

DTMP

Guidelines

FOR THE PREPARATION OF THE DISTRICT TRANSPORT MASTER PLAN (DTMP)



2012

ABBREVIATIONS

DDC	District Development Committee
DIM	District Inventory Map
DOLIDAR	Department of Local Infrastructure Development and Agriculture Road
DOR	Department of Road
DRCN	District Road Core Network
DTICC	District Transport Infrastructure Coordination Committee
DTMP	District Transport Master Plan
GON	Government of Nepal
LGCDP	Local Governance and Community Development Programme
MFALD	Ministry of Federal Affairs and Local Development
VDC	Village Development Committee
RAIDP	Rural Access Improvement and Decentralisation Programme
RAP	Rural Access Programme
RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Programme
SWAp	Sector Wide Approach
VRCN	Village Road Core Network



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INTRODUCTION

1. These **DTMP Guidelines** serve to assist the user in the preparation of a District Transport Master Plan (DTMP) for the conservation, improvement and new construction of the District Road Core Network (DRCN). The DTMP is to be prepared every five years and provides a prioritised list of interventions for the DRCN that can be carried out with the estimated budget for the 5-year DTMP period. Each year the planned interventions are further detailed in the Annual Work Programme of the DDC, adjusting the plan according to the actual budget and requirements. The conservation works are further detailed in the Annual Road Maintenance Plan (ARMP) that defines the maintenance interventions to be carried out in the DRCN and provides further detail to the general proposal included in the DTMP.


2. These DTMP Guidelines provide the following sequence of steps to be followed in the preparation of a DTMP in a specific district. (See Flow Diagram on next page) These steps should be carried out in this order, as each subsequent step depends on information obtained in the previous step. For each step, a number of sub-steps are identified and a description is given of the activities to be carried out, the items to be produced and the equipment and data required for doing so.

- **Step 1:** Identification of the District Road Core Network (DRCN)
- **Step 2:** Collection of primary and secondary data
- **Step 3:** Preparation of the DTMP

3. These DTMP Guidelines should be used together with the **DTMP Excel Template**, which provides the standard table templates to be used in the DTMP report. The **Excel Template** also carries out the necessary calculations based on the data collected and entered by the user. Although it is recommended to make use of the **Excel Template** in order to avoid misunderstandings of the DTMP process and to promote coherence between different DTMPs, this is not strictly necessary and the tables and calculations can also be prepared without using the **Excel Template** (as long as the formulas and prioritisation criteria presented in these **DTMP Guidelines** are adhered to). The **Excel Template** has not been protected in any way and can be adjusted to the specific needs of any district (or amended for future changes in the DTMP process). The cells where data should be entered have been shaded yellow/orange and only in these cells should the contents be changed. All other cells contain automatic formulas or standard text and the changing of their content should only be done by experienced users wishing to deviate from the standard DTMP procedures.

4. A **DTMP Report Template** is also provided together with these DTMP Guidelines. This **Report Template** provides the structure of the DTMP report and serves to promote coherence between different DTMP reports, making it easier to compare them. The **Report Template** explains the contents of each chapter and section, providing templates of the tables and examples of the maps to be included. The **Report Template** also refers to the **Excel Template** regarding the different tables to be copied into the report. An effort should be made to keep the DTMP report as short and simple as possible, while at the same time ensuring that all information described in the **Report Template** is provided. Short and simple reports are more likely to be read and understood by those involved in decision making, increasing the chances of an approved DTMP actually being followed in practice. Ideally, a DTMP report should not exceed 25 pages.

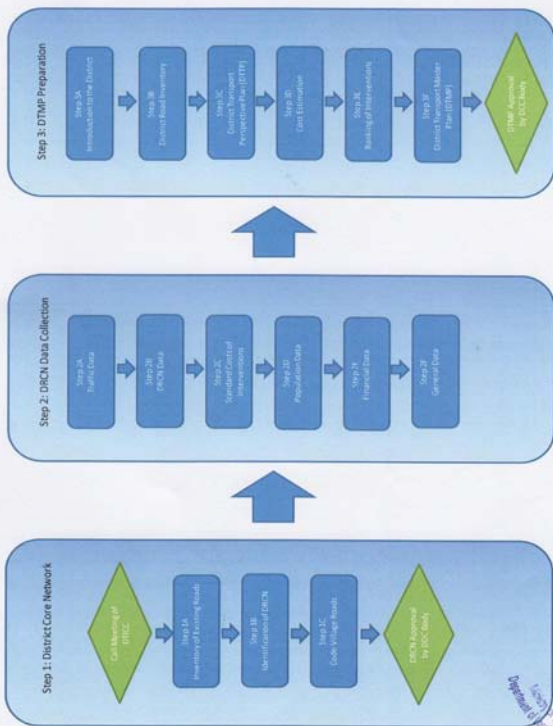
5. Lastly, two **DTMP Sample Reports** are available for Jhapa and Dailekh, which can be used as examples in the preparation of the DTMP report. These are based on data from previous DTMPs and have not been discussed or approved in the districts concerned. Their

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contents should therefore only be used as an example in the preparation of a DTMP Report, and do not necessarily reflect the proposed interventions for these two districts.

Flow chart of DTMP Process and Steps



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STEP 1: DISTRICT ROAD CORE NETWORK

6. The first step in the preparation of the DTMP is the identification of the roads making up the District Road Core Network (DRCN), for which the DTMP will be prepared. The DRCN is defined as the minimum network of rural roads that provides access to all VDC headquarters (administrative buildings or nearest economic centre) and links them (either directly or indirectly) with the district headquarter and the strategic road network (SRN). By bringing the DRCN to a maintainable and all-weather standard, year-round access to all VDCs can be ensured.

7. At the time of writing these guidelines, the DRCN has not yet been identified in the districts, and this therefore needs to be done before the DTMP can be prepared. In subsequent DTMP preparation exercises it is assumed that the DRCN will already have been identified. However, even in that case the DRCN may require adjustment to incorporate changes to the roads as well as the possible expansion to include other roads considered to be very important.

8. For this first identification of the DRCN, all existing roads will first need to be mapped in order to be able to select those that will make up the DRCN. Secondly, the most suitable candidate roads to form the DRCN will need to be selected from the existing rural road network. Those VDCs that do not yet have any road access and where the DRCN roads still need to be constructed, will also need to be identified. Lastly, a map will need to be prepared indicating the existing DRCN roads as. The final step looks at the remaining roads that are not selected as part of the DRCN.

STEP 1A: INVENTORY OF EXISTING ROADS

9. The inventory of the existing road network involves driving a motorbike over the different roads with a GPS device in order to track the coordinates of each road and to allow the preparation of a map of all existing roads. In order to carry out the survey in all existing roads in the district, previous DTMPs and the DOLIDAR LRN Inventory 2069¹ should be consulted and local authorities questioned about the roads in existence. Where roads are impassable by motorbike, this should be indicated in the inventory form and the survey should be carried out on foot.

10. The inventory will be carried out for all roads in the district, including strategic roads (highways and feeder roads), urban roads and all rural roads². At the same time, basic information for each road must be recorded, including road code, road name, surface type (earthen, gravel, blacktop, other), condition (good/fair, poor, bad/impassable) and fair/all weather. Although the surface categories are quite straightforward, the condition categories are more subjective and therefore the following definitions should be applied:

- Good/Fair - Road is passable by normal car
- Poor - Road is only passable by 4x4, bus, truck or tractor
- Temporarily Impassable - Road is temporarily not passable to 4-wheeled motorized vehicles
- Permanently Impassable - Road is permanently impassable to 4-wheeled motorized vehicles.

11. This data must be recorded in Table A4 in the Excel Spread sheet separately for each section where the surface type or condition changes and this must be indicated in the GPS.

¹ Available in Nepali from the office of DOLIDAR's RTI Sector Wide Programme

² In districts with large urban centres such as Kathmandu, Lalitpur and Bhaktapur urban roads will be excluded.



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Figure 1 Example road inventory map



	VDC HQ
	District HQ
	District boundary
	VDC boundary
	Waterway
	SRN road
	Blacktop road
	Gravel road
	Earthen road



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data (by marking a waypoint). Using the GPS data collected, a map of A3 size should be included in the report together with a poster size map of A1 size indicating all roads in the district as well as their surface type. Both maps should indicate the following (an example map is given on the following page):

- District boundaries (thin black line)
- VDC boundaries (thin dashed black line)
- Names of surrounding districts/states/countries
- District headquarters (red circle, including name)
- VDC headquarters (yellow circle, including name of VDC)
- Major waterways and water bodies (light blue lines or shapes)
- SRN roads (thick black line, including road code)
- Blacktopped local roads (thick red line)
- Gravel local roads (slightly thinner green line)
- Earthen roads (thin orange line)
- Scale
- Compass pointer

12. Data on condition should be made available in Table A4 in the Excel Template to assist in the process of selection of the DRCN roads. This may require some kind of temporary coding of roads to facilitate the looking up of data of a specific road.

STEP 1B: IDENTIFICATION OF THE DISTRICT ROAD CORE NETWORK

13. Once all the existing roads in the district have been inventoried, the District Road Core Network (DRCN) can be identified. The identification of the DRCN roads involves the selection of one road linking each VDC headquarters to the SRN, to the district headquarters or to another VDC headquarters (which in turn is linked to the SRN or VDC headquarters). Where VDC headquarters are already linked directly to the SRN, no other roads need to be selected to form part of the DRCN, as the required access already exists.

14. In some cases the selection will be easy as there is only one road linking a specific VDC headquarters. For example, Shantinagar VDC in the map on the previous page (top right) is linked by only one road. In many cases, however, there will be different alternative roads linking the VDC headquarters, and the most suitable candidate should be selected. In this selection, the following criteria should be taken into account (additional criteria may also be used if considered relevant):

- **Road surface** - priority should be given in the order blacktop - gravel - earthen, as higher standard roads will require fewer interventions to bring them to a maintainable all-weather status.
- **Missing water crossings** - priority should be given to roads that are not lacking important water crossings that prohibit access in the rainy season, as the construction of such water crossings will be very costly.
- **Condition** - priority should be given to roads in better condition, as these will require fewer investments to bring them to a maintainable standard.
- **Length** - priority should be given to roads that provide the shortest connection to the rest of the DRCN, as this will reduce the costs involved in the upgrading and maintenance of the DRCN.
- **Traffic** - Priority should be given to roads with higher traffic volumes. In the absence of traffic data, the knowledge of the DTO Engineers and other local authorities should be used.



15. For example, in the case of Korobari VDC in the map on the previous page (bottom left), there are two existing roads linking the VDC headquarters to the SRN. However, priority should be given to the blacktop road given the higher standard of this road. In the case of Goldhap VDC (middle of the map), it is recommended to select the road linking up with Garaman VDC to the north even though this is longer than the connection with Rajgadh VDC to the south, given that most of the road to the north is already blacktopped. In the case of Gherabari VDC (bottom of map), it is recommended to select the road to the east towards Pathariya VDC rather than to the north towards Rajgadh VDC because of the missing water crossing in the latter road.

16. Where certain VDC headquarters are not yet linked by road, a complete DRCN cannot be identified and new construction is required to complete the network. It such cases it is important to verify whether any roads (or even tracks) exist that link the VDC headquarter(s) concerned that may have been overlooked during the survey. If this is the case, then these should be surveyed and added to the road inventory map and DRCN map. Where no roads exist whatsoever, a likely alignment to link the VDC to the DRCN should be identified and plotted in the DRCN map, using dashed lines to indicate that it still needs to be constructed. For this purpose, use should be made of 1:25,000 topographical maps of Google Earth to identify the best technical and most economical route. This exercise serves only to determine a tentative length for new construction and not to determine the exact alignment and control points for the new construction. The final alignment and control points will be determined at a later stage based on a thorough walk over and feasibility studies.

17. The approach is simple enough to apply, and appears to follow to a large degree the planning already taking place. It also allows for sufficient flexibility in the actual selection of the roads, while limiting the total number of roads. The concept may be expanded to also include roads with high traffic levels in the core network. It may also contemplate including access to areas with great economic importance (tourism, industry, hydropower, etc.). The main thing is that it allows for easy identification of a core network consisting of a limited number of roads, which on the one side provides sufficient access, and on the other side is not too large as to require excessive funds to bring it to a maintainable all-weather status.

18. Once the DRCN roads have been selected, an A3 size DRCN map and a poster size map size A1 need to be prepared. A DRCN map for an example district is provided on the next page. As can be seen in the map, each VDC is linked by at least one road and priority has been given to blacktop roads and gravel roads. Nevertheless, not all blacktop roads have been included as some simply complement other roads providing access to VDC headquarters. Similarly, there are still some earthen road sections included that are required to ensure access to all VDC headquarters.

19. The exercise of identifying the most suitable roads and any new construction required to form the DRCN should be first carried out by the planners preparing the DTMP on behalf of the DDC. The resulting draft DRCN will be a first proposal that will then be discussed with the DTICC and subsequently presented to the DDC and District Council for approval. The proposed DRCN may be amended based on these discussions, as the DTICC members and DDC will have a more detailed knowledge of the roads and areas concerned, and may come with arguments for including or excluding a specific existing road, or drastically changing the alignment for new construction (e.g. that a specific road is very prone to landslides, is not accessible in the rainy season, or that another road has much higher traffic volumes and shorter travel times). Although there is considerable freedom in the selection of the roads to be included in the DRCN, the final selection of DRCN roads must comply with the following criteria:



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- A DRCN road must end at a VDC headquarters (or continue on to a following VDC headquarters). It should not end at any other part of the VDC. In such cases the road should either be extended to link up with the VDC headquarters or the section beyond the VDC headquarters should be excluded from the DRCN.
- A VDC headquarters should not be linked by more than one road unless that road serves to link up with a subsequent VDC.
- If the VDC headquarters is connected directly to a strategic road, no DRCN road should be identified.

The discussion regarding the identification of the DRCN should be facilitated by the planners. The planners should make use of large maps of the full network and the proposed DRCN or alternatively a projector, in order to facilitate participation and understanding. First the full road inventory map is presented, indicating the roads selected to form the DRCN, explaining the reasons for selecting these roads. Any need for new construction of DRCN roads should also be indicated. Subsequently, the map of the DRCN should be presented. Before the rest of the DTMP process is started, an agreement needs to be reached regarding the roads to be included in the DRCN, and approval needs to be obtained from the DDC.

20. Once the DRCN has been approved by the DDC, the map needs to be finalised, and each of the DRCN roads needs to be assigned a code in line with the national road code standards. For rural roads, the new road code is made up of two digits identifying the district (see table below), followed by two letters indicating the road class (DR for roads belonging to the district road core network or VR for village roads), and three digits identifying the road number that are to be assigned by working from west to east and north to south ("top left to bottom right") as shown in Figure 2 (e.g. 04DR001 in the case of Jhapa district). These codes will be used to uniquely identify the roads in the rest of the DTMP process as well as in subsequent Annual Work Programmes, ARMPs, projects, etc. These codes need to be added to the map portraying the agreed DRCN (see the example on the previous page).

Table 1 District numbers for inclusion in the road code

Number	District	Number	District	Number	District
01	Taplejung	26	Bhaktapur	51	Arghakhanchi
02	Panchathar	27	Kathmandu	52	Pyuthan
03	Ilam	28	Nuwakot	53	Rolpa
04	Jhapa	29	Rasuwa	54	Rukum
05	Morang	30	Dhading	55	Salyan
06	Sunsari	31	Makawanpur	56	Dang
07	Dhankuta	32	Rautahat	57	Banke
08	Tehrathum	33	Bara	58	Bardiya
09	Sankhuwasaba	34	Parsa	59	Surkhet
10	Bhojpur	35	Chitwan	60	Dailekh
11	Solukhumbu	36	Gorkha	61	Jajarkot
12	Okhaldunga	37	Lamjung	62	Dolpa
13	Khotang	38	Tanahun	63	Jumla
14	Udaypur	39	Syangja	64	Kalikot
15	Saptari	40	Kaski	65	Mugu
16	Siraha	41	Manang	66	Humla
17	Dhanusha	42	Mustang	67	Bajura
18	Mahottari	43	Myagdi	68	Bajhung
19	Sarlahi	44	Parbat	69	Achham
20	Sindhuli	45	Baglung	70	Doti
21	Ramechhap	46	Gulmi	71	Kailali
22	Dolakha	47	Palpa	72	Kanchanpur
23	Sindhupalchowk	48	Nawalparasi	73	Dadeldhura
24	Kavrepalanchowk	49	Rupandehi	74	Baitadi
25	Lalitpur	50	Kapilbastu	75	Darchula

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STEB 1C: VILLAGE ROADS

21. With the identification of the DRCN, all other roads that do not belong to the DRCN, the strategic road network or the urban road network (except for large urban areas such as Kathmandu, Lalitpur and Bhaktapur), are classified and coded as village roads and fall under the responsibility of the VDCs. An analysis of a few districts shows that the length of village roads is likely to be less than 20km in most cases (much lower in the case of Hills districts). This length of roads will be easy to manage by the VDC level.

22. The planning for these roads is not included in the DTMP, as they are not the responsibility of the district. Instead, a separate Village Road Core Network (VRCN) will need to be identified, which will include the more important roads in the VDC. The management of these roads will be the responsibility of the VDC, and any planned interventions will be included in the Annual Work Programme of the VDC. Funding for these interventions will largely come from VDC grants and community contributions, but some limited additional funding will also be made available from district level and through rural road projects.

23. The purpose of these VRCN roads is to provide access from the different settlements in the VDC to the DRCN and ultimately the SRN. However, there will also be village roads that do not extend the access to other settlements in the VDC, but only to a few households or to agricultural land. Although these roads are also considered village roads, they should be excluded from the VRCN and their management should become the responsibility of the communities themselves.

24. The planners responsible for the preparation of the DTMP are not required to identify the VRCN for each VDC. However, in the DTMP report and the presentation to the DTICC, DDC and District Council, they should clarify that the remaining roads will be classified as village roads, that a Village Road Core Network (VRCN) will be identified at a later stage that will be managed by the VDC, and that all non-VRCN village roads will be managed at community level. They will also need to clarify the planning for these roads will not form part of the DTMP, but will be done in the Annual Work Programme of the VDC, and that funding will come mainly from VDC sources with only limited funding from district level.



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STEP 2: DATA COLLECTION

26. In order to carry out the planning and prioritization process involved in the DTMP, certain data is necessary and needs to be collected. Some of this data can be collected from secondary sources, while other data is generally not readily available and needs to be collected from primary sources. The following data needs to be collected:

- Traffic data for the DRCN roads
- Road data for the DRCN roads
- Standard costs of different interventions
- Population data for the VDCs in the district
- Financial data for the road sector
- Other general data regarding the district

STEP 2A: TRAFFIC DATA

27. Traffic data is required to determine the importance of the different DRCN roads, and to determine what surface standard is required for a specific road. Traffic data is generally not readily available and needs to be collected by the planners involved in preparing the DTMP. Traffic data only needs to be collected for the DRCN roads included in the DTMP. For this purpose, shopkeepers and/or other knowledgeable persons along the road are interviewed to obtain an estimate of the number of vehicles making use of the road. Distinction is made between different vehicle categories, as heavier vehicles tend to cause more damage to the road, requiring a higher road surface standard to avoid such damage.

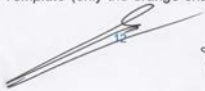
28. For determining the need for widening of the road to the higher standard of 3.75m, the number of vehicles per day (VPD) is calculated by adding up all motorised vehicles with four wheels or more. Widening is required for roads with a traffic volume of more than 100 VPD (check the latest version of the standards for any updates). The unit of VPD is used as the criteria for widening is related to congestion, which is strongly influenced by the number of vehicles with four wheels or more and their ability to pass each other.

29. For the purpose of determining the need for blacktopping, account is also taken of motorised vehicles with two wheels and of the different types of motorised vehicles with four wheels or more, by converting the different types of motorised vehicles into "passenger car units" (PCU). This is done by multiplying the number of vehicles in each category by a specific weight for each vehicle category. The unit of PCU is used as the criteria for blacktopping is related to the number and load of the vehicles using the road, which is influenced both by the absolute number of vehicles, but also the type of vehicle (a truck will cause faster deterioration of the road than a motorcycle). The different vehicle categories and weights are listed in the table below (the weights can be adjusted in Table A1.1 of the *Excel Template*).

Table 2 Vehicle categories and weights

Type	Weight
Motorcycle	0.5
Car-Jeep- Minibus	1
Tractor	2
Truck-Bus	4

30. It is recommended to carry out at least two interviews for every 10 km of road. For the calculation of the traffic volume of each road, the average is taken of the estimations for the number of vehicles in each category given in each interview. These averages are entered into table A1.2 in the *Excel Template* (only the orange shaded areas). The *Excel Template*



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automatically calculates the total passenger car units using the weights mentioned above. This table can later be copied into the Annex to the DTMP report.

STEP 2B: DRCN ROAD DATA

31. Now that the DRCN roads have been identified, data on these DRCN roads and the strategic road network needs to be compiled in tables and a more detailed inventory of the DRCN roads needs to be carried out. This detailed inventory is not done during the overall survey to avoid having to collect detailed data for all the roads in the district. This detailed inventory can be combined with the traffic survey mentioned above.

32. First, the data collected during the overall inventory for the strategic roads and DRCN roads is entered into the relevant Tables 2.1.2, 2.2.1, 2.3.1 and 2.3.2 in the *Excel Template*. This involves data on the length by surface type of each DRCN road and strategic road, as well as the road code and the description (places the road passes) of the DRCN and strategic roads. Make sure to only enter data in the orange shaded cells as the other cells are calculated automatically. These tables can later be copied into the DTMP report.

33. Next the DRCN roads are surveyed to identify any necessary interventions required to improve the road to a maintainable all-weather standard. Firstly this involves identifying any sections that require rehabilitation (length in km) due to the very bad (impassable) condition. The need for any additional cross drainage structures is also assessed, whereby distinction is made between bridges (length in m), slab culverts (length in m), cement concrete causeways (length in m), stone paved causeways (length in m) and culverts (units).

34. The need for additional protective structures is also evaluated, distinguishing between masonry retaining walls (volume in m³), dry stone masonry walls (volume in m³) and lined side drains (length in m). Lastly data is collected regarding the need for widening (length in m) of the road to comply with the national standards. Please note that the new Rural Road Standards have set a new standard width for DRCN roads of 3.75m, except where traffic volumes are below 100 VPD and are unlikely to increase, in which case a width of 3m may be applied (check the latest version of the Rural Road Standards for updates). This data is collected for each DRCN road and entered into Table 3.2.1 (rehabilitation), Table 3.2.3 (cross drainage), Table 3.2.4 (protective structures) and Table 3.2.5 (widening) of the *Excel Template*.

35. In addition, the need for upgrading of the road surface needs to be analyzed for the DRCN roads. As all DRCN roads need to be brought to all-weather status, the minimum standard is gravel, while roads with high traffic volumes will require a blacktop surface. All earthen road sections first need to be upgraded to gravel standard, and the length of these sections needs to be entered into Table 3.2.2 of the *Excel Template*. Blacktopping should only be applied to roads that have a sufficiently high traffic volume to warrant this investment. The limit for upgrading to blacktop standard is >150 PCU in the Terai and >100 PCU in the Hills. For the DRCN roads with traffic volumes exceeding these values, the sections that do not yet have a blacktop surface are identified and their length (in km) is entered into table 3.2.6 of the *Excel Template* as the road length to be upgraded to blacktop standard. These two tables can again later be copied into the DTMP report. The identification of the sections requiring gravelling or blacktopping can be done as a desktop exercise based on the road surface and traffic data collected.

36. For the collection of the data on necessary interventions, a DRCN Survey Form is included at the end of these *DTMP Guidelines*. One or more survey forms are used for each road. For each intervention identified, the location is recorded. For rehabilitation, gravelling, blacktopping, widening and side drains, this is done using the start and end chainage. For the cross drainage structures and retaining walls, this may either be done using the chainage



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or by noting the X- and Y-coordinate of the location. This data can later be copied into the above mentioned tables in the *Excel Template*. The data for the different interventions should be included in Annex 3 of the DTMP Report, indicating for each intervention the road code, the type of intervention, the size (volume/length), and the location (start/end chainage of X/Y coordinates)

37. For determining the type of cross drainage structure required, the DTO Engineer should be consulted as there will generally already be a plan for creating appropriate water crossings in the roads concerned. Where this is not the case, the following rule of thumb may be applied. However, the topographical and geographical context should be taken into account as this may influence the choice of infrastructure and a proper Engineers assessment is preferred.

Table 3 Rule of thumb for selection of cross drainage

Length of gap	Type of waterway	Volume of water	Recommended structure
<2m	Occasional (during rains)	Small	Pipe culvert
>2m	Occasional (during rains)	Medium	Causeway
>5m	Seasonal or permanent	Small to medium	Vented causeway
<10m	Seasonal or permanent	Medium to large	Slab culvert
>10m	Seasonal or permanent	Medium to large	Bridge

38. For determining the type of retaining wall required, the DTO Engineer should be consulted as there are generally plans for the creation of retaining walls in the roads concerned. Where this is not the case, the following rule of thumb may be followed. However, the topographical and geographical context should be taken into account as this may influence the choice of structure and a proper Engineers assessment is preferred.

Table 4 Rule of thumb for selection of retaining structures

Height of wall	Susceptibility to settlement	Recommended structure
<3m	Low	Dry stone masonry
>3m	Low	Mortared stone masonry
>3m	High	Gabion

39. Where certain VDC headquarters are not yet connected by road, new construction is required to complete the DRCN. In the preparation of the DRCN map, a tentative alignment for the roads to be constructed has been identified and the required length of new construction has been estimated. This length needs to be entered into Table 3.3.1 of the *Excel Template*, together with any requirements for bridge construction. This table can again later be copied into the DTMP report.

STEP 2C: STANDARD COSTS OF INTERVENTIONS

40. Once the required interventions have been determined as a result of the detailed survey of the DRCN roads, the cost of the different interventions needs to be estimated. For this purpose, use is made of standard costs or unit rates. These DTMP guidelines provide a set of standard unit rates based on an analysis of previous DTMPs, which may be used as an initial estimation of the costs involved. However, it is recommended to verify these standard costs with the actual average costs according to the DTO engineers, as costs tend to vary greatly from one district to the next. It is strongly recommended to use one single standard cost for the whole district and to avoid making detailed calculations for each road of intervention, as that will cost a lot of time and money and is not necessary for this level of planning. The required standard costs and the proposed unit rates are listed in the table below. These costs are reflected in the *Excel Template* in tables 4.1.1, 4.2.1 and 4.3.1. In case of adjustments to these standard costs, the new standard costs need to be entered into the above mentioned tables in the *Excel Template*.





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Table 5 Standard costs for different interventions

Activity	Unit	Unit cost (NPR)
Emergency maintenance	km	30,000
Routine maintenance	km	20,000
Recurrent maintenance (blacktop)	km	500,000
Recurrent maintenance (gravel)	km	400,000
Recurrent maintenance (earthen)	km	250,000
Periodic maintenance (blacktop)	km	200,000
Periodic maintenance (gravel)	km	250,000
Rehabilitation	km	800,000
Widening	m	25,000
Gravelling	km	2,200,000
Blacktopping	km	5,700,000
Bridge construction	m	600,000
Slab culvert construction	m	150,000
CC Causeway construction	m	100,000
Stone Causeway construction	m	10,000
Pipe culvert placement	unit	10,000
Masonry wall construction	m ³	10,000
Gabion wall construction	m ³	2,500
Lined drain construction	m	1,000
Track opening	km	4,000,000
Gravelling	km	2,200,000
Bridge construction	m	600,000

STEP 2D: POPULATION DATA

41. Population data is required for the prioritization of interventions, where priority is given to those interventions with the lowest cost per capita. Population data is collected for each VDC (total population only). This data can be obtained from the latest census. Preferably data obtained directly from the DDC is used, but if this is unavailable, the census data online can be consulted³. This population data is entered into table A2.1 in the *Excel Template*, together with the names of the different VDCs.

42. The rest of the orange shaded area of this table also needs to be completed. This involves filling indicating for each road with an "X" the VDCs it links up. The *Excel Template* will then calculate the total population served by each road as the sum of the populations of the different VDCs linked by the road concerned as an estimation of the population served by each road. VDCs linked by the strategic roads should not figure as links in any of the DRCN roads but should instead be indicated with an X under the column marked "SRN".

STEP 2E: FINANCIAL DATA

43. To determine how much of the proposed work can be carried out in the 5-year DTMP period, it is necessary to estimate the budget available in this period. This is done by estimating the amount of money available from different sources based on the actual amounts of the current or last financial year, assuming certain growth rates for each funding source.

³ Data from the 2011, 2001 and 1991 censuses can be found online. It is preferable to use the data from the latest census, although this may be incomplete, in which case data from a previous census may be used (adjusting the data in line with population growth in neighbouring VDCs).

2011 census: <https://sites.google.com/site/nepalcensus/>

2001 census: <https://sites.google.com/site/nepalcensus/home/2001-vdc>

1991 census: <http://dl.dropbox.com/u/37323160/Archive%20Data/Population%20Census%201991/index.htm>



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44. Firstly, the total budget for the current or last financial year needs to be determined. This information needs to be obtained from the LDO, DDC account and planning section or the Annual Budget Book published by the DDC, indicating the different sources of funding and the amount of funding from each source allocated to the road sector. Sources of funding should be clarified as much as possible to avoid confusion and duplication. The most common sources of funding are listed below. In writing up the budget of the last financial year, the wording of the funding sources below should be used to facilitate understanding and comparison with other districts. Additional funding sources may be included where relevant.

- **DDC grant** - allocation from the unconditional block grant received from MLD
- **VDC grant** - allocation from the unconditional block grant received from MLD
- **LGCDP grant** - allocation from the LGCDP top-up grant
- **DDC internal revenue** - allocation from the funds collected locally by the DDC
- **Rural road projects** - allocation from rural road projects (either government or donor funds). The acronym of the rural road project should be indicated (e.g. RRRSDP, RAP, RAIDP, etc.)
- **SWAp funding** - allocation received from the Sector Wide Approach for maintenance
- **Road Board Nepal** - allocation received from RBN for maintenance
- **Members of Parliament** - allocation from the funds received by members of Parliament
- **People's contribution** - Estimated value of the contribution from local community members (usually a fixed percentage is applied)

45. Once the budget for the current or last financial year has been determined, the expected changes for the different funding sources over the next five years needs to be determined. Usually a fixed annual growth rate is used and applied to the amounts of the current or last financial year. The percentage to be used will depend on the funding source and the expected growth. In many cases either 5% or 10% annual growth is used. In some cases a more accurate estimation may be possible, for instance in the case of rural road projects where financing programmes are already known some years in advance. The allocations to the road sector for the 5-year DTMP period need to be estimated and entered into table 6.1.1 in the *Excel Template*.

46. A last step in the collection of financial data is to determine which percentage of the total road sector budget at district level, will be allocated to the DRCN and thus form the DTMP budget. The setting of this percentage is at the discretion of the DDC, but at least 80% of the total road sector budget must be allocated to the DRCN (it is recommended to allocate a greater portion). The remainder of the road sector budget may be allocated to village roads (the Village Road Core Network) or used to prioritise new construction of DRCN roads (this is at the discretion of the DDC and does not form part of the DTMP). This percentage should be entered in the orange cells at the right side of Table 6.2.1 in the *Excel Template* (the percentage for village roads at the top, and the percentage for DRCN roads at the bottom).

STEP 2F: GENERAL DATA

47. For the report it is also necessary to provide some general data regarding the district, to allow the reader to get a better idea of the context within which the interventions are to take place. This data will be presented in the *Introduction* section of the DTMP report. This information can be collected from internet, from national statistics or directly from the district. A good source of information is Wikipedia (http://en.wikipedia.org/wiki/districts_of_nepal), which provides some general information as well as general maps. Examples of information to be collected and included in the DTMP report are listed below. Although not all information


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Director General



is strictly necessary, it is strongly recommended to provide as much of this information as possible to provide a proper overview of the district.

- Map indicating the location of the district within Nepal (available from Wikipedia)
- Total number of VDCs and municipalities
- Total area of the district (km²)
- Elevation above sea level (lowest and highest in metres)
- Annual rainfall (mm)
- Minimum and maximum temperature (°C)
- Main sources of occupation and livelihood
- Population size (if possible disaggregated by men and women)
- Population density (persons per km²)
- Average household size (persons)
- Life expectancy (years)
- Literacy rate (%)
- Ethnic groups and languages (including percentages of population)
- Main access routes to and from the district (description)



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Department of Local Government, Rural Development
and Infrastructure
Saramshik Sahakar, Lalitpur
2073



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STEP 3: DTMP PREPARATION

48. Once the DRCN road network has been identified and the necessary data has been collected, the next step is the actual preparation of the DTMP as well as the writing of the DTMP report. For this step it is recommended to also consult the *DTMP Report Template*. The preparation of the DTMP includes:

- **Chapter 1** - A written introduction to the district
- **Chapter 2** - A description of the current road network in the district and the selection of the DRCN roads
- **Chapter 3** - The listing of the required interventions in each of the DRCN roads (also called the District Transport Perspective Plan (DTPP))
- **Chapter 4** - The cost estimation for the interventions identified in the DTPP
- **Chapter 5** - The ranking of these interventions according to priority
- **Chapter 6** - The actual definition of the District Transport Master Plan (DTMP) for the DRCN for the next 5 years

49. Once the DTMP has been prepared by the planners, it needs to be presented and approved by the DTICC, DDC and District Council.

STEP 3A: INTRODUCTION TO THE DISTRICT

50. The introduction to the district is a short text providing the general data of the district as collected under Step 2F. It should also include a map of Nepal showing the location of the district. More information on the contents of this chapter can be found in the *DTMP Report Template*. This chapter should ideally not exceed 1 page.

STEP 3B: DISTRICT ROAD INVENTORY

51. This second chapter of the DTMP report will provide the results of the general road inventory carried out for all the roads in the district. It will start by providing an overview of all the roads in the district in terms of type (strategic roads, urban roads, rural roads) and surface type (blacktop, gravel, earthen). This will be portrayed in Table 2.1.1 of the *Excel Template* which can be copied into the report. The road inventory map prepared as part of the first step should also be included in the report. A short description of the strategic road network should also be provided, in terms of current status and foreseen improvements and expansion. This includes Table 2.2.1 of the *Excel Template* listing the different strategic roads in the district and their surface type.

52. The most important part of this chapter is the identification of the DRCN. A description of the identification process needs to be included in the report, as well as a table listing the final DRCN roads and their surface type and whether they are all-weather or fair-weather. Table 2.3.1 of the *Excel Template* provides an overview of the different road classes (highways, feeder roads, urban roads, DRCN roads and village roads) while Table 2.3.2 lists the different roads that make up the DRCN (these can be copied into the report). Lastly, the DRCN map should be included in the report. This map was already prepared under Step 1B, although it needs to be adjusted to only show the infrastructure currently in existence (it should include only the existing DRCN roads and major water crossings, and not the proposed roads and other infrastructure for new construction).

STEP 3C: DISTRICT TRANSPORT PERSPECTIVE PLAN (DTPP)

53. The District Transport Perspective Plan is simply the list of all the identified interventions that are necessary to bring the roads to a maintainable all-weather standard and keep them


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there, as well as the construction of any new roads considered necessary to complete the DRCN. As such it is the summation of the interventions identified under Step 2B which are required to improve the road to the proper standard, as well as the conservation requirements to keep the roads at this standard.

54. The need for **conservation** applies to the entire DRCN in existence, for as far as it is in maintainable condition and does not require rehabilitation first. A table needs to be prepared to show the length of DRCN roads that require conservation, differentiating between emergency, routine, recurrent and periodic maintenance. For all conservation types the full length (in km) of the DRCN roads in maintainable standard is entered into Table 3.1.1 of the *Excel Template* and copied into the report. Even though the roads will only require emergency and periodic maintenance in some of the years, for DTMP planning purposes an average requirement and cost are applied to the entire network. The specific roads to receive emergency and periodic maintenance each year are determined in the ARMP.

55. For the road **improvements**, separate tables are prepared to show the required interventions for rehabilitation, gravelling (upgrading to gravel standard), cross drainage, protective structures, widening and blacktopping. For this purpose, the Tables 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5 and 3.2.6 are copied from the *Excel Template*. These tables should be complemented with a short paragraph describing any specific issues regarding the required interventions identified during the detailed survey. The location of the interventions (using geo-referencing or chainage) should be entered into table A3.1 of the *Excel Template* and copied into Annex 3 of the DTMP report.

56. In case any **new construction** of DRCN roads is required, this is also included in the report. Table 3.3.1 of the *Excel Template* is copied and complemented with a short paragraph describing the roads proposed for new construction and explaining why they are required to complete the DRCN.




57. Finally an overview table is included in the report, showing for each road all the interventions that are required to bring it to a maintainable all-weather standard and keep it there. This table is the actual District Transport Perspective Plan (DTPP). This table is prepared automatically in the *Excel Template* as Table 3.4.1.

58. A map of A3 size and a poster size map of A1 size also need to be prepared, based on the map of the existing DRCN of Step 3A. In addition, this map will indicate the sections of road requiring gravelling, blacktopping or new construction. The map will further indicate any bridges, causeways and slab culverts that need to be constructed. An example of such a DTPP map is provided on the next page.

STEP 3D: COST ESTIMATION

59. With the DTPP providing the full list of required interventions to bring the DRCN to a maintainable all-weather standard and keep it there, the costs of these interventions can be calculated using the standard costs determined under Step 2C.

60. The **conservation** costs are calculated for the first year as an indication of the amount of funding required. The costs are estimated by multiplying the length of roads requiring conservation by the relevant standard cost, taking into account the surface type for recurrent and periodic maintenance. This is done automatically in the *Excel Template* with the standard costs entered in Table 4.1.1 and the road lengths by surface type from Table 2.3.2. The resulting Table 4.1.2 of the *Excel Template* can be copied into the report as an estimation of the conservation costs for the first year. These estimated costs reflect the costs for the first year of keeping the existing DRCN in good condition. Costs for later years will vary slightly due to changes to the road network in terms of upgrading and new construction.

  
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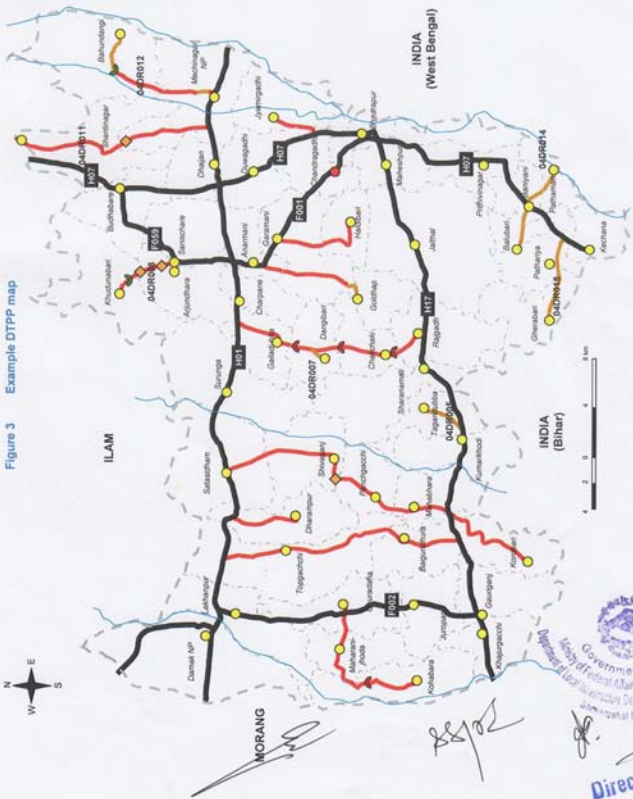


Figure 3 Example DTPP map



Code	Total length	Rehabilitation	Black Topping	Gravelling	New construction
04DR001	14.30		13.59	1.04	
04DR002	19.83		17.65		
04DR003	5.00		5.00		
04DR004	32.00				
04DR005	4.00				
04DR006	15.00		15.00		
04DR007	1.00				
04DR008	6.80				
04DR009	8.58		1.50		
04DR010	6.26		14.20		
04DR011	18.00		3.00		
04DR012	11.01				
04DR013	3.00				
04DR014	9.95			0.43	
04DR015	6.31			3.54	
Total	161.04	0.00	0.00	5.01	0.00

- VDC HQ
- District HQ
- District boundary
- VDC boundary
- Waterway
- SRN road
- Gravel road
- Blacktop road
- Bridge for construction
- Causeway for construction
- Slab culvert for construction

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 Government of Nepal
 Ministry of Federal Affairs and Local Development
 Department of Local Infrastructure Development and Urban Management
 Kathmandu, Nepal

61. More detailed estimations of the total conservation costs for the DTMP period are available in Table 6.2.1 of the *Excel Template* that calculates the full conservation costs taking into account changes to the surface type and DRCN length during the DTMP period. The conservation costs will be worked out in further detail in the Annual Road Maintenance Plan (ARMP).

62. The **improvement** costs are estimated in a similar way using the *Excel Template*, by multiplying the standard costs in Table 4.2.1 with the intervention lengths and volumes indicated in Tables 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5 and 3.2.6. The resulting Table 4.2.2 can again be copied into the DTMP report as an estimation of the improvement costs. These estimated costs reflect all costs for the improvement of the existing DRCN to a maintainable all-weather standard.

63. The costs for **new construction** are estimated by multiplying the standard costs in Table 4.3.1 of the *Excel Template* with the estimated new construction length from Table 3.3.1. The resulting Table 4.3.2 can be copied into the DTMP report as an estimation of construction costs. In case no new construction is planned, this table can be omitted from the report.

64. An overview of all costs of conservation, improvement and new construction is provided at the end of Chapter 4. For this purpose Table 4.4.1 of the *Excel Template* is copied into the report.

STEP 3E: RANKING

65. Once the costs of the different interventions are known, the roads can be ranked according to priority. Prioritization is according to the cost per capita, whereby a separate ranking is carried out for conservation, improvement and new construction. The cost of all the interventions under conservation, improvement or new construction is summed up for each road, and this total cost is divided by the population served by the road. The population served is defined as the total population of all VDCs linked by the road (excluding VDCs of which the headquarters are linked directly to the strategic road network) and is automatically obtained by the *Excel Template* from Table A2.1.

66. For **conservation**, this is done in Table 5.1.1 of the *Excel Template* using the data from Table 4.1.2. By pressing the button at the top of the column "Cost/person" and selecting "Sort smallest to largest", the roads will be ranked in order of increasing cost per capita. The road with the highest priority (most benefit in relation to cost) will be at the top. This table can then be copied into the report. The actual allocation to the different maintenance types will be determined in the ARMP, and this table serves more as an indication of the priority to be given to different roads.

67. For **improvement**, a similar process is applied in Table 5.2.1 of the *Excel Template* using the data from Table 4.2.2. Again the button at the top of the column "Cost/person" needs to be clicked and "Sort smallest to largest" selected in order for the roads to be ranked in order of increasing cost per capita. This table can then be copied to the DTMP report.

68. In the case of earthen roads that need to be upgraded to blacktop standard due to the high traffic volumes, it is recommended to divide the works into two parts: the first to bring the road to gravel standard and all other improvement works, and the second to bring the road to blacktop standard. This will avoid the road being given very low priority due to the excessive costs involved in gravelling and subsequently blacktopping the road.

69. Lastly, where **new construction** of DRCN roads is required, Table 5.3.1 of the *Excel Template* provides an overview of the estimated costs per road. The table needs to be

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ranked using the same process of clicking the button at the top of the column "Cost/person" and selecting "Sort smallest to largest". The table can then be copied to the DTMP report.

STEP 3F: DISTRICT TRANSPORT MASTER PLAN (DTMP)

70. The final part of the DTMP process is the balancing of the available budget and the estimated costs of the required interventions, to determine which interventions can be carried out in the 5-year DTMP period. Here the *Excel Template* will assist the user, but greater involvement is required to determine which portion of the DTPP can be carried out in each of the DTMP implementation years.

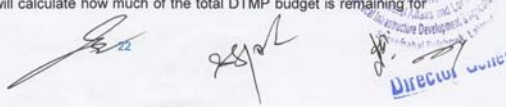
71. The estimation of the financial resources available at district level for investments in the road sector has already been carried out under Step 2E and entered into Table 6.1.1 of the *Excel Template*. This table is copied into Chapter 6 of the DTMP report.

72. The next step is to determine the percentage of the available budget that will be allocated to the DRCN and be used in the DTMP. This percentage will already have been defined together with the DTICC and DDC in Step 2E, and should be a minimum of 80% of the total road sector budget in the district. This percentage is entered in the orange shaded cells on the right hand side of table 6.2.1 in the *Excel Template*, allowing the calculation of the budget for the DTMP. This percentage should also be mentioned in the DTMP report, explaining the process used to define it. The percentage of the total road sector budget at district level not used for the DTMP, may be used in village roads not belonging to the DRCN, or alternatively used for new construction of DRCN district roads (thus bypassing the ranking procedure). The percentage of the budget spent in this way may not exceed 20% of the total road sector budget in any district.

73. In the allocation of the DTMP budget, priority is given to conservation works, followed by improvement works and finally new construction. That is to say, any DTMP funding will first be allocated to conservation, and remaining funds will be allocated to improvement of the existing DRCN roads, and if there is still funding available this will be allocated to new construction of DRCN roads (if there is still funding left over at the end of this process, this may be allocated to village roads that do not form part of the DRCN).

74. Table 6.2.1 of the *Excel Template* will automatically calculate the budget allocations required for **conservation** of the existing DRCN roads based on the data from the preceding tables. For each year it will recalculate the required budget based on the changes to the DRCN due to upgrading and new construction in the preceding year (the lengths of different surface types in each year are indicated in rows 9, 10, and 11 in Table 6.2.1 of the *Excel Template*). The *Excel Template* will calculate the total allocation required for conservation (row 12) as well as the remaining budget for improvement (row 20). In case the available budget for DRCN roads is insufficient to cover the conservation costs, the allocation to conservation should be reduced until the total allocation to conservation is equal to the available budget (there is then no allocation possible to improvement or new construction). Allocations to conservation should be done in order of priority: emergency – routine – recurrent (blacktop) – recurrent (gravel) – periodic (blacktop) – periodic (gravel). And reduction in allocation should be applied to the lowest priority type of conservation.

75. For the **improvement** works, the *Excel Template* will automatically list the road codes, the estimated costs of the improvement works, and the required lengths of gravelling or blacktopping in order of ranking. The user will now have to enter the budget allocated to each road in each year of the 5-year DTMP period. In principle the budget allocated will be the same as the estimated cost of the interventions for each particular road (this can be done by simply copying from the "Cost" column). After a budget allocation is entered for a specific road, the *Excel Template* will calculate how much of the total DTMP budget is remaining for

The bottom of the page contains several handwritten signatures in black ink. On the right side, there is a blue circular official stamp. The text within the stamp includes "Ministry of Transport, Works and Local Government", "Director of Road and Transport Planning", and "Director of Infrastructure Development". The word "DIRECTOR" is printed in large blue letters at the bottom of the stamp. There are also some illegible handwritten notes and initials scattered around the stamp.

further interventions (row 65). As long as the remaining budget is positive, further allocations can be made to improvement works by entering an allocation for the next road in the ranking.

76. At a certain moment, however, the remaining budget will become negative, as the total allocation to conservation and improvement works exceeds the DTMP budget. If this is the case, the most recent allocation must be decreased in order to bring the remaining budget back up to zero. This effectively means that for that particular road, not all interventions are carried out in the year concerned. Part of the required interventions are carried over to the next year and the difference between the total cost of the improvement works and the initial budget allocation for that particular road, is then entered as a budget allocation in the next year (implying that the required interventions for that road will be completed in the second year).

77. The budget allocation for the second year follows the same process, continuing where the first year ended in allocating budgets to each road in order of the ranking. Once again this process is continued until the remaining budget of the second year becomes negative, after which the most recent budget allocation is decreased until the remaining budget is zero. The lacking budget for that road is then allocated in the third year and so on.

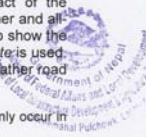
78. At a certain moment, all the required improvement interventions will have their budget allocated in a specific year, and there will still be budget remaining⁴. If this is the case, this remaining budget can be allocated to new construction of DRCN roads (if required). The process is the same, with allocations being made to each road to be constructed in order of the ranking, until the available budget is used up. Where additional budget is required to complete the construction, this is done in subsequent years, until all DRCN roads planned for new construction have sufficient budget allocated.

79. At this stage, budget will be remaining without any improvement or new construction of DRCN roads to allocate it to, with only a portion being allocated to conservation of the existing DRCN. In such circumstances it is recommended to carry out a new detailed survey of the DRCN to identify any additional improvement or new construction requirements. If no such improvement or new construction requirements exist or if there is still a portion of the budget remaining after allocation to these requirements, it may be decided to expand the DRCN to include additional important roads, or alternatively remaining funds may be allocated to village roads not forming part of the DRCN. It must be noted, however, that this situation is unlikely to occur in the first 5-year DTMP period, and for many districts will not even occur in the second 5-year DTMP period.

80. Once Table 6.2.1 of the *Excel Template* has been completed and the estimated budget for each year of the DTMP period has been allocated in the order of conservation - improvement - new construction (following the ranking for each intervention type), the DTMP can be said to be complete. Most likely the DTMP will not include all interventions identified in the DTPP, and the remaining interventions will be addressed in the next DTMP. Table 6.2.1 can now be copied into the DTMP report as a representation of the interventions to be carried out in the next five years.

81. To show the outputs of the DTMP in terms of gravelling, blacktopping and new construction, Table 6.3.1 of the *Excel Template* is used. To show the impact of the interventions included in the DTMP on standard of the DRCN in terms of fair-weather and all-weather roads, Table 6.4.1 of the *Excel Template* is copied to the DTMP report. To show the changes in terms of access of the different VDCs, Table 6.4.2 of the *Excel Template* is used. This shows the number of people and the percentage of the population with fair-weather road

⁴ Please note that in districts with a large DRCN requiring many improvements, this may only occur in the second DTMP.



access, all-weather road access and with no road access, both at the start and at the end of the DTMP period. The type of access of a specific VDC is defined by the standard of the road linking the VDC headquarters to the rest of the DRCN and strategic road network (SRN). Where this road is gravel or blacktopped and all water crossings are in place, the access is considered all-weather. Where the surface is earthen or where essential water crossings are missing, the access is considered fair-weather. Where there is no road linking the VDC headquarters, there is considered to be no access.

82. In Table A2.2, the type of access of each VDC is indicated both at the start of the DTMP and as expected at the end of the DTMP (considering the interventions included in the DTMP). An "X" is put in the appropriate columns next to each VDC, after which the *Excel Template* calculates the population with different access levels before and after the DTMP. The resulting Table 6.4.2 needs to be copied into the DTMP Report.

83. Lastly, a DTMP map of A3 size and a poster size map of A1 size need to be prepared indicating the existing DRCN and the interventions included in the DTMP. This is similar to the DTPP map, except that it does not necessarily include all interventions. This map effectively shows the situation in the district after the 5-year DTMP period. An example DTMP map is provided on the next page.

84. It is also important to include an Executive Summary in the DTMP Report. This Executive Summary should not exceed two pages. It should include a paragraph describing the district, a paragraph describing the existing road network (together with table ES1 of the *Excel Template*), a paragraph describing the conservation, improvement and new construction requirements and costs (together with Table ES2 of the *Excel Template*), a paragraph describing the available budget and its allocation, and a final paragraph describing the expected outputs and outcomes of the DTMP.

STEP 3G: DTMP APPROVAL

85. With this, the draft DTMP is finalized and needs to be presented to the DTICC, DDC and District Council for approval. In each case the DTMP is presented and explained to the target audience. This is mainly done on the basis of the maps prepared. It is recommended to prepare large maps for this purpose to facilitate participation and understanding. Use of a projector is also possible.

86. Firstly the DRCN map is again presented. This is no longer subject to amendment as it has already been discussed and approved. It serves solely to remind the audience about the selected DRCN roads and to ensure that everybody understands which roads are included in the DTMP.

87. Subsequently the DTPP map is presented and for each DRCN road the required interventions (as identified during the detailed inventory) are explained. In as far as possible, the required interventions should be shown on the map and the location explained so everybody properly understands what is being proposed.

88. Next, the estimated costs are discussed, presenting the standard costs of Table 4.1.1, 4.2.1 and 4.3.1 as well as the estimated costs in Table 4.1.2 (conservation), Table 4.2.2 (improvement) and Table 4.3.2 (new construction). The standard costs are explained and the link with the length and volume of interventions identified in the DTPP is clarified. At this stage it is important to explain that not all interventions can be carried out in the DTMP due to a shortage of budget (if this is indeed the case), and that priority needs to be given to certain interventions.

89. The road ranking for each intervention is described, explaining that this is done on the basis of the cost per capita, whereby the total cost of the interventions in a specific road is divided by the number of people served by that road (the sum of VDC populations linked by the road). The result is shown using Table 5.1.1 (conservation), Table 5.2.1 (improvement) and Table 5.3.1 (new construction). It may be necessary here to again explain the basis of the road ranking, as some members of the audience may not be pleased to see the roads they consider important, ranked low down on the list.

90. Lastly, the DTMP is presented. First the estimated budget is presented (Table 6.1.1) and the percentage allocated to the DTMP and the DRCN is repeated. Then Table 6.2.1 with the DTMP is presented, explaining how the budget is first allocated to conservation of existing roads, followed by improvement of existing roads to a maintainable all-weather standard, and lastly to new construction of additional roads required to complete the DRCN. The process of allocating remaining budget to improvement and new construction works in order of their ranking is explained, and the allocation to different roads over different years is described.

91. Although it is necessary to present this table, it will be difficult to understand, and the DTMP map should be used to facilitate understanding, shifting back and forth between the map and the table to explain both the process and the results. Special attention should be given to those interventions that are not included in the DTMP, once again explaining why they have not been included (lack of budget, prioritization in order conservation-improvement-new construction, and ranking of roads according to cost per capita). It must also be explained that the remaining interventions not included in the DTMP will be carried out in the next DTMP. Additional funding outside the DTMP budget (the portion of the district road budget not allocated to the DTMP, VDC block grants, etc.) may also be used to complement the DTMP and allow these remaining interventions to be carried out sooner (in this case it is recommended to include those funding sources in the DTMP budget, however, and to adjust the DTMP accordingly). Lastly, the impact of the DTMP interventions in terms of access is presented using Table 6.4.1 and 6.4.2.

92. During these presentations, any comments are taken into consideration and may result in the amendment of the DTMP if they are found to be justified and in line with the DTMP process. The important thing is that the DTMP is accepted and will be followed by the DTICC, DDC and District Council. To a large extent the DTMP should follow the procedures and prioritization criteria in these Guidelines, but a certain degree of leniency is allowed to incorporate particular priorities of the district. However, this leniency is only permitted with regards to the ranking and prioritization of interventions. **Interventions that do not pertain to the DRCN cannot be included in the DTMP!**

93. Once the DTMP has been finalized and approved by the DTICC, DDC and District Council, a letter to this effect should be prepared and signed by the LDO. This letter will be included as the Foreword to the DTMP report.



Government of Nepal
Department of Local Infrastructure Development
Ministry of Federal Affairs and Local Development
Strengthening District Development Committees (DDCs)

Director General

**RTI SECTOR Maintenance Pilot
Road Inventory Form -1/2**

Name of District: _____

Date: _____

Road Name	<input type="text"/>	Length	<input type="text"/>	Section: From	<input type="text"/>	To	<input type="text"/>
Road Classification	<input type="text"/>	Road Code	<input type="text"/>	Start point	<input type="text"/>	End point	<input type="text"/>
VDCs (passes by road)	<input type="text"/>						
Right of way (Row)	<input type="text"/>	Carriageway width	<input type="text"/>	Shoulder Left	<input type="text"/>	Shoulder Right	<input type="text"/>
Serviceability	All weather road		<input type="text"/>	Fair weather road		<input type="text"/>	
Topography	Flat	<input type="text"/>	Hill	<input type="text"/>	Mountain	<input type="text"/>	

Traffic Survey	Motor cycle	Car Jeep & Minibus	Tractor	Truck, Bus	Starting Time of Road Survey	<input type="text"/>
Survey-1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Finishing Time of Road Survey	<input type="text"/>
Survey-2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		



Name: _____

Designation: _____

Signature: _____

Director General

RTI SECTOR Maintenance Pilot

Rural Road Inventory and Rapid Visual Condition Survey (Form - 2 / 2)

Road Name		Date		Specific (Recurrent Major) Maintenance:					
Roadway width (m)		Terrain		soft spot/short section on road surface - spotrep(m); road inundate in rainy season - embank raising(m); creation or large repairs to retaining/breast wall-DW/GW/MW(m ³); slope stabilisation and bio-engineering - bio works(m ²); Creation of earthen side drain-ER drain(m); Creation of stone-paved drifts-cc / sc causeway(m); placement of sign & road furniture-sign & furniture (no); Removal of hanging cliff/rocks-slope maintain(m ²)					
Drain	Specific Maintenance (recurrent major)	Pavement type	Settlement passes	Way Points	Cl	Description of way points	Periodic / Rehabilitation	Emergency Maintenance	Drain
					5+000				
					4+500				
					4+000				
					3+500				
					3+000				
					2+500				
					2+000				
					1+500				
					1+000				
					0+500				
					0+000				

Legend

- Bridge
- Slab culvert
- Pipe culvert
- Causeway
- Proposed Bridge
- Proposed Slab culvert
- Proposed pipe culvert
- Proposed causeway
- Road Junction
- River
- Km0, second bridge - br-0/2
- Km0, second slab culvert - sc-0/2
- Km0, third pipe culvert - pc-0/3
- Earthen drain - ED
- Stone masonry drain - SMD
- Dry stone drain - DSD
- Surface
- Blacktopped -BT
- Gravel -GR
- Stone paved - SP
- Earthen - ER
- Way Point -
- Proposed - Prop
- Existing -Ex

Road Condition of this section:
Overall Assessment:

Name & Designation: _____ Signature: _____





Road condition: Good/Fair = road is passable by normal car, Poor = road is only passable by 4 x 4 bus, truck, Temporarily impassable = if road is passable to 4-wheeled vehicles only after emergency maintenance, Permanently impassable = if road could not be passable even after emergency maintenance

Note: (1)Use 'Spheroid Everest 1830' coordinate system for GPS (2) for additional information, see other side of sheet.

Director

LEGEND FOR DTMP











Standards for 1:150,000 Map Scale

Descriptions	Symbol	Size Specification	Colour Specification	Remarks
Administrative Boundaries				
International Boundary		Dash-dot-dot Thickness (3 Pt)	Gray	
District Boundary		Dash line Thickness (2 Pt)	Gray	
VDC/Municipal Boundary		Thickness (1pt)	Gray	
Strategic Road Network		Solid line Thickness (4 pt)	Black	
District Road (Black-topped)		Solid line Thickness (3pt)	Red	
District Road (Gravel)		Solid line Thickness (3pt)	Brown gold	
District Road (Earthen)		Solid line Thickness (3pt)	Orange	
New Road (Proposed)		Dot-dot-dot line Thickness (3 Pt)	Brown gold	
Village Road (Black-topped)		Solid line Thickness (1.5 Pt)	Red	
Village Road (Gravel)		Solid line Thickness (1.5 Pt)	Brown gold	
Village Road (Earthen)		Solid line , Thickness (1.5 Pt)	Orange	



[Handwritten signature]

Director General

Descriptions	Symbol	Size Specification	Colour Specification	Remarks
River		Solid line, Thickness (1.5 pt)	Blue	
District Headquarters		Filled Red Circle Size (12pt)	Line colour- Black / Fill Colour Red	
VDC/Municipal Centre		Filled Yellow Circle Size (10pt)	Line colour- Black / Fill Colour yellow	
Airport		Plane	Black	
Bridge		Bridge	Red	
Proposed Bridge		Dashed line 1.5 pt thick	Red	
Causeway		Rectangle with Two line, thickness 1.5 pt	Red	
Proposed Causeway		Dashed line 1.5 pt thick	Red	
Culvert (Slab/Box/Pipe)		Thick line 1.5 pt	Red	
Proposed Culvert		Dashed line 1.5 pt thick	Red	



Director General

Signature