

## ROAD INFRASTRUCTURE AND TRANSPORT IN NEPAL

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Unless a country has a good road network, it can not achieve other development activities. So, development of roads is one of the most important aspects of infrastructure development of a country. This paper describes about road infrastructure and transport system in Nepal. Different aspects such as development of roads, passenger and freight transport, various problems in this field and proposal for future policy and planning are discussed here.

### 1. Introduction

Nepal is situated in South Asia between China and India. Its area is 147181 sq.km and population is about 19 million (1991). The population of Kathmandu, the capital city is about half a million. The country can be divided into three regions running throughout its length in East-West direction. They are mountains in the north, hills in the center and plains in the south. These regions constitute 22%, 44% and 34% of the total area of the country, respectively. The country is politically divided into 5 Development Regions, 14 Zones and 75 Districts. Since 66% of the country is covered by mountains and hills, development of transport infrastructure has been very difficult and expensive. The major mode of transport is road followed by air transport. Railways are not developed much due to rugged topography. Only two minor railway lines are in existent in the southern part. In the high mountain regions, mule tracks are still in existent and are important because goods have to be transported by mules as no other means are available.

### 2. Road Infrastructure

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### 2.1 Development of Roads

The planned development of the country started in 1956 and since then development of road infrastructure has been given high priority. Department of Roads(DOR) under the Ministry of Works and Transport is responsible for the development of roads in the country. Roads are dominant mode of transport over all and will continue to be so because of topographical condition. The total length of roads in 1956 was 624 km which increased to 7330 km in 1990. Out of 75 districts 52 districts are already connected by roads and two more will be connected as "Pokhara-Baglung Highway" connecting them will be completed and opened to the traffic by 1992. Remaining 21 districts are still without any road access.

Length of roads, influenced population and area per km of road for different years of development plan from 1956 to 1990 are given in table 1.

Table 1

Year	Description	Length of road km	Influenced population per km of road	Influenced area km <sup>2</sup> /km
1956	1st five year plan	624	13609	235
1962	2nd three year plan	1193	7970	123
1965	3rd five year plan	2049	5130	71
1970	4th five year plan	2504	4600	58
1975	5th five year plan	3137	3800	46
1980	6th five year plan	4940	2844	29
1985	7th five year plan	5925	2840	24
1990		7330	2579	20

There was substantial development in roads in this period despite of country's economic problem and

unfavourable topography. However, many roads are yet to be constructed as many places remain without a road.

The average road density and road per 1000 people for Nepal and its neighbouring countries are given in table 2.

Table 2

Country	Road density km/km <sup>2</sup>	Road per 1000 people km
Nepal	0.05	0.39
China	0.10	0.90
India	0.53	2.26

Thus Nepal is lagging far behind in road infrastructure than its neighbouring countries.

### 2.2 Budget for roads

Budget for construction and maintenance of roads are allocated in the annual development budget of the country. During first four development plans (fiscal year(FY) 1956/57 to 1974/75), 40% of the total public development budget was spent in transport sector and roads were given 1st priority within transport sector. In seventh plan (FY 1985/86-1990/91), about 74% of the budget allocated to transport sector was allocated to roads. Apart from the govt. budget, foreign grants and loans are important fund for road construction.

Most of the Highways are constructed by foreign assistance or loans. The major assisting countries are China, India, former USSR, USA, UK and Switzerland whereas among international organization are ADB and World Bank.

### 2.3 Classification of Roads

Roads are classified into four categories as following -

#### a) Highway

This is the road connecting two regional headquarters or more than two districts. This is generally two lanes in the mountainous region and two or more lanes in the plain.

#### b) Feeder road

This is the road connecting Highway and district Headquarter or other destinations.

#### c) District road

This is the road connecting different places in a district or between districts.

#### d) Urban road

This is city road or road which does not include in above categories in urban areas.

The classification is also governed by design standards such as design speed, grade, radius of curve, lanes etc. which are set by Department of Roads for each category.

From the construction aspect roads can be divided into following types :

#### a) Black-topped

#### b) Gravelled

#### c) Earthen ( Earth surfaced )

Earthen roads are used for very low traffic flow and are generally fair weather roads.

Table 3 and 4 show length and type of road for each category nationwide and in the capital.

Table 3 Nationwide

Type of roads	Highway	Feeder	District	Urban	Total
Black topped	1752	480	241	485	2958
Gravelled	205	481	672	300	1658
Earthen	154	861	1386	313	2714
				Total	7330

Table 4 For capital ( Kathmandu )

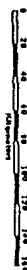
Type of road	Highway	Feeder	District	Urban	Total
Black topped	18	0	51	146	215
Gravelled	0	0	72	66	138
Earthen	0	0	49	38	87
				Total	440

The major highway called "Mahendra Rajmarg" which connects east and west boundaries of the country is the backbone of roadnetwork in the country. Its total length will be 1003 km out of which 969 km are completed. Highway is called Rajmarg in Nepalese. Other important highways are given in table 5.

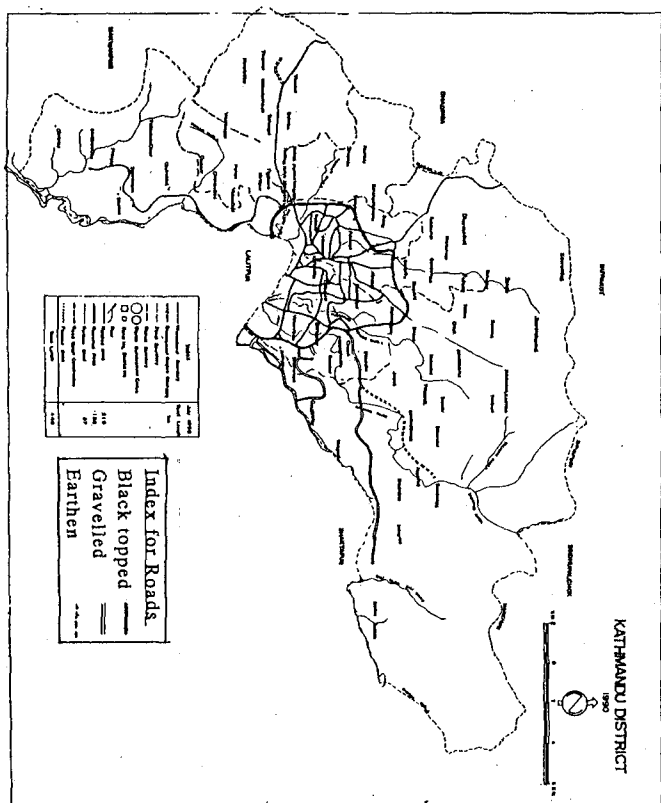
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## TRANSPORTATION NETWORK

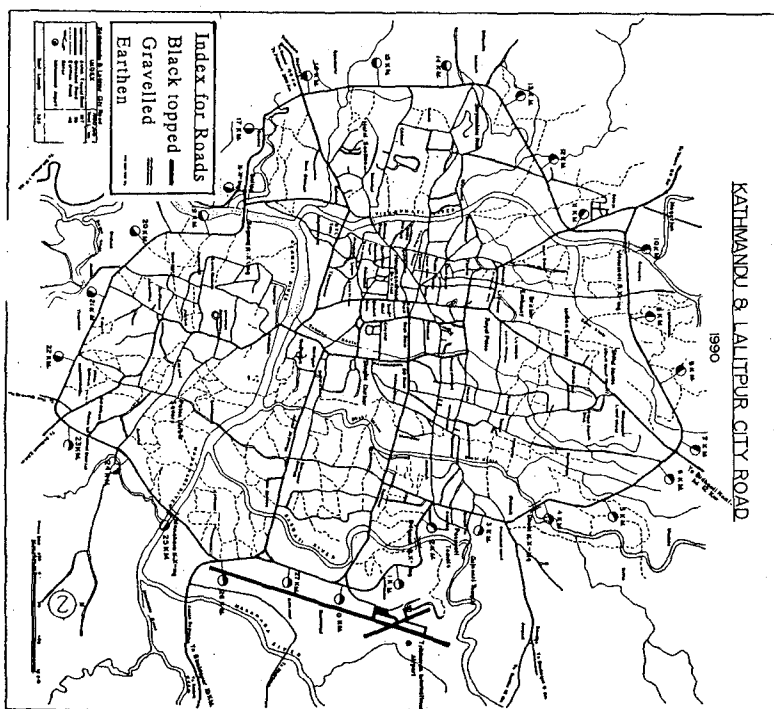
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Map No. - 2



Map No. - 3



City Road Network in Kathmandu and Lalitpur ( Annex City to Kathmandu )

Table 5

Name of highway	Origin & destination	Length(km)
Arniko Rajmarg	Kathmandu-Kodari(border with China)	114
Tribhuvan Rajmarg	Kathmandu-Raxaul(border with India)	192
Prithvi Rajmarg	Kathmandu-Pokhara	200
Siddhartha Rajmarg	Pokhara-Sunauli	180
Ratna Rajmarg	Kohalpur-surkhet	91
Dhangadi-Dadeldhura	Dhangadi-Dadeldhura	135
Jogbani-Dharan-Dhankuta	Jogbani-Dhankuta	100
Gorkha-Narayanghat	Gorkha-Narayanghat	61
Mugling-Narayanghat	Mugling-Narayanghat	36
Pokhara-Baglung	Pokhara-Baglung	73
(will be opened in 1992)		

## 2.4 Maintenance condition

Many roads are not maintained timely due to financial and other constraints. This causes vehicle operation cost high and increase in road maintenance cost as damage to road will be more without timely maintenance.

## 3 Road Transport

### 3.1 Mobility

Road transport is the most suitable and major mode of transport in the country which accounts for 90% of the total passenger and freight transport. The growth rate of road transport has been 6% per year since 1975/76 against its GDP growth rate of 4% annually. About 75% of passenger-km was by bus and 19% by light vehicles in 1982/83.

The number and type of vehicles nationwide and in Kathmandu according to vehicle registration record for 1990/91 are as following.

Table 6

Type of vehicles	Number	
	Nepal	Kathmandu
Bus	2936	645
Mini-bus	1734	1181
Truck, Lorry	8315	2559
Private passenger car	22880	18253
Public passenger car( Taxi)	3629	2282
Motoreycles, Scooters	37369	26121
Autoricksaws( "Tempo")	3542	2991
Tractors(used for freight transport)	7129	1864
Ricksaw ( Nonmotorised )	16062	822
Total	103596	56718

Thus 54% of total vehicles are in the capital.

## 3.2 Passenger transport

### 3.2.1 Inter-city Transport

Since private vehicle ownership is very low, bus is the common means of transport for inter-city transport. Many private companies operate bus services between different cities and destinations all over the country. In addition to this, a government undertaking corporation called as "Sajha Yatayat" operates such services. For long routes night services are much popular than day services. There is no any fixed policy for role sharing between private companies and "Sajha Yatayat". Private companies have to obtain route permit from the Ministry of Transport for operating bus services. About 80% of passengers are transported by private companies and only about 20% by "Sajha Yatayat".

Some of main intercity bus lines are Kathmandu-Pokhara, Kathmandu-Birgunj etc. About 40 buses are operated in each of these lines daily.

### 3.2.2 Urban Transport

Bus is the main means of urban transport. Mini-bus and taxis are the other means. In the southern region Rickshaws and Horse driven cart are also popular means of urban transport.

In Kathmandu, city buses are operated by both "Sajha yatayat" and private companies. Private buses are more in numbers and cover many routes compared to "Sajha Yatayat". The role sharing in urban transport by private companies and "Sajha yatayat" are about 70% and 30%, respectively. Mini-buses are also operated in many routes. These are mostly owned by individuals or private companies. There is Trolley-bus service between Bhaktapur and Kathmandu in a length of 18 km. Taxis are another means of urban transport which are used for comfort as well as saving time because bus services are not that punctual. Auto-ricksaw locally called as "Tempo" are becoming popular in city transport since they are cheaper than taxis and more frequent and comfortable than buses. Cycle-rickshaws are also available but the usage is decreasing as they are

prohibited in some city roads and the fare is almost same as autorickshaw but service is slow.

### **3.3 Freight Transport**

More than 90% of freight transport are carried by roads. Private carriers are mostly engaged in this work. Kathmandu is the business center of the country and hence freight to and from here are the largest part of the total freight transport. Since the country is landlocked, it has to use Calcutta Port in India for shipment of goods to and from overseas countries. The goods are transported from there to several entry points in the southern region near Indian border either by railways or trucks. Birgunj is the main entry and exit point nearest from Kathmandu. So, the freight transport between these two places are significantly high which are carried by trucks. There is a government undertaking corporation called as "Yatayat Sansthan" for freight transport which generally transport freights for government offices. Tractors and Handcarts are also used for goods transport in some areas. In Kathmandu, tractors are popular for transport of construction materials and other freights within the city area.

## **4 Various problems**

### **4.1 Topographical constraint**

As 66% of country's area covered by hills and mountains, it is very expensive and hard to develop transport infrastructure in the country. Many problems such as landslide and erosion are faced while constructing roads in the mountainous region. There are also restriction in geometric design due to sharp curves, loops and high grade which are unavoidable in mountain roads.

### **4.2 Lack of finance**

Being a poor country, it can not invest adequately to construct and maintain many needed roads and to improve the transport service system.

### **4.3 Scattered population**

In the mountainous region populated areas are scattered here and there and not confined to an area.

This makes difficult and expensive to link these areas by roads or any other access.

### **4.4 Insufficient road network**

The road density is 0.05 km per sq. km area so road network is insufficient which causes longer time and tiresome walking to get into a road access.

### **4.5 Low frequency of buses**

Due to inadequate number of buses their frequency is low in many urban routes resulting into crowds in the buses and longer time of travel for the passengers.

### **4.6 Small freight transport companies**

Many small freight carrier may have just one truck or some may not have any. In such cases they have to use on-hire trucks which may not be at their disposal any time they need. Thus the delivery time may not be reliable which will cause trouble and losses to the customers.

## **5. Proposal for future policies and planning**

### **5.1 Better road infrastructure**

Following points should be considered in road development plan :-

- \* The 21 Districts which are still not linked by roads should be linked by roads from the nearest road available.

- \* To construct or extend road in the north-south direction in every zone and connect this to "Mahendra Rajmarg".

- \* To construct alternative road as passage to capital from southern part. At present there are two highways namely Tribhuvan Highway and Naubise-Mugling (part of Prithvi Highway) with Mugling-Narayanghat Highway between the capital and southern region. However, Tribhuvan Highway is not used much after the later Highway was opened as it is much better and takes less time of travel than the former one. So congestion and much wear and tear to pavement are caused in the later highway. One of the possible alternate routes is Banepa-

Sindhuli Road which has been proposed by DOR and preliminary survey has been done by JICA.

## **5.2 Road transport policy**

### **5.2.1 Subsidy**

Govt should subsidize to transport companies operating services for public transport. The good way to subsidize is to reduce import duty on buses and trucks to be used for passenger and freight transport, respectively.

### **5.2.2 Checking of quality of service**

The vehicles used for public transport should be checked for safety and comfort of passengers, periodically and permission for operation should be given only if found satisfactory.

### **5.2.3 Trolley Bus**

Nepal has abundance potentiality of hydro-electricity. This energy should be used to operate trolley buses for passenger transport. Trolley bus service should be expanded in Kathmandu for urban trans-

port. This service should be gradually expanded in other cities and long routes, too.

### **5.2.4 Loan Schemes**

Private companies operating public transport services should be provided with loans through banks or such agencies to improve their services.

### **5.2.5 Incentives**

To create a better service and competition transport company should be given an incentive for best service which will be judged by interviewing the passengers. The incentive may be in the form of relaxation in tax or so on. This will be more important for the company to win goodwill and get more market.

## **References**

- 1 Nepal Road Statistics 1990 - Department of Roads, Nepal
- 2 Development and Management Profile of Transport Infrastructure in Asia and the Pacific 1989 - JICA