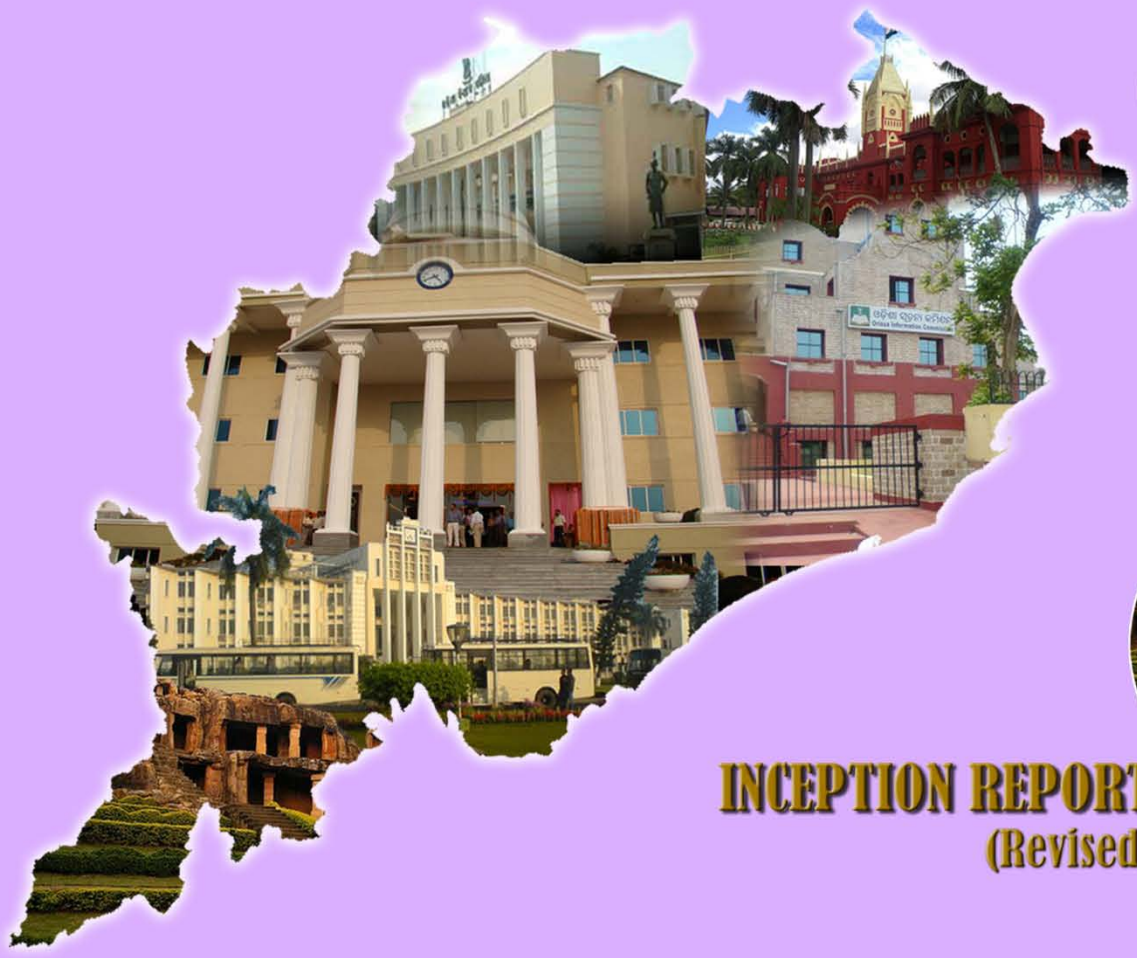
Government of Odisha (GOO)
Chief Engineer, World Bank Projects, Odisha
Odisha State Roads Project

Consultancy Services for Road Sector Institutional Development Loan # 7577-IN



INCEPTION REPORT
(Revised)

Intercontinental Consultants and Technocrats Pvt Ltd

In joint venture with
Grant Thornton Advisory Pvt. Ltd.

In association with
ARKITECHNO
CONSULTANTS (INDIA) PVT. LTD.

Project Office : N - 3/91, I.R.C Village, Nayapalli, Bhubaneswar - 751015, Odisha
L : +91-674 - 2557204, F : +91-674-2553689, email : orissa@ictonline.com

Table of Contents

List of Annexures

List of Tables

List of Figures

Abbreviations

AE	Assistant Engineer
AEE	Assistant Executive Engineer
AP	Andhra Pradesh
BOLT	Build Own Lease and Transfer
BOT	Build Operate and Transfer
BOOT	Build Own Operate and Transfer
CE	Chief Engineer
CRRI	Central Road Research Institute
DBFOT	Design Build Finance Operate and Transfer
DCP	Dynamic Cone Penetration
DPI	Design Planning and Investigation
DRRP	District Rural Road Plan
DRSC	District Road Safety Councils
DTCN	Detailed Tender Call Notice
E&I	Economic Importance
EE	Executive Engineer
EIC	Engineer-In-Chief
EIRR	Economic Internal Rate of Return
EOT	Extension of Time
FA	Financial Analyst
FD	Finance Department
FYP	Five Years Plan
GAAP	Governance and Accountability Action Plan
GIS	Geographical Information System
GNI	Gross National Income
GOI	Government of India
GOO	Government of Odisha
GT-APL	Grant Thornton Advisory Pvt. Ltd.
HRD	Human Resource Development
HRM	Human Resource Management
ICT	Information and Communication Technology
ICTPL	Intercontinental Consultants and Technocrats Pvt. Ltd.
ID	Institutional Development
IDS	Institutional Development Strategy
IG	Inspector General
IR	Inception Report

IRC	Indian Roads Congress
ISAP	Institutional Strengthening Action Plan
IT	Information Technology
JE	Junior Engineer
KBK	**K**alahandi, Nuapada, **B**olangir, Sonepur, **K**oraput, Rayagada, Malkanagiri and Nawarangpur
LASA	LEA Associates South Asia Pvt. Ltd.
LCV	Light Commercial Vehicle
LNA	Learning Needs Analysis
LWE	Left Wing Extremist
MD	Managing Director
MDR	Major District Road
MIS	Management Information System
MoRT&H	Ministry of Road Transport and Highways
MoSRT&H	Ministry of Shipping Road Transport and Highways
MP	Madhya Pradesh
MV	Motor Vehicle
MVI	Motor Vehicle Inspector
NAC	National Academy of Construction
NABARD	National Bank for Agriculture and Rural Development
NCRB	National Crime Records Bureau
NH	National Highway
NHAI	National Highways Authority of India
NPV	Net Present Value
O&M	Operation and Maintenance
OBCC	Odisha Bridge and Construction Corporation Ltd.
OD	Organisation Development
ODA	Odisha Development Authority
ODR	Other District Road
OPWD	Odisha Public Works Department
ORDC	Odisha Road Development Corporation
ORSAC	Odisha Space Applications Centre
OSRP	Odisha State Roads Project
OSRTC	Odisha State Road Transport Corporation
OWD	Odisha Works Department
P&CD	Planning and Coordination Department
PD	Police Department

PIU	Project Implementation System
PMGSY	*Pradhan Mantri Gram Sadak Yojana*
PMU	Project Management Unit
PPP	Public Private Partnership
PRD	*Panchayat Raj* Department
PWD	Public Works Department
R&B	Roads and Bridges
R&DD	Research and Development Department
RDC	Road Development Corporation
RDD	Rural Development Department
RIDF	Rural Infrastructure Development Fund
RLTAP	Revised Long Term Action Plan
RM	Road Maintenance
RNMP	Road Network Master Plan
ROW	Right of Way
RSAP	Road Safety Action Plan
RSID	Road Sector Institutional Development
RTI	Right to Information
SBD	Standard Bidding Document
SCRB	State Crime Records Bureau
SE	Superintending Engineer
SH	State Highway
SPs	Superintendent of Police
SRSC	State Road Safety Council
SWOT	Strengths, Weaknesses, Opportunities and Threats
TIMS	Training Information Management System
TL	Team Leader
TNA	Training Needs Analysis
ToR	Terms of Reference
VDF	Vehicle Damage Factor
VR	Village Road
WB	World Bank

Observations of World Bank & Client and the Compliance Status

Reference:

1. World Bank Letter to CE (WB) dated 10 July 2012
2. Discussions of 11 September 2012
3. Submission of draft Inception Report (IR) by email on 14 September 2012
4. Detailed Presentation of IR on 17 September 2012

Taking into consideration the observations made by World Bank (WB) and Client, the reference to all these observations have been addressed in revised IR, and will be resolved progressively.

Sl. No.	Para No.	Main Points Observed	Compliance Status
1	Para 1	• Generally well covered o Project Background • Understanding of Scope, Objective and Approach and Methodology • Preliminary Findings to be progressively substantiated	• Refer Section 1 and 2 of IR • Though an encouraging statement made but, o Partial modifications made to Sections 1 and 2, based on additional inputs and developments of interim period • Preliminary findings of each task to form part of ongoing process of assignment
2	Para 2	• Misconception and narrow vision of ISAP, strategic aims and targets • Reflection visible in IR and Executive Summary • Annexures 13 to 15 of IR specifically been mentioned for attention	• No aim to narrow the scope of work, the assignment will be progressed in joint consultation with WB, the Client, the ISAP parameters, the ToR and taking the inputs of concerned Stakeholders • Annexures 13 to 15 revised based on latest developments • Also taken note of the discussions held during interaction with WB Mission from 19–24 July 2012
3	Para 3	• Need for a less constrained strategic focus	• Refer comments on para 2 above

Sl. No.	Para No.	Main Points Observed	Compliance Status
		• Executive Summary and description task, methodology, more OWD centered • Need to have wider view of Odisha Road Sector as a Whole	• Executive Summary suitably amended • IR tasks and methodology accordingly modified • All Road User groups will be consulted for, by way of conducting Workshops prior to final submission of major deliverables
4	Para 4	Shortlisted following four tasks: • Road Sector Policy and Strategy for specific attention • Future Funding Options • Future Institutional Options • Revision of Works Code and Manuals For above tasks: • To have wider view and inclusive of GOO and not only OWD • Institutional framework of GOO, for planning, provision and management of road to be made as part of policy • GOO Road Sector Institutions to be accordingly restructured	• OWD centric focuses amended to cover complete Road Sector of GOO • Refer Section 4 of IR on Road Policy and Strategy, where in the wide scope of this aspects has been broadly defined for • The same action of revising the Executive Summary has also been taken to amend OWD centric statements to cover GOO as well as Road User Groups and concerned department where ever deemed appropriate • All referred tasks will progress in accordance with broad GOO centric parameters
5	Para 4 Sub Head 1	• Road Sector Policy and Strategy, larger spectrum of Road Policy beyond OWD to be covered	• Proposed vision of Road Policy as covered in Section 4 takes into account the larger spectrum

Sl. No.	Para No.	Main Points Observed	Compliance Status
		• OBCC; working to be covered for • Identification of GOO anticipated intention on Institutional arrangements to be taken in consideration	• Meeting with EIC-cum-Secretary already held twice to know intentions • Will be followed up in writing and made part of subsequent Reports • Refer Section 4 on Road Policy • OBCC covered vide para **12.3.2** of Section 12 for its basic findings • Will also be considered while working out options for new Institutions for road sector and where OBCC will fit in?
6	Para 4 Sub Head- II	• Future Road Management Funding	• Will consider all forms of roads with different ownerships and the GOO road agencies responsible • Funding mechanism of various road departments will be considered for review • OBCC-centered toll collection regime will also be reviewed for its governance afresh • Refer para **9.2** onwards of Section 9 for conceptual approach and preferred options • The toll collection regime will be reviewed and established, afresh, delinking it with OBCC. New option should be worked out in consultation with Client and WB • Options for new road fund will be examined in consultation with GOO for all categories of road with different ownerships • Will be followed up for working out a regulatory framework of road fund management for all category of roads of various departments including its governance by GOO • This issue will also be addressed during Stakeholders Workshop to get their views
7	Para 4 Sub Head-III	**Future Institutional Options** • To establish basis for Institutional Structural Improvements for 5–10 years • Assess limitations of GOO framework, as well as shortcomings	• Suggestions for study of limitations of GOO framework noted • Noted for assessing the limitations and will further be addressed and resolve progressively during the course of assignments. We have also made notes of your views expressed during the discussions from 21–23 July 2012, your mission visit

Sl. No.	Para No.	Main Points Observed	Compliance Status
		• Look into possibility of establishing of RDC with proper analysis, linking it to OBCC	• Four states i.e. AP, Gujarat, Maharashtra and Karnataka will be visited to analyse the existing working models of various Institutions • Various models to be analysed with their SWOT analysis and considering their applicability and suitability for GOO and Road User Agencies in consultation with ISAP Working Group/Steering Committee officials/OWD prior to making any recommendation • IR specifies it as part of Work Plan • Refer para **12.3.2** on OBCC and **12.4.3.2** on RDC of Section 12
8	Para 4 Sub Head- IV	**Revision of Works Code and Manuals** To include sections on • Quality Control • Road Safety • Environment and Social Management • To be a separate section and not linked to PPP Policy • Legislation on anti-corruption and good governance • Dispute redressal and RTI Act	• As mentioned it revised Section of IR, these provisions will be covered in the revised Works Code and Manual • Refer Section 3 which has been, re-written taking into account all these points
9	Para 5	**Consultant Staffing Schedule** • Deployment of Team Leader (TL)	• Discussed in detail during interaction with WB and Client on 21–23 July 2012

Sl. No.	Para No.	Main Points Observed	Compliance Status
			• The revised Staffing Schedule prepared as per actual deployment till now as well as subsequently in consultation with Key Professionals and schedule of deliverables • Team Leader has been mobilised w.e.f. 01.09.12. Please refer our letter no. ICT:660:OR:39, dated 1 September 2012 • Also Transport Planner, Mr. Chandi Ganguly has visited the project site during August and given his inputs for revise IR. His further schedule will be worked out as per the project requirements • The Staffing Schedule has been re-worked and discussed with client on 11 September 2012
10	Para 6	**Widening of Stakeholder Involvement in Issues and Solutions** • Higher level consultation with every stakeholder/ Road User Agency required • Participation to be beyond OWD	• Already planned for • The proposed workshop tentatively scheduled in during mid October, which will include all Stakeholders as decided by Client and will covered larger spectrum of Project Objectives, Scope, Task and its integrated parameters of ISAP objectives • A visit to two of the states i.e. AP and Karnataka proposed for 3rd week of November as advised by WB officials that prior to working out Road Sector Policy, the inputs of other states preferably to be taken • Aid Memoire on proposed visits to be got approved by OWD from WB and GOO • Aid Memoire to be given to Consultant to plan for visit to States and Stakeholders Workshop • For Aid Memoire kindly refer our letter no. ICT:660:OR:40, dated 3 September 2012

Sl. No.	Para No.	Main Points Observed	Compliance Status
11	Para 7	**Long Term Ownership** • Issues for Road Sector on Policy Sensitive matter to be resolved with GOO and not OWD	• This issue will be part of discussions of stakeholders workshop and later resolved with GOO • Ownership of Road Sector involving various categories of Roads a major issue • Included in Road Policy Parameters also • It will be further discussed during Stakeholders Workshop and linked issues resolve with joint consultations
12	Para 8	**Integration and Harmonisation of RSID Tasks and Outputs** • Interaction with other ISAP Consultants already in Process. • Regular interaction with OWD and other Stakeholders regularly going on	• It will be ensured • Please refer notes 1 and 2 given below
13	Para 9	• Mobilisation of Team Leader • Modification of IR	• Action taken • Team Leader mobilised w.e.f. 1 September 2012
14	Observations of Client refer letter no. ICT:660:OR:45, dated 12 September 2012 with reference to discussion of 11 September 2012	• Environment and Social Issues with comments on o regulatory framework concept • Quarry operations and recycling of road materials • Inputs on delay in joining of TL	Refer para **3.5.7** of Section 3 • Refer para **14.4** of Section 14

Sl. No.	Para No.	Main Points Observed	Compliance Status
		• Indicative tentative dates for first few Workshops at Odisha and visit to other states • An additional Section on Risk and Challenges of Project and Assignment, to be part of IR	• Block indicative dates for first five Workshops and visit to two other states indicated in additional Task Group no. 12 on Work Plan • Refer Section 16 of IR
15	Observations, refer Presentation of draft IR on 17 September 2012	Issues to be addressed in revised IR • Land accusation models of Haryana, Uttarakhand and Rajasthan for their reference, so that can be part of main study for adoption if found appropriate for Odisha • Procurement Manual Documents to be separate deliverable and not part of revised Codes and Manual • Rights of Citizen to be part of good governance/RTI mechanism • Amendment to certain issues of Risk and Challenges • Review of responsibilities of certain Key Professionals related to specific task, as already specified at para 8 of ToR (p-50) with heading as 'Specific Tasks Comprising the Assignment'	• Refer para **3.5.6** of Section 3 as well as para **4.3.6** of Section 4 • Action taken, refer revised Work Plan and Deliverable Schedules • Refer para **3.5.9** of Section 3 • Action taken and accordingly revised, refer para **16.4.5.1** and **16.4.5.2** of Section 16 • Reviewed, e.g. for Task no. 9 i.e. Vehicle Axle Load Regulation, no provision made for Legal Specialist but Procurement Specialist was considered, amended to Legal Expert. Refer para **11.6** of Section 11

Sl. No.	Para No.	Main Points Observed	Compliance Status
		• Workshop and visit block dates to be reviewed. The main format of conduct of Workshop and certain specific issues to be discussed during visit to other States to be worked out by the Consultants • The agenda and format of conduct of Workshop to be proposed by Consultants	• Will be done in consultation with Client. 1st Workshop as proposed during Presentation on 17 September 2012, tentatively being planned between 9–11 October 2012. However again subject to joint consultations with CE (WB) • Being planned for

Note:

1. Staffing Schedule and Work Plan duly integrated and harmonised with Tasks and likely inputs of each Key Professional have been discussed with client and modified suitably.
2. Inputs of other ISAP Consultants will also be considered for their inclusiveness to be part of Final Deliverables.

EXECUTIVE SUMMARY

Executive Summary

1. Background

The Government of Odisha (GOO) has developed an Institutional Strengthening Action Plan (ISAP) for the period 2008–18 to initiate restructuring and strengthening of institutions involved in road development and management. The ISAP 2008–18 has identified several key result areas to be addressed within a short term (2 years) to a medium term (2–5 years) horizon.

GOO has appointed **Intercontinental Consultants and Technocrats Pvt. Ltd (ICTPL), New Delhi, in joint venture with Grant Thornton Advisory Pvt. Ltd. (GT-APL), UK and in association with ARKITECHNO Consultants (India) Pvt. Ltd., Odisha**, to provide consultancy services for Road Sector Institutional Development (RSID) Study to assist in the realisation of ISAP objectives. The Odisha Works Department (OWD) is the Client for this study and this IR details out the scope of work and various tasks involved in RSID study and the approach and methodology proposed to be adopted by the Consultant to deliver the outputs.

The contract for the consultancy services was signed on **16 March 2012** and the Consultant team has been mobilised on **9 April 2012**.

2. RSID – Overview

The economic progress made by the State in recent years has resulted in more than 15 percent annual growth of motor vehicles (MVs). Many parts of the road network in Odisha are facing problems of congestion and high incidence of road accidents. On the other hand, many parts of the State are not adequately connected to the economic, education and health facilities due to poor accessibility. It is anticipated that the State will continue to grow at this rate in near future and therefore, it has been realised by the GOO that right strategies, policies and institutions have to be in place to manage the future demands for road infrastructure in Odisha.

The Consultants understand through their interactions with the GOO and Road User Groups of the state, that it has not been able to cope with the demands on State roads, and is strained at the field level, owing to lack of trained staff, adequacy of facilities and necessary motivation for executing various tasks besides funding. From various meetings with the Client, the Consultants understand that Road User Groups of GOO are facing serious shortcomings in respect of the following:

- Organisational capacity constraints in terms of system, processes, and competencies to meet various demands in design, execution and maintenance management of the works/projects
- Inadequate funding arrangements to meet the road development and maintenance requirements
- Coherent road policy and strategy (short and long term) considering State's development aims and priorities

The Consultants plans to focus on the following major issues within the ambit of Terms of Reference (ToR), so that the project outcomes could assist the Client to address the above concerns. Thus, the Consultants propose to address the issues through defined tasks elaborated in this Report. However, Consultants' overall approach and methodology will hinge on the following:

1. To develop a coherent roads policy and strategy to enable GOO to develop roads with the aim of having a road network which is safe, reliable and can cater to the development objectives of the state
2. To advice Road Organisation of GOO to be the dynamic organisation with motivated people having updated technical skills and managerial knowledge commensurate with their roles and responsibilities, contributing to achieve the stated objectives in the roads policy
3. Advice and support restructuring the Road Departments of GOO to enable efficient management of the road network, with changed focus on the needs of road user
4. Review and revise codes, manuals, guidelines and legislations to enable to achieve the stated objectives

By working on the above framework, the Consultants will aim to achieve the following outputs;

- A **road network master plan (RNMP)** for a 10–20 year horizon, the implementation of which will help achieve the objectives of revised road sector policy;
- A multi-dimensional **road safety action plan (RSAP)** to help the Road User Groups and GOO to develop a safe road network under an established safety management policy;
- An efficient **axle load regulation and management system**, which will keep the roads in safe and sound condition throughout its design life;
- A model **Toll Contract Agreement** to outsource road toll collection plus maintenance operations for roads funded by Odisha State Roads Project (OSRP) or any other road; and
- An efficient and **sustainable funding mechanism** to optimally manage the road development programmes of the State.

3. Consultant's Approach and Methodology

The following are the 10 major components identified in the RSID study, each of which is a different entity on its own. It is important to establish a sequence in the delivery of these components. The basic link between these 10 components is shown in **Figure A.**

Figure A: Link between different components within RSID

The approach and methodology proposed by the Consultants to deliver the outputs under each of the above 10 major components as given in the Report are briefly detailed below:

Road Sector Policy and Strategy – This involves assisting GOO in developing a road sector policy reflecting State's aims, targets and priorities in road sector. The output of this task is the preparation of a **road sector policy** for Odisha State. The tasks identified to prepare a draft road sector policy and strategy is as follows:

- Review the current road sector policies including legislation, regulatory and statutory mechanisms
- Study current and projected road sector demands and GOO's aims and targets in the sector
- Identify gaps in the existing policies/ authority and other statutory mechanisms to meet the future requirements in the sector
- Determine GOO options and opportunities for strengthening the road sector
- Prepare a draft policy and vision document in consultation with the stakeholders
- Prepare the final road sector policy and vision document for a 5 and 10 year horizon

Revision of Works Code and Manual – This involves comprehensive revision of Works Code and Manual as the framework of policy, standards, responsibilities and powers for planning, contracting

and execution of public works in Odisha related to both roads and buildings. The deliverables under this component is the final revised **Works Code and Manual, Procurement Manual and all standard procurement documents for goods, works and services**.

The Consultants will review the following of the current Works Codes and Manual and will suggest improvements wherever required to meet the evolving sector requirements:

- Planning from inception to completion: Management of public works
- Public Private Partnership (PPP) policy guidelines including environmental and social management aspects
- Review of contract documents and procedures for procurement of works, goods and services including e-procurement process for tendering
- Construction zone safety guidelines
- Dispute redressal mechanism effectively handling disputes
- Review of Right to Information (RTI) Act related aspects

After the review of the above elements and preparation of draft Works Code and Manual, the Consultants will arrange an interactive workshop with GOO/Road User Group officials and stakeholders at various levels and study the suggested improvements in the existing policies and functioning. The final version of the documents will be prepared after incorporating comments/inputs from various stakeholders from the workshop and other consultations.

Reorganisation and Strengthening OWD – OWD is in the process of implementing improved human resource structure (as approved by GOO in December 2011). Consultants will review the efficacy of the restructured OWD to effectively manage the emerging road sector requirements commensurate with the newly accepted Road Sector Policy and Strategy. The Consultants shall develop the vision for the organisation and would endeavor to bridge the gaps. By analysis of internal forces for change as well as outer forces for change (e.g. technology, computerisation, GIS etc.) suitable changes in the organisational structure would be undertaken in consultation with the Works Department. The output of study will be a report on the **medium to long term strengthening options of the organisational structure of Works Department of GOO besides its Human Resource Management (HRM) Policy**. The broad tasks proposed to be covered under this component are:

- Review the current restructuring done by GOO for Works Department
- Identify gaps
- Analyse internal and external forces for organisational restructuring
- Develop short term (0–3 years) restructuring options to meet the short term demand for managing the network
- Develop a medium to longer term organisational vision of GOO Works Department to meet the future demands of the sector
- Match the powers and authorisations for the Works Department's main functions with the revised Works Code and Manual
- Facilitate the change management process of the Works Department to complete the transition

GOO, Road Works Staff Training and Human Resource Development (HRD) – This involves developing a multi-year staff training programme supported by an HRD policy for GOO. This task will involve:

- Carry out a comprehensive Training Needs Analysis (TNA) both at head quarter and field level – considering reorganised structure
- Identify training competency requirements for Works Department technical staff at varying levels of roles and responsibilities
- Develop multi-year 'rolling' Staff Training program
- Prepare an HRD policy for Works Department along with strategy and action plan
- Assist in establishment of adequate capacity related to Training/HRD functions for Works Department
- Pilot 'ISO certification' process – initiation

Road Safety Engineering and Planning – This involve assessment of road safety management and responsibility framework in Odisha and developing a **RSAP** for the State. The tasks identified to comply with the ToR under this component are:

- Review of Works Department engineering functions in managing the road safety
- Assess the roles, responsibilities and capacity of various Works Department staff to make the road network safer
- Collection and analysis of accident data from State Police, hospitals, and insurance companies, at State level
- Identification and safety assessment of a sample road network of 2,000 km
- Identification and suggestion for improvements for hazardous locations
- Capacity building measures within Works Department – on the job training and external training programmes (visits to identified institutions and organisations)
- Assess inter-departmental road safety responsibility framework
- Prepare a report on road infrastructure safety management, covering institutional requirement and funding options
- Conduct workshop and prepare a RSAP for the State

Road Network Master Planning – This involve development of a comprehensive **RNMP** for the state of Odisha, including State Highway (SH), Major District Road (MDR), Other District Road (ODR) and Village Road (VR), but excluding Expressways, National Highway (NH) and Municipal/Urban roads, taking into account current network status, emerging State level trends in road transport demand, development plans in other transport modes and future funding options for Odisha. In addition, **capacity building** and **revised road upgradation system** will also be carried out under this component. The tasks identified to comply with the ToR under this component are:

- Review of existing policies and road classification system
- Preparation of base map showing all major categories of roads in the State
- Collect data from secondary and primary sources
- Record data relating to socio economic profile of the State
- Identify sample network of 3,000 km and carry out engineering surveys
- Situation analysis and diagnosis of the existing road network
- Analyse data and forecast future traffic volumes
- Develop criteria for upgradation of roads from one category to the next of the road network
- Develop strategic options for road network development
- Finalise the strategic options through a stakeholder workshop
- Develop improvement strategies along with budget requirements
- Develop a draft Master Plan for the upgradation of the roads in the State

Vehicle Axle Load Regulation and Management – The GOO wishes to establish an effective axle load control and management on Odisha road network, to prevent the rapid deterioration of pavements due to excessive loading beyond the permissible limits. The tasks identified to comply with the ToR under this component are:

- Assess the prevalence (reasons, location, pavement deterioration) of excessive loading – through surveys and consultations (about 50 locations in a selected sample network)
- Assess the adequacy of existing methods, resources and institutions to monitor and regulate axle loading
- Develop a new axle load control regime which includes, optimum equipment, resource allocation and institutional arrangement
- Development of a State level database for Vehicle Overload Management

Future Roads Management Funding – This involves studying the current and future options available to the GOO to generate funds for road development and asset management. The study also involves recommending to GOO a preferred institutional arrangement for administration of road funds. The deliverable under this task is a **report on road funding options** for possible creation of a **State Road Fund** supported with recommended legislation. The tasks identified to comply with the ToR under this component are:

- Review the current funding arrangements for the road sector – 'as is' situation and defined the challenges in road financing
- Review, analyse and suggest suitable options to augment the funds for road development

- Estimate future funds requirements based on outputs from RNMP, RSAP, asset management and other requirements
- Suggested mechanisms for effective and efficient management of the funds and an implementation plan

Road Toll Collection and Management – The GOO has a Toll Act to facilitate such collection through outsourcing of Toll. It is contemplated to review this Act so as to permit Road Maintenance (RM) and toll collection as a composite work. It is required to establish a model tolling contract agreement for outsourcing of 'Road Toll Collection combined with RM operations'.

- Review of Toll Act enacted by the GOO
- Develop guidelines for toll operations by assessing best practices in road toll collection and operations within the country
- Develop model Tolling Contract Agreements for road toll collection plus RM operations

Future Road Sector Institutional Options – Management of roads of any State, depending on categories of road, is an exercise involving various Government entities, i.e. National, State and local bodies, besides other entities like the construction industry, Training institutions, Laboratories, etc. The future institutional options as seen by the Consultants will take into account all the entities related to the Road Sector.

- Review the functioning of already established entities, with regard to their roles and responsibilities, distribution and adequacy of powers and accountability;
- Identify overlaps in responsibility as well as unaddressed roles;
- Addressing important weaknesses and/or gaps in the existing institutional arrangements in the road sector;
- Options analysis for each group of roles and responsibilities;
- Identifying, ranking/prioritising the realistic options for medium-to-long term strategic improvements in institutional framework, which will support GOO objectives and overall governance;
- Workshop to finalise the option; and
- Finalisation of institutional option.

4. Project Delivery

The project team comprises 15 subject experts inclusive of two Adhoc Consultants, to study and deliver the outcome of each component. The key expertise available for the project delivery as under:

1. Road Agency Management Specialist
2. Organisation Development (OD) Specialist
3. Financial Analyst (FA)
4. Transport Planning Specialist
5. Transport Economist
6. Senior Highway Engineer
7. Geographical Information System (GIS) Specialist
8. Road Safety Specialist
9. Public Works Department (PWD) Sector Domain Specialist
10. Procurement Specialist
11. Training and HRD Specialist
12. Human Resources Management (HRM) Specialist
13. Legal Specialist
14. Adhoc Consultant for Institutional Strengthening, Restructuring and Training
15. Adhoc Consultant for Road Network Planning and Road Safety

In the pursuit to change Works Department of GOO to a dynamic organisation working towards achieving the State's development objectives within a well laid out policy, the team has started its work of consultation with the Works Department officials and other Stakeholders/Road User Groups of the GOO. Several consultation meetings have taken place during the month of April–September 2012, encompassing different components of RSID project.

The project activities have already gained momentum and in coming months there will be more intensive consultations with GOO officials and other Stakeholders/Road User Groups supported with the field surveys, all aiming to achieve the objectives of this study. The outcome of RSID project will help in transforming road sector of Odisha supporting economic and social development in the state. The project duration is 30 months and the expected completion date is October 2014, which is achievable.

Notes:

Certain additional inputs have been made in the revised IR in accordance with discussions held with Client on 11 September 2012 as per details below:

- Environment and Social Issues with comments on regulatory framework concept
- Quarry operations and recycling of road materials, to be discussed and also form part of IR as part of environmental issues
- A paragraph on delay in joining of TL, to be reflected in IR
- Indicative tentative dates for first few Workshops at Odisha and visit to other states
- A Chapter on Risk and Challenges of Project and Assignment (refer Section **16**)

SECTION 1
PROJECT BACKGROUND

1. Project Background

1.1. Introduction

Road transport is a key component of the economic and social development process, often requiring a high proportion of national budgets. Road networks usually have an asset value that represents a significant proportion of national and State wealth. In the emerging scenarios, the countries worldwide have been accorded high priorities for the annual requirement for operations and maintenance of their infrastructure/road assets. This means that roads represent the sector with large revenue and expenditure requirements. There is a strong correlation between the kilometres travelled and the Gross National Income (GNI) of a country, which shows that road transport, makes an important contribution to GNI. Roads constitute 'big business'. It is therefore important that road networks are managed effectively and efficiently.

Since the liberalisation of the Indian economy in 1991 the GOO has moved to improve the financial sustainability as well as the effectiveness and viability of key industry sectors within the State. Odisha has become the first State to have undertaken a comprehensive reform in the power sector following the passing of the Odisha Electricity Reform Act in 1995. This Act is aimed at fostering private sector participation in the generation, transmission and distribution areas. It also facilitates the taking of measures conducive to the development and management of the industry in an efficient, economic and competitive manner.

To upgrade the major road network in Odisha the GOO with the support of the Government of India (GOI) have embarked on a WB assisted project called the Odisha State Road Project (OSRP). This project is intended to enhance both the major road transport infrastructure as well as the institutional capacity of the Odisha Works Department (OWD) which has primary responsibility for the State's main road network. Road infrastructure will not only play an influential role in creating this 'new world' for Odisha, but also its effective management will be vital to sustain the transformation and to secure the future for Odisha. This will not only lead to development of the road sector, but also have a cascading effect on the overall development of the State.

The GOO too has realised the need for reforms and is preparing itself for capacity building, organisational restructuring and skill upgradations to meet the new challenges. The Government is not only thinking for Road Sector, but also planning an all-round re-modeling, restructuring and overall review of regulatory framework, to match the development strategy for the State.

The ICTPL has been retained by OWD to review the current institutional and financial structures and processes associated with the OWD. The main objective of this institutional strengthening is to develop Institutional Options, Organisation Structure, Master Plan etc. with focus on OWD and its linkages with other road sector agencies beside financing of roads.

1.2. Project Rationale

To move forward, GOO conceived and planned to upgrade major roads in the network and sent proposals to the WB for Loan Assistance in the year 1997–98. The WB however desired that the proposed project cover not only improvement of the Road Transport Infrastructure, but also improve and upgrade the Institutional Structure and Capacity of OWD. In response, the WB and the GOO engaged a Consultant to carry out Institutional Development Strategy (IDS) Study in the year 1998–99. This study made series of recommendations to the GOO for implementation in OWD, under short, medium and long term, in the year 2000.

Based on findings of IDS Study the GOO wanted to establish a vision for the Road Sector reform with a view to update the policies and enhance the capacities in planning and management of Road Transport Sector effectively.

The GOO constituted a 'Task Force' to revise the IDS, update its vision and findings where appropriate, and develop an ISAP with the assistance of the Consultant and in Joint Consultation of the WB. As an integral part of the new project, GOO has developed an integrated ISAP to be implemented in a phased manner during the term of the OSRP. Based on the WB recommendations, the Task Force inputs and GOO requirements, a Road Sector Reforms Plan emerged in 2007, named as ISAP covering major objectives of Institutional Strengthening and Capacity Building of OWD.

In order to implement ISAP for the Road Sector in general and the OWD in particular, OWD initiated actions to procure the Services for:

- Developing the IT – Information and Communication Technology (ICT) Management Information System (MIS), Monitoring and Evaluation Architecture, across the Road Sector;
- Establish an Asset Management System on the Core State Road Network for OWD; and
- RSID and Enhance the Capacity of OWD.

To support its needs, the GOO through the GOI received a loan from the WB for implementation of the OSRP and applied a portion of this loan to finance technical assistance and advisory services for ID support to assist GOO to improve its road sector policy, institutional capacities and legal framework, to align it with the rapidly changing environment.

To implement the Support Needs for ISAP, the GOO/OWD has entrusted the work to M/s ICTPL along with GT-APL as JV Partner and ARKITECHNO as Associates, here in after called the Consultants, to provide the Services for a period of 30 months commencing from 9 April 2012 and fulfilling the established Goals and Targets of the Organisation, as given in the objectives of the study.

1.3. Project Objectives

The main objective of the RSID consultancy assignment is to enhance the capacity of the OWD and where appropriate, other GOO road sector agencies concerned to carry out road infrastructure development, to improve the engineering aspects and planning for road safety management in the

State and to initiate mechanism for sustainable future growth with the resources dedicated to roads infrastructure development.

As a follow up action, ISAP 2008–18 has been endorsed by the State Government to guide the implementation of ISAP activities in the sector and to facilitate monitoring of ISAP results by the GOO and the Bank. The ISAP includes clear, monitorable targets and milestones for a planned range of policy, capacity and resource improvements in the following fields:

i. Road Sector Strategy (Regulatory and Strategic Context);
ii. Core Processes in Road Management;
iii. Organisational Structure and Management;
iv. Financial Management, Audit and Administration;
v. ICT and MIS; and
vi. HRD and Capacity Building.

1.4. Scope of Services

Dynamics of highway sector involve many direct, complementary, supporting and regulatory departments for translating a development vision into reality and require that all such organisations/agencies/bodies respond and work in synergy at organisation, group and individual levels. This calls for capacity building-in the shape of continuous development, retention and harnessing of professional expertise, effective HRM policies in recruitment, training, job assignment, transfer and postings, rewards and punishment, decision making, motivation, and cross function specialisation. Harmonious blending of HRD and HRM with the Organisation Development (OD) needs to be taken up as one of the prime requirements for the development of the highway sector. The organisational requirement of the OWD, Consultant, contractor, research, training, quality assurance and other supporting organisations whether in Government, autonomous or private sector, are thus wide and varied, encompassing both the organisation and those working for it.

The RSID Consultancy Assignment will focus to enhance the capacity of the OWD and where appropriate, other GOO road sector agencies to carry out road infrastructure development, provisioning and management of assets efficiently and effectively; to improve the engineering aspects including planning for road safety management in the State, and to initiate mechanisms for optimal utilisation of resources dedicated to roads infrastructure management for sustainable future growth.

The achievement of this overall objective will, at varying stages, involve policy and institutional interventions in the roads sector, in accordance with the ISAP. This will require diverse forms of technical assistance, training and capacity building services, policy studies and implementation support (including legal and statutory aspects).

For achieving the above goal the Consultants are supposed to carry out a set of distinct Tasks integrated into one overall ‘package’. The services ‘package’ shall include broad-based ‘decision-

making, facilitation and support' to the Clients in the process of preparing and presenting recommendations to the GOO and (once GOO decisions are made) in subsequent implementation of the accepted package. This will also require the Consultants to provide assistance for legislative, drafting and/or development of documentation of a legal and/or statutory nature.

The Tasks Comprising the Assignment, as per the ToR are:

i. Revision of Works Code and Manual;
ii. Road Sector Policy and Strategy;
iii. Re-organisation and Strengthening of OWD*;
iv. OWD Staff Training and HRD*;
v. Road Safety Engineering and Planning;
vi. Road Network Master Planning;
vii. Future Roads Management Funding;
viii. Road Toll Collection and Management;
ix. Vehicle Axle Load Regulation and Management; and
x. Future Road Sector Institutional Options.

***** The sequence of these tasks and their descriptions has been changed in the revised IR. The Re-organisation and Strengthening has been brought to sl. 3, to be followed by Training and HRD. The rationale of changing the sequence is, that until the concepts of re-organisation of the road departments have been worked out and their staffing have tentatively been planned, training can then be only planned and not earlier. Since it will depend on planning of departments, no. of staffs and their revised job profiles.

1.5. Presentation of Inception Report

The IR has been developed in accordance with reporting requirement provided in Appendix B of the Contract Agreement. It has been laid out as below. An additional section on 'Risk and Challenges of Project and Assignment' has been added as desired by Client. Refer to letter no. ICT:660:OR:45, dated 12 September 2012, giving details to the preliminary discussions of IR held on 11 September 2012.

- Section 1: Project Background
- Section 2: Overview of Road Sector in Odisha
- Section 3: Revision of Works Code and Manual
- Section 4: Road Sector Policy and Strategy
- Section 5: Reorganisation and Strengthening of OWD
- Section 6: OWD Staff Training and HRD

- Section 7: Road Safety Engineering and Planning
- Section 8: Road Network Master Planning
- Section 9: Future Roads Management Funding
- Section 10: Road Toll Collection and Management
- Section 11: Vehicle Axle Load Regulation and Management
- Section 12: Future Road Sector Institutional Options
- Section 13: Work Plan
- Section 14: Staffing Schedule
- Section 15: Reporting and Schedule of Deliverables
- Section 16: Risk and Challenges of Project and Assignment

1.6. Mobilisation

Having signed the contract agreement with OWD on 16 March 2012, the Consultant's consortium comprising of ICTPL in joint venture with Grant Thornton Advisory Pvt. Ltd. (GT-APL) and in association with ARKITECHNO Consultants (India) Pvt. Ltd., have mobilised w.e.f. 9 April 2012 and commenced their services.

The project office has been established at the address given below:

Project Office

Plot No: N-3/91, IRC village,
Nayapalli, Bhubaneswar-751 015, Odisha, India
Tel.: 0674-2557204
Fax: 0674-2557204
E-mail: orissa@ictonline.com
Web: www.ictonline.com

1.7. Preliminary Meetings and Consultations

Soon after the mobilisation, the Consultants commenced the process of interaction with various stakeholders. Some of the important meetings, which took place during the Inception Period, are:

• Chief Engineer (CE) WB and OWD Staff	9 and 10 April 2012
• IT-ICT Consultants	17 April 2012
• Asset Management System Consultants	17 April 2012
• Engineer-in-Chief (EIC) cum Secretary (Works), GOO	21 April 2012
• WB Officials	26 April 2012
• Steering committee, headed by Development Commissioner, GOO	22 May 2012
• ISAP Working Group Meeting	26 June 2012
• WB Mission Discussions	19–24 July 2012

- Discussions on submission of IR covering: 11 September 2012
  - Compliance Matrix of observations made by World Bank
  - Revised Work Plan
  - Modified Staffing Schedule

Besides the above meetings, the Key Professionals have continued their one-on-one meetings with other Road User Groups regularly. To mention a few:

- Tourism Department
- CE, Rural Roads
- CE, NH
- CE (Buildings)
- Chief Architect
- EIC (Civil)
- CE (Roads)

To collect the data and assess the issues involved in road safety engineering and planning and road network master planning, the key experts have carried out following consultations:

- 11 April 2012 – Met with Asset Management Consultants, LEA Associates South Asia Pvt. Ltd. (LASA) to collect data
- 12 April 2012 – CE, NHs Division, GOO
- 12 April 2012 – CE, Rural Development Department (RDD), GOO
- 17 April 2012 – Attended the workshop conducted by IT/ICT Consultant and had interactions
- 17 April 2012 – OWD Secretary to have a brief introduction to the project objectives
- 8 May 2012 – Meeting with officials of Transport Department, Bhubaneswar
- 9 May 2012 – Meeting with Mr. Nirmal Kumar Sahoo, Director, Office of Transport Commissioner, Cuttack
- 9 May 2012 – Meeting with Inspector General (IG), Crime Branch, Cuttack to collect accident data
- 10 May 2012 – Director, Department of Mines
- 11 May 2012 – Director, Survey of India, Bhubaneswar
- 19 May 2012 – Secretary, RDD
- 6 August 2012 – CE (WB) and OWD Staffs regarding Network Planning

These interactions have been of immense help to assess the existing situation, so as to plan the Way Forward to perform the assignment.

SECTION 2

OVERVIEW OF ROAD SECTOR IN ODISHA

2. Overview of Road Sector in Odisha

2.1. Development of Road Sector Infrastructure in Odisha

In the absence of adequate rail network in Odisha, Roads have been crucial in providing connectivity to cities and rural areas and have witnessed a growth aggregating to a length of 249,642 km by the end of 2010–11. The road network of the State is depicted in **Figure 2-1**, which consists of NHs, SHs, and MDR and Village/Rural roads detailed of the respective lengths in the state are presented in **Table 2-1***(p-10)*.

Figure 2-1: Odisha Road Network

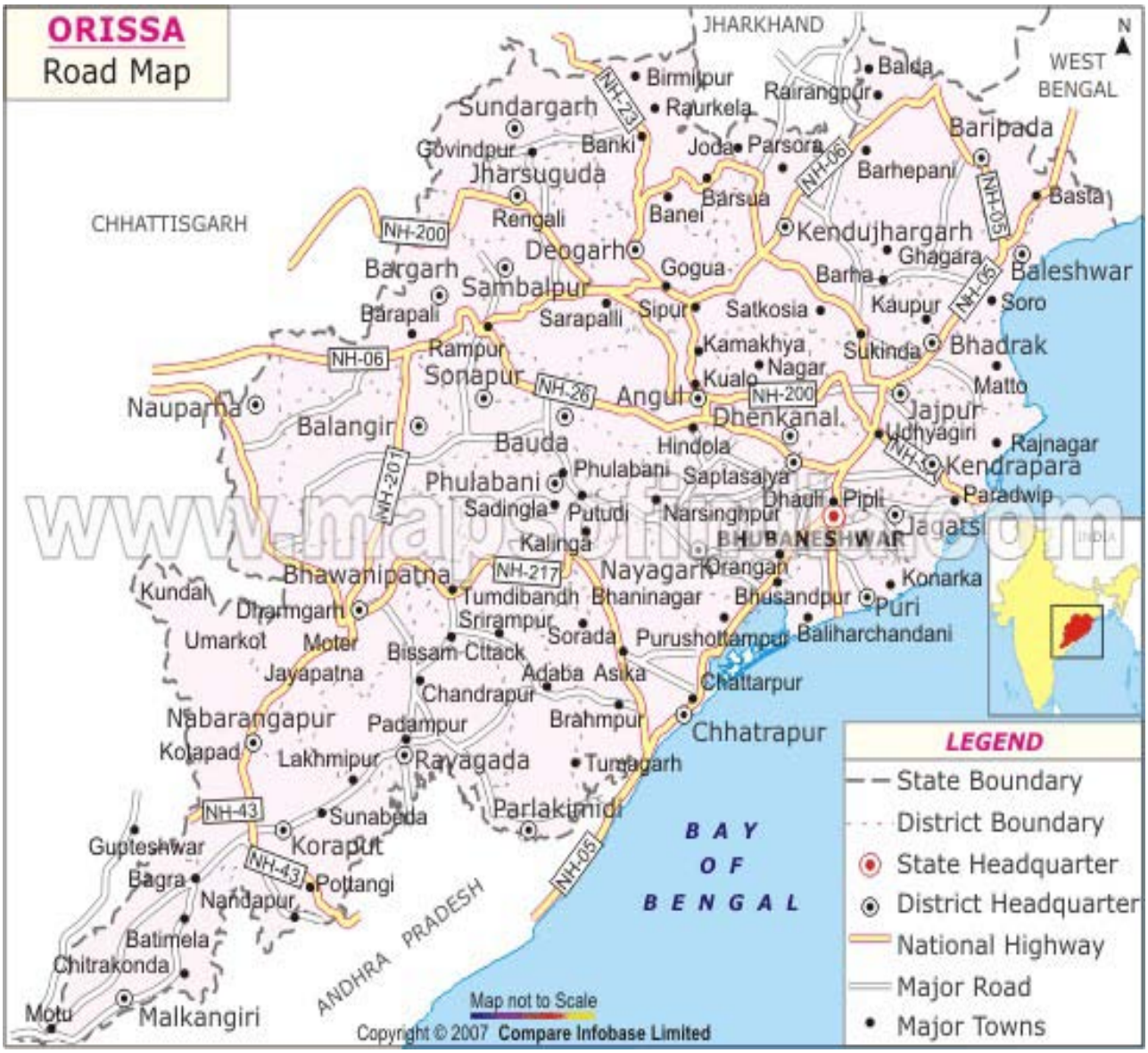


Table 2-1: Road Length in Odisha as on March 2011

Road Category	Responsible Agency	Length (km)
National Highways	National Highways Authority of India	1,070
	Works Department	2,524
Express Highways	Works Department	18
State Highways		3,640
Major District Roads		4,119
Other District Roads		6,808
Rural Roads	Rural Development Department	27,967
Panchayat Samiti Roads	*Panchayat Raj* Department	25,702
Gram Panchayat Roads		145,368
Forest Roads	Forest Department	7,469
Urban Roads	Urban Development Department	18,590
Irrigation Roads	Irrigation Department	6,277
GRIDCO Roads	Electricity Department	88
Total		**249,642**

Source: Economic Survey Odisha, 2011–12.

However as per 12th draft Five Years Plan (FYP) document the total length of the roads in the state as on March 2012 is 2,58,589 km which is about 6.10% of National Road network. Total length of road under Works Department of the State is **18,512.672** km (which is about 7% of the total road length in the State) out of which and **3,594.162** km NHs and **14,918.510** km State roads.

2.2. Density of Roads in the State

Road density a measure of the extent of connectivity in a region, is usually defined as the total length of all Roads per 100 km^2 of area. In 2004, the total road length per 100 square kilometer was recorded at 137 km as compared to 81 km at the national level, and the road length per million population in the State was estimated at 58 km, which was higher than the national average of 26 km. By 2010–11, road length per 100 km^2 in Odisha has increased to 161 km. Odisha fares better than the all India average of road density. However as per draft 12th FYP document the density of road has increased to 166.07 km/100^2 km as on March 2012.

2.3. Road Sector Developments during 11th FYP

2.3.1. Eleventh Five Year Plan

During the 11th FYP (2007–08 till 2011–12), OWD formulated its target for improvement of 4,500 km of road stretches and construction of 52 bridges with a financial outlay of Rs. 1,945.84 crore. Under zero based budgeting procedure, OWD had undertaken projects under different schemes on priority basis, which as conceived were supposed to provide quick results to the satisfaction of the users as well as completion of substantial number of major ongoing bridges and road projects.

The physical and financial achievements during the year 2007–08 to 2011–12 of 11th FYP are presented in **Table 2-2** *(p-12)* and **Table 2-3** *(p-13)* respectively. The annual plan for 2012–13 provides an allocation of 1,063.9 Crores for OWD. During this plan period construction of 64 Bridges, 3 ROBs and improvement of 3,354 km length of road in different stretches have been completed.

2.3.2. Road Development Programme (State Plan Normal)

Under normal State Plan, funds have been provided for construction of railway over bridges, flyovers, bridges, improvement of important roads, provision for land acquisition, capacity building, etc. During 11th FYP construction of 18 Nos. of Bridges, 3 Nos. of ROB and improvement of 224.9 km road have been completed. The anticipated expenditure during this period was Rs. 851.73 Crore. During 12th FYP, it is proposed to improve 1,075 km of road length and completion of 25 Nos. Bridges, 10 Nos. of ROB/Flyover at cost of Rs. 2,400 Crores.

2.3.3. NABARD – RIDF Assistance

Loan assistance from NABARD through its Rural Infrastructure Development Fund (RIDF) has been a major source of funding of the road and bridge projects in the State. By end of December 2010, a total road length of 2,160 km has been improved under NABARD – RIDF assistance. During 11th FYP (from 04/2007 to 03/2012) 125 Nos. of road projects with potentiality of 1,811.070 km at an estimated cost of Rs. 1,465.67 Crore and 35 Nos. of Bridges at an estimated cost of Rs. 690.20 Crore were sanctioned. Out of this 43 Nos. of road projects with 560 km at Rs. 372 Crore and 5 Nos. of Bridge projects with expenditure of Rs. 21.41 Crore have been completed. During the 12th FYP, it is proposed to complete 40 Nos. of Bridges and to improve 1,750 km road length in different roads with allocation of Rs. 3,000 Crores under NABARD assistance.

2.3.4. Road Improvement in KBK Districts

KBK Districts of Odisha consists of – **K** - Kalahandi, Nuapada; **B** - Bolangir, Sonpur; **K** - Koraput, Rayagada, Malkanagiri and Nawarangpur. The KBK Districts account for 19.80% population (as per 2011 Census) and 30.60% geographical area of the State. 89.95% people of this region still live in villages. Tribal communities dominate this region.

Table 2-2: Physical Achievements during 11th FYP relating to Road and Bridge Projects

Target: Completion of Bridge: 52 Nos.
Improvement of Road: 4,500 km

Sl. No.	Scheme	NABARD		General State Plan		CRF		KBK		ISC and E&I	ACA		ROB	EAP	Total	
	Year	No. of Bridge	Road in km	No. of Bridge	Road in km	No. of Bridge	Road in km	No. of Bridge	Road in km	Road in km	No. of Bridge	Road in km	No.	Road in km	No. of Bridge	Road in km
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	2007–08	10	351.225	2	0.000	1	118.110	3	28.400	58.690	0	48.960	0	0	16	605.385
2	2008–09	12	265.134	0	0.000	0	102.060	2	55.600	39.700	0	72.200	1	0	15	534.694
3	2009–10	5	295.905	4	45.000	2	113.614	0	5.000	50.000	0	60.000	2	0	13	569.519
4	2010–11	5	637.882	4	81.136	1	87.279	1	17.580	35.850	0	94.914	0	31.360	11	986.001
5	2011–12	2	364.851	8	98.778	0	42.550	1	20.755	18.530	1	81.906	0	31.640	12	659.010
	Total	**34**	**1,914.997**	**18**	**224.914**	**4**	**463.613**	**7**	**127.335**	**202.770**	**1**	**357.980**	**3**	**63.000**	**67**	**3,354.609**

Source: Draft 12th FYP Document, GOO.

Table 2-3: Financial Achievements during 11th FYP relating to Road and Bridge Projects

Financial target for 11th FYP Period: Rs. 1,94,584 Lakhs							Rs. in Lakhs
Sl. No.	Scheme	2007–08	2008–09	2009–10	2010–11	2011–12	Total
1	2	3	4	5	6	7	8
	PLAN						
1	Rural Infrastructure Development Fund (RIDF)	16,603.21	19,483.05	28,132.03	35,551.61	32,871.77	1,32,641.67
2	General State Plan	1,357.52	25,618.33	12,735.86	24,241.56	21,220.16	85,173.43
3	Central Road Fund (CRF)	6,656.48	15,184.79	7,391.11	5,218.04	4,856.56	39,306.98
4	One Time Additional Central Assistance (ACA)	3,424.34	4,852.95	4,819.21	6,796.61	6,181.39	26,074.50
5	State Support (S/S) of CSP (E&I)	669.84	1,357.46	3,330.55	5,246.22	5,330.31	15,934.38
6	EAP	1,405.57	5,001.09	3,369.69	9,402.97	7,495.63	26,674.95
		30,116.96	**71,497.67**	**59,778.45**	**86,457.01**	**77,955.82**	**3,25,805.91**
7	KBK	840.10	1,444.20	142.38	1,003.00	1,320.56	4,750.24
	Total	**30,957.06**	**72,941.87**	**59,920.83**	**87,460.01**	**79,276.38**	**3,30,556.15**
8	Central Support (C/S) for CSP (E&I)	3,160.41	1,957.49	2,199.96	2,660.58	3,302.04	13,280.48
9	Central Plan (ISC)	1,696.08	1,451.92	700.98	671.97	274.18	4,795.13
	Total	**4,856.49**	**3,409.41**	**2,900.94**	**3,332.55**	**3,576.22**	**18,075.61**
	Total of PLAN	**35,813.55**	**76,351.28**	**62,821.77**	**90,792.56**	**82,852.60**	**3,48,631.76**

Source: Draft 12th FYP Document, GOO.

In order to boost the socio-economic condition of people of KBK Districts, GOO has taken effective steps to provide better connectivity as well as to improve existing roads. OWD has been entrusted to take up road connectivity programme under RLTAP for KBK Districts. The details of projects taken up and achievements under RLTAP are given in the **Table 2-4**. During 11th FYP (from 04/2007 to 03/2012) 41 Nos. of road project with potentiality of 113.450 km and 4 Nos. of Bridge Projects, 8 Nos. Culverts at a provision of Rs. 99.52 Crore has been taken up. Out of this 40 Nos. of road projects with 111.45 km., 8 Nos. CD works with an expenditure of Rs. 96.94 Crore have been completed. All 4 Nos. Bridge Projects are in progress as on March 2012. It is proposed to complete 5 Nos. Bridges and improvement of 75 km road length with an allocation of Rs. 84.05 Crore in 12th FYP.

Table 2-4: Achievements under RLTAP for KBK Districts

Sl. No.	RLTAP (KBK)	Amount (Rs. Crore)	Bridge (Nos.)	Road (km)
1	Project taken up with Financial allocation from 2001–02 to 2009–10	105.23	30	576.9
2	Financial and Physical Achievement upto 2009–10	94.65	23	493.59
3	Financial and Physical Target for 2010–11	14	3	30
4	Financial and Physical Achievement made upto December 2010 during 2010–11	5.17	0	0

Source: Activity Report, 2010–11, OWD, GOO.

2.3.5. Rural Roads under *Pradhan Mantri Gram Sadak Yojana* (PMGSY)

PMGSY was launched on 25 December 2000 as a fully funded Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country. The State has completed 5,566 roads of 21,398 km length out of the sanctioned length of 29,875.12 km with an expenditure of Rs. 7,913.92 Crores as on 31st March 2011. Out of 21,398 km of completed roads, 15,841 km were blacktopped and 4,073 km concrete roads. These roads provided all weather connectivity to 7,448 habitations.

During 2001–02, 27.84 km road were constructed with an expenditure of Rs. 36.3 Crores. Whereas during 2010–11, 1,486 roads of 4,941 km length were completed with an expenditure of Rs. 1,924 Crores. There has been almost five fold increase in fund utilisation over last five years. While in 2001–02 the financial achievement under the scheme was Rs. 36.34 crore, it reached Rs. 377.37 crore in 2005–06 and Rs. 1,924.25 crore in 2010–11. There has been a steady increase in investments over last ten years indicating a 53 fold increase by 2010–11.

PMGSY became a part of '***Bharat Nirman***' in 2005–06 to provide all weather connectivity to unconnected habitants with a population of 1,000 or more in plane areas and 500 or more in hilly and tribal areas.

2.3.6. Central Road Fund

Funds are also available from GOI as Central Grants. Road and bridge projects sanctioned under Central Grants and progress attained are presented in the **Table 2-5**. During 11th FYP (from 04/2007 to 03/2012) 39 Nos. of road projects with potentiality of 347.105 km at estimated cost of Rs. 489.44 Crore and 1 No. of Bridge at estimated cost of Rs. 3.44 Crore was sanctioned. Out of this 27 Nos. of road projects with 229.210 km at Rs. 240.47 Crore and 1 No. of Bridge projects with expenditure of Rs. 3.78 Crore have been completed. It is targeted to improve 300 km road length at an allocation of Rs. 603.26 Crore proposed for the 12th FYP.

Table 2-5: Central Road Fund Allocation

Sl. No.	Central Road Fund	Estimated Cost (Rs. Crore)	Bridge (Nos.)	Road (Nos.)
1	Project sanctioned under Central Road Fund from 2001–02 to 2009–10	558.07 (Govt. of India Sanction)	21	143
2	Financial and Physical Achievement made upto 2009–10	345.92 (Expenditure)	19	125
3	Financial and Physical Target for 2010–11	75.62 (Budget provision)	2	10 (Completion of 70 km of road length)
4	Financial and Physical Achievement made upto December 2010 during 2010–11	28.42	0	06 (Completion of 43.99 km of road length)

Source: Activity Report, 2010–11, OWD, GOO.

2.3.7. One Time Additional Central Assistance (ACA) for Tourism Importance Road

Odisha is an attractive Trove House of Cultures, Customs and Traditions, languages and literature, Art and Architecture. Odisha truly bears the essence of India. Its ancient grandeur is un-matched. While contemporary scene is encouraging the future holds great promise on several counts. Vigorous pursuit on Tourism activities in the State shall not only help in economic progress of the State but also provide employment to its youth on sustained basis.

For providing a better connectivity to places of tourist importance/cultural heritage and to attract the tourists from various parts of the World, Government have taken conscious steps for improvement and strengthening of the roads connecting such places by providing one time assistance under this scheme.

During 11th FYP (from 04/2007 to 03/2012) 84 Nos. of road project with potentiality of 465.990 km at estimated cost of Rs. 314.07 Crore and 2 Nos. of Bridge at estimated cost of Rs. 8 Crore was sanctioned. Out of this 37 Nos. of road projects with 236.456 km at Rs. 158.63 Crore have been completed and 1 No. Bridge project with cost of Rs. 2 Crore have been completed. Other projects are

in progress. It is targeted to improve or maintaining 350 km road length at a cost of Rs. 600 Crore proposed to be allocated in the 12th FYP.

2.3.8. Centrally Sponsored Scheme of State Roads

GOI has sanctioned nine road projects under this scheme with 50:50 share of State and Central Government with an estimated cost of Rs. 333.69 crore till end of December 2010. Out of the nine projects, seven projects have been completed by the end of December 2010. Till the end of 2009–10, 98.18 km road length with an expenditure of Rs. 136.64 crore was completed. During 2010–11, 16.50 km road length has been completed with an expenditure of Rs. 53.31 crore.

2.3.8.1. Economic Importance (E&I)–(CSP)

During 11th FYP (from 04/2007 to 03/2012) 5 Nos. of road projects with potentiality of 135.680 km at estimated cost of Rs. 361.46 Crore were sanctioned. Out of this 3 Nos. of road projects with 19.700 km at Rs. 17.51 Crore have been completed during this period and other 2 projects are in progress. Out of above 1 No. of road project of 91.180 km with estimated cost of Rs. 302.09 Crore is expected to be completed during the year 2012–13. It is targeted to complete 74 km of road if commensurate grant amounting to Rs. 150 Crore is received from Central Government for different roads during 12th FYP period.

2.3.8.2. Inter State Connectivity – ISC (CP)

During 11th FYP (from 04/2007 to 03/2012) 3 Nos. of road projects with potentiality of 23.300 km at estimated cost of Rs. 19.65 Crore were sanctioned. All the three projects involving improvement of road of 23.300 km with an expenditure of Rs. 19.84 Crores have been completed.

Under Special Central Assistance during 11th FYP period, 4 Nos. of road projects were taken up for improvement of 51.70 km of road length at a sanction cost of Rs. 100 Crore. All the projects were part of Vijayawada Ranchi Corridor which has been completed.

2.3.9. National Highways (NH)

Construction of NH passing through the State is entrusted to the office of the CE, NH. NH projects are sanctioned and funded by MoRT&H, GOI. **Tables 2-6** *(p-17)* and **2-7** *(p-17)* below provides the number of projects sanctioned and progress achieved under the projects during 11th FYP.

2.3.10. Odisha State Road Project (OSRP)

Under the WB loan agreement for the OSRP, an amount of US$ 250 million has been provided. The loan has a funding ratio of 80:20 between the WB and the State Government. The major funding is for construction, improvement and strengthening of roads. About 461 km of busy corridors of the State have been identified under OSRP in the first phase at an estimated cost of Rs. 1,431 crore.

Table 2-6: Projects Sanctioned during 11th FYP of Odisha

Year	Number of Jobs Sanctioned	Sanctioned Amount (Rs. Crore)
2007–08	30	207.32
2008–09	82	548.66
2009–10	23	664.96
2010–11	10	76.21
2011–12	12	80.54
Total	**157**	**1,377.69**

Source: Office of CE, NHs.

Table 2-7: Achievement on NH Sector during 11th FYP (2007–12)

Sl. No.	Nature of Works	2007–08	2008–09	2009–10	2010–11	2011–12	Total
1	Expenditure under NH(O) works (Rs. Crore)	138.87	208.84	313.12	328.4	273.75	1,263
2	Widening to two Lane (km)	23.35	60.71	171.126	106	74.3	435
3	Strengthening of existing pavement (km)	19.29	43.6	115.76	95	50.293	324
4	Improvement of riding quality (km)	182.95	96.25	134.81	76	80.955	571
5	Construction of Missing Link (km)	16.93	1.8	0	0	0	19
6	Re-construction of Bridge (Nos.)	2	5	1	1	1	10

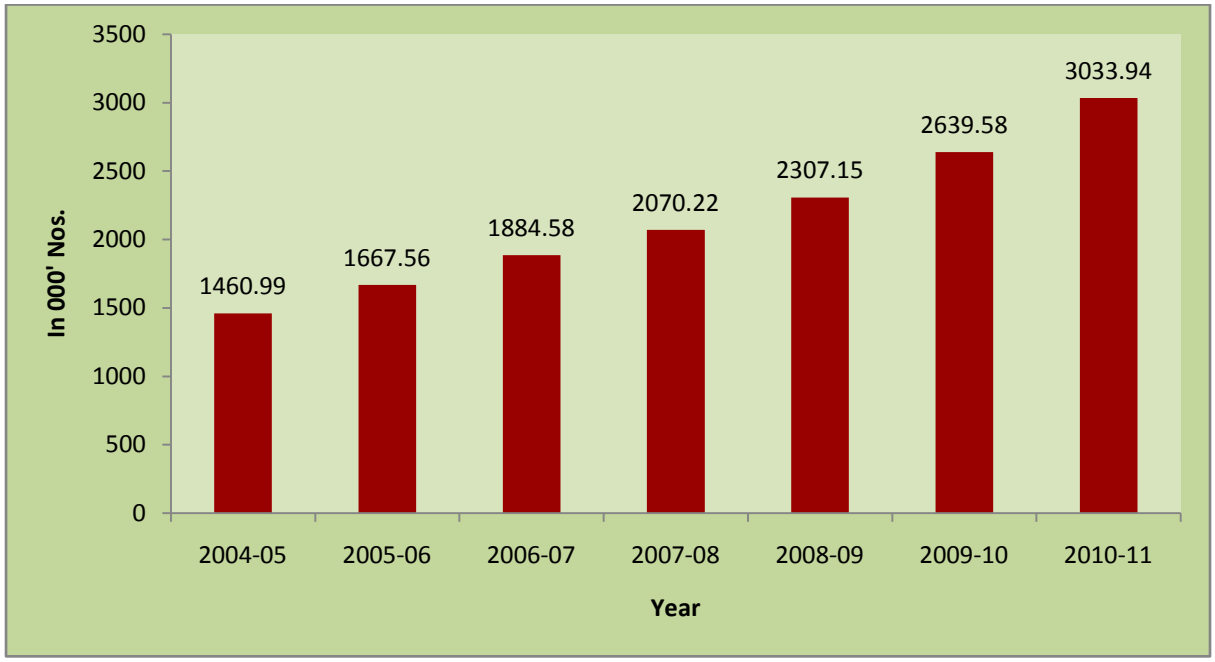
Source: Office of CE, NHs.

2.4. Road Transport

2.4.1. Number and Composition of Vehicles on Roads

The total numbers of vehicles on roads in Odisha has been 3,033,940 as on March 2011. Out of these 80.9% has been Two Wheelers, 1.8% Autos, 6.2% Cars, 5.6% Goods Vehicle, 3.7% Tractor and Trailors, 0.4% Buses and 1.4% other vehicles. As roads have expanded, so have their uses. There total numbers have been only 1,460,990 in 2004–05 showing a rise of another 110% during last six years. The changes in vehicles on roads in Odisha are presented in **Figure 2-2** *(p-18).*

Figure 2-2: Vehicles on Roads in Odisha – 2004–05 to 2010–11



Source: Economic Survey Odisha, 2011–12 (223P).

2.4.2. Policy and Administration

Odisha is the leading state in India to enunciate the State Transport Policy 2007. The main objectives of this policy are to increase competition, improve efficiency, transparency, access and availability of transport services and support development of user friendly roads so as to evolve an improved transport system. The policy included forming regulatory and institutional mechanism.

2.4.3. Road Safety

High growth of vehicles combined with poor driving skills and deficient road infrastructure have led to increasing number of accident in the state. 9,395 road accidents were recorded during 2010, claiming 3,773 lives as against 8,827 accidents and 3,491 lives during 2009. The state government through State Transport Authority (STA) implements road safety measures.

2.5. Institutional Stakeholders in Road Sector

2.5.1. National Government Organisations and Linkages

2.5.1.1. Ministry of Road Transport and Highways (MoRT&H)

The MoRT&H is a Central Agency which is responsible for the development, formation and implementation of policies and programs relating to transport with the exception of railways and civil aviation. MoRT&H has 5 Wings within its structure, one of which is the Roads Wing. The Roads Wing deals with all matters concerning NHs, including externally aided projects. Works on NHs

including maintenance, but excluding those handed over to the NHAI are carried out by OWD in Odisha.

There are three Central Government departments with links to the Roads Wing of MoRT&H:

- Planning Commission. This Transport Division of Planning Division sets the guidelines and overall priorities for preparation of annual and five year NH Plans by MoRT&H
- The Ministry of Finance which is concerned with all economic and financial policy matters. It provides funding for NHs and approves expenditures on projects
- The Ministry of Environment and Forest (MoEF) provides clearances for projects prior to their implementation

In addition to undertaking works on NHs by agreement with MoRT&H the OWD interacts with MoRT&H by providing advice on road design, construction and routine maintenance practices on NHs in Odisha.

2.5.1.2. National Highways Authority of India (NHAI)

The NHAI was established as a result of Act of Parliament of 1988 with the primary objective to address the inefficiencies caused by the execution of NH works by states on behalf of MoRT&H. It was constituted in 1994 and became operational in 1995. The objectives of the NHAI are to:

- Develop, maintain and manage the highways entrusted to it
- Construct workshops and facilities at or near highways vested in it
- Construct buildings and townships for its employees
- Regulate and control vehicles on highways entrusted to it
- Develop and provide consultancy and construction services and carry out research in relation to the development, maintenance and management of highways
- Provide facilities and amenities for the users of the highways vested in it
- Form one or more companies under the Companies Act, 1956
- Engage or entrust any of its functions to any corporation or body owned or controlled by the Government
- Advise on such terms and conditions as may be mutually agreed upon by any State Government in the formulation and implementation of schemes for highway development
- Collect fees on behalf of the Central Government for services rendered under Section 7 of the NHs Act

Like all other states Odisha too has its NH office located at Bhubaneswar (Capital of Odisha) to take care of NH projects.

2.5.2. State Government Road Sector Organisations and Linkages

The maintenance, improvement and development of the Odisha road network is managed by a number of state government and district level organisations each with its own well defined road network responsibility and operational support structures to carry out planning and engineering activities. Each entity follows its own set of economic and social policy objectives and directions in delivering road user access services to urban and rural communities.

The organisations involved include:

- Odisha Works Department
- State and Local Government Organisations
- Private sector

By and large GOO road sector policy as it relates to coordinated development is principally left to each entity to manage and implement. Little if any coordinated road development planning, investment coordination and prioritisation is undertaken, each entity preferring to make and take its own decisions in isolation to the investment priorities being proposed and implemented by others. This inherent lack of planning and coordinating linkages between the different organisations within the roads sector has in the past fostered and reinforced extensive duplication of road provision activities resulting in limited opportunities for the GOO to take full advantage of economies of scale and the benefits of private sector competitive environments.

2.5.2.1. Odisha Works Department (OWD)

The functions and responsibilities of OWD, as given in the Odisha Public Works Department (OPWD) Code, are as follows:

- Construction, repair and maintenance of buildings, roads, bridges and other related structures financed from the State and capital budget allocations in Odisha;
- Execution of original, renewal and repair works of the NH network financed through MoRT&H after levying agency charges at the rates agreed between GOI and the GOO. Construction of buildings, roads and bridges (R&B) as relief works in the event of floods, cyclones or other natural disasters;
- Ensuring that no encroachment or structure, whether temporary or permanent is erected on the land and property under the control of OWD. It is also responsible for removal of such encroachments as per GOO rules; and
- Maintaining a register of land, buildings and properties belonging to the GOO and under the administration of OWD.

Therefore main function of the OWD is to maintain, improve and develop Odisha's SHs, MDRs and ODRs for the economic and social benefit of the State's population. In addition to its own responsibilities, OWD further maintains and improves most of NHs passing through the State and the Expressway on behalf of the GOI and MoRT&H. OWD's new road development activities include road

and bridge construction projects such as municipal roads, rural R&B, projects funded by RIDF of the National Bank for Agriculture and Rural Development (NABARD), Central Road Fund (CRF) etc.

OWD is also involved in undertaking building construction works on behalf of other government departments across Odisha as well as maintaining non-residential buildings and residences.

2.5.2.2. Rural Development Department (RDD)

The function of the RDD is to provide improved water supply and transport communications to Odisha's 51,057 rural communities. The total length of road under its administrative control is 29,220 km out of which 8,610 is bitumen and 12,613 km is metalled and 7,999 earthen/*moorum*. This road network does not include roads within the village block or boundary or the access roads between the village and *Panchayat* administrative offices. The RDD receives its main funding from the GOO and under NABARD-RIDF.

The department has constituted Odisha State Rural Road Agency (**OSRRA**) by an resolution in May 2003 for implementing PMGSY in the state.

2.5.2.3. Panchayat Raj

Article 40 of the Constitution of India states 'The state shall take steps to organise village *Panchayats* and endow them with powers and authority as may be necessary to enable them to function as units of self- government.' Within Odisha the *Panchayat Raj*'s role is that of facilitator of rural local self governance as prescribed by the Constitution. This self governance is exercised through 30 Administrative Districts, 314 Blocks, and 6234 Panchayats (covering about 51394 villages as per 2001 census). The *Panchayat Raj* Department (PRD) is responsible for *Panchayat Raj* roads, which are mostly earthen with a *moorum* sub-base at few sections. These roads are generally of a lower standard than the VRs of RDD

The important scheme supported by the *Panchayat Raj* relating to the provision and maintenance of accessible road networks that is relevant to this study is the Development Works Programme. Three subprograms are funded under the umbrella of the Development Works Programme that support PS (*Panchayat Samiti*) and GP (*Gram Panchayat*) road network development. Although the standard of road maintained under the administration of the PRD is considered to be poor in terms of geometry and drainage, the roads are trafficable for low volumes of motorised and non-motorised vehicles.

There is little formal planning interaction between the PRD and the OWD or RDD although some interaction occurs on an informal basis with each organisation pursuing its own development priorities. This suggests that transport and access bottlenecks are could occur where each organisation places a different emphasis on access priorities on sections of the same road on linking roads.

2.5.2.4. Department of Finance

The key functions of the Finance Department (FD) mainly include preparation of the State budget, mobilisation of funds from revenue and other sources and disbursement of funds to various

departments. The State Budget includes both Plan expenditures and Non-Plan expenditure such as expenditure for recurrent RM and establishment costs including salaries and upkeep of buildings, procurement of tools and plant etc.

The FD determines the Non-Plan expenditure on the basis of the previous year's expenditure allocation plus a small increase to take account of increased costs and scope of maintenance works. To assist the FD in establishing its various recurrent cost allocations, the GOI provides a set of unit costs or 'norms' that represent the theoretical cost to maintaining a road so as to prevent further deterioration at various levels of traffic density. Because road condition information is not used in deriving these norms they do not necessarily reflect the true cost of maintaining the roads. In any case, since the State Government is not able to raise sufficient revenue to satisfy its full expenditure needs (that includes its current high overhead costs) the OWD receives less that the recommended 'norm' for recurrent works.

2.5.2.5. Planning and Coordination Department (P&CD)

The P&CD is the Governments planning co-ordination agency for new infrastructure. It is primarily responsible for preparing the Annual State Plan in consultation with each individual department. The consultant was advised that the GOO does not have a planning policy for roads or for the majority of Civil Service Departments but does apply a number of norms to assess needs. Apart from the norms mentioned above there does not appear to be any established methodology/formula based on socio-economic analyses for the funding of new works or prioritising projects between individual departments. The absence of socio-economic analyses and rates of return on investment costs makes it very difficult for the P&CD to objectively review the relative priorities of projects within individual departmental programs. However, it was recognised that even with the necessary justification information it would be difficult to evaluate priorities between various departmental submissions due to the difficulty in quantifying all costs and benefits.

2.5.2.6. Housing and Urban Development Department (HUDD)

There are a total of 103 municipal authorities (2 Corporations, 34 Municipalities and 67 Notified Area Councils) in Odisha which are constituted under Section 4 of the Odisha Municipalities Act 1950 (as amended). Municipal authorities are responsible for the supply and upkeep of a large number of public services and access and upkeep necessary to provide 'adequate' public road access to residential, recreational and commercial areas. Under the GOI's municipal roads development and maintenance scheme the GOI through the provides up to 50% of the cost of upkeep works as grant-in-aid, with the balance being contributed by municipal authorities. In many cases NHs, SHs, MDRs and ODRs cross into municipal areas and pass through town and village centres. Interaction between urban authorities and the OWD, in the past has been limited to the development of urban bypass projects.

2.5.2.7. Special Purpose Networks

A number of government organisations maintain their own road networks that allow limited vehicle access for the management and operation of their activities. Although these roads are in effect owned and maintained as private roads, they are used from time-to-time for local travel. Since the

upkeep of these roads is the sole responsibility of the respective departments any planning and development coordination activities is generally not referred to the other road organisations. The lack of consultation between these organisations and the other road organisations is likely to be a problem at points where 'private' roads join or cross roads under the administration of other organisations as follows:

- No responsibility is taken for the damage caused to roads at points where trucks enter or cross an existing road from a private road
- Joining and crossing points are not planned in relation to traffic safety
- Roads under the administration of other organisations cannot be planned and maintained to take account of seasonal traffic would for example be generated from forestry output

The special purpose networks include:

- Irrigation roads (Water Resource Department): are roads that are developed and maintained to (i) provide transport access for dams and canals besides agricultural inputs and outputs to and from irrigation areas and (ii) to act as flood protection and control embankments for towns and villages.
- Forest roads (Forestry and Environment Department): though considered to be in an unsatisfactory condition, these roads provide vital access to support proper resource management and protection of forests, national parks and nature reserves from environmental and undesirable human impact.

2.5.2.8. Odisha Bridge and Construction Corporation (OBCC) Ltd.

The OBCC is a wholly owned construction agency of OWD under GOO. It was established by an Act of state Government in 1983 with a share capital of Rs 500 Crores to construct bridges. It subsequently expanded its activities to the construction of roads, buildings and power plants. In addition to steel fabrication and electrical works, it also has a unit for subsoil investigation and testing of soils and construction materials. The OBCC also collects toll fees on behalf of GOO throughout the state. It mainly subcontracts various works rather than in undertaking the work with its own resources in line with its mandate and has become a contracts manager, which is similar to duplication of mandate of OWD.

2.5.2.9. State Transport Authority (STA)

The STA is responsible for regulating transport within the road sector in Odisha. The head of the Authority is the Transport Commissioner who is based in Cuttack. The Authority has both statutory and administrative functions. The STA's statutory functions are derived from the MV Act. These functions include vehicle registration, driver licensing and enforcement. Administration of the STA is carried out through 3 zones each headed by a Deputy Commissioner with 18 Regions within each zone. Revenue collected in these Regions include vehicle taxes, registration fees, licensing charges, permit fees, and fines. The Transport Commissioner reports to the Ministry of Commerce and Transport. The Secretary for Transport within the Ministry is a separate arm which is responsible for

all policy matters relating to the regulation of traffic such as loadings, licencing and registration as well as the control of road based public transport.

Although, accident attendance and reporting is a Police responsibility, however, STA generally attends accident scenes if vehicle faults are considered to be a contributing cause by the Police. STA impound vehicles considered to be unroadworthy. Therefore, STA has records of more than 90% of fatal and personal injury accidents. STA also collects some other information on type of vehicle involved, type of accident in broad categories and accident severity by road classification.

STA also undertakes road safety program supported by GOI in early January of each year.

On licensing, it was informed that tests for light vehicle licenses was not difficult and did not produce vehicle drivers that were reasonably competent and with a good knowledge of road law and safe driving habits.

On enforcement against overloaded or over-dimensional commercial vehicles, the Department uses a limited number of Government weigh-bridges as well as some private weighing facilities. Fines are defined under MV act.

2.5.2.10. Police Department (PD)

The PD operates under the State Home Department and within the roads sector it is responsible for enforcing traffic regulations, conducting investigations into traffic accidents and prosecuting offenders. In major urban areas there are separate traffic departments involved in traffic management and enforcement. In rural areas, traffic control is part of normal police duty.

2.5.2.11. Road Construction Industry

The last decade has seen in India a growth in terms of numbers and quality of the domestic contractors for undertaking road and bridge construction. This has been as a result of a number of externally aided highway projects. The liberalisation of the GOI's policy towards the import of specialised road construction plant and equipment has also given an impetus to the contractors to use modern mechanised methods of construction. The mandatory International Competitive Bidding (ICB) procedures for procurement of goods and services laid down by the foreign financial institutions encouraged participation of a number of joint ventures between domestic and overseas contractors. Though some of the joint ventures did have some weaknesses, they did contribute to the use of improved technology by the domestic contractors. In spite of the present growth in the number and quality of contractors, the Indian contracting industry is nowhere near the required capability and capacity to handle the ambitious highway works targets.

In Odisha, it was found through consultation with the sector that the growth of local contractors has not been at the same pace as in the all India scenario. The number of contractors, operating in Odisha, is far less compared to the requirements for its roads and bridge works. It was indicated that most local contractors don’t possess reliable plant and equipment fleets comprising heavy earthmoving machinery, crushers, graders, compacting equipment, paving equipment and the mixing plants with matching capacities to the paving equipment. While mechanisation is on the

increase, the majority of local contractors are only capable of small to medium road and bridge works.

2.5.2.12. Road Transport Operators and Users

The majority of road transport vehicles in Odisha, are privately owned and operated. The Odisha State Road Transport Corporation (OSRTC) has almost the entire publicly owned vehicle fleet in providing a long distance passenger bus service. Out of about 37,66,450 motorised vehicles (as on 31 March 2012) in the state about 80.2% are smaller two and three wheelers and there are about 2,40,000 goods vehicles and 24,350 buses. In addition to motorised vehicles there are relatively high numbers of road users who travel on rickshaws or who are cyclists or pedestrians. The differential in travel speed and vehicle mass within the typical traffic stream is high and a very significant factor which must be properly managed to improve the safety and efficiency of road travel.

Truck operations in Odisha are almost wholly privately owned with most operators owning a small number of trucks or being owner operators. The fragmented nature of the industry has mitigated against the development and articulation of an industry point of view to the community and to government. National bodies such as the All India Motor Transport Congress in affiliation with local ones such as the Truck Owners Association have begun to develop industry responses to road transport issues and to forward them to the GOO. These issues are principally about: Taxes and charges levied on the industry, Tolls, Road safety, Wayside facilities, Conditions of R&B, overloading and enforcement. Increasingly the industry is also seeking a much greater voice in the allocation of funds to roads and in how efficiently and effectively these funds are utilised by road authorities in providing road construction and maintenance services.

There are a total of about 12,264 buses in the state (March 2011), which translates to 29 buses per lakh of population compared with a GOI guideline of 21 buses per lakh of population as a desirable level of supply. Most of these buses are in private ownership.

2.5.2.13. Odisha State Road Transport Corporation (OSRTC)

The OSRTC is a government enterprise which provides bus services for long haul journeys generally in excess of 200 km and involving both intra and interstate travel. Like many government corporations in developed countries the OSRTC is losing money and market share. The OSRTC has a bus fleet of over 283 operational buses (fleet of 334), which constitutes about 2.3% of the total number of buses in Odisha. It is subjected to the same taxes and regulations as a private company. The OSRTC operates under the Road Transport Corporation Act of 1950 which is a Central Government Act.

Interaction between OSRTC and the OWD is isolated to certification of routes for fitness for bus travel. There is no interaction on matters such as route condition, road programmes and bus facilities.

The Institutional Development (ID) priorities and strategies of OWD have direct linkages and bearings with different Stakeholders in the State. While working on road ID plans for GOO/OWD, the opinions of Stakeholders, on plans, policies and strategies need to be incorporated. After careful

consideration of the list of Stakeholders provided by GOO {vide Letter No: PMU-(WB)-29/2012/12959 dated 17 April 2012}, the Consultant have updated the list and finally identified the following Stakeholders for intensive consultations as provided in **Table 2-8**.

Table 2-8: Major Stakeholders in Road Sector

Stakeholders	Focus Areas
Law Department	Formulation of bills, acts
Finance Department	Funding, Revenue generation accounting, Plan allocations
Planning and Co-ordination	Plan Approvals, Fund Allocation
Forest and Environment	Clearances
General Administration	HR, Policies
Commerce and Transport	Licensing, Design standards
Works	
Industries	Roads- Industrial
Urban Development	Municipal roads
Rural Development	Rural roads
Panchayat Raj	*Panchayat Raj* Roads
Mining (mining Corridor)	Master planning, Vehicle load
Tourism (Development Plans, Buddhist Corridor)	Master planning
Revenue, land records	Land acquisition
Education	Road safety
Transporters/Trucker's and Passenger Buses Representatives	Road safety, Vehicle load
Road Users, Public	Road safety
Water Resources	Irrigation Roads
Railways	Future Development Plans
Ports and Shipping	Future Development Plans
Home/Traffic Police	Data on Road Accidents

Source: Letter No: PMU-(WB)-29/2012/12959, dt. 17.04.12 of OWD.

2.6. Institutional Strengthening Initiatives

GOO in 2000 had commissioned an IDS Study to establish a vision for the road sector to reform and enhance the policies, capacities and resources in planning and management of road transport effectively. As a result an Institutional Strengthening Action Plan (ISAP) was prepared. The Institutional Developmental priorities and strategies for Odisha's Road Sector were developed keeping in view both the internal and external 'drivers' for change.

Internal Drivers (the pulls)

- Clear regulatory functions
- Stable expanded sources of funding both for improvement and maintenance
- An efficient and effective organisation structure
- Modern steam lined processes
- Integrated information system
- Shared vision
- Efficient core processes
- Trained main power HR policy
- Customer focus

External Drivers (the pressures)

- Optimum Capacity of the State Road network to cater for rapidly increasing the vehicle population
- Better quality roads
- Transparent and rationale approach for prioritising the road improvements
- Regulatory environment
- Improved road user safety to reduce casualties on the highways
- Better environment and minimising the environment impacts
- Efficient and effective construction industry
- Transparent procurement of works-e-procurement
- Strategy and guidelines for attracting private investment

Based on the critical analysis and detailed discussions amongst taskforce members, OWD Engineers and senior officials of GOO, the draft ISAP was submitted to GOO and WB. Thereafter, with certain modifications the final ISAP matrix was approved during May 2007, as provided in **Annexure 2.1**. With the approved ISAP matrix, the OWD finally developed a ToR for the present consultancy services (RSID) with ten components covering all the aspects of ISAP 2008–18.

SECTION 3

REVISION OF WORKS CODE AND MANUAL

3. Revision of Works Code and Manual

3.1. General

Execution of road projects involves a long chain of activities commencing with planning, survey and investigations, preparation of DPR, call of tenders, supervision and quality control during execution of work and maintenance. To be compatible with technical requirements consistent with modern designs and construction practice, it is essential in the government system that each project and staff follows standard processes, templates, formats, design parameters and methodology, quality assurance standards etc. To meet all these requirements, the States follow the standard codes and manuals for effective management of infrastructure projects. For roads works, these should be in accordance with the Indian Roads Congress (IRC) codes of practice and manuals besides sound engineering practices. For the State of Odisha, the Works Codes and Manual has not been updated for more than 30 years. As highlighted by EIC-cum-Secretary during a meeting with the Consultants held on 21 April 2012, revision of works code and manual is to be given highest priority, so as to reflect the best design and construction practices in the country.

The scope of work defined vide Appendix A of the Contract Agreement includes the following:

- Review existing OWD code and manual for updating of procedures, responsibilities and accountabilities in all works stages from project inception/planning to completion, in conformity/consistency with GOI and GOO accounting and audit requirements;
- Revision of provisions on dispute redressal mechanism(s) to acknowledge relevant 'complaints handling' and RTI Act aspects;
- Inclusion of new sections on PPP policy and guidelines, on Environment and Social (safeguards) Management, on e-procurement requirements and processes, on Construction Zone Safety guidelines and on Road Safety Engineering/Design requirements; and
- Assistance to OWD for completion of the (already underway) review/updating of contractual documents for all GOO procurement of goods, works and services, with their integration/cross-referencing in the contents of the revised Code and Manual where appropriate.

For overall development of the State, not only the OWD, but also all connected departments of GOO dealing with road sector works would have to jointly coordinate their functions within the regulatory framework of GOO so that development of the State is integrated. For this purpose, the policies, the powers, institutional and structural arrangements with their legislative framework should be in place to meet the requirements of OWD.

3.2. Background

An ISAP for 2008–18 has been endorsed by the GOO to guide Institutional Strengthening of OWD with a planned range of policy, capacity and resource improvement, financial management, audit and administration. Further, during recent years, organisations like Central Public Works

Department, Military Engineering Services, Railways and a number of State PWDs (Kerala, Karnataka, Gujarat etc.) have their works code and manual revised, which lay down the revised framework of policies, standards, responsibilities and powers for planning, contracting and execution of works.

With an all-round development in infrastructure and highway sector, the procedures and functioning of OWD needs to be updated in respect of organisational structure, procedures, power and other functional parameters for optimisation of performance. This has also become necessary from the point of view of lending agencies, i.e. domestic as well as international banks, who seek to ensure adopting modern management practices by the Clients.

Therefore, under RSID project, OWD included this aspect and plans to have its updated works code and manual for roads and buildings consistent with modern management principles, to meet the requirements of emerging scenario. RSID plans to deal with the issues related with modern day road sector developments and their integration for GOO. The concept of restructuring, strengthening and the revision of OWD manual, training and capacity building etc. are interrelated and therefore are intended to take into account various modern day developments and increased emphasis of GOO on specific aspects as being practiced by other successful infrastructure organisations.

To support such initiatives, GOO engaged the services of ICTPL and Associates to provide consulting services on RSID project and assist GOO/OWD in undertaking desired improvements. The Consultants have since then mobilised after receiving the commencement letter from Project Management Unit (PMU) for the above assignment. The key personnel had start-up meetings with the PMU and other staff concerned. The Consultants have obtained existing Works code and manual of GOO to undertake a detailed study and analysis. They have undertaken a desk study of existing works manual besides road network of Odisha; land data records, Right of Way (ROW) status of roads, inventory data of existing roads and other statistical data besides other studies like ISAP Study, Governance and Accountability Action Plan(GAAP) Study, HR Study, Draft Road Sector Policy, E-Procurement Policy, PPP policy etc.

3.3. Approach

The basic approach for revision shall be diagnostic and consultative involving following:

- Desk study–Review and Analysis
- Updation using analysis (by consultants) and experiences (best management practices) from other states
- Consultation, feedback, suggestions from stakeholders
- Integration and Finalisation

This ‘Works’ shall in general include both original works as well as maintenance and repair works mainly in relation to roads and buildings and the processes shall include planning to completion involving master planning, survey and investigation, budgeting, administrative approval, technical

sanction, expenditure sanction and allotment of funds, construction management, quality management etc.

3.4. Methodology

The methodology has been described in **Figure 3-1** *(p-32).* This mainly includes:

3.4.1. Desk Research

The OWD works code and manual shall be studied in-depth along with work codes and manuals of other states. Besides these, experiences in regard to all facets of policy development, project management (planning, implementation, monitoring etc.), resource management, organisational development etc. shall be studied in detail to identify potential hindrances emanating due to provisions laid down under OWD Code and Manual in improving efficiency, effectiveness and economy of various operations/functions. This shall provide the consultants with major areas (sections of OWD Manual and Code) requiring change/improvements as well as potential directions for improvements.

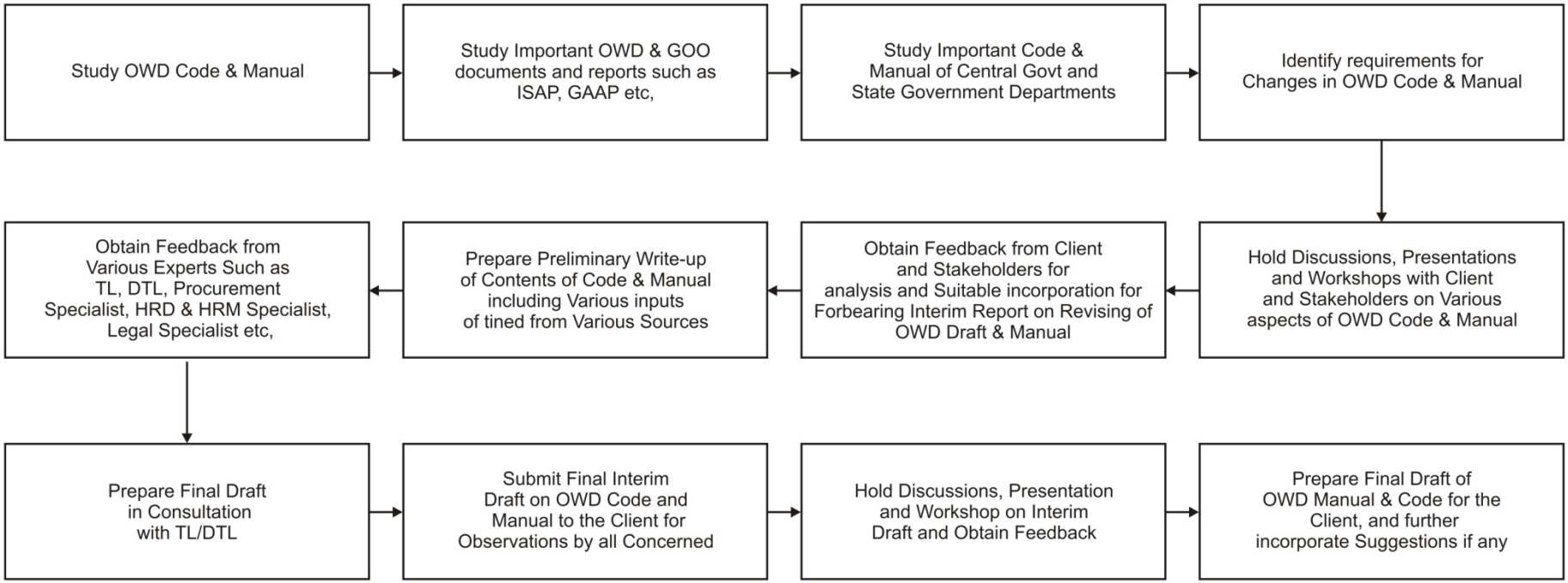
3.4.2. Identifying Reasons for Change

Based on review undertaken, major reasons for change in OWD Manual and Code could include:

- Integration of Management and Technological Changes (Construction Technology, Project Management, GIS, Asset management systems and Road Maintenance Management System (RMMS) etc.)
- Policy and Legal Changes (PPP policy, RTI Act etc.)
- GOI, IRC requirements/guidelines on road and/or building sector aspects
- Market changes (inflation, free market economy, outsourcing possibilities, contract management, capital availability etc.)
- Increased emphasis on issues like quality management, social and environmental considerations, safety in design and construction, role of contractors thru PPP etc.
- Transparency, efficiency and governance
- Institutional changes and new role definitions (new organisations, redundancy of organisations, organisational restructuring etc.)
- Improved clarity
- Elimination of redundancies and inconsistencies

Consultants shall undertake detailed review of improvements undertaken by various states in India along with available 'performance' feedback on such improvements so as to justify their integration in OWD code and manual.

Figure 3-1: Revision of OWD Code and Manual Flow Chart



3.4.3. Analysis and Improvements

After review and analysis of existing works code and manual, consultants shall undertake in depth analysis and integration of best management practices in OWD Manual. For each existing chapter/section, such specific (sub section level, point-wise) improvements shall be described in detail: 'As is Situation – with existing words'; 'Suggested Change' – with appropriate wordings and 'Justification for change based on analysis'. The justification for change shall include feedback from OWD officials at task group level. In addition, where no sections/sub-sections/sentences describing specific areas are presently not available, new sections/sub-sections/sentences shall be suggested.

3.4.4. Facilitating Consultations, Workshops and Integration

The Consultants shall then hold discussions, arrange presentation and workshop with OWD officials and other concerned stakeholders at various levels and undertake further improvements in the existing policies and functioning. This shall help in preparing the final document after considering inputs and feedback from various stakeholders.

The Consultants shall submit an interim report on revision of OWD Manual, which could be circulated to all the departments concerned for their comments and observations. During the period of interim report to final submission of the OWD Manual, the intervening period could be utilised for phased and progressive integration of these aspects keeping in view the requirements of various departments transacting with OWD.

The feedback shall then be integrated in finalisation of OWD Works Code and Manual.

3.5. Works undertaken

While the process of identification of major areas needing improvements is on-going, consultants have also initiated revision of certain sections of OWD code and manual besides inclusion of some additional focus areas in the manual. These at present (not limited) include:

3.5.1. Planning from Inception to Completion: Management of Public Works

This aspect has been dealt with in Chapter 3 of OWD code under the heading 'Works'. This includes the concepts of original works, maintenance and repairs and the formalities for commencement of works, viz. administrative approval, technical sanction, expenditure sanction and allotment of funds, etc.

This shall be reviewed and the chapter modified and rewritten as required to update the provisions suitably to make it more applicable for implementation. This shall cover stages for execution of works, estimates, deposit works, execution of original works, and other miscellaneous aspects. A separate chapter is proposed to be retained as in the current OWD Code 'Powers of Sanction of Government Officers of OWD in charge of Public Works'.

3.5.2. Audit and Accounting Requirements

All engineering/accounts offices have to ensure that accounts are maintained properly as per Codal and GOO instructions on the subject. The Chief Accounting Authority of the state is generally responsible for various aspects of accounting procedures, generation of statements, data presentation etc. The existing procedures shall be reviewed and analysed to identify improvements and to compare the same with existing GOI rules, regulations and guidelines. After discussions with accounting officials, necessary changes shall be suggested as required in respect of the following:

- Preparation of budget of OWD and its department in close coordination with heads of departments including proper procedures for budget allotment among various wings of the department;
- Undertaking payments through pay and accounts offices;
- Compilation and consolidation of accounts in accordance with instructions of GOO/CAG;
- Preparation of appropriation accounts;
- System of internal audit to ensure accuracy in accounting and efficiency of operations;
- Inspection of various offices including periodic inspection of field offices and various branches at head office; and
- Streamlining of the process of letter of credit (LOC) to divisional offices.

OWD manual prescribes accounting procedure presently being followed. It will be reviewed and suitable modifications suggested with a view to improve accounting and audit procedures of GOO/OWD, with a view to maintain consistency with GOI and GOO procedures and instructions.

3.5.3. Quality Management

It is proposed to deal with aspects of Quality Control and Assurance in detail in OWD Manual by including an exclusive section on this topic. The focus is planned on Quality Assurance Plan, Quality Control Set Up and responsibility of Officers in the Quality Assurance Units, issues of Quality Inspection Reports, Field Testing Laboratories, Central and State Govt. Laboratories, Independent Testing Laboratories and Other Related Aspects of Quality Management etc.

3.5.4. Safety Management

This aspect during design and construction is of paramount importance for construction of roads and buildings etc. to avoid possible hazards involved. Safety relates to safety of structures, safety of workers, safety of public, etc. and is required to be observed in conformity with provisions of National Building Code of India 2005 and other applicable safety codes.

Safety in construction has to be catered for during construction phase, post construction phase and during maintenance and operation, road to cover unsafe conditions, unsafe electrical practices, personnel protective equipment, safety education and training, etc. Safety on roads shall be dealt with so as include structures, highway patrol, traffic aid posts, trauma centre, etc.

For road construction, road safety is an important feature during planning of construction of roads. In this respect 'Manual of Safety in Road Design' published by MoSRT&H through the IRC needs to be referred to. Road safety will normally involve a number of measures as follows:

- Safety conscious planning for new road works incorporating safety features
- Improvement of safety aspects of existing roads
- Improvement of hazardous locations or black sports on network

It is proposed to put greater emphasis on the topic of 'Safety in Construction' in revised OWD manual, which is often neglected during implementation of projects both during construction phase and post construction phase. In this respect the National Building Code 2005 should be referred to for important aspects of safety specially with reference to building construction.

3.5.5. PPP Policy Guidelines

The PPP concept is today an accepted norm by the Planning Commission, GOI as well as at State governments specially in respect of MoRT&H projects. Under this, the private players/organisations participate in such infrastructure development at national and State levels. The projects taken up under this option normally require huge investments. To smoothen the process, Planning Commission, GOI has developed Model Concession Agreement and has circulated to various state governments intending to follow PPP mode of infrastructure development. At State level, the PPP policies would require some adjustments to fit into the State level scenario.

As per the PPP mode of infrastructure development, there are various options including BOT (Build, Operate, Transfer), BOOT (Build, own, operate, transfer) etc. under which Concessionaires normally operate and maintain the road constructed by them as per terms and conditions of the concessionaire agreement. Normally, during this period they collect the toll as part of their accepted/contracted revenue model or on annuity basis. However, they must follow road construction guidelines and safety practices specific by IRC/state government. Thus PPP policy and guidelines have to suitably address all these aspects.

This shall be comprehensively dealt with in accordance with PPP legislation and framework *interalia* covering, procurement processes, selection of project, preparation of bid documents, selection of concessionaire, financial close, independent engineer, monitoring of construction, change of scope, operation and maintenance, etc.

3.5.6. Land Acquisition

Various formats of land accusation models being followed in other states e.g. Haryana, Uttarakhand, Rajasthan, Himachal Pradesh and other institutionally restructured states i.e. AP, Gujarat and Karnataka etc. will be studied and discussed with works department and GOO for its merit. Based on views of GOO, necessary recommendations will form part of revised manual. The same could also be recommended as part of legal framework of Odisha and be part of road policy.

3.5.7. Environment and Social Management (Rehabilitation and Resettlement)

As per EIA notification 1994 and 2006 and subsequent amendments the development of project should have the required environmental impact assessment and environmental management plans. The various aspects that have impact on environmental resources include topography, land, air, water, ecology, social environment, public health, safety, etc. Potential negative environmental impacts and their feasible remedial measures have to be a part of the environment management plan as per the relevant existing legislation, policies at national and state level. Some of the large size projects or those having considerable impact on forests lands require clearance from Expert Appraisal Committee of Ministry of Environmental and Forest, New Delhi. Other important clearances required can be from respective state pollution control board, local civic bodies, etc.

The issues of land acquisition, rehabilitation, resettlement and compensation aspects are part of social management and needs to be suitably addressed in the OWD code. This normally should follow the State R&R (Resettlement and Rehabilitation) policy of GOO besides any other legal and policy issues of GOO. Both the environmental and social management aspects are critical for road sector development, any existing gaps and limitations in existing legal frameworks is planned to be addressed by the Consultants.

With reference to the discussions held on 11 September 2012, which was attended by Mr. Satpathy, Divisional Forest Officer, also responsible for environmental and social issues, the following points were highlighted to be covered under environment:

- Environment and social issues with comments on regulatory framework concept
- Quarry operations and recycling of road materials, to be available to construction industry of Odisha. This point has significance, since a government ban stands imposed on quarry operations, making it difficult for road projects to progress.
- The use of waste products of Power Plants and Steel Industry i.e. Fly Ash, Slag Iron and Foundry Shops Waste. How best can these be used as recycled material in Construction Industry?

The environmental issues as a whole including the points highlighted above would be addressed as below:

- Making community a development partner through benefit sharing
- Negotiation and participatory approach preferable to prescriptive ‘top-down’ philosophy
- The manner in which the benefits are shared is another important issue
- Determining how much to share on project to project is another delicate issue needing addressal
- Review and Strengthening of Institutions connected with Environmental Management
- Improving the effectiveness of environmental consent management and performance
- Strengthening the enforcement tools and compliance incentives

- Improving public participation for a shared vision of growth
- Enhancing the role of Mining and Industry Institutions in the participatory approach.
- Need for giving incentives to Construction Industry and Contractors for use of industrial wastes
- The Research and Development Department (R&DD) of Odisha to be encouraged by sanctioning specific projects for working out modalities and specifications for use of industrial wastes as construction materials
- Based on findings of R&DD the Procurement Department to make provisions in Contracts for use of industrial wastes
- Delegation of powers from Central Environment Ministry to States to excise certain emergency provisions for quarrying operations for building materials so that important projects are got executed as per time schedule

To make the above concepts workable, the Environmental Institutions of state of Odisha will be reviewed and proposals for strengthening the same made. Some of the points for strengthening of these institutions could be as below:

- Keeping pace with the Investment Profile of the State
- Keep abreast with Development Plans of Infrastructure Sector involving various GOO departments
- Consideration of Multiple Policies and Institutions to achieve common goals. For this purpose following departments of GOO to come out with common regulatory framework:
  - Forest and Environment
  - Odisha Pollution Control Board
  - Steel and Mines
  - Indian Bureau of Mines
  - Industries
- Mitigation Plans to control risk through Environmental Assessment and Forestry Clearances
- Enhancing accountability for environmental violations: Improving monitoring and enforcement, by strengthening reporting inspection and monitoring
- Creating credible enforcement deterrents
- Proving compliance incentives
- Building Public Trusts in environmental management and role of public participation
- Improving linkages between environmental and sectoral policies and processes

During the course of assignment the RSID Consultants will be addressing the issues as listed above in consultation with GOO as deemed appropriate.

3.5.8. Good Governance Measures and RTI Act (2005)

GOO has been practicing E-tendering, improvement in bid document etc. so as to improve transparency and quality of contract management. Such processes coupled with better construction technology and improved maintenance of infrastructure and other assets is likely to assist in improving overall satisfaction of road users and other stakeholders. It is envisaged that such good governance measures commensurate with GAAP Report could require appropriate vigilance structure in OWD/GOO, not only for investigation of complaints, but also for routine vigilance inspections from time to time (preventive). The complaints management system could be dovetailed with the vigilance structure suitably.

The adoption of RTI act 2005 has imposed specific requirements in the organisations specifically to supply the information. Following up of RTI Act requires both structural as well as funding options. With increasing awareness of public at all levels and pro-activeness of the media, the public works are likely to face frequent scrutiny. The Consultants shall propose needful provisions in the OWD Code and Manual for effective RTI mechanism. These shall be addressed in the revised work procedures of OWD/GOO, so that the organisation is in a position to handle this aspect effectively.

3.5.9. Citizen's Charter and Right to Public Service Act

Under citizen's charter the GOO had decided to enact a comprehensive Right to Public Services Act that would empower citizens to seek over 70 services in a time frame while erring officials could invite penalties.

"Necessary preparatory work for enactment of the law has been completed and it will be placed before the Cabinet soon," said a release from the Chief Minister's Office.

Important public services delivered by 10 departments like Commerce and Transport, Energy, Housing and Urban Development, Finance, Health and Family Welfare, Home, Rural Development, Revenue and Disaster Management, School and Mass Education and Women and Child Development have been identified for coverage under the proposed law.

Once the Act comes into force, citizens of the State will be entitled to public services in a prescribed time limit. In case of lapses by public officials, the people will have the right to appeal before the appellate authorities.

Penalties will be imposed on erring public officials.

The proposed Act provides for identifying the government functionary at any level and fixing responsibility for causing delay in providing service. The guilty could invite a penalty which will be decided by the Cabinet, informed sources said.

The law will entitle citizens to collect information as the legislation makes it mandatory for civil servants and public authorities to comply with the provisions promptly.

3.5.10. Dispute Redressal Mechanism

Redressal of complaints at present is undertaken through various channels including through the concerned CE or the Chief Vigilance Officer in routine cases. Any improvement in the system as required shall be examined and catered for appropriately.

The Consultants shall examine the provisions of contract document regarding arbitration clause provided therein and examine its effectiveness. The measures for post completion contract management during defect liability period and later shall be closely examined commensurate with the best practices at national and of international agencies participating in major road works. It shall be necessary to examine the available experiences and procedures being practiced under FIDIC and other international contract documents, before modifying the existing dispute redressal mechanism.

3.5.11. Review of Contract Documents of GOO

The Consultants are to review various documents pertaining to procurement of works, goods, and services. The deliverables under the task includes preparation of revised procurement procedures and Standard Bidding Documents (SBDs) for works, goods and services. New section on PPP policy and guidelines and on e-procurement requirements and shall be proposed.

The Consultants during the visit to Odisha during May 2012 have held discussion with Procurement Officer in charge, OWD. It transpired during discussions that there is no specific procurement manual developed and used by GOO. The GOO has OPWD Code Volumes I and II, containing rules and regulations on contractual matters and also refers to the Treasury Rules governed by the Odisha Treasury Code. Further GOO has now made it mandatory to use e-procurement method for all works put to tender of value above Rs. 10 Lakhs.

The proposed line of action on various issues is as under:

- **SBD for Procurement of Works**

During the discussions it was highlighted that OWD/GOO does not have an appropriate SBD for the National Competitive Bidding for works, which can be used by various officers of the OWD. The Detailed Tender Call Notice (DTCN) for procurement of works issued by various authorities has some variations based on their understanding of the conditions of the works. The OWD has prepared three SBDs, which after approval by the OWD, were sent to the Finance (GOO) for approval. But it has been since been decided that SBD needs to be prepared consistent with best practices as being followed by the GOI. The Procurement Officer Dr. N.C. Pal provided the following documents, which are being used for Road Works, Building Works and Bridge Works:

(i) Govt. of Odisha Works Department – Technical Bid Documents/DTCN for the Work '4-lanning of Panposh-Uditnagar' – Bid Identification No- CE-DPI&R-01/2012-13 Estimated cost- Rs. 4.75 crore;

(ii) Govt. of Odisha Works Department- Technical Bid Documents/Detailed Tender Call Notice for the Work 'Construction of Academic Building for Govt. Polytechnic (Composite Tender)'– Bid Identification No: CE-(B)-18/2011-12, Estimated cost Rs. 4.34 crore;

(iii) Govt. of Odisha Works Department- SBD- Procurement of Bridge Works on Turnkey Basis (Design and Execution).

The Consultants will study and review the above documents and prepare draft documents in close interaction with the Procurement Officer of OWD and other concerned officials of OWD/GOO. The draft SBD for Procurement of Works is planned to be submitted by 30 October 2012.

- **SBD for Procurement of Goods**

The Govt. of Odisha, Finance Department has issued Guidelines for Procurement of Goods vide Office memorandum no. 4939/F. (Codes-27/2011) dated 13-2-2012. The document will be studied/reviewed and improvements suggested as required after discussions with the officers/authorities concerned. The draft SBD for Procurement of Goods is planned to be submitted by 15 November 2012.

- **SBD for Consultancy Services**

It was also revealed during the discussions that there was no standard bid document for selection of the Consultants for Consultancy Services. The Consultants will prepare standard Request for Proposal (RFP) document and Conditions of Contract for the GOO on similar lines as being used by some of the Departments of GOI. The draft SBD for Consultancy Services is planned to be submitted by 30 November 2012.

- **SBD for Non-Management Services**

This will deal with services of persons like gardener, driver, labour, data entry operator etc.

- **E- procurement Process of Tendering**

The GOO has issued instructions that all future projects will be tendered based on e-procurement framework for all works costing more than Rs. 10 Lakhs. The detailed Guidelines have been issued by the GOO vide office Memorandum no. FA-R-3/08/1027/W dated 24-01-2009. The GOO is presently inviting tenders based on e- procurement mechanism. The Consultants had discussion with the CE e-procurement on the issue of e-procurement procedure being adopted by the department. The Consultants were shown step by step demonstration of existing software being used for e-procurement. The demonstration included slides of Tendering Invitation, Bidding Process, Bid opening of Technical Bids, Technical Evaluation, Bid opening of financial documents, financial evaluation and Award of work.

The Ministry of Finance, Department of Expenditure (Public Procurement Cell), GOI has issued instructions dated 30 March 2012 for comprehensive implementation of end to end e-procurement procedure. The Consultants will study the GOI e-procurement guidelines and suggest for improvement in the existing e-procurement process as required.

3.5.12. Preparation of Procurement Manual for GOO

There is no existing procurement manual in OWD, Odisha except that some guidelines have been provided in OWD Works Code and Manual. The GOI has recently introduced the Public Procurement Bill, 2012 which will be studied by the Consultants. It is proposed to draft the Procurement Manual consistent with the guidelines provided in the GOI, Public Procurement Bill 2012. The draft procurement manual is planned to be submitted by 30 November 2012.

3.5.13. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Sector Domain Specialist
- Procurement Specialist
- Legal Specialist

SECTION 4

ROAD SECTOR POLICY AND STRATEGY

4. Road Sector Policy and Strategy

4.1. General

The Scope defined vide Appendix A of Contract Agreement is as follows:

- Review and assessment of current policies relating to roads development and management including legislation, regulation and other statutory mechanisms;
- Analysis of known and projected road sector demands, challenges and GOO aims/targets;
- Identification of limitations and gaps for authority/powers/policies of GOO for road sector management;
- Options and opportunities for strengthening the road sector framework for future requirements; and
- Draft Policy and Vision Documents – 5–10 years horizon (to be modified to 20 year vision).

Although the ToR specifies a 5–10 year Policy Document, but Steering Committee desired that it should be developed for 20 years horizon. Accordingly, the consultants shall undertake the development of policy document for a 20 years horizon.

4.2. Approach

The basic approach of the study shall involve

- Desk research and analysis
- Vision development of road sector for GOO using consultative approaches
- Redefining aims, objectives and time based targets for road sector
- Defining policy and strategic framework
- Feedback, integration and validation by GOO

The reviewed legal framework of GOO legal framework will cover statutory mechanism related with road development and all its aspect for funding and operational management. These provisions shall be evolved such that there are minimum legal obstacles in execution of the road projects in future.

4.3. Methodology

4.3.1. Review of Existing Road Sector Policies and Legislation Plans

The Consultants shall undertake review and analysis of the existing policies and strategies of GOO with regard to the road sector. They shall also review the existing inter-departmental functions with concerned stakeholders as well as policy framework of various road sector stakeholders as defined in Chapter 2. In addition, road sector policies of other states shall also be studied and analysed to

assess their strengths and applicability under socio-economic, political and legal provisions prevailing and anticipated in the state of Odisha.

4.3.2. Vision Development for Road Sector

Consultants shall undertake discussions and define road sector vision, using diagnostic and analytical approach. The road sector vision document for Government of Odisha shall be in consultation with road user groups, concerned stakeholders and shall have required flexibility for review and improvements in future. The focus shall be on assessing the upcoming opportunities due to various developmental efforts of Government of Odisha besides its overall vision and policies on such developments. It shall involve study of existing legal and institutional framework along with organisational capacities of these road organisations. It may also be noted that consultants are also undertaking simultaneous studies on network planning, traffic studies, review of existing works code and manual and also assessing present organisational capacity, strengths and limitations. Overall, this activity shall result in development of a GOO vision and development of a medium to long-term organisational model, commensurate with the vision.

Based on the studies carried out by the Consultants and reviewing the development plans of Odisha and the developed vision and mission, options for road sector strategy shall be developed. The development of strategy shall be based on models and theories of planned change, existing policy, legal and institutional framework, existing organisational capacities, participation and empowerment, normative-re-educative strategy for change, and applied behavioral science.

The Consultants shall work out various options for modification and review of policies.

4.3.3. Identification of Gaps in Policy and Strategy

For the overall development of the State, not only the OWD, but all the departments of the GOO shall have to jointly coordinate their functions as per laid down regulatory framework and future vision of development. For this purpose, the policies and the institutional and structural arrangements along with their legislative framework need to be in place to meet the demands of road sector. The inputs from the Government Departments vested with powers for regulations of development taking place in roads sector shall be reviewed and suitably modified in consultation with the GOO.

Another important aspect of GOO is related with land acquisitions, environmental clearance and rehabilitation/resettlement policies of the State, as all these aspects are critical from the point of development of road sector. The gaps and limitations in existing legal framework shall also be suitably addressed.

4.3.4. Options and Opportunities in Strengthening the Road Sector

The draft road sector policy and strategy as at present shall be studied. It shall be supported with the SWOT analysis appropriately by factoring in the likely situations and their implications. Various options shall be based on factors related to different stakeholders taking part in development of the

State. This could be dependent upon the available financial outlay, investment profile, industrial profile and the political support.

4.3.5. Develop Policy Document

Based on vision document, strategic directions and existing socio-political and legal environment of Odisha, a policy document for road sector for GOO shall be developed. Since review of policies in state government takes time, the issue of 5-10 years policy document, as required by ToR was brought to the notice of Steering Committee for the RSID project and the committee advised the consultants to develop the policy document for 20 years horizon (till 2032). The Consultants shall prepare a vision document based on data and keeping various options in view. The policies enabling the successful implementation of the vision document shall also be highlighted and recommended for acceptance by GOO after interaction with various stakeholders including Review Committee.

4.3.6. Essential Features to be covered under Road Policy Document

Based on interactions with WB, Steering Committee, ISAP Working Group and other road departments of GOO, the following issues on Road Policy will be addressed by Consultants. While developing the new Road Policy, the draft policy statement prepared in year 2004, will also be taken into consideration.

Specific Issues proposed to be integrated in Policy Document:

- Eradication of Poverty
- Economic and Social Development
- Concentrate on development of LWE Sector to bring them into main stream
- Achieve 100% Connectivity in next 10 years
- To develop the road infrastructure with requisite quality and adequate capacity to meet, the multi-sectoral demands to achieve the socio economic goals for upliftment and prosperity for the people of Odisha

Issues to be covered for Road Policy Document

- Road sector demands for medium to long term as part of its vision
- As part of background of the Document to cover existing legal and institutional framework along with organisational capacity of Road Sector departments
- Proposed Authority, Powers and regulatory framework for:
  - Administrative – Inter departmental Postings etc.
  - Technical – For Technical Sanctions and Supervision etc.
  - Financial – For acceptance of Contracts, approval of deviation/variation, grant of EOT and approval of CVs etc.

- Guide lines for work procedure of all road departments of GOO to jointly co-ordinate their road development activities under laid down institutional framework
- Policies for environment clearance, rehabilitation and resettlement
- Ownership of Road Assets, covering all categories of roads i.e. SHs, MDRs, ODRs and VRs, etc.
- Public Private Participation
  - Participation for 4 and 6 lanes only or allowed for 2 lanes (though NHAI follows) also. To be clarified during discussions/conduct of Workshop
  - Should 2 lanes roads to be left for development to the road department themselves or taken up for PPP models
  - Development of Concessionaire Models for BOT, BOOT, DBFOT and BOLT etc.
- Maintenance of existing Road Assets
  - GOO maintenance
  - Normal Maintenance Contracts or
  - Performance Based Management Contracts
- ROW Management – Revenue Generation – Yamuna Expressway Concept
- Land Acquisition –
  - For Normal Works – Haryana Model – 30 years compensatory, annual annuity to Land Owners and Employment of one person from family
  - For BOT works -partnership with Concessionaire, land owners as Stakeholders
- Budgetary Reforms for Non Plan Expenditure and Emergency Works (Flood and Cyclone etc.) – Mechanism to be evolved and developed
- Phased development of Green Projects for Tourist Hubs – Tourism Department to be consulted
- Environment Protection Institutional Framework
- KBK Development Plans and their Review, present concept is of 1987–88 vintage
- LWE Area Development proposals for integration of misguided youth to main stream
- Procurement Policies for Good, Services and Works
- Development Plans for Road Network next 10 and 20 years
- Formulation of Policy on Renewal Cycles of pavement for various category of roads
- Consideration of new Institutional Structures e.g. ODA or ORDC taking into account present working of OBCC
- Proposed establishment of Road Transport Council for Road User Satisfaction Survey, a requirement suggested by ISAP Study

- Quarterly Control Systems and TQC (Total Quality Control) Management
- Establishment of Road Policy and Planning Unit
- Consideration of Autonomous Road Fund structure exclusively for Road Development Plans

4.3.7. Way Forward and Action Plan

The proposed action plan is as below:

- Stakeholder Workshop combined with the tasks of Revision of Codes and Manual to have inputs/views of various stakeholders/road users for incorporation in both these documents, i.e. Road Policy and Revision of Codes and Manual;
- Development of Road Sector Vision Development;
- Submit Draft Road Policy Document to Client by end of December 2012 for observations and its moderation as deemed appropriate;
- Integration of comments/suggestions; and
- Development, Presentation to ISAP working Group and Finalisation of Road Policy Document and its submission.

A total time frame envisaged for all these activities is appreciated to be approximately nine months i.e. up to end of December 2012.

4.3.8. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Transport Planning Specialist
- Transport Economics Specialist
- Legal Specialist

SECTION 5

REORGANISATION AND STRENGTHENING OF OWD

5. Reorganisation and Strengthening of OWD

5.1. General

The Scope defined vide Appendix A of Contract Agreement in relation to reorganisation and strengthening of OWD is as follows:

- Review and confirmation of the short-to-medium term OWD organisation and its main determinants;
- Development of a medium-to-longer term organisational vision/model for the OWD and its key functional and operational features;
- 'Mapping' the scope and distribution of administrative, financial and technical powers and authorisations for the OWD's main functions with the revised OWD code/Manual;
- Facilitation of OWD and GOO action on measures required to complete the transition within OWD, into changed arrangements and structures;
- Ensure the new Staff Training program and HRD strategy are compatible with the organisational changes; and
- Medium to longer term strengthening of the Institutional framework and structures of Odisha's roads sector.

5.2. Background

GOO in the year 2000 initiated the IDS study. Accordingly, an ISAP action plan has been prepared for implementation during 2008–18. Following the above recommendations review and revision of some engineering cadres have been approved in December 2011 by GOO. Accordingly, some additional posts have been created at various levels of Junior Engineers (JEs), Assistant Engineers (AEs), Assistant Executive Engineers (AEEs), Executive Engineers (EEs), SEs and CEs and the same is being implemented. Interestingly, no cadre review and revision has been undertaken till date for non- engineering cadres like administration, accounts etc.

5.3. Approach

The proposed approach to undertake reorganisation and strengthening of OWD shall include:

5.3.1. Desk Research

The desk research shall be carried out by scanning, reading and analysing various reports, documents etc. To understand and analyse the present organisational structure of the OWD and its strengths and weaknesses documents like Annual Administrative Reports, internal and public documents including reports of organisational/institutional studies undertaken hitherto (especially under IDS and ISAP), relevant legal Acts, rules, policies, Government Orders, available Perspective Plan of OWD etc. Besides these, available reform reports of other states in the country and even

outside the country (international) shall also be studied and analysed for their applicability to situation under GOO and in OWD.

5.3.2. Interaction with Officials of the Department

This shall be undertaken in the nature of both open-ended (semi-structured) and 'structured' interviews, covering top and senior and middle level officers through:

- Inter-facing with small groups - homogeneous and heterogeneous formations, representing different disciplines and levels;
- 'Discussion Groups' and 'Workshops' covering selectively larger population of the organisation;
- Consultation with other selected stake-holders like Government Departments, NGOs etc.;
- District Authorities, road users etc. to elicit their views and opinions; and
- Meetings with the leaders of relevant interest groups, if any.

5.3.3. Interaction with Stakeholders, the Mechanism shall Include

- Structured and semi-structured questionnaires;
- Interviews;
- Stakeholder Workshops;
- Brain-storming sessions (especially with middle and senior management);
- One to one meetings and discussions with select staff – senior and middle management of OWD, elected representatives, policy makers and other stakeholders, as necessary; and
- Presentation and feedback from OWD officials and stakeholders.

5.3.4. Interaction with Road Sector Experts, the Mechanism shall Include

- Structured and semi-structured questionnaires;
- Interviews; and
- Stakeholder Workshops/brainstorming sessions.

5.3.5. Observations on the Functioning of OWD

Both the key processes and positions in the OWD shall be observed to map the processes and to assess the workload to determine scope for improvements and to assess the potential to improve productivity by re-distribution of work load etc. It would also provide insight into the functioning of OWD and assist the consultants in undertaking proper strength, weakness, opportunities and threat (SWOT) analysis.

5.4. Methodology

5.4.1. Review and Analysis of Present Organisational Setup

During recent years, demand for infrastructure has grown manifold and public works have come to have a sizeable share of annual Government spending. The increasing role and contribution of public infrastructure in a progressive, industrialised and welfare State of Odisha has stretched more intensively from the traditional domain of public buildings to catalytic growth areas of road sector. The structure of the organisation (OWD), entrusted to undertake majority of such tasks, has been traditionally inclined towards conventional areas and needs rearrangement to undertake upcoming challenges.

The present organisational structure of OWD is presented in **Figure 5-1** *(p-52)* **and 5-2** *(p-53)*. It is headed by an EIC-cum-Secretary to the GOO, Works Department. As 'EIC'; this position carries technical responsibility for the OWD and as 'Secretary' exercises administrative control of the OWD. The EIC-cum-Secretary provides the vital link between the Government and the OWD.

With revision of cadre strength (**Table 5-1**), there are 10 CEs, and one CE cum Managing Director (MD), Odisha Bridge and Construction Corporation, who reports to the EIC-cum-Secretary and EIC-Civil. Each CE is responsible for a functional unit called a 'wing'. The senior most CE holds the title of EIC (Civil) and, is responsible for all the administrative functions of the OWD. This includes financial reporting and personnel functions. A brief description of each wing follows:

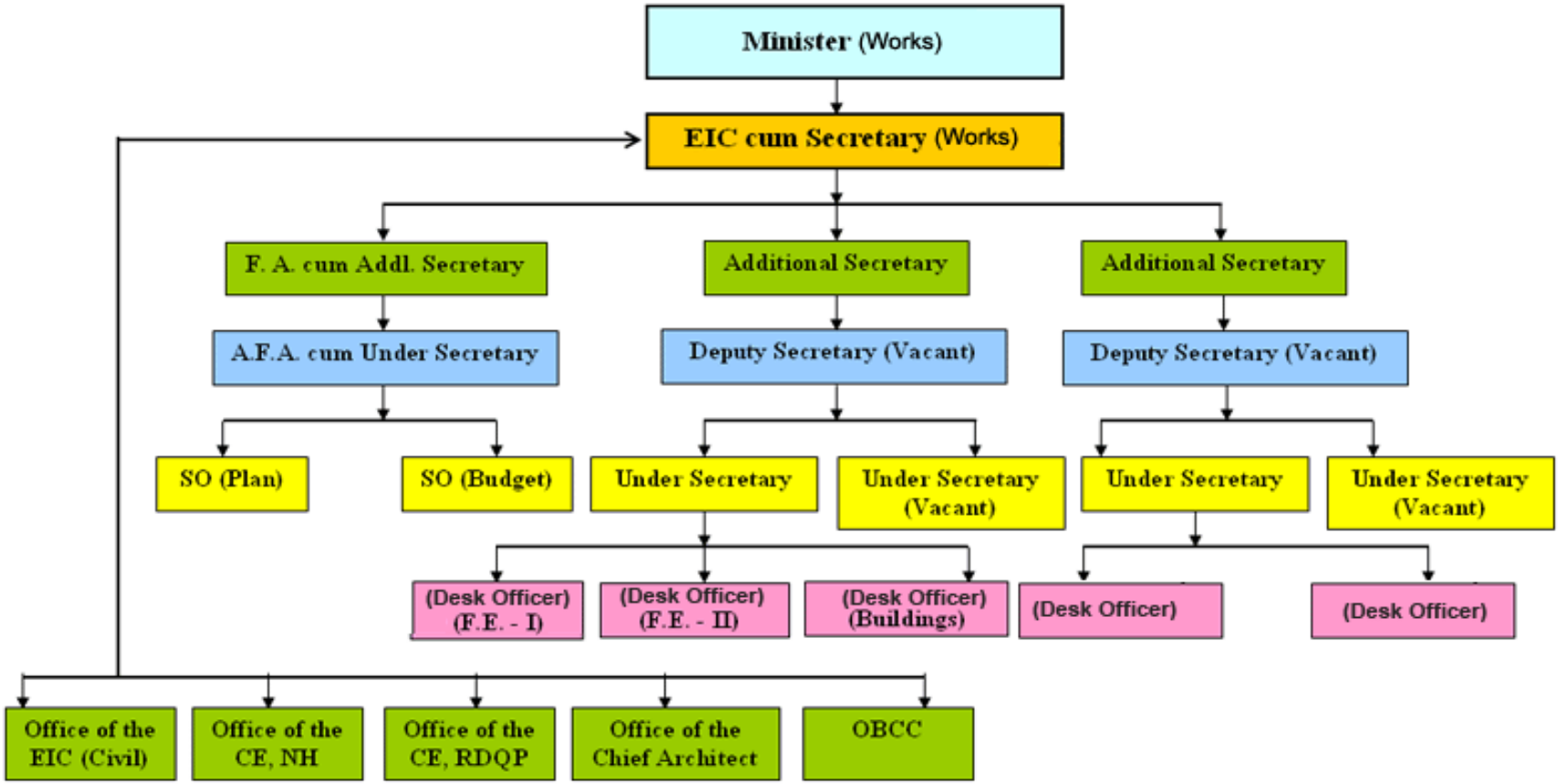
Table 5-1: Present Cadre Strength of Engineers in OWD

Sl. No.	Category of Post	Total		Total Strength after Creation
		Works	R.D.	
1	EIC (Civil)	2	2	**4**
2	CE	11	3	**14**
3	SE (Level-I)	15	9	**24**
4	SE (Level-II)	16	12	**28**
5	Executive Engineer (EE)	129	77	**206**

Source: As per Resolution No. 12723, dt. 23.12.2011, F.E.-II.(p)97/2011 of OWD.

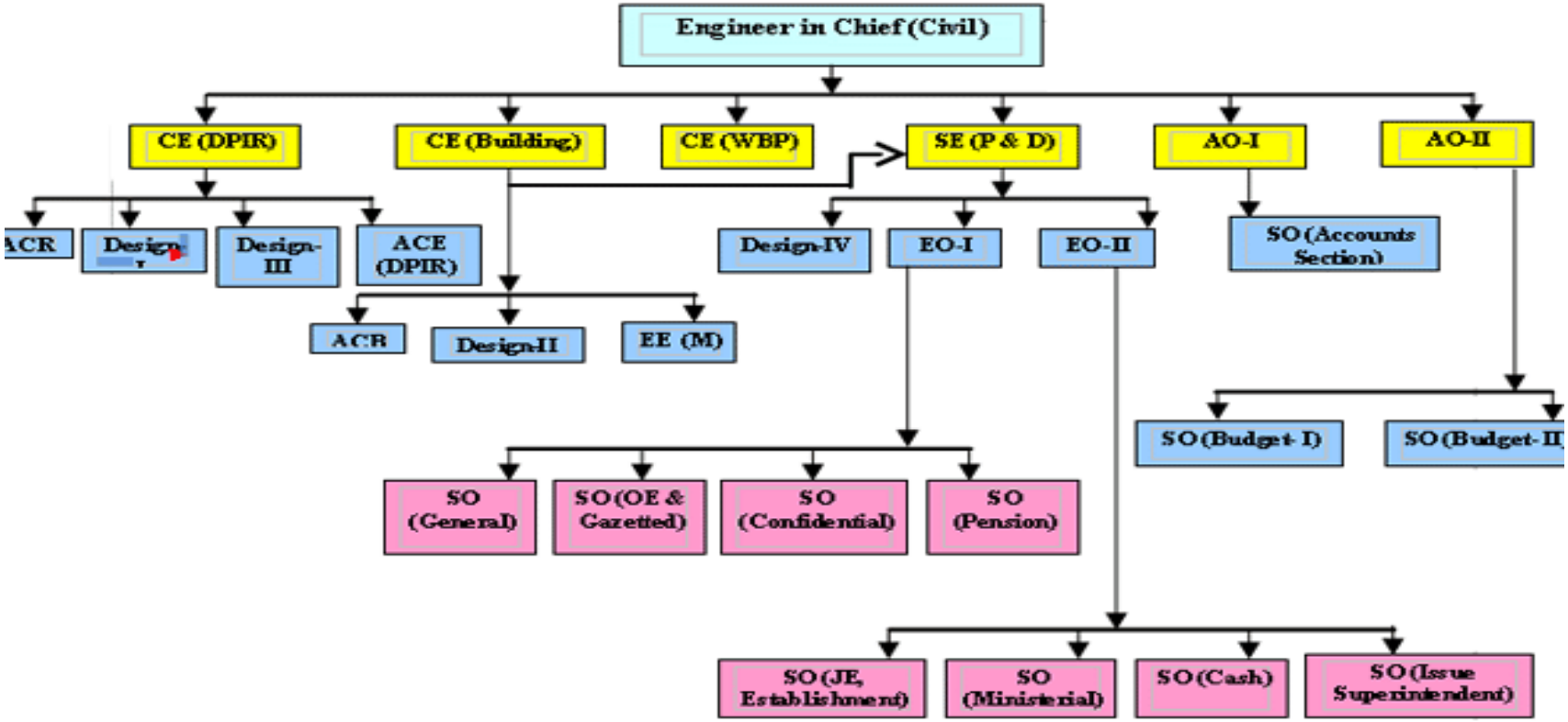
The three wings, i.e. the Roads, NHs, and Buildings have field offices called circles, which are headed by the SEs. Each circle in turn is subdivided into a number of divisions, each headed by an EE. The head office is responsible for overall coordination and monitoring activities, while execution of works is carried out by the EE at divisional level. Divisions manage a number of sub-divisions mostly located at *taluka* level, each headed by an AEE/AE; further lower level are the 'sections', managed by JEs.

Figure 5-1: Administrative Setup of office of EIC-cum-Secretary, Works



Source: Works Departments Website, GOO (www.worksodisha.gov.in).

Figure 5-2: Administrative Setup of office of EIC (Civil), OWD



Source: Works Departments Website, GOO (www.worksodisha.gov.in).

The OWD presently has 7 CEs for Roads; Buildings; WB Projects; Design Planning and Investigation (DPI); NHs; Research Development and Quality Promotion and E-procurement and as MD to OBCC, whereas 4 CEs are on deputation to Odisha State Police Housing Corporation, Odisha State Housing Board, Bhubaneswar Development Authority and IDCO, whereas 3 CEs are on deputation to Rural Works (under RDD, GOO).

The present organisation structure has following wings:

5.4.1.1. Roads Wing

The Roads Wing is headed by a CE (Roads), reporting to the EIC-cum-Secretary. It is responsible for the maintenance and upgrading of 14,557 km of existing SHs, MDRs and ODRs and construction of new roads at the State and District level. The Wing is responsible for routine and periodic maintenance together with supervision of contracts for R&B works. It comprises 7 geographical circles and a specialist Mechanical Circle, each headed by a SE. The SEs supervise the activities of 40 divisions (36 R&B, 4 Mechanical), who execute the works. Each of these divisions is managed by an EE. There are 224 sub-divisions in the OWD under the charge of AEE or AE.

5.4.1.2. Design Planning and Investigation Wing

The design and planning activity is provided by DPI Wing in the OWD. The CE (DPI) heads the Wing and has a reporting responsibility to the EIC-cum-Secretary.

5.4.1.3. Research, Development and Quality Promotion Wing

R&D and quality promotion activity is under the control of CE (Research, Development and Quality Promotion). The wing was created with the establishment of a material testing laboratory in 1965 to cater to the needs for testing of materials involved in road and building construction. The function expanded in 1982 to include a research development and quality promotion cell. The bulk of the investigative and reporting work of the unit is related to the work undertaken in the Roads Wing. The unit is also responsible for monitoring and reporting on the quality of work undertaken in other operational wings, including NHs and Buildings Wings.

5.4.1.4. Buildings Wing

In addition to its responsibilities for roads, OWD has the task of supervising the construction and maintenance of public buildings on behalf of a number of State Government organisations. For this purpose, the OWD has this ‘building wing’, which is headed by a CE (Buildings) reporting to the EIC-cum-Secretary. The divisions, sub-divisions and sections in the field, which look after the roads, are also responsible for maintenance and construction supervision of public buildings within their jurisdiction but report to CE (Buildings) in building matters. The Wing has a dedicated SE who is responsible for electrical works including installation, repairs and maintenance of electrical works in Government buildings. Four EE's (Electrical) are also part of this Wing. Similarly, there is an SE and two EEs responsible for Public Health, i.e. water supply and sanitation.

5.4.1.5. National Highways Wing

The responsibility for improvement and maintenance works on NHs is under the jurisdiction of CE (NHs). There are three NH circles and 15 NH divisions. This Wing was set up to comply with the requirements of Ministry of Shipping Road Transport and Highways (MoSRT&H) now MoRT&H to:

- Reduce the line of communication between the GOI and the State authorities;
- Achieve efficiencies in implementation by avoiding the cumbersome and outdated delegations for administrative and technical sanction which limit the ability of the OWD to respond quickly; and
- Achieve uniform maintenance and construction standards on NHs.

5.4.2. Situational Analysis for Organisational Determinants of OWD

This shall be undertaken by desk research (review and analysis) of plans, policies, processes, structure, human resources, financial resources of OWD and by field research (data collection and analysis) on work load, performance etc. Based on these, a detailed SWOT analysis of OWD shall be carried out jointly with departmental officials to establish present situation and key focus areas for improvement under current scenario. This shall bring out main organisational determinant affecting performance (efficiency, effectiveness and economy of operations) of the organisation. While comparing performance, review of performance of other states as well as results of previous ISAP study shall be validated and integrated to define key focus areas for strengthening.

5.4.3. Envisioning (Developing Vision and Mission) the Future of OWD

Purpose: To develop a Vision, Mission and Mandate statement for OWD in the context of current technological and social scenario, while integrating the expectations of the stakeholders. The vision and mission statements OF OWD shall be aimed towards developing the organisation into a forward looking, flexible, learning, and an effective road sector service delivery organisation.

Description: This task will be undertaken collaboratively with OWD, road sector experts and key stakeholders and will assist in developing a broad framework of the future OWD and shall integrate vision and mission developed by some forward looking OWDs in the country as well as draw on similar experiences available outside the country. The consultants will seek to identify the replicable best practices by reviewing the related experience of at least two states that have undertaken and completed similar reforms (i.e. Maharashtra, Gujarat, AP, and Karnataka), within India, which shall be selected in consultation with OWD This exercise shall finally result in developing a vision, mission statement and broad goals to be achieved against a defined timeframe. The consultant shall develop these with the year 20 Year perspective plan. While undertaking such an exercise, integration of most recent perspective plan of GOO and expectations from ISAP study shall be undertaken. It is envisaged that the vision and mission document shall support efficiency, effectiveness, transparency, accountability, sustainability, environment and equity in road planning, construction, operation and maintenance, road safety etc. and shall encourage flexibility and stakeholder

participation (Including PPP) so as to provide satisfaction to road users as, stakeholders and more importantly to the GOO.

The envisioning exercise shall be aimed to bring out the expectations (**required changes**) in relation to:

- Organisational processes – assist in identifying Business Process Re-engineering (BPR) Needs;
- Organisational Systems and Structure (new units, removal of redundant units/positions, process modifications especially in budgeting, fund prioritisation and allocation etc.);
- HR improvements - in terms of numbers (positional numbers) and competencies (regarding new road management technologies and processes, GIS, MIS, Computerisation etc.);
- Policy Improvements – Road sector, recruitment, promotion, outsourcing, performance management etc.;
- Resource needs (both physical and financial) and their effective allocation and management; and
- Linkages with other stakeholders, stakeholder role clarifications and need for intra-institutional coordination mechanism.

5.4.4. Assessment of Internal and External Forces for Structural Change

GOO has undertaken various improvement measures in the past. It has initiated GAAP in 2008 regarding working of OWD for better accountability and transparency in functioning; implementation of RTI Act (2005); improved procurement policy including e-procurement; preventive vigilance through the unit of Chief Vigilance officer; third party quality monitoring etc. Overall, a lot of positive changes have been undertaken within the organisation. However, when OWD develops its new VISION and MISSION, its expectations might require a greater degree of paradigm shift within OWD. It is likely to expand and strengthen some functional areas and make certain ongoing functions as redundant or shall require changes in the way, certain functions are presently carried out. In view of these, revised SWOT analysis shall be undertaken by consultants with consideration of existing structure of OWD in the context of the envisaged scenario and to identify external and internal change drivers for the change. Based on experiences, possible key change drivers have been indicated in **Figure 5-3** *(p-57)*.

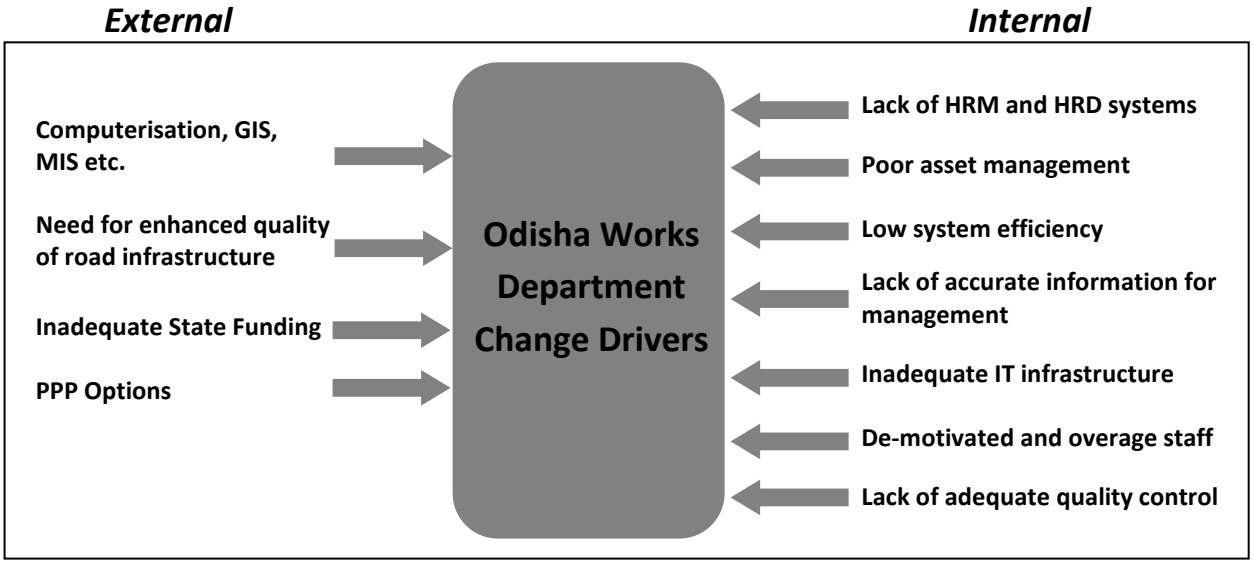
5.4.4.1. Internal Forces

The internal forces for structural change include the following:

- Introduction of New processes (ex. e-procurement), there is a need to integrate the same into the structure;
- Increased focus on staff functions (HRM, Finance, Accounts, Contract Management, Asset management etc.). These staff functions are as important as engineering functions and are essential for professionalisation of OWD;

- Need of specialised professional for functions like, HRM (HR) in the OWD. HR issues seems to be compounded by inadequate cadre management arising from individual and group conflicts within OWD, political interference etc.;
- Internal need for computerisation in areas like Asset Management, Contract Management, Project management, HRM (using HRMIS) etc.;
- Internal need for redefinition of roles and responsibilities at various levels/positions to incorporate new work dimensions (relevant to new technologies and practices) and clear patterns of accountability;
- Need to optimise available human resources, physical resources (equipment etc.) and finances using operational flexibility;
- Ned for improved resource coordination to support economy of operations;
- Need for a balance between authorities and responsibilities of positions. Adequate authorities must be delegated for improved decision making at various levels (in most cases at lower ones) to provide wider flexibility in its operations;
- Reduction/elimination of functions and positions, which are becoming redundant due to technology or easy availability in the market at much competitive prices; and
- Assessment and integration of employee support for structural reforms.

Figure 5-3: Key Change Drivers



5.4.4.2. External Forces for Change

Being one of the government departments, conventionally the organisational structure of OWD appears to be bureaucratic (leading to non-dynamicity) and not designed to respond to changing requirements of the environment in a dynamic way. The external forces expect it to change, which includes:

- Increasing stakeholder expectations requires development of coordination mechanism between OWD and stakeholders;
- The external developments can assist in efficiency improvements or cost optimisation by approaches like Inventory Control, GIS – Geographical Information Systems, MIS-Management Information System etc., availability of (consulting) services for security, housekeeping etc. Availability of these should be considered not only as an opportunity but the structure should be able to provide scope for its integration in OWD;
- Increasing demand for quality necessitating identification, assessment and remediation of rod user specific quality issues and its integration; and
- With the free market economy and role of private sector (bringing in PPP), there is a need to develop greater selectivity in strategies, refocusing around core activities and outsourcing those activities that could be performed more efficiently by outside suppliers (PPP). The organisational structure needs identify such services and have personnel specialising in outsourcing of specialised, high technology intensive works, PPPs, low skill services like gardening, security etc.

Overall, there are both internal and external forces, which are likely to influence (key drives) for the changes in the organisational structure of MPWRD.

5.4.5. Assessment of Gaps (Envisioned – Present)

Purpose: To assess the OD (organisational development) gaps of envisioned OWD from the present status of OWD, from the perspectives of organisational development besides policy issues, process and system requirements, Human Resource Requirements (both rightsizing and competency consideration) and resource needs. These shall be carried out with the broad objectives of implementing reforms in road sector services through restructuring and strengthening OWD. Overall, it shall be aimed at improving the department's capability to plan, allocate, develop, manage and monitor the road sector assets and resources in an integrated manner. The outputs of the gap analysis are presented in **Figure 5-4** *(p-59).*

Description: This task shall be undertaken as indicated below:

Step 1: Articulating the Objectives of restructuring OWD

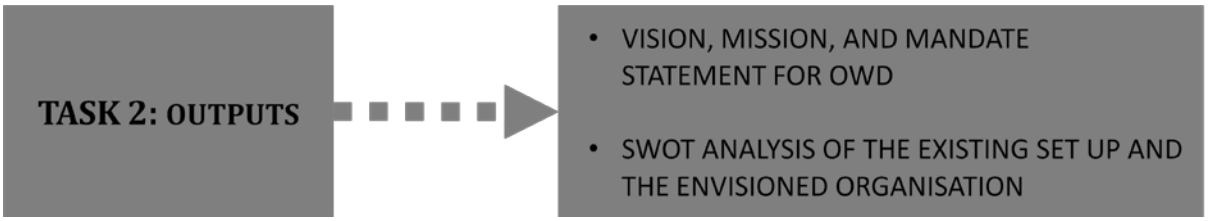
Step 2: Mapping the existing system (as will be done under Task 1)

Step 3: Mapping the ideal/envisioned system and determine the gaps i.e. determining where to be and establishing objectives

Step 4: Defining capacity targets and outputs i.e. determining what capacities are needed to get there

Step 5: Defining Time Frame and Phasing for Implementation

Figure 5-4: Identification of Institutional Gaps



In light of the objectives for restructuring OWD and the goals and demand for service delivery, the consultants shall define the functions of the required organisational system by reviewing the issues related to institutional capacity development (activity 1 and 2 above) and translate the capacity gaps between the old and new functions into capacity targets. The gaps and capacity targets will be identified at both the level of road services and the level of OWD. Our gap analysis will seek to address the following major issues:

a. Organisational framework of OWD
    1. Purpose/mission
    2. Policies, regulations and laws
    3. Functions (including their distribution) and competencies
    4. Functions and competencies of relevant units within OWD

b. Structures
    1. Clear relationship to functions
    2. Formal and non-formal internal structure of units
    3. Interrelationships, levels of decentralisation
    4. Possibility of horizontal structures and 'matrix' forms of non-formal relations

The above will provide us a clear mapping of the ideal system along with an articulation of the new functions and outputs. The outcome of the above assessment will be used to define measures and targets for organisational strengthening of OWD (**activity 4)** based on the existing and new functions of the Department. The targets will be derived from reform goals/objectives and stakeholders expectations and are proposed to be aimed at improving the functioning of the system as a whole. These shall be defined using SMART (Simple, Measurable, Achievable, Result oriented and Time based) objectives.

Under **activity 5**, Consultant shall identify key result areas (improved from ISAP) and key performance indicators and a time frame to achieve them.

5.4.6. Development of Options

Once above gaps have been identified, the next step shall be to develop a number of rationale structures by grouping of tasks; and developing an organisational structure, which addresses the

new needs vis-à-vis change in role of OWD. While developing these, review and analysis of organisational structures of other forward looking states shall be undertaken and their applicability under Odisha situation shall be assessed using a PESTEL (political, economic, social, technological, environmental, legal) approach. The consultants will then highlight the positive and negatives of each developed structure under Odisha situation. A workshop shall be used to validate and refine the proposed 'structure' on the basis of inputs received from OWD, Stakeholders and visit to other States.

5.4.7. Change Management

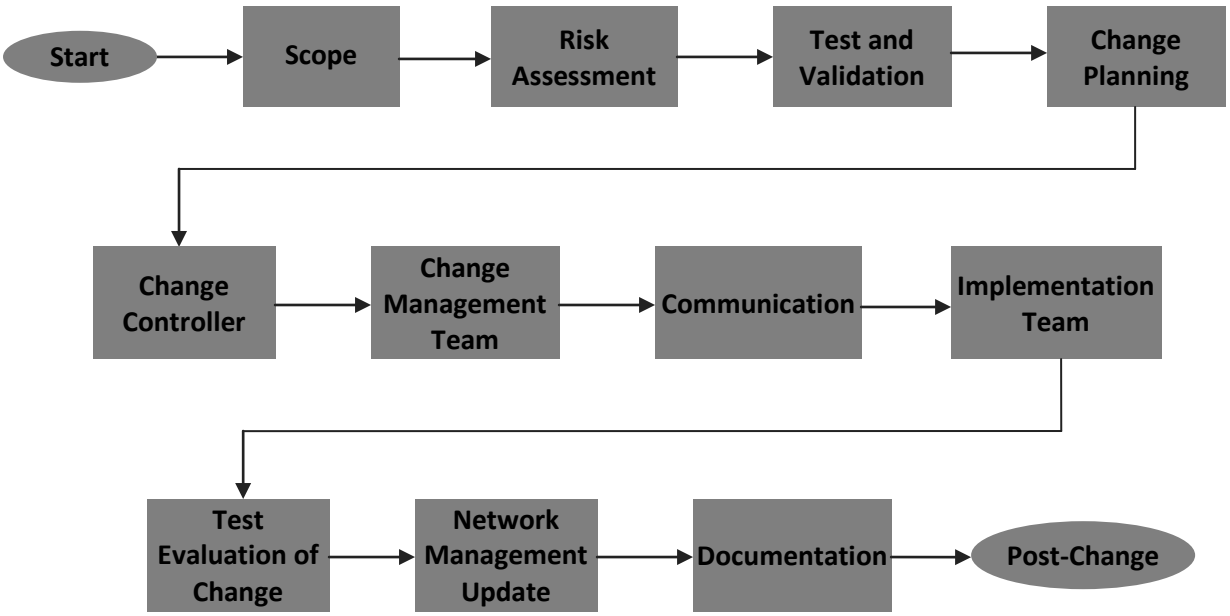
After validation of the recommended organisational structure, the consultant shall suggest scheduling of the proposed changes in the department to ensure that the transition is smooth and least disruptive of on-going activities. The Consultant shall also prepare a cost estimate for the restructuring need-giving estimate of both onetime initial cost and the recurrent annual cost. The consultant shall also suggest modalities for subsequent programming and budgeting, monitoring and evaluation including management and training capabilities of the restructured department.

Based on review and restructuring plans of OWD, the work culture at various levels shall also require the transition from the present scenario to the improved high performance standards and as per stakeholder expectations. This will have to be imbibed both by existing incumbents as well as new recruits to the organisation. The staff shall have to be well communicated and motivated to accept the new challenge and perform accordingly. For this a change management strategy {**Figure 5-5** *(p-61)*} shall be developed mainly using 'change managers and change agent concept. This shall involve changes and improvements in the following:

- Vision and values at various levels of staff and establishments;
- Functions and structure;
- Delegations of authority;
- Staffing and other resources;
- Job descriptions and assignments;
- Duty descriptions at various levels;
- Individual and establishment assessment policies;
- Change over from manual to electronic documentation;
- Quality assurance and quality control management;
- Planning procedures;
- Documentary and office management procedures;
- Rationalisation of salary structures at various levels;
- Training development programs;
- Development of short and long term policies and strategy;

- Integration of public community and Government, functional and operational requirement in road sector; and
- Inter relationship between OWD and other related departments.

Figure 5-5: Frame for Developing Change Management Strategy



The master document prepared on reorganisation of strengthening of OWD shall also have a tentative forecast of financial outlay to be incurred on shaping the present organisation to the revised format of restructuring. This shall also involve recasting/capacity building/development of human resources and restructuring of establishments at all levels.

5.4.8. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Organisational Development Specialist cum Deputy Team Leader
- Human Resource Management Specialist
- Financial Analysis cum Business Planning Specialist

SECTION 6

OWD STAFF TRAINING AND HRD

6. OWD Staff Training and HRD

6.1. General

HRD of the staff of OWD has to be compatible with the OWD plans, policies, strategies, action plans and institutional requirements. The scope of work defined vide Appendix A of the Contract Agreement is as follows:

- Planning and execution of a comprehensive TNA both at head office and field level for all OWD staff and officers involved on foreseeable OWD functions, operating challenges and skill priorities;
- Identification of an integrated set of 'core technical and management skills and knowledge' for OWD technical staff for future effectiveness;
- Developing multi-year 'rolling' Staff Training program supported by HRD policy Statement for the department;
- Evaluation of training requirements as per TNA both at head quarter and field level for OWD staff;
- Identification of desirable changes and enhancements to OWD organisational documentation on establishment to improve their communication skills and competency requirements;
- Preparation and facilitation of HRD policy for OWD along with strategy and action plan;
- Establishment of Training/HRD functions capacity building for OWD to sustain the delivery and management of new staff training and HRD activities based on internal/external training programmes; and
- Pilot 'ISO certification' process including training for staff and managers in ongoing core functions such as quality management, contracts/procurement, planning, design and or environmental and social management.

6.2. Approach and Methodology

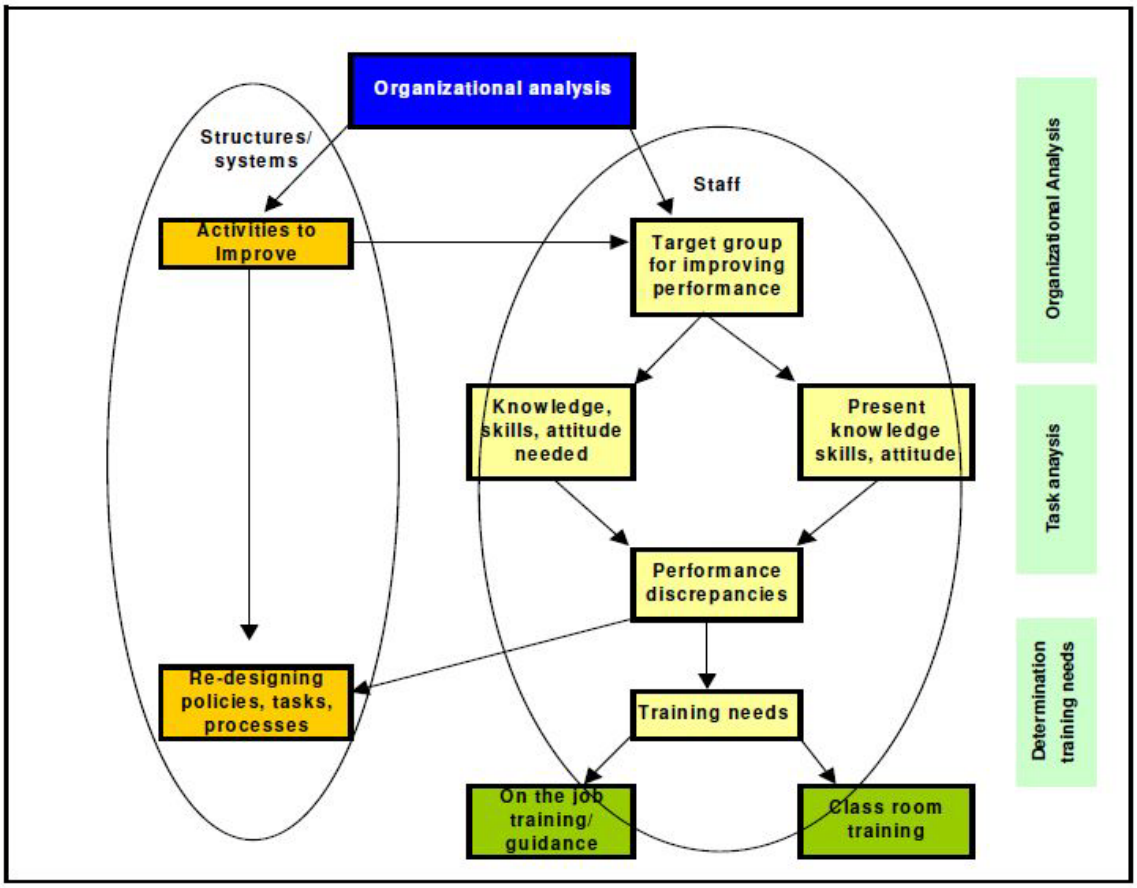
For effective and efficient plan formulations and project implementation, it is required that the activities of all the varied functionaries working in OWD are competent to realise the goals of the road sector.

During the course of the consultancy, utilising the 'process approach', focus will be on the following seven key activity areas as presented in **Figure 6-1** *(p-64)*.

- OD review
- Develop OWD – HRD Policy
- TNA
- Curriculum Development

- Training planning
- Training Delivery
- Training Information Management System (TIMS)

Figure 6-1: Key Activity Areas for Training



Each of these key activities are proposed to be undertaken in the following manner:

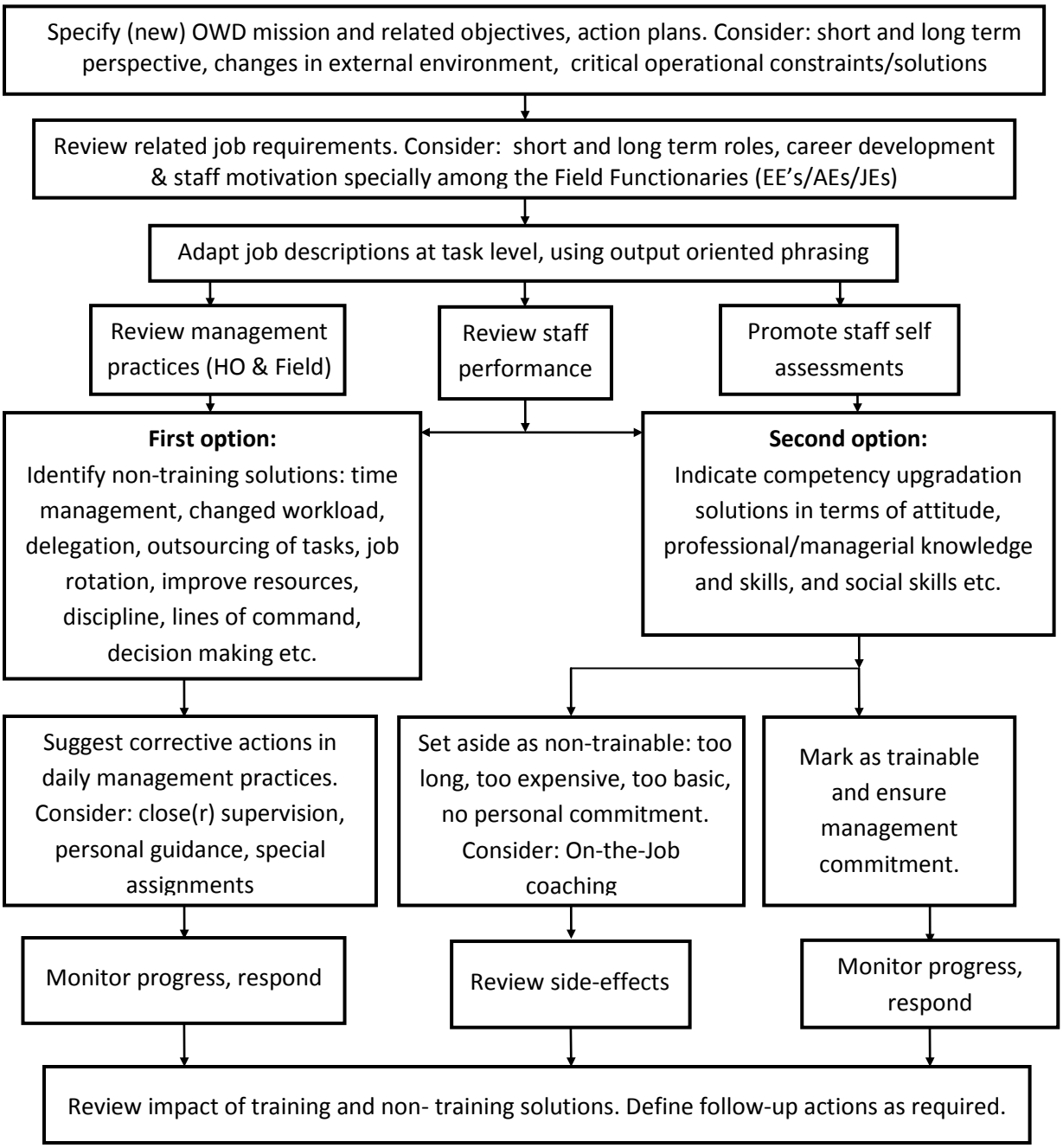
6.2.1. Organisation Development Review

In the process of analysing various capacity-building initiatives it is essential to understand the current status of human resources development practices of human resources in the existing OWD. Consultant will undertake 'situational analysis' to assess the Organisational Capacity Building Needs. Initial discussions with Officers of OWD have revealed a very high desire and an equally high level of expectation towards HRD. It's observed that most of HRD efforts are mainly reactive. Initial discussions revealed the mindset of the counterpart staff from OWD, which highlights short comings in HRD policy, budget, time, need, options for trainings, outcomes etc.

This activity will flow from the redefinition of OWD Vision/Mission, to be undertaken under organisational restructuring exercise. Identified gaps emanating from 'Road sector Policy and Strategy' and 'Reorganisation of OWD' will feed into the OD review. The consultant team, adopting a

participatory approach, will undertake the organisational review and assimilate the core issues. A two way segregation of these issues will be undertaken to categorise them into a) management solutions and/or b) competency upgradation solutions. The initiatives to be addressed during the review phase are presented below as an 'activity flow' diagram shown in **Figure 6-2.**

Figure 6-2: Activity Flow Diagram for Training



6.2.2. Develop OWD–HRD Policy

It is an accepted fact that training activities should be a 'continuous' essential function to be introduced in the Works Department. Therefore, training sustainability becomes a core concern for all. Core members from OWD, during initial discussions agreed on the immediate and essential need to have an HRD policy to sustain the training function. In fact, OWD has already taken initiatives to establish a 'Construction Academy'. This is also reflected in their document 'RESTRUCTURING OF ENGINEERING CADRE IN WORKS DEPARTMENT.' Consultants propose to develop (in consultation with OWD) a HRD policy document to support training functions within the department.

The Policy document may include:

- Basic philosophy of OWD HRD;
- Objectives of the policy;
- Who all are covered in the training policy;
- Training target (number/percentage of employees to be trained in a year);
- Training budget (percentage of establishment budget);
- Selection criteria for training providers/institutions;
- Definitions - types of training (in-house, external, foreign etc.);
- Definitions - duration of training (long term, short term, medium term, etc.);
- Process of TNA (coverage, frequency etc.);
- Process of curriculum development;
- Development of training plan;
- Criteria for selection/nomination of participants;
- Procedure to deal with non-attendance/absence from training;
- Honorarium payment;
- Regulation of entitlements regarding TA/DA to participants;
- Pre-training evaluation of trainees;
- Submission of training reports by the participants;
- Post training evaluation and impact assessment of trainees;
- Monitoring and evaluation of training agency/organisation;
- Programme evaluation;
- Training database; and
- Policy review and improvement strategy.

Consultant will support in institutionalisation of HRD functions within OWD by undertaking development of OWD-HRD Policy document, Development of Action Plan and then its implementation. Consultant will work towards issuance of a Government Order and its acceptance by all concerned.

6.2.3. Training Needs Analysis

Based on preliminary discussions, it became apparent that there is no strategic planning in relation to the overall size, type and level of competencies of the workforce within OWD. Many changes and capacity development measures shall be required as the key areas for improvement in the various organisational units. The TNA exercise shall cover:

a. Organisational analysis, beginning with an examination of the short and long term goals of the organisation, as well as trends that are likely to affect these goals. This analysis will require that the top-level management examine their own expectations concerning these training programs.

   NB: Not all performance problems in an organisation have a trainable solution. Changes in the organisation itself, re-postings, improved management practices could be better solutions, and if this is the case, training may offer very little.

b. Tasks analysis, will be the second part of the needs assessment and shall include a careful analysis of the jobs to be performed by the trainees upon completion of the training program.

c. Personal analysis, which is concerned with the question as to how well a specific employee is, at present, carrying out the tasks which make up his job. As such, this component of the needs assessment is very much related to the determination of the knowledge, skills and abilities necessary to perform the tasks.

From the outset, a number of new competencies will be required for developing the policies and strategies. Consultant will map the present and required competency of OWD staff at various levels through a questionnaire based self assessment competency survey. Stated in the ascending order, following four competency measures as indicated in **Table 6-1** will be covered. The competency survey will be carried out both at head office level as well as field level.

Table 6-1: Definition of Competency Measures

Competency measure	Definition
Awareness	have generally heard about the subject
Exposure	a broad understanding of the principles
Basic Knowledge	knowledge on the subject has been acquired through education and training, but has not been put to practical use

Competency measure	Definition
Ability to Work	have the knowledge and skills to be able to work in a specified area with satisfactory results

Based on the findings of the survey, **Training Needs** shall be specified and classified per learning stream. Initial assessment during discussions with OWD Staff and from experience it can be stated that the *learning streams/Core skill areas* enumerated below should form part of the overall list of Training Needs:

- Policy and Planning;
- Investment Decision making;
- Design;
- Construction Supervision;
- Project Management;
- Quality Management;
- Procurement and Contract Management;
- Environmental and Social Management;
- Financial Management;
- HR Management/Personnel Relations;
- Road Safety Aspects;
- Road Maintenance Management; and
- Information Technology etc.

Each of the above *learning streams/Core skill areas* will include 'a few, to many' training programmes. Findings for the Competency survey and the TNA will be documented and be made available for use in OWD by the end of year 2012.

6.2.4. Curriculum Development

As per Confucius - 'Learning without thought is labour lost. *Thought without learning is* intellectual death.' Discussion with most OWD staff on the past efforts with respect to training brought significant pessimism on trainings. Although, it was revealed that OWD had recently conducted several trainings during November, December 2011 and even January 2012 an have trained more than 400 participants. A close examination of documents related to training on 'Quality' brings out a series of questions, viz.

- What was the objective of the training?
- What was the specific purpose – aptitude change, knowledge improvement or skills development?

- How can skills be transferred through an 'orientation programme'?
- Doesn't participant size of '28' to '86' per programme defy training fundamentals?
- What are the plans for training of remaining 669 JE's and 362 AE's?
- With '5 hour-training-day', for 3 days, how can 35 topics be covered in 15 hours? (i.e. say 24 minutes per topic)
- What was the objective achieved by conducting an examination?
- Was the quality of the training programme itself assessed?

Though the efforts of the Training team should be lauded, however, the intent here is to highlight the areas of improvement towards 'Training development' within OWD by posing and answering such questions. Considering these, staff training programs covering all categories of staff shall be developed in collaboration with PMU/OWD. The curriculum of training program shall be based on training needs assessments for various field and HO jobs at different levels.

Since Learning is not attained by chance; it must be sought through training with ardour and attended to with diligence. Therefore, for 'each' course, consultant shall

- Define the training objectives,
- Develop curriculum.

6.2.5. Training Planning

The training plan will specify following 5 W's:

- Why is training needed? (Results of TNA, type of competencies to be obtained) – defines learning objectives
- Who is to be trained (participants)?
- What type of training would fit? (Training delivery strategy)
- How long and when is the training to take place? (Details - how much of the time allocated, availability of participants)
- Where does it take place? (Who is responsible for the delivery)

Consultant shall initially develop and focus only on 'Demand-based training planning' whereby:

- Training will respond mainly to organisational weaknesses and changes (OWD Vision and TNA)
- Courses will be based on job descriptions and confirmed job training needs (TNA)
- Training targets will match with available and sanctioned staff for each function
- Course series and duration will be manageable for the participants (and trainer)
- Delivery timing will matches with physical progress, staffing, work season
- Short term and long term satisfaction of OWD and WB expectations (ISAP)

- Professional credibility of training teams (trainers and coordinators)

Consultant shall develop a short term (say 2–3 years) Training Plan to include target numbers, duration, possible organisations, possible schedule, and tentative costs.

The training plan will outline who will deliver the training, and when and where OWD participants' needs to go to receive the structured component of the training. The training plan will be a working document. It will be flexible enough to meet all the needs and will be modified, as and when needed, but reviewed every six months during the course of the project.

The first annual plan will be prepared and be ready for use by February 2013 followed by the second one in February 2014. The plan will be reviewed each calendar quarter and corrections will be incorporated.

Besides, for new entrants to engineering services at JEs/AEs/AEEs level, a multi-year rolling plan shall be developed. This could initiate with orientation/induction trainings of a period of 1-3 months to acquaint them on the following:

- Rules, regulations, enactments likely to have bearing on the individual working;
- Familiarise with political, systems, processes, roles and responsibilities, organisational structure and goals etc.
- Develop healthy attitude to work, service, sub ordinates and public; and
- Imbibe healthy value system and work culture.

The Consultants shall identify desirable changes in the OWD organisation to enhance communication skills and competency requirements, apart from other aspects of HRD. Training programmes shall be developed for various levels of employees.

While planning annual plans, the time match shall be adjusted by considering the development in each domain, availability of domain specialists, and time for training course development. The Training Plans shall have scope for review to integrate any situational changes.

6.2.6. Training Delivery

Consultants will facilitate, monitor and report on the implementation of various training initiatives. For each programme training staff/instructors from its own pool of professionals will be mobilised. If there's need be take the faculty from outside, depending on need of the topic that too shall be organised. When preparing the training delivery plan and calendar following considerations will be kept in mind

A. Define courses and learning path per job
    - What is the title: content, job reference
    - Schedule max 1–2 weeks of uninterrupted formal training
    - Split long courses in linked-up shorter courses
    - Sequence different courses for the same participants

B. Cluster participants per course/job
   - Local deliveries for smaller geographical area, Circle/Division
   - Centralise for higher level data collection staff
   - Plan for 15 – 20 participants per course

C. Consider sequence of courses deliveries
   - Which jobs come first: bottom-up, top-down?
   - Which regions come first?

D. Setting dates
   - When do we have our training (and demo) equipment available?
   - When is the job equipment procured and installed?
   - Avoid high workload season, holidays and 'holy' days
   - Simultaneous deliveries in different Circles/Divisions, maybe?

E. There is more to plan than just deliveries:
   - Training preparations, evaluations, administration
   - Non-training activities in work place
   - Sanctioning of funds
   - Timely announcements and gaps for nominations

Regarding training delivery, it has been given to understand that OWD is in the process of establishing Academy of Construction. Amongst various training delivery options (in-house, external training agency, hiring a training consultant etc.), consultants shall explore and suggest an appropriate option including bets use of Academy of Construction. Many State or central level organisations or public sector institutions offer a variety of courses, which could suitably meet the requirements of OWD and can be considered for competency upgradation.

It will be the Consultant's endeavour to create a pool of resource persons/trainers from within/outside OWD. Being an on-going activity it is expected that the first set of delivery may start from April 2013 and henceforth will become a continuous process for all times, going beyond the timeframe of RSID Project.

6.2.7. Training Information Management System (TIMS)

With large scale training expected in OWD, it becomes important for the Training/HRD Unit to keep record of training development and its implementation possibly using a *TIMS*. Consultant will develop a draft document on the structure of TIMS.

To generate and distribute the right type of information in an accessible way, a planning and reporting system will be proposed which will be based on standardised formats. This shall provide a set of forms and checklists to plan various training activities, organise training data, prepare progress reports, and facilitate monitoring and feedback. Based on the feedback, the detailed design of the TIMS will be improved as required, and confirmed as a standard training management tool.

This TIMS manual could cover the following checklists and reporting formats:

- **Trainees information**

- **Training courses**
  - Course development activities
  - Annual course planning
  - Course evaluation findings
- **Training modules**
  - Module identification
  - Module listings and production sheets
- **Training institutes**
  - Training Institute profile
  - ID
- **Faculty/Trainers**
  - Faculty/Trainer profiles
  - Faculty/Trainer involvement and development
- **Finance and budgeting**
  - Checklist for course budgeting
  - Checklist for capital training cost
  - Annual training budget and balance sheets

6.3. Establishing Effective Training and HRD Setup within OWD

It will be necessary to strengthen the HRD structure within OWD to effectively undertake the function of training and development. The unit shall be responsible for effective implementation of training policy, TNA, training planning, delivery of trainings, selection of participants and resource persons/training institutions, training evaluation and managing Training Management Information System. Consultants shall interact/discuss with OWD to finalise the location/structure of such a unit within OWD. Although, an alternative training organisation could be established to undertake training programmes, consistent monitoring and evaluation of organisational training requirements is a must. The Academy of Construction could be suitably utilised for the training purposes. Efficacy of same shall be explored and reported for consideration of OWD.

6.4. Development of ISO Certification Process

The Consultants shall advise on procedure for 'ISO 9001:2008' certification to the OWD, covering engineering, financial management, project management and other sectors such as highways and buildings. As per consultants, the salient features of requirement of ISO 9001:2008 are: Quality Management System; Management Responsibility; Resource Management; Product Realisation and Measurement Analysis and Improvement, which should be otherwise also developed within the organisation.

The ISO certification shall enable OWD to develop as an organisation of national and international acceptance level, in respect of policies/documentary processes and procedures.

6.5. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- Organisational Development cum Deputy Team Leader
- Training and Human Resource Development Specialist
- Human Resource Management Specialist
- Legal Specialist

SECTION 7

ROAD SAFETY ENGINEERING AND PLANNING

7. Road Safety Engineering and Planning

7.1. Background of the Study

One of the objectives of ISAP 2008-18 is to set up an 'Effective State level road safety policies, resources and actions' to improve the road safety situation in the State of Odisha. The key areas identified to achieve the desired results under this objective are:

- RSAP along with required funds;
- Road safety action framework and with the supporting arrangement for implementation in the State; and
- Reduce the rate of accidents resulting in safe travel on the State road network.

ISAP 2008-18 identified certain key actions required to be implemented on short term (0 to 2 years) and medium term (2 to 5 years) as shown in **Table 7-1**.

Table 7-1: ISAP Key Actions – Short Term and Long Term

Short Term (0–2 Years) Actions	Long Term (2–5 Years) Actions
1. Establish traffic engineering and road safety cell in OWD 2. Initiate GOO steering body for evolving RSAP 3. Establish road safety councils at State and District level 4. Develop road accident recording and analysis system duly training the staff in consultation with police and State Transport Authority (STA) departments 5. State wide road safety database initiated 6. Identify accident-prone areas/black-spots on all roads under OWD and improve 7. Evolve State road safety policy and action plan 8. Provide sufficient funds to improve the accident-prone areas/black-spots	1. Establish an empowered and funded State Road Safety Apex Body, with active community linkages, for RSAP oversight 2. Implement phased plan for highway patrol operations on the core road network (CRN) 3. Integrate black-spots remedial actions into all road plans/programs

Following the recommendations of ISAP, the OWD called for consultancy services for Odisha RSID Study, in which 'Road Safety Engineering and Planning' is one of the important tasks. The objective of the study is to proposed mechanisms and means to achieve key result areas specified in ISAP, which were framed with the objective of reducing road crashes and fatalities in Odisha.

7.2. Scope of Work

The broad scope of work mentioned in the ToR is to assess and advice on the engineering elements of road safety management practices, legal and institutional framework for road safety and facilitate progressive planning for more strategic road safety management initiatives, and the commensurate organisational structure. The deliverables include:

- A report with analysis of crash data/accident root causes, identification of high risk/problem groups, identification of high risk/hazardous locations along with design for road safety countermeasures, safety campaign materials, new legislation, formulation of enforcement plans, road improvements etc. besides
- Detail report on Road Infrastructure Safety Management Review
- Proposed Odisha RSAP

To achieve the broad scope of work and deliverables, the following tasks has been identified in the ToR:

- Road infrastructure safety management review of relevant OWD engineering functions and of a limited sample survey of road network sections/corridors;
- Provision of technical capacity building in road safety design to OWD units;
- Clarification and preliminary assessment of the current road safety responsibility framework in the State;
- Facilitation of a high level workshop with WB participation to explore the GOO's concerns, aims and priorities in relation to improving road safety management; and
- Facilitation of GOO planning for more strategic externally-assisted multi-sectoral measures to improve overall road safety management strategy, capacity and outcomes in Odisha.

The initial consultations and desk study carried out by the Consultants after mobilisation revealed that some actions recommended in ISAP have already been taken up by the GOO. For example, District Road Safety Councils (DRSC) have been formed with the District Collector as the Chairman; and the State Road Safety Council (SRSC) has been constituted with the Chief Secretary as the Chairman, and the same is under the approval of the Cabinet. However, a number of other actions, such as capacity building of road safety engineering within OWD, identification of black-spots/hazardous locations and preparation of RSAP remain to be realised, which are the core objectives of the ToR under the task 'Road Safety Engineering and Planning'.

In light of the above, the major objectives to be achieved in road safety engineering and planning under this assignment can be summarised as follows:

- Enhanced technical capacity of OWD staff in accident data analysis, safety assessment of road network, identification of black-spots/hazardous locations and design of road network infrastructure for road safety improvements;

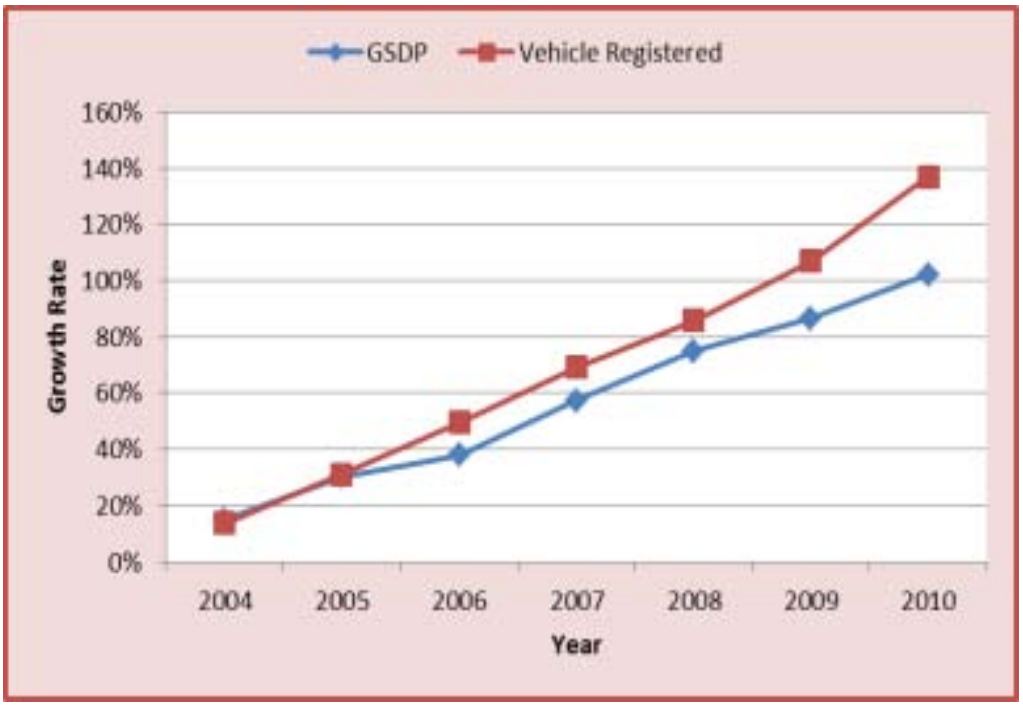
- Comprehensive understanding of road safety engineering, commensurate with roles and responsibilities of OWD staff;
- Review of road safety management of relevant engineering functions of OWD and road safety responsibility framework of GOO, and recommend improvements; and
- Preparation of a RSAP addressing the concerns, aims and priorities of the stakeholder departments of GOO in consultation with WB.

The approach and methodology proposed by the Consultants to achieve the objectives behind the tasks set forth in the ToR has been described in Section 7.5.

7.3. Road Safety Problem and Initiatives in Odisha

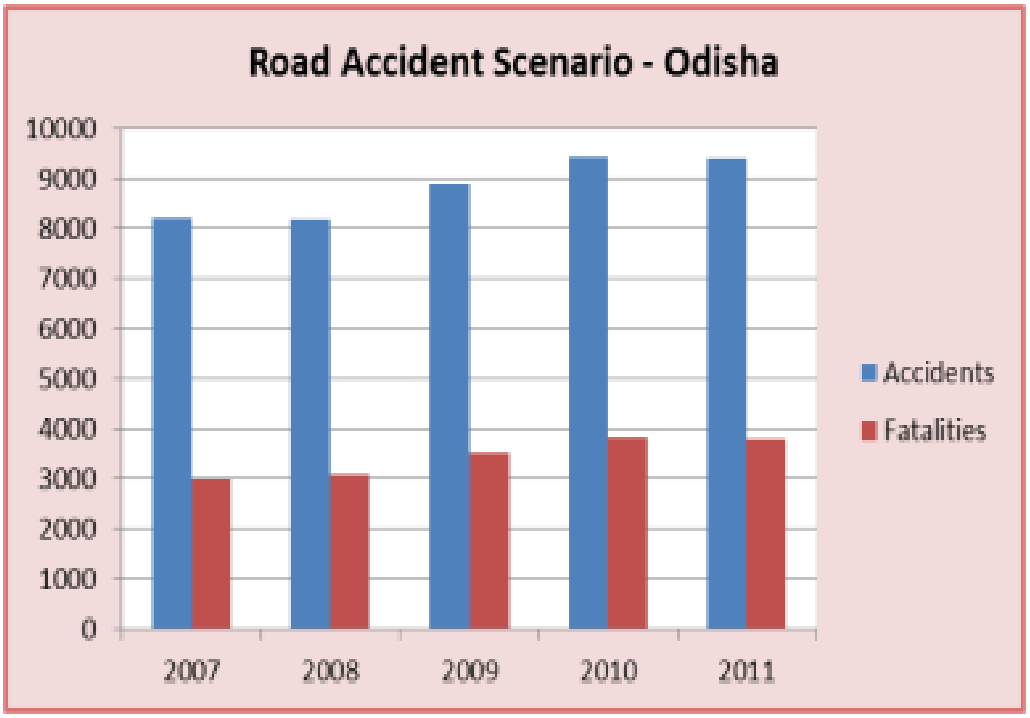
Odisha is a mineral rich State and is on the path of rapid economic progress. **Figure 7-1** shows the trend of some socio-economic indicators. The gross State domestic product (GSDP) is increasing at about 8 to 9 percent (at constant prices)**,** while the number of vehicles are increasing at a rate of 15 to 20 percent per annum.

Figure 7-1: GSDP and Vehicle Growth Rate



The number of accidents and associated fatalities are shown in **Figure 7-2** *(p-77)***.** Based on the experience elsewhere with similar trends, the growth rates are likely to increase the potential for road accidents, it is highly likely that the casualties on the road should also increase over the years.

Figure 7-2: Road Accident Scenario – Odisha



In late 1990's, the GOO set up an Odisha Safety Society, to look into the issues affecting road safety in the State. However, it did not result in any significant activities due to various reasons. In 2010, GOO has recommended setting up a SRSC with Minister of Transport as President/Chairman of the council. The Council will have 30 members, including chief secretary, transport secretary, transport commissioner and 10 nominated members.

DRSCs have already been set up with District Collectors as Chairman with members from OWD, Police and other stakeholders. However, the activities of the council at this stage can be considered still in the preliminary stages.

7.4. Site Visits and Consultations

7.4.1. Site Visits

On 6 May 2012, the Consultants undertook a site visit to have an initial assessment of different types of roads in the State road network. The visits were organised in such a way to cover all categories of roads – NH, SH, MDR, ODR and few VRs. The following roads were visited:

- SH 60 Phulnakhara-Charichhak Road;
- ODR at junction with SH 60 near Bagalpur;
- VR from Chaupada towards village Barasailo;
- NH 204 – Pipli to Khordha;

- MDR 77 – Khordha to Chandaka Road; and
- NH 5 – Khordha to Bhubaneswar.

ON SH 60 and NH 204, encroached settlements have been found along the road and there are no traffic calming measures provided to alert the driver of the impending situation of mixed traffic. The lane width is generally narrow for a SH classification and junctions are not well laid out, leading to insufficient sight distances and hazardous conflicts. Though provided on certain locations, provision of road markings and traffic signs are not adequate. In addition, the shoulder width is too narrow at places and on certain sections, shoulders are absent forcing the pedestrians to move on the road with high speed traffic. Few examples of deficiencies identified are shown in the pictures below.

Hazardous 3 armed junction form

Sharp curve, but no warning signs

Poorly laid out major 4 arm junction

Hidden non-standard direction signs

Uncontrolled junction with NH5

No shoulder and road furniture

7.4.2. Stakeholder Consultations

After mobilisation on 9 April 2012, the Consultants carried out various consultations with different departments of GOO, responsible for keeping road accident data and involved in the road safety. In addition to various meetings with OWD staff, the following consultations were made:

- 8 May 2012 – Meeting with officials of Transport Department, Bhubaneswar
- 9 May 2012 – Meeting with Transport Commissioner, Cuttack
- 9 May 2012 – Meeting with Director, Office of Transport Commissioner, Cuttack
- 9 May 2012 – Meeting with IG, Crime Branch, Cuttack to collect accident data

The Consultants have obtained data pertaining to accidents, vehicle registration and licensing from the above offices.

7.5. Approach and Methodology

Based on the objectives and scope of the services, an appropriate methodology has been developed by the Consultants so as to address the requirements of the ToR, which include the deliverables as per the completion period, with due interaction with OWD as indicated in the ToR.

The work to be carried out as per the ToR has been broken down into different tasks as indicated in the following sections. The methodology developed by the consultants to comply with the requirements of the ToR and to deliver a RSAP for Odisha is shown in **Figure 7-3** *(p-80)*.

The activities involved in the tasks shown in the flow chart above are explained in detail in the following sections. Some of these tasks may be taken up simultaneously and therefore, numbers given do not reflect a sequential order.

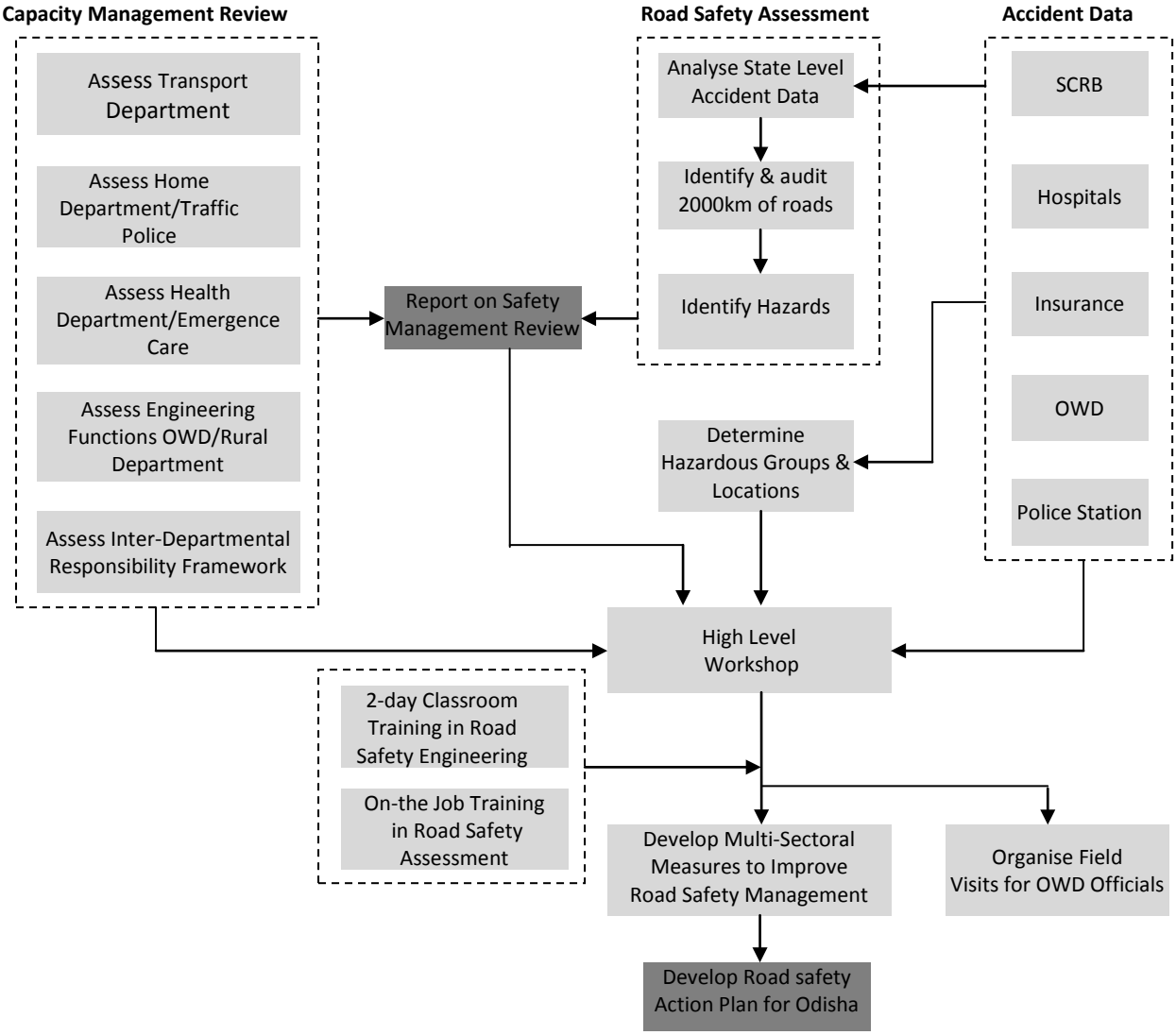
7.5.1. Collection and Analysis of Accident Data

The National Crime Records Bureau (NCRB) requires the States to collect accident data in a given format (19 different tables) and the data are available with State Crime Records Bureau (SCRB) in line with the format required by the NCRB. The following types of data are available with the SCRB, which indicate accidents classified by:

- Month of the year
- Type of area and time
- Accident classified according to road classification
- Accident classified according to location
- Types of vehicles and objects involved
- Age of vehicle
- Type of manoeuvre
- Driver's action
- Particulars of vehicles involved
- Age of passengers
- Type of persons and animals killed/injured
- Road condition
- Road geometry

- Nature of accident
- Cause of accident
- Age group of drivers involved
- Junction type and traffic control
- Type and number of vehicles and persons involved

Figure 7-3: Work Methodology – Road Safety Action Plan



The above District level data are available in the SCRB in a paper format. The Consultants has already collected the data for the period 2008–11, and developed the same into an electronic format.

In addition to the above, the Consultants will collect accident data from hospitals/trauma care centres and insurance agencies. It is important to note that along with other stakeholder consultations, the State level data will be the primary driver to develop a **RSAP** for the State.

7.5.2. Identification of the Hazardous Corridors

The data collected from the SCRB indicate the districts where crashes and fatalities are high. The summary of crash data in different Districts are shown in **Figure 7-4** *(p-82)*. Whereas, the number of fatalities across the districts of Odisha during 2009–11 is presented in **Figures 7-5 to 7-7** *(p- 83)*.

The Consultant will select different types of road (NH, SH, MDR, ODR and VR), of approximate 2,000 km, length of highly hazardous corridor/sections having different terrain, from the districts having high incidence of accidents and fatalities, as indicated from the crash data collected from SCRB and other sources. The process of identifying the 2,000 km for safety assessment will be as follows:

- Identify the districts having higher levels of crashes and fatalities from the data collected from SCRB;
- Identify the location (NH, SH or MDR) of accidents on these Districts from the data collected from SCRB;
- Carry out consultation with District level SP and OWD EEs of these Districts to collect crash data from all the police stations; and
- Identify the road sections amounting to 2,000 km, where accident rates are high, in consultation with OWD engineers and District SP.

It is anticipated that, significant percentage of accidents might be occurring on NH and SH network. However, the 2,000 km of road for safety assessment will be selected from other type of road sections (MDR, ODR and VR including junctions) in different terrains to demonstrate road safety inadequacies in different types of roads.

The final road sections will be chosen after consultations with the Client.

7.5.3. Safety Assessment of the Hazardous Corridors/Road Section

The analysis of data gathered from police, hospitals and other sources will enable to identify the major accident types, hazardous groups and tentative type of hazardous locations in the State road network. Following the accident data analysis, the consultant will carry out a safety assessment of the selected hazardous corridors/road sections totalling to approximate 2000 km. The safety assessment of identified road sections involves the following sub-tasks:

7.5.3.1. Identification of Road Safety Inadequacies

While investigating the site (project road), both physical checklist and operational checklist will be used. The checklists will pose questions to be answered during the site visit and some major questions are:

Figure 7-4: Summary of Crash Data – 2010

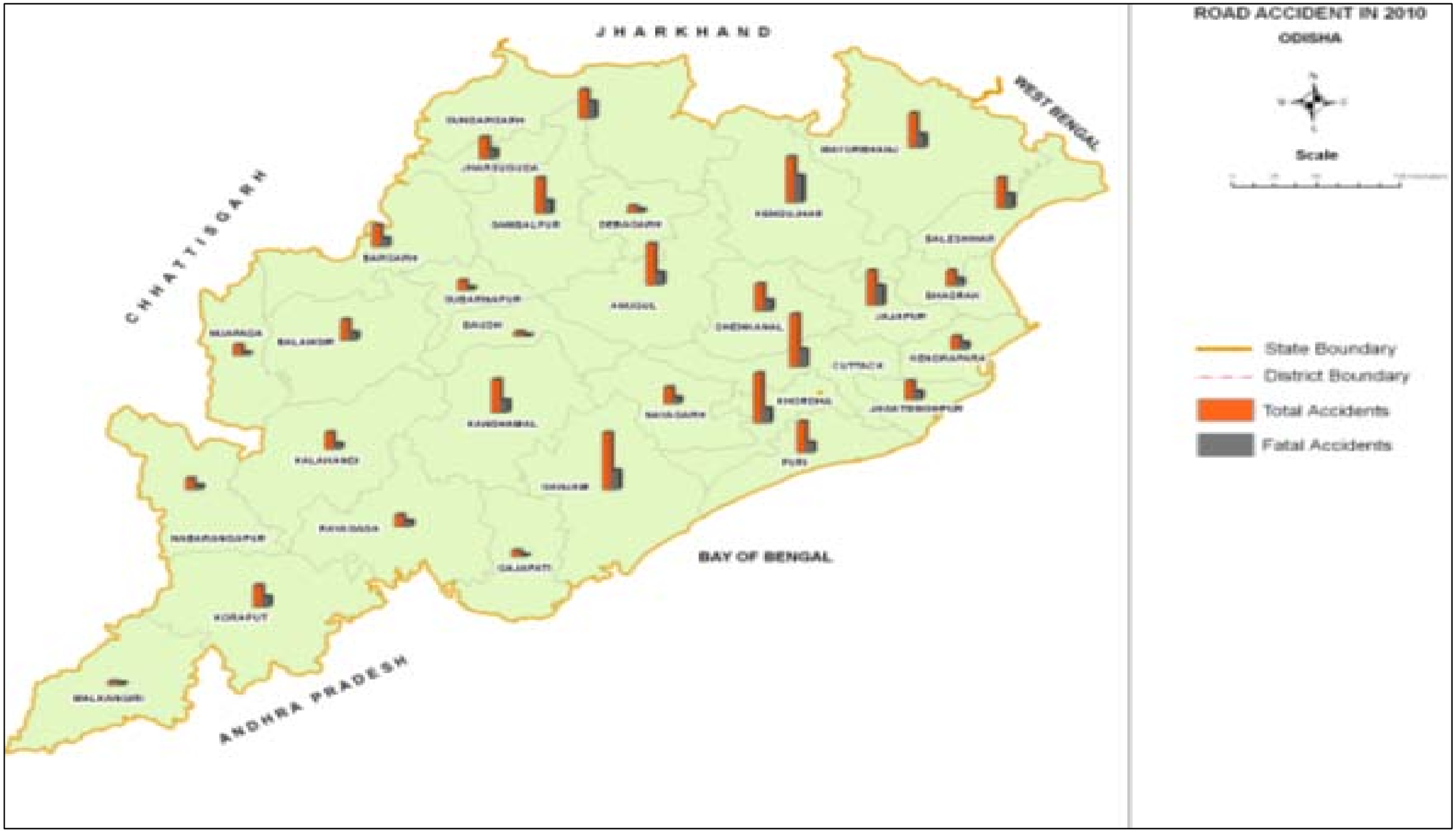
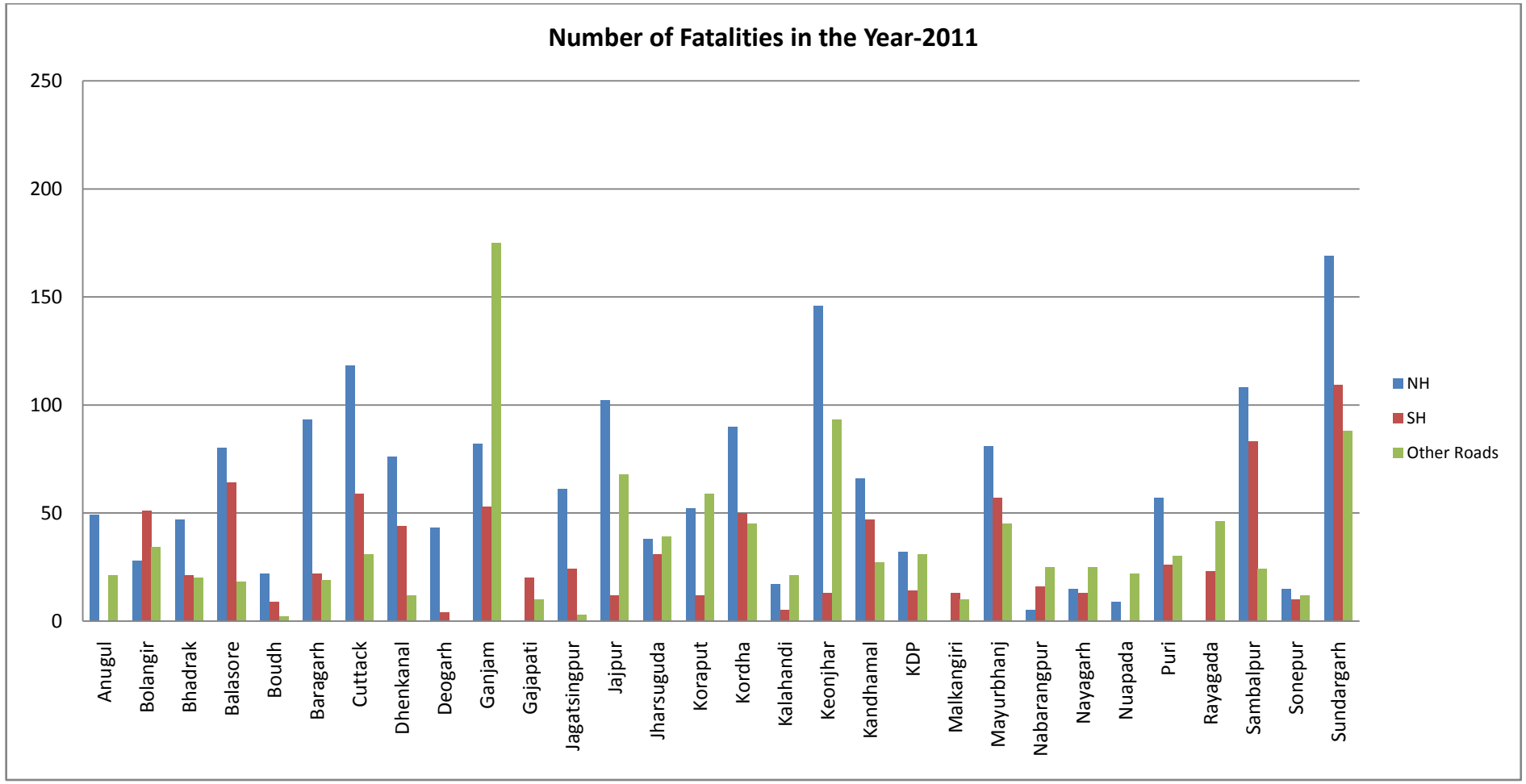
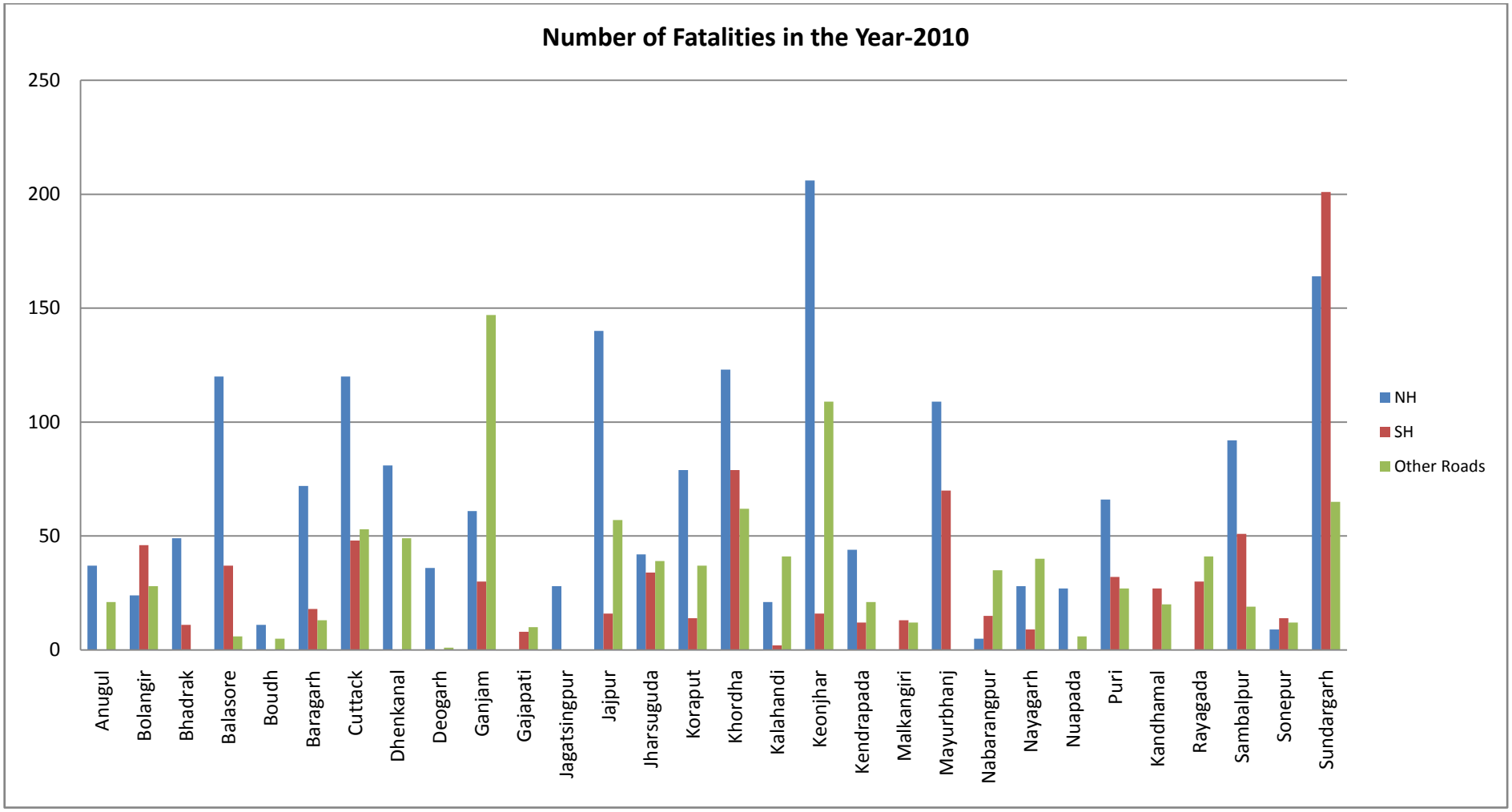


Figure 7-5: Number of Fatalities – Year 2011



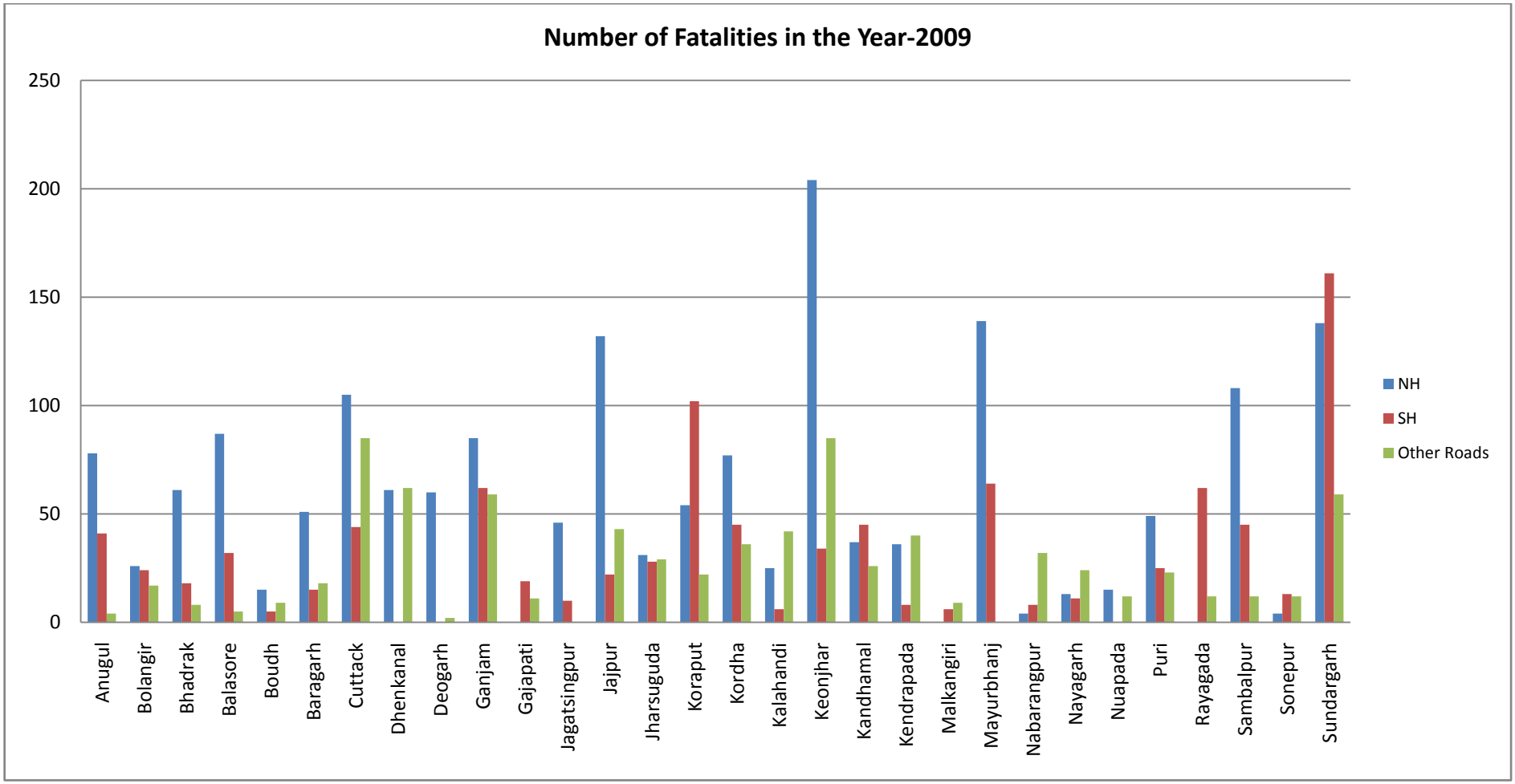
Source: Data collected from SCRB, Cuttack, Odisha.

Figure 7-6: Number of Fatalities – Year 2010



Source: Data collected from SCRB, Cuttack, Odisha.

Figure 7-7: Number of Fatalities – Year 2009



Source: Data collected from SCRB, Cuttack, Odisha.

Physical checklist

- Were accidents caused by physical condition of the road?
- Is street light adequate?
- Are lane widths adequate?
- Are there adequate facilities for pedestrians?
- Are road signs adequate in terms of their placement, conformity, and sizes etc.?
- Are road markings adequate in terms of type, clarity and locations?
- Were there obstructions on the road or close to the edge?

Operational Checklist

- Is the driver's view of other vehicles/pedestrians obstructed?
- Do drivers respond correctly to signs and other control devices?
- Do drivers have trouble in understanding and finding the correct path through the locations?
- Are there hidden hazards?
- Are vehicle speeds excessive?

The site visit using the checklists and the inputs from analysis of accident data from police stations will enable the Consultant to compile a comprehensive list of hazardous locations and road safety inadequacies.

7.5.3.2. Problem Diagnosis and Development of Countermeasures

The countermeasures will be developed by collating details/inferences of analysis gathered from the following:

- Safety assessment of existing road
- Accident analysis

For the locations perceived to be highly hazardous on the project road, the technically acceptable and economically viable countermeasures will be chosen to match the diagnosed problems evolved from the road safety assessment. The measures will be largely low cost engineering measures which could be implemented easily without much difficulty, such as:

- Improving signing
- Improving road markings
- Improving visibility
- Soften roadside environment
- Improve road surface
- Speed limiting measures
- Improve pedestrian facilities (across and along the road)
- Improve controlling the movement of vehicles
- Minor improvements in alignment

In proposing countermeasures, care will be taken to avoid increase of other types of accidents in the same location, and even migration of accidents from one location to another.

7.5.3.3. Prepare Safety Assessment Report of Hazardous Corridors/Road Sections

A detailed road safety assessment will be prepared for the existing road which would capture the safety deficiencies of project road and the suitable countermeasures will be proposed on the basis of accident data and engineering survey inferences.

7.5.4. Identification and Improvement of Hazardous Locations

The Consultant will proceed to **identify at least five black-spot** locations on each identified road section on the sample road network to **demonstrate 'Accident Investigation and Prevention techniques'** to the OWD staff. However, it is important to note that black-spot identification require police FIRs to note exact location of accidents. **If this is not available, identification of black-spots based on FIR records will become difficult and in that case the process will be taught to OWD staff in a Workshop proposed to conduct at a later stage**. The following procedures will be followed to complete this task:

7.5.4.1. Detailed Accident Data Collection and Identification of Hazardous Locations

The Consultant will visit selected police stations along the identified road sections to collect detailed accident data to identify at least five black-spots. The data will be collected from the police First Investigation Report (FIR) in a standard accident recording form, developed in accordance with IRC and international guidelines. The map of police stations in Districts of Odisha is shown in **Figure 7-8** *(p-88).*

Before proceeding to respective Police stations for detailed accident data collection, the Consultants will obtain formal authorisation from police headquarters to extract the required details from the records. OWD is expected to facilitate in liaising with Police Stations and for introducing the Consultants' team to Police. The details collected in the prescribed form will help the team to identify the hazardous locations (black-spots) and nature of accidents.

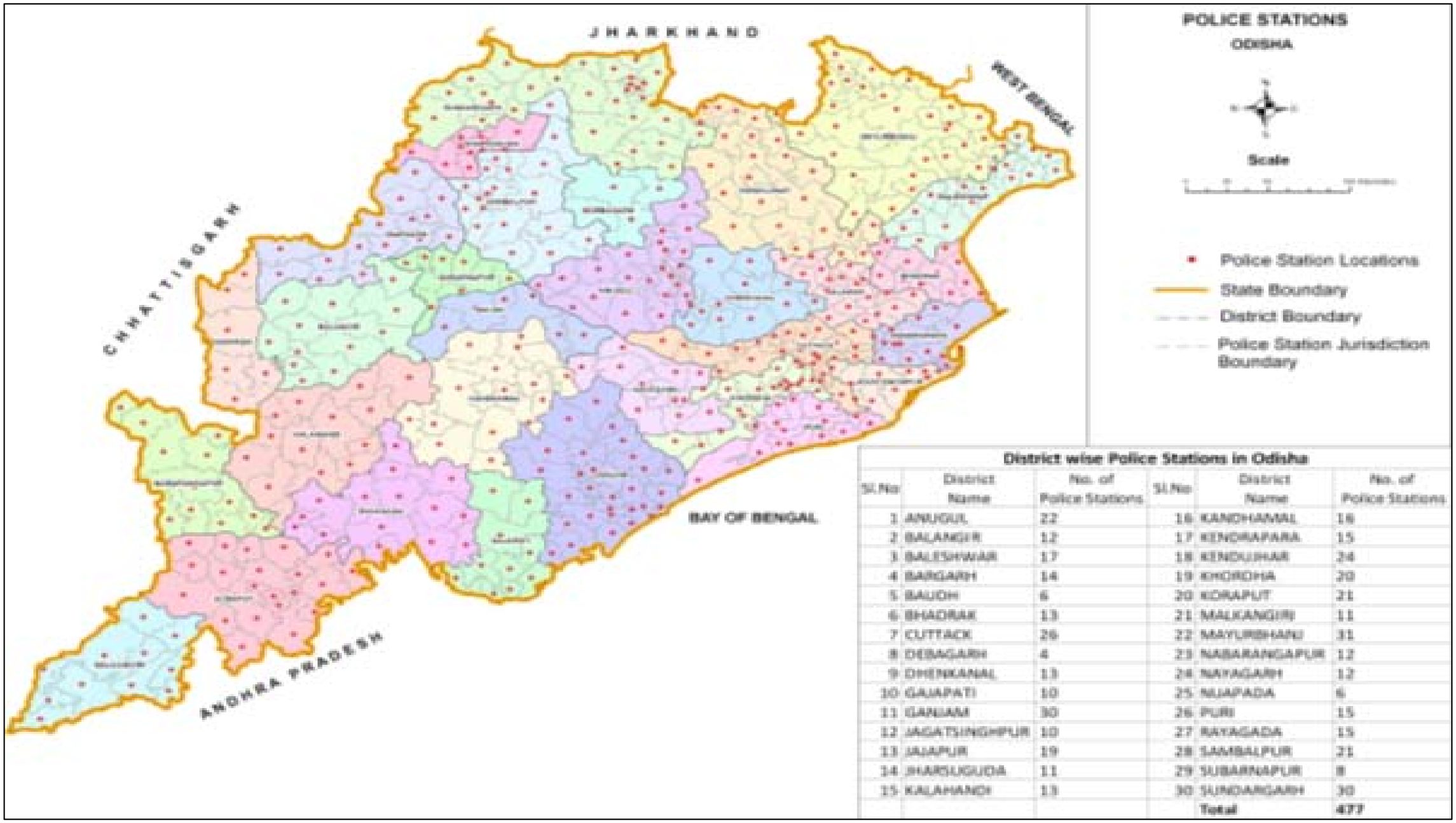
The accident data of the last three years on project road will be plotted to identify the cluster of accident locations. Generally a small reach of road having more than three causality accident in a year can be called as a black-spot. Thus the accident black-spot in the project road will be identified to proceed with accident analysis for each spot.

7.5.4.2. Carry out Accident Analysis

The accident analysis will be carried out to determine the pattern of accidents in the black-spot locations. The following sub-tasks explain the process involved in accident analysis:

1. Prepare summary analysis
2. Develop accident factor grid
3. Prepare composite collision diagram
4. Evolve accident pattern

Figure 7-8: Map of Police Stations



District wise Police Stations in Odisha

Sl.No	District Name	No. of Police Stations	Sl.No	District Name	No. of Police Stations
1	ANUGUL	22	16	KANDHAMAL	16
2	BALANGIR	12	17	KENDRAPARA	15
3	BALESHWAR	17	18	KENDUJHAR	24
4	BARGARH	14	19	KHORDHA	20
5	BAUDH	6	20	KORAPUT	21
6	BHADRAK	13	21	MALKANGIRI	11
7	CUTTACK	26	22	MAYURBHANJ	31
8	DEBAGARH	4	23	NABARANGAPUR	12
9	DHENKANAL	13	24	NAYAGARH	12
10	GAJAPATI	10	25	NUAPADA	6
11	GANJAM	30	26	PURI	15
12	JAGATSINGHPUR	10	27	RAYAGADA	15
13	JAJAPUR	19	28	SAMBALPUR	21
14	JHARSUGUDA	11	29	SUBARNAPUR	8
15	KALAHANDI	13	30	SUNDARGARH	30
				Total	**477**

7.5.5. Capacity Management Review

As shown in **Figure 7-3** *(p-80)*, the consultants will conduct capacity management review of different stakeholder departments having influence on the road safety situation of Odisha State. This will involve assessment of departments such as Transport, Police, Health, Works and other road sector agencies. The capacity management review will generally follow the guidelines prescribed by the World Health Organisation (WHO) to carry out such reviews in a Country/State level.

The reviews will be carried out with the help of checklists developed by WHO for such reviews in addition to the consultations at the department level and through an integrated Workshop including high level officers from the Stakeholder departments. The objectives of the review will be as follows:

- Develop an understanding of multi-sectoral issues involved in road safety among all the stakeholders;
- Assess government ownership of safety results and identify institutional accountabilities and responsibilities; and
- Reach official consensus on road safety management capacity weaknesses and measures to overcome them.

The capacity management review will be conducted through the following steps:

1. Review all stakeholder departments at the system level, interventions level and institutional management functions level;
2. Assess the lead agency and identify the capacity strengthening priorities for the lead agency;
3. Confirm review findings at high level workshop; and
4. Prepare report on road safety management review.

The following are major agencies involved in the design, construction and maintenance of Odisha road network:

- OWD – responsible for some sections of NHs, SHs, MDR and ODR;
- RDD – VRs; and
- PRDs – *Panchayat Samiti* Roads.

For a roads authority, efficient safety management requires applying road safety engineering at different stages of project development both for existing and new road sections. Efficient safety management can be achieved by incorporating the following safety measures with the routine engineering functions of OWD:

- Road safety assessment of the existing network and Identification and ranking of hazardous locations;
- Developing area wide and route treatment options for identified hazards;

- Road Safety Audit at different stages of the project life cycle;
- Development of key performance indicators; and
- Monitoring and evaluation of the key performance indicators.

The Consultants will carry out a competency assessment of OWD engineers together with their responsibility at the level of Circles, Divisions and Sections and will prepare a 'competency requirement' matching the roles and responsibilities of the OWD staff involved in design and execution of road works. The above task will be done through consultations with PIU staff and selected engineers in the Divisions and Sections.

The experiences of the Consultant indicate that it is important to identify dedicated and passionate engineers to be trained in road safety, for sustained progress of road safety management.

Assess inter-departmental safety responsibility framework

The Consultant will carry out consultations with the following departments to map and establish the road safety responsibility framework within the State.

- Department of Works
- Department of Transport – Vehicle licensing authority
- Home department – Traffic laws
- Department of health

The above Departments will be reviewed against a check list developed to align with the WB's recommendations in the sector. Key questions in the checklist will include, but not limited to:

- Have States or Districts set a target for improved safety performance?
- Which agencies are responsible for achieving the level of safety and how are they held to account for the performance achieved?
- Does Odisha State have lead agency with statutory powers to manage the road safety situation in the State?
- Have comprehensive safety standards and rules been set for roads, vehicles and road users? Which departments are responsible for setting standards and further monitoring and evaluation?
- Are the compliance regimes in place to ensure adherence to identified safety standards and rules?
- Have the high risk groups been identified? Are the causes of accidents analysed? Who is responsible for data collection, further analysis and to develop countermeasures?
- Have funds been provided for improved road safety activities? Are the funds utilised for right interventions derived from analysis of accident data?

The Consultant will examine the ownership, guidelines, laws and regulations pertaining to the following:

- ROW encroachment
- Accident data collection
- Traffic axle load regulations
- Legal measures available with the police for better enforcement
- Laws pertaining to post crash care

The Consultant will develop a responsibility framework which will define the ownership, roles and responsibilities of different departments and will recommend improvements in laws and statutes required for improved road safety management.

7.5.6. Prepare Report on Road Infrastructure Safety Management Review

The Consultant will prepare a report on road infrastructure safety management review after completion of accident data collection, safety assessment and sample surveys of the selected road network. This report will include:

- Analysis of crash data/accident root causes
- Identification of high risk/hazardous locations
- Design for road safety countermeasures
- Supportive legislation for improved enforcement plans
- Safety assessment of sample road network

7.5.7. Organise the High Level Workshop

After the compilation of the report on road infrastructure safety management review, the Consultant, with the support of OWD, will organise a workshop including representatives from the following stakeholders, but not limited to:

- Home Department
- Education Department
- Department of Planning
- Transport Department
- Health Department
- RDD
- NHAI
- NGOs

During the interactive workshop, the Consultants will present the findings from the studies and assessment carried out so far on the project. The Consultants will present broad problems concerning Odisha State regarding the capacity constraints, institutional arrangements and present responsibility framework and the action plans developed to arrest and then minimise the rate of accidents and fatalities.

7.5.8. Capacity Building Measures

As discussed earlier, for better road safety management, OWD engineers are proposed to be equipped with the following elements of road safety engineering:

1. Road safety assessment of existing road network and identification of hazardous locations
2. Develop and prioritise safety improvement schemes for implementation
3. Black-spot improvement studies
4. Road safety audit

The training on above items will be imparted to selected OWD engineers through a 2 day Workshop conducted at OWD office at Nirman Soudha in Bhubaneswar.

Workshop Training

The Consultant will arrange a 2-day formal workshop/training session (classroom) to impart training on road safety engineering to professionals within OWD and Rural Department. It is expected to impart training to the following number of staff identified by the OWD and the training specialist of Consultant team.

- Superintending Engineer – 3
- Executive Engineer – 10
- Assistant Engineer – 15

Field Visits

In addition, the Consultant will facilitate a site visit for 10 GOO officials, to a different State, where improved systems are in place on road safety. The format and other requirements of this field visit will be decided after consultations with the Client.

7.5.9. Develop a RSAP for the State

The Consultant will develop a RSAP based on the analysis of following data:

- Accident data available from State Crimes Records Bureau (SCRB);
- Accident data collection from the sample network;
- Road safety assessment of the sample network;
- Review of OWD engineering functions;
- Road Safety Management Review; and
- Road Safety responsibility framework in the State.

From the data available, the Consultants will determine the high risk groups, the reasons for their significant exposure to the hazards, highly hazardous locations contributing to significant accident

rates, develop countermeasures and the roles and responsibilities of the agencies to the successful implementation of these countermeasures. The RSAP for the Odisha State will include:

- Major contributory factors to road accidents and fatalities in the State;
- Identification of High Risk Groups and locations;
- Review of existing safety management and responsibility framework;
- Recommended action plans to counter the predominant accident causes, high risk user groups and hazardous network;
- Definition of inter-departmental responsibilities;
- Measurable targets to be achieved;
- Time frame to achieve the targets;
- Performance monitoring indicators for recommended actions; and
- Funding requirements for implementation of the plan.

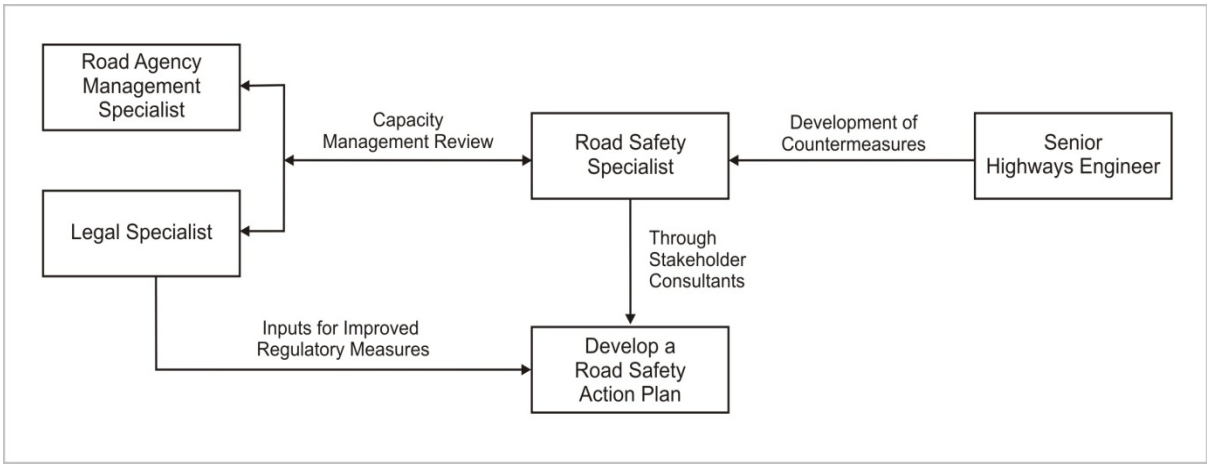
7.6. Information Flow and Work Programme

The key input for this task will be provided by the following key experts:

- TL-cum-Road Agency Management Specialist
- Senior Highways Engineer
- Road Safety Specialist
- Legal Specialist

The contribution of experts and the flow of information/data between experts to deliver this task is shown in **Figure 7-9.**

Figure 7-9: Flow of Information/Data among Key Experts



The detailed work programme to develop the RSAP is shown in **Figure 7-3** *(p-80).*

7.7. Way Forward and Action Plan

Based on the data available from SCRB, the consultants have broadly identified the districts and category of road where the road safety assessment shall be focussed.

An initial criterion of more than 90 average fatalities {refer **Figure 7-5 to 7-7** *(p-83)*} per year on NHs during the period 2009–11 is selected to carry out road safety assessment. Following this criteria, it is evident that the NHs of the following districts required specific attention:

- Balasore
- Cuttack
- Jajpur
- Khordha
- Keonjhar
- Sambalpur
- Sundargarh

For assessment of SHs and other roads, a criterion of more than 50 average fatalities during the period 2009–11 is adopted to select the districts where road safety assessment is to be carried out. Based on this criterion, the road network on the following districts will be selected for conducting safety assessment:

- Cuttack
- Ganjam
- Jajpur
- Khordha
- Keonjhar
- Sambalpur
- Sundargarh

For accident data, the Client has already written to the Director General of Police (DGP) of Odisha and Superintendent of Police (SPs) of all districts to provide accident details vide letter number PMU-WB-33/2012/18744, dated 6 June 2012.

In addition, the consultants will explore the availability of accident data from other sources such as Hospitals and Insurance companies simultaneous to the above activity. The data collection exercise is planned to be completed by fourth week of September 2012.

Referring to the work programme, the identification of 2,000 km is planned to be completed by second week of October 2012. After the analysis of accident data, which is expected to be completed by early October 2012, the sample network of 2,000 km, including NHs, SHs and ODRs will be selected from the above districts, in consultation with PMU officials and District SPs. The safety assessment of the selected network will be carried out during the period October 2012 to January 2013.

SECTION 8

ROAD NETWORK MASTER PLANNING

8. Road Network Master Planning

8.1. Background of the Study

GOO during the late 90's sought the assistance of the WB to upgrade the core road network within the State of Odisha, based on which Odisha State Roads Project (OSRP) was initiated. The WB along with the road improvement schemes advised the GOO to ensure implementation of required ID measures to develop a sustainable solution to tackle the road network related issues and plan for road improvement based on a predefined priority list. An Institutional Development Study was thereafter initiated, as a component of the Odisha State Road Program (OSRP), while a consulting organisation was appointed in 2007, to develop an ID matrix. The intended institutional matrix development was targeted to be based on a former study developed by the OWD in the late 90's.

Institutional Strengthening Action Plan (ISAP) was established to ensure completion of the implementation of the institutional strengthening within a period of Ten years starting from 2008 to 2018. ISAP (2008–18) has set up an objective of development of the 'Comprehensive and Transparent Planning for Roads' in the State of Odisha. The procedure of such comprehensive plan presumes involvement of different stakeholders to ensure enhanced planning process in formulation of the statewide road development. The key results are as identified under this objective are:

1. Master Plan for road development; and
2. Multi-year plans and annual plans for roads development and management in line with Master Plan.

ISAP 2008–18 identified certain key actions required to be implemented in short term (within first Two years) and medium term (Two years to Five years), which are summarised in **Table 8-1**.

Table 8-1: Key Actions – Short Term and Long Term

Short Term (First Two years)	Medium Term (Two years to Five years)
1. Initiate Statewide road network master planning study 2. Update core road network development plans 3. Odisha Works Department (OWD) to prepare comprehensive road development plan for primary core network of roads before master plan is approved and finalised 4. Establish OWD roads policy and planning capacity	1. Evolve road development master plan for the entire State involving stakeholders 2. Implement comprehensive RNMP for Odisha

The OWD, following the recommendations of ISAP, called for consultancy services for Odisha RSID Study, which includes one of the prime task of developing 'RNMP' for the entire State.

8.2. Scope of Work

The scope of work related to 'RNMP' has been clearly defined in the 'Terms of Reference' (ToR), which forms the Appendix A of the contract agreement. The broader scope of work includes the followings:

1. Preparation of a draft RNMP (consistent with the new road sector policy);
2. Targeted capacity building measures within OWD; and
3. Development of a proposed new road classification system and responsibility framework for GOO endorsement.

The major tasks identified in the ToR are as follows:

a. Compilation of data and information from various secondary sources on the physical, social, economic, transport system, traffic characteristics, environmental and social characteristics of the State;

b. Conducting field surveys on selected stretches over road network length of approximately 3,000 km spread over all categories of roads in the State for obtaining data on road network inventory, pavement condition, sub-grade investigation, traffic volume and movement pattern surveys, axle load survey, bus and truck operator survey, limited environmental and social screening etc.;

c. Interaction with the Governmental and public sector agencies, chambers of commerce and industries, transport operators and other non-Governmental organisations;

d. Building up the socio-economic profile of the region, analysing present and future prospects;

e. Situation analysis and diagnosis of existing road network and identification of capacity constraints, network evaluation;

f. Development of strategic options using parameters such as: volume/capacity ratio, road/route serving inter-State traffic, backward area linkages, high commercial traffic, strategic/industrial linkages, road condition, traffic growth rate, road connectivity, alternative routes, environmental aspects, tribal areas; and

g. Improvement strategies and preliminary costing, prioritisation as per economic appraisal, ranking of roads and selected network and financing plan.

Successful accomplishment of the above tasks will facilitate to deliver an implementable RNMP **for Odisha covering major roads including a new road classification system**, and a consistent and sustainable guideline on **capacity building measures** aligned with other major tasks indicated in the project ToR.

The RNMP will be developed considering the existing road network, existing travel pattern, traffic volumes, future developments and forecast traffic demand including establishing new connectivity to revitalise the remote areas and establish alternate travel corridor. The RNMP will identify the potential traffic operation issues including capacity constrain and road connectivity, and develop road improvement alternatives to assess the best mitigation measures. Section 8.3 presents an

overall view of all the existing transportation arrangements present in the State including surface transport, marine transport and rail transport, and discusses the inter connectivity among all the transport systems/major modes of travel.

8.3. Transport Network of Odisha

An efficient transportation network forms the spine of the overall growth of a State, and delivers a crucial role in enhancing the gross domestic product including progression of various socio-economic activities. The State GOO has, therefore, conferred a high priority to develop and promote the transportation infrastructure to encourage development of backward areas and to establish connections to remote areas.

8.3.1. Road Transportation

The State possessed a total length of 249,642 km of road by the end of fiscal year of 2010–11. The total road network of the State consists of NHs, SHs, MDRs, VR/Forest roads and other roads. Road inventory information of different categories of existing roads including their respective managing agencies, as extracted from the available records, is summarised in **Table 2-1** *(p-10).*

The ratio of the total length of existing roads in a State with respect to the State's land surface area represents the quantitative density of the road network (i.e. total length of the roads per 100^2 km. The quantitative density, however considers all roads including surfaced and non-surfaced road consisting of varying standards and right-of-way widths. The quantitative density of Odisha Road Network stands as approximately 160.36 km per 100^2 km of Odisha land surface area, whereas the quantitative density of the surfaced road in the State stands as about 28.60, with respect to the National average, which is approximately more than 50 percent.

8.3.2. Railways

The State of Odisha consists of thirty districts, out of which approximately 23 Districts of the State are fully or partially served by the existing services. The seven districts, where no railway services exist, are Boudh, Deogarh, Kandhamal, Kendrapara, Malkangiri, Nabrangpur and Nayagarh. The density of the rail services is relatively high in some sectorial regions of the State, while railway services are predominantly absent in the central region of the State. **Figure 8-1** *(p-99)* below illustrates the existing railway network.

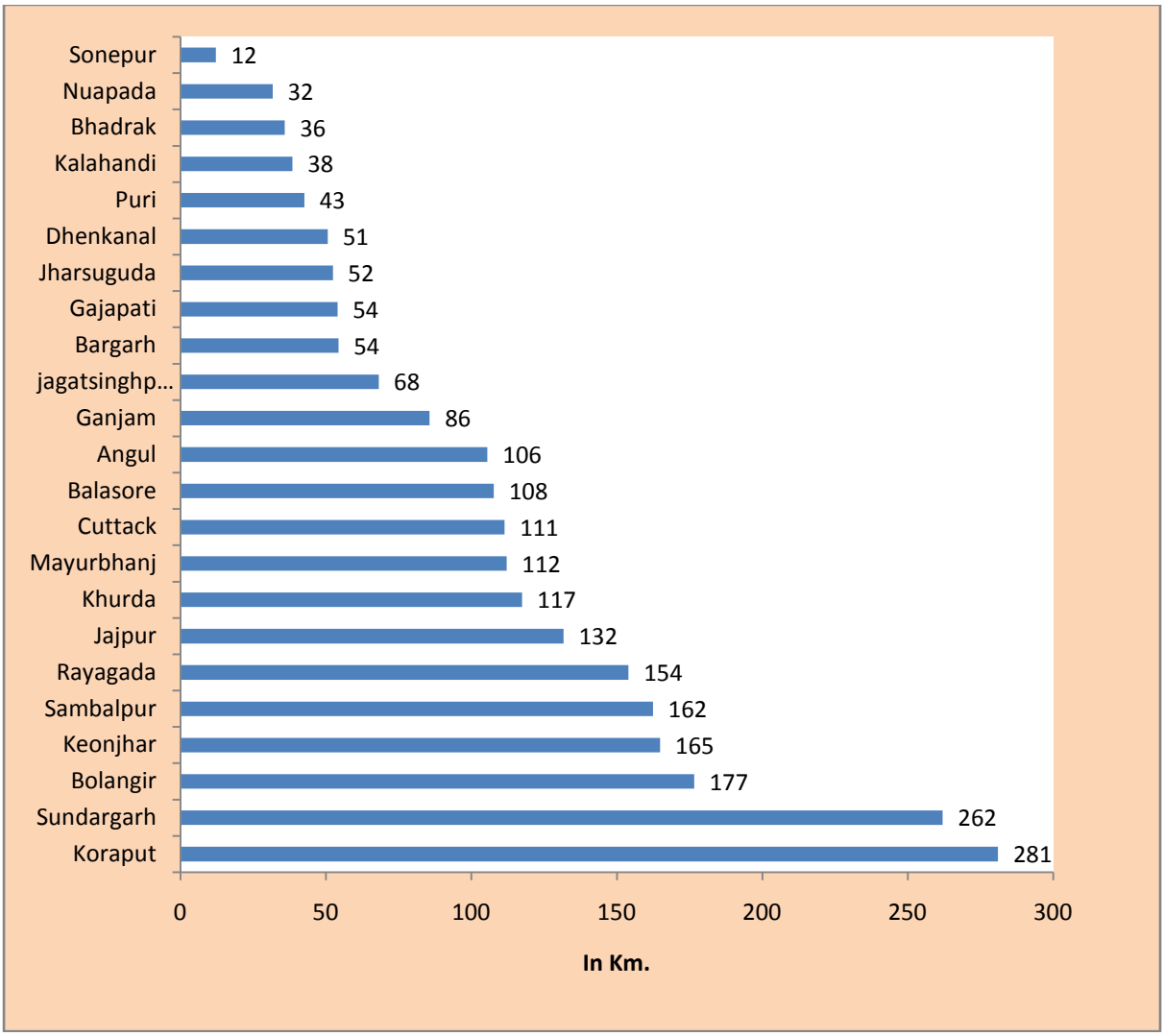
The District-wise railway coverage is shown in **Figure 8-2** *(p-100)* below.

By the end of 2010–11, Odisha had 2,417 km of railway lines including 54 km of narrow gauge lines. The railway route length in the State per $1{,}000^2$ km i.e. the quantitative density is approximately 16 km, while the national quantitative density is approximately 20 km.

Figure 8-1: Map of Odisha Rail Network

Source: Economic Survey Odisha, 2011–12.

Figure 8-2: District wise Railway Coverage in Odisha

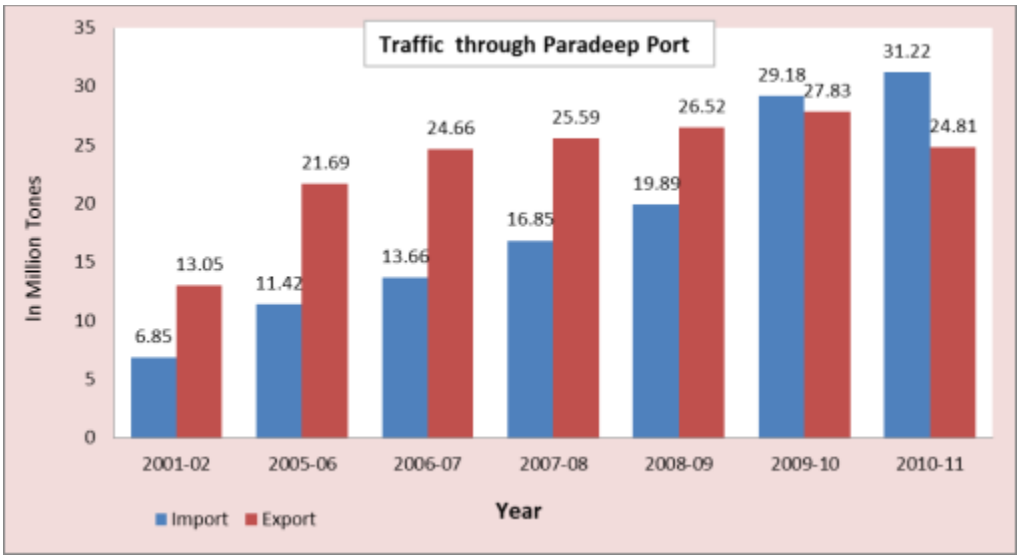


Source: Economic Survey Odisha, 2011–12.

8.3.3. Ports

Odisha is a maritime State with 480 km of coastline. Paradeep Port is one of the major ports in the State, which has been functioning as one of the major national ports in the Country. Paradeep Port is ranked as the eighth major port in India, which primarily functions as the prime major port in the east coast since commissioned in the Independent India. The port is located between two major coastal cities, and situates approximately 210 nautical miles south of Kolkata and approximately 260 nautical miles north of Visakhapatnam. During 2010–11, approximately 56 million tonnes of cargo were handled at this port, making this port as one of the busiest ports at the east coastline of the Country. The total cargo handled through Paradeep Port during past decade is illustrated the **Figure 8-3** *(p-101).*

Figure 8-3: Traffic through Paradeep Port, Odisha



Source: Economic Survey Odisha, 2011–12.

The GOO has identified 14 more potential sites for development of minor ports to enhance the marine cargo handling, out of which some of the sites have been converted to accommodate active port operation. Out of these locations Gopalpur operates as the second largest port in Odisha, and has been in operation since January 2007. Further to these operating facilities, the State Government has signed concessional agreement/MoU with various organisations to develop the following minor Ports along the eastern coast:

- Dhamara Port
- Kirtania Port in Balasore
- Astarang Port in Puri
- Chudamani in Bhadrak

8.3.4. Inland Water Transport

The State does not possess significant inland water transport. Some minor marine operations are present, which primarily caters for passenger transportation. Some of such water transportation accommodates commercial freight, however only a few passenger launch services available in remote areas to ferry commuters. The passenger motor launch services are present in eight different water routes in three sectors:

- Chandabali sector provides ferry services from Chandabali to Aradi, Talachuan and Rajnagar. The fleet size consists nine motor boats;
- Balugaon sector provides services from Balugaon to Krushnaprasad, Kalijai, Nuapada and Satapada, with a fleet size of 8 motor boats; and
- Astaranga sector provides services from Nayagarh to Sribantapur, with a minimal fleet.

8.3.5. Air Transport

Odisha has one domestic airport (Biju Patnaik Airport) situated in Bhubaneswar, the State Capital of Odisha. Bhubaneswar is connected to almost all major cities in India. Airport Authority of India (AAI) had plans to expand to Bhubaneswar airport to a modern International airport. The status of this expansion plan is still not evident yet.

8.4. Road Network Development – State's Initiatives

In addition to efficient utilisation of road connectivity program developed by the GOI, GOO has initiated several rural and strategic road development program, the brief details of which is summarised in the following sections/paragraphs.

8.4.1. Rural Roads Program

By the end of 2010–11, the State has developed approximately 19,775 km of paved roadway, out of which approximately 17,416 km consists of asphalt concrete and the rest 2,359 km consists of cement concrete. These roads were developed under the following State and centrally sponsored road development schemes:

- PMGSY, funded by GOI;
- *Bharat Nirman Yojana*, funded by GOI;
- Schemes funded by RIDF of NABARD;
- RLTAP (Revised Long Term Action Plan) and Backward Regions Grant Fund (BGRF), funded by GOI; and
- *Biju KBK* (Kalahandi, Bolangir, Koraput) Plan
- *Gopbandhu Grameen Yojana*
- *Biju Kandhamal-O-Gajapati Yojana*

} All funded by GOO.

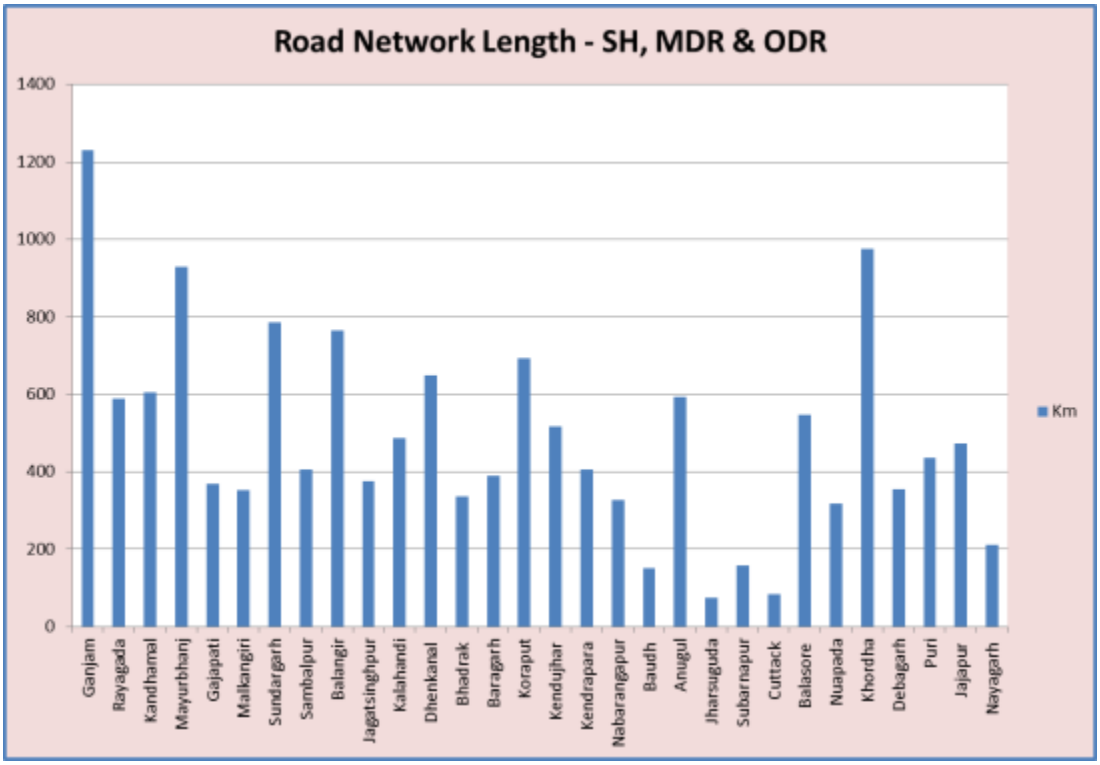
Notwithstanding all the initiatives as above, the extent of rural connectivity in Odisha is still far less than the desired level and expectations. Only 62 percent villages possess all-weather connectivity to the existing State Road network system.

8.4.2. State Roads Program

Traditionally, the development of road network in the State (NH, SH, and major/District roads) has been funded though State and Central budgetary funds. The OWD has been the major agency, who has been responsible for the development and maintenance of State road network up to the level of District roads. The State of Odisha has witnessed a constant growth in vehicular traffic commensurate with the economic development in the State during the last two decades. However, due to limited resources, operation and maintenance endeavor by the OWD was not sufficient to maintain the existing road network infrastructure, and to constantly improve to accommodate rising

traffic demand to maintain an acceptable level of service **Figure 8-4** illustrates approximately the total road network of SH, MDR and ODR generally managed by the OWD.

Figure 8-4: District Wise Length of Road Network (SH, MDR & ODR)



Source: Economic Survey Odisha, 2011–12.

It becomes evident from the figure that some of the Districts (Ganjam, Khordha and Mayurbhanj) possess more than 900 km of SH, MDR and ODR. In general, it becomes apparent from the **Figure 8-4** that the easterly districts possess better road connectivity than the southern Districts.

In order to improve the capacity of certain road sections, OWD has initiated Odisha State Road Program (OSRP), with the support from the WB, which includes improvement of approximately 900 km of SH network. In addition, OWD has identified approximately 1,600 km of core road network (CRN), which include SH, MDR and ODR. The objective of developing the CRN was to deploy adequate resources through separate budgetary support to support necessary development and provide effective management to all such roads.

8.4.3. Provision of Maps from ORSAC

During the collection of secondary as well as map data from Survey of India Toposheets, it was observed that this data will not serve the purpose for detailed assessment and review of existing network with regards to overall assessment of road network assets as available with GOO road agencies. For this purpose after interaction with ORSAC it emerged that the data available with ORSAC is in WGS 84 format, georeferenced and GIS compatible. This data if made available will be extremely useful for RSID project in terms of hierarchical road network (all types of roads shown

distinctly with separate notations) along with the existing rail network, etc. In addition, OWD could also use these extremely valuable database for other possible uses.

It was therefore requested to OWD to facilitate the availability of these Toposheets in softcopy form to the Consultants for the master planning and all other related work of the RSID project.

In response to the request of Consultant, the CE (WB) has approached ORSAC to make these maps available covering all categories of roads in the state, indicating different classification, ownership and condition (paved or unpaved) of the road network. In addition, the base map should include the land use pattern of the state and the locations of social and economic growth centres. The format requested to ORSAC is as below:

Administrative Layers

- Village Boundary
- Village Label
- GP Boundary
- Block Boundary
- Settlement Locations
- Land Use
- Contours
- Mines and Industrial
- Tourist Centres

Developed Resources

- Canal
- Road
- Railways
- Ports
- Ownership (NH, SH, MDR, ODR, VR, GPR, PSR etc.)
- Total Population

To follow it up further the Consultants contacted Mr. P. Mishra, Scientist of ORSAC and clarified the requirement of data as per following details:

- Entire road network, including NH, SH, MDR, ODR, Village Roads, Panchayat Roads, Forest Roads and Irrigation Roads
- The plans shall be in a readable scale (preferably 1:50,000) and shall show paved and unpaved roads

Availability of these maps will facilitate:

- Identifications of 50 locations for Axle Load Survey
- Identification of 2000 km for Road Safety Assessment
- Identification of 3000 km to carry out field investigation for Master Planning

For these purpose CE (WB) has already paid Rs. 42,000 for procurement of paper maps and will be followed up by payment of approximately Rs. 22 Lakhs for GIS maps which are required in long term for development of RNMP. The Consultants have also submitted the priority of availability of paper maps District-wise at the earliest so that the investigations can be commenced soon. It is expected

that maps to be available from last week of September 2012 onwards in accordance with priorities given and investigations commence from second week of October 2012 onwards.

8.5. Data Collection Takeoff

At the very inception of the project i.e. during the first week of signing the contract a more detailed approach was undertaken to enhance the reconnaissance experience. Preliminary site visits were undertaken including meeting with internal stakeholders to commence secondary data collection activity. Written requests were put through to different agencies requesting several pieces of required information for the project work including meeting the client project team and submission of formal request to supply several data. The following sections summarise the activities undertaken during the data collection take-off and list the data requirements that shall be mandatory to successful completion of the project, reflecting the details of data request made already to the client and other stakeholder agencies.

8.5.1. Site Visits

A site visit was undertaken on 6 May 2012 by the team to have an initial assessment of different types of roads under the ownership of OWD and Rural Department. The site visit was organised to cover the most categories of roads – National Highway (NH), State Highway (SH), Major District Road (MDR), Other District Road (ODR) and some Village Roads (VR). The visit covered portions of the following roads:

- SH 60 Phulnakhara-Charichhak Road
- ODR at junction with SH 60 near Bagalpur
- VR from Chaupada towards village Barasailo
- MDR 77 – Khordha to Chandaka Road

SH 60 – Phulnakhara to Niali

ODR – Bagalpur–Sailojharpada Road

VR – Chaupada–Barasailo Road

PMGSY VR

8.5.2. Stakeholder Meeting and Initial Consultations

A number of stakeholder meeting and initial consultations were carried out with different departments of the GOO. The targeted departments were primarily those, who could supply existing data related to road and traffic inventory, on-going/future development plans, any future plans that could have an impact on the future trip volumes on the existing road network etc. In addition to the inception meetings with various government departments, active interactions with Asset Management and IT/ICT Consultants were also established to procure several data, information and also the GIS map of the OWD road network. Several meetings were conducted to consult with the OWD's PMU team and necessary data requests were made and pursued as follow-up actions.

In addition to various team meetings with the PMU staff, the following **Table 8-2** summarises the stakeholder meetings that were done in support of active initiation of data collection activity:

Table 8-2: Summary of Stakeholder Meetings – Data Collection

Sl. No	Date	Meeting	Activity
1	11 April 2012	Asset Management Consultants	Traffic Data Collection and Request for GIS Map of OWD Road Network
2	12 April 2012	CE, NH Division, GOO	To collect data on recently reclassified NH network
3	12 April 2012	CE, Rural Development, GOO	To collect CRN of rural roads and District Rural Road Plan (DRRP)
4	17 April 2012	IT/ ICT Consultant	Attended the workshop conducted by IT/ICT Consultant and had interactions
5	17 April 2012	OWD Secretary	To have a brief introduction to the project objectives

Sl. No	Date	Meeting	Activity
6	8 May 2012	Motor Vehicle Inspector in Bhubaneswar	To collect vehicle registration data and other relevant data available with Transport department
7	9 May 2012	Transport Commissioner, Cuttack	To collect vehicle registration data and other relevant data available with Transport department
8	10 May 2012	Director, Department of Mines	To collect details on proposed Mines corridor and future expansion plans
9	11 May 2012	Director, Survey of India, Odisha	To procure road network map of Odisha State
10	18 May 2012	Director, Survey of India	Follow up meeting to procure Odisha road network map
11	19 May 2012	Secretary, RDD	To collect CRN of Rural Department and DRRP
12	19 May 2012	CE, RDD	Follow up meeting to procure DRRP and CRN of rural department
13	2 July 2012	Chief Executive Officer, ORSAC	To procure GIS enabled road network map of Odisha
14	4 July 2012	Chief Executive Officer, ORSAC	Follow up meeting to procure GIS enabled map of Odisha road network
15	5 July 2012	Scientist, ORSAC	Follow up meeting to procure GIS enabled map of Odisha road network

The Consultants have collected various data from the above consultations pertaining to road network master planning. Some of the data (development plans) is still in the process of collection from the above departments at the time of writing this report.

8.5.3. Secondary Data Request

Several secondary data requests have been made to several agencies and stakeholders through the PMU. Secondary data sets are of very high importance, as procurement of some of the data set including procurement of the GIS Map are on the critical path of the project, delayed obtainment of which will have an impact on the project schedule.

8.6. Approach and Methodology

Based on the objectives and scope of the consultancy services, the entire Road Master Planning process was divided into, three tentative phases consisting of Phase-I, -II & -III. The individual phases will primarily consist of the followings:

Phase-I: During this phase the primary focus will be to complete the data collection, data processing and data analyses tasks to identify any issues and develop mitigation alternatives. Data collection activity will be accomplished through collection of the GIS Map covering entire 'State Road Network'; followed by processing the GIS Map identifying road attributes, connectivity and also available right-of-way. This task will be the most significant step to successfully accomplish the study objective.

Further to obtainment of the GIS maps activity pertaining to identify 3,000 km of road stretches will be undertaken in consultation with the PMU, OWD to start collection of necessary data and information pertaining to primary source. Data available from the secondary sources will also be pursued simultaneously to develop an enrich database for proper facilitation to necessary analyses. The targeted data will include information on existing/historic traffic volumes, roadway and other inventories including all available statistics pertaining.

The traffic information and other inventory will be used to evaluate existing traffic conditions and identification of issues related to connectivity, accessibility and mobility; development traffic projection and future demand; identification of capacity issues with respect to future demand and develop mitigation measure alternatives; providing input for the economical evaluation to develop a prioritisation list and road financing plan.

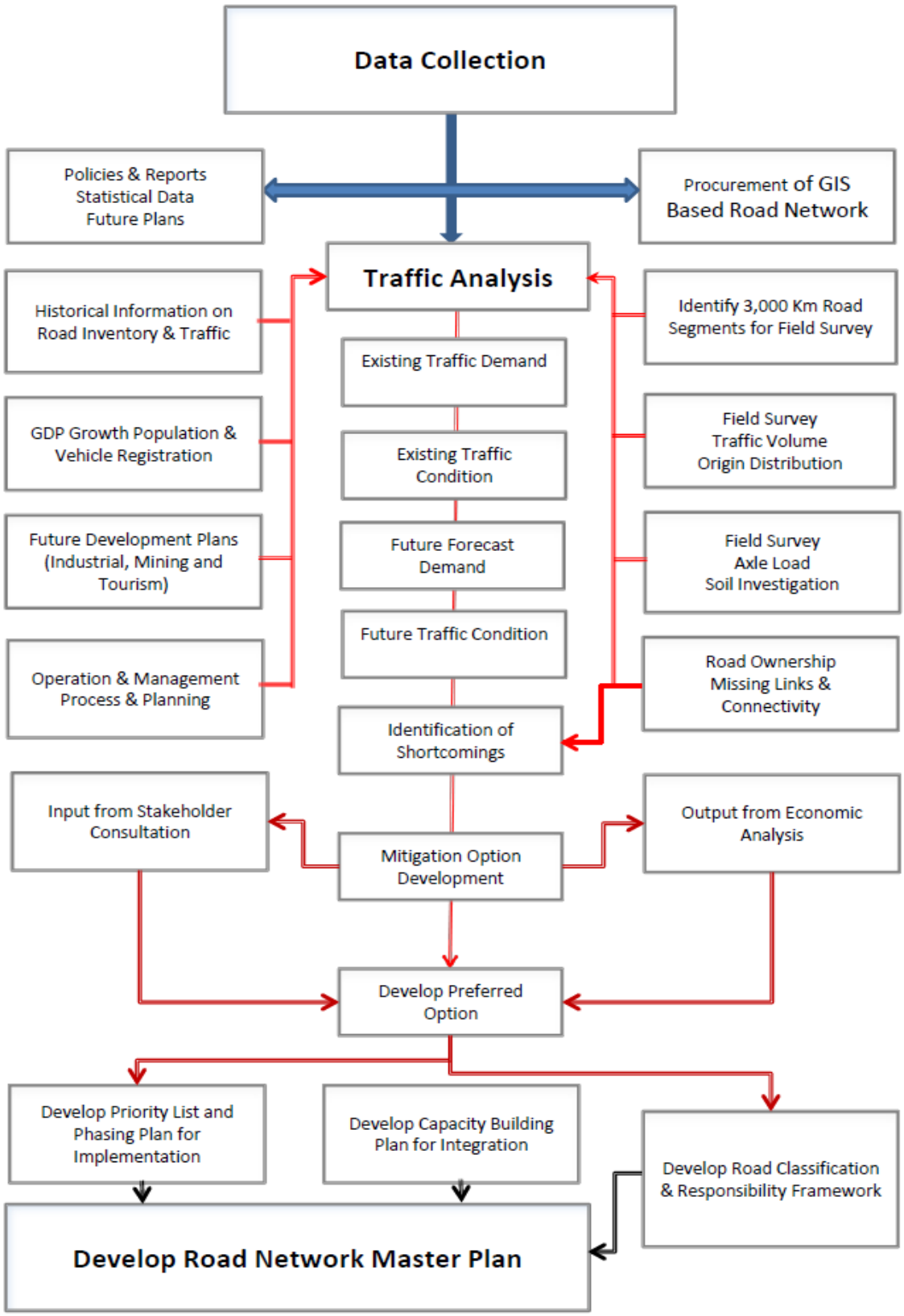
Phase-II: Phase-II will primarily focus on input from the stakeholders through consultation to finalise the development alternative and also to develop a road development priority list. During this phase, necessary initiative will also be taken for development of a road classification system for approval and implementation on the basis of well-defined traffic parameters in consultation with OWD.

Phase-III: During this phase activities will more focus on identifying areas in the organisational structure and operation that needs to be strengthened including processes/procedures to augment capacity building to manage updating and implementation of RNMP. The activities are discussed in detail in the forthcoming paragraphs below.

The methodology adopted by the Consultants to deliver a master plan for the Odisha State road network is shown in **Figure 8-5** *(p-109)*.

The activities involved to complete the tasks shown in the above flow chart are explained in the sections below.

Figure 8-5: Work Methodology – Road Network Master Plan



Task 701: Collection of Base Data

Inputs from Policy

Existing policies of GOO will be reviewed to determine the priorities set by different departments of GOO. The following policies will be reviewed based on their availability:

- Existing road sector policies
- Transport policy
- Land development policies
- Land access policies
- Traffic planning and traffic operation policies
- Road classification system
- Access control policies
- Dedicated commercial routing
- Public transportation policies

In addition, the draft road sector policy developed under the task 'Road Sector Policy and Strategy' will also be reviewed, with respect to the road network to be included in the master plan.

Data from Secondary Sources

Collection and reviewing data from secondary sources has already been commenced since the inception of the project. The data collected so far was utilised to assess the socio economic profile of the State including developing a growth analysis based on available statistics. The present traffic characteristics in the State will also be reviewed based on obtaining some pertinent data from historical studies, although traffic evaluation will primarily be based on the primary data source, where secondary data source will be utilised to develop necessary calibration of the forecast traffic. The targeted secondary data to be collected including their respective sources are summarised in **Table 8-3**.

Table 8-3: Source and Type of Secondary Data

Type of Data	Source
Road Links, Ownership and Future Development Plans	OWD
Core rural road network and ownership	RDD
Road Inventory and Condition within OWD Road Network	Asset Management Consultants
Traffic Data within OWD Road Network	Asset Management Consultants and OWD
Vehicle registration data	Motor Vehicle Department
Railway development plans	Department of Transport; Railways
Port connectivity and development plan	Department of Commerce and Transport; NHAI
Agricultural Centres and development plan	Economic Survey 2011; Agriculture department, Office of Economics and Statistics

Type of Data	Source
Tourism growth plan and existing connectivity	Department of Tourism(Odisha and India)
Demographic profile	Office of Economics and Statistics; Census Department
Industry Development Plans	GOO Economic survey; Department of Industries
Mines – Existing and future plans	Department of Mines

The data from secondary sources will be used for different analyses, although the primary focus will be on the following areas:

- Assess the socio-economic profile
- Identify the existing and future traffic generation points on the network
- Develop a traffic growth pattern

Assess Socio Economic Profile – A socio economic profile of the State will be developed based on the procured socio-economic information from available secondary sources. The socio-economic feature focused under the Road Mater Planning development generally includes those, which will influence the traffic demand in the State. The socio-economic profile will generally include, but not limited to:

- Parameters that are closely correlated to the traffic growth in terms of demographic and economic data;
- Assessment of accessibility for tribal hamlets and other inhabited pockets with limited connectivity;
- Data pertaining to industrial, tourism and mine sectors, future investment plans from Government, private sectors and other future expansion plans;
- Existing road network facilities in and around the remote/tribal areas, their adequacy and shortcomings; and
- Agricultural centres and development and investment plans for agriculture.

Identify Potential Future Traffic Generation Points – The preliminary consultations reveal that different departments in the State have been planning individual developments that might create some additional volumes on the surface road network, and might pose an impact on the future traffic movement pattern in the State Road Network. Some of such plans include dedicated mining corridors desired by the Department of Mines, direct connection to planned industrial hubs and enhancement of some tourist activities like Buddhist Circuit mooted by Department of Tourism. The details of such plans are requested to the PMU, and on obtaining the same, these will be incorporated into the road network master planning activity and might be selected for primary surveys and further analysis based on the potential additional future trip generation.

Develop a Traffic Growth Pattern – The gathered vehicle registration data and other economic data pertaining to GDPs and population growth etc. will be utilised to develop a traffic growth pattern in the State. A preliminary statistical analysis indicates a high correlation between the traffic volumes, as a dependent variable and State's GDP, density of population, and as independent variables. Further analyses will be carried out, with the progress of data procurement to develop an acceptable traffic growth parameter through necessary regression analysis for different major modes of traffic in the State.

Task 702: Procurement GIS Map of Odisha Road Network

The procurement of the GIS Map covering the entire Odisha Road Network is one of the most vital tasks of the Road Mater Plan preparation for the State. The map should include all categories of roads (NH, SH, MDR, ORD and VR) including all other relevant parameters including ownership, surface conditions (paved or unpaved), right-of-way and also the connectivity to the villages, tribal hamlets and remote areas. The GIS base map could be assembled from data available from:

- Survey of India Topo Sheets;
- GIS based Network from Asset Management Consultants;
- DRRP from RDD; and
- Odisha Space Applications Centre (ORSAC).

It became evident from the initial consultations that DRRP is in the final stages of completion and will be available for use by various Government agencies. It is expected that the PMU, OWD will arrange to obtain the final DRRP document to include in the GIS base map, covering all categories of the road, with ownership, etc. This base map will provide the basic data for the Master Plan process and to determine the **missing links in the network**.

The following basic road inventory information that should be incorporated in the GIS map:

- Road Classification (NH, SH, MDR, ODR, VR, *Panchayat* Roads, Irrigation Roads etc.);
- Width of road (Four lane, Two lane, Intermediate lane, Single lane etc.); and
- Type of road (Paved, Unpaved, Bituminous, Concrete).

Task 703: Identify Target Road Stretches and Conduct Field Surveys

The present Odisha road network consists of NH, SH, MDR, ODR, VR, Forest roads (FR) and *Panchayat* roads (PR). These roads are distributed across the State and the total length is more than 200,000 km. Over a period of time, the State will have to record inventories of the entire network, but for the purpose of road network master planning, a sample length of 3,000 km will be selected for the collection of the basic road data. The subject 3,000 km representative road length will be selected beyond the 8,000 km length that is already covered for detailed investigation by the Asset Management Consultant for their study purpose. The GIS based road network developed by the

Asset Management Consultants including the traffic count and axle load survey locations are illustrated in **Figure 8-6** *(p-114).*

The targeted 3,000 km length to be selected for the current study will be drawn in consultation with the PMU staff of OWD from various types of the existing roads spread over different regions of the State. The following broad criteria will be considered to select the road network for conducting field surveys:

1. Links connecting block headquarters within a district;
2. Links connecting district centers to other major towns/cities within the district;
3. VRs connecting group of villages to the nearest higher road category;
4. Links connecting all district centers to nearest road of higher category (NH); and
5. Existing or future road links connecting major economic growth centers such as important tourist destinations, mines, industrial centers etc. to the existing roadway network.

The GIS map procurement and utilisation of the same are critical tasks and attribute to the critical path of delivering the project. Finalisation of survey locations will significantly be dependent on the integrated GIS Map, as the same could identify some major parameters, which would be hard to comprehend from disintegrated hard copy maps of segregated areas. Upon finalisation of the 3,000 km road segments identification, in consultation with the PMU and finalisation of the survey locations for categorised data collections the following surveys will be carried out:

Traffic Count Surveys – This will include a classified midblock traffic volume count on selected segments of the major/minor roads. The survey will be carried out on both directions for 24 hours with 15 minute slots. Trained enumerators will be employed to carry out the survey. The number of locations to undertake such survey will better be determined on final procurement of the GIS base map, although intermittent locations cold be developed based on the hard copies of the base map expected to be supplied by the PMU in short term.

Origin Destination (O/D) Survey – Origin Destination (OD) survey is expected to be carried out at **60 locations**, spread all over the State, excluding the locations already covered by the AMS Consultant. The survey location selection will be developed based on major corridors that are travelled by commuters including locations on links connecting major District Centres, Block Head Quarters and major market areas. OD survey data will be utilised to determine the traffic movement pattern on the network. Preference will be given to carryout OD surveys and traffic count surveys simultaneously on same locations.

Axle Load Survey – Axle load survey will be carried out based on relatively heavily travelled corridors. The survey points will generally be chosen based on the road geometry and availability of unimpeded sightlines.

Figure 8-6: Traffic and Axle Load Locations – Asset Management Study

Data will be recorded on specially formulated forms, segregating the various categories of passenger and commercial vehicles. The broad categories of commercial vehicles that would include LCV Goods, LCV Passenger, 2 Axle Truck, Bus, Semi Truck Trailer (single rear axle), Truck Trailer (single rear axle), 3 Axle Truck, Semi Truck Trailer (tandem rear axle), Truck Trailer (tandem rear axle), primarily based on the IRC vehicle classification.

The data will be utilised to assess the Vehicle Damage Factor (VDF) for the different categories of vehicles plying on roads in Odisha.

Road Inventory and Road Condition – Measurement of surface deterioration will be undertaken in two stages. During the first stage, an in vehicle survey will be undertaken along the selected sections at slow speed to develop a riding index of the road. The extent of damage and severity of distress will be recorded based on visual evaluation of the condition of the road.

During the second stage, the survey will be undertaken to record detailed measurement of defects from a representative sample of 10 km. Data will be recorded on specially formulated data sheets.

Emphasis will be on general roughness level of the pavement, although pavement cracking, rutting, raveling and potholes will also be recorded to identify major pavement failure. These failures have profound effect on pavement performance and would have a bearing on decision on economic evaluation and prioritisation of road sections that will be considered for economic evaluation followed by necessary improvement.

Subgrade Investigation – The Consultants will carry out subgrade investigations at the identified locations on the sample network of 3,000 km. The subgrade investigation will be carried out following the axle load surveys at the same locations for the advantage of pavement analysis.

Subgrade soil strength under in-situ conditions will be determined through Dynamic Cone Penetration (DCP) testing within the identified 200 m length of sub section of the selected road stretches. A test pit 0.75 m x 0.75 m will be dug in the pavement along the outer wheel path. The test pit will be dug up to the subgrade level, and the pavement crust details will be recorded. Having prepared the subgrade surface layer for testing, the base plate of the DCP will be placed and relevant data will be recorded for penetration up to 600 mm. The in-situ strength of the subgrade soil will be assessed from the DCP data.

The result of the subgrade investigation will provide an indication to the type of existing pavement structure and this data can further be used to estimate the cost of improvement works recommended in the master plan. The estimated cost of improvement works will be used to prioritise the road sections for improvements in the master plan.

Task 704: Data Analysis and Traffic Volume Forecasting

Sub Task 704.1: Set up criteria for estimating traffic growth factors to respective modes

Homogeneous section of roads will be identified based on the survey results obtained from primary surveys. A traffic forecasting model will be developed based on population and economic

parameters. A traffic growth factor will be derived for different classification of roads based on their location (Districts and linkages to major road network). Based on available extent of statistical data, different traffic growth factors will be derived for passenger and freight traffic to identify probable growth in automobile, freight and public transportation.

The vehicle registration data and other economic data have already been collected to develop a traffic growth pattern in the State. A preliminary correlation analysis have been developed, which will be enhanced further to develop empirical traffic growth formulas, which could applied to respective areas including varying traffic classifications.

Sub Task 704.2: Apply the growth factors statewide to forecast volumes of all classified MVs

The Consultant will derive traffic count in all parts of the network, based on the traffic surveys carried out on the sample 3,000 km network and from the traffic data gathered from the Asset Management Consultants for another 8,000 km, in addition to the data collected from other secondary sources. The traffic growth derived for different modes of traffic (2 wheeler, 3 wheeler, passenger car and commercial traffic) will be applied to obtain the traffic volume on the network for a plan period of 20 years.

Sub Task 704.3: Identify any future development plans and estimate additional traffic

It has been gathered from GOO sources that departments of Industry, Mines and Tourism are planning to develop dedicated routes to cater for their respective development plans. In addition, it is understood that there are studies done to check the feasibility of having mass transit facilities in certain urban centers like Bhubaneswar. All such development plans including alternate modes of transport (e.g. Rail) will be assessed and additional traffic generated due to this planned developments will be added to the traffic forecast model to generate the future traffic volume in the network.

Sub Task 704.4: Calibration of traffic forecast model

The traffic volume will be forecasted for a 20 year horizon based on the traffic growth factors and potential traffic from area developments and also induced traffic for phased road development in any given areas under consideration. OD matrix that will be developed from the OD survey, followed by necessary data analyses and calibration to estimate existing travel pattern among the major district centres including travel pattern for external traffic. This OD matrix will be used to forecast future travel pattern based on the forecast growth, and will be utilised to cross check the forecast traffic volumes on the major roads.

Task 705: Network Analysis

Once the traffic forecasts along the major roads are completed, further analyses will be carried out under this phase for the development of master plan:

- Undertake demand capacity ratio analysis and list Level of Service (LOS) for individual/ homogeneous segments;

- Identify capacity constrained sections;
- Identify apparent gaps in road connectivity based on visual inspection of the GIS roadmap;
- Evaluate alternate routes in terms of by-pass to alleviate traffic congestion; and
- Evaluate impact of implementing mass transit on the identified corridor recommended by any other consultants.

In addition to the above, assessment will also be undertaken to mitigate congested road corridors through developing new connectivity, or improving existing connectivity between the road corridors to existing rail corridor or inland water transportation facility. Connectivity to existing ports will also be evaluated for addressing in capacity constrained freight corridors in and around the major ports in Odisha.

Sub Task 705.1: Volume capacity analysis

A detailed volume capacity analysis will be carried out for the all the road segments considered for evaluation. The available capacity considerations of the road sections will be based on the 'IRC: 64-1990 Guidelines for Capacity of Roads in Rural Areas'. The capacity constrained sections under the existing traffic conditions including potential sections which become capacity constrained under future traffic conditions will be identified. The analysis will present an annual forecast identifying individual homogeneous sections of roads that will become capacity constrained on and from a given year.

Sub Task 705.2: Identify gaps in road connectivity

In addition to the capacity constrained sections apparent gaps in road connectivity will be identified based on visual inspection of the GIS roadmap. The following parameters will be considered to identify the gaps in road connectivity:

- Connection of backward areas/tribal hamlets to the nearest town centres;
- Linkages of towns to District centres and SHs;
- Agricultural centres connectivity to the SH network;
- Industrial connectivity to NH network;
- Tourism locations connectivity to SH network;
- Linkage between SH and NHs (re-routing options); and
- Linkages to mining zones.

To identify the missing links, the economic growth centres (as above) will be plotted on the GIS map, once procured by OWD through ORSAC or other similar sources.

Sub Task 705.3: Evaluate alternative routes

The possibility of developing alternate routes to relieve the congestion on capacity constrained road sections will be explored. The identifications of such sections will be based on information obtained from GIS map and other available road inventory data.

Sub Task 705.4: Identify mass transit plans

The experience elsewhere indicate the capacity constraints of some of the MDRs and urban roads can be improved significantly by developing mass transit facilities through encouraging a major modal split from private vehicles onto the transit. Undertaking mass transit facility studies are not included within the current scope. However, preliminary consultations reveal that studies for mass transit facilities have been carried out by other consultants for Bhubaneswar City, which could be used to develop mitigation measures along the urban corridor to integrate in the master plan for State road network.

Task 706: Stakeholder Consultation

A Stakeholder Workshop is presumed to be conducted during January/February 2013. Problem statements, mitigation options including the detail criteria adopted to develop such options for the study area will be presented to obtain input from various agencies and groups. The list of the stakeholders will be established in consultation with the PMU; at the very inception the following agencies appear to be included in the Stakeholders include:

- Works Department
- Rural Department
- Irrigation Department
- Tourism Department
- Industries Department
- Mines Department
- Transport Department
- Forest Department

The feedback from the workshop will be incorporated to select the preferred options and develop the phased improvement plan for the Master Plan.

Task 707: Economic Analysis

The economic analysis will assess the economic criteria with respect to the Net Present Value (NPV) and Internal Rate of Return (IRR) of all the improvement options, recommended for implementation to mitigate the constrained road network. The economic analysis will compare different design alternatives in terms of their economic costs and benefit. The economic analysis balances the cost of improvements against the benefits constituted by savings in road user costs.

The economic analysis will be based on IRC SP: 30-1993 with combination of updated Road User Cost Study of 2001. Step-wise Cost Benefit Analysis (CBA) will be used for evaluations. The evaluation in principle compares the improvement options and a 'Do Nothing' alternative, to produce a cost benefit ratio of each option. Based on the results of evaluation, which satisfy the justification of minimum investment subsequent iterations are done to compare marginal cost of any additional investment with marginal benefits.

The results of analysis will be expressed in NPV and 'Economic Internal Rate of Return' (EIRR). The analysis compares the total NPV of all costs and benefits of an alternative with the NPV of all costs and benefits for the 'Do Nothing' alternative.

The agency costs involve:

- Construction and maintenance of improvement options

The road user costs involve:

- Vehicle operating costs
- Travel time costs
- Congestion costs

Economic analysis will be carried out on road links based on the following parameters:

- Links that exceed available respective capacities during any future year within the analysis horizon (20 years);
- Links that lack connectivity to major routes or to remote clusters;
- Links that are considered for improvement complying roads policies and connectivity to economic centers or major alternative transportation hubs; and
- Links that could be viable to provide alternative routes and modes.

The methodology adopted for economic analysis and phasing of works for the RNMP will be as follows:

- Develop the cost estimate of the improvement options (e.g. widening a single lane road to two-lane road with unpaved shoulder, two-lane with granular/paved shoulders, two-lane with passing lane and paved shoulder, Four lane etc.);
- Determine benefit cost ratio/EIRR of all the improvement options on road network selected for improvement for each year during the plan period;
- Compare the economics of improvement options with any alternatives available, such as developing a different route or in case of urban roads implementing mass transit facility based on recommendations made by others;
- Select improvement option, which provides best value for money after consultations with Stakeholder; and
- Prepare the phasing plan for improvements during the planning period, which include links having high EIRR or other social benefits (e.g. connectivity to remote settlements).

Sub Task 707.1: Develop the road network for improvement and respective cost

The road network improvement will be developed based on the analysis as discussed in the section related to Task 805. The standard improvement options for treatment will subsequently be

developed for the selected road segments for the study horizon period. Some of the potential improvement options could be as follows:

- Two Lane dual carriageway;
- Two lane with passing lane and paved shoulders;
- Two lane with paved shoulders;
- Two lane with earthen shoulders;
- Standard carriageway with side walk facilities for urban areas/built up locations;
- Alternative route development through building new links; and
- Implementation of multi-modal transport options on routes recommended by others.

Standard pavement designs will be developed for homogeneous sections based on field survey of axle load, traffic survey sub-grade investigations etc.; the cost estimate that would be developed for the economic analysis will assume standard design sections.

Sub Task 707.2: Evaluate alternatives and identify preferred option

The different improvement options/alternatives for each identified road segment will be evaluated with respect to individual benefit-cost ratio. The improvement option with maximum EIRR will generally be chosen as the preferred option for each road segment. This choice could be adjusted to some extent to develop a tailor-made solution based on inputs received from the stakeholders during stakeholder consultation.

Task 708: Development of Master Plan

Sub Task 708.1: Development of priority list of road network improvement

The list of the preferred options for all individual road segments will further be analysed to develop a priority list indicating the prioritised road sections for year-wise implementation. The list containing the prioritised road sections including yearly implementation plan will be submitted to the client through a formal presentation, following completion of the stakeholder consultation and input analysis.

Sub Task 708.2: Finalisation of priority list

The existing road policy implementation and enhancement, and active interaction with internal stakeholders will be undertaken to discuss and finalise the priority list for implementation. One the priority list is finalised and agreed upon by the OWD, a final implementation plan will be developed including an annual phasing plan of road network improvements for the entire study horizon which will facilitate developing an integrated road network master planning for the State supportive of sustainable social and economic growth.

Sub Task 708.3: Develop a revised road classification system and responsibility framework

The roads within the State of Odisha are classified as NH, SH, MDR, ODR and VRs. However, like in many other States, classification is possibly based on connections to major district centres or roads belong to other categories, as provided in the IRC 73-1980 (Non-Urban Roads), IRC 86-1983 etc. A revised road classification system will be developed that could be based on:

- The function of the link in the road hierarchical system based on IRC guidelines;
- ROW width; and
- AADT volume.

As shown in **Table 2-1** *(p-10)*, the ownership of roads in Odisha sector lies with different departments of GOO. Consequently, the planning, design, construction and maintenance functions of these roads lies with different agencies resulting in a non-uniform disjointed approach, not catering to the optimum utilisation of transport requirement of the State. Furthermore, this administrative arrangement does not help in optimum utilisation of the available resources.

An appropriate responsibility framework after due consultations with the stakeholders will be developed to facilitate efficient operation and maintenance of the road network in Odisha.

Sub Task 708.4: Develop and recommend capacity building measures within OWD

The Road Network Master Planning team will work closely with PMU staff to develop a clear understanding on the existing responsibility framework among the OWD staff, and others that related to road sector operation and funding for the State. Based on the expected responsibility level to be carried by the OWD staff for successful future operation, improvement and implementation of the Road Master Plan, the gaps between the existing and future responsibility levels will be evaluated. Subsequent to periodical evaluations necessary steps and capacity building plan will be developed to identify the extent of training that will be required to enhance the staff responsibility to effectively deliver. A detailed capacity building plan applicable to enhance road operation and maintenance including mobilisation of road funding in the upcoming budgets will be developed in consultation with other relevant experts and PMU staff to be integrated in the final Capacity Building document.

Sub Task 708.5: Develop draft master plan for the state

The development of RNMP will be for a 20 year horizon and will include phasing of capital road improvement to implement on an annual basis. The master plan will be directly be linked to the new road sector policy of the State and will facilitate achieving GOO's aims, targets and priorities for social and economic development. The Road Master Plan will ensure:

- The recommendations are feasible and could be achievable, i.e. the funds required for the implementation of master plan shall be realistically found from different sources, and mobilised in the capital improvement budget;
- The objectives are attractive to the investors, and governing class, i.e. the improvements proposed shall be perceived as mutually people and development friendly; and

- Inclusion of other transport alternatives available for the State for its varying social and economic needs and connectivity to remote areas.

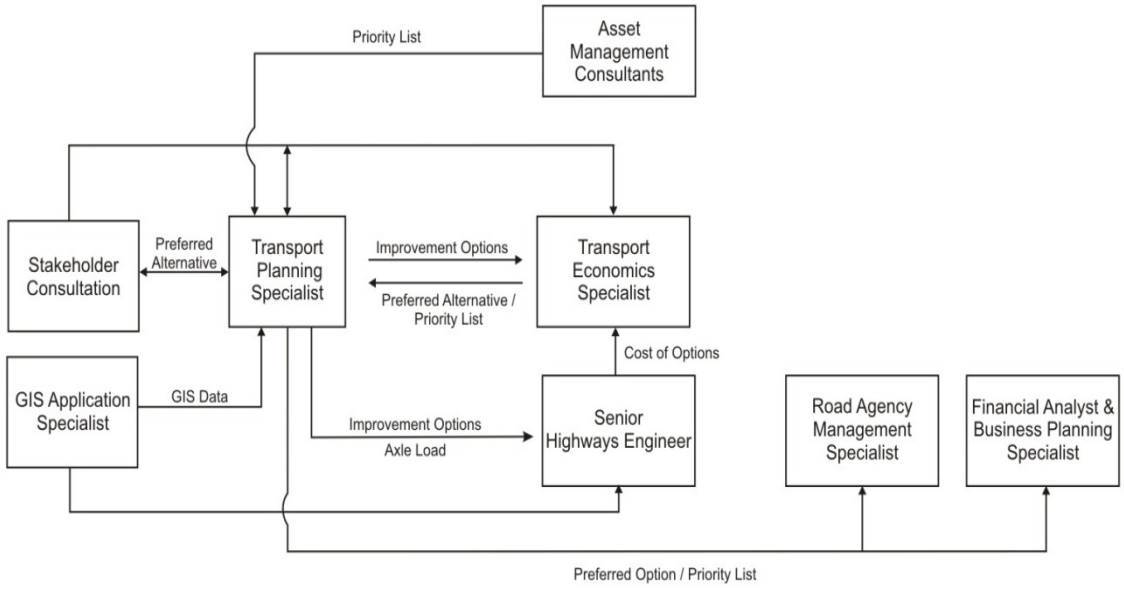
8.7. Information Flow and Work Program

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Senior Highways Engineer
- Transport Planning Specialist
- Transport Economics Specialist
- GIS Applications Specialist

The interrelation and the flow of information/data among the subject experts are illustrated in **Figure 8-7.**

Figure 8-7: Flow of Information/Data among Key Experts



8.8. Progress to Date

Since mobilisation, various data had been collected from secondary sources such as Survey of India maps, Government publications by Office of Economics and Statistics, GOO and other documents prepared by various Consultants. Some relevant data had also been collected through various stakeholders such as Survey of India, Ministry of Transport, etc.

Statistical data pertaining to population from Department of Census, Vehicle registration data for all districts in Odisha, and other economic data were collected from various sources, which would be

useful in forwarding the traffic analyses work. The efficient progress of the Master Planning process is significantly dependent on review and detail analyses of the GIS Map, including identifying 3,000 km of road segments to procure all relevant traffic information that will be used for progress of the analyses towards final delivery.

Other than data collection from the primary sources, the data collection processes from the secondary sources are on-going. Furthermore, data analyses of the available statistical information has already been commenced to evaluate the growth factors, which will be properly utilised to proceed onto the RNMP.

8.9. Way Forward and Action Plan

It is extremely important to procure the GIS enabled map covering the entire road network of Odisha State. As indicated in the earlier section this GIS based map is extremely necessary to start field investigations at the earliest. The progress of the work including the details of upcoming steps, involved in successful delivery of the RNMP is laid out in the detailed work plan presuming the primary tasks effecting the critical path of the project progress completes within time. The primary focus in developing the RNMP will be on data analyses, although the existing attributes as presented below will be closely integrated in the decision making process in developing the RNMP.

Population Distribution: Figure 8-8 *(p-125)* illustrates that predominant parts of Odisha has less than 20 percent of the total population living in urban areas. This indicates large rural population in the State will be supported with a well laid out road network to provide all weather connectivity to major economic, health and education, and district centres in the State.

Land-use Pattern: Figure 8-9 *(p-126)* illustrates the existing land use exists in the State, where agricultural land-use dominates the State land use pattern. This confirms that connection to rural agricultural centers is one of the important parameters to be considered in developing the RNMP to ensure enhancement of logistics and connectivity among major economic centres/district centres/urban centres and the agricultural centres.

Tourism: Figure 8-10 *(p-127)* illustrates major tourist attractions within the State. The major tourist centres are located primarily in Bhubaneswar, Cuttack, Puri and Konark, which are geographically situated on the easterly periphery of the State. However, the State has several other attractions like wildlife, lakes, scenic spots, religious centres, waterfalls and wide sea beaches. Odisha's possesses a much bigger potential for enhancing tourism industry, which would again be dependent on an efficient and effective road network layout connecting such tourist centres.

Though the percentage of foreign tourists visiting Odisha since the year 2000 is declining, the number of tourists from within the Country has been increasing. Within India, most tourists to Odisha come from the neighbouring states of West Bengal and AP, which will further be enhanced simultaneous to an effective RNMP

Figure 8-11 *(p-128)* indicates the major road and rail network of Odisha. It can be seen from the figure that the present rail does not connect through all the major areas of the State to support the

economic growth, particularly in the Central Districts of the State. The existing total length of the NHs contributes only about 2 percent of the road network, whereas approximately 40 percent of the total road traffic uses NH facilities for State-wide travel or travel to and from external traffic zones. The focus of Road Network Master Planning will definitely examine enhancing of connectivity between rail and road transportation to facilitate a smoother intermodal transfer for passenger and freight transportation.

The Road Network Master Planning in brief will be developed based on the output from the analyses of existing traffic volumes, existing travel pattern among the major trip centres, all relevant attributes that are effective for traffic growth, connectivity, alternate routing, installation of multimodal transportation and enhancing interdependency of road traffic and other major modes of transportation.

Figure 8-8: Percentage of Urban Population

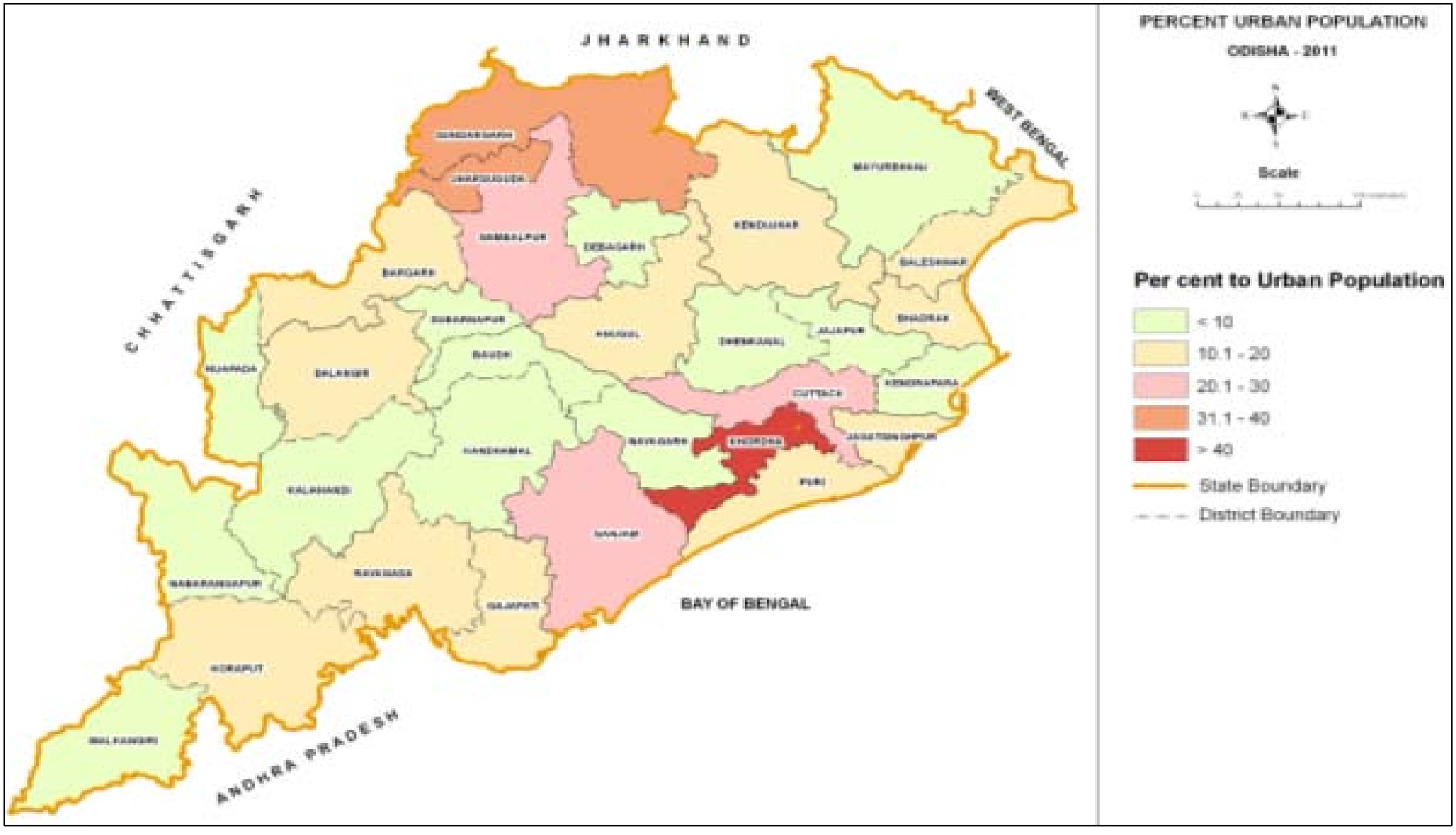


Figure 8-9: Land Use Pattern

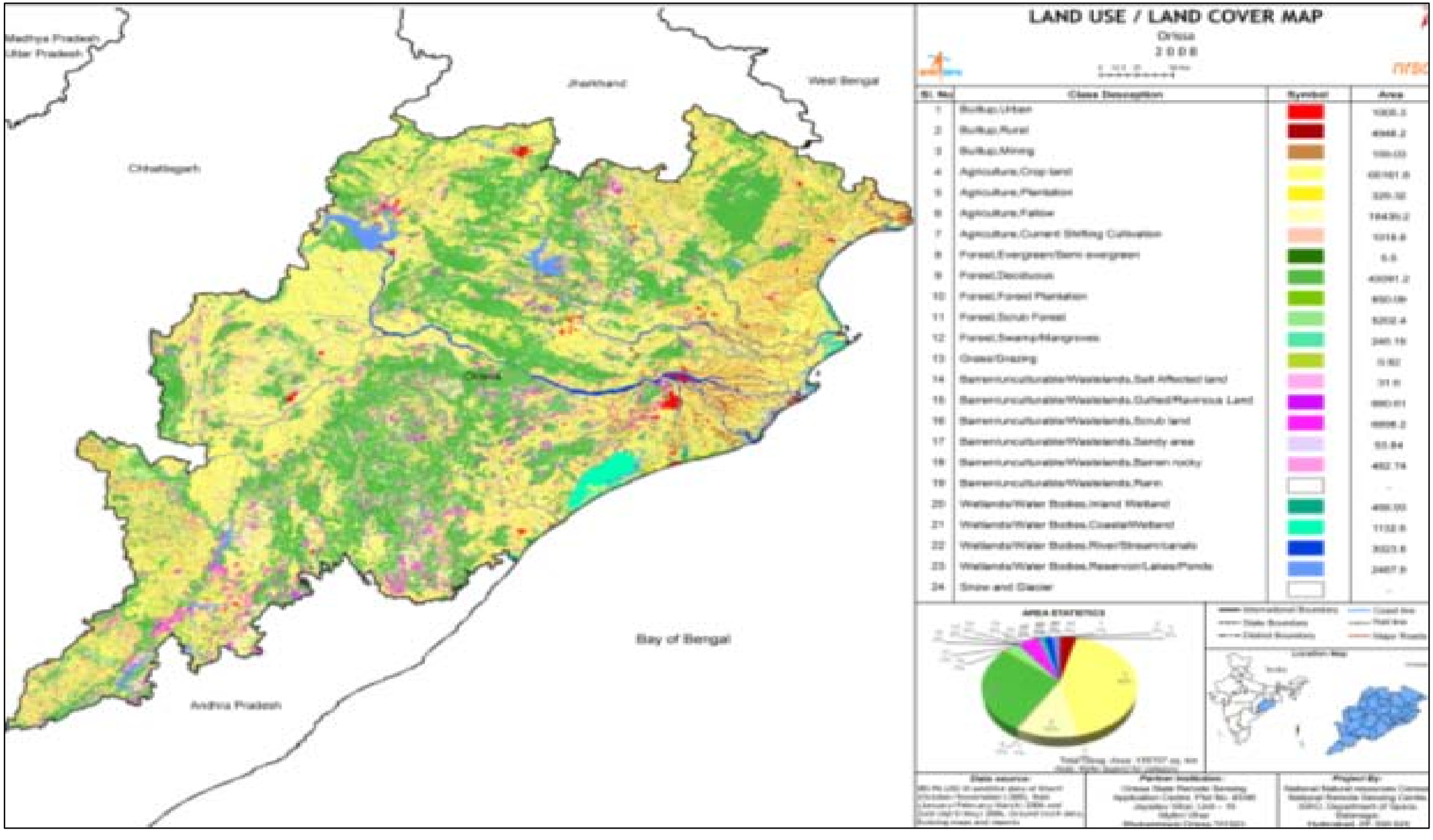


Figure 8-10: Tourism Map

Figure 8-11: Major Road and Rail Network

SECTION 9

FUTURE ROADS MANAGEMENT FUNDING

9. Future Roads Management Funding

9.1. Introduction

Roads constitute an important backbone for economic progress. GOO has provided significant importance to development of roads in the State and improved connectivity. However there is a need to generate increased funding for RM and asset development besides development of mechanism for new road dedicated revenues such as road fund. As per ToR the task involves following activities:

- Review of existing funding sources and 'road user charges' mechanisms available to GOO to meet the financial requirements of the state's main road network infrastructure;
- Assessing the adequacy of the resulting funds for objectively-determined 'road asset management' needs and priorities;
- Identification of realistic new measures available to GOO to improve resource mobilisation for roads financing in the state, projection of the funding volumes potentially mobilised via such measures (individually and cumulatively), and comparison of the efficiency of each such measure;
- Identification of viable institutional options to 'channel' road user charges and other new roads-dedicated revenues onto road infrastructure purposes, via (e.g.) possible creation of a state-level Road Fund;
- Identifying the structuring, powers and resources needed for (e.g.) an effective and sustainable Road Fund; and
- Facilitating the implementation of the GOO preferred mechanism(s).

9.2. Present Funding Status

9.2.1. Sources of Fund

The major sources of fund for the road sector of the State are:

1. State Budgetary Allocation for plan and non-plan outlays including RLTAP and Tourism;
2. Central Grants from Central Road Fund;
3. Funds under PMGSY;
4. NABARD – RIDF loan assistance; and
5. Funds from MoRT&H for NH.

In addition, there are different specific schemes/project such as:

- E&I scheme of GOI; and

- Externally aided projects such as OSRP from WB.

A vignette of road sector investment in Odisha has been presented in para **2.3.** *(p-11)***.**

Table 9-1 provide an abstract of plan and non-plan allocation and expenditure from 2008–09 to 2010–11 for the road sector in the State from the budgetary allotment.

Table 9-1: Plan and Non-Plan Allocation and Expenditure (Rs. Lakhs)

NON PLAN						
Head of Account	**2008–09**		**2009–10**		**2010–11**	
	Final Allotment	**Expenditure**	**Final Allotment**	**Expenditure**	**Final Allotment**	**Expenditure**
2059ME	1,221.23	987.33	1,209.88	1,134.73	1,071.55	1,065.04
3054	40,109.15	40,986.68	43,320.61	45,180.48	49,589.89	49,740.03
5054	5,317.40	5,309.61				
PLAN						
4217	476.83	474.53	99.98	99.90	100.00	93.94
5053	111.43	111.43	199.00	199.00	199.99	199.99
5054	73,250.25	72,941.85	59,954.33	59,920.84	80,708.78	85,661.78
CP						
5054	1,522.45	1,451.92	591.99	700.98	780.96	671.97
CSP						
5054	1,957.47	1,957.49	2,199.96	2,199.96	2,660.58	2,660.58
Grand Total	**1,23,966.21**	**1,24,220.84**	**1,07,575.75**	**1,09,435.89**	**1,35,111.75**	**1,40,093.33**

Source: Finance and Accounts Division, OWD.

The data of OWD will be taken as a based data to get inputs from other road departments of GOO and analysed for subsequent planning for future budgetary forecast and proposals.

9.2.2. Status of Toll Collection

Odisha Bridge and Construction Corporation (OBCC) Limited, a State Government undertaking under the administrative control of OWD has been mandated to collect (as an agent of the State Government) toll on vehicles for use of bridges, bridge works and approach roads to bridges which are entrusted to it by the State Government. OBCC is also authorised to collect toll on bridges owned by the State Government and purchased, taken on lease or otherwise acquired through transfer by OBCC. Details of toll collected by OBCC from 2007–08 to 2011–12 is presented in the **Table 9-2** *(p-132).*

However, after retaining the agency charges, OBCC deposits the net toll collection amount into the Consolidated Fund of the State.

Table 9-2: Toll Collection under M/S. OBCC Ltd. (Rs. Lakhs)

Financial Year	No. of Toll Gates (R&B)	Toll Collection (R&B)	No. of Toll Gates (RD)	Toll Collection (RD)	Total Nos. of Toll Gates (R&B and RD)	Total Toll Collection
1	**2**	**3**	**4**	**5**	**6 (2+4)**	**7 (3+5)**
2007–08	39	2,188	14	1,025	53	2,198
2008–09	44	2,741	12	1,218	56	2,753
2009–10	42	2,727	8	1,139	50	2,739
2010–11	42	3,213	8	1,399	50	3,228
2011–12	37	3,360	8	1,680	45	3,377
Total		**14,229**		**6,462**		**14,295**

Source: Accounts Office, OBCC Ltd.

9.3. Approach and Methodology

For future road management funding, intensive interaction and consultation will be held with counterpart team of GOO road departments, certain concerned officials with toll collection management of works department of EIC (Civil), finance department, rural works department, and other relevant departments such as tourism, mining, industry, other transport department of GOO and the concerned stakeholders, etc. The consultations will be in format of one-to-one discussion, group discussion and workshops. Referring to the ToR of the assignment, the objectives of the road management funding component of the study can be addressed by undertaking six specific tasks briefly mentioned below:

Task 1 Situational Analysis

At the onset, relevant documents, reports, budgets, data and information shall be reviewed and analyse to assess the present road financing situation in the State. The different sources of fund for different categories of roads (viz. NH, SH, MDR and ODR) in the State with different ownerships will be identified and assessed. Further, allocation of funds for different categories of roads and pattern of expenditure for construction of new roads, strengthening and widening of roads, and maintenance will be studied and analysed for last 3–5 years. In addition, levy, collection and utilisation of toll fees for the road sector of the State will be reviewed, along with scope and extent of public-private partnership (PPP) in roads sector in the State under Odisha PPP Policy 2007. Discussions shall be held with officials concerned and other road sector stakeholders to understand the road financing situation, issues and challenges in the State. Overall, an in-depth analysis will be carried out to assess:

- Allocation of funds and expenditure made and levies collected for various categories of roads and type of works (new constructions, repair and maintenance of existing roads and other road related institutions e.g. road laboratories etc.);
- Trends of fund utilisation and capacity of the implementing agencies to utilise the funds allocated;
- Adequacy of funds allocated to address the needs of core road network; and
- Other potential sources of dedicated and sustainable funding.

This stage of the exercise will provide inputs for understanding and assessing the present situation of road financing in the State, the issues faced in terms of fund sourcing, allocation and utilisation.

Task 2 Define the Challenges of Road Financing in the State

The issues and challenges in road sector financing in the State shall be analysed along with an assessment of the existing mechanism used to allocate financial resources for the road sector. In addition issues in raising fund through alternate mechanisms (market borrowing, bonds, tolls etc.) shall be explored.

Task 3 Estimate Future Financial Requirements for the Road Sector in the State

Considering the 'RNMP' being developed under this consultancy, an assessment shall be undertaken for the future financial requirements for the road sector to meet the demand arising from the economic development of the State. The future fund requirements will be for capital outlay, maintenance, road safety and capacity building for road planning, design, operation and management. Consultations will be made with respective experts working on this assignment and their counterpart team for the purpose of fund requirement estimation.

The estimated fund requirement will be classified in terms of priority activities and phased out in consultation with respective experts working on this assignment and their counterpart team, as well as in discussion with the stakeholders.

Task 4 Estimation of Financing Gaps

The prioritised and phased estimated fund requirement will be linked with available finances so as to clearly phase out the gaps in financing as emerging out of RNMP. Based on the future financial requirements for the road sector in the state as assessed and present financing pattern under state plan and various schemes/projects (including GOI and WB), the gaps in financing shall be assessed and brought to the notice of GOO. This shall no doubt analyse the funding patterns during various FYP's in the past as well as plans of the GOO under 12th FYP.

Task 5 Identify Feasible Options

This task focuses on identifying different options for meeting the challenges of road funding and recommends the most preferred solution.

Based on the findings emanating from pervious task potential sources of road finance will be listed. This shall include various feasible options (PPP, viability gap funding, commercial borrowing, bonds using a corporate body, road fund etc.) will also be generated, analysed and evaluated. In preparing the list of existing and potential sources of road finance, reference will be made and performance analysis for other States in the country such as Gujarat, Karnataka, MP, Maharashtra etc. shall be studied. Following the listing and performance analysis of existing and potential sources of road financing, each listed sources of finance will be studied and reviewed in detail in terms of quantum of funds that can be potentially generated, sourcing mechanism, social acceptability, and administrative and financial viability. Considering the merits and demerits of each listed sources of finance will be assigned suitable weightage and ranked in order of weightage indicating sequence of preference.

Under this stage, the financial and socio-economic viability of setting up a Road Fund for the State will also be examined; Also, the toll collection system and setting of toll rates under Odisha State Roads Tolls Act, 2010 and Odisha State Roads Tolls (Determination of Rates and Collection) Rules 2011 will be studied and reviewed with the objective to set the guidelines for toll fees setting with such modifications, if and as necessary. Parallely, the challenges for PPP in the road sector in the State and possibilities for enhancement of PPP in this sector in line with the Road Sector Policy to be developed as part of the current assignment will be examined. In this regard, reference will be made to local conditions and lessons learned from national and international experiences.

Finally, the recommendations for preferred feasible options for road sector financing and guidelines for setting toll fees and its collection mechanism will be developed. Based on these, discussions shall be undertaken with officials of GOO and other departments of GOO i.e. OWD, RDD, PRD, Irrigation/Forest, Tourism and Industry etc. to develop the case for or against establishing road financing options including a dedicated road fund in the State and needful decision shall be undertaken. Overall, suitable road financing mechanism for future road sector management shall be suggested.

Task 6 Drafting an Implementation Plan for Preferred Options

Under this a plan for implementing the preferred options for road financing shall be drafted, discussed with the GOO officials and finalised. This implementation plan in terms of tasks and time schedule will be prepared for a 20 year time horizon based on prioritised and phased fund estimation and potential sources of fund. This shall also include an appropriate institutional mechanism to plan and monitor such funding activities with its constitution, functions, structure, manpower requirements etc. Consultants shall support GOO in establishing such mechanism.

9.4. Deliverables

The deliverables for the road management funding component of the study will consist of:

i. Preliminary Report on As Is situation, funding gaps, feasible
ii. and suggested funding options; and

iii. Final Report on As Is situation, funding gaps, feasible and suggested funding options and implementation plan.

The preliminary report will be presented and discussed with Client, ISAP Working Group and the Steering Committee. Based on their feedback, suggestions, and inputs received, the report will be finalised.

The Report will provide assessment of existing situation of road sector financing in the State for all category of roads, identify the key issues in current road sector financing and identify different financing options that will be suitable to address the key issues in road sector financing. The Report will also contain evaluation of the financing options on guiding parameters and recommendation for the preferred options, giving the prevalent financial models of other states. An implementation plan detailing a realistic schedule showing major transition from the current arrangements to full operation of the preferred option(s) will be presented in the Report and submitted to GOO for their further action.

9.5. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Financial Analysis cum Business Planning Specialist
- Transport Planning Specialist
- Transport Economist
- Legal Specialist

SECTION 10

ROAD TOLL COLLECTION AND MANAGEMENT

10. Road Toll Collection and Management

10.1. General

The scope of work defined vide Appendix A of Contract Agreement is as follows:

The major activity is to develop for GOO endorsement, a framework for effective Road Toll Collection and Management to be implemented by the Transport Department and focused primarily on outsourcing of road toll collection under performance-based contracts. This shall involves following activities:

1. Develop framework for effective road toll collection process and systems;
2. Development of Guidelines on toll setting and tolling operations;
3. Preparation of Model tolling contract agreement;
4. Preparation of an action plan for progressive GOO implementation of the new 'Road Toll Collection and Maintenance' management model; and
5. Assistance in initial stages of implementation.

10.2. Approach and Methodology

10.2.1. Review and analysis of present Tolling Act

The new tolling act enacted by GOO shall be reviewed and analysed for its strengths, limitations and possibilities of pilferage under the situation of Odisha. The Consultants shall review the existing toll collection methodology adopted by the State and the revenues collected in last 2–3 years. This shall enable to assess various leakages and gaps in the existing system. Similar acts enacted by other state governments shall also be reviewed along with their performance so that the deficiencies can be identified and addressed.

10.2.2. Develop Framework for Effective Road Collection Management

Based on the review and analysis of the tolling act and the performance in various states, improved processes, systems and entities shall be identify/evolved to reduce leakages, pilferages etc. and to improve efficiency of toll collection. This may evaluate outsourcing of roll toll collection under performance based contracts, which may be linked to maintenance and operation.

The advantages and disadvantages of outsource arrangements vs. centralised control by OWD for toll collection shall also be analysed and be part of the report prepared for OWD. As per the experience of NHAI, who outsourced the toll collection responsibility to the third party organisations sponsored by Director General of Resettlement (Defense Organisation), did not find the process successful. The Consultants while making their recommendations shall integrate such experiences. The evolved process and system shall be discussed with OWD/GOO officials prior to finalisation.

10.2.3. Guidelines on Toll Setting and Tolling Operations

Considering factors like traffic load (No. and type of vehicles), type of road, life of road, alternate routes, length of road, type of area (e.g. industrial, mining, tourist etc.), date of construction and cost of operation and management of such roads, studies shall be undertaken by the Consultants to generate data on optimum toll amounts. Based on these, draft guidelines for toll collection shall be developed by Consultants for different options of outsourcing/in-house collection of management. The draft guide lines shall be discussed and finalised with Government officials/OWD.

10.2.4. Preparation of Model Tolling Contract Agreement

Consultants shall review and analyse available model toll contract agreements executed by other state governments and NHAI along with their performance so as to bring out their strengths and limitations. Based on these Consultants shall develop model tolling contract agreement for outsourcing of road toll collection and maintenance/operations. This shall contain the main document and associated document for implementation of contracting out of combined 'road toll collection plus RM plus operations' packages for selected road network sections, which may include OSRP funded roads also. Such documents before finalisation shall be discussed with OWD/GOO officials.

10.2.5. Action Plan for New Road Toll Collection and Maintenance Management

As of now there is enough experience available on successful toll collection management being practiced by various Concessionaires as part of PPP (BOT) projects executed by NHAI and State Governments such as Maharashtra, Gujarat etc. Such arrangements facilitate development/ maintenance/operation of such roads for the entire life span of roads as toll collection continues for years. The action plan to be prepared by Consultants shall be based on review and analysis of the mechanism and performance in these States, and present arrangements being followed by Odisha combined with feedback based on visits organised to such tolls for a group of ten GOO officials. The plan shall also envisage the operation and maintenance (O&M) methodology for roads falling under toll collection ambit. The GOO shall be assisted by Consultants for formulating appropriate legal framework for the toll collection action plan.

10.2.6. Assistance in Initial Stages of Implementation

Consultant shall support OWD/GOO in initial stage of implementation by participating in selection of contractors and in developing agreements with the contractor. The Consultant shall support in legal and documentary aspects.

10.2.7. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Financial Analysis and Business Planning Specialist
- Procurement Specialist
- Legal Specialist

SECTION 11

VEHICLE AXLE LOAD REGULATION AND MANAGEMENT

11. Vehicle Axle Load Regulation and Management

11.1. Scope of Work

This involves reviewing the situation concerning existing road transport axle load control practices in Odisha and develop proposals for new realistic, sustainable axle load control policy and strategy, for implementation by the Transport Department. The tasks identified to achieve the objectives in the ToR to develop a new axle load regulation and management are:

- Assess the prevalence and main features of excessive loading by truckers and other categories of vehicles in the State;
- Review of the range of methods, resources and institutional arrangements objectively available to the GOO for more effective regulation, monitoring and management of vehicle axle loading in the heavy road transport corridor of the main network;
- Assess the experiences elsewhere in axle load regulation and management;
- Prepare options for sustainable axle load management regime and responsibility framework; and
- Provide assistance to procurement of essential equipment/resources and establish performance monitoring processes.

11.2. Overloading – The Problem

One of the key factor in the life of a pavement is the standard axle load repetition during the design life of the pavement. Equivalency factor in terms of damages to the pavement varies approximately to the fourth power of standard axle load. As the overloading increases, damages to road increases exponentially.

In addition to the detrimental effect on service life of the pavement, overloading also results in higher road user cost, besides increase in pollution level. It is also a potential hazard and may lead to accidents. The amount of damage caused due to overloading to the road infrastructure and the life expectancy of the road far outweighs any short term again.

Overloading of trucks to the extent of 200–300 percent in goods vehicles is often reported. Almost every stakeholder in the road transport sector except consignors is against such overloading, yet the practice is rampant. The general perception of the vehicle operators is that they would not be inconvenienced in case the existing limits of permissible axle loads and GVWs (Gross Vehicle Weight) are not enhanced. Generally, the operators/contractors of transport vehicles mobilise the vehicles from third party, who are the owners of the vehicle. Therefore, such Contractors per-se cannot be considered as a stakeholder, because eventually the vehicle owner is held responsible in cases of overloading. The Truck Owners associations generally feel that overloading increases their vehicle operating cost and reduces demand for trucks. Some of them also feel that it is they who have to

bear the brunt and penal consequences of plying the overloaded vehicle, which is although done at the behest of Consignors.

11.3. Countermeasures Developed by States

Invoking their power of compounding under Section 200 of MV Act, many States notified graded fines for compounding the offence of overloading. However, such fines are much lesser than that prescribed under section 194 of MV Act. In the process of earning revenue in such manner, there is very little concern for the damage caused to the road infrastructure.

The GOI, however, had maintained that off-loading of overloaded cargo was a pre-requisite even for compounding the fine. Some deterrent actions taken in this regard, such as temporary suspension of Centre's grant to concerned States, etc. were also resorted to.

11.4. General Measures to Control Overloading

The following are the generally recognised measures adopted by some of the States to regulate the overloading of vehicles:

- Discourage modification in design (tyre size, no. of springs, etc.) to suit overloading by incorporating essential features in Registration Certificate;
- Install weigh in motion (WIM) at select points on NH, Inter State Check Posts, industrial areas, etc. on a selective basis. This will generate information for monitoring;
- Enforcement at sources of loading (ports, industrial areas, etc.); and
- Deregistration of offending companies displaying repeated lapses under Section 199 of MV Act.

11.5. Consultant's Approach and Methodology

Axle load survey will be carried out at 50 locations to study the loading pattern on both the mining areas and other locations which are sources of traffic carrying heavy loads, covering OWD and other roads in the state. These locations will be selected keeping in view the requirement to augment the data base on axle load taking into account the locations on which Asset Management Consultant would have collected relevant data. Field work for collection of the data at 50 locations, to be taken along with the data on Pavement Condition for Master Planning of the total network on a selected road network of 3,000 km, it proposed to be completed in a period of 4 months (September–December 2012).

The locations for axle load survey are to be selected in such a way that the test point is located in a plain area on a straight stretch with proper visibility. In order to fully understand the haulage pattern the survey would be undertaken both during the day and the night time.

Data will be collected through recording using portable wheel weighing platforms recorded on specially formulated proformae, separately for the various categories of commercial vehicles. The broad categories would include LCV Goods, LCV Passenger, 2 axle Truck, Bus, Semi Truck Trailer (single rear axle), Truck Trailer (single rear axle), 3 axle Truck, Semi Truck Trailer (tandem rear axle) and Truck Trailer (tandem rear axle).

The data will be utilised to assess the VDF for different categories of vehicles plying on roads in Odisha. The information will be further utilised for options analysis and development of a sustainable framework with an action plan for effective vehicle load regulation and management.

The Regulation and Management strategies would include the following:

- Recording wheel loads using portable weighing pads and controlling/disciplining the erring vehicles through enforcement agencies; and
- Recording wheel loads at Toll Plazas, wherever tolling is going to be introduced, using permanently installed weigh-in-motion capabilities.

Two different approaches can be adopted:

1. The erring vehicle can be made to pay toll proportional to the potential damaging effect of the overloaded vehicle; or
2. The overloaded vehicle can be temporarily impounded at the lay by and the extra load is got offloaded to another vehicle and the two vehicles are then allowed to resume journeys; and
3. Imposed penalties (*Challaning*) vehicles that have undergone body modifications to help carry extra load.

11.6. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Senior Highway Engineer (Pavement Management and Planning)
- Road Safety (Infrastructure Design and Management) Specialist
- Legal Specialist

SECTION 12

FUTURE ROAD SECTOR INSTITUTIONAL OPTIONS

12. Future Road Sector Institutional Options

12.1. General

Management of Roads of any State, depending on types of road, is an exercise involving various Government entities, i.e. national, State and local bodies, besides other supporting structures like construction industry, Training institutions, Laboratories, etc. The future institutional options as seen by the Consultants will take into account all the entities related to the Road Sector.

The Scope as Defined vide Appendix A of Contract Agreement:

- Mapping of established range of entities, functions and resources involved in road sector outputs and operations;
- Clarifying the distribution and adequacy of powers, authority and accountability relative to current and newly emerging priorities for GOO;
- Addressing important weaknesses and/or gaps in the existing institutional arrangements in the road sector;
- Identifying, ranking/prioritising the realistic options for medium-to-long term strategic improvements in institutional framework support for GOO objectives and overall governance; and
- Recommendations on the merits and 'domain' of funding requirements and implementation timeframe for new Road Development Corporation (RDC).

12.2. Concept of Restructuring of Road Institution

Road administrations have generally been evolved over a period and the established systems world over have identified five stages for this evolutionary process:

- Stage 1: Traditional construction and maintenance (works) organisation;
- Stage 2: Identification of Client and supplier functions;
- Stage 3: Separation of Client and supplier functions;
- Stage 4: Corporatisation of the supplier organisation; and
- Stage 5: Corporatisation of the Client organisation.

The evolutionary process identifies and focuses on the following two key requirements:

- Increase the specificity of an organisation; and
- Subject the organisation to competition.

Before we go into the details of looking into options of creation of new road institutions for OWD, it will be worthwhile to analyse the concept and mechanism for its effectiveness.

Specificity

Specificity is the ability of an organisation to identify and focus on its core business, without concentrating on the unproductive tasks. The several measures for increasing specificity include:

- **Objectives:** when well-defined, these measures focus on increasing efficiency and meeting road users demand; they should be set in terms of output, and defined with as much precision as possible;
- **Time periods:** for meeting the objectives can also be defined closely; longer time period usually imply lower specificity, and a greater likelihood that an activity will be affected by the vagaries of human behavior or political interferences;
- **Procedures:** for achieving objectives can affect specificity; vaguely defined methods, for which there are only general standards, imply that it will be difficult to measure performance and efficiency; and
- **Control:** of achievement requires the collection of data so that accomplishment can be verified, and is a result of the ability to specify objectives and methods; controlling achievement is easier with higher specificity activities.

Identification of core issues of road sector requires the recognition of road user groups, and an understanding that the principal aim is to meet their requirements. This will enable the main objectives to be set, and management structures and procedures to be put in place that are designed to achieve these objectives. There is also a need to introduce sound management practices and to encourage managerial accountability.

Competition

Competitive pressure is also a mechanism for increasing effectiveness and efficiency, since it provides user with choices about how their needs are met, and compels providers to become more efficient and accountable. Competition can be:

- **External**: such as between private contractors in a competitive tender situation;
- **Internal**: competitive social pressures can be exerted on an organisation by the political establishment, regulatory agencies and by road users, and by managerial measures that create a competitive atmosphere within the organisation; and
- **Mixed**: where a public sector organisation competes with organisations from the private sector; this has been carried out in the road sector in the various countries and even in some of our States with great success.

12.3. Existing OWD Organisational Structure

The OWD is headed by an EIC-cum-Secretary to the GOO, Works Department. As 'EIC'; this position carries technical responsibility for the OWD and as 'Secretary' exercises administrative control of the OWD. The EIC-cum-Secretary operates as the senior liaison officer between the GOO and the OWD.

In the OWD, there are six* CEs, and one MD, Bridge and Construction Corporation who report to the EIC-cum-Secretary and EIC-Civil. Each CE is responsible for a functional unit called a 'wing'. The senior most CE holds the title of EIC (Civil) and, is responsible for all the administrative functions of the OWD. This includes financial reporting and personnel functions.

*Though the latest cadre review carried out in 2010–11 has five more CEs added, but it yet to be implemented for its deployment and implementation on ground. This issue will be addressed and consulted with OWD as well as EIC-cum-Secretary for its final outcome.

The organisation chart of OWD is shown in **Figure 12.1** *(p-147).*

Some of the newly created wings of OWD require specific mention as described in succeeding paragraph.

12.3.1. WB Projects Wing

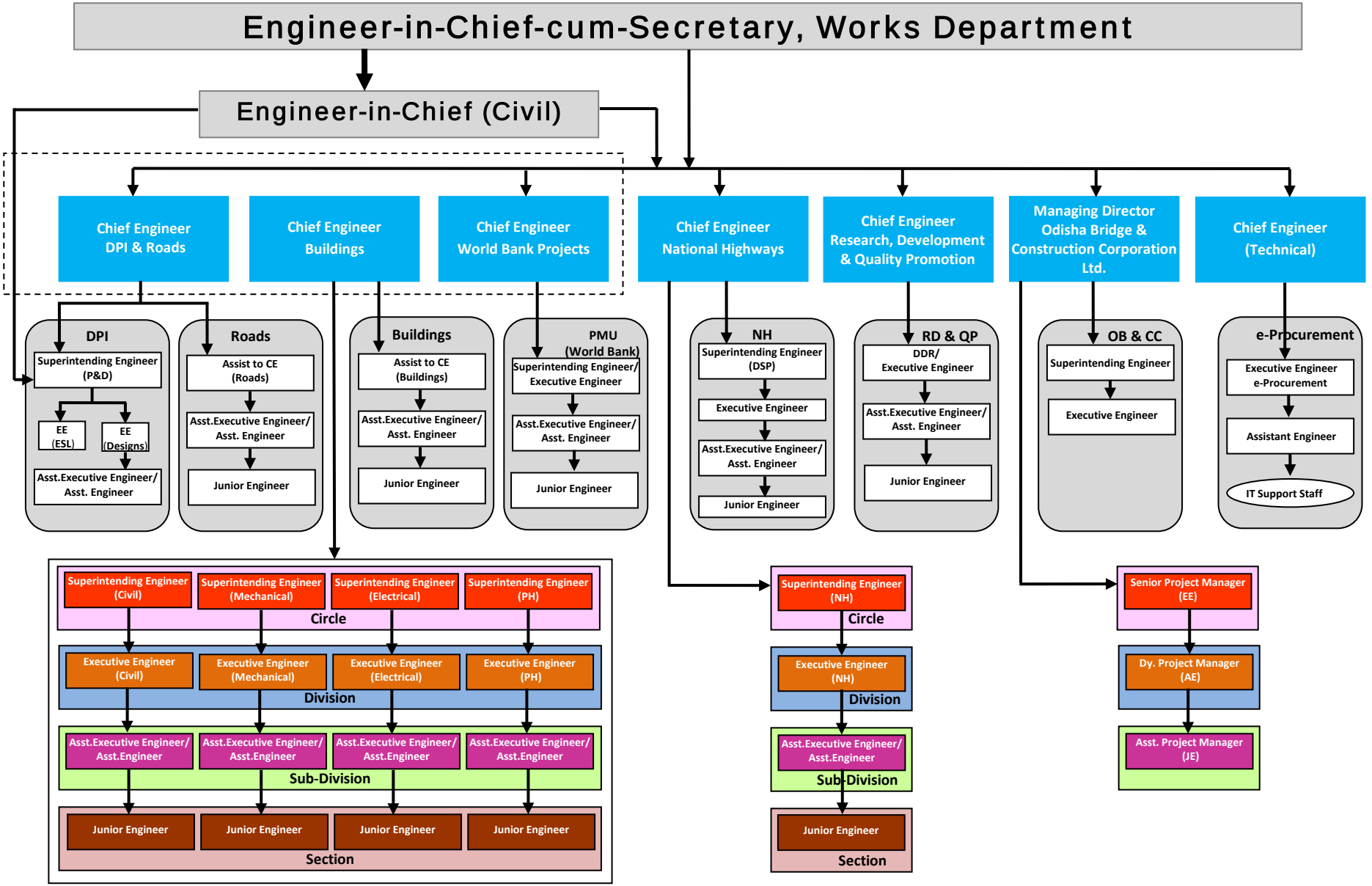
It is a newly created Wing headed by CE (WB Projects). This Wing is responsible for upgradation and maintenance of priority corridors of SHs funded by the WB and other external funding agencies/financial institutions. As part of its main responsibility, this wing is undertaking a WB assisted projects to upgrade part of the Core Road Network under OSRP.

12.3.2. Odisha Bridge and Construction Corporation Ltd.

This organisation has been established by an Act of state Government in 1983 with a share capital of 500 Crores to construct bridges. It is wholly owned construction agency of OWD under GOO. It is headed by a MD of the rank of CE. The EIC-cum-Secretary is the Chairman of this organisation. This Wing is responsible for construction and maintenance of bridge works allotted to it by the Works Department and other Government agencies in the State. It has subsequently been expanded to takes up the activities of construction of roads, buildings and power plants. In addition, it also takes up steel fabrication and electrical works. It also has a unit for subsoil investigation and testing of soils and construction materials. The OBCC collect Toll fees on behalf of GOO throughout the state.

However for sometimes, this organisation has not been in its self sustaining healthy financial position. Its working has been under question for its efficacy and output. As observed by the Consultants as well as advised by client and WB its working needs to be reviewed in consultation with EIC-cum-Secretary for its final outcome i.e. to be merged with proposed new Institutional Structures or otherwise. It will be based on its working profile of last five years with regards to financial contribution to GOO.

Figure 12-1: Organisation Chart of OWD



12.4. Methodology

12.4.1. Mapping of established range of entities, functions and resources involved in road sector outputs and operations

Development of Institutional options requires a detailed understanding of present road sector entities and their roles and responsibilities. This shall require a closer analysis of various stakeholders, who have direct roles and responsibilities in development of road sector in the state. This could include both national level and state level organisations. For this, a detailed activity mapping shall be undertaken, which shall include major and minor activities, which should be undertaken for the development of road sector. The activities would not only include present activities but envisaged activities in future due to road sector vision of GOO and road sector policy development.

A matrix then shall be developed for each desired role/activity for development of road sector against the entity (identified above) performing these roles. The roles and responsibility of entity could be as a main (mainly responsible entity taking a lead role) as well as support to the lead role (supporting entity). This mapping exercise shall be undertaken based on review of available documents, reports and discussions.

The mapping exercise may also bring out two major features: entities having same lead responsibility (overlapping responsibilities – more than one organisation having lead role) and uncovered responsibilities (no one having lead responsibility).

12.4.2. Redefining Institutional Roles and Responsibilities

This task involves analysing responsibility matrix and assigning respective Roles and Responsibilities along with distribution of adequate powers, authority and accountability relative to current and newly emerging priorities for GOO. This involves strengths and limitations analysis of existing stakeholders along with their capacities, competencies and past performance under given socio-political and legal environment. The analysis shall not include identification of suitable stakeholders to undertake them, propose new Institutions to undertake them or modify existing institutions (including merger of some organisations) or changing their type (quasi-government, Corporation, Agency etc.).

As part of this task, OWD has been looking forward for RSID Consultants to analyse the options to provide the recommendations for establishment of new institutions, i.e.:

- RDC; and
- Establishment of Training Academy of Construction.

The Conceptual Approach

Proposing any change in existing structure for Institutional Strengthening and capacity building involves a detailed and comprehensive study of present institutional establishments for their

directional, executional and ground level functions, professional competencies of every level of organisation and individuals.

While reviewing the existing status of OWD, the analysis shall include integration of the following:

- Stakeholder Feedback (including Secretary – works, Engineer in Chief, OWD etc.);
- Experience of other States;
- Road Sector Policy, Strategy and its Vision; and
- Development Plans of State.

12.4.3. Analysing Some Preliminary Options

12.4.3.1. Construction Academy

As learnt, its building has been constructed, but leased out to L&T.

***The Consultants' Preliminary Views on* Construction Academy**

Existing Practices being followed by other Works Departments are:

- College of Military Engineering running a Diploma Institute at Pune for development of skills of subordinate staff involved in construction activities of Military Engineer Services;
- **National Academy of Construction** (NAC) being run by AP Government; and
- Indian Academy of Highway Engineers under MoRT&H.

The Initial Views on This Option

- Attaching the existing construction academy of OWD to an existing engineering institutions, i.e. IIT Bhubaneswar, KIIT or NAC Hyderabad could be economical and quicker option to establish it than running it as an independent institution; and
- The course content should be aimed at practical and basic skills – leaving engineering theory and practice to the universities and technical colleges. These skills could be developed in site supervision, tendering processes, cost control, quantities and measurement, quality management, contract management, programming works – and so on.

Studies should be flexible and allow for part-time study so that people in the industry can study while they are working:

- Courses should be accompanied by comprehensive work booklets which can be retained by individuals and referred to in work places;
- Where possible, recruit teaching staff from industry. People who are involved in day-to-day industry issues can pass their experience on to students;
- Include practical, hands-on training with appropriate field visits to observe construction practices; and

- Award of a certificate after successful completion of course to acknowledge the individual's achievement.

12.4.3.2. Road Development Corporation

As of now, the OWD manages the road network in Odisha using a traditional PWD model – providing road related services such as design, construction, O&M using its own cadre of engineers and direct hire labour gangs. Over recent years, some States in India have recognised that this model was becoming ineffective and most of repair and maintenance works are now contracted out to private sector. Typical problems faced by PWDs included under-funding, over-staffing and untimely delivery of road rehabilitation and maintenance. While State Governments recognise these problems, it appears there is some reluctance to act because of difficulties anticipated in restructuring the OWD.

However, with economic advancement, there is general agreement that road management practices have to be modernised to meet future demands. Some of the States have already adopted this new concept of Development Corporations, such as AP and MP, and incorporated under the companies act. This is a separate, Government-owned entity specialising solely in the management of State roads. Its main role is to manage a quality road network comprising construction and rehabilitation and maintenance works.

Its major differentiation from the conventional PWD model is that all the needed services are procured though private sector participants. This means that the structure of the RDC is relatively small as compared to the PWD model. Its staff directly manages program proposals of Government and funding agencies and contracts out major functional works like planning, project preparation and supervision, quality control, design and construction. Along with effective management of the physical assets of the road network, an RDC has the opportunity to:

- Streamline and accelerate construction of the network;
- Increase commitment to maintenance with more emphasis on PPP participation;
- Return fiscal integrity to budgetary allocations in order to meet infrastructure and maintenance needs; and
- Improve work zone and workplace safety.

The creation of a new, modern road management agency such as an RDC could derive following advantages – such as:

- Good office environment and facilities, equipment and working conditions;
- Attractive employment conditions;
- Excellent ICT infrastructure;
- Computerised business applications;
- Enthusiastic and experienced staff with proven performance drawn from a PWD, other Government agencies or the private sector;

- Strong commitment to training and HRD;
- A strong sense of corporate purpose concentrating solely on roads; and
- A clear mandate from the Government and assured budget for major road projects.

However, on the debit side, the RDC model relies heavily upon the availability of resources and expertise in the private sector to respond competitively to a fluctuating workload.

Also RDC is not expected to take over the duties of OWD. The two organisations can co-exist, but with separate responsibilities.

However, if RDC concept is accepted and introduced in Odisha, it will add yet another organisation and require additional coordination effort on the part of all road organisations in the State. Its creation would require deputing better expertise from OWD and could weaken OWD. This aspect will need deliberations within OWD and GOO.

The Consultants will examine the experiences of other States in India, where RDC have been functional and appraise the GOO on the major issues with pros and cons an assist OWD/GOO in decision making on establishment of such an organisation.

12.5. Way Forward and Action Plan

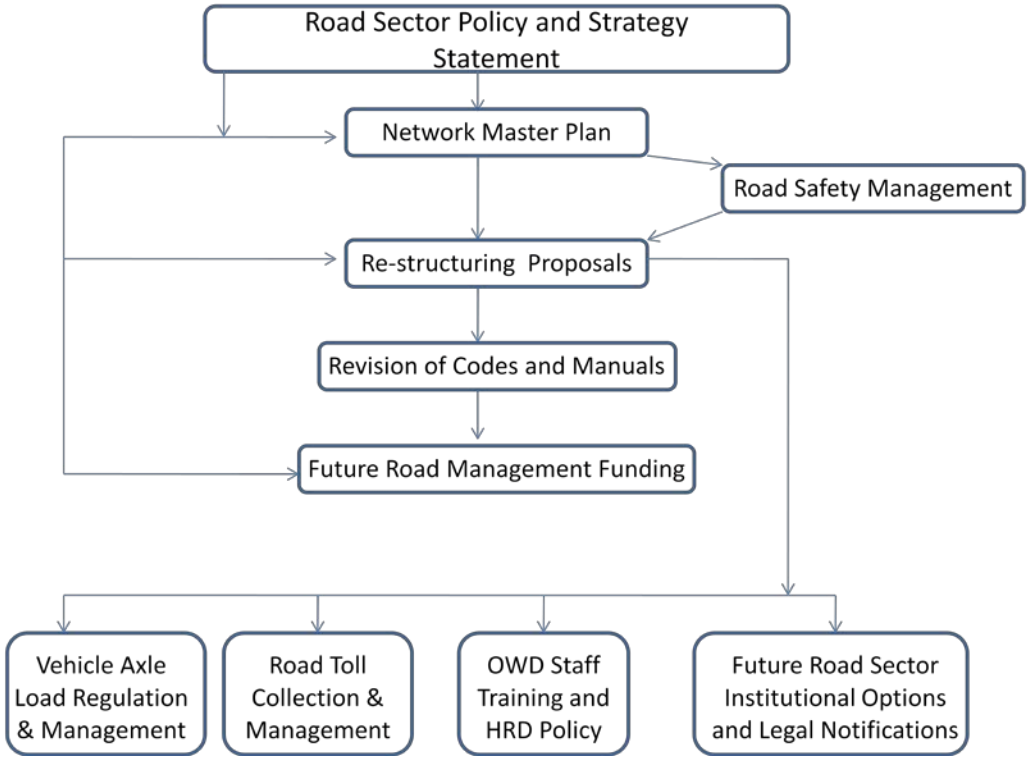
Based on outcome of visits to other States, the GOO officials are likely to form up their opinions with regards to type of new Institutional Framework and establishment of new organisational structure. This will be discussed for their strength and weaknesses by the Consultants to work out new strategy for future Road Institutions. A consensus decision by GOO and Consultants will be arrived, that what all new Road Institutions can be proposed and for what major functions. Subsequently their detailed organisational structures will be developed from HRM considerations. It shall then be followed up by submission of Drafts for legislative notification.

The time frame will depend on various linked activities which commence from visit to other States and followed by conduct of Stakeholders Workshop to get their views on this critical issue.

Based on interactions and discussions with various Stakeholders and Client, the emerged sequential flow diagram for the main 10 numbers of Tasks to be executed as part of this assignment is presented in **Figure 12-2** *(p-152).*

The same flow diagram has also been presented during the deliberations with ISAP Working Group on 26 June 2012.

Figure 12-2 Sequential Flow Daigram of Tasks



12.6. Information Flow for Deliverables

The key output for this task will be provided through the following key experts for delivery of the final deliverables:

- TL-cum-Road Agency Management Specialist
- Financial Analyst and Business Planning Specialist

SECTION 13

WORK PLAN

13. Work Plan

The Work Programme is consistent with the ToR and Para 8 of Appendix A of Contract Agreement. As explained in Technical Approach and Methodology, the scope of services has been divided into work plan of eleven main tasks inclusive of the activity of mobilisation/commencement of project assignment. These main tasks have further been divided into sub tasks, so as to cover all aspects of RSID and ISAP.

All the activities of the work plan have been covered under following main task groups:

Task Group	Task
I	Commencement of Project Assignment
II	Revision of Works Code and Manual
III	Road Sector Policy and Strategy
IV	Re-Organisation and Strengthening of OWD
V	OWD Staff Training and HRD
VI	Road Safety Engineering and Planning
VII	Road Network Master Planning
VIII	Future Roads Management Funding
IX	Road Toll Collection and Management
X	Vehicle Axle Load Regulation and Management
XI	Future Road Sector Institutional Options
	Deliverables/Milestones

In accordance with date of mobilisation and completion of services, the work plan has been scheduled from 9 April 2012 and to be completed on 7 October 2014, i.e. duration of Consultancy period being of 30 months.

13.1. Salient Features of Revised Work Plan

The work plan has been revised taking into following consideration:

- Observations of WB made vide letter dated 10 July 2012;
- The perception and thought process of key Professionals as visualised during their visits to project site, Road Departments and interaction with various officials of these departments and GOO;
- Work done on data collection so far;
- Interaction with EIC-cum-Secretary, ISAP Working Group and Steering Committee;
- Likely time period for availability of ORSAC Maps;

- Interaction with other ISAP Consultants; and
- Discussions with OWD on 11 September 2012.

The group tasks of Work Plan with respect to Road Safety Engineering & Planning and Road Network Master Planning have been added based on the ground visit, data collections and the perception of respective Key Professionals as visualised during the progress of assignment so far. The further investigations and execution of these tasks will be carried out as per this revised format of Work Plan.

13.2. Schedule of Workshops

A total of 10 Workshops are required to be conducted by Consultants. Their schedule will be worked out in joint consultation with Client and WB. Since WB officials during their interaction from 19–24 July 2012 had advised that the First Workshop should preferably be conducted after the visit to the states, where best management practices on Institutional Strengthening and Capacity Building are being observed. For this purpose they had also suggested that an Aid Memoire of WB covering the guidelines for conduct of such visits have been laid down. Suggested that First Workshop may please be conducted after the visit to either to AP or Maharashtra, so that the views of those organisations are taken and first deliverable on Works Code and Manual is finalised taking into consideration those points. The schedule of these Workshops will be worked out accordingly.

The work plan is given at **Annexure 13.1.**

SECTION 14

STAFFING SCHEDULE

14. Staffing Schedule

14.1. General

To execute the Consultancy Assignment smoothly and effectively, the Project Organisation and Staffing schedule consisting of Key Professionals and Technical Support Staff have been prepared in accordance with ToR and para 15.3 of Appendix A of Contract Agreement.

14.2. Project Organisation

The Project Organisation has been structured, taking into account the functional operational, hierarchical structure of OWD and GOO, approval of deliverables and decision making process during the course of performance of assignment.

At operation level, the Consultants will report to CE, OWD, WB Projects, PMU and ISAP Nodal Officer, which shall provide an assist for technical support. The PMU shall be the main link between Consultant and OWD. In addition, the Professionals/Key Experts shall directly liaise with concerned GOO departments for discussions, queries and information specific to their field and services.

The CE (WB) and Head of PMU has nominated Shri R. R. Bohidar, SE as Nodal Officer for coordinating the activities during consultancy services. This additional provision of PMU has been included as part of the Project Structure. The Project Organisation is given at **Annexure 14.1.**

At operational level, the Key Professionals will coordinate with Nodal Officer of ISAP and other staffs of OWD nominated vide their Letter No. PMU-(WB) 29/2012-12767 dated 12 April 2012 and No. 60/2011-124 dated 4 May 2012.

The Consultants, having analysed the need to interact with large number of departments of GOO and OWD, have also nominated Col. S. P. Tomar as Project Coordinator for liaison and coordination activities with various departments and Stakeholders of GOO.

14.3. Staffing Schedule

The Staffing Schedule of Key Professionals and Support Staff has been prepared, keeping in view the total man-months of Key Professionals, i.e. 122 man-months and for Technical Support Staff, 400 man-months.

With regard to ten man-months for Adhoc Consultants, the following two professional have been nominated and intimated to PMU vide ICT Letter No. ICT:660:PK:4205 dated 3 April 2012, i.e.:

Sl. No.	Name	Qualification	Position	Man-Month
1.	Col. (Retd.) S. P. Tomar	B.E. (Civil), M.E., M.B.A. and Finance Management	Institutional Strengthening, Restructuring and Training	5
2.	Mr. Tony Mathew	B.E. (Civil), P.G. (Road Management and Engineering), UK	Road Network Planning and Road Safety	5

Provision of Additional Consultant

In order to provide further technical support to the project, Mr. Baljit Singh Rajpal, who retired as an EIC of Himachal Pradesh PWD, has been posted from Head Office to the project, refer ICT letter no. ICT:660:OR:42, dated 5 September 2012. His broad assignment profile on this project will be as below:

- To assist PWD Sector Domain Specialist
- To assist OD and Training Specialist
- Monitor Investigations
- Monitor Collection of Data as required by Key Professionals
- Interact with OWD on need basis
- Assists TL in overall functioning and project management

14.4. Mobilisation of Team Leader

Mr. Norgildo Banal Cacal, the TL has been mobilised w.e.f. 1 September 2012, refer our letter no. ICT:660:OR:39, dated 1 September 2012. There has been a delay of approximately five months for this critical mobilisation. The reasons are as below:

- Mr. Cacal was fielded as TL at the time of submission of proposal, submitted on 26th August 2011.
- However during November he fell sick, which was intimated to Client and a replacement proposed at the project negotiation stage i.e. on 23–24 November 2011.
- The replacement was approved by Client and WB during December 2011. But somehow for reasons best known, the replaced professional in spite of regular correspondence made by lead Consultant i.e. ICTPL,he did not join the project.
- Replacement CVs proposed were not found acceptable to the WB.

- Meanwhile Mr. Cacal recovered from his illness and agreed to join the project. The proposal of his joining the project was submitted to the Client which was agreed to.

In support of the above, the details of correspondences are already available with the office of CE, WB.

14.5. Salient Features of Revised Staffing Schedule

It has been developed, considering the following main parameters:

- The time spent by each professional on the project so far
- Balance man-months
- Deliverable schedule
- Inter-linkages of Tasks and the Professionals responsible for specific tasks

The man-months specified as per ToR and Contract Agreement, however this could be reviewed depending on requirement of project/assignment as need be while progressing it, in consultation with client and WB.

For Staffing Schedule, refer **Annexure 14.2.**

SECTION 15

REPORTING AND SCHEDULE OF DELIVERABLES

15. Reporting and Schedule of Deliverables

15.1. General

Appendix B of contract Agreement gives out the details for the reporting and submission of documents during the period of consultancy services. It also covers the brief layout of following reports, which will be adhered to.

- Inception Report
- Quarterly Progress Report
- Mid-term Status Report
- Various Workshops
- Draft Final Report
- Final Report

15.2. Immediate Deliverables

- Inception Report (Present Report)
- Quarterly Progress Report
- Working Paper on Short-to-Medium Term OWD Re-structuring and Reorganisation – End of month 8
- Interim Report on Revision of OPWD Code and Manual – End of month 8

However, suggested that the draft on Road Policy and Strategy be developed prior to Works Code and Manuals and Re-structuring of Organisations. Since the draft Road Policy and Strategy will form the back bone of other deliverables, in view of points given by ISAP Working Group and GOO officials.

15.2.1. Inception Report

As far as the IR is concerned, it was required to be submitted at the end of 4 weeks. However, appreciating the requirement of ground work and consultations/interactions with large number of OWD/GOO officials, it was jointly agreed by Client and Consultants that the IR be submitted at the end of 8 weeks. In this regard reference may please be made to the letter no. ICT:660:OR:05, dated 12 April 2012.

The major issues to be covered in the IR as specified in the reporting requirements have been complied with.

15.3. Monitoring Organisations of GOO/OWD for Deliverables

The following organisations will be reviewing the deliverables from draft stage to its final submissions.

a) Steering Committee

1. Development Commissioner-cum-Additional Chief Secretary, GOO	Chairman
2. Secretary to Government, Revenue and D. M. Department	Member
3. Secretary to Government, Commerce and Transport Department	Member
4. Secretary/Special Secretary to Government, Finance Department	Member
5. Secretary to Government, RDD	Member
6. Secretary to Government, Law Department	Member
7. Special Secretary (Plan), P&C Department	Member
8. EIC-cum-Secretary to Government, Works Department	Member
9. CE, WB Projects, Odisha	Member

b) ISAP Working Group

1. CE, R.W.-II	Member
2. CE, RDQP, Odisha	Member
3. CE (DPI and Roads), Odisha	Member
4. CE (NHs), Odisha	Member
5. Additional Transport Commissioner Technical	Member
6. Director, IT Department	Member
7. CE (Buildings), Odisha	
8. Joint Secretary/Deputy Secretary, Law Department	Member
9. CE, WB Project	Member

c) Group of Officers nominated by OWD to Monitor Each Task

Nodal Officer – Shri R. R. Bohidar, SE, ISAP

ISAP Activities	Officer-in-Charge
1. Revision of Works Code and Manual	Sri M. B. Acharya (FA)
2. Road Sector Policy and Strategy	Dr. N. C. Pal (EE)
3. OWD Staff Training and HRD	Sri B. C. Tripathy
4. Re-organisation and Strengthening of OWD	Sri C. R. Mandhata (EE)

5.	Road Safety Engineering and Planning	Sri M. R. Misra (EE)
6.	Road Network Master Planning	Dr. N. C. Pal (EE)
7.	Future Roads Sector Funding	Sri M. B. Acharya (FA)
8.	Road Toll Collection and Management	Dr. N. C. Pal (EE)
9.	Vehicle Axle Load Regulation and Management	Sri M. R. Misra (EE)
10.	Future Road Sector Institutional Options	Sri M. R. Misra (EE)

The modus-operandi for submission of deliverables as discussed with Client is suggested to be as below:

- Review of each task by nominated ISAP/OWD officials;
- Presentation of draft report on deliverables to be presented to ISAP working committee at for getting their comments, inputs and subsequent corrections before its submission to OWD; and
- Presentation to steering committee for its final approval.

15.4. Schedule of Deliverables

A total of 23 nos. of major reports are required to be submitted during the course of consultancy period. For details refer **Annexure 15.1.**

SECTION 16

RISK AND CHALLENGES OF PROJECT AND ASSIGNMENT

16. Risk and Challenges of Project and Assignment

16.1. General

Institutional studies involve a multi-disciplinary approach, having a number of major tasks encompassing a large number of stakeholders. In order to accomplish such an assignment, the Consultants apart from capturing the existing scenario in Odisha have also to flag the significant changes that have already taken place in other States and how they have stood the test of time. This often involves sorting conflicting view points to arrive at a consensus, paving the way forward for implementation of such reforms. The method of dealing with analysis of risks, their mitigations and challenges which are to be addressed by top management at times will require an effective ground analysis of perceptions of various senior officials of the department, who matter in overall Institutional Strengthening and Restructuring proposals for their implementation.

16.2. Conceptual Approach

A conceptual approach for handling the risk and challenges goes through the following process:

Risk Analysis: The likely risks of the project are required to be anticipated well in advance and preventive steps taken to minimise collateral damage.

Sensitivity Analysis: This process is dependent on outcome of each of the more important variables which could be changing quite frequently. As an example on projects the frequent change of Key Professionals related without considerable overlaps, as well as induction of certain unsuitable professionals in a particular assignment, could effect the outcome of project deliverables.

Scenario Analysis: The scenario analysis relates with ground situations where the perceptions of various individuals and the large variety of data to be collected from ground which bear the risk of un-authenticity and incorrectness can affect the outcome of the study being carried out.

16.3. Some of the Common Risks and Challenges of a Project

- Unrealistic schedule of deliverables
- Communication gap between top management and ground staff
- Incorrect appreciation of scope of work, involving more number of Key Professionals with different professional backgrounds and past experiences
- Resource mobilisations
- Disparities in perception of administrative, finance and technical Departments of the Organisation
- Uncertain dependencies, viz. use of data from other ISAP Consultants
- Failure to manage the risk timely

- Stakeholders, customers and users not regularly engaged in the project study
- Gap in perception of vision and strategy of various stakeholders (immediately monitoring agency and for which the institutional study is proposed
- More predominant challenges:
  - Shifting organisational priorities
  - Business process model
  - Change scenarios between drafting of methodological concepts, acceptance of contract and schedule of key deliverables involving a period of two years or more.

16.4. Spectrum of Variables of Present Assignment

16.4.1. Scope

The main statement on the **Project Objective** reads as below:

The main objective of the RSID consultancy assignment is to enhance the capacity of the OWD and where appropriate, other GOO road sector agencies concerned to carry out road infrastructure development, to improve the engineering aspects and planning for road safety management in the State and to initiate mechanism for sustainable future growth with the resources dedicated to roads infrastructure development.

The objective of the study brings out a number of variables encompassing the expected organisational restructuring perceptions, involving other GOO road sector agencies, which is a major challenge for Consultants to deal with.

16.4.2. Number of Tasks

A total of ten tasks have been undertaken with focus on the following:

i. Road Sector Strategy (Regulatory and Strategic Context);
ii. Core Processes in Road Management;
iii. Organisational Structure and Management;
iv. Financial Management, Audit and Administration;
v. ICT and MIS; and
vi. HRD and Capacity Building.

It implies that while analysing all the ten tasks for their final deliverables, one would not lose sight of above major focus, which is the backbone of ISAP study.

16.4.3. Number of Stakeholders

As identified by the Client in joint consultation with the Consultants, an approximate number of 25 Stakeholders/Road User Groups have to be consulted for various deliverables. To have their consensual approach for any deliverable is a challenge in itself.

16.4.4. Number of Key Professionals

A total of 15 key professionals are deployed for achieving the objectives of the assignment.

16.4.5. Anticipated Risk and Challenges on this Assignment

16.4.5.1. Risks

- Dependency of Data collection on large number of departments e.g. Engineering, Police, Tourism Industry, Finance etc.
- Data Collection and their authenticity
- Inter-linkages with other ISAP Consultants for timely availability of data and its suitability for this study
- Staff Movements
- Discontinuity of existing statute
- Availability of GIS Maps
- Investigations in areas having major risk factor i.e. districts affected with LWEs
- Timely visit to other States for study of best organisational management practices for the institutional study and capacity building. This has already been delayed for certain pre-requisites
- Client and Consultant Relationship a risk at other projects, however a most cordial and proactive atmosphere is prevalent between RSID Consultants, OWD and GOO
- Timely decision making for deliverables when specifically submitted in draft form prior to final report
- Gap between perception of various officials on study deliverables
- Timely approval by ISAP Working Groups and Steering Committee for deliverables involving financial implications for Consultants

16.4.5.2. Challenges

- Anticipating the likely effect of institutional strengthening and restructuring, some officials in the Department may not like to go with such recommendations
- Delay in notification of Regulatory Frameworks, the RSID Consultants are required to put up detailed drafts for various notifications to be taken out by GOO

- Ambitious expectations at various levels
- Adoption of change management which require to be taken up after TNA study on submission of Interim Report on restructuring

16.5. Conclusion

The risk and challenges as foreseen by RSID Consultants with analytical conceptual approach highlighted above, point to the need of greater understanding of project linked with expectation of Client and WB officials, so that the deliverables can be achieved with minimum loss of time, thereby resulting in timely completion of project contractually and financially.

ANNEXURE 2.1

ISAP 2008–18

Government of Odisha

Odisha Works Department – Institutional Strengthening Action Plan (ISAP) 2008–18

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
i. Road Sector Strategy						
1	Effective Institutional Frame work	Implementation of Govt. endorsed Roads Policy and Management framework	Draft Road Policy is under finalisation	Finalize and approve Road policy covering legal frame work, financing arrangements to have sustainable funding for road maintenance		
		Determine the Core Road Network (CRN) and implement new dedicated entity and capacity for CRN management	Funds for the entire road Network are being distributed On prorate basis with no consideration for high traffic Roads namely for the 'Core Road network'	Identify Core roads and Provide separate budget head for the same		
		Well-defined legal 'Right of Way' (ROW) and asset Management powers through Govt. legislation to avoid encroachments and misuse of Road Boundaries	Works Dept. Engineers need to Approach police and revenue departments for removing encroachments, which is taking years leading to time and cost overrun in the road projects	Initiate identification of ROW for all road networks under works dept. and fix ROW boundary stones	Enact highways encroachment and prevention bill empowering PWD engineers with magisterial powers similar to that of NH administrator	

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
2	Adequate and sustainable funding for Road Sector	Autonomous Road Fund for road maintenance needs and upkeep of at least the core road network	Maintenance funds are provided only to the tune of about 33% of the projected amount and are being distributed on prorate basis depending on the length of road network in each division	1. Identify the important roads carrying high level of traffic and classify them as primary core network of roads 2. Maintenance funds requirement to be assessed based on road condition and accordingly to be kept in budget 3. Distribute funds on the need base to each of the divisions	Establish Autonomous Road Fund though additional cess on fuel	
3	Satisfactory Sector information, consultation, Governance and accountability mechanisms	Governance and Accountability Action Plan (GAAP) for Works Dept. and other roads bodies with annual and multi-year plans and public reporting in place	The RTI based GAAP is presently taking shape so as to enable public to access reports concerning Development activities		Implementation of Govt. endorsed GAAP for Works Dept. and other roads bodies	
4	Comprehensive Master planning for roads	Annual and multiyear plans for road infrastructure development based on road master plan	No master plan at present for Works Dept. road network	1. Master Plan for Odisha road network development in place 2. Multi-year plans and Annual Plans for roads development and management in place, in line with master plan(s)		

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
5	Effective Road safety Policy, Resources and action.	1. Safe travel 2. Accident rate reduced 3. Road safety council at headquarters and at district Level established	The accident rate is very high in the state. There is no safety council to address the issues related to safety to road user. No study to reduce the accident rates on the roads.	1. Establish Road safety council at state headquarters and also at district level 2. Establish Highway Patrolling unit on core road network along with clear duties and responsibilities. 3. Establish traffic engineering unit at headquarters 4. Develop accident recording system duly training the staff in consultation with police and transport departments 5. Initiate Road safety database. 6. Identify accident- prone areas on all roads 7. Evolve road safety guide lines specifying roles and responsibilities of the organisation involved 8. Govt. to provide necessary funds to improve the accident prone areas.	With Technical assistance develop pilot Strategy for road safety actions.	
6	Private sector participation in road sector infrastructure	State-level PPP/BOT policy, guidelines and model concession agreements (MCA) in place and projects being facilitated	State PPP policy with institutional mechanism in place	PPP transaction for identified PPP viable roads and preparation of Project specific MCA. Project implementation through PPP unit		

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
7	Enhance capacity of local construction industry in Construction management of Road and Bridge works	Qualified and capable local contractors are available in sufficient numbers for taking up Road development and maintenance works	1. Only very few contractors are available that too not experienced in Contracts to take up the modern road and bridge works 2. No training institutes are available to train the contractors and their personnel	1. Position an expert/consultant advisor to review the existing status of construction industry and recommend steps to enhance their capacities and encourage new entrepreneurs to enter in the industry 2. Assess the needs of construction industry and evolve strategy and action plan to formulate training programmes taking help of National Academy of Construction	Improve Govt. decisions on review findings and Recommendations	
ii. Core Processes						
8	Transparent, effective and accountable procurement policy through E-procurement in roads contracting	E-procurement in place	Conventional manual Procurement is being done for all the road contracts. IT department at Government level is taking action to introduce E-procurement. Two Pilot projects have been lunched	1. Govt. to expedite e-procurement processes 2. Works Dept. to take action to train their staff on e-procurement 3. Switch over to E-procurement at least for major works costing more than Rs.10 million		
9	Effective performance monitoring by OWD	Performance monitoring and evaluation (M&E) system	Performance Monitoring is absent the system of monitoring & evaluation is mainly on the basis of amount spent with respect to funds released	Implement comprehensive MIS linked monitoring and evaluation system		

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
10	Rationally prioritized Road Maintenance funds planning and commitment	Closure of Adhoc decision for planning and maintenance funding	Asset Management Technique with modern decision support planning tool are absent There is no systematic maintenance planning. The budget proposals are finalised adopting norms without considering road condition	Asset management system (RAMS) in place for network asset database, and for prioritisation of road maintenance (RM) funds annually on the basis of road condition data, traffic level, axle load parameters, soil parameter etc. Use of techno-economic planning tool such as HDM-IV with GIS platform for web based application and reporting in place	Extensive training and skill development for field engineers on RAMS	
11	Improve quality in construction and maintenance	Better roads at optimum price with minimal maintenance needs in future	The construction industry in general is not equipped with the Quality control systems and procedures. Only in projects of large size, contractors are establishing site laboratories and testing the materials, job mix and final product	Introduce a condition in all the contracts for establishment of laboratory and engage trained technicians for testing the materials, job mix etc.		
12	Environment and Social aspects of roads are properly resolved	Capacity to manage Environment and Social impacts for road projects in place. Rehabilitation and Resettlement issues are well taken	Environmental and social issues are now being considered in the project design. State Govt. has Rehabilitation and Resettlement policy in place	Implement the policy to assure that the project affected people are rehabilitated with improvement in their social status		

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
iii. Organisational Structure and Management						
13	Efficient management of Core Road Network	Determine the Core Road Network (CRN) and implement its management within Works Dept. and subsequently through establishment of ORDC (Odisha Road Development Corporation)	Funds for the entire road network are being distributed on prorate basis. No consideration for high traffic roads both in improvement and maintenance	1. Identify Core Road Network and entrust its management to a separate Chief Engineer pending establishment of ORDC for effective management 2. Provide separate budget head for core roads		
14	Effective Organisation for performing the new roles and responsibilities in managing the road network	Strengthened Works Dept. organisation in place to perform efficiently the functions of policy, planning and programming	The existing organisation is a traditional PWD structure. The capacity in the Core processes is weak and requires strengthening and reorganisation, especially in policy, planning and programming	Strengthen/Reorganise Works Dept. to perform effectively in delivering the new roles especially in the core business area, i.e. policy planning and programming	1. Plan to consolidate these functions efficiently, as per Govt. sector restructuring decisions 2. Ensure sustainability in these functions, capacities and resources	
		Enhance the PWD organisation at headquarters and field to match key roles and functions	The existing setup does not match the requirement of modern road organisation. There is immediate need to reorganise the department to perform new roles and functions efficiently	1. Establish various units for PPP, Asset Management, Social, Environmental etc. with trained and capable persons at headquarters to perform the key roles 2. The field units are to be reorganised duly assigning the workload and keeping the new role in view.		Review functions of various units and take corrective action based on the implementation feedback in the short term

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
iv. Financial Management, Audit and Administration						
15	Effective Financial management, Audit and Administration	Efficient Financial management system in place	Financial Management Software (FMS) for the Dept. was developed during FY-2000 by a consulting firm. This needs modification and installation at various levels to suit present procurement and implementation procedures as well as computing environment	Comprehensive IT-based Financial Management System in place Works Dept. to take action to introduce FMS in place for use across the department and to initiate action to train staff in FMS		Make FMS fully operative across all field units and HQ. Produce various finance output reports
		Strengthen Dept. financial Compliance auditing functions and resources including internal audit	There is no financial audit except AG audit, which is mostly verifying vouchers and procedures	Introduce financial compliance audit functions and resources among all field units. Benchmark expenditure for Routine maintenance per km based on this audit		
v. Information and Communication Technology (ICT), MIS and GIS Application						
16	Comprehensive and efficient IT and ICT support for OWD roads Sector planning and management	Effective IT-ICT-MIS Strategy and implementing capacity in place up porting Dept. decision-making	Whatever little information available is being provided through hard copies. Computerisation is yet to be taken up in big way	1. Install computers along with the necessary custom built software's across Dept. starting form Junior Engineer's office to E-in-C's offices 2. Train the persons to manage, develop and implement sustain-able M&E operational and report-ing framework and resources	Initiate full compre-hensive annual M&E reports on roads program by 2010. Review and refine M&E processes outputs and their impacts bi annually	

Sl. No.	Objective	Key Result Area	Present Status	Key action required Short term 0–2 years	Key action required Medium term 2–5 years	Key action Required Long term 5–10 years
		Effective IT supported Asset register and Management information system in place	The road and bridge registers exist in HQ and in divisions. But these registers are not updated since many years	1. Develop IT based asset register linked with GIS. All the inventory data of roads/bridges to be linked in GIS format 2. Development of comprehensive long term IT/ICT strategic plan for Govt. roads sector requirements		1. Period ice valuation of IT/ICT services and results 2. Refinement of ICT, GIS and MIS strategy and funding for business priorities
vi. Human Resources (HR) Development and Capacity Building						
17	Effective and sustainable capabilities for core road functions	Capacity building plans for Dept. to Strengthening road sector management	The capacity of the Dept. engineers need to be improved in order to perform the core processes efficiently and more effectively	1. Assess the training needs in each of the core business 2. Establish training institute 3. Identify suitable faculty to impart meaningful training. Consultant assistance may be taken if necessary		Get the capacity of the engineers assessed by an outside expert and take appropriate action. This should be continuous processes

Final Institutional Strengthening Action Plan-January 2008.

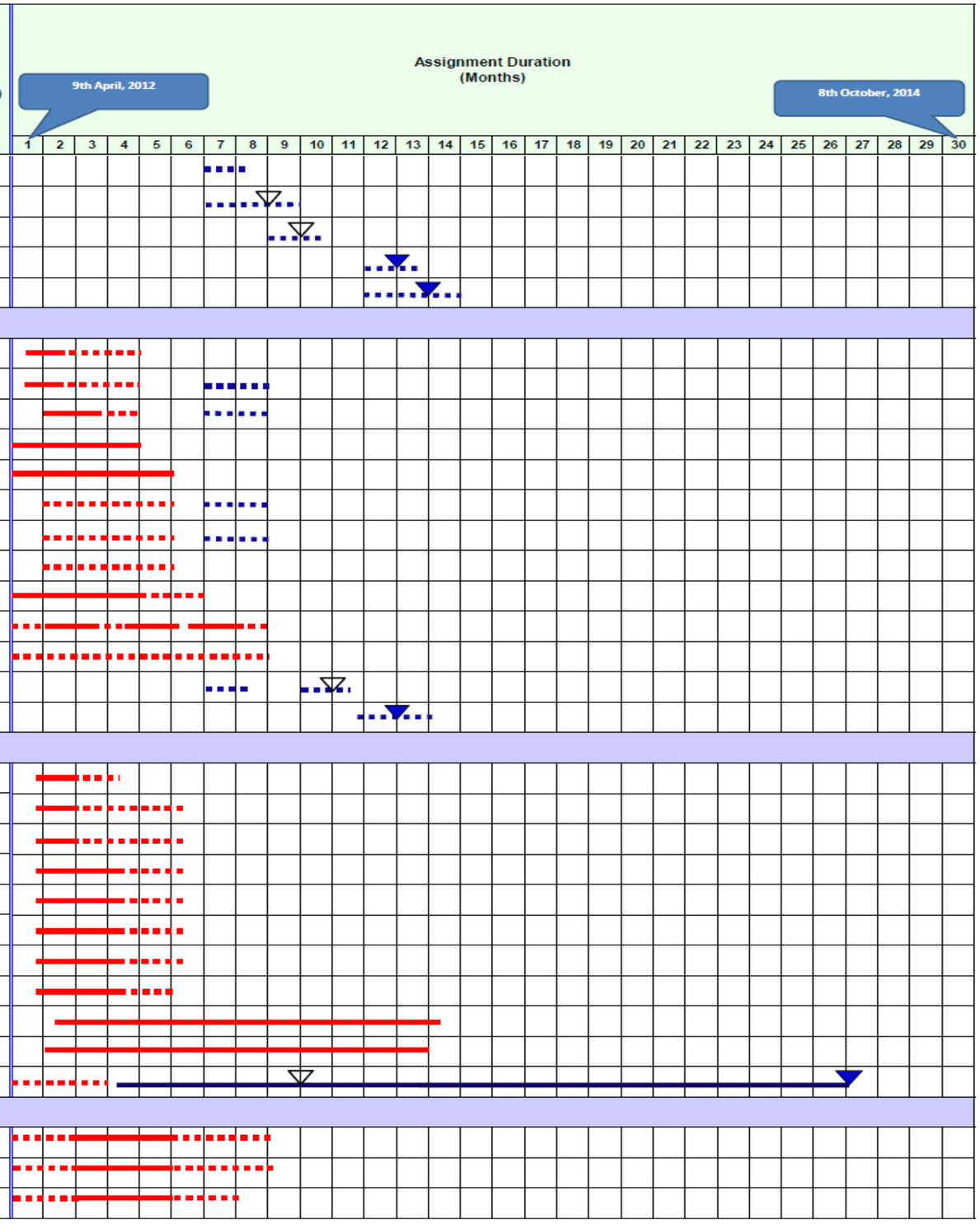
ANNEXURE 13.1

WORK PLAN

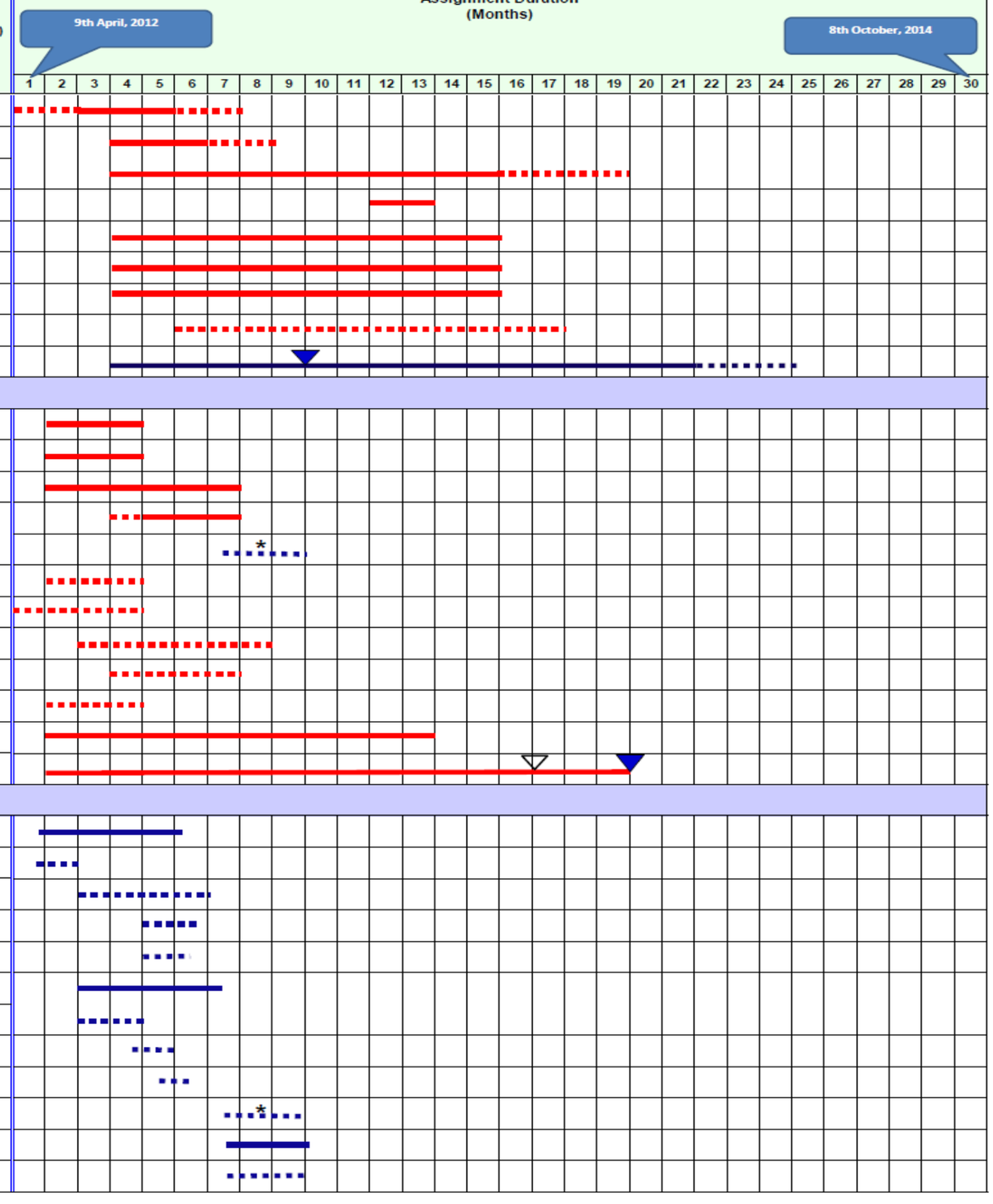
WORK PLAN (REVISED)

Task No.	Description of Activity	Activity Duration (in Months)	Assignment Duration (Months) — 9th April, 2012 … 8th October, 2014 (1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30)
TASK GROUP I:COMMENCEMENT OF PROJECT ASSIGNMENT			
101	Mobilization of Consultant Team	0.50	
102	Collection of existing Works Code and Manual of OWD	AW	
103	Introductory Briefing and Meeting with Client	AW	
104	Visit to select Nodal Centres / Roads of Orissa Road Network	1.0, AW	
105	Prioritization of Activities and Workshops in Consultation with Client	AW	
	Submission of Inception Report		
TASK GROUP II: REVISION OF WORKS CODE AND MANUAL (As per Proposal & Contract)			
201	Study Works Code and Manuals	2.0, AW	
202	Study Present Organization, Structure, Functioning and GOO Legal Endorsements	1.5, AW	
203	Update them for any latest Amendments	1.5, AW	
204	Conceptualization for Updating Procedures, Responsibilities and Accountabilities from inception till Completion of Projects by OWD	5.00, AW	
205	Discuss Existing Policies at Appropriate Levels of Client for its Shortcomings as per their Observations	2.0, AW	
206	Review and Updating of Procedures, Responsibilities and Accountabilities for various Stages of Project Works	2.0, AW	
207	Review of Existing Channel of Submission of Documents for Endorsement by GOO for their Promulgation and Operationalization as well as Implementation	2.0, AW	
208	Review of Dispute Review Mechanism in line with Legal Framework	2.0, AW	
209	Redressal of Complaints and RTI Act related Queries and Linked Aspects	2.0, AW	
210	Review of PPP Policies and Guidelines in Consonance with Environmental and Social Management, E-procurement and Road Safety Engineering	2.0, AW	
211	Review of Contractual Procedures and Documents for all Categories of Works i.e., Goods, Works and Services to Support GOO and OWD	2.0, AW	
212	Conduct of Workshops / Submission of Interim Report of OPWD Code & Manual (Structuring, Content, Issues, Timing)	3.00	
213	Phased and Progressive Integration of all the above Tasks by Organizing Workshops and Consultations at various levels of GOO to Evolve Revised Draft Codes & Manuals for OWD	AW	
214	Submission of Final Report Prepared by Consultant, PWD Sector Domain Specialist, Procurement Specialist and Legal Specialist	13.00	
TASK GROUP II: REVISION OF WORKS CODE AND MANUAL (As per ground assessment & analysis of Key Professional)			
201	Study Works Code and Manuals		
202	Study Present Organization, Structure, Functioning and GOO Legal Endorsements		
203	Update them for any latest Amendments		
204	Conceptualization for Updating Procedures, Responsibilities and Accountabilities from inception till Completion of Projects by OWD		
205	Discuss Existing Policies at Appropriate Levels of Client for its Shortcomings as per their Observations		
206	Review and Updating of Procedures, Responsibilities and Accountabilities for various Stages of Project Works		
207	Review of Existing Channel of Submission of Documents for Endorsement by GOO for their Promulgation and Operationalization as well as Implementation		
208	Review of Dispute Review Mechanism in line with Legal Framework		
209	Redressal of Complaints and RTI Act related Queries and Linked Aspects		
210	Review of PPP Policies and Guidelines in Consonance with Environmental and Social Management, E-procurement and Road Safety Engineering		
211	Review of Contractual Procedures and Documents for all Categories of Works i.e., Goods, Works and Services to Support GOO and OWD and prepare draft SBDs & Procurement Manaul		

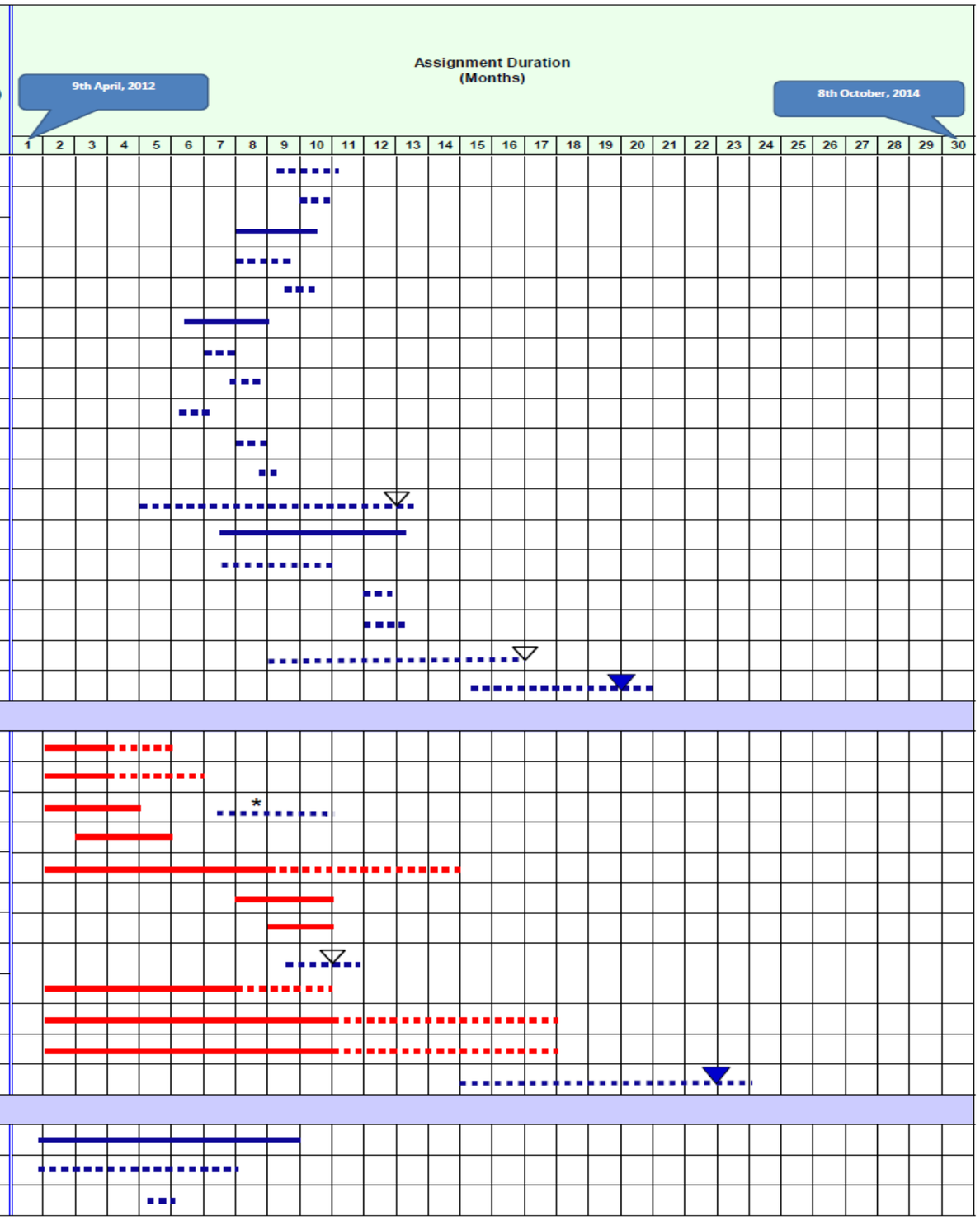
Task No.	Description of Activity	Activity Duration (in Months)
212	Conduct of Workshops involving all Stakeholders	
213	Submission of Interim Report of OPWD Code & Manual (Structuring, Powers, Authorities & Deligation, etc.)	
214	Interim Report on Revision of Contract Procurement Manual for Works, Goods and Services	
215	Final Report on Revision of Contract Procurement Manual for Works, Goods and Services	
216	Submission of Final Report Prepared by Team Leader-cum-Road Agency Management Specialist, PWD Sector Domain Specialist, Procurement Specialist and Legal Specialist after obtaining comments from OWD/GOO	
TASK GROUP III: ROAD SECTOR POLICY & STRATEGY		
301	Study Existing Road Sector Policy Based on Organization Structure and Works	1.0, AW
302	Establish Strategy and Vision Document of OWD Road Sector with Matching Resources to Meet the Targets of Vision Documents	1.0, AW
303	Study of Existing Legal, Institutional Frame Work and Organizational Capacities with Required Needs of Road Sector	3.00
304	Review Framework of Road Development and Management, Formulation of Associated Legislation, Regulatory and other Statutory Mechanisms	4.00
305	Analysis of Current and Projected Road Sector Demands	5.00
306	Assessment of Risks and Challenges in Meeting the GOO Targets for Road sector	2.0, AW
307	Identification of Weaknesses, Limitations, 'Gaps' in Authority, Delegation, Powers inclusive of Financial, Contractual and Executive with regard to Current Policies of GOO	2.0, AW
308	Work Out Various Options for Modification and Review of Policies of GOO to Strengthen the Existing Framework and Future Requirement	2.0, AW
309	Work Out various Options for Modification and Review of Policies to Meet the Needs of Vision Document	4.0, AW
310	Preparation of Draft "Vision Statement for 5 & 10 Years" and Linked Policies	6.00
311	Organize Phased Consultations and Workshop to Discuss Draft with OWD and Review Committee	3.0, AW
312	Submission of Draft Report by Integrating the Activities/Inputs of Transport Planning, Transport Economics and Legal Specialist	
313	Submission of Final Report	
TASK GROUP IV: RE-ORGANIZATION & STRENGTHENING OF OWD		
401	Study Existing OWD Management, Establishments & their Technical & Professional Staff	1.0, AW
402	Study Current Departmental Plans for Restructuring of OWD Establishments at Various Levels	2.0, AW
403	Review and Confirmation of Short to Medium Term OWD Organization and its Main Determinants, Linking them with Staffing Pattern of Establishments	2.0, AW
404	Development of a Medium to Long Term Organizational Vision/Model for OWD including its key Functional and Operational Parameters and Features	3.0, AW
405	Mapping the Scope and Distribution of Administrative, Financial and Technical Powers of Key Functionaries at Different Levels	3.0, AW
406	Delegation and Authorization of OWD's Main Functions Matching the Revised OWD Structure, Code and Manuals for Intended Roles / Responsibilities / Accountabilities	3.0, AW
407	Work Out Methodology to Facilitate OWD and GOO Actions on Measures and Steps Required to Complete the Transition of Present Structures of OWD to Changed Structural / Organizational / Operational needs, Requirement and Functions	3.0, AW
408	Organize the Revised Training Programmes for Various Levels, Compatible with New Organizational Changes and Structure	3.0, AW
409	Develop HRD Strategy and HRM Functional Map Compatible with Forecasted Organizational Changes for Short, Medium and Long Term to Manage the Road Network and Infrastructure Sector of GOO Effectively	12.00
410	Prepare Master Document on Strengthening, Restructuring and Capacity Building along with its Financial Implications	12.00
411	The Deliverables to be the Synthesis of Efforts /Inputs of Dy. TL/OD Specialist, HRM, Financial and Business Specialist besides Team Leader-cum-Road Agency Management Specialist	25.00
TASK GROUP V: OWD STAFF TRAINING & HRD		
501	Assessment of Current Professional Competence of Staff of OWD at Various Levels	3.0, AW
502	Carry out Training Needs Assessment (TNA)	3.0, AW
503	Prepare Phased TNA based Multiyear Rolling Staff Training Programme Covering each Segment of Organizational Structure	3.0, AW



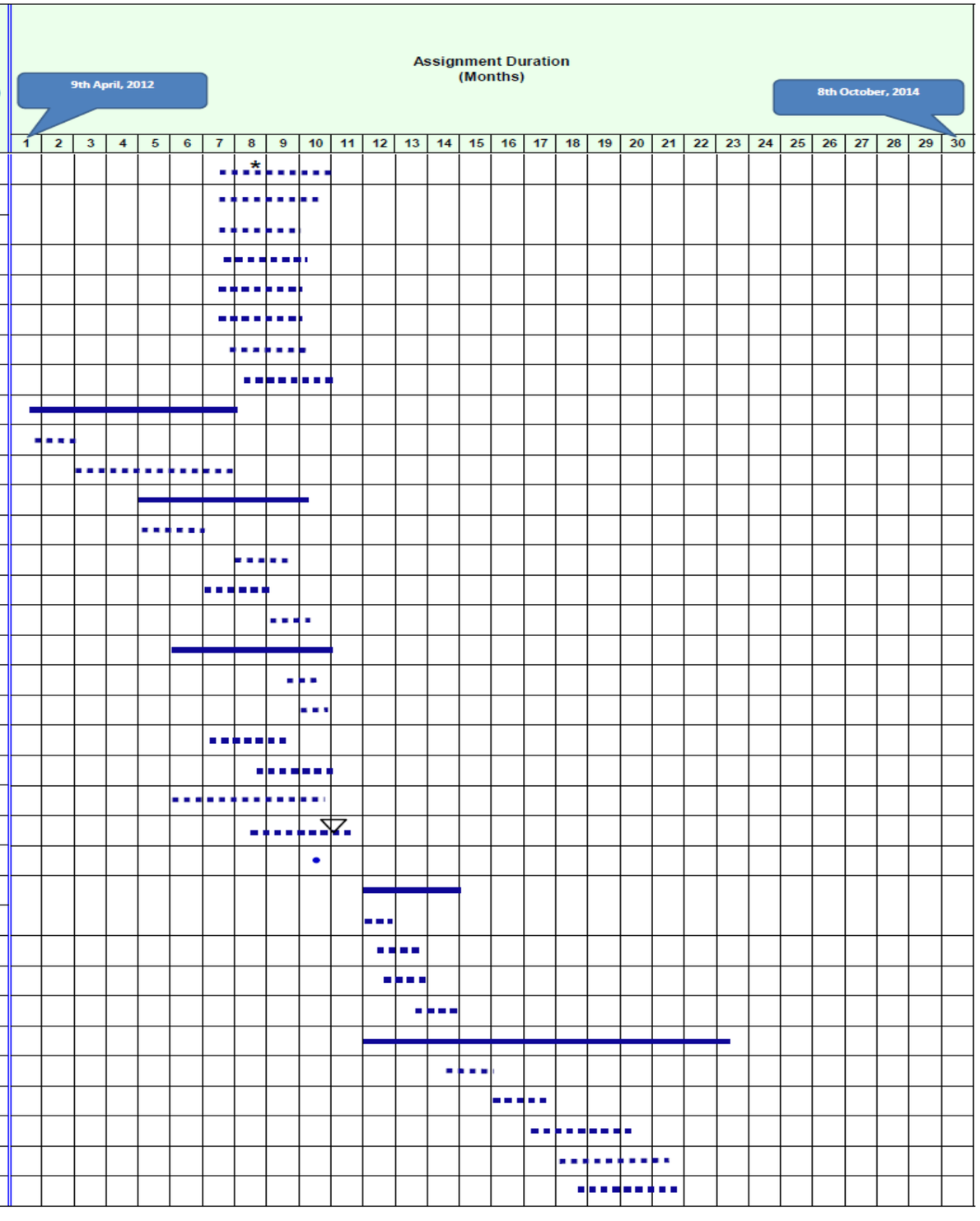
Task No.	Description of Activity	Activity Duration (in Months)
504	Develop HRD Policy Statement Linking with Training Needs to Cover Planning and Execution for Foreseeable OWD Functional Requirement for the OWD Staff at Head Office & Field Level	3.0, AW
506	Identification of Skill and Operational Requirement of Field Staff with Priorities for Phased Training Programmes and Challenges Linked, if any?	3.0, AW
507	Develop, Facilitate, Execute, Implement of Rolling Staff Training Programme Covering all Categories of Staff	12.0, AW
508	Evaluation and Mid-course Assessment of Imparted Training to Apply Corrections	1.00
509	Prepare HRD Policies, Activities for its Sustenance, Movement/Promotions, Retention, Output/Delivery Linked Performance Management, Internal HR Roles, i.e. Grievance, Appraisal, Supported with Internal/External Training Programmes	12.00
510	Prepare ISO Certification Processes to include Quality Management, Contracts / Procurement, Planning, Design, Environment and Social Management to Enable OWD to get ISO Certified Status	12.00
511	Prepare HRD Policy Documents and Action Plan of Core Functionaries of OWD at Head Quarter and Field Level	12.00
512	Organize Phased Consultations and Workshop to Discuss Draft HR Policies with OWD and Review Committee	AW
513	Timely Submission of Deliverables Duly Integrating Inputs from HRM Specialist, Training & HRD Specialist & Legal Specialist	18.00
TASK GROUP VI: ROAD SAFETY ENGINEERING AND PLANNING (As per Proposal & Contract)		
601	Review Engineering Functions for Existing Road Infrastructure Safety, Regulatory and Legal Set Up, as well as Institutional Framework of OWD/GOO	3.00
602	Review Road Infrastructure Safety Management Initiatives and Engineering Functions for Pre-Selected Corridors of OWD in accordance with Codal Provisions	3.00
603	Conduct of Workshops with OWD, GOO, World Bank and Review Committee Participation to Explore Concerns, Aims, Priorities on Road Safety Management for its Implementation on Ground	6.0, AW
604	Collection of Data & Safety Assessment of 2000 km of Identified Roads in Different Urban and Non-urban areas and various Districts of Odisha	3.0, AW
605	Review and Establish the requirements of Technical Capacity Building on Road Safety Design; Develop Institutional Framework for Technical Capacity Building on Road Safety Norms, Designs and Training of Staff and various Sections of Road Users	2.0, AW
606	Organize Field / Institutional Visit of GOO Officials to various Organizations dealing with Road Safety	2.0, AW
607	Assessment of Current Road Safety Framework and Development of New Regulatory System Framework for Road Safety responsibility for OWD and GOO	3.0, AW
608	Facilitation of GOO in Planning for more Multi-sectoral Measures Aimed at Enhanced Road Safety Management in Orissa	2.0, AW
609	Prepare Comprehensive Document on 'Orissa Road Safety Strategy and Action Plan' through Evolved Processes	1.5, AW
610	Assist GOO to Legally Endorse the Regulatory Framework for its Implementation by OWD and other Institutions	12.00
611	Submission of Deliverables	19
TASK GROUP VI: ROAD SAFETY ENGINEERING AND PLANNING (As per ground assessment & analysist of Key Professional)		
7.1.	**Collect and analyse State level crash data**	
7.1.1.	State level accident data from State Crime Records Bureau	
7.1.2.	Crash data from Trauma Care Centre in Cuttack and others	
7.1.3.	Crash data from insurance companies	
7.1.4.	Collect data from vehicle operators, if available	
7.2.	**Identification of the sample network**	
7.2.1.	Analyse state level accident data	
7.2.2.	Determine the hazardous groups and hazardous locations	
7.2.3.	Consultation with Stakeholders	
7.2.4.	Identify 2000 km long sample road network	
7.3.	**Safety assessment of the sample road network**	
7.3.1.	Road Safety Assessment of 2000 km of selected road network	



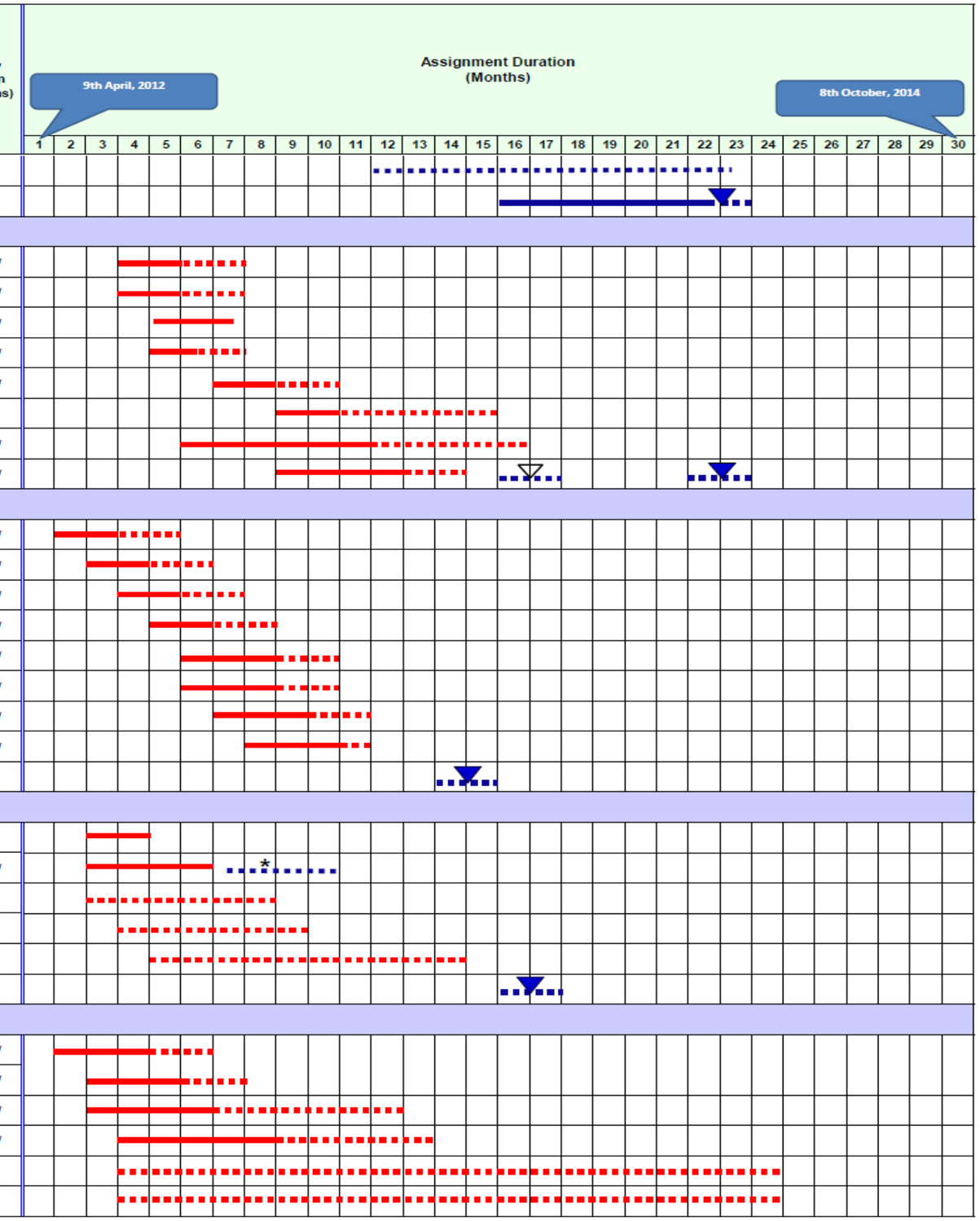
Task No.	Description of Activity	Activity Duration (in Months)
7.3.2.	Problem diagnosis and development of countermeasures	
7.3.3.	Report on road safety assessment of the sample road network	
7.4.	**Identification and improvement of hazardous locations**	
7.4.1.	Detailed accident data collection	
7.4.2.	Carry out accident analysis	
7.5.	**Capacity assessment of safety management in Odisha**	
7.5.1.	Assess Transport Department	
7.5.2.	Assess Home Department*functions*	
7.5.3.	Assess OWD – *specifications and guidelines, resources,aim*	
7.5.4.	Assess inter-departmental safety responsibility framework	
7.6.	**Conduct Stakeholder Workshop**	
7.7.	**Prepare and report on Road Infrastructure Safety Management Review**	
7.8.	Development of capacity building measures within OWD	
7.8.1.	Impart on the job training on road safety assessment of limited hazardous locations	
7.8.2.	Provide classroom training on Road Safety Engineering	
7.8.3.	Assist selected OWD officials in carrying out site visit to best practice States	
7.9.	Prepare draft report on proposed 'Road Safety Action Plan'	
7.10.	Prepare final report on proposed 'Road Safety Action Plan'.	
TASK GROUP VII: ROAD NETWORK MASTER PLANNING (As per Proposal & Contract)		
701	Study Current Road Network based on Asset Management Data, the Condition of Roads and Existing Data Entry Systems for the State	2.0, AW
702	Collection of Data for Master Plan from various Sources i.e. Primary and Secondary	3.0, AW
703	Conduct Extensive Field Surveys on Pavement Conditions and Traffic Components on approximately 3000 km of Existing Road Network of State and Collect Data regarding Social and Environmental linkages with Road Network	3.00
704	Build Socio-economic Profile at District Level through an Analysis of Present and Future Prospects	3.00
705	Review, Critically and Analytically, Diagnose the existing Road Network in Light of Social Economic Profile and Capacity Constraint of Road Network	7.0, AW
706	Development of Draft Master Plan, consistent with new Road Sector Policy, Road Classification System, Investment Opportunities and Matching Capacity Building with Responsibility Framework for Implementation	3.00
707	Match the Draft Plan with Social Economic Development Policy of GOO	2.00
708	Submission of Interim Report	10.00
709	Development of Master Road Network Plan with Strategic Options	6.0, AW
710	Development of Road Classification System, GIS based Information Data on Roads and Responsibility Framework for Implementation by the OWD and other Government Entities for the Total Road Network of Orissa	10.0, AW
711	Organize Approval and Endorsement of Road Network Master Plan by Way of Organizing Workshops and Consultation Framework at various Levels of OWD and GOO	10.0, AW
712	Submission of Master Plan prepared by Senior Highway Engineer (Pavement Management & Planning), Transport Economist Specialist & GIS Application Specialist besides Team Leader-cum-Road Agency Management Specialist	22.00
TASK GROUP VII: ROAD NETWORK MASTER PLANNING (As per ground assessment & analysist of Key Professionals)		
8.1.	**Map & Field Surveys**	
8.1.1.	Procure GIS Map of Odisha State Road Network	
8.1.2.	Procure Printed Copies of District Level Road Network Maps	



Task No.	Description of Activity	Activity Duration (in Months)
8.1.3.	Identify road segments totalling to 3000 km and tentative locations for data collection	
8.1.4.	Carry out field surveys	
	Traffic count data @ mid-block locations	
	Origin Destination Surveys	
	Axle Load Surveys	
	Road Inventory and Road Condition Survey (3000 km)	
	Soil Subgrade Investigation (3000 Km)	
8.1.5.	Identify homogeneous sections based on road environment and other pertinent data	
8.2.	**Collect data from Secondary Sources**	
8.2.1.	Existing data	
8.2.2.	Future data and Plans	
8.3.	**Traffic Forecast**	
8.3.1.	Set up criteria for estimating traffic growth factors to respective modes	
8.3.2.	Apply the growth factors statewide to forecast volumes of all classified vehicle modes	
8.3.3.	Identify any future development plans and estimate additional traffic	
8.3.4.	Finalise future total traffic forecast based on corridor growth and future generated traffic	
8.4.	**Network Analysis**	
8.4.1.	Undertake demand capacity ratio analysis and list LOS for individual segments	
8.4.2.	Idenify capacity constrained sections	
8.4.3.	Identify apparent gaps in road connectivity based on visual inspection of the GIS roadmap	
8.4.4.	Evaluate alternate routes to alleviate traffic congestion	
8.4.5.	Identify any mass transit corridors recommended by any other consultants	
8.5.	**Prepare and submit Interim Report**	
8.6.	**Conduct Stakeholder consultation/ Workshop**	
8.7.	**Economic Analysis**	
8.7.1.	Develop improvement alternatives	
8.7.2.	Cost estimate of the development alternatives	
8.7.3.	Evaluate cost of alternatives for preferred option for individual road segment	
8.7.4.	Idenitify preferred option based on economic analysis	
8.8.	**Development of Master Plan**	
8.8.1.	**Develop criteria for prioritization of network improvements**	
8.8.2.	Conduct benefit cost ratio analysis of preferred improvement option for phasing of works	
8.8.3.	Develop a phased improvement program for 20 year horizon	
8.8.4.	Develop a new road classification system	
8.8.5.	Recommend new responsibility framework consistent with policies and relevant parameters	



Task No.	Description of Activity	Activity Duration (in Months)
8.8.6.	Develop and recommend capacity building measures within OWD	
8.9.	Prepare and submit Master Plan for Odisha State Road Network	
TASK GROUP VIII: FUTURE ROADS MANAGEMENT FUNDING		
801	Study, Road Development Programmes for the last 5 and 10 Years and the Financial Commitment during this Period by OWD / GOO	2.0, AW
802	Review of Existing Funding Sources and Road User Charges, Mechanism available with GOO to Meet Financial Needs of Road Sector	2.0, AW
803	Assess adequacy of Funds for Objectively Determined Road Asset Management to Match with Needs and Priorities	2.5, AW
804	Identification of New Measures and Option to Improve Funds Resource Mobilization for Roads Financing in State	1.5, AW
805	SWOT Analysis of each Option for Generation of Funds Mobilized with New Options, their Cash Flow Status and available to State on Rolling Plan Basis	2.0, AW
806	Identify Structure, Powers and Resources Needed to Create Sustainable and Effective Road Fund	4.00
807	Conduct of Workshops to Develop Mechanism, Methodologies, for viable Economically and Socially Acceptable Option to Create / Generate Additional Dedicated Road Funds	6.0, AW
808	Preparation of Preliminary and Final Report related with Road Fund and its Final Implementation	4.0, AW
TASK GROUP IX: ROAD TOLL COLLECTION & MANAGEMENT		
901	Assess Traffic Growth Pattern of State	2.0, AW
902	Work Out various Options on Toll-able and Non-toll able Roads	2.0, AW
903	Link Toll-ability with socio-Economic & Demographic Panorama of State	2.0, AW
904	Review Current Toll-Collection System and Revenues received from various Toll Booths so far	2.0, AW
905	Organize Visits of Minimum of 10 GOO Officials to Various Government or Concessionaire Tolling Sites/Booths Outside State for Understanding the Toll Collection Management	3.0, AW
906	Development of New Draft Guidelines to Facilitate Improvement on Toll-setting, its Operation, and Collection of Toll Revenue with Outsource Operations under New Tolling Act	3.0, AW
907	Prepare Model Tolling Contract Agreements and Documents	3.0, AW
908	Prepare Action Plan for Toll Collection and its Implementation by GOO Legislatively and Legally	3.0, AW
909	Submission of Report based on Inputs to be by Financial Analyst, Procurement Specialist, and Legal Specialist besides Team Leader-cum-Road Agency Management Specialist	14.00
TASK GROUP X: VEHICLE AXLE LOAD REGULATION & MANAGEMENT		
1001	Study Existing Road Transport Axle Load Control Practices as Prevalent in Orissa	2.00
1002	Carry Out Axle Load Survey over 50 Selected Locations Spread Over State	4.0, AW
1003	Review and Assess Existing Methods, Resources and Institutional Arrangements available with GOO for Effective Regulatory Monitoring and Management	AW
1004	Compare and Assess the Ongoing Regulatory Regime of Other States and Develop it into Draft Regulatory Framework for GOO's Considerations	AW
1005	Advise / Discussions with GOO on the Regulatory Framework a Legislative and Legal Nod to Form Part of Government Legislation for its Efficacy and Control	AW
1006	Submission of Final Report on Vehicle Axle Load Regulation and Management	16.00
TASK GROUP XI: FUTURE ROAD SECTOR INSTITUTIONAL OPTIONS		
1101	Study and Assess Present Institutional Structure / Establishment, its Capacities, for their Functions, Powers and available Resources for Road Sector Output and Operations and Arrangements in Road Sector	3.0, AW
1102	Assessment of Adequacy of Powers, Authority, Accountability Relevant to Current and Emerging trends in Road Sector, being Faced and Exercised by GOO / OWD	3.0, AW
1003	Assess Weakness and Gaps in Existing Road Sector Institutions	4.0, AW
1104	Work Out various Options on Institutional Strengthening and Improvement for a Medium to Long Term Strategic Review	5.0, AW
1105	Conduct of Workshops to take Inputs from various Departments of OWD and GOO to Arrive at Acceptable Option on Restructuring, Institutional Strengthening and Capacity Building	AW
1106	Assist GOO/OWD in Drafting of Documents related with Restructuring, Capacity Building and Institutional Strengthening	AW



Task No.	Description of Activity	Activity Duration (in Months)	Assignment Duration (Months) — 9th April, 2012 … 8th October, 2014 (1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30)
1107	Assist in Overall Coordination and Monitoring of ISAP Implementation Process	AW	
1108	Knowledge Sharing and Skill Transfer	AW	
1109	Establishment of Orissa Road Development Corporation, Merits / Demerits	AW	
1110	The Schedule of various reports on Medium-to-Longer Term Strengthening of the Institutional Framework / Structures of Orissa's Roads Sector	24.00	
TASK GROUP XII: Schedule of Workshops and Visit to Other States with Indicative Block Programme			
1201	Workshop No-1 (General / Inceptive, Covering scope of work and involving all Road User Groups of GOO)	October	09-12 Oct
1202	Workshop No-2 (Revision of Works Code & Mannual)	December (3rd Week)	Dec
1203	Workshop No-3 (Road Sector Policy & Strategy) ,however could be combine with Workshop No-2.	Dec/Feb	Dec; Feb
1204	Workshop No-4 (Reorganisation Strengthening of OWD)	January (2nd Week)	Jan
1205	Workshop No-5 (OWD Staff Training & HRD)	March (3rd Week)	Mar
1206	Workshop No-6 (Road Safety Engineering & Planning)	To be finalised later (Refer Note-5 below)	
1207	Workshop No-7 (Road Network Master Planning)		
1208	Workshop No-8 (Future Roads Management Funding)		
1209	Workshop No-9 (Rad Toll Collection & Management)		
1210	Workshop No-10 (Vehicle Axle Load Regulation & Management)		
1211	Workshop No-11 (Future Road Sector Institutional Options)		
1212	Visit - 1 (Andhra Pradesh & Kamattak)	November (3rd Week)	Nov
1213	Visit - 2 (Gujurat & Maharastra)	February	Feb
1214	Visit - 3 [Institutes, Central Institute of Road Transport(CIRT), Pune and Automotive Research Association of India(ARAI), Pune]	May/June	May / June
1215	Visit - 4 [Institutes, CRRI, New Delhi, NIMHANS, New delhi, Institute of Road Traffic Education(IRTE), New Delhi and HO-ICT]	August/ September	Aug / Sept

Legend:

- Continuous Activity
- Intermittent Activity
- Revised Continous Activity
- Revised Intermittent Activity
- Submission of Interim and Draft Report
- Submission of Final Reports
- Workshop
- Optional
- *Subject to avilable of GIS Maps
- Visit

Task No.	Description of Activity	Activity Duration (in Months)	Assignment Duration (Months) 9th April, 2012 … 8th October, 2014
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

DELIVERABLES / MILESTONES

Deliverable	Tentative 'Due Timing'
Inception Report (IR)	End of week 8
Quarterly Progress Reports (QPR) x 7	End of each calendar quarter
Workshops: associated Presentations / Working Papers / Materials) – up to ten (10) workshops	Timings to be resolved in IR
Working Paper on Short-to-Medium Term OWD Re-structuring & Reorganization	End of month 8
Interim Report on Revision of OPWD Code & Manual (Structuring, Content, Issues, Timing)	End of month 8
Interim Report on Revision of Contract Procurement Manual for Works, Goods and Services	End of month 9
Final Report on Revision of Contract Procurement Manual for Works, Goods and Services	End of month 12
Final OPWD Code & Manual	End of month 13
Report on Training Needs Assessments (TNA) Results, Proposed TNA-Based Program(s) and OWD 'Training' Role	End of month 9
Draft Report on Orissa Road Sector Policy and requirements for its implementation	End of month 10
Interim Report on Preparations for Inaugural Master Plan for Main Road Network in Orissa	End of month 10
Report on Road Infrastructure Safety Management Review	End of month 12
Final Report on Orissa Road Sector Policy	End of month 12
Report on Management of Out-sourced Road Toll Collection & Maintenance / Operations	End of month 14
Mid-Term Status Report (MTSR)	End of month 14
Report on Vehicle Axle Load Regulation & Management	End of month 16
Preliminary Report on Study of Main Roads Funding Options & Possible Road Fund	End of month 16
Draft Report on Proposed 'Orissa Road Safety Action Plan'	End of month 16
Final Report on Proposed 'Orissa Road Safety Action Plan'	End of month 19
Completion Report on Inaugural Master Plan for Main Road Network in Orissa	End of month 22
Final Report on Study of Main Roads Funding Options & Recommendations on Road Fund	End of month 22
Draft Report on Medium-to-Longer Term Strengthening of the Institutional Framework / Structures of Orissa's Roads Sector	End of month 24
Final Report on Strengthening of the Institutional Framework / Structures	End of month 26
Draft Final Report (DFR)	End of month 28
Final Report (after OWD / GOO response to DFR)	End of month 30

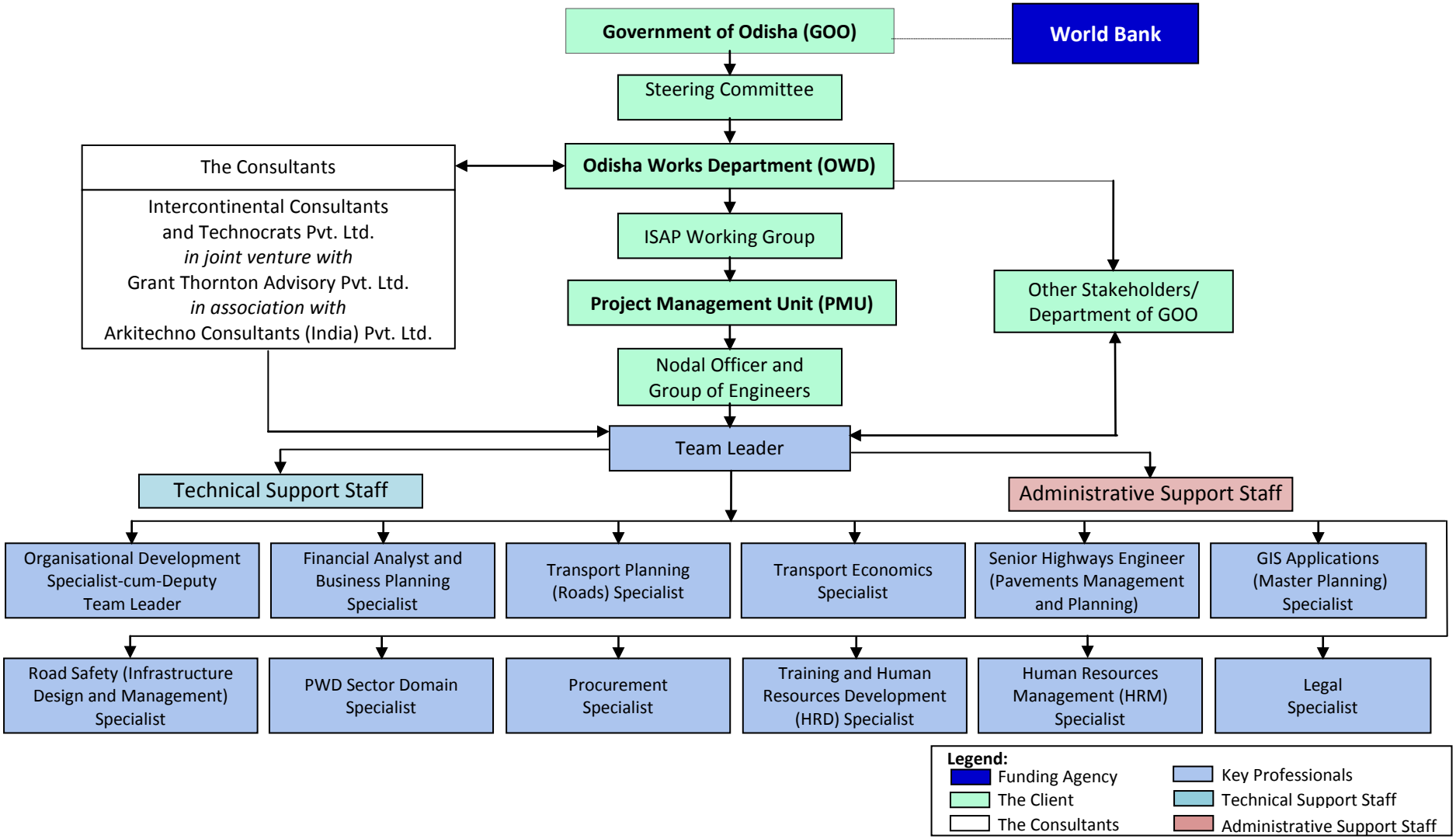
Note:

1. The Deliverables/ Milestones have also been incorporated in main Work Plan with defined Primary and Secondary Responsibilities.
2. The above list to strengthen the stated requirements of deliverables further for their timely submission.

ANNEXURE 14.1

PROJECT ORGANISATION

PROJECT ORGANISATION



ANNEXURE 14.2

STAFFING SCHEDULE

STAFFING SCHEDULE

Sl. No.	Name of Staff	Position	Man-Months (Up to 31.August)	Home / Field	Duration (30 Months) — 9th April, 2012 … 8th October, 2014	Total Staff Month Input		
						Home	Field	Total
	Key Personnel							
1	N. B. Cacal	Road Agency Management (Institutional Development) Specialist-cum- Team Leader	NA	*Home*		-		25.00
				Field			25.00	
				Home		2.00		
				Field			23.00	
2	Dr. Chandra Prakash Bohra	Organizational Development Specialist-cum-Deputy Team Leader	1.0	*Home*		-		18.00
				Field			18.00	
				Field	• • 4 7 20 21			
3	Amitava Basu	Financial Analyst & Business Planning Specialist	0.4	*Home*		-		6.00
				Field			6.00	
				Field	• • 4 10 12 19 20 21			
4	Chandi Ganguly	Tansport Planning (Roads) Specialist	0.36	*Home*		-		6.00
				Field			6.00	
				Field	9 18			
5	Boominathan Muthuthevar	Transport Economics Specialist	0.1	*Home*		-		6.00
				Field			6.00	
				Field	• 8 & 9 11 15 18 & 19			
6	Dr. P. K. Nanda	Senior Highways Engineer (Pavements Management & Planning)	0.5	*Home*		-		6.00
				Field			6.00	
				Field	• • Inv. 9 10 14 & 16 17 18			
7	D. Vasudevan	GIS Applications (Master Planning) Specialist	NA	*Home*		-		3.00
				Field			3.00	
				Field	9 18			
8	Dr. Prabeer Kumar Sikdar	Road Safety (Infrastructure Design & Management) Specialist	0.83	*Home*		-		6.00
				Field			6.00	
				Field	• Inv. 10 14 & 16 17			
9	Deepak Narayan	PWD Sector Domain Specialist	0.8	*Home*		-		6.00
				Field			6.00	
				Field	• • 5 6			
10	Baldev Raj Suri	Procurement Specialist	0.56	*Home*		-		6.00
				Field			6.00	
				Field	• • 5 6 12			
11	Sandeep Jagota	Training & Human Resources Development (HRD) Specialist	0.6	*Home*		-		9.00
				Field			9.00	
				Field	4 7 4 & 7 20			
12	Sachchida Nand Swaroop	Human Resources Management (HRM) Specialist	0.06	*Home*		-		9.00
				Field			9.00	
				Field	• 4 & 7 4 & 7 20			
13	Dipak Rao	Legal Specialist	0.13	*Home*		-		6.00
				Field			6.00	
				Field	11 6 20 21			
14	Col. S.P. Tomar	Adhoc Technical Specialist Institutional restrucring and training	1.6	*Home*		-		5.00
				Field			5.00	
				Field	8 11			

Sl. No.	Name of Staff	Position	Man-Months (Up to 31.August)	Home / Field	9th April, 2012 — Duration (30 Months) — 8th October, 2014	Total Staff Month Input		
					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Home	Field	Total
	Key Personnel							
15	Tony Mathew	Adhoc Technical Specialist Road Network Planning & Asset Management	2.16	*Home*		-		5.00
				Field			5.00	
				Field	Inv. 9 10 16 17 18			
						Sub Total		**122.00**
	Technical Support Staff							
1	D.Laxmi Narayan	Assistant Highway Engineer (Codes / Manuals / Policy)		*Home*		-		30.00
				Field			30.00	
2	Chandan Kumar Dey	Assistant Highway Engineer (Road Network & Master Plan)		*Home*		-		30.00
				Field			30.00	
3	Jitendra Wadhwani	Road Safety Engineer		*Home*		-		24.00
				Field			24.00	
4	Pradip Kumar Patra	Surveyor		*Home*		-		20.00
				Field			20.00	
5	Chandrakanta Maharana	CAD Engineer - 1		*Home*		6.00		30.00
				Field			24.00	
6	Niharika Ojha	CAD Engineer - 2		*Home*		6.00		15.00
				Field			9.00	
7	Abhaya Kumar	HR Manager (OD, HRM & Training)		*Home*		-		9.00
				Field			9.00	
						Sub Total	**12.00**	**146.00**	**158.00**

Legend:

- Original Continuous Activity
- Original Intermittent Activity (as and when required)
- **Inv.** Investigation
- Revised Continous Activity
- Revised Intermittent Activity (as and when required)

STAFFING SCHEDULE

I. Deliverables

Sl.No.	Report	Due
1	Inception Report (IR)	End of week 8
2	Quarterly Progress Reports (QPR) x 7	End of each calendar quarter
3	Workshops: Presentations/Working Papers/Materials) up to ten (10) workshops	Timings to be resolved in consultation with OWD
4	Working Paper on Short-to-Medium Term OWD Re-structuring and Reorganization	End of month 8
5	Interim Report on Revision of OPWD Code and Manual (Structuring, Content, Issues, Timing)	End of month 8
6	Final OPWD Code and Manual	End of month 13
7	Report on Training Needs Assessments (TNA) Results, Proposed TNA-Based Program(s) and OWD 'Training' Role	End of month 9
8	Draft Report on Odisha Road Sector Policy and requirements for its implementation	End of month 10
9	Interim Report on Preparations for Inaugural Master Plan for Main Road Network in Odisha	End of month 10
10	Report on Road Infrastructure Safety Management Review	End of month 12
11	Final Report on Odisha Road Sector Policy	End of month 12
12	Report on Management of Out-sourced Road Toll Collection and Maintenance/Operations	End of month 14
13	Mid-Term Status Report (MTSR)	End of month 14
14	Report on Vehicle Axle Load Regulation and Management	End of month 16
15	Preliminary Report on Study of Main Roads Funding Options and Possible Road Fund	End of month 16
16	Draft Report on Proposed 'Odisha Road Safety Action Plan'	End of month 16
17	Final Report on Proposed 'Odisha Road Safety Action Plan'	End of month 19
18	Completion Report on Inaugural Master Plan for Main Road Network in Odisha	End of month 22
19	Final Report on Study of Main Roads Funding Options and Recommendations on Road Fund	End of month 22
20	Draft Report on Medium-to-Longer Term Strengthening of the Institutional Framework/Structures of Odisha's Roads Sector	End of month 24
21	Final Report on Strengthening of the Institutional Framework/Structures	End of month 26
22	Draft Final Report (DFR)	End of month 28
23	Final Report (after OWD/GOO response to DFR)	End of month 30

II. Tasks as per ToR

Sl.No.	Tasks
1	Revision of Works Code & Mannual
2	Road Sector Policy & Strategy
3	Reorganisation Strengthening of OWD
4	OWD Staff Training & HRD
5	Road Safety Engineering & Planning
6	Road Network Master Planning
7	Future Roads Management Funding
8	Rad Toll Collection & Management
9	Vehicle Axle Load Regulation & Management
10	Future Road Sector Institutional Options

III. Interlinkages

Names	Task Nos.	Deliverable Nos.
N. B. Cacal (Team Leader)	All Tasks	All Inclusive
Dr. C. P. Bohra (Dy.Team Leader)	3,4	4,7,20,21
Amitava Basu (Financial Analyst)	4,7,8,10	4,10,12,19,20,21
Chandi Ganguly (Tansport Planning (Roads) Specialist)	2,6,7	9,18
Boominathan Muthuthevar (Transport Economics Specialist)	2,6,7	8,9,11,15,18,19
Dr. P. K. Nanda (Senior Highways Engineer)	5,6,9	9,10,14,16,17,18
D. Vasudevan (GIS Applications Specialist)	6	9,18
Dr. P. K. Sikdar (Road Safety Specialist)	5,9	10,14,16,17
Deepak Narayan (PWD Sector Domain Specialist)	1	5,6
B. R. Suri (Procurement Specialist)	1,8	5,6,12
Sandeep Jagota (HRD Specialist)	3,4	4,7,20
S. N. Swaroop (HRM Specialist)	3,4	4,7,20
Dipak Rao (Legal Specialist)	1,2,3,5,7,8,9	6,11,20,21
Col. S. P. Tomar (Adhoc Technical Specialist)	2,4	8,11
Tony Mathew (Adhoc Technical Specialist)	5,6	9,10,16,17,18

Notes:

1. The Mobilisation of Key Professionals for conduct of Workshop & visit to other state shall be need based and will be finalized in consultation with Client.
2. The Staffing Schedule has been worked out keeping in view the number of trips to Project Sites as specified in Contract and available Man-Months.
3. The interlinkages are based on deliverables and connected Tasks of ToR.
4. For Investigations additional staff from other resources will be mobilised as required. The concerned Key Professionals, however will be available for guidance as required .
5. First five Workshops and Visit to two of the States have been tentatively indicated for their Block Programme. Balance Workshops will be finalised with the progress of Assignment.

ANNEXURE 15.1

SCHEDULE OF DELIVERABLES

SCHEDULE OF DELIVERABLES

Deliverable/Output Per Contract	Tentative 'Due Timing'
Inception Report (IR) ➢ Inception Report based on consultant's post-mobilisation approach to the requirements of the main elements, finalisation of both the phasing of inputs and the overall work program for the Services period, and outlining any key issues needing further resolution by the client for efficient execution of the overall assignment.	End of week 8
Quarterly Progress Reports (QPR) x 7 ➢ These reports shall be submitted at the end of each quarter indicating the progress made on various s integrated in TOR during last 3 months.	End of each calendar quarter
Workshops: associated Presentations/Working Papers/Materials) up to ten (10) workshops ➢ These will be conducted as per details indicated in No. 807 of Description of Services given in Appendix A in CA.	Timings to be resolved in consultation with OWD
Working Paper on Short-to-Medium Term OWD Re-structuring and Reorganisation ➢ This will be submitted as per the details indicated in No. 503 of Description of Services given in Appendix A in CA.	End of month 8
Interim Report on **Revision** of OPWD Code and Manual (Structuring, Content, Issues, Timing) ➢ This will be submitted as per the details indicated in No. 212 of Description of Services given in Appendix A in CA.	End of month 8
Interim Report on **Revision** of Contract Procurement Manual for Works, Goods and Services	End of month 9
Final Report on **Revision** of Contract Procurement Manual for Works, Goods and Services	End of month 12
Final OPWD Code and Manual ➢ This document shall be submitted as per the details indicated in No. 214 of Description of Services given in Appendix A in CA.	End of month 13
Report on **Training** Needs Assessments (TNA) Results, Proposed TNA-Based Program(s) and OWD 'Training' Role ➢ This report shall be submitted as per the details indicated in No. 402 of Description of Services given in Appendix A in CA.	End of month 9

Deliverable/Output Per Contract	Tentative 'Due Timing'
Draft Report on Odisha Road Sector Policy and requirements for its implementation ➢ This report shall be submitted as per the details indicated in No. 312 and 313 of Description of Services given in Appendix A in CA.	End of month 10
Interim Report on Preparations for Inaugural Master Plan for Main Road Network in Odisha ➢ This report shall be submitted as per the details indicated in No. 708 of Description of Services given in Appendix A in CA.	End of month 10
Report on Road Infrastructure Safety Management Review ➢ This report shall be submitted as per the details indicated in No. 602 of Description of Services given in Appendix A in CA.	End of month 12
Final Report on Odisha Road Sector Policy ➢ This report shall be submitted as per the details indicated in No. 313 of Description of Services given in Appendix A in CA.	End of month 12
Report on Management of Out-sourced Road Toll Collection and Maintenance/Operations ➢ This report shall be submitted as per the details indicated in No. 909 of Description of Services given in Appendix A in CA.	End of month 14
Mid-Term Status Report (MTSR) ➢ The consultants shall submit the overall progress report of all activities of the project work after completion 50% of work.	End of month 14
Report on Vehicle Axle Load Regulation and Management ➢ This report shall be submitted as per the details indicated in No. 1006 of Description of Services given in Appendix A in CA.	End of month 16
Preliminary Report on Study of Main Roads Funding Options and Possible Road Fund ➢ This report shall be submitted as per the details indicated in No. 808 of Description of Services given in Appendix A in CA.	End of month 16
Draft Report on Proposed 'Odisha Road Safety Action Plan' ➢ This report shall be submitted as per the details indicated in No. 611 of Description of Services given in Appendix A in CA.	End of month 16
Final Report on Proposed 'Odisha Road Safety Action Plan' ➢ This report shall be submitted as per the details indicated in No. 611 of Description of Services given in Appendix A in CA.	End of month 19

Deliverable/Output **Per Contract**	**Tentative** **'Due Timing'**
Completion Report on Inaugural Master Plan for Main Road Network in Odisha ➢ This report shall be submitted as per the details indicated in No. 712 of Description of Services given in Appendix A in CA.	End of month 22
Final Report on Study of Main Roads Funding Options and Recommendations on Road Fund ➢ This report shall be submitted as per the details indicated in No. 808 of Description of Services given in Appendix A in CA.	End of month 22
Draft Report on Medium-to-Longer Term Strengthening of the Institutional Framework/Structures of Odisha's Roads Sector ➢ This report shall be submitted as per the details indicated in No. 1110 of Description of Services given in Appendix A in CA.	End of month 24
Final Report on Strengthening of the Institutional Framework/Structures ➢ This report shall be submitted as per the details indicated in No. 1110 of Description of Services given in Appendix A in CA.	End of month 26
Draft Final Report (DFR) ➢ This report shall be submitted one month before completion date of Services which will indicate comprehensively the consultants Services, results and achievement against the requirement of the TOR	End of month 28
Final Report (after OWD/GOO response to DFR) ➢ This report shall be submitted within two weeks of receipts of Clients comments on draft final report, upon completion of Services.	End of month 30