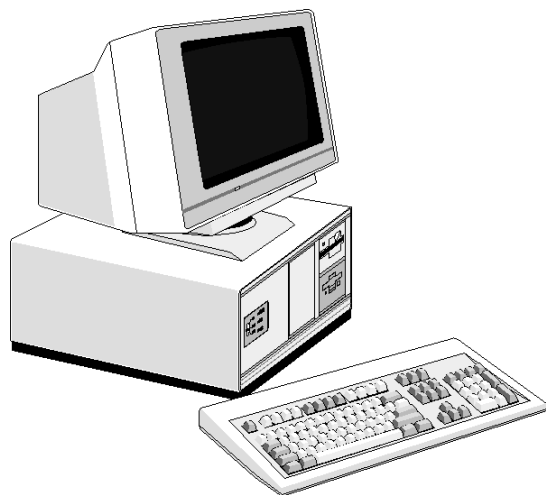


# HMIS News

A NEWSLETTER FROM THE PLANNING BRANCH ,DOR



## LATEST NEWS

### Road referencing system introduced into HMIS

**T**he road referencing system developed by the DOR and approved by the National Planning Commission has now been incorporated into the HMIS. The system forms a basic and most important element for the HMIS as much of the other data, eg. road roughness, surface distress index, traffic data etc. is collected and recorded within the context of the road referencing system.  
(cont'd page 2.)

## WHAT IS HMIS

### The Highway Management Information System in DOR

**T**he increase in size of our road network and the enormous capitals that our Government has invested in it justify the use of efficient management tools. Therefore the DOR has installed last year in April, a Highway Management Information System or in short HMIS.

The HMIS consists of several components: people, data, procedures, hardware, and software. The core of the HMIS is the database, however "data" does not equal "information", data is only the basis for information, therefore only selected relevant data is put into the database. Another reason for being selective is that data is costly to obtain and maintain. Maintaining the data involves timely updating to insure that the database contains reliable data.

The different branches of DOR need information to operate and part of the information is common to the different branches, this information should be supplied to the branches by a common central database.

The policy proposals concerning the central database are being prepared by a database working group with representatives from each branch and section. Procedures have been set up concerning the collection of data to be put into the database and concerning the distribution of the required information to each branch and section.  
(cont'd page 3.)

## TO CONTACT US:

The HMIS is located in the Planning Section of the DOR.  
The HMIS manager is Dr. Nabin Kazi Pradhan.  
You can reach us by phone or by fax at number 221.771 or you can visit us in our office on the first floor of Babar Mahal.  
Mail can be send to:  
DOR-HMIS POBox 2623  
Kathmandu.

## Inside this issue:

- 1 The Highway Management Information System in DOR
- 2 Road referencing system introduced into HMIS
- 3 Development of different database systems in DoR
- 4 Data Available in HMIS
- 5 Big drive to collect and process traffic data

**Road referencing system** (cont'd)

The usual criteria used when choosing a road referencing system are: (i) Traffic Volume, (ii) Traffic Loading, (iii) Functionality and Location.

Since the road network in Nepal is still relatively new, was built to a wide range of construction and geometric standards, and has to be much further developed, it is not practical to link serviceability levels (traffic volume and loading) to functionality. Likewise, given the early

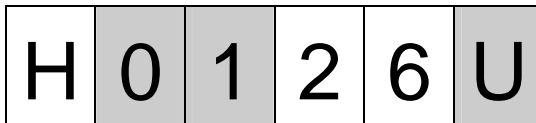
the roads such as major junctions, buildings in towns or villages and river crossings. There is always a node point where a road crosses national, regional, district or municipal

boundaries. Each road link is given a reference number. The referencing system includes the suffix letter U for urban road links.

The two examples in the box below illustrate the referencing

Reference Code For Urban Road Link No 26 Of National Highway Road H1

Reference Code For Road Link No 8 Of Feeder/Secondary Road F13



▼  
Road Category Letter

▼  
Road Link Number

▼  
Road Number

▼  
Letter Denoting Urban Link

stage of development of the network, it was not viable to link road referencing to routing within the network. The DOR road referencing system entails the categorisation of roads, the

numbering of roads and the division of roads into road links which are also given a number. A distinction is made between urban and non-urban roads.

The roads in Nepal are, at present, classified in five categories as set out in the Nepal Road Standards (2027), Second Revision (2050), which are: 1 National Highways, 2 Feeder Roads, 3 District Roads, 4 Urban Roads, and 5 Village Roads. The DOR is mainly concerned with national highways and feeder roads which form the strategic road network and for which it is responsible. The national highways are the major arterial routes passing through the country and include all the main highways connecting East to West and South to North. Feeder roads are of a more local nature than national highways but form important links between national highways or link regional or divisional headquarters or major places of industry, tourism or public utilities with national highways or with other feeder roads.

The road referencing system indicates the category of road by allocating the letter H to all highways and F to all feeder roads. Each road is given a number. At present there are 15 national highways and 51 feeder roads. There is provision in the system for an increase in the number in each category up to 99. For highways H1 to H6 the number also indicates a nominal order of importance and, where highways have overlapping sections, the more important road (lowest number) takes precedence in the referencing system. Additionally, each road is divided into several sub-sections called road links. The links are generally between 10 km and 40 km long and the start and end points of each link, called node points, are located at easily identifiable features on

system:

The development of the road referencing system is obviously not an

end in itself and benefit will only be derived from it by use of the system within DOR and by other agencies. Besides making use of the system for road roughness, SDI, and traffic surveys, the road inventories prepared and being prepared by the divisional engineers are compatible with the new road reference numbers. It is expected that other database users eg. NPC, MOWT, The Police, District Development Councils will make use of the road referencing system for recording and reporting purposes and to facilitate the exchange and linking of data in different fields. It must be understood that full national acceptance and utilisation of the system will only be achieved after the establishment of the system on the ground ie. the installation of the road referencing marker posts. A discussion paper on "The Establishment of Road Marker Posts" has been circulated within the DOR by the MRCU. The paper explains the rationale behind the installation of road referencing marker posts in combination with distance signs and suggests a specification for the various types of posts and signs. All constructive comments on the discussion paper, in either verbal or written form are very welcome and would be much appreciated by Planning Branch or the MRCU.

*HMISNEWS Supplement Includes:*

1. ROADS IN NATIONAL STRATEGIC ROAD NETWORK
2. TRAFFIC DATA FOR FY1994/95

# BIG DRIVE TO COLLECT AND PROCESS TRAFFIC DATA

The DOR staff in the divisional and regional offices may have noticed an increase in traffic data collection activities in recent months. Some of you are actively participating in the operation. Those less experienced members of staff may be tempted to pose the question "Why bother going to all this trouble to collect traffic data?". That question is easily answered. Traffic studies are essential if we are to correctly analyse the characteristics of the vehicles on our roads. We need to be aware of the type and volume of present traffic in order to make realistic estimates of future traffic. Such estimates are essential for both the geometric and pavement design of our roads and are an important tool for use in deciding priorities for expansion or improvements to particular roads or to the road network as a whole.

The Planning Branch of the Dor has recently assumed ownership, from the MRCU, of all traffic loggers, both existing and to be installed, and has undertaken an ambitious programme of installing 16 more automatic traffic loggers throughout the road network to bring the total number of loggers in operation to 24. This programme can only be achieved through the active cooperation of the regional authorities. It is the intention of Planning Branch to handover all of the loggers to the regional authorities who will arrange installation and be responsible for the maintenance of the loggers and for the regular collection of data from the loggers and the timely transmission of that data to the Planning Branch for processing by the HMIS.

While the traffic loggers will enable the production of valuable and comprehensive information on traffic volume on the whole of the strategic road network it must be noted that mechanical counters have their limitations. They usually cannot supply data on vehicle classification, direction of traffic and turning movements as well as loading conditions and number of occupants.

Being aware of these facts the Planning Branch has already carried out a series of classification and origin & destination surveys throughout the country. The assistance received from the regional and divisional offices in carrying out those surveys is heartily acknowledged and indeed it must be said that, as in all of its data collection activities, the Planning Branch must rely on the active cooperation of the regional authorities if it is to achieve success.

There is some concern in the DOR at recent reports that suggest considerable overloading on our roads. In order to determine the extent of the problem an axle load survey will shortly take place on the Naubise/Muggling road near Muggling and depending on the result of the survey, the exercise may be repeated at strategic locations throughout the network.

Readers may be interested in the most recent traffic information available. To that end we have included a supplement.....

## HMIS(contd.. from page 1)

Initially the central database has been located in the Planning Branch who is the database operator. Gradually access to the

information will be improved for all users in DOR, first by distributing copies of the database information on diskette and on paper and in a later stage by installing a network in DOR allowing real time access for all users.

Exchange of information is also required with database users outside DOR (DOTM, NPC, Traffic Police, ICIMOD, etc.). DOR maintains contact with these users, exchanges data and

promotes standards to ensure exchangeability of data such as the road referencing system developed by DOR.

A set of initial data has been put into the database during the last

year. The data collected so far although limited to the more important information is already impressive: about 18,000 data entries have been made into 345 fields. Each field represents one parameter describing a specific characteristic of the road, like its width, traffic or pavement type. The collaboration of the different branches and units of DOR has been essential.

The data in the database is used to produce useful information. The transformation of data into information is done in different stages of increasing complexity: as of this stage database querying already allows to retrieve information based on conditions and filters and to sort this information.

In the following stage a mapping module will be installed that will allow for the preparation of thematic maps generated by the computer based upon the stored information. This is now planned for September 1995 and our newsletter will bring you more news about this application at that time.

But most expected is the installation of a planning and budgeting module to develop a road rehabilitation and maintenance programme taking into account the available budgets. This will allow planning to take into account all the information stored in the database. We expect this module to be installed early 1996 if data collection goes according to schedule, because it makes sense to install tools to handle the data only if there is enough data to handle.

In addition to the main objective of planning and programming the HMIS database will be also be used for research and development. It will for example be interesting to look for a link between road characteristics and traffic accidents. Maybe we will discover that small changes in the design can improve safety tremendously and save many lives this way.

In our next newsletter we will explain some of the specific characteristics of our database such as the "dynamic segmentation". This feature allows the computer to break up road links into homogeneous sections according to one characteristic like roughness and then calculate for each section representative values for the other parameters: traffic, road width etc. This is a special operation no ordinary database can handle!

## Data Available in HMIS

1. Description of Roads, its length depending upon the pavement type.
2. Description of links, beginning & ending chainage & locations; Administration responsible for the section of road(region,district,DoR division & region). Traffic data of some of the links.
3. Location of different reference points (permanent objects) along the road.
4. Pavement condition (roughness & surface distress data ) of the most of the roads in strategic Road Network for FY 1992/93 & FY 1993/94.

5. Information about the committed sections, sections under construction and rehabilitation.
6. Pavement structure data of some of the major roads.
7. National average unit cost rate for major items of works on construction & maintenance for planning & budgeting purposes
8. Information on the availability heavy equipment in regions and projects.
9. Information on DoR project & division office location

## Development of different database systems in DoR

With the growing awareness of the importance of information for the purpose of successful planning & implementation of different programmes & projects, the development of the paper-based as well as computer-based database system in DoR is rapidly growing. When a large number of data are to be handled computer-based database system is probably the best solution.

Mechanical Branch was first to introduce the computer based database. In FY 1991/92 Equipment inventory database was developed. The location & condition of various equipment available in DoR are kept in this database. Under RMRP project database is now being upgraded to "Asset register system" by the outside consultant. Then it will be possible to get the information about the depreciation value & equipment operation & maintenance cost .

During FY 1993/94 a project monitoring software was developed under Environment & planning strengthening project in the planning branch. All the data concerned with agreed Annual programme, budget and trimester progress reports are entered in this database system kept in Monitoring & Evaluation Unit(MEU). All the major items of works were coded to facilitate the query from this database. Most of the Data are kept in Nepali to facilitate automatic generation of progress report on format required by NPC. But many of data are also kept in English for general query & for easy exchangeability of data with other database.

To facilitate Network level programming & budgeting the concept of establishment of a computer based central level database system called Highway Management information system (HMIS) was developed in FY 1993/94, The DoR has acquired and installed in April 1994 a dedicated database software, dROAD version 5, produced by Deighton Associated LTD, Bowmanville, Ontario, Canada. The database is installed and operated in the Planning Branch of DoR The software include an input/output modules(dROAD), a mapping module(dMAP), a general application module (dTIMS). The latter two modules will be acquired in 1995/96, when sufficient data will be available in the database to operate them usefully.

The Road Sector Skills Development Unit (RSSDU) is installing a database containing information about the personnel : bio-data, education, successive positions & postings, additional education & training, etc. The database is being developed by an outside local consulting company: Unlimited software.

Under the Road Safety component of the Road Maintenance Project a traffic accident database (MAAP5, developed by TRL, UK) has been installed on computers of the Design Branch DoR and at the valley traffic police office. Accident data are being collected and stored. Unfortunately the programme could not export in .DBF format and the DoR road referencing system was not being used. This makes more difficult for exchanging the data with other databases in DoR which uses

.DBF format for exchanging data. Contact is being maintained to ensure easy exchangeability of data.

Bridge Management Information system is planned to be developed by bridge Unit in FY 1994/95. At the first stage mainly data related to Bridge inventory will be collected. At present paper based database system is being developed. It is planned to upgrade to computer based database.

Besides, to facilitate the maintenance purposes a paper-based Road Inventory Database is being initiated in strengthened maintenance divisions(SMD).

Certainly a lot of progress has been achieved in the initial development of database systems in DoR. New database systems will be established in other branches and lot of modifications & improvements in the exiting system are anticipated in future. For the best use of them it is essential that data exchangeability between the databases could be done with out much difficulty. Following the DoR Referencing systems, use of standard codes for different locations and office as well using the software capable of exporting in .DBF and .DXF format are prerequisites. Compatibility will be inevitable when one day all these databases will be connected in a network.

In our next newsletter we will give more detail on one of the database systems.



## Do You Know ?

- The highest traffic count in National Strategic Road Network is in the link H0203 (Thankot - Nagdhunga) in H02 Tribhuvan Raj Path. According to the Automatic Traffic logger counter placed at Nagdhunga the Average Annual Daily Traffic (AADT) is equal to 2332
- The shortest link in the strategic Network is H0137U Pulchok (Narayanghat) junction - Narayani bridge in H01 Mahendra Raj Marg. The length of the link is only 140 m..
- The National Highway H01 Mahendra Rajmarg has the largest number of links (167).

- Road condition survey conducted in the FY 1993/94 showed that the link H0401 ( Naubise-Galchi) had the minimum roughness value (IRI = 2.7) .
- The longest structure crossing the river is Koshi Barrage with the length of 1150m in the National Highway H01 Mahendra Rajmarg.