



Ministry of Finance and Economic
Planning



Republic of Ghana

Integrated Transport Plan for Ghana

Volume 1: Integrated Transport Plan 2011-2015
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Executive Summary

This Integrated Transport Plan is the first in Ghana to utilise an integrated economic and transport planning methodology to identify investment priorities based on the future demand for transport. The Plan aims to support the Government's strategy-lead approach to development planning.

The Plan includes strategies and actions to be undertaken between 2011 and 2015 for all modes of transport including many institutional and regulatory measures aiming to improve performance and bring about better integration throughout Government's transport planning environment.

Government has identified the importance of the transport sector in providing strategic support to the productive sectors of the economy and the measures set out in this Plan aim to support the attainment of the NTP Goals. It therefore becomes the primary implementation plan for the transport sector and it is hoped that the Plan will inform Government's budgetary allocations to the sector from 2011 onwards.

To satisfy expectations, there are three main outputs from the process undertaken so far:

- This Integrated Transport Plan – proposing a range of infrastructure developments, institutional and regulatory measures aimed at improving the effectiveness of Ghana's transport system. Investments in infrastructure have been prioritised for the plan period and targeted at locations to overcome capacity constraints and where economic viability has been proven.
- Decision making tools and procedures to carry out the forecasting, modelling and evaluation necessary to implement a strategy-led approach to transport planning; identifying strategic investments and measures that inculcate a more integrated approach to policy formulation, planning and delivery.
- Knowledge and understanding of how the transport planning framework needs to be changed and improved with recommendations.

Large investment projects for road and rail infrastructure have been identified as necessary to meet demand. The evaluation method has proven them to be economically viable within the life of the Plan. Developments in other modes, such as aviation, inland water and non-motorised transport, have also been considered and the Plan provides a framework in which future modal masterplans can be developed. The following masterplans are either underway or about to commence: airports, maritime ports, railways and non-motorised transport in Tema.

A core objective for the ITP project was to introduce an evidence-based planning methodology into the current planning environment. As has been demonstrated throughout the process, an integrated transport planning methodology relies on data being available for the purpose and a collaborative environment amongst agencies to share that data. Whilst in many instances, both data and cooperation were missing, concerted efforts were made to build bridges between organisations and fill the data gaps so that proposals made in this plan are based on the Ghanaian reality. This has been achieved in several ways:

- Following extensive analysis of Ghana's past economic performance, forecasts of growth and development in the future were agreed with NDPC and these provided the basis for assessing growth of key factors of the economy and the subsequent demand for transport.

- Statistical data was collected from Ghana Statistical Service and other Ghanaian agencies to determine the extent to which key socio-economic factors such as population and urbanization will create a demand for transport throughout the country.
- A joint team from the Ministry of Transport and Ministry of Roads and Highways undertook extensive consultation with all key commodity stakeholders to determine which commodities would be the key drivers of transport demand in the future.
- Traffic surveys were undertaken using local teams in over 30 locations throughout the national road network and these were used as the basis for calibrating the transport model and forecasting future traffic levels.
- The project has progressed under the joint supervision of The Ministry of Transport and Ministry of Roads and Highways including a Project Steering Committee comprising senior personnel from all transport sector agencies.
- A special transport planning group (TPG) was formed by the Ministry of Roads and Highways and the Ministry of Transport to guide the planning process. It is proposed that the TPG will become the core transport planning group to ensure cooperation and integration between the transport modes.
- Personnel have been selected from the sector to form a core transport modelling team. They have undergone extensive hands-on training and will take charge of the transport model used to formulate this Plan.

Therefore, considerable progress has been made in establishing a system of integrated economic and transport planning in Ghana. Manuals, models and decision making tools have been produced to aid the decision making process and enable integrated transport planning to be undertaken for the first time. Personnel have been involved throughout the process and a core capability has been established.

Considerable learning has also taken place and measures are proposed in this Plan to further strengthen the capacity to formulate integrated transport plans in the future.

Therefore, whilst this Plan is the culmination of over 2 years of work, it should also be seen as the launch-pad from which an integrated transport planning methodology can be fully developed and adopted.

This Plan, Volume 1 'Integrated Transport Plan 2011-2015', contains only a small part of the outputs from the ITP project. In addition, the following reports contain a description of the full methodology and the results of analyse, forecasts and evaluations carried out throughout the planning process:

Volume 2 contains an analysis of Ghana's economic performance to forecast potential growth for the period to 2035.

Volume 3 contains studies undertaken on Ghana's key commodities including forecasts of their future production up to 2035 and subsequent demand on transport.

Volume 4 sets out data on Ghana's socio-economic factors that will affect transport demand in the future. Key growth factors include: GDP, population, urbanization, motorisation, tourism and forecasts of future production in key sectors of the economy.

Volume 5 provides a brief report on transport costs including the development of a simple model for comparison.

Volume 6 is a report on the calibration of the transport model used in the methodology.

Volume 7 is the multi-criteria evaluation manual used to evaluate the selected projects and select the priority projects for investment 2011-2015..

Volume 8 contains a report on the project evaluations undertaken to identify the priority projects for the 2011-2015 period.

Volume 9 is a report on the Road Transport Sector identifying the current state of road transport services and how they can be improved.

Volume 10 is a report on the current financing arrangements in Ghana and sets out a full breakdown of the potential cost and funding for the projects identified.

Volume 11 is a Pre-feasibility study on Boankra Dry port which utilises the traffic levels developed in the ITP methodology to assess the economic and financial viability of developing Boankra port as an integral part of the transport system.

Volume 12 is a Pre-feasibility study on the Eastern Railway which also considers the operational benefits of combined operations between the eastern and western lines.

Volume 13 is a Pre-feasibility study that has focused on a specific connectivity issue in the aviation sector; that of connecting between international and national flights at Kotoka International Airport.

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AfDB	African Development Bank (and Fund)
ALTOPS	Association of Liberal Transport Operators
BOST	Bulk Oil Storage and Transport Co.Ltd
CDA	Commercial Drivers Association
CEPS	Ghana Customs Excise and Preventive Service
CF	Consolidated Fund
CIP	Capital Investment Plan
CUTE	Common User Terminal Equipment
DA	District Administration
DBOT	Develop Build Operate and Transfer
DFR	Department of Feeder Roads
DP	Development Partner
DUR	Department of Urban Roads
DVLA	Drivers and Vehicle Licencing Authority
DWD	District Works Department
EIB	European Investment Bank (and Fund)
FS	Feasibility Study
GATA	Greater Accra Transport Authority
GACL	Ghana Airports Co. Ltd
GCAA	Ghana Civil Aviation Authority
GCTA	Ghana Cooperative Transport Association
GHA	Ghana Highway Authority
GHACOA	Ghana Coach Owners Association
GHTDA	Ghana Haulage Transport Drivers Association
GLSS	Ghana Living Standards Surveys
GMA	Ghana Maritime Authority
GMU	Ghana Maritime University
GNCTA	Ghana National Cargo Transport Association
GPHA	Ghana Ports and Harbours Authority
GPRTU	Ghana Private Road Transport Union

GRCL	Ghana Rail Co. Ltd
GRDA	Ghana Rail Development Authority
GRF	Ghana Road Fund
GRHA	Ghana Road Haulage Association
GSA (GSC)	Ghana Shipping Authority (previously Council)
HCM	Highway Capacity Manual
HDM IV	Highway Development and Management Model
HIPC	Highly Indebted Poor Countries
IBRD	International Reconstruction and Development Bank
IRI	International Roughness Index
ITPG	Integrated Transport Plan of Ghana
JICA	Japan International Cooperation Agency
LGS	Local Government Service
MDA	Ministry, Department or Agency
MiDA	Millennium Development Authority
MLGRD	Ministry of Local Government and Rural Development
MMRU	Metropolitan and Municipal Roads Units
MMT	Mass Metro Transit Ltd
MoFEP	Ministry of Finance and Economic Planning
MoLGRD	Ministry of Local Government and Rural Development
MOT	Ministry of Transport
MRH	Ministry of Roads and Highways
MTEF	Medium Term Expenditure Framework
MTTU	Motor Transport and Traffic Unit of the Ghana Police
NEPAD	New Partnership for Africa's Development
NRSC	National Road Safety Commission
OD	Origin-Destination (usually refers to an OD pair or an OD matrix)
OLS	Ordinary Least Square
PDA	Positive Drivers Union
PFS	Pre Feasibility Study
PPP	Public Private Partnership
RMU	Regional Maritime University
SMTDP	Sector Medium Term Development Plan

SSNIT	Social Security National Investment Trust
STC	State Transport Co Ltd
VLTC	Volta Lake Transport Company Ltd
UEMOA	Union économique et monétaire ouest-africaine
SSATP	Sub-Saharan Africa Transport Policy Program
TOR	Tema Oil Refinery
VOC	Vehicle Operation Cost
VLTC	Volta Lake Transport Co. Ltd
VRA	Volta River Authority
VoT	Value of Time

Chapter 1 Introduction

1. Context

1.1 Economic Conditions: Global, Sub Regional, National

Despite the global economic downturn Ghana's economy grew by 7% in 2008, 6% in 2009 and the government projects that growth will be at least 10% this year. The IMF estimates that Ghana will be among the fastest growing economies in Africa this year.

ECOWAS is expecting a 4.7 % growth for the region in 2010, higher than the 4.4 % recorded in 2009.

Ghana's vision of achieving middle-income country (MIC) status by 2015 means doubling the size of Ghana's economy within a decade. This requires that gross domestic product grows by six to eight percent per annum and per capita income rises from around US\$400 to US\$1,000 per annum.

On a regional level the focus will be the Economic Partnership Agreement with the European Union, the creation of a common market, regional infrastructure development, implementation of the agricultural policy, human development, institutional capacity building, private sector development and multilateral convergence.

Not only did Ghana perform spectacularly in 2008 according to the quoted sources, but the structure of the economy has also substantially improved. The share of agriculture in GDP has fallen to 33.6 per cent in 2008 and is closely followed by the service sector whose share increased to 31.8 percent, up from 30.5 per cent in 2007. Industry accounted for 25.9 per cent of GDP in 2008.

The service sector led growth with a 9.3 per cent, followed by industry with 8.1 per cent and agriculture with a 5.1 per cent growth rate. In the industrial sector, growth in electricity and water sub-sectors was the most significant: 19.4 per cent whilst the construction sub-sector grew by 12 per cent.

However, the other macroeconomic indicators look much less promising. The year on year inflation stood in March 2009 at 20.5 per cent, up from 18.1 per cent in December 2008. The cedi continues its downslide against all major currencies. It buys US\$ 1.00 at the rate of 1.44, compared to 0.93 a year ago. There are quite serious prospects for its devaluation. Simultaneously, the budgetary deficit is 14.9 per cent of GDP, way above the projections of the former Government.

The ITPG Study Team has carried macro-economic forecasts (2009-2035) based on the fundamental assumption that by the year 2015-2017 Ghana will possess a strong oil industry which will become the real engine of growth for the country, perhaps surpassing by its dynamics and overall macroeconomic impact the agricultural sector.

Ghana seems to be in the good direction to learn with the experience of other African countries in order to avoid the Dutch Disease and generate wealth distribution from the gas revenues.

In order to reflect the slower recovery anticipated, post global recession, but allowing for the realization of oil revenue into the economy, the forecasting period to 2035 was divided into several sub-periods with different scenarios of GDP growth rates, such as below:

- Years 2009-2010 will be a period of countering the effects of the worldwide recession that Ghana cannot avoid (growth rate between 3 and 5.5%);
- Years 2011-2015 will be a period of moderate to average growth, particularly if the world recession subsides and Ghana becomes a net oil exporter (growth rate between 4 and 7.5%);
- Years 2016-2020 will be a period of a high sustainable growth (growth rate between 5 and 8%);
- Years 2021-2025, 2025-2030, 2031-2035 and beyond will see continuation of this high growth (between 5.5 and 10%).

These optimistic scenarios notwithstanding, it will be crucial that the Ghanaian economy realizes certain structural changes despite the fact that it will still be export-driven and based on a strong agricultural sector. These changes should involve the following:

- Modernization of the agricultural sector which is often branded as the engine of growth in Ghana;
- Expansion of a strong manufacturing sector¹ capable of satisfying consumer needs without an unduly increase in imports;
- Expansion of a strong services sector.

On top of the above is a need for a strong domestic demand for goods and services. This demand depends, of course, on net disposable income which, in turn, comes from economic growth. Without strong domestic demand, growth will have to come from external factors (foreign trade) but the latter may prove elusive.

Sustained economic reforms, improvements in budget deficit and the new oil find will cause foreign investments to come back to Ghana creating jobs and increasing economic activity in the process. Foreign remittance by Ghanaians in Diaspora is expected to gradually increase this year as the global economy recovers. This money which has reduced the national budget deficit in the past will also improve conditions on the demand side since it is a major source of income for individuals and households as well as a source of foreign capital.

Continued reforms around communications, energy and transportation sectors are expected to improve growth and reduce poverty in the medium run. The government also seeks to engage Vodafone especially in the area of providing a fibre optic network which is crucial to the nation's ICT infrastructure.

Ghana is also modernizing tax infrastructure and expanding the tax base to improve revenue generation. The manufacturing sector is expected to continue expanding as more companies will continue to relocate from Nigeria to Ghana due to the poor power infrastructure there.

¹ Currently economic growth from industry is basically secured by such sub-sectors as energy, water, etc. Manufacturing sector still remains relatively weak.

The West African Regional trading block ECOWAS is moving faster towards regional integration. Recently agreements were made around Taxes and Tariff as well as macro economic conditions for convergence. Also plans for a regional stock market are in the pipeline, this will boost liquidity and market capitalization across West Africa. It will also boost companies' access to capital across the region as cross listing of companies will be allowed. For a country like Ghana this will make her more attractive to foreign investment. It will also allow her access to other markets in West Africa in addition to all the economic benefits associated with an expanded common market.

1.2 Development Policy and Objectives

Government has identified the importance of the transport sector in providing strategic support to the productive sectors of the economy. The Transport Sector is consistently described as an important facilitator of growth, poverty reduction and provider of cost effective service delivery.

Strategic goals and objectives for the sector have already been set out in the National Transport Policy (NTP). Development priorities for the Sector fit within 7 strategic Goals as follows:

- Establish Ghana as a Transportation Hub for the West African Sub-Region
- Create a sustainable, accessible, affordable, reliable, effective, efficient, safe and secure transport system that meets user needs
- Integrate land use, transport planning, development planning and service provision
- Create a vibrant investment and performance-based management environment that maximizes benefits for public and private sector investors
- Develop and implement a comprehensive and integrated Policy, Governance and Institutional Framework.
- Ensure Sustainable Development in the Transport sector
- Develop adequate Human Resources and apply new Technology

The Transport Sector goals were formulated to address issues affecting the sector and were identified through a wide ranging strategic review of transport sector performance undertaken between 2005 and 2007. Special emphasis was placed on public consultation providing platforms for contributions from regional bodies, national interest groups and the multi-party parliamentary select-committee on transport.

To ensure the relevance of these Transport Sector Goals to Government's ongoing development objectives, and particularly this Integrated Transport Plan, a comprehensive analysis has been undertaken by the Transport Sector ministries to determine the relevance of the stated transport sector goals and Government's ongoing key development themes.

In support of Government's commitment to sustaining good governance, achieving its sustainable development agenda and improving the quality of life for all citizens, decision makers realise they must consider more fully the social and environmental conditions in Ghana.

In this case, the Government of Ghana has adopted the use of the Strategic Environmental Assessment (SEA) methodology as the means to ensure the operational integration of

environmental quality objectives, economic efficiency principles, and social equity goals in planning and decision-making. SEA therefore becomes a valuable tool in ensuring environmental sustainability. As a result SEA tools have been incorporated into the National Development Planning Commission's (NDPC) Planning Guidelines for Sectors and Districts. The National Transport Policy, itself subjected to a SEA, also stresses the need for sustainable development in the Transport Sector, and requires that SEAs be carried out on all transport policies, plans and programmes. The SEA proved very effective in its application to the National Transport Policy (June 2007) and this Integrated Transport Plan has been subject to a full Strategic Environmental Assessment compliant with the requirements of Ghana's Environmental Protection Agency (EPA), putting Ghana at the leading edge of SEA practice.

In applying SEA to this integrated transport plan, broad stakeholder consultation has been undertaken with a view to strengthening the plan, testing its sustainability in terms of economic, environmental, social and institutional factors, enhancing its scope and final acceptance by all stakeholders.

Findings from the SEA process undertaken so far have reinforced the most important social and environmental issues concerning transport sector development: Transportation safety; Risk of accelerating the spread of HIV/AIDS; and Effects of transportation services on climate change.

1.3 The Current Economic and Transport Planning Arrangements in Ghana

Transport Sector policy is primarily informed by Government's national development goals and objectives. In formulating the National Transport Policy, it was shown that the Sector responds to a wide range of demands as indicated by the list below:

- International Standards, Sub-regional agreements
- Government's National Development goals and objectives
- Ghana's sectoral, regional and local policies and development plans
- Institutional, regulatory and technical issues impacting on the effectiveness of the Sector
- Constraints of the existing transport network
- Future demands of users

Over the years, this has meant a more complex decision making environment as well as gradual re-orientation from a project-led approach to a strategy-led approach to planning investments in the Sector. This re-orientation was characterised by the introduction of a National Transport Policy (NTP) in 2008, setting out the priority goals and objectives for the sector, in response to Government's strategic objectives for growth and development. The extent of change currently underway in Ghana's policy and planning framework is illustrated well by the following list of Government documents that have, or continue, to set strategic objectives for the sector:

- Road Sector Development Programme (RSDP) 2002-2008, a 1.2billion USD programme of investment in road infrastructure, regulation, institutional development and capacity building.
- Ghana Poverty Reduction Strategy II (GPRSII) 2005-2009 – a strategic and coordinated national development programme

- National Transport Policy (NTP) 2008-2012 – reflecting development objectives set out in GPRSII and previous Vision 2020, also reflecting international standards, sector demands and constraints in the existing transport network.
- Transport Sector Development Programme (TSDP) 2008-2012 and updated 2009-2013, an integrated programme of activities reflecting the NTP Goals with a programme of activities budgeted at 4.8billion USD with a 2.4 billion USD funding gap.
- Sector Medium Term Development Plan (SMTDP) 2010-2013 adapted from TSDP, reviewed against NTP and new Government development objectives. (Superseding the TSDP but inheriting TSDP budget and funding forecasts)
- National Medium Term Development Plan (NMTDP) 2010-2013 being compiled by NDPC from SMTDPs provided by sector Ministries (superseding GPRSII as Government's strategic national development plan)

In addition, the individual policies, strategies and plans of public sector organisations throughout the sector, add to the array of documents indicating priorities for the transport sector.

Subsequently, the introduction of an integrated transport planning process from which this, Ghana's first Integrated Transport Plan (ITP), has been produced, further reinforces and facilitates the transition to a strategy-led approach.

2. Integrated Transport Plans: Theory and Practice

As this is Ghana's first ITP, it is worth considering the scope of integration possible.

2.1 Defining integration

There are a number of distinct terms concerning policy integration and a hierarchy of terms, namely:

- policy co-operation, at the lowest level, which simply implies dialogue and information
- policy co-ordination, policy coherence and policy consistency – all quite similar, which imply co-operation plus transparency and some attempt to avoid policy conflicts (but do not necessarily imply the use of similar goals)
- policy integration and joined-up policy – includes dialogue and information (as in policy cooperation), transparency and avoidance of policy conflicts (as in policy co-ordination, policy coherence and policy consistency) but also includes joint working, attempts to create synergies between different sectors (win-win situations) and the use of the same goals to formulate policy

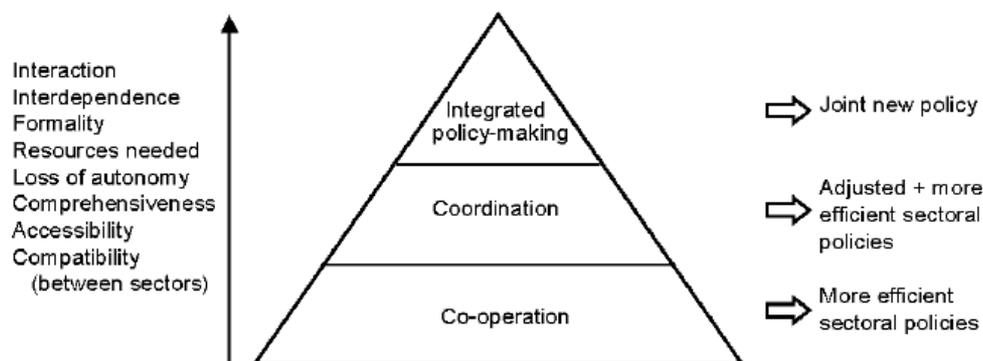


Figure 1 : Integrated policy making, Coordination and Co-operation.²

Using this definition, we can expect integrated transport planning and policy making to be a joint process including all the sectors connected with the transport sector. It is not, however, overstated to say that all economic and social components of a country are connected to transport in some way, for example, the UK Department for Transport in its New Approach to Appraisal (NATA)³ identifies four areas of integration:

- 1- Integration with and between different transport modes
- 2- Integration with the environment

² Source : Stead and Meijers (2004) Policy Integration in Practice : some experiences of integrating transport, land-use planning and environmental policies in local government. Berlin.

³ Department for Transport (2002) Guidance on the Methodology for Multi-Modal Studies.

- 3- Integration with land-use planning
- 4- Integration with policies for education, health and wealth creation

These four areas of integration can be condensed into three

- 1- Integration of modes
- 2- Integration of transport and land-use
- 3- Integration with the whole government policies / strategic sector plans (an integrated policy environment)

The figure below shows these three spheres of integration.

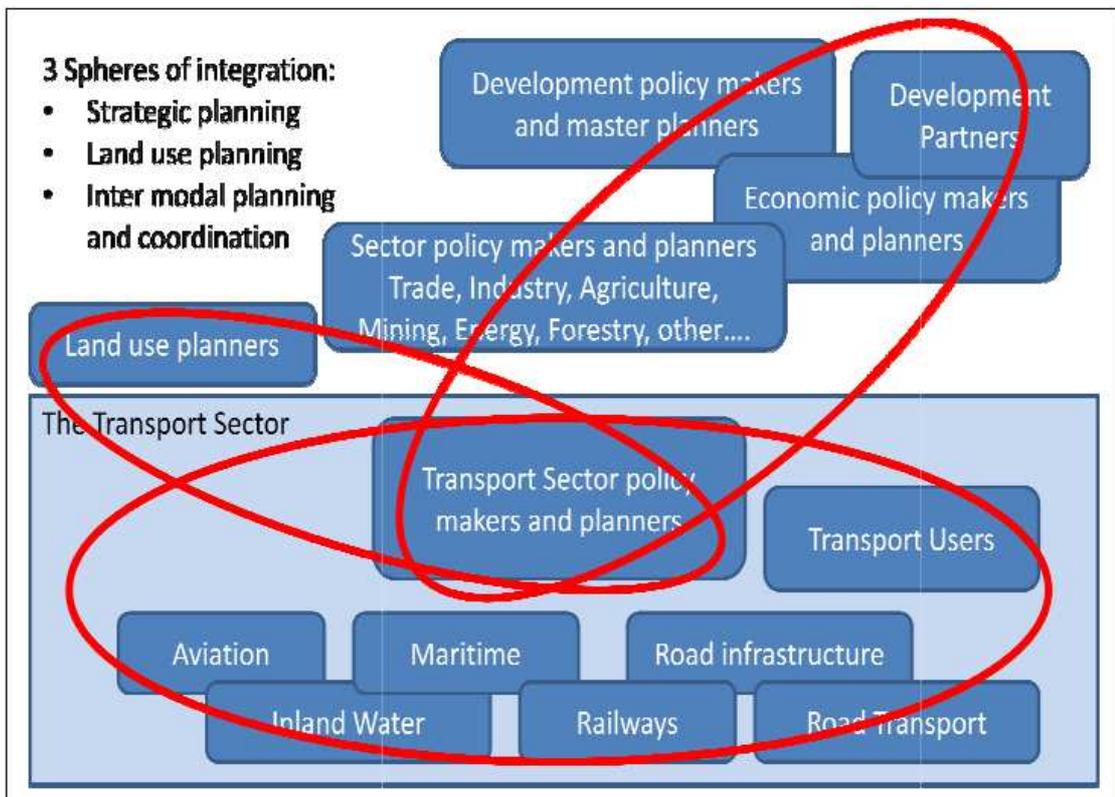


Figure 2 : Three spheres of integration

2.2 Land Use Planning

Land use planning, in turn, comprises an integrated economic and social planning process. According to the Canadian Institute of Planners: "[Land use] planning means the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities".

Land-use planning provides a valuable level of planning which aims to integrate economic development with spatial planning in the medium or long term.

The key integration is then the integration of land use and transport that, if achieved effectively, achieves integration of transport modes and whole of government policies.

In theory, the viability of an integrated transport plan depends upon the existence of an integrated land-use plan. In reality, although many places in the world (countries, regions, towns) are developing their plans, a few have an established integrated and well enforced land-use plan.

As in many countries, Ghana lacks of integrated land use plans. This creates problems for the transport planner. Whereas with land use plans the transport planner would work from the land-use plans. In its absence the transport planner must try to integrate as much as possible with all the individual sector plans and forecasts and use transport plans to inform other sectors. Thinking in terms of the three spheres of integration mentioned earlier, integrated transport plans must incorporate:

- 1- Integration within and between modes
 - a. On-going and planned multimodal infrastructure and policies
 - b. National and regional multimodal frameworks
- 2- Integration with sector plans
 - a. Forecast for the economy
 - b. Socio-economic forecasts (Living Standards, etc)
 - c. Plans for Energy, Agriculture, Industry, Mining, Oil, etc.
- 3- Integration with strategic planning
 - a. Wide ranging plans encompassing sector plans,
 - b. National Transport Policy
 - c. National Environmental Policy
 - d. Social and Equity issues

Without land use plans it becomes impossible to develop an integrated transport plan without including considerable speculation in regard to development in other sectors.

Annexe 1 presents some examples of integrated transport plans.

2.3 Planning Horizons

As a consequence, the planning horizon for Integrated Transport Plans is usually reduced to the medium term. As will be show in Annexe 1, their horizon is usually 5 years. The main reasons to this are:

- Need for integration of other plans: the integrated transport plans shall integrate land-use plans when available and any other demand and supply sector development plans which usually are developed for the medium term.
- Financial Implications: transport sector finance plans usually take the form of a 3 to 5 year rolling plan.
- Implementation and Monitoring: Implementation and monitoring of the actions must provide prompt feedback to update and review the plan.

3. The Purpose and Content of this Integrated Transport Plan

This is Ghana's first integrated transport plan which aims to support Government's strategy-led approach to development planning and implementation. To ensure the transport sector is properly aligned to the socio-economic development taking place in Ghana, an integrated transport planning process has been undertaken by the Ministry of Transport and Ministry of Roads and Highways to formulate this Plan. The process got underway in November 2007, following on closely from the completion of the National Transport Policy.

The expectation is that the ITP will become the strategic implementation plan for National Transport Policy Goals and strategies, the successor to the Transport Sector Development Program and the overarching document to guide Government's annual budgetary allocations to the sector.

It aims to describe a framework in which development will take place in the transport sector over the next five years.

The ITP has also introduced an objective decision making process to transport planning which prioritises investments that meet future demands for transport. It is a tool that facilitates integration within the transport sector and between the sector and other sectors of the economy.

To satisfy expectations, there are three main outputs from the process undertaken so far:

- This Integrated Transport Plan – proposing a range of infrastructure developments, institutional and regulatory measures aimed at improving the effectiveness of Ghana's transport system. Investments in infrastructure have been prioritised for the plan period and targeted at locations to overcome capacity constraints and where economic viability has been proven.
- Knowledge and understanding of how the transport planning framework needs to be changed and improved with recommendations.
- Decision making tools and procedures to carry out the forecasting, modelling and evaluation necessary to implement a strategy-led approach to transport planning; identifying strategic investments and measures that inculcate a more integrated approach to policy formulation, planning and delivery.

Whilst institutional and regulatory measures proposed in this Plan are applicable to the entire transport sector, infrastructure developments are concerned only with developments on the national routes comprising national roads (N-roads), national railways, national air routes and the north-south inland water route. This approach has been adopted to enable the introduction of the integrated planning process within the current decision making framework; working within the limitations of data availability and reliability in Ghana.

It is envisaged that as data on regional and local transport networks is collected, the methodology can be expanded and successive versions of this Plan will become incrementally all-embracing of Ghana's transport system.

Proposals are included in this Plan for bringing about improvements in the decision making framework, including specifically data collection and management to increase the capacity for, and scope of, integrated transport planning in the future. It should be noted that some of the tools used in the methodology have already been applied at the 'urban' scale in Ghana; formulating transport plans for Kumasi and Tamale. The methodology adopted therefore

provides a consistent approach to transport planning throughout the country and aids the integration of plans developed at national, regional and urban/local scales.

A structured analysis of sectoral policies and plans, has been undertaken for the preparation of this Plan. A joint team from the Ministry of Transport and Ministry of Roads and Highways visited Ministries, Departments and Agencies (MDAs) with oversight responsibility for key sectors of the economy to determine their future plans and strategies. The following sectors were consulted: Finance and economic planning, agriculture, trade & industry, energy, cocoa, mining, oil and gas, oil storage and transport and forestry. From the information provided, an assessment was made of their impact and where clearly described and quantified, the future demand for transport was calculated.

A review of funding options has also been carried out and this is presented as an integral part of this Plan.

Therefore, this ITP is formulated to:

- Strengthen and support Government's strategy-led approach to development planning
- Reflect the growth expected in key socio-economic factors (such as GDP, population, urbanisation, etc) and key commodities produced in Ghana
- Target investments into strategic projects that satisfy the future demand for transport
- Identify the optimum national transport network in the plan period (selecting from rail, road, inland water and air options)
- Evaluate projects using a multi-criteria evaluation process ensuring due consideration of government's economic, social and environmental objectives at an early stage in the process.
- Identify constraints in each transport mode and key cross-cutting issues and propose various regulatory and institutional measures needed to address those constraints and continuously improve performance of the sector through better governance including: policy formulation, planning, management, maintenance, supervision, monitoring and reporting.
- Include realistic financing options

Chapter 2 Diagnosis

1. The Governance framework affecting the transport sector

There has been a long-stated need for a coordinated and integrated approach to policy formulation, planning and implementation in the Transport Sector. The demand for increasing integration within Government's policy, governance and institutional frameworks is clearly stated in the NTP Goals 3 and 4 and continues to put intense pressure on transport sector MDAs to carry out tasks for which they are often poorly equipped.

For example, the Ministry of Transport has responsibility for oversight of 16 'agencies'. It is faced with many operational problems such as shortages of accommodation and personnel, the latter problem caused by inadequate recruitment and poor retention of staff. Also, the increasingly diverse array of organisations involved in transport sector decision making means that coordination, communication and reporting activities become more complex and far reaching; outstripping capacity and resources and introducing the requirement for new skills, operating systems and behaviour.

Performance reviews undertaken by transport sector ministries over the last 5 years have revealed the need for greater functional clarity, identifying gaps in functional capacity caused by inappropriate institutional arrangements. A lack of performance-related management structures, inadequate levels of skills and competencies, and poor motivation are often cited as reasons for poor performance. There remains considerable uncertainty about the outcome of change and reform in the sector, including the potential impact on decentralisation of road sector agencies, and this adversely affects performance of personnel.

The requirement for coordination and integration within the sector, between the sector and other sectors of the economy, including the private sector, continues to pose a significant challenge to the sector's effectiveness and efficiency. In many cases, it will be necessary to change the institutional arrangements, organisational structures and corporate culture; introducing new working practices and behaviour that facilitate performance improvement as envisaged by Government in its long-term public sector reform agenda.

1.1 The Policy framework affecting the transport sector

In this section we are concerned with the policies and strategies that impact directly or indirectly on the transport sector.

The lead policy document for the transport sector is the National Transport Policy (NTP). In its formulation a range of factors were taken into consideration including policies and strategies guiding Ghana's socio-economic development, international conventions applicable to the transport sector and prevailing conditions in the transport network.

As the GPRS II has drawn to a close, there is a lack of overarching economic development strategy for Ghana. What has also become evident in the formulation of this Plan is that key

sectors of the economy are operating without policies and strategies and where they do exist they are often out of date or with only a limited period still to run.

In the absence of an overarching development strategy for Ghana and without long-ranging sectoral plans (i.e. those looking 10, 15, 20 years ahead) being available from sector ministries, long-range transport master planning is impossible using the objective-led tools used to formulate this ITP.

Other policies also impact on the transport sector. Whilst the objectives for these policies have been built into the NTP, agencies implementing transport projects must necessarily be aware of the more detailed requirements of Government in the areas such as: environment, society, training, employment, procurement, private sector development, and public finance.

In practice it has been found that often the transport sector agenda is influenced by the policies and plans of Ghana's development partners, foreign-based inward investors and elite stakeholder groups.

As the policy framework strengthens, longer-range transport planning will become feasible improving the planning process and its overall effectiveness.

The key strength of Ghana's policy framework is that change is currently underway to implement a policy-led approach to development planning. This however puts pressure on all sectors of the economy to plan and strategise for the future.

Much work is needed to develop a comprehensive framework of policies and strategies that set out the development agenda for each individual sector of the economy and Ghana as a whole.

As identified in Chapter 1, section 2.3, the lack of land use master planning in Ghana puts the emphasis on sectoral strategies to guide the transport planner. The subsequent lack of policies, strategies and clearly defined objectives set out for individual sectors of the economy severely restrict the ability of transport planners to respond effectively to the developments that are likely to take place in other sectors of the economy. The same lack of policies, strategies and clearly defined objectives also threaten the opportunities to achieve good governance and improve the performance of individual organisations and sectors as a whole.

1.2 The regulatory framework affecting the transport sector

It is essential that laws and regulations are established to create an enabling environment in which policy objectives can be achieved. Increasingly, as the emphasis shifts to private sector provision of services, transport sector laws and regulations are increasingly aimed at the 'users' and 'providers' of transport services. In the case where there are significant 'market forces' (meaning well informed, organised and empowered consumers) they will regulate the quality, price and availability of goods and services. Where consumers are poorly informed and poorly organised, there is a need for market regulation which defines the performance required of goods and services on their behalf. The latter situation prevails in Ghana. The situation was reinforced by a benchmarking survey carried out at the outset of the Urban Transport Project identified that the users (i.e. consumers) were poorly represented and poorly served by transport providers.

Therefore, the transport sector's regulatory framework must consist of laws and regulations that define directly or indirectly the level of service required for consumers and the overall performance required of the sector.

Whilst the need for such regulation is recognised in the NTP, there are currently few examples in use. As is evident from analysis of the transport sub-sectors, Ghana's transport sector is

currently governed by laws and regulations established over a long period with many laws and regulations requiring updating. The most critical areas for new or updated laws identified in the analysis include:

- Maritime laws and regulations particularly concerned with governing offshore activities associated with the rapidly developing oil and gas sector
- Laws and regulations governing inland water operations concerned with the provision of safe, reliable and affordable services to local communities
- Road traffic regulations aimed at operators, owners and drivers to improve the quality of driving, vehicles and services and improve safety.
- Lack of harmonization throughout the West Africa sub region which is particularly important for road transportation
- Laws and safeguards affecting private sector investment in transport infrastructure and services

Increasingly, agencies responsible for the provision of transport infrastructure and services must comply with the requirements of laws and regulations in areas such as: environment, society, training, employment, procurement, private sector development, and public finance.

The NTP states that *“Regulation is meaningless unless consistently enforced and updated as Ghana’s governance framework evolves”* Therefore enforcement is a critical component of the regulatory framework yet all transport sector regulatory bodies report a lack of resources, facilities, and suitably qualified personnel to fulfil their regulatory obligations.

In order to improve the enforcement regime, the NTP states that public and private sector agencies involved in the management and regulation of the Transport system should be allowed to raise and retain the cost of administration through fares or ‘user charges’. The NTP says that the enforcement of environmental, safety, security, and road vehicle control standards such as vehicle licenses, route licenses, axle load control fines and fees, should be included.

In countries with well developed ‘markets’ for private sector goods and services, there is an increasing reliance on voluntary regulation. This is where the suppliers and providers of goods and services voluntarily adopt standards in lieu of formal government regulation. Modern governance thinking says that good governance is a balance between voluntary and compulsory compliance. However, for voluntary regulation to work, it is necessary to have an attitude of openness, high levels of transparency, effective media and good communications, cooperation and coordination between suppliers, consumers and government. There is limited experience of this approach in Ghana and no examples from the transport sector are evident.

1.3 Financing arrangements for the transport sector

1.3.1. Introduction

Funding issues reflect both institutional financial constraints (affecting annual operations) as well as limitations on the sources of infrastructure (essentially of a financing nature, matching funding to the life cycle of assets). These are set out in detail in Volume 10 Finance.

GoG’s MDAs (including legally autonomous institutions) benefit directly and indirectly from the involvement of GoG in financing their activities, through devolved revenues, transferred revenues, subsidies, on-lending from international banks and funds, government loan

guarantees, explicit and implicit promises to maintain the solvency of institutions, etc. Some MDA finances are affected by straying away from core functions and investing (long and short term) in non-transport or non-viable activities.

Although full cost recovery principles to calculate tariffs, fee and charges, have been accepted, these are ameliorated and regulated by GoG in various ways, thus reducing the revenue raising potential of the institutions, generally for social and public benefit reasons.

A high level of public expenditure funding comes from grants through Development Partners, from concessionary loans from international banks and funds, and general taxation (through the Consolidated Fund). This is supplemented by tariffs, fees and charges (often quite substantial) levied for services provided which used to be part of the Treasury's general revenues in the Consolidated Fund.

Despite these various sources, there is a significant gap between demand for funds and supply, and the ability of GoG to contract loans that have to be amortised. The availability of future recurrent and capital funding is unlikely to be significantly different from the current situation, except for the possibility of a "windfall" from oil revenues, much of which would go to bridging the current fiscal gap and current expenditure needs.

Development Partners with grant aid and general budgetary support remain the most likely source of investment and development funds post 2013. For selected "commercially" oriented projects under Public Private Partnership or various other forms of private participation in service provision, international banks (AfDB, IDB, EIB, etc) and their funds remain a major parallel potential sources of infrastructure funding. However, Ghana's experience in PPP is limited and has had mixed results.

1.3.2. Pricing principles

Ghana's policy clearly states that the 'user pays' principle applies to all transport services and maintenance of infrastructure.

GoG is gradually implementing past recommendations to increase tariffs, fees and charges, and to introduce new fees to generate additional transport sector revenues. GoG has restricted or delayed increases in tariffs, fees and charges despite the need to cover operational costs. This has had a detrimental effect on institutional finances and made it impossible to set aside funds for future asset replacement.

Transport institutions are being reorganised into individual operating units, separating commercial and non-commercial functions with appropriate public and private sector profiles (companies, agencies, authorities, etc). Some of these institutions will manage the infrastructure assets; others will provide services with full cost recovery principles.

Necessary and agreed increases in the fuel levy have been inhibited by the need to impose a parallel levy to clear Tema Oil Refinery debts through the under-pricing of fuel in past years. The parallel levy will continue to be imposed for the foreseeable future, thus restricting the generation of funds for the road sub-sector.

1.3.3. Public Finance

Macro-economics

Ghana's Central Bank recently successfully floated a medium term domestic bond instead of Treasury Bills, thereby demonstrating an easing up of domestic credit conditions. Previous years had almost seen a systemic collapse of the banking system through inappropriate financial policies in the energy sector.

Management of Ghana's economy has improved in recent years and its finances have stabilised. Inflation remains high in Ghana and it is subject to many external economic forces over which it has no control. Inflation expectations continue to remain high although probably less than in the past. Ghana has a high fiscal deficit in relation to its Gross Domestic Product.

The loan interest costs of GoG borrowing have not always been passed on to the institutions benefiting from the funds made available. Foreign borrowing carries an exchange rate risk which is not always passed on to the institutions benefiting from the funds made available. This distorts the finances of the institutions and imposes a cost on the general taxpayer through the Consolidated Fund.

The domestic banking sector is weak and most credit is usurped by the government to the detriment of funds being available to the private sector. Most domestic private sector funding on offer is at extremely high interest. Consequently, private sector proposals to invest in transport projects involve foreign sources of fund at lower interest rates but with a high foreign exchange risk.

The Consolidated Fund may benefit in the next few years from a "windfall" from oil taxes with an increased allocation being possible for the transport sector.

Transport institutions

Financial management in transport MDAs is generally weak. Several institutions have not been managed or operated in a commercially viable way. Where problems arise they are not satisfactorily or quickly resolved, leading to problems in other MDAs.

Financial reporting, monitoring and accountability by MDAs are not always timely, transparent or informative. Financial accounts availability has been delayed by the slow or late auditing of many institutions.

GoG directs the surplus funds in MDAs from solvent to non-solvent institutions, thereby undermining the financial and commercial viability of those institutions.

Ministries tend to become directly involved in the management of legally autonomous institutions instead of keeping at "arms length" and monitoring performance.

Transport institutions have resorted to special financial arrangements whereby infrastructure users finance operational investment (e.g. railway rolling stock, Volta Lake tug rehabilitation) in exchange for repayment from future freight revenues.

Devolved revenues to finance specific transport objectives in autonomous institutions have been more than sufficient to ensure their financial viability and to meet their operational and investment needs.

GoG and its agencies have failed to provide transparent subsidies to transport institutions to compensate for the loss of revenue as a result of applying social objectives, e.g. for free travel or the application of sub-economic tariffs, fees and charges.

Many transport institutions are burdened by legacy costs and liabilities and are not viable as “going concerns”. Despite many consultancies and studies no action has been taken to resolve the issues. Instead short term measures have been taken that will ultimately affect other institutions, such as SSNIT, which have provided funds to deal with the problem.

Institutions are resorting to borrowing from future revenue flows (e.g. fuel levy) to meet and current contract arrears, and this will reduce the funds available in the future to meet on-going expenses.

The financial arrangements of some autonomous agencies are complicated by the continued involvement of GoG in paying some expenses directly.

Transport finance

The public sector has a record of failure to maintain and repair transport infrastructure from revenues received despite the above stated policy objectives.

Ghana has not resolved the paradox of accepting the need to extend the national, urban and feeder road networks but being unable to provide the finance to maintain the networks on a routine and periodic basis (resulting in the depreciation of assets and the accumulation of a maintenance deficit).

Despite detailed planning and budgeting procedures, the transport sector annual budgets and periodic plans of expenditure still exceed the funding available.

Contracts are still awarded where funding is not secured or available, despite detailed procedures and regulations to the contrary. Consequently, contract arrears accumulate and incur additional heavy penalties and interest costs which have not been budgeted for.

Some autonomous institutions have invested in non-core projects to the detriment of funds being available for core transport projects. Funds used or planned to be used for the investment are often of a short term nature and have been diverted (by GoG in most instances) to the detriment of the continuation of the planned investment.

The economic and financial viability of many desired transport projects is often below the financial thresholds at which private participation is of interest. Low rates of return have attracted some offers of long term finance at international market levels, but tied to parallel concessions (e.g. exploitation of mineral rights) which are not shown in the economic or financial analyses.

The financial costs of domestic short, medium and long term funding has been, and continues to be, well in excess of the economic and financial rates of return for many identified projects.

The integrated approach to transport planning and funding should ensure the optimising limited financial resources and their use on economic and viable projects.

1.3.4. Development Partners

International capital markets are available to Ghana and have been successfully utilised. Ghana has been able to attract grant aid to finance many transport investment projects which would otherwise have not been implemented.

Ghana has successfully participated in the Enhanced HIPC debt forgiveness arrangement, thereby improving its external finances and reallocating internal resources to key sectors.

There is a willingness of international development institutions (AfDB, IDB, EIB, etc) to continue to invest in Ghana's transport infrastructure through grant aid and long term concessionary loans. These Development Partners are prepared to provide this funding to otherwise autonomous and commercially oriented institutions, including under PPP arrangements. The current programme of DP assistance to the transport sector expires in 2013 and there are not specific proposals to replace the programme.

The process to obtain the participation of DPs and the private sector is slow, given that some ITP projects need immediate investment. Ghana does not have much experience in PPP arrangements although DP training is being provided to a MOFEP unit (Policy and Finance). The benefits accruing may take some years to appear.

1.3.5. Private Sector Participation

Ghana's policy clearly states that the private sector is encouraged to invest in transport infrastructure and services where commercially viable.

The current international financial crisis is inhibiting some interested parties from following up their expressed interest in PPP arrangements.

There has been private sector participation in several major commercially oriented projects in Ghana with positive results. Some GoG institutions have gained experience in negotiating concessions and franchises and joint venture arrangements. Private sector interest continues provided that the risk/return ratio is acceptable. There have been failures in the financial management of transport projects involving PPP and the withdrawal of joint venture partners.

Some transport infrastructure is too large or of a long term nature for private sector investment participation or for raising private sector finance.

Private sector institutions have made several detailed proposals to undertake (operate and finance) PPP or concessionary arrangements for key transport projects.

Feasibility studies have been arranged or received for several strategic transport projects. They clearly set out the economic and financial parameters on which private and public investors can judge their degree of investment participation. The infrastructure elements of the projects appear attractive to international banks and funds which can provide long term and concessionary finance. Operational elements of the projects are identified for full private sector participation through concession or full management arrangements. Non-commercial elements are identified for continued public sector involvement through investment via the Consolidate Fund, Development Partner grant assistance, or public subsidies to sub-economic operational elements (see Bonifica Western Corridor FS, KIA MasterPlan FS, and GPHA USTDA/Halcro Ports study).

There are international institutions in Africa that are willing and able to assist Ghana in specific PPP studies and negotiations, drawing upon similar infrastructure projects with PPP arrangements applicable to Ghana.

Private sector interest in planned projects – already partly financed by transport institutions - has been undermined by the lack of parallel funds to invest in providing the connecting infrastructure.

1.4 Key 'demand-side' stakeholders

As noted throughout this Plan, the need for transport is derived from the need for passengers and goods to be transported. Therefore, the transport sector has a 'demand-side' which comprises the policy makers, planners, regulators, producers and service providers concerned with development in key sectors of the economy and with the overall socio-economic development of the country.

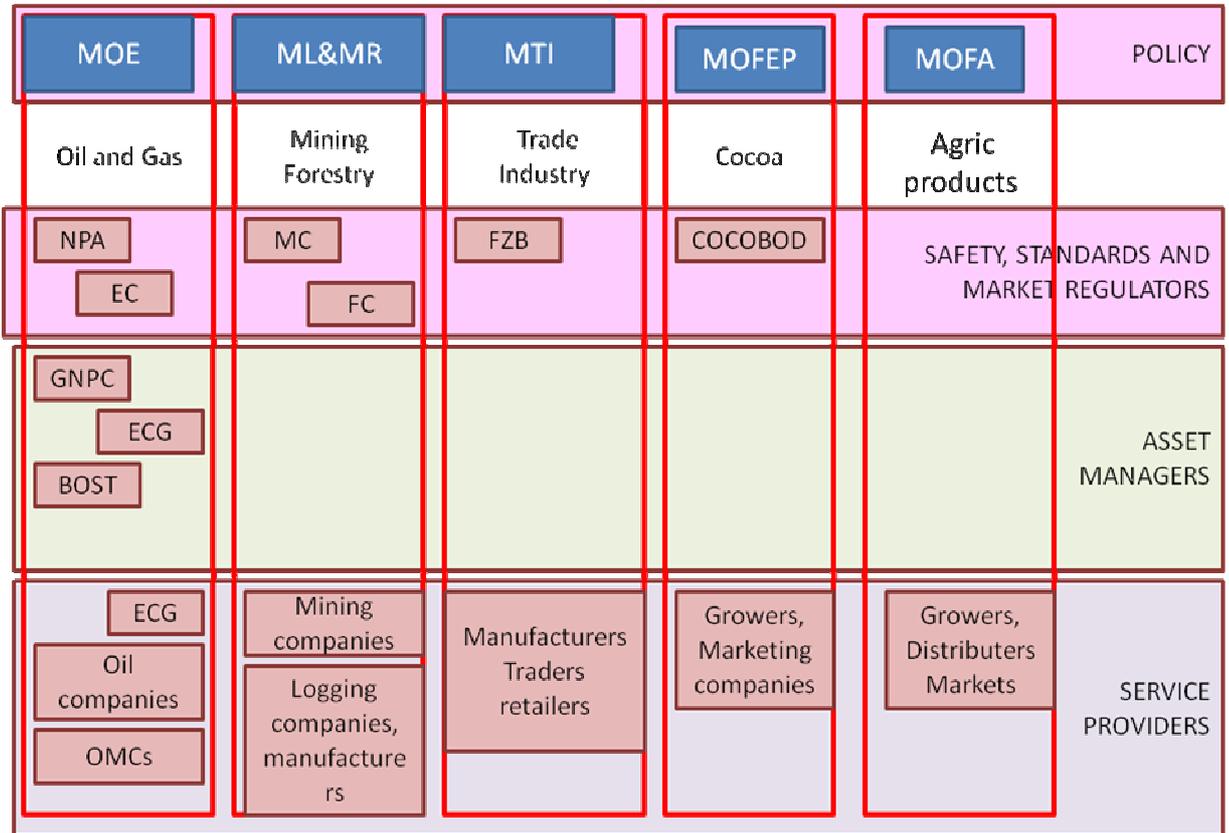


Figure 3 : Indication of key sectors of the economy creating a demand for transport

Organisations included:

- Ministry of Energy: National petroleum Authority, Energy Commission, Ghana National Petroleum Company, Electricity Generating Company, Bulk Oil and Storage Company, Oil Companies (Exploitation) and Oil Marketing Companies (Distribution)
- Ministry of Lands and Mineral Resources: Minerals Commission, Forestry Commission, Mining Companies, Logging and timber manufacturing companies
- Ministry of Trade and Industry: Free Zone Board, Manufacturers, Traders and Retailers
- Ministry of Finance and Economic planning; Cocoboard, cocoa marketing companies, growers, processors
- Ministry of Foods and Agriculture: Growers, distributors, wholesalers and markets

This diagram whilst not exhaustive, illustrates the diversity and independence of organisations in these sectors and reinforces the problems for transport planners associated with the lack of land use master planning and lack of quantified sectoral development strategies.

1.5 Key 'supply-side' stakeholders and the Institutional framework in which they function

The transport sector's policy and planning framework is underpinned by two Ministries and various Departments, Agencies and Companies of the aviation, maritime, railways and road sub-sectors. These are largely organised in an institutional framework based on international best practice, namely:

Ministry (ies) – responsible for policy, coordination, oversight and enabling

Regulatory bodies – responsible for regulating activities in the sector

Asset managers – responsible for managing the transport infrastructure assets

Service providers – providing transport and support services to users, operators, asset managers and regulators throughout the sector.

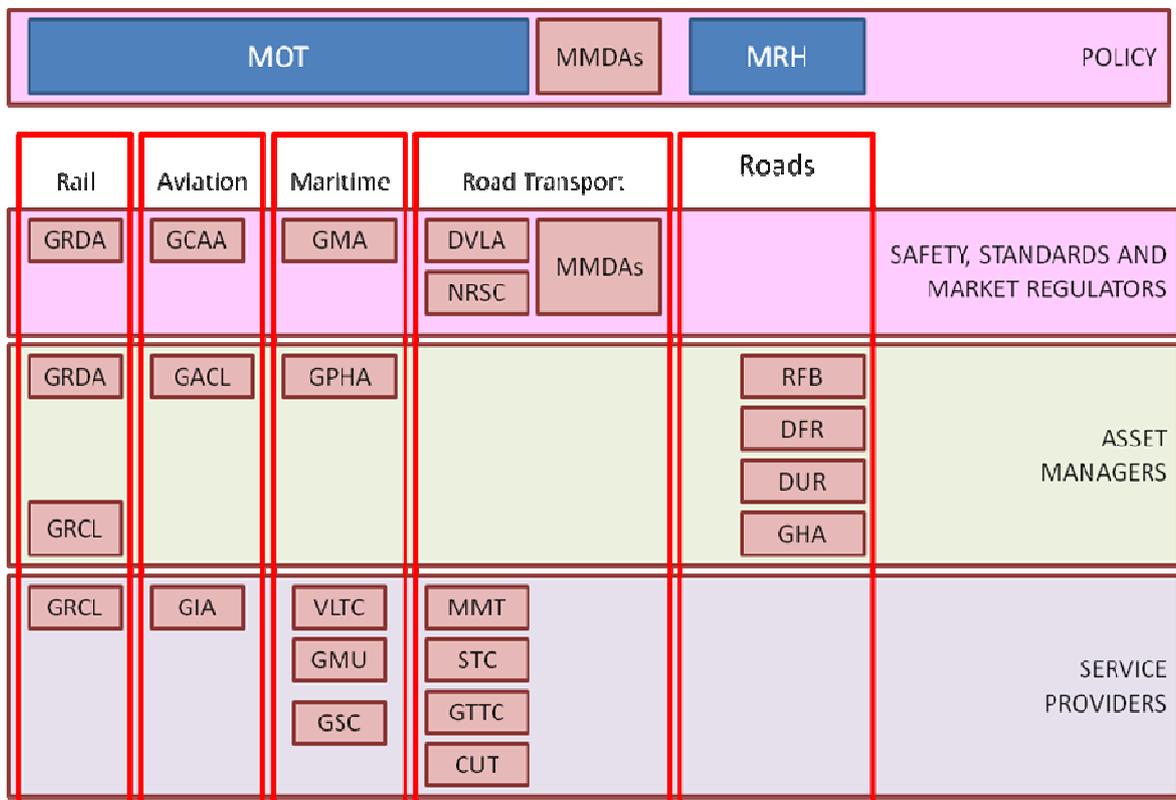


Figure 4 : Public Sector organizations in the Transport Sector’s institutional framework

In some cases, for example the aviation sub-sector, Ghana is pursuing further separation of functions between regulation of services, air traffic control and accident investigation, reflecting further their desire to meet international standards of best practice.

In other cases, for example in the road transportation sub-sector, Ghana is pursuing outsourcing to the private sector for testing, licensing and road toll collection activities.

Road infrastructure ‘agencies’ remain closely aligned to the Ministry of Roads and Highways.

1.5.1. Policy formulation

The Ministry of Roads and Highways (MRH) is responsible for policy development, coordination and oversight of road infrastructure including oversight of the Department of Urban Roads (DUR), Department of Feeder Roads (DFR), The Ghana Road Fund (GRF) and Ghana Highways Authority (GHA).

The Ministry of Transport (MOT) is responsible for policy development, coordination and oversight of aviation, inland water and maritime, railway and road transport sub-sectors.

In recent years both Ministries have come together to formulate the National Transport Policy, Transport Sector Development Program and their respective Sector Medium Term Development Plans. With the implementation of the integrated transport planning process, there has been an increase in the number of formal mechanisms for collaboration and coordination between the Ministries. However, without a clear mandate for coordination and integration between the modes, as has been experienced in the formulation of this ITP, attendance at the formal integration meetings is threatened by more 'pressing' sub-sector issues and therefore priorities tend to be determined by the formalised sub-sector mandates.

1.5.2. Regulatory bodies

Overseen by the Ministry of Transport, a number of agencies fulfil various regulatory functions as follows (in strict alphabetical order):

- Driver and Vehicle Licensing Authority (DVLA) responsible for regulating drivers and road vehicles
- Ghana Civil Aviation Authority (GCAA) responsible for regulating the aviation sub-sector
- Ghana Maritime Authority (GMA) responsible for regulating the inland water and maritime sub-sector
- Ghana Railway Development Authority (GRDA) responsible for regulating future rail operators and managing the rail infrastructure assets
- National Road Safety Commission (NRSC), whilst not having regulatory powers, NRSC plays a valuable role promoting road safety in Ghana including coordinating the activities of all key stakeholders impacting on road safety
- Motor Transport and Traffic Unit of the Ghana Police (MTTU), is the enforcer of laws affecting users of the transport system.

All of the regulatory bodies report a lack of resources and capacity to undertake their regulatory responsibilities. This is most acutely noticed in the areas of road and maritime transportation both experiencing rapid growth of operations for which they need to develop and enforce wide-ranging regulation.

MMDAs are mandated through Act 462(1993) to plan and regulate transport services in their locality (see 1.5.5 below).

The lack of a national body mandated to develop regulations for road transport operations and services has been previously identified and this remains a priority recommendation of both the urban transport project and this ITP.

1.5.3. Asset Managers

Overseen by the ministries, a number of agencies fulfil the asset planning and management functions as follows (in strict alphabetical order):

- Department of Feeder Roads (DFR) responsible for planning, managing and maintaining feeder roads throughout Ghana
- Department of Urban Roads (DUR) responsible for planning, managing and maintaining urban roads throughout Ghana
- Ghana Airports Company Limited (GACL) responsible for managing airport infrastructure
- Ghana Highway Authority (GHA) responsible for planning, managing and maintaining a network of national trunk roads and highways throughout the country
- Ghana Ports and Harbours Authority (GPHA) responsible for managing Ghana's maritime port assets
- Ghana Railway Development Authority (GRDA) responsible for regulating future rail operators and managing the rail infrastructure assets
- Ghana Road Fund (GRF) responsible for collecting revenues for road maintenance purposes

With the exception of DFR, DUR and GRF, who report through the Ministry of Roads and Highways (Minister and Chief Director), all other agencies are mandated through their formative legislation to act as separate legal entities, planning, managing and reporting on their performance.

DFR, DUR, GHA and GRF report to the Ministry of Roads and Highways and the MRH provides the secretariat for the GRF.

DFR, DUR, GHA and GRF are well established organisations with experience of managing large road sector development programmes and projects. Organisationally they face many governance, management, financial and supervisory challenges and they have not achieved the level of 'autonomy' that might be expected of road agencies operating primarily as asset managers.

GACL, GPHA and GRDA report to the Ministry of Transport

Since its formation, GACL has been hampered as an asset manager by uncertainties about its ownership of assets including those to be transferred from GCAA and the long-term tenure of airport lands.

GRDA has been created to plan and manage Ghana's railway infrastructure assets but currently lacks the capacity and resources to fully implement its responsibilities.

GPHA is well established and effectively engaging with the private sector to develop Ghana's port assets.

1.5.4. Service providers

A number of agencies fulfil the service provision functions as follows (in strict alphabetical order):

- Ghana International Airlines Company Limited (GIA), Ghana's national carrier and responsible for providing aviation services

- Ghana Ports and Harbours Authority (GPHA) responsible for managing Ghana's maritime port assets but still providing 30% stevedoring services in Tema and Takoradi ports
- Ghana Railway Company Limited (GRCL) responsible for providing passenger and freight rail services
- Ghana Shippers Authority (GSA) a representative body for shippers operating in Ghana (previously Ghana Shippers Council)
- Ghana Trade and Technical College (GTTC) responsible for providing training in trade and technical skills suitable for use in the transport sector
- Mass Metro Transit Ltd (MMT) responsible for providing bus passenger services
- Regional Maritime University (RMU) responsible for providing specialist training for mariners, maritime operators and regulators
- State Transport Co Ltd (STC) responsible for providing inter-city coach passenger services
- Volta Lake Transport Company Ltd (VLTC) responsible for providing ferry services on Volta Lake and the Volta River

All of the agencies listed above are created as separate entities with their own Board; reporting to the Ministry of Transport for oversight purposes. Their performance is analysed in their respective modal sections in Chapter 2,

As well as the governmental organisations identified above, there are a large number of stakeholder groups actively engaged in the transport sector. These comprise the various service providers, vehicle owners and operators, driver and owner unions, trade associations, etc.

In the Aviation sub-sector, local carriers such as Antrak and City Link provide domestic air services. An increasing number of international airlines operate to and from Accra including sub-regional connection services. Other operators, such as Aviance provide aviation support services.

Ghana does not possess a national shipping line although local operators provide a range of services to the ports and maritime sector.

Local transport on Volta Lake and other inland waterways is characterised by small scale, owner operators, poorly trained, equipped and uninsured.

A range of non-governmental organisations are also involved in road transport services. The following list based on the membership of the Ghana Road Transport Coordinating Council (GRTCC) provides a useful indication of the range of road transport service providers and their representative bodies:

- Intercity State Transport Company (STC)
- Ghana Private Road Transport Union (GPRTU)
- Concern Transport Union (CONCERN)
- Association of Liberal Transport Operators (ALTOPS)
- Ghana National Cargo Transport Association (GNCTA)
- Commercial Drivers Association (CDA)
- Positive Drivers Union (PDA)

- Unity Transport Union (UNITY)
- Express Drive Transport (AWOTWE)
- Ghana Coach Owners Association (GHACOA)
- Great Imperial Transport (IMPERIAL)
- Ghana Cooperative Transport Association (GCTA)
- Ghana Haulage Transport Drivers Association (GHTDA)
- Progressive Transport Drivers Association (PROTOA)
- Ghana Road Haulage Association (GRHA)
- Pergah Transport Service (PERGAH)
- Redeemer Transport Service (REDEEMER)
- Labour Enterprise (LET)
- Kingdom Transport Service (KTS)
- Transcity Express (CITY EXPRESS)
- Agate Transport Service (AGATE)
- Mighty Transport Union (MIGHTY)

1.5.5. Decentralised Government

In addition to the central agencies noted above, in accordance with the 1992 Constitution and Local Government Act, 1993 (Act 462), every Metropolitan, Municipal and District Assembly (MMDA) is mandated to plan, regulate and manage transport infrastructure and services in their respective localities.

In some cases additional bodies, working within the existing authority of the MMDAs, are being considered such as the Greater Accra Transport Authority (GATA) to plan, regulate and manage passenger transport services throughout the Greater Accra area.

With the exception of taxi registration and isolated incidents of boat operator licenses being issued by District Assemblies on the Volta Lake, there is no evidence of widespread transport planning or regulation undertaken by the MMDAs. One DA has managed a ferry service on the Lake although this was discontinued as the ferry fell into disrepair.

The urban transport project is pioneering the development of bye laws, institutional capacity and procedures in Greater Accra and Kumasi intending to introduce route and operator licensing in those locations by 2012. This has involved the creation of urban passenger transport units (UPTUs) in each of the MMDAs involved, recruiting and training personnel, developing and implementing operating manuals and undertaking extensive public consultation with users, service providers and local authority personnel.

The MMDAs are also responsible for land use planning and the importance of land use plans to transport planning have been explained in Chapter 1. This remains a significant area of concern for transport planners for which the authority needed to implement a more comprehensive land use planning process lies outside the transport sector.

The current plans to decentralise road infrastructure management is a significant challenge facing the transport sector. Plans assume that the Department of Urban Roads (DUR) and the

Department of Feeder Roads (DFR) will be fully devolved to the Local Government Service (LGS) with the possible exception of some head office and strategic planning functions which, within the current institutional arrangements, would most likely be retained in the Ministry of Roads and Highways.

Current decentralization plans pre-suppose that a governance environment exists at the MMDA level with established management capacity to ensure the effective organization of road network management including adequate human resources. Current decentralization plans also anticipate the creation of District Works Departments (DWDs) in each of the District Assemblies and Metropolitan and Municipal Roads Units (MMRUs) in each of the Metropolitan and Municipal Assemblies. It is anticipated that capacity would be developed for the DWDs to manage the finances, procure and supervise the works involved in road network management alongside the management of local housing, public works, water and sanitation projects.

Due to the recognized lack of personnel available for each District, in practice, this may require that a number of District Assemblies join together to jointly resource 'Area' offices, as they are already mandated under Local Government Act 462. Efforts have been made to find a practical solution to local road network management through the 'Area Office' concept. However, the pilot projects have had limited success in ensuring balanced cover of technical and supervisory personnel for road network management across each of the Districts covered. Further pilot programmes have been undertaken aiming to create DWDs in each District by directly appointing technical and supervisory personnel to manage some aspects of road maintenance alongside the management of local housing, public works, water and sanitation projects.

Driven by the rapid expansion of Metro and Municipal Assemblies, DUR now has offices in 18 locations. This poses considerable challenges to the organisation, logistics and personnel.

In all cases, so far proposed, it is also anticipated that existing DUR and DFR personnel will be transferred to the Local Government Service (LGS), assigned roles in the respective MMDA Departments including 'back stopping' roles within the Regional Coordinating Councils (RCCs). Some proposals suggest that some DUR and DFR Head Office personnel would be retained for policy and planning purposes either within a Ministry environment or within a road authority.

Fiscal decentralisation is also necessary and has so far extended to allocations to each MMDA from the Common Fund, small amounts of locally generated revenue and some directly applied Donor funding for local development projects. Currently, and in the foreseeable future, the dominant source of funding for road maintenance activities will come from user charges and fees as raised currently by the Ghana Road Fund. Most road development projects receive funding from Donors and are administered centrally. The proposed decentralization will require a mechanism for the objective, cost-effective and fully accountable distribution of this funding to MMDAs.

Decentralisation of road network management has been the subject of various reports including a thorough analysis and review by the (then) Ministry of Transportation's Institutional Reform Working Group (2007). The Working Group identified that a number of challenges needed to be overcome in the transition from central to local government control. They said that mechanisms should be found to ensure:

- No deterioration in the overall network condition and subsequently no loss of asset value

- Collaboration between the MRH, MLGRD, Road Agencies and MMDAs is achieved to formulate and implement a performance-based solution – effective management of the overall road network is of paramount importance.
- Adequate governance and accountability arrangements are created in the MMDAs to ensure the road network under their control is effectively managed throughout the transition.
- Mechanisms are created and consistently applied that enable the MMDAs to fulfil their primary decision making role for local road networks in cognizance of national policy objectives, agreed technical criteria and availability of investment funds.
- Priorities, for road maintenance and development investments, are determined by the use of nationally agreed decision making and referencing tools and adopted as standard practice, for example: Highway Design Model IV (HDM4), Roads Economic Decision Model (RED), Road Prioritisation Methodology (RPM) for stakeholder participation, Geographical Information Systems (GIS).
- Funding made available for road maintenance and development at the local level is dedicated for roads and not redirected to other activities. Eg. The Road Fund Law restricts the use of the fund, only for road maintenance
- The scarce road management and supervisory skills currently residing in DUR and DFR are retained and utilised effectively.

Whilst decentralisation is clearly established in the Constitution, there continue to be uncertainties about the eventual institutional arrangements in which it will be implemented.

1.6 Human Resources and Capacity available to the sector

Studies over the last 5 years have identified that, despite there being an increasing number of well qualified and dedicated personnel, important capacity and skills gaps exist throughout the transport sector. These can be summarised as follows:

- Lack of appropriately qualified technical personnel to fill existing functional requirements. There are critical examples from each mode in the areas of:
 - Site management and engineering supervision for road construction and maintenance. The problem affects private sector contractors, consultants and public sector 'supervisory' agencies.
 - 'Operator' competence for road transport services – affects level of services and user safety
 - 'Operator' competence for inland water services – affects level of services and user safety
 - Availability of locally trained pilots and aviation engineers – local demand cannot be satisfied
 - Management and administration skills for maritime services – affects organisational efficiency
 - Commercial Management and business planning in Ghana Railway Company Ltd – affects ability of GRCL to adapt to new operating environment
- Skills and knowledge gaps caused by the changing face of policy making, planning and decision making in the sector including the need for: (i) wider stakeholder consultation and engagement in policy formulation; (ii) longer term 'sustainable development' planning; (iii) increased coordination and integration between sectors of the economy; (iv) integrated transport planning and modelling; (v) public information gathering and distribution; (vi)

understanding, facilitation and support of the private sector including the development of various forms of public private partnerships.

- Lack of appropriately qualified personnel to fulfil the new separated responsibilities of public sector organisations including appropriate knowledge, skills and disciplines:
 - To undertake integrated economic and transport planning
 - Amongst Board appointees to implement corporate governance standards anticipated of corporations and 'autonomous' agencies governed by the Companies Act or similar.
 - To develop and enforce regulation of transport sector services on behalf of transport users
 - To undertake the management, planning, financial management and supervision of infrastructure projects
 - To plan, develop and provide commercialized operations

- As is evident in assessments of the sector's human resources, morale and motivation are key factors affecting performance. Apart from the often cited inadequate remuneration, other reasons can be cited such as:
 - The lack of flexibility for organisations to match remuneration with performance
 - The lack of clearly defined mandates for organisations and individuals and hence a lack of performance-based evaluation of personnel
 - Lack of structure in some modes, particularly road transportation where entry levels are low and unregulated
 - General unwillingness (noticed particularly in decentralised government) to value and engage professional services
 - Lack of understanding of the pressures on Government to adapt, develop and reform the public sector and hence a resistance to change and adopt new practices. This is particularly evident where more commercialized and evidence-based approaches are required.

Perhaps most evident in the road infrastructure and transportation sub-sectors, there is the need for a holistic approach to improving performance that includes:

- Knowledge and skills acquisition including on-the-job training for operatives, technicians and management
- Restructuring and formalising of the sector to demand higher professional and management standards of entry, including a 'license to operate' based on capacity and performance
- Recognising in law professional and managerial qualifications and standard (including the recognition of professional bodies and the establishment of new categories of 'operator')
- Creating a performance based work environment, as required in the National Transport Policy Goal 5, where managing 'agencies' have the flexibility to match remuneration with performance

In summary, it is not sufficient to train personnel. It is essential also to create a demand for their newly acquired competencies within an industry structure which values professionalism and performance.

Many difficulties have also been identified in the education and training institutions. A general lack of trainers and educators is reported especially with the knowledge and experience of modern transport policy formulation, planning, financing and management. This has led to a reliance on personnel attending overseas training courses with the subsequent loss of their expertise in the workplace during their attendance and often immediately after their qualification due to their increased attractiveness on the international jobs market.

Other problems reported by training institutes include:

- Lack of training facilities including student accommodation
- Difficulties recruiting and retaining appropriately qualified trainers
- Lack of physical facilities including modern teaching resources and equipment

Previous studies on the state of human resources in the sector also identified a range of 'attitudinal' issues which affect the attainment of reforms and development envisaged by Government. Whilst these are not unique to organisations in Ghana's transport sector, they do indicate the extent to which attitudes and behaviour need to change to achieve the 'performance-based' environment described in Goal5 of the NTP.

These can be summarised as follows:

Table 1 : Summary of changes envisaged for transport sector organisations

From	To	Comment
Inward looking (silo thinking)	outward and strategic approach	Relinquishing a defensive and secretive approach for a more pro-active and inclusive approach to policy formulation, planning, monitoring and evaluation – developing the ability to express sector performance in terms of benefits to other sectors of the economy
Risk averse	Tolerant of uncertainty	To create an environment where innovation, new technologies and practices are objectively assessed and adopted where beneficial
Very short-term planning	Medium to long-term planning	Improving sustainability of decision making by matching planning horizons with life-cycles of sector components (e.g. Rail infrastructure requires a 25 to 30 year time horizon to recover investment costs)
Informal	Formal	Providing structures and benchmarks in which performance can be defined and delivered
Personal and	Consultative	Reflecting the need to engage with wider-ranging stakeholders in policy formulation and strategising
Meetings-based decision making	Delegated responsibility	In support of performance based management principles
Hierarchy and rules	Operational and costs	Where outputs are clearly described in the corporate strategies and business plans

The changes envisaged as a result of external pressures to adapt and improve performance will have impacts on the organisational structures and job descriptions throughout the sector.

2. The current state of integration and multimodality

An important objective for this ITP is to improve ‘integration’ – it is necessary to understand how the transport sector is currently integrated at different levels

2.1 Sub-regional integration

Sub-regional integration involves the coming together of the West-African states, through reciprocal preferential agreements, based on integrated cooperation arrangements in key sectors of common interest. Besides the UN, Ghana is an important member of the Economic Community of West African States (ECOWAS).

Among key sectors of the on-going integration process, it is increasingly recognized that the transport sector serves and facilitates intra-regional trade and free movement of the factors of production. Ghana’s location at the cross-roads of several trade corridors in West Africa

makes the issue of transit transport a major challenge to strengthen the role of the country as an important player in the regional integration and trade facilitation programs.

This section focuses on the achievements, problems and challenges of key components of the regional integration process in terms of:

- Roads and Railway infrastructural development
- The ECOWAS transit system and the GCnet (i-trade and transit Ghanaian system)
- Sub-regional Integration of railways
- Sub-regional Integration of air transport
- Sub-regional Integration between transport modes

2.1.1. Roads and Railways infrastructural development

Transit transport is a major challenge for Ghana given its favourable position in serving intra-regional trade (east-west and north-south) including the overseas trade of landlocked countries. Main achievements in terms of infrastructure development involve:

- The east-west, Abidjan-Lagos corridor (Highway corridor)
- The north-south routes from Tema to landlocked countries (Burkina Faso, Mali, Niger) including a 795 km rail link to provide a connection with Burkina Faso
- Accra to Lagos through Lomé and Cotonou by rail.

East-west routes: the Abidjan-Lagos highway corridor

At a continental scale, the most relevant on-going infrastructure development is the Trans-African Highway: TAH. The TAH network is made of 9 continental corridors, within which, the corridor TAH 7 is linking Ghana to other African countries on an east-west axis. The TAH 7 goes from Dakar to Lagos, passing through Accra. It continues as TAH 8 Lagos-Mombasa and forms in total a 10,269-km east-west crossing of the continent. This highway also joins with TAH 1 to form an additional north-south route around the western extremity of the continent.

At the Africa scale, the TAH is a project developed as part of the UN support to African Union (AU) and Program (New Partnership for Africa's Development (NEPAD), with funding from the African Development Bank. At a Sub-regional scale, the project is supported by ECOWAS, which drives the development and maintenance of TAH 5 and 7.

From Dakar to Lagos, the TAH (Highway N° 7), is made of 4010 km. The corridor is almost complete and paved in about 80% of the route.

From Abidjan to Lagos, the status is as follows:

- From Abidjan to the Ghanaian border, the Highway is complete
- From the border, in Ghana, the existing road goes through Cape Coast and Accra and further to the border with Togo.
- In Togo, a section of 80 km is being replaced by a new road by-passing Lomé on the north side.
- The Benin section through Cotonou and Porto Novo is existing up to the Nigerian border and

- In Nigeria, about 60 km from the border to Lagos is existing.

The whole highway is two-lanes, with the exception of short four-lane sections in the eastern third of the route, including Ghana.

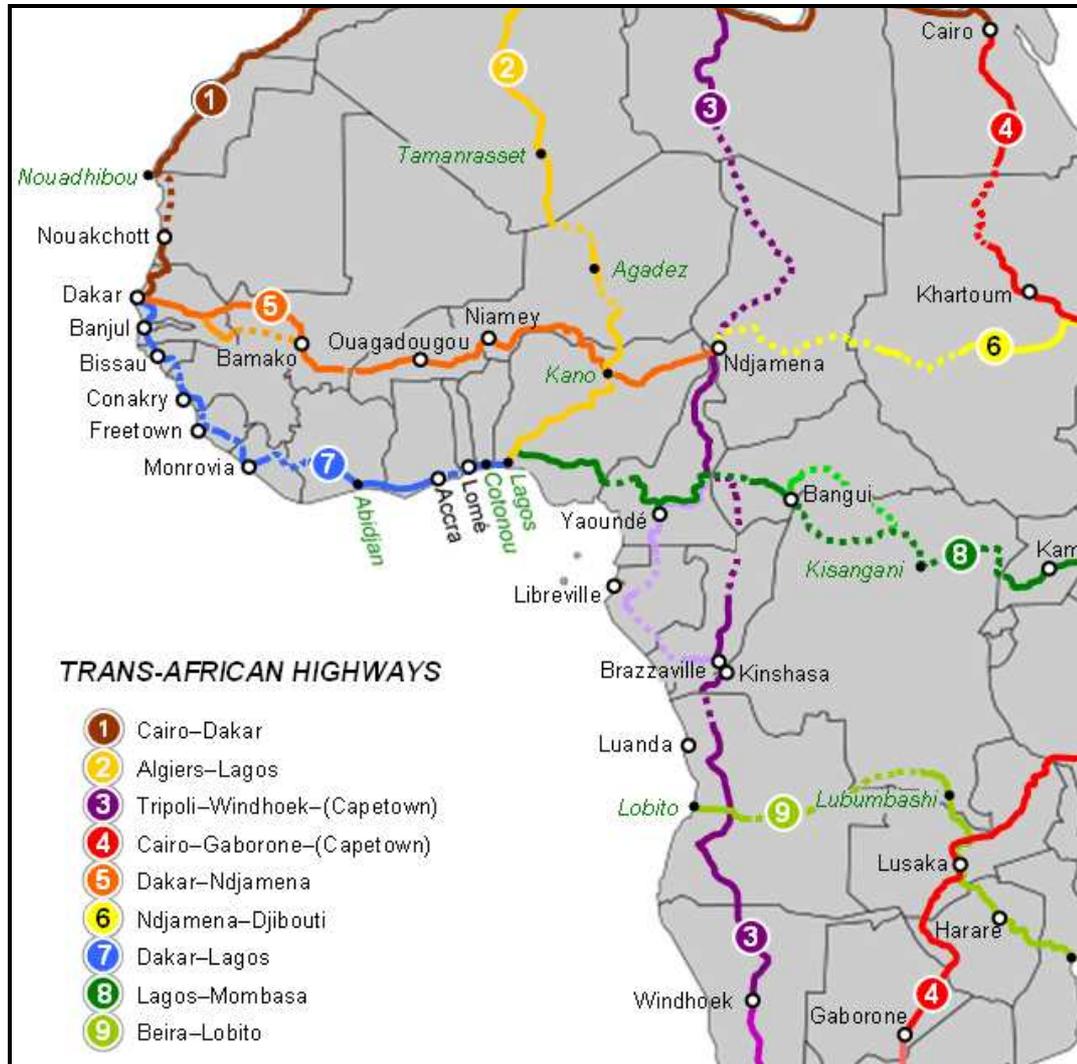


Figure 5: The Trans-African Highway

The level of flows of intra regional trade as compared with the overseas trade or even transit traffic is relatively low so that the investments, especially in rail transport, often appears as premature.

Visible progress within ECOWAS has been made, especially on the Abidjan Lagos section, including:

- Continuous cooperation at the Border level, within ECOWAS, through the National Committees for Transport Facilitation and Road Transit
- At Regional level, in partnership with ECOWAS for the Managing Directors of Control agencies (Customs, Immigration, Police, Transport) and the press for the five countries of the Corridor, with the participation of WAEMU, the USAID / West Africa Trade Hub (WATH), SSATP and World Bank
- An Observatory of transport conditions which is now operational,

Main problems observed on Abidjan-Lagos relates to

- Transit times are too long (about ten days),
- The transport costs are quite significant and, especially, they are not controlled (not transparent nor easily understood);
- Sub-standard vehicles are used on the route
- Frequent overloading affecting the road condition and safety,
- Rather vague legal context with a multiplication of guarantees
- Systematic escorts and higher cost, instead of sealed transport under application of proper procedures of the TRIE system
- Too many on road controls (check points).

The North-South routes: routes from Tema to landlocked countries (Burkina Faso, Mali, Niger)

Bamako, Mali and Ouagadougou, Burkina Faso (the two landlocked countries of ECOWAS), but also Niger are already linked to the coastal highway by paved highways to Abidjan, Accra and Lomé. The landlocked countries are served by five competing corridors, as follows:

- The Abidjan road and railway corridor to Burkina (the “historic” corridor)
- The Lome corridor (also historic)
- The Tema corridor, which has developed considerably in response to the Ivorian crisis (since 2003).
- The Cotonou corridor, basically reserved for oil imports, less convenient for general cargo
- The Dakar – Bamako rail corridor

The competing position of Ghana as compared with alternative transit routes is good in terms of distances and better in terms of controls along the route, as shown in the following tables.

Table 1: Distances from/to Tema in comparison to competing alternatives

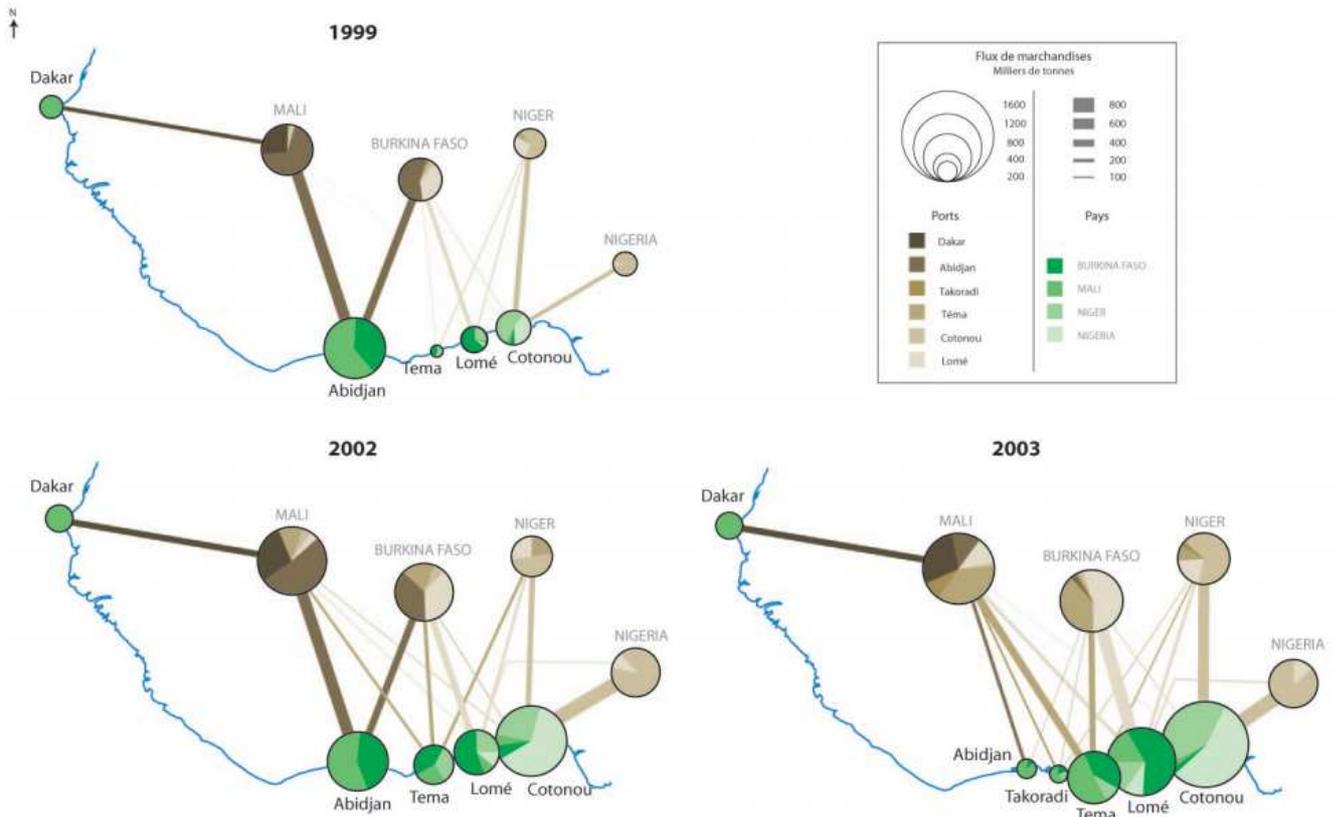
	Ouagadougou	Bobo-Dioulasso (Dry port)	Bamako	Niamey
Abidjan	1,176		1,225	1,708
Takoradi	971	1,280		
Tema	<u>968</u>	1,277	<u>1,994</u>	<u>1,475</u>
Lomé	990	1,282	<u>1,967</u>	<u>1,241</u>
Cotonou	1,200	1,300		1,060

Source: Mike Griffin, Ghana Ports and Harbours Authority

It is also favourable in terms of number of checks points. Indeed, while the number of stops in Ghana has been recently reduced, none of the other transit countries or even the land-locked countries reduced the number of stops along the principal roads.

The route through Ghana is also favourable in terms of road conditions. The National Highway N6 & N10 are the official transit corridor mainly to Burkina Faso and Niger. The official transit

corridors are all in good or fair condition. This explains a clear trend in transit traffic diversions of shipments through Ghana (from Abidjan), particularly since 2003 (civil war in Cote d'Ivoire) as compared with more "traditional" routes through the francophone countries. The following charts show (although the figures are outdated and more recent not available), the increasing role of Tema as a transit port in the sub-region:



The following figures summarise recent trends in transit traffic volumes by country of origin – destination, from/to Tema and Takoradi.

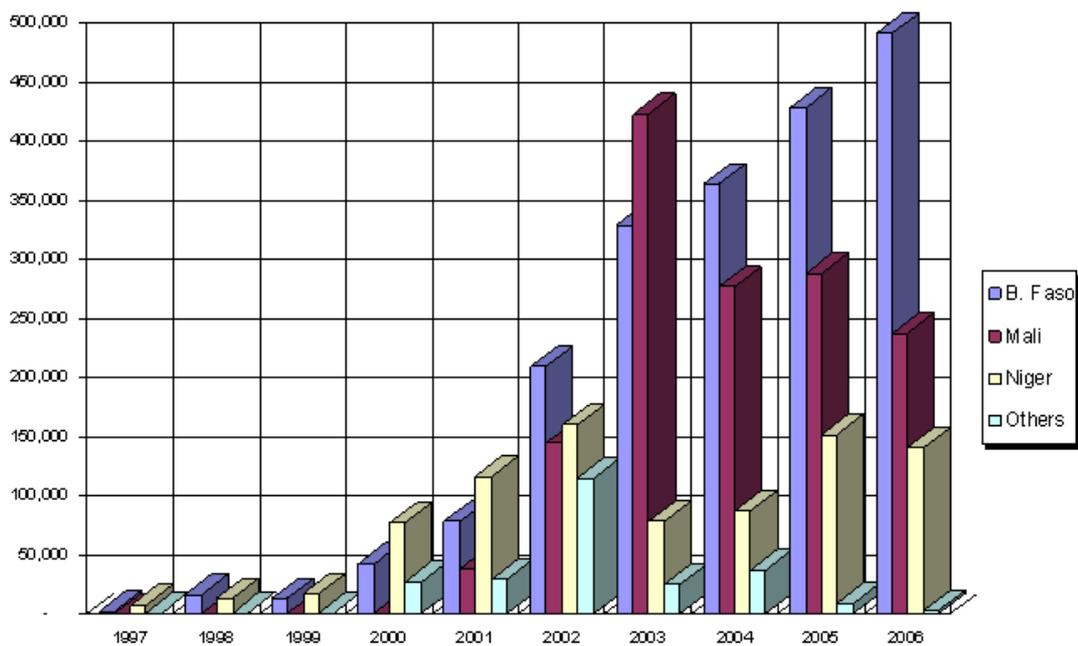
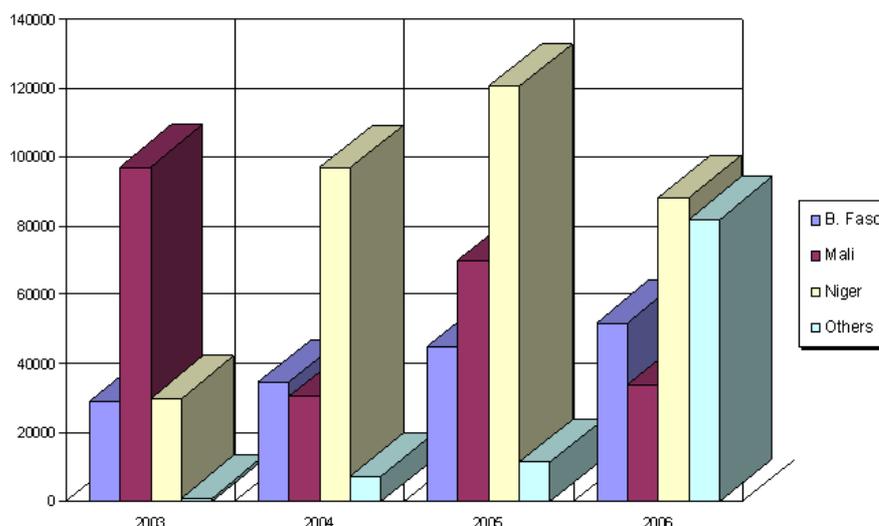


Figure 6: Tema transit by country of origin/destination**Figure 7: Takoradi transit by country of origin/destination**

This trend represents a 10 to 15% average increase per year.

From a sub-regional integration point of view, this trend is to be encouraged. This transit traffic has impacts on infrastructure and on the customs administration's capacity to manage that transit. But it is also a source of service activities and a further reason to create a regional dynamic of transit facilitation and to seek economies of scale.

2.1.2. The ECOWAS transit system and the GCnet (i-trade and transit Ghanaian system)

One of ECOWAS main achievements includes the Free Movements of Persons: Free movements of persons include the abolition of visa and entry permit requirement and guaranteeing the right of residence and right of establishment. This has been exemplary in ECOWAS as no visa is required any where for nationals of Member States who travel across the ECOWAS region.

For freight, the transport operation within countries is governed by regional instruments, which are rather sub-standard as compared with the i-customs and i-transit system developed in Ghana.

Freight Transport within ECOWAS and UEMOA member countries is mainly governed by two Conventions:

- The Interstate Transport Convention,
- The Interstate Road Transit Convention and by numerous bilateral agreements.

A third party insurance scheme has also been introduced.

In Ghana, the current customs and transit procedures are based on the GCnet system or i-transit.

The electronic procedures of the Ghana Customs Excise and Preventive Service (CEPS) are only permitted at approved entry points. This must be separately and specifically reported on the manifest. Customs have access to GCMS and therefore can check declarations related to

consignments leaving the port area, but also follow goods in transit under one of the 7 different regimes (exports, imports, temporary and international transit, etc.).

The system uses a guarantee bond or cash deposit as collateral. Invoices accompanying the declaration help to determine the value and corresponding duties. Trucks under bond are to travel on approved roads and report at designated customs stations. A satellite tracking system, introduced in August 2007, is part of the system.

Goods in transit benefit, generally, from a reduced tariff (structured to the advantage of the transit operator).

The results are outstanding:

- Processing time fell from 2-7 days to 2 minutes
- The number of documents required for clearance fell from a maximum of 30 to 1
- Transactions rose from 10,000 per day to 30,000 per day
- Trade forwarders estimate that they saved 20-35% of transaction costs
- Customs duty and excise tax revenues enter the Treasury's coffers immediately rather than after a long delay
- Trade statistics are prepared in a prompt manner
- Traders can lodge information with a single body to fulfil all import and export related regulatory requirements and the number of transactions is reduced to a minimum.

However, if Ghana has a high competitive advantage for transit, serious problems, affecting equally all the competing corridors, still exist:

- Poor control of axle loads on all routes: the widespread practice of overloading has a considerable cost for infrastructure and for the logistics chain.
- Low containerisation rate: the overloading of existing trucks is detrimental to containerisation, and consequently to the modernisation of transport and logistics services. Lack of coordination between ECOWAS competing countries makes unequal control at ports. The less the control, the higher the traffic, but incurring higher economic and social costs.
- Indiscriminate parking of cargo trucks
- Social impacts in and around the ports, as well as along the road
- Diversion of goods (commercial fraud, especially by shadow freight forwarders)

2.1.3. Sub-regional Integration of railways systems

Even when fully operational Ghana railways network provided no links with the sub-region. The figure below shows that more than lack of integration, there is a huge lack of rail infrastructure in the region added to the scarcity of infrastructure and the use of three different gauges within the sub-region.

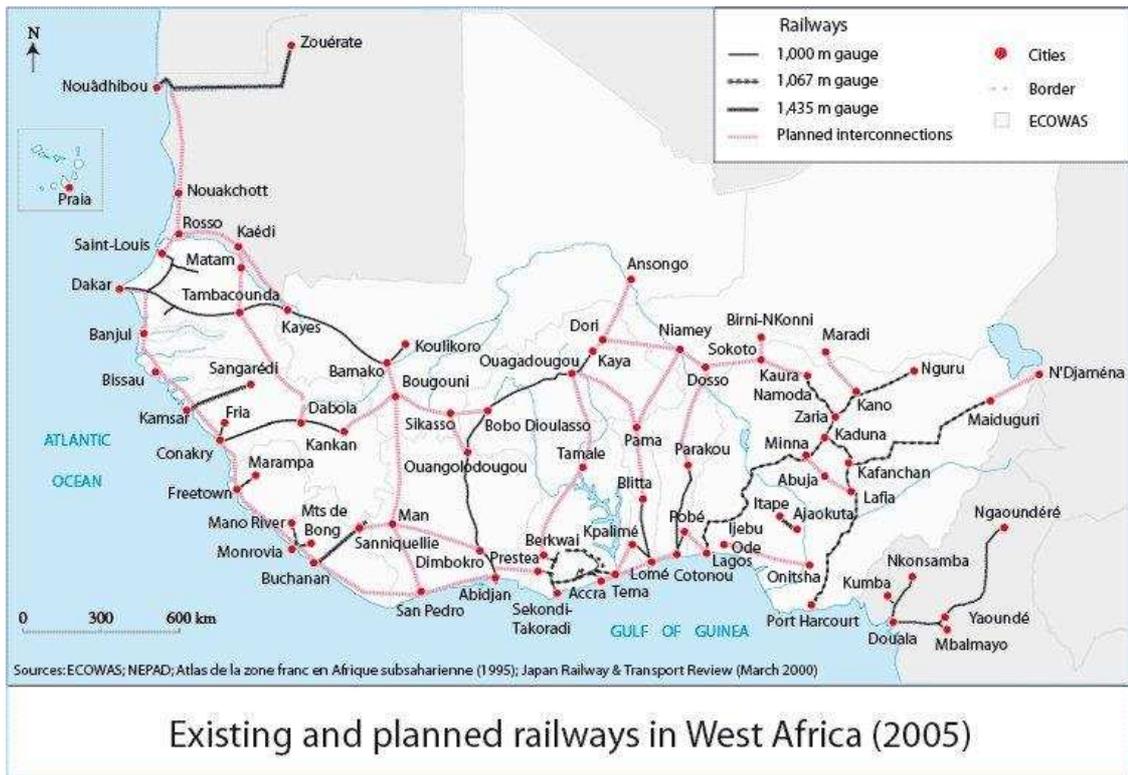


Figure 8 : Rail network in ECOWAS Region.

Plans for sub regional railway development abound yet the lack of: (i) a common track gauge in neighbouring countries; (ii) viable demand for services over sections planned to connect between countries; and (iii) affordable funding from international donor agencies, frustrate attempts to develop national systems with the potential for regional connectivity.

2.1.4. Sub-regional Integration of air transport systems

Kotoka Airport has developed as an important node. It is well connected regionally and internationally and gives hope for further development. Currently it operates flights to the following African destinations:

- Abidjan
- Abuja
- Addis Abeba
- Bamako
- Banjul
- Casablanca
- Conakry
- Dakar
- Freetown
- Johannesburg
- Lagos

- Lomé
- Monrovia
- Nairobi
- Ouagadougou
- Tripoli
- Windhoek

The graphic below shows the evolution of passenger traffic between Ghana and the rest of Africa by main region (in passengers/year). We can see a recent strong evolution in the traffic within the West Africa.

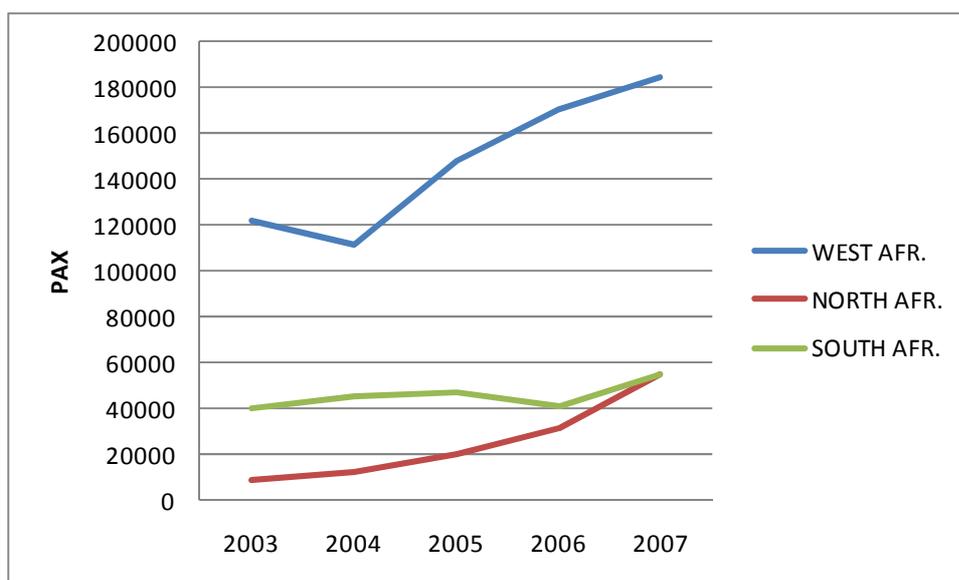


Figure 9 : Evolution of air traffic between Ghana and the rest of Africa

2.2 Integration between transport and development planning and other sectors of the economy

The advent of Government's strategy-led approach to planning and prioritising development in Ghana offers the possibility of improved governance and accountability. However, its full realisation also poses several challenges to the sector and non-sector stakeholders alike.

The demand for transport is derived from socio-economic activity in the Country. As socio-economic activity increases, demand for transport increases. Therefore, as implemented in this Plan, there is a need to prioritise development in the transport sector that best meets the future demand for transport created by other sectors of the economy and the socio-economic activity of the country.

The best results require a long-term perspective to be taken by Government and its Sector Ministries, especially those which have the greatest impact on, or need for, transport. As has been evident in the formulation of this plan, there are several factors mitigating against the full potential being achieved in this, Ghana's first integrated transport plan. The following points explain why this is the case:

- There is currently no development master plan for Ghana. A development master plan provides guidance on Government's long term development objectives which are especially critical when predicting transport demand associated with new centres of population, production and trade as may be envisaged. In the absence of guidance on long term master planning (20 years), forecasts of demand will either be limited to shorter time horizons or based on general socio-economic activity forecast for the long-term period. The latter approach has been taken in formulating this ITP.
- There is a lack of land use plans produced by the MMDAs for their locality. Despite Government's stated objectives, as clearly stated in the NTP, there is insufficient evidence of (i) MMDAs developing and enforcing land use plans; or (ii) integration between the land use and transport planning processes. Problems arising today, particularly evident in the urban areas such as congestion and long commuting distances, are results of unplanned and coordinated development in the past. Without the necessary planning leadership and integration at MMDA level, transport planners will be unable to avert even worse problems in the future. This ITP includes proposals for institutional development to address this issue.
- There is a lack of policies and strategic development plans in other sectors of the economy which both impact on transport and look beyond the 2010-2015 period. In the absence of long-ranging sectoral plans (i.e. those looking 10, 15, 20 years ahead) being available from sector ministries, forecasts of demand are necessarily based on general socio-economic activity and/or best-guess predictions by transport planners. No attempt has been made to 'best-guess' development in other sectors of the economy as this appears to counter one of the core objectives of this project: that is to implement a more objective and evidence-based planning methodology.
- Data is a critical component for effective transport planning. In this case, the planning team has experienced difficulties in locating data from many sources including Government MDAs responsible for data collection and analysis and Government MDAs responsible for quantifying performance in other sectors of the economy. Often, data has not been collected and is simply not available. In some instances, when the owner of original data has been identified difficulties have hampered its acquisition to the point where in some cases data was never released. Where data has not been forthcoming from original sources, alternative sources have been sought, often incurring additional expense and delay to the process and often requiring further adaptation and validation before its use. Differences are often found between data from alternative sources thus requiring additional validation before use. This is not a new problem for the transport sector and many projects are underway to collect data appropriate for planning, management and performance reporting purposes. In some cases, data has become available to the planning team at a late stage in the process, in which case every effort has been made to incorporate the new data into the final output.
- At the root of the difficulties is a general lack of communication, cooperation and information sharing between MDAs within the transport sector and between the transport sector and other sectors of the economy. Experience from the formulation of this Plan supports the evidence of previous studies which highlighted the 'silo' working practices of government as major inhibitors of effective coordination, integration, planning and implementation. These characteristics inhibit performance improvement in the sector. The need to establish formal mechanisms and organisation mandates, to aid communication and coordination between organisations, is increased as functional separation is achieved within the transport sector's institutional framework. Therefore institutional reforms must

seek to achieve functional separation and provide formal mechanisms in which coordination will take place.

The effectiveness of transport sector planning is therefore highly influenced by a range of factors outside the control of the sector including the state of: (i) Economic development planning and master planning for the Country; (ii) Strategic planning in key sectors of the economy; (iii) Land use planning by local authorities; (iv) Data collection on socio-economic factors, its accuracy and relevance; (v) Adherence to strategic development plans and local land use plans, including enforcement, monitoring and reporting; and (vi) Information sharing within the public sector and with non-governmental stakeholders including availability of data suitable for transport planning purposes.

A final point regarding integration is concerned with the way the transport sector currently plans.

There are two ministries and over 20 separately mandated departments and agencies obliged to plan their activities. As has become evident in the preparation of this Plan, there are variations in planning cycles and time horizons utilised by the individual organisations. With limited mechanisms for coordination within the sector, it is no surprise therefore that plans are most often developed in isolation of other MDA's. This is particularly evident between modes and Ministries.

For example, plans are afoot for development of an inter-modal corridor using railway and inland water from Tema to Buipe. Alongside this are plans to develop 2 railway routes to the north in addition, of course, to the existing north-south road corridors running up the west, centre and east of the Country.

In many cases, schemes are proposed with often competing objectives, utilising data that has been separately applied to different projects, such as predicted traffic flows and future demand. For example, a key factor in the viability of four, of the north-south, routes noted above is the transit traffic carried to and from the land locked countries of Mali, Burkina Faso and Niger. As a result, schemes are presented as potentially viable in different modes and expectations are unrealistically high for the potential of multi and inter-modal development.

In order to ensure a realistic assessment of viability and potential for multi-modal solutions, it is necessary therefore, to apply a robust planning framework in which all potential projects can be analysed against the total demand; eliminating 'double-counting' and conflicts of interest between agencies, modes and projects.

2.3 Integration between transport modes

The lack of integration between transport modes is explained by two reasons:

- The lack of alternative modes
- The lack of integrated planning

As discussed before the lack of integrated planning is a major issue for efficient transport provision. But even before reaching the desired level of integration, some coordination is needed between the agencies in charge of the different modes in order to ensure that action and projects for one mode ensure compatibility and provide the opportunity for users to combine modes along their route.

The lack of alternative modes is a more critical issue. A prerequisite to modal integration is to have at least two working modes. Both for freight and for passengers, there are only a few origin-destination pairs for which modal integration can be possible at the moment.

2.3.1. Freight modal integration

Basically, we can only talk about modal integration for freight at the following points

- **Takoradi Port:** connection between the port, the road network and the western line. The western railway connects the bauxite and manganese mines to the ports. As described in chapter 2 section 3.3 the western line is in a very poor condition and its traffic (from the mines to the port) diverted to the road.
- **Tema Port:** connection with the road network and in particular to the official ECOWAS corridor. There is currently no rail connection at Tema port.
- **Akosombo:** Pipeline connexion to the oil refinery in Tema. This is not currently used since BOST is not transporting fuel through the Volta Lake.
- **Buipe:** connexion to Akosombo via the Volta Lake. Currently cement and general cargo (and passengers) are transported. Navigation North of Buipe is not possible all year around due to water level problem ; convoys must stop at Debre where there is no facilities and no pipe-line connection to Buipe oil depot. The pipe-line from Buipe further North to Bolgatanga at the border with Bukina Faso) has been built, but is not yet in operation.
- **KIA:** there is a limited but growing amount of agriculture products delivered to KIA by road for export by air.

2.3.2. Passenger modal integration

- **KIA:** Airports are natural intermodal centres. In Ghana only road connexion is available at airports and in particular to private vehicles (private cars, taxis and hotels or tourism operator transport).
- **Urban railway stations:** Park and ride facility in Asoprochona. In Achimota a bus station has been developed about 1km away the railway station. There is no evidence of coordination between the road and rail facilities in this case.
- **Non-motorized transport:** there is a clear need for improvements on the access to bus and railway stations by non-motorised transport. Access is restrained by the road infrastructure and safety problems for NMT as well as by the lack of safe and secure parking space (for bicycles in particular) at bus and railway stations.

2.3.3. Intra-modalism

By intra-modalism we mean the integration of passengers and goods from different means of transport within the same mode, for example bus to taxi, bus to tro-tro, heavy to light trucks, etc.

The intra-modal transfer of people and goods can improve transport conditions, safety, reduce costs and environmental impacts if service providers cans coordinate their services and facilities in order to ease connexion.

3. The transport system – challenges and constraints

3.1 Air transport

The Aviation Sector continues to face a number of challenges which inhibit the potential for Ghana to become an aviation hub in West Africa.

Ghana faces tough competition from Nigeria as West Africa's most prominent aviation hub. Nigeria has shown enormous growth of traffic in domestic and international routes and boasts many Nigerian-based airlines operating national and international routes. Data4 shows that, within West African regional airports, Ghana (capturing 10% of market) ranks 2nd to Nigeria (capturing 57% of market) in passenger movements and freight carried, but ranks 6th in aircraft movements capturing only 6% of market share.

Increases in airport passenger service charge (APSC) (now the highest in the West Africa sub-region), the high cost of fuel (ATK), inadequate maintenance and transit facilities at KIA are factors which inhibit the growth potential of international flights to and from Ghana.

There are restrictions on market access to non African carriers therefore limiting the pool of companies able to develop aviation services in Ghana. With the exception of two international routes operated by GIA, but recently suspended, Ghana is wholly dependent on foreign-owned airlines to provide international connections including the fulfilment of Ghana's bilateral agreements.

The main challenges are summarised below:

Institutional and regulatory

- Ghana International Airlines faces challenges which threaten its very survival some of which have been evident since 2007. For example, the dispute between the shareholders has affected the ability of the Company to raise funds from financial institutions to finance its expansion programmes. At the moment, its operations have been suspended by the Government.
- As a result of its inability to purchase aircraft of its own, GIA continues to wet lease its only aircraft. Whilst wet leasing of aircraft is not uncommon in the industry, it is mainly employed as a stop-gap measure in times of operational difficulties. This leads to very high Direct Operating Costs (DOC).
- Ghana's loss of FAA category 1 status means that direct flights cannot be operated by Ghanaian carriers to the USA. The lack of Ghanaian owned aircraft able to ply international routes has hampered the re-attainment of FAA Category 1 along with further mitigating circumstances such as the inadequate safety and security features at KIA. However, in 2008, GCAA signed a Technical Assistance Agreement with the Federal Aviation Administration (FAA) in a bid to restore Ghana to FAA Category 1 status.
- Even though Ghana is party to the Yamoussoukro Decision, this Decision is not being implemented fully by member states. This should have helped in a form of Open Skies Policy for the sub-region. Ghana has however been signing Bilateral Air Service Agreement with other states.

⁴ Airport Council International (ACI) 2006 in ITP Diagnosis Report 2008

- Ghana however, has an Open Skies Policy with the USA which enabled United Air Lines to operate to Accra.
- Ghana is also a member of the Banjul Accord and has to maintain membership due to benefits that inure to the state especially in technical areas.
- Good progress has been made in carrying out institutional reforms that separate the policy, regulatory, asset management and service functions of the sub-sector. The sharing of assets between GCAA and GACL has been virtually completed. However, there is a further separation planned between GCAA as a regulator, and Air Navigation Service as a service provider.
- Delays occur in applying for Air Operators Certificate and Aircraft Carriers license, what is to take about 6 months can take as long as 2 years and can deter investors' in the air transport business. There is no Closed Circuit TV (CCTV) at the domestic airports and this can cause breaches in the security system.
- Part of the Airport Passenger service charge (APSC) goes to the Government instead of the agencies which is contrary to ICAO recommendation where it is expected that all such revenues should go back to the agencies to improve services at the airports.

Infrastructure Planning

- Terminal buildings have several problems such as lack of space, only 2 boarding gates at KIA to serve all passengers, cumbersome custom procedures leading to delays to passenger's, body searches and examination of passports making the airport seem unfriendly to many travellers, small space, air conditioning problems at the Arrivals Hall. Etc...
- Several major airlines arriving around the same time can cause problems when parking and turning of aircraft on the aprons. Taxiway not rehabilitated for long time.
- There is not enough land to generate non-aeronautical revenue.
- The Common User Terminal Equipment (CUTE) for checking in passengers at the airport by the airlines does not function well.
- There are no aerobridges now, but we understand one is being constructed at KIA.
- Insecurity of water supply and power supplies together with high utility tariffs mean that operating costs for KIA are high.
- The lack of title and the increasing encroachment on airport lands threaten plans for airport expansion and also destabilise plans for GACL to raise capital for expansion against the value of assets owned.
- There are no maintenance facilities to undertake maintenance of aircraft beyond check A.
- There is no national airports master plan hence some communities' construct their airstrips without reference to such a master plan.
- General Aviation is not developed and many airstrips which existed during the world wars no longer function or are abandoned.

Operations

- High cost of fuel and airport charges detract from potential growth.
- Clearing of goods takes a long time with cumbersome custom procedures. There is no cold storage facility for fresh fruits, vegetables and meat. There are still no fuel pipelines to connect the cargo village to the fuel farm.
- Connections between international and domestic flights are currently not possible due to the lack of equipment at Ghana's regional airports for night-time flying and the lack of through-ticketing facilities with local operators. Lack of sufficient funds and payment of overtime have made GACL to close at 2pm at Tamale and Sunyani Airports.

Human resources capacity

- Ghana's aviation sector continues to suffer from inadequate levels of trained personnel. Overstaffing is also a concern, especially when considering the size of Ghana's aviation sector and the ability of agencies to raise sufficient revenue from the market available. Service and safety levels are driven by international standards making the training of inspectors, flight crew and ground staff particularly expensive.
- Few institutions exist for the training of aviation personnel and those that exist do not run key aviation courses such as the training of pilots. The Ghana Airways Training School no longer functions.
- The decoupling has resulted in vacancies at some departments in both organizations. As a result of the embargo in the recruitment of staff in the 1980's and 1990's, senior staff at both GCAA and GACL are due to retire at the same time.

3.2 Inland water, Maritime and Pipelines

3.2.1. Inland navigation and pipe-lines

Although VLTC's traffic probably represents no more than 20 per cent of the total transport activity on inland waterways, very little is known about inland navigation except along routes served by VLTC. GMA's capability to regulate and manage the sector and consequently to facilitate the development of inland navigation on Volta Lake is severely hampered by the lack of available data about the prevailing situation on the Lake and other inland waterways (navigation conditions, number, characteristics and condition of landing facilities, transport demand, etc.). In addition, GMA reports shortages in its regulatory capacity, insufficient resources and a low investment level.

Fluctuating water levels and lack of updated navigation charts on Lake Volta pose many operating challenges including the exposure of tree stumps and the Debre Shoals in low water conditions. The latter condition severely restricts the passage of barges and ferries to the northern terminal of the lake at Buipe. Whilst most problems are caused by low water levels, the current high water conditions (early 2010) have made it impossible to use the established landing facilities.

Generally speaking, inland water travel is bedevilled by a poor safety record. There is a perceived lack of skilled and competent boat operators on Volta Lake which is brought into sharp focus each time lives are lost due to a boating accident. Of the 409 craft currently operating on the Lake, 328 are wooden vessels of traditional design between 15 and 25

metres long. Inspections show that these vessels have many defects and have been involved in all 11 accidents occurring on the Lake since 1990. Due to their poor condition and characteristics, most boats sailing on Volta Lake – including that operated by VLTC – probably do not comply with the safety regulation. Problems affecting safety include: lack of updated charts; overloading; poor boat design and construction defects; incompetent boat handling; obsolete and defective regulations; bad weather conditions; lack of regular surveillance and patrols to enforce safety; lack of navigational aids; lack of loading controls (for passenger and freight).

Further clarification is also required in the area of port and landing facilities on Volta Lake. Should these assets be provided, i.e. owned and maintained, by: (i) VRA as the manager, and tacet owner on behalf of Government, of Volta lake as an asset; (ii) VLTC as a main provider of services on the Lake; or (iii) GPHA as the established manager of Ghana's port assets.

In the case of VLTC, inadequate revenues are cited as the main cause for low levels of training and poor maintenance of equipment suggesting that the fares charged are inadequate or that traffic levels are inadequate to provide viable returns for operators. VLTC struggles to fulfil the longstanding moral obligation to provide services to communities disrupted by the formation of the Volta Lake, yet receives no subsidy from Government or its owner Volta River Authority (VRA).

The potential for carrying fuel products on the south – north link of Volta Lake is dependent on pipelines owned by Ghana's Bulk Oil and Storage Company (BOST). These connect Tema with Akosombo at the southern end and Buiepe to oil storage facilities at Buiepe and on to Bolgatanga at the northern end. Tema to Akosombo is supplied by a 150mm diameter pipe and Buiepe to Bolgatanga is supplied by a 200mm diameter pipe which, although installed, is yet to be commissioned. An additional requirement in the north is a connection between Buiepe and Debre to allow for periods when barges are unable to pass to Buiepe due to low water levels. Whilst it is understood that BOST has committed to expenditure on this latter pipeline, there is uncertainty about its completion.

Of serious concern for the future of VLTC freight services on the Lake is the withdrawal of fuel products from the south-north route by BOST. BOST is currently planning to establish a competing service on the Lake which poses a serious threat to VLTC's short and long term viability. Since its withdrawal of fuel products from VLTC, BOST is consigning all fuel products to be transported by road, increasing the burden on road infrastructure throughout the country.

A key challenge is therefore to determine the strategic role of inland water transport in Ghana including the strategic role of VLTC. Viability is dependent on several factors including: the future demand for traffic suitable for inland water; a comprehensive view of the inland navigation sector which is not limited to activities performed by VLTC; the ability of VLTC to utilise fully its existing capacity; the availability of competing modes (road and rail), including the possible introduction of rail services from Tema to Kumasi and on to the north.

3.2.2. Maritime

Although the new container terminal which has recently been built in Tema has considerably eased port congestion, berth capacity is still a major physical constraint: it still needs to be increased in order to cater for the regular increase in container traffic which is by far the main traffic in Tema.

Another physical constraint faced by Ghanaian maritime ports, is depth limitation. At Tema, the maximum depth is found at the new container terminal where it is 11.50 m : this is too small to accommodate the increasing size of the container vessels calling in the sub-region. The risk is thus that Tema misses the opportunity to become a regional hub for the increasing traffic of transshipment of containers. Another risk is that the share of the traffic to land-locked countries which has been attracted by Tema over the last few years decreases to the benefit of other ports in neighbouring countries (Abidjan where the maximum draft reaches 15 m or Lomé where it is 14 m). At Takoradi, where the main traffic is export of bauxite and manganese and import of inputs for the cement industry, depth limitation is also a severe physical constraint: bulk carriers cannot be operated at berth resulting in double handling of materials including the use of barges to load ships with the corresponding delays and additional costs.

The future of Ghana's maritime ports is currently being considered in a study aimed at updating the Ports Master Plan prepared in 2002. In addition to the problems of capacity and draft constraints, this Master Plan, which should be released in the near future, will also consider the immediate need to provide supply-chain logistics which may include port facilities at Takoradi/Sekondi to handle the expected demand for supply vessels working in the offshore oil fields. Ghana would derive many benefits if the supply chain could be provided by Ghanaian owned and based supply companies although currently Ghana is without a home-based shipping line.

The implementation of the recommendation of the Ports Master Plan will inevitably raise huge financial issues: although GPHA is currently financially strong and self-sustaining, cost of major port development projects will most probably exceeds its financial capacity. As private investors look for high rates of return, development of major infrastructures with very long life duration, like breakwaters and capital dredging works, may prove to be unfeasible under Public Private Partnerships (PPP) schemes: substantial funds will have to be made available from the Government budget.

Other challenges faced by the Ghanaian maritime ports are: providing adequate road and rail links to reduce congestion at the port access and smoothen the transport logistic chain with their hinterland; improving port performances and service quality for instance through increased and fair competition in port handling services ; reducing delays due to formal and informal customs clearing procedures and police inspections; integrating a wider range of stakeholders in strategy development, planning and performance improvement; improving GPHA capacity in financial management, contracts management and licensing; ensuring good governance including prudent financial management, effective revenue collection, the creation of an inclusive and team orientated culture, and the development and retention of staff; etc.

In addition to these challenges, consolidation and growth of Tema's share in the transit business for land-locked countries is dependent on a wide range of factors such as: enforcing axle loading control on roads; improving road condition; ensuring safety and security of goods in transit; reducing transportation costs, fuel cost and transit fees; etc.

Development of a dry port has been identified in Government plans as a key factor to performance improvement in the maritime and railways sub-sectors. Whilst land has been secured at Boankra, south of Kumasi, where an administration block has been constructed, finance to develop and operate the port is not forthcoming. The realisation of Boankra dry port as an integral part of Ghana's strategic transport network hinges on its economic viability to the country and its financial viability for its potential owners and operators. The feasibility of this project still needs further investigations considering the changes which have occurred in

the last few years (in particular the opening of the new container terminal, of the Golden Jubilee Terminal and the development of private Inland Container Depots in Tema).

Good progress has been made in the ports and maritime sector in carrying out institutional reforms that separate the policy (Ministry of Transport), regulatory (Ghana Maritime Authority), asset management (Ghana Ports and Harbours Authority) and service functions of the sub-sector. Nevertheless, GPHA, which is responsible for controlling the concessionaires and stevedoring operators, still carries out 25% of stevedoring activities in both Tema and Takoradi ports: this situation may lead to conflict of interests.

The recent oil and gas finds off the coast in Ghana's Western Region pose several challenges for the maritime transport sub-sector. The transport sector's oil and gas conference (July 2009) clarified the urgent need to review legislation affecting the maritime aspects of oil and gas off-shore activities in particular addressing issues in relation with security, safety, and environmental impacts. Following the preparation of a Bill which will be submitted in the near future to the approval of the Parliament, GMA is still under extreme pressure to develop regulations and enforcement mechanisms and procedures in good time. However, whilst GMA is already mandated to coordinate these activities, it faces additional challenges caused by the multi-agency environment in which maritime regulation is developed and enforced.

Considerable efforts have recently been made by setting up a search and rescue sub-regional centre, but one should recognise that coastal surveillance, search and rescue and capacity to respond to oil spills still need to be substantially developed.

Generally speaking, there is a shortage of local skills and capacity in the administration and management of the maritime sector. Although, the Regional Maritime University (RMU) provides courses on a wide range of subjects drawing students from many countries throughout Africa, it faces many challenges in securing funding to complete and extend its teaching and accommodation facilities. Recruitment of experienced teachers (like retired captains and master mariners) is difficult. The RMU suffers from the absence of an adequate training vessel and the need for additional simulator training facilities.

Finally, GMA reports shortages in its regulatory capacity and insufficient financial resources.

3.3 Rail transport

Challenges facing rail industry in Ghana are summed up from an institutional and regulatory perspective as well as from a technical and operational viewpoint.

3.3.1. Existing institutional and regulatory structures

Under the control and supervision of the Ministry of Transport, the Ghana Railways Development Authority (GRDA) is the Authority in charge of the promotion and development of the railway sector.

The operations of both, movements of goods and passengers, are under the responsibility of the Ghana Railway Corporation (GRC), a public sector company.

GRCL is overmanned, poorly organised, lacking of commercial expertise and orientation, charging sub-economic rates.

Unfortunately, due to several decades of neglect and underfunding, the existing rail network is completely broken down, except for partial freight services on the Western line and some passenger commuter rail services in Accra. Signal and communication equipment are

obsolete and inoperable, track infrastructure has deteriorated and, where lines have remained unused for years, encroachment has taken place. Rolling stock is poorly maintained and much of the stock has remained unused for years.

The Ghana Railway Act of 2008, Act 779 had been passed to establish the Ghana Railway Development Authority (GRDA) as a regulator thereby separating the commercial activities of GRCL from the regulation.

Also bedevilling the railways sub-sector is the issue of labour. The railways productivity is so low that their operations cannot pay for the over-staffed and aged labour force. This has resulted in the Ministry of Transport using its investment provisions to pay for salaries in GRCL and to undertake a labour rationalization exercise.

There is no doubt that the investment in the railways is capital intensive and therefore arrangements like Public-Private Partnerships (PPP) need to be considered in the investment drive.

The private sector will, however, only be attracted if the regulatory regime is right and projects can demonstrate both economic and financial viability. In the past, concessionary arrangements have been difficult because the Ghana Railway Company acted as both the referee and player. Therefore, it is essential to establish an enabling regulatory framework that wins the confidence of private investors.

3.3.2. Rail infrastructures and operational performance

The railway is divided into three routes:

- Western Line: Takoradi - Kumasi and branches to Awaso and Prestea;
- Central Line: Huni Valley - Kotoku and the Kade branch;
- Eastern Line: Accra - Kumasi and the branch to Tema.

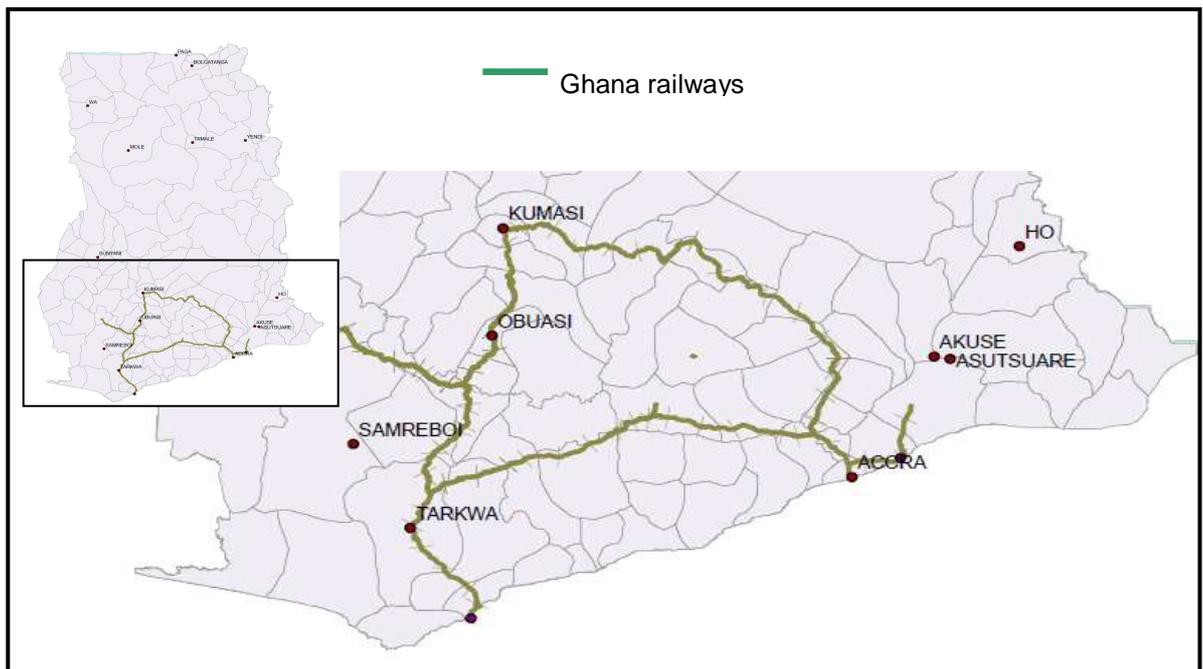


Figure 10 : Ghana rail network

The railway is built to 1 067 mm gauge, with a maximum axle load of 16 tonnes.

All lines are single-track except for a 30 km double-track section between Takoradi and Manso. Semaphore signaling was originally installed, but is now only operational on the double-track section.

The first line between Takoradi and Dunkwa was built very cheaply and is plagued by severe curvature north of Tarkwa, although some consideration has been given to re-alignment to ease operations.

Solar-powered colour-light signaling, funded by the World Bank, replaced the mechanical equipment on the Western Line, but the cost of spares soon became prohibitive and the system has now been abandoned. Likewise, the single line token apparatus has fallen into disuse, and train operation and crossing arrangements on the rest of the network are controlled using paper tickets.

The system has not been maintained to the standards as constructed and complete withdrawal of government subsidy in 1997 has led to rapid deterioration in track condition and state of the rolling stock.

The system comprises 947 km of route, but 2/3rds of the system has not been operated for more than 12 years and would now require complete re-construction in order to restore services.

Only 1/3 of the system is operable and this at a time when:

- transit traffic to hinterland has been growing
- both principal freight customers (GBC/GMC) offering more traffic and financial assistance

One third of the operable system provide services on the Western Line (dedicated to the transport of minerals) while on the Eastern Line the primary focus is on passenger traffic in and out of the capital. The Central Line is only occasionally used.

Freight services on the Western Line are the primary reason for the railway's continued existence, peak operations see an average of eight loaded trains a day carrying mineral exports to Takoradi harbour, including two trains of bauxite from Awaso (236 km) and six trains manganese ore from Nsuta (60 km). Both minerals are top-loaded at the mines and discharged by tippler at the port. At the time of writing, train movements are unpredictable and unlikely to achieve the peak figures quoted above.

Both the bauxite and manganese mining companies are reported to be keen to increase their output but are limited by GRC's restricted capacity in its current run-down condition.

A maximum of 21 locos are needed for daily operations when both mines are working at full output. But the maintenance department is unable to meet this demand.

Availability of the GM and Henschel fleets average 78%, but the availability of the Alstom locos is much lower, due to the high cost of obtaining spares.

Previous daytime and overnight passenger services between Takoradi and Kumasi were "temporarily" suspended in 2005 due to flooding of the track north of Dunkwa.

On the Eastern Line, the primary focus is passenger traffic in and out of the capital: Accra - Nsawam / Asoprochrona. The line is being maintained only for commuters. Two pairs of trains opera each day over the 40 km section between Accra and Nsawam. Three locos and two sets of nine or 10 inter-city coaches are allocated to work on the Eastern Line.

Trains call at all stations, and a number of halts; these have no passenger facilities but still generate substantial patronage, so the trains are usually well-filled. Using the same rolling stock, GRC operates another pair of trains on the Tema branch as far as Asoprochrona (19 km), and these are due to be extended to Tema shortly.

Although the Tema branch was opened in 1954, services were interrupted in 1995 by construction of a new road under-bridge to improve access to the port: train services to Asoprochrona have only very recently been restored.

Prior to the interruption of services there was a firm proposal to extend the rail line to Akosombo, the river port at the south end of the great Lake Volta, created by the Akosombo dam built to provide hydro-electric power in 1966. The navigable waters of this lake extend well into the north of the country.

The passenger fleet includes open passenger cars, first and second class sleepers and buffet cars. Diesel multiple units (DMU) have recently been delivered and are expected to be cheaper to operate on suburban services, and capable of more intensive utilisation than the loco-hauled fleet.

The line between Nsawam and Kumasi has been out of use for 10 years, and no freight services are currently operated anywhere on the Eastern Line.

The Central Line is currently only being used for occasional rolling stock transfers between Accra and the workshops at Sekondi.

The safety of train operations is a major concern for GRC, because of the lack of secure signalling, but also the very poor condition of the track and the mineral wagons which convey the bulk of current freight traffic. These vehicles are in continual service, and require a much higher standard of maintenance than they currently receive. Derailments are frequent, caused by bad track or poorly-maintained vacuum brakes and running gear.

3.3.3. Consequences of the rail poor condition on the transport system as a whole

The current state of atrophy in Ghana's rail system has had a negative impact on the overall transport system as well as on the other trades the system serves:

- Mining activity suppressed
- Accelerated deterioration of road system
- Increased transport costs due to lack of competition
- Failure to adapt rail system to changed market demand
- Development of hinterland inhibited

In the interim heavy investment in the country's roads and increase in road vehicle capacity has served to reduce rail's competitive advantage. Donors to the road investment programme have expressed disquiet at the road damage being caused by heavy traffic discarded by the rail system. Such of the rail system as has continued to be operated has been allowed to atrophy down to a level where it is now barely possible to operate at all.

It is highly ironical that such a situation has been allowed to develop at a time when both major mining companies were keen to increase output and rail movement. Both companies have contributed some investment to keep rail services in operation and have been prepared to take a leading role in running trains. No agreement however was reached between government and partners, and the rail spiral of deprivation has been allowed to continue and worsen.

In addition to the increasing domestic mining traffic potential, political instability in adjoining land-locked Sub-Saharan countries, together with continuing expansion of both of the country's main ports, has encouraged development of robust flows of transit traffic to the interior. Were the rail lines in operation this traffic could also have been conveyed by rail between the coast and Kumasi (via the planned Boankra Dry Port) with less impact than on roads.

The main challenges faced by railways in Ghana can be summarised as follows:

- Modernising the institutional and regulatory framework
- Improving services and operating standards to win new costumers
- Re-orientating personnel to modern railway practices
- Rehabilitation of the existing network
- Re-introducing passenger and freight services
- Objective analysis of new developments

3.4 Road transport

This section aims at assessing the road transport industry problems and challenges. The section is structured around three main aspects:

- ***The institutional and policy context***

- **The current regulatory framework**
- **The operational performance**

3.4.1. Existing institutional structures and policy context

The institutional assessment presented in Volume 9 focuses on the stakeholders (organisations) and their prevailing functions and the way in which policies and operations are developed as well as the internal and external factors affecting the performance of individual organisations and the sector as a whole.

There are several stakeholders concerned with road transport. From an operational point of view, carriers are one of the more important stakeholders and are organized according to the type of activity (passengers or freight); the distances or areas where services are delivered (regional, national, international and transit), and for the freight sector according to the specificity of the service they operate. In Ghana, the large majority of service suppliers are from the private sector: private transport companies and craftsmen vehicle-drivers.

Within the private sector, and from a legal point of view, a world-wide distinction is made between “hire-or-reward” and “own-account” road transport operations. “Hire-or-reward” operations or “professional transport” is where transport services are provided on a “third-party” basis by road transport contractors. Own-account operations are transport services by a company or manufacturer for its own needs: transport of company staff, transport of goods the company manufactures itself. In this latter case, transport is not a core or commercial business but an accessory activity. “Own-account” operations are often subject to less stringent regulations and obligations than “hire-or-reward” operators. In return, own-account operators are prohibited from performing work for hire or reward.

In Ghana, the distinction between “own-account” and “hire and reward” is not made. However, there are several reasons this should be done:

- **Clarification of responsibilities for transport operations:** there are different responsibilities for the person who produces, owns, works on or has borrowed the goods (own account), or a professional haulage contractor (hire or reward).
- **Sector analysis and policy-making:** it makes policy making easier, as well as data collection for market research and analysis.
- **Stimulate private investment in the sector and its efficiency:** The shift in demand away from own account to hire-or-reward operations responds to new pressures in supply chains such as the outsourcing of all activities perceived as non-core.

In Ghana, the responsibilities of a private person with a private registered bus or truck, whether they are doing business or not, are the same. This situation not only discourages investments and professionalization, but can also result on unfair competition.

The lack of legal distinction between types of road operations also results in a poor road transport sector management system, from an Authority perspective. While Driver and Vehicles Licensing Agency (DVLA) is responsible for licensing or registering vehicles and the drivers, there is no authority in charge of licensing the operator, which is not even contemplated.

Operator licensing systems already applies to other modes (air, rail and sea). However, despite the fact that road transport represents more than 95% of all Ghanaian transport volumes, including international and transit, operators are not licensed. This creates a context

of an institutional vacuum from an Authority's point of view. There is therefore a regulatory vacuum for road transport services.

Thus, a person who owns a vehicle and hires a driver is allowed to put the vehicle on the road, without any clear identified legal status, or even a real interest for the quality or development the sector. Having little understanding of business, the person often relies on the Unions to guide their actions. And hence the unions become the defacto regulators of road services.

In fact, the Unions, through their national associations (particularly the Ghana Private Road Transport Union, GPRTU) are fully involved in the commercial facet of the business. So that most of vehicle owners can obtain loads (or passenger traffic) through a queuing model managed by the Unions they belong to. The model is composed of vehicle parking places all over the country, serving as transport terminals and spot markets that are generally owned by the local governments.

On the other hand, the large Unions, such as the mentioned GPRTU, who draw their membership from hired drivers, owner-drivers and vehicle owners are often in a sensitive position as the interest of the owner and the hired-drivers often differs. The Union can hardly act as a conciliator between these two entities since their interests are conflicting.

At the time of completing this plan, the hired drivers of the GPRTU have called on the government to force vehicle owners to register their drivers and assistants with the National Insurance Trust (SSNIT). The problem is that the status of the vehicle-owner, as earlier stated, has no solid legal definition. Most of them are solely acting as renters. As it is difficult to supervise the driver, the owner fixes an amount of rent. Driver assistants and mates, who are often apprentices, receive only trip allowances which are sometimes paid by the driver out of his daily earnings.

In the passenger sector there are two state owned service providers, several private-owned bus and coach companies and a predominance of mini bus vehicles owned and operated by individuals. The State Transport Company (STC) provides intercity coach services and the Metro Mass Transit Company (MMT), originally mandated to provide urban bus services, now provides country-wide intercity and interregional services.

As a result of previous institutional context, the following are the preliminary conclusions on the problems that have a negative impact on road transport services:

- There is an institutional vacuum in the absence of a national regulatory body and lack of regulation that defines the role of operators.
- Unclear role played by the Unions in terms of guidance to the sector for higher competitiveness of the services.
- The market for road transport services is negatively affected by the excessive role of Unions in the organisation of the commercial facet of the operations. Furthermore, during the present era of public-private partnerships, the conflicting interests of GPRTU as both a drivers union and an owners association apparently can only be an increasing problem.
- The users are under-represented
- A framework for regular meetings between stakeholders, to develop jointly-agreed work programs, is lacking. Policy development and the revision of regulations by the Ministry of Transport, and other road transport-related administrations should involve discussions with representatives from the transport profession and transport users.

3.4.2. The current regulatory framework and its impacts

The regulation of the road industrial and commercial transport is fundamental it represents more than 95% of national traffic. Private operators develop an industrial activity in public domain (road and terminals). Commercial bus and truck traffic is mixed with other non-commercial traffic. In such a context, many crucial issues are at stake:

- **Safety of all the users of roads:** their protection is essential. The Cost of road traffic crashes in Ghana represents 1.6% of GDP (source BRRI, 2006). In 2007 more than 2000 died and 15 000 were injured. According to survey by DVLA, in 81% of all accidents, there are commercial vehicles involved. More than 2/3 of death and injured on intercity roads
- **Investments in roads are costly** (approx. cost of 1 million/kilometre). A commercial vehicle such as 40 ton heavy industrial vehicle impacts up to 200 times more than a private light car. Preventing overloading is therefore fundamental for the economy. Deteriorated road imply higher vehicle operating costs (VOC) and poorer quality of service.
- **Efficiency of services is vital to the economy** as this transport mode has a large and direct impact on other trades it serves. The way commercial activities develop depends on the quality of the existing regulations.
- **Environmental protection.** Mitigation of air pollution from road transport, one the main source of pollution, is vital in terms of public health.

In Ghana, The Ministry of Transport and its agencies work within the legal framework set forth in the following laws and regulations, including for road transport, the following:

- The Road and Traffic Ordinance 1952 (Repealed)
- Ghana Highway Authority Act: ACT 540 1997
- National Road Safety Commission Act: ACT 567 1999
- Road Traffic Offenses Regulations 1974 (Repealed)
- Driver and Vehicle Licensing Authority Act
- Road Fund Act 1997
- Road (Vehicle) Fee Act, 1998
- Road Traffic Act, Act 683 2004
- Road Traffic Regulations 2006

This later document, drawn from previous documents, compiles the main provisions in different fields.

However, some regulations are poorly enforced and key regulatory features are missing. For instance:

- **Safe condition of the fleet / vehicle:** road-worthiness certificates are delivered when the vehicle is registered. The problem is that the vehicle inspection is being done only visually as the DVLA lacks the inspection equipment required. Furthermore, the road-worthiness is not periodically properly renewed (legally each vehicle is to be inspected twice a year). So that safe condition of the vehicle can not be ensured on a permanent basis (at least every year for trucks and every six months for buses). In Ghana, the deployment –through outsourcing - of periodic vehicle inspection under the supervision of DVLA is being contemplated, but not yet implemented.

- **Protection of roads and road infrastructure:** weights/dimensions are defined and checked by DVLA when the vehicle is registered. Once on the road, there is minimum control of overloading activities. Apart from the impact on road infrastructure, the lack of weighbridges and overloading managements systems put safety of drivers and other road users at stake. Vehicles are less safe when overloaded.
- **Working conditions for the crew:** Driving hours and rest time for drivers (social standards) are defined but not enforced. Many studies carried out world-wide have demonstrated that legislation is required to limit driving time to 4.5 hours and to 10 hours/day maximum. This reduces the risk of accidents and their severity.
- **Recording devices (speed, driving time...).** Legislation on driving hours, speeds, loads, etc, can only be effective if provisions are also introduced to register these series of parameters to allow a proper control. In Ghana this is being contemplated, but not implemented yet.
- **Road operators' commitment for the cargo/passengers,** via the payment for missing items, damage, delays, etc. are not based on written service contract. Conditions to fulfil before developing commercial business on a the public domain (roads and terminals) are not contemplated: having a minimum knowledge of the responsibilities in relation to ownership and operation of commercial vehicles and good repute, minimum financial standing, are not contemplated. In Ghana, road transport services are performed as if they were a driver's and mechanic matter, not an upper level issue.
- **Minimum level of proper training in industrial driving** is poorly defined and implemented. Driver's licenses for industrial vehicles are being delivered on similar basis to those for private cars licenses. Commercial drivers are trained to drive using the speedometer instead of the tachometer (indication about the torque of the engine). The important issue is that industrial vehicles are "torquey" while "light cars are "speedy": the engine is designed to be used at their peak torque (the force applied on the rotating shaft using longer pistons allows for higher loads). The peak torque is delivered in a middle range of the engine speed (between 1200 to 1500 rpm, for an engine with a maximum speed fixed at 2200 rpm). Out of this range, vehicles are easily rendered out of control. Thus there are situations where industrial vehicles are highly dangerous in the hands of poorly trained drivers.



Figure 11: Speedometer to drive lights cars vs Tachometer for "torquey" vehicles

3.4.3. The Administration capacity of road transport services

In Ghana, the lack of an administration division within the Ministry of Transport in charge of transport services makes it impossible to properly ensure the enforcement of regulation through the various control bodies.

The key activity of similar administration in other countries, such as the Administration of the Road Transport Operator Licensing System is not managed. Typically, a licensing system will apply to all vehicles over 3.5 tonnes maximum permissible weight and vehicles of more than 9 passenger's capacity. The Road transport Operators must hold an Operators licence for such vehicles, whether they are used for carrying goods in connection with the operator's main trade or business as an own-account operator (i.e. a trade or business other than that of carrying goods for hire or reward) or are used for hire or reward road haulage operations.

The main concern of the administration in this regard is not on the existence or adoption of regulations but on the implementation of these regulations.

Controls should be carried out on-roads by the various control bodies (police, customs, vehicle weight inspectors, transport inspectors) related to the speed, weights and dimensions, working times and rest, vehicles conditions and their equipment specific, documents, etc. Checks are also carried out within the companies, by certified inspectors of the Ministry of transport, notably at the moment of renewal of licenses.

Failure to observe the requirements and conditions under which Operators licenses (or driving licenses) are granted, lead to severe penalty. This can include the withdrawn or suspension of license. Indeed, road transport operators and vehicle licenses are renewed on condition that no serious and reiterated violations or default are found: good repute is preserved (no serious and repeated offenses detected) and financial standing kept (viability of current proofs is still right).

For the administration to be able to ensure renewal of licenses on a quality and good behaviour basis, it is important to collect and centralise data on infringements detected, process this data and check the operator's quality of service provided.

The following diagram illustrates the principle (in a green box, the "vision" capacity is highlighted)

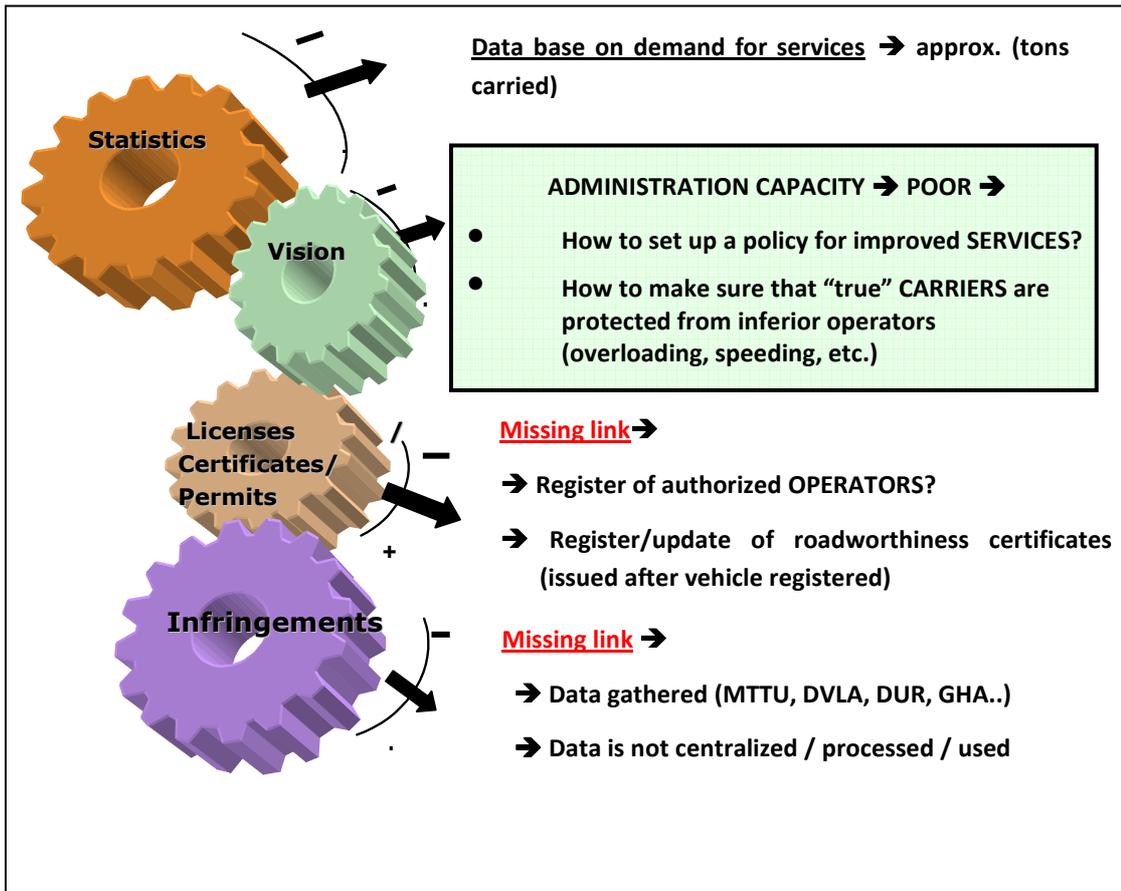


Figure 12: Road Services Administration and Control Capacity in Ghana

3.4.4. The operational performance:

The operational performance of road transport in Ghana is being negatively affected by the transport policy and the regulatory framework governing the services as well as the technical operations of transport networks, especially in the freight sub-sector.

The technical development of the transport services by the operators have been analysed at four levels: ownership structure, fleet, Terminals and warehouses and competitiveness. Main findings are the followings:

Ownership structure

In the passenger sub-sector as well as in freight transport, the structure of the operator is characterised by a high level of Ownership dispersion

- Passenger transport: predominance of “one-vehicle-man” model. 90% of minibus (1/1 ratio) and 50% for buses and coaches
- Freight transport : Ownership structure : one-truck-owner: 75 % of the fleet
- Ownership dispersion combined with poor operating techniques results in poor operation management and economic losses (for the country, the users and the operators themselves). For freight transport, It also have a negative Impact on other trade they serve (quality of services, waiting times, fares, etc)

Fleet management techniques

According to this estimate, the total fleet represents approx. 657,000 vehicles, of which almost 100,000 are buses and coaches and 53,000 trucks (all categories included).

Table 2: Assumed current operational vehicle fleet by category

Registration Category		Assumed operational fleet			
		2004	2005	2006	2007
Motorcycle		62,784	65,710	78,365	88,215
Motor car ⁵		190,646	215,174	223,209	277,845
LCV		56,182	49,154	53,293	57,027
MV >2000cc		39,288	47,628	60,809	83,593
Buses & coaches		49,222	56,310	74,599	98,716
Rigid trucks	Light	18,185	21,637	24,191	31,579
	Medium	5,928	4,129	4,670	6,577
	Heavy	3,265	4,011	7,564	9,160
Artic trucks	<=24t	2,405	2,965	1,447	861
	24-32t	2,753	2,738	1,377	2,504
	>32t	2,305	2,140	3,003	3,106
Total fleet		432 963	469 258	536 131	657 218

Source: the Consultant using different sources and a methodology explained in Volume 9.

During the last three years, the vehicle fleet has been increasing by an impressive average rate of 15% per year. This is mainly due to increases of the number of heavy rigid trucks (44%), motor vehicles of >2000cc (28%) as well as buses and coaches (26%) and, to a lesser extent, by an increase in the number of artic trucks.

This particularly high rate, three times higher than the economy growth rate itself, suggest that investments in the road transport industry concentrated on vehicles; in spite of the economic and financial weakness of the transport sector (in the freight sector, rate of empty returns is around 50%, and waiting times on a queuing system is up to one month).

Spot market is oversupplied in trucks: too much investment in vehicles done in detriment to road transport services techniques and technologies (storage/warehousing and IT technologies, etc.)

Terminals and warehouses

The passenger transport, managed largely by the Unions, is composed of a number of passenger terminals mainly owned by municipalities.

The movement of passengers, from terminal to terminal requires simple planning, and operating is easier than freight transport-logistics, which is much more dispersed and fluctuating. The passengers market is mainly served by individual transport owners, including

⁵ These figures are estimated for the total fleet while the figures used in volume 4 is based on household survey for working cars.

large buses managed by GPRTU. They predominate. However, a few number of large structured bus companies offering intercity of higher services quality (MMT, STC, OSA, CES).

As for freight transport, Unions organise transport activities from simple yards facilities have any warehousing or storing function.

The following diagram illustrates the current operating techniques and their impacts as compared with other more efficient methods.

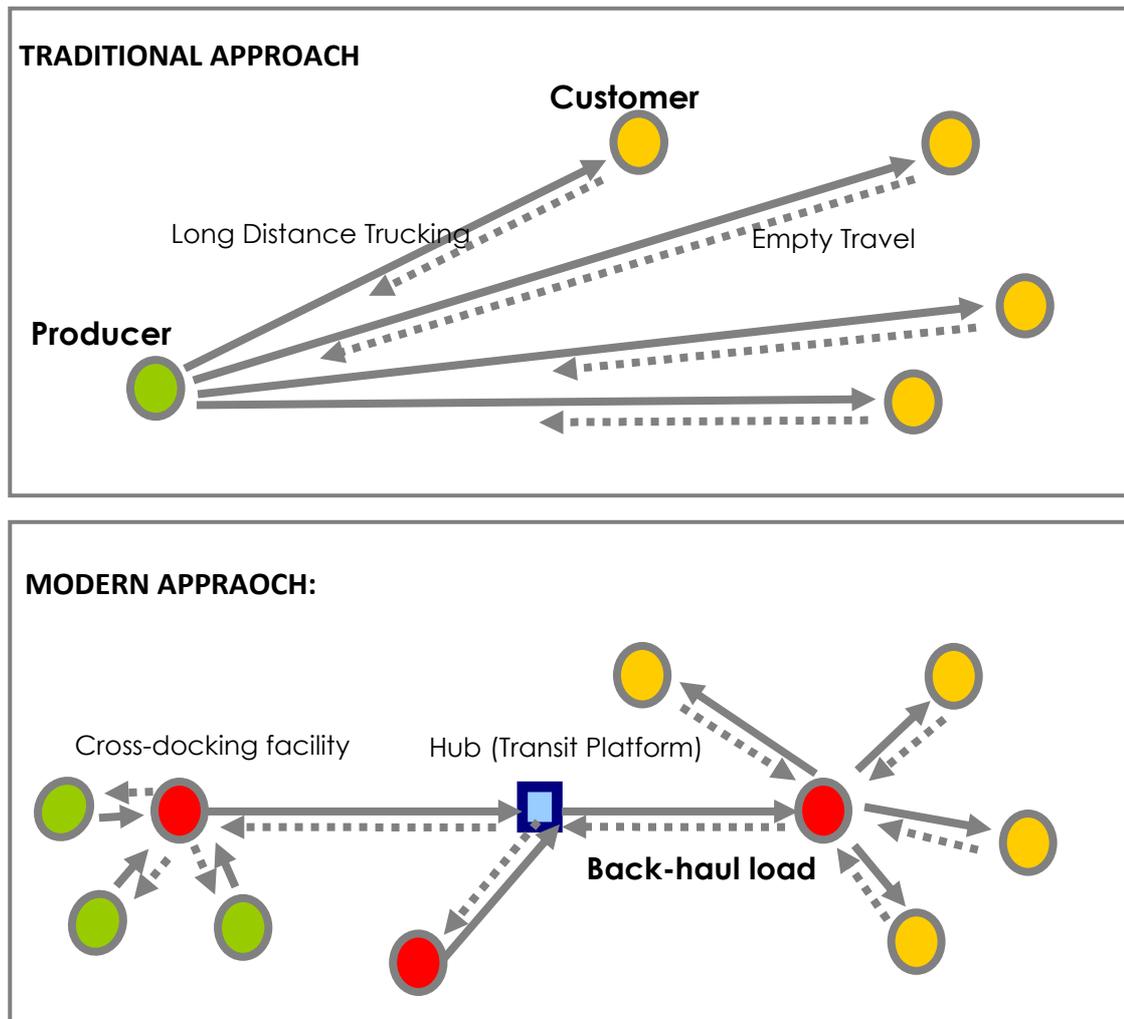


Figure 13: Road transport Network Operating Techniques

In comparison therefore we can see two approaches. Traditional approach which implies:

- For the trucker: operations of one-man-truck are inefficient and expensive
- Cargo-owner: they have little choice and are often forced to have large and varied inventory which is very costly.

The modern approach which implies:

- Less investment in trucks without consequence on capacity as the market is vehicle-crowded
- More investment in facilities: warehouses network, cross-docking, IT technology, Training (new skills, etc)

In conclusion, the road transport market is being saturated by poorly-used vehicles (most of them second hand), while the provision of better services through the investment in services operation techniques are dramatically missing. This affects both passengers and freight services. This not only results in poor return of the investment by the one-man-vehicle but also affects the quality of service and safety to all road users.

3.4.5. Road transport infrastructure

The Ministry of Roads and Highways has oversight responsibility for the Departments of Feeder Roads, Department of Urban Roads, the Ghana Road Fund and Ghana Highway Authority. These MDAs manage Ghana's road infrastructure assets.

From 2002-2008, road infrastructure benefited from the Road Sector Development Programme (RSDP). The RSDP was a comprehensive programme with multi-donor support providing a total of 1.2 billion USD investment in road infrastructure, institutional development and capacity building to enhance the planning, management and maintenance of Ghana's road network. The RSDP provided a valuable learning ground for the road sector, identifying the following challenges:

- Unplanned expansion of road network,
- Inconsistent prioritisation of maintenance investments,
- Over commitment of approved budget,
- Inadequate revenue raised to cover the cost of routine and periodic maintenance and a subsequent back log of required maintenance,
- Inadequate project preparation and inappropriate packaging of works,
- Inconsistent application of procurement procedures including difficulties with the authentication of bidders supporting tender documents and contractor register entries,
- Shortfalls in contract administration due to non-adherence to contract conditions, inexperience of staff, lapses in documentation during contract execution,
- Delays in execution of works due to scarcity of materials and capacity constraints of contractors,
- Ineffective supervision and monitoring of works caused by large numbers of ongoing projects (over commitment), inadequate capacity of agency staff, capability constraints of staff, logistics constraints including lack of basic laboratory facilities at district and regional level,
- Delayed payment for works due to infrequent monthly submission of contractor's invoices, delays in the certification of works and inadequate funds to pay for completed works,
- Lack of coordination between road agencies for planning, programming, data collection, performance reporting, contract utilization,
- Lack of management and supervision of construction works by contractors, consultants and the supervising agencies,
- Inadequate axle load control in the network,

A lack of motivation, skills and competencies are often cited as reasons for many of the management and supervisory shortfalls for both contractors and Government agencies.

Throughout the RSDP, the (then) Ministry of Transportation and all road agencies faced the challenge of continuously improving many aspects of the road sector including: investment prioritization, financing, decision-making, management, supervision, monitoring and reporting. It is recognised that road infrastructure agencies are uniquely structured compared to the organisations in other transport sub-sectors. As a result, studies have identified institutional and organisational improvements, the Highway Development and Management Model (HDMIV) has been calibrated for Ghana, extensive training of personnel has been undertaken and new baseline indicators on which performance can be measured have been developed. However, although it is a well established policy objective to utilise HDMIV and harmonize the planning tools used by the different agencies, progress is limited and many of the improvements identified have yet to be implemented. Prioritization and investment planning is further complicated by the use of different tools and methodologies by each of the road agencies and better integration of the network is hampered by a lack of cooperation.

Particular issues for trunk roads

Ghana has a substantial trunk road network. The main corridors in the country provide fair to good transport conditions while overall, 17% of the network is reported as in poor condition. Given the limited resources for the sector, the decreasing needs for trunk road development and the need to maintain existing assets, key challenges for GHA are to:

- Ensure that the development of new roads follow a rational prioritizing process and does not compromise the funds available for maintenance
- Secure funds to ensure full maintenance of the existing network
- Better integrate with urban and feeder road networks
- Improve contract administration, management and implementation

Particular issues for feeder roads

Ghana has more than 42,000 km of feeder roads, representing its largest road network; the vast majority of it (about 97%) is still unpaved. While many efforts have been made to improve the conditions in feeder roads, the lack of investment is huge with only about a third of the network being maintained in 2007.

Feeder roads play an important role in providing accessibility to rural areas, representing a major social component of the economy. In 2007, the road density was 0.18 Km/km². While this density is higher than the average for Sub-Saharan countries, its development must follow the population needs and ensure access to rural areas.

As expectations are high in all rural communities, effective prioritization of its limited resources is a continuous challenge for DFR. Currently it responds in 3 ways:

- Roads Prioritization Manual (RPM) – is a prioritization method that enables DFR to work closely with communities. It was developed specifically for DFR and is being used in pilot locations.
- Maintenance Performance Budgeting System (MPBS), which combined with a database and Geographical Information System (GIS) is a road inventory programme developed to enable DFR to plan and manage its maintenance programme

- Requests from external agencies – DFR is often approached by agencies such as Cocobod or Ministry of Agriculture who wish to develop specific areas of production. In these cases, DFR will work closely with the development authority to determine their needs and develop an appropriate works programme

The main challenges for the feeder road network can therefore be summarised as:

- To ensure that network expansion is properly targeted, balancing technical and community needs
- To ensure that full maintenance is achieved through the use of appropriate methods
- To achieve effective decentralization of feeder road management to the District Assemblies.

However, whilst the feeder road network has many similarities with the trunk and urban road networks, challenges faced by DFR have a more direct impact on rural communities and their chances for poverty reduction and economic growth. For example, the trend away from labour-based methods means that local communities miss out in many ways: income is diverted away; people are forced to migrate for work; and the communities become more dependent on high cost mechanised plant which falls into disrepair due to the lack of adequately trained operatives and the high cost of maintenance.

Particular issues for urban roads

Urban areas need special attention. Roads are most heavily congested in urban areas yet there is the need to create even greater carrying capacity. In this case remedies must be sought with the Metropolitan, Municipal and District Assemblies (MMDAs) who have responsibility for land use planning, traffic management, transport planning and regulation of local roads in their locality. The need for integration of land use and transport planning has been firmly stated elsewhere.

DUR also faces many challenges to support the establishment of effective Road Units (RUs) in each of the Metro and Municipal Assemblies.

A particular challenge identified by DUR is the need to adopt a more objective and evidence-based method for prioritising investments in urban road networks. Realisation of such an approach, over and above the integration of land use and transport planning as a priority, requires changes to the transport planning environment including: (i) collection of data through surveys and studies; (ii) use of planning models (such as used for this ITP) which are calibrated for each urban location; (iii) the adoption of the HDM tool to implement a comprehensive road investment prioritisation programme suited to each location.

Notwithstanding potential improvements in the prioritisation methodology for urban road investments, the source of financing will inevitably be through central Government and Development partners until the Metro and Municipal authorities have adequate revenue generation opportunities. Therefore locally deduced priorities for road investment will continue to be subject to central government control and budgeting restrictions.

Therefore urban roads face 4 challenges:

- The need for integration of land use and transport planning
- Support for the establishment of effective MMRUs in each of the Metro and Municipal Assemblies
- Adopting a more objective and evidence-based method for prioritising investments in urban road networks, including better coordination with the trunk road network.
- More sustainable source of financing for essential road maintenance and development.

3.5 Non-motorised and intermediate forms of transport

The most common form of NMT is walking and the other means of non-motorised and intermediates forms of transport are bicycles, push cars, wheelbarrows and animal draws carts. These forms of transport are mainly used by the poor, both in urban and rural areas and play a key role in the economy as the informal sector requires transport at lowest cost. Thereby, NMT remains an important means of transport in Ghana, although less than three percent of urban dwellers in the south use NMT. It is more extensively used in the North⁶.

Unfortunately this mode of transport, and especially bicycles, has a negative image which is associated with poverty. Moreover, there is a lack of adequate infrastructure for NMT in Ghana even though investments have been made in this sector with the creation of cycle lanes in important urban centres such as Accra and Tamale.

NMT users are vulnerable; they suffer from lack of road safety measures attuned to their needs. They are frequently involved in accidents. For instance, pedestrian fatalities recorded 43.1% of all fatalities in 2007 showing an increase of 14.2% over the 2006 figures⁷. These figures show that road safety is the primary need for NMT and this issue could explain among others, why people prefer to use other modes. The lack of safety can be explained by an inadequate infrastructure for NMT, the behaviour of drivers that do not recognize and respect cyclists or pedestrians.

Moreover, wheelbarrow and hand pulled trolleys mingle with motorised traffic creating considerable delay and causing high accident levels in their interaction with motorised traffic.

Finally, there is a lack of appropriate legislation and safety measures for NMT operations, combined with a lack of control.

However, non motorised transport has several advantages/

It is non-polluting and therefore a largely sustainable form of transport. It also contributes to reduce urban noise and congestion. Bicycles are relatively affordable and enable an important increase of mobility at low cost. Moreover their loading capabilities could be used in order to replace human portage which is mainly practiced by women.

In big cities many commuters travel patterns are within pedestrians or cycling distance, the non motorised transport could improve mobility for these users. The NMT can also be used to reach public transport stations, facilitating integration between modes; NMT is complementary to public transport and can be used for improving accessibility.

⁶ Project appraisal document on a proposed credit to the republic of Ghana for a transport sector project, World Bank

⁷ Source: Statistical and Analytical Report (2000-2007) released by the Ministry of Transport & Ghana Statistical Service

A survey in Accra shows that 42% of NMT-users consider the low costs involved as the most important reason to use a bicycle, followed by the time factor (36%) and its flexibility by another 8%. If compared with other modes of transport, the bus for instance, respondents actually preferred the bicycle because of its cost (98%), speed (96%) and its reliability (94%).⁸

Finally, A NMT policy development could enable to improve the conditions of mobility giving access to education, health and employment and help to integrate transport in the strategy of poverty reduction. A NMT policy will also help to integrate the conditions of mobility of the poorest in transport plan.

Currently some studies or strategies to develop NMT are under way:

- GHA and DFR have plans to incorporate NMT facilities along the roads they administer
- DUR is undertaking a Master plan for non motorized transport in Tema, Ashaiman and Sakumono

3.6 Urban transport

Urban transport is an important issue as the urbanisation rate in Ghana is estimated at 45.4% in 2008 (cf Volume 4: Socio-economic variables and commodities forecasts for Ghana) and as Ghana is facing a demographic and economic growth. Thus, the improvement of living involved a mobility increase. The Urban Transport issue impacts mainly Greater Accra, Kumasi, Takoradi/Sekondi and Tamale but is rapidly expanding to affect all metro and municipal centres.

For example, Accra is currently expanding beyond the original city boundaries to the fringes of the Greater Accra Metropolitan Area. This expansion explains the increase of demand for transport services for a population that commute regularly in the city to access employment and services.

Two studies have been already carried out:

- Urban Transport Planning and Traffic Management Studies for the Greater Accra Metropolitan Area, Sekondi-Takoradi, Cape Coast and Koforida (financed by IDA) in 2005
- Urban Transport Planning and Traffic Management Studies for Kumasi and Tamale (financed by AFD) in 2005

Moreover, the Ghana Urban Transport Project started in 2007 (financed by the World Bank) is aimed at improving mobility in Kumasi and Accra through a combination of traffic engineering measures, management improvements, regulation of the public transport industry, and implementation of a Bus Rapid Transit (BRT) system.

Urban transport comprises individual transport (with private car, motorcycle, NMT and taxis), public transport (with buses, minibuses and shared taxis and urban railways) and freight vehicles which will not be treated here (see section on road transport services).

Public transport is currently dominated by the informal sector. For example, in Accra, the modal share for informal transport (minibus and collective taxis) is more than 70% following by private car and NMT and finally the modal share for Bus Public Transport is low, less than 5%.⁹

⁸ "The significance of non-motorised transport for developing countries", ICE

⁹ "Public Transport in Sub Saharan Africa" Major trends and Case studies, Trans-Africa project, UITP

3.6.1. Institutional and regulatory framework

The Department of Urban Roads is an implementing agency of the Ministry of Roads and Highways and is responsible for planning, managing and maintaining urban roads throughout Ghana. Every Metropolitan, Municipal and District Assembly (MMDA) is mandated to plan, regulate and manage transport infrastructure and services in their respective localities (see section 2.1.5.5), and are responsible for land use.

In some cases additional bodies, working within the existing authority of the MMDAs, are being considered such as the Greater Accra Transport Authority (GATA) to plan, regulate and manage passenger transport services throughout the Greater Accra area.

However, the lack of institutional resources and regulations make MMDAs currently inoperative to coordinate those activities; this is why the “Ghana Urban Transport Project” is pioneering the development of bye laws, institutional capacity and procedures in Greater Accra and Kumasi intending to introduce route and operator licensing in those locations by 2012. This has involved the creation of urban passenger transport units in each of the MMDAs involved, recruiting and training personnel, developing and implementing operating manuals and undertaking extensive public consultation with users, service providers and local authority personnel.

3.6.2. Public transport operators

In Accra metropolitan area the public transport is provided by the formal sector with big buses and informal sector with a mix of minibus (approximately 18 seats, called tro-tro) and taxis.

The primary bus operator is Metro Mass Transport (see the previous sections) which also operates intercity services, operates along the main corridors of the cities and the outskirts. MMT deploys around 107 buses in Accra (2008)¹⁰. Out of the car owners, three out of four Ghanaians use public transport to reach their destination in the Greater Accra Region which is the most heavily congested area in Ghana and it has therefore the highest priority to set up an efficient public transport system¹¹.

The informal sector with minibuses (tro-tro) and shared taxis provides the main part of the transport services. According to users surveyed as part of the Urban Transport Project, services are unsafe, unreliable and uncomfortable. Tro-Tro are managed by cooperatives and unions and operate along defined routes. The overall quality of this transport is poor, most of the vehicles are old, uncomfortable and overcrowded, however this is the common mode of transport for Ghanaians as the services are very cheap.

Taxis are often shared by 4 or 5 passengers (their capacity is exceeded) and their maintenance standards are also very low. Private taxis operate in Accra, Kumasi and Tamale.

For the informal sector the fares are determined after negotiation between the unions and the Ministry of Transport. The demand for public transport exceeds the supply and passengers suffer important waiting time (19 minutes for Accra)¹². As the informal sector comprises low

¹⁰ “Public Transport in Sub Saharan Africa” Major trends and Case studies, Trans-Africa project, UITP

¹¹ “Overview of Public Transport in Sub Saharan Africa”, Trans-Africa project, UITP

¹² “Urban Transport Planning and Traffic Management Studies for the Greater Accra Metropolitan Area (GAMA), Sekondi – Takoradi, Cape Coast and Koforidua”, 2005

capacity vehicles minibus and cars, the increase of traffic conduct to the congestion in urban roads, mainly in Accra's road.

3.6.3. Summary problems and challenges for urban transport

The main problems and challenges for urban transport can be summarised as follows:

- Lack of a strong institutional framework that manage urban transport
- Lack of regulatory framework for operating the public transport, and improving its quality
- Lack of planning for urban transport
- Insufficiency and inadequacy of public transport
- Road safety
- Traffic congestion
- Difficulties for NMT

4. Social and environmental issues

4.1 Social impacts

4.1.1. Poverty reduction

Poverty reduction emerges as the most important criteria for sustainability of a country's economy. Within the broad national development-planning framework, transport is seen as providing a key strategic support to the productive sectors of the economy, as well as being a facilitator of growth and poverty reduction. The GPRS II (2006-2009) identified inadequate transport infrastructure as a major challenge to achieving growth since transport is considered to be a strategic support service. The broad policy objectives are to "ensure the provision, expansion and maintenance of the appropriate transport infrastructure which strategically links the rural and urban production centres and which ensures the provision of affordable and accessible transport system that recognizes the needs of people with disabilities.

Indeed the underlying theme of the ITP has been to integrate poverty reduction, in line with the national development agenda. Poverty reduction has then been included as a social effect in the project evaluation criteria.

The rural poor are in general at a disadvantage in terms of accessing transport services due to limited supply and relatively high transport costs. The ITP therefore included access as important evaluation criteria. As indicated, the infrastructure proposals are centred on upgrading stretches of existing national highways and railway lines which will in effect improve access to the rural poor who reside in communities located close to the main roads and railway lines. This can largely be attributed to the weighting methodology applied during the project selection process.

In addition, accessibility to basic social and technical services would contribute to poverty reduction.

4.1.2. Cultural Heritage

Ghana has a wide range of archaeological and historic sites. Much of the historic landscape in Ghana is under pressure from development. Cultural resources in any country are very important in identifying any particular group of people. In some cultures as in Ghana, some rivers, mountains, trees, etc are revered. There are sacred groves and shrines, religious artefacts and places of worship, cemeteries, etc, which people tend to have emotional attachment and sensibility to. It is therefore necessary to consider these during any form of Transport development in order not to offend any people, but rather preserve our cultural heritage. Also an integrated transport plan facilitates the movement of people to the sites that have become tourist attractions and to festivals which form one of the elements of the culture.

4.1.3. Access

As mentioned earlier, accessibility to basic social and technical services through transportation is a key contributor to poverty alleviation in rural and urban areas. The National Transport Household Survey Report¹³ indicates that nearly 17% of the population in Northern Region travel more than 15 km to reach a motorable road, while about 10% of the country's population have to walk three to six kilometres to reach a motorable road. The report states that in Upper West and Northern Regions, 22.4% and 19.3% of the population, respectively, take more than an hour to reach a health facility. Apart from bad road conditions, a major obstacle in reaching a health facility is quoted as being the difficulty in getting a vehicle. The report also shows that approximately 53% of the nation's population travel to work on foot, while about 15% use "trotros".

From the report it implies that infrastructure proposals must consider local access as a criterion in the selection of priority roads, which include connection to local markets, health centres, education facilities and human settlements which would provide widespread accessibility to basic social and technical services, especially in rural areas. Institutional and regulatory measures that are proposed for cross-sectoral planning should be implemented for improvement in rural health, education levels and agricultural productivity. Promotion of non – motorized and intermediate transportation is an essential element of the total network system to support accessibility by all to basic social and technical services. Strategies should therefore be developed to provide incentives and motivation for people to move towards these forms of transportation.

4.1.4. Gender

Disparities between genders continue to exist with respect to access to and control of productive, human capital and social capital assets. In the road sector there are a number of women working as engineers in the MRT and its agencies. Some women are also heading contractor companies. A large number of women work as labourers on road works.

4.1.5. HIV

HIV and AIDS are of particular relevance to the transport sector. Truck and bus drivers as well as those involved in road construction are vulnerable to the disease because they are

¹³ MOT & GSS; National Transport Household Survey Report; TSPS II Transport Indicators Database Project; February 2009.

regularly working away from their home environment. MRT has developed an HIV/AIDS Education Programme.

4.2 Environmental impacts and climate change

The environment, defined in terms of built-up human environment and the physical natural environment, is affected by and impacts on the provision of transport infrastructure.

The built human environment does place limitations on the provision of transport infrastructure. Whilst transport infrastructure is provided for the good of people, the potential impact of the infrastructure on peoples' wellbeing is a major consideration in its planning, design and implementation. Concerns about the displacement and resettlement of persons, impact on peoples' properties and livelihoods, and generation of disturbances such as noise, vibration and dust as well as vehicular emissions are issues that affect the design and implementation of projects.

Climate change is a phenomenon that is likely to have implications for the planning, design and implementation of initiatives in the transport sector. Transport policies, programs, plans as well as projects will have to consider the integration of concerns about climate change. Climatic conditions such as rainfall and temperature, which are taken into consideration in the design of projects are likely to be affected by climatic change. Based on climate change modelling, it has been predicted that a one degree rise in temperature in Ghana as a result of climate change will lead to rainfall and runoff reduction and flooding in coastal areas. Scenarios such as the above will potentially have implications for the design and implementation of projects.

Concerns about the emission of greenhouse gases such carbon dioxide, nitrous oxide, sulphur oxide from various transportation vehicles will impinge on the selection and mix of transport modes in the country. Ghana has chosen a low carbon growth development strategy; as a result the transport sector will be expected to make policies and implement programs, plans and projects that will help in reducing emissions as a means of controlling Ghana's carbon footprint. It is therefore possible that future decisions on the choice of transport investments will be influenced by the potential emission rates of the various modes.

Whilst the Transport Sector accounts for 99.7% of gasoline consumption in the economy, almost all of which is consumed by road transport, and is responsible for over 60% of non-biomass carbon dioxide and over 50% of Nitrogen Oxide emissions, Ghana's transport system lacks comprehensive measures for minimizing environmental damage. Strategic Environmental Assessment (SEA) is in its infancy and is seldom carried out at the strategic and planning stages as programmes are developed. The requirement for Environmental Impact Assessments (EIAs) to be carried out on development projects is now being applied more widely.

Most of the materials (sand, stones, gravels, wood, water, steel, etc) needed for the provision of infrastructures are resources taken from the environment. These are non-renewable resources whose misuse and depletion can affect the future provision of the infrastructure.

Addressing the issues raised above and other environmental concerns requires that adequate capacity exists within the Ministries and agencies in the transport sector. Without adequate environmental capacity, identifying the issues if environmental concern will be challenging enough, let alone coming up with the strategies and measures to address them.

There is inadequate evidence-based analysis and comparison of social, environmental and economic impacts undertaken on transport plans and project proposals. The lack of

environmental data is a major inhibitor. Whilst the SEA provides a consistent measure, and this Plan has included a multi-criteria evaluation process, much work is still to be done to achieve the desired 'mainstreaming' of socio-environmental issues.

When widely applied, Government's new Environmental Framework and Framework for Resettlement will enhance the socio-environmental impacts of road infrastructure development. Health and safety issues have not been given adequate attention at construction sites, transport terminals and along service routes.

Chapter 3 The Planning Process

This chapter contains a description of the integrated economic and transport planning method used in the ITP. Although it is unusual for Integrated Transport Plans to contain such a detailed description of the methodology, it is felt that as this is Ghana's first integrated transport plan, it is helpful to introduce the concepts and methodology of modelling and evaluation to Ghana's policy makers and planners.

1. The integrated economic and transport planning methodology

The basic idea behind the transport planning methodology is that the demand for transport is derived. By derived demand we mean that transport is not an end in itself but is used to satisfy needs. People move to go to their workplace, school, visit their family, etc. Goods are moved to reach the consumption centres from the production centres.

Having said this, it becomes clear that in order to forecast the future transport demand in the country we need to:

- 1- identify the drivers of transport demand; e.g. if the economy grows, the consumption will increase, and there will be more goods to be transported
- 2- Translate these drivers into standard economic variables such as GDP, population, employment, etc,
- 3- Identify the relationship between these variables and the current need for transport,
- 4- Forecast the future value of such variables,
- 5- Estimate the future need for transport corresponding to these forecasts.

This methodology establishes a very close relationship between

- 1- the transport and the overall economy: socio-economic development will lead to increase in the demand for transport
- 2- land-use planning and transport planning: if development is planned in a certain region or place in quantitative terms (amount of investments, number of jobs created) one can estimate its impact on the demand for transport

The forecasting process leads to an estimation of the future needs for transport. Using the forecast demand, we can evaluate the impact of interventions (new infrastructure or additional capacity) in the network. The benefits of such interventions (time and cost savings, safety improvements, etc) will be compared to their costs in order to identify the best alternative.

The figure below illustrates the process.

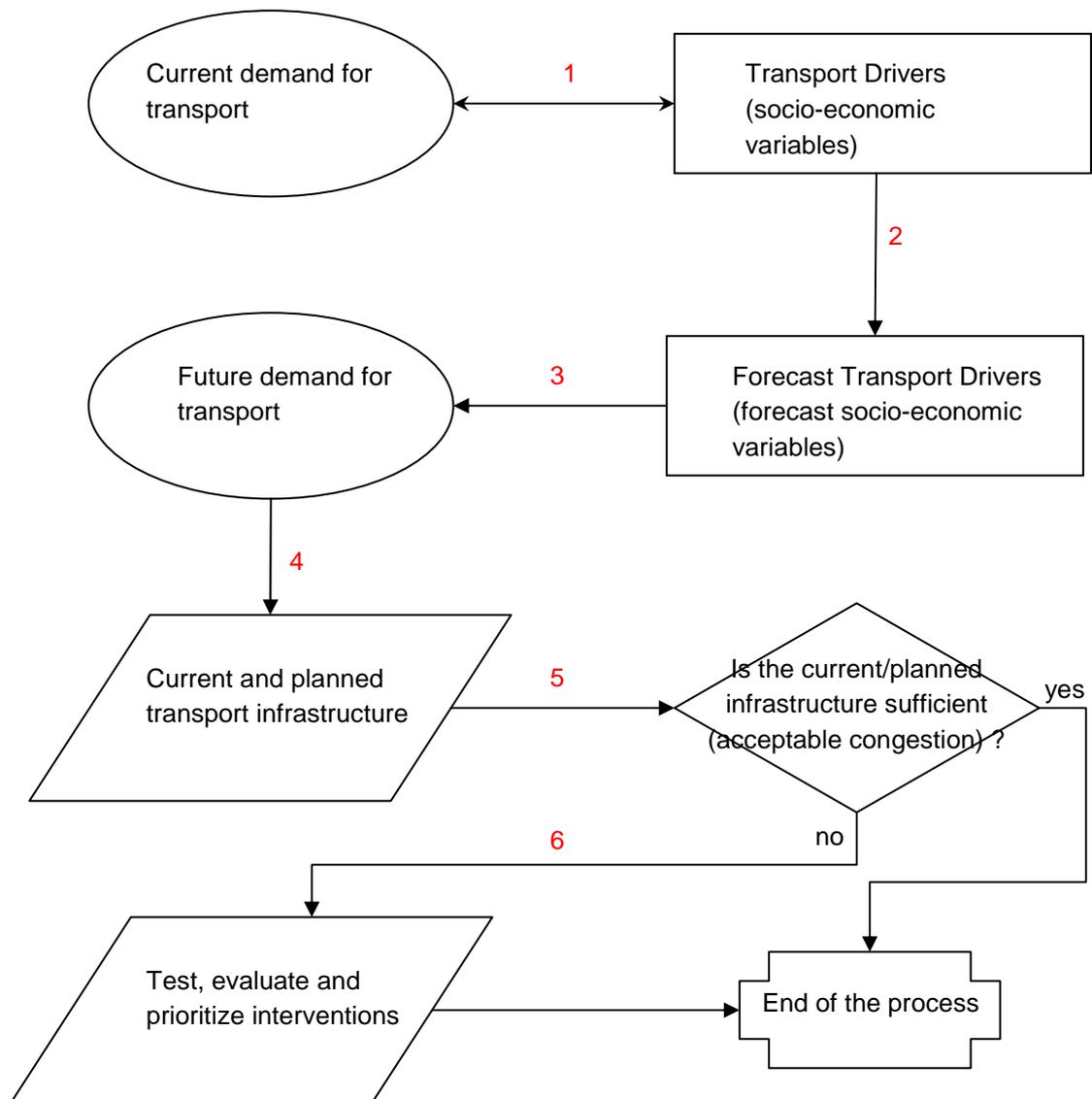


Figure 14 : The planning Process

We will now discuss all the planning steps and processes.

2. Assessing the current demand for transport

The first step in the planning process is the assessment of the current demand for transport. Surveys and databases are used for this purpose. In some countries, regular data collection is implemented, which makes the process easier and more reliable.

When no regular data collection exists, one must carry out a coupled traffic count and OD survey.

The traffic counts is used to estimate the total number of cars, buses and trucks on the roads, passengers on trains (when no ticketing information is available) and air passengers leaving and arriving at airports (when no official statistics are available). The OD (Origin-Destination), as it name says, is used to investigate the origin and destination of the trips. Only a part of the total traffic is surveyed because it would be to expensive and logistically impossible to survey all traffic. The analyst must ensure that the OD sample size is sufficient to represent the population.

In practice, traffic volumes and ODs are available from official sources for rail and civil aviation and the analyst only needs to survey road traffic. Before carrying out the surveys, it is important to set the zoning system.

2.1 The zoning System

A traffic demand model applies to a particular geographical study area. In principle, trips in this area can begin and end at any address, and travellers can choose from all roads, streets and other transport options. Because of the sheer volume of data, however, it is not practical to gather and analyse data based on individual information. We construct a simplified model of reality by dividing the area to be studied into a number of *zones*. We study the trips from and to these zones. We assume that all trips begin and end at an imaginary point inside this zone, which is called the centroid of that zone.

We distinguish the *study area* and a surrounding *area of influence*. Both areas are divided into zones. Zones within the study area are called internal zones and the zones within the area of influence are called external zones. In the study area we investigate the traffic flows from and to each zone. As for the area of influence we only examine traffic flows that start or end inside the study area. When traffic moves between two external zones, we only look at the traffic that crosses the study area.

Important parameters are the number of zones to be used and their size. Each zone has a fictitious point, usually situated in the point of gravity of the area, from which all trips from and to the zone are supposed to depart and arrive. This point, called the *centroid* is linked to the network by *connectors*. Trips between two zones, the *interzonal* traffic, occur on the network. Traffic that does not leave the zone, the *intrazonal* traffic, has its departure and arrival point in the same centroid and is not analysed.

This means that zones must not be too large. If they are too large, a sizeable part of the traffic does not appear on the network and will, therefore, fall outside the analysis. Nor can zones be too small. Small zones require numerous input data. This increases the costs of studies, hampers interpretation of the results and increases the chances of mistakes.

The main criteria used to divide the area of study – Ghana – into zones were:

- Each zone must be within one, and only one, region;
- Zones are compatible with 169 and 138 districts; this means that the districts created in the 169 system are in the same zone of the “parent” district.
- Zones should be as homogeneous as possible in terms of socio-economic characteristics.
- They must permit the analysis of the main corridors and facilities (train stations, ports) in the network
- Each main cross-border link is associated to an external zone.

The following zoning system was adopted in the study.

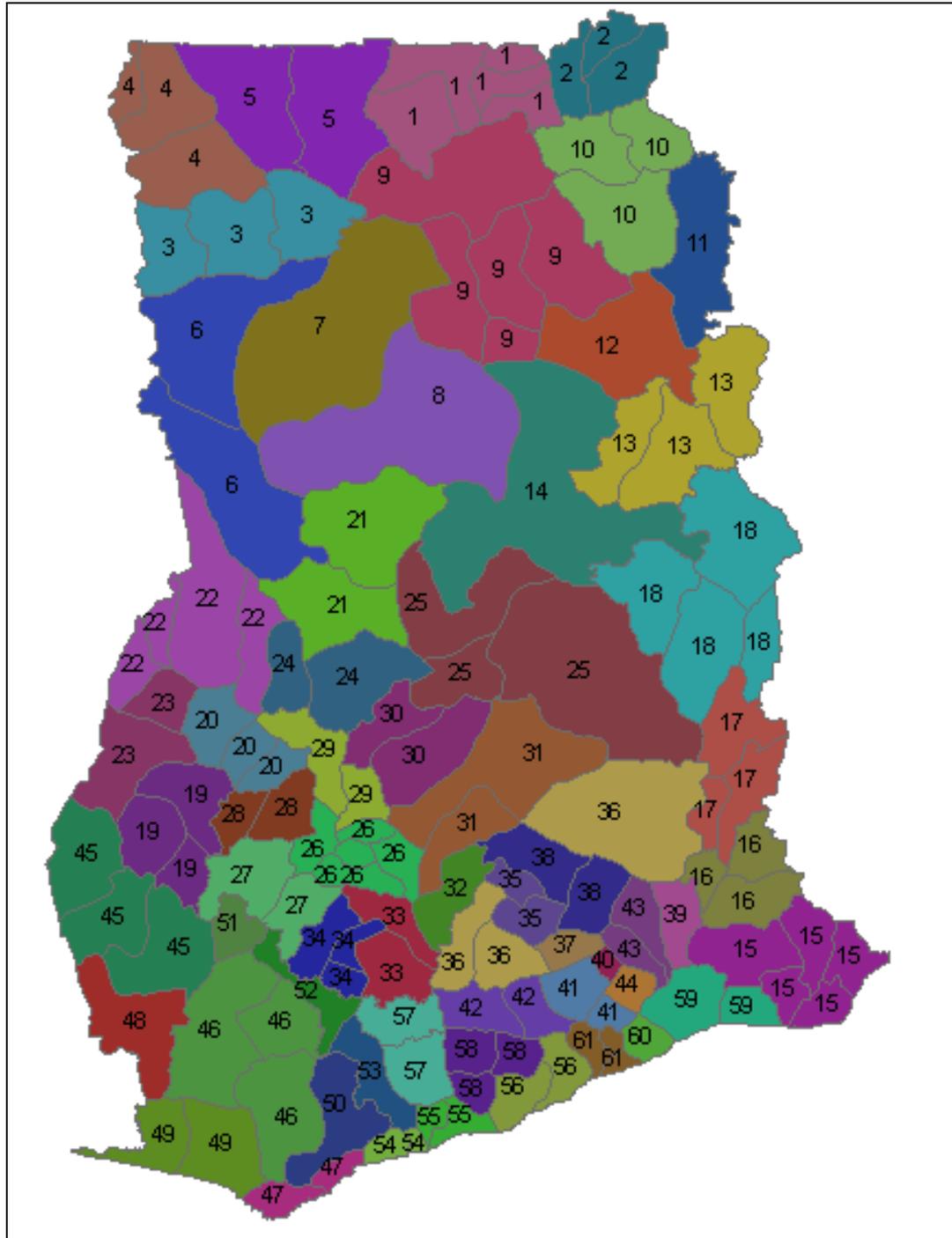


Figure 15 : Zoning system for the ITP model

In addition to these zones, 6 external zones were created, corresponding to the main borders crossings in the country; Hamile Border, Paga Border, Kulungugu Border, Dormaa Ahenkro Border, Elubo Border and Aflao Border. See the report on Transport Model Calibration for more details on the zoning system.

2.2 Data Collection

The counts were carried out on thirty-one (31) stations. For each station, the survey was conducted in both directions, for two days, from 30th September, 2008 to 30th October, 2008. The data was collected for forty periods of 15 minutes. Data for Rail and Aviation are based on national statistics. All the relevant data can be found in the model, as it will be explained later.

A number of indicators can be drawn from the data collection. These indicators can provide a better understanding of the current situation of the transport sector in Ghana.

The total number of interzonal trips observed was 524,600 trips/day, which means that, in average, one out of 44 people are making a long distance trip every day.

These trips are divided into the different modes as follows:

- Car: 21%
- Bus: 78%
- Rail: 0.7%
- Air: 0.05%

The road sector (cars and buses) accounts for 99.2% of all passenger trips.

The total number of passenger kilometres is 94 million, which represents an average distance of 179 km.

The freight transport represents 71,300 tons/day. The road transport accounts for 93% of these movements. The traffic generated by freight transport represents 23.6 million ton.km; the average distance for freight is 330 km.

3. Transport Model

Transport model calibration is the process of creating a computerized transport model capable of reproducing the transport demand and supply, as well as their interactions.

3.1 What is a computerized transport model?

A transport model is a computer-based tool capable of

- Estimating the transport demand resultant from a set of socio-economic drivers
- Estimating the modal split of the demand based on information about the transport supply
- Simulating the transport network for all the modes
- Estimating the interaction between demand and supply/infrastructure.
- Estimating the effect of an intervention on the network.

A transport model can be a “home-made” tool developed for an organization or authority. More currently, it is based on modelling software, in which case the modeller inputs his data and uses the functions he needs to build his own model.

The market for modelling software is dominated by a few suppliers¹⁴. It was commonly agreed by the ITP Team and the Ministry of Roads and Highways to adopt the Cube software. Cube is a comprehensive set of modules that support transportation planning, including transportation forecasting and system analysis. Cube is a very flexible tool which allows virtually any type of treatment and any model development, from the analysis of a single roundabout to a national-wide master plan.

Cube has been applied by Egis Bceom International in several countries, including the transport master plan of Kumasi and Tamale, in Ghana.

3.2 Model structure

The history of transport demand modelling has been dominated by the modelling approach which has come to be referred to as the four step (or four stage) model. The steps are: trip generation, trip distribution, modal split and network assignment.

Trip generation determines the frequency of origins or destinations of trips in each zone by trip purpose, as a function of land uses and household demographics, and other socio-economic factors.

Trip distribution matches origins with destinations, to develop a trip table; a matrix that displays the number of trips going from each origin to each destination.

Mode choice computes the proportion of trips between each origin and destination that use a particular transportation mode. They are estimated by either aggregated or disaggregated choice models.

Network assignment allocates trips between an origin and destination by a particular mode to a route. Often (for road assignment) Wardrop's principle of user equilibrium is applied (equivalent to a Nash equilibrium), wherein each traveller chooses the cheaper path, subject to every other driver doing the same.

Table 2 shows the question that need to be answered with each step in the model.

¹⁴ Cube (Citilabs), VISUM (PTV), EMME2 (INRO) and TransCad (Caliper) are the main softwares in the market.

Table 2 : Questions to be answered by each model step

Model step	Answer the question
Trip Generation	<i>How many trip does the user in some location wants to take in a day?</i>
Trip Distribution	<i>Where is the user going with each trip among all possible destinations?</i>
Modal Split	<i>Which transport mode the user adopts for each trip? What are the factors affecting that decision and to what extend?</i>
Network Assignment	<i>Which route between the origin and the destination does the user choose?</i>

3.3 Transport model calibration

Calibrating the model means that we determine the values for the parameters in order to ensure maximum agreement between the values calculated through the model and the original observations. The observations for a traffic model apply to a specific point in time that we use as a point of reference. One usually says that the model is calibrated for a specific baseline year. Other terms used for calibration are: the 'estimation' of a model and the 'fitting' of a model.

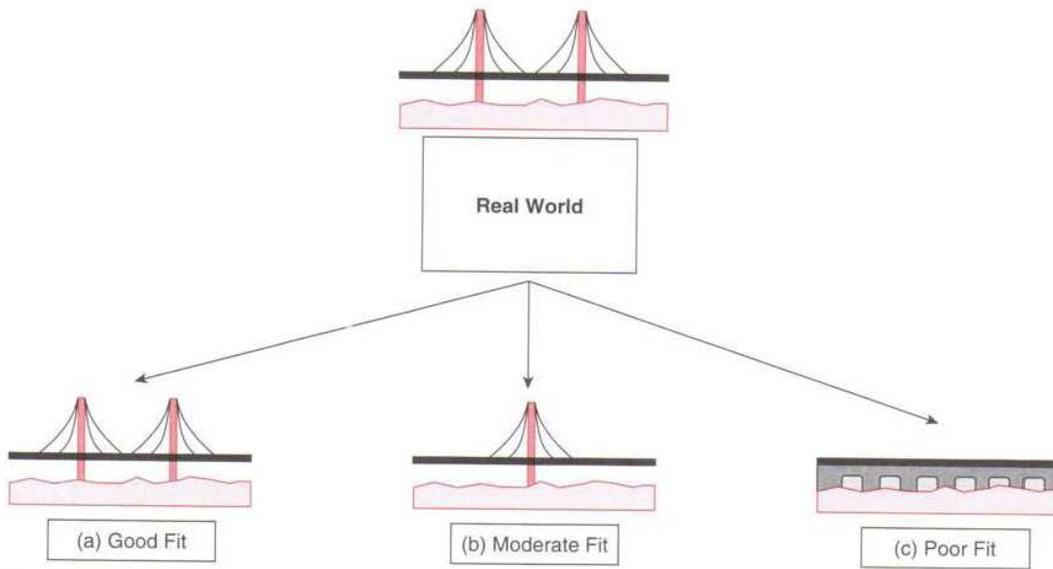


Figure 16 : Illustrative notion of fit quality.

3.3.1. Generation

The calibration of the transport generation will build the relationship between the demand for passengers transport and the socio-economic variables – link number 1 in the Figure 14.

The generation is based on socio-economic data from the GLSS 5 (2005/2006) and the 2000 Census.

The number of trips per capita produced and attracted by each zone are given by the following equations (see the Report on Transport Model Calibration for details).

For trip production

$$\ln(TPPC_r) = -36.76 + 2.2 \ln(EXPENDTOT) + 0.06 \ln(NBCARS) + 0.79 \ln(TURISM) - 3.92 \ln(URBSHARE) + 2.68 D_{Accra} \quad (3.02)$$

(-4.04) (2.72) (0.12) (3.18) (-2.6)

$$R^2 = 0.87$$

For trip attraction

$$\ln(TAPC_r) = -36.69 + 2.12 \ln(EXPENDTOT) + 0.34 \ln(NBCARS) + 0.85 \ln(TURISM) - 4.51 \ln(URBSHARE) + 2.48 D_{Accra} \quad (2.21)$$

(-3.18) (2.04) (0.52) (2.69) (-2.36)

$$R^2 = 0.82$$

For the external zones, since they concern other countries, we do not estimate their traffic in terms of socio-economic variables, but just apply an annual growth rate of 5%.

3.3.2. Distribution

In the distribution model the trips originating in a certain zone i , that have been calculated in the production model, are distributed over possible destinations j . The trips that have been

calculated in the attraction model with zone j as their destination, are distributed over the possible points of origin i . The distribution process produces an origin-destination matrix in which the rows of the table represent the origins and the columns represent the destinations and the entries in the table represent the trips between a certain origin and destination.

When an O-D matrix is available for the calibration year (from the OD survey), as is the case here, the distribution problem consists in updating this matrix given the productions and attractions issued from the generation model using future data. This is done through a Fratar process.

3.3.3. Induced Demand

In this study we apply elasticity of traffic between two zones with respect to the minimum generalized cost between them (among the modal options available) which is equal to -0.2.

It means that a reduction in the generalized cost of 10% generates, per se, an increase of the traffic of 2%. This is the induced demand.

For each OD pair, the traffic will be:

$$T_S^{OD} = T_B^{OD} \left[1 + e \left(\frac{GC_S^{OD} - GC_B^{OD}}{GC_B^{OD}} \right) \right]$$

Where:

T_S^{OD} is the traffic in the scenario situation

T_B^{OD} is the traffic in the base-case (without project) situation

e is the elasticity of traffic with respect to the generalized cost

GC_S^{OD} is the minimum generalized cost in the scenario situation

GC_B^{OD} is the minimum generalized cost in the base-case (without project) situation

3.3.4. Modal split

The modal split model estimates the distribution of trips over the transport modes available. At the end of this process, several OD matrices, one by mode, will be generated.

A logit model is used to estimate the modal share of one mode, given the generalized costs of all the modes available. For example, the modal share for car will be:

$$P(car) = \frac{e^{\lambda GC_{car}}}{e^{\lambda GC_{car}} + e^{\lambda GC_{bus}} + e^{\lambda GC_{train}} + e^{\lambda GC_{air}}}$$

3.3.5. Freight Model

The freight transport is highly dependent of the economic activity of the country. New industrial developments, mining exploitations, investments, technological change, etc, can dramatically change the structure of freight transport¹⁵.

In order to get the best possible picture about the planned and expected developments on the different industries, the ITP team with support from the Ministry of Roads and Highways and the Ministry of Transport organized workshops with the following bodies:

- Ministry of Finance
- Ministry of Trade and Industry
- Ministry of Energy
- Ministry of Food and Agriculture
- Ministry of Lands and Natural Resources
- Forestry Commission
- Minerals Commission
- Energy Commission
- Timber Export Development Board
- Cocoa Board
- Bulk Oil Storage and Transportation

The outputs of these workshops are presented in the reports:

- Socio-Economic Variables and Commodities Forecasts for Ghana 2008-2015-2025
- Commodities Generation and Transport in Ghana

Using this information an updated forecast freight matrix could be generated, which is then applied as the most likely demand scenario for freight transport.

3.3.6. Freight Modal Split

Due to the lack of data on price structure and in particular to the lack of real modal competition for freight transport in Ghana, the use of a mathematical model is not viable. In addition, the real market for rail will heavily depend on the quality of service offered.

Instead we adopt a qualitative assessment of the potential freight market for rail for those origin-destination pairs linked by rail in the infrastructure project scenarios.

We suppose that if the rail is available, all the cement, timber, bauxite, manganese, cocoa and 70% of general cargo are transported by rail. The rest, 30% of general cargo and all

¹⁵ For a review on transport models applied to freight transport see : Recent Developments in Transport Modelling – Lessons from the Freight Sector. Ben-Akiva, Meersman and Van de Voorde. Emerald Publications. 2008.

agriculture products, are still transported by road. Of course, this market share concerns only the long distance trips (interzonal).

This simplified approach gives only an idea of the potential traffic and can be used as a strategic approach but a detailed analysis is required if a feasibility study is carried out.

3.3.7. Network assignment

Network assignment is the process of determining which route, among all available, will be used by each user between his origin and destination.

If all of them were to take the shortest route (calculated over the unloaded network) then this route could become congested. This would lead to an increase in travel impedance along that route to the point where this route would no longer be the shortest one. Some road users would choose an alternative route. Congestion could also develop on the alternative route, etc. Eventually, equilibrium will be reached, as formulated for the first time in 1952 by *Wardrop*. (*Wardrop's first principle*):

Traffic distributes itself across the links of a network in such a way that an equilibrium occurs in which no individual road user can lower his travel resistance by unilaterally (independently of the other road users) choosing another route.

The assignment for rail and air consists simply in finding the lowest cost path (which usually coincides with the shortest path) for each OD. Given the very small rail and air networks in Ghana, the assignment is straightforward, namely; identifying if there is any link available between the origin and the destination and assigning the traffic for that OD on this link.

3.4 Issues about recalibration

A frequent question about model calibration is: When should the model be recalibrated? There are two different issues about ensuring the validity of the model. The first one is the recalibration and the second is keeping the model up to date. We should think about model recalibration when:

- the economic reality has dramatically changed from the situation in the model; while most changes, including macro-economic and population growth and other socio economic characteristics can be easily included in the model, some structural changes can not; a high increase in the service sector for example will affect the global economy and also the mobility patterns.
- the infrastructure has dramatically changed; the development of some projects can obviously be included in the model – this is actually the main purpose of the model. However, when a significantly large number of infrastructure projects have been completed, the mobility patterns can change as a function of these developments; for example, the developments of new industries along these new roads.
- any external factor affecting the mobility patterns in a significant way. These factors can be psychological (some countries invest in campaigns to improve perceptions about public transport), technological (affecting costs and way of travel), etc.

- when more reliable information becomes available. This is the main issue in Ghana, since data: is often not available; requires disaggregation; and not always reliable. We would in particular seek to improve the quality of data on a district-by-district level.

However, a model can only be applied if it is up to date. Updating the model does not mean recalibrating it, but ensuring that each new project is included in the base network and that each new actual socio-economic data replaces a forecast data.

It is fundamental that the model must be frequently updated to remain valid. Otherwise the model becomes obsolete in a very short time.

The process of updating should be continuous and a unique version of the model must be used (different versions of updates must be avoided). We recommend at least an annual complete update. The recalibration must be driven by external factors affecting the validity of the model. We can, however, expect that a new calibration will be needed in about 5 years.

4. Forecasting future demand for transport

The process of forecasting the future demand for transport involves (link number 3 of Figure 14):

- forecasting the values for the variables used to represent the transport demand drivers,
- forecast the production of commodities,
- introduce these on the transport model in order to estimate the future demand.

Forecasting horizons are 2015 and 2035. 2015 is the year when we expect the projects proposed in the ITP to be operational, considering the time to making decision and full construction. Since for the economic evaluation of projects we need a 20-year forecast, the last forecast year is 2035.

The description of the forecasts are provided on the report **Socio-economic variables and commodities forecasts for Ghana**. These are summarised below.

Table 3 : Socio-economic forecasts

	Variable	Unit	2008	2015	2035
Socio-economic	GDP	index 2008=100	100.0	138.0	546.5
	Population	million inhabitants	22.9	27.2	45.8
	Urbanization	average Ghana (%)	45.4	49.5	61.9
	Tourism	million trips	24.3	28.1	43.8
	Motorization	million of working cars	0.19	0.30	1.06
	Expenditure	million 2005 cedis	5.4	5.7	8.2
Commodities	Bauxite	million tons	0.6	1.0	2.0
	Manganese	million tons	1.0	1.3	1.6
	Cement	million tons	1.6	1.9	3.2
	Timber	million tons	12.1	14.7	24.2
	Cocoa	million tons	0.7	1.0	1.3
	Agriculture	million tons	26.0	31.1	52.0
	Oil consumption	million tons	3.1	4.3	12.6
	Other/general cargo	million tons	5.0	7.0	27.0

Entering the socio-economic forecasts presented here, we estimate the total number of long distance trips made by passengers, using the transport model developed for Ghana. It is important to remember that these constitute inter-zonal trips, according to the zone system defined for the transport planning model in Ghana.

The total number of inter-zonal trips increases from 524,600 in 2008 to 643,700 in 2015 and reaches 1.76 million in 2035, which represents a sustained increase of 5% per annum in average. This growth is led essentially by the growth in population and in expenditure.

Table 4 : Passengers' traffic growth

	2008	2015	2035
Passenger traffic (million of interzonal trips)	0.52	0.64	1.76

These figures exclude any effect related to induced or disincented traffic. Traffic induction is the increase in traffic due to a new project, which lowers transport costs. Traffic disincent is related to the increase in transport costs due to congestion, bad network conditions or traffic management measures. See the calibration report (Volume 6) for details.

5. Future Reference or 'without project' Network

The network analysis and the transport model calibration are based on GIS for 2008 provided by GHA. It integrates data about the road conditions (type of surface, IRI, number of lanes, width ...) as well as the rail links and stations and airports.

Since the first year of project evaluation was defined as 2015 (considering that this would be the first year of operation for new projects), the "without project situation" should not be the network today, but what the network will be in 2015, integrating all the on-going and planned activities.

The ITP Team has worked closely with the government transport agencies in order to identify all the projects that should be added to the current network in order to establish the network which will serve as the base for the project evaluation. This is called the base network.

The Reference Network for 2015 and 2035 as well as the Base Network for 2008 are included in the Transport Model developed by the ITP Team. It is worth noting that to extract the maximum information from the model, the information about the networks must be updated in the model to reflect its real condition (updated conditions survey) and new and improved links (new projects).

5.1 Roads

The reference network for 2015 is composed by the road network, consisting of National Roads N1-N15, as it was in 2008 (calibration year) augmented by the following projects:

Table 5 : Road projects added to the reference network

	ROAD NAME	LENGTH (KM)	DEVELOPMENT ACTIVITY DESCRIPTION	COMPLETION DATE
Ongoing Projects				
1	Kumasi - Techiman Phase 2	76.0	Reconstruction from Surface Dressing to Asphaltic Concrete Surfacing	2010
2	Nsawam - Apedwa Road, Nsawam Bypass	9.3	Construction of Virgin Road to two-lane dual carriageway with Asphaltic Concrete Surfacing	2012
3	Techiman - Kintampo	60.0	Reconstruction from Surface Dressing to Asphaltic Concrete Surfacing	2012
4	Tetteh Quarshie - Mamfe Road Project, Madina - Pantang Section	5.4	Widening from two-lane single carriageway Surface Dressing to Asphaltic Concrete Surfacing three-lane dual carriageway with service roads	2011
5	Tetteh Quarshie - Mallam (Lot 1)	8.0	Widening from two-lane single carriageway to three-lane dual carriageway Asphaltic Concrete surfacing with an underpass	2011
6	Akatsi - Dzodze - Akanu (not included since not National Road)	30.0	Upgrading from Gravel Surfacing to Surface Dressing	2012
7	Akatsi - Aflao Road & Akatsi	58.7	Reconstruction from Surface Dressing to	2012

	Bypass		Asphaltic Concrete Surfacing	
8	Tetteh Quarshie - Madina Road	4.6	Widening from two-lane single carriageway to three-lane dual carriageway with service roads + Interchages	2011
9	Bamboi - Tinga	53.4	Upgrading from Gravel Surfacing to Surface Dressing	2010
10	Ho - Fume	25.0	Upgrading from Gravel Surfacing to Surface Dressing	2011
11	Sogakope - Adidome - Ho	87.0	Upgrading from Gravel Surfacing to Surface Dressing	2012
12	Asankragwa – Enchi (not included since not National Road)	56.4	Upgrading from Gravel Surfacing to Surface Dressing	2011
13	Berekum – Sampa (not included since not National Road)	56.0	Upgrading from Gravel Surfacing to Surface Dressing	2011
14	Kpandu - Worawora - Dambai, Phase 3 (not included since not National Road)	70.0	Upgrading from Gravel Surfacing to Surface Dressing	2013
15	Wenchi - Sampa Phase 2, Nsawkaw - Namase Section (not included since not National Road)	26.0	Upgrading from Gravel Surfacing to Surface Dressing	2011
16	Bomfa Junction - Asiwa - Bekwai	36.2	Upgrading from Gravel Surfacing to Surface Dressing	2011
17	Sefwi Bekwai - Eshiem - Asankragwa, (Km 10-56) (not included since not National Road)	46.0	Upgrading from Gravel Surfacing to Surface Dressing	2012
18	Addendum No. 1 to Anyinam - Konongo Continuation Project	15.3	Construction of Virgin Road to 2-lane dual carriageway with Asphaltic Concrete Surfacing	2011
19	Achimota - Ofankor	5.7	Widening from two-lane single carriageway Asphaltic Concrete Surfacing to three-lane dual carriageway Asphaltic Concrete Surfacing with service roads + Interchages	2011
20	Nsawam - Apedwa Road, Kwafokrom - Apedwa	31.7	Widening from two-lane single carriageway Surface Dressing to two-lane dual carriageway Asphaltic Concrete surfacing	2014
21	Fumesua - Ejisu	4.7	Widening from two-lane single carriageway Asphaltic Concrete surfacing to two-lane dual carriageway Asphaltic Concrete surfacing	2010
22	Enchi - Dadieso (km 0-50) (not included since not National Road)	50.0	Upgrading from Gravel Surfacing to Surface Dressing	2011
SUB TOTAL (ON-GOING PROJECTS)		815.4		
New Projects				
1	Tetteh Quarshie - Mallam (Lot 2)	6.0	Widening from two-lane single carriageway to three-lane dual carriageway Asphaltic Concrete surfacing with Interchange	2011

2	Buipe - Tamale	103.4	Rehabilitation and 4km reconstruction	2011
3	Ayamfuri – Asawinso (not included since not National Road)	52.2	Reconstruction from Surface Dressing to Asphaltic Concrete Surfacing	2011
4	Dodi Pepeso - Nkwanta	35.0	Upgrading from Gravel Surfacing to Surface Dressing	2011
5	Tarkwa – Ayamfuri (not included since not National Road)	94.4	Reconstruction from Surface Dressing to Asphaltic Concrete Surfacing	2012
6	Takoradi - Agona Jn	28.0	Rehabilitation	2012
7	Agona Jn - Elubo	110.0	Asphaltic Concrete Overlay on existing AC Surfacing + Reconstruction	2013
8	Anwiankwanta - Yamoransa (Sect.Rehab)	83.2	Rehabilitation	2013
9	Fufulso - Sawla Road	147.5	Upgrading from Gravel Surfacing to Surface Dressing	2013
SUB TOTAL (NEW PROJECTS)		659.7		

All the projects are considered to provide a final surface in good condition.

5.2 Rail

The reference network includes:

- Kumasi – Takoradi mixed line
- Awaso – Dunkwa freight line
- Tema – Accra passenger line
- Accra – Nsawan passenger line

For freight, the hypothesis is that the rail provides the capacity and the service necessary to carry all the potential demand.

5.3 Civil Aviation

The reference network includes links between:

- Accra – Kumasi
- Accra – Sunyani
- Accra – Tamale
- Accra – Takoradi
- Takoradi - Kumasi
- Takoradi - Tamale
- Tamale - Kumasi

5.4 Inland Waterways

For the purpose of modelling it is assumed that the multimodal corridor (pipeline and fuel barge) from Tema to Buipe is operational in 2015 and transporting fuel products only.

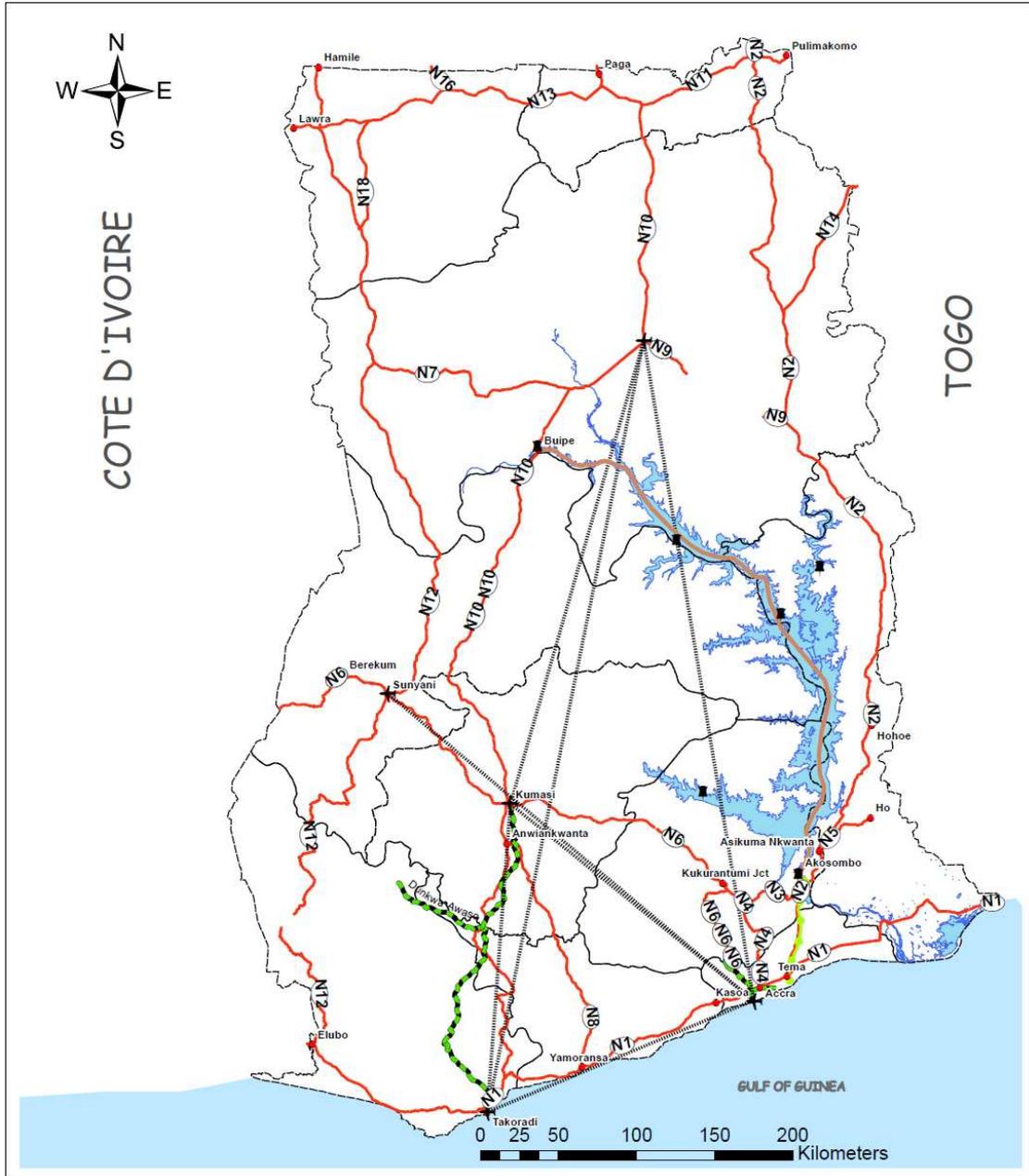


Figure 17: Reference Network

6. Future 'without project' road conditions

Using the demand forecast and the transport networks including only the ongoing and planned interventions, we can estimate what will be the travel conditions in the future in absence of additional projects. But it is assumed that maintenance is properly done and no degradation of the surface conditions occurs.

6.1 Surface conditions

The map below shows the surface conditions according to the IRI (International Roughness Index). Higher IRI means poorer surface conditions.

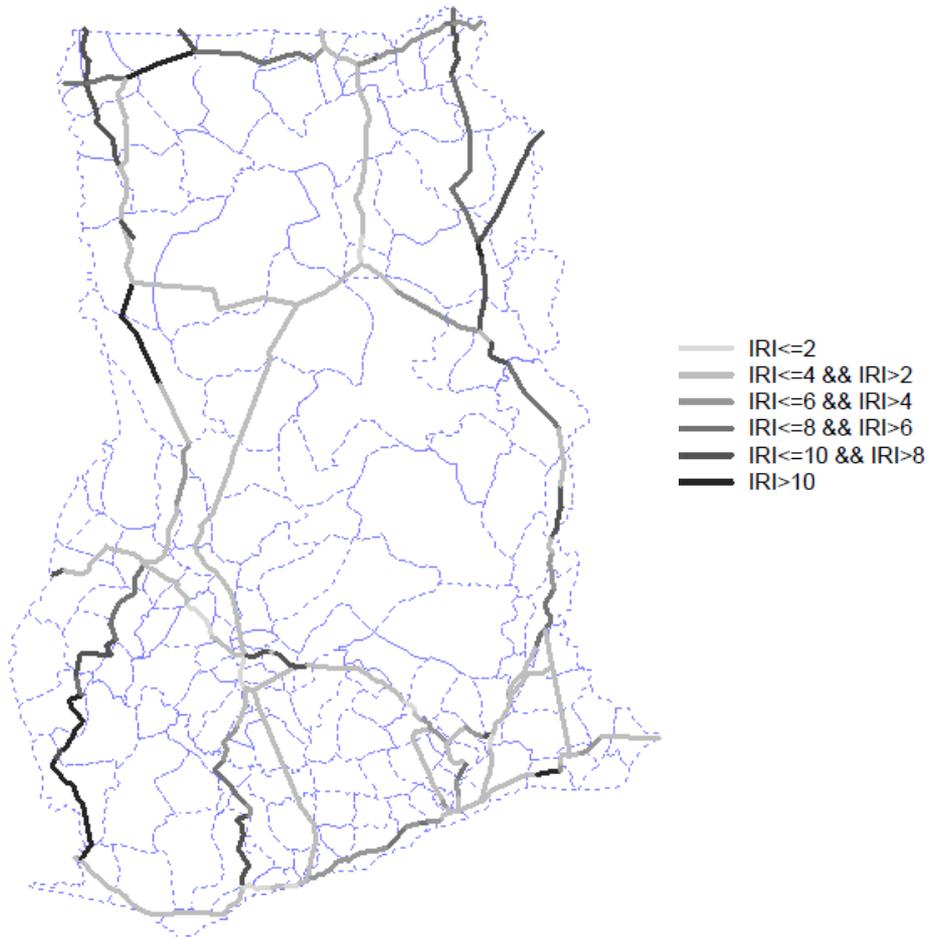


Figure 18 : IRI conditions

As we can see, the N12, N13 and northern section of N2 present the worse conditions.

6.2 Congestion effects

Looking at the interactions between demand forecast and infrastructure, we can analyse the evolution of the congestion as is shown below, where the levels of service are represented.

For 1-Lane per direction roads, the LOS (level of service) is estimated using the time spent following, while for 2 or more lanes per direction it is based on the traffic density. These standards are set out in the Highway Capacity Manual 2000, used as reference for road design.

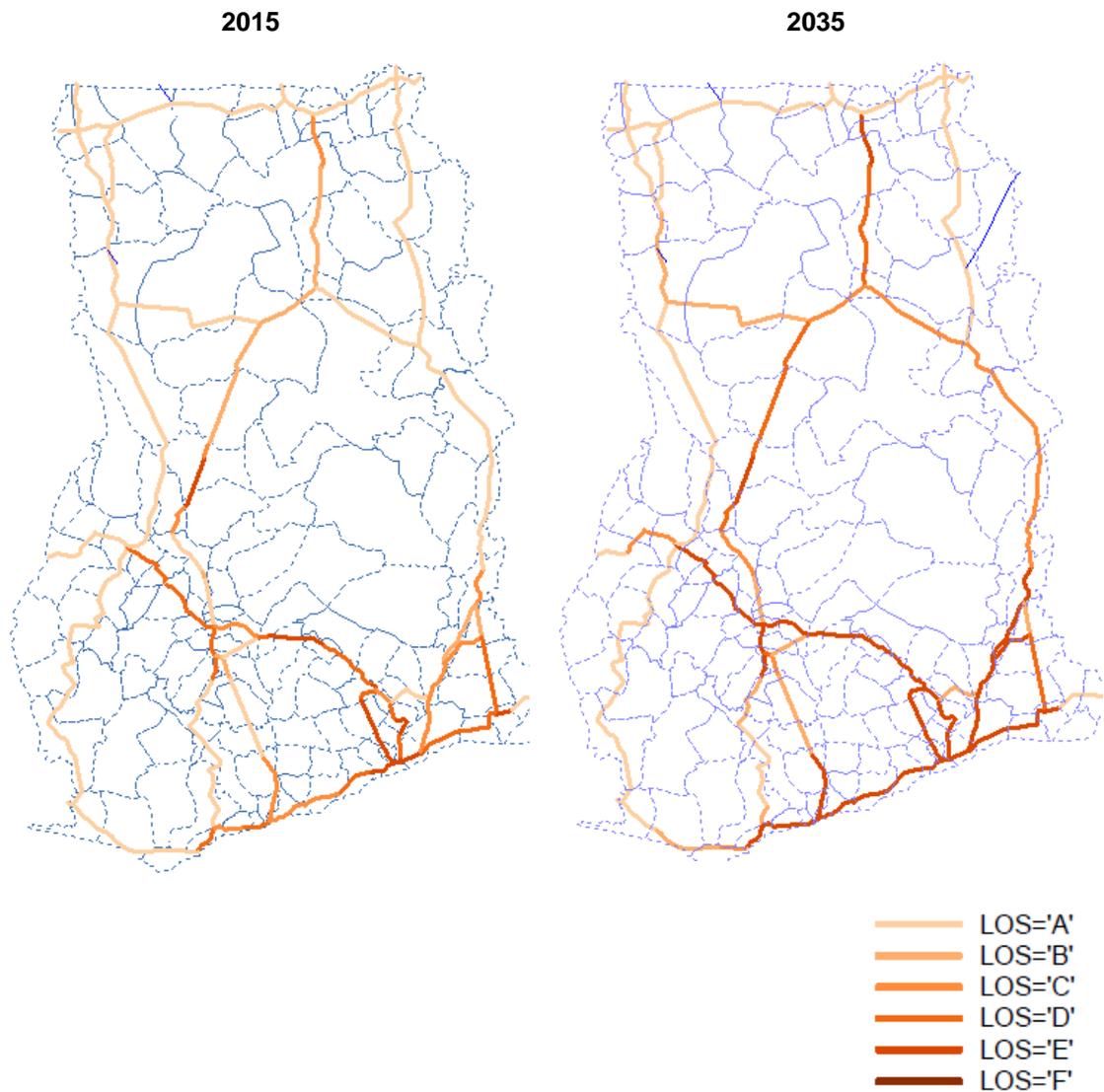


Figure 19 : Level of Service in the Reference Situation

The main congestion effects are on the N1, N6 between Tema and Kumasi and the N10 from Kumasi to the north.

It is interesting to note that the high trafficked roads are in general in good conditions and the low-traffic roads in bad conditions. It means that the focus on the proposed interventions should be in surface improvements for the low traffic roads and capacity improvement for the high traffic roads.

7. Pre-evaluating railways

For the railways, in order to identify the most viable projects, a pre-evaluation process, called here 'screening' was used. The screening approach is based on the potential traffic for

railways. For the rail screening, the maximum potential traffic is allocated to the rail in order to identify the potentially viable rail projects.

The main difference between this approach and the standard approach to evaluation is that in the screening, the preference is given to the rail projects against the roads. If a rail project is viable, instead of studying the rail and its competing road against the reference (without project situation), we suppose that the rail will be chosen and study the road against the situation with the rail.

The screening process point of departure is a virtual scenario including all possible rail projects as agreed with MOT/GRDA. This is the Ultimate Scenario. Because of financing limitation, it is difficult to implement all of these projects during the 2011-2015 planning period. In order to undertake a pre-selection of the projects, the screening process will evaluate the economic viability of each of these projects and successively remove from the network those which are not viable. For this purpose, road and aviation networks remain unchanged from the base network.

The lines composing the ultimate rail scenario are:

New lines:

- Aflao – Tema
- Kumasi – Buipe – Tamale
- Tamale – Bolgatanga – Paga
- Accra – Takoradi (via Cape Coast)
- Tarkwa – Omanpe (to Cote d'Ivoire)

Reconstruction:

- Tema – Accra
- Accra – Kumasi
- Takoradi – Kumasi

All the lines are considered to be mixed (passenger and freight) and of either standard or existing cape gauge.

The figure below shows the freight traffic for the Ultimate Scenario in tons/day for 2015. We must now estimate the minimum traffic threshold which makes the construction or rehabilitation of the line viable.

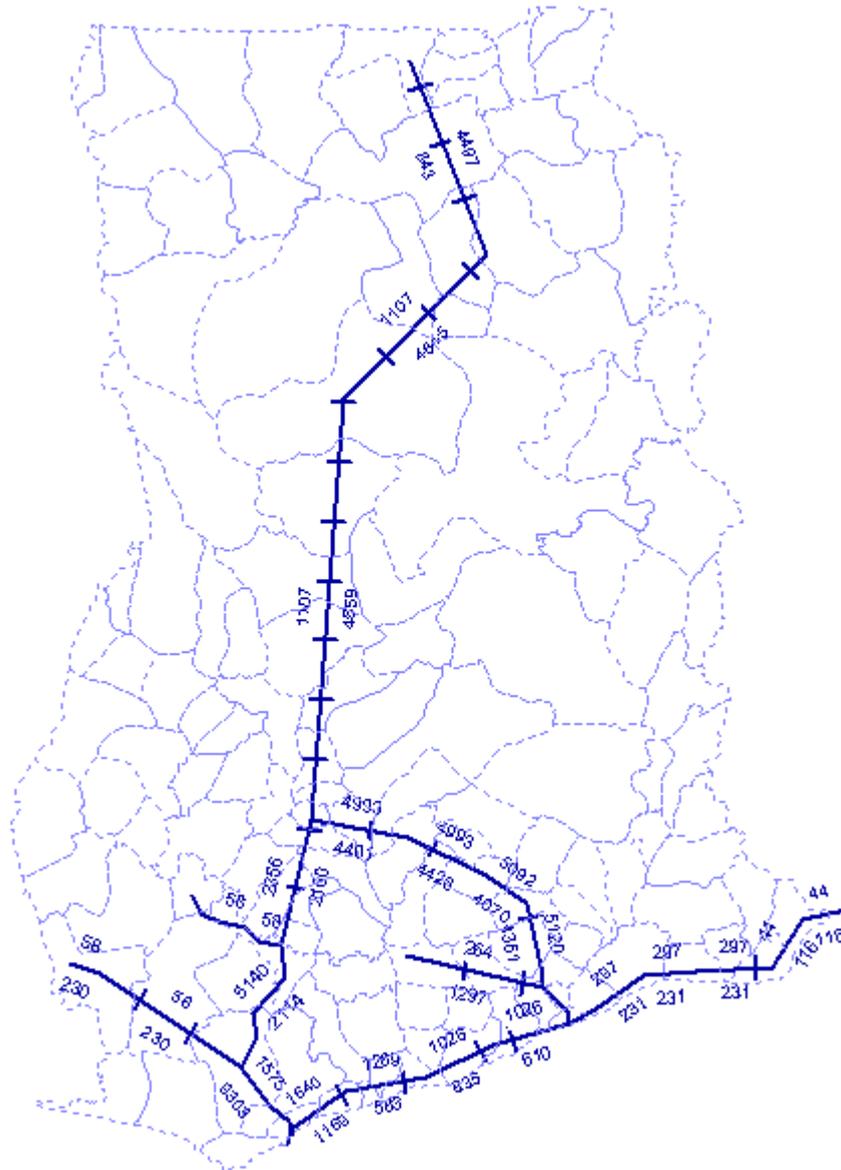


Figure 20 : Ultimate Rail Scenario (tons/day 2015)

7.1 Simplified Economic Analysis

7.1.1. In the 'with project' situation

- Railway construction cost:** It is assumed an average of 1.4 million US\$ per km cost for rehabilitation and 3.5 million US\$ per km for new construction. It is assumed a 3-year construction period, and that successively 30%, 40%, and 30% of the total cost is annually spent. At the end of the analysis period, a 50% residual value of the construction cost may be taken into account. This percentage of salvage value is based on normal service life of the various components of the construction (e.g. 100 years for land acquisition, design and tunnels, 50 years for structures, 30 years for signaling system).

- **Rolling stock amortization cost:** for passengers, it is assumed that a train consists of a locomotive hauling 13 coaches with 60 seats each provides an average 800 km service per day; i.e. offering $14 \times 60 \times 800 \times 365 / 1.15 = 198.1$ million seat-km per year taking into account a 15% time for maintenance; amortization time is usually 40 years and initial investment cost is $\$3.8 + \$1.0 \times 13 = \$16.8$ million giving an amortization cost of $\$0.0025$ per passenger-km taking a passenger train occupation rate of 85%. For freight, it is assumed that a train consists of a locomotive hauling 50 wagons with 40 ton load on one way with return trip empty providing an average 200 km service per day i.e. transporting $50 \times 40 \times 0.5 \times 200 \times 365 / 1.15 = 63.5$ million ton-km per year taking into account a 15% time for maintenance; amortization time is usually 40 years and initial investment cost is $\$3.8m + \$0.09m \times 40 = \$7.4m$ giving an amortization cost of $\$0.0029$ per ton-km.
- **Railway operating cost:** They include train operation cost and rolling stock and infrastructure maintenance costs. These costs are economic costs using in particular fuel cost without subsidy (i.e. international cost at $\$0.48$ per litre). They amount to $\text{US}\$0.038$ per passenger-km and $\text{US}\$0.012$ per ton-km.

7.1.2. In the 'without project' situation:

- **Road transport costs:** Road transport costs (i.e. Vehicle Operating Costs -VOC) are calculated with HDM/RED model. The inputs of the model are shown in the figure below. Unit costs are economic costs using in particular economic fuel costs. VOC are calculated for paved road in fair condition. In order to allow the comparison with railway transport costs, costs per passenger-km and ton-km are estimated based on average vehicle occupancy/load. Passenger car and bus occupancy is 3.15 and 17.5 respectively. Taking into account unloaded vehicles, the average load per truck is 9 tons per truck. In the base case road passengers divide into passenger car (20%) and bus (80%) giving an average of 0.042 $\text{US}\$/\text{passenger-km}$.

Input

Rail Construction cost (M\$/km)	Traffic growth rates		Road maint (\$/km/year)	Rolling stock amortization		Road VOC		Rail operating costs		Discount rate
	Passenger	Freight		(\$/pkm)	(\$/tkm)	(\$/pas./km)	(\$/t/km)	(\$/pas./km)	(\$/t/km)	
1.400	5.0%	5.0%		0.0025	0.0029	0.042	0.099	0.038	0.012	15%

Output

Ttraffic threshold	Passenger (Nb.)	Freight (tons/year)	Freight (tons/day)	NPV (M\$/km)
	0	2 230 593	6 111	0.000

Year	Construc. cost (M\$/km)	Road Dual cost (M\$/km)	Annual traffic		Road maint. (M\$/km)	Rolling stock amortization		Annual operating costs (M\$/km)				Annual savings balance			
			Passengers	Tons		Passenger (M\$/km)	Freight (M\$/km)	'Without project'		'With project'		Savings	Undiscounted	Discounted	
								Passengers	Freight	Passengers	Freight	Passengers	Freight	(M\$/km)	(M\$/km)
2012	-0.420	0.000												-0.420	-0.420
2013	-0.560	0.000												-0.560	-0.487
2014	-0.420	0.000												-0.420	-0.318
2015			0	2 230 593	0.000000	0.000	0.006	0.000	0.221	0.000	0.026	0.000	0.195	0.188	0.124
2016			0	2 342 123	0.000000	0.000	0.007	0.000	0.232	0.000	0.027	0.000	0.204	0.198	0.113
2017			0	2 459 229	0.000000	0.000	0.007	0.000	0.243	0.000	0.029	0.000	0.215	0.207	0.103
2018			0	2 582 191	0.000000	0.000	0.007	0.000	0.256	0.000	0.030	0.000	0.225	0.218	0.094
2019			0	2 711 300	0.000000	0.000	0.008	0.000	0.268	0.000	0.032	0.000	0.237	0.229	0.086
2020			0	2 846 865	0.000000	0.000	0.008	0.000	0.282	0.000	0.033	0.000	0.248	0.240	0.079
2021			0	2 989 208	0.000000	0.000	0.009	0.000	0.296	0.000	0.035	0.000	0.261	0.252	0.072
2022			0	3 138 669	0.000000	0.000	0.009	0.000	0.311	0.000	0.037	0.000	0.274	0.265	0.065
2023			0	3 295 602	0.000000	0.000	0.010	0.000	0.326	0.000	0.039	0.000	0.288	0.278	0.060
2024			0	3 460 382	0.000000	0.000	0.010	0.000	0.343	0.000	0.041	0.000	0.302	0.292	0.055
2025			0	3 633 402	0.000000	0.000	0.011	0.000	0.360	0.000	0.043	0.000	0.317	0.307	0.050
2026			0	3 815 072	0.000000	0.000	0.011	0.000	0.378	0.000	0.045	0.000	0.333	0.322	0.045
2027			0	4 005 825	0.000000	0.000	0.012	0.000	0.397	0.000	0.047	0.000	0.350	0.338	0.042
2028			0	4 206 116	0.000000	0.000	0.012	0.000	0.416	0.000	0.049	0.000	0.367	0.355	0.038
2029			0	4 416 422	0.000000	0.000	0.013	0.000	0.437	0.000	0.052	0.000	0.385	0.373	0.035
2030			0	4 637 243	0.000000	0.000	0.013	0.000	0.459	0.000	0.054	0.000	0.405	0.391	0.032
2031			0	4 869 106	0.000000	0.000	0.014	0.000	0.482	0.000	0.057	0.000	0.425	0.411	0.029
2032			0	5 112 561	0.000000	0.000	0.015	0.000	0.506	0.000	0.060	0.000	0.446	0.431	0.026
2033			0	5 368 189	0.000000	0.000	0.016	0.000	0.531	0.000	0.063	0.000	0.468	0.453	0.024
2034	0.700	0.000	0	5 636 598	0.000000	0.000	0.016	0.000	0.558	0.000	0.066	0.000	0.492	1.176	0.054

The difference between the respective 'without project' and 'with project' costs enables the annual savings balance to be assessed. The analysis period includes a 3-year construction period (i.e. year 1-3) followed by a 20-year operation period (year 4-23). During the construction period both in 'without project' and 'with project' situations, passengers and freight are transported by road and there is no transport cost savings. During this period the balance is negative and consists of construction costs. Starting in year 4 all the potential freight is transported by rail generating savings on VOC.

In a first step, traffic threshold is calculated in relation to freight traffic exclusively, since freight transport cost savings are predominant. Based on the previous assumptions, the traffic threshold is estimated at 6,000 tons/day for rehabilitation and 15,000 tons/day for new construction (both directions). Since the operating costs for road and rail are very close, the passengers can be disregarded for this first analysis.

7.2 'Do Optimum' Rail Scenario

The 'Do Optimum' rail scenario integrates all the rail links with traffic higher than the threshold. Briefly, the only additional rail project in the Do Optimum compared to the reference situation is the rehabilitation of the Eastern Line and its extension to Tema.

We should highlight that the potential traffic supposes a massive modal shift from road to rail, in particular for transit traffic. To reach this modal shift, efforts have to be made to provide a high quality of service and a performing logistic system.

8. Proposed Road Interventions

The following projects have been subject to analysis. They include basically all the national roads and propose capacity improvement where future congestion is identified and surface improvements where the future situation (including on-going and planned projects) presents high IRI.

Table 6 : List of projects

Project ID (PID)	Transport Mode	Nature of Works	Route	Length (km)	Type of work in the scenario
01	Road	Road Capacity & Conditions Improvement	N1 Aflao-Tema	170,0	Widening Adding 2 Lanes
02	Road	Road Capacity & Conditions Improvement	N1 Tema-Accra	21,0	Widening Adding 4 Lanes
2bis	Road	Road Capacity & Conditions Improvement	N1 Tema-Accra	21,0	Widening Adding 2 Lanes

03	Road	Road Capacity & Conditions Improvement	N1 Accra-Kasoa	17,1	Widening Adding 4 Lanes
03bis	Road	Road Capacity & Conditions Improvement	N1 Accra-Kasoa	17,1	Widening Adding 2 Lanes
04	Road	Road Capacity & Conditions Improvement	N1 Kasoa-Jct N8	104,8	Widening Adding 2 Lanes
05	Road	Road Capacity & Conditions Improvement	N1 Jct N8-Takoradi	87,5	Widening Adding 2 Lanes
06	Road	Road Capacity & Conditions Improvement	R28 Sogakope-Ho	86,6	Widening Adding 2 Lanes
07	Road	Road Capacity & Conditions Improvement	N5 (all of it)	48,4	Widening Adding 2 Lanes
08	Road	Road Capacity & Conditions Improvement	N2 Jct N1-Asikuma Nkwanta (Jct N5)	90,9	Widening Adding 2 Lanes
09	Road	Road Capacity & Conditions Improvement	N2 Asikuma Nkwanta (Jct N5)-Hohoe	126,6	Widening Adding 2 Lanes
10	Road	Road Capacity & Conditions Improvement	N4 Jct N1-Kukurantumi Jct	120,2	Widening Adding 2 Lanes
11	Road	Road Capacity & Conditions Improvement	N6 Apedwa-Kukurantumi Jct	22,3	Widening Adding 2 lanes
11bis	Road	Road Capacity & Conditions Improvement	N6 Accra-Kukurantumi Jct	87,8	Widening Adding 4 Lanes
12	Road	Road Capacity & Conditions Improvement	N6 Kukurantumi Jct-Kumasi	153,5	Widening Adding 2 Lanes
13	Road	Road Capacity & Conditions Improvement	N6 Kumasi-Berekum	211,5	Widening Adding 2 Lanes
14	Road	Road Capacity & Conditions Improvement	N10 Kumasi-Paga	577,5	Widening Adding 2 Lanes
15	Road	Road Capacity & Conditions Improvement	N10 Takoradi-Kumasi	201,7	Widening Adding 2 Lanes
16	Road	Road Capacity & Conditions Improvement	N8 (all of it)	184,3	Widening Adding 2 Lanes
17	Road	Road Conditions Improvement	N12 Elubo-Hamile	593,7	Upgrading Reconstruction 2 Lanes
18	Road	Road Conditions Improvement	N2 Hohoe-Kulungugu	475,8	Upgrading Reconstruction 2

					Lanes
19	Road	Road Conditions Improvement	N13/N11 Lawra-Pulimakomo	335,1	Upgrading Reconstruction Lanes 2

9. Evaluating Projects

The evaluation of the projects is undertaken using a multi-criteria analysis approach integrating economic, social, environmental aspects, strategic access, inter and intra modal integration, and local access aspects:

- **Economic viability.** This criterion takes into account the economic viability of the projects and should use indicators based on a cost-benefit approach.
- **Environmental effects.** This criterion takes into account the possible negative environmental impacts of the projects. The type of impact may vary from one mode to another. For instance, port projects have an impact on marine ecosystems that has not to be considered for other modes.
- **Social effects.** In particular, this criterion takes into account the effects of the project on poverty alleviation. This effect is mainly related to the increasing accessibility to job opportunity and health/education services given to poor people; however, it also takes into account negative impacts such as resettlement.
- **Strategic access.** This criterion takes into account the capability of the projects to improve the economic and physical access to strategic transport routes for goods and passengers.
- **Inter and intra modal integration.** This criterion is related to interchange facilities required as part of transport infrastructure projects.
- **Local access.** This criterion regards local access aspects including integration of NMT.

The economic analysis computes the benefits from the reduction of transport costs due to the new project. It takes into account, explicitly or implicitly, a number of parameters such as:

- Generalized costs (including vehicle operating costs, the value of time, etc,..)
- the population and the type and level of economic activities in the project's zone of influence (through the demand analysis and traffic projections),
- the investment and recurrent maintenance costs.

The multi criteria analysis approach supplements the economic analysis by taking into account the various parameters that should be considered in the prioritization process of the projects, leading to a unique score summarizing all the considered parameters.

Each criterion in the multi-criteria analysis must be quantified in order to enable inputting its score in a scoring system. Further, the importance of each criterion should be weighted in an appropriate weighting system. The combination of these two systems leads to the final score

of each project enabling its comparison with the other scored projects and their prioritization. A specific score is calculated for each criterion. In order to homogenize and improve the visibility of the scoring system, each specific score has a maximum of 10. It is desirable that the maximum score always corresponds to the highest level of priority: highest economic viability, lowest negative environmental impacts, highest impact on poverty alleviation, etc. Negative aspects may be given a negative score.

The **Multi-Criteria Evaluation Manual** defines the methodology to be applied and the scoring system. The following flow-chart summarizes the road projects multi-criteria evaluation process.

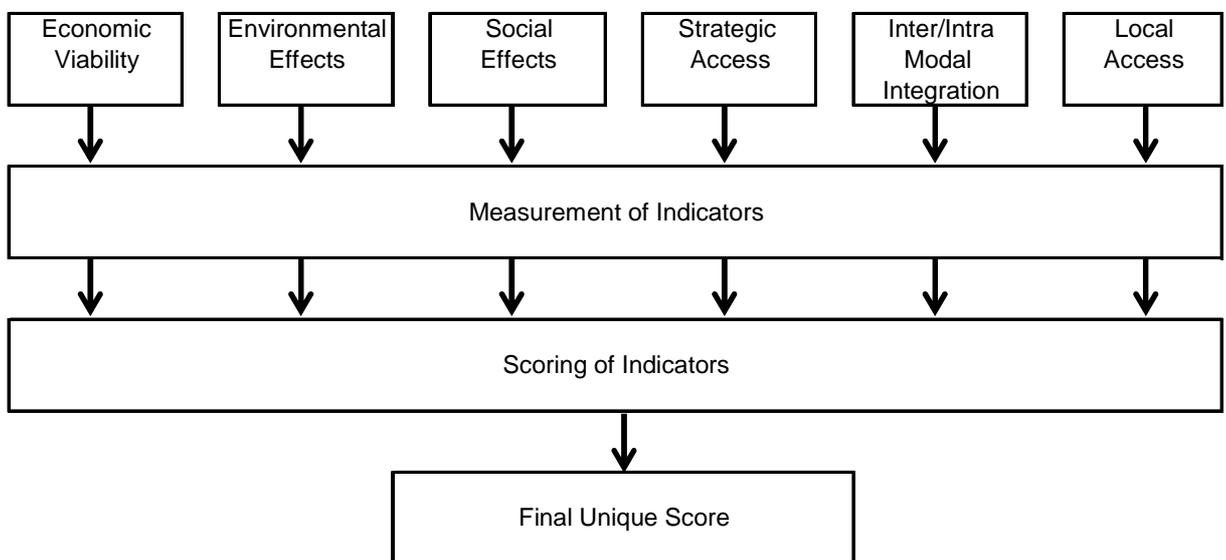


Figure 21: Multi-criteria evaluation process

9.1 Evaluation Criteria

The evaluation criteria applied are based upon the Multi-Criteria Evaluation Manual developed to this very specific purpose and encompasses the following criteria and sub criteria:

Table 7 : List of criteria applied in the project evaluation

<p>Criteria 1: Economic Viability</p> <ul style="list-style-type: none"> • Sub-Criteria 1.1: NPV/Discounted Investment Cost Ratio • Sub-Criteria 1.2: Score for Optimum Year to putting into operation

<p>Criteria 2: Environmental Impact</p> <ul style="list-style-type: none"> • Sub-Criteria 2.1: Proximity to Environmentally Sensitive Areas • Sub-Criteria 2.2: Noise Pollution <ul style="list-style-type: none"> -Number of settlements affected by Noise -Proximity to communities • Sub-Criteria 2.3: Impact on Water Quality <ul style="list-style-type: none"> -Number of rivers crossed -Proximity to water body • Sub-Criteria 2.4: Impact on Ecological Zones <ul style="list-style-type: none"> -Location of project • Sub-Criteria 2.5 Environmental Impact Potential <ul style="list-style-type: none"> -Nature of road works -Type of works
<p>Criteria 3: Social Effects</p> <ul style="list-style-type: none"> • Sub-Criteria 3.1: Average percentage incidence of poverty per districts traversed • Sub-Criteria 3.2: Average number of accidents per districts traversed by road • Sub-criteria 3.3: Involuntary Resettlement <ul style="list-style-type: none"> -Type of Road Works -Type of Works (Railways, Sea Ports & Airports) - Percentage of Communities traversed which have 5000 or more inhabitants • Sub-criteria 3.4 :Destroyed Cultural Heritage
<p>Criteria 4: Strategic Access</p> <ul style="list-style-type: none"> • Sub-Criteria 4.1: Access to Strategic Commercial/Production/Tourism Center/Areas • Sub-Criteria 4.2: Access to Strategic Ports • Sub-Criteria 4.3: Access to Strategic Railway Stations • Sub-Criteria 4.4: Access to Strategic Airports • Sub-Criteria 4.5: Access to Strategic Border Crossings
<p>Criteria 5: Inter and Intra Modal Integration</p> <ul style="list-style-type: none"> • Sub-Criteria 5.1: Connection to other transport mode facilities • Sub-Criteria 5.2: Connection to sub mode facilities • Sub-Criteria 5.3: Use of containers
<p>Criteria 6: Local Access</p> <ul style="list-style-type: none"> • Sub-Criteria 6.1: Access to human settlements • Sub-Criteria 6.2: Connection to medical/health facilities • Sub-Criteria 6.3: Connection to educational facilities • Sub-Criteria 6.4: Connection to local market facilities • Sub-Criteria 6.5: Connection to feeder roads • Sub-Criteria 6.6: Connection to tourism sites • Sub-Criteria 6.7: Adverse effects on Non Motorized Transport & Intermediate Modes of Transport

9.2 Evaluation Results

An excel spreadsheet including all the criteria and calculations was developed and applied to each project. All the files are provided with the ITP Project Evaluation Report.

The evaluation results are summarized below. See the Multi-Criteria Evaluation Manual for the definition of the economic and scoring indicators.

Project ID (PID)	Mode	Nature of Works	Route	Length (km)	Type of work in the scenario	Economic Viability Y=yes N=no	NPV / Disc. Inv. Cost	Final Score	Optimum Year of Putting into Operations
01	Road	Road Capacity & Conditions Improvement	N1 Aflao-Tema	170,0	Widening Adding 2 Lanes	Y	0,66	7,18	2015
02	Road	Road Capacity & Conditions Improvement	N1 Tema-Accra	21,0	Widening Adding 4 Lanes	N	-0,11	5,10	2024
2bis	Road	Road Capacity & Conditions Improvement	N1 Tema-Accra	21,0	Widening Adding 2 Lanes	Y	0,62	5,64	2018
03	Road	Road Capacity & Conditions Improvement	N1 Accra-Kasoa	17,1	Widening Adding 4 Lanes	N	-0,21	4,57	2024
03bis	Road	Road Capacity & Conditions Improvement	N1 Accra-Kasoa	17,1	Widening Adding 2 Lanes	Y	0,43	5,2	2017
04	Road	Road Capacity & Conditions Improvement	N1 Kasoa-Jct N8	104,8	Widening Adding 2 Lanes	Y	0,31	6,12	2017
05	Road	Road Capacity & Conditions Improvement	N1 Jct N8-Takoradi	87,5	Widening Adding 2 Lanes	N	-0,28	4,62	2026
06	Road	Road Capacity & Conditions Improvement	R28 Sogakope-Ho	86,6	Widening Adding 2 Lanes	N	-0,33	3,07	2029
07	Road	Road Capacity & Conditions Improvement	N5 (all of it)	48,4	Widening Adding 2 Lanes	N	-0,01	3,65	2021
08	Road	Road Capacity & Conditions Improvement	N2 Jct N1-Asikuma Nkwanta (Jct N5)	90,9	Widening Adding 2 Lanes	N	-0,17	3,20	2024
09	Road	Road Capacity & Conditions Improvement	N2 Asikuma Nkwanta (Jct N5)-Hohoe	126,6	Widening Adding 2 Lanes	Y	0,20	5,34	2016
10	Road	Road Capacity & Conditions Improvement	N4 Jct N1-Kukurantu mi Jct	120,2	Widening Adding 2 Lanes	Y	0,60	6,16	2015
11	Road	Road Capacity & Conditions Improvement	N6 Apedwa-Kukurantu mi Jct	22,3	Widening Adding lanes	Y	1,61	7,34	2015
11bis	Road	Road Capacity & Conditions Improvement	N6 Accra-Kukurantu mi Jct	87,8	Widening Adding 4 Lanes	N	-0,50	2,94	2051
12	Road	Road Capacity & Conditions Improvement	N6 Kukurantu	153,5	Widening Adding 2	Y	0,20	4,90	2019

		Conditions Improvement	mi Jct-Kumasi		Lanes				
13	Road	Road Capacity & Conditions Improvement	N6 Kumasi-Berekum	211,5	Widening Adding 2 Lanes	N	-0,50	2,77	2051
14	Road	Road Capacity & Conditions Improvement	N10 Kumasi-Paga	577,5	Widening Adding 2 Lanes	N	-0,50	2,72	2051
15	Road	Road Capacity & Conditions Improvement	N10 Takoradi-Kumasi	201,7	Widening Adding 2 Lanes	N	-0,20	3,65	2025
16	Road	Road Capacity & Conditions Improvement	N8 (all of it)	184,3	Widening Adding 2 Lanes	N	-0,56	2,03	2051
17	Road	Road Conditions Improvement	N12 Elubo-Hamile	593,7	Upgrading Reconstruction 2 Lanes	N	-0,58	2,50	2051
18	Road	Road Conditions Improvement	N2 Hohoe-Kulungugu	475,8	Upgrading Reconstruction 2 Lanes	N	-0,33	3,80	2029
19	Road	Road Conditions Improvement	N13/N11 Lawra-Pulimakom o	335,1	Upgrading Reconstruction 2 Lanes	N	-0,72	2,69	2051
20	Rail	Upgrade	Tema-Kumasi	303,9		Y	0,15	5,72	2016
21	Rail	New Construction	Aflao-Tema	150,0		N	-0,75	3,41	2051
22	Rail	New Construction	Accra-Takoradi	112,0		N	-0,55	3,32	2051
23	Rail	New Construction	Kumasi-Paga	617,8		N	-0,38	3,28	2030

Chapter 4 Strategic Objectives for the Transport Sector

1. Vision, Mission and Policy Goals

This section sets out briefly the overall vision, mission, policy goals and general expectations for the transport sector.

1.1 The Vision:

An integrated, efficient, cost-effective and sustainable transportation system responsive to the needs of society, supporting growth and poverty reduction and capable of establishing and maintaining Ghana as a transportation hub of West Africa

1.2 The Mission for the Transport Sector:

Provide leadership and an enabling environment for the development and maintenance of Ghana's transportation system through effective policy formulation, market regulation, asset management and service provision.

The following policy objectives, principles and actions provide indicators against which the plan can be measured. Measures proposed in the plan should align with, contribute to, or facilitate the achievement of the stated policy objectives, principles and actions.

1.3 Policy objectives

- Provide access through better distribution of the road network with special emphasis on high poverty areas in order to reduce transport disparities between the urban and rural communities
- Ensure the provision, expansion and maintenance of transport infrastructure of all kinds
- Ensure provision of affordable and accessible transport system that recognises the needs of people
- Ensure the provision of integrated, well managed and sustainable transport infrastructure with services that meet national and international standards

1.4 Policy principles

The policy should be guided by the following principles:

- Government will create the appropriate Policy, Governance and Institutional Frameworks for the Transport Sector, taking a lead in: (i) Policy Formulation and coordination, ensuring that transport infrastructure and services contribute to Sustainable Development in Ghana; (ii) Ensuring adequate finance is available to meet maintenance and development needs; (iii) Establishing integrated transport, land use and spatial planning; (iv) Establishing the integrated transport planning methodology and ensuring inter-modal solutions are properly assessed; (v) Monitoring & Evaluation of sectoral performance in regard to national development indicators; (vi) Policy-led Research, Data Collection and Information Management; (vii) Sector-wide human resource development strategies.
- Government will aim to create: (i) An enabling environment for multi-stakeholder consultation; (ii) An enabling environment for increasing private sector investment in Transport infrastructure and services; (iii) An appropriate regulatory environment, to ensure transport services meet user needs; and (iv) An appropriate enforcement environment, to ensure transport investors and users derive maximum benefit from existing assets.
- The Role of Ministries, Departments, Agencies and Assemblies will be coordinated to ensure transport infrastructure and services meet user needs and maximise benefits derived from investments by Government and the private sector
- The Private Sector will be encouraged to participate in policy formulation and sector improvements to ensure: (i) Their needs as investors and providers are reflected in transport policy, strategies and plans; and (ii) A level of commercialism is balanced with social and environmental requirements when planning, developing and operating transport infrastructure and services
- Civil Society represents the citizens and electorate of Ghana including minority and disadvantaged groups as well as representation of environmental interests. They provide a balance to ensure good governance in the transport sector and guidance to policy makers on the needs of people in a transportation system.
- Government will continue to 'Invest' in transport infrastructure and 'Subsidise' transport services where they provide mainly social and environmental benefits important to users and the country.
- Regulation is meaningless unless consistently enforced and updated as Ghana's governance framework evolves. Government, through its regulatory bodies, will retain responsibility for establishing and enforcing Regulations in Ghana.
- Government's Market Regulatory role will consist of regulating and enforcing levels of service required for transport infrastructure and services in the areas of social, health, safety, security and environmental standards and safeguards against public hazard.
- Government will create an appropriate performance-led governance framework for institutions, organisations and personnel throughout the sector by: (i) Ensuring that goals, objectives and performance expectations (including mandates, authority, roles and responsibilities) are clearly stated in policies, plans, strategies and job descriptions; (ii) Honour attainment of performance agreements - Sanction underperformance; (iii) Establish Monitoring and Evaluation as an integral part of good management; and (iv) Ensure adequate checks and balances including independent audits are undertaken.

1.5 Policy Goals

- GOAL 1 Establish Ghana as a Transportation Hub for the West African Sub-Region.
- GOAL 2 Create an accessible, affordable, reliable, effective and efficient transport system that meets user needs
- GOAL 3 Integrate Land Use, Transport Planning, Development Planning, and Service Provision.
- GOAL 4 Create a vibrant investment and performance-based management environment that maximizes benefits for public and private sector investors
- GOAL 5 Develop and implement comprehensive and integrated Policy, Governance and Institutional Frameworks
- GOAL 6 Ensure Sustainable Development in the Transport Sector
- GOAL 7 Develop adequate Human Resources and apply New Technology

Each Goal has been formulated to address key issues affecting performance in the transport sector as well as responding to Government's development themes as set out in the National Medium Term Development Plan. See Appendix 1.

2. Strategic Objectives for the period 2011-2015

2.1 Improving the overall Governance framework affecting the transport sector – strategic objectives

It was stated in the National Transport Policy that: *“Good Governance requires increased transparency and accountability from policy makers and providers.”* It said that *“By setting out the strategic objectives for the Transport Sector against which the performance of policy makers, practitioners and providers of transport infrastructure and services can be measured and by which they can be held to account; this Transport Policy becomes a key driver for good governance in Ghana.”*

Therefore the importance of a national transport policy is clear, yet it can only be seen as a starting point for improving the governance and organisation of the Sector. Already recognised in the SMTDP, achieving the key transport sector goals and objectives also requires an efficient institutional and regulatory framework. The following strategies have been identified:

- Strengthening the policy framework
- Strengthening the regulatory framework
- Improving the financing arrangements of the sector
- Strengthening the Institutional Framework to improve organizational effectiveness and efficiency
- Building capacity of, and working conditions for, personnel

2.1.1. Policy – improving the Policy framework affecting the transport sector

Although the demand for transport is derived from developments taken in other sectors of the economy, the transport sector does not have the mandate or authority to drive change in those sectors. Responsibility for improving the transport sector's policy framework rests with Government at the highest level. Government must therefore ensure that sectoral policies and strategies, which determine performance levels expected in the sector, are coordinated and provide the necessary guidance on development to be undertaken in the future.

The strategic objective will be:

Sectoral policies and strategies, which determine performance levels expected in the sector, are coordinated and provide the necessary guidance on development to be undertaken in the future.

Strategies:

- Enhance the policy formulation and coordination capability, engaging wider stakeholder representation including other sectors of the economy
- Ensure transport sector policy, strategies and plans are always well informed and based on the Government's overall development agenda and the latest strategic objectives of key sectors of the economy
- Promote to other sectors of the economy the improvements possible in transport policy and planning when the sector is properly informed of their planned development.

2.1.2. Regulations – improving the regulatory framework affecting the transport sector

The NTP sets out very clear guidelines for the regulatory framework.

The key strategic objective:

To create a well regulated market for the provision of transport and infrastructure services which is: Fair, efficient, orderly, and non-corrupt; That meets the needs of customers; Safeguards the interests of the users and private sector operators; and Prevents discrimination against women, children, the aged and physically challenged

Strategies will be implemented to develop:

- Maritime laws and regulations particularly concerned with governing offshore activities associated with the rapidly developing oil and gas sector
- Laws and regulations governing inland water operations concerned with the provision of safe, reliable and affordable services to local communities
- Road traffic regulations aimed at operators, owners and drivers to improve the quality of driving, vehicles and services and improve safety.
- Laws and regulations that are harmonized with those of other West Africa countries and between transport modes.
- Laws and safeguards affecting private sector investment in transport infrastructure and services

Strategies and actions required for specific modes of transport are described in the modal sections that follow.

2.1.3. Finance – improving the financing arrangements for the transport sector

The National Transport Policy sets out financing principles defining the role of government and the private the sector in investments in transport services and infrastructure.

NTP Goal 4 sets out specific objectives associated with transport pricing, investment and expenditure.

The strategic objectives for improving the financing arrangements for the transport sector have been identified as:

- **Improve to existing institutional financial arrangements**
- **Apply of commercial principles and full cost recovery where appropriate**
- **Improve to recurrent financial operations**
- **Identify of investment funding options and approaches**
- **Utilise of PPP and related interventions to mobilise private sector participation and funding**

For many aspects of this plan, implementation is dependent on sufficient funds being available to the sector. Practical steps needed to secure the necessary funding and institutional financial changes include:

- MoFEP to open negotiations with development partners and multilateral/bi-lateral banks and funds specifically promoting economically and financially viable transport projects identified in ITP for which no long term funding has been identified.
- MoFEP to address current funding shortfall on roads sub-sector (to 2013) as identified in the SMTDP, either to reduce expenditure plans or to supplement agreed and secured funding (with proposal to double DP funding over 2011 level).
- MoFEP/MRH - review the three Scenarios for funding 2011-15 and determine course of action.
- MoFEP to seek specific DP funding of road maintenance (periodic/rehabilitation) and minor improvement needs post 2013 – suggested request USD 200m plus per annum for five years.
- Individual MDAs to prepare working papers and proposals and present to appropriate Boards, Ministries, MoFEP, Cabinet/Office of the President, etc – re revenue generation, long term funding, PPP proposals, feasibility study results, etc
- MoLGRD to explore possibility of introducing urban property tax specifically to finance urban road maintenance.
- MoFEP to implement an increasing Fuel Levy incrementally from 2011, in real terms, to the targetted level of USD 9.5cents by 2015 (Scenario 3)
- GoG to commit to increased general revenue funding (Consolidated Fund) of transport sector under MTEF, increasing it to USD 200m by 2105 (Scenario 3)
- MoFEP to agree to and introduce annual subsidy provisions in MoT/Ministry of Energy, and MRH/Ministry of Education MTEF budgets to cover costs of free or sub-economic transport services (school children on lake and bus transport, passengers on Eastern and Western Corridor rail services).

- Institutional Financial improvements in several institutions are required to ensure the effectiveness of proposed investments. These include:
 - VLTC – rationalise staff and costs, deregulate tariffs; GoG to provide subsidies for “free services”.
 - VLTC – focus on core passenger and N/S non-oil services, including successfully implementing grant/GoG funded ferry replacements.
 - VLTC - review need for expansion in oil-freight services on grounds of duplication of services with BOST and unlikely availability of investment funds.
 - VLTC/VRA – resolve inter-institutional financial transactions (loans, liabilities).
 - BOST – resolve operational problems with TOR to ensure resumption of oil supplies and revenues from OMC deliveries. Determine source of finance for lake barges link to complete pipeline infrastructure.
 - GMA – prepare proposals for introduction of tariffs, fees and charges to cover cost of lake safety certifications, inspections, etc; prepare justification for investment in patrol boats, lake HQ, etc for presentation to DPs.
 - GCAA/GACL – continue to disaggregate functions into separate institutions to show true cost of operations and link to funding (revenue generation, Consolidated Fund, etc)..
 - GRCL – continue to rationalise staff and overhead costs, clear legacy debts and liabilities.
 - VRA – to meet responsibilities for lake infrastructure improvements (landings, stump clearance); pass costs on to beneficiary (ECG).

In relation to existing and future investments:

- GMU – undertake analysis of regional demand for training, prepare proposals for regional stakeholders to finance expansion of facilities; resolve non-payment issue with stakeholders for past training.
- GSA/GPHA – review investment in and commitments to Boankra Inland Port in connection with studies on Eastern and Western rail corridors.
- GPHA – review investments in and commitments to non-core projects (hotels, etc) given the continued need for GoG funding/guarantees for core port investment proposals.
- GRCL -seek DP long term finance for infrastructure developments by circulating feasibility studies; seek user funding for rolling stock (minerals, containers); seek management and operations agreements for freight services; seek franchise operator for passenger services.
- GACL – review KIA Master Plan and seek long term funding for core investments; separate regional terminal investment into alternative institution to facilitate GoG funding of expansion.

Rail Transport

- Investment to be undertaken only on an incremental basis, with each stage being undertaken only when an underwriting revenue stream has been created for its justification

- Opportunities for private investment to be encouraged. It is generally recognized that transport operators should not be expected to shoulder the entire risk of train service operation. In return for service standard guarantees, freight forwarders/traders can be encouraged to take the revenue risk in train operation. If the rail operator can guarantee service frequency and transit time, the trader can be prepared to take the risk of train space utilization, to the extent of providing rolling stock and being responsible for its utilization. Thus the train operator's costs can be covered whilst being insulated against fluctuation in traffic levels. Pressure on limited investment budgets can be thereby minimized.

2.1.4. Institutions – improving the institutional framework and stakeholder the effectiveness

The NTP sets out guidelines on the institutional framework expected for the transport sector. As the diagnosis has shown, reforms are proceeding in some areas with a separation of functions between policy makers, regulators, asset managers and service providers. The diagnosis also shows that, despite the mandate for MMDAs to plan and regulate transport in their localities, a gap exists in the institutional framework at the national level for a regulatory body mandated to establish national standards for road transport services.

Transport sector ministries have undertaken a number of studies and monitoring programmes to identify areas for improvement in their operations. The Road Sector Development Programme in particular, provided a long-term opportunity for the road-sector MDAs to identify areas for improvement in the governance, management and supervision of works. Lessons have been learnt and it is proposed that a key strategy will systematically ensure compliance with existing laws, regulations and procedures set out for MDAs

The Strategic objective:

The establishment of an institutional framework which enables good governance and improved performance based on separated functions of: Policy formulation, Regulation, Asset management and Service provision.

Strategies:

- Implement existing recommendations and initiatives for institutional reform and strengthening
- Apply the principle of separated functions to institutional arrangements for decentralized management of road infrastructure
- Develop institutional arrangements to regulate the road passenger and freight transport services market
- Strengthen existing management and supervisory arrangements

Institutional arrangements required to improve policy formulation and coordination of the sector are proposed in 2.2 above.

Additional strategies and actions are also proposed in the modal sections that follow.

2.1.5. Human Resource Development – improving human resources and capacity available to the sector

Goal 7 of the National Transport Policy is dedicated to the development of knowledge, human resources and capacity to improve performance.

The Strategic Objective is:

- **To develop knowledge, key skills and competencies needed by transport sector organizations** to fulfil their functional mandates, roles and responsibilities.

Strategies:

- Develop a Multi-disciplinary Human Resource Strategy covering all skills needed by transport sector organisations and including an analysis of the attitudinal, cultural and working environmental issues affecting motivation and organizational performance. This strategic document will be used to: (i) inform recruitment and training needs of transport sector MDAs; (ii) inform trainers and educators about the courses they should be providing on a sector-wide and modally specific basis; and (iii) inform public sector organizations about the working environment and corporate cultures needed to optimise performance.
- Develop an ICT development and investment strategy for transport sector MDAs including a comprehensive training programme for public sector personnel and adaptations to the work place and work environment to enable ICT to be fully utilised.
- Develop a comprehensive Research Strategy for the transport sector. The strategy will aim to increase knowledge levels in sector organizations and improve policy formulation, infrastructure design and management and transport services management. It should address issues that are of immediate importance and extend to the changes likely in the next 30 years.

A special strategy will aim to:

- Address the long standing need to understand the local contracting sector and improve the skills and capacity of local contracting companies. Whilst the road infrastructure sub-sector will be the primary recipient of improvements, the problem is of national importance and knock-on benefits will be enjoyed by other transport projects and the construction sector in Ghana.

2.2 Improving integration

2.2.1. At sub regional level

To contribute to deeper sub-regional integration the following strategic objectives have been identified:

- **Stimulate transit trade of the landlocked countries of Burkina Faso, Mali and Niger** through the ports of Ghana;
- **Promote the CGnet trade system** to further focus on transit development activities and the development of the private sector;
- **Reduce the transport costs** by promoting efficient transport and transit practices and monitor transit facilitation and road transport services;
- **Ensure the sustainability of investments in roads** through efficient management and control of axle load

2.2.2. Development planning and integration with other sectors of the economy

The NTP Goal 2 requires that transport infrastructure investment is targeted to better serve key centres of population, production and tourism. In order to achieve this it is necessary for transport planners to have access to land use master plans or, where not available, the development strategies and plans from key sectors of the economy. NTP Goal 3 reinforces the need for integration between land use planning and transport planning at the national and local authority levels.

The Strategic objective is to:

Target transport sector investment to better serve key centres of population, production and tourism, identifying strategic areas of development and necessary expansion to meet accessibility targets.

Strategies:

- Establish the ITP methodology as the primary integrated planning method for the transport sector.
- To continuously improve the conditions in which the ITP methodology is undertaken
- Continuously develop and adapt the ITP methodology for application at different scales including: Regional scale; Urban/City scale; Development Authority scale such as the Sahel Accelerated Development Authority (SADA)

2.2.3. Between transport modes

The strategic objective is to increase intermodality in the transport network. The strategy to achieve the objective is to **formalise modal integration at existing locations where there is a need and opportunity to improve conditions**. Locations have been identified in chapter 2:

For freight the strategy will be focused on:

- Takoradi Port
- Tema Port
- Akosombo
- Buipe

For passengers the strategy will be focused on:

- KIA
- Urban railway stations
- Non-motorized transport

2.3 Development of air transport

In order to be able to face the challenges discussed in chapter 2, the following strategies are recommended for the civil aviation industry in Ghana:

2.3.1. Institutions and regulations

- Regulate and enforce rules (ICAO and national) in the industry to ensure effective performance

2.3.2. Infrastructure planning

- Upgrade equipment to international standards in order to enhance safety and avoiding technical problems.
- Upgrade and expand infrastructural facilities at airports/aerodromes to facilitate domestic and international flights in order to meet the future demand, ensuring adequate safety and security.
- Explore the feasibility of establishing other international airports in Ghana; conduct feasibility to establish demand and suitability for alternatives to KIA
- Secure title to Airport land(s) for future development, securing the tenure and avoiding encroachments.

2.3.3. Operations

- Develop and establish framework for excellent service standards through benchmarking successful airport companies in order to provide competitive services
- Create enabling environment through liberalization and open skies policies in order to attract more airlines to operate international and/or domestic flights
- Intensify effort to achieve hub status providing incentives as support for home base carrier for effective hub and spoke operations
- Attract the private sector through the establishment of a fine tuned legal framework for private sector participation, attracting new airlines to expand network to new routes, charging competitive airfares and provide quality services to passengers

2.3.4. Human resources capacity

- Provide adequate training to staff in order to improve security and safety aspects for themselves and for the passengers.

2.4 Development of inland water, maritime transport and pipelines

Based on the findings of the diagnosis, the strategic objectives to be pursued for developing inland navigation will aim at (i) improving the fleet characteristics and the level of service provided by both small private operators and VLTC ; (ii) improving safety of navigation on Volta Lake through an effective enforcement of safety regulation, the strengthening of crew and the development of aids to navigation; and (iii) Developing the traffic on Volta Lake based on a comprehensive assessment of the transport demand on the Lake which is not limited to the lines traditionally served by VLTC.

Regarding inland navigation, infrastructure will focus on the improvement of navigation conditions on Volta Lake including charting the main fairways, removing obstacles to navigation and developing and improving landing facilities. The prerequisite is to get a clear picture of the prevailing situation on the Lake along all routes including those which are not

served by VLTC. Efforts should also be aimed at improving the pipe-line / Lake Volta multi-modal corridor for oil transport.

Performances of port operations will have to be substantially improved through measures aimed at improving efficiency and productivity of port operations including promotion of a fair competition in handling activities and capacity building for port operators and GPHA staff. Reduction of delays due to formal and informal customs clearing procedures and police inspections will be achieved through simplification and streamlining of procedures. Ensuring the competitiveness of Ghanaian ports vis-à-vis competing ports in neighbouring countries will be a constant concern for GPHA and the multi-stakeholders of the port community with which the much-needed collaboration will be developed.

The administration of the maritime sector will be strengthened in order to safeguard Ghana's socio-economic and environmental interests in particular in the context of the development of oil and gas off-shore activities.

As far as port infrastructures are concerned, one of the main findings of the diagnosis is that, even though a new container terminal has been recently opened in Tema, port infrastructures at both Tema and Takoradi still need to be urgently developed: the draft constraint in both Tema and Takoradi must be removed and berth capacity must be increased to cater for the traffic natural growth resulting from the socio-economic development of Ghana and for the new traffic generated by the development of off-shore oil and gas industry. One of the main objectives is also that Tema increases its share of the transit traffic transit to land-locked countries and has opportunities to become a sub-regional hub for the transshipment of container traffic.

2.4.1. Objectives for inland navigation

Improve fleet characteristics and level of service

- Improve construction and operation standards for private boats
- Bring VLTC's fleet condition to the required standards

Improve navigation conditions on Volta Lake

- Get a clear picture of navigation conditions on Lake Volta which is not limited to the zones served by VLTC (i.e. South – North line and ferry crossings)
- Chart main fairways in Volta Lake
- Remove obstacles to navigation and improve and develop ports and landing facilities

Improve safety of navigation on Volta Lake

- Ensure all boats sailing on Volta Lake comply with the safety regulation
- Strengthen capacity of crew sailing on Volta Lake
- Improve aids to navigation on Volta Lake

Develop traffic on Volta Lake

- Get a clear picture of global transport demand on Lake Volta (not limited to the South – North line served by VLTC, and at the ferry crossings)
- Improve and develop road access to ports and landing facilities

- Elaborate strategy for developing VLTC's traffic, and rationalise VLTC organisation to match supply to demand according to the expected traffic
- Envisage compensation for regulated public service obligations (ferry crossing & transport to remote areas for which tariffs should remain regulated by the Government)

2.4.2. Objectives for ports

Improve performance of port operations

- Promote competition within and between ports
- Improve the capacity and efficiency of port operators
- Simplify custom clearance and other procedures to reduce port dwell time and delays on transit corridors
- Develop cooperation between stakeholders (port users & operators, regulatory agencies) in strategy development, planning, etc.
- Continuously improve competitiveness of Ghanaian ports within the region

Develop the port infrastructures to fit to the demand

- In Tema : develop new container facilities at Tema for large container vessels (up to 4 500 TEU with 14 m-draft)
- In Takoradi : expand port infrastructures including
 - New deep-water berths for bulk carriers
 - New container facilities
 - New on-shore supply facilities for oil and gas industry
- Develop « PPP » projects (whenever financially viable)
- Mobilise funds from Government budget for developing port related projects both inside (major infrastructures for which GPHA and privates financing is insufficient) or outside the port area (road & rail projects)

2.4.3. Objectives for maritime transport

Strengthen the administration of the maritime sector in order to safeguard Ghana's socio-economic and environmental interests in particular in the context of the development of oil and gas off-shore activities

- Implement capacity building programme for GMA and increase GMA revenues
- Develop coordination between Government agencies responsible for enforcing the maritime regulation

2.4.4. Objectives for pipelines

Improve the efficiency of the pipe-line / Lake Volta multi-modal corridor for oil transport

- Rehabilitation and capacity improvement of the pipe-line from Tema to Akosombo
- Construction of a new section of the pipe-line North from Buipe to the border with Burkina Faso

2.5 Development of rail transport

The strategic objectives for rail transport are to:

- **Modernise the institutional and regulatory framework**
- **Re-orientate personnel to modern railway practices**

- **Rehabilitate of the existing network and improve services and operating standards to win new costumers**
- **Objectively analyse new developments**

2.5.1. Modernise the institutional and regulatory framework

The following measures are proposed:

- Review and restructure GRCL to:
 - Focus GRCL management only on the new network
 - Introduce commercial, business procedures that: (i) ensure services offered are cost-effective and saleable in the transport market; (ii) investment is directed to maximize the earning capacity of the system; (iii) business opportunities are planned, quantified and fully exploited
- Allocate resources to the reformed GRCL to: (i) Establish accurate management information systems for cost control and business planning; (ii) Re-train operating staff to achieve new standards of safety and operating efficiency

2.5.2. Re-orientate personnel to modern railway practices

- Appointment of key personnel, capacity building and resource allocations to GRDA to enable it to become fully operational and complete its strategic development plan for Ghana's railways by end 2010.

2.5.3. Rehabilitate the existing network, improve services and operating standards to win new costumers

Western Railway

The strategies that need to be addressed in relation to the Western Line are:

- Rehabilitation between Takoradi and Awaso to address manganese / Bauxite traffic demand. Indeed, the assessment made have shown that rehabilitation of the Western Railway can be financially justified, based upon the existing levels of mining output, both flows of which have potential to increase.
- Re-opening to Kumasi / Boankra for containers / cement / passenger traffic: the traffic survey and studies have shown that there is substantial and growing movement of transit containers between the Ghanaian ports of Tema and Takoradi and the land-locked hinterland countries of Burkina Faso and Mali. There appears therefore to be reasonable expectation that, in due course, rail extension towards the Burkina Border is possible

Eastern Railway

Out of all rail scenarios that have been tested using the methodology presented in chapter 3, only the rehabilitation of the eastern line has proved its economic viability.

The investment cost for the rehabilitation is estimated at 400 million USD, generating a net present value of 60 million (IRR of 14%). Its optimal year for putting into operations is 2016 and its multicriteria score of 5.72.

The project has a potential of diverting 2.2 million ton-km from the roads, which represents savings of 50 million USD for the society in its first year of operations alone. The summary evaluation is provided below:

- Problem Identified: Operations interrupted due to bad infrastructure conditions
- Intervention Proposed: rehabilitation, extension of freight line to Tema
- Project Length: 304 km
- Estimated Investment Cost: 400 M USD
- Overall Benefits:

NPV	60 M USD
IRR	14%
Optimal Year	2016
Multicriteria Rating	5.72

As a first stage it is suggested that the route be re-commissioned between Nsawam and Koforidua to enable provision of an extended and intensified suburban service. Proposals for this have already been put forward

Apart from re-commissioning of the rail route, acquisition of rolling stock for all the above traffic flows will be required. Container services require specialized skeletal container wagons. As these trains will clearly be tailor-made for container traffic, it is considered that they present an ideal opportunity for private sponsorship. These services could in fact be operated by or under contract to container firms/shipping lines as an extension of their transit offer, as is the case in the UK. Petroleum wagons equally are commonly owned or leased by Petroleum companies who then become responsible for the wagon turnround/utilization. Cocoa bean traffic to date has been conveyed in sack form in railway- owned bogie vans, but moves toward containerization are taking place which would put the traffic on a more economic footing.

Northern Extension

Additionally, planning an extension of the network to the North of Kumasi is possible as a medium term priority. More specifically, the objectives to be addressed are:

- Carry out a traffic study on opportunities in the Northern region and further in terms of transit traffic,
- Prepare plans for incremental rail extension to Burkina border
- Examine mining opportunities and rail connection options

The role of Boankra

The pre-feasibility study carried out within this plan, shows that Boankra Dry Port has the potential to work as a catalyst for shifting freight from the road to rail, increasing the demand for both the eastern and western lines.

The pre-feasibility study suggests that a full feasibility should be carried out in order to assess in detail the benefits and impacts of the dry port.

2.5.4. Objectively analyse new developments

- Promote the use of the multicriteria evaluation manual developed by the ITP
- Coordinate on-going plans and feasibility studies in order to avoid “double counts” for potential demand
- Ensure that forecasts for future transport reflect planned developments instead of targets.

2.6 Development of road transport

2.6.1. Development of road transport services

The strategic objectives for road transport services are to

- ***Change the role of road transport organizations,***
- ***Introduce quality regulation to improve the provision of road transport services***
- ***Introduce more productive techniques and fleet management approaches***

Change the role of road transport organizations

Government is to focus on the implementation and enforcement of regulations to achieve its goals for road freight and passenger transport at the national scale. General goals are:

- Set up a Central Regulatory Body, to create and enforce regulations governing national freight and passenger road transport services
- Develop the administrative system at the national scale which focuses on monitoring the operation of markets, notably service standards to ensure that monopoly or predatory practices do not develop. The administration system deployed around a central database will rely on the entry of data collected by regional and district authorities in implementing and enforcing regulations.
- Encourage Unions to be more active in the policy-making process, promoting and integrating better safety behaviour on roads as well as improving service competitiveness.
- Establish regular consultation forums with industry, users and unions on matters of policy and regulation to facilitate mutual understandings and ease the implementation of largely discussed and agreed stimulating regulations.

Introduce quality regulation

Current regulations allow individual to operate in the transport business with little responsibility for the services provided. This has mitigated against improved productivity, quality of services and lower tariffs. The lack of professionalism has also led to excessive investment in trucks, worsening drivers working conditions and vehicles road worthiness. This

approach holds the sector back from developing more sophisticated transport and logistics services with nationwide networks.

The key strategic objective for regulation is therefore is to introduce quality regulation to encourage healthier competition, higher productivity and a fair share of responsibilities for the use of safer commercial/industrial vehicles on the roads.

- Define in law a distinction between “own-account” and “hire-and-reward” operators
- Introduce a licensing system for road transport operator: within the “hire and reward” sub-sector (vehicles of more than 3.5 tons and more than 9 passengers) introduction of a licensing system for road transport operator fulfilling basic criteria focused on road safety and better quality of services.

To be effective these changes have to rely on better enforcement of safety regulations, with the possibility that operators who employ unsafe drivers and vehicles may be stopped from operating. More specifically, the suggested regulatory strategic objectives are:

- Introduce a road transport operator license focused on road safety (not to be related with the driver license which requires upgrading from basic defensive driving to technical driving of industrial vehicles). As a starting point, the criteria that determine an operator's eligibility for different types of service may be:
 - Keeping roadworthiness certificate updated (maintenance of the vehicle);
 - Being literate (able to read, write and sign a service contract)
 - Having good repute
 - Evidence of compliance with regulations (speed, overloading, etc.)
- Ensure the enforcement of renewed roadworthiness test: introduce a network of vehicle technical inspection stations and make test compulsory on a 6 month basis for buses, one year for trucks
- Reduce the incidence of truck overloading through an effective enforcement system, sanctions (install a set of fixed and mobile weighbridges on main roads) with possibility to put a vehicle out of service when it fails to meet safety and overloading standards. For vehicles repeatedly checked for overloading or for very serious infringements the road transport operator License should be revoked.
- Reduction the high rate (up to 80%) of commercial vehicles in road accidents, by defining, implementing and enforcing some basic standards on driving hours and rest periods. Such a strategic objective is to be reached by the introduction, at the same time of tachographs (a recording devices that register several operating parameters allowing on-road or in companies control of such standards) into commercial vehicles.
- Invest in vocational training centres with a priority to upgrade skills of drivers (technical driving) and road transport operators (road transport rules, fleet management and operating procedures)
- Introduce written transport contracts to clarify the responsibilities of all parties connected with the road transport service (passenger or cargo owner and the road transport operators).

Introduce more productive techniques and fleet management approaches

The current dominant queuing model both for passenger and freight does not stimulate the level of services expected of a modern transport system: Intensive use of IT technologies, proliferation of collaborative businesses: joint ventures, strategic alliances, partnerships are to be encouraged.

Therefore, the key operational strategies are to

- Implement a network approach to transport systems. A network approach of various competing transport groups instead of the queuing model (single vehicle on a single set of poor equipped park yards) is a key notion in modern transport planning. It requires pivotal points throughout the market area and relies heavily on capital-intensive investments including information and communication technologies.
- Encourage road transport operators to set up collaborative businesses (joint ventures, strategic alliances, partnerships) to set up more economical ownership structures of the transport fleet, including the development of integrated national networks of services,
- Tighten the conditions for obtaining a truck driver's permit through more stringent driver training and testing and the possible introduction of endorsements to signify various levels of qualification.
- Support the development of skills through education and training programs.

2.6.2. Development of road transport infrastructure

The Road Sector Development Programme provided a long-term opportunity for Government to identify areas for improvement in the governance, management, financing and supervision of road works. Lessons learnt are reflected in NTP Goals 2, 4 and 5.

The Strategic objective:

The establishment of an institutional framework which enables good governance and improved performance based on separated functions of: Policy formulation, Regulation, Asset management and Service provision.

Strategies

- Apply the principle of separated functions to institutional arrangements including the decentralized management of road infrastructure
- Strengthen existing planning, management and supervisory functions

Improving capacity of the trunk road network

The planning process undertaken in the ITP, explained in chapter 3 of this report¹⁶, has identified the following projects as economically viable for implementation during the plan period 2011 - 2015.

The need for these projects has been identified as the result of an assessment of the network capacity to meet the future demand for transport. Projects selected are therefore strategic objectives to be achieved during the plan period.

¹⁶ Details on the model are provided in the report on Model Calibration and details on the project prioritization process on the report on Project Evaluation.

Costs are given in constant 2008 values, generalized costs (gen costs) include VOC and travel time cost. NPV is the net present value, IRR is the internal rate of return and Optimal Year is the optimal year for putting in operations. All these variables are described in the Multicriteria Evaluation Manual Volume 7 of this ITP.

N1 Aflao-Tema (PID 1)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Project Length: 170 km

Estimated Investment Cost: 128.5 M USD

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	137	min	94	min
Average Gen Cost Car	38.9	USD	36.6	USD
Average Gen Cost Bus	94.7	USD	83.6	USD
Average Gen Cost Truck	97.6	USD	92.7	USD
Level of Service	D		B	

Overall Benefits:

NPV	84.8 M USD
IRR	19%
Optimal Year	2015
Multicriteria Rating	7.18

N1 Tema-Accra (PID 2bis)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 15.9 M USD

Project Length: 21 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	23.15	min	18.4	min
Average Gen Cost Car	7.3	USD	7.1	USD
Average Gen Cost Bus	17.1	USD	16.2	USD
Average Gen Cost Truck	18.3	USD	18.3	USD

Level of Service	C/D	A
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Overall Benefits:

NPV	9.9 M USD
IRR	18%
Optimal Year	2018
Multicriteria Rating	5.64

N1 Accra-Kasoa (PID 3bis)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 13 M USD

Project Length: 17.1 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	18.46	min	13.8	min
Average Gen Cost Car	5.8	USD	5.4	USD
Average Gen Cost Bus	13.9	USD	12.3	USD
Average Gen Cost Truck	14.6	USD	13.7	USD
Level of Service	C/D		A	

Overall Benefits:

NPV	5.6 M USD
IRR	17%
Optimal Year	2017
Multicriteria Rating	5.2

N1 Kasoa-Junction N8 (PID 4)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 79.2 M USD

Project Length: 105 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	81.1	min	62.9	min
Average Gen Cost Car	26.9	USD	24.6	USD
Average Gen Cost Bus	65.9	USD	56.1	USD
Average Gen Cost Truck	70.8	USD	62.2	USD
Level of Service	C/D		A/B	

Overall Benefits:

NPV	24.5 M USD
IRR	15.7%
Optimal Year	2017
Multicriteria Rating	6.12

N2 Asikuma Nkwanta (Jct N5)-Hohoe (PID 9)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 95.7 M USD

Project Length: 127 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	81.6	min	57.1	min
Average Gen Cost Car	25.5	USD	22.3	USD
Average Gen Cost Bus	63.7	USD	51.0	USD
Average Gen Cost Truck	67.5	USD	56.5	USD
Level of Service	C		A	

Overall Benefits:

NPV	18.75 M USD
IRR	14.7%
Optimal Year	2016
Multicriteria Rating	5.34

N4 Jct N1-Kukurantumi Jct (PID 10)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 91.6 M USD

Project Length: 121 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	110.6	min	53.8	min
Average Gen Cost Car	23.9	USD	21.0	USD
Average Gen Cost Bus	62.0	USD	47.8	USD
Average Gen Cost Truck	59.3	USD	53.0	USD
Level of Service	C/D		B	

Overall Benefits:

NPV	55.39 M USD
IRR	18.6%
Optimal Year	2015
Multicriteria Rating	6.16

N6 Apedwa-Kukurantumi Jct (PID 11)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 16.9 M USD

Project Length: 22.3 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	72.4	min	52.8	min
Average Gen Cost Car	21.5	USD	20.6	USD
Average Gen Cost Bus	51.6	USD	47.1	USD
Average Gen Cost Truck	54.2	USD	52.3	USD
Level of Service	C/D		A	

Overall Benefits:

NPV	27.1 M USD
IRR	26.6%
Optimal Year	2015
Multicriteria Rating	7.34

N6 Kukurantumi Jct-Kumasi (PID 12)

Problem Identified: Lack of Capacity

Intervention Proposed: widening adding two lanes

Estimated Investment Cost: 116 M USD

Project Length: 153.5 km

Travel time and cost improvement in 2015:

	Without Project		With Project	
Average Travel Time	162.8	min	103.7	min
Average Gen Cost Car	43.8	USD	40.4	USD
Average Gen Cost Bus	108.1	USD	92.4	USD
Average Gen Cost Truck	109.4	USD	102.5	USD
Level of Service	C/D		A/B	

Overall Benefits:

NPV	22.9 M USD
IRR	14.5%
Optimal Year	2019
Multicriteria Rating	4.9

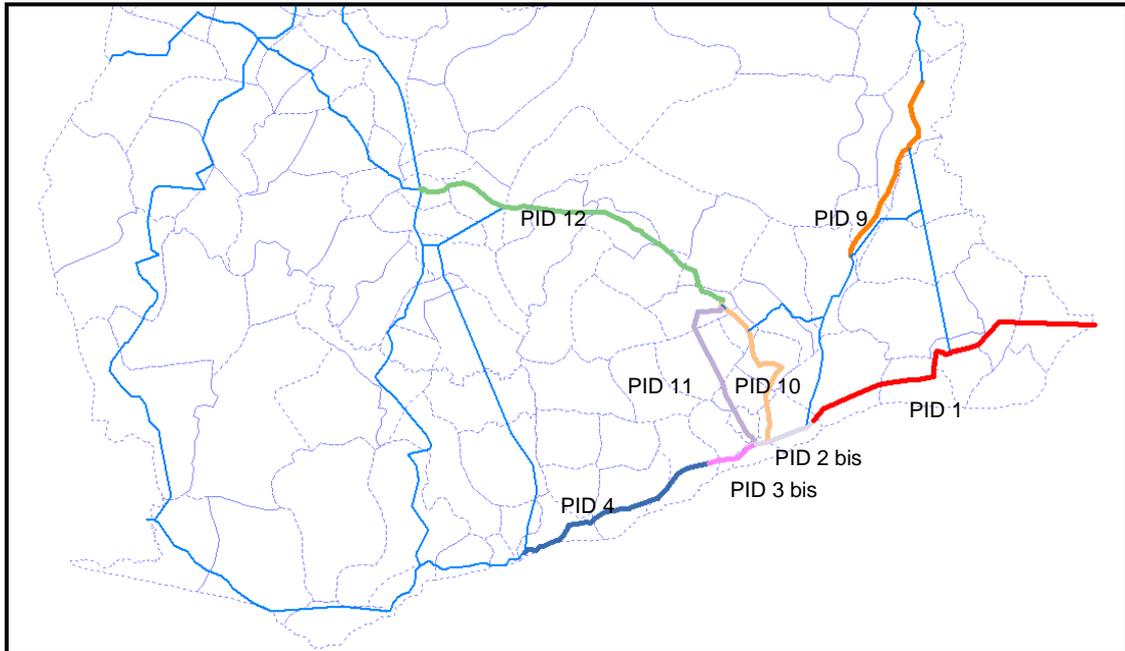


Figure 22 : Road interventions during the plan period

Performance improvements in trunk roads

In addition to the projects selected above, of strategic importance during the plan period, various other projects have been studied for capacity and condition improvement. It has been assessed that these latter projects are not required until after the plan period and it is recommended that their relative priority will have to be reassessed in the next plan update.

In order that the infrastructure objectives can be achieved it is essential that the following strategies are adopted for trunk roads:

- Full adoption of the ITP methodology to ensure that trunk road development meets future demand for transport
- Full adoption of HDMIV as the road network management tool
- Integration with Feeder and Urban road networks for planning road infrastructure investments
- Continuous improvement of contract administration, management and site supervision on all GHA projects

Performance improvements in feeder roads

Given the challenges faced by the feeder roads as discussed in chapter 2, the main strategies to be adopted are:

- The development and utilization of planning tools to prioritize maintenance and network development, integrating social and poverty reduction impacts.
- Adoption of more appropriate methods for maintenance, for example through the use of performance-based contracts and labour intensive methods in order to meet the needs.

- Integration with Trunk and Urban road networks for planning road infrastructure investments
- Continuous improvement of contract administration, management and site supervision on all DFR projects

Performance improvements in urban roads

The Department of Urban Roads is undertaking a review to identify strategic priorities for the ITP period of 2011-2015. Five strategies have been identified:

- Develop land-use transport plans for cities, in order to drive future developments and provide appropriate transport systems to meet the demand.
- Continuously improve contract administration with constructors and consultants in order to improve performance, reducing costs and delays.
- Adopt an evidence-based method for prioritizing investments, focusing on maintenance in order to preserve the urban road network.
- Allocate appropriate resources to support the establishment of effective MMRUs in each of the Metro and Municipal Assemblies
- Work closely with MMDAs to identify new sources of funding for road maintenance and development projects prioritized by local communities.
- Improve integration with trunk and feeder road networks

See also the section on Urban and Non-Motorized transport for strategies on these themes.

Maintenance of the road network

Whilst the foregoing sections have presented ongoing development projects and future developments identified by the ITP methodology, the priority for all road infrastructures is maintenance. Programming and costing maintenance associated with the new projects will affect future planning periods. In an attempt to quantify maintenance works in the ITP plan period of 2011-2015, we present here the results of a Ministry-funded study called "Determination of Maintenance Needs of Ghana's Road Network" completed in November 2009. Using HDM IV calibrated with the current road conditions in Ghana provided by GHA, DFR and DUR, the study determined the total road maintenance needs.

The study considered three road network maintenance scenarios which were defined as follows:

- Scenario 1 Unconstrained Budget: assumes that there are no constraints in the budget necessary for road maintenance and upgrade of unpaved roads. Existing backlogs (proportion of the network in poor condition) are either eliminated or reduced to less than 10% within the first few years of analysis period, and there after the road network is maintained to a generally good condition.
- Scenario 2 Target Condition: designed to deliver the least-cost path of maintenance financial needs required to improve the Ghana road network condition to "70% Good and

20% Fair” within a maximum of 8 years, and thereafter keep the network condition to within less than 10% Poor for 12 years.

- Scenario 3 Below Target Condition: formulated in recognition of the uncertainties associated with the availability of sustainable funding necessary to achieve the target condition. To that end, financial maintenance needs were determined for an average road network condition which is below the Target road network condition of Scenario 2.

For each scenario and for each road agency (DFR, GHA or DUR), maintenance needs were determined for two cases. In the first case, financial costs for upgrading unpaved roads to paved roads were included within the overall road maintenance needs on the assumption that the funding for upgrading activities will be sourced from road users. In the second case, it was assumed that road funding for upgrading works would not be funded from road user charges.

We focus here on Scenario 2 Target condition without upgrade.

DFR Needs

Maintenance needs on the feeder roads focus essentially on regravelling and routine works. The investment profile shows that pavement reconstruction equivalent to US\$ 26.6 million is scheduled in the first year of analysis to reduce the proportions of paved roads in poor condition. From the 2nd year, annual investment in routine activities, surface dressing, occasional overlay and intermittent reconstruction is necessary to maintain the average road network in poor condition to within 10%. About US\$ 1.3 billion is required over the 20 year period for re-gravelling works.

The following Table shows DFR Scenario 2 without upgrading investment profile

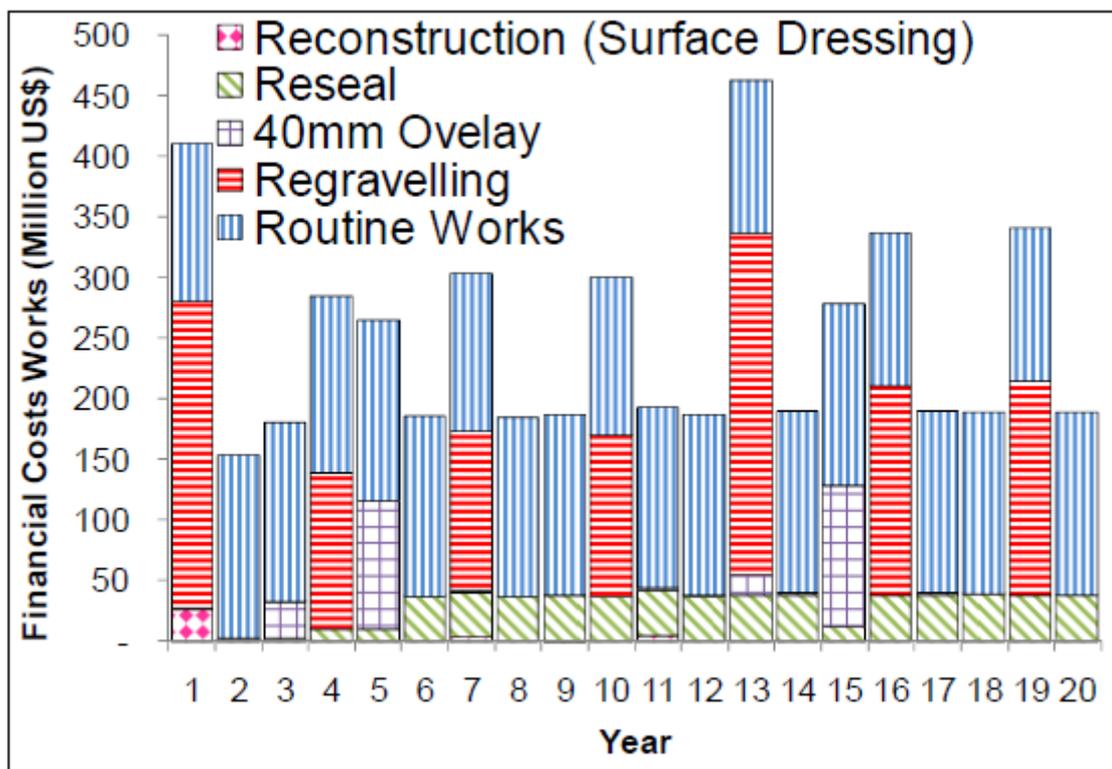


Figure 23 : DFR Maintenance Needs

DUR Needs

For the Urban Roads, the analysis shows that a massive investment in reconstruction is necessary as soon as possible. The investment profile shows that pavement reconstruction equivalent to US\$ 1.9 billion needs to be scheduled in the first year of analysis to reduce the proportions of paved roads in poor condition. From the 2nd year, annual investment in routine activities, surface dressing, occasional overlay and intermittent reconstruction is necessary to maintain the average road network in poor condition to within 10%. Gravel roads are maintained to fair condition in the long-term by largely applying routine maintenance and some re-gravelling.

The following figure shows DUR Scenario 2 without upgrading investment profile.

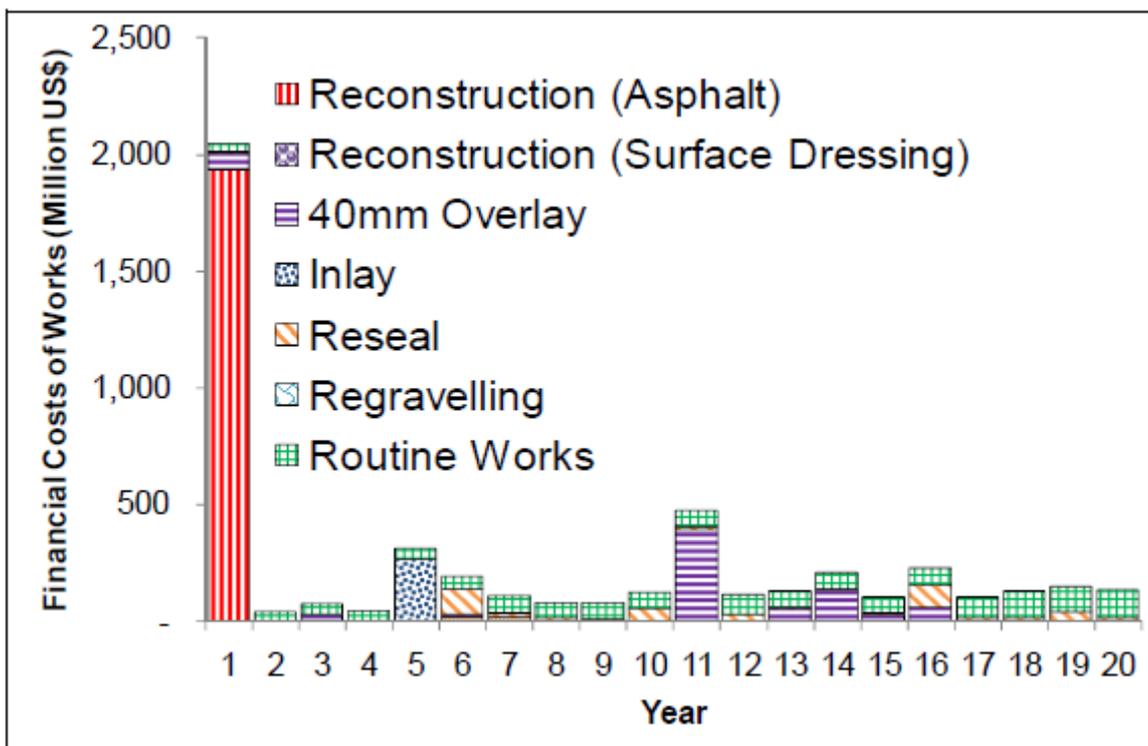


Figure 24 : DUR Maintenance Needs

GHA Needs

The investment profile determined in the analysis shows that structural works comprising pavement reconstruction, 80mm overlay and 50mm overlay totalling US\$ 577 million is scheduled in the first eleven years of analysis to reduce the proportions of paved roads in poor condition. Thereafter; annual investment in routine activities, surface dressing and 40mm overlay is necessary to maintain the average paved road network condition within the target condition requirement. Unpaved roads are maintained using routine works.

The following figure shows GHA Scenario 2 without upgrading investment profile

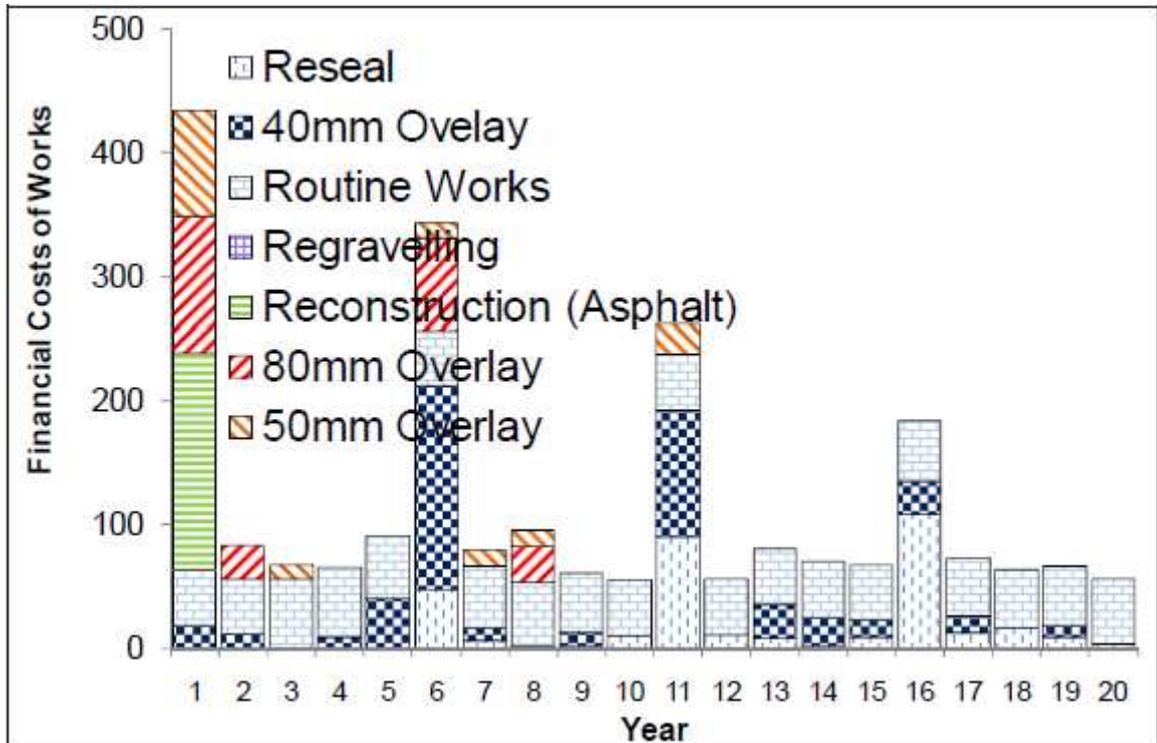


Figure 25 : GHA Maintenance needs.

As is evident from the foregoing sections, the maintenance need identified for the entire road network far outstrips the likelihood of funding and the ability of the MDAs to disperse such quantities on an annual basis.

The NTP states clearly that:

- Maintenance is critical to achieving the desired: accessibility, affordability, reliability and safety (NTP page 44);
- Given limited resources of Government, finances for some time will be adequate only to meet the highest-priority demands (NTP Principles of financing 2.3); therefore,
- The need arises to prioritise the maintenance of existing infrastructure to reduce vehicle operating costs and future rehabilitation costs (NTP policy statement 4.2.2.1).

It is proposed therefore that government strictly applies its resources in the following order of priority:

- Routine and periodic maintenance
- Rehabilitation of existing roads
- Construction of new capacity

2.7 Development of non-motorised and intermediate forms of transport

Following the vision and policy goals for the transport sector, the strategic objectives for the Non-motorized Transport are:

Provide NMT basic infrastructure such as dedicated lanes and bicycles parking places in order to encourage their use, improving safety and security

Integrate NMT in transport plans, in order to ensure that actions regarding NMT are coordinated with all the transport modes

Market NMT in order to promote their use through campaigns and financial incentives to their use

Improve safety for NMT users with traffic management measures and actions on driving behaviour in the way they perceive and respect NMT users.

Prepare regulations to organise the NMT circulation and roadway use and ensure that the enforcement will be efficient

2.8 Development of transport services in an urban environment

Several projects and strategies are being developed in order to improve the urban transport in Ghana; the most important of them being the Ghana Urban Transport Project, a part of TSDP dedicated to urban transport and the DUR strategy for 2010-2014 aiming to meet the Ministry road sector objectives.

Ghana Urban Transport Project

The project objectives are:

- To improve mobility in Metropolitan, Municipal and District assemblies through a combination of traffic engineering measures, management improvements, regulation of urban passengers transport and implementation of BRT
- To promote a shift to more environmentally sustainable transport modes and lower transport-related GHG emissions along the Pilot BRT corridor in Accra

To achieve these objectives, the project comprises five components:

- Institutional development:
 - a. Support the assemblies to develop the capacity to plan and regulate urban passenger transportation within their area of jurisdiction.
 - b. Improve the capacity of the private operators
- Traffic engineering, management and safety
- Development of a bus rapid transit system
- Integration of urban development planning and transport planning for better environmental management
- Provide a framework for monitor the urban transportation

TSDP

In the transport Sector Development Programme (2008 – 2012) the goal n°2 is to “Create a sustainable, accessible, affordable, reliable, effective and efficient transport system that meets user needs” with the following policy statement:

- Mass transportation will be prioritised in urban areas, aiming to move at least 80% of passengers
- Non motorised transport shall be developed to improve affordability and accessibility for urban and rural communities- aiming for 10% of passengers movements

DUR

The Urban Roads objectives are:

- To reduce the average travel time for all modes on the road network in each city;
- To progressively improve the proportion of the network in good riding condition in each city;
- To reduce the number of accident fatalities and serious injuries on the road network in each city;
- To minimize the adverse and enhance the beneficial impacts of urban road projects on people and the environment in each city;
- To develop and use quality systems that promote efficiency, accountability and transparency;
- To strengthen the capacity of the Head Office and MMDRU to manage the roads and transport systems in each city;

Having a look at these different policies we can see that all the stakeholders are aware of the urban transport issue and of the main challenges it faces. The first objectives for urban Transport, instead of proposing a new strategy, will be to implement the existing strategies, monitor and evaluate them. After the review of their results, it will be possible to propose corrective actions and strategies to complement the previous.

If we bring the different objectives together and organise them following the key areas used for diagnosis: institutional aspect, regulatory framework and operational performance, the strategic objectives for transport in urban environment are:

Improve the institutional framework of urban transport with the establishment of strong organisations able to improve and manage urban transport

Improve the regulatory framework in order to regulate the public transport operations and to ensure safe services with low impacts on environment

Improve the quality of services for urban transport with the provision of an efficient, sustainable, safe, affordable and comfortable system of transport

Improve the planning of urban transport and integrate it with land use planning with measures to ensure the collaboration between entities responsible for planning and the consistency and compatibility of the different plans.

3. Social and environmental issues

3.1 Social impacts

The strategic objectives regarding social issues for the transport sector are:

Promote Poverty reduction

- To provide, expand and maintain transport infrastructure that links rural and urban

production centres

- To provide an affordable and accessible transport system that recognizes the needs of the poor

Protect the Cultural Heritage

- To promote the development of our cultural sites through improved transport infrastructure and services.
- To minimize the negative impact of transport infrastructure on our cultural heritage through improved planning consultation and engineering design.

Provide Access

- To respond to agencies' plans and requests for development in rural areas
- To develop and promote more affordable modes of transport to agricultural production centres
- To improve accessibility by all to basic social and technical services through promoting making non-motorised and intermediate transport

Improve Health and Safety (including HIV/AIDS)

- To improve the transport sector in the parts of the country where people are denied access to quality health care
- Transport sector MDAs to ensure that contracts specify obligations on raising awareness on STI/HIV/AIDS and environmental management

Promote Equality (including gender, disability)

- To ensure that all transport infrastructure and services provide adequate access for women, children, the aged and physically challenged.

3.2 Environmental impacts and climate change

The strategic environmental objectives include:

Build adequate environmental and climate change capacity within ministries and agencies in the transportation sector: having adequate capacity in environmental and climate change issues in the ministries and agencies in the transport sector is key to identifying and coming up with strategies and measures to address issues of concern. Even though the environmental aspects of projects are analysed through environmental impact assessment, the implementation and monitoring of environmental management plans on the projects become a challenge because besides the lack of personnel in the field offices to supervise the implementation of the plans, the few environmental personnel in the head offices are over-stretched because of their engagement on a number of projects.

Ensure environmental sustainability of transport projects: transport initiatives in the transport sector impact and are impacted upon by various features of the environment. Whilst the impacts of the environment may successfully be managed through adjustments to the design of projects, there is raising concern about the management of the impacts of transport projects. Significant issues of concern that affect the sustainable development of projects in the transport sector include air pollution, noise pollution and vehicular emissions, as well as impacts on property and livelihoods and environmental resources. To ensure the sustainability

of transport projects, it will be necessary to proactively factor environmental concerns into the design and implementation of projects rather than relying on mandatory EIA.

Develop transportation systems that can withstand changes resulting from climate change: changes in climatic conditions as a result of climate change will affect the sustainability of transport infrastructure. Rising or decreasing rainfall and temperature can affect the integrity of projects; it is therefore imperative that projects in the transport sector are planned, designed and implemented to withstand these changes. For instance, with the prediction that climate change will lead to flooding in the coastal areas, roads that will be built in the coastal areas of Ghana will have to incorporate measures to withstand exposure to floods.

Reduce the carbon footprint of the transport systems: vehicular emissions are a significant contributor to global warming. Reducing the carbon footprint of the transport sector is important in Ghana's efforts at cutting back on its emissions is reflected in the fact that the sector has been prioritized for attention under Ghana's low carbon development strategy. The transport sector must therefore develop strategies and initiatives, and possibly appropriate legislation, to help in reducing exhaust emissions from various vehicles in the sector.

Chapter 5 Action Plan

This chapter summarises the strategic objective and strategies discussed in chapter 4 and proposes actions. Actions are proposed for different time horizons. For the purpose of the plan “short term” is defined as the period up to one year, “medium term” from one to five years and “long term” more than five years.

While the focus of the plan is in the short and medium term, long term actions are proposed for planning and strategic purposes.

1. Improving the overall governance framework affecting the transport sector

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Policy Framework					
Sectoral policies and strategies, which determine performance levels expected in the sector, are coordinated and provide the necessary guidance on development to be undertaken in the future. (NTP Goals 4 and 5)	Enhance the policy formulation and coordination capability, engaging wider stakeholder representation including other sectors of the economy	Create a formal inter-ministry advisory group mandated and authorized at the highest level to improve cooperation, coordination and integration between the transport sector and other sectors of the economy	Short	MoT / MRH Gvt	Gvt
	Enhance the policy formulation and coordination capability, engaging wider stakeholder representation including other sectors of the economy	Update the National Transport Policy regularly (currently envisaged 2012) as the lead policy document for the sector consulting fully with sector stakeholders	Medium	MoT / MRH	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Promote to other sectors of the economy the improvements possible in transport policy and planning when the sector is properly informed of their planned development.	Provide other sectors of the economy with the national transport policy, integrated transport plan and other documents that describe transport sector performance Regularly produce information on transport sector performance and key issues affecting other sectors of the economy for public distribution.	Immediate Continuous	MoT / MRH	Gvt Donors
Regulatory Framework					
To create a well regulated market for the provision of transport and infrastructure services which is: Fair, efficient, orderly, and non-corrupt; That meets the needs of customers; Safeguards the interests of the users and private sector operators; and Prevents discrimination	Develop Maritime laws and regulations particularly concerned with governing offshore activities associated with the rapidly developing oil and gas sector	Actions required for specific modes of transport are described in the modal sections that follow.	Ongoing	GMA / MoT	Gvt
	Laws and regulations governing inland water operations concerned with the provision of safe, reliable and affordable services to local communities	Actions required for specific modes of transport are described in the modal sections that follow.	Ongoing	GMA / MoT	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
against women, children, the aged and physically challenged (NTP Goals 2, 4 and 5)	Road traffic regulations aimed at operators, owners and drivers to improve the quality of driving, vehicles and services and improve safety.	Actions required for specific modes of transport are described in the modal sections that follow.	Ongoing	MoT / DVLA / NRSC	Gvt
	Laws and regulations that are harmonized with those of other West Africa countries and between transport modes.	Actions required for specific modes of transport are described in the modal sections that follow.	Ongoing	MoT	Gvt
	Laws and safeguards affecting private sector investment in transport infrastructure and services	Actions required for specific modes of transport are described in the modal sections that follow.	Ongoing	MoFEP/ MoT / MRH	Gvt
Institutional Framework					

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
The establishment of an institutional framework which enables good governance and improved performance based on separated functions of: Policy formulation, Regulation, Asset management and Service provision. (NTP Goals 4 and 5)	Implement existing recommendations and initiatives for institutional reform and strengthening	<ul style="list-style-type: none"> ■ Separate the policy formulation and asset management functions for road infrastructure ■ Complete the separation of functions already underway between Ghana Airports Company Limited (GACL) and Ghana Civil Aviation Authority (GCAA) ■ Complete the separation of safety, air traffic control and accident enquiry functions from Ghana Civil Aviation Authority ■ Allocate resources necessary to the Ghana Railway Development Authority (GRDA) to enable it to fully function as the regulator and asset planner of the rail network ■ Further strengthen the technical capacity of Ghana Maritime Authority (GMA) to fulfil its responsibilities as the regulatory body for Maritime and Inland Water services. 	Medium	MRH	Gvt
	Develop institutional arrangements to regulate the road passenger and freight transport services market	<ul style="list-style-type: none"> ■ Create a national regulatory body for road transport services ■ Strengthen the capacity of MMDAs to undertake their regulatory role of road transport services. 	Short Medium Short Ongoing	MoT MoT MoT MoT	Donors
Human Resource Development					

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
<p>To develop knowledge, key skills and competencies needed by transport sector organizations to fulfil their functional mandates, roles and responsibilities. (NTP Goal 7)</p>	<p>Develop a Multi-disciplinary Human Resource Strategy covering all skills needed by transport sector organisations and including an analysis of the attitudinal, cultural and working environmental issues affecting motivation and organizational performance.</p>	<ul style="list-style-type: none"> ■ Develop TOR to develop the strategy ■ Approach DPs for funding and aim to proceed with development within 12 months. ■ Completed strategies will be made available to transport sector MDAs by mid 2012 enabling implementation to commence by end 2012 with results measurable by end 2015. ■ Use Technical Assistance (TA) to fill the recognised gaps in local skills and knowledge – on a short-term basis. This is already common practice for major projects, especially those funded by development partners. Further benefit will be derived from these projects if special attention is paid to technology transfer and capacity building as specific outputs for each project, therefore; ■ All commissioning and procurement MDAs are tasked to ensure that all technical assistance projects include measures for technology transfer and capacity building. 	<p>Short (6-12 months)</p> <p>Short / Medium</p> <p>Short / Medium</p> <p>Short / Medium</p>	<p>MoT / MRH</p>	<p>Gvt</p> <p>Donors</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Develop an ICT development and investment strategy for transport sector MDAs including a comprehensive training programme for public sector personnel and adaptations to the work place and work environment to enable ICT to be fully utilised.</p>	<ul style="list-style-type: none"> ■ Develop TOR to develop the strategy. ■ Approach DPs for funding and aim to proceed with development within 12 months. ■ Completed strategies will be made available to transport sector MDAs by mid 2012 enabling implementation to commence by end 2012 with results measurable by end 2015. 	<p>Short / Medium</p>	<p>MoT / MRH</p>	<p>Gvt Donors</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Develop a comprehensive Research Strategy for the transport sector. The strategy will aim to increase knowledge levels in sector organizations and improve policy formulation, infrastructure design and management and transport services management. It should address issues that are of immediate importance and extend to the changes likely in the next 30 years.</p>	<ul style="list-style-type: none"> ■ Develop TOR to develop the strategy ■ Approach DPs for funding and aim to proceed with development within 12 months. ■ Completed strategies will be made available to transport sector MDAs by mid 2012 enabling implementation to commence by end 2012 with results measurable by end 2015. 	<p>Short / Medium</p>	<p>MoT / MRH</p>	<p>Gvt Donors</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Address the long standing need to understand the local contracting sector and improve the skills and capacity of local contracting companies. Whilst the road infrastructure sub-sector will be the primary recipient of improvements, the problem is of national importance and knock-on benefits will be enjoyed by other transport projects and the construction sector in Ghana.</p>	<ul style="list-style-type: none"> ■ Prepare TOR and commissioning of consultants to carry out a study to review contractor economics in Ghana; prescribing measures to improve the performance of plant for road construction and maintenance work. The Ministry will report on findings with recommendations for improvement within 6 months. Actions will be implemented within 12 months ■ Intensify locally delivered training for the supervisory personnel of contractors and Road Agencies ■ Re-mobilise the collaborative project between NVTI and ASROC to train site tradesmen and extend to include operators and mechanics ■ Develop courses with a combination of classroom and on-the-job training for operators – issue certificates of competency and keep a register ■ Explore use of GTTC and Koforidua training schools as a base for delivering vocational and skills-based training ■ Introduce training to target senior managers of local contractors in business and financial management and contract management. ■ Engage professional bodies and tertiary education establishments in the development of financial, technical, and human resource management for contractors including business planning and leadership capacity ■ Train and certify plant operators ■ Train and certify plant maintenance operatives and mechanics 			

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Improve Integration – Land use planning and other sectors of the economy (Spheres 1 and 2)					
<p>Target transport sector investment to better serve key centres of population, production and tourism, identifying strategic areas of development and necessary expansion (NTP Goals 2, 3, and 4)</p>	<p>Establish the ITP methodology as the primary integrated planning method for the transport sector.</p>	<ul style="list-style-type: none"> ■ Publish and distribute the ITP ■ Formalise the Transport Planning Group (TPG), created for the formulation of this ITP, as the core technical decision making and planning group for the transport sector. The TPG will operate under the authority of the Directors of Policy and Planning for the Ministry of Transport and Ministry of Roads and Highways. The TPG will be a permanent Group formed of key technical and planning representatives from transport sector agencies with outreach facility to engage a wider audience when necessary. The frequency of TPG meetings will vary according to the intensity of planning activities underway at any time during the planning cycle. 	<p>Short / Continuous</p>	<p>MoT / MRH</p>	<p>Gvt</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	To continuously improve the conditions in which the ITP methodology is undertaken	<ul style="list-style-type: none"> ■ Transport sector ministries will promote the ITP method with other sector stakeholders, ensuring they are aware of and understand the benefits of its utilisation. ■ Transport sector ministries will undertake a comprehensive survey and review of the current state of data and how it can be used more effectively for transport planning ■ The proposed inter-ministerial planning group (proposed in 4.2.2) above, will be co-chaired by the Minister of Transport and Minister of Roads and Highways and formed of ministerial representation from Finance, Economic Planning, Trade and Industry, Mining, Agriculture, Forestry, Energy, Cocoa production and Regional Development. The committee will meet quarterly and be mandated to formally: <ul style="list-style-type: none"> • Make guidance available to the Transport Sector as a priority in the area of: Development master plans for geographical areas designated by Government for special attention (e.g. SADA); and Strategies and development plans for future exploitation of Ghana's natural resources, requiring transportation to port or production facilities and including investment plans and production targets in the following areas: Minerals, Forestry, Cocoa, Agriculture, Oil and Gas (including plans for off-shore and on-shore development, production and distribution, logistics supply and distribution networks). • Provide feedback to the transport sector on their proposed development policies and plans for the future • Alert the transport sector to transport problems experienced by other sectors of the economy • Increase levels of cooperation, coordination and integration including information sharing, between Government MDAs. 	Immediate for continuous application	MoT / MRH	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Continuously develop and adapt the ITP methodology for application at different scales including: Regional scale; Urban/City scale; Development Authority scale such as the Sahel Accelerated Development Authority (SADA)	<ul style="list-style-type: none"> ■ Transport Sector ministries will create and maintain a dedicated transport modelling capability, i.e. a core team of modellers, to provide support to the TPG, demonstrate the planning methodology ■ DUR will develop a capacity to undertake integrated transport planning at the urban/city scale, replicating the actions with Metropolitan and Municipal Assemblies ■ Every attempt should be made to harmonize the planning cycle of MDAs in the sector. 	Short – continuous actions	MoT / MRH DUR	Gvt Donors
Finance					
Improve existing institutional financial arrangements	Ensure MDAs have secure sources of finance	<ul style="list-style-type: none"> ■ Allow MDAs to make strategic and operational decisions on tariffs, fees and charges. ■ Prohibit utilisation of surplus or accumulated finances to assist insolvent MDAs. 		MoFEP / titular Ministries	
	Provide public subsidies to MDAs for transport services	Annual GoG budgetary provision from CF to VLTC, MMT, etc	Short	MoT / MoFEP	Gvt
	Clear legacy debts and liabilities	Obtain funds from DPs or out of CF to clear inter-institutional transactions	Short		
	Fund rationalisation costs of institutions	Obtain funds from DPs or CF to rationalise staff and other overhead costs in VLTC, GRCL.	Short	MoT / MoFEP	
	Restrict use of funds to core purpose of MDA	Prohibit investments in non-core activities; prohibit diversion of funds to non-core purposes.	Short		

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	New source of funding for road improvements	Study possibility of Urban property tax to finance road improvements, or obtain finance from Common Fund	Medium	MRH / MLGRD	
	Relax regulatory regimes	Review regulation of tariffs, fees and charges where restrictions affect viability of institutions.	Short		
Apply commercial principles and full cost recovery where appropriate	The « user pays » principle shall be applied to all transport services and maintenance of infrastructure	<ul style="list-style-type: none"> ■ Fuel levy increased from current levy to US 9.5 cents per litre by 2015. ■ Other road user charges to reflect full cost recovery 	Short	MRH / MoFEP, and Ministry of Energy / Road Fund DVLA / MMT	Road users
	Generate revenues	<ul style="list-style-type: none"> ■ Increase tariffs, fees and charges annually in line with inflation ■ Introduce new tariffs, fees and charges where possible 	Short Short	MoFEP E.g. GMA	
	Avoid short term approach to long term issues	<ul style="list-style-type: none"> ■ Match forex loans with projects that generate forex revenues sufficient to amortise loans ■ Match investment life cycle with period of borrowing 	Short		
Improve recurrent financial operations	Employ effective financial management to improve utilisation of public funds	<ul style="list-style-type: none"> ■ Contracts issued only where funding is secured and available ; pay promptly to avoid penalties, interest charges ; prioritise labour based contractors. ■ Use domestic bank funding for working capital purposes only 	Short		
	Preservation of future revenues	Review policy of borrowing (from SSNIT) against future Road Fund revenues	Medium		

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Transparency and accountability	<ul style="list-style-type: none"> Annual financial statements prepared within three months of end of financial year Annual audits prepared within six months of end of financial year 	Short	Individual institution	
		Titular ministries to require presentation of monthly and quarterly management accounts for review and monitoring	Short	Titular Ministry	
Diversify sources of investment funds	Identify investment funding options and approaches	<ul style="list-style-type: none"> Approach international banks and funds for long term concessionary funding with grace periods for infrastructure projects Approach DPs with view to funding Strategic ITP projects from 2011 onwards Approach DPs for grant based funds to bridge gap in current ITP 2011-15 with grant aid or soft loans Approach domestic investors to obtain Cedi based loans Approach sovereign funds/-government agencies as source of medium/long term finance Ensure responsible authority undertakes necessary investment in lake infrastructure 	Short / Medium	MoFEP / VRA	All DPs with specific interest in sub-sector, Merchant banks, Governments, agencies and institutions that have already shown interest in specific projects
Utilise of PPP and related interventions	Explore PPP, concession and related private sector	Apply PPP approach to projects with clear financial and economic benefits in excess of cost of borrowing, etc.	Medium	Operating institution	Private sector (domestic

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
to mobilise private sector participation and funding	options for investment and funding of projects				merchant banks, international banks, specialist PPP companies)
		Utilise expertise developed in MoFEP Policy Unit	Medium	MoFEP	
		Prepare and present detailed feasibility studies of selected investment opportunities to private sector and other investors		Operating institution	International banks and funds (IBRD, EIB, etc) ; sovereign funds ; known private sector PPP purveyors.
		Utilise franchises where private sector can provide cost effective management and operation of services with minimal public sector subsidy	Medium	MoT / MRH	Specialist private sector organisations with previous management and operational experience in rail, road, etc sub-sectors.
		Outsource revenue collection where clear net financial benefit arises	Medium	MoT / MRH	Domestically based specialists
		Continue to seek BoT and similar solutions for financially and economically viable projects	Medium	MoT / MRH	Known private sector specialists in sub-sector

2. Improving integration

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Sub-regional integration					
Improve sub-regional integration: East-west transit routes as well as North-South	Lower the prices of transport by reducing, transit time to cross borders on the roads along the Abidjan-Lagos corridor (998 km) and Coastal port to Landlocked countries	<p>Trade and Transit Facilitation: Ghanaian to take part in ECOWAS with a view of increasing synergy with others projects aimed at the same trade facilitation objectives.”</p> <ul style="list-style-type: none"> ■ Integrated review of all the documentation and processes be carried out with the view to harmonize, simplify and facilitate implementation, ■ Assessment of required institutional support to Ghanaian and neighbors ECOWAS Trade and Transport Facilitation Committees and Stakeholders order to enhance their roles in ensuring the implementation of regional trade and transport facilitation instruments; ■ Share of relevant information and data between customs administrations) ■ Share the CGnet Ghanaian positive experience with neighboring countries: ■ Promote the establishment of a single window in neighboring countries to facilitate the efficient and rapid processing of all transactions; and ■ simplification of customs procedures and preparation of manuals to streamline their implementation; ■ Document the experience on the supervision of the performance of the corridor (provided by the Abidjan-Lagos Corridor Organization (ALCO), in accordance with the Accra protocol agreement, signed in July 2008) and 	Short	ECOWAS, Ghana Customs, CGnet, ALCO	World Bank L/IFI donors

		replicate it on the Norh-South routes.			
Sub-regional integration: axle loads control	Study on the harmonization of regulations, procedures and modalities for the implementation of axle load controls of vehicles on transitt Corridors, particularly on the North-South competing transit corridors.	<p>Strength the current overload control operations on all the transit corridors should be promoted by Ghanaian Authorities not only to protect Ghanaian road but also and specially to stimulate regional development within a fair competition context.</p> <p>Particularly emphasis is on the routes from Tema, Lomé, Cotonou and Abidjan to landlocked countries: Burkina Faso, Mali, Niger.</p>	Short	MoT / Ecowas	ECOWAS / Afd
Sub-regional integration: axle loads control	Promote containerisation higher of overseas traffic	<p>Increase the containerisation rate from current 15% to at least 40% in the next 5 years to the facilitation of transit and to the modernization of transport and logistics services along the regional corridors.</p> <p>To this end, design a mechanism to increase coordination between ECOWAS transit countries making:</p> <ul style="list-style-type: none"> ■ Same control of truck weights at ports (Tema, Lome, Cotonou, Abidjan) and on-roads weighbridges control as well as share of information on carriers which are repeatedly convicted of overloading activities. ■ Introduce ways to quick up customs and transit procedures applied to container traffic as compared with semi-trailer transport. ■ Organise container pools between shipping lines to facilitate the container return (as much loaded as possible) to any of the four ports: container fleet management system. ■ Improve trade / logistics chain (modal interfaces, border 	Short	Ghana trade facilitation committees within ECOWAS, Customs and shipping,g lines. , CGnet and ALCO	ECOWAS / Afd

		crossings, ICD) : consideration on port operations and management as well as control procedures and formalities at ports, joint border posts and at other service facilities (inland customs warehouses and clearance centres, ICD, or other destuffing and delivery points), transport logistics processes, overall door-to-door costs and delays, communications tools and associated methods (EDI, web-based systems),			
Integration between transport modes					
Establishment of an intermodal framework	Formalising modal integration in key locations	Takoradi Port – connections to Rail, Road <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	MoT / GPHA / GRDA / GRCL / TMA / DUR / COCOBOD / GBC / GMC	Gvt / Donors / Users
		Tema Port – connections to Railn Road <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	MoT / GPHA / GRDA / GRCL / DUR	Gvt / Donors / Users
		Akasombo – connection to Road, Lake, Pipeline <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	VLTC / BOST	Govt / Donors / Users
		Buipe – connections to Road, Lake <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	BOST / VLTC / GHA	Gvt / Donors / Users

		<p>KIA – connection to Road</p> <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	MoT / GAA / GACL / GRDA / AMA / DUR	Gvt / Donors / Users
		<p>Urban railway stations – connection to Road</p> <ul style="list-style-type: none"> ■ Review current intermodal arrangements ■ Identify improvements ■ Propose actions 	Short / Medium	MoT MMT, AMA, DUR, CUT	Gvt / Donors / Users

3. Development of air transport

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Aviation					
Provide appropriate regulations for the sector	Regulate and enforce rules in the industry	<ul style="list-style-type: none"> ■ License and certify AVSEC Staff/screeners as recommended by ICAO SARPS ■ Carry out daily inspection of the perimeter fence. ■ Educate stakeholders on Licensing mechanisms. ■ Establish an easier and fast-track system of updating and amending the Ghana Civil Aviation Regulations (GCARs). ■ Establish a system of monitoring other foreign regulations (i.e. FAR & EASA) and ICAO SARPs and then amend the GCARs appropriately. ■ Make the GCARs readily available to the aviation industry and general public. ■ Amend the amount of Civil Penalty Points in the GCARs to reflect more realistic fines. ■ Implement policies and procedures as spelt out in operations manual. ■ Ensure enforcement action on all breaches of rules and regulations 	Short	GCLA / GCAA	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Provide adequate infrastructure	Upgrade equipment to international standards	<ul style="list-style-type: none"> ■ Procure state of the art equipment (e.g. Carousel, Chillers, Scanners, X-ray machines, etc...) ■ Install power quality improvement facilities ■ Complete the installation of Aeronautical ground lighting (AGL) at the regional airports. ■ Establish performance indices for service contract operators and provide regular reports on their performance ■ Stock adequate spares for technical equipment ■ Carry out weekly audits of staff and equipment to ensure effective performance 	Short / Medium	GCLA / GCAA	Gvt
	Upgrade and expand infrastructure and facilities	<ul style="list-style-type: none"> ■ Rehabilitate fire hydrants and water reservoir at KIA and the domestic airports. ■ Complete the construction of new Fire Station at KIA. ■ Expand and refurbish Domestic Terminal at KIA to facilitate International passenger travels ■ Expand and refurbish the International Terminal Building to facilitate expected passengers up to 2025, ■ Install AGL system at Kumasi, Tamale and Sunyani to encourage night flights ■ Secure Government guarantees and assistance in the development/rehabilitation of airports/airstrips/airfields to open up country for increased trade 	Short / Medium	GCLA / GCAA	Gvt
	Explore the feasibility of establishing other international airports in Ghana	<ul style="list-style-type: none"> ■ Conduct feasibility to establish demand and suitability. ■ Undertake demand forecast to establish needs and services required. ■ Undertake Feasibility studies. ■ Advertise for public awareness of project. 	Short / Medium	GCLA / GCAA	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Secure title to airport lands	<ul style="list-style-type: none"> ■ Organize stakeholder forum and lobby government for title to all airport lands ■ Initiate process to procure and secure land for future development 	Short	GCLA / GCAA	Gvt
Enhance safety and quality of service	Develop and establish framework for excellent service and safety standards	<ul style="list-style-type: none"> ■ Maintain established technical cooperation/links with neighbouring FIRS (NAMA, ASECNA) ■ Benchmark successful airport companies to develop and establish framework for excellent service standards. ■ Conduct service quality audit monthly on: X- ray system, conveyor system, lighting system ■ Continuously liaise with airlines to identify short comings and address them in good time ■ Generate as much funds as practically feasible from operations. ■ Activate a safety management system for all airports, airfields, and helipads in the country. 	Short / Medium	GCLA / GCAA	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Create enabling environment	<ul style="list-style-type: none"> ■ Aggressively market KIA to attract new airlines to: <ul style="list-style-type: none"> ● expand network to new routes(i.e. better connections) ● charge competitive airfares and provide quality services to passengers ■ Assist new applicants seeking Airport Operator’s Certificate (AOC) to complete requirements within a maximum period of six months. ■ Introduce incentives to encourage diurnal flights ■ Encourage more direct flights to make journeys less cumbersome and affordable ■ Create enabling environment through liberalization and open skies policies ■ Foster closer relations with ministries of Tourism and Food and Agriculture to increase trade and passenger thru put. ■ Provide incentive as support for home based carriers for effective hub and spoke operations 	Short / Medium	GCLA / GCAA	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Attract the private sector	<ul style="list-style-type: none"> ■ Carry out substantial research and surveys to encourage PSP in airport operations ■ Identify areas of participation (i.e. retail/concessions, freight and passenger handling, catering, fuelling , advertising, security services, cleaning and sanitation,etc) ■ Set up regulatory framework/ laws to enable private sector participation in an efficient and effective manner ■ Ensure the right environment is in place for PSP ■ Advertise/Implement programmes in master plan ■ Use specialized skills of private sector to the benefit of stakeholders to: <ul style="list-style-type: none"> ● deliver/build better infrastructure faster ● maintain infrastructure more effectively ■ Liberalize/Deregulate to encourage more private sector participation. 	Short / Medium	GCLA / GCAA	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Provide adequate training to staff	<ul style="list-style-type: none"> ■ Determine skills gap and potential for Ghanaians. ■ Train staff (ASIs & Legal) in Compliance and Enforcement actions on violations and recommended sanctions and amount of Civil Penalties. ■ Meet all emergency air disaster situations at KIA and domestic airports ■ Train instructors in the relevant course areas ■ Conduct periodic refresher courses ■ Establish a training institution in Ghana ■ Train airport operators to ensure effective team approach to safety and security ■ Secure accreditation from Accreditation Board ■ Identify institutions for approved training and collaborated. 	Short / Medium	GCLA / GCAA	Gvt

4. Development of inland water, maritime and pipelines

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Inland navigation					
<i>Improve Navigation conditions and facilities on Volta Lake</i>	Get a clear picture of navigation conditions on Lake Volta which is not limited to the zones served by VLTC (i.e. South – North line and ferry crossings)	Contract a study to a consultant firm to carry out a comprehensive “feasibility study” aimed at getting a clear and detailed picture of the prevailing situation on Lake Volta and proposing recommendations to improve the situation for the short, medium and long-term.	Short	GMA / MoT	GMA / Gvt / Donor
	Chart main fairways in Volta Lake	Contract hydrography to specialised firm <ul style="list-style-type: none"> ■ Identify main fairways based on the result of the previous feasibility study ■ Call for tender and award contract for hydrographic surveys of selected fairways 	Short / Medium	GMA	GMA / Gvt / Donors
	Remove obstacles to navigation and improve and develop ports and landing facilities	<ul style="list-style-type: none"> ■ Establish and discuss with the Government and stakeholders a programme aimed at improving navigation conditions on Lake Volta <ul style="list-style-type: none"> • Debre shoals / new port in Buipe • Removal of tree stumps and weeds • Rehabilitation and development of new ports and landing facilities ■ Secure public funds for “infrastructures projects” on Volta Lake ■ Liaise with VRA to ensure all year around navigation 	Medium / Long	GMA / VRA / MOT GMA / VRA / MOT / VLTC / stakeholders	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
<i>Improve fleet conditions on Volta Lake</i>	Improve construction and operation standards for private boats sailing on Volta lake	<ul style="list-style-type: none"> ■ Develop and enforce new standards for boat construction and operation ■ Develop training for crew, boat owners and operators ■ Develop pilot programmes aimed at strengthening capacity of small private operators in the boat construction sector 	Short / Medium	GMA / MoT / private stakeholders	GMA / Gvt / donors
	Bring VLTC's fleet condition to the required standards	<ul style="list-style-type: none"> ■ Rehabilitate VLTC's ferries ■ Improve maintenance system (develop routine & preventive maintenance programmes) 	Short / Medium	VLTC	VLTC / Gvt / Donors
<i>Improve safety of navigation on Volta Lake</i>	Ensure all boats sailing on Lake Volta comply with safety regulations	<ul style="list-style-type: none"> ■ Strengthen GMA capacity in ensuring the safety of navigation on Lake Volta (additional staff, patrol boat, and other equipment) ■ Investigate the situation of VLTC fleet with regards to security and implement the recommendations of this investigation 	Short / Medium	GMA / VLTC / MoT	GMA / Gvt / Donors
	Improve capacity in search and rescue	<ul style="list-style-type: none"> ■ Finance and set up local search and rescue coordinating centres along Volta Lake 	Short / Medium	GMA / MoT / Gvt	GMA / Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Strengthen capacity of crew sailing on Volta Lake	Develop and enforce standards for training and certification of crews	Short / Medium	GMA	GMA
	Improve aids to navigation on Lake Volta	Establish and implement a programme for developing aids to navigation on Lake Volta	Medium	GMA	GMA / Gvt / Donors
<i>Satisfy the demand</i>	Get a clear picture of global transport demand on Lake Volta (not limited to the South – North line served by VLTC, and at the ferry crossings)	Carry out a comprehensive “feasibility study” aimed at getting a clear and detailed picture of the prevailing situation on Lake Volta and proposing recommendations to improve the situation for the short, medium and long-term encompassing all operators	Short t	MOT / GMA	GMA / Gvt
	Improve road access to ports and landing facilities	<ul style="list-style-type: none"> ■ Based on the findings of the proposed feasibility study, establish and discuss with Government programme of improvement of road access to ferry stations ■ Secure public funds and implement the programme 	Medium	GMA / VLTC / MoT / MoFEP / private operators	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Elaborate strategy for developing VLTC's traffic, and rationalise VLTC organisation to match supply to demand according to the expected traffic	<ul style="list-style-type: none"> ■ Establish new VLTC Corporate Strategic Plan for the period 2013-2015 considering the findings of the previous feasibility study; notwithstanding the outputs of this feasibility study, this VLTC Corporate Strategic Plan should focus on: <ul style="list-style-type: none"> • Consolidating relations with main VLTC's customers (BOST, TOR, Ghacem) • Discuss and establish common strategy for oil transport between VLTC and BOST • Pursue an aggressive marketing strategy to develop new traffic along the South-North line and along other lines to be possibly created • Develop cruise business, possibly in joint venture ■ Rationalise VLTC organisation <ul style="list-style-type: none"> • Review manpower needs and implementation of corresponding human resources policy • Review the tariff policy • Optimise the use of resources through effective planning, programming and budgeting procedures • Etc. 	Short / Medium	VLTC / BOST / TOR / Ghacem	VLTC / Gvt
Strengthen regulation and institutional arrangement	Envisage compensation for regulated public service obligations (ferry crossing & transport to remote areas)	<p>Study, compare and decide upon possible alternative models for regulated public services (ferry crossing and transport to remote areas)</p> <ul style="list-style-type: none"> ■ Concession model possibly subsidized (to VLTC or private operators) ■ Direct compensation to VLTC (subsidies from Government) <p>Depending upon the findings of the study, develop the regulatory framework required to implement the "concession model"</p>	Short / Medium	MoT / GMA	GMA / Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Clarify ownership of ports and landing facilities on Volta Lake	Review administrative arrangements <ul style="list-style-type: none"> ■ Based on the findings of the feasibility study mentioned above, review the situation of all ports and landing facilities ■ Make recommendations based on this review ■ Implement the decision taken based on these recommendations 	Medium / Long	GMA / MoT / Gvt	GMA / Gvt
	Transfer VLTC from VRA to MOT	Achieve the transfer of VLTC from VRA to the MOT	Medium	MoT / Gvt	Gvt
Ports					
<i>Develop port Infrastructures</i>	In Tema : develop new container facilities at Tema for large container vessels (up to 4 500 TEU with 14 m-draft)	<ul style="list-style-type: none"> ■ Finalise and approve Tema Port Master Plan ■ Carry out feasibility study for the construction of new deep-water container facilities and determine the possible extent of PPP scheme ■ Secure required public funds : ■ Prepare tender documents for construction and operation of a new container terminal ■ Call for tender and implement contract 	Medium	GPHA / MoT	GPHA / Gvt / Donors / Private
	In Takoradi : expand port infrastructures including <ul style="list-style-type: none"> ■ New deep-water berths for bulk carriers ■ New container facilities ■ New on-shore supply facilities for oil and gas industry 	<ul style="list-style-type: none"> ■ Finalise and approve Takoradi Master Plan ■ Carry out feasibility study for the extension works and determine the possible extent of PPP schemes ■ Secure necessary public funds ■ Prepare tender documents for construction and operation of the new facilities ■ Call for tender and implement contract 	Medium / Long	GPHA / MoT	GPHA / Gvt / Donors / Private

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>In Tema :</p> <ul style="list-style-type: none"> ■ Improve road access to the port ■ Develop new rail connection to the port hinterland including the dry port in Kumasi 	<ul style="list-style-type: none"> ■ Liaise with Tema Metropolitan Authority for physical planning of port – city interfaces ■ Review design of Meridian road and Harbour-road motorway (GPHA), ■ Secure funds (MOT, DUR, GPHA) ■ Call for tender for construction (DUR) ■ Liaise with, MOT, GSC and GRDC ■ Carry out feasibility study of Boankra dry port considering the present environment ■ Implement decisions taken based on the recommendations of the feasibility study 	Short / Medium	GPHA / TMA / MoT / GSC / GRDC	Gvt / Donors / GPHA
	Develop « PPP » projects (whenever financially viable)	<ul style="list-style-type: none"> ■ Assess potential for PPP in port infrastructure projects ■ Identify possible viable PPP projects and suitable PPP partners ■ Implement PPP project 	Short / Medium	GPHA / MoT	GPHA
	Mobilise funds from Government budget for developing port related projects both inside or outside the port area	<ul style="list-style-type: none"> ■ Prepared and present a policy paper justifying needs from Government funding for major port projects ■ Secure the funds in the Gvt budget 	Short / Medium	GPHA MoT / Ministry of budget	Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
<i>Improve Services</i>	Promote competition within and between ports	<ul style="list-style-type: none"> ■ Abolish quota allocation system for stevedoring ■ Clarify the roles of GPHA – handling department vis-à-vis private stevedoring operators through achieving setting up a subsidiary of GPHA responsible for all handling activities currently carried out by GPHA, GPHA's divesture of handling activities, or any other solution ■ Envisage competition for container handling (possible second container terminal operator in Tema when a new container terminal is built) ■ Promote competition between ports by giving more autonomy to the management of Tema and Takoradi ports 	Short / Medium	GPHA / MoT / Gvt	GPHA / Gvt

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Improve the capacity and efficiency of port operators	<ul style="list-style-type: none"> ■ Assist stevedoring companies in assessing training needs and organise training ■ Establish performance standards, including sanctioning system ■ Improve GPHA capacity in management of concessions and licences 	Short / Medium	GPHA	GPHA / Private
	Simplify custom clearance and other procedures to reduce port dwell time and delays on transit corridors	<p>Develop collaboration between GPHA, custom, police & immigration in order to streamline procedures for custom clearance:</p> <ul style="list-style-type: none"> ■ Develop a framework for collaboration ■ Organise regular meetings and workshops on selected topics (GPHA) 	Short	GPHA / ministries	GPHA
	Develop cooperation between stakeholders in strategy development, planning, etc.	<ul style="list-style-type: none"> ■ Develop a general framework for reviving the port community ■ Organise regular formal meetings ■ Organise regular workshops on selected topics 	Short / Medium	GPHA with the participation of all stakeholders	
	Continuously improve competitiveness of Ghanaian ports within the region	<ul style="list-style-type: none"> ■ Undertake regular comparison of tariffs and performance between Ghanaian ports and competing ports ■ Undertake comparative studies of corridor costs and performances on competing corridors ■ Implement decisions taken based on the recommendations of these comparative studies ■ Develop a strategic pricing policy considering <ul style="list-style-type: none"> • GPHA's financial needs and potential for PPP in infrastructure projects • Concurrence with competing ports (transit traffic – hub) 	Short / Medium / Long	GPHA / MoT / GSC	GPHA / Gvt / Donors / Private

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Achieve separation of regulation and operation in handling activities ("Landlord Port Model")	<ul style="list-style-type: none"> ■ Clarify the roles of GPHA – handling department vis-à-vis private stevedoring operators through achieving setting up a subsidiary of GPHA responsible for all handling activities currently carried out by GPHA, GPHA's divesture of handling activities, or any other solution ■ Review, and possibly, revise the existing regulation (MOT, Gvt) ■ Prepare and implement a phased programme of measures necessary to shift from the existing situation to the desired one 	Short / Medium	GPHA / MoT, other Ministries	GPHA / Gvt / Donors / Private
Maritime transport					
<i>Improve capacity and resources for the sector</i>	Implement capacity building programme for GMA and increase GMA revenues	<ul style="list-style-type: none"> ■ Carry out a comprehensive study of GMA financing: <ul style="list-style-type: none"> • identify the level of funds required for GMA to fully function • develop a strategy for increasing GMA revenues to the required level ■ Implement capacity building programme for GMA 	Short / Medium	GMA / MoT / Gvt	GMA / Gvt / Donors
	Develop coordination between Government agencies responsible for enforcing the maritime regulation	<ul style="list-style-type: none"> ■ Strengthen MOT capacity in agency coordination ■ Develop a framework for collaboration ■ Organise regular meetings and workshops on selected topics 	Short	GMA / MoT	MOT / GMA
<i>Improve Regulation</i>	Improve existing standards dealing with safety of seafarers, vessels and search and rescue at sea	<p>Review, update and enforce standards to improve safety in relation to</p> <ul style="list-style-type: none"> ■ Training and certification of seafarers ■ Control of Ghanaian vessels and foreign vessels visiting Ghana ■ Search and rescue at sea 	Short / Medium	GMA	GMA

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Develop and enforce new standards in relation with security, safety, and environmental impact of off-shore activities	<ul style="list-style-type: none"> ■ Develop comprehensive regulation including enforcement mechanisms ■ Adopt and enforce the new standards 	Short / Medium	GMA / Gvt	GMA
<i>Provide Training</i>	Develop the Regional Maritime University teaching and accommodation facilities to fit the regional demand	<ul style="list-style-type: none"> ■ Strengthen the Regional Maritime University <ul style="list-style-type: none"> ● Carry out comprehensive analysis of regional training demand including development of new courses for the maritime industry and administration ● Establish strengthening programme to fit the demand ● Discuss programme with stakeholders (RMU – Maritime administrations) ● Approve the programme and secure funds for its implementation (RMU Board - Gvt) ● Implement the approved programme (RMU) ■ Equip RMU with a training vessel ■ Attract experienced teachers (retired captain and master mariners) <ul style="list-style-type: none"> ● Review the recruitment conditions of the teachers ● Prepare a comprehensive incentive scheme aimed at attracting highly experienced retired master mariners or captains 	Short / Medium	RMU in collaboration with member Government	RMU / Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Pipeline					
Improvement of pipeline transport	Rehabilitation and capacity improvement of the pipeline from Tema to Akosombo	<ul style="list-style-type: none"> ■ Carry out feasibility study and design ■ Possibly, secure required public funds ■ Prepare tender documents for works ■ Call for tender and implement contract 	Medium	BOST	BOST / Gvt
	Commission the pipeline recently installed from Buipe to Bolgatanga	<ul style="list-style-type: none"> ■ Investigate reasons why the new pipeline could not be commissioned ■ Take necessary measures and commission the pipeline 	Short	BOST	BOST
	Install a new section of pipe-line from Debre to Buipe	<ul style="list-style-type: none"> ■ Carry out feasibility study and design ■ Possibly, secure required public funds ■ Prepare tender documents for installation works ■ Call for tender and implement contract 	Medium	BOST	BOST / Gvt / Donors

5. Development of rail transport

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Railways					
Modernise the institutional and regulatory framework	Review and restructure GRCL	<ul style="list-style-type: none"> ■ Review and restructure GRCL to: <ul style="list-style-type: none"> ● Focus GRCL management only on the new network ● Introduce commercial, business procedures that: (i) ensure services offered are cost-effective and saleable in the transport market; (ii) investment is directed to maximize the earning capacity of the system; (iii) business opportunities are planned, quantified and fully exploited ■ Allocate resources to the reformed GRCL to: <ul style="list-style-type: none"> ● Establish accurate management information systems for cost control and business planning; ● Re-train operating staff to achieve new standards of safety and operating efficiency 	Short / Medium	GRC / GRDA	Gvt / Donors
Re-orientate personnel to modern railway practices	Create capacity for GRDA	<ul style="list-style-type: none"> ■ Appointment of key personnel, capacity building and resource allocations to GRDA to enable it to become fully operational and complete its strategic development plan for Ghana's railways by end 2010. 	Short / Medium	GRC / GRDA	Gvt
	Immediate Measures to restore service quality and safety of operation	<ul style="list-style-type: none"> ■ Implement a programme of staff safety training ■ Preventive maintenance regime for rolling stock/locos ■ Safe and effective system of train control ■ Commercialization of management structure ■ Release of redundant staff 			

Rehabilitate the existing network and improve services and operating standards to win new costumers	Rehabilitation of the western line	<ul style="list-style-type: none"> ■ Rehabilitation between Takoradi and Awaso to address manganese / Bauxite traffic demand. Indeed, the assessment made have shown that rehabilitation of the Western Railway can be financially justified, based upon the existing levels of mining output, both flows of which have potential to increase. ■ Re-opening to Kumasi / Boankra for containers / cement / passenger traffic: the traffic survey and studies have shown that there is substantial and growing movement of transit containers between the Ghanaian ports of Tema and Takoradi and the land-locked hinterland countries of Burkina Faso and Mali. There appears therefore to be reasonable expectation that, in due course, rail extension towards the Burkina Border can be anticipated. 	Short / Medium	GRC / GRDA	Gvt / Donors
	Rehabilitation of the eastern line	<ul style="list-style-type: none"> ■ As a first stage it is suggested that the route be re-commissioned between Nsawam and Koforidua to enable provision of an extended and intensified suburban service. Proposals for this have already been put forward ■ Apart from re-commissioning of the rail route, acquisition of rolling stock for all the above traffic flows will be required. ■ The boankra pre-feasibility study suggests that a full feasibility should be carried out in order to assess in details the benefits and impacts of the dry port. ■ Extension of suburban passenger services between Nsawam and Koforidua with increased frequency, coupled with increased frequency between Accra and Tema. 	Medium	GRC / GRDA	Gvt / Donors

	Plan and extension to the north	<p>Planning an extension of the network to the North of Kumasi is strategically to be considered as a medium term priority. More specifically, the objectives to be addressed are:</p> <ul style="list-style-type: none"> ■ Carry out a traffic study on opportunities in the Northern region and further in terms of transit traffic, ■ Prepare plans for incremental rail extension to Burkina border ■ Examine mining opportunities and rail connection options 	Medium/ Long	GRC / GRDA	Gvt / Donors
Objectively analyse new developments	Promote and apply rational planning	<ul style="list-style-type: none"> ■ Promote the use of the multicriteria evaluation manual developed by the ITP ■ Coordinate on-going plans and feasibility studies in order to avoid “double counts” for potential demand ■ Ensure that forecasts for future transport reflect planned developments instead of targets. 			

6. Development of road transport

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Road transport Services					
<p>Change the role of the road transport Authorities</p>	<p>Set up a Central Regulatory Body</p>	<ul style="list-style-type: none"> ■ Set up a Road Operators License Agency (ROLA) and its objectives: <ul style="list-style-type: none"> • Promote safety on roads and service competitiveness. • Training centres focused on training on technical driving as well as fleet managers (Road operators) • Safety issues: fight against overloading, invalid roadworthiness certificate • Issuing & renewing road transport Operator licenses and properly feed official databases (drivers, vehicles and operator's after introducing some form of Operator' License) 	<p>Short-term</p>	<p>Ministry of transport</p>	<p>Ministry of transport</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Develop the administration method at the national scale</p>	<p>Design a built a road transport monitoring database focused on monitoring operators' compliance with safety and service standards.</p> <ul style="list-style-type: none"> ■ Management method: administration of infringements (renewal of licenses) around a central database (mirror), relying on the implementation and enforcement of regulations by regional and districts authorities to achieve its goals for road freight and passenger transport. ■ Key issue is the register of infringements detected by various enforcers (a copy is sent to the Road Transport new Authority by the enforcement body) ■ Subordinate the renewal of Operator license to fair operators and weed out inferior carriers convicted of committing serious or too many repeated infractions (speed, overloading, exceeding driving hours, etc.) 	Short-term	Ministry of transport	Ministry of transport

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Encourage the Unions to be more active in the policy-making process promoting and integration of better safety behaviour on roads and higher competitiveness.</p>	<ul style="list-style-type: none"> ■ Union’s mission reviewed : develop a vision of problems and be active in proposing solutions to other protagonists (administration and users) ■ Take part in regular sectoral meetings Information and training + integration of safety norms within the sector. ■ Information dissemination and training (information on practices and on operation better services), Follow up of operating conditions and operating cost, Publish synthetic index serving as reference for pricing different techniques. ■ Carry out a training of trainers: for Drivers (“technical driving”) and Road Operators (Passenger, Fleet & cargo management...) ■ Promote integration of safety norms 	Short-term	Ministry of transport and the Unions	Ministry of transport and the Unions
	<p>Establish regular consultation forums with industry, users and unions.</p>	<p>Gather all parties involved on a regular basis: the Authority, the Unions and the Users (freight and passengers)</p> <ul style="list-style-type: none"> ■ Define a regular meeting framework. ■ Deduce changes and improvement, discuss it and agreed upon an action program. ■ Measure and followed up. Progress made. 			

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Introduce quality regulation	Introduce a licence system for road transport operator.	<ul style="list-style-type: none"> ■ Introduce a new legal actor entity: the road transport OPERATOR as being the person who pays the driver’s salaries. He should fulfill 3 basic conditions: <ul style="list-style-type: none"> • Keeping roadworthiness certificate update (maintenance of the vehicle); • Being literate (able to read, write and sign a service contract) • Have good repute : no convicted of responsibility in road accidents; or infractions to laws (including new social and technical standards) • Passenger transport: An additional criterion is on financial standing. ■ New rule: OWNER-DRIVER can act as an OPERATOR if the candidate fulfill previous conditions to be operator (otherwise, to remain driver (work for someone having an operator license) ■ Once the conditions are fulfilled, the candidate is granted a License and is registered as a <u>Road Transport Operator</u> (license valid 5 years, (a copy kept on each vehicle mandatory), ■ Renewal: if not convicted of serious infringement or too many violations to new rules. 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Ensure the enforcement of renewed roadworthiness test.	Prepare a tender dossier for the deployment a of network of vehicle inspection for industrial/commercial vehicles <ul style="list-style-type: none"> ■ Vehicle technical inspection: by certified controllers in special centers, with special equipment (Private centers certified and controlled by DVLA) ■ Contents (focused on safety items): Braking system, equipment, mechanics; steering, visibility, lighting, street signs, chassis and accessories, pollution, noise level, etc. ■ Periodicity and compulsory: every 6 months for passengers. 1 year for trucks. 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors
	Defining, implementing and enforcing some basic standards on driving hours and rest periods.	<ul style="list-style-type: none"> ■ Driving time: The daily driving time period shall not exceed 9 hours. It may be extended twice in a week to 10 hours. ■ Continuous driving time: after 4,5 hours' driving: break of at least 45 minutes, unless he begins a rest period. ■ Rest time: In each period of 24 hours: daily rest period of 11 consecutive hours, ■ Digital tachograph compulsory: Activities recorded and stored for possible checks by enforcers. 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors
	Introduce written transport contracts to clarify the responsibilities of all parties involved	Design and implementation of a single transport contract for freight and another for the passengers subsection.	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Introduce more productive techniques and fleet management approaches	Implement a network approach to transport systems	<ul style="list-style-type: none"> ■ Introduce modern transport operating techniques: requires pivotal points throughout the market area and relies heavily on capital-intensive investments including in information and communication technologies: <ul style="list-style-type: none"> • Independent private (or “spontaneous») warehouses: Storage according to different use and period of time □ stages of the manufacturing process □ (raw material, intermediary products, finished products...). Handling equipment more or less sophisticated □ type of products, size of consignments □ frequency of supply-delivery process, • Consolidation / groupage Warehouses: gathering of the goods from several senders to several destinations and the other sense. • Hubs: this is a warehouse cross docking oriented more than stocking. ■ Logistics centres: served by many different means of transport 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Encourage road transport operators to set up collaborative businesses	<ul style="list-style-type: none"> ■ Remove the queuing model (single vehicle on a single set of poor equipped park yards). ■ Design a pilot project on collaborative businesses (joint ventures, strategic alliances, partnerships) on a given relevant route ■ Show evidence on how more economical ownership structure of the transport fleet, and the development of integrated national networks of services contribute to better health of transport companies and larger choice for the users and others trades (freight transport). 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors
	Tighten the conditions for obtaining a truck driver's permit	<ul style="list-style-type: none"> ■ Introduce industrial driving techniques. ■ Make driver's licensing more stringent and granted after training and testing: possible introduction of endorsements to signify various levels of qualification. ■ Contents: <ul style="list-style-type: none"> • Management of the available power of an industrial vehicle by the driver through the engine, transmission and rear axle fixed gear. • Understanding of Torque and power notions: why light cars are cinematically designed to be "speedy" (drivable with a simple speedometer) as compared with "torquey" vehicles : completely differently design: to allow for heavy loads (drivable with a simple tachometer) ■ The driving styles and principles: "green zone"; "Plume foot"; "Cut peaks". 	Short & medium term	The Ministry of Transport	IFI/ Govt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Improved governance, management, financing and supervision of road works					
Establishment of an institutional framework which enables good governance and improved performance based on the separation of functions of: Policy formulation; Regulation; Asset Management; and Service Provision	Apply the principle of separated functions to institutional arrangements including the decentralized management of road infrastructure	<ul style="list-style-type: none"> ■ Separate the policy formulation and asset management functions for road infrastructure ■ Review previous studies and recommendations on decentralization of road network management (ISTS 2006, IRWG 2007, RMFM 2007) and recommend arrangements to meet operating requirements ■ Adopt recommendations and promote with Government to adopt and implement ■ Develop implementation plan and commence implementation 	Medium Short / Medium Medium / Long	MRH	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	<p>Strengthen the existing planning, management and supervisory functions</p>	<ul style="list-style-type: none"> ■ Ensure budget approval procedures will comply with Act 536 ■ Implement remedial measures to restore good management practice as follows: (i) Stop letting contracts for which funding has not been secured; (ii) Apportion a percentage of budget to systematically eliminate the back log; (iii) Review contractor lists and eliminate those contractors failing to comply with requirements; (iv) Terminate contracts in which the contractor has failed to perform (v) Develop criteria for expansion of the road network based only on policy objectives; (vi) Implement Performance Agreements based on 5 year strategic plans prepared and submitted by road agencies as proposed ISTS (2006) and IRWG (2007); (vii) strictly abide by Section 12(1) of the Road Fund Act, ■ Prepare, and update quarterly, procurement plans as required by Section 21 of the Public Procurement Act 2003 (Act 663).. ■ Develop and apply a procedure to manage 'unplanned' or 'non-programmed' projects which are introduced mid-programme.. ■ Report on the status of procurement plans and their compliance with Act 663 will be a compulsory item in management reports and meeting agendas for all transport agencies. ■ Introduce the use of 'Term' contracts and 'performance-based' contracts as a mechanism for reducing the supervisory burden and re-orientating attention of both contractors and road agencies to 'performance' associated with the use of the asset - Identify and implement 10 pilot projects employing 'term' and 'performance-based' contracts commencing 2011 – monitor and evaluate success. 	<p>Immediate – continuous application</p>	<p>MRH</p>	<p>Gvt</p>

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
		<ul style="list-style-type: none"> ■ Develop procurement and tendering guidelines for application on development, routine and periodic maintenance contracts. (The Ministry of Transport will take a 'watching' brief to ensure the guidelines are applicable to all transport infrastructure and maintenance projects) <p>limprove management, supervision and certification of the works, Road Agencies will (i) Adopt a more streamlined management and supervisory arrangement to focus responsibility, authority and capacity at the Area and Regional Engineers; (ii) Request and approve works programmes at the outset of each project, report against programmes and update regularly; (iii) Provide contractors with more realistic workloads (ie focus resources on fewer contracts to reach completion) thus enabling management and supervisory resources to be targeted on work actually being done; (iv) Ensure contract management responsibilities are clearly defined in job descriptions with a clear authority and reporting structure throughout the organisation; (v) Ensure that maintenance and operations manuals include simple tools, guidelines and procedures that facilitate more effective management and supervision of maintenance operations enabling personnel with specific responsibilities to understand and fulfill their obligations; (vi) Focus engineering resources to provide adequate supervision 'in-the-field'; (vii) Put greater emphasis on skills and competencies at Area and Resident Engineer level; (viii) Ensure that measurement of maintenance works is carried out jointly by Contractor and Agency personnel (ideally at Area Engineer level to issue 'I certify' statement see ix below); and (ix) Make the 'I certify' statement the focus of approval of works and payment certification and ensure Area and Resident Engineers are properly trained and equipped to fulfil their responsibility.</p>			
Improving capacity of the national road network					
Increase capacity of	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding 	Short /	GHA	Donor / Lending

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
N1 Aflao – Tema		<ul style="list-style-type: none"> ■ Design ■ Procure ■ Construct 	Medium		Institution
Increase capacity of N1 Tema – Accra	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Short / Medium	GHA	Donor / Lending Institution
Increase capacity of N1 Accra – Kasoa	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Short / Medium	GHA	Donor / Lending Institution
Increase capacity of N1 Kasoa – Junction N8	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Short / Medium	GHA	Donor / Lending Institution
N2 Asikuma Nkwanta (Jct 5 N5) – Hoehoe	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Short / Medium	GHA	Donor / Lending Institution
Increase capacity of N4 Jct N1 – Kukurantumi Jct	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Short / Medium	GHA	Donor / Lending Institution
Increase capacity of N6 Apedwa – Kukurantumi Jct	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding ■ Design ■ Procure ■ Construct 	Operational by 2015	GHA	Donor / Lending Institution
Increase capacity of	Add 2-lane extension	<ul style="list-style-type: none"> ■ Carry out feasibility ■ Secure funding 	Operational	GHA	Donor / Lending

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
N6 Kukurantumi Jct - Kumasi		<ul style="list-style-type: none"> ■ Design ■ Procure ■ Construct 	by 2015		Institution
Trunk Roads					
Performance improvements for trunk roads	Full adoption of the ITP methodology	<ul style="list-style-type: none"> ■ Agree with management to adopt the methodology ■ Assign a modeller full time and utilise calibrated model to inform future plans ■ Provide feasibility consultants with assessments generated in the ITP ■ Undertake a study to identify areas in which additional data is required or can be strengthened ■ Commission surveys to collect data 	Short / Medium	GHA	Gvt / Donors
	Full adoption of HDM IV	<ul style="list-style-type: none"> ■ Agree with management to adopt the methodology ■ Assign a modeller full time and utilise calibrated model to inform future plans 	Short / Medium	GHA	Gvt / Donors
	Improve Integration with feeder and urban road networks	<ul style="list-style-type: none"> ■ Harmonize/integrate GIS and road inventory systems used by GHA/DUR/DFR ■ Authorise formal coordination meetings with DFR and DUR ■ Meet regularly and report monthly to management 	Short / Medium	GHA	Gvt / Donors
	Continuous improvement of contract administration	<ul style="list-style-type: none"> ■ See actions noted for improved governance, management, finance and supervision 	Short / Medium	GHA	Gvt / Donors
Feeder roads					
Performance improvements for feeder roads	Development and utilization of planning tools and other systems appropriate to reducing poverty in rural communities	<ul style="list-style-type: none"> ■ Adapt, where necessary, and fully adopt the RPM for feeder road development ■ Respond to requests from development authorities for road construction and maintenance in areas identified for increased agricultural production ■ Undertake a study to identify areas in which additional data is required or can be strengthened ■ Commission surveys to collect data 	Short / Medium	MRH / DUR / DFR / GHA	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
	Adoption of more appropriate methods for maintenance provision	<ul style="list-style-type: none"> Develop and adopt a policy statement on the use of labour-based methods Finalise the labour-based strategy Implement, including training of management personnel and community 	Short / Medium	MRH / DUR / DFR / GHA	Gvt / Donors
	Improve Integration with trunk and urban road networks	<ul style="list-style-type: none"> Harmonize/integrate GIS and road inventory systems used by GHA/DUR/DFR Authorise formal coordination meetings with DUR and GHA Meet regularly and report monthly to management 	Short / Medium	MRH / DUR / DFR / GHA	Gvt / Donors
	Continuous improvement of contract administration	<ul style="list-style-type: none"> See actions noted for improved governance, management, finance and supervision 	Short / Medium	MRH / DUR / DFR / GHA	Gvt / Donors
Urban Roads					
Performance improvements for urban roads	Work closely with MMDAs to develop integrated land use and transport plans for cities and identify new sources of funding for road maintenance	<ul style="list-style-type: none"> Strengthen mandate for coordination with MMDAs Establish an integrated planning unit in DUR Appoint personnel with expertise in urban economics, planning and coordination Undertake joint studies to formulate a strategy and action plan to implement integrated economic and transport planning in key urban centres of: Greater Accra, Kumasi, Tamale, Takoradi/Sekondi Implement plan/commence integrated planning Roll out to other MMAs as the need arises or when invited by the host Assembly 	Immediate – continuous application Long	DUR / MMDAs	Gvt / Donors
	Adopt an evidence-based method for prioritizing investments	<ul style="list-style-type: none"> Agree to adopt ITP methodology and HDMIV as basis for prioritising investments Assign a modeller full time to promote and adopt the methodology Establish guidelines for its use and enforce for all new projects 	Immediate – continuous application	DUR	Gvt / Donors

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
		<ul style="list-style-type: none"> ■ Report monthly on its application 			
	Improve Integration with trunk and urban road networks	<ul style="list-style-type: none"> ■ Harmonize/integrate GIS and road inventory systems used by GHA/DUR/DFR ■ Authorise formal coordination meetings with DFR and GHA ■ Meet regularly and report monthly to management 	Immediate – continuous application	DUR	Gvt / Donors
	Allocate resources to establish effective MMRUs in each of the MMAs	<ul style="list-style-type: none"> ■ Continue to build capacity and recruit personnel for MMRUs ■ Review management procedures to identify areas for improvement 	Short / Medium	DUR	Gvt / Donors
	Continuously improve contract administration	<ul style="list-style-type: none"> ■ See actions noted for improved governance, management, finance and supervision 	Immediate – continuous application	DUR	Gvt / Donors

7. Development of non motorised and intermediate forms of transport

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Non-motorised transport					
Provide NMT basic infrastructure	Create segregate ways for pedestrians and cyclists	<ul style="list-style-type: none"> ■ DUR is undertaking a Master plan for non motorised transport in Tema, Ashaiman and Sakumono, extend this experience to the main cities of Ghana ■ Mapping of the existing NMT facilities and the existing NMT flows ■ Using the results of NMT masterplan to create sidewalks and bicycles lanes in the areas identified (where the traffic flows are the most important and in poor areas) ■ GHA and DFR have plans to incorporate NMT facilities along the roads they administer, follow up this project and evaluate the results with monitor indicators as the km of facilities provided 	Medium	MRH / DUR	Gvt / Donors
	Provide bicycle parking facilities	<ul style="list-style-type: none"> ■ Using the results of the NMT masterplan identify areas where bicycle parking places could be created (around traffic generator: shopping centres and schools...) 	Medium	MRH / DUR / MMDAs	Gvt / Donors / NGO / local business
Integrate NMT in transport plans	Consider NMT as part a integrated transport policy	<ul style="list-style-type: none"> ■ Collect the results of NMT masterplan and integrate the main recommendations in transport policies (at national and regional level) ■ Specify in infrastructure program that for the new projects, the impact of NMT will be studied with proposals to improve NMT mobility ■ Integrate accessibility policy in transport plans and studies : NMT can help accessibility to other mode like public transport modes. For instance, the Ghana Urban Transport Project plans that the BRT will be supported by NMT, extend this experience to other cities and projects 	Short	MoT / DUR / MMDAs	Gvt
Market NMT to the general public	Facilitate the access to bicycles	<ul style="list-style-type: none"> ■ Help bicycle purchase to be affordable for the poorest. Some experiences were carried out in other SSA countries, after a benchmarking of these experiences, an similar project could be prepared involving MOT and NGO or donor. 	Medium	MoT	Gvt / Donors / NGO

Promote the use of bicycles for short distance travel	<ul style="list-style-type: none"> ■ Prepare promotions campaigns at regional and national level to improve the NMT image and show the advantages to use it for short distances travel pattern ■ Educative programmes will be carried out to encourage children to use NMT 	Medium	MoT	Gvt / Donors / NGO
Promote cycle use amongst women to replace human portorage	<ul style="list-style-type: none"> ■ Fight the cultural barrier to women cycling with education programme in villages and cities ■ Help women to buy bicycles with micro-credit or subsidies 	Medium	MoT / Ministry of Women's Affairs	Gvt / Donors / NGO
Change Driving Behaviour	<ul style="list-style-type: none"> ■ Emphasize during driving license the importance to respect NMT users which are vulnerable (for cars and trucks) ■ Prepare campaigns on regional and national level for NMT road safety 	Medium	MoT NRSC / DVLA / Driving Schools	Gvt / NGO
Develop traffic management measures to ensure NMT safety	<ul style="list-style-type: none"> ■ Mapping the traffic accidents ■ Minimising and/or softening confrontations between motorised traffic and cycling/pedestrian by improving intersection design, provide pedestrians crossing with crossing signal and allow cycling crossing along side pedestrian crossing, give priorities to NMT crossing.. ■ Provide the walkways and sidewalks with protective barriers separating them for the roadway 	Long	MRH / DUR	Gvt
Regulate the roadway use and the use of NMT facilities	<ul style="list-style-type: none"> ■ Inventory of existing regulations and conditions (law, regulation and design standards) ■ Regulate non-motorised vehicles : ■ The roadway use with restrictions on Non Motorised vehicles (restrictions for the use of roadway by push carts...) ■ Regulation of existing facilities use (bicycle lane not allowed for 2 wheelers...) ■ The enforcement and control of these rules will be crucial 	Short	MoT MMDAs MTTU	Gvt

Prepare regulations	Regulate the design of new and existing roadway facilities	<ul style="list-style-type: none"> ■ Preparation of a regulation to specify the design standards of NMT facilities ■ Preparation of a regulation on the design of new roadway facilities which specifies that new roadway will include grade-separated bicycles paths or sidewalks of specific dimension for some specific cases (area around schools...) 	Medium	MRH / DUR MMDAs	Gvt / Donors
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8. Development of transport services in an urban environment

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Urban Transport					
Improve the institutional framework of urban transport	Establish a strong organisation responsible of Urban Transport	<ul style="list-style-type: none"> ■ Implement the current decentralisation plans, monitor and evaluate the results ■ Clarify the role of each entity responsible on transport in urban environment, define their roles and objectives ■ Strengthen the capacity of this entity to manage the urban transport ■ Consider the creation of transport organising authorities specialised in Public Transport like GATA ■ Evaluate the results of the Ghana Urban Transport Project on institutional aspects and propose complements or corrective actions 	Short / Medium	MoT / MRH	Gvt / MoT / MoRH / Donors
Improve the regulatory framework	Improve the regulation of urban passengers transport	<ul style="list-style-type: none"> ■ Begin negotiations with cooperatives and unions of the informal sector in order to prepare a regulation for the formalisation of informal sector and to clarify their roles ■ Prepare regulations in order to improve public transport operations (with operator license) and to professionalize the services. Clarify the relations with MMT. 	Short / Medium	MoT	IFI / Govt / Donors
	Introduce some form of quality regulation to improve the quality of services, the safety and environmental impacts	<p>Refer to section on transport services with the action plans for following objectives :</p> <ul style="list-style-type: none"> ■ Ensure the enforcement of renewed roadworthiness test ■ Introduce of road transport operator licenses focused on road safety and service quality 	Short / Medium	MoT	IFI / Govt / Donors
Improve quality of services for urban transport	Develop urban transport plans for the main cities to identify how to improve the transport system	<ul style="list-style-type: none"> ■ Contract a consultant to carry out new transport master plans or update the existing ones for Accra, Kumasi (process ongoing) and Tamale 	Short	MoT / MMDAs	Gvt / Donors

Improve quality of services for urban transport	Develop urban transport plans for the main cities to identify how to improve the transport system	<ul style="list-style-type: none"> Contract a consultant to carry out new transport master plans or update the existing ones for Accra, Kumasi (process ongoing) and Tamale 	Short	MoT / MMDAs	Gvt / Donors
	Improve comfort and safety for users of urban transport	<ul style="list-style-type: none"> Provide a good urban transport network (see section on road infrastructure) Actions to develop and improve facilities for NMT (see previous section) Reduce traffic congestion by implementing the recommendations of the Urban Transport Plan Reduce the number of accidents with a mapping of black spots and research for improvements in traffic management, new design of intersections, etc. Improve the quality of public transport vehicles with the application of the regulation (roadworthiness) 	Short / Medium	MoT / MRH	Gvt / Donors
Improve the planning of urban transport and integrate it with land use planning	Improve collaboration between entities responsible for planning	Specify the role of each entity responsible for planning (land use and transport) and the principles of collaboration (involvement of each entity in planning processes, organisation of regular meeting...)	Short	MoT / MRH	Gvt
	Integrate in Urban Transport Plans the other sector plans and mainly land use plans, forecasts...	<ul style="list-style-type: none"> At the beginning of a planning study, make an inventory of the previous planning project in order to integrate the main results Meet and collaborate with the other planning stakeholders 	Medium	MoT / MRH	Gvt

9. Social and environmental issues

Strategic Objective	Strategy	Actions	Timeframe	Lead organisation	Possible Financing
Reduce poverty	To provide, expand and maintain transport infrastructure that links rural and urban production centers	<ul style="list-style-type: none"> Promote the railways (see actions for railways) 	Medium	MoT / MRH / GRDA / GRC	Gvt
		<ul style="list-style-type: none"> Regularly maintain road networks in areas with high poverty incidence (see actions for feeder and urban roads) 	Short / Medium		
	To provide affordable and accessible transport system that recognizes the needs of the poor	<ul style="list-style-type: none"> Facilitate the use of efficient and high capacity means of transport 	Medium / Long		
Protect the cultural heritage	To promote the development of our cultural sites through improved transport infrastructure and services.	<ul style="list-style-type: none"> Develop and regularly maintain transport links to cultural heritage sites 	Short / Medium	MoT / MRH	Gvt

	To minimize the negative impact of transport infrastructure on our cultural heritage through improved engineering design.	<ul style="list-style-type: none"> ■ Include cultural impacts in the project evaluation stage. 	Short Medium	/	MoT MRH	/	Gvt
Improve access	To respond to agencies' plans and requests for development in rural areas	<ul style="list-style-type: none"> ■ Enhance access to market by improving road links to major market centres in Ghana. See actions for trunk and feeder roads. 	Short Medium	/	MoT MRH	/	Gvt
	To develop and promote more affordable modes of transportation to agricultural production centers	<ul style="list-style-type: none"> ■ Target affordability in transport planning 	Medium Long	/	MOT MRH GRDA GRC	/	Gvt
	To improve accessibility by all to basic social and technical services through making non-motorised and intermediate transportation essential elements of the total transportation network system.	<ul style="list-style-type: none"> ■ Promote the increased use of non-motorised and intermediate transportation in Ghana (see actions for NMT) 	Short		MoT		Gvt

	To improve the transport sector in the sections of the country where people are denied access to quality health care	<ul style="list-style-type: none"> ■ Enhance access to health care facilities: <ul style="list-style-type: none"> • identify the main deficiencies • propose and implement projects 	Short / Medium	MoT / MRH	Gvt
	Target the promotion of STI/HIV/AIDS prevention and services in transport delivery	<ul style="list-style-type: none"> ■ Transport sector MDAs to ensure that contracts specify obligations on raising awareness on STI/HIV/AIDS and environmental management 	Short	MoT / MRH	Gvt
Promote equality	Highlight gender mainstreaming in the transportation system	<ul style="list-style-type: none"> ■ To incorporate gender analysis into all transport planning so that gender impact are studied before project implementation 	Continuous	MoT / MRH	Gvt
	Provide access to all persons with disabilities in transport infrastructure design and services	<ul style="list-style-type: none"> ■ Highlight the needs of the disabled in transportation planning and implementation 	Continuous	MoT / MRH	Gvt

Environment					
Build adequate environmental and climate change capacity within ministries and agencies in the transportation sector	Capacity building	<ul style="list-style-type: none"> Build capacity in environmental assessment in the ministries and agencies in the transport sector Involve staff with environmental capacity in the designing of programs, plans and projects Ensure staff with environmental capacity undertake monitoring of implementation of mitigation and management measures 	Short / Medium		Gvt / Donors
	Establish environmental units/desk officers in the regional offices of ministries and agencies in the transport sector	<ul style="list-style-type: none"> Evaluate the needs of regional offices for the road sectors according to their planned projects Where required, create office and provide staff of the unit or desk officers with appropriate and adequate training 	Short / Medium	MoT / MRH	Gvt / Donors
Ensure environmental sustainability of transport projects	Enforce the accomplishment of a Environmental Impact Assessment for transport projects	<ul style="list-style-type: none"> Condition public and donor funds to the existence of a EIA Include mitigation costs in the economic and financial evaluation of projects 	Short	MOT / MRH	
Develop transportation systems that can withstand changes resulting from climate change	Factor various climate change scenarios in the design and implementation of projects	<ul style="list-style-type: none"> Ensure that environmental issues are included in early stages of project evaluation Promote the use of the multicriteria evaluation manual developed by the ITP 	Short	MOT / MHR / EPA	
Reduce the carbon footprint of transport systems	Reduce road transport emissions	Set maximum level of emissions for different categories of vehicles and for different pollutants and include the control in a periodic roadworthiness test.	Medium	MOT / EPA / DVLA	Gvt

Annexe 1 Examples of integrated transport plans

9.1.1. Queensland - Australia

According to the Queensland Government, an integrated transport plan is a plan to develop and manage the transport system which supports the region's forecast population growth, employment, economic and social activities. The Government has developed a number of integrated transport plans, from which we highlight:

The Integrated Transport Planning Framework

The Integrated Transport Planning Framework is a guide for transport planning in Queensland. It sets out a collaborative, consistent and sustainable approach to transport planning. It is a tool for transport and land use decision makers and planners in state and local government and industry, offering 'hands-on' advice for integrated transport planning across urban, rural and remote locations.

The framework aims to encourage good-practice transport planning. It does this by setting out:

- desired outcomes that provide a consistent framework to focus planning on achieving good outcomes for the community and the transport system
- directions and principles that provide guidance on how to achieve the desired outcomes
- planning steps that offer a process to follow when undertaking integrated transport planning.

The framework recognises sustainability, integration and partnerships as the foundations of successful integrated transport planning.

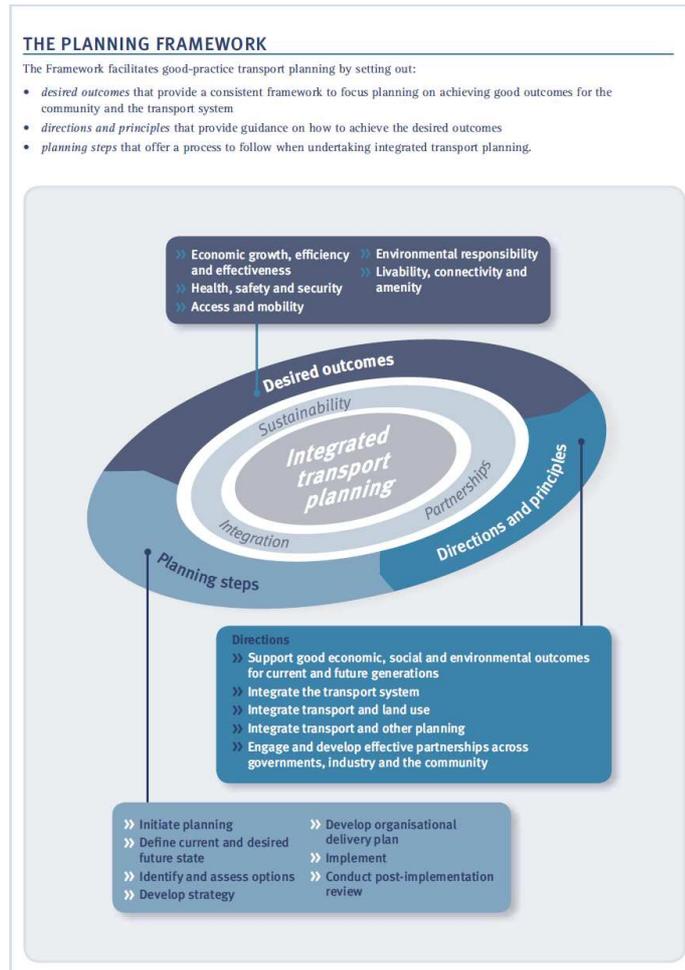


Figure 26 : Queensland Planning Framework

Gladstone Integrated Regional Transport Plan

The Gladstone Integrated Regional Transport Plan is good example of integration between different agencies in the process of planning. It is the result of collaboration between the Department of Transport and Main Roads, Gladstone City Council, Calliope Shire Council, QR, Gladstone Port Authority and the Gladstone–Calliope Aerodrome Board, in partnership with state and local government. It was developed through a combination of technical research and consultation with government, business and industry within the Gladstone area.

The plan sets a comprehensive framework for the future development of the region's transport network up to 2030. It contains eight action plans, which are being implemented cooperatively and in a coordinated manner by all of the partners involved.

The plan helps meet emerging transport needs for the Gladstone area, in response to regional growth in population, employment and industry.

To capture the achievements and ongoing priorities, the Gladstone Integrated Regional Transport Plan — Implementation Report was developed. This was a cooperative effort

between the agencies of the Implementation Committee established to oversee the implementation of the plan.

The main roles of the committee are to:

- monitor progress on the implementation of the plan
- review and adjust the plan's action plans and recommended capital programs, as required
- review the plan in three to five years.

Member organisations of the committee include:

- Department of Transport and Main Roads
- Department of State Development
- Gladstone City Council
- Calliope Shire Council
- Gladstone–Calliope Aerodrome Board
- Gladstone Port Authority
- QR
- Gladstone Economic and Industry Development Board.

9.1.2. Cape Town – New Zealand

The reviewed ITP is comprehensive and holistic in that it is developed around the Integrated Development Plan (IDP) which acknowledges the Spatial Development of Cape Town and seeks to encourage mixed land use thus bringing the home and economic areas closer together.

The various elements that make up the transport system in Cape Town include the road, rail, aviation, port, freight, safety, all forms of public and private transport, goods movement as well as non-motorised modes such as walking and cycling.

As a five-year plan, the ITP sets out the actions that need to be undertaken by government and other stakeholders to ensure that Cape Town provides the efficient, sustainable transport infrastructure. All projects are to be evaluated in terms of a unified approach which evaluates the economic, social and environmental impact of the proposals.

The reviewed ITP initiatives are structured to respond to strategic informants and specific needs. The ITP programmes and action plans are bound together by the over-arching strategies for Transport Safety, Congestion Management, Metropolitan Growth, Economic Growth, and Environmental Protection.

9.1.3. Wales

The Wales Transport Strategy established the framework for the creation of an integrated transport system to deliver One Wales. It set out that joining together proposals for road, rail and public transport will enable people and freight to travel more efficiently and sustainably, whilst being able to access the goods, markets, services, facilities and places they need. The

Strategy grouped the 17 long-term outcomes for transport into five strategic priorities for the next five years:

- Reducing greenhouse gas emissions and other environmental impacts.
- Integrating local transport.
- Improving access between key settlements and sites.
- Enhancing international connectivity.
- Increasing safety and security.

This Plan will take forward the process of delivering integration. It builds on previous plans, adding and integrating public and community transport, walking and cycling so that our investments help to deliver One Wales. The National Transport Plan sits alongside the Regional Transport Plans in delivering the Wales Transport Strategy. This will ensure consistency of service provision for our customers across the transport network. This means that national and regional plans will together strengthen local service delivery, for example in helping to improve access to essential services such as health and education.

9.2 SEA of ITP in the UK

According to the UK SEA Directive, its objective is 'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development'. This environmental commitment is broadly consistent with Government policies and is reflected in other transport planning and appraisal guidance.

The UK SEA Directive defines 'environmental assessment' as a procedure comprising:

- preparing an Environmental Report on the likely significant effects of the draft plan on the environment;
- carrying out consultation on the draft plan and the accompanying Environmental Report;
- taking into account the Environmental Report and the results of consultation in decision-making; and
- providing information when the plan is adopted and showing how the results of the SEA have been taken into account.

Table below shows the main SEA Stages. SEA should be a tool for improving the plan, not a 'snapshot' of the plan once it has been finalised.

Table 8 : Stages of SEA

SEA stage	Purpose of this stage
<p>A: Setting the context, identifying objectives and problems and establishing the baseline.</p> <ul style="list-style-type: none"> ● Analyse the environmental protection objectives, established at international, Community or national level, which are relevant to the plan. ● Establish SEA objectives, indicators and targets. ● Collect relevant information on the environmental context as relevant to the plan / programme, and its evolution 	<p>Document how the plan is affected by outside factors; suggest ideas for how any inappropriate constraints can be addressed.</p> <p>Streamline the subsequent baseline description, prediction and monitoring stages.</p>

- without the plan / programme.
- Outline the environmental characteristics of areas likely to be significantly affected.
- Outline any existing environmental problems which are relevant to the plan including, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds and Habitats Directives (79/409/EEC & 92/43/EEC).

Provide a base for effects prediction and monitoring.

Focus on key environmental issues and opportunities; help to identify environmental problems, objectives and alternatives.

B: Deciding the scope of SEA and developing alternatives.

Help ensure that:

- Outline the relationship with other relevant plans, programmes and their environmental objectives.
- Identify relevant alternatives at the strategic level.
- Scope the likely significant effects of the plan and alternatives.
- Consult with environmental authorities when deciding on the scope and level of detail of the information which must be included in the Environmental Report (Art. 5.4).

- the SEA covers key issues.
- the plan better meets the Government's aims for more sustainable development.
- the best plan alternative(s) is/are considered.

C. Assessing the effects of the plan.

Defensible consideration of all likely significant environmental effects.

- Forecast the significant effects on the environment of the chosen strategy taking into account the objectives and geographical scope of the plan.
- Outline the reasons for selecting the alternatives dealt with.
- Propose measures to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme. Such measures should be costed and deliverable.
- Describe the measures envisaged concerning monitoring in accordance with Article 10.

Propose mitigation measures where appropriate.

Propose a monitoring programme.

D. Consultation on the draft plan and the Environmental Report.

Identify the opinions and concerns of the public and environmental authorities on environmental issues.

- Prepare an Environmental Report in which the likely significant effects on the environment of implementing the plan, and reasonable alternatives taking into account the objectives and geographical scope of the plan. The information to be given is listed in Article 5 and Annex 1 of the SEA Directive.
- Give environmental authorities and the public an early and effective opportunity within appropriate time frames to express their opinion on the draft plan and accompanying Environmental Report before the adoption of the plan (Art. 6.1, 6.2).
- Take consultation results into account.
- Make available:
 - the plan as adopted.
 - a statement summarising how environmental considerations have been integrated into the plan and how the Environmental Report of Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8, and the reasons for choosing the plan as adopted, in the light of the other reasonable alternatives dealt with. proposals

Show how information and opinions on environmental issues have been considered.

for monitoring.

E. Monitor the significant effects of implementing the plan on the environment.

- Decide what needs to be monitored.
- Identify the information required, including existing sources and the gaps.
- Confirm when the remedial action would be required and identify what remedial actions might be needed.
- Consider who is responsible for the monitoring activities, when it should be carried out and propose what the appropriate format for presenting the monitoring results.

Achieve implementation of the plan in accordance with the outcomes of the SEA. Ensure that adverse effects of implementing the plan can be identified and corrective action taken.

Provide information for future SEAs.

Annexe 2 Preparation of the Financial Statements

The sub-sector financial statements comprise data from several sources:

- SMTDP (data for 2010-13)
- MoT 2008 TSDP (data for 2011-13, as also found in the SMTDP)
- ITP (evaluation data for 2011-2030)
- Determination of Maintenance Needs of Ghana's Road Network DMNGRN); Nov 2009 (data year 1 to 17)
- Road Fund reports
- Interim Urgent Plan Feasibility Study of the Western Corridor Infrastructure Project, Bonifica, December 2009
- DUR Development Project Brief and Strategic Plan 2010-14.
- Various agency strategic plans, updated by modal strategy plans where available, and recent feasibility studies.

The tables present the data year by year for 2011 to 2015.

10. Principles

The financing principles previously proposed at the Transport Planning Group to apply to the 2011-15 ITP are set out below:

- Utilize concessionary, long term finance, matched to investment life (and grant aid where available)
- Involve the potential users in long term agreements to use the infrastructure
- Determine full cost recovery user charges with provision to revise and reflect changes in underlying costs
- Ensure committed government subventions where Public Service Obligations are imposed.
- Ring-fence operations from the diversion of resources to other institutions and public services.
- Use bank funding for working capital purposes only
- Utilize private sector funding, ownership and independent management where feasible

At this stage there is no GoG, DP or private sector funding committed or proposed for rail or road projects in the 2011-15 ITP. Nor is there any evidence of funding being immediately available from any source. GoG may have to identify Consolidated Fund monies in the early years, by switching funds from one to project to another, and initiate discussions with DPs for short term assistance (e.g. grants). Trade/supplier credits should also be considered.

On a two year perspective some DPs may be able to provide concessionary finance (e.g. IDA). The EIB might well be able to step in on the Eastern or Western railway projects at short notice.

Longer term financing remains feasible if appropriate bankable projects are proposed that link long term, concessionary financing with the long term nature of the proposed investments.

The detailed tables following show substantial unsecured funding elements for 2011-13 under the original SMTDP as well as the need for additional funding resources for new projects from 2011 to 2015. Three scenarios are provided for the Road Sub-Sector funding with revised assumptions as to availability of funding from the CF and DPs.

11. Inter-Ministerial Collaborative Items

The aggregate data for the inter-ministerial collaborative items were obtained from the SMTDP/TSDP documents. The individual projects are disseminated throughout the sub-sectors of the SMTDP and constitute too many small items to list in the following table.

There is a substantial unsecured funding element for 2011-13. Nothing is proposed beyond that date. The most likely source of funding is by DPs or from the Consolidated Fund, depending on the nature of each proposal

Table 9 : Inter-Ministerial Collaborative Items

Integration, Improvement and Cross-Cutting Measures	2011	2012	2013	2014	2015	Total 2011-15
Expenditure	USDm	USDm	USDm	USDm	USDm	USDm
SMTDP Existing Plans	27.9	22.7	6.4	0	0	57.0
Funding						
Shown as Secured in SMTDP	0.5	0.6	0.1	0	0	1.2
DP/CF - assumed	27.4	22.1	6.3	0	0	55.8
Total Funding	27.9	22.7	6.4	0	0	57.0

12. Aviation

The original data obtained from the SMTDP/TSDP documents showed a substantial unsecured funding element for 2011-13. The SMTDP data with secured funding is shown as a consolidated line item – there are too many small individual items to list.

Phase 1 data from the KIA MasterPlan high growth scenario has been used in the following table, and shifted one year to commence in 2011 (the MasterPlan commences 2010). The MasterPlan indicates that, even in this scenario, KIA cannot breakeven or be commercially viable. Minor project expenditure in the SMTDP which was shown to have secured funding could not be specifically identified and has not been included below.

It is assumed that GCAA and GACL will continue to disaggregate functions into separate companies and institutions so that commercial and non-commercial functions do not cross-subsidise each other. Key to GACL's profitability and future funding will be the removal of regional airport costs to other institutions, which can thereby be funded transparently by GoG, DPs, etc.

Ghana International Airlines is an example of a commercialised service operating under a failed PPP arrangement, which has been in receipt of a substantial GoG subsidy for several years. Aviation sector strategy is to have a strong national carrier to support KIA and promote regional services. Nothing is known of current GoG plans in relation to this organisation.

Table 10 : Aviation Sub-Sector

Aviation Sub-Sector	2011	2012	2013	2014	2015	Total 2011-15
Expenditure	USDm	USDm	USDm	USDm	USDm	USDm
SMTDP - miscellaneous	8.8	4.1	1.7	0	0	14.6
KIA MasterPlan						
- Existing plans/replacement (3)	2.9	2.9	2.9	2.9	2.9	14.5
- Non-Commercial CIP	24.6	24.5	24.6	24.5	19.3	117.5
- Cargo & Maintenance CIP	2.2	10.3	10.3	8.0	-	30.8
Regional airports	17.0	7.0	-	-	-	24.0
Safety/Security (4)	12.3	9.1	8.7	-	-	30.1
Encourage Prv. Sector (4)	-	0.4	-	-	-	0.4
2nd Int. Airport FS/Land	20.5	21.0	20.5	-	-	62.0
Total	88.3	79.3	68.7	35.4	22.2	293.9
Funding						
Secured funding - unspecified	8.8	4.1	1.7	0	0	14.6
KIA MasterPlan						
- Non-Commercial CIP loan (1)(6)	25.8	27.1	28.4	24.5	20.2	126.0
- Cargo & Maintenance loan (2)(6)	2.4	10.9	11.5	8.0	-	32.8
- Internal Funding (Depr) (3)	2.9	2.9	2.9	2.9	2.9	14.5
Development Partners - grant (4)	12.3	9.1	8.7	-	-	30.1
GoG - Consolidated Fund (5)	37.5	28.4	20.5	-	-	86.4
Total (6)	89.7	82.5	73.7	35.4	23.1	304.4
Ghana International Airline	N/a	N/a	N/a	N/a	N/a	N/a

1. Based on past ability to borrow in USD at 2% over LIBOR – say 5% 10 year commercial loan.
2. E.g. From AfDB, IBRD, etc – concessionary, 10 year plus.
3. Replacement of current assets funded from depreciation.
4. Security and safety development
5. Regional airports, land for 2nd international airport. – GoG Consolidated Fund.
6. Including rolled up interest which is not shown under investment, resulting in the funding totals differing from the expenditure totals

13. Maritime and Inland Waterways

Many of the autonomous and semi-autonomous institutions in the Maritime and Inland Waterways sub-sector fall outside the formal GoG budget but call on public funds through government guarantees, DP participation (direct and indirect), and devolved GoG revenues. Although these institutions prepare annual budgets and corporate investment plans, not all have been available in a timely fashion or, where available, could not be linked directly to the ITP presentational requirements. This situation is reflected in the limited information shown for many of the marine institutions below.

The GoG Maritime and Inland Waterways expenditure data for 2011-13 were obtained from the SMTDP/TSDP documents, all of which is shown with secured funding in Table 4. Data are awaited for GPHA, from the USTDA financed Halcrow feasibility study for Tema and Takoradi. The probable sources of funding shown are based on the nature of the expenditure to be incurred (i.e. infrastructure will require long term concessionary funding from institutions such as AfDB, EIB, etc). There are elements within the port environs that could be fully funded under concession arrangements or fully privatised.

Table 11 : Maritime and Inland Water Sub-Sector – SMTDP and GPHA

SMTDP and GHANA PORTS AND HARBOURS AUTHORITY	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure						
SMTDP						
- Training Needs Assessment	0.0	0.0	0.0	-	-	0.1
- Takoradi - reclaim land, cocoa works	30.0	10.0	-	-	-	40.0
- DBOT tender for terminals	1.0	1.0	-	-	-	2.0
- GSA - Ship Movement misc	0.5	0.5	0.5	-	-	1.4
- GSA - Port Owners ICT	0.2	0.2	0.2	-	-	0.6
Total SMTDP Existing	31.7	11.7	0.7	-	-	44.1
GoG	31.7	11.7	0.7	-	-	44.1
Total SMTDP Funding	31.7	11.7	0.7	-	-	44.1
GPHA						
Investment Needs per Master Plan	N/a	N/a	N/a	N/a	N/a	N/a
- Infrastructure – berths, dredging, quays						
- Infrastructure – roads, rail within port, access to port						
- Equipment						
- Warehouses/container						

SMTDP and GHANA PORTS AND HARBOURS AUTHORITY	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
terminals						
Other Planned Investment						
Total Expenditure - GPHA	N/a	N/a	N/a	N/a	N/a	N/a
Funding						
Internal Operations						
Government Sources						
- Grant						
- Subsidy						
Loan (Commercial)						
Loan (On-lent by GoG)						
Others						
- International Development Bank/Fund						
- Private Equity/Participation						
Total Funding GPHA (1)	N/a	N/a	N/a	N/a	N/a	N/a

(1) Draft GPHA Strategic Corporate Plan 2010-14 – awaiting data from USTDA/ Halcrow Feasibility Study.

GSA data on Boankra Inland Port are from a 2003 feasibility study. No data have been included for other GSA investments, which are assumed to be internally funded by GSA or funded from other sources. The land purchase may have been partly funded by GPHA.

Table 12 : Maritime and Inland Water Sub-Sector – GSA

GHANA SHIPPERS AUTHORITY	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure (1)	Phase 1				Phase 2	
Boankra Inland Port						
- Land (already purchased)	1.6				2.0	3.6
- Administrative Office (built)	0.2				0.2	0.4
- Infrastructure	2.7				3.4	6.1
- Cargo Depots/Workshop	3.7				4.2	7.9

- Equipment	2.9				3.3	6.2
- Contingencies	2.1				2.6	4.7
Other Planned Investment - GSA	N/a				N/a	N/a
Total Expenditure – GSA	13.2				15.7	28.9
GSA - Internal	1.8				2.2	4.0
Development Partners	2.7				3.4	6.1
GoG	0				0	0
Commercial Sector	8.7				10.1	18.8
Total Funding - GSA	13.2				15.7	28.9

1. Phasing nominal, Development Study of an Inland Port at Boankra Report 2003.

GMU and GMA provide institutional, regulatory and inland water safety aspects to the ITP and brief investment details are provided where available. GMU needs to provide justification for extension of its regionally based operations, which should be funded partly from the regional stakeholders (other regional governments).

Table 13 : Maritime and Inland Water Sub-Sector – GMU

GHANA MARITIME UNIVERSITY	2011	2012	2013	2014	2015	Total 2011-15
Expenditure (1)	USDm	USDm	USDm	USDm	USDm	USDm
Expansion of Premises						
Other Planned Investment						
Total Expenditure - GMU	N/a	N/a	N/a	N/a	N/a	N/a
International Stakeholders						
Development Partners						
GoG						
Total Funding - GMU	N/a	N/a	N/a	N/a	N/a	N/a

(1) Unquantified. Need to prepare a pre-feasibility study, demonstrating regional and national demand for strategic training facilities, taking into consideration other regional development proposals and ability of regional institutions to finance current as well as future demand.

The Volta Lake related investment proposals arose during discussions and were confirmed in a subsequent document outlining the costs for Volta Lake improvements generally. Some of the items are listed in Table 8 and are attributed to the Volta River Authority and/or District Administrations.

Table 14 : Maritime and Inland Water Sub-Sector – GMA

GHANA MARITIME AUTHORITY	2011	2012	2013	2014	2015	Total 2011-15
Expenditure (1)	USDm	USDm	USDm	USDm	USDm	USDm
FS - Lake Volta Traffic Imp & Dev	1.5	-	-	-	-	1.5
Study - Boat Construction Standards	0.1	-	-	-	-	0.1
Study - Inland Boat Operators Training Standards	0.1	-	-	-	-	0.1
Capacity Building		-	-	-	-	
- Head Quarters	4.0	-	-	-	-	4.0
- Staff Training	1.0	-	-	-	-	1.0
- Boats, Equipment,	8.2	-	-	-	-	8.2
Other Planned Investment	N/a	-	-	-	-	N/a
Total Expenditure	14.9	-	-	-	-	14.9
Development Partners	10.9	-	-	-	-	10.9
GoG	N/a					N/a
GMA - Internal	4.0	-	-	-	-	4.0
Total Funding	14.9	-	-	-	-	14.9

(1) Based on draft strategy paper 2010; expenditure phasing not provided, suggested funding sources assumed by consultant.

There are minor expenditure proposals scattered throughout the SMTDP. These have not been included in the maritime and inland water tables even though they affect lake safety and management issues.

Table 15 : Maritime and Inland Water Sub-Sector – VRA & DAS

VOLTA RIVER AUTHORITY/ DISRICT ADMINISTRATIONS	2011	2012	2013	2014	2015	Total 2011-15
Expenditure (1)	USDm	USDm	USDm	USDm	USDm	USDm
Improved/New Landing Stages						
Lake Navigation/Trunk Clearing						
Total Expenditure VRA/DAs	N/a	N/a	N/a	N/a	N/a	N/a
Total - Funding VRA/DAs – GoG/VRA	N/a	N/a	N/a	N/a	N/a	N/a

1. Based on discussions at Maritime and Inland Water Planning Meeting June 2010

Volta Lake Transport Company's critical issue is the extent to which it should continue to pursue its commercial venture with BOST, which organisation has been affected by operational problems at TOR, and with the Oil Marketing Companies.

Given VLTC's dependency on BOST for oil supply freight allocations (and BOST's own plans to purchase oil barges), and VLTC's core purpose of ferry and non-oil freight services, it may

be argued that all oil services should be concentrated under the state owned BOST. Thus, nothing is shown the ITP for VLTC investments at this time.

VLTC's financial viability is fundamentally undermined by its excess staff rather than poor commercial judgement. If the cost of these excess staff could be removed, than a more rational appraisal of its cross-lake ferry operations could be made. This, combined with prompt regulatory approval of tariff proposals, would enable GoG/VRA to determine the extent to which a public subsidy should be provided to cover sub-economic tariff levels.

GoG subsidies would come from MoT to make up for below cost tariffs and from Ministry of Education for providing school children with free transport.

The MiDA financed ferry replacement project requires the ring-fencing of finances to ensure full life cycle cost recovery is implement for the Adawso Eyke-Amanfrom ferries. The level of public subsidy (excluding excess staff cost element) should be quite modest.

The conditions under which the GoG funded Kete Krachi ferry rehabilitation project proceeds should at least include the full operational cost recovery of ferry operations. By including depreciation, funds would be generated to ensure the future replacement of the ferry.

Nothing is included in the ITP for the replacement of the district authority owned/operated ferry at Kpondu. A private sector venture could be sought for this car/passenger route.

Table 16 : Maritime and Inland Water Sub-Sector – VLTC

VOLTA LAKE TRANSPORT COMPANY	2011	2012	2013	2014	2015	Total 2011-15
Expenditure	USDm	USDm	USDm	USDm	USDm	USDm
- Kete Krachi Ferry Rehab.	1.5	1.5	0	0	0	3.0
- Adawso Eyke-Amanfrom Ferries	3.5	3.5	0	0	0	7.0
- Akosombo Port, Dry Dock	2.7	0	0	0	0	2.7
Other VLTC (1)	N/a	N/a	N/a	N/a	N/a	N/a
Total Expenditure	7.7	5.0	0	0	0	12.7
MiDA/MCC	6.2	3.5	0	0	0	9.7
GoG	1.5	1.5	0	0	0	3.0
Supplier Credits (1)	N/a	N/a	N/a	N/a	N/a	N/a
VLTC - Internal	0	0	0	0	0	0
Total Funding	7.7	5.0	0	0	0	12.7

(1) VLTC Strategic Plan proposes the purchase of two oil barges at USD 7m each and a pusher tug for USD 9.5m but with no indicated source of funding.

Given the substantial infrastructure investment made by BOST in pipelines and storage facilities, a strong argument can be made for the completion of the N/S land/inland water oil corridor (essentially the oil barges link), which will take a substantial percentage of oil freight off national roads. A full review of BOST's operations and finances is also required as much

of the existing and proposed funding is of a commercial medium term nature whereas the infrastructure life cycle is of a long term nature.

Table 17 : Maritime and Inland Water Sub-Sector – BOST

BULK OIL STORAGE AND TRANSPORT COMPANY	2011	2012	2013	2014	2015	Total 2011-15
Expenditure	USDm	USDm	USDm	USDm	USDm	USDm
Oil Barges (1)						
Storage Depots (1)						
Other Planned Investment						
Total Expenditure	N/a	N/a	N/a	N/a	N/a	N/a
Suppliers Credits/ExIm Korea						
Internal BOST						
Total Funding	N/a	N/a	N/a	N/a	N/a	N/a

(1) BOST. Marginal/incremental investment to ensure completion of North-South link to ensure utilisation of heavy investment in pipelines and storage facilities. Contract and funding details not available. Ensures up to 20% of Ghana's N/S fuel freight needs are removed from the roads.

14. Railways

The Urban Mass Transit projects shown in Table 11 are understood to be on-going and to have secured funding from various sources including the Consolidated Fund.

Provisional data from the draft Bonifica Western Corridor Feasibility Study Urgent Plan have been included in the ITP. The investment allocations over 2011-15 are arbitrary as the draft report does not provide a year on year analysis. 100% funding is assumed although the probable source has yet to be determined (some investment plans show GoG providing the bulk of the funds)

Funding for the Western Corridor project is being sought from EIB and similar sources, with the Bonifica feasibility study being referred upwards through MoT and MoFEP to the Cabinet. It is expected that the final financing package will involve GoG, EIB, Mineral Extracting Companies (mineral rolling stock) and International Development Bank (infrastructure) concessionary funding.

If the passenger element in the project is proceeded with, then a parallel concessionary agreement will be required, the private sector providing rolling stock and taking operational responsibility and GoG providing an annual subsidy.

Shown as a note below¹⁷ are the annual losses that would fall on GoG from the individual freight and passenger operations. These would have to be met by subvention – provided in GoG's MoT annual appropriations – and would be in addition to any other net GRCL losses for Headquarters (HQ) staff, other rail links, etc.

The Eastern Corridor (Tema-Kumasi) project is shown in the ITP as an economically viable freight project, subject to the assumptions in the ITP analysis. The economic viability is, for instance, determined in part by the model's allocations of container freight between road and rail on competing routes.

For financial viability the freight tariff to be imposed will need to be competitive with road transport rates and will have to generate sufficient funds to make the freight operations at least breakeven (taking into account amortisation of investments, reasonable HQ overheads, etc). Within this ring-fenced operation, it will be required that the management of the freight operations is made more efficient, that there is no intervention in the establishment of the tariffs by government, and no diversion of cash surpluses to other parts of the rail network.

A Public-Private Partnership approach appears the most appropriate funding method, mobilising private sector capital and management. If passenger operations are included then GoG will need to provide a subsidy for any losses arising therefrom.

A short feasibility study is underway under the ITP consultancy to consider combining the two rail Corridor projects into one.

Other GRDA/GACL investment proposals (if any) are not included in the table.

Table 18 : Rail Sub-Sector

Rail Sub-Sector	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure						
Urban Mass Transit						
- Rehabilitation of rail lines	21.1	4.9	-	-	-	26.0
- 12 sets Diesel Multiple Units	23.0	23.0	46.0	-	-	92.0
- Other civil works	-	-	-	-	-	-
- Rehabilitate signals, etc	4.0	4.0	1.1	-	-	9.1
- Construct DMU workshops	-	1.2		-	-	1.2
Sub-total Urban Mass Transit	48.1	33.1	47.1	-	-	128.3
Western Corridor – urgent (5)(6)	25.0	26.5	5.0	-	-	56.5
- 2 nd priority improvements	-	-	10.0	11.4	-	21.4
- 3rd priority improvements	-	-	-	10.0	16.5	26.5
Sub-total West Corridor – Urgent	25.0	26.5	15.0	21.4	16.5	104.4

¹⁷ Annual subventions from GoG: 2011 USD 11.1m, 2012 USD 2.8m, 2013 USD 12.4m, 2014 USD 14.1m, 2015 USD 11.9m.

Rail Sub-Sector	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Western Corridor – upgrade	-	-	-	-	125.0	125.0
Eastern Corridor						
- Encourage private sector to invest in Boankra	0.0	0.0	0.0	-	-	0.1
- FS and rail line Tema/Akosombo	14.5	17.3	17.2	14.5	-	63.5
Other GRDA/GACL investment	N/a	N/a	N/a	N/a	N/a	N/a
Northern Corridor – FS, Design	0.5	1.5	1.0	-	-	3.0
Total	88.1	78.4	80.3	35.9	141.6	424.3
Funding						
Urban Mass Transit						
- GoG Consolidated Fund	N/a	N/a	N/a	N/a	N/a	N/a
- Other Sources	N/a	N/a	N/a	N/a	N/a	N/a
Western Corridor						
- International Dev. Bank/Fund (1)						
- Mineral Companies (2)						
- Pax Concession Operator (3)						
- GoG (4)						
Eastern Corridor						
- International Dev. Bank/Fund (1)						
- Freight Companies (2)						
- Pax Concession Operator (3)						
- GoG (4)						
Northern Corridor FS – Dev. Partner						
Other/Internal						
Total Funding	N/a	N/a	N/a	N/a	N/a	N/a

- (1) Infrastructure
- (2) Freight Rolling Stock, etc
- (3) Passenger Rolling Stock, etc (with annual subsidy from GoG)
- (4) Counterpart Funding, (taxes, etc).
- (5) Bonifica Urgent Measures Report 2010
- (6) Implementation schedule assumed.

In identifying and proposing funding arrangements for the Ghana rail links identified above, consideration should also be given to the proposed port developments (Tema, Takaordi) and to possible linkages in their funding arrangements, especially to ensure commitments to utilise the rail links if constructed (for extractive minerals, container freight, etc).

15. Roads and Highways

Road improvements and new construction for up to 2013 follow the TSDP/SMTDP projections, whether funded or not. No improvements or new construction are shown post 2013 except as determined by the ITP analysis¹⁸. In addition, no institutional, training, or road safety development expenditures are shown after 2013. Nor are any other investment proposals for GHA, DFR and DUR included in this analysis.

Data used for the road maintenance (routine, periodic, rehabilitation) in the years 2011-13 (and 2014 for DUR) reflect known or planned commitments, most of which are funded by the Ghana Road Fund or GoG. There is a substantial element of proposed expenditure in that period that is shown unfunded in the TSDP, which is assumed to reflect projects not shown in the Base Network list (for national roads) used in the ITP analysis.

Data for road maintenance from 2014 onwards (2015 for DUR) are derived from the Determination of Maintenance Needs of Ghana's Road Network 2009 completed in November 2009 (DMNGRN)t. The report presents three scenarios. The scenarios chosen for GHA, DRF and DUR are based on the "unimproved constrained target" approach, i.e. there is no element of improvement¹⁹ to the roads, and the maintenance target is the Good 70%, Fair 20%, and Poor 10% formulation.

One way of looking at the fundamental issues of maintenance funding – which tends to overshadow the investment element of Table 12 - is presented in the DMNGRN report of 2009. The report states clearly that, to achieve the target condition scenario for maintenance without upgrading the gravel roads, the current fuel levies would need to be increased five or six times over the current level, i.e. to as much as Gp 30 to 36 per litre.

This is not to deny that funding maintenance achieves a greater return on investment than do new roads. The problem is that maintenance of the existing road network (all types) exceeds the capacity of the economy, now and in the foreseeable future, and needs to be funded from annual revenues (user charges and other recurrent revenues) rather than from borrowing.

In calculating the maintenance values in Table 12, the 2014 DMNGRN year 1 maintenance costs are used less the TSDP plan values for 2011-13 for routine and periodic maintenance (except for DUR, the data for which are shifted one year later).

The DMNGRN analysis shows a substantial expenditure peak in 2015. The DMNGRN values indicate the extent of the maintenance deficit (requiring rehabilitation) that has arisen over previous years that needs to be cleared before a normal pattern of routine and periodic

¹⁸ The ITP analysis was on national roads. No analysis has been undertaken on urban or feeder roads. The inclusion of DUR projects e.g. the Kumasi Outer Ring Road USD 307m, Accra East Corridor Roads USD 316.3m, is subject to the evaluation process.

¹⁹ This is consistent with the ITP approach that calculates the cost of improvements and capacity increases only where traffic growth indicates the need. In other words, the rest of the road network should remain at the current level of investment and needs only to be maintained.

maintenance expenditure prevails²⁰. The DMNGRN values have been spread over several years for inclusion in the Table.

The Road Sub-Sector Table 12 comprises the identified Strategic ITP Projects, set out in a separate list in other volumes of this consultancy, the existing SMTDP/TSDP projections, and the DMNGRN projected rehabilitation/-maintenance needs from 2014/5,

The current SMTDP/TSDP ends in 2013 (2014 for Urban Roads) and shows a substantial amount of unsecured funding as part of the current programme. There are no known proposals to fund this element of the road sub-sector needs, which comprise different forms of maintenance, minor improvements, development works, traffic management and road safety and institutional development.

Several of the ITP investment projects should be eligible for long term infrastructure funding from EIB, IDB, AfDB, etc. The N6 route remains under consideration for BOT/ROT funding, according to MoRH, although the traffic volumes and new toll rates are substantially below the benchmarks announced by MoRH in 2009.

Table 19 : Roads Sub-Sector – National, Feeder and Urban Roads Expenditure

	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure						
Strategic ITP Projects – see list	-	75.2	130.8	140.8	88.6	435.4
National Roads						
- Routine Maintenance	17.1	17.1	17.2	-	-	51.4
- Periodic Maintenance	47.8	45.5	45.6	-	-	138.9
- Rehabilitation/Maintenance (1)	-	-	-	239.7	90.0	329.7
- Minor Improvements	24.7	19.4	19.4	-	-	63.5
- Development Works	273.2	147.9	147.9	-	-	569.0
- Traffic Management & RS	4.5	4.5	4.5	-	-	13.5
- Institutional Strengthening	16.3	16.1	16.1	-	-	48.4
Sub-total Trunk	383.6	250.5	250.7	239.7	90.0	1,214.5
Feeder Roads						
- Routine Maintenance	25.6	25.9	29.0	-	-	80.5
- Periodic Maintenance	28.7	24.7	19.1	-	-	72.5
- Rehabilitation/Maintenance (1)	-	-	-	133.9	150.0	283.9
- Minor Improvements	35.2	33.7	45.2	-	-	114.1

²⁰ An alternative projection of maintenance costs, using RONETS, shows much higher levels of expenditure. The aggregate GHA/DFR/DUR expenditure average USD 700m per year for the 20 year period from 2009.

	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
- Development Works	6.5	4.6	6.9	-	-	18.0
- TA, Logistics, Training	6.9	5.9	7.0	-	-	19.8
Sub-total Feeder	102.9	94.8	107.2	133.9	150.0	588.8
Urban Roads						
Routine Maintenance (incl walk, cycle ways)	14.8	15.4	15.4	15.4	-	60.9
Periodic Maintenance	13.1	13.1	13.1	13.1	-	52.3
Minor Rehab/Improvements	13.1	13.1	13.1	13.1	-	52.2
Rehabilitation/Maintenance (1)	-	-	-	-	400.0	400.0 -
Major RehabReconstruction	80.1	26.9	0.9	0.7	-	108.6
Development Works	28.5	26.5	34.5	36.5	-	126.0
Traffic Mgt, Admin, Institutional	14.6	12.9	11.4	10.8	-	49.7
Sub-total Urban	164.2	107.7	88.3	89.5	400.0	849.7
Other GHA, DFR & DUR investment	N/a	N/a	N/a	N/a	N/a	N/a
Total Expenditure	650.7	528.2	577.0	603.9	728.6	3,088.4

(1) Data from 2014 (2015 for Urban) not disaggregated over types of maintenance intervention. The Urban accumulated maintenance deficit of USD 1,886.8m has been spread over five years at approx USD 400m per annum, commencing 2015.

Development Partners, with grant and loan interventions, have provided substantial funding for many years. Major DP participation post 2013/4 (when the current programme ends) is required, especially on periodic maintenance and rehabilitation, but especially on the strategic projects identified for this ITP.

GoG participates through the Consolidated Fund from general taxation sources. A substantial increase in Consolidated Fund releases in 2008 was partly funded from the expensive Eurobond borrowing by GoG, which is unlikely to be repeatable in – and cannot be recommended for - subsequent years funding of the road construction programme.

Specific user charges and other recurrent revenues also finance part of the sub-sector programme (mainly the recurrent maintenance element). Reference should be made to past consultancies (e.g. Transport Sector Institutional Development and Public Finance Management reports) that have explored all possible funding sources and approaches to increasing road sector revenues through new or increased user charges. GoG appears to be implementing many of the recommendations.

Current Road Fund financing of the road sub-sector maintenance needs is being achieved by further medium term (6 year) borrowing by the Road Fund against future revenues, thus diminishing the future ability of the Road Fund to fund the increasing level of maintenance deficit that has been projected. These reductions to future funds availability have not been brought into these broad calculations of future revenues.

Three funding scenarios have been developed for the existing SMTDP proposals, the core ITP projects identified as economically justified, and road maintenance in all its forms, viz Scenario 1 Existing, Scenario 2 Reasonable, and Scenario 3 Full Funding.

The funding Scenarios assume increases in the Fuel Levy at 50% of the existing agreement (Scenario 2), 100% increases in Fuel Levy (targeting US 9.5 cents by 2015) (Scenario 3), different assumptions of increased Consolidated Fund funding (from the “oil windfall” from 2014), and a new Development Partner programme commencing in 2014 covering mainly periodic and rehabilitation needs, again at two levels of support.

The maximum Road Fund projections (Scenario 3) assume that the Fuel Levy of Gp6 is increased regularly from 2011 onwards as follows:

2011 7.5Gp, 2012 9.0Gp, 2013 10.5; 2014 12.0Gp, 2015 14.0Gp

The Fuel Levy is applied to a rising consumption of petrol and gas oil, with a base year 1,808m litres in 2008. The Fuel Levy increases cease when reaching 14Gp, approximately US 9.5 cents. Fuel consumption is assumed to increase cumulatively at 6% per annum thereafter, the mid-point growth rate in GDP projections used in the ITP model. The issue of elasticity of demand to the increasing fuel price is subsumed in the growth rate used.

The new road tolls are estimated to generate (net of expenses) GHC 20m in 2010, rising at 6% per annum in line with fuel consumption (i.e. reflecting the growing number of vehicles on the road). Tariffs remain unchanged from the 2010 levels until the effect on revenues of the new charges introduced in February 2010 is known.

Other revenues (e.g. DVLA fees and charges) are similarly increased annually to reflect growth, with no change in the tariffs. It is not clear from the Road Fund accounts the extent to which DVLA revenues are returned to the DVLA to finance current operations.

Other road sub-sector revenue sources have been subjected to substantial increases in tariffs, fees and charges in recent years but do not constitute sufficient sources of funding to substantially bridge the current funding gap. Outsourcing of toll collection (c.f. SMTDP report 2009) was unsatisfactory and resulted in losses of revenue. A major toll booth construction programme on national roads (partly involving the private sector) is yielding increased revenues (helped by new tariffs in 2010) which cover many of the costs of collection that past low tariffs did not.

For the Existing Funding Scenario 1 the projected expenditure is well in excess of what is affordable even with the current level of Development Partner participation. Recurrent funding (mainly Road Fund) covers only part of the routine maintenance, rehabilitation and upgrading costs. It is assumed that no new funding from CF or DPs will be received for the years 2011-13.

Fuel Levy remains at 2010 level of GHC 0.06 per litre. All RF revenues increase in proportion to traffic or fuel consumption growth. There is no new DP programme from 2014. It is assumed that the Consolidated Fund continues at the past rate of contribution.

Table 20 : Funding Scenario 1 - Existing

Funding – Scenario 1	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Road Fund	110.0	116.6	123.6	131.0	138.8	620.0
GoG	70.0	65.3	60.0	70.0	70.0	335.3
DPs	96.7	42.6	12.9	0	0	152.2
Total Funding Scenario 1	276.7	224.5	196.5	201.0	208.8	1,107.5
Funding Shortfall Scenario 1	374.0	303.7	380.5	402.9	519.8	1,980.9

The Reasonable Scenario 2 in Table 14 assumes that the Fuel Levy increases at 50% of the proposed increments, rising to 10Gp per litre by 2015. Other Road Fund revenues are assumed to increase at the same rate. Development Partners assist from 2014 onwards at the 2011 level (new programme). The CF makes increased contribution using oil revenues from 2014.

Table 21 : Funding Scenario 2 - Reasonable

Funding – Scenario 2	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Road Fund	121.5	141.0	162.5	185.9	216.5	827.4
GoG - CF	70.0	65.3	60.0	100.0	100.0	395.3
DPs/Millennium	96.7	42.6	12.9	100.0	100.0	352.2
Total Funding Scenario 2	288.2	248.9	235.4	385.9	416.5	1,574.9
Funding Shortfall Scenario 2	362.5	279.3	341.6	218.0	312.1	1,513.5

The Full Funding Scenario 3 in Table 15 assumes implementation of full Fuel Levy as per agreement (GHC 0.14 by 2015). Development Partners double assistance above the Scenario 2 level. The CF takes up difference using oil revenues from 2014 at twice the rate used in Scenario 2.

Table 22 : Funding Scenario 3 – Full

Funding – Scenario 3	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Road Fund	133.0	165.5	201.3	240.9	294.2	1,034.9
GoG - CF	70.0	65.3	60.0	200.0	200.0	595.3
DPs	96.7	42.6	12.9	163.0	234.4	549.6
Total Funding Scenario 3	299.7	273.4	274.2	603.9	728.6	2,179.8
Funding Shortfall Scenario 3	351.0	254.8	302.8	0	0	908.6

Brief mention is made of other road sub-sector institutions for which some expenditure is included in the SMTDP but which all call upon the GoG's and Road Fund's resources to some extent, involve DPs through grant or loans, or to a small extent the private sector. These include DVLA, NRSC, MMT and STC.

DVLA

The DVLA financing arrangements are complex. Although constituted as an autonomous authority, part of its expenditure (e.g. payroll) is directly paid for by GoG. Other expenses are paid from a share of the fees and charges generated by activities (channelled through the Road Fund and then returned to the DVLA, although arrangements were in hand at one stage for 15% of revenues to be retained automatically by DVLA).. Investment is funded in part from DP grant aid.

No strategic expenditure proposals have been identified for DVLA beyond 2013.

Table 23 : Drivers and Vehicle Licensing Authority

	2011	2012	2013	2014	2015	Total 2011-15
DVLA	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure						
Privatization of Vehicle Inspection	0.2	0.2	0.1			
Automation of DVLA Activities	0.5	0.4	0			
Improvement Driver Testing/Trg.	0	0.1	0			
Library, Offices, Accommodation	2.4	2.5	2.0			
Monitoring & Education	0.1	0.1	0			
Capacity Building DVLA	1.9	1.2	1.2			
Total Expenditure (2)	5.1	4.5	3.3	N/a	N/a	
Total Funding (2)	N/a	N/a	N/a	N/a	N/a	

(1) DVLA expenditure data differs within the SMTDP report (pages 54 and 64) but is shown fully funded from Road Fund in one place in the report.

Some finance comes from the Road Fund; other from a levy on insurance companies. The nature of the expenditure is more recurrent than of an investment nature.

No strategic expenditure proposals have been identified for NRSC beyond 2013.

Table 24 : National Road Safety Council

NRSC	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Expenditure						
Campaign/Road User Education	1.7	1.9	2.7			
Road Safety Research	0.2	0.2	0.3			
Admin/Prog. Dev. Support	1.2	1.2	1.2			
Institutional Capacity	3.1	2.8	2.0			
Total Expenditure NRSC	6.2	6.1	6.2	N/a	N/a	
Funding						
GoG	0.5	0.4	0.5			
DPs	4.0	3.8	3.8			

NRSC	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Road Fund	1.3	1.4	1.5			
Insurance	0.4	0.4	0.3			
Local Sponsorship	0.1	0.1	0.1			
Total Funding (1)	6.2	6.1	6.2	N/a	N/a	

1. NRSC secured funding totals differ from SMTDP document, which shows substantial unsecured funding need. Cause of discrepancy has not been identified but approximates the values shown for DP funding by IDA and Danida.

MMT is a substantial beneficiary of grant funded buses and has a small loan financed element of current assets. Nothing is know of any future investment plans, through grant or loan or internally funded replacement.

Past MMT management deficiencies and weak financial management are being rectified by DP technical assistance. A key remedy would be the implementation of full cost recovery (including asset replacement) through fees and charges. If the sub-economic fees and charges are to continue (a regulatory issue) then MoR&H/MoFEP should ensure that MMT is provided with a subsidy to cover the cost of the free travel given to school children.

STC's problems arise in part through the breaching of its regulated monopoly on inter-city routes that MMT now competes on through its sub-economic charges. STC is principally owned by state organisations and has only a small genuine private sector element of ownership.

Table 25 : Metro Mass Transit & State Transport Co.

MMT and STC	2011	2012	2013	2014	2015	Total 2011-15
	USDm	USDm	USDm	USDm	USDm	USDm
Metro Mass Transit	N/a	N/a	N/a	N/a	N/a	N/a
State Transport Company	N/a	N/a	N/a	N/a	N/a	N/a

It should be noted that the Bus Rapid Transit project requires an operator (probably from the private sector) to provide up to 480 buses to be used on dedicated bus lanes. MMT and STC vehicles and operations could provide the core facilities around which the operator is created. No funding is shown for this element of the project, which is most likely to be sought from the private sector as part of an operations and management arrangement.