



HIS MAJESTY'S GOVERNMENT OF NEPAL
MINISTRY OF WORKS AND TRANSPORT
DEPARTMENT OF ROADS

**DEPARTMENTAL POLICY
DOCUMENT**

THE DOR STRATEGY

July 1995

FOREWORD

It is most important to remember that the Department of Roads is a service oriented institution. The Department and therefore each member of the Department owes a duty of service to the travelling public of Nepal - the Department exists to provide this service. However, in order to provide an efficient and effective service, we need an End Goal and a clearly defined Strategy for realising the Goal.

An End Goal for the Department - the reduction of total road transport costs - was incorporated into the 8th National Plan. Over the past two years the Department, assisted by the MRCU, has been developing a strategy to achieve it. This strategy, the DOR Strategy, and the principles underlying its development and implementation are the subject of this document. The Strategy is flexible and can be adjusted to suit changing circumstances; it is also not essentially time-bound. All future work of the Department, including donor financed projects, will be designed in accordance with the Strategy principles and to support the Strategy.

This DOR Strategy document was first issued in November, 1994, with the full support of my predecessor, Mr N P Chalise. It is now being published, with my added endorsement, as a Departmental Policy Document. For success and the eventual achievement of the End Goal, the Department must provide direction and exercise firm management and control of the Strategy. This will require the active commitment of each member of the Department and a change in the present thinking and approach. I appreciate that this will not be achieved easily, however, the result will be a much improved service to the travelling public and more effective use of the resources available to Government. These results will certainly justify, in the longer-term, the extra effort needed from each one of us now.

M B Karki

Director General

Department of Roads

July, 1995.

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LIST OF ABBREVIATIONS

DDC	District Development Committee
DDG	Deputy Director-General
DLO	Direct Labour Organisation within DOR
DOR	Department of Roads
HED	DOR Heavy Equipment Division
HMG/N	His Majesty's Government of Nepal
MOWT	Ministry of Works and Transport
MRCUDOR	Maintenance and Rehabilitation Co-ordination Unit
ODA	British Government Overseas Development Administration
RD	Regional Director
RMF	Road Maintenance Fund
RMP	Road Maintenance Project (ODA supported component of the RMRP)
RMRP	Road Maintenance and Rehabilitation Project
RSSDU	DOR Road Sector Skills Development Unit
SDC	Swiss Development Co-Operation
SDI	Visual Surface Distress Index (0-1.7 good, 1.8-3.0 fair, 3.1-5.0 poor)
SED	DOR Strengthened Equipment Division
SMD	DOR Strengthened Maintenance Division
TESU	DOR Traffic Engineering and Safety Unit
UNDP	United Nations Development Programme

1. INTRODUCTION

The Department of Roads (DOR) is a government agency whose main purpose is to translate Government policies for the roads sub-sector into the provision of a service to the general public of Nepal, and especially the travelling public. DOR is therefore a service orientated institution. The service should comprise but is not necessarily restricted to the following provisions.

- The construction of a basic road network which meets the present road transport needs of the Country in the three essential areas of: long distance transport; collection and distribution; human and social liaison and development.
- The maintenance of the network to provide a reasonable level of serviceability for road users at all times and to protect the considerable capital investment made in the roads.
- The provision of measures to ensure a reasonable level of safety for all road users including pedestrians.

The question we must ask ourselves in the Department is we fulfilling our duty of service to the public in meeting the above requirements and if not, why not?

It is not the intention of this Note to provide an answer to these questions. We must all examine our own actions for areas where we can improve on present performance. What is important, however, is that the Department has a clearly defined goal and a strategy for achieving the goal. Without this, it is extremely difficult, if not impossible, for DOR to meet it's obligations to the general public.

2. BACKGROUND

In 1991/92 during the preparation of the 8th National Plan, the Department identified an End Goal which is:

"the reduction of total road transport costs".

Total road transport costs is the sum of the interdependent costs of road construction, road maintenance and the direct costs to road users (vehicle operating costs). This goal satisfies the requirements for providing a service to the public and was included in the 8th Plan. The

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goal is therefore fully supported by central government and is in accordance with the Government's policy for the roads subsector.

Having established a goal, the next step was to develop a strategy for achieving it. This has been accomplished by DOR with the assistance of the IVIRCU. The strategy was developed using the principles of Policy Action Planning and is made-up of the following components.

- **6 OBJECTIVES** - forming a combination of interrelated targets which taken together should enable the Department to realise the end goal.
- **9 POLICY OPTIONS** - representing a range of viable policies through which the Objectives can be achieved.
- **51 KEY MEASURES** - comprising a series of activities designed to translate the Policy Options into practice and hence generate the conditions necessary for realising the Objectives.

The Objectives, Policy Options and Key Measures are listed in Annex I and together comprise the **DOR Strategy**.

For the Strategy to be successful there has to be a change in thinking and approach in **DOR** and **MOWT**. The rate of institutional change is uncertain and cannot be fixed therefore, while a programme has been drawn-up for implementing the key measures in the medium term, the Strategy is not essentially time bound although forward progress in some form should be maintained. Government policies also change in response to changing circumstances, the Strategy must therefore be flexible in order to respond to any changes as they occur. Finally, in so far as the resources of the Country are limited and subject to competing demands from other development actions, the Strategy must be *affordable* - it must ensure that the best possible use is made of the resources available including donor support.

3. STRATEGY DETAILS

Taking account of the factors noted in sections 1 and 2, the Strategy has been designed by the Department to:

- introduce Network Planning (global level decision making) as the basis for allocating resources to the Strategic Network and to make the best use of the resources available;

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- support and promote the use of local expertise and materials for road construction;
- maximise the benefits of these resources through the use of stage construction for new roads (design for present needs and upgrade only when justified by actual demand);
- put the present roads in the Strategic Network into a maintainable condition through a programme of reconstruction, rehabilitation and backlog maintenance (some 1, 138 km or 40% of the bitumen roads in the Network are presently in a poor and therefore unmaintainable condition);
- execute *planned maintenance* comprising a programme of integrated routine, recurrent and periodic activities on those roads which are in a maintainable condition;
- initiate the development of National Standards for road construction and maintenance to achieve greater uniformity and hence improved use of available resources and better quality of the finished product;
- put the DOR Heavy Equipment Divisions on more commercial lines by restricting the fleet to appropriate items for use by DOR and local contractors, introducing improved management of the fleet and invoicing all users of the fleet.

By these means, realise the end goal of reducing total road transport costs on the Network.

The six objectives given in Annex 1 are largely self-explanatory and have been shown diagrammatically in order to emphasise their interdependence. As a result of this interdependence, it is not possible to achieve any one objective alone; all the objectives must be addressed together. It would appear from the diagram that Network Planning has no dependency, however, it is clear that any global investment plan produced must have the approval of central government. An implied dependency therefore exists between Network Planning and Policy Level Awareness. The importance of Objective 111, Donor Direction, cannot be overstressed. Some 80% of the roads sub-sector budget is donor financed, if the maximum benefit is to be obtained from this valuable resource and overlap and competing interests avoided, the Department must provide clear direction to and firm management of its donors.

A brief description is given below of the nine policy options initially selected to realise the objectives, together with a summary of the key measures.

1.0 Decentralise Network Administration

The main priority for DOR should be the development and maintenance of a strategic network of main roads. The Department has identified such a network comprising some 5,340 km of National Highways and Feeder Roads of which 2,694 km are bitumen surfaced. This network is now the main responsibility of DOR. The detailed composition of the network is given in the Departmental Document: Statistical Data of the Strategic Network.

The remaining Urban, District and Village Roads totalling some 4,194 km are the responsibility of the Municipalities, District Development Committees and Village Development Committees respectively. However, it will take time to establish the necessary technical and administrative capability in these authorities. The DOR will therefore have to play a supporting role, albeit a declining one, in the management of these roads for some time to come. This is especially the case with respect to urban roads.

2.0 Establish a Network Planning/Monitoring Capability in DOR

The basic requirement for network planning is reliable, relevant and accessible information on the road network to support informed decision making. The Department fully recognises this need and has established a dedicated Planning Branch in DOR Headquarters which is progressively developing and introducing a **Highway Management Information System (HMIS)** for the Strategic Network. The HMIS will operate at two levels: **Network Level** and **Operations Level** and, as a first step, DOR has divided the roads in the Strategic Network into links with lengths varying from 140 m to 59 km. Each link has clearly defined nodes and has been given a unique reference number.

Network Level data covering road/bridge inventory, pavement condition (roughness and SDI), traffic, construction and maintenance costs, and road closure risk is being collected and stored in a dedicated database on a microcomputer in the Planning Branch. This data will be processed to provide management information for the preparation of 3 year and 5 year rolling programmes of periodic maintenance (cyclic resealing), rehabilitation and reconstruction. Statistics indicating road serviceability and the performance of DOR in

managing the roads should also be available by early 1996. Annual comparisons can then be made of the statistical information.

Operations Level data will be kept by the Divisions using paper-based systems and by the Regions using paper-based or computer based systems as appropriate. This data can be utilised for day-to-day management of the roads and will, in general, be more detailed than at network level. The data will be processed to provide information on road inventory, pavement condition (SDI), traffic, unit costs and operations performance, and for building up a historical record of road treatments.

Although the HMIS is divided into two levels, both levels are interdependent. The Regions and Divisions will need to supply data to the Planning Branch and, in return, the Planning Branch will provide management information to the Regions and Divisions.

3.0 Establish a Self-Sustaining Fund for Road Maintenance

It is essential that the Regions and Divisions have ready access to an adequate level of funding to cover their overheads and to carry out a programme of routine, recurrent and emergency maintenance on the roads. A mechanism for such a fund has been agreed with government and should be sanctioned by Parliament early in 1995. The fund will be held and administered by MOWT/DOR and will accrue revenue initially from tolls and, eventually, from a modest percentage of indirect road user taxes on fuel and vehicle registration. It is anticipated that toll revenue alone could cover the costs of planned routine/recurrent maintenance activities on the Strategic Network.

However, it is most unlikely that there will be sufficient funds to meet all the maintenance needs of the network. Prioritisation in the use of funds will therefore be required and it is most important that such funds as are available are used efficiently. The best way of ensuring this is to adopt the policy of *Planned Maintenance* noted at the beginning of section 3.

4.0 Improve Maintenance Operations in the Divisions

Planned maintenance activities on a road are designed to defer the need for the much more costly operations of repairs such as rehabilitation and reconstruction. In this context, rehabilitation and reconstruction are not part of the planned maintenance. As previously

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noted, planned maintenance comprises routine, recurrent and periodic activities of which the programming and implementation of routine and recurrent maintenance is the direct responsibility of the Divisions (the definitions of the various activities have been agreed within the Department and are contained in the Departmental Policy Document: Definition of Maintenance and Maintenance Activities, November 1994).

Improved routine/recurrent operations are being introduced by the Department through the Strengthened Maintenance Division (SMD) programme. This programme, which covers a minimum period of two years for each Division, involves the selection of a Division having a reasonable length of road in a maintainable condition (SDI 0-3.0). The first year is spent on putting the Division into a "working" condition, introducing management systems and preparing a work programme and a related needs based budget for the second year. The work programme involves cyclic planning of activities covering the whole of the fiscal year with additional responsive measures added during the monsoon period.

The second year comprises the implementation of the Planned Maintenance Programme utilising various methods of undertaking routine and recurrent maintenance operations. Methods being tested are lengthman and gang systems executed by DLO (Direct Labor Organization), petty contract and local contractors. The Department intends to review progress on these methods as the basis for a National Road Maintenance Strategy which will be set-out in a Departmental Working Paper to be published in 1996. The Work Programme and the method of implementation constitute the *Maintenance Management System* for the Division.

The SIVID programme is a process and not a project. It receives limited financial and technical support from SDC; the MRCU also provides technical support through a local consultant Maintenance Adviser. The aim is to build-up in each Division a capability for undertaking routine and recurrent maintenance activities as part of a Planned Maintenance Programme while working under normal government regulations and constraints. The annual maintenance budget comprising of regular (for routine/recurrent) and development (for other developmental activities and periodic) has also to be applied for using government procedures. Once the RMF (Policy Option 3.0) has been established, the SMDs, especially the better performing SMDs, will be given priority from this fund. In fact, the RMF funding levels will be closely tied to the SIVID programme, The SMD programme is being developed in stages until all 25 Divisions are incorporated. Two

Divisions, Harihar Bhawan and Bharatpur, were designated SMDs in 1993; four Divisions, Pokhara, Butwal, Nepalgunj and Lahan, have been made SMDs in 1994.

5.0 Improve Periodic Maintenance of the Strategic Network

Periodic maintenance is an essential element of Planned Maintenance and comprises regravelling of gravel roads and cyclic resealing of bitumen roads. In particular, cyclic resealing is considered to be the single most cost effective operation to improve the serviceability of bitumen roads in Nepal. It involves applying a seal to all roads in a maintainable condition at a fixed interval of 5-8 years depending on environment and traffic. All resealing has a high economic rate of return; the principal of *cyclic resealing* is therefore to reseal 12 months early rather than 1 day late. With the present road network and traffic levels, the *intervention approach* using economic models such as HDM III is not appropriate for developing a resealing programme for Nepal and could be counter-productive. For the time being, prioritizing in the selection of the roads (or resealing will be limited to the consideration of the 4 parameters namely road age, visual survey ratings, traffic and strategic importance.

The aim of the DOR Strategy in adopting cyclic resealing is to build-up a programme of 400 km to 500 km of resealing annually which can be undertaken as a straightforward management exercise and with predictable funding needs. Such a programme will, in addition, provide an on-going source of work for local contractors and thereby materially assist the development of the local contracting industry. Resealing is non-structural, it slows down the rate of deterioration by renewing the waterproofing properties of the pavement. Types of resealing include double and single seal surface dressing, slurry seals and cape seals using straight-run bitumen or bitumen emulsion.

Initially, the cyclic resealing programme will be prepared centrally by the Planning Branch and the regravelling programme by the Regions. Once the resealing programme has become established, responsibility for it will be transferred fully to the Regions. Execution of the resealing and regravelling programmes will be carried out through the Regions and the Divisions.

6.0 Improve Bridge Maintenance on the Strategic Network

As part of the new organisational structure for DOR a dedicated Bridge Unit has been established in the Design Branch with overall responsibility for bridges on the Strategic

Network of which there are at present some 800 in total. The task of the Bridge Unit is firstly to prepare a comprehensive inventory of these bridges followed by a detailed condition survey. The condition survey should lead to a programme of rehabilitation designed to put all bridges into a serviceable and hence maintainable condition. At the same time, planned maintenance involving principal inspections at 6-10 year intervals and regular routine inspections will be progressively introduced. The principal inspections will remain the responsibility of the Bridge Unit but routine inspections should be undertaken by the Divisions as part of their normal maintenance activities, The Bridge Unit will initiate and advise on any major bridge repair work which will be executed through the Regions and Divisions.

7.0 Improve Roadside Support Maintenance

Roadside support maintenance is concerned with slope stability and measures to reduce the risk of slope failure above the road and supporting the road. Preserving slope stability is a major problem in Nepal especially, but not exclusively, in the hills. From a practical point of view, it is almost impossible to reduce the risk of failure entirely. The question is thus to determine what level of risk is acceptable for a particular road on economic and social grounds and then to provide appropriate risk reduction measures.

Given the development level of Nepal and the relatively low traffic on most of the roads, it is not economically viable at the present time to implement high cost measures designed to provide a low risk of failure. In most cases what is needed are low cost measures utilising local skills and resources, backed-up by frequent inspection of the road environs and timely maintenance. Maintenance in this context comprises not only repairs but also modification to existing slope stability measures including extending retaining walls and adapting drainage to suit the changing environment. These works are never completed in the hill areas of Nepal and are on-going for the life of the road. An appropriate annual budget should be provided for them. In high risk areas, slips will continue to occur and responsive maintenance activities must be organised to clear them.

Slope stability measures will be a combination of normal geotechnical engineering and bio-engineering techniques appropriate to the site. To assist in the development and implementation of these techniques, DOR has established a Geo-Environmental Unit in the Planning Branch. The Unit will provide advice to the Regions and Divisions who will

be responsible for implementation. However, it is most important in dealing with slope stability for the Divisional Engineer and especially the overseers to get to know their roads and the high risk sections on them. This can only be achieved by regular inspection of the roads leading to timely and cost effective roadside support maintenance. The Unit is also concerned with developing the capability of local consultants and contractors in designing and executing bio-engineering techniques

8.0 Establish the Concept of National Standards

National Standards for road construction and maintenance broadly comprise sets of norms, contracts, specifications, detail drawings, codes of practice and other guidelines. They are important for:

- maximising the use of local resources in a manner appropriate to the development stage of the Country and to meet local needs;
- providing a common base for evaluating the performance of the standards and progressively improving them to suit local conditions;
- providing a degree of uniformity to assist contractor bidding and the development of local contractors while improving quality control;
- enabling timely changes in construction and maintenance practices to respond to changing circumstances within the Country.

There are some road-related standards in Nepal but they are generally outdated and rarely used in practice. A strategy for the development of Nepal specific standards in the roads sub-sector is therefore needed. In this respect, a Discussion Paper was issued by DOR/MRCU in May 1994 and a seminar will be held in March/April 1995 to obtain a consensus on the key issues. The development of National Standards is a major long-term undertaking. The suggested approach is therefore to carry out a review of present standards and select a set of existing standards which have been prepared for conditions similar to Nepal. These *interim* standards will then be progressively refined and developed to form National Standards.

This process is already underway. A Steering Committee has been established in MOWT/DOR together with a Working Group which is reviewing contract documents.

Feeder Road geometric and construction standards based on stage construction have also been prepared by DOR/MRCU and approved by government, Changes in existing standards and the preparation of new standards will be initiated by DOR Headquarters. However, the Regions and the Divisions have a lot to contribute in this respect and must be fully involved in the work. This will be achieved through joint review and development of new standards and, especially, by providing essential feedback from the field on the performance of the standards.

9.0 Improve DOR Plant Management and Utilisation

Of necessity, DOR will continue to be the main provider of plant and equipment to the roads sub-sector in the medium term. It is therefore important that the HEDs are able to provide adequate, reliable, cost effective and appropriate plant for DOR and local contractor use in road construction and maintenance over this period. Three main issues need to be addressed:

- the replacement of old, non-standard and inappropriate plant and equipment (the retention of any item which is not being utilised for more than 600 hours/year should be seriously questioned);
- the introduction of standard management systems into the HEDs;
- underfunding and overstaffing.

The Department is addressing these issues through the Strengthened Equipment Division (SED) programme. This programme follows a similar approach to the SIVID programme described under Policy Option 4.0 and has the objective of putting the HED operations on more commercial lines. A HED is selected and limited refurbishment of offices, stores and workshops is undertaken, including the supply of additional workshop equipment and tools, to bring the HED into a "working" condition.

At the same time management systems, particularly for cost accounting, are introduced. If plant operations are to be made cost effective, it is essential that all costs are recorded and that these costs are invoiced to all users including DOR. It is not the responsibility of DOR to say how these charges will be met, that is a policy level decision for government. It is, however, the Department's duty to determine these costs and to make provision for

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their recovery through the application of commercial hire rates. All DOR users must in turn make an allowance in their annual budgets for any plant required at these rates.

A large proportion of the plant in the HEDs is supplied from donor aided construction projects. As a result, the plant is often inappropriate for use by DOR or local contractors and has exceeded its economic life. The Department must work closely with its donors at the project appraisal stage to avoid this situation in the future. Nepal has a major resource of relatively cheap labour. If efficient use is to be made of this resource in road construction and maintenance, as indeed it must, an intermediate technology approach should be adopted. This approach involves the use of labour supported by plant, their outputs must therefore be compatible and smaller plant items are preferable. The Regional Directors should review their maintenance operations on this basis and notify the DOR Mechanical Branch and the HEDs of their plant requirements. A similar exercise should be undertaken with local contractors.

Butwal was selected as the first HED in the SED programme and the process of establishing Butwal on more commercial lines has been continuing for some 5 months. If this process proves successful, the DOR Strategy is to progressively extend it to the remaining five HEDs.

By the nature of the End Goal, the DOR Strategy is very comprehensive. As previously noted it must also be flexible to respond to changing circumstances both within government and the Country as a whole. Furthermore, if the Strategy is to be successful and local resources are to be used to maximum advantage, particular attention must be given to the question of *balance* during the execution of the Strategy. In this respect, there is a need to maintain an *external balance* and an *internal balance*.

External Balance - at any development level of a country, a balance should be maintained between all development actions. No action should greatly precede nor lag too far behind other development actions since a broad range of actions are needed for sustainable development yet all are competing for a share of the available resources. In the case of infrastructure for instance, there is no point in building a highly sophisticated road system if the general level of education and resources in the country are such that it cannot be fully utilised or maintained. On the other hand, a road may well be needed to bring education to the remote areas but this can often be achieved by a motorable track and the resources saved can contribute to the education process.

Internal Balance - where a strategy involves institutional strengthening such as the DOR Strategy, operations, management and policies must be addressed concurrently and a balance achieved between them. This is shown diagrammatically by the Brooke's Pyramid in Annex 11. For technical operations to be effective there must be sound management direction and support, and for successful management there must be an appropriate policy framework within which management can be managed. Too often in the past efforts have been concentrated on improving operations when there have been inadequate management and policies to support the operations.

As development of the Country proceeds the "quality" of balance will improve. However, as noted in section 2., the Strategy and hence the quality of balance at any particular stage of development must always be affordable.

4. STRATEGY SUPPORT

In order to carry out the DOR Strategy, substantial donor assistance is needed. To this end, the Department has negotiated major support in the form of the Road Maintenance and Rehabilitation Project (RMRP) which has the backing of the World Bank, ODA, SDC, and UNDP. The RMRP directly supports the central aim of the Strategy namely: to bring the Strategic Network roads to a maintainable condition and to execute Planned Maintenance on these roads. It also promotes improvements in DOR plant management and several of the DOR Policy Options including network decentralisation. A summary of the support provided to DOR by the RMRP is given under the sub-headings below and is shown diagrammatically in Annex III.

4.1 Project Support for Rehabilitation/Backlog Maintenance

The World Bank is funding a programme of 454 km of rehabilitation and 681 km of backlog maintenance on the Strategic Network during 1994-98 to bring these road lengths to a maintainable condition. The programme is being administered by the Foreign Aid Branch and will be executed through the Regions and the Divisions. Supervision of the rehabilitation works will be carried out by foreign consultants, and backlog maintenance by local consultants with technical assistance support from 2-3 expatriate Field Implementation Advisers. The rehabilitation works will be carried out under the

World Bank international contractor bidding (ICB) procedures and the backlog maintenance under local contractor bidding (LCB) procedures.

Backlog maintenance comprises carriageway improvement, repairs and resealing together with drainage and roadside support works to restore the road to its design serviceability. In common with rehabilitation, backlog maintenance should be a one-off operation to be followed by a continuous programme of *planned maintenance* for the life of the road.

4.2 Institutional (Process) Support for Planned Maintenance

The RMRP includes several components designed to support the process of building-up a capacity in DOR to undertake planned maintenance. The main ones are as follows.

Support for the SMDs - is provided by SDC in the form of limited financial assistance for office refurbishment and the provision of transport and small items of plant and equipment for the Division. Technical assistance is also available to help with the establishment of management systems and the implementation of planned routine and recurrent maintenance activities. There is no financial Support for the maintenance budget which has to be obtained through the normal DOR process.

Support for Periodic Maintenance - is provided by ODA under the Road Maintenance Project (RMP) component through the provision of 350 km of reseal training contracts. These contracts are designed to build-up a capacity in DOR, local consultants and local contractors for resealing bitumen roads and will initiate the periodic maintenance programme of cyclic resealing noted in section 3., Policy Option 5.0. ODA assistance comprises financial support for the contracts, technical assistance for training and some items of plant and equipment. The work is predominantly a training exercise and will be carried out in conjunction with the Regions and the Divisions.

Support for Roadside Support Maintenance - is provided by ODA under the RMP component in the form of technical assistance and limited funding to the GeoEnvironmental Unit. This assistance is aimed at developing bio-engineering techniques in conjunction with normal geotechnical measures to provide cost effective and Sustainable treatments for slope stability, and introducing these techniques across the

country. The Unit will be consulting and working closely with the Regions and the Divisions.

Support for Bridge Maintenance - the recently established DOR Bridge Unit is receiving technical assistance and financial support from ODA through the RMP component. The support is aimed at improving bridge maintenance by setting-up a micro-computer based bridge inventory in the Unit, by undertaking a programme of principal inspections using local consultants, and by implementing routine maintenance procedures through the Divisions. A detailed condition survey of all bridges on the Strategic Network is also being carried out which should result in a rehabilitation programme to ensure that the bridges are in a serviceable condition.

4.3 Other Institutional (Process) Support

Support for Decentralisation of Network Administration - the UNDP is providing funding and technical assistance to the DDCs to develop their technical and administrative capability to plan and manage District Roads. In addition, UNDP is supporting pilot labour-based training projects for local contractors in District Road construction and maintenance. These initiatives are being undertaken through MILD but DOR has an advisory role in the setting of geometric and construction standards.

Support for Network Planning - the World Bank is funding the preparation of a Priority Investment Plan by foreign and local consultants. This Plan will indicate the priorities for further investment in roads covering new construction, rehabilitation and maintenance, to support the Government's development aims while maximising the use of available resources. The Plan will form the basis for the transport infrastructure section of the 9th Development Plan and should be completed by early 1996.

Support for National Standards - the World Bank is also funding a Materials and Standards Study by foreign and local consultants. This Study will compile a comprehensive construction materials inventory for each of the six administrative regions and will prepare general specifications for use of the materials in road construction and maintenance. The Study is a key element in the development of National Standards for the roads sub-sector and will assist in maximising the use of local resources. It is due for completion at the end of 1995.

Support for Plant Management - ODA is providing technical and limited financial assistance to the SED process noted in section 3., Policy Option 9.0. The financial assistance will comprise workshop refurbishment, provision of small tools and equipment and the installation of management systems. In addition, the World Bank is funding a continuation of the mechanical training programme at the DOR Mechanical Training Centre, Patan.

Support for Human Resource Development - a Road Sector Skills Development Unit (RSSDU) has been established in DOR Headquarters under the Planning Branch with responsibility for planning and co-ordinating a uniform training programme for DOR staff. The Unit will not conduct training itself but will identify training needs and locate suitable training providers for in-house and overseas courses. Unit will also be involved in developing in-house capability in training facilities and addressing related issues such as the working environment, performance evaluation and career progression. The Unit is assisted jointly by SDC and ODA through the provision of technical assistance and limited funding for transport and equipment.

Support for Monitoring and Evaluation - a Monitoring and Evaluation Unit has been set-up under the Planning Branch with financial support from SDC. Initially the Unit has responsibility for monitoring the performance of the individual components of the RMRP and the Project as a whole. Eventually, the aim is for the Unit to undertake global monitoring of the DOR Strategy so that conflict and overlap between the various components can be minimised and priorities set for the allocation of resources. The Unit has an important role in the Department as it provides the means by which DOR is able to plan, manage and direct its Strategy. In the common interest, the Unit should therefore receive the full support and backing of all DOR personnel.

Support for Improvements in Road Safety - ODA through the provision of technical assistance and funding under the RMP component are assisting the establishment of Road Safety Unit. This unit is now temporally placed under the design branch of DoR unstill the time when it will be moved permanently to the Department of Transport Management. This Unit is responsible for promoting an awareness of road safety in MOWT/DOTM/DOR and, to the extent possible, the general public, and will initiate road safety measures appropriate to the development stage of the Country. These measures will apply to new road construction and improvements to existing roads where a safety

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hazard has been identified. The Unit is working alongside the Police in setting-up a microcomputer based national traffic accident record system

Although the RMRP is providing substantial support for the DOR Strategy as outlined above, it does not comprise the only Support. Other donor projects in the roads subsector have similar objectives and therefore make a valuable contribution in their own right. Notable are:

- the ADB Second Road Improvement Project and the upcoming Third Road Improvement Project which will account for 314 km and 369 km of respectively of rehabilitation, backlog maintenance and improvement;
- the SDC Arniko Highway Project which will rehabilitate some 114 I-cm of main highway;
- rehabilitation of km 0-78 of the East-West Highway; plus replacement of timber bridges in Biratnagar-Rangeli Road with support from ODA.
- the Lamasangu-Jiri Road Maintenance Project and the Eastern Region Road Maintenance Project supported by SDC and ODA respectively which are undertaking planned maintenance trials using different approaches.
- reconstruction of 5 km of the East-West Highway immediately west of the Karnali River, including the construction of 17 bridges, under Indian Bilateral Aid.

The DOR Strategy is complex and receives essential support from numerous donor aided components. If the Strategy is to be executed successfully and the Objectives and the End Goal realised, firm direction, management and control must be exercised over all the components. Given the many and varied interests involved, it is clear that this can only be provided by the DOR itself.

The MRCU has been active in helping the Department identify the End Goal, develop the Strategy and negotiate support for it. The present role of the MRCU is to assist the Department in managing and implementing the Strategy. In particular, the Unit will work, with DOR to establish the policy and management environment which will be needed for the ultimate success of the Strategy. The MRCU is not 5 permanent units in DOR and it has no executive authority. Its essential function is assisting the DOR to manage institutional change by *guiding* the Department through the change process. The respective roles of DOR, the

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MRCU and donor support in implementing the DOR Strategy are shown diagrammatically in Annex IV.

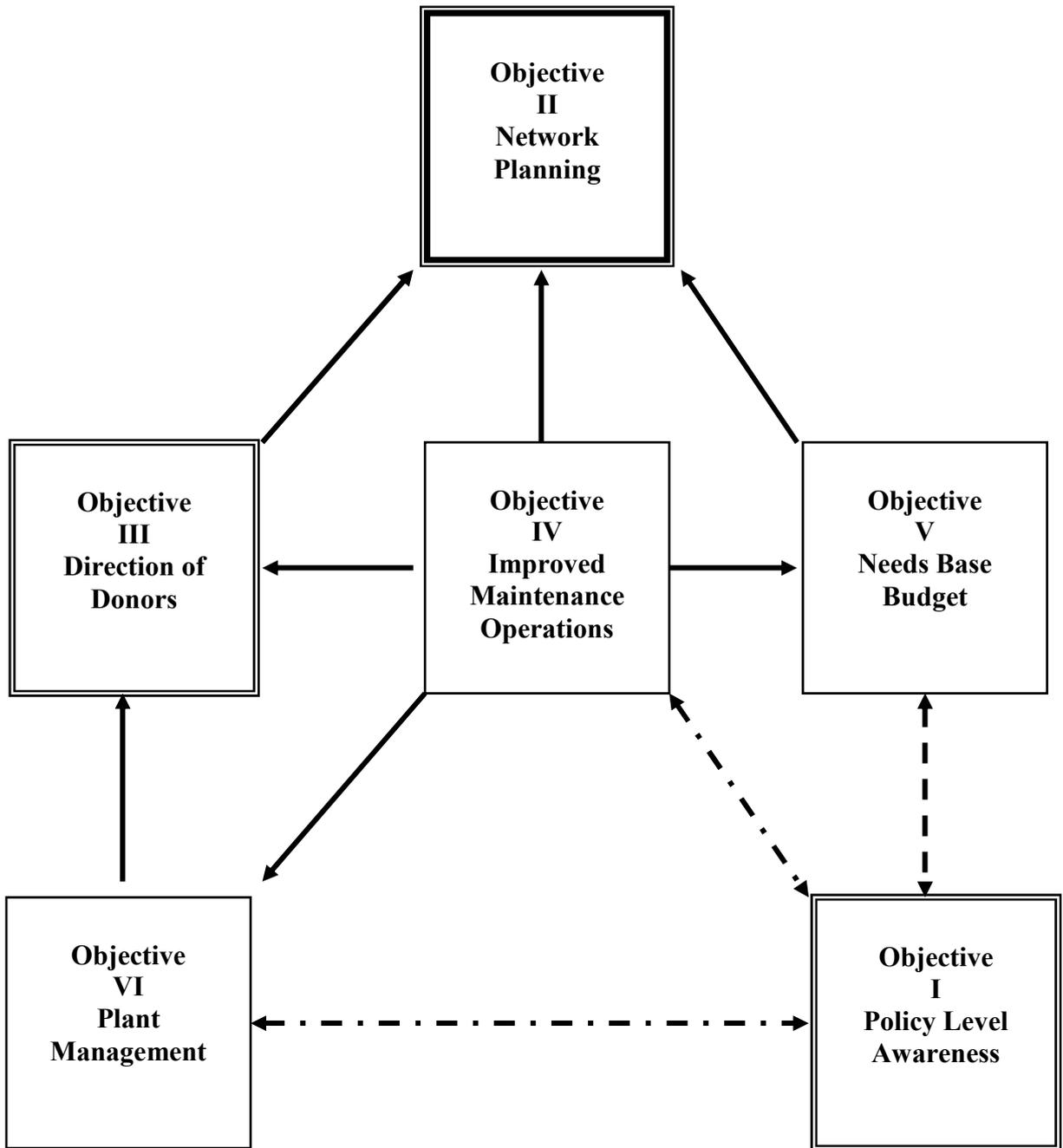
5. CONCLUSION

The DOR is a government agency whose main purpose is to translate government policies for the roads sub-sector into the provision of a service to the travelling public. This service comprises a road network meeting the needs of government and the general public which is maintained in a serviceable condition at all times. The DOR is therefore a *service* orientated institution.

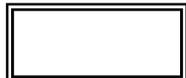
In order to meet its obligations, the DOR needs a clearly defined End Goal and a Strategy for achieving the goal. These provide an essential framework for subsequent action. An End Goal - the reduction of total road transport costs - has been identified and is included in the 8th National Plan. DOR has also developed a Strategy for achieving it and has negotiated substantial donor support for the Strategy. The Strategy concurrently addresses policy, management and operations issues and is appropriate to the present development stage of Nepal. It is also sufficiently flexible to respond to changing circumstances in government and the Country as a whole.

However, the Strategy is complex and has numerous donor components. While these components provide essential support for the Strategy, they can also embody differing approaches and interests. For success, the Strategy must therefore be firmly directed, managed and controlled by the Department itself. This will require acceptance of ownership of the Strategy and a strong commitment to the Strategy by each and every member of the Department.

OBJECTIVES FOR DOR STRATEGY



Legend



Solid line arrows indicate decency

Broken line arrows indicate interdependency

Policy level objectives

Operations level objectives

DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES

DOR STRATEGY - POLICY OPTIONS AND KEY MEASURES		
REF.	POLICY OPTIONS/KEY MEASURES	STATUS AT 01/12/94
1.0	DECENTRALISE THE ADMINISTRATION OF THE NETWORK	
1.1	Complete the classification and referencing of the main roads, identify and introduce the concept of strategic/core networks.	Completed. Strategic Network of some 5,300 km made the main responsibility of DOR.
1.2	Liaise with the World Bank, UNDP and Helvetus for strengthening the DDCs	On-going.
2.0	ESTABLISH A NETWORK PLANNING AND MONITORING CAPABILITY IN DOR	
2.1	Complete and codify in DOR the Working Papers on "Road Referencing and Inventory" and "Road Management Data".	85% complete.
2.2	Set-up a functioning Planning Branch in DOR Headquarters and determine the requirements for a Highway Management Information System.	Completed.
2.3	Train and assist the Planning Branch to carry out annual roughness and visual pavement distress surveys on bitumen roads.	On-going.
2.4	Set-up and establish in the Planning Branch a computer-based Highway Information Data System providing "query" information.	System set-up, data input continuing.
2.5	Assist the Planning Branch in preparing, storing and updating network level inventory, pavement condition, traffic and road closure data.	28% complete.
2.6	Resolve problems with the automatic traffic loggers and install additional loggers. Arrange data transfer to HQ.	Problems resolved, data collection continuing.
2.7	Establish in the Planning Branch a programme of vehicle classification, origin & destination and axle load surveys.	On-going.
2.8	Develop with the Planning Branch a construction and maintenance cost databank and install it as a central Cost Module in the HMIS,	35% complete, data collection on-going.
2.9	Install/develop analytical modules to support the preparation of annual and rolling periodic maintenance programmes as the second stage of the HMIS.	Due to commence January, 1996.
2.10	Assist DOR in developing monitoring tools and performance indicators and provide support for monitoring DOR Strategy.	On-going.
3.0	ESTABLISH A SELF-SUSTAINING FUND FOR ROAD MAINTENANCE	
3.1	Recommend to the Steering Committee measures to increase direct and indirect road user revenues and simplify disbursement.	Completed.
3.4	Formally establish a self-sustaining fund for road maintenance in MOWT/DOR.	Mechanism agreed by NPC/MOF and now awaiting the formal approval of Parliament.

DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES

4.0	IMPROVE ROUTINE MAINTENANCE OPERATIONS IN THE DIVISIONS	
4.1	Issue as a Departmental Policy Document the Paper on the Definition of On-Road Maintenance.	Completed. The Paper has been combined with the Paper on Roadside Support Maintenance.
4.2	Assist the Department in defining and establishing	Completed.
4.3	Assist DOR in developing and establishing an expanding programme of functioning SMD's with support from SDC.	On-going. Six SMDs now established.
4.4	Review, systemise and improve the cost effectiveness of routine/recurrent and roadside support maintenance operations in the SMDs.	On-going.
4.5	Identify and agree an expansion of the SMID programme for support by SDC under the RMRP.	Completed.
4.6	Prepare and issue in the Department Working Papers on a Road Maintenance Strategy for the Strategic Network in Nepal.	Scheduled for completion in July 1996. An interim Paper to be completed by September 1995.
4.7	Prepare separate Road Maintenance Manuals covering routine/recurrent and roadside support maintenance operations in the Divisions.	Scheduled for completion by July 1996.
4.8	Develop and establish a HMIS at Division and Regional level through the SIVID programme to suit management requirements.	On-going.
5.0	IMPROVE PERIODIC MAINTENANCE OF THE STRATEGIC NETWORK	
5.1	Identify and initiate any additional work programmes necessary to bring the Strategic Network into a maintainable condition.	Completed.
5.2	Develop the capacity within DOR to plan, prioritise and manage a cyclic resealing programme for bitumen roads in the Strategic Network as part of Planned Maintenance.	On-going.
5.3	Between 1994-98 undertake training contracts to improve the capability of local consultants and contractors to respectively design/supervise and undertake resealing works.	First training contract to start early in 1995.
5.4	Identify and recommend in conjunction with the RSSDU appropriate overseas training opportunities for DOR staff associated with the periodic maintenance programme.	On-going.
6.0	IMPROVE BRIDGE MAINTENANCE ON THE STRATEGIC NETWORK	
6.1	Recommend and establish an organisation structure in DOR to undertake bridge maintenance.	Completed - a Bridge Unit has been established in the Design Branch.
6.2	Issue a Discussion Paper on Bridge Inventory and Bridge Maintenance and hold a seminar in DOR to obtain a consensus on the key issues.	Completed.

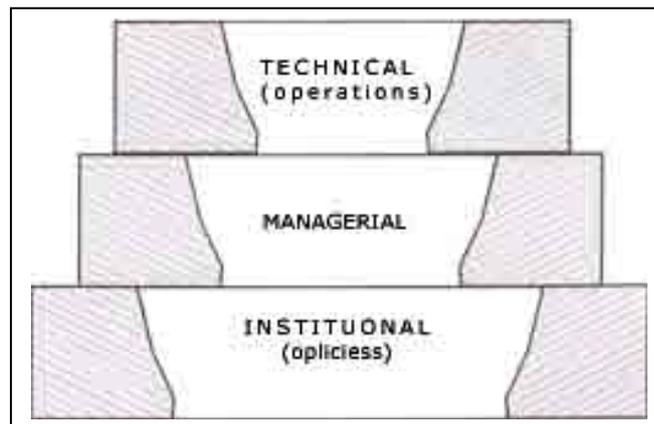
DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES

6.3	Carry out in consultation with the Divisions inventory and condition surveys of all bridges on the Strategic Network and identify maintenance and rehabilitation programmes.	To start 1995.
6.4	Set-up a computer/paper based Bridge Management Information System in the Bridge Unit and the Regions. Link with the central HMIS in the Planning Branch.	On-going.
6.5	Initiate through the Regions/Divisions an annual routine maintenance programme for bridges on the Strategic Network using local consultants and contractors.	To start 1995.
6.6	Prepare a 3-year rolling programme and budget for bridge maintenance on the Strategic Network.	To start 1995.
6.7	Develop and execute a training programme for local consultants and contractors on bridge maintenance works.	On-going.
7.0	IMPROVE ROADSIDE SUPPORT MAINTENANCE	
7.1	Issue as a Departmental Policy Document a Paper on the Definition of Roadside Support Maintenance.	Completed - the Paper has been combined with the Paper defining On-Road Maintenance.
7.2	Formulate and establish in DOR an organisation structure to provide support to the Regions and Divisions for roadside support maintenance.	Completed - a Geo-Environmental Unit has been established in the Planning Branch.
7.3	Develop sustainable bio-engineering measures to complement normal geotechnical measures for slope stability-.	On-going.
7.4	Introduce these measures as part of roadside support maintenance through the Regions and Divisions. Monitor and evaluate the field performance of these measures.	On-going.
7.5	Provide support and training in designing and executing sustainable bio-engineering techniques to DOR staff, local consultants and contractors,	Programme to be introduced in 1995.
8.0	ESTABLISH THE CONCEPT OF NATIONAL STANDARDS	
8.1	Establish a Standards Committee in MOWT/DOR.	Completed.
8.2	Introduce the concept of national standards in DOR. Review and advise on suitable geometric, construction and maintenance standards for roads in the Strategic Network	On-going. Papers on geometric and construction standards for Feeder Roads issued.
8.3	Formulate and initiate a medium to longterm strategy for the introduction of national standards for road construction and maintenance.	On-going. Discussion Paper on Strategy issued and seminar to be held in March, 1995.
9.0	IMPROVE DOR PLANT MANAGEMENT AND UTILISATION	
9.1	Prepare detailed guidelines for improving DOR workshop administration and operations through the Strengthened Equipment Division (SED) process.	Completed.

DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES

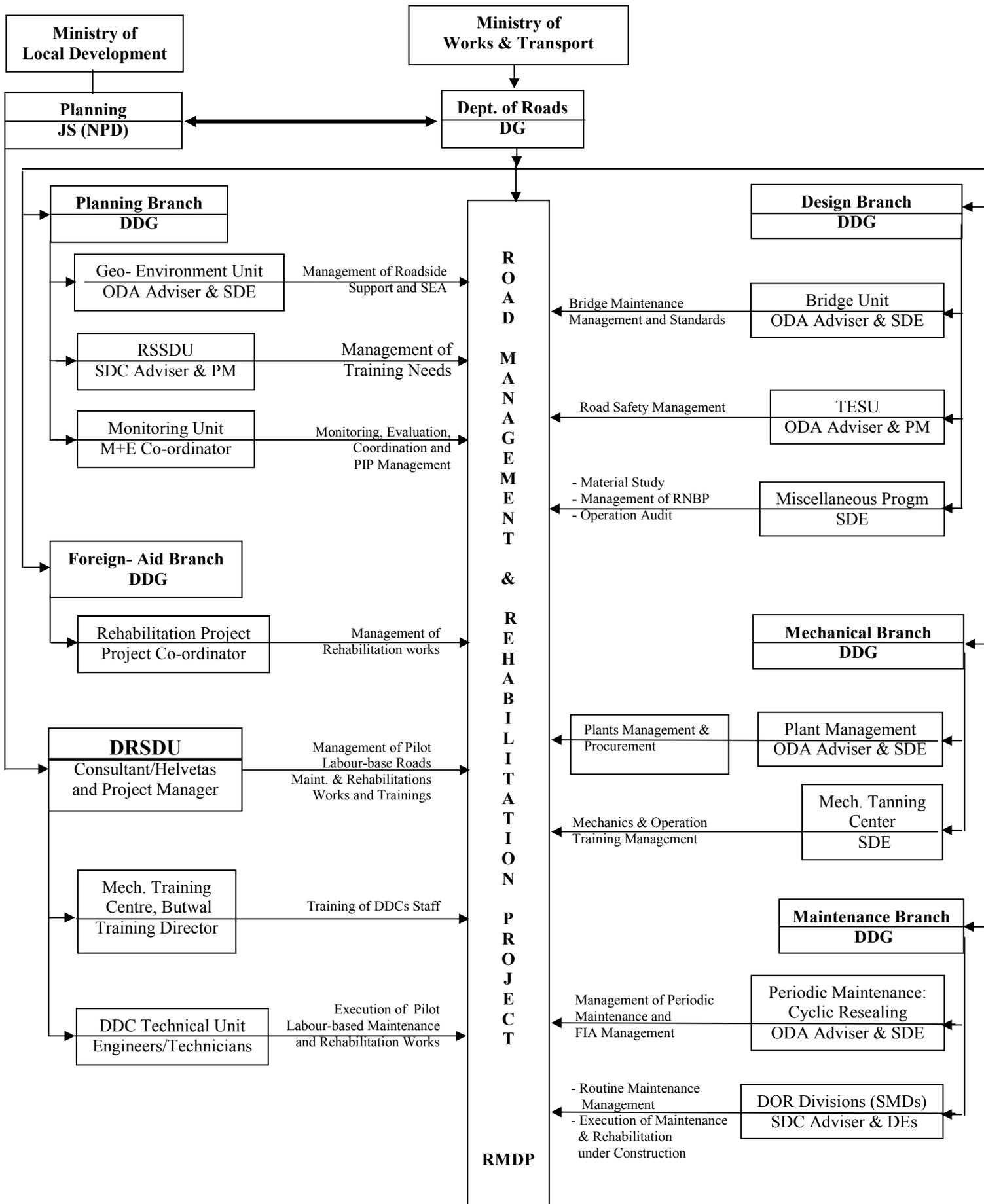
9.2	Initiate and monitor the establishment of Butwal Heavy Equipment Division as an SED on commercial lines.	On-going.
9.3	Standardise workshop and plant management systems in DOR and rationalise the fleet to comprise appropriate and reliable items for use by DOR and local contractors.	On-going.

BROOKE'S PYRAMID



INTERDEPENDENCE OF TECHNICAL MANAGERIAL AND INSTITUTIONAL ELEMENTS OF DEVELOPMENT

DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES



DOR STRATEGY – POLICY OPTIONS AND KEY MEASURES

