.0
Oblogo	302200071	312	8175.8	14.9	21	0.0	0.0	95.2	0.0	0.0	0.0
Gbawe	302200249	266	5450.1	16.6	16	0.0	0.0	100.0	0.0	0.0	0.0
Adjei Kojo (Tema)	324200151	563	13591.8	3.8	148	0.0	0.0	0.0	87.2	2.0	0.0
Dzen Ayor (Adenta)	315200064	470	2353.2	1.0	492	4.1	0.2	0.0	93.9	0.2	0.0
Darkuman	304200193	602	75062.8	4.2	145	7.6	0.0	0.0	90.3	2.1	0.0
New Town	309200065	332	194.7	47.4	7	0.0	0.0	0.0	0.0	0.0	85.7
Mallam	302200033	183	4665.6	11.4	16	0.0	0.0	0.0	0.0	0.0	100.0
Nima	310200031	1749	232.7	1.2	1503	19.0	1.2	0.1	2.2	0.9	0.1
Ashaiman	323200098	458	6649.2	3.2	141	23.4	4.3	0.0	1.4	0.0	0.0

Source: COWI

GAMAPLAN aims to increase housing choices and opportunities in GAMA in in MMDAs and subareas. These choices include: housing type, affordability range, number of rooms, and location (EA). One common numerical indicator to measure the mix of housing types in an area is the Housing Diversity Index (HDI). HDI is a quantitative measure that reflects the variety of housing types, calculated based on the distribution of different housing unit types. The formula for the Housing Diversity Index is:

$HDI = 1 - \sum_{i=1}^{n} p_i^2$

Where n is the number of different housing types, pi is the proportion of housing units that belong to the i-th housing type. The HDI ranges from 0 to 1. A higher HDI indicates a more diverse mix of housing types.

In common English, the steps to calculate the HDI are as follows:

- List of the different types of housing in the area.
- Determine the percentage of the total housing units each type represents.
- Square each percentage (multiply it by itself) for each housing type (For example, if the percentage of single-family homes is 20%, you square it (0.2 x 0.2) to get 0.04.
- Sum the squared percentages for each housing type.
- Subtract this from 1.
- The result is the HDI.

Indicator 16. Number of dwelling units

Indicator 1	# of dwelling units
Indicator 2	Increase and percent increase in dwelling units
Indicator Level	Output
Definition	According to the PHC Field Officers Manual, "a dwelling unit may have one or more rooms that may or may not be occupied at the time of the Census. It includes units within a structure such as a compound house, apartment building, detached or semi-detached house, and a kiosk. A housing unit is "a separate and independent place of abode that is intended for habitation by one or more households.

Disaggregation	GAMA, MMDA, local plan areas, neighbourhoods, centres, EAs
Units of Measure	Number and % increase
Data Source	Population and Housing Census question LH12b, which asks for "type of residence". Total responses for 01. "occupied housing unit"; and 03. Vacant housing unit.
Frequency	2030 and 2040
Responsible Parties	GSS, LUSPA, MMDAs
Baseline	N/A (number of dwelling units as of 2023)
Target	Increase the number of dwelling units so that there is a balance between the rate of dwelling unit construction and household formation. Building too many units without corresponding household growth can lead to oversupply, potentially causing issues such as high vacancy rates and decreased property values. On the other hand, insufficient housing supply can result in housing shortages, affordability challenges, and increased competition for available units. MMDAs, developers, and policymakers should collaborate to assess the unique circumstances of each area and plan housing growth accordingly.

Monitoring the number and increase of dwelling units at multiple scales is crucial for effective urban planning, infrastructure development, and economic growth. This data informs policymakers about current and future housing needs, facilitating strategic resource allocation. The number of dwelling units is equal to the number of new units less the number of units that have been demolished. For a more detailed analysis, the indicators may consider the occupancy rate, as some units may be vacant, while others may be occupied.

Indicator 17. New development type and location

Indicator 1	Number and types of development applications made and approved annually
Indicator 2	Annual percent change in development numbers and types
Indicator Level	Output
Definition	"Development" refers to construction, infrastructure, or other forms of enhancement of a piece of land or an area.
Disaggregation	GAMA, MMDA, local plan areas, neighbourhoods, centres
Units of Measure	Use GIS to analyse change in development pattern over time
Primary Data Source	GSS Population and Housing Census.
Frequency	Annual, 4-yearly with MTDP, 2030 and 2040 to compare with PHC
Responsible Parties	MMDAs, LUSPA, GSS
Baseline	N/A
Target	There is no specific numerical nor developmental target here. What is important is comprehending the trajectory and patterns of development.

Monitoring the number and types of development applications and permits (for new development and changes to existing development) at a granular level over time helps to understand the pattern and nature of the development trends. By tracking and analysing development data, MMDAs can proactively address risks, evaluate and adjust policies, assess land values, and enforce building codes, contributing to well-planned urban growth while fostering transparency and community participation.

MMDA permit application form already includes data such as commercial square footage, number of housing units, plot coverage, number of storeys, type of building, year, location (sub-metro, community), proposed land use, and description of proposed development. The permit application form should be changed to

capture data such as development on vacant plot or underused; whether an existing building was rehabilitated or upgraded; use (residential, commercial, industrial); cost estimates and valuation. Most crucially, the permit form should include the GPS point and plot number.

Another way to monitor new development and to compare with the first method, is to use the population and housing census. The PHC includes data (PS01) on all structures which can be compared to the five-year data from the development application system.

Indicator 18. Neighbourhood Satisfaction with Housing

Indicator 1	Level of satisfaction with housing and its characteristics
Indicator Level	Outcome
Disaggregation	MMDA, local plan areas, neighbourhoods, centres
Units of Measure	Percent of respondents satisfied with housing in general, and satisfied with variables such as affordability, accessibility, amenities, safety and neighbourhood quality – using Likert scale (1 to 5, with 1 being "very dissatisfied" and 5 being "very satisfied"). Compute averages and percentages for each metric; conduct cross-tabulations to explore relationships between different variables; calculate correlations to identify potential connections between variables; conduct advanced statistical analyses such as regression analysis to identify factors that strongly influence satisfaction or chi-square tests to assess the association between categorical variables.
Data Source	Surveys of a representative sample of residents to gauge their opinions on housing-related factors such as quality, affordability, and inclusivity of housing in the neighbourhood.
Frequency	4-yearly with MTDPs
Responsible Parties	MMDA, LUSPA, Ministry of Housing
Baseline	N/A (level of satisfaction with housing as of 2023)
Target	High satisfaction (% of satisfaction to be defined by responsible parties), increasing with reducing disparities between areas.

Measuring household satisfaction with housing is important for assessing the well-being of individuals and communities. This practice informs urban planning, policymaking, and resource allocation by providing insights into housing needs, preferences, and potential disparities. Household satisfaction surveys can be conducted by various entities, including government agencies, nonprofit organizations, and research institutions. The results guide decisions in real estate development, help evaluate the effectiveness of housing policies, and foster community engagement. Understanding satisfaction levels contributes to the creation of inclusive, affordable, and accessible housing options, promoting social equity and enhancing overall quality of life.

4.3 Accessibility, Mobility and Connectivity

VISION: WE HAVE CONNECTED NEIGBORHOODS. We have good connectivity and access to multiple mobility options, various infrastructure, services, and opportunities. We are also well connected to each other. Our region has become more connected as a whole, through public transport, greenways, walkways, and cycle ways.

To achieve this vision, GAMAPLAN puts forward two goals: (3) Integrate Land Use and Transportation Planning and (4) Create High Performing Transport Infrastructure Network and Systems.

4.3.1 GOAL 3: Integrate Land Use and Transportation Planning

This goal has two objectives: 3.1 increase the number of residents and jobs in centres and along corridors in a pattern that prioritizes multi-modal. transportation options and 3.2 promote transit-oriented development (TOD) in centres, facilitated by a high-capacity bus system and network.

Integrating land use and transportation planning is a complex goal that involves aligning policies, strategies, and infrastructure development to create more sustainable and efficient urban environments. Here are some quantifiable indicators to monitor and evaluate the achievement of this goal.

Indicator 19. Collaborative land use and transport planning process

Indicator 1	Number of joint meetings between spatial planning entities (LUSPA and MMDA) and transport planning entities (Ministry of Roads and Highways)
Indicator 2	Number of cross-functional teams, joined programs and joined initiatives created
Indicator Level	Input
Disaggregation	N/A
Units of Measure	Number
Primary Data Source	Annual reports of all transportation agencies and spatial planning agencies.
Frequency	4-yearly with MTDPs and 2030 and 2040 with PHC
Responsible Parties	All transportation agencies and spatial planning agencies.
Baseline	N/A (number of joint meetings, cross-functional teams, joined programs etc as of 2023)
Target	Increase of number of meetings up to an annual number to be defined by responsible parties. At least one cross-functional team/program/initiative created

The integration of land use plans and transportation plans, including infrastructure plans, is essential for creating a sustainable and well-functioning GAMA, MMDAs and neighbourhoods. But to achieve these integrated plans, we must first foster a collaborative planning process involving land use and transportation agencies. Measuring the level of collaboration between land use and transport planning entities may include:

- Shared Goals and Objectives: Land Use and Transportation Agencies have a meeting to review align their missions, goals and objectives to achieve a shared purpose.
- Communication and Information Sharing: Land Use and Transportation Agencies hold regular meetings and have transparent communications.
- Cross-Agency Teams: Land Use and Transportation Agencies establish cross-functional teams.
- Joint Training and Capacity Building: Land Use and Transportation Agencies hold joint training programs and capacity-building initiatives.
- Shared Performance Metrics: Land Use and Transportation Agencies establish common metrics and key performance indicators (KPIs) to measure the success of collaborative efforts.

Indicator 20. Commute Mode Share

Indicator 1	Percentage of trips made by different transportation modes (e.g., walking, cycling, public transit, private vehicles) and by different socioeconomic groups
Indicator 2	Percent change in indicator 1
Indicator Level	Outcome
Disaggregation	MMDA, local plan areas, neighbourhoods, centres | different socioeconomic groups | gender
Units of Measure	Percentage
Primary Data Source	Regular transportation surveys or use data from transportation agencies to assess the distribution of transportation modes.
Frequency	4-yearly with MTDPs and 2030 and 2040 with PHC
Responsible Parties	Department of Urban Roads, LUSPA, Ghana Railway Development Authority
Baseline	N/A (modal share in GAMA as of 2023)
Target	The optimal distribution of commute share can vary based on several factors, including the characteristics of a specific region, urban planning goals, environmental considerations, and infrastructure development. There is no one-size-fits-all answer as different locations may have different priorities and challenges. Nevertheless, here are some general figures that are often considered: 30-50% using public transport for their daily commute; a range of 10-20% combined walking and cycling; 30-50% or lower cars and motorcycles.

Commute mode share measures the percentage of workers who commute either by private vehicle (including car, truck, trotro, taxi, ride hailing, and motorcycle), public transportation, bicycle and by foot. Commute mode share reflects how well land use patterns and infrastructure support different types of travel to work. Commute share is linked to the economy (where jobs are located relative to housing); and health outcomes from air pollutant emissions, which vary by transportation mode. Shifts in commute modes over time are reflective of changes in the population, the economy, and the built environment including land use – but also of policy choices and investments in specific transport infrastructure. Commute mode share data can help transportation decision makers to measure the success of investments or policies over time. Changes in commute mode choice, for example, have occurred in areas where bicycling facilities have been added, suggesting that changes to the built environment might lead to changes in travel behaviour.

Commute mode share is not yet in the PHC. One way to obtain the data is through a household sample survey that asks the mode that workers choose for travel. Survey questions related to commuting behaviours may include: "How did this person usually get to work last week?"; "How many minutes did it usually take this person to get from home to work last week?"; "How many vehicles, including vans, trucks, and motorcycles, are usually kept at home for this person's use?"; "Did this person work at home?"; "How many people, including this person, usually rode to work in the car, truck, or van last week?". Another way to obtain modal share data is through data collected by transportation agencies such as public transport ridership data.

Indicator 21. Vehicle Kilometres/hours travelled

Indicator 1	Total annual miles travelled by vehicles in a defined area
Indicator 2	Track changes in indicator over time
Indicator Level	Outcome
Disaggregation 1	GAMA, MMDA, LPAs

Disaggregation 1	Types of vehicles: cars, trucks, motorcycles
Units of Measure	Number kilometres, number of hours
Data Source 1	GIS analysis of cell phone data
Data Source 2	Recording of VKT by reading the odometer of vehicles registered and operated in GAMA.
Frequency	4-yearly with MTDP
Responsible Parties	DUR, National Communications Authority, Driver and Vehicle Licensing Authority
Baseline	N/A (annual miles travelled by vehicles in defined area as of 2023)
Target	Reduction over time (% to be determined by responsible parties)

VKT is the total annual kilometres of vehicle travel divided by the total population in an area. High VKT and VHT indicates residents and workers are spending large amounts of time and resources commuting and driving to other destinations. These indicators are related to land use; a high VKT indicates that housing and employment opportunities are not located close to one another, while a high VHT can also indicate traffic problems that could be related to road and transit capacities as associated with VKT. A high VKT also reflects car-dependence. Decreasing annual VKT per capita can directly improve air quality and the overall health of a population. High VKT also equates to increased sedentary time, a person's risk for obesity. In general, VKT levels are lower in neighbourhoods that are more walkable and compact and that have strong public transportation systems. Increased population density is also associated with lower VKT per capita. Planners can use data on VKT and VHT per capita to track the effects of implemented policies and strategies to reduce traffic on the road.

Indicator 22. Household vehicle ownership

Indicator 1	Number of households that own a vehicle asset (a car, or truck, motorcycle or bicycle)
Indicator 2	Percent of all households/individuals that own an asset
Indicator 3	Density of assets
Indicator 4	Rate of increase in asset ownership
Indicator Level	Outcome
Disaggregation	MMDA, local plan areas, neighbourhoods, centres | different assets | different socioeconomic groups
Units of Measure	Various
Primary Data Source	PHC question H13 measures vehicle ownership by household H13a provides the number of cars a car-owning household owns. This can be used to target car-owning households for car use surveys.
Frequency	2030 and 2040
Responsible Parties	GSS, MMDA, LUSPA,
Baseline	16% households own private cars, 5% own motorcycles, 9% own bicycles as of 2023.
Target	Reduction of car ownership over time. Car ownership is closely linked to the characteristics of an area, with urbanization, density, and transportation options playing significant roles. Dense, urban areas with well-established public transportation systems might target around 50% or lower; suburban areas with

	limited public transportation might target 60% to 80%; rural areas with no public transportation may target more than 80%.

Monitoring household ownership of private vehicles and changes over time is crucial for effective transportation planning and management. The data obtained aids in developing and maintaining transportation infrastructure, managing traffic congestion, and promoting sustainable practices. It also contributes to environmental assessments by evaluating the impact on air quality and guiding policies for energy-efficient and eco-friendly transportation options. By tracking ownership trends, GAMA authorities can make informed decisions about infrastructure investments, address disparities in transportation access, and create more liveable neighbourhoods.

Indicator 23. Walkability

Indicator 1	Walkability index (WI)
Indicator 2	Percent change in indicator 1 over time
Indicator Level	Outcome
Definition	Walkability refers to the measure of how friendly an area or neighbourhood is for walking. A holistic concept, it considers various factors that influence the ease and safety of walking, including the presence of sidewalks, pedestrian-friendly infrastructure, proximity of destinations, traffic conditions, street design, and overall urban or suburban layout.
Disaggregation	MMDA, local plan areas, neighbourhoods, centres
Units of Measure	Number
Data Source	MDA records, GIS data, and neighbourhood surveys.
Frequency	4 yearly with MTDP
Responsible Parties	MMDA, LUSPA
Baseline	N/A
Target	High and increasing walkability index; % of walkable streets across GAMA to be defined by responsible parties

Walkable neighbourhoods provide many benefits. They promote physical health by encouraging regular exercise through accessible sidewalks and biking paths. The mix of residential, commercial, and recreational spaces fosters community interaction and a sense of belonging. Moreover, walkable neighbourhoods contribute to environmental sustainability by reducing car dependence, leading to lower emissions and less traffic congestion. The economic impact is positive, as local businesses thrive with increased foot traffic, and the overall quality of life improves with reduced stress from commuting and enhanced urban aesthetics. Ultimately, the appeal of walkable neighbourhoods lies in their holistic approach to well-being, community, sustainability, and overall liveability.

Walkability Index is a tool that measures the relative walkability of neighbourhoods. Constructing a walkability index involves several steps as follows:

- Define the critical components influencing pedestrian experience in a given area, such as the availability and quality of sidewalks, street connectivity, land use mix, density of destinations, safety, and aesthetic features like green spaces.
- Collect relevant data from diverse sources including MMDA records, GIS data, and neighbourhood surveys.
- Normalize the data to create a consistent scale, enabling the comparison of different components.

- Assign weights based on the perceived importance of each factor to walkability (for instance, safety may carry a heavier weight than the presence of trees).
- Assign scores to sub-components within each category.
- Calculate overall walkability index by combining these scores according to their respective weights.
- The final index serves as a quantifiable measure of how conducive an area is to pedestrian activities.

4.3.2 GOAL 4: Create High Performing Transport Infrastructure Network and Systems

This Goal has 6 objectives as follows:

4.1 Promote Transportation Demand Management

4.2 Promote parking strategies that manage demand and supply efficiently

4.3 Promote safe movement of people and vehicles across all travel modes

4.4 Improve key corridors connecting people to centres thru public transport service and shared mobility.

4.5 Promote and support existing road capacity to service new development and density.

4.6 Improve existing road infrastructure.

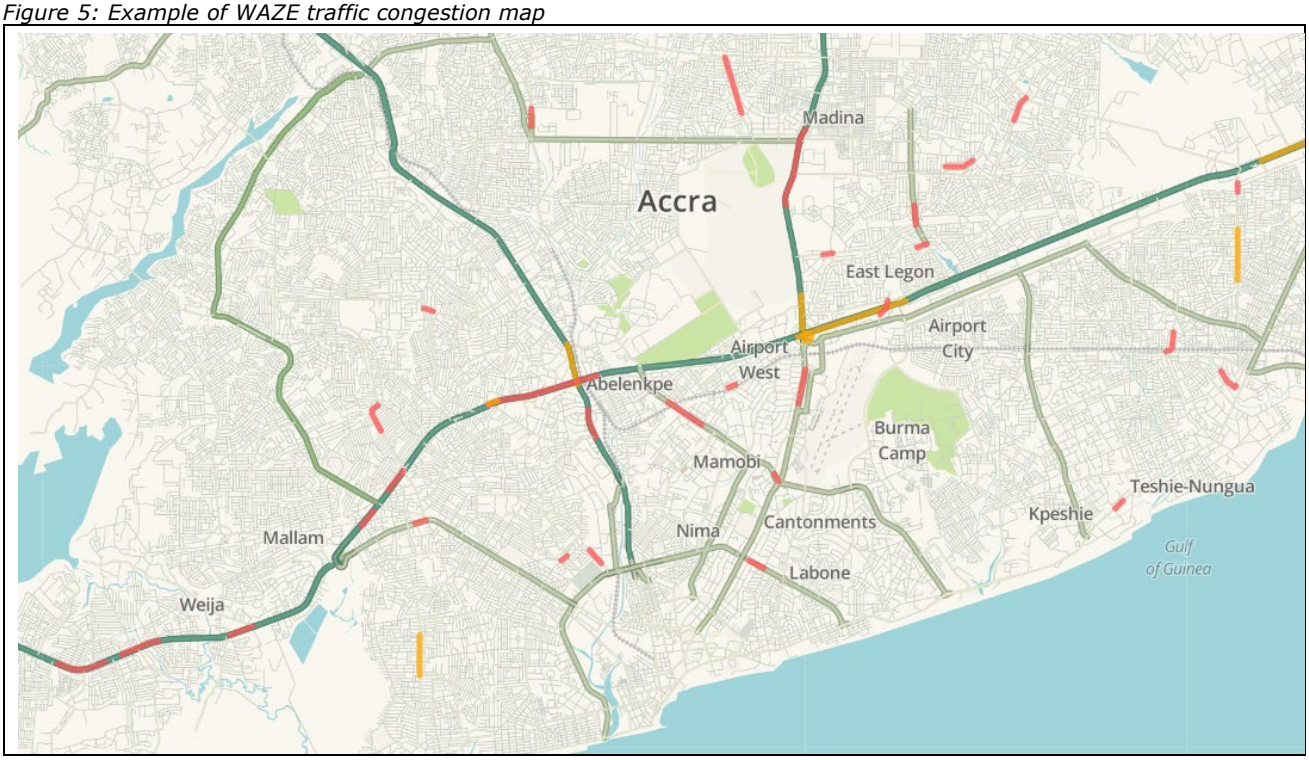
Indicator 24. Reduced traffic congestion

Indicators 1	Travel Time Index (TTI), Congestion Cost, Vehicle Hours of Delay (VHD), Modal Shifts, Congestion Reduction Programs, average speeds on key roadways, queue length at intersections, traffic density (vehicles per unit length of road) and flow rates (vehicles passing a point per unit time).
Indicators 2	Annual change in indicators 1
Indicator Level	Outcome
Disaggregation	Key road corridors, key road segments, times of day, days of week
Units of Measure	Various Index value, GHC for congestion cost, vehicle hours, etc.
Data Source 1	National Communications Authority's cell phone data can be used to monitor traffic flows. Smartphones with built-in GPS receivers t constantly provide location information. By collecting and analysing this data in aggregate, planners can gain insights into traffic flow patterns. This is often done through apps that track users' movements (with their consent) or through anonymized and aggregated data collected by mobile service providers.
Data Source 2	National Communications Authority cell towers track the location of mobile devices as they connect to different towers. Analysing the movement of devices between cell towers can provide information about the speed and direction of traffic flow.
Data Source 3	Mobile navigation apps like Google Maps and Waze collect real-time data from users about their speed, location, and route. This data can be used to identify congested segments
Frequency	Annual
Responsible Parties	DUR, National Communications Authority, LUSPA
Baseline	See example of Waze traffic congestion map

Targets	Numerical targets for indicator of traffic congestion may vary. Examples of common best practices include the following: › Travel Time Index (TTI): 10% reduction in TTI within the next five years. TTI is the ratio of the travel time in congested conditions to the travel time in free-flow conditions. › Congestion Cost: 15% reduction in overall economic cost of congestion by 2030. This metric estimates the economic cost of congestion in terms of wasted time, fuel, and productivity for individuals and businesses. › Vehicle Hours of Delay (VHD): 20% percentage decrease in total hours of delay experienced by vehicles by 2030. › Modal Shift Targets: 15% increase in the percentage mode share of trips taken by public transit by 2030. › Congestion Reduction Programs: 10% reduction in peak-hour traffic through measures such as congestion pricing schemes, intelligent transportation systems (ITS), carpooling initiatives.

Monitoring traffic flow speeds along key corridors and identifying congested road segments and bottlenecks is essential. Google Maps is a valuable tool for achieving this, offering real-time traffic information, including speed data and congestion points. While effective for analysing a single corridor during a specific time period, employing this method for monitoring all key corridors in GAMA can be time-consuming. Furthermore, it offers only three levels of congestion: clear traffic, moderate, and heavy congestion.

Figure 5: Example of WAZE traffic congestion map



Source: COWI

Indicator 25. Public Satisfaction with transport infrastructure

Indicators 1	Percentage of public satisfied with services (see below)

Indicators 2	Percent change in indicator 1 over time
Indicator Level	Outcome
Disaggregation 1	GAMA, MMDA, local plan areas, neighbourhoods, centres
Disaggregation 2	Roads, rail, cycleways, walkways
Disaggregation 3	Genders, age groups, socio economic groups.
Units of Measure	Number
Data Sources	Online or social media surveys. Physical MMDA and neighbourhood surveys.
Frequency	4 yearly with MTDP
Responsible Parties	DUR, MMDA, LUSPA
Baseline	N/A (public satisfied with transportation services as of 2023)
Target	High and increasing level of satisfaction with services, target % of satisfaction to be defined by responsible parties

A public satisfaction survey of transport infrastructure should cover a wide range of themes to gather comprehensive feedback and insights from the neighbourhood residents. Some key themes to consider:

1 **Accessibility and Affordability**: How accessible and affordable are the transportation options for various demographics? Are there disparities in access based on income, age, or location?

2 **Safety and Security:** Perceptions of safety on public transportation. Concerns about crime and security in transit areas.

3 **Reliability and Punctuality:** How reliable are different modes of transportation? Are there common issues with delays or disruptions?

4 **Ease of Use and Convenience**: User-friendliness of transportation systems. Integration and ease of transferring between different modes of transport.

5 **Environmental Impact:** Awareness and opinions on the environmental impact of various transportation options. Interest in and willingness to use eco-friendly modes of transport.

6 **Infrastructure and Maintenance:** Feedback on the state of transportation infrastructure. Opinions on maintenance practices and their impact on service quality.

7 **Technological Integration**: Satisfaction with technology integration including mobile apps, contactless payments.

8 **Community Engagement:** Involvement of the community in decision-making processes related to transportation planning, including opportunities for public input and feedback.

9 **Public Health:** Awareness of the health implications of transportation choices. Perceptions of air quality and other health-related aspects. Parking and Last-Mile Connectivity:

10 **Availability and affordability of parking facilities.**

11 **Community Impact:** Perceived impact of transportation systems on local communities, including effects on property values, local businesses, and community cohesion.

12 **Public Transit vs. Private Transportation**: Preferences between public transit and private transportation and factors influencing the choice between modes.

Indicator 26. Access to public transport

Indicators	› These accessibility indicators may include the following. › Service Coverage: (i) Density of public transport routes and stops and (ii) geographical coverage of the public transport network. › Frequency and Reliability: (ii) How often public transport services run; (ii) reliability of the services including on-time performance. › Travel Time: (i) Time it takes for passengers to travel from origin to destination using public transport; (ii) Average Vehicle Speeds. › Infrastructure Quality: (i) Quality bus stops, train stations, buses and trains; infrastructure that is usable by vulnerable people (blind, wheelchairs, etc) through universal design practices › Affordability: the cost of public transport relative to the income of the population. › Equity and Accessibility: (i) Whether public transport services are distributed equitably across different areas and socioeconomic groups; (ii) Whether the system considers the needs of vulnerable people › Public transport ridership: number of people using public transport
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs
Primary Data Source	Ministry of Transport surveys
Frequency	Annual, 4-yearly with MTDPs
Responsible Parties	Public transport providers
Baseline	N/A
Target	Improved accessibility with targets to be defined by responsible parties in terms of service coverage, frequency, reliability, travel time, infrastructure quality, affordability, equity and ridership

Measuring access to public transport requires a combination of methods and indicators to provide a comprehensive understanding of the strengths and weaknesses of the public transport system's accessibility.

4.4 Economy

WE HAVE EQUITABLE OPPORTUNITIES. Our people have good access to resources, jobs and learning opportunities to be successful and prosper. GAMA gives people of all incomes, ages, abilities, and genders equitable opportunities to live fully, healthy, and productive lives, especially in disadvantaged communities.

To achieve this vision statement, five goals are put forward: (5) Strengthen GAMA's manufacturing sector as an engine of economic growth; (6) Develop GAMA as a trade hub for West Africa; (7) Equitable opportunities; (8) Affordable and prosperous neighbourhoods; and (9) Engaged communities.

Indicator 27. Overall economic success of GAMA

Indicator	Difference between GAMA's population growth rate and GHANA's population growth rate
Disaggregation	Disaggregation: GAMA, Ghana, 3 GAMA RCCs

Metric	Metric: GAMA growth rate - GHANA growth rate
Baseline	1.5% (3.6 percent compared to 2.1 percent) 2010-2021
Target	Ghana population growth rate higher than GHANA growth rate
Method	Method: Compare GAMA's pop growth rate to Ghana's
Means of measurement	PHC IN 2030 and 2040.
Actors	GSS/LUSPA

GAMA's persistent population growth, especially if its growth rate surpasses both national and regional rates, and exceeds those of competing cities like Kumasi, can be considered an indicative measure of economic success. The growth suggests that GAMA is generating economic opportunities, attracting businesses, and fostering job creation. Furthermore, it signifies an improvement in amenities, infrastructure, and services, as well as a positive net migration.

While GAMAPLAN aims to support the ongoing population growth in GAMA, it is essential to acknowledge that this growth is not guaranteed. Escalating urbanization-related challenges, such as congestion, increased population density, and concerns about disease transmission, have the potential to impede the growth rate. Consequently, closely monitoring the growth rate in comparison to the national average becomes of utmost importance. This proactive approach allows for timely adjustments and interventions to sustain and enhance GAMA's economic success amid evolving urban challenges.

4.4.1 GOAL 5: Strengthen GAMA's manufacturing sector as an engine of economic growth

This goal has three objectives, the most important of which is 5.3 Increase workforce capacity by upgrading technical skills. This is because a skilled and adaptable workforce is crucial for the competitiveness and growth of the manufacturing sector. Investing in technical skills will enhance the productivity and innovation potential of the workforce, making it easier for industries to adopt new technologies and processes. Other objectives are 5.1 Support and strengthen existing industrial zones and 5.2 Fill existing and increase the number of industrial zones. Potential indicators for tracking progress toward and the achievement of the goal are:

Indicator 28. Manufacturing Output and Value Addition

Indicator 1	Manufacturing sector economic output
Indicator 2	Gross value added (GVA) in the manufacturing sector.
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs
Units of Measure	USD or Ghana Cedis
Data Sources	GSS, Bank of Ghana, Ministry of Trade and Industry, World Bank, International Monetary Fund (IMF), Manufacturing associations.
Frequency	Annual
Responsible Parties	GSS, LUPSA
Baseline	N/A
Target	Increasing manufacturing sector output and value addition

Monitoring the growth in the value of goods and services produced in the manufacturing sector, and it gross value added, offers a good indicator of the sector's contribution to the overall GAMA economy. But economic

output and Gross Value Added (GVA) are different. Economic output is the total value of goods and services produced by an industry or sector, including final products and intermediate goods used in the production process. Gross Value Added (GVA) specifically measures the value generated by a sector, minus the value of intermediate goods used in the production process. Data on both output and GVA may be sourced at Ghana Statistical Service (GSS), the Bank of Ghana, the Ministry of Trade and Industry, the World Bank, the International Monetary Fund (IMF), and various manufacturing associations. Additionally, employment in the manufacturing sector serves as another crucial indicator of manufacturing output, assuming no change in labour productivity, and can be measured using the indicator provided below.

Indicator 29. Employment in Manufacturing in GAMA

Indicator 1	Number of jobs in the manufacturing sector
Indicator 2	Annual growth in indicator 1
Indicator 2	Annual growth in manufacturing jobs as share of all jobs
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs, LPAs, neighbourhoods
Data Source	PHC question P15a for number employed in manufacturing, and P15 for location of employment; P14 .
Frequency	2030 and 2040
Responsible Parties	GSS, LUSPA
Baseline	N/A number of jobs in manufacturing sector as of 2023)
Target	Growth of manufacturing jobs with increase target (%) of number of manufacturing jobs defined by the responsible parties

The share of the workforce engaged in the manufacturing sector serves as a valuable indicator of the sector's significance – at the GAMA scale but also at lower levels. A rise in this share signals the sector's increasing strength as a driver of economic growth, notwithstanding the impact of labour productivity. The Population and Housing Census (PHC) provides comprehensive data on the residential and workplace locations of the workforce. More specifically, PHC Question 15a inquires, "What is the main economic activity (product or service) of the establishment where the worker works?" — Manufacturing jobs are categorized under C in the International Standard Industrial Classification. PHC Question P15 records, for each worker, both the name and physical location of their current workplace. By utilizing the household location data from P14a and the employment location information from P14, it may also be possible to calculate the commuting distance for all workers.

4.4.2 GOAL 6: Develop GAMA as a trade hub for West Africa

This goal has two objectives, the most important of which is 6.2 Integrate GAMA into the Global Value Chain. This is for it to realise its potential for long-term economic growth and competitiveness on a global scale. Objective 6.1 Enhance GAMAs connectivity to benefit the economy - is a crucial supporting factor that complements the broader objective of integration into the global economy.

An area may be considered a trade hub when it becomes a central place for the exchange of goods and services, both regionally and internationally. This status hinges on key indicators such as a substantial trade volume and value, supported by a well-maintained transportation infrastructure.

Indicator 30. Trade Volume and Value

Indicators	Volume and value of imports/exports passing through GAMA
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs
Units of Measure	Numbers
Data Source	Ghana International Merchandise Trade Data 2022; other trade statistics from GSS and Ministry of Trade and Industry
Frequency	Annual
Responsible Parties	GSS and Ministry of Trade and Industry
Baseline	Ghana Container Port Throughput of 1,604,724 TEU containers in Dec 2021.
Target	Increasing trade volumes and value; increase % to be defined by responsible parties

Ghana International Merchandise Trade Data 2022 provide comprehensive data on Ghana's imports and exports for the year 2022. The data is sourced from the Customs Division of the Ghana Revenue Authority. Key indicators include trade values, partner countries and commodity codes.

Indicator 31. Investment Flows

Indicators 1	Total Foreign direct investment (FDI) and domestic investment in GAMA infrastructure, industries, and services.
Indicators 2	Percent annual increase in indicator 1
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs
Data Source	GSS, Ghana Investment Promotion Centre (GIPC), World Bank, United Nations Conference on Trade and Development International Monetary Fund.
Frequency	Annual
Responsible Parties	LUSPA
Baseline	N/A (Total FDI and domestic investment as of 2023)
Target	Increasing FDI and DI in GAMA; increase % to be defined by responsible parties

4.4.3 GOAL 7: Equitable opportunities

This goal has nine objectives, the three most important of which are 7.5 Increase equitable access to education, quality jobs, and living wages for all residents; 7.1 Support, regularize, and integrate the informal economy; and 7.2 Support growth and expansion of businesses owned by locals, women, and youth. Other objectives are 7.3 plan for workforce diversity and development; 7.4 support economic competitiveness by improving quality of life in neighbourhoods; 7.6 maximize local job creation and household earnings through job retention, business attraction and business expansion; 7.7 support the emerging digital economy; 7.8 support agriculture and urban food production; and 7.9 encourage and support international and domestic tourism.

GAMA will have equitable opportunities when its socio-economic structure guarantees that all residents, irrespective of background, enjoy fair access to resources and opportunities. This means not only equal

access to quality education, healthcare, housing, and public services but also extends to employment and entrepreneurial prospects. Equitable employment opportunities require a diverse job market, providing avenues for individuals with varying skill sets. Low unemployment rates across different demographic groups indicate a fair distribution of employment opportunities. Economic diversity signifies a resilient and inclusive economy. Equitable income distribution ensures that the benefits of economic growth are shared among all residents, reducing income disparities. Finally, a thriving entrepreneurial ecosystem with diverse business ownership reflects an equitable environment.

At the district and subarea levels, indicators such as employment rates, economic diversity, income distribution, entrepreneurship, and business ownership should be balanced to ensure that opportunities are spread evenly, and that no particular community faces systemic disadvantages. This holistic approach promotes a metropolitan environment where all residents have the chance to prosper and contribute to the overall economic vitality.

Achieving equal economic opportunities for all people in the Greater Accra Metropolitan Area (GAMA) requires careful monitoring of various indicators.

Indicator 32. Employment Rate

Indicators 1	Percentage of working-age population employed
Indicators 2	Annual percent change in indicator 1 or (% year 2 - % year 1)/(% year 1)
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs, neighbourhoods | socioeconomic status, gender and age group
Units of Measure	Percent
Data Source	GSS Labor force surveys | MTDPs | PHC
Frequency	Annual, 2030 and 2040 PHC
Responsible Parties	GSS and LUPSA
Baseline	N/A (unemployment rate as of 2023)
Target	Increasing employment rates; reducing spatial, gender and age disparities; increase % to be defined by responsible parties

Employment/unemployment statistics are available from multiple sources, including from regular GSS labour force surveys, MTDPs, and population and housing census (PHC). Specifically, for PHC, the relevant questions are P13a (engage in any economic activity?); P13c (type of work mainly engaged in); P13d (main purpose of production/service). When disaggregated spatially and socioeconomically, employment rate is an excellent indicator of equitable opportunities. It is related to economic participation, income distribution, social mobility, good quality of life, and poverty alleviation.

Indicator 33. Income Inequality (Poverty)

Indicators 1	Measures of income inequality, including Gini coefficient, or measure of poverty, including multidimensional poverty.
Indicators 2	Annual change in indicator 1
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs, neighbourhoods
Definition	The Gini coefficient is a statistical measure of income inequality within a population. It ranges from 0 to 1, where 0 represents perfect equality (everyone has the same

	income) and 1 represents perfect inequality (one person has all the income). The coefficient is calculated based on the distribution of income across the population, with higher values indicating greater income disparity. The Multidimensional Poverty Index (MPI) considers income, health and education. By choosing specific indicators in each area and assigning scores based on deprivation, the MPI gives an overall measure of poverty for individuals and communities. Those falling below a set threshold are considered multidimensionally poor.
Units of Measure	Number
Data Source	Ghana Annual Income and Expenditure Survey*, GSS, Ghana Investment Promotion Centre (GIPC), World Bank, United Nations Conference on Trade and Development International Monetary Fund.
Frequency	Annual
Responsible Parties	GSS
Baseline	22.3 MPI for GAR (2022)
Target	Reducing spatial, gender and age disparities

Ghana's Annual Household Income Expenditure Survey (AHIES) 2022 was the first effort to obtain disaggregated data on the expenditure, income and living conditions of households in Ghana. It also includes a multidimension poverty index (MPI) that measures deprivation across three dimensions and 10 indicators: health (child mortality, nutrition), education (years of schooling, enrolment), and living standards (water, sanitation, electricity, cooking fuel, floor, assets). Subsequent surveys in future years should try to collect data for specially for GAMA.

Indicator 34. Entrepreneurship and Business Ownership

Indicators 1	Percentage of population owning businesses.
Indicators 2	Percent population owning small and medium-sized enterprises.
Indicators 3	Percent annual change in indicators 1 and 2
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs, neighbourhoods
Units of Measure	Percent
Data Source	Registrar General's Department (RDG), chambers of commerce,
Frequency	Annual, 2030 and 2040
Responsible Parties	Registrar General's Department
Baseline	N/A (% of population owning businesses in GAMA as of 2023)
Target	Increase in number of businesses, number of small and medium sized, and reducing spatial disparities; increase % to be defined by responsible parties

Data on the number and sizes of formal businesses can be obtained from various sources, including Registrar General's Department, chambers of commerce, and the population and housing census. RDG oversees maintain records of registered businesses, sizes and legal structures. The Ghana National Chamber of Commerce and Industry may have business directories with this data. Industry-specific associations and reports can also be valuable sources of information.

4.4.4 GOAL 8: Affordable and prosperous neighbourhoods

This goal has three objectives, the most important of which is 8.1 Promote, protect and build affordable and healthy housing, because this is foundational to creating prosperous neighbourhoods. Other objectives are 8.3 ensure that all neighbourhoods benefit from growth, improvement, and development and 8.2 increase support and resources for community-based developers and businesses.

Potential indicators include:

Indicator 35. Housing affordability

Indicator 1	Average market value (GHC) of real estate property
Indicator 2	Average Income (see indicator 33)
Indicator 3	Average income to average household price
Indicator 4	Annual change in Indicator 3
Indicator Level	Outcome
Disaggregation	GAMA, MMDAs, neighbourhoods
Disaggregation 2	Property types (e.g., single-family detached, townhouse, flats
Units of Measure	Percent
Data Source	MMDAs, Ghana Property Centre website, Ghana Real Estate Developers Association (GREDA), Lands Commission, Ghana Revenue Authority, Banks and Financial Institutions,
Frequency	Annual
Responsible Parties	LUSPA
Baseline	N/A (values of 2023)
Target	Increase in number of businesses, number of small and medium sized, and reducing spatial disparities; increase % to be defined by responsible parties

The ratio of average income to average house price is a commonly used indicator to assess housing affordability. A lower ratio suggests better affordability, indicating that the average income is relatively higher compared to the average house price. Conversely, a higher ratio may imply affordability challenges, as the average income may not be sufficient to comfortably afford the average-priced home in that particular market.

Alternative or supplementary indicators of affordability are median house prices to median household income; housing expense ratio (share of income households spend on housing-related expenses); rent burden (share of income spent on rent), and local wage growth (growth rate of local wages over time to measure if income levels are keeping pace with rising housing costs).

Data on property values can be found on websites of:

- https://www.realtor.com/international/gh/accra-greater-accra-region//
- https://meqasa.com/houses-for-sale-in-Accra
- https://ghanapropertycentre.com/for-sale/houses/greater-accra/showtype

4.4.5 GOAL 9: Engaged communities (neighbourhoods)

This goal has two objectives: 9.1 Build a culture and system of effective citizen planning and cross-functional partnerships that include marginalized populations and 9.2 Improve public information sharing and communications for a responsive government and informed citizen base.

Engaged communities or neighbourhoods exhibit various characteristics that contribute to a sense of connectedness, collaboration, and overall well-being. Regularly monitoring and analysing quantifiable indicators of these characteristics can help assess the health and vibrancy of a community and identify areas for improvement in fostering engagement.

Indicator 36. Evidence of community engagement

Indicators 1	Evidence of community engagement (see below)
Indicator Level	Outcome
Disaggregation 1	LPAs, Neighbourhoods
Units of Measure	Various (see list below)
Data Source	MMDAs attendance records from community events/meetings
Frequency	Annual
Responsible Parties	MMDA Community Development Department
Baseline	N/A
Target 1	Annually increasing levels of engagement in all neighbourhoods

Some ways to measure the level of engagement of communities are:

- Number of community events, clubs, or social gatherings.
- Frequency/quality of community newsletters, online forums, or
- Volunteer participation rates, number of community projects completed, or attendance at community meetings.
- Surveys measuring residents' sense of belonging and pride.
- Number of community-led initiatives, participation in town hall meetings.
- Use rates of public spaces, community gardens, and shared resources.
- Number of participants in community events, meetings, and gatherings.

4.5 Environmental Sustainability and Resilience to Climate Change

WE ARE ENVIRONMENTALLY SUSTAINABLE AND CLIMATE CHANGE RESILIENT. We have conserved resources, reduced greenhouse gas emissions, and eliminated untreated sewage discharges. We have created a new blue-green infrastructure network and green spaces that reduce flooding and mitigates extreme heat risks.

To achieve this vision statement, GAMAPLAN puts forward 3 goals, each of which has an associated indicator. These Goals are: Green.GAMA. GRID; Interconnect green, public spaces and routes; and sustainable and Resilient Environments and Neighbourhoods.

4.5.1 GOAL 10: GREEN. GAMA. GRID

This Goal has five objectives. The most important is 10.1 develop a Green GAMA GRID because it is a new, bold, transformative idea whose implementation would contribute to other goals and objectives. Other objectives are: 10.2 Protect and expand urban forests, trees and vegetation; 10.3 Redevelop River basins and wetlands; 10.4 Significantly reduce flooding throughout GAMA, targeting affected areas; 10.5 Manage and protect surface water sources.

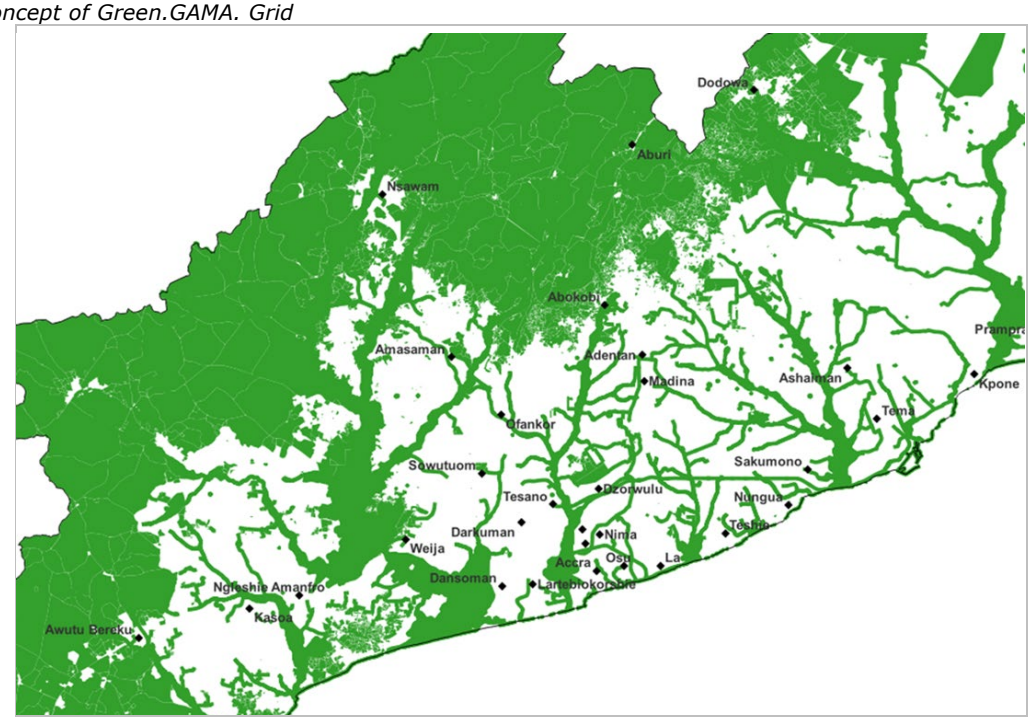
To realize the Vision, economic development must be integrated with the land use, transportation, housing, and other concerns of the GAMAPLAN. A strategic approach to economic development is needed to create and retain jobs and foster businesses that thrive. To track progress toward meeting the Economic Development goals and objectives, a set of indicators was created.

Indicator 37. Progress toward creating a Green.GAMA. GRID

Indicator 1	Detailed GGG plan prepared from GGG concept
Indicator 2	MMDAs include GGG projects in MTDPs
Indicator 3	Number of GGG projects completed
Indicator Level	Output
Disaggregation	GAMA, MMDAs, LPAs
Units of Measure	Various
Data Source	LUSPA, MMDAs
Frequency	Annual
Responsible Parties	LUSPA, MMDAs
Baseline	See Figure 2
Target	Implementation of whole concept

Measuring the implementation of a GAMA-wide green infrastructure network plan involves assessing several aspects of the plan's execution. These include: (i) Number of planned green infrastructure projects completed. This could include the green spaces developed, tree plantings, permeable pavement installations; (ii) Total land area covered by green infrastructure projects including parks, green roofs, and other sustainable features.

Figure 6: Concept of Green.GAMA. Grid



Source: COWI

4.5.2 GOAL 11: Interconnected Green, Public Spaces and Routes

This goal has four objectives, the most important of which is 11.2 Revitalise existing parks, squares, and open spaces. Other objectives are 11.1 Invest in public space improvements that provide multiple community and environmental benefits; 11.3 Make our streets green; and 11.4 Increase and improve public toilets.

Indicator 38. Number of revitalised parks-squares-open spaces

Indicator 1	Number of existing parks, squares and open spaces identified and inventoried.
Indicator 2	Number of existing parks, squares and open spaces revitalised.
Indicator Level	Output
Disaggregation	GAMA, MMDA, LPA, neighbourhoods
Units of Measure	Number
Data Source	Google Maps, OSM, MMDA Parks Department, Smart scrapers (https://rentechdigital.com/smartscraper/business-report-details/ghana/greater-accra-region/city-parks)
Frequency	Annual
Responsible Parties	MMDA, LUSPA
Baseline	230
Target	All existing parks revitalised by 2030

Identifying, inventorying and revitalizing existing parks, squares, and open spaces is critical for numerous reasons. It ensures the preservation of green infrastructure, promoting biodiversity and mitigating urban heat. Beyond environmental benefits, revitalization enhances community well-being by creating aesthetically pleasing and functional spaces, fostering social interaction, and promoting healthier lifestyles through

improved recreational facilities. The economic impact is significant, attracting tourism and businesses, while historical and cultural preservation adds to the cultural identity of communities. Revitalization also contributes to environmental sustainability, improves safety and security, and allows for adaptation to changing community needs. Ultimately, the process enhances the overall liveability, attractiveness, and functionality of urban areas.

Indicator 39. New parks, trails, sidewalks and open space

Indicator	Number of new parks, trails, sidewalks and open spaces
Indicator Level	Output
Disaggregation	GAMA, MMDA, LPA, neighbourhoods
Units of Measure	Number
Data Source	MMDAs
Frequency	Annual
Responsible Parties	GSS, LUSPA
Baseline	N/A
Target	The target should be determined by an assessment of opportunities by the MMDA planning departments.

Creating new parks, trails, sidewalks, and open spaces within existing urban areas presents significant physical challenges. Yet there are opportunities to do so such as repurposing underused or vacant plots, transforming transportation corridors into linear parks, and providing sidewalks where they do not exist. GAMAPLAN aims to increase park area. By increasing park access, it hopes to encourage physical and social activities and interactions that will build healthier communities.

4.5.3 GOAL 12: Create Sustainable and Resilient Environments and Neighbourhoods

This goal has four objectives, the most important of which is (12.2) protect life, property, infrastructure and environment from disaster events. The other objectives are: (12.1) improve the health of environmental systems; (12.3) plan for the mitigation and redevelopment of brownfields for productive use; and (12.4) keep GAMA Clean. Potential indicators are:

Indicator 40. Flood prone areas protected or people relocated

Indicator 1	Number and hectares of identified flood prone areas.
Indicator 2	Evidence of actions to protect life, property, infrastructure and environment from flood events
Indicator 3	Percentage of identified flood prone areas and hectares protected
Indicator Level	Input-output-outcome
Definition	Protecting life, property, infrastructure, and the environment from flood events involves a comprehensive and integrated approach that includes early warning systems, effective land-use planning, infrastructure resilience, and environmental conservation.
Disaggregation	GAMA, MMDAs, neighbourhoods, key waterways
Units of Measure	Number and area of flood prone areas and type of action taken.

Data Source	Reviewing of the National, Regional and District Disaster Management Plans (DDMPs) for effective implementation.
Frequency	Annual
Responsible Parties	MMDAs District Disaster Management Committees, LUSPA, National Disaster Management Organisation (NDMO). Note NDMO aims to identify, map, and monitor the hazards. The DDM Committee aims to prepare plans to prevent and mitigate disasters.
Baseline	May be available from district disaster management plans
Target	Addressing flood prone areas

GAMAPLAN's preliminary flooding analysis and maps identified the areas in which 240,000 people are exposed to river flooding for 1-in-10 years return period and 340,000 for 1-in-100 years event. It also found that 66,000 buildings are flooded by 1-in-10-year return period flood, rising to 86,000 for a 100-year flood. Protecting life, property, infrastructure, and the environment from future flood events involves a combination of measures. Indicators may include the following.

Number of areas with:

- detailed risk assessment and mapping.
- new local area plans that take into account the risk assessment and determine future actions.
- relocated households.
- Infrastructure e.g., levees and stormwater management systems to withstand and mitigate flooding.
- early warning systems to provide timely alerts to communities at risk.
- updated building codes to include flood-resistant construction techniques.
- elevated of structures in flood-prone areas.

4.6 Infrastructure and Services

VISION: WE HAVE ACCEPTABLE INFRASTRUCTURE AND SERVICES. Our investments in new and improved infrastructure and services have kept pace with the growing population and provided a high level of service to all people in GAMA.

GAMA has benefited from some investments in new and improved infrastructure and services. However, these investments have not kept pace with the growing population, leading to significant challenges in providing acceptable infrastructure and services to all people in the region. Significant spatial disparities exist in terms of access to basic services, including water, sanitation, solid waste, electricity, and ICT. Much more needs to be done to create a more sustainable, connected, equitable, and resilient region that provides acceptable infrastructure and services to all its residents.

To achieve this vision statement, GAMAPLAN puts forward 8 goals. Each these goals have at least one indicator.

4.6.1 GOALS 13-Provide a Clean and Continuous Water Supply; 14-Improved Wastewater Infrastructure and Management; 15- Access to Sufficient Sources of Energy, Migrating to Solar, Wind and More Hydro; 16-Increased Investments in Information Communication Technologies

Indicator 41. Access to public infrastructure and services

Indicator 1	Tap Water: % of households with access to safe and reliable tap water.
Indicator 2	Wastewater Management: % of households connected to proper sewage system.
Indicator 3	Solid Waste Collection: % of households with waste collected regularly and disposed of properly.
Indicator 4	Broadband: % of households with high-speed internet access.
Indicator 5	Electricity: % of households with reliable access to electricity.
Indicator Level	Output
Definition	Public infrastructure and services include: drinking water through tap; wastewater; sewerage; solid waste collection; broadband; electricity. Access refers to household connections.
Disaggregation	MMDA, subareas, LPA, neighbourhoods, socio-economic groups
Units of Measure	Percentage of households
Data Source	GSS Population and Housing Census
Frequency	2030 and 2040 PHC
Responsible Parties	GSS, LUSPA, MMDAs
Baseline	N/A (values of 2023)
Target 1	100% of people/households served by the five types of public infrastructure/services
Target 2	Reducing spatial disparities in infrastructure and services; increase % of households who have access to the above-mentioned infrastructure shall be defined by responsible parties

Monitoring progress in improving access to public infrastructure and services —, including tap water, wastewater management, solid waste collection, broadband, and electricity — is essential to achieve the goal. Most of these services directly impacts the quality of life, public health, and environmental sustainability. Access to clean water, sanitation, and reliable electricity promotes healthier living conditions, prevents diseases, and contributes to a sustainable environment. Regular monitoring facilitates efficient resource allocation, enabling GAMA planners to assess the effectiveness of infrastructure investments and address disparities in access among different neighbourhoods and socio-economic groups.

The diversity of public services like tap water, wastewater management, solid waste collection, broadband, and electricity suggests tailored indicators to capture the unique characteristics and challenges of each. Nevertheless, it is possible to create a comprehensive index that considers multiple factors to assess the overall quality of infrastructure in an area. Such approach may be useful in the context of GAMAPLAN.

Indicator 42. Share of people owning ICT devices/accessing internet

Indicator 1	Share of people owning a functional smart phone, computer, tablet
Indicator 2	Share of people using smart phone, computer, tablet.

Indicator 3	Share of people using smart phone, laptop, or desktop to access internet in last 3 months.
Indicator Level	Outcome
Definition	Access to ICT devices: smart phones, computer, tablets, internet
Disaggregation	Spatial development and protected area levels
Units of Measure	Number of people (rate of growth)
Data Source	PHC questions: (P19) personal ownership of functional smart phone, computer, tablet; (P19b) personal use of smart phone, computer, tablet; and (P19c) personal use of smart phone, laptop, or desktop to access internet in last 3 months.
Frequency	2030 and 2040 PHC
Responsible Parties	GSS, MMDA, LUSPA
Baseline	N/A (values of 2023)
Target	Increase in share of people owning and using devices to access internet; increase % to be defined by responsible parties

Increasing the share of people owning ICT devices and accessing the internet is crucial for fostering digital inclusion, empowering individuals with information, and bridging socio-economic gaps. It enhances educational opportunities, facilitates communication, and opens avenues for economic participation, ultimately contributing to a more connected and equitable society.

Indicator 43. Household Investment in solar energy projects

Indicator 1	Percentage of households using electricity from solar panels for main source and secondary source of lighting.
Indicator Level	Outcome
Definition	Electricity generated through solar panels
Disaggregation	MMDAs, LPAs and neighbourhoods
Units of Measure	Number of people (rate of growth)
Data Sources	(i) PHC question H08 main source and H08b secondary of household lighting; (ii) Satellite Imagery to identify solar panels on rooftops; (iii) building permits for solar installations; (iv) energy consumption data from utility companies to identify households with significant reductions in energy consumption; local solar installation companies.
Frequency	2030 and 2040 PHC; annually
Responsible Parties	GSS, LUSPA
Baseline	N/A (values of 2023)
Target	Increasing percentages over time; increase % to be defined by responsible parties

4.6.2 GOAL 17. Improve Health Equity and Provide High-Quality, Accessible, Efficiently Managed and Properly Funded Facilities; GOAL 19. Improved Access to Health Services for Specific Groups: Women, Children, Seniors and Other Vulnerable People

Goals 17 and 19 are similar and thus can share indicators. Goal 17 has three objectives, the most important is Objective 17.1, Provide accessible and equitable social development infrastructure. This will be achieved by basic and emergency medical facilities located so that all residents have safe, convenient access, health centers upgraded into hospitals, additional teaching hospitals to cater to anticipated population growth. Other objectives are 17.2 Ensure adequate numbers and locations of police and fire safety facilities and 17.3, integrate gender concerns into planning. Goal 19 has one objective 19.1 Improve the access to health services for women, seniors, children, and disabled people.

Achieving these goals involves addressing multiple facets of healthcare. To measure progress toward and achievement of toward this goal, several indicators can be considered. Ideally, a combination of these indicators provides a comprehensive assessment of progress. Regular monitoring and adjustments based on these indicators can help refine strategies and ensure continuous improvement.

Indicator 44. Health Outcomes

Indicators 1	Health Outcomes (see below)
Indicators 2	Change in indicator 1 over time.
Indicator Level	Outcome
Definition	Mortality rates, disease-specific indicators, nutrition indicators, reproductive health indicators, healthcare access, use and surveys health facility density; tobacco and alcohol consumption rates; physical activity levels; non-communicable disease indicators
Disaggregation	GAMA, MMDA, neighbourhoods
Units of Measure	Number of people (rate of growth)
Primary Data Source	GSS Population and Housing Census
Frequency	DHS 5 yearly; MICS; 5 yearly
Responsible Parties	GSS, Ministry of Health, Ghana Health Service; Private hospitals.
Baseline	N/A (values of 2023)
Target 1	Improved health outcomes in GAMA over time.
Target 2	Decreasing disparities between neighbourhoods

Health outcome indicators include: mortality rates (infant mortality rate, under-five mortality rate, maternal mortality rate, life expectancy at birth; disease-specific indicators (incidence and prevalence rates for malaria, HIV/aids, tuberculosis); nutrition indicators such as underweight, stunting, wasting; reproductive health indicators such as contraceptive prevalence rate, antenatal care coverage, skilled attendance at birth; healthcare access, use and surveys health facility density; tobacco and alcohol consumption rates; physical activity levels; non-communicable disease indicators such as diabetes, hypertension.

There are two surveys that are undertaken in Ghana by international agencies: Demographic and Health Surveys (DHS), funded by USAID, provide data on maternal and child health, family planning, and other

health indicators; Multiple Indicator Cluster Surveys (MICS), supported by UNICEF, collect data on the well-being of children and women, covering health, education, child protection, and other areas.

Hospitals collect and maintain a vast amount of data that might be made available if it can be anonymised. This includes patient age, gender, neighbourhood; medical history; physician observations, assessments, and recommendations; patient admissions and discharges; diagnostic data; treatment and medication data; surgical procedures and outcomes; infection rates, patient satisfaction scores, bed occupancy rates, emergency department wait times., staffing levels and ratios. access to this data can aid in various planning activities, such as resource allocation, budgeting, quality improvement initiatives, and strategic decision-making.

Indicator 45. Access to health facilities

Indicator 1	Number, type and location of health facilities
Indicator 2	Number of facilities by type per population
Indicator Level	Output
Definition	Spatial distribution of different types of health facilities within GAMA
Disaggregation	GAMA, MMDA, neighbourhoods
Units of Measure	Number of facilities
Primary Data Source	Ministry of Health, GSS, Open Street Map
Frequency	PHC 2030 and 2040
Responsible Parties	Ministry of Health, MMDA, LUSPA
Baseline	See below (Figure 6)
Target 1	An appropriate health facility in every neighbourhood.
Target 2	At least 90% of the population is within 15-30 minutes of a hospital for emergency medical services.

The spatial distribution of different types of health facilities within GAMA plays a pivotal role in ensuring that healthcare services are easily accessible in general and to specific groups in particular. For instance, maternity clinics centers can be strategically distributed to cater to the needs of women and children, while specialized clinics can be integrated to address the unique healthcare requirements vulnerable groups. By incorporating a comprehensive network of health facilities tailored to the specific needs of different demographics, GAMAPLAN can lay the foundation for an equitable and accessible healthcare system.

Ultimately, the goal is to strike a balance between ensuring broad access to healthcare services and optimizing the allocation of resources. It's important to periodically reassess and adjust these targets based on changes in population distribution, healthcare needs, and the evolving healthcare landscape. Collaboration among healthcare providers, urban planners, and policymakers is crucial for effective and sustainable urban healthcare planning.

Figure 7: Baseline - Numbers of health facilities by type and MMDA

MMDA	TOTAL	CHPS	Clinic	Health Centre	Hospital	Sub-District	Matrnty Home	District	Poly-clinic	Univ Hospital	Teach Hospital	Psych Hospital	Reg Hospital
Ada West	23	16	0	2	0	3	0	1	1	0	0	0	0
Ayawaso North	25	10	6	0	2	4	2	1	0	0	0	0	0
Krowor	29	12	5	5	2	3	0	1	1	0	0	0	0
Ledzokuku	29	12	6	1	4	2	3	1	0	0	0	0	0
Ablekuma West	31	17	6	0	0	4	2	1	1	0	0	0	0
Ablekuma Central	32	16	4	4	0	5	2	1	0	0	0	0	0
Ayawaso East	32	18	9	0	1	3	0	1	0	0	0	0	0
Ada East	33	24	1	3	1	3	0	1	0	0	0	0	0
Ablekuma North	35	19	4	1	0	5	5	1	0	0	0	0	0
Ayawaso Central	41	19	9	1	4	4	2	1	0	1	0	0	0
Okai Koi North	41	22	7	2	5	3	1	1	0	0	0	0	0
Shai-Osudoku	45	26	2	7	3	5	1	1		0	0	0	0
Ga North	49	16	8	8	8	3	5	1	0	0	0	0	0
Ayawaso West	53	16	13	8	7	5	1	1	0	1	1	0	0
Ga West	53	29	5	7	2	4	4	1	1	0	0	0	0
La-Dade-Kotopon	54	15	21	7	2	3	5	1	0	0	0	0	0
Ningo Prampram	54	23	9	6	4	6	4	1	1	0	0	0	0
Korle-Klottey	59	19	17	2	7	5	5	1	1	0	0	1	1
Tema	62	26	14	3	10	4	3	1	1	0	0	0	0
Weija-Gbawe	63	19	22	5	3	2	11	1		0	0	0	0
Tema West	64	28	9	13	4	5	3	1	1	0	0	0	0
Ga South	69	30	9	10	5	4	8	1	2	0	0	0	0
Kpone-Katamanso	79	39	12	7	8	5	5	1	1	1	0	0	0
La-Nkwantanang-Madina	81	36	17	5	10	5	4	1	2	0	0	1	0
Ga East	82	47	12	7	7	5	2	1	1	0	0	0	0
Ga Central	87	28	29	11	5	4	9	1	0	0	0	0	0
Adentan	96	38	29	11	5	4	7	1	1	0	0	0	0
Ashaiman	120	75	21	7	5	7	2	1	2	0	0	0	0
Accra Metro	156	79	41	6	10	3	10	1	5	0	1	0	0
GAR	**1677**	**774**	**347**	**149**	**124**	**118**	**106**	**29**	**22**	**3**	**2**	**2**	**1**

Source: COWI

It is important that the number, types and locations of facilities must be adequate to meet needs, offering a range of services, and placed to ensure accessibility for all residents, especially in underserved or marginalized communities.

4.6.3 GOAL 20: Improved Access to Education, Knowledge and Culture

Goal 20 has four objectives, the most important being (20.1) "provide more accessible and affordable educational facilities". Other objectives are 20.2 Ensure access to quality educational facilities at all levels; 20.3 Ensure access to sports and recreation facilities; and 20.4 Improve access to cultural and learning facilities.

Measuring progress toward and achievement of the goal of improved access to education, knowledge, and culture is a complex task that requires a combination of indicators. Several key indicators are commonly used to assess progress in this are:

Indicator 46. Educational Outcomes

Indicators 1	Educational Outcomes (see below)
Indicators 2	Change in indicator 1 over time.
Indicator Level	Outcome
Definition	Indicators that assess the knowledge, skills, and achievements of students, as well as broader societal outcomes
Disaggregation	GAMA, MMDA, neighbourhoods
Units of Measure	Various
Data Sources	GSS PHC, Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS)

Frequency	DHS 5 yearly; MICS 5 yearly; PHC 2030 and 2040
Responsible Parties	Ministry of Education, Ghana Education Service, GSS, UNESCO Institute for Statistics, Research Institutions and Universities.
Baseline	N/A (values of 2023)
Target 1	Improved educational outcomes in GAMA over time.
Target 2	Decreasing disparities between neighbourhoods

Indicators of educational sector outcomes include those that assess the knowledge, skills, and achievements of students, as well as broader societal outcomes. These indicators include: student achievement and performance as measured by standardized test scores and grade point averages; educational attainment such as completion rates and dropout rates; percentage of graduates who secure jobs; percentage who pursue higher education; educational equity as measure by a gender parity index (gpi); and literacy rates.

Indicator 47. Access to schools

Indicator 1	Share of relevant age cohort living within target distance of educational facility
Indicator 2	Change in indicator 1
Indicator Level	Output
Definition	Indicators related to spatial distribution of educational facilities and the quality of their infrastructure
Disaggregation	MMDAs, LPAs, neighbourhoods
Units of Measure	Number of people (rate of growth)
Data Source	GSS PHC, OSM, MMDA plans
Frequency	2030 and 2040
Responsible Parties	GSS, LUSPA
Baseline	N/A
Targets	Increase in household access to schools
Max distance 1	Preschool and Elementary Schools: Walking distance Up to 1.6 km and Bus or car distance up to 8 km.
Max distance 2	Junior High Schools: Walking distance up to 3.2 km and bus or car distance up to 16 km
Max distance 3	Senior High Schools: Walking distance up to 4.8 and bus or car distance up to 15 miles (24 km)

The spatial distribution of different types of educational facilities is linked to ensuring equitable access to education across GAMA, in different MMDAs, and different neighbourhoods. Indicators related to the spatial distribution of educational facilities can help assess the geographical accessibility and availability of educational resources. Other indicators of access relevant to the spatial distribution of educational facilities are:

- **Access Disparities Index:** A measure of the disparities in access to facilities between different neighbourhoods.
- **Infrastructure Quality** includes (i) condition of school buildings and infrastructure and (ii) availability of necessary facilities like libraries, laboratories, and sports facilities.