

Government of Nepal



District Transport Master Plan (DTMP)

Ministry of Federal Affairs and Local Development

Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR)

District Development Committee, Dadeldhura

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Prepared by the District Technical Office (DTO) for Dadeldhura with Technical Assistance from the Department of Local Infrastructure and Agricultural Roads (DOLIDAR), Ministry of Federal Affairs and Local Development and grant supported by DFID



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FOREWORD

It is my great pleasure to introduce this revised District Transport Master Plan (DTMP) of Dadeldhura district which was concurred by the district stakeholder's meeting held on 22 January 2013, passed by DDC Board Meeting of 25 January 2013 and approved by the DDC Council on 27 February 2013. Based on the DTMP Guideline 2012, all together 14 District Road Core Network (DRCN) aiming to connect all Village Development Committee (VDC) headquarters with the district headquarter, either directly or through strategic road network (SRN) have been selected. By bringing the DRCN to a maintainable and all-weather standard, year-round access to all VDCs headquarters can be ensured.

I believe this document will be helpful to materialize Rural Transport Infrastructure Sector Wide Approach (RTI-SWAp) through sustainable planning, resources mobilization, implementation and monitoring of the road development. The document is anticipated to generate substantial employment opportunities for rural people through conservation, improvement and new construction activities of the existing road network. DRCN plays an important role to strengthen and promote overall economic growth of the district through established and improved year round transport services reinforcing intra and inter-district linkages. It is most crucial to expand DRCN in a planned way as per the DTMP recommendations by considering the framework of available resources in DDC. This document is very essential in lobbying the donor agencies through central government to attract fund gap. Furthermore, this document will be supportive in avoiding prevailing duplication in resources allocation in road network development by considering basket fund approach.

I would, firstly like to express my gratitude to RTI Sector Maintenance Pilot for financial and technical support. Secondly, my thanks go to Mr Yuba Raj Aryal, Planning Officer (DDC), Mr Shyam Bahadur Khadka, District Engineer (DTO), Mr Yagya Raj Bhatta, Program Officer (DDC), Mr Krishna Dev Joshi, communication Officer (DDC) and other DDC/ DTO staff for their valuable efforts in the process of producing this document. Equally, I would like to thank Mr. Birendra K.C., District Asset Management Engineer (DAME) and Mr. Jay Raj Bhatta Sub-Asset Management Engineer (SAME) for their continuous dedication and hard-work in bringing this DTMP document to this stage. My special thank goes to all the representatives of political parties, who played crucial role in providing constructive feedbacks and valuable support in preparing this document successfully.

Last but not least, I would like to express my heartfelt gratitude to Ministry of Federal Affairs and Local Development (MFALD) and Department of Local Infrastructure Development and Agriculture Road (DOLIDAR/MFALD) for providing valuable suggestions and cooperation to produce this report. Any pioneering and constructive suggestions regarding this document will be highly appreciated.

जिय विकास अधिकारी

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We would like to express our gratitude to Mr Tulasi Bahadur Shrestha, Local Development Officer (LDO), Mr Shyam Bahadur Khadka, Chief District Technical Officer (DTO), Mr Yuba Raj Aryal, Planning Officer (DDC) and other DDC and DTO staff for their valuable suggestions and co-operation for the preparation of this report.

Equally, we would also like to thank Mr Bhupendra Bahadur Basnet, Director General of DOLIDAR, members of the DOLIDAR Technical Committee, including Mr. Ganga Bahadur Basnet, Coordinator, Mr Jeevan Guragain, Mr Krishna Bahadur Katwal, Mr Kumar Thapa and Mr Manoj Krishna Shrestha, RTI Planning and Infrastructure Specialist, as well as Serge Cartier Van Dissel, RTI Rural Roads Engineering Specialist and Mr Michael Green, RTI Team Leader all of whom were instrumental in shaping the new, "slim " version of the DTMP.

The DTMP for Dadeldhura was prepared by Mr Birendra K.C., RTI Pilot District Asset Management Engineer and Mr Jaya Raj Bhatta, RTI Pilot Sub Asset Management Engineer. The authors are grateful to all the local people and leaders who have rendered their valuable assistance to the team during the preparation of the DTMP.

Executive summary

Dadeldhura district is located in Mahakali Zone in Far-western Development Region and covers an area of 1538 square kilometre within latitude 28° 59" N to 29° 26" N and Longitude 80° 12" E to 80 ° 47" E. The district lies partly in the *Terai* and partly in the *Mid-Hills with* elevation ranges from 333 m to 2639 m above mean sea level (msl). Dadeldhura district borders Doti & Kailali to the East, India to the West, Baitadi to the North and Kailali and Kanchanpur to the South.The district has 1 municipality, 20 VDCs, 9 Ilikas and 1 constituency areas. Total population of the district is 152,157 comprising 49% female clustered in 24,507 households. Subsistence agriculture farming, mainly small scale livestock is the main source of occupation and livelihood of the majority of the population. Due to low level of agriculture production, the majority of the households face acute food shortage for the most part of the year.

Dadeldhura has limited but increasing road accessibility. The district is served by surface transport facilities linking the district with the national strategic road network through Mahakali highway and Seti highway. The network of feeder roads, rural roads and village roads are increasing significantly in the district. However, rural and village roads are mostly in poor condition that require upgrading, rehabilitation and proper maintenance.

The district inventory identified just over 432 km of roads, including 77 km of strategic roads and 355 km of rural roads. In coordination with the DTICC and DDC, 14 rural roads with a length of 220 km were identified as making up the district road core network (DRCN), and the remaining 135 km were classified as village roads. The existing DRCN roads link up 12 of the 20 VDC headquarters. All of the DRCN roads are earthen fair-weather roads.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	77.0	77.0	-	-
Urban roads	-	-	-	-
District road core network	220.0	-	-	220.0
Village roads	135.0	-	-	135.0
Total	432.0	77.0	-	355.0

Annual conservation costs are estimated at NPR 66 million based on the first year, and will be updated in the ARMP based on actual annual maintenance needs as determined in the annual road condition survey. For the full five-year period the conservation costs will come to NPR 330 million. An analysis of the road network identified the need for improvement of all the DRCN roads in order to bring them to a maintainable all-weather standard and provide them with a proper road surface in light of existing traffic volumes. The required improvements and their estimated costs are listed below.

The available budget for the road sector for the coming five years (fiscal year 2069/70 to 2073/74) is estimated to be NPR 323.6 million. Allocation to the district road core network was set at 80% of the total road sector budget. It is not enough even to complete all the conservation within the end of the DTMP period. Therefore, recurrent and routine maintenance activities need to be carried out in an alternative year. This will result conservation of whole DRCN and gravelling of 13.11km road length. Gravelling of the remaining road and blacktop works will be carried out in the next DTMP. New construction is not possible within this DTMP period and will also be carried out under the next DTMP.

VDC headquarters with access to fair-weather DRCN roads or the SRN will increase from 7 to 13, while the percentage of the district population with such access will increase from 49% to 66%.

Improvement type	Requirement		Cost (NPR)
Bridges	2415.0	m	1,173,000,000.0
Slab culverts	203.0	m	30,450,000.0
Causeways	400.0	m	40,000,000.0
Hume pipes	10.0	units	100,000.0
Masonry retaining walls	21150.0	m³	211,500,000.0
Gabion retaining walls	93250.0	m³	233,125,000.0
Lined drains	65250.0	m	65,250,000.0
Widening	30437.0	m	760,925,000.0
Rehabilitation	-	km	-
Gravelling	220.0	km	484,000,000.0
Blacktopping	81.0	km	461,700,000.0
New construction	88.0	km	821,600,000.0
Total			4,281,650,000.0

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
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GON	Government of Nepal
GPS	Global Positioning System
GON	Government of Nepal
LGCDP	Local Governance and Community Development Programme
MFALD	Ministry of Federal Affairs and Local Development
RAIDP	Rural Access Improvement and Decentralisation Programme
RAP	Rural Access Programme
RRRSDP	Rural Reconstruction and Rehabilitation Sector Development Programme
SWAp	Sector Wide Approach
VDC	Village Development Committee
VRCN	Village Road Core Network

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	Location of the district Total road inventory District Road Core Network (DRCN) District Transport Perspective Plan (DTPP) District road sector budget allocation District Transport Master Plan (DTMP)

1. INTRODUCTION

Dadeldhura district is located in Mahakali Zone in Far-western Development Region and covers an area of 1538 square kilometer within latitude 28° 59" N to 29° 26" N and Longitude 80° 12" E to 80 ° 47" E. The district has elevation ranging from 333 m to 2639 m above mean sea level (msl). Dadeldhura district borders Doti & Kailali to the East, India to the West, Baitadi to the North and Kailali and Kanchanpur to the South.

Subsistence agriculture farming, mainly small scale livestock is the main source of occupation and livelihood of the majority of the population. Due to low level of agriculture production, the majority of the households face acute food shortage for the most part of the year. As a result of the elevation differences, the district has different level of temperature. The average maximum temperature is 32 °C while average minimum temperature is 3.6 °C. The annual average rainfall is about 1346.6 mm.



Figure 1 Location of the district

According to the annual survey conducted by DDC in 2068, the total population of the district is 152,157 comprising 75,903 female (49%) residing in 24,507 households. Dadeldhura district has an average population density of around 99 people per square km. The average family size is 6.22. Life expectancy of the people is 46 years. The average literacy rate is about 53.43% (33.9% female and 74.3% male are literate). Dadeldhura district has a multi ethnic composition with Chhetri, Kami, Thakuri, Brahman, Magar, Damai, Sarki, Newar, and Sanyashi (Giri). The common language is Doteli (71%), followed by Nepali (21%).

The district has access to Mahakali highway (Atariya-Dadeldhura-Doti) and Seti highway (Saule-Doti). The Mahakali highway passes through district headquarters while Seti highway goes to Doti from Saule which lies about 3km east from district headquarter. Both of these highways are blacktopped and are in good condition. Although road accessibility to Dadeldhura is limited, this is improving rapidly.

2. DISTRICT ROAD CORE NETWORK (DRCN)

This chapter illustrates an overview of the existing roads in Dadeldhura district, distinguishing between strategic roads and rural roads. It goes on to identify those rural roads that make up the district road core network (DRCN) that will form the basis for this DTMP. The remaining rural roads are classified as village roads.

2.1 TOTAL ROAD NETWORK

Dadeldhura district has an estimated road network of 432 kilometres, including two strategic roads with total length of 77 km managed by DOR and 355 km of rural roads managed by Dadeldhura DDC and the VDCs. Both the strategic roads are blacktopped while all the rural roads have an earthen surface. A map of the total road network in Dadeldhura district is shown in Figure 2 at the end of this chapter.

Table 2.1.1Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	77.00	77.00	-	-
Urban roads	-	-	-	-
Rural roads	355.00			355.00
Total	432.00	77.00	-	355.00

2.2 NATIONAL HIGHWAYS AND FEEDER ROADS

Dadeldhura district has 2 highways (Mahakali Highway and Seti Highway) totalling 77 km length. Both of these Highways have already been blacktopped by DOR. Currently there are no feeder roads in the district. However, two DRCN Ugratara – Samaiji – Ajayemeru - Melauli and Budar - Jogbuda – Gaibandhe – Lipna are foreseen to promote into feeder road.

Code	Description	Total length	Black Top	Gravel	Earthen
1	Mahakali Highway	52.00	52.00	-	-
2	Seti Highway	25.00	25.00	-	-
Total		77.00	77.00	-	-

Table 2.2.1 National Highways and Feeder Roads (km)

2.3 DISTRICT ROAD CORE NETWORK

As part of the preparation of this DTMP, District Road Core Network (DRCN) were identified in close coordination with the DTICC and DDC. This DRCN is the minimum network that allows all VDC headquarters to be connected with the strategic road network and the district headquarters, either directly or through other VDCs. The identified DRCN roads were subsequently provided with road codes according to national standards.

The resulting District Road Core Network in Dadeldhura district is shown in Figure 3 at the end of this chapter. The DRCN consists of 14 district roads with a total length of 220.0 km. The remaining 135.0 km of existing rural roads are not considered to be DRCN roads and are classified as village roads under the responsibility of the VDCs. All DRCN roads are currently earthen roads and are considered

fair-weather only (Table 2.3.1). A complete list of the DRCN roads and their characteristics is provided in Table 2.3.2.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	77.00	77.00	-	-
Highways	77.00	77.00		
Feeder roads	-			
Urban roads	-	-	-	-
District road core network	220.00	-	-	220.00
Village roads	135.00	-	-	135.00
Total	432.00	77.00	-	355.00

Table 2.3.1Total road length (km)

Table 2.3.2 District road core network (km)

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	-	-	34.00	-	34.00
73DR002	Pokhara -Belapur	29.00	-	-	29.00	-	29.00
73DR003	Bhatkanda- Ashaigram	8.00	-	-	8.00	-	8.00
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	-	-	47.00	-	47.00
73DR005	Sakyal - Kailpalmandu	8.00	-	-	8.00	-	8.00
73DR006	Ugaratara- Ajayemeru	18.00	-	-	18.00	-	18.00
73DR007	Sadhani - Gaibandhe - shaleta	20.50	-	-	20.50	-	20.50
73DR008	Jogbuda-Shirsh - Rupal	8.00	-	-	8.00	-	8.00
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	-	-	14.00	-	14.00
73DR0010	Dungari - Sheragad - Dewal	6.00	-	-	6.00	-	6.00
73DR0011	Gaira - Gangkhet - Unikot	6.00	-	-	6.00	-	6.00
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	-	-	8.00	-	8.00
73DR0013	Raduwa - Badum - Manilekh	2.50	-	-	2.50	-	2.50
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	-	-	11.00	-	11.00
Total		220.0	-	-	220.50	-	220.50

2.4 VILLAGE ROADS

The 135.0 km of remaining roads that do not form part of the identified district road core network (DRCN) are classified as village roads and are under the responsibility of the 20 VDCs and one Municipality in Dadeldhura district. These are roads of a lower importance that do not form the main link between the VDC headquarters and the district headquarters or strategic road network. Instead they provide additional access to other parts of the VDCs. On average each VDC/municipality will thus be responsible for 6.4 km of village roads.

It is recommended that the VDCs organise maintenance workers to carry out the emergency and routine/recurrent maintenance of these roads to ensure they remain accessible. Any upgrading or new construction of village roads falls outside the scope of this DTMP and is the responsibility of the VDCs/municipality. Funding for these roads will mainly come from the VDC/Municipality grants. Some district funding will also be allocated to the village roads (see also chapter 6). However, this district funding will be mainly for maintenance, especially emergency maintenance and routine/recurrent maintenance to keep the village roads open.





Figure 2 Total road inventory



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4

8 km

Code	Total length	Black Top	Gravel	Earth
73DR001	34.00	-	-	34.00
73DR002	29.00	-	-	29.00
73DR003	8.00	-	-	8.00
73DR004	47.00	-	-	47.00
73DR005	8.00	-	-	8.00
73DR006	18.00	-	-	18.00
73DR007	20.50	-	-	20.50
73DR008	8.00	-	-	8.00
73DR009	14.00	-	-	14.00
73DR0010	6.00	-	-	6.00
73DR0011	6.00	-	-	6.00
73DR0012	8.00	-	-	8.00
73DR0013	2.50	-	-	2.50
73DR0014	11.00	-	-	11.00
Total	220.0	_	-	220.50



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3. DISTRICT TRANSPORT PERSPECTIVE PLAN (DTPP)

This chapter looks at the required interventions regarding conservation, improvement and new construction of the district road core network. It provides a complete list of all works required in the DRCN, which together form the District Transport Perspective Plan (DTPP). For the works forming part of the DTPP, chapter 4 will subsequently provide cost estimation, while chapter 5 will rank the works according to priority and chapter 6 will select those priority works that can be carried out in the next 5 years and thus form part of the District Transport Master Plan (DTMP).

3.1 CONSERVATION

Conservation refers to the actions required to repair a road and keep it in good and passable condition. For DTMP planning purposes standard costs per kilometre for each maintenance type are applied to the entire district road core network, whereby for certain maintenance type's distinction can be made according to the surface type of the road. Identification of the actual maintenance requirements of each road will be made annually in the ARMP. Conservation activities include:

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
73DR001	34.00	34.00	34.00	34.00
73DR002	29.00	29.00	29.00	29.00
73DR003	8.00	8.00	8.00	8.00
73DR004	47.00	47.00	47.00	47.00
73DR005	8.00	8.00	8.00	8.00
73DR006	18.00	18.00	18.00	18.00
73DR007	20.50	20.50	20.50	20.50
73DR008	8.00	8.00	8.00	8.00
73DR009	14.00	14.00	14.00	14.00
73DR0010	6.00	6.00	6.00	6.00
73DR0011	6.00	6.00	6.00	6.00
73DR0012	8.00	8.00	8.00	8.00
73DR0013	2.50	2.50	2.50	2.50
73DR0014	11.00	11.00	11.00	11.00
Total	220.0	220.0	220.0	220.0

Table 3.1.1 Conservation requirements

- 1. <u>Emergency maintenance</u> Basic repairs aimed at removing landslides and repairing damage to the road that inhibit the proper use of the road and make it impassable. This mainly takes place during and after the rainy season. A provisional lump sum is reserved for the entire district road core network based on the network length. Allocation to specific road sections is based on the actual need for clearing landslides or repairing washouts and cuts in the road.
- <u>Routine maintenance</u> General maintenance of the road aimed at preventing damage by ensuring the proper working of the different road elements (retaining walls, drainage system, carriageway, etc.) and cutting vegetation. This is carried out each year on a more or less continuous basis. Routine maintenance is required for the entire district road core network. The specific requirements for routine maintenance are determined on an annual basis through the road condition survey and defined in the ARMP.

- 3. <u>Recurrent maintenance</u> Repairs of minor damage to the road surface and road structures to bring them back to good condition. This is generally carried out once or twice a year. Recurrent maintenance is required for the entire district road core network, whereby distinction is made according to the surface type. The specific requirements for recurrent maintenance are determined on an annual basis through the road condition survey and defined in the ARMP.
- 4. <u>Periodic maintenance</u> Larger repairs to the road largely aimed at renewing the road surface through re-gravelling, resealing or overlays. It is generally carried out with several years interval. Although periodic maintenance is only required for specific sections of the district road core network, a lump sum allocation is made for the entire district road core network based on average annual requirements, distinguishing between different surface types. The specific periodic maintenance requirements are determined on an annual basis through the annual road condition survey and defined in the ARMP.

The length of roads to be included under each conservation type for the first year is indicated below. This is basically the entire district road core.

3.2 IMPROVEMENT

Improvement refers to actions required to improve a road to bring it to a maintainable all-weather standard. It includes the following actions, which for Dadeldhura are described in more detail in the subsequent sections.

- 1. <u>Rehabilitation</u> Significant repairs required to bring a very poor road back to a maintainable standard. This does not include any changes to the original surface type.
- 2. <u>Gravelling</u> Placement of a gravel layer to make it all-weather and ensure that the road remains passable during the rainy season.
- 3. <u>Cross drainage</u> Placement of suitable cross-drainage structures with the aim of making the road all-weather and ensuring that the road remains passable even during the rainy season
- 4. <u>Protective structures</u> Placement of retaining walls and lined side drains to avoid excessive damage to the road during the rainy season and bring it to a maintainable standard.
- 5. <u>Blacktopping</u> Placement of a blacktop layer in roads with traffic volumes exceeding 50 passenger car units (PCU) to reduce damage to the road surface
- 6. <u>Widening</u> Increase of the road width in roads with traffic volumes exceeding 500 passenger car units (PCU) to ensure the proper flow of traffic.

3.2.1 REHABILITATION

No rehabilitation needs were identified in the district road core network.

Code	Description	Total length (km)	Rehabilitation (km)	
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	-	
73DR002	Pokhara -Belapur	29.00	-	
73DR003	Bhatkanda- Ashaigram	8.00	-	
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	-	
73DR005	Sakyal - Kailpalmandu	8.00	-	
73DR006	Ugaratara- Ajayemeru	18.00	-	
73DR007	Sadhani - Gaibandhe - shaleta	20.50	-	
73DR008	Jogbuda-Shirsh - Rupal	8.00	-	
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	-	
73DR0010	Dungari - Sheragad - Dewal	6.00	-	
73DR0011	Gaira - Gangkhet - Unikot	6.00	-	
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	-	
73DR0013	Raduwa - Badum - Manilekh	2.50	-	
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	-	
Total		220.0	-	

Table 3.2.1 Sections of the district road core network requiring rehabilitation

3.2.2 GRAVELLING

As the entire district road core network needs to be brought to an all-weather status, gravelling of the road surface is required for all the earthen sections in the DRCN. For Dadeldhura this concerns the total of 220.0 km of DRCN roads.

Code	Description	Total length (km)	Gravelling (km)
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	34.00
73DR002	Pokhara -Belapur	29.00	29.00
73DR003	Bhatkanda- Ashaigram	8.00	8.00
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	47.00
73DR005	Sakyal - Kailpalmandu	8.00	8.00
73DR006	Ugaratara- Ajayemeru	18.00	18.00
73DR007	Sadhani - Gaibandhe - shaleta	20.50	20.50
73DR008	Jogbuda-Shirsh - Rupal	8.00	8.00
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	14.00
73DR0010	Dungari - Sheragad - Dewal	6.00	6.00
73DR0011	Gaira - Gangkhet - Unikot	6.00	6.00
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	8.00
73DR0013	Raduwa - Badum - Manilekh	2.50	2.50
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	11.00
Total		220.0	220.0

Table 3.2.2 Sections of the district road core network requiring gravelling

3.2.3 CROSS DRAINAGE

The need for cross drainage was identified for the different DRCN roads. A total of 24 bridges with a total length of 1955m, 24 slab culvert with a total length of 203m, 40 CC causeway with a total length of 400, and 1 pipe culverts with 10m length were identified as being required.

Code	Description	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
73DR001	Bagbajar-Bagarkot-Bhageswor	45.00	-	35	-	-
73DR002	Pokhara -Belapur	30.00	40	20	-	-
73DR003	Bhatkanda- Ashaigram	-	-	30	-	-
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	320.00	43	60	-	-
73DR005	Sakyal - Kailpalmandu	65.00	15	18	-	-
73DR006	Ugaratara- Ajayemeru	120.00	20	24	-	-
73DR007	Sadhani - Gaibandhe - shaleta	615.00	50	54	-	-
73DR008	Jogbuda-Shirsh - Rupal	190.00	-	18	-	10
73DR009	Raduwa-Parikhet - Ganespur-Badal	60.00	-	50	-	-
73DR0010	Dungari - Sheragad - Dewal	130.00		10	-	-
73DR0011	Gaira - Gangkhet - Unikot	80.00	10	18	-	
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	120.00	15	36	-	-
73DR0013	Raduwa - Badum - Manilekh	65.00			-	-
73DR0014	Dhimaula - Bhadrapur - chipur	115.00	10	27	-	-
Total		1,955	203	400	-	10

Table 3.2.3 Required cross drainage structures

3.2.4 PROTECTIVE STRUCTURES

Based on the road survey carried out in Dadeldhura, the following retaining walls were identified as being required to ensure the protection of the district road core network.

Code	Description	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
73DR001	Bagbajar-Bagarkot-Bhageswor	900	2,500	10,200
73DR002	Pokhara -Belapur	1,350	5,000	8,700
73DR003	Bhatkanda- Ashaigram	450	1,000	2,400
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	1,350	3,250	14,100
73DR005	Sakyal - Kailpalmandu	1,800	5,000	2,400
73DR006	Ugaratara- Ajayemeru	900	2,500	5,400
73DR007	Sadhani - Gaibandhe - shaleta	2,700	7,500	2,700
73DR008	Jogbuda-Shirsh - Rupal	1,800	25,000	2,400
73DR009	Raduwa-Parikhet - Ganespur-Badal	900	4,000	4,200
73DR0010	Dungari - Sheragad - Dewal	900	2,500	3,450
73DR0011	Gaira - Gangkhet - Unikot	2,250	5,000	1,800
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	1,800	20,000	3,300
73DR0013	Raduwa - Badum - Manilekh	1,800	5,000	2,400
73DR0014	Dhimaula - Bhadrapur - chipur	2,250	5,000	1,800
Total		21,150	93,250	65,250

Table 3.2.4	Required protective structures	
	negan ca protective stractares	

3.2.5 WIDENING

Widening of the district road core network in Dadeldhura is required only in specific locations to bring it up to the minimum standard and to ensure sufficient space in the curves. Additional widening to a higher standard is not required because traffic volumes remain very low.

Code	Description	Total length (km)	Widening (m)
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	287
73DR002	Pokhara -Belapur	29.00	9,330
73DR003	Bhatkanda- Ashaigram	8.00	-
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	-
73DR005	Sakyal - Kailpalmandu	8.00	905
73DR006	Ugaratara- Ajayemeru	18.00	-
73DR007	Sadhani - Gaibandhe - shaleta	20.50	8,000
73DR008	Jogbuda-Shirsh - Rupal	8.00	
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	4,725
73DR0010	Dungari - Sheragad - Dewal	6.00	4,000
73DR0011	Gaira - Gangkhet - Unikot	6.00	455
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	735
73DR0013	Raduwa - Badum - Manilekh	2.50	2,000
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	-
Total		220.0	30,437

Table 3.2.5	Sections of the district road core network requiring widening

3.2.6 BLACKTOPPING

An analysis of the traffic data for the different roads making up the district road core network (see **Annex 1**) shows that there are two roads that are eligible for blacktopping (traffic volume exceeds 100 PCU). The blacktopping of the roads will be treated as a second phase of improvement after they have been gravelled.

Code	Description	Total length (km)	Blacktop (km)	Traffic (VPD)	Blacktopping (km)
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	-	109	34.00
73DR002	Pokhara -Belapur	29.00	-	21	-
73DR003	Bhatkanda- Ashaigram	8.00	-	18	-
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	-	112	47.00
73DR005	Sakyal - Kailpalmandu	8.00	-	5	-
73DR006	Ugaratara- Ajayemeru	18.00	-	29	-
73DR007	Sadhani - Gaibandhe - shaleta	20.50	-	33	-
73DR008	Jogbuda-Shirsh - Rupal	8.00	-	6	-
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	-	6	-
73DR0010	Dungari - Sheragad - Dewal	6.00	-	-	-
73DR0011	Gaira - Gangkhet - Unikot	6.00	-	1	-
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	-	-	-
73DR0013	Raduwa - Badum - Manilekh	2.50	-	-	-
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	-	6	-
Total		220.0			81.00

Table 3.2.6 Sections of the district road core network requiring blacktopping

3.3 NEW CONSTRUCTION

New construction of DRCN roads is required to connect the remaining VDC headquarters. A list of proposed roads for new construction is provided below. These roads provide access to 8 VDC HQs that do not currently have road access.

Code	Description	New VDCs	Existing length	New length	Bridge (m)
73DR001	Bagbajar-Bagarkot-Bhageswor		34.00	-	-
73DR002	Pokhara -Belapur		29.00	-	-
73DR003	Bhatkanda- Ashaigram		8.00	-	-
73DR004	Buder-Jogbuda - Gaibandhe - Lipna		47.00	-	-
73DR005	Sakyal - Kailpalmandu		8.00	12.00	25.00
73DR006	Ugaratara- Ajayemeru		18.00	-	-
73DR007	Sadhani - Gaibandhe - shaleta		20.50	5.00	225.00
73DR008	Jogbuda-Shirsh - Rupal		8.00	30.00	60.00
73DR009	Raduwa-Parikhet - Ganespur-Badal		14.00	-	-
73DR0010	Dungari - Sheragad - Dewal		6.00	6.00	-
73DR0011	Gaira - Gangkhet - Unikot		6.00	12.00	60.00
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal		8.00	17.00	-
73DR0013	Raduwa - Badum - Manilekh		2.50	6.00	60.00
73DR0014	Dhimaula - Bhadrapur - chipur		11.00	-	30.00
Total			220.0	88.00	460.00

 Table 3.3.1
 Sections of the district road core network requiring new construction

3.4 DISTRICT TRANSPORT PERSPECTIVE PLAN

The DTPP foresees bringing the entire existing district road core network to maintainable all-weather status, and expanding it to provide access to an additional 8 VDC headquarters. For this purpose, all 220.0 km will be gravelled and a number of different cross drainage and protective structures will be constructed. A further 88.0 km of new road will be constructed to maintainable all-weather gravel standard providing access to 8 additional VDC HQs. The district road core network will subsequently consist of 220.0 km of maintainable all-weather roads. The following table lists the required interventions, while the proposed network is shown in the DTPP map in Figure 4.

Table 3.4.1 District Transport Perspective Plan

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Widening (m)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)	New construction (km)
73DR001	34.00	34.00	34.00	34.00	-	34.00	34.00	287.00	45.00	-	35.00	-	-	900.00	2,500.00	10,200.00	-
73DR002	29.00	29.00	29.00	29.00	-	29.00	-	9,330.00	30.00	40.00	20.00	-	-	1,350.00	5,000.00	8,700.00	-
73DR003	8.00	8.00	8.00	8.00	-	8.00	-	-	-	-	30.00	-	-	450.00	1,000.00	2,400.00	-
73DR004	47.00	47.00	47.00	47.00	-	47.00	47.00	-	320.00	43.00	60.00	-	-	1,350.00	3,250.00	14,100.00	-
73DR005	8.00	8.00	8.00	8.00	-	8.00	-	905.00	90.00	15.00	18.00	-	-	1,800.00	5,000.00	2,400.00	12.00
73DR006	18.00	18.00	18.00	18.00	-	18.00	-	-	120.00	20.00	24.00	-	-	900.00	2,500.00	5,400.00	-
73DR007	20.50	20.50	20.50	20.50	-	20.50	-	8,000.00	840.00	50.00	54.00	-	-	2,700.00	7,500.00	2,700.00	5.00
73DR008	8.00	8.00	8.00	8.00	-	8.00	-	-	250.00	-	18.00	-	10.00	1,800.00	25,000.00	2,400.00	30.00
73DR009	14.00	14.00	14.00	14.00	-	14.00	-	4,725.00	60.00	-	50.00	-	-	900.00	4,000.00	4,200.00	-
73DR0010	6.00	6.00	6.00	6.00	-	6.00	-	4,000.00	130.00	-	10.00	-	-	900.00	2,500.00	3,450.00	6.00
73DR0011	6.00	6.00	6.00	6.00	-	6.00	-	455.00	140.00	10.00	18.00	-	-	2,250.00	5,000.00	1,800.00	12.00
73DR0012	8.00	8.00	8.00	8.00	-	8.00	-	735.00	120.00	15.00	36.00	-	-	1,800.00	20,000.00	3,300.00	17.00
73DR0013	2.50	2.50	2.50	2.50	-	2.50	-	2,000.00	125.00	-	-	-	-	1,800.00	5,000.00	2,400.00	6.00
73DR0014	11.00	11.00	11.00	11.00	-	11.00	-	-	145.00	10.00	27.00	-	-	2,250.00	5,000.00	1,800.00	-
Total	220.0	220.0	220.0	220.0	-	220.00	81.00	30,437	2,415	203	400	-	10	21,150	93,250	65,250	88.00



Code	Total length	Black Topping	Gravelling	New construction
73DR001	34.00	34.00	34.00	-
73DR002	29.00	-	29.00	-
73DR003	8.00	-	8.00	-
73DR004	47.00	47.00	47.00	-
73DR005	8.00	-	8.00	12.00
73DR006	18.00	-	18.00	-
73DR007	20.50	-	20.50	5.00
73DR008	8.00	-	8.00	30.00
73DR009	14.00	-	14.00	-
73DR0010	6.00	-	6.00	6.00
73DR0011	6.00	-	6.00	12.00
73DR0012	8.00	-	8.00	17.00
73DR0013	2.50	-	2.50	6.00
73DR0014	11.00	-	11.00	-
Total	220.0	81.00	220.00	88.00



4. COST ESTIMATION

For the cost estimation, use has been made of standard costs for the different activities required. For the conservation activities this results in an estimation of annual costs, while for improvement and new construction activities this result is an estimation of the total costs required.

4.1 CONSERVATION

The costs of the required conservation measures have been calculated using the following standard costs. These standard costs have been applied to the entire district road core network, whereby distinction is made based on the surface type in the case of recurrent and periodic maintenance. It must be noted here that the standard costs for periodic maintenance are the average annual costs, but that the cost for applying periodic maintenance in a specific section every several years will be higher (the cumulative cost of several years). The estimated costs for the first year are presented below, while the costs for subsequent years will vary slightly as road surface types change as a result of improvements. Detailed cost estimations for the actual maintenance needs in any given year will be presented in the ARMP.

Activity	Unit	Unit cost (NPR/km)
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

For the first year the estimated costs for conservation of the DRCN come to NPR 66 million. Based on this cost for the first year, the costs for conservation of the DRCN for the next 5 years are estimated at NPR 330 million. These costs will change slightly as the roads are improved and the standard conservation costs change. This will be updated in the ARMP on an annual basis.

Code	Total length (km)	Blacktop (km)	Gravel (km)	Earthen (km)	Emergency	Routine	Recurrent (blacktop)	Recurrent (gravel)	Recurrent (earthen)	Periodic (blacktop)	Periodic (gravel)	Total annual cost	Total 5-year cost
73DR001	34.00	-	-	34.00	1,020	680	-	-	8,500	-	-	10,200	51,000
73DR002	29.00	-	-	29.00	870	580	-	-	7,250	-	-	8,700	43,500
73DR003	8.00	-	-	8.00	240	160	-	-	2,000	-	-	2,400	12,000
73DR004	47.00	-	-	47.00	1,410	940	-	-	11,750	-	-	14,100	70,500
73DR005	8.00	-	-	8.00	240	160	-	-	2,000	-	-	2,400	12,000
73DR006	18.00	-	-	18.00	540	360	-	-	4,500	-	1	5,400	27,000
73DR007	20.50	-	-	20.50	615	410	-	-	5,125	-	-	6,150	30,750
73DR008	8.00	-	-	8.00	240	160	-	-	2,000	-	-	2,400	12,000
73DR009	14.00	-	-	14.00	420	280	-	-	3,500	-	-	4,200	21,000
73DR0010	6.00	-	-	6.00	180	120	-	-	1,500	-	-	1,800	9,000
73DR0011	6.00	-	-	6.00	180	120	-	-	1,500	-	-	1,800	9,000
73DR0012	8.00	-	-	8.00	240	160	-	-	2,000	-	-	2,400	12,000
73DR0013	2.50	-	-	2.50	75	50	-	-	625	-	-	750	3,750
73DR0014	11.00	-	-	11.00	330	220	-	-	2,750	-	-	3,300	16,500
Total	220.0	-	-	220.0	6,600	4,400	-	-	55,000	-	-	66,000	330,000

 Table 4.1.2
 Estimated conservation costs for the first year (NPR '000)

4.2 IMPROVEMENT

The costs of the required improvement measures have been calculated using the following standard costs. These standard costs have been applied to the identified improvement requirements presented in the previous chapter. The resulting estimated improvement costs come to NPR 3,460 million as indicated in the table 4.2.2 below.

Activity	Unit	Unit cost (NPR)
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

 Table 4.2.1
 Standard unit costs for improvement activities

4.2.2

Cost estimate for improvement measures (NPR '000)

Code	Total ength (km)	ehabilitati on	Widening	Gravelling	slacktoppi ng	Bridges	Slab culverts	CC auseways	Stone auseways	Pipe culvert	Masonry walls	Gabion walls	Lined drains	Total cost
73DR001	34.00	-	7,175	74,800	193,800	27,000	-	3,500	-	-	9,000	6,250	10,200	331,725
73DR002	29.00	-	233,250	63,800	-	18,000	6,000	2,000	-	-	13,500	12,500	8,700	357,750
73DR003	8.00	-	-	17,600	-	-	-	3,000	-	-	4,500	2,500	2,400	30,000
73DR004	47.00	-	-	103,400	267,900	192,000	6,450	6,000	-	-	13,500	8,125	14,100	611,475
73DR005	8.00	-	22,625	17,600	-	39,000	2,250	1,800	-	-	18,000	12,500	2,400	116,175
73DR006	18.00	-	-	39,600	-	72,000	3,000	2,400	-	-	9,000	6,250	5,400	137,650
73DR007	20.50	-	200,000	45,100	-	369,000	7,500	5,400	-	-	27,000	18,750	2,700	675,450
73DR008	8.00	-	-	17,600	-	114,000	-	1,800	-	100	18,000	62,500	2,400	216,400
73DR009	14.00	-	118,125	30,800	-	36,000	-	5,000	-	-	9,000	10,000	4,200	213,125
73DR0010	6.00	-	100,000	13,200	-	78,000	-	1,000	-	-	9,000	6,250	3,450	210,900
73DR0011	6.00	-	11,375	13,200	-	48,000	1,500	1,800	-	-	22,500	12,500	1,800	112,675
73DR0012	8.00	-	18,375	17,600	-	72,000	2,250	3,600	-	-	18,000	50,000	3,300	185,125
73DR0013	2.50	-	50,000	5,500	-	39,000	-	-	-	-	18,000	12,500	2,400	127,400
73DR0014	11.00	-	-	24,200	-	69,000	1,500	2,700	-	-	22,500	12,500	1,800	134,200
Total	220.0	-	760,925	484,000	461,700	1,173,000	30,450	40,000	-	100	211,500	233,125	65,250	3,460,050

4.3 NEW CONSTRUCTION

For new construction, the following standard costs have been applied to estimate the costs involved. These standard costs have been applied to the identified new construction requirements presented in the previous chapter.

Table 4.3.1 S	Standard unit costs for new construct	ion
	Unit	Unit cost (NPR)
Activity		
Track opening	km	4,000,000
Gravelling	km	2,200,000
Bridge construction	m	600,000

Based on the standard cost adopted, the resulting estimated costs for new construction come to NPR 821 million as indicated in the table below.

Code	Description	Length (km)	Opening up	Gravelling	Bridges	Total cost
73DR001	Bagbajar-Bagarkot-Bhageswor	-	-	-	-	-
73DR002	Pokhara -Belapur	-	-	-	-	-
73DR003	Bhatkanda- Ashaigram	-	-	-	-	-
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	-	-	-	-	-
73DR005	Sakyal - Kailpalmandu	12.00	48,000	26,400	15,000	89,400
73DR006	Ugaratara- Ajayemeru	-	-	-	-	-
73DR007	Sadhani - Gaibandhe - shaleta	5.00	20,000	11,000	135,000	166,000
73DR008	Jogbuda-Shirsh - Rupal	30.00	120,000	66,000	36,000	222,000
73DR009	Raduwa-Parikhet - Ganespur-Badal	-	-	-	-	-
73DR0010	Dungari - Sheragad - Dewal	6.00	24,000	13,200	-	37,200
73DR0011	Gaira - Gangkhet - Unikot	12.00	48,000	26,400	36,000	110,400
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	17.00	68,000	37,400	-	105,400
73DR0013	Raduwa - Badum - Manilekh	6.00	24,000	13,200	36,000	73,200
73DR0014	Dhimaula - Bhadrapur - chipur	-	-	-	18,000	18,000
Total		88.00	352,000	193,600	276,000	821,600

Table 4.3.2 Cost estimate for new construction (NPR '000)

4.4 DTPP COSTS

The total costs for the District Transport Perspective Plan that comprises cost for conservation, improvement and new construction, come to NPR 4,611 million as indicated in the table below.

Table 4.4.1 DTPP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
73DR001	51,000	331,725	-	382,725
73DR002	43,500	357,750	-	401,250
73DR003	12,000	30,000	-	42,000
73DR004	70,500	611,475	-	681,975
73DR005	12,000	116,175	89,400	217,575
73DR006	27,000	137,650	-	164,650
73DR007	30,750	675,450	166,000	872,200
73DR008	12,000	216,400	222,000	450,400
73DR009	21,000	213,125	-	234,125
73DR0010	9,000	210,900	37,200	257,100
73DR0011	9,000	112,675	110,400	232,075
73DR0012	12,000	185,125	105,400	302,525
73DR0013	3,750	127,400	73,200	204,350
73DR0014	16,500	134,200	18,000	168,700
Total	330,000	3,460,050	821,600	4,611,650

5. RANKING

The ranking of the required interventions determines the order in which they will be carried out. This ranking is done separately for conservation, improvement and new construction. Ranking is done according to the cost per person served, whereby the costs are the estimated costs of the previous chapter. For the calculation of the population served, use is made of the population data for the VDCs linked by the road concerned. This data is presented in **Annex 2**.

5.1 CONSERVATION

Ranking of roads for conservation is based on the total conservation costs per person served by the road. This ranking of roads will be updated each year in the ARMP based on the actual cost estimates for the year concerned. An example ranking is provided in the table below based on standard costs for the first year.

Code	Total length (km)	1. Emergency	2. Routine	3. Recurrent (paved)	4. Recurrent (gravel)	5. Recurrent (earth)	6. Periodic (blacktop)	7. Periodic (gravel)	Total cost (NPR '000)	Population served	Cost/person (NPR)
73DR008	8.00	240	160	-	-	2,000	-	-	2,400	20,882	115
73DR0013	2.50	75	50	-	-	625	-	-	750	4,859	154
73DR006	18.00	540	360	-	-	4,500	-	-	5,400	29,650	182
73DR0012	8.00	240	160	-	-	2,000	-	-	2,400	12,563	191
73DR002	29.00	870	580	-	-	7,250	-	-	8,700	43,419	200
73DR005	8.00	240	160	-	-	2,000	-	-	2,400	9,910	242
73DR007	20.50	615	410	-	-	5,125	-	-	6,150	22,247	276
73DR0010	6.00	180	120	-	-	1,500	-	-	1,800	5,924	304
73DR001	34.00	1,020	680	-	-	8,500	-	-	10,200	31,858	320
73DR0011	6.00	180	120	-	-	1,500	-	-	1,800	5,148	350
73DR004	47.00	1,410	940	-	-	11,750	-	-	14,100	36,182	390
73DR003	8.00	240	160	-	-	2,000	-	-	2,400	3,942	609
73DR0014	11.00	330	220	-	-	2,750	-	-	3,300	5,409	610
73DR009	14.00	420	280	-	-	3,500	-	-	4,200	4,175	1,006

 Table 5.1.1
 Ranking of conservation works (NPR '000)

The allocation of maintenance funding will follow a specific sequence indicated below, and will be applied to the road ranking as defined in the ARMP. This will be of particular importance where funding is insufficient to cover all conservation costs.

- 1. Emergency maintenance
- 2. Routine maintenance
- 3. Recurrent maintenance paved roads
- 4. Recurrent maintenance gravel roads
- 5. Recurrent maintenance gravel roads
- 6. Periodic maintenance blacktop roads
- 7. Periodic maintenance gravel roads

5.2 IMPROVEMENT

In the case of improvement activities, ranking is again based on the basis of the total cost per person served. The resulting order of the roads is shown in the table below. In the case of roads requiring blacktopping, the improvement of the road has been split into two phases. The first phase includes all improvements to bring the road to a maintainable all-weather standard (gravelling, widening, cross drainage and protective structures), while the second phase only includes the blacktopping. This has been done to avoid unnecessarily delaying the improvement of such roads to all-weather gravel standard due to the additional cost of blacktopping (increasing the cost per person served).

Code	Total length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
73DR006	18.00	18.00	-	137,650
73DR003	8.00	8.00	-	30,000
73DR002	29.00	29.00	-	357,750
73DR008	8.00	8.00	-	216,400
73DR001	34.00	34.00	34.00	331,725
73DR005	8.00	8.00	-	116,175
73DR0012	8.00	8.00	-	185,125
73DR004	47.00	47.00	47.00	611,475
73DR0011	6.00	6.00	-	112,675
73DR0014	11.00	11.00	-	134,200
73DR0013	2.50	2.50	-	127,400
73DR007	20.50	20.50	-	675,450
73DR0010	6.00	6.00	-	210,900
73DR009	14.00	14.00	-	213,125

Table 5.2.1 Ranking of improvement works (NPR '000)

5.3 NEW CONSTRUCTION

For the roads proposed for new construction, ranking is also according to the cost per person served by the new road. The resulting ranking is indicated in the table below.

Table 5.3.1 Ranking of construction works (NPR '000)							
Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)			
73DR0014	-	18,000	5,409	3,328			
73DR0010	6.00	37,200	5,924	6,280			
73DR007	5.00	166,000	22,247	7,462			
73DR0012	17.00	105,400	12,563	8,390			
73DR005	12.00	89,400	9,910	9,021			
73DR008	30.00	222,000	20,882	10,631			
73DR0013	6.00	73,200	4,859	15,065			
73DR0011	12.00	110,400	5,148	21,445			

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

The District Transport Master Plan (DTMP) that covers the next five years is prepared based on the projected financial resources available and the prioritized transport interventions as listed in the DTPP. Year-wise targets are prepared for the different roads and intervention types.

6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

The projected financial resources for the next five years are estimated by considering all possible funding sources. The funding levels are based on the existing trend of funding. An annual increase in funding of 10% is assumed for all funding sources. The total district budget for the road sector is NPR 323.6 million for the five-year period.

Funding source	2069/70	2070/71	2071/72	2072/73	2073/74
DDC Internal Budget	300.0	330.0	363.0	399.3	439.2
RTI SWAp regular	9,000.0	9,900.0	10,890.0	11,979.0	13,176.9
RTI SWAp additional	20,000.0	22,000.0	24,200.0	26,620.0	29,282.0
RRRSDP	-	-	-	-	-
RBN	1,550.0	1,705.0	1,875.5	2,063.1	2,269.4
DDC Matching fund	4,441.6	4,885.8	5,374.3	5,911.8	6,503.0
DFID	8,883.2	9,771.5	10,748.7	11,823.5	13,005.9
Fund of Members of Parliaments	-	-	-	-	-
LGCDP	-	-	-	-	-
VDC	-	-	-	-	-
People Participation (20%)	8,835	9,718	10,690	11,759	12,935
Total	53,010	58,311	64,142	70,556	77,612
Grand total			323,630		

Table 6.1.1Estimated funding levels (roads) for next five years (in NPR '000)

6.2 BUDGET ALLOCATION

The distribution of the available district road sector budget is indicated in the figure below. At least 80% of the total budget is reserved for the district road core network and at most 20% is to be used by the DDC for the village roads, giving priority to emergency maintenance and routine/recurrent maintenance. Alternatively, this 20% may be used for the new construction of DRCN roads where this is considered a priority by the district. The 80% of the district road sector budget for the DTMP is not enough even to cover full conservation. Therefore, routine and recurrent maintenance activities are planned to be undertaken in alternative year. With this strategy we can accomplish conservation of whole DCRN and manage to gravel 13.11km of road length. This implies without having sufficient budget we can not materialized DTMP plan.



Based on this distribution of the estimated budget, the available annual budget for each intervention type and the resulting district road core network length by surface type can be calculated. The results are shown in the following table.

Table 6.2.1DTMP investment plan

		Item										Year		- F							
	Fiscal year				20	69/70)	2	070/7	'1	207	71/72		20	72/73	3	201	73/74			
Α	Total budget				53	3,010			58,311	1	64	,142		7(0,556		77	7,612		Budget	
	Village roads				10	0,602			11,662	2	12	,828,		14	4,111		15	5,522		20%	VRCN
	Core road netw	ork budget	: (DTMP)		42	2,408			46,649	9	51	,313		56	6,445		62	2,089		80%	DRCN
	Core network l	ength (km)	1		22	20.00			220.00	D	22	0.00		22	20.00		22	20.00		220.00	DRCN length
	Blacktop (km)					-			-			-			-			-		-	Blacktop length
В	Gravel (km)					-			4.11		4	.11		-	7.41		8	8.48		13.11	Gravel length
	Earthen (km)				22	20.00		:	215.89	Э	21	5.89		2:	12.59		21	.1.52		206.89	Earthen length
	Conservation (I	NRs)			11	L,000			46,649	9	26	,030		48	8,281		26	659		158,618	Conservation cost
	Emergency				6	,600			6,477	,	6,	477		6	,378		6,	,346			•
	Routine				4	,400					3,	082		1	,236		3,	,016			
С	Recurrent (blac	ktop)				-			-			-			-			-			
	Recurrent (grav	el)				-			1,643					2	,965						
	Recurrent (eart	hen)							38,529	9	15	,444		37	7,702		15	5,177			
	Periodic (blackt	op)				-			-			-			-			-			
	Periodic (gravel)				-					1,	027					2,	,120			
	Improvement	Cost	BT	GR	31,408	BT	GR	-	BT	GR	25,284	BT	GR	8,164	BT	GR	35,430	BT	GR		
	73DR006	137,650	-	18.00	31,408	-	4.11	-	-	-	25,284	-	3.31	8,164	-	1.07	35,430	-	4.63		
	73DR003	30,000	-	8.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR002	357,750	-	29.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR008	216,400	-	8.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
D	73DR001	331,725	34.00	34.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR005	116,175	-	8.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR0012	185,125	-	8.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR004	611,475	47.00	47.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR0011	112,675	-	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR0014	134,200	-	11.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

	73DR0013	127,400	-	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR007	675,450	-	20.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR0010	210,900	-	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	73DR009	213,125	-	14.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tota	l improven	nent		31,408	-	4.11	-	-	-	25,284	-	3.31	8,164	-	1.07	35,430	-	4.63	100,286	Improvement cost
	Construction	Cost	GF	۲	-		GR	-	(GR	-		GR	-		GR	-	C	GR		
	73DR0014	18,000	-		-		-	I		-	-		-	-		-	-		-		
	73DR0010	37,200	6.0	0	-		-	I		-	-		-	-		-	-		-		
	73DR007	166,000	5.0	0	-		-	I		-	-		-	-		-	-		-		
	73DR0012	105,400	17.0	00	-		-	-		-	-		-	-		-	-		-		
E	73DR005	89,400	12.(00	-		-	-		-	-		-	-		-	-		-		
	73DR008	222,000	30.0	00	-		-	-		-	-		-	-		-	-		-		
	73DR0013	73,200	6.0	0	-		-	-		-	-		-	-		-	-		-		
	73DR0011	110,400	12.0	00	-		-	-		-	-		-	-		-	-		-	Budget	
	Total r	new constru	uction		-		-	-		-	-		-	-		-	-		-	-	New construction
F	Ren	naining bud	lget		-			-			-			-			-			-	Remaining

6.3 DTMP OUTPUTS

Based on the investment plan presented above, only 258 million NRs will be available for all DRCN roads to undertake necessary conservation work for the duration of the DTMP period. However, we require 330 million NRs to conserve all DRCN. Therefore, in principle we cannot complete all the conservation work during the DTMP.

Therefore, routine and recurrent maintenance activities are planned to be undertaken in alternative year. With this strategy we can accomplish conservation of whole DCRN and manage to gravel 13.11km of road length. Gravelling of the remaining road and blacktopping work will be carried out in the next DTMP based on the available budget. The same goes for the new construction which will only take place after the existing DRCN roads have been improved to maintainable all weather standards (some of these roads may be constructed using VDC funding).

Table 6.3.1 DTMP output

Conservation	Improvement gravel	Improvement blacktop	New construction
220.00	13.11	-	-

6.4 DTMP OUTCOME

Due to lack of required budget, all-weather gravelling of all DRCN and blacktop are not possible during this DTMP.

	Total length	Fair-weath	ner	All-weather gra	vel	All-weather blackt	ор
	km	km	%	km	%	km	%
Start of DTMP	220.00	220.00	100%	-	0%	-	0%
End of DTMP	220.00	206.89	94%	13.11	6%	-	0%
Difference	-	- 13.11	-6%	13.11	6%	-	0%

Table 6.4.1 Standard of DRCN roads

The number of VDC headquarters with direct access to the SRN or fair-weather DRCN roads will increase from 7 to 13 and the district population with access to the SRN or fair-weather DRCN roads will increase from 49% to 66%. Due to lack of required budget, we will be unable to decrease the number of VDC headquarters with no access to DRCN roads and SRN.

Table 6.4.2	Population with access to road network

	Dire	ct access to SF	RN	No	access to roa	d	Fair-v	weather core	roads	All-w	eather core ro	bads
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	2	26,527	17%	8	51,792	34%	5	48,073	32%	0	-	0%
End of DTMP	2	26,527	17%	8	51,792	34%	11	73,838	49%	2	7,479	5%
Difference	-	-	0%	-	-	0%	6	25,765	17%	2	7,479	5%



Indicator	Start	End
District road core network length	220.00	220.00
All-weather DRCN roads	0.00	13.11
VDCs with all-weather/SRN access	2	4
% Population with all-weather/SRN access	17%	22%



4 2 0 4 8 km

ANNEX 1 TRAFFIC DATA

Based on the traffic survey carried out in each of the DRCN roads, traffic data are filled in the Table A1.2 below

Code	Description	Total length (km)	Motor-cycle	Car-Jeep- Minibus	Tractor	Truck-Bus	PCU
73DR001	Bagbajar-Bagarkot-Bhageswor	34.00	27	9	21	11	109
73DR002	Pokhara -Belapur	29.00	5	2	4	2	21
73DR003	Bhatkanda- Ashaigram	8.00	5	3	4	1	18
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.00	29	7	19	13	112
73DR005	Sakyal - Kailpalmandu	8.00	1		2		5
73DR006	Ugaratara- Ajayemeru	18.00	5	4	5	3	29
73DR007	Sadhani - Gaibandhe - shaleta	20.50	12	1	13		33
73DR008	Jogbuda-Shirsh - Rupal	8.00	3	-	2	-	6
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.00	2	1	2	-	6
73DR0010	Dungari - Sheragad - Dewal	6.00	-	-	-	-	-
73DR0011	Gaira - Gangkhet - Unikot	6.00	2	-	-	-	1
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.00	-	-	-	-	-
73DR0013	Raduwa - Badum - Manilekh	2.50	-	-	-	-	-
73DR0014	Dhimaula - Bhadrapur - chipur	11.00	3	-	2	-	6
Total							

ANNEX 2 POPULATION SERVED

S.N.	VDC	Population	73DR001	73DR002	73DR003	73DR004	73DR005	73DR006	730R007	73DR008	73DR009	73DR0010	73DR0011	73DR0012	73DR0013	73DR0014	SRN
1	Alital	13,935	-	-	-	x	-	-	-	-	-	-	-	-	-		-
2	Jogbudha	22,247	-	-	-	х	-		х	-	-	-	-	-	-	-	-
3	Shirsa	13,333	-	-	-	-	-	-	-	х	-	-	-	-	-		-
4	Rupal	7,549	-	-	-	-	-	-	-	х	-	-	-	х	-		-
5	Bhageswor	4,673	х	-	-	-	-	-	-	-	-	-	-	-	-		-
6	Dewaldivyapur	5,924	-	-	-	-	-	-	-	-	-	х	-	-	-		-
7	Bagarkot	5,014	х	-	-	-	-	-	-	-	-	-	-	х	-	-	-
8	Bhadrapur	2,613	-	-	-	-	-	-	-	-	-	-	-	-	-	х	-
9	Chipur	2,796	-	-	-	-	-	-	-	-	-	-	-	-	-	х	-
10	Ajayameru	4,609	-	-	-	-		х	-	-	-	-	-	-	-	-	-
11	Samaiji	2,870	-	-	-	-	-	х	-	-	-	-	-	-	-		-
12	Koteli	5,091	-	x		-	-	-	-	-	-	-	-	-	-		-
13	Manilekh	4,859	-	x	-	-	-	-	-	-	-	-	-	-	х		-
14	Belapur	7,566	-	x	-	-	-	-	-	-	-	-	-	-	-		-
15	Nawadurgha	3,732	-	х	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Ganeshpur	4,175	-	-	-	-	-	-	-	-	х	-	-	-	-		-
17	Mastamandu	4,356	-	-	-	-	х	-	-	-	-	-	-	-	-		x
18	Kailpalmandu	5,554	-	-	-	-	х	-	-	-	-	-	-	-	-		-
19	Amargadhi	22,171	х	x	-	-	-	х	-	-	-	-	-	-	-		x
20	Asigram	3,942	-	-	x	-	-	-	-	-	-	-	-	-	-		-
21	Gankhet	5,148	-	-	-	-	-	-	-	-	-	-	х	-	-		-
	Total population	31,858	43,419	3,942	36,182	9,910	29,650	22,247	20,882	4,175	5,924	5,148	12,563	4,859	5,409	31,858	26,527
	Total VDCs/municipalities	3	5	1	2	2	3	1	2	1	1	1	2	1	2	3	2

Based on the collected population data for each VDC, population served data are filled in the Table A2.1below

ANNEX 3 LOCATION OF PROPOSED INTERVENTIONS

Based on the collected data regarding required interventions in the DRCN roads, detail information have been filled in the Table A3.1

Road code	Description	Length (km)	Start chainage (km) or X- coordinate	End chainage (km) or Y-coordinate	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Widening (m)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
73DR001	Bagbajar-Bagarkot-Bhageswor	34	0+000	34+000	-	34.0	34.0	287.0	45.0	-	35.0	-	-	900.0	2,500.0	10,200.0
73DR002	Pokhara -Belapur	29	0+000	29+000	-	29.0	-	9,330.0	30.0	40.0	20.0	-	-	1,350.0	5,000.0	8,700.0
73DR003	Bhatkanda- Ashaigram	8	0+000	8+000	-	8.0	-	-	-	-	30.0	-	-	450.0	1,000.0	2,400.0
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47	0+000	47+000	-	47.0	47.0	-	320.0	43.0	60.0	-	-	1,350.0	3,250.0	14,100.0
73DR005	Sakyal - Kailpalmandu	8	0+000	8+000	-	8.0	-	905.0	65.0	15.0	18.0	-	-	1,800.0	5,000.0	2,400.0
73DR006	Ugaratara- Ajayemeru	18	0+000	18+000	-	18.0	-	-	120.0	20.0	24.0	-	-	900.0	2,500.0	5 <i>,</i> 400.0
73DR007	Sadhani - Gaibandhe - shaleta	20.5	0+000	20+500	-	20.5	-	8,000.0	615.0	50.0	54.0	-	-	2,700.0	7,500.0	2,700.0
73DR008	Jogbuda-Shirsh - Rupal	8	0+000	8+000	-	8.0	-	-	190.0	-	18.0	-	10.0	1,800.0	25,000.0	2,400.0
73DR009	Raduwa-Parikhet - Ganespur- Badal	14	0+000	14+000	-	14.0	-	4,725.0	60.0	-	50.0	-	-	900.0	4,000.0	4,200.0
73DR0010	Dungari - Sheragad - Dewal	6	0+000	6+000	-	6.0	-	4,000.0	130.0	-	10.0	-	-	900.0	2,500.0	3,450.0
73DR0011	Gaira - Gangkhet - Unikot	6	0+000	6+000	-	6.0	-	455.0	80.0	10.0	18.0	-	-	2,250.0	5,000.0	1,800.0
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8	0+000	8+000	-	8.0	-	735.0	120.0	15.0	36.0	-	-	1,800.0	20,000.0	3,300.0
73DR0013	Raduwa - Badum - Manilekh	2.5	0+000	2+500	-	2.5	-	2,000.0	65.0	-	-	-	-	1,800.0	5,000.0	2,400.0
73DR0014	Dhimaula - Bhadrapur - chipur	11	0+000	11+000	-	11.0	-	-	115.0	10.0	27.0	-	-	2,250.0	5,000.0	1,800.0
Total		220	0	220000	0	220	81	30437	1955	203	400	0	10	21150	93250	65250

ANNEX 4 TOTAL ROAD INVENTORY

		Roa	d length (Ki	M)		Surface ty	pe	Acce	ssible
S.N.	Name of the road	Completed	New	Total	Black Top	Gravel	Earthen	All weather	Fair weather
А	DRCN								
73DR001	Bagbajar-Bagarkot-Bhageswor	34.0	-	34.0	-	-	34.0	-	34.0
73DR002	Pokhara -Belapur	29.0	-	29.0	-	-	29.0	-	29.0
73DR003	Bhatkanda- Ashaigram	8.0	-	8.0	-	-	8.0	-	8.0
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	47.0	-	47.0	-	-	47.0	-	47.0
73DR005	Sakyal - Kailpalmandu	8.0	12.0	20.0	-	-	8.0	-	8.0
73DR006	Ugaratara- Ajayemeru	18.0	-	18.0	-	-	18.0	-	18.0
73DR007	Sadhani - Gaibandhe - shaleta	20.5	5.0	25.5	-	-	20.5	-	20.5
73DR008	Jogbuda-Shirsh - Rupal	8.0	30.0	38.0	-	-	8.0	-	8.0
73DR009	Raduwa-Parikhet - Ganespur-Badal	14.0	-	14.0	-	-	14.0	-	14.0
73DR0010	Dungari - Sheragad - Dewal	6.0	6.0	12.0	-	-	6.0	-	6.0
73DR0011	Gaira - Gangkhet - Unikot	6.0	12.0	18.0	-	-	6.0	-	6.0
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	8.0	17.0	25.0	-	-	8.0	-	8.0
73DR0013	Raduwa - Badum - Manilekh	2.5	6.0	8.5	-	-	2.5	-	2.5
73DR0014	Dhimaula - Bhadrapur - chipur	11.0	-	11.0	-	-	11.0	-	11.0
Total		220.0	88.0	308.0	-	-	220.0	-	220.0
В	VRCN								
73VR001	Aita - Niglad - Achalsain -Katal	6.0	44.0	50.0	-	-	6.0	-	6.0
73VR002	Ajayemeru Melauli	4.0	31.0	35.0	-	-	4.0	-	4.0
73VR003	Anarkholi-Mungraun-Dewal Rural Road	3.0	47.0	50.0	-	-	3.0	-	3.0
73VR004	Asigram Rel	4.0	28.0	32.0	-	-	4.0	-	4.0
73VR005	Bagarkot-Chulla-Sirad-Rupaligad Rural Road	4.0	24.0	28.0	-	-	4.0	-	4.0
73VR006	Bhageswor Rupal	-	31.0	31.0	-	-	-	-	-
73VR007	Bhajnpur -Chhachauda Rural Road	4.0	0.5	4.5	-	-	4.0	-	4.0
73VR008	Bhatkada - Parikhet - Raduwa	22.0	-	22.0	-	-	22.0	-	22.0
73VR009	Budar - Nile	19.0	6.0	25.0	-	-	19.0	-	19.0
73VR010	Dadaban-Nawdurga-Ghupatkhan Rural Road	1.0	9.5	10.5	-	-	1.0	-	1.0

73VR011	Dakale - Sallaghari	5.0	5.0	10.0	-	-	5.0	-	5.0
73VR012	Dhangad - Sunkot - Koteli	1.5	3.5	5.0	-	-	1.5	-	1.5
73VR013	Finedeu - Raduwa - Manilekh	1.0	4.0	5.0	-	-	1.0	-	1.0
73VR014	Gaibadhe-Jamrani Bramdev Rural Road	5.0	25.0	30.0	-	-	5.0	-	5.0
73VR015	Gharelu - Khilnebhadi - Saleta - Gaibade	15.0	11.0	26.0	-	-	15.0	-	15.0
73VR016	Jogbuda - Shirsh-Parigaun Rural Road	18.0	-	18.0	-	-	18.0	-	18.0
73VR017	Kritipur -Bhaliya-Ajaymarukot-Jagannath Rural Road	6.0	9.0	15.0	-	-	6.0	-	6.0
73VR018	Maljhula - Dewal	1.0	11.5	12.5	-	-	1.0	-	1.0
73VR019	Puntura-Simkhet-Tatapani -Sadani Rural Road	13.0	3.0	16.0	-	-	13.0	-	13.0
73VR020	Raduwa - Badum - Dadaban - Manilekh	0.5	6.5	7.0	-	-	0.5	-	0.5
73VR021	Raduwa - Kalari - Badal	0.5	5.5	6.0	-	-	0.5	-	0.5
73VR022	Sadani - Gairikhan - Chunepani	1.5	10.5	12.0	-	-	1.5	-	1.5
73VR023	Unikot Niglad	-	12.0	12.0	-	-	-	-	-
	Total VRCN	135.0	327.5	462.5	-	-	135.0	-	135.0
	Total DRCN and VRCN	355.0	415.5	770.5	-	-	355.0	-	355.0

ANNEX 5 PROPOSED WATER CROSSING

Code	Name of the road	Bridge proposed rivers	proposed Slab culvert in Khola/Kholsi (m)	proposed CC Causeway in kholsi (m)
73DR001	Bagbajar-Bagarkot-Bhageswor	Parchheta-45m	-	35
73DR002	Pokhara -Belapur	Asurpa -30m	40	20
73DR003	Bhatkanda- Ashaigram	-	-	30
73DR004	Buder-Jogbuda - Gaibandhe - Lipna	Sunkhola -40m, Bagakhola -100m, Puntura-180	43	60
73DR005	Sakyal - Kailpalmandu	Kuleni -25m, Jaisera-40m	15	18
73DR006	Ugaratara- Ajayemeru	Basanagad -120m	20	24
73DR007	Sadhani - Gaibandhe - shaleta	Dewari-120m, Sadhani -150m, jamrani -100m, Lamigada -100m, Gaibandha-50m, Dhakani-25m, Salghadi -70m	50	54
73DR008	Jogbuda-Shirsh - Rupal	Shirsha -110m, Rudrawati-80m	-	18
73DR009	Raduwa-Parikhet - Ganespur-Badal	Ruwakhola-60m	-	50
73DR0010	Dungari - Sheragad - Dewal	Seragad -130m	-	10
73DR0011	Gaira - Gangkhet - Unikot	Bantal-80m	10	18
73DR0012	Bagarkot - Shirad - Rupaligad - Rupal	Doteligad-120	15	36
73DR0013	Raduwa - Badum - Manilekh	Ruwakhola-65m	-	-
73DR0014	Dhimaula - Bhadrapur - chipur	Bhamdewoli-70m, Nanigad-45m	10	27
Total		24 Nos with total length of 1,955m	203m	400m

