



HMIS News

Highway Management Information System, Planning Branch, DOR

New Director General in DoR

Mr. Ananda Prasad Khanal took charge as the Director General of Department of Roads on 1st November 1999. Before that he was working as Deputy Director General, Planning Branch.

Mr. Ananda Prasad Khanal did the Bachelor in Civil Engineering from Indian Institute of Technology (I.I.T) Bombay in 1968. He joined the Department of Roads in 1968 and has been working since then. He had worked as assistant engineer, divisional engineer, zonal engineer, Regional director, Project director of ADB Project Directorate Office and DDG of Planning Branch. He has visited several countries and has vast and diverse experience in the field of road construction, maintenance and planning.

All the staffs of DoR congratulate him in his new appointment as DG and hope to look forward in the fulfillment of his commitment of institutional development and teamwork spirit which he had promised in the inaugural speech at the joining day of department as Director General.

The staffs of Department of Roads organized "get together program" on 5th November 1999 to welcome the new DG, Mr. Khanal and give farewell to the outgoing DG Mr. Niranjana Prasad Chalise.

dROAD6

Deighton Company of Canada has upgraded the software dROAD5, installed in Highway Management Information System (HMIS) to dROAD6 with the financial assistance of Maintenance and Rehabilitation Co-ordination Unit (MRCU). dROAD6 is a window version, while dROAD5 is DOS version. During the upgrading of this system, the company has transferred all the previous data from dROAD5 to dROAD6.

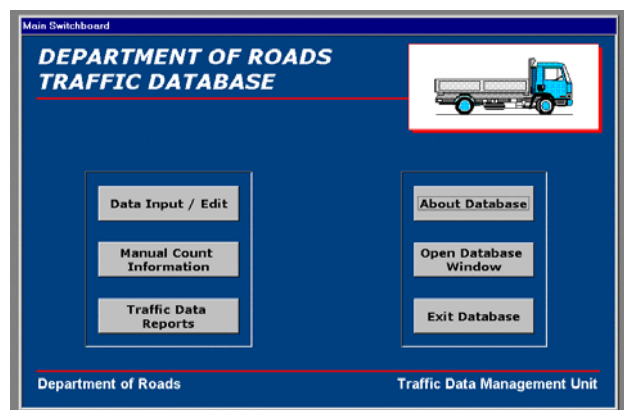
During the up-gradation of this software, engineer Gary Ruck from Deighton Company held five day training program. About half a dozen of engineers from Planning branch took part in this program which was held from 17 Sept to 22nd Sept 1999. The training program consisted of how to run the dROAD6 and dMAP.

(Continued in Page No. 4)

Traffic Database

Maintenance and Rehabilitation Coordination Unit (MRCU) has developed a database application for storing and processing traffic data obtained from Automatic Logger and Manual traffic count conducted every year by the Planning Branch. This database is useful in maintaining the data systematically. It eliminates the tradition of keeping data in spreadsheet instead of in Access. This database is not the substitute of the software dROAD6 installed in the Highway Management Information System (HMIS).

The design of this database uses Microsoft Access 97 software and incorporates Access 2000. Minimum hardware requirements are a Pentium processor, 16Mb of Ram (32 MB Preferred), and 1.5 MB of spare storage capacity. The database can be accessed through a straightforward menu system that is displayed in the following format.



The basic feature of this application is, it calculates the AADT (Annual Average Daily Traffic) from the ADT (Annual Daily Traffic) taken manually considering seasonality factors. Specific factors for 22 stations have been calculated and for rest of the station general factors have been adopted that are applicable to the Strategic Road Network as a whole. The value of seasonality factors has been calculated from the data available from Automatic traffic logger.

This software can sort out traffic data according to region; road link and traffic count year. In the automatic logger data, one can find out the traffic growth rate also. The manual data up to F/Y 1998/99 has been entered in the database.

F.R.I.P

Roads financed by ADB

Asian Development Bank had given the regular support to His Majesty's Government of Nepal in the field of road rehabilitation and maintenance. From the financial support of this bank Department of Roads had successfully completed two major road projects called First Road Improvement Project and Second Road improvement Project. Most of the roads under Third Road Improvement Project are also completed. Roads under Third Road Improvement Project (T.R.I.P) rehabilitated or maintained are as follows:

Name of the Road Project	Length (km)
1. Sahajpur – Dadeldhura	120
2. Lamahi – Tulsipur	47
3. Maikhola – Ilam – Phidhim	79
4. Road Rehabilitation	
(a) Dhuhabi – Inaruwa	14
(b) Gokarna – Sankhu	8
(c) Ring Road – Tika Bhairab	8
(d) Biratamod – Bhadrapur	13
(e) Chaurhawa – Siraha	18
(f) Bhardaha – Rajbiraj	18

Sahajpur – Dadeldhura road and Ilam – Phidim road are still under construction.

The study of the road projects, which are supposed to be included in the Fourth Road Improvement Project package, is complete. The consultant (Roughton and Partners) had already submitted the final study report to DoR.

The roads under consideration for this Fourth Road Improvement Project are as follows;

Name of the Project	Length (Km)
Ilam – Phidim Road	85
Phidim -Taplejung Road	16
Dadheldhura – Patan Road	43
Biratnagar – Rangeli- Dainaiya – Bardanga	30
Uralabari – Bardanga Road	34
Damak – Gauriganj Road	22
Melamchi Road	23
Chautara Road	25
Kathmandu Ring Road	14
Baudha Road (KTM)	10
Mahendra Highway	104

INFORMATION ABOUT HIGHWAYS

There are 15 highways in our country. The construction of all highways is not completed yet. The completed highways are as follows;

Name of the Highways	Length (Km)
Mahendra Rajmarg	1024
Tribhuvan Rajmarg	189
Arniko Rajmarg	113
Prithvi Rajmarg	173
Narayanghat - Mugling Rajmarg	36
Siddhartha Rajmarg	183
Ratna Rajmarg	113
Seti Rajmarg	65

The status and the budget allocation for under constructed highways for the fiscal year 2056/57 is as follows:

Name of the Highways	Length (Km.)		056/57 Budget (000)
	Total	Motorable track	
Mechi Highway (Phidim Taplejung Section)	87	72	30,100
Sagarmatha Highway (Gaighat - Diktel Section)	83	18	35,000
Banepa - Sindhuli - Bardibas Highway	159	47	1,25,300
Rapti Highway (Salyan - Musikot Section)	95	43	39,240
Karnali Highway (Surkhet - Jumla Section)	210	112	2,50,842
Mahakali Highway (Baitadi - Darchula Section)	126	65	90,000
Koshi Highway (Basantapur - Chainpur - Khadbari Section)	96	20	22,500

The constructions 21 out of of 22 bridges in the Kohalpur – Mahakali section of MRM are already completed with the assistance of Indian Government.



The policy of His Majesty's Government of Nepal (HMGN), as detailed in the *Ninth Plan* (HMGN, 1997), includes the construction of motorable roads to all non-road connected District Headquarters. The Priority Investment Plan (PIP) Project, completed in 1997, identified 10 potential new roads that would provide connections to 12 districts. The PIP Project screened and prioritized these potential roads, most of which are under construction as earthen roads.

The PIP Study identified a series of project components including maintenance programs upgrading and new construction activities for the Strategic Road Network located in Western Nepal. The Road Maintenance and Development Project (RMDP) was formulated to further refine the recommendations of the PIP Study and to advance these recommendations through to implementation. The project has now passed through a planning stage that has identified and detailed the works to be undertaken through World Bank funding. The components that make up the RMD Project are:

- **The Policy Component** has the objective of establishing a Road Board and a Road Fund that will be responsible for

financing road maintenance programs executed by contracts by the various road agencies in Nepal. The goal of the policy component is to establish an adequate and stable source for financing road maintenance and therefore to preserve the road asset and to reduce total road user's costs.

- **The New Road Development and Upgrading Component** that has the objective of the construction and/or upgrading of sections of the strategic highway network to connect currently non-road-served District Headquarters in Western Nepal. The new roads are to be constructed to 'Fair Weather Earth Track' standard. Upgrading roads will be upgraded to 'Fair Weather Gravel Track' standard. Details about road stretches taken up for new construction and upgrading are as shown in following tables:

Table 1A: Roads to be constructed

Road No.	Description	Starting Point		Length (km)
		Village	DOR Chainage	
1	Chamelia - Darchula	Thaktholi	93+000	33.7
2	Sanfebagar – Martadi	Singada	19+000	37.2
3	Sanfebagar – Mangalsen	Timilsen	23+000	14.7
4B	Kalikot – Jumla	Sirane	132+000	88.4
5B	Chedegad – Jajarkot	86+000 km	107+000	21.0
Total				195

Table 1B: Roads to be upgraded

Road No.	Description	Starting Point		Length (km)
		Village	DOR Chainage	
4A	Surkhet - Kalikot	Bangesimal	0+000	134.9
5A	Dharapani - Chedegad	Bhurke	24+500	61.5
7	Gorusinghe - Sandhikharka	Birpur	9+000	59.2
Total				255.6

- **The Rehabilitation Component** that has the objective to bring a number of nominated existing roads into maintainable condition through rehabilitation. These roads were initially proposed to be rehabilitated in RMRP but were deferred due to shortage of fund.

Table 2: Roads to be rehabilitated

S.N.	Road	Section	Length (Km)
1.	Siddhartha Highway	Tansen - Syangja	85
2	Lumbini - Taulihawa	Kothi – Taulihawa	14
3	Tansen - Tamghas	Harthok - Tamghas	63

- **The Periodic Maintenance Component** that has the objective to maintain the existing strategic road network of Western Nepal through the development and implementation of a resealing program

Table 1: Periodic Maintenance Programme

Project / Roads	Length (Km)
1. 1st Year Periodic Maintenance Programme	65
2. 2nd Year Periodic Maintenance Programme	106
3. 3rd Year Periodic Maintenance Programme	137
4. 4th Year Periodic Maintenance Programme	108
5. 5th Year Periodic Maintenance Programme	116

The Institutional Strengthening and Training Component that has the objective of expanding the DoR's capabilities by building on the institutional development activities supported under the Road Maintenance and Rehabilitation Project. The RMDP will focus on the following initiatives:

- support for the development of a comprehensive human resources development program;
- expansion of the environmental and social capabilities of DOR, to assist with project design and management, and enhance the quality of outputs (own and externally funded);
- support of DOR's efforts to expand its mechanical training activities to cover private sector personnel;
- establishment of a technical audit and third party operational audit capacity; and
- Other Institutional Activities which include short-term inputs to RSSDU, GEU, MEU of the Department of Roads.

Roads Connecting District Headquarters

In our last issue we have mentioned that there are 17 districts whose headquarters are not linked by the road. Out of these districts, the following eight districts have road projects under construction to connect its headquarter by road-head.

1. Bhojpur
2. Manang
3. Mustang
4. Jajarkot
5. Bajura
6. Achham
7. Kalikot
8. Bajhang

The conditions of the road projects linking the headquarters of the above districts are depicted in the following table. The table shows the total length of the road, track opened till now, budget allocation for this fiscal year 2056/57 and the donor agencies.

Name of the Project	Length(Km)		Budget (,000)	Agency
	Total	Track		
Hile – Leguwaghat – Bhojpur Road	83	15	20,000	HMG
Beshisahar – Chame Road	78	10	5,500	HMG
Baglung - Beni – Jomsom Road	60	14	15,000	HMG
Chhinchu – Jajarkot Road	107	91	56,000	World Bank
Sanfebagar – Martadi Road	58	21	42,500	World Bank
Sanfebagar – Magalsen Road	30	27	47,500	World Bank
Karnali Highway - Manma Road	18	0	5,000	HMG
Khodpe – Bajhang Road	108	69	50,000	HMG

Road Improvement Project linking the district

Department of Roads has not only the upheaval task of linking the district headquarters of some of the remotest districts of the country but also of maintaining the existing road linking the headquarters of the accessible districts. This year some of the road improvement projects linking the district headquarter are going to start. The following table shows the budget allocation, total road length and the track opened till now for these undertaken projects.

Name of the Project	Length (Km.)		056/ 57 Budget (,000)
	Total	Track opened	
Basantapur - Terathum – Aathrai Road	26	26	10000
Katari - Okhaldhunga Road	88	88	55000
Khimti - Manthali – Ramechhap Road	18	18	12500
Malekhu - Dhading Road	18	18	177500
Dumre - Beshisahar Road	42	42	26369
Lumbini – Taulihawa – Tilaurakot Road	23.50	23.50	20000
Tansen (Harthok) - Ridi – Tamghas Road	75	75	50000
Gorusinghe – Sandhikharka Road	68	34	10000
Surkhet – Ranimatta – Dailekh Road	61	61	7500
Chakchake – Libang Road(Including Bridges)	68	68	10000

Nepal Engineers Association Election

Nepal Engineer's Association, which is responsible for the institutional development of the engineers of our country has entered the new phase with the formation of new 23rd executive body on 32nd Bhadra 2056. According to NEA, 758 members out of 4191 are life members.

The election was held on the National Convention Hall on 32nd Badhra 2056 for Kathmandu and other 6 stations outside the country. Er. Komal Karki is representing DoR as an executive member in the executive body.

(Continued from Page No. 1)

dROAD6 consist of two software, which are dROAD and dMAAP. dROAD is data bank where the different data related to different road is kept and dMAP is the software, which will produce map of the road linked with the databank dROAD. The map is produced in AutoCAD in dMAP. dMAP runs in the AutoCAD software with the map linked with the databank dROAD6.

dROAD6 consists of following phases.

- ◆ Creating the Perspective
- ◆ Creating the Views
- ◆ Formula transformation
- ◆ Creating the Query

Before entering the data in the dROAD one should be sure about which type of data and how the data should be stored. For instance one can store the traffic data, SDI values, IRI and general data like link length and pavement type in different perspectives.

After creating these perspectives one must have to create view to enter the data. In the views one can adjust what data should be viewed according to one's will.

After creating views, one can create the new data field with the formula transformation. In formula transformation one can introduce different formula to create the new field.

The last command query is necessary to produce the data and present it. By using different type of query we can produce different data from connecting different views.

This database system will also enable to connect the data with map by the help of the dMAP. dMAP will help to produce the map of the roads according the query created in the dROAD6. dMAP is totally AutoCAD and only difference is that it is the map in AutoCAD connected with the data of the dROAD. By choosing different type of colour for indicating different road sections with different type of data, we can produce the map of any particular road or any number of roads.

PLANNING BRANCH

Feasibility Study Project:

Planning Branch has been carrying out the feasibility studies of roads and bridges from the F/Y 2054/55. In our last issue we had given the list of bridges and roads, whose feasibility studies were conducted in the F/Y 2054/55 and 2055/56.

The list of the roads, studied in the F/Y 2054/55 and their estimated length and the IRR (Internal Rate of Return) values estimated by the consultants is depicted in the following tables

S. N.	Name of the Project	District	Length (KM)	IRR (%)
1	Phattepur - Ambador Road	Bara	5.40	11.21
2	Sitalpur - Basantpur	Bara	6.02	12.43
3	Pipradhi - Badhibi Phulbariya	Bara	5.87	20.62
4	Malai - Bispurwa	Bara	2.92	17.40
5	Nijgadh - MRM - Biratgunj	Bara	5.42	19.87
6	Gulariya Ringroad	Bardiya	36.44	14.40
7	Ranibas Ghoretar Yun VDC Ranke bazaar	Bhojpur	33.15	17.19
8	Lower Dungeshwor - Upper Dungeshwor	Dailekh	21.1	12.15

9	Dailekh Sadarmukam - Rawalkot - Kusapani	Dailekh	25.8	12.35	4	Bhimbari Khola	Jhapa	Miyabari Khola	16.00
10	Narayan Khari Village - Gitachaur	Dailekh	19.20	12.97	5	Ramchandra Khola Bridge (Kohabara-Damuna Bazar-Khajuragahchi)	Jhapa	Ramchandra Khola	20.00
11	Ranimatta - Jajarkot	Dailekh	21.10	12.15	6	Kamal Khola Bridge (Dharampur – Panchganchhi)	Jhapa	Kamal Khola	24.00
12	Nayanbazar - Dakanagol Takuri	Dang	23.27	10.92	7	Chandu Khola (Parajudi-Damuna Bazar-Khajuraganchhi)	Jhapa	Chandu Khola	16.00
13	Sindhuwa Kajiman Chautari	Dhankuta	12.02	12.37	8	Aduwa (Bhuteni) Khola	Jhapa	Aduwa Khola	14.00
14	Kagate Okmalun	Dhankuta	5.74	15.18	9	Dhand (Dhoda) River (West)	Parsa	Dhand River	20.00
15	Tribeni - Santanfed Road	Dhankuta	14.65	13.91	10	Aurayia River	Parsa	Auriya Khola	66.00
16	Rajarani Gidhe Phalometar	Dhankuta	36.65	12.30	11	Shingyi River Bridge (Jitpur - Thori Road)	Parsa	Shingyi Khola	60.00
17	Dhalkebar - Chitrapur	Dhanusha	4.25	10.56	12	Dhand (Dhoda) River (East)	Parsa	Dhand Khola	60.00
18	Buchakpur - Digambarpur	Dhanusha	9.22	11.20	13	Tiyar River	Bara	Tiyar River	20.00
19	Dhalkebar - Gausala	Dhanusha	21.67	17.08	14	Dudhaura Bridge (Simara – Jitpur)	Bara	Dudhaura Khola	160.00
20	Mude - Sailunga - Dormba	Dolkha	35.67	10.90	15	Balganga River (Bhaktapur VDC)	Sarlahi	Balganga Khola	12.00
21	Seuwa - Simghat - Purkotdaha	Gulmi	15.20	10.29	16	Bhiman Khola	Sindhuli	Bhiman Khola	40.00
22	Anarmuni - Satanu Bridge - Bhagodubba	Jhapa	18.75	24.63	17	Paudi Khola	Lamjung	Paundi Khola	50.00
23	Majhathan - Begnash	Kaski	14.00	14.16	18	Rupatal Khola	Kaski	Rupatal Khola	16.00
24	Talbisi - Lipyani	Kaski	7.00	9.03	19	Midim Khola	Lamjung	Midim Khola	80.00
25	Kharanephat - Kalika	Kaski	7.00	13.89	20	Mahadev Khola Tarkughat	Bhaktapur	Mahadev Khola	4.00
26	Nawalpur - Sarikhet	Makawanpur	38.95	14.15	21	Khahare Khola (Jitpur)	Parsa	Khahare Khola	14.00
27	Khursanibari - Sinhadebi	Morang	33.00	27.76	22	Budhi Rapti Khola Bridge	Chitwan	Budhi Rapti Khola	24.00
28	Patle - Duipipal	Nuwakot	29.90	11.17	23	Manahara Khola (Kathmandu Bhramhakhel)	Kathmandu	Manahara Khola	60.00
29	Simbu - Keurini	Nuwakot	7.02	10.70	24	Balkhu Khola	Kathmandu	Balkhu Khola	21.00
30	Rampur - Arun Khola	Palpa	15.21	9.84	25	Bagmati River (Jorpati-Gothatar)	Kathmandu	Bagmati River	30.00
31	Jorpokhari Charibhanjyang	Panchthar	12.00	12.09	26	Bagmati River (Siddipur Luvu Bhairabdevi)	Lalitpur	Godawari Khola	20.00
32	Saptami Dashami Hangum-Mauwa	Panchthar	25.20	17.98	27	Hanumante River (Tikathali – Lokanthali)	Bhaktapur	Hanumante Khola	30.00
33	Mulghat Kusunte -Sawasera Yashok	Panchthar	53.00	16.79	28	Betani Sisneri	Nuwakot	Okhle Kholi	8.00
34	Kusma - Neta	Parbat	12.00	10.21	29	Mohana River (MRM-Tikapur- Khakraula)	Kailali	Mohana River	300.00
35	Manthali Okhaldhuga Link Road	Ramechhap	102.40	11.33	30	Daulatpur Ghat	Bardiya	Karnali River	500.00
36	Chaurjhari - Musikot	Rukum	39.00	12.81	31	Syano River	Dang	Syano River	51.00
37	Mangalbare- Rambeni	Sankhuwasabha	33.60	13.45	32	Dharmawati River (Bijuwar Khalanga)	Pyuthan	Dharmawati River	144.00
38	Tumlingtar - Num	Sankhuwasabha	34.50	12.72	33	Sukhgor Khola	Dhanusa	Sukhgor Khola	60.00
39	Bagmati River (Left Bank)	Sarlahi	54.60	15.40	34	Jagdar Khola (Janakpur – Baghchaura)	Dhanusa	Jagdar Khola	44.00
40	Belhibazar - Basbariya	Sarlahi	5.35	16.85	35	Jhang Khola	Sunsari	Tengra Khola	40.00
41	Bayar Dhari - Biruwa	Syangja	14.00	12.71	36	Kechana River	Morang	Kechana Khola	48.00
42	Buddha Singh Marg	Tanahu	8.00	24.82	37	Manusmara Bridge (Madhubani- Armaha)	Sarlahi	Manusmara River	25.00
43	Kyamin Road	Tanahu	8.15	34.41	38	Khand Khola (Budhibazar – Danda School Road)	Kaski	Khand Khola	8.00
44	Jiri Khimti - Morahan - Gupha Road	Terathum	34.75	15.32	39	Mainari Bridge (Bhatani Khola)	Kapilvastu	Bhatani Khola	22.00
45	Betani Bhanjyang-Raut Kharka-Puware Bhanivang	Udayapur	57.25	8.77					

The list of bridges with its main data, whose feasibility study had been carried out in the fiscal year 2054/55 is shown in the following table.

S.N.	Name of the Projects	District	Name of River	Span of Bridge (M)
1	Sunsari Khola(Basant VDC)	Sunsari	Sunsari Khola	60.00
2	Singhiya Khola	Morang	Singiya Khola	60.00
3	Sunsari Khola (Babiya Narsing)	Sunsari	Sunsari Khola	60.00

Traffic Engineering and Safety Unit (TESU):

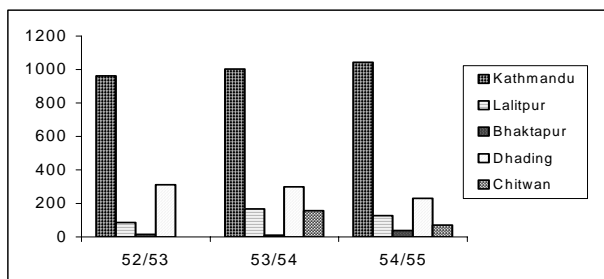
The Department of road (DoR) has established Traffic Engineering and Safety Unit (TESU) in Baisakh 2052 in order to provide technical support to the road division office for ensuring road safety.

TESU has developed the computerized road accident database set up in cooperation with the Traffic Police. This system was installed in fiscal year 2053/54. In the database the accidents occurred in the Kathmandu valley and Prithvi highway has been stored. This database provide information on what sort of accidents are happening and where. This information helps to plan the traffic safety measures effectively.

According to the report published by TESU on August 1998, in Kathmandu valley there is slow increased of casualties from accident within last three years. The casualties from accidents on Prithvi highway have dropped significantly. The following table shows the number of casualties with its severity in Kathmandu valley and Prithvi highway.

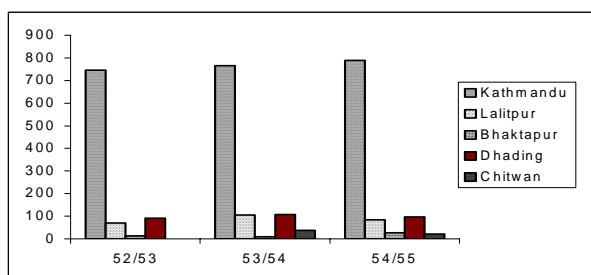
Type of casualties by district and year

District	Severity of Injury											
	Fatal			Serious			Minor			Total		
	52/53	53/54	54/55	52/53	53/54	54/55	52/53	53/54	54/55	52/53	53/54	54/55
Kathmandu	68	50	60	207	172	199	686	781	784	961	1003	1043
Lalitpur	12	9	14	25	35	40	50	123	73	87	167	127
Bhaktapur	0	4	8	7	1	10	7	6	20	14	11	38
Dhading	32	39	46	75	105	60	206	154	125	312	298	231
Chitwan	NA	10	21	NA	29	30	NA	117	20	NA	156	71



Number of accidents by district and year

District	Accident Severity											
	Fatal			Serious			Minor			Total		
	52/53	53/54	54/55	52/53	53/54	54/55	52/53	53/54	54/55	52/53	53/54	54/55
Kathmandu	64	51	56	167	141	162	516	573	571	747	765	789
Lalitpur	11	9	14	23	25	29	35	72	41	69	106	84
Bhaktapur	0	4	8	5	0	8	7	5	11	12	9	27
Dhading	22	30	29	32	37	32	38	40	35	92	107	96
Chitwan	NA	7	6	NA	12	10	NA	18	6	NA	37	22



Lists of Publications from Traffic Engineering and Safety Unit

Books:

Traffic Sign Manual -Volumes 1 and 2
Road Users Guide

Reports

Road Safety Note #1: Road Traffic Accidents 2052-53
Road Safety Note #2: Designing Safer Side Drains
Road Safety Note #3: Road Accidents Costs 2051-52
Road Safety Note #4: Road Safety Audit Manual
Road Safety Note #5: Delineation Measures
Road Safety Note #6: Safety Barrier
Road Safety Note #7: Safety at Bridges
Road Safety Note #8: Identifying and Treating Accident Sites
Road Safety Note #9: Road Traffic Accidents 2053-54
Road Safety Note #10: Road Traffic Accidents 2054-55

Posters:

Traffic Signs (Nepali and English versions)
Driving Tests (Cars and Motorcycles)
Primary- School-age safety posters (4 types)
Secondary -school -age posters (3 types)

Leaflets:

Safety at Roadwork (Nepali and English versions)
Zebra for safety (Nepali and English versions)
Park Safety
Request to Pedestrians
Request to Passengers
Request to Cyclists
Request to Motorcyclists
Request to Drivers
Traffic signs in Nepali

RSSDU

Road Sector Skill Development Unit under Planning Branch plays a leading role in human resources development of the Department. It has maintained the database for all of the staff of department. It has systematically kept the records of qualifications, training, of all the personnel employed in the Department of Roads.

In spite of these data, it has the records of the participants who has participated/will be participating in different seminars and study tours after being nominated from Department of Roads. The following are the list of participants, who has recently taken training and other activities after nomination from the DoR. It is the continuation of the previous list which we had published in the last Issue No. 11.

Er. Mr. Achut Bhatta and Er. Mr. Suraj Sigdel did not get the confirmation for the Post Graduates Training course on GIS (01 Oct 1999 - June 30, 2000) India.

Training In Country

- 1. International Symposium on Engineering Geology, Hydrology and National Disaster with emphasis on Asia.(28-30 Sep.1999) Nepal Geological Society, Kathmandu**

SDE Mr. Dinkar Sharma
 SDE Mr. Lila Nath Tripathi
 SDE Mr. Krityananda Thakur
 SDE Mr. Bhoj Bahadur Dhakal
 SDE Mr. Bhagawan Shrestha
 SDE Mr. Sudershan Ram Bhandary
 SDE Mr. Indu Sharma Dhakal
 SDE Mr. Rajendra Prasad Pradhanang
 Er. Mr. Madhusudan Acharya
 Er.Mr. Uttam Lal Pradhan
 Er Mr. Sunil Kumar Poudyal
 Er.Mr. Buddhi Neupane
 Er.Mr. Shiva Raj Adhikary
 Er.Mr. Biswo Ranjan Singh Shahi

- 2. Professional Management and Development Program(09 Aug-18 Sep,1999) NASC, Jawalakhel**

Er.Mr. Mo. Safi Ahamad

- 3. Project Preparation (31 Aug-12Oct,1999) NASC, Jawalakhel**

Er.Mr. Bhubaneswor Pd Dev
 Er.Mr. Uttam Lal Pradhan
 Er.Mr. Umesh Jha
 Er.Mr. Madan Bandhu Regmi

- 4. Seminar on Maintenance Management for Overseers (15- 17 Sep. 1999) Technical Instructor Training Institute, Sanothimi**

Mr. Madhushudhan Prasad Gautam
 Mr. Avaya Chandra Jha
 Mr. Nawab Lal Saha
 Mr. Deepak Kumar Kafle
 Mr. Bhupendra Shrestha
 Mr. Kailash Saha
 Mr. Shovit Lal Thakur
 Mr. Krishana Man Pradhanag
 Mr. Amarendra Kumar Karna
 Mr. Yogendra Kumar Choudhary
 Mr. Kameswor Saha

- 5. Training on Instructors Skill training (15-26 Nov, 1999) Technical Instructor Training Institute, Sanothimi**

Er.Mr. Tulsi Prasad Situlaula
 Er.Mr. Ashok Tiwari
 Er.Mr. Arjun Jung Thapa
 Er.Mr. Buddhi Bahadur Gurung

Training Abroad

- 1. Technical Exchange "Road Planning & Strategy" (August 1999) Thailand**

DG/ DoR Mr. Niranja Pd. Chalise
 SDE Mr. Bindu Shumsher Rana
 Er Mr. Saroj Kumar Pradhan

- 2. M.Sc in Transport Planning (Sep 1999 - Sep 2000) UK**

Er.Mr. Krishna Kishor Shrestha

- 3. Operation and Maintenance of Construction Machinery (04 Oct-01 Nov, 1999) Pakistan**

SDE Mr. Krishana Ram Thapa

- 4. World Road Congress (3-9 Oct,1999) Malaysia**

DDG Mr. Madan Gopal Maleku

- 5. On Job Training (11-28 Oct,1999) Malaysia**

SDE Mr. Babulal Agrawal

- 6. Inspection Visit (21-28 Oct,1999) Pakistan**

DG/ DoR Mr. N.P. Chalise
 Under Sec. (MOWT) Mr. Ram Bahadur Khadka
 Er.Mr. Babu Ram Ranabhat

Share your views on this PL ATFORM

Digital Terrain Model

(By Er. Shakil Manandhar)

The process of generating a contour map, so called terrain modelling and use of the model for civil engineering works, have dramatically changed along with the development of software. The pace at which the survey can be carried out, survey data can be processed, contours can be drawn has become tremendously fast. Furthermore, the jobs like design and quantity calculation of irrigation canals and roads can also be easily done on this Digital Terrain Model (DTM).

The basic principle behind the generation of a DTM includes, in the first place, defining the surveyed points with respect to three-dimensional co-ordinates. Then every point is interconnected to form a mesh of non-intersecting triangles, situated in different planes to represent the surface of the terrain. Theoretically there are virtually infinite possibility of such mesh depending upon the interconnection of the points and DTM software chooses one of them. The main task of a DTM software is the interpolation of the elevation of a point, assuming it to be on this system of pre-defined triangular planes. When there is the possibility more than one system of triangular planes from the same set of surveyed points, the elevation of a point traced out, is also one among the many possibilities.

Secondly, on a DTM plan, suppose a line is traced, the elevation of the every point of the line will be interpolated from the chosen system of triangles. When a line can be defined in elevation, the area bounded between such two lines within a certain boundary can also be calculated and volume of the prism having such two areas as ends can also be found.

Using this principle, in a case of a road design, firstly an alignment is traced out on a DTM plan. Then elevation of the alignment is generated as stated above in the principle. Then formation line with required elevation is superimposed on the alignment, so that both lines follows the same co-ordinates in plan with different elevations. Then the elevation of a line (cross-section) perpendicular to the alignment at a point (chainage) is traced out. In the same vertical plane of cross-section, another line (road width) perpendicular to the alignment is generated at the level of the formation line. Then the area between these two lines in a same vertical plane, within the boundaries defined by the side slopes is calculated.

Since the base terrain represented by DTM is one of the many possibilities, a DTM software user must not forget that the road designed on DTM, along with its cross-sections (formation level and ground level) and quantities, is also one of many possible results and may not be the correct. The reliability design and quantity calculations become doubtful and sometimes misleading when the design is carried on DTM of alignment strip with fewer surveyed points. Sometimes, in case of hill roads, the traced elevation of a chainage can be so different that there may be fill in the actual site while DTM-traced-cross-section shows cutting.

In conclusion, the accuracy of a DTM depends upon the density of surveyed points. It is wrong to judge a DTM software by the smoothness of contours it generates. And finally, for a better and accurate design of a road, especially where balanced earthwork or reduced retaining structures is given priority, every chainage points and its corresponding cross-section should be traced out in the field directly.

Recently completed project.

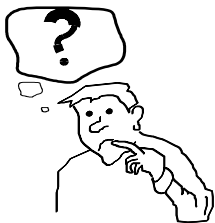
Dumre - Beshisahar Road

Dumre - Besisahar road connects Dumre (134km. West of Kathmandu on Prithivi Rajmarg) to headquarter of Lamjung district, Beshisahar. This road is classified as Feeder road and its number is F36 as FRN (Feeder Road National). The construction history of this road started in 1974 when 6 km earthen road was voluntarily constructed. Later on Department of Roads took the project and started to construct. The construction of road was previously slow due to lack of budget.

The pace of the construction of this road became fast when International Development Agencies (IDA) of World Bank agreed to provide assistance to build this road in 1992. During the agreement with World Bank, the construction of this road was included as one of the four components of Marsyangdi Catchment Management Pilot Plan (MCMPP).

The length of this road is 42.8 km. The road was constructed as double bituminous surface dressing (DBSD) with crushed stone base. The carriageway width of the road is 4.5 m with the provisions of by-pass and widening in settlement and bazaar areas. There are total of 5 major bridges and 20 number of causeways.

Department of Roads acted as an executing agency during the construction of road with SILT Consultants (P) Ltd. as the local consultant for the supervision of the construction works.



Do You Know

1. According to traffic survey by DoR in fiscal year 1998/99, the highest traffic count is in Manohara bridge in Arniko Highway (H03) which is 8341 and lowest is in border of Ilam district in Koshi Highway(H08), which is 64.
2. HMG has decided to impose the toll tax in nine sectors of four national highways.
3. The total budget of the Ministry of Works and Transport for the fiscal year 2056/57 is 5,38,64,88,000

Length, Date of Start, Date of Completion

S.No	Road Sector	Total Length (in Km.)	Date of Start	Date of Completion	Cooperation
1	Thankot - Naubise	17	1953	1956	India
2	Naubise - Mugling	84	1967	1974	China
3	Naubise - Bhainse	97	1953	1956	India
4	Bhainse - Hetauda	10	1958	1962	USA
5	Hetauda - Narayangarh	77	1973	1982	USA (cons.),ADB (upgrad.)
6	Narayangarh - Butwal	113	1969	1972	UK
7	Narayangarh - Mugling	36	1978	1982	China
8	Anglukhaireni - Gorkha	25	1978	1982	China
9	Mugling - Pokhara	90	1967	1974	China
10	Dhangadi - Dandeldhura	135	1967	1974	USA (Gravel)
11	Pokham - Sunauli	183	1964	1972	India
12	Kohalpur - Banbasa	200	1973	1978	India
13	Hetauda - Raxaul	57	1958	1967	USA
14	Kohalpur - Surkhet	91	1957	1967	Nepal
15	Kathmandu - Kodari	113	1963	1972	China
16	kathmandu - Trisuli	70	1957	1974	India
17	Butwal - Kohalpur	237	1973	1985	India
18	Bhairahawa - Lumbini	22	1973	1978	Nepal
19	Pathalaya - Dhalkebar	109	1967	1972	USSR
20	Dhalkebar - Itahari (Including Bhardaha Rajbiraj Link)	174	1967	1974	India
21	Dhalkebar - Bhattamod	43	1967	1974	India
22	Itahari - Kakarbhitta	93	1967	1974	India
23	Charali - Ilam	78			Nepal
24	Jogbani - Dharan	50			UK
25	Lamosangu - Jiri	110	1975	1985	Switzerland
26	Dharan - Dhankuta	50	1976		UK
27	Pokhara - Baglung	73	1988	1994	China
28	Bhatkanda - Doti	67	1990	1994	ADB
29	Bhalubang - Pvuthan	67	1990	1994	Nepal

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E D I T O R I A L

This newsletter is being produced for the dissemination of information of activities related to Highway Engineering and its development in the country and abroad. Highway Management Information System (HMIS) welcomes any article, news, events, suggestions related to Highway Engineering development.

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