

**His Majesty's Government of Nepal
Ministry of Physical Planning & Works
Department of Roads**

DISCUSSION PAPER

**ROAD CLASSIFICATION &
ROAD RESPONSIBILITIES**

FIRST DRAFT

MRCU

August 2001

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LIST OF ABBREVIATIONS

AADT	Average Annual Daily Traffic totalled in both directions
DDC	District Development Committee
DOR	Department of Roads
HMG/N	His Majesty's Government of Nepal
HMIS	Highway Management Information System
MOAC	Ministry of Agriculture and Co-operatives
MOF	Ministry of Finance
MOLD	Ministry of Local Development
MOPPW	Ministry of Physical Planning and Works
MRCU	Maintenance & Rehabilitation Coordination Unit in DOR
SRN	Strategic Road Network
VDC	Village Development Committee

Road Classification and Road Responsibilities

INTRODUCTION

1. A balanced and well-managed national road system is required to support the needs of the population and economic development as a whole. A balanced national system comprises a mix of roads having separate but complementary transport functions serving:

- i) **Long Distance Through Transport** – this is essentially the transport of goods between areas with complementary economies, between areas of production and import and areas of consumption and export both internally and with neighbouring countries.
- ii) **Collection and Distribution** – is the complement and necessary extension of the long distance transport facility that allows direct contact between producing and consuming populations and the development of an exchange economy.
- iii) **Human and Social Liaison** – is one of the principal driving forces in development, not only through the sense of well-being it brings to a community but also through the realisation of new needs and the means of satisfying them.

This is particularly the case for Nepal which is landlocked and where a relatively high proportion of the population lives in remote rural areas. A key policy consideration for government is to determine an appropriate balance between these functions and then to allocate resources and responsibilities accordingly.

2. In order to effectively perform all of these functions, the national road system must be comprehensively designed and managed such that each road in the system is a:

- i) **Serviceable Road** – the road is designed and maintained to satisfy its function and the levels of serviceability related to that function in particular, the strategic importance of the road and the types and numbers of traffic using the road;
- ii) **Safe Road** – the road provides a relatively safe environment for all users of the road including pedestrians;
- iii) **Cost-Effective Road** – the road performs its particular function in a cost-effective manner (the road should be affordable in financial terms and the available capacity to maintain the road).

When developing a national road system the focus for individual roads within the system should be on cost effective service delivery in relation to need. Only in this way can appropriate road standards be set and acceptable road standards be

sustained in the longer-term. At the same time, given the disparity in functions within the national road system, management responsibility should be decentralised wherever possible to the representatives of the main beneficiaries of the roads.

3. As a first step in improving national road system management, the following requirements should be met.

- i) A road hierarchy should be established and the roads should be classified by functional and administrative importance.
- ii) The principal strategic roads should be separately identified, grouped and referenced such that the referencing system provides a means of locating road features, identifying maintenance control sections, allocating traffic levels and recording accidents.
- iii) Responsibility for roads or groups of roads should be allocated and clearly defined by statute.

The subsequent sections of this document set-out the proposed approach to classifying and referencing the Nepal national road system and allocating administrative responsibility for the roads. The approach taken is in accordance with the recommendations contained in the Government's National Transport Policy, 2001, the 20-Year Road Plan, and the Decentralisation Act, 1998.

ROAD CLASSIFICATION

Classification Approach

4. There are three principal objectives in classifying the national road system.

- i) To highlight the function of a road and thus the level of service to be provided by the road (this will in turn largely govern the engineering standards to be adopted for design, construction and maintenance but see paragraph 5 below).
- ii) To determine the position of a road within the road system hierarchy and thus the nominal road priority.
- iii) To indicate the administrative level of the road and the authority responsible for the road.

5. The approach adopted for meeting these objectives should be comprehensive yet sufficiently flexible to allow for future network expansion and upgrading. However, there is a further consideration when classifying roads in Nepal. The national road system is relatively new (the first road into Kathmandu was constructed in 1956) so there is a need to indicate the function of the road in terms of future rather than present development. At the same time, the present level of economic development justifies the use of a staged approach to construction standards based on existing rather than anticipated road traffic levels. The result is that for any particular road classification, there will be a wide range of traffic and serviceability levels and hence geometric and construction standards. In providing an indication of road function, it is not yet feasible in Nepal to link serviceability to function and therefore to indicate traffic levels and road standards by means of the road classification.

6. The proposed approach to classifying the Nepal national road system divides all the roads into three separate but interrelated systems. Individual roads in each system are then grouped under various classifications and sub-classifications. The three road systems and their classified sub-groups are shown diagrammatically in Annex I and described as follows.

7. **CENTRAL ROAD SYSTEM** – comprising:

National Highways – these are the main highways connecting East to West, South to North and those roads joining the main north-south valleys of the Nation. The roads connecting these roads to Regional Headquarters are also classified as National Highways. National Highways directly serve the greater proportion of long distance travel, they normally provide a consistently higher level of service (but see paragraph 5) and serve the inter-community mobility (regional interest) and cross border traffic. These roads comprise the main arterial routes passing through the length and breadth of the Country and fulfil all three functions given in paragraph 1. A list of the National Highways is contained in the HMIS operated by DOR Planning

and Design Branch. The list is published annually by the Branch in the Nepal Road Statistics.

8. **Feeder Roads** – these are important roads of a more localised nature than National Highways and are of secondary importance in the road system hierarchy. They are sub-classified into Feeder Roads (Major) and Feeder Roads (Minor). Feeder Roads fulfil the principal functions of collection and distribution and human and social liaison given in paragraph 1.

Feeder Roads (Major) – comprise:

- major links (AADT over 100) between the National Highways;
- roads linking District Headquarters/Zonal Headquarters to other Feeder Roads;
- links from National Highways to the major places of industry, tourism, public utilities and power generation (hydropower sites).

Feeder Roads (Minor) – comprise:

- links from Feeder Roads to the major places of industry, tourism, public utilities and power generation (hydropower sites);
- links from Urban Roads to the major places of industry, tourism, public utilities and power generation (hydropower sites).

9. To assist in obtaining a more appropriate balance between road system investments and in decentralising road responsibilities, Feeder Roads (Major) and Feeder Roads (Minor) are further grouped using four sub-sub classifications. These are based on traffic density, agriculture development, infrastructure and strategic support, and community strengthening as follows.

- i) **Multipurpose Roads** – all Feeder Roads having traffic levels greater than 50 AADT.
- ii) **Agriculture Roads** – farm to market Feeder Roads in the Terai and Mid-Hill valleys, shorter than 60 km, linking with agricultural areas and predominantly serving agricultural traffic.
- iii) **Project (Sector) Specific Roads** – all Feeder Roads integral to hydropower development, tourism related development or industrial development. This sub-sub classification also covers Feeder Roads of high strategic importance (VIP Roads) such as the roads connecting the Royal Palace, the Parliament and the Kathmandu International Airport to the National Highways. A list of Project (Sector) Specific Roads is given in Annex III.
- iv) **Social Roads** – all Feeder Roads with an initial traffic level of 50 AADT or below.

It should be noted that the term 'Feeder Roads' is used in Nepal to classify what are generally known as 'Secondary Roads' in international road classification terminology. A list of the Feeder Roads is contained in the HMIS operated by DOR

Planning and Design Branch. The list is published annually by the Branch in the Nepal Road Statistics.

10. **Hulaki (Postal) Roads** – these roads comprise the remnants of the former communications network in Nepal and are now principally located along the Indian Border in the Terai. They command a high political priority as they continue to provide links between the East-West Highway and the Border. However, as the network develops, these roads will be progressively upgraded to Feeder Roads according to the classification criteria given above or they will become redundant. A list of these roads is given in Annex IV.

11. **LOCAL ROAD SYSTEM** – comprising:

District Roads – these are roads connecting groups of villages within a District to the Central Road System. They command the top priority in the Local Road System and fulfil the principal functions of collection and distribution and human and social liaison given in paragraph 1 at the local level. District Roads are key elements in promoting and supporting local development. However, they depend on a well-balanced and maintained Central Road System and complementary inputs in other development sectors in order to realise their development potential.

Agriculture Roads – serve specific areas of agricultural importance within a District and connect these areas to District Roads or the Central Road System. They are classified separately in order to highlight the importance of their agriculture collection and distribution function in the District. Although positioned second in the Local Road System hierarchy, these roads are generally accorded the same priority as District Roads.

Village Roads – these are short, non-through roads connecting isolated villages to District Roads or directly to the Central Road System. They are tertiary elements in the local road hierarchy but fulfil an important human and social development function.

Mule Tracks/Main Trails/Village Trails – roads are not the only means of fulfilling transport functions (ii) and (iii) in paragraph 1 at the local level. In fact, given the relatively high cost of constructing and maintaining even minor roads in the Hills, Mule Tracks, Main Trails and Village Trails will continue to play a major role in the transport needs of rural communities for some time to come. Their preservation and further development should be encouraged through a policy of local ownership and decentralised infrastructure responsibilities. To promote this objective, they have been included in the classification structure of the Nepal Road Network. In the classification hierarchy, Mule Tracks are the most important in this grouping.

12. **URBAN ROAD SYSTEM** – comprising:

Municipal Roads – these are roads and streets within a municipal boundary, excluding the Central Road System. They provide access to residential, business,

government and industrial establishments within the municipality and thus enable the local distribution of goods, assist business activity and are the primary means of social interaction. They accordingly fulfil functions (ii) and (iii) in paragraph 1. It is most important for Municipal Roads to be developed and designed within a land-use planning framework for the Municipality.

City Development Roads – these roads form a network of relatively short access connections within specific development areas of a municipality such as residential and industrial estates. The networks connect with Municipal Roads or Urban Links of the Central Road System (Strategic Network Roads) and are secondary elements within the Urban Road System hierarchy.

The Strategic Road Network

13. Within all national road systems there are certain core roads that act as the principal collection and distribution elements and thus form the essential backbone of the system. These roads are the primary roads in the national road system hierarchy. The National Highways and Feeder Roads fulfil this important function in the national road system of Nepal. In order to highlight the importance of these roads they have been additionally grouped under the heading, the Strategic Road Network. The Strategic Road Network was defined by DOR/MRCU and approved by the Government in 1994. A list of the roads comprising the Strategic Road Network is given in Annex II.

14. Strategic Network Roads are the first to be constructed in a national road system. By definition, they normally carry the highest traffic levels (but see paragraph 5 for Nepal) and by reason of their strategic importance, these roads should command the highest priority for maintenance and further development. However, as demands on the national road system increase, a more balanced approach to road investment should be adopted covering the system as a whole. In this way, the system can be managed and expanded to meet the development needs of the Country in a cost-effective manner.

ROAD RESPONSIBILITIES

15. Given the wide disparity of functions served by the roads in the national road system it is important that, wherever possible, administrative responsibility for particular roads is placed with the representatives of the main beneficiaries of these roads. This approach assists in clarifying responsibilities, encourages road ownership by the beneficiaries and thus lays the foundation for improving road management and operations in the longer-term. To this end, the Government included the decentralisation of roads administration in the Decentralisation Act that was enacted in 1998.

16. Applying the above approach, administration responsibilities for the Nepal national road system have been defined and are shown in the following table. The results accord with the 1998 Decentralisation Act and the National Transport Policy.

National Road System Administration Responsibilities

Responsible Authority	Executing Agency	Road Classification
Ministry of Physical Planning and Works	Department of Roads	<u>Central Road System</u> National Highways Feeder Roads (Major) {Multi-Purpose} Feeder Roads (Major) {Sector Specific VIP} Feeder Roads (Major) {Social} Feeder Roads (Minor) {Multi-Purpose} Feeder Roads (Minor) {Social} Hulaki (Postal Roads)
		<u>Urban Road System</u> City Development Roads
Ministry of Local Development	District Development Committees	<u>Local Road System</u> District Roads Agriculture Roads Village Roads Mule Tracks/Main Trails
	Village Development Committees	<u>Local Road System</u> Village Trails
	Municipalities	<u>Urban Road System</u> Municipal Roads and Streets (excluding National Highways and Feeder Roads)

National Road System Administration Responsibilities continued:

Responsible Authority	Executing Agency	Road Classification
Ministry of Agriculture and Co-operatives	Agency to be determined, directed, and funded by MOAC	<u>Central Road System</u> Feeder Roads (Major) {Agriculture} Feeder Roads (Minor) {Agriculture}
Representative Authority of the Concerned Sector	Agency to be determined, directed, and funded by Sector Representative Authority	<u>Central Road System</u> Feeder Roads (Major) {Sector Specific} Feeder Roads (Minor) {Sector Specific}

It can be seen from the table that Central Government carries the ultimate responsibility for the majority of roads in the national road system through MOPPW, MOLD and MOAC. Central Government through its Agency DOR also administers and manages the majority of roads in the Strategic Road Network. However, the administration of roads in the Local and Urban Road Systems has largely been delegated to the local level. The Nepal national road system classification and administrative responsibilities are shown diagrammatically in Appendix I.

17. Due to a lack of adequate road management capacity within the DDCs and the Municipalities, it is likely that DOR will continue to provide progressively reducing road management and operations support to these agencies while capacity is developed. However, it is important to note that in so doing, DOR does not take-over responsibility for the particular roads within the Local and Urban Road Systems. The responsibility for ensuring a reasonable level of service from these roads for the main beneficiaries remains with the Responsible Authority and its Executing Agency. As such, any support provided by DOR should be the subject of an inter-agency agreement and a transfer of funds should be made to cover the support costs. This approach equally applies to Agriculture Feeder Roads that are the responsibility of MOAC but where DOR provides management and operations support. A list of the Districts and Municipalities is given in Annex V and Annex VI respectively.

18. Project (Sector) Specific Feeder Roads are the responsibility of the representative authority of the concerned sector. For instance, Feeder Roads linking National Highways or other Feeder roads to specific tourist sites would be the responsibility of the Ministry of Tourism. Similarly, the private sector or the Ministry of Water Supply would be responsible for Feeder Roads linking hydropower stations. In all these cases, the representative authority will appoint, direct and fund an executing agency to manage the roads but will retain overall responsibility for the roads.

19. Unlike civil aviation or railways, there is no clear price for using roads. The cost of providing and maintaining road infrastructure is met from general tax revenues and is not therefore directly reflected in charges to the road-user. The result is that the road-user does not have a high expectation of the level of service offered by the road and there is little pressure on the road agency to improve the level of service. This situation should be improved.

20. For Local and Urban System Roads, improvement can be achieved through contributions from the main beneficiaries of finance and labour as appropriate. This approach could also be used for Feeder Roads in the sub-sub classifications of Agriculture, Project (Sector) Specific and Social. For other roads, direct (road tolls) and indirect road-user charges should be levied. The first and most important step in introducing road-user charges, as opposed to additional taxes, is to establish the relationship that a charge for using the roads will be reflected in a guaranteed level of service from the roads. This will raise the expectancy of the user and place pressure on the agency for improved service delivery.

21. The relationship can be initiated by levying toll charges on particular road sections where the user is able to judge the results of the charge in terms of road condition. Nepal experience has shown that acceptable toll charges can be levied to cover the road maintenance costs where traffic levels exceed 950 AADT, and the management and operations capacity exists to deliver a reasonable level of service on the road. It is important that user charges are held in a dedicated fund and administered independently of the MOF. The fund should be utilised solely to provide the required level of service on the roads. As road-user confidence is increased and government and private sector capacity for undertaking maintenance is built-up, indirect user charges on fuel and vehicle licensing should be introduced. In the longer-term, it is recommended that all user charges be made the responsibility of an autonomous Highway Authority (Roads Board).

REFERENCING OF THE STRATEGIC ROAD NETWORK

22. The Department of Roads developed a basic road referencing system in 1994 and has applied it to the roads comprising the Strategic Road Network. The system supports the objectives in paragraph 4 as for each road it:

- enables the particular road system to be identified and hence, the authority responsible for the road;
- indicates the road category;
- provides a unique reference for each link in the road;
- utilises a straightforward reference for the road links (6-alphanumeric characters);
- adopts descriptive node points for the road links rather than a separate numbering system.

23. The referencing system first identifies National Highways and Feeder Roads. These roads are given a reference code to reflect the road category comprising a designatory letter:

'H' representing National Highways and **'F'** representing Feeder Roads

followed by a number from 1 to 99 (at present up to 15 for National Highways and 51 for Feeder Roads). For Highways H1 to H6, the number also indicates a nominal order of road importance. Where Highways have overlapping sections, the more important road has precedence in the referencing system. For instance, the section between Pathlaiya and Hetauda of the Mahendra Rajmarg (designated H1) that overlaps with the Tribhuvan Rajpath (designated H2) is designated H1. Other Highways have been numbered from east to west and north to south.

24. Feeder Roads are numbered following two criteria:

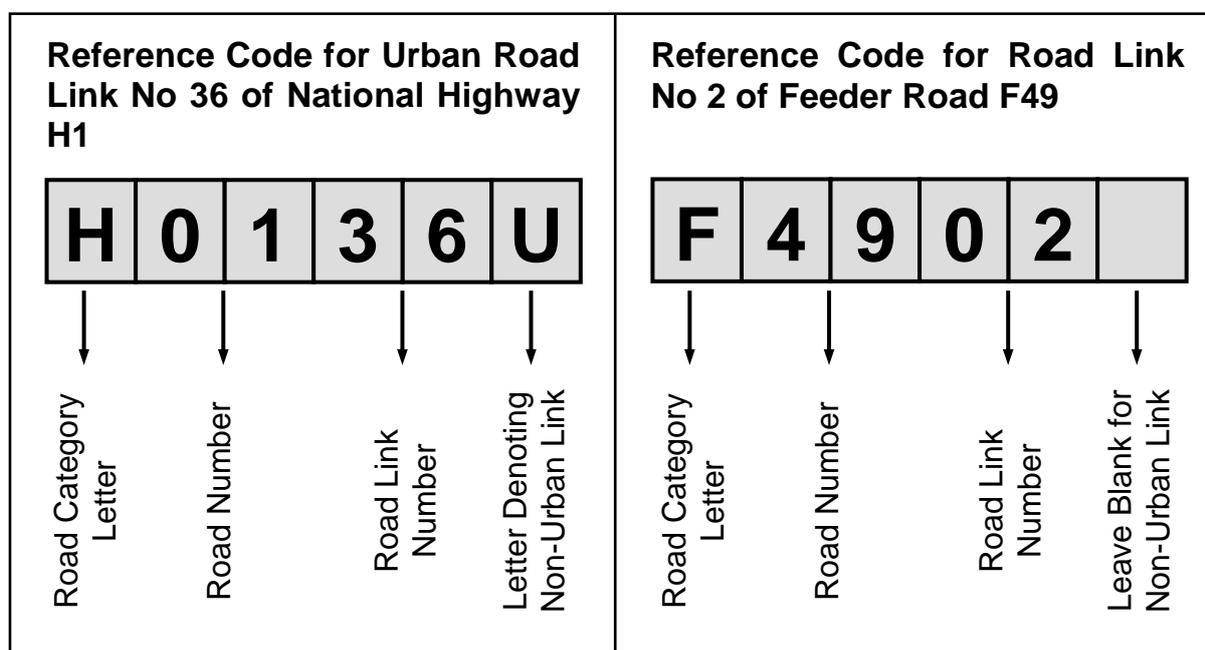
- i) Feeder Roads (Major) are numbered sequentially east-west or north-south starting in the order of the Highway Number from which they originate;
- ii) Feeder Roads (Minor) are taken at random and are numbered in sequence from the last Feeder Road (Major).

25. The referencing system secondly breaks down each road into several links or sub-sections. These links are generally between 10 km and 40 km long and the start and finish points of each link (the node points) are located at easily identifiable features on the road. Such features include major junctions, town and village boundaries and river crossings (named abutment joint of river bridge). National, Regional, District and Municipal borders always form node points therefore a link will never pass over an administrative boundary.

26. Each road link is given a unique reference code. The coding consists of five or six characters:

- i) a prefix letter denoting the road category, in the case of VIP Roads (paragraph 9(iii)) the prefix letter 'P' is used;
- ii) two digits representing the
- iii) road number;
- iv) two digits representing the
- v) link number;
- vi) for urban links (any Strategic Network road link within a municipality) the suffix letter 'U' is added, for other links this character is left blank.

For each road, link numbers start at '01' and run sequentially east-west or north-south. The two examples shown in the box below illustrate the road link coding system.



27. The road category letter and road number together form the road reference code to be used on road signs for traffic guidance and management. Kilometre posts and structures should display, in addition, the link identification code to provide management support (road inventory, identification of maintenance sections, accident recording).

28. The referencing system has been applied initially to the Strategic Road Network. However, the principles described above could equally be used for District and Agriculture Roads within the Local Road System using a six digit reference code as follows:

- i) the prefix letter 'D' or 'A' denoting road category;
- ii) two digits indicating the particular District (a list of the

- iii) 75 Districts and their numbers is given in Annex V);
- iv) two digits representing the road number thus allowing a maximum
- v) of 99 District and 99 Agriculture Roads in any one District;
- vi) a single digit link number (9 links should be adequate for the relatively short District and Agriculture Roads).

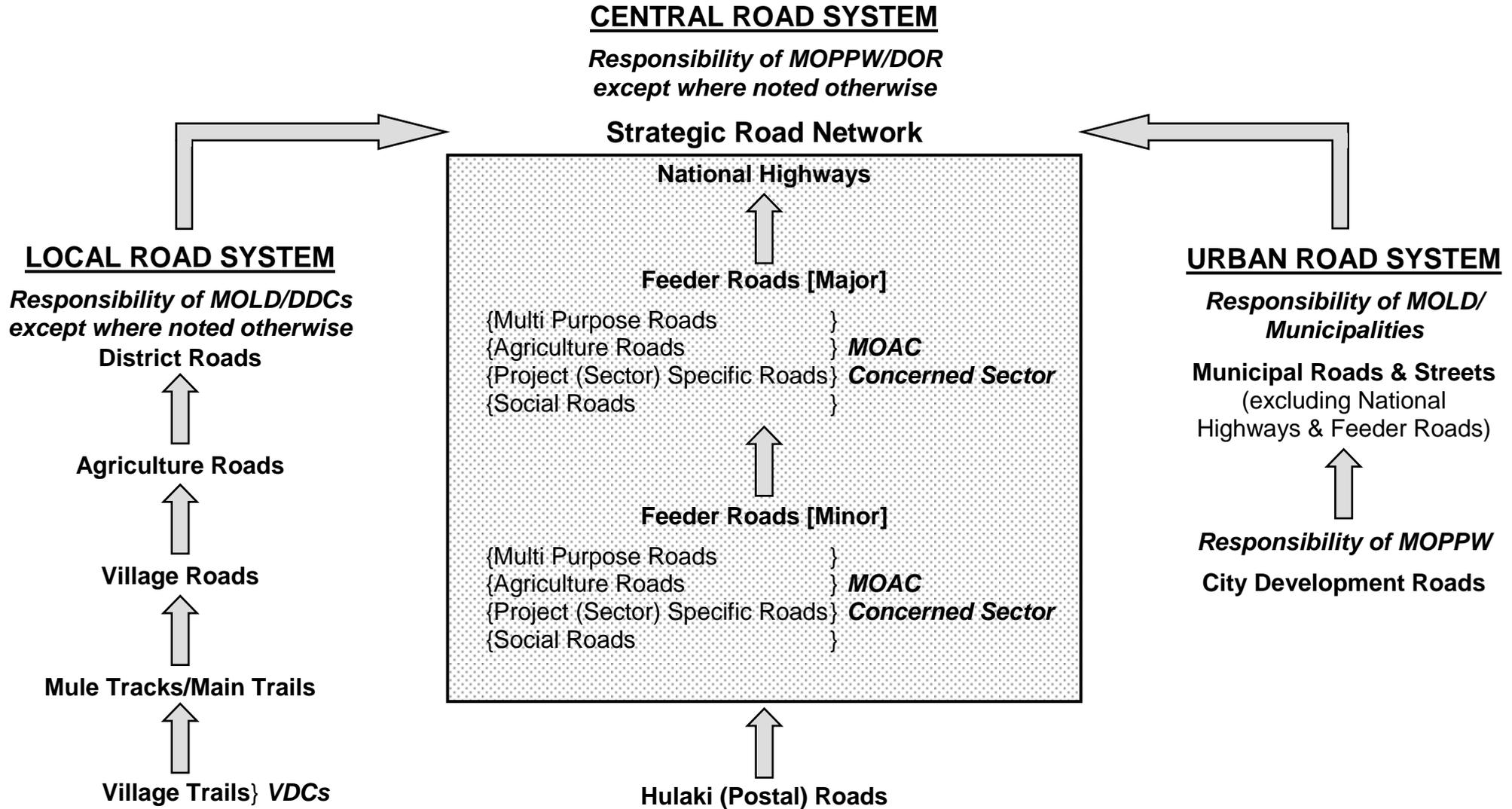
District and Agriculture Roads necessarily have to observe the District boundaries and could be numbered according to a system established by each District. There is no need to reference Village Roads at the national level and this should also be undertaken locally. In general, the concerned Municipality should reference roads comprising the Urban Road System.

29. The referencing system for the Strategic Network Roads described above has largely been incorporated into the Highway Management Information System (HMIS) database held in DOR Planning Branch. In addition to the basic referencing system described, the HMIS also differentiates between Feeder Roads (Major) denoted FRN and Feeder Roads (Minor) denoted FRO. If the proposed Classification System is approved, there will be a need to update the database to further differentiate Feeder Roads according to the four sub-sub classifications (paragraph 9). This should be a relatively straightforward task.

ANNEX I

**Diagram Showing Nepal Roads Classification
and Statutory Roads Responsibilities**

Nepal Roads Classification and Statutory Responsibilities



ANNEX II

Roads Comprising the Strategic Road Network

ANNEX III

Project (Sector) Specific Roads

ANNEX IV

Hulaki (Postal) Roads

ANNEX V
List of Districts

ANNEX VI

List of Municipalities