

## A Newsletter of Department of Roads

Jan' 2002

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No. 17

## Sustainable transport

**UN** defines "Sustainability as meeting the needs of the present, without compromising the ability of future generations to meet their own needs". Sustainable transport is therefore the complex balancing of mobility and accessibility, considering the broader concerns of environment, social equity and the economy.

Strategies for developed and developing countries to move towards sustainable transport include:

- Reduce the amount of single occupant car travel.
- Maintain and improve efficiency of the transport system – rather than just adding road capacity to address traffic congestion.
- Make transport decisions that incorporate the broader goals of environment, economy, social equity and quality of life.
- Selective application of ITS can help provide sustainable solutions for transport.

(Source: Transport Futures, Dec' 2000)

But, different issues predominate in underdeveloped countries. In Nepal, road transport along with air transport is only a means of moving peoples and goods. Specially, roads are built to pave the way for the development of other sectors. The question of sustainable road transport will have to be answered in the course of long-term planning and formulation of policy for development plan of the country.

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## Appointment - NEW DG in DOR



DG, MG Maleku

The newly appointed Director General, Madan Gopal Maleku was felicitated by all DOR staff, which included DDGs, SEs, SDEs, engineers, administrative and account officers including their spouses.

In the meantime former DG Ananda Prasad Khanal was bade farewell, who is transferred to joint secretary in MPPW.

(continued in page 3)

## CONTENTS

Sustainable transport	1
New Director General in DOR	1
Division Roads Office – Bhaktapur	2
NEA Election	2
ITS Application on Kathmandu Streets	2
Nepal: Remote and Challenging	2
Some aspects of road maintenance	2
History of Department of Roads (DOR)	3
Road Network in Tibet	4
Average Daily Traffics (ADT)	4
Rail link to Biratnagar	5
SMDP's new phase	5
Reinforced Soil (Soil Nailing) Technique	5
Four-lane Wide Ring Road	6
RMDP	6
RNDP	7
RAP	7
MTEF	8
Banepa Sindhuli Bardibas Road Project	8
Intersection Improvement Project in Ktm	9
Map of Strategic Road Network	10
Nepal Road Statistics 2000	12
Road condition of National Highways	14
Road classification of Nepal and India	16
Information of RSSDU Activities	17
Transport Policy 2058	19
20 years Road Plan	19
Ropeway to facilitate Nepal-China trade	19
Arniko Highway Project	20
Editorial	20

## Division Roads Office – Bhaktapur

### New office building at DRO Bhaktapur:

A two-storeyed office building with 1870 sq. ft. area has been inaugurated by the then DG Mr. Ananda Prasad Khanal on 18<sup>th</sup> Asadh 2058. The building is jointly financed by SMD (40%) and HMG/N (60%).

### Hanumante Bridge on Balkot - Thimi Road:

An RCC bridge on Hanumante River is ready for the traffic on Balkot-Thimi Road. The bridge has 3nos. of span with 15m each and 4m of carriageway width. The type of foundation is precast pile.

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## 24th NEA Election

The following engineers are elected for 24<sup>th</sup> executive committee of Nepal Engineer's Association on September 17, 2001.

1. President: Narayan Govinda Halwai, MEH Consulants.
2. Vice-president: Dr. Narendra Kumar Lal, DOI
3. General Secretary: Bharat Raj Pahari, IOE
4. Deputy General Secretary: Dr. Santoshananda Mishra, NEAu
5. Treasurer: Krishna Chandra Manandhar, TAEC Consultants.
6. Member1: Karuna Sharma, NEAu.
7. Member2: Kishor Thapa, DOH
8. Member3: Birendra Bahadur Deuja, MPPW
9. Member4: Nahendra Pradhan, SASCON
10. Member5: Sambhu Bahadur Shrestha, NEAu
11. Member6: Dilip Kumar Jha, NTV
12. Member7: Chet Nath Pandey, IOE
13. Member8: Ghana Shyam Gautam, DOR
14. Member9: Rajesh Pathak, KEC
15. Member10: Arun Rajouriya, Hymal Hydro

They have vowed to dedicate the entire team's effort for professional development of engineers. Some of the election promises included were:

- ❖ Establishment of engineering resource center
- ❖ Establishment of employment exchange center
- ❖ NEA's web site creation
- ❖ Continuing education and training.

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## ITS application on Kathmandu streets

You will be caught on the streets if you behave badly. The Valley Police Office aims to launch a multimillion-rupee high tech security plan known as 'Safer Valley Project', which will be operated within three cities of the Kathmandu valley to curb crime.

Intelligent Transport System (ITS) in the form of various hi-tech gadgets including Close Circuit Television (CCTV) will be installed in the valley streets to monitor street traffic and activities. The control center will be situated in Panipokhari. International consultants were involved in the study of technology. Various international agencies including DFID and DANIDA have shown interest on financing the project.

Article Review  
from 'World Hiahwavs'

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## Nepal: Remote and challenging

In World Highways' Road Notes - Country Series, authors Robert Bartlett and Lal Krishna KC have highlighted on road development in Nepal.

In the article, it has mainly concentrated on describing Nepal's Strategic Road Network (SRN) with respect to its network structure, priority investment, and improvement history including private sector involvement. Further, non-SRN road systems are briefed, which represent rural accesses.

Other highlights include geographical variance in the country affecting road development in hilly areas including road maintenance fund, BOT and BOO system of projects, SRN's links system and technical support for non-SRN executing agencies. Lastly, authors have discussed SRN's capacity restraint strategy and briefly mentioned about labour-intensive method used in Nepal.

(for details please refer: [www.worldhighways.com](http://www.worldhighways.com) - World Highways online)

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## Notes to DOR Engineers

### Some aspects of road maintenance

(SK Regmi, DDG, Maintenance, DOR)

The objective of MAINTENANCE ACTIVITIES is to provide cost-effective safe roads for users. There are four types of maintenance activities.

#### 1. Routine: Daily activities

- To clean and manage surface water to save roads and make smooth and safe running of traffic.
- Temporary patching and removing obstructions.
- Mass action for valley side road land necessary.
- Clearing of bushes and trees from support walls and cross drainage structures.

- Special attention to be paid on clearing of culvert boxes.

water has to pass until the discharge is safe for roadway and supporting structures.

**2. Recurrent:**

- Pothole patching and maintenance of all road structures including road furniture and river training works.
- Bridge waterway, river cut in hill roads maintenance (mass action).
- Special attention needed for ponding in culverts outlet and near road embankment edges.

**3. Periodic: As per life of road pavement**

- Expert advice of DOR bridge unit to be taken for bridge and structures maintenance

**4. Emergency:**

- To open traffic blocked by land slides, road cross drainage works breached by flood and slides
- Road blockage by accidents on bridge and structures
- Traffic opened immediately
- Maintenance of damage to roads restored in dry season

**Issues on water management in road maintenance**

Most of the maintenance activities required because of DAMAGE CAUSED BY WATER to the roads i.e. sub-surface and surface - monsoon and river water waters.

**1. Sub-surface site specific treatments:**

- Inverted sub-soil drain for collecting water from sub-grade.
- Raising the embankment by granular materials.
- Horizontal drills for hill slopes.

**2. Surface and river water treatments:**

- Cross slopes
- Side drains
- Embankment raise
- Cross drainage
- Structures for river damage and toe and embankments cuts
- Slope treatments

**Precautions:**

- The subsurface water from inverted subsoil drain from horizontal drills is to be discharged safely to nearby culverts.
- The surface water passes through cross slopes, side drains, hill slopes, land beyond shoulders on the valley sides, cross drainage structures, waterways upstream and downstream of natural drainage. These are to be maintained for water management.
- In the plain areas generally water from road is collected to side drains and its discharge to cross drainage should be managed.
- The successful management of water depends on the maintenance of all the areas through which

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**History of Department of Roads (DOR)**

Before 2007 BS, Chhembhadel Adda was the office for construction and maintenance of non-road civil engineering works, where as a special office ‘Batokaj Goswara’ was established for road construction and maintenance in Kathmandu. There were offices ‘Banaune Addas’ in other parts of the country, which were to take care for all types of Civil Engineering Works.

After 2007 B.S. Public Works Department (PWD) was formed for construction and maintenance for all civil engineering works including road works.

The modern office ‘Department of Roads’ was separated from PWD only in 2027. Before DOR the Road Transport Office (RTO) was formed for road works consisting engineers from Nepalese, Indian and USA.

Some of early roads include urban roads in Kathmandu and the Tribhuvan Rajpath (2013 BS) connecting Kathmandu with outside the valley through Bhainse.

Names of Department chiefs after the formation of PWD (2007 BS) are listed below:

SN	Name	Numbers of years served			
		PW D	RTO	DOR	
				Chief Engineer	Director General
1	Kul Ratna Tuladhar	7			
2	Bishnu Bahadur Karki		4	1	
3	Gyan Prasad Sharma			8	
4	Birendra Keshari Pokarel			2	
5	Dipti Jung Thapa			5	
6	Birendra Pratap Shah			6	
7	Shiv Bahadur Pradhanang			6	
8	Narayan Datta Sharma			1	3
9	Ram Babu Sharma				1
10	Varun Prasad Shrestha				1
11	Niranjana Prasad Chalise				>3
12	Mohan Bahadur Karki				2
13	Bharati Sharma				<1
14	Ananda Prasad Khanal				>2
15	Madan Gopal Maleku				Newly appointed

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Continued from page 1

**Brief CV of Madan Gopal Maleku, DG, DOR**

Year of Birth: 1949.  
 Graduation: MSc. in Civil Engineering, Moscow, Russia.  
 Deputy Director General, Foreign Cooperation Branch DOR  
 (1998 Sep. – 2002 Jan. and 1995 Nov. –1997 Aug.)  
 Regional Director, Central Region in Kathmandu, DOR  
 (1997 Aug. - 1998 Sep. and 1993 Sep. – 1995 Nov.)  
 Project In-charge, Track and Trail Project, MLD (1992 Sep. - 1993 Sep.)

Division Chief, Kathmandu Division Road Office (1989 Sep. –1991 Aug.)

Program Coordinator, Road Flood Rehabilitation Project and Senior Divisional Engineer, Planning Branch, DOR (1984 Jul. – 1989 Sep.)

Divisional Engineer, MLD (1985 Dec. – 1988 Jul.)

District Engineer, Bhairawa Sub-Division, Rupandehi District Road Office (1980 Sep. - 1985 Dec.)

Engineer

Bharda Sub-Division, Planning, programming and Road maintenance and rehabilitation of Roads (1979 Feb. –1980 Sep.)

Design section, Department of Roads (1976 Nov. – 1978 Feb.)

Nepalgunj-Surkhet Road Project, for reconnaissance survey, feasibility survey and detailed survey (1972 Nov. – 1976 Oct.)

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**News from The Roof-Top of World**

**Road Network in Tibet**

In Tibet, the first two Highways known as “rainbow roads” connecting Sichuan-Tibet and Qinghai-Tibet were completed in December 1954. Later, a number of trunk roads including Xinjiang-Tibet and Yunnan-Tibet highways were built. This highway network ushered in a new era in the development of Tibet’s transportation.

Among these four highways, the Sichuan-Tibet Highway is considered the most dangerous road in the world, because it is subject to frequent landslides and mud-rock flows.

The Tibetan Plateau has a unique natural environment and varied topographical, geological and climatic conditions. Often these roads are damaged by natural disasters. Developing transportation facilities on the Tibetan Plateau is more difficult than in other parts of the country.

Between 2000 and 2005, Tibet will totally renovate the China-Nepal Highway, sealing the surface of the entire route with asphalt.

The Qinghai-Tibet Railway, a gigantic project attracting worldwide attention, was inaugurated simultaneously at Golmud in Qinghai, and Tibet’s Lhasa. Tibet having no railway will soon become a thing of the past. The Qinghai-Tibet Railway will help them realize their dreams to see the outside world.

Hence, the future transportation network of Tibet will consist of highways, railways and airways.

As far as the highway network is concerned, in the coming 20 years, road network will be expanded to areas bordering Myanmar, India, Bhutan, Nepal and Kashmir.

The Central Government plans to make enormous investments in this, the world’s highest and longest railway on the rooftop of the world, which is expected to boost the economic development of Tibet.

\* \* \*

**Average Daily Traffics (ADT)**

A three-day survey was conducted for manual counting of vehicular traffic under Design and planning Branch, DOR at 155 stations throughout Nepal on Strategic Road Network in 2001 (2057). Below in the table below are given ADT values. ADT can be converted to annual ADT (AADT) by multiplying them by corresponding seasonality factor. The seasonality factor for each station as per monthly variation can be obtained from HMIS unit, DOR.

**ADT 2001**

Road Link	Location	Station No.	ADT
H0101	Charali East	54	957
H0102	Charali West	55	1104
H0108	Itahari East	56	2477
H0109	Itahari West	57	1828
H0111	Kosi Barrage	58	1329
H0115	Lahan	59	1280
H0120	Dhalkebar East	60	1343
H0121	Dhalkebar West	61	1431
H0128	Pathalैया East	62	1675
H0129	Pathalैया south	63	2575
H0132U	West from Hetaunda	64	2643
H0134	Narayanghat East	65	3168
H0138	Gaindakot	66	2619
H0141	Bhardaghat West	67	2015
H0144U	Butwal East	68	2767
H0146U	Butwal West	69	2327
H0149	Jitpur South	70	341
H0150	Gorusinge West	71	625
H0151	Chanauta West	72	933
H0153	Bhalubang West	73	317
H0155	Ameliya	74	992
H0157	Kohalpur East	75	993
H0158	Kohalpur West	76	913
H0163	Attariya East	77	799
H0164	Attariya West	78	759
H0204	Pathalैया South	79	2575
H0205U	Hetaunda North	80	323
H0214	Nagdhunga	81	4333
H0304	Manohara Bridge	82	8730
H0310U	(Dhilikhel) Panchkhal, EMC	83	978
H0315	Lamosangu North	84	386
H0404	East from Mugling	85	3416
H0405	Mugling Bridge	86	1130
H0411	Pokhara East	87	833
H0503	South from Mugling	88	3228
H0602	Dhudhmadi Bridge	89	317
H0604	Dhalkebar South	90	1349
H0607	Bardibas north	91	192
H0705	Charali North	92	390
H0707	Fikkal Chibitar	93	473
H0709	Ilam North	94	352
H0803	Itahari South	95	2457
H0804	Itahari north	96	1744
H0806	Dharan North	97	365
H0901	Kadmaha	98	326
H1002	Butwal South	99	3383
H1004U	Butwal North	100	1052
H1008	Bartung North	101	352
H1012	Pokhara South	102	296
H1101	Ameliya North	103	63

H1103U	Tulsipur North	104	256
H1204	Kohalpur South	105	1567
H1205	Kohalpur North	106	402
H1208	Chinchu North	107	102
H1308	Surkhet North	108	179
H1402	Attariya South	109	992
H1403	Attariya North	110	425
H1407	Syaule South	111	50
H1408	Syaule North	112	116
H1410	Khodpe North	113	60
H1412	Satabanjh North	114	21
H1501	Syaule East	115	51

persons can have an access to report, which is available at SMD Co-ordination Unit.

### Main findings and recommendations

(according to the External Evaluation Team)

- Improvements of the road condition testify to the validity of a system in which the maintenance is being carried out based on systematic and decentralized planning through a transparent decision making process.
- SMD so far has not addressed gender and poverty, the main reason being a lack of effective guidance.
- Sustainability calls for decisions in three areas: management (keeping an adequate structure to monitor the DROs), legislation (to protect the road from man-made damages), and planning of periodic maintenance (so far not addressed by SMD).

### Strategic options suggested by the team

**1.Consolidation Phase** with the vision to establish the planned system of carrying out routine and recurrent maintenance in a sustainable way in all 25 division of DOR.

**2.New challenge Phase** with a vision to improve countrywide the maintenance of SRN, with the decentralized structures taking new responsibilities in a sustainable way.

Potential new responsibilities include:

- Addressing planned periodic maintenance
- Broadening the scope to bridge and off-road maintenance
- Addressing gender balanced development and poverty
- Involving NGOs and CBOs

**Conclusion:** All concerned have felt that the programme has brought substantial changes in attitude of road maintenance practice in the country. It has reasonably increased the level of awareness pertaining to the value of maintenance among the road authorities, road users and policy makers. However, the process has still to achieve a lot to attain a full-fledged maintenance management system in the Department. For this reason the forthcoming phase of SMD programme would be very important, which could lead us to the targeted goal of supporting the planned maintenance. Department has to formulate the basic concept for the new phase keeping in mind the real needs of the organization, its capability to cope with the new challenges and the sustainable resources required for new task. For this necessary homework has to be carried out and participatory approach should be adopted to finalize the need based demands.

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### Special Section

## Reinforced Soil (Soil Nailing) Technique

(Sudarshan Lal Shrestha, Engineer)

## Other Transport Mode

### Rail link to Biratnagar

Biratnagar – an eastern custom point of Nepal, will be linked with 107km broad-gauge railway line connecting Katihar of Bihar in India. The Rs. 2 billion worth railway project will be financed by the Central Government of India and will be completed within 18 months.

Since the project is soon to complete, Nepalese entrepreneurs have suggested to construct an Export Promotion area to catch with the project's infrastructure. Department of Roads and other authorities should take consider this development for their forthcoming plan.

Transport problem will be solved with the extension of Calcutta–Katihar line up to Biratnagar, which will eliminate loading and unloading processes. This ultimately will reduce transportation time and cost.

The daily Kathmandu Post has further reported that the railway line will be extended up to Dharan to link up with BP Memorial Hospital.

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## Gender and Poverty Issues

### In the New Phase of SMDP

Planned Maintenance is one of the key strategies adopted by the Department of Roads for the achievement of its end goal. Being a service delivery public agency, its attention is always focused on maintaining all roads in strategic network up to the desired level of services. SMDP has played vital role in developing and establishing maintenance management system in the Department. Regional directorates and division road offices are being supported continuously for the implementation of SMD process. By now SMD has become another name for the planned maintenance within the Department. The ongoing second phase of SMD Programme is completing by the end of June 2002. Last September, an external evaluation team (EET) comprising of expatriate consultant (team leader) and two local consultants carried out the overall evaluation of the programme. Evaluation report has been now published and widely distributed among the participants of External Evaluation Workshop held on 3<sup>rd</sup> October 2001. Interested

**Soil nailing** - is the technique to stabilize the existing or excavated slopes and fill materials by reinforcing the in-situ ground with tension resistance soil nails.

**Material of soil nails** - may be of either metallic or polymeric.

**Position of soil nails** - They are normally be installed at slight downward inclination (10° to 70°) to the horizontal and are inserted into the soil mass either using displacement technique or grouted into predrilled hole.

**Soil type in the strength** - range  $\phi = 15^\circ$  to  $50^\circ$ , value of  $c$  may be included, as well as pore water pressure and unlimited surcharge applied at the top of the slope.

**Design steps of Soil Nailing:**

- i. The position of critical slip surface is determined as accurately as possible.
- ii. The resisting moment required to maintain the equilibrium of the active zone determined.
- iii. The Tensile and shearing loads are determined for an initial constant spacing and inclination of nails of constant stiffness and length.
- iv. The distribution of pressure along the length of the nail in the resisting zone is determined.
- v. A check of each level, allowing the stage of construction, against, failure due to.
  - a. Tension in the nail at the slip surface.
  - b. Pull out of the length of the nail in resistance zone.
  - c. Bending and shear in the nail near the slip surface.
  - d. Bearing failure of the soil against nail.

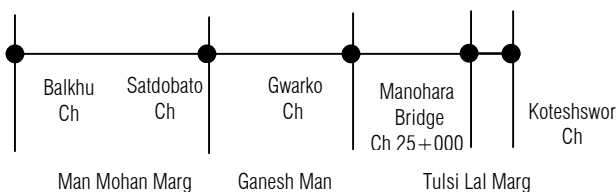
**Construction procedure** - The construction of soil nailing is done by inserting the nail directly into the existing mass of earth at downward angle of inclination to horizontal. In addition to the construction process for the excavated slope the nailing is done at the top level and proceed downwards, such that the upper nails are loaded first.

**Application** - Most of the application of soil nailing has been associated with new construction such as foundation excavation and slope stabilization for both temporary and permanent structures. However, there are an increasing number of applications where precast and prefabricated facing units are used to facilitate construction. Improved appearance provides long term durability or enhanced noise absorption.

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**Four Lane Wide Ring Road**

**Lalitpur Sub-Metropolitan City (LSMC) Area**



The LSMC has planned to widen its 7km-part of 27km long Ring Road to a four-lane width in phases according to LSMC Mayor, Buddhi Raj Bajracharya and Head of planning and urban development, Prabin Shrestha.

The four lane widening programme of the LSMC precedes the DOR's plan of improving Ring Road to dual two lane with median.

However, the LSMC's plan is encouraging, which ultimately will help to pull out the traffic from Lalitpur city core area.

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**RMDP**

**Institutional Strengthening, Social Assessment and Resettlement & Rehabilitation Action Plan (RAP)**

Major project components of RMDP are as follows.

1. Establishment of Nepal Roads Board and Road Fund for sustainable road maintenance funding.
2. New construction of 200km fair weather earthen road to connect district headquarters (DHQs).
3. Upgrading of 250km of existing earth standard road to fair weather gravel standards connecting 3 DHQs.
4. Rehabilitation of 162km SRN in the western Development Region.
5. Periodic Maintenance 470km of highways and feeder roads.
6. Institutional Strengthening of MPPW and DOR in terms of developing technical audit capacity of the Ministry and developing institutional capacity of the DOR in the social and environmental aspects.

In RMDP, labour-based methods are adopted for new construction of civil works. In addition, in about 20% of total works, community based organization (CBOS) have participated in construction of road works for the benefit to the local people. CBOs were provided two-week training on labour-based construction methods. The project has also conducted training programmes for locals and contractors' principals, managers and supervisors.

Furthermore, the project is working on DOR's Human Resource Development (HRD) policy and strategies, strengthening of capabilities in EIA in the road sub-sector and strengthening of legal frameworks.

Environmental Management Action Plan (EMAP) requirements are generally new to the contractors and difficulties are being experienced for getting the EMAP requirements adhered.

Following completion of EIA or IEE, preparation of EMAPs and Social Assessment and preparation of the Resettlement and Rehabilitation Action Plan (RAP) have to be conducted. Implementation of Resettlement and Rehabilitation Action Plan (RAP) was the key activity for execution of civil works of new construction and upgrading components. Affected assets have been compensated and monitoring of the implementation of resettlement and rehabilitation action plan is being carried out by four different NGOs.

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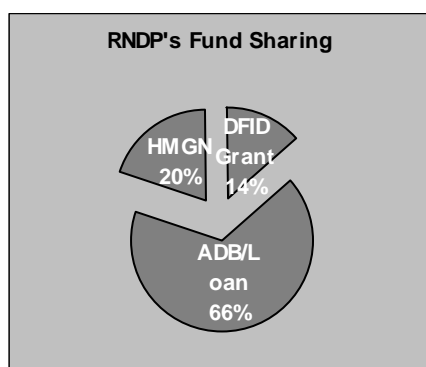
## ADB funded project

### Road Network Development Project (RNDP)

Road Network Development Project (RNDP) is a new name for Fourth Road Improvement Project.

The final estimate of the RNDP project is US \$69.5 million out of which:

- US \$9.6 million                      DFID grant assistance is
- US \$ 46.0 million                  ADB Loan
- US \$ 13.90 million                HMG/N



The following activities will be implemented under the RNDP:

1. East-West Highway Strengthening (Bebari -Chaurahawa)
2. Roads Improvement:                      164km
 

Dolalghat – Chautara Road	25km
Biratnagar – Bardanga Road	39km
Udayapur – Bardanga Road	28km
Damak – Gaurigunj Road	22km
Pouwa Bhanjyang – Phidim Road	24km
Hile – Basantapur Road	26km
3. Feeder Road construction (new)  
Basantapur – Khandabari Road: 96km
4. Other Projects  
Performance based maintenance 200~300km.  
Cross border accesses

Road Safety and axle-load control  
Community facilities  
Consulting  
Project Management  
Land acquisition/resettlement plan

### Institutional Strengthening and Social Development Intervention Programmes in RNDP

1. The component includes use of community-based organization (CBOs) through local consultative forums (LCFs) in construction of Basantapur – Khandabari Road project. The project provides training local contractors under the Rural Access program (RAP) interventions as envisaged by the DFID. The aim is to assist the Poverty Intervention component by reducing poverty.

2. Road Safety and Axle Load Control (RSALC) Component includes the following procedures:

- Selection and Improvement of selected black spots.
- Training and public awareness on road safety to be provided.
- Safety audit to be conducted to comply with safety requirements.

3. Performance Based Maintenance (PBM) Component includes the training DOR officials and local contractors for implementation of the ongoing works.

4. Poverty Interventions include Physical Interventions, Social Development Intervention and Community based construction of facilities.

- Physical Interventions are to improve rural accessibility for the poor and their socially excluded by constructing tracks, trails, footpaths, pedestrians bridges, slope protection, bus station/stops and markets at community selected locations to meet their domestic, economic and social needs.
- Social Development Intervention is to ensure that poor and socially excluded can benefit from the longer-term socio-economic opportunities that the road may bring.
- Community based construction of facilities is to improve community access.
- Formation of a revolving fund and capacity building and training for community groups on how to use the income and invest in income generating activities.
- Enhancement and development of protective interventions.

The social development Intervention will also be financed and implemented by DFID. Further, Japan Fund for Poverty

Reduction financing (JFPR) on a grant basis will finance on some of the SDI programmes.

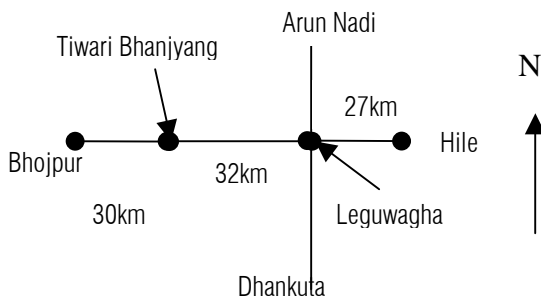
Finally, the poverty impact component is targeted to the rural poor and the disadvantage groups, including ethnic minority groups.

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## Road Construction with social awareness

### Rap – a new experience of DOR

Rural Access Programme (RAP) is a project targeted to develop transport infrastructure for provision of access to rural people to goods and services. DOR and DOLIDAR both are involved in RAP Feeder road and district road programmes respectively.



RAP is financed by DFID. 89km long Feeder road standard RAP road starts from Hile on the east, passes through Leguwaghat North of Dhankuta destined for Bhojpur after crossing Tiwari Bhanjyang (Refer to Schematic diagram). The innovative construction methodology uses labour-based environmentally sound methods with green road concepts.

Local laborers employment, use of low-cost structures with well-established bioengineering technique, the project will further involve local community labor groups for contracting of simple not complicated jobs. The community local group will not require special skill, but these groups will be informed through social awareness program which is a new approach employed so far in DOR. With 3 main working seasons it is envisaged to complete the work at the end of 2004. DOR will be responsible for Land acquisition and operation & maintenance (O & M) works. EIA of the feeder road will be a prerequisite as per environmental regulation.

An M & E team will watch all these works regularly. The project cost will be borne by £3,893,000 and HMG/N 778,600 (20%).

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## MTEF – Three Years Rolling Plan

Due to the problem of internal peace and security, country's economic growth is not as desired and suitable environment

for development is hampered as a result, the government is forced to curtailed development expenditure. This will also reduce government's ability to provide counterpart fund for donor-funded projects and programs. This has in fact challenged the fiscal discipline/public expenditure management of the country that has resource constraint even in normal circumstances.

It is in this context, the Medium term Expenditure Framework (MTEF) concept on the need for three-year forward planning, programming and budgeting system can be a laudable step towards establishing better planning practice. The adoption of this approach will certainly result in the judicious utilization of limited and scarce resources in prioritized projects leading to optimal use of the available resources in the country and help meeting the national and sectoral objectives.

Moreover, as the programmes and projects are well tied-up with resources, the element of uncertainty in the resource availability for the future is expected to be considerably minimized by this approach. This MTEF will help to translate the tenth plan into action program to achieve the target set. There is also a greater possibility of convincing donors directing their funds towards prioritized programs and projects to meet the national goals.

Despite all these positive side of the picture, institutionalization of MTEF can be a challenge particularly to replace the existing planning practices by this approach more or less abruptly. The other equally important issues to be resolved are related with poor and weak database for forward planning. The existing established planning practices probably might feel it difficult to internalized as quickly as desired by MTEF.

(Compiled by Lal Krishna KC, Technical Adviser to NPC/MPPW)

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## Banepa Sindhuli Bardibas Road Project

The construction of Banepa Sindhuli Bardibas Road started in November 1996 with a grant assistance of Government of Japan. The main objective of this road is to connect Capital city of Kathmandu with the Eastern Terai hence linking to neighboring cities in India. This road link is not only expected to provide an alternate link to Kathmandu with the Terai, it is also expected to bring considerable socio-economic changes along its corridor. This road joins Dhulikhel along the Arniko highway to Bardibas along the East West Highway with a length of about 158 km. For the construction purpose this road has been divided into four sections.

Section I	Bardibas- Sindhulibazar section ( 37 Km)
Section II	Sindhulibazar- Khurkot section ( 39 Km)
Section III	Khurkot - Nepalthok section (32 Km)
Section IV	Nepalthok-Dhulikhel section (50 Km)



Out of these sections, construction of **Bardibas - Sindhuli Bazar section** started in November 1996 and was completed in March 1998. The construction of this section included 9 numbers of bridges and 17 numbers of causeways over the 37 km of road, which was constructed in 1987. This section has been opened to traffic since its completion in 1998.

The construction of **Nepalthok-Dhulikhel section** started in April 1998 and is under construction. This section includes construction of 50 km of road with 5 numbers of bridges and 6 numbers of causeways. Out of 50 km 34 km section of this road has already been completed and is already opened to public traffic while rest of the road is expected to be complete by March 2003.

The construction of **Sindhulibazar-Khurkot section** started in January 2001, this section includes construction of 39 km of road with a bridge and 3 number of causeways. Earthwork over 12.5 km of this road section has been completed. This section is expected to be complete by 2007.

The construction of **Khurkot - Nepalthok section** has not yet been started and expected to be start soon.

## Environmental Issues

After the promulgation of Environmental Protection Act (EPA) for the first time during the basic design of section II Sindhulibazar Khurkot section, a Complete Environmental Impact Assessment was conducted. Extensive discussion on various aspects on environmental issues was discussed with the local people and their concerns are properly addressed. Furthermore, various slope stabilization techniques has been adopted, this includes use of retaining and breast walls, crib works, gabion works, geotextiles and most interesting being the bio-engineering works which includes the locally available techniques like plantation of trees, shrubs including turfing and the soil seeding method imported from Japan. Though initially this technique has been found little expensive because most of the materials used in this method being imported from Japan and for making this method economical effort has been made to use the locally available materials so that this method could be extensively used in Nepal.

## Other issues

In order to effectively address the most common local issues related to local drinking water supply and irrigation channels to the local fields. This project has taken this challenge to properly relocate the existing drinking water supply line and the irrigation channels so that the affect from these could be minimized. Extensive discussion with the locals regarding the environmental issues has been very useful for the project, however the late realization and awareness in these issues is still a challenge to the project to address issues to be faced in later stages of the project execution.

\* \* \*

## Intersections Improvement Project in Kathmandu City

Road intersections in Kathmandu are getting congested with the passage of time. Many factors, including the exponential increase in road traffic, are responsible for this. As a result of the congestion, road users and residents of the city have to endure more noise and air pollution, increased rate of accidents and longer commuting time.

The Government of Japan has provided a grant assistance to improve the situation. This project will thus be a landmark in the friendly relationship between Nepal and Japan. For the successful completion of the project and trouble free operation thereafter, proper coordination of the relevant agencies and cooperation of the road users are expected. Following the survey and design phases, physical works have already started.

### Organization

- Donor: Government of Japan
- Facilitating agency: JICA
- Client: MOPPW, DOR
- Consultant: Nippon Koei Co. Ltd., Japan
- Contractor: Obayashi Corporation, Japan

### Objectives

The project envisage to improve the following 10 intersections located along the arterial roads in Kathmandu from November 21, 2001 to March 15, 2003:

- |                      |                  |                            |
|----------------------|------------------|----------------------------|
| 1. Maitighar         | 2. Kalimati      | 3. Koteswar-Tinkune        |
| 4. Padmodaya Turning | 5. Keshar Mahal  | 6. Koteswar-Ring Road      |
| 7. Naya Baneshwar    | 8. Singha Durbar | 9. Dillibazar-Ramshah Path |
| 10. Kalanki Chowk    |                  |                            |

### Scope

The project consists of the following major components:

- Installation of traffic signals and street lights
- Pavement works
- Reconstruction of walkways, drainage, flag-post, handrail
- Improvement of traffic sign, motorcycle storage lanes, bus lay-byes
- Road marking
- Road safety education campaigns

### Effects

- Provision of turning and storage lanes, traffic signals, good drainage and bus lay-byes will definitely increase the capacity of the intersections.
- Past studies have indicated that road accidents in Kathmandu are concentrated at road intersections. The

improved intersections will decrease the rate of road accidents.

- By reducing the chances of traffic jams, unnecessary burning of fuel oil and the emissions resulting from it will be minimized. The roadside environment will be enhanced further by providing planting zones.
- The traffic signals will be operated by solar cell system for the first time in Nepal. The normal city power supply will be used as backup. Similarly, instead of the conventional incandescent bulbs, light-emitting diodes

(LED) will be used in the signal heads. This will ensure reliability of the signal system and minimize operation costs.

Due to the safety campaigns in cooperation with the police, considerable behavioral change of the road users is expected.

\* \* \*



## NEPAL ROAD STATISTICS 2000

## ROAD LENGTH (km)

SN	Region/Zone/District	Type of Road			Total	Road Category					Total
		BT	GR	ER		NH	FRN	FRO	DR	UR	
1	Taplejung	0	18	19	37	26	0	0	11	0	37
2	Panchthar	8	83	67	158	93	0	0	65	0	158
3	Ilam	114	2	245	361	97	11	0	240	13	361
4	Jhapa	153	235	213	601	111	35	0	370	85	601
<b>Total in Mechi Zone</b>		<b>275</b>	<b>338</b>	<b>544</b>	<b>1157</b>	<b>327</b>	<b>46</b>	<b>0</b>	<b>686</b>	<b>98</b>	<b>1157</b>
5	Morang	147	217	326	690	56	24	0	482	128	690
6	Sunsari	146	203	122	471	89	0	0	226	156	471
7	Dhankuta	52	23	118	193	48	17	0	113	15	193
8	Terhthum	0	4	41	45	0	30	0	15	0	45
9	Sankhuwasabha	0	0	40	40	0	0	0	40	0	40
10	Bhojpur	0	0	3	3	0	0	0	3	0	3
<b>Total in Koshi Zone</b>		<b>345</b>	<b>447</b>	<b>650</b>	<b>1442</b>	<b>193</b>	<b>71</b>	<b>0</b>	<b>879</b>	<b>299</b>	<b>1442</b>
11	Okhaldungha	0	0	17	17	0	0	0	17	0	17
12	Udayapur	16	72	111	199	36	0	0	158	5	199
13	Saptari	145	54	96	295	71	41	0	161	22	295
14	Siraha	80	117	103	300	43	27	0	205	25	300
<b>Total in Sagarmatha Zone</b>		<b>241</b>	<b>243</b>	<b>327</b>	<b>811</b>	<b>150</b>	<b>68</b>	<b>0</b>	<b>541</b>	<b>52</b>	<b>811</b>
<b>Total in Eastern Region</b>		<b>861</b>	<b>1028</b>	<b>1521</b>	<b>3410</b>	<b>670</b>	<b>185</b>	<b>0</b>	<b>2106</b>	<b>449</b>	<b>3410</b>
15	Dhanusa	110	103	384	597	61	0	0	490	46	597
16	Mohattari	88	149	166	403	43	0	0	334	26	403
17	Sarlahi	63	331	117	512	31	27	0	439	14	512
18	Sindhuli	0	26	68	94	28	0	0	66	0	94
19	Ramechhap	0	6	28	34	0	16	0	18	0	34
20	Dolkha	87	42	49	178	0	68	38	72	0	178
<b>Total in Janakpur Zone</b>		<b>348</b>	<b>657</b>	<b>813</b>	<b>1818</b>	<b>163</b>	<b>111</b>	<b>38</b>	<b>1420</b>	<b>86</b>	<b>1818</b>
21	Sindhupalchowk	67	53	87	207	55	73	0	79	0	207
22	Kabrepalanchowk	85	42	258	385	60	21	1	291	12	385
23	Lalitpur	136	63	139	338	0	0	35	196	107	338
24	Bhaktpur	73	55	49	177	15	23	0	134	5	177
25	Kathmandu	493	172	139	804	21	17	43	267	456	804
26	Nuwakot	64	14	160	238	0	63	0	162	13	238
27	Rasuwa	0	12	90	102	0	39	0	63	0	102
28	Dhading	103	38	111	252	93	18	0	141	0	252

## DOR - HMIS News No. 17

<b>Total in Bagmati Zone</b>	<b>1021</b>	<b>449</b>	<b>1033</b>	<b>2503</b>	<b>244</b>	<b>254</b>	<b>79</b>	<b>1333</b>	<b>593</b>	<b>2503</b>
29 Makwanpur	161	103	62	326	141	33	0	116	36	326
30 Rautahat	74	37	115	226	26	44	0	148	8	226
31 Bara	83	70	182	335	65	12	0	244	14	335
32 Parsa	82	65	190	337	21	3	0	293	20	337
33 Chitwan	197	415	186	798	89	5	0	352	352	798
<b>Total in Narayani Zone</b>	<b>597</b>	<b>690</b>	<b>735</b>	<b>2022</b>	<b>342</b>	<b>97</b>	<b>0</b>	<b>1153</b>	<b>430</b>	<b>2022</b>
<b>Total in Central Region</b>	<b>1966</b>	<b>1796</b>	<b>2581</b>	<b>6343</b>	<b>749</b>	<b>462</b>	<b>117</b>	<b>3906</b>	<b>1109</b>	<b>6343</b>

## NEPAL ROAD STATISTICS (CONTINUED)

SN	Region/Zone/District	Type of Road			Total	Road Category					Total
		BT	GR	ER		NH	FRN	FRO	DR	UR	
34	Gorkha	25	3	105	133	0	24	0	105	4	133
35	Lamjung	19	0	62	81	0	19	0	62	0	81
36	Tanahun	104	15	166	285	72	25	0	184	4	285
37	Syangja	84	0	101	185	79	0	0	101	5	185
38	Kaski	206	25	179	410	35	44	5	109	217	410
<b>Total in Gandaki Zone</b>		<b>438</b>	<b>43</b>	<b>613</b>	<b>1094</b>	<b>186</b>	<b>112</b>	<b>5</b>	<b>561</b>	<b>230</b>	<b>1094</b>
39	Myagdi	0	1	13	14	0	13	0	0	1	14
40	Parbat	26	2	14	42	0	24	0	14	4	42
41	Baglung	6	1	26	33	0	12	0	17	4	33
<b>Total in Dhaulagiri Zone</b>		<b>32</b>	<b>4</b>	<b>53</b>	<b>89</b>	<b>0</b>	<b>49</b>	<b>0</b>	<b>31</b>	<b>9</b>	<b>89</b>
42	Gulmi	0	0	171	171	0	45	0	126	0	171
43	Palpa	73	23	194	290	59	34	0	150	47	290
44	Nawalparasi	139	63	46	248	98	30	0	117	3	248
45	Rupandehi	134	99	34	267	78	23	6	95	65	267
46	Kapilbastu	142	119	75	336	61	65	18	157	35	336
47	Arghakhanchi	4	23	187	214	4	57	0	153	0	214
<b>Total in Lumbini Zone</b>		<b>492</b>	<b>327</b>	<b>707</b>	<b>1526</b>	<b>300</b>	<b>254</b>	<b>24</b>	<b>798</b>	<b>150</b>	<b>1526</b>
<b>Total in Western Region</b>		<b>962</b>	<b>374</b>	<b>1373</b>	<b>2709</b>	<b>486</b>	<b>415</b>	<b>29</b>	<b>1390</b>	<b>389</b>	<b>2709</b>
48	Pyuthan	0	44	120	164	0	60	25	79	0	164
49	Rolpa	0	0	63	63	0	39	0	24	0	63
50	Salyan	0	0	205	205	96	13	0	96	0	205
51	Dang	140	246	144	530	123	55	0	335	17	530
<b>Total in Rapti Zone</b>		<b>140</b>	<b>290</b>	<b>532</b>	<b>962</b>	<b>219</b>	<b>167</b>	<b>25</b>	<b>534</b>	<b>17</b>	<b>962</b>
52	Banke	169	61	109	339	128	15	0	180	16	339
53	Bardiya	117	93	95	305	89	58	0	145	13	305
54	Surkhet	47	71	211	330	90	78	0	143	19	330
55	Dailekh	0	0	143	143	54	45	0	44	0	143
56	Jajarkot	0	0	27	27	0	27	0	0	0	27
<b>Total in Bheri Zone</b>		<b>333</b>	<b>226</b>	<b>585</b>	<b>1144</b>	<b>361</b>	<b>223</b>	<b>0</b>	<b>512</b>	<b>48</b>	<b>1144</b>
<b>Total in M. W Region</b>		<b>473</b>	<b>516</b>	<b>1117</b>	<b>2106</b>	<b>580</b>	<b>390</b>	<b>25</b>	<b>1046</b>	<b>65</b>	<b>2106</b>
57	Bajura	0	0	7	7	0	0	0	7	0	7
58	Bajhang	0	0	85	85	0	82	0	3	0	85
59	Achham	0	26	49	75	0	26	0	49	0	75
60	Doti	73	41	35	149	73	41	0	27	8	149

**DOR - HMIS News No. 17**

61	Kailali	159	98	129	386	151	12	0	210	13	386
<b>Total in Seti Zone</b>		<b>232</b>	<b>165</b>	<b>305</b>	<b>702</b>	<b>224</b>	<b>161</b>	<b>0</b>	<b>296</b>	<b>21</b>	<b>702</b>
62	Kanchanpur	51	80	54	185	44	0	0	123	18	185
63	Dadeldhura	72	0	96	168	80	0	0	88	0	168
64	Baitadi	0	0	242	242	101	36	0	105	0	242
65	Darchula	0	0	40	40	40	0	0	0	0	40
<b>Total in Mahakali Zone</b>		<b>123</b>	<b>80</b>	<b>432</b>	<b>635</b>	<b>265</b>	<b>36</b>	<b>0</b>	<b>316</b>	<b>18</b>	<b>635</b>
<b>Total in F. W Region</b>		<b>355</b>	<b>245</b>	<b>737</b>	<b>1337</b>	<b>489</b>	<b>197</b>	<b>0</b>	<b>612</b>	<b>39</b>	<b>1337</b>
<b>Total in Nepal (km)</b>		<b>4617</b>	<b>3959</b>	<b>7329</b>	<b>15905</b>	<b>2974</b>	<b>1649</b>	<b>171</b>	<b>9060</b>	<b>2051</b>	<b>15905</b>

**ROAD CONDITION OF NATIONAL HIGHWAYS IN 2000/2001  
BLACK TOP ROAD**

Ref. Code	Link Name	IRI	Length	G/F/P	Ref. Code	Link Name	IRI	Length	G/F/P
		(m/km)	km				(m/km)	km	
<b>H02</b>	<b>TRIBHUVAN RAJPATH</b>								
H0201U	Sirsiya Border-Jn.Old Alignment	4.07	1.33	F	H0209	Simbhanjyang-Palung	5.27	14.84	G
H0202U	Jn. Old Alignment-Gandak Canal	4.31	7.30	G	H0210	Palung-Tistung	5.68	4.78	F
H0203	Gandak Canal-Jitpur	4.15	12.52	G	H0211	Tistung-District Border	5.84	17.80	F
H0204	Jitpur - Pathlaiya	4.25	6.89	G	H0212	District Border-Naubise	5.59	17.11	F
H0205U	Hetauda - Samari	4.28	3.31	G	H0213	Naubise-Pipalamod	4.31	10.66	G
H0206	Samari-Bhainse	4.77	7.90	F	H0214	Pipalamod-Nagdhunga	4.43	1.89	G
H0207	Bhainse-Lamidanda	5.61	18.11	F	H0215	Nagdhunga-Ring Road(Kalanki)	4.47	9.11	G
H0208	Lamidanda-Simbhanjyang	6.54	22.65	P	H0216U	Ring Road(Kalanki)-Tripureswor	4.20	3.46	G

<b>H06</b>	<b>DSB RAJMARG</b>								
H0601U	Bhittamode - Jaleswor Munc. Border	4.83	5.61	F	H0603	Dhudmati - Janakpur Munc. Border	4.90	6.03	F
H0602	Jaleswor Munc. Border - Dhudmati	4.81	12.20	F	H0604	Janakpur Munc. Border - Dhalkebar	4.88	19.10	F

<b>H01</b>	<b>MAHENDRA RAJMARG</b>								
H0101	Kakarbhitta - Charali	4.18	11.25	G	H0135U	Tikauli - Hakim Chowk	4.51	2.06	G
H0102	Charali - Birtamod	4.20	6.27	G	H0136U	Hakim Chowk - Narayanghat	4.67	3.63	G
H0103	Birtamod - (Padjogi) Damak	4.23	29.51	G	H0137U	Narayanghat - Narayani Bridge	4.21	0.14	G
H0104	(Padjogi) Damak - Ratuwa	4.30	0.96	G	H0138	Narayani Bridge - Jn. Tiger Mountain	4.63	35.26	F
H0105U	Ratuwa - Mawa	4.18	6.76	G	H0139	Jn. Tiger Mountain - Arung Khola	4.79	14.93	F
H0106	Mawa - Harichamod	4.17	26.11	G	H0140	Arung Khola - Bardaghat	4.79	24.87	G
H0107	Harichmod - Budhi Khola	4.10	10.19	G	H0141	Bardaghat - Sunwal	4.52	17.46	F
H0108	Budhi Khola - Itahari	4.16	1.35	G	H0142	Sunwal - Maha Khola	4.41	5.81	G
H0109	Itahari - Sakuwa Gachhi	4.23	15.25	F	H0143	Maha Khola - Sukoura	4.49	11.97	G
H0110	Sakuwa Gachhi - Sunsari Bridge	4.15	3.41	G	H0144U	Sukoura - Butwal (Milan Chowk)	4.55	3.36	G
H0111	Sunsari Bridge - Koshi Barrage	4.18	23.88	G	H0145U	Butwal - Butwal (Mahendra Chowk)	4.66	1.40	G
H0112	Koshi Barrage - Bhardaha	4.48	6.02	G	H0146U	Butwal - Bahama Khola	5.07	9.54	G
H0113	Bhardaha - Rupani	4.07	30.79	G	H0147	Bahama Khola - Kothi River	4.95	17.24	G
H0114	Rupani - Kadmaha	4.24	20.68	G	H0148	Kothi River - Jitpur	5.09	4.92	G
H0115	Kadmaha - Balan	4.20	1.55	G	H0149	Jitpur - Gorusinghe	5.01	14.60	F
H0116U	Balan - Padariya Chowk	4.27	5.14	G	H0150	Gorusinge - Chanauta	4.94	19.27	F
H0117	Padariya Chowk - Chouharwa	4.20	19.66	G	H0151	Chanauta - Dhana Khola	5.08	22.05	F
H0118	Chouharwa - Mirchaiya	4.69	5.15	G	H0152	Dhana Khola - Bhalubang	5.25	12.24	F
H0119	Mirchaiya - Kamala	4.69	13.32	G	H0153	Bhalubang - Lamahi	5.00	27.02	G
H0120	Kamala - Dahlkebar	4.55	20.57	G	H0154	Lamahi - Ameliya	5.07	35.18	F
H0121	Dhalkebar - Ratu	4.66	8.01	G	H0155	Ameliya - Shiva Khola	5.26	2.66	G
H0122	Ratu - Bardibas	4.70	1.89	G	H0156	Shiva Khola - Khairi Khola	5.12	35.62	F
H0123	Bardibas - Banke	4.52	15.59	G	H0157	Khairi Khola - Kohalpur	4.88	35.27	G
H0124	Banke - Nawalpur	4.64	16.88	G	H0158	Kohalpur - Man River	4.56	12.13	G
H0125	Nawalpur - Bagmati	4.60	13.35	G	H0159	Man River - Bhuregaon	4.66	41.63	F
H0126	Bagmati - Chandranigahapur	4.69	13.71	G	H0160	Bhuregaon - Karnali	4.66	22.71	F
H0127	Chandranigahapur - Dhansar	4.58	12.68	G	H0161	Karnali - Junga	4.77	14.48	G
H0128	Dhansar - Pathlaiya	4.58	27.71	G	H0162	Junga - Bhadaipur Chouraha	4.74	34.08	G
H0129	Pathlaiya - Chure	4.31	19.34	F	H0163	Bhadaipur Chouraha - Atariya	4.79	29.79	G
H0130	Chure - Ratmate	4.31	4.39	G	H0164	Atariya - Mohana Bridge	4.77	4.25	G

**DOR - HMIS News No. 17**

H0131	Ratmate – Hetauda	4.27			H0165	Mohana Bridge - Daiji	4.68	28.16	G
H0132	Hetauda - Saraswoti Khola	4.58	5.34	G	H0166	Daiji - Sukhanala	4.81	6.90	G
H0133	Saraswoti Khola – Lothar	4.77	35.47	G	H0167U	Sukhanala - Gaddachauki	4.65	9.26	G
H0134	Lothar – Tikauli	4.50	30.23	F					

<b>H03</b>	<b>ARNIKO RAJMARG</b>								
H0301U	Maitighar – Tinkune	4.34	2.74	F	H0309U	Banepa - Chalnadhunga	4.84	1.91	P
H0302U	Tinkune – Koteswor	4.35	0.87	F	H0310U	Chalnadhunga - Khawa	4.70	5.87	F
H0303U	Koteswor - Manohara Bridge	4.32	0.78	P	H0311	Khawa - Lamidanda	4.56	13.32	F
H0304	Manohara Bridge - Sallaghari	5.34			H0312	Lamidanda - Dolalghat	4.67	12.15	G
H0305U	Sallaghari - Hanumante Culvert	5.12	3.64	P	H0313	Dolalghat - Lamosanghu	4.63	19.24	G
H0306	Hanumante Culvert – Sanga	4.51	5.14	G	H0314	Lamosanghu - Barabise	4.65	10.48	G
H0307	Sanga - Punyamati Bidge	4.45	4.18	G	H0315	Barabise - Kodari			
H0308U	Punyamati Bridge – Banepa	5.13	0.96	P					

**ROAD CONDITION OF NATIONAL HIGHWAYS IN 2000/2001**  
**BLACK TOP ROAD**  
(Continued)

<b>H04</b>	<b>PRITHIVI RAJMARG</b>								
H0401	Naubise – Galchhi	4.26	22.06	G	H0407	Anbukhaireni - Dumre	4.66	16.65	G
H0402	Galchhi - Jn. Trisuli Bridge	4.26	20.48	G	H0408	Dumre - Muse Khola	4.75	14.11	G
H0403	Jn. Trisuli Bridge - Mawa Khola	4.27	24.07	G	H0409	Muse Khola - Byas Munc. Border	4.96	5.32	G
H0404	Mawa Khola – Mugling	4.21	16.35	G	H0410	Byas Munc. Border - Kotre	4.86	27.79	G
H0405	Mugling - Mugling Bridge	4.75	0.33	G	H0411	Kotre - Bijayapur Khola	5.34	14.04	F
H0406	Mugling Bridge - Anbukhaireni	4.47	7.38	G	H0412U	Bijayapur Khola - Prithvi Chowk	5.52	4.85	F

<b>H05</b>	<b>NARAYANGHAT-MUGLING</b>								
H0501U	Narayanghat – Anptari	4.75	2.45	G	H0503	Ramnagar - Mugling	4.94	30.16	G
H0502U	Anptari – Ramnagar	4.55	3.55	G					

<b>H07</b>	<b>MECHI RAJMARG</b>								
H0703	Jhapa Chowk - Bhaire Chowk	4.75	4.17	F	H0707	Fikkal - Mai Khola	4.71	25.08	G
H0704	Bhaire Chowk – Charali	4.38	10.37	F	H0708U	Mai Khola - Chureghati	4.61	14.42	G
H0705	Charali – Chihandand	4.28	16.78	G	H0709	Chureghati - Ranke	4.52	32.14	G
H0706	Chihandanda – Fikkal	4.64	23.06	G	H0710	Ranke - Phidim	6.34	7.00	G

<b>H09</b>	<b>SAGARMATHA RAJMARG</b>								
H0901	Kadmaha Chowk - Siswari Bridge	4.92	12.11	G	H0903	Cement Factory - Gaighat	5.13	6.00	F
H0902	Siswari Bridge - Cement Factory	4.87	8.61	F					

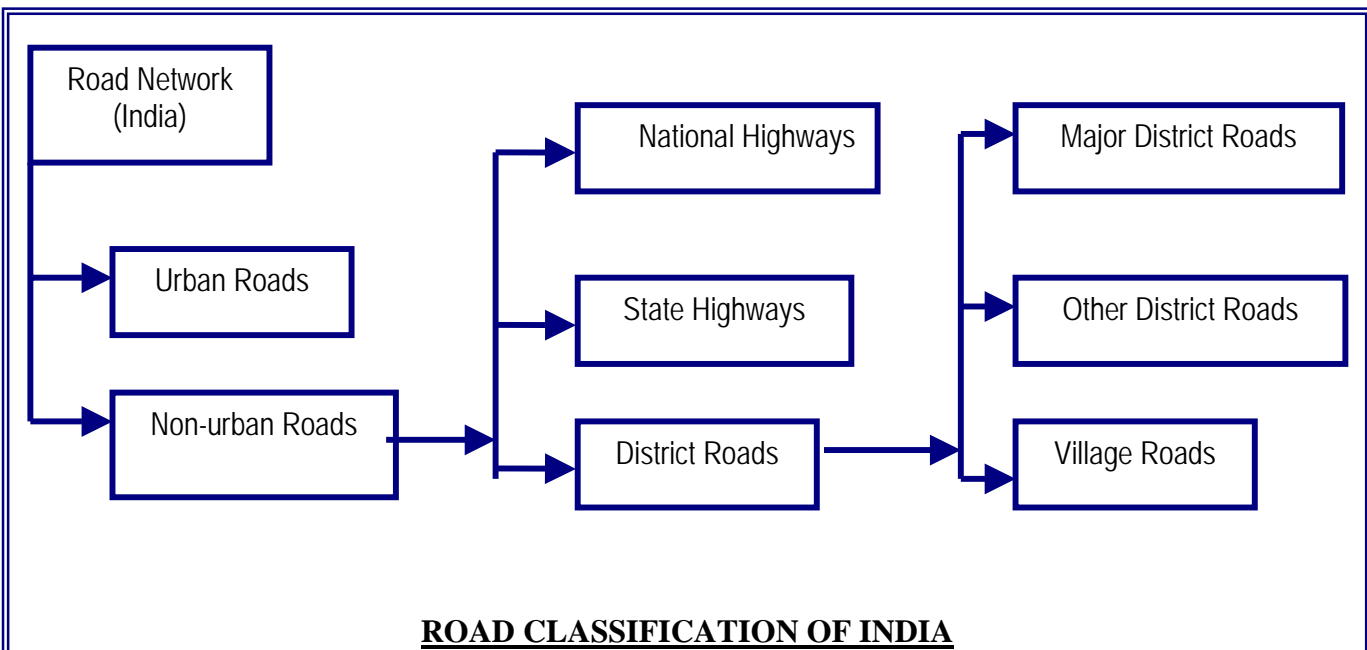
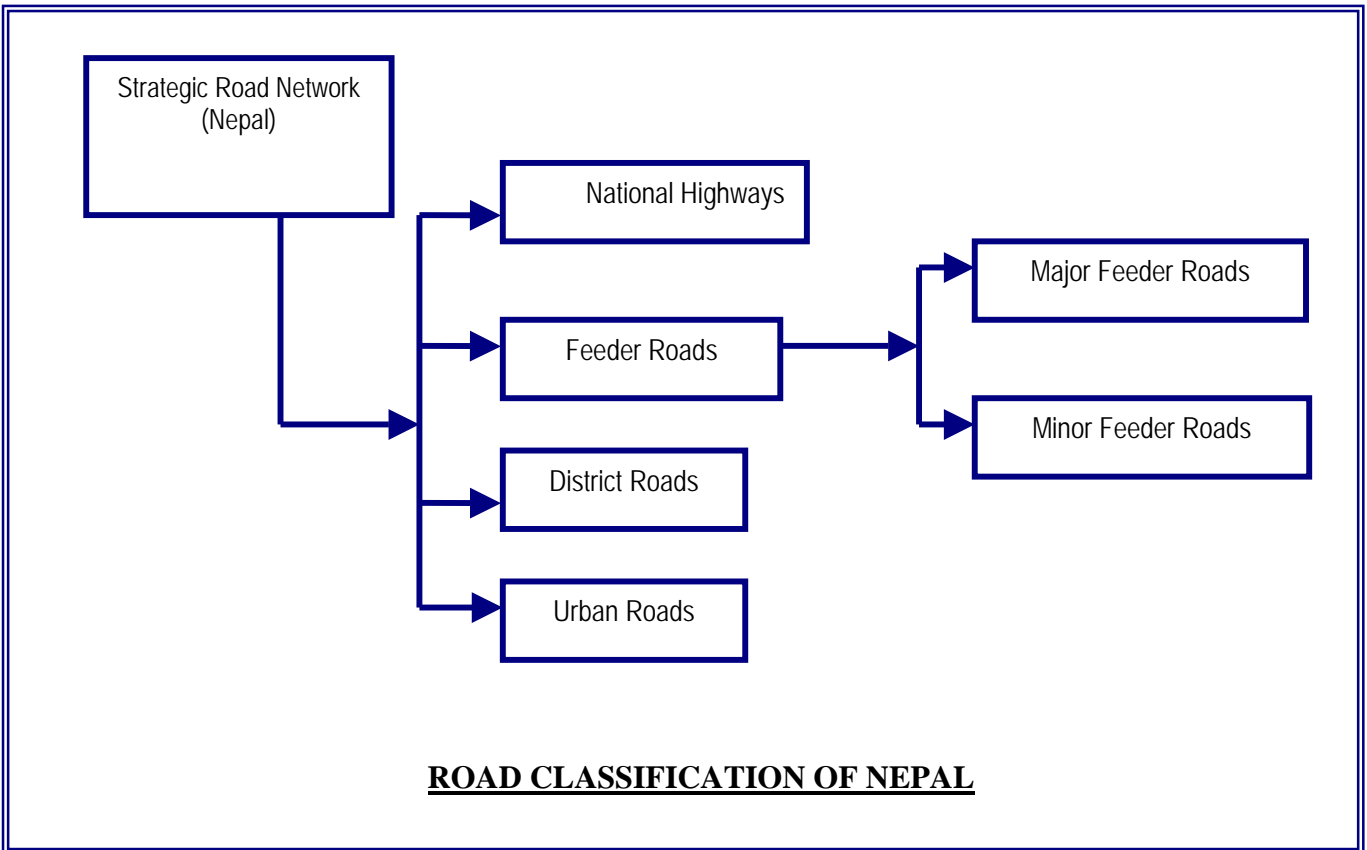
<b>H08</b>	<b>KOSHI RAJMARG</b>								
H0801U	Rani - Kanchanbari	4.59	13.37	G	H0806	Base Camp - Bhendetar	4.85	12.32	G
H0802	Kanchanbari - Duhabi	4.52	4.67	F	H0807	Bhendetar - Mulaghaat	4.76	18.38	G
H0803	Duhabi - Itahari	4.61	11.61	G	H0808	Mulghat - Patle Khola	4.78	11.58	G
H0804	Itahari - Seuti Bridge	4.23	11.09	G	H0809U	Patle Khola - Hile	4.91	18.31	G
H0805U	Seuti Bridge - Base Camp	4.28	10.13	G					

<b>H10</b>	<b>SIDDARTHA RAJMARG</b>								
H1001U	Belhiya - S'nagar Munc. Border	5.05	6.08	G	H1008	Tansen Munc. Border - Kaligandaki	7.51	25.15	P
H1002	S'nagar Munc. Border - Butwal Munc. Bdr.	5.07	16.03	F	H1009	Kaligandaki Bridge - Waling	7.30	30.71	P
H1003	Butwal Munc. Bdr - Milan Chowk	5.11	1.99	G	H1010	Waling - Syangja	6.24	27.62	F
H1004U	Mahendra Chowk - Chidiya Khola	4.85	2.74	G	H1011	Syangja - Kubinde	5.63	20.61	F
H1005	Chidiya Khola – Banstari	5.07	27.39	G	H1012	Kubinde - Pokhara Munc. Border	4.80	12.09	G
H1006	Banstari – Bartung	4.92	5.29	G	H1013U	Pokhara Munc. Border - Prithvi Chowk	4.70	4.42	G
H1007U	Bartung - Tansen Munc. Border	8.24	1.10	P					

<b>H12</b>	<b>RATNA RAJMARG</b>								
H1201	Jamuniya – Campus	5.13	2.01	G	H1206	Deurali - Harre	5.17	23.55	G
G	Campus – Dhamboji	5.02	4.02		H1207	Harre - Chhinchu	5.36	11.75	G
H1203U	Dhamboji - Munc. Border	5.11	1.28	G	H1208	Chhinchu - Newari Khola	5.15	25.40	G
H1204	Munc. Border – Kohalpur	4.67	15.02	G	H1209U	Newari Khola - Bangesimal	5.07	6.99	G

H1205	Kohalpur – Deurali	5.04	23.06	G					
<b>H13 KARNALI RAJMARG</b>									
H1301	Bangesimal – Jumla								
<b>H14 MAHAKALI RAJMARG</b>									
H1301	Mohan Bridge – Boradandi	5.19	6.23	F	H1405	Faltunde - Budar	4.83	11.38	G
H1402	Boradandi - Atariya	5.29	8.32	P	H1406	Budar - Gairha	4.87	22.08	G
H1403	Atariya - Godavari Bridge	5.25	9.01	G	H1407	Gairha - Syaule	4.82	29.74	G
H1404	Godavari Bridge - Faltunde	5.03	44.62	F					
<b>H15 SETI RAJMARG</b>									
H1501	Syaule Bazar - Korayal	5.15	24.96	F	H1503U	Samuhaghad - Jn. Sanfe Road	5.10	14.36	F
H1502	Korayal - Samuhaghad	4.89	24.73	F					

**ROAD CLASSIFICATION OF NEPAL & INDIA**  
(Source: WORLD HIGHWAYS)





Road classification systems of Nepal and India are presented here above. Comparison of systems will help to understand the systems of neighboring countries.

## INFORMATION OF RSSDU ACTIVITIES

These are lists of DOR staff having higher education. These include both DOR sponsored and self-financed.

### A. MSc Highway

SN	Name	Pos.	Year	Country
1	Yogendra K. Rai	DE	2046	UK
2	Mahendra B. Pradhanang	DE	2047	UK
3	Biplab K. Karki	DE	2049	UK
4	Pawan Karki	Er.	2049	UK
5	Ananda K. Bataju	DE	2049	UK
6	Sudarshan L. Shrestha	Er.	2053	UK
7	Umesh Jha	Er.	2053	UK
8	Hari P. Dahakal	DE	2054	UK

### B. MSc Bridge

SN	Name	Pos.	Year	Country
1	Prakash J Shah	DE	2043	UK
2	Pushpanjali Khanal	Er.	2054	UK

### C. MSc Geotechnical

SN	Name	Pos.	Year	Country
1	Rajendra P. Pradhanang	DE	2043	UK
2	Dinker Sharma	DE	2044	Thailand
3	Bhagawan Shrestha	DE	2046	India
4	Bishnu MS Dangol	DE	2046	Thailand
5	Dr. Bishnu P. Shrestha	DE	2048	UK
6	Bhoj B. Dhakal	DE	2048	UK
7	Kiryananda Thakur	DE	2049	Thailand
8	Uttam L. Pradhan	Er.	2050	UK
9	Dipak Shrestha	Er.	2050	Thailand
10	Sudarshan R. Bhandary	DE	2051	UK
11	Sunil K. Poudel	Er.	2053	Germany
12	Deepak R. Maskey	Er.	2054	UK
13	Deepak KC	Er.	2055	UK
14	Manoj Shrestha	Er.		Thailand
15	Deepak Shrestha	Er.		Thailand
16	Madhusudan Acharya	Er.	2055	Germany
17	Indu S Dhakal	DE	2055	UK
18	Ajay K. Mul	Er.	2056	UK
19	Binod Tiwari	Er.		Japan
20	Binod Mainali	Er.		Japan
21	Akhilesh K. Karn	Er.		Japan

### D. MSc Structure

SN	Name	Pos.	Year	Country
1	Suresh K. Regmi	SE	2033	Thailand
2	Ram C. Amatya	DE	2039	India
3	Nanda K. Amatya	Er.	2044	UK
4	Yogendra M. Bajracharya	Er.	2053	UK
5	Ganesh B. Kandel	Er.	2055	Nepal
6	Saroj Bhattarai	Er.	2056	Nepal
7	Ananta Acharya	Er.	2057	Nepal
8	Bishnu O. Bade	Er.	2057	Nepal
9	Chandra N. Yadav	Er.	2057	Nepal
10	Dileep K. Pokharel	Er.	2057	Nepal
11	Mukti Gautam	Er.	2057	Nepal
12	Ram P. Pathak	Er.	2057	Nepal

### E. MSc Construction/Project Management

SN	Name	Pos.	Year	Country
1	Dipak N. Chalise	DE	2051	UK
2	Tulsi P. Sitaula	Er.	2052	India
3	Bhupendra C. Bhatt	Er.	2052	UK
4	Mahamad S. Ahamad	Er.	2053	UK
5	Dr. Laxman Sunuwar	Er.	2053	Thailand
6	Madan B. Regmi	Er.	2054	UK
7	Shiva P. Adhikari	Er.	2055	India
8	Rupak Rajbhandari	Er.	2055	UK
9	Rodesh R. Shakya	Er.	2055	UK
10	Amulya D. Shrestha	Er.	2056	Thailand
11	Kishor K. Gongal	Er.	2057	UK
12	Satyendra Shakya	Er.	2057	UK
13	Vijaya Chapagain	Er.	2057	UK
14	Sanjaya Shrestha	Er.	2057	Nepal
15	Keshav Thapa	DE	2057	Nepal
16	Harish C. Shah	DE	2057	Nepal

### F. MSc Geology

SN	Name	Pos.	Year	Country
1	Lila N. Tripathi	DE	2044	UK
2	Surendra J. Thapa	DE	2045	UK

### G. MSc Water Resources/River

SN	Name	Pos.	Year	Country
1	Shiva P. Uprety	Er.	2046	Thailand
2	Saroj K. Pradhan	Er.	2052	Netherlands

### H. MSc Environment

SN	Name	Pos.	Year	Country
1	Ramesh Koirala	Er.	2044	Thailand

### I. MSc Traffic

SN	Name	Pos.	Year	Country
1	Bidur Rajbhandari	Er.	2055	UK

**J. MSc Transport**

SN	Name	Pos.	Year	Country
1	Kamal R. Pandey	DE	2040	Thailand
2	Ramesh R. Bista	DE	2042	Thailand
3	Ram K. Lamsal	DE	2043	Thailand
4	Hari O. Shivastav	DE	2046	India
5	Sharad K. Shrestha	DE	2049	Thailand
6	Manoj Shrestha	Er.	2054	Thailand
7	Birendra P. Shrestha	Er.	2054	UK
8	Ghan S Gautam	Er.	2056	UK
9	Krishna K. Shrestha	Er.	2058	UK

**K. MSc Transport Economics**

SN	Name	Pos.	Year	Country
1	Sushila Dali	STE	2037	Australia

**L. MSc Civil Engg.**

SN	Name	Pos.	Year	Country
1	Pradip Raj Pant	Er.	2058	Australia

**The following in-country training events are being organized under RSSDU.**

1. Professional course in Management and Development for Engineers in NASC (2058/1/5).

- Er. Bishnu Om Bade Shrestha
- Er. Madhusudan Acharya
- Er. Hari Raman Thapa

2. Computer Training for Non-Gazetted (Nasu)

- Phanindra Bhattarai
- Narayan Chandra Bhattarai
- Rohit Kumar Koirala

3. Workshop on Geomatics and Space Science Technology Application 19 April 2001.

- SDE Chiranjibi Karki
- SDE Rajendra Pradhananga
- SDE Phanindra Bhattarai
- SDE Narayan Chandra Bhattarai

4. Advance Course (2058/1/17 to 2058/2/23)

- Er. Giri Raj Adhikari Er. Rohit Kumar Bisural

5. Laboratory Training for Overseer/ Lab Technician

- Deependra K. Chaudhari Dhan K. Thapa
- Yubaraj Pande Prem P Ghuwai
- Ananda K Karna Uttam B.K.C.

6. Laboratory Training for Engineers/Lab-incharge

- Er. Prakas Upadhyaya Er. Bholu P. Shah
- Er. Shivaji Prasad Ghimire Er. Shiva Upreti
- Er. Tulsi Prasad Sitaula Er. Rodes Ratna Shakya
- Er. Amulya Das Shrestha Er. Ganesh Kadel
- Er. Shyam Bikram Khad Er. Ayodhya P. Shrestha
- Er. Sankar P. Rajbhandari Er. Kishor Nath Gangol
- Er. Purna Siddhi Lal Shrestha

7. DG, DDGs, RDs, SDEs and 86 engineers participated in 7<sup>th</sup> National Convention of Engineers organized by NEA on 2057/12/29-31.

Paper "Intelligent Transport System" by Er. Krishna Kishor Shrestha

8. Participation in EROM2 Presentation Skills Training (May 24,2001)

- DDG, M. G. Maleku
- SDE, L. N. Tripathi SDE, H.O. Srivasthav
- SDE, K. P. Wagle SDE, R. R. Bista
- SDE, K. L. Joshi
- STE Mrs. Sushila Dali

9. Auto CAD Training (2058/320 to 3 Weeks)

Engineers:

- Bed Kantha Yogol Shiva Adhikari
- Keshav Lal Shrestha Ananta Acharya
- Laxman Sunuwar Satyandra Shakya
- Narendra K. Shrestha Pravat K. Chalise
- Roshan Lal Shrestha Mukti Gautam
- Hari Raman Thapa Basanta Lal Shrestha
- Bishnu Om Bade Shrestha Deepak K.C.

10. Computer Training (058/3/21 for 45 days)

- Hari K. Ghimire Chandra K. Gyawali

11. Remote Sensus & GIS Workshop

SDE, Chiranjibi Karki SDE, Rajendra Pradhananga  
Er. Pramen P. Shrestha Er. Raju K. Aryal

12. 15 Participants in "First National Seminar on Managing Construction Projects in Nepal (20-21 August 2001)

13. Presentation Skills Training (23-24 August 2001)

- DDG, M. G. Maleku
- Project Manager, T. L. Yadav
- Project Manager Durga P. K.C.
- SDE, H. O. Srivastav SDE, Y. C. Pokhrel
- SDE, M. B. Pradhananga SDE, S. J. Thapa
- SDE, C. Karki
- STE Sushila Dali

14. Report Writing Workshop (29-30 August 2001)

- DDG, K.P. Khadgi
- SDE, B. Karki SDE, K. B. Thapa
- SDE, P. M. Shrestha SDE, C. Karki
- SDE, P. J. Shah SDE, D. L. Karna
- SDE, D. Jha

15. Advance Management and Development Course (5 Weeks)

SDE, Bhoj B. Dhakal

16. Training on Geo Information System (24 Sep - 5 Oct 2001)

- SDE, Rames Raj Bista
- Er. Naresh Man Shakya, Er. Narendra Shrestha

17. Road Design Software Training (2058/5/18 to 2058/6/30)

- Er. Bhubaneswor P. Deo

18. Management and Development Training

- Er. Mukti Gautam

19. ADB Seminar on Procurement of Civil Works, 4-5 Dec 2001

DDG, Keshab P. Pokharel  
CA, Narayan Regmi

20. Participation in Presentation Skills Training

Engineer:

- Madhusudan Acharya            Kishor Nath Gangol
- Bishnu Om Bade Shrestha      Laxman Sunuwar
- Amulya Das Shrestha          Uttam Lal Pradhan
- Vijaya Chapagai                Bhubaneswar P. Deo
- Bishwa Ranjan Singh Shahi    Bimal P. Subedi

21. Supervisor's Training (5 - 6 Dec 2001)

Engineer:

- Prakash B. Upadhyaya          Arjun Thapa
- Krishna P. Bhandari              Tulsi P. Sitaula
- Rupak Raj Bhandari

Overseer:

- Madhusudan Sankhi                      Krishna Pd.  
Panthi
- Bharat Man Shrestha                  Ram Babu Pathak
- Bishwa Bijaya Lal Shrestha

Supervisors (24):

From Damauli, Palpa, Pokhara, Butwal, and Bharatpur Divisions participated in the training.

\*\*\*

## The following out-country training events are being organized under RSSDU.

1. Executives' Road Safety Course, Sweden (08-19May, 2000)  
SDE, Suresh Raj Dali
2. MSC in Geo-technical Engineering, Bangkok (Thailand) (Jun 12-2000 – Jun 12 2002)  
Er. Nava Raj Adhikari
3. Transport Research Laboratory (TRL) Course: "Roads and Transport in Development Countries and Emerging Nations", U.K. (2-14 July, 2000)  
SDE, Pawan Man Shrestha
4. Master in Civil Engineering, Australia (10 Jul., 2000 - Jan 2002)  
Er. Pradip Raj Pant
5. Study tour, Indonesia (27 Aug - 6 Sep., 2001)
  - DDG, Keshab Prasad Pokharel
  - SDE, Daya Ram Dhungana
  - SDE, Harish Chandra Shah
  - SDE, Guru Prasad Dhakal
6. Sixth International Course on Operation and Maintenance of Construction Machinery, Pakistan (22 Jan. - 20 Feb, 2001)
  - Mech. Er. Bal Krishna Bashal
  - Mech. Er. Kapur Raj Giri
7. Executive Forum on Urban and Transport Development Management, Japan. (2001/2002)
  - SDE, Lila Nath Tripathi
8. Road Construction Site Management, Japan. (Feb. 2001)
  - Overseer Lalit Bahadur Rawal

## Transport Policy 2058

Ministry of Physical Planning and Works has recently published National Transport Policy 2058, which has been approved by the 27<sup>th</sup> Cabinet of Ministers.

This comprises of seven chapters, which includes mainly objectives, strategy, policy, programme policy and sub-sectoral transport policy. Transport sub-sectors include roads, airways, water transport, railways, cable cars, ropeways, horse trails, foot trails and suspension bridges.

Programme strategies highlighted in Transport Policy are immediately applicable in planning 10<sup>th</sup> Five-year plan, which are as follows:

- Development of new roads linking remote areas with labor intensive and employment generation methods.
- Upgrading of strategic road network to provide better access for agricultural productive areas, hydropower projects and tourist area.
- Private participation for development of toll road, alternate roads and for maintenance of roads.
- Programs with decentralized institutional building, fostering capacities of local construction industry and development of new contract system.
- Strengthening and expansion of SRN to cater the traffic growth.
- Construction by-pass roads and intercity link roads, road widening for consideration of traffic pressure.
- Traffic management programs for accident reduction and reduction vehicle pollution.
- Define role of executing agencies:
  - Central level for projects with National importance
  - Local Level for projects with district importance
- Planned road maintenance for routine, recurrent, periodic maintenance works and rehabilitation works.

Similarly programmes identified by the policy are included in 10<sup>th</sup> plan:

- Implementation of feasible road projects with consideration of reducing environmental impact and regional unbalance.
- Planning of mid hill East West Highway and Hulaki Roads as parallel highways to the East West Highway.
- Construction of new roads linking remote districts.
- Development of roads to open access to Tibetan markets in the Northern boarder.
- Development of East West Highway as per Asian Highway standard.

\* \* \*

## 20 years Road Plan

Department of Roads (DOR) has been preparing 20 years plan for road network development. The draft report of 20

years Road Plan is already at hand. 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> plans are being planned for roads and bridges.

Total of planned length of strategic roads 4000 km will be built in 20 years period and similarly the estimated cost of roads is NRs. Million 32369.

The maintenance cost estimated for 20 years period is NRs. Million 37076 for all type of maintenance works including routine, recurrent, urban road, bioengineering and emergency maintenance. Further the maintenance cost includes the cost for rehabilitation, upgrading and widening of roads.

This draft report findings will also be discussed in higher level including Ministry of Physical Planning and Works and National Planning Commission. Due consideration will be given for the planning of road network for 20 years period.

In the workshop held in the DOR it is recommended by many of DOR technicians that unit cost, some of the selection criteria have to be reconsidered. Furthermore, institutional capabilities required for the plan have to be assessed.

\* \* \*

## Ropeway to facilitate Nepal - China trade

Chinese Government is now constructing a ropeway to link Nepal and Tibet at the estimated cost amount of around 200 million rupees. That will ease the transportation of goods by heavy trucks carrying from Khasa to Tatopani within ten minutes. This is a boon for the local people as well as the Nepalese traders. The ropeway will commence its service within a few months.

The ropeway system could also be planned for other parts of the country where road transport is difficult to manage.

(The Himalayan Times)

## Arniko Highway Project

### Phase III (1 January 1999 - 31 December 2001)

Arniko Highway Project (AHP) is characterized by being only a road access to Tibet, Autonomous Region of China in the North. As other road projects, Swiss aided AHP has contributed to the strengthening of the capacities and capabilities of the private local construction industry in order to improve its position towards international competition along with improvement of road access to the northern border.

The planned works of Phase III consists of mainly the Rehabilitation and Improvement works in Suryavinayak-Dhulikhel Section (16 km) and the Maintenance works in Barhabise - Kodari Section (26 km).

#### Salient Features of Project Phase III:

Starting Date: 1st January 1999

Proposed Date of Completion: 31<sup>st</sup> December 2001

Project Estimate : NRs. 397,721,738.- (HMG NRs. 126,221,755.- and Swiss Grant CHF. 6,000,000.-)

Expenditure till 15 Nov. 01 : NRs. 317,454,000.-

Financial Assistance

HMG/N 25% and Swiss Grant 75%

Technical Assistance

By SDC through ITECO-CH (Foreign Consultant)

### Physical Development of phase III

- rehabilitation and improvement of the road section from Suryavinayak (km 14) to Dhulikhel (km 30) of Arniko Highway.
- execution of Routine, Recurrent, Emergency and Preventive maintenance on Pavement and Off Road Works including small scale engineering works from Barhabise (km 89) to Kodari (km 114+500).
- strengthening of capacities and capabilities of the Private Local Construction Industry of Nepal in the field of Road Rehabilitation and Maintenance in order to improve its position towards international competition within Nepal by employing Local Consultants and Local Contractors with appropriate technical/ managerial support and trainings
- privatization of Equipment Maintenance Center.

\* \* \*

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Rahmahal Kathmandu Nepal

### Editorial

After five decades, DOR has taken the present shape, which is so big and matured that we can proudly count on Department's technical and management capabilities.

Until now DOR has been taking responsibility of non-SRN roads also, which counts about 70% of total roads maintained by DOR.

The constantly growing demand on road transport infrastructure in urban and rural areas has put DOR in an awkward situation. The local bodies are not ready to take over roads with local importance and DOR resources are not enough to maintain the total roads.

Hence, there is a big challenge before DOR to maintain the balance between demand and resources.

Many of us have realized the changed environment of DOR's institutional capabilities. This should be reflected in the actual operation of DOR and in fact the donor should look upon this issue with a serious implication.

Since there are future perspectives on public-private partnership on road construction and maintenance activities, we have to ask ourselves: Where we are now? What will be our next step?

Lastly, we hope the present bulletin will highlight on current situation of DOR activities.