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, **Achham**

Volume I: Main Report

April, 2013

Prepared by the North Star Engineering Consultant (P) Ltd for the District Development Committee (DDC) and District Technical Office (DTO), Achham with Technical Assistance from the Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), Ministry of Federal Affairs and Local Development and grant supported by DFID

FOREWORD

Government of Nepal
Ministry of Federal Affairs and Local Development
Office of District Development Committee
Mangalsain, Achham

Ref.No

Date: 13 March, 2013

FOREWORD

It is my great pleasure to introduce this revised District Transport Master Plan (DTMP) of Achham, district which was concurred and approved by the joint meeting of district stakeholder's and DDC board held on 12 March 2013. Prior to this, DRCN was passed by the joint meeting of district stakeholder's and DDC board held on 4 March 2013. Based on the DTMP Guideline 2012, all together 44 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 (RTISWAp) 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, Acting District Engineer (DTO), Mr. Om Prakash Joshi, and other DDC/ DTO staff for their valuable efforts in the process of producing this document. Equally, I would like to thank Mr. Shrawan Thapa., Team Leader and Mr. Dhanendra Angdembe Sub-Engineer from North Star Engineering Consultancy 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.

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Padam Bahadur Majhi
Acting Local Development Officer

नि.स्थानिय विकास अधिकारी

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The District Transport Master Plan of Achham District has been prepared for RTI Sector Maintenance Pilot, DoLIDAR under the Contract Agreement between RTI Sector Maintenance Pilot and North Star Engineering Consultant (P) Ltd. (Contract No: RTI Sector_DTMP/001/2012) to carry out the task of preparing of DTMP of Achham District of Nepal. We would like to convey our indebtedness to RTI Sector Maintenance Pilot for entrusting us the responsibility to carry out the task of preparing of DTMP of Achham Districts.

We would like to express our sincere gratitude to the Project Coordinator Mr. Ganga Bahadur Basnet (SDE), and Team leader Mr. Michael Green, DTL Mr. Dilli Prakash Sitaula and Er. Manoj Krishna Shrestha of RTI Sector Maintenance Pilot whose valuable co-operation and suggestions guided us to accomplish the agreed task to this level. We would also like to express our sincere thanks to LDO of Achham DDC, Mr. Bishnu Prasad Koirala, Planning officer, Social Development Officer, Information officer, DTO Chief, Engineers, Sub-engineers and other staffs of DDC and DTO offices, Achham for their extended help and regular support; and coordination at different levels while working at the field level.

The local leaders and local people from Achham district are also thankful for their help and suggestion for the selection and identification of the DRCN. We hope, this prepared DTMP of Achham District will be very helpful and a valuable guideline for the planning and development of effective and systematic transport network in Achham District.

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Dhruba Raj Tripathi
Managing Director
North Star Engineering Consultant

EXECUTIVE SUMMARY

Achham District is located in Seti Zone of the Far-Western Development Region of Nepal. It borders with Kalikot and Dailekh districts to the East, Doti district to the West, Bajura and Bajhang districts to the North and Surkhet of Bheri Zone to the South. Topographically, Achham district entails 28°46' - 29°23' latitude and 81° 32' - 81°35' longitudes. Geopolitically, the district is administratively divided into 2 Electoral constituencies 13 Illakas which consist of 75 VDCs. Each VDC is divided into 9 Wards.

The total area of the district is 1,692 sq km. Almost area of the district is lies on Mid-hill area and few area lies on high hill. The lowest elevation point is 540 meter and the highest elevation point is 3,820 meter from mean sea level. Elevation of District Headquarters Mangalsen is 1362 m.

Subsistence agriculture farming, mainly small scale livestock is the main source of occupation and livelihood of the majority of the population, with 61% of the population active in this sector. Due to low level of agricultural production, the majority of the households face acute food shortages for a large part of the year.

The district inventory identified just over 630 km of roads, including 154 km of strategic roads and 476 km of rural roads. In coordination with the DTICC and DDC, 39 rural roads with a length of 342 km were identified as making up the district road core network (DRCN), and the remaining 134 km were classified as village roads. The existing DRCN roads link up 35 of the 75 VDC headquarters. All of the DRCN roads are earthen fair-weather roads.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	154.00	79.00	-	75.00
District road core network	342.24			342.24
Village roads	133.98			133.98
Total	**630.22**	**79.00**	**-**	**551.22**

Annual conservation costs are estimated at NPR 92.4 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 462 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 for existing traffic volumes. The required improvements and their estimated costs are listed below.

Improvement type	Requirement		Cost (NPR)
Bridges	718	m	49,800,000
Slab culverts	66	m	9,900,000
Causeways	2725	m	51,910,000
Hume pipes	237	units	2,370,000
Masonry retaining walls	267	m^3	2,670,000
Gabion retaining walls	16626	m^3	41,565,000
Lined drains	10885	m	10,885,000
Widening	3316	m	82,900,000
Rehabilitation	0.92	km	736,000
Gravelling	342.24	km	684,480,000
Blacktopping	0	km	-
New construction	161.67	km	1,351,020,000
Total			**2,288,236,000**

The available budget for the road sector for the coming five years (fiscal year 2070/71 to 2074/75) is estimated to be NPR 891 million. Allocation to the district road core network was set at 90% of the total road sector budget, which was subsequently allocated firstly to the annual maintenance needs, secondly to the improvement needs and lastly to new construction. This budget is insufficient to cover all the estimated costs of conservation, improvement and new construction. However, it allows all conservation requirements to be covered throughout the DTMP period and one third improvement works to be completed before the end of the DTMP period. The remaining improvement 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.

Within the DTMP period 106 km of roads will be gravelled (31%) resulting that length being brought to a maintainable all-weather standard. VDC headquarters with access to all-weather DRCN roads or the SRN will increase from 12 to 24, while the percentage of the district population with such access will increase from 17% to 33%.

ABBREVIATIONS

BT	Black Top
DDC	District Development Committee
DOLIDAR	Department of Local Infrastructure Development and Agriculture Road
DOR	Department of Road
DTICC	District Transport Infrastructure Coordination Committee
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GPS	Global Positioning System
GON	Government of Nepal
GR	Gravel
Km	Kilometer
LGCDP	Local Governance and Community Development Programme
LRBP	Local Road Bridge Project
MLD	Ministry of Local Development
NPR	Nepali Rupees
PCU	Passenger Car Unit
RAP	Rural Access Programme
RCIW	Rural Community Infrastructure Works
SWAp	Sector Wide Approach
VDC	Village Development Committee
VPD	Vehicle Per Day

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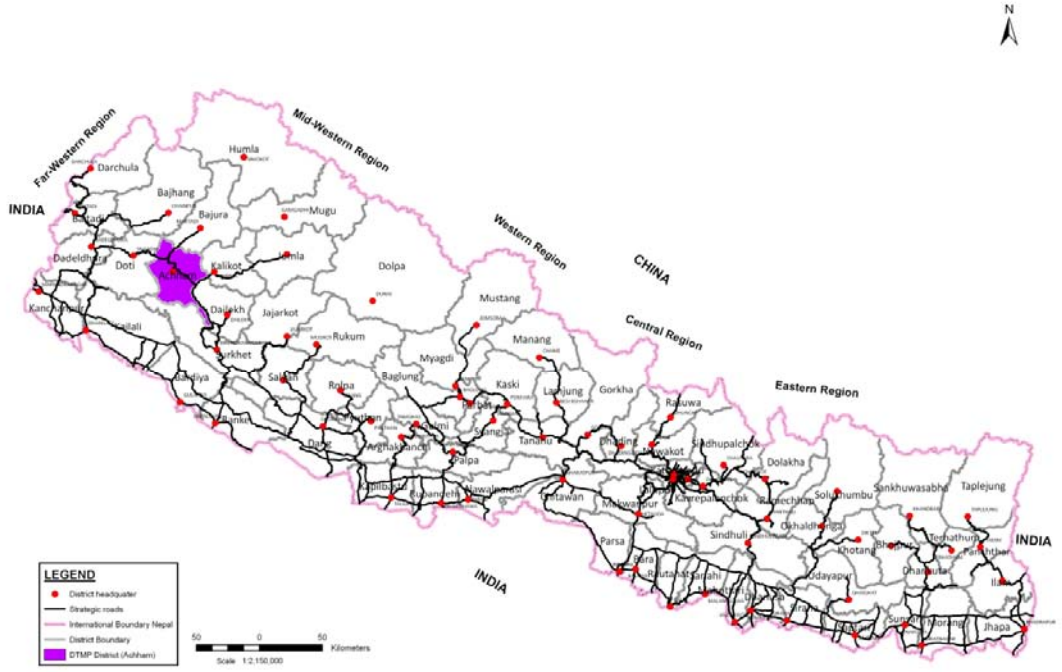
1. INTRODUCTION

Achham District is located in Seti Zone of the Far-Western Development Region of Nepal. It borders with Kalikot and Dailekh districts to the East, Doti district to the West, Bajura and Bajhang districts to the North and Surkhet of Bheri Zone to the South. Topographically, Achham district entails 28°46' - 29°23' latitude and 81° 32' - 81°35' longitudes. Geopolitically, the district is administratively divided into 2 Electoral constituencies 13 Illakas which consist of 75 VDCs. Each VDC is divided into 9 Wards.

The total area of the district is 1,692 sq km. Almost area of the district is lies on Mid-hill area and few area lies on high hill. The lowest elevation point is 540 meter and the highest elevation point is 3,820 meter from mean sea level. Elevation of District Headquarters Mangalsen is 1362 m. Karnali, Budhiganga and Kailash are main rivers flowing in district.

As a result of the elevation differences, the district has four different types of climate: tropical up to 1,200 m where temperature increase more than 30^0 Celsius, subtropical from 1,200-2,100 m, Temperate above 2,100-3300m and Alpine above 3300m . The annual rainfall is about 1,891 mm and temperatures vary from 5 ºC to 30 ºC. Subsistence agriculture farming, mainly small scale livestock is the main source of occupation and livelihood of the majority of the population, with 61% of the population active in this sector. Due to low level of agricultural production, the majority of the households face acute food shortages for a large part of the year.

Figure 1 : Map of Nepal indicating Achham district



According to the National Census 2011, the total population of the district is 257,477 comprising 137,469 female (53%) and 120,008 male (47%) residing in 48,351 households. Achham district has an average population density of around 152 people per square km. The average family size is 5.3. Life expectancy of the people is 58 years. The average literacy rate is about 53.18% (37.18% female and 71.54% male are literate). Achham district has a multi ethnic composition with Chhetri, Kami, Brahman, Sarki, Damai, Thakuri, Magar, Sanyashi, Muslim and others. The common language is Nepali (97.4%).

There are numerous district and village roads. From the field study, it has been observed that most of them are in fair weather condition. Most of these roads have been constructed using excavator without proper planning and engineering design.

The study team has found Achham district in a relatively better transport situation. This district has an easy surface transport connection with major market and commercial cities namely Dipayal and Dhangadhi. However, most of the rural roads are in poor condition and need to be improved /upgraded for safe and reliable journey.

The district has access to the Mahakali Highway (Attariya-Dadeldhura-Darchula). A feeder road, 105 km in length between the district headquarters Mangalsen and Doti, Silgadhi is recently upgraded to bituminous standard by DOR. The Mid-Hill highway is under construction and will cross the Achham district east to west and links with the Karnali Highway which shorten 165 Km travel distance for commuter who wish to travel Kohalpur and east.

2. DISTRICT ROAD CORE NETWORK (DRCN)

This chapter gives an overview of the existing roads in Achham 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

Achham district has an estimated road network of 630 kilometres, including 154 km of strategic roads managed by DOR and 476 km of rural roads managed by Achham DDC and the VDCs. Some of the strategic roads and all of the rural roads have an earthen surface. A map of the total road network in Achham district is shown in figure 2 at the end of this chapter.

Table 2.1.1 Road length in Achham district (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	154.00	79.00		75.00
Rural roads	476.22			476.22
Total	**630.22**	**79.00**		**551.22**

2.2 NATIONAL HIGHWAYS AND FEEDER ROADS

Achham district has a highway (Midhill Highway) and three feeder roads of total 154 km. A part of Mid-Hill Highway (Safebagar to Mangalsen) is recently blacktopped and Mangalsen to Belkhet is still under construction by DOR. The Mid-Hill Highway is foreseen to incorporate one district road (Kailashkhola to Bayalpata) that will be upgraded to national highway and is therefore treated as strategic roads in this DTMP.

Table 2.2.1 National Highways and Feeder Roads in Achham district (km)

Code	Description	Total length	Black Top	Gravel	Earthen
F051	Chaukhutte Bazar-Safebagar	**26.00**	26.00		
H18	Mangalsen-Safebagar	**39.00**	39.00		
F146	Safebagar-Rakse	**14.00**	14.00		
H18	Rakam (Belkhet)-Mangalsen	**48.00**			48.00
F195	Seti Lok Marga	**15.00**			15.00
	Bayalpata-Kailashkhola	**12.00**			12.00
	Total	**154.00**	**79.00**	**0.00**	**75.00**

2.3 DISTRICT ROAD CORE NETWORK

As part of the preparation of this DTMP, the District Road Core Network (DRCN) was identified together 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. In the selection of the DRCN roads, account was taken of the road conditions and the existing traffic levels. The identified DRCN roads were subsequently provided with road codes according to national standards.

The resulting District Road Core Network in Achham district is shown in Figure 3 at the end of this chapter. The DRCN consists of 39 district roads with a total length of 342 km. The remaining 134 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 2.3.1.

Table 2.3.1 Road length in Achham District (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road Network	**154.00**	**79.00**	**-**	**75.00**
Highways	99.00	39.00	-	60.00
Feeder roads	55.00	40.00	-	15.00
District road core Network	**342.24**	-	-	342.24
Village roads	**133.90**	-	-	133.98
Total	**630.22**	**79.00**	**-**	**551.22**

Table 2.3.2 District Road Core Network in Achham District (km)

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
69DR001	Chaukhutte-Duni VDC	**1.80**			1.80	-	1.80
69DR002	Gairilek -Sokat	**9.99**			9.99	-	9.99
69DR003	Kirtikham-Lungra VDC	**5.80**			5.80	-	5.80
69DR004	Budhabagar-Babala-Khaptad	**0.50**			0.50	-	0.50
69DR005	Ghughurkot (Thantibazar)-Devisthan	**9.00**			9.00	-	9.00
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	**10.20**			10.20	-	10.20
69DR007	Mastamadu-Hattikot	**11.63**			11.63	-	11.63
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha	**27.70**			27.70	-	27.70
69DR009	Chillepipal-Bhageshwor VDC	**1.90**			1.90	-	1.90

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
69DR010	Kotgar-Gajra VDC	**2.30**			2.30	-	2.30
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	**30.27**			30.27	-	30.27
69DR012	Mangalsen-Kunti-Basti-Lodeghat	**19.75**			19.75	-	19.75
69DR013	Nandegada-Mellekh-Kuskot	**4.40**			4.40	-	4.40
69DR014	Jayagadh-Nandegadh-Mellekh	**4.46**			4.46	-	4.46
69DR015	Jayagadh-Kalika-Majhthana-Darna	**3.30**			3.30	-	3.30
69DR016	Timalsen-Sallisain-Ramaroshan	**36.75**			36.75	-	36.75
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	**12.34**			12.34	-	12.34
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan	**11.87**			11.87	-	11.87
69DR019	Thulasain-Janalibandali-Syaule	**3.21**			3.21	-	3.21
69DR020	Shodashadevi VDC Link road	**1.10**			1.10	-	1.10
69DR021	Nagarikban-Birkham (Kalika)	**1.90**			1.90	-	1.90
69DR022	Dhongneta-Hichma VDC	**2.80**			2.80	-	2.80
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	**8.28**			8.28	-	8.28
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat	**11.96**			11.96	-	11.96
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	**32.45**			32.45	-	32.45
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	**5.70**			5.70	-	5.70
69DR027	Kamalbazar-Muli-Bayala	**3.50**			3.50	-	3.50
69DR028	Kamalbazar-Dugala-Syaule	**3.22**			3.22	-	3.22
69DR029	Timalgaira-Mastabandali VDC	**4.16**			4.16	-	4.16
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	**26.17**			26.17	-	26.17
69DR031	Punyapata-Dhamali	**8.80**			8.80	-	8.80
69DR032	Punyapata-Dhungachalna	**12.02**			12.02	-	12.02
69DR033	Baskada-Raniban	**2.33**			2.33	-	2.33
69DR034	Turmakhand-Nada VDC	**1.04**			1.04	-	1.04
69DR035	Turmakhand-Bahairabsthan-Rahaph	**4.30**			4.30	-	4.30
69DR036	Binayak-Toli-Pulletola-Barala	**2.10**			2.10	-	2.10
69DR037	Binayak-Kuika	**0.50**			0.50	-	0.50
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	**1.70**			1.70	-	1.70
69DR039	Kuchi-Todkesal-Bayala	**1.04**			1.04	-	1.04
Total		**342.24**	**-**	**-**	**342.24**	**-**	**342.24**

2.4 VILLAGE ROADS

The 134 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 75 VDCs in Achham 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.

In addition to village road some additional roads that would be developed as tourism roads or inter-district roads or link roads have been recommended from DTICC/DDC meeting and listed below.

i) Rakam-Kalekanda-Khulalu
ii) Kamalbazar-Muli-Bayala-Belkhet
iii) Gadesimal-Khimadanda-Khalsain-Thantikhan
iv) Rakam-Layati-Pulletola-Ramaroshan
v) Thandikhand-Odarkhet-Seta
vi) Thanti-Rishidaha-Malika-Ramaroshan
vii) Jayagadh-Chhatasain-Sodasha-Rishidaha
viii) Mujabagar-Sutar-Rishidaha
ix) Dhakari-Dhogneta-Hichma
x) Janalibandali-Pipalgaun-Sainkhet
xi) Binayak-Kalapani-Ramaroshan
xii) Punnepata-Dhamali-Belkhet
xiii) Gairitad-Surakhod-Malatikot
xiv) Mangalsen (Zero point)-Red cross
xv) Kolgada-Kalikasthan-Rakam

On average each VDC will thus be responsible for 1.78 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.

Funding for these roads will mainly come from the VDC grants. Some district funding will also be allocated to the village roads. 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 Map for Achham District

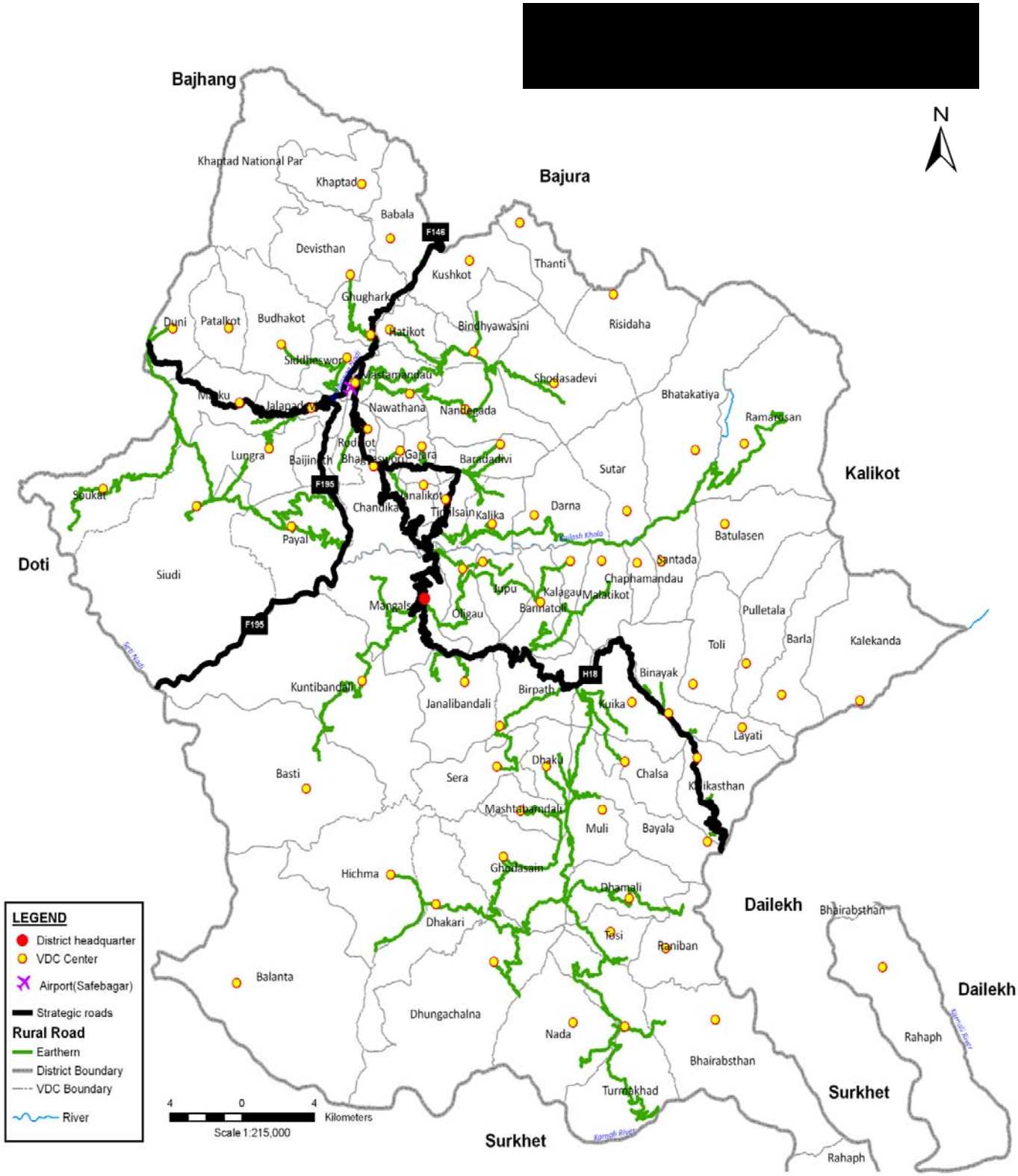
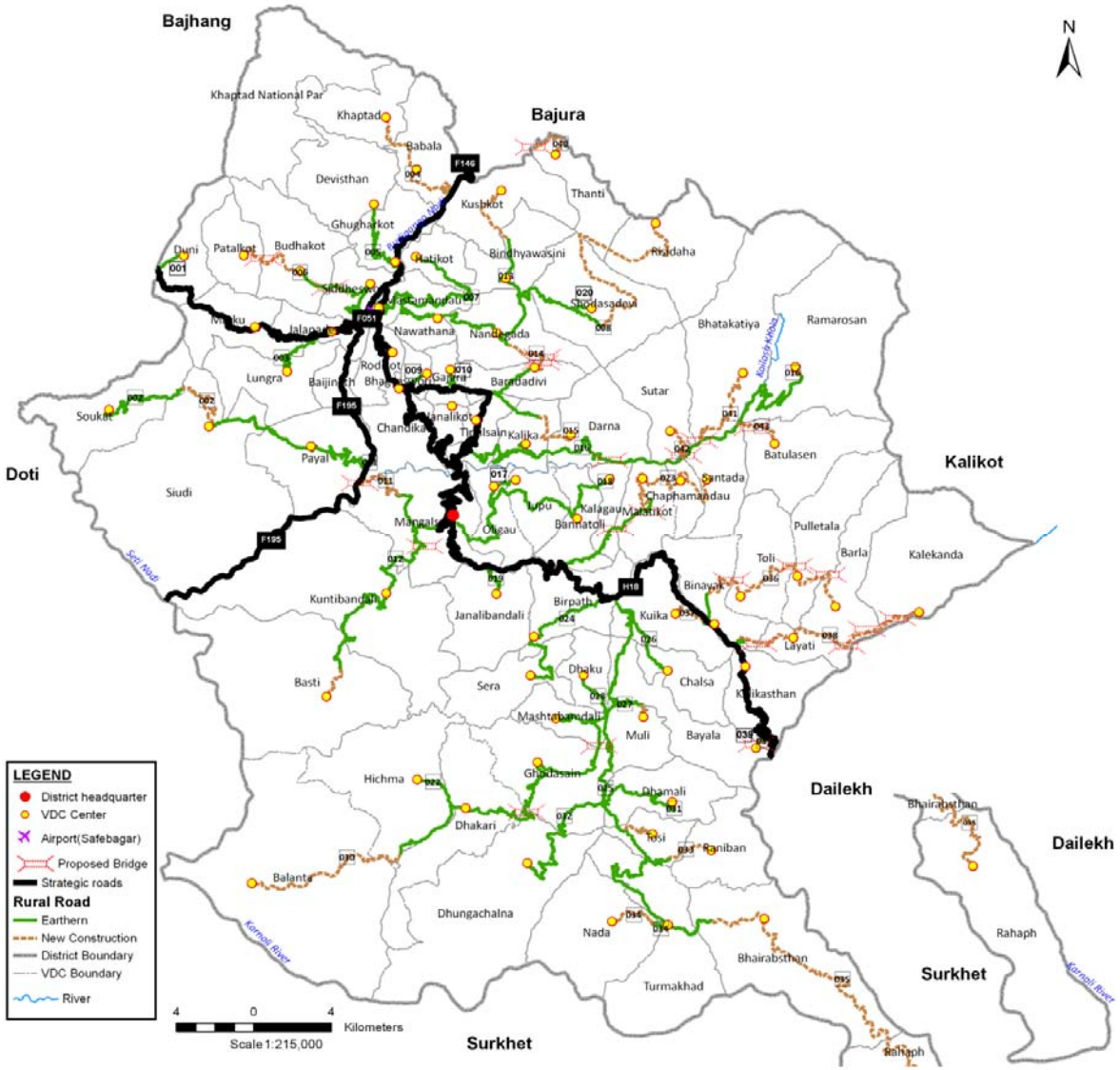


Figure 3 : District Road Core Network (DRCN) Map



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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 types distinction is made according to the surface type of the road. Identification of the actual maintenance requirements of each road is made annually in the ARMP. Conservation activities include:

1. **Emergency maintenance** - 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 lumpsum 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.
2. **Routine maintenance** - 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. **Recurrent maintenance** - 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. **Periodic maintenance** - Larger repairs to the road largely aimed at renewing the road surface through regravelling, 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 network as far as it does not require rehabilitation.

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
69DR001	1.80	1.80	1.80	1.80
69DR002	9.99	9.99	9.99	9.99
69DR003	5.80	5.80	5.80	5.80
69DR004	0.50	0.50	0.50	0.50
69DR005	9.00	9.00	9.00	9.00
69DR006	10.20	10.20	10.20	10.20
69DR007	11.63	11.63	11.63	11.63
69DR008	27.70	27.70	27.70	27.70
69DR009	1.90	1.90	1.90	1.90
69DR010	2.30	2.30	2.30	2.30
69DR011	30.27	30.27	30.27	30.27
69DR012	19.75	19.75	19.75	19.75
69DR013	4.40	4.40	4.40	4.40
69DR014	4.46	4.46	4.46	4.46
69DR015	3.30	3.30	3.30	3.30
69DR016	36.75	36.75	36.75	36.75
69DR017	12.34	12.34	12.34	12.34
69DR018	11.87	11.87	11.87	11.87
69DR019	3.21	3.21	3.21	3.21
69DR020	1.10	1.10	1.10	1.10
69DR021	1.90	1.90	1.90	1.90
69DR022	2.80	2.80	2.80	2.80
69DR023	8.28	8.28	8.28	8.28
69DR024	11.96	11.96	11.96	11.96
69DR025	32.45	32.45	32.45	32.45
69DR026	5.70	5.70	5.70	5.70
69DR027	3.50	3.50	3.50	3.50
69DR028	3.22	3.22	3.22	3.22
69DR029	4.16	4.16	4.16	4.16
69DR030	26.17	26.17	26.17	26.17
69DR031	8.80	8.80	8.80	8.80
69DR032	12.02	12.02	12.02	12.02
69DR033	2.33	2.33	2.33	2.33
69DR034	1.04	1.04	1.04	1.04
69DR035	4.30	4.30	4.30	4.30
69DR036	2.10	2.10	2.10	2.10
69DR037	0.50	0.50	0.50	0.50
69DR038	1.70	1.70	1.70	1.70
69DR039	1.04	1.04	1.04	1.04
Total	**342.24**	**342.24**	**342.24**	**342.24**

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 Achham are described in more detail in the subsequent sections.

1 . **Rehabilitation** - 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 . **Gravelling** - Placement of a gravel layer to make it all-weather and ensure that the road remains passable during the rainy season.

3 . **Cross drainage** - 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 . **Protective structures** - 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 . **Blacktopping** - Placement of a blacktop layer in roads with traffic volumes exceeding 50 passenger car units (PCU) to reduce damage to the road surface.

6 . **Widening** - 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

Four roads are identified for rehabilitation in the district road core network.

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Description	Total length (km)	Rehabilitation (km)
69DR004	Budhabagar-Babala-Khaptad	0.50	0.12
69DR010	Kotgar-Gajra VDC	2.30	0.20
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.30	0.30
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.70	0.30
	Total	**8.80**	**0. 92**

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. Total 342 km DRCN need to be gravelled in Achham district which is given in table 3.2.2 below.

Table 3.2.2 Sections of the district road core network requiring gravelling

Code	Description	Total length (km)	Gravelling (km)
69DR001	Chaukhutte-Duni VDC	1.80	1.80
69DR002	Gairilek -Sokat	9.99	9.99
69DR003	Kirtikham-Lungra VDC	5.80	5.80
69DR004	Budhabagar-Babala-Khaptad	0.50	0.50
69DR005	Ghughurkot (Thantibazar)-Devisthan	9.00	9.00
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	10.20	10.20
69DR007	Mastamadu-Hattikot	11.63	11.63
69DR008	Safe-Nawathana-Nandegadh-Shodasha- Rishidaha	27.70	27.70

Code	Description	Total length (km)	Gravelling (km)
69DR009	Chillepipal-Bhageshwor VDC	1.90	1.90
69DR010	Kotgar-Gajra VDC	2.30	2.30
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	30.27	30.27
69DR012	Mangalsen-Kunti-Basti-Lodeghat	19.75	19.75
69DR013	Nandegada-Mellekh-Kuskot	4.40	4.40
69DR014	Jayagadh-Nandegadh-Mellekh	4.46	4.46
69DR015	Jayagadh-Kalika-Majhthana-Darna	3.30	3.30
69DR016	Timalsen-Sallisain-Ramaroshan	36.75	36.75
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	12.34	12.34
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan	11.87	11.87
69DR019	Thulasain-Janalibandali-Syaule	3.21	3.21
69DR020	Shodashadevi VDC Link road	1.10	1.10
69DR021	Nagarikban-Birkham (Kalika)	1.90	1.90
69DR022	Dhongneta-Hichma VDC	2.80	2.80
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	8.28	8.28
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat	11.96	11.96
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	32.45	32.45
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	5.70	5.70
69DR027	Kamalbazar-Muli-Bayala	3.50	3.50
69DR028	Kamalbazar-Dugala-Syaule	3.22	3.22
69DR029	Timalgaira-Mastabandali VDC	4.16	4.16
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	26.17	26.17
69DR031	Punyapata-Dhamali	8.80	8.80
69DR032	Punyapata-Dhungachalna	12.02	12.02
69DR033	Baskada-Raniban	2.33	2.33
69DR034	Turmakhand-Nada VDC	1.04	1.04
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.30	4.30
69DR036	Binayak-Toli-Pulletola-Barala	2.10	2.10
69DR037	Binayak-Kuika	0.50	0.50
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.70	1.70
69DR039	Kuchi-Todkesal-Bayala	1.04	1.04
	Total		**342.24**

3.2.3 CROSS DRAINAGE

The need for cross drainage was identified for the different DRCN roads. A total of 3 bridges with a total length of 83 m, 9 slab culverts with a total length of 66 m, 379 causeways (concrete and stone) with a total length of 2,725m, and 83 pipe culverts were identified as required.

Table 3.2.3 Required cross drainage structures

Code	Description	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
69DR001	Chaukhutte-Duni VDC				41	6
69DR002	Gairilek -Sokat				65	3
69DR003	Kirtikham-Lungra VDC		8		107	8
69DR004	Budhabagar-Babala-Khaptad					
69DR005	Ghughurkot (Thantibazar)-Devisthan				50	
69DR006	Safe-Siddheshwor-Budhakot-Patalkot				151	
69DR007	Mastamadu-Hattikot			50	166	6
69DR008	Safe-Nawathana-Nandegadh-Shodasha- Rishidaha			56	250	45
69DR009	Chillepipal-Bhageshwor VDC				24	6
69DR010	Kotgar-Gajra VDC				17	
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi				213	3
69DR012	Mangalsen-Kunti-Basti-Lodeghat	11		14	86	16
69DR013	Nandegada-Mellekh-Kuskot				80	
69DR014	Jayagadh-Nandegadh-Mellekh				59	6
69DR015	Jayagadh-Kalika-Majhthana-Darna				74	
69DR016	Timalsen-Sallisain-Ramaroshan	60		42	38	10
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan		8	27	145	16
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan		8	18	103	14
69DR019	Thulasain-Janalibandali-Syaule			15	12	6
69DR020	Shodashadevi VDC Link road				5	
69DR021	Nagarikban-Birkham (Kalika)				18	
69DR022	Dhongneta-Hichma VDC					
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada				140	16
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat		15		93	8
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat			19	53	31
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa		6		45	3
69DR027	Kamalbazar-Muli-Bayala				29	
69DR028	Kamalbazar-Dugala-Syaule		6		32	3
69DR029	Timalgaira-Mastabandali VDC				5	
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	12			65	16
69DR031	Punyapata-Dhamali			27	23	6
69DR032	Punyapata-Dhungachalna		7	6	160	6
69DR033	Baskada-Raniban				18	
69DR034	Turmakhand-Nada VDC				6	
69DR035	Turmakhand-Bahairabsthan-Rahaph				36	
69DR036	Binayak-Toli-Pulletola-Barala		8		24	3

Code	Description	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
69DR037	Binayak-Kuika				12	
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada				-	
69DR039	Kuchi-Todkesal-Bayala				6	
	Total	**83**	**66**	**274**	**2,451**	**237**

3.2.4 PROTECTIVE STRUCTURES

Based on the road survey carried out in Achham, following retaining/breast walls and lined drain were identified as required to ensure the protection of the district road core network.

Table 3.2.4 Required protective structures

Code	Description	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
69DR001	Chaukhutte-Duni VDC		515	60
69DR002	Gairilek -Sokat		2,280	
69DR003	Kirtikham-Lungra VDC		1,495	400
69DR004	Budhabagar-Babala-Khaptad			
69DR005	Ghughurkot (Thantibazar)-Devisthan		622	400
69DR006	Safe-Siddheshwor-Budhakot-Patalkot		650	1,420
69DR007	Mastamadu-Hattikot		553	340
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha		679	2,350
69DR009	Chillepipal-Bhageshwor VDC		190	50
69DR010	Kotgar-Gajra VDC		185	
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi		1,245	1,970
69DR012	Mangalsen-Kunti-Basti-Lodeghat		983	300
69DR013	Nandegada-Mellekh-Kuskot		276	100
69DR014	Jayagadh-Nandegadh-Mellekh		383	130
69DR015	Jayagadh-Kalika-Majhthana-Darna		205	120
69DR016	Timalsen-Sallisain-Ramaroshan		365	300
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	20	1,292	320
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan		285	690
69DR019	Thulasain-Janalibandali-Syaule		112	250
69DR020	Shodashadevi VDC Link road			
69DR021	Nagarikban-Birkham (Kalika)		10	
69DR022	Dhongneta-Hichma VDC		154	
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada		818	60
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat		328	
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat		140	685
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	25	135	
69DR027	Kamalbazar-Muli-Bayala		160	170
69DR028	Kamalbazar-Dugala-Syaule	40	124	

Code	Description	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
69DR029	Timalgaira-Mastabandali VDC			
69DR030	Motarkatte-Ghodasain-Galwal-Benighat		608	
69DR031	Punyapata-Dhamali	37	272	130
69DR032	Punyapata-Dhungachalna	108	378	130
69DR033	Baskada-Raniban		248	200
69DR034	Turmakhand-Nada VDC		122	
69DR035	Turmakhand-Bahairabsthan-Rahaph		671	210
69DR036	Binayak-Toli-Pulletola-Barala		57	100
69DR037	Binayak-Kuika	37	36	
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada		22	
69DR039	Kuchi-Todkesal-Bayala		28	
	Total	**267**	**16,626**	**10,885**

3.2.5 WIDENING

Widening of the district road core network in Achham is required only in specific locations (especially in loops) 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.

Table 3.2.5 Sections of the District Road Core Network requiring widening

Code	Description	Total length (km)	Widening (m)
69DR002	Gairilek -Sokat	9.99	315
69DR003	Kirtikham-Lungra VDC	5.80	150
69DR005	Ghughurkot (Thantibazar)-Devisthan	9.00	100
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	10.20	335
69DR007	Mastamadu-Hattikot	11.63	25
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha	27.70	45
69DR010	Kotgar-Gajra VDC	2.30	210
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	30.27	205
69DR012	Mangalsen-Kunti-Basti-Lodeghat	19.75	270
69DR013	Nandegada-Mellekh-Kuskot	4.40	140
69DR016	Timalsen-Sallisain-Ramaroshan	36.75	90
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	12.34	155
69DR019	Thulasain-Janalibandali-Syaule	3.21	50
69DR021	Nagarikban-Birkham (Kalika)	1.90	45
69DR022	Dhongneta-Hichma VDC	2.80	33
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	32.45	135
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	5.70	40
69DR027	Kamalbazar-Muli-Bayala	3.50	94
69DR028	Kamalbazar-Dugala-Syaule	3.22	55

Code	Description	Total length (km)	Widening (m)
69DR029	Timalgaira-Mastabandali VDC	4.16	25
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	26.17	277
69DR031	Punyapata-Dhamali	8.80	284
69DR032	Punyapata-Dhungachalna	12.02	58
69DR033	Baskada-Raniban	2.33	84
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.30	45
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.70	51
	Total		**3,316**

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 no roads that are eligible for blacktopping (traffic volume exceeds 50 PCU).

Table 3.2.6 Sections of the district road core network requiring blacktopping

Code	Description	Total length (km)	Traffic (VPD)	Blacktopping (km)
Total				

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 28 VDC HQs that do not currently have road access.

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

Code	Description	New VDCs	Existing length	New length	Bridge (m)
69DR002	Gairilek -Sokat	Sokat, Siudi	9.99	5.64	
69DR004	Budhabagar-Babala-Khaptad	Babla, Khaptad	0.50	9.34	
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	Patalkot	10.20	5.91	30
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha	Sodasha, Rishidaha	27.70	16.1	
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	Mangalsen	30.27	4.53	90
69DR012	Mangalsen-Kunti-Basti-Lodeghat	Basti	19.75	2.36	
69DR013	Nandegada-Mellekh-Kuskot	Kuskot	4.40	4.14	
69DR014	Jayagadh-Nandegadh-Mellekh	Nandegadh	4.46	3.5	40
69DR015	Jayagadh-Kalika-Majhthana-Darna	Kalika, Darna	3.30	3.81	
69DR016	Timalsen-Sallisain-Ramaroshan	Ramaroshan	36.75	1.65	
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	Malatikot, Chaphamandu, Santada	8.28	10.69	40
69DR027	Kamalbazar-Muli-Bayala	Muli	3.50	1.21	
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	Balata	26.17	11.23	20

Code	Description	New VDCs	Existing length	New length	Bridge (m)
69DR033	Baskada-Raniban	Raniban	2.33	3.15	
69DR034	Turmakhand-Nada VDC	Nada	1.04	3.09	
69DR035	Turmakhand-Bahairabsthan-Rahaph	Bhairabhsthan, Rahaph	4.30	25.77	
69DR036	Binayak-Toli-Pulletola-Barala	Toli. Pulletola, Barala	2.10	13.44	60
69DR037	Binayak-Kuika	Kuika	0.50	2.18	
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	Layati, Kalekada	1.70	13.02	90
69DR039	Kuchi-Todkesal-Bayala	Bayala	1.04	0.48	40
69DR040	Rithhabazar-Thanti	Thanti	-	5.16	75
69DR041	Baskhet-Bhatakatiya	Bhatakatiya	-	6.27	60
69DR042	Mujabagar-Sutar	Sutar	-	3.57	60
69DR043	Khal-Batulasain	Batulasain	-	3.02	30
69DR044	Gaire-Tosi	Tosi	-	2.41	
	Total		**342.24**	**161.67**	**635**

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 28 VDC headquarters. For this purpose, all 342 km will be gravelled and number of different cross drainage and protective structures will be constructed. A further 162 km of new road will be constructed to maintainable all-weather gravel standard providing access to 28 additional VDC HQs. The district road core network will subsequently consist of 504 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.

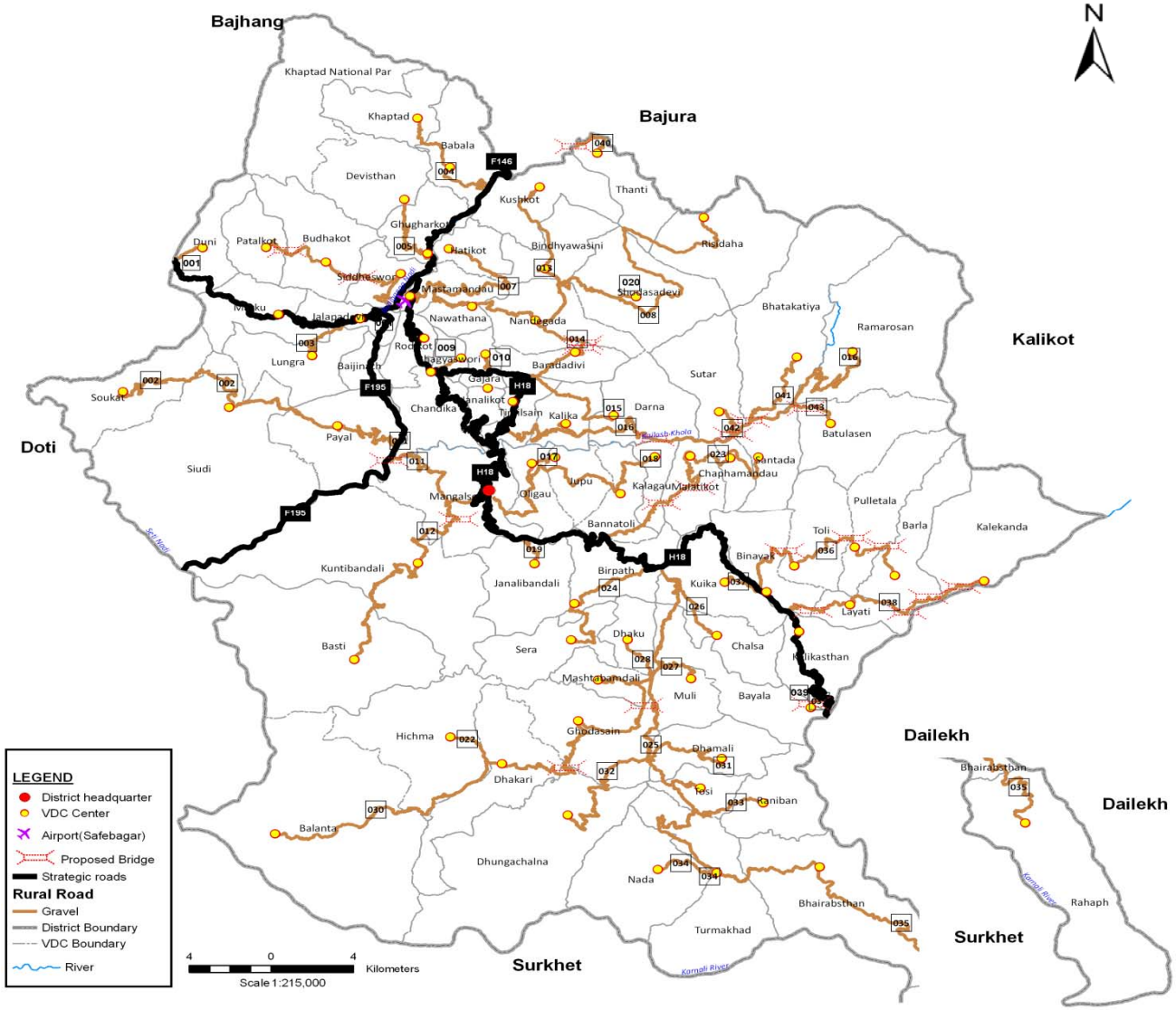
Table 3.4.1 District Transport Perspective Plan

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)
69DR001	1.80	1.80	1.80	1.80	-	1.80	-	-	-	-	-	41.00	6.00	-	515.00	60.00	-
69DR002	9.99	9.99	9.99	9.99	-	9.99	-	315.00	-	-	-	65.00	3.00	-	2,280.00	-	5.64
69DR003	5.80	5.80	5.80	5.80	-	5.80	-	150.00	-	8.00	-	107.00	8.00	-	1,495.00	400.00	-
69DR004	0.50	0.50	0.50	0.50	0.12	0.50	-	-	-	-	-	-	-	-	-	-	9.34
69DR005	9.00	9.00	9.00	9.00	-	9.00	-	100.00	-	-	-	50.00	-	-	622.00	400.00	-
69DR006	10.20	10.20	10.20	10.20	-	10.20	-	335.00	30.00	-	-	151.00	-	-	650.00	1,420.00	5.91
69DR007	11.63	11.63	11.63	11.63	-	11.63	-	25.00	-	-	50.00	166.00	6.00	-	553.00	340.00	-
69DR008	27.70	27.70	27.70	27.70	-	27.70	-	45.00	-	-	56.00	250.00	45.00	-	679.00	2,350.00	16.10
69DR009	1.90	1.90	1.90	1.90	-	1.90	-	-	-	-	-	24.00	6.00	-	190.00	50.00	-
69DR010	2.30	2.30	2.30	2.30	0.20	2.30	-	210.00	-	-	-	17.00	-	-	185.00	-	-
69DR011	30.27	30.27	30.27	30.27	-	30.27	-	205.00	90.00	-	-	213.00	3.00	-	1,245.00	1,970.00	4.53
69DR012	19.75	19.75	19.75	19.75	-	19.75	-	270.00	11.00	-	14.00	86.00	16.00	-	983.00	300.00	2.36
69DR013	4.40	4.40	4.40	4.40	-	4.40	-	140.00	-	-	-	80.00	-	-	276.00	100.00	4.14
69DR014	4.46	4.46	4.46	4.46	-	4.46	-	-	40.00	-	-	59.00	6.00	-	383.00	130.00	3.50
69DR015	3.30	3.30	3.30	3.30	-	3.30	-	-	-	-	-	74.00	-	-	205.00	120.00	3.81

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)
69DR016	36.75	36.75	36.75	36.75	-	36.75	-	90.00	60.00	-	42.00	38.00	10.00	-	365.00	300.00	1.65
69DR017	12.34	12.34	12.34	12.34	-	12.34	-	155.00	-	8.00	27.00	145.00	16.00	20.00	1,292.00	320.00	-
69DR018	11.87	11.87	11.87	11.87	-	11.87	-	-	-	8.00	18.00	103.00	14.00	-	285.00	690.00	-
69DR019	3.21	3.21	3.21	3.21	-	3.21	-	50.00	-	-	15.00	12.00	6.00	-	112.00	250.00	-
69DR020	1.10	1.10	1.10	1.10	-	1.10	-	-	-	-	-	5.00	-	-	-	-	-
69DR021	1.90	1.90	1.90	1.90	-	1.90	-	45.00	-	-	-	18.00	-	-	10.00	-	-
69DR022	2.80	2.80	2.80	2.80	-	2.80	-	33.00	-	-	-	-	-	-	154.00	-	-
69DR023	8.28	8.28	8.28	8.28	-	8.28	-	-	40.00	-	-	140.00	16.00	-	818.00	60.00	10.69
69DR024	11.96	11.96	11.96	11.96	-	11.96	-	-	-	15.00	-	93.00	8.00	-	328.00	-	-
69DR025	32.45	32.45	32.45	32.45	-	32.45	-	135.00	-	-	19.00	53.00	31.00	-	140.00	685.00	-
69DR026	5.70	5.70	5.70	5.70	-	5.70	-	40.00	-	6.00	-	45.00	3.00	25.00	135.00	-	-
69DR027	3.50	3.50	3.50	3.50	-	3.50	-	94.00	-	-	-	29.00	-	-	160.00	170.00	1.21
69DR028	3.22	3.22	3.22	3.22	-	3.22	-	55.00	-	6.00	-	32.00	3.00	40.00	124.00	-	-
69DR029	4.16	4.16	4.16	4.16	-	4.16	-	25.00	-	-	-	5.00	-	-	-	-	-
69DR030	26.17	26.17	26.17	26.17	-	26.17	-	277.00	32.00	-	-	65.00	16.00	-	608.00	-	11.23
69DR031	8.80	8.80	8.80	8.80	-	8.80	-	284.00	-	-	27.00	23.00	6.00	37.00	272.00	130.00	-

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)
69DR032	12.02	12.02	12.02	12.02	-	12.02	-	58.00	-	7.00	6.00	160.00	6.00	108.00	378.00	130.00	-
69DR033	2.33	2.33	2.33	2.33	-	2.33	-	84.00	-	-	-	18.00	-	-	248.00	200.00	3.15
69DR034	1.04	1.04	1.04	1.04	-	1.04	-	-	-	-	-	6.00	-	-	122.00	-	3.09
69DR035	4.30	4.30	4.30	4.30	0.30	4.30	-	45.00	-	-	-	36.00	-	-	671.00	210.00	25.77
69DR036	2.10	2.10	2.10	2.10	-	2.10	-	-	60.00	8.00	-	24.00	3.00	-	57.00	100.00	13.44
69DR037	0.50	0.50	0.50	0.50	-	0.50	-	-	-	-	-	12.00	-	37.00	36.00	-	2.18
69DR038	1.70	1.70	1.70	1.70	0.30	1.70	-	51.00	90.00	-	-	-	-	-	22.00	-	13.02
69DR039	1.04	1.04	1.04	1.04	-	1.04	-	-	40.00	-	-	6.00	-	-	28.00	-	0.48
69DR040	-	-	-	-	-	-	-	-	75.00	-	-	-	-	-	-	-	3.57
69DR041	-	-	-	-	-	-	-	-	60.00	-	-	-	-	-	-	-	6.27
69DR042	-	-	-	-	-	-	-	-	60.00	-	-	-	-	-	-	-	2.41
69DR043	-	-	-	-	-	-	-	-	30.00	-	-	-	-	-	-	-	3.02
69DR044	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.16
Total	**342.24**	**342.24**	**342.24**	**342.24**	**0.92**	**342.24**	**-**	**3,316**	**718**	**66**	**274**	**2,451**	**237**	**267**	**16,626**	**10,885**	**161.67**

Figure 4 : District Transport Perspective Plan (DTPP)



Code	Total length	Surface Type			
		Black Top	Gravel	Earthern	New Construction
69DR001	1.8	-	1.8	-	-
69DR002	15.63	-	15.63	-	-
69DR003	5.8	-	5.8	-	-
69DR004	9.84	-	9.84	-	-
69DR005	9	-	9	-	-
69DR006	16.11	-	16.11	-	-
69DR007	11.63	-	11.63	-	-
69DR008	43.8	-	43.8	-	-
69DR009	1.9	-	1.9	-	-
69DR010	2.3	-	2.3	-	-
69DR011	34.8	-	34.8	-	-
69DR012	22.11	-	22.11	-	-
69DR013	8.54	-	8.54	-	-
69DR014	7.96	-	7.96	-	-
69DR015	7.11	-	7.11	-	-
69DR016	38.4	-	38.4	-	-
69DR017	12.34	-	12.34	-	-
69DR018	11.87	-	11.87	-	-
69DR019	3.21	-	3.21	-	-
69DR020	1.1	-	1.1	-	-
69DR021	1.9	-	1.9	-	-
69DR022	2.8	-	2.8	-	-
69DR023	18.97	-	18.97	-	-
69DR024	11.96	-	11.96	-	-
69DR025	32.45	-	32.45	-	-
69DR026	5.7	-	5.7	-	-
69DR027	4.71	-	4.71	-	-
69DR028	3.22	-	3.22	-	-
69DR029	4.16	-	4.16	-	-
69DR030	37.4	-	37.4	-	-
69DR031	8.8	-	8.8	-	-
69DR032	12.02	-	12.02	-	-
69DR033	5.48	-	5.48	-	-
69DR034	4.13	-	4.13	-	-
69DR035	30.07	-	30.07	-	-
69DR036	15.54	-	15.54	-	-
69DR037	2.68	-	2.68	-	-
69DR038	14.72	-	14.72	-	-
69DR039	1.52	-	1.52	-	-
69DR040	5.16	-	5.16	-	-
69DR041	6.27	-	6.27	-	-
69DR042	3.57	-	3.57	-	-
69DR043	3.02	-	3.02	-	-
69DR044	2.41	-	2.41	-	-
Total	**503.91**	**-**	**503.91**	**-**	**-**

4. COST ESTIMATION

For the cost estimation, standard costs for the different activities required have been referred. For the conservation activities this results in an estimation of annual costs, while for improvement and new construction activities these results in 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. The standard costs for emergency, routine and recurrent maintenance is slightly decreased (10%) because of being better road surface and comparatively less district labour rate. 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.

Table 4.1.1 Standard unit costs for conservation

Activity	Unit	Unit cost (NPR/km)
Emergency maintenance	km	27,000
Routine maintenance	km	18,000
Recurrent maintenance (blacktop)	km	500,000
Recurrent maintenance (gravel)	km	400,000
Recurrent maintenance (earthen)	km	225,000
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 92.4 millions. Based on this cost for the first year, the costs for conservation of the DRCN for the next 5 years are estimated at NPR 462 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.

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

Code	Total length (km)	Blacktop (km)	Gravel (km)	Earthen (km)	Emergency maintenance	Routine maintenance	Recurrent maintenance (blacktop)	Recurrent maintenance (gravel)	Recurrent maintenance (earthen)	Periodic maintenance (blacktop)	Periodic maintenance (gravel)	Total first year cost	Total 5-year cost
69DR001	1.80	-	-	1.80	49	32	-	-	405	-	-	486	2,430
69DR002	9.99	-	-	9.99	270	180	-	-	2,248	-	-	2,697	13,487
69DR003	5.80	-	-	5.80	157	104	-	-	1,305	-	-	1,566	7,830
69DR004	0.50	-	-	0.50	14	9	-	-	113	-	-	135	675
69DR005	9.00	-	-	9.00	243	162	-	-	2,025	-	-	2,430	12,150
69DR006	10.20	-	-	10.20	275	184	-	-	2,295	-	-	2,754	13,770
69DR007	11.63	-	-	11.63	314	209	-	-	2,617	-	-	3,140	15,701
69DR008	27.70	-	-	27.70	748	499	-	-	6,233	-	-	7,479	37,395
69DR009	1.90	-	-	1.90	51	34	-	-	428	-	-	513	2,565
69DR010	2.30	-	-	2.30	62	41	-	-	518	-	-	621	3,105
69DR011	30.27	-	-	30.27	817	545	-	-	6,811	-	-	8,173	40,865
69DR012	19.75	-	-	19.75	533	356	-	-	4,444	-	-	5,333	26,663
69DR013	4.40	-	-	4.40	119	79	-	-	990	-	-	1,188	5,940
69DR014	4.46	-	-	4.46	120	80	-	-	1,004	-	-	1,204	6,021
69DR015	3.30	-	-	3.30	89	59	-	-	743	-	-	891	4,455
69DR016	36.75	-	-	36.75	992	662	-	-	8,269	-	-	9,923	49,613
69DR017	12.34	-	-	12.34	333	222	-	-	2,777	-	-	3,332	16,659
69DR018	11.87	-	-	11.87	320	214	-	-	2,671	-	-	3,205	16,025
69DR019	3.21	-	-	3.21	87	58	-	-	722	-	-	867	4,334
69DR020	1.10	-	-	1.10	30	20	-	-	248	-	-	297	1,485
69DR021	1.90	-	-	1.90	51	34	-	-	428	-	-	513	2,565
69DR022	2.80	-	-	2.80	76	50	-	-	630	-	-	756	3,780
69DR023	8.28	-	-	8.28	224	149	-	-	1,863	-	-	2,236	11,178
69DR024	11.96	-	-	11.96	323	215	-	-	2,691	-	-	3,229	16,146
69DR025	32.45	-	-	32.45	876	584	-	-	7,301	-	-	8,762	43,808
69DR026	5.70	-	-	5.70	154	103	-	-	1,283	-	-	1,539	7,695
69DR027	3.50	-	-	3.50	95	63	-	-	788	-	-	945	4,725
69DR028	3.22	-	-	3.22	87	58	-	-	725	-	-	869	4,347
69DR029	4.16	-	-	4.16	112	75	-	-	936	-	-	1,123	5,616
69DR030	26.17	-	-	26.17	707	471	-	-	5,888	-	-	7,066	35,330
69DR031	8.80	-	-	8.80	238	158	-	-	1,980	-	-	2,376	11,880
69DR032	12.02	-	-	12.02	325	216	-	-	2,705	-	-	3,245	16,227
69DR033	2.33	-	-	2.33	63	42	-	-	524	-	-	629	3,146
69DR034	1.04	-	-	1.04	28	19	-	-	234	-	-	281	1,404
69DR035	4.30	-	-	4.30	116	77	-	-	968	-	-	1,161	5,805
69DR036	2.10	-	-	2.10	57	38	-	-	473	-	-	567	2,835
69DR037	0.50	-	-	0.50	14	9	-	-	113	-	-	135	675
69DR038	1.70	-	-	1.70	46	31	-	-	383	-	-	459	2,295
69DR039	1.04	-	-	1.04	28	19	-	-	234	-	-	281	1,404
Total	**342.24**	**-**	**-**	**342.24**	**9,240**	**6,160**	**-**	**-**	**77,004**	**-**	**-**	**92,405**	**462,024**

4.2 IMPROVEMENT

The costs of the required improvement measures have been calculated using the following standard costs. The rate of gravelling has been reduced by 10% in standard cost mentioned in guideline because of availability of gravel in nearby rivers and lesser district labour rate. These standard costs have been applied to the identified improvement requirements presented in the previous chapter.

Table 4.2.1 Standard unit costs for improvement activities

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	800,000
Widening	m	25,000
Gravelling	km	2,000,000
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

The resulting estimated costs come to NPR 937.2 million as indicated in the table below.

Table 4.2.2 Cost estimate for improvement measures (NPR '000)

Code	Total length (km)	Rehabilitation	Widening	Gravelling	Blacktopping	Bridges	Slab culverts	CC causeways	Stone causeways	Pipe culvert	Masonry walls	Gabion walls	Lined drains	Total cost
69DR001	1.80	-	-	3,600	-	-	-	-	410	60	-	1,288	60	**5,418**
69DR002	9.99	-	7,875	19,980	-	-	-	-	650	30	-	5,700	-	**34,235**
69DR003	5.80	-	3,750	11,600	-	-	1,200	-	1,070	80	-	3,738	400	**21,838**
69DR004	0.50	96	-	1,000	-	-	-	-	-	-	-	-	-	**1,096**
69DR005	9.00	-	2,500	18,000	-	-	-	-	500	-	-	1,555	400	**22,955**
69DR006	10.20	-	8,375	20,400	-	-	-	-	1,510	-	-	1,625	1,420	**33,330**
69DR007	11.63	-	625	23,260	-	-	-	5,000	1,660	60	-	1,383	340	**32,328**
69DR008	27.70	-	1,125	55,400	-	-	-	5,600	2,500	450	-	1,698	2,350	**69,123**
69DR009	1.90	-	-	3,800	-	-	-	-	240	60	-	475	50	**4,625**
69DR010	2.30	160	5,250	4,600	-	-	-	-	170	-	-	463	-	**10,643**
69DR011	30.27	-	5,125	60,540	-	-	-	-	2,130	30	-	3,113	1,970	**72,908**
69DR012	19.75	-	6,750	39,500	-	6,600	-	1,400	860	160	-	2,458	300	**58,028**
69DR013	4.40	-	3,500	8,800	-	-	-	-	800	-	-	690	100	**13,890**
69DR014	4.46	-	-	8,920	-	-	-	-	590	60	-	958	130	**10,658**
69DR015	3.30	-	-	6,600	-	-	-	-	740	-	-	513	120	**7,973**
69DR016	36.75	-	2,250	73,500	-	36,000	-	4,200	380	100	-	913	300	**117,643**
69DR017	12.34	-	3,875	24,680	-	-	1,200	2,700	1,450	160	200	3,230	320	**37,815**
69DR018	11.87	-	-	23,740	-	-	1,200	1,800	1,030	140	-	713	690	**29,313**
69DR019	3.21	-	1,250	6,420	-	-	-	1,500	120	60	-	280	250	**9,880**
69DR020	1.10	-	-	2,200	-	-	-	-	50	-	-	-	-	**2,250**
69DR021	1.90	-	1,125	3,800	-	-	-	-	180	-	-	25	-	**5,130**
69DR022	2.80	-	825	5,600	-	-	-	-	-	-	-	385	-	**6,810**
69DR023	8.28	-	-	16,560	-	-	-	-	1,400	160	-	2,045	60	**20,225**
69DR024	11.96	-	-	23,920	-	-	2,250	-	930	80	-	820	-	**28,000**
69DR025	32.45	-	3,375	64,900	-	-	-	1,900	530	310	-	350	685	**72,050**

Code	Total length (km)	Rehabilitation	Widening	Gravelling	Blacktopping	Bridges	Slab culverts	CC causeways	Stone causeways	Pipe culvert	Masonry walls	Gabion walls	Lined drains	Total cost
69DR026	5.70	-	1,000	11,400	-	-	900	-	450	30	250	338	-	**14,368**
69DR027	3.50	-	2,350	7,000	-	-	-	-	290	-	-	400	170	**10,210**
69DR028	3.22	-	1,375	6,440	-	-	900	-	320	30	400	310	-	**9,775**
69DR029	4.16	-	625	8,320	-	-	-	-	50	-	-	-	-	**8,995**
69DR030	26.17	-	6,925	52,340	-	7,200	-	-	650	160	-	1,520	-	**68,795**
69DR031	8.80	-	7,100	17,600	-	-	-	2,700	230	60	370	680	130	**28,870**
69DR032	12.02	-	1,450	24,040	-	-	1,050	600	1,600	60	1,080	945	130	**30,955**
69DR033	2.33	-	2,100	4,660	-	-	-	-	180	-	-	620	200	**7,760**
69DR034	1.04	-	-	2,080	-	-	-	-	60	-	-	305	-	**2,445**
69DR035	4.30	240	1,125	8,600	-	-	-	-	360	-	-	1,678	210	**12,213**
69DR036	2.10	-	-	4,200	-	-	1,200	-	240	30	-	143	100	**5,913**
69DR037	0.50	-	-	1,000	-	-	-	-	120	-	370	90	-	**1,580**
69DR038	1.70	240	1,275	3,400	-	-	-	-	-	-	-	55	-	**4,970**
69DR039	1.04	-	-	2,080	-	-	-	-	60	-	-	70	-	**2,210**
Total	**342.24**	**736**	**82,900**	**684,480**	**-**	**49,800**	**9,900**	**27,400**	**24,510**	**2,370**	**2,670**	**41,565**	**10,885**	**937,216**

4.3 NEW CONSTRUCTION

For new construction, the following standard costs have been applied to estimate the costs involved.

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Opening up	km	4,000,000
Gravelling	km	2,000,000
Bridge construction	m	600,000

The resulting estimated costs for new construction come to NPR 1351.2 million.

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

Code	Description	New length (km)	Opening up (NPR)	Gravelling (NPR)	Bridges (NPR)	Total cost (NPR)
69DR002	Gairilek -Sokat	5.64	22,560	11,280	-	**33,840**
69DR004	Budhabagar-Babala-Khaptad	9.34	37,360	18,680	-	**56,040**
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	5.91	23,640	11,820	18,000	**53,460**
69DR008	Safe-Nawathana-Nandegadh-Shodasha- Rishidaha	16.10	64,400	32,200	-	**96,600**
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	4.53	18,120	9,060	54,000	**81,180**
69DR012	Mangalsen-Kunti-Basti-Lodeghat	2.36	9,440	4,720	-	**14,160**
69DR013	Nandegada-Mellekh-Kuskot	4.14	16,560	8,280	-	**24,840**
69DR014	Jayagadh-Nandegadh-Mellekh	3.50	14,000	7,000	24,000	**45,000**
69DR015	Jayagadh-Kalika-Majhthana-Darna	3.81	15,240	7,620	-	**22,860**
69DR016	Timalsen-Sallisain-Ramaroshan	1.65	6,600	3,300	-	**9,900**
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	10.69	42,760	21,380	24,000	**88,140**
69DR027	Kamalbazar-Muli-Bayala	1.21	4,840	2,420	-	**7,260**
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	11.23	44,920	22,460	12,000	**79,380**
69DR033	Baskada-Raniban	3.15	12,600	6,300	-	**18,900**
69DR034	Turmakhand-Nada VDC	3.09	12,360	6,180	-	**18,540**
69DR035	Turmakhand-Bahairabsthan-Rahaph	25.77	103,080	51,540	-	**154,620**
69DR036	Binayak-Toli-Pulletola-Barala	13.44	53,760	26,880	36,000	**116,640**
69DR037	Binayak-Kuika	2.18	8,720	4,360	-	**13,080**
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	13.02	52,080	26,040	54,000	**132,120**
69DR039	Kuchi-Todkesal-Bayala	0.48	1,920	960	24,000	**26,880**
69DR040	Rithhabazar-Thanti	5.16	20,640	10,320	45,000	**75,960**
69DR041	Baskhet-Bhatakatiya	6.27	25,080	12,540	36,000	**73,620**
69DR042	Mujabagar-Sutar	3.57	14,280	7,140	36,000	**57,420**
69DR043	Khal-Batulasain	3.02	12,080	6,040	18,000	**36,120**
69DR044	Gaire-Tosi	2.41	9,640	4,820	-	**14,460**
Total		**161.67**	**646,680**	**323,340**	**381,000**	**1,351,020**

4.4 DTPP COSTS

The total costs for the District Transport Perspective Plan come to NPR 2750 million as indicated in the table below.

Table 4.4.1 DTPP Costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
69DR001	2,430	5,418	-	7,848
69DR002	13,487	34,235	33,840	81,562
69DR003	7,830	21,838	-	29,668
69DR004	675	1,096	56,040	57,811
69DR005	12,150	22,955	-	35,105
69DR006	13,770	33,330	53,460	100,560
69DR007	15,701	32,328	-	48,028
69DR008	37,395	69,123	96,600	203,118
69DR009	2,565	4,625	-	7,190
69DR010	3,105	10,643	-	13,748
69DR011	40,865	72,908	81,180	194,952
69DR012	26,663	58,028	14,160	98,850
69DR013	5,940	13,890	24,840	44,670
69DR014	6,021	10,658	45,000	61,679
69DR015	4,455	7,973	22,860	35,288
69DR016	49,613	117,643	9,900	177,155
69DR017	16,659	37,815	-	54,474
69DR018	16,025	29,313	-	45,337
69DR019	4,334	9,880	-	14,214
69DR020	1,485	2,250	-	3,735
69DR021	2,565	5,130	-	7,695
69DR022	3,780	6,810	-	10,590
69DR023	11,178	20,225	88,140	119,543
69DR024	16,146	28,000	-	44,146
69DR025	43,808	72,050	-	115,858
69DR026	7,695	14,368	-	22,063
69DR027	4,725	10,210	7,260	22,195
69DR028	4,347	9,775	-	14,122
69DR029	5,616	8,995	-	14,611
69DR030	35,330	68,795	79,380	183,505
69DR031	11,880	28,870	-	40,750
69DR032	16,227	30,955	-	47,182
69DR033	3,146	7,760	18,900	29,806
69DR034	1,404	2,445	18,540	22,389
69DR035	5,805	12,213	154,620	172,638
69DR036	2,835	5,913	116,640	125,388
69DR037	675	1,580	13,080	15,335
69DR038	2,295	4,970	132,120	139,385
69DR039	1,404	2,210	26,880	30,494
69DR040	-	-	75,960	75,960
69DR041	-	-	73,620	73,620
69DR042	-	-	57,420	57,420
69DR043	-	-	36,120	36,120
69DR044	-	-	14,460	14,460
Total	**462,024**	**937,216**	**1,351,020**	**2,750,260**

5. RANKING

The ranking of the required interventions determine the priority for implementation. 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. Population served is calculated using population data for the VDCs linked by particular road given in **Annex 3**.

5.1 CONSERVATION

Ranking of roads for conservation is done in basis of 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.

Table 5.1.1 Ranking of Conservation works (NPR '000)

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)
69DR038	1.70	46	31	-	-	383	-	-	459	15,411	30
69DR004	0.50	14	9	-	-	113	-	-	135	4,508	30
69DR037	0.50	14	9	-	-	113	-	-	135	4,281	32
69DR036	2.10	57	38	-	-	473	-	-	567	16,494	34
69DR034	1.04	28	19	-	-	234	-	-	281	6,905	41
69DR039	1.04	28	19	-	-	234	-	-	281	3,948	71
69DR020	1.10	30	20	-	-	248	-	-	297	3,934	75
69DR035	4.30	116	77	-	-	968	-	-	1,161	12,996	89
69DR017	12.34	333	222	-	-	2,777	-	-	3,332	32,218	103
69DR015	3.30	89	59	-	-	743	-	-	891	8,232	108
69DR033	2.33	63	42	-	-	524	-	-	629	5,119	123
69DR027	3.50	95	63	-	-	788	-	-	945	6,727	140
69DR022	2.80	76	50	-	-	630	-	-	756	5,355	141
69DR014	4.46	120	80	-	-	1,004	-	-	1,204	8,232	146
69DR013	4.40	119	79	-	-	990	-	-	1,188	7,876	151
69DR021	1.90	51	34	-	-	428	-	-	513	3,081	167
69DR023	8.28	224	149	-	-	1,863	-	-	2,236	12,352	181
69DR001	1.80	49	32	-	-	405	-	-	486	2,457	198
69DR026	5.70	154	103	-	-	1,283	-	-	1,539	6,845	225
69DR028	3.22	87	58	-	-	725	-	-	869	3,733	233
69DR003	5.80	157	104	-	-	1,305	-	-	1,566	6,011	261
69DR019	3.21	87	58	-	-	722	-	-	867	3,304	262
69DR018	11.87	320	214	-	-	2,671	-	-	3,205	11,860	270
69DR025	32.45	876	584	-	-	7,301	-	-	8,762	32,074	273
69DR006	10.20	275	184	-	-	2,295	-	-	2,754	9,870	279
69DR012	19.75	533	356	-	-	4,444	-	-	5,333	17,343	307
69DR032	12.02	325	216	-	-	2,705	-	-	3,245	10,438	311
69DR011	30.27	817	545	-	-	6,811	-	-	8,173	24,339	336
69DR016	36.75	992	662	-	-	8,269	-	-	9,923	29,135	341
69DR007	11.63	314	209	-	-	2,617	-	-	3,140	8,849	355
69DR030	26.17	707	471	-	-	5,888	-	-	7,066	18,251	387
69DR010	2.30	62	41	-	-	518	-	-	621	1,599	388
69DR002	9.99	270	180	-	-	2,248	-	-	2,697	6,655	405
69DR005	9.00	243	162	-	-	2,025	-	-	2,430	5,339	455
69DR009	1.90	51	34	-	-	428	-	-	513	1,091	470
69DR008	27.70	748	499	-	-	6,233	-	-	7,479	14,279	524
69DR024	11.96	323	215	-	-	2,691	-	-	3,229	5,591	578
69DR029	4.16	112	75	-	-	936	-	-	1,123	1,932	581
69DR031	8.80	238	158	-	-	1,980	-	-	2,376	3,801	625

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 is importance and be followed accordingly where fund 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 earthen roads
6 . Periodic maintenance blacktop roads
7 . Periodic maintenance gravel roads

5.2 IMPROVEMENT

In the case of improvement activities, ranking is again done in 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).

Table 5.2.1 Ranking of improvement works (NPR '000)

Code	Total length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
69DR004	0.50	1,096	4,508	243
69DR038	1.70	4,970	15,411	322
69DR034	1.04	2,445	6,905	354
69DR036	2.10	5,913	16,494	358
69DR037	0.50	1,580	4,281	369
69DR039	1.04	2,210	3,948	560
69DR020	1.10	2,250	3,934	572
69DR035	4.30	12,213	12,996	940
69DR015	3.30	7,973	8,232	968
69DR017	12.34	37,815	32,218	1,174
69DR022	2.80	6,810	5,355	1,272
69DR014	4.46	10,658	8,232	1,295
69DR033	2.33	7,760	5,119	1,516
69DR027	3.50	10,210	6,727	1,518
69DR023	8.28	20,225	12,352	1,637
69DR021	1.90	5,130	3,081	1,665
69DR013	4.40	13,890	7,876	1,764
69DR026	5.70	14,368	6,845	2,099
69DR001	1.80	5,418	2,457	2,205
69DR025	32.45	72,050	32,074	2,246
69DR018	11.87	29,313	11,860	2,472
69DR028	3.22	9,775	3,733	2,619
69DR032	12.02	30,955	10,438	2,966
69DR019	3.21	9,880	3,304	2,990

Code	Total length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
69DR011	30.27	72,908	24,339	2,996
69DR012	19.75	58,028	17,343	3,346
69DR006	10.20	33,330	9,870	3,377
69DR003	5.80	21,838	6,011	3,633
69DR007	11.63	32,328	8,849	3,653
69DR030	26.17	68,795	18,251	3,769
69DR016	36.75	117,643	29,135	4,038
69DR009	1.90	4,625	1,091	4,239
69DR005	9.00	22,955	5,339	4,299
69DR029	4.16	8,995	1,932	4,656
69DR008	27.70	69,123	14,279	4,841
69DR024	11.96	28,000	5,591	5,008
69DR002	9.99	34,235	6,655	5,144
69DR010	2.30	10,643	1,599	6,656
69DR031	8.80	28,870	3,801	7,595

* Phase 1: Earth to gravel standard ** Phase 2: Gravel to blacktop standard

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 result of ranking is given 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)
69DR016	1.65	9,900	29,135	340
69DR012	2.36	14,160	17,343	816
69DR027	1.21	7,260	6,727	1,079
69DR034	3.09	18,540	6,905	2,685
69DR015	3.81	22,860	8,232	2,777
69DR037	2.18	13,080	4,281	3,055
69DR013	4.14	24,840	7,876	3,154
69DR011	4.53	81,180	24,339	3,335
69DR033	3.15	18,900	5,119	3,692
69DR030	11.23	79,380	18,251	4,349
69DR002	5.64	33,840	6,655	5,085
69DR006	5.91	53,460	9,870	5,416
69DR014	3.50	45,000	8,232	5,466
69DR044	2.41	14,460	2,282	6,337
69DR008	16.10	96,600	14,279	6,765
69DR039	0.48	26,880	3,948	6,809
69DR036	13.44	116,640	16,494	7,072
69DR023	10.69	88,140	12,352	7,136
69DR038	13.02	132,120	15,411	8,573
69DR043	3.02	36,120	4,199	8,602
69DR035	25.77	154,620	12,996	11,898
69DR004	9.34	56,040	4,508	12,431
69DR041	6.27	73,620	4,653	15,822
69DR042	3.57	57,420	3,614	15,888
69DR040	5.16	75,960	2,673	28,418

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

Based upon the prioritized transport linkages and the projected financial plan, first five year District Transport Master Plan (DTMP) indicating the year-wise target has been prepared. Various categories of interventions such as Conservation, Improvement and New construction for roads have been prepared and presented in this report.

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6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

Major sources of funding to rural road network development are mainly the DDC development grant, VDC allocation, DDC's and VDC's own resources, DoLIDAR support, GON's grant and support from other donor agencies. While preparing the financial plan, current available financial resources from various agencies and assuming 10% annual growth on this was considered and this is then projected for the next five years to prepare the First Five-year Financial Plan as presented in table 6.1.1.

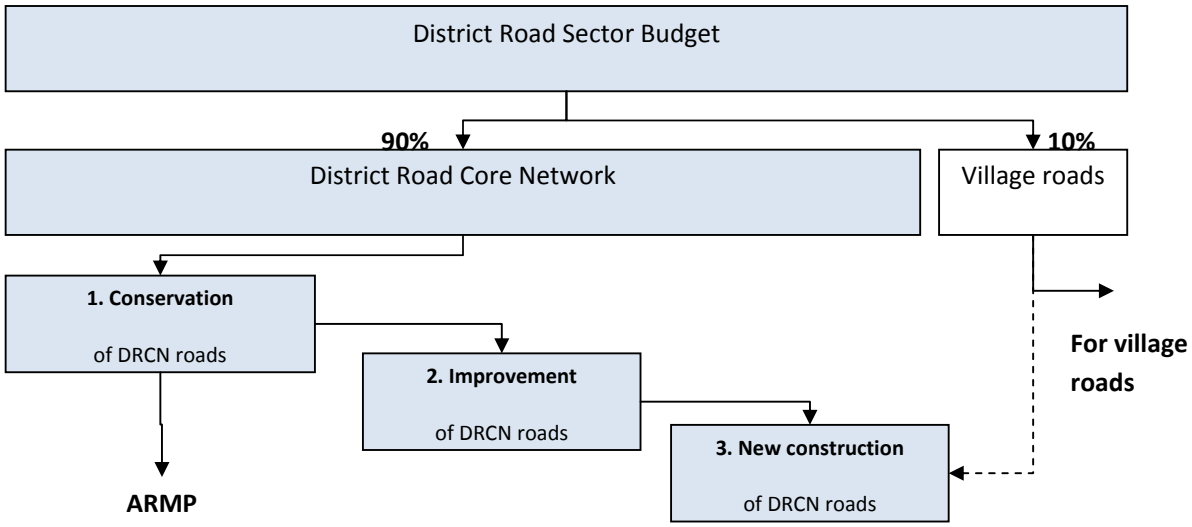
Table 6.1.1 Estimated funding levels (roads) for next five years (in NPR '000)

Funding source	2070/71	2071/72	2072/73	2073/74	2074/75
DDC Capital Grant	5,000	5,500	6,050	6,655	7,321
Local Transport Infrastructure Area Program	6,200	6,820	7,502	8,252	9,077
Road Board Nepal	2,000	2,200	2,420	2,662	2,928
Central Level Grant to road	6,000	6,600	7,260	7,986	8,785
RAP GoN	2,400	2,640	2,904	3,194	3,514
Local Road Bridge Project	6,000	6,600	7,260	7,986	8,785
VDC Grant (4 lakh/VDC)	30,000	33,000	36,300	39,930	43,923
Karnali area Special program	9,500	10,450	11,495	12,645	13,909
People's participation based Development program	15,000	16,500	18,150	19,965	21,962
RCIW (50%)	11,700	12,870	14,157	15,573	17,130
RAP Direct	40,000	60,000	66,000	72,600	79,860
Total	**133,800**	**163,180**	**179,498**	**197,448**	**217,193**
Grand total	**891,118**				

6.2 BUDGET ALLOCATION

Distribution of the available district road sector budget is indicated in the figure below. Due to the few number of village roads, 90% of the total budget is allocated for the District Road Core Network. Remaining 10% budget can be used by the DDC for the village roads, giving priority to emergency maintenance then routine/recurrent maintenance. Alternatively, this 10% may be used for the new construction of DRCN roads where this is considered a priority by the district. The DRCN budget is primarily allocated to conservation and surplus of this is then allocated to improvement. There is not sufficient budget for improvement of all DRCN of Achham so, no budget is remains for new construction.

Figure 5 : District Road Sector Budget Allocation



Based on 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. Budget allocation to some roads for improvement is not possible due to the various reasons however, they are ranked on top. These roads are short in length and ended in jungle or river and local people do not use these road sections until they completed. Some roads are linking with earthen road, which is fail to get DTMP budget for improvement, are also not getting DTMP budget because it would be difficult to consider as all weather access if approaching road is remain earthen.

Table 6.2.1 Investment Plan

Item	**Year**				
Fiscal year	2070/71	2071/72	2072/73	2073/74	2074/75
Total budget	133,800	163,180	179,498	197,448	217,193
Village roads	13,380	16,318	17,950	19,745	21,719
Core road network budget (DTMP)	**120,420**	**146,862**	**161,548**	**177,703**	**195,473**
Core network length (km)	**342.24**	**342.24**	**342.24**	**342.24**	**342.24**
Blacktop (km)	-	-	-	-	-
Gravel (km)	-	10.16	28.01	49.69	78.59
Earthen (km)	342.24	332.08	314.23	292.55	263.65
Conservation	**92,405**	**96,721**	**104,308**	**113,522**	**125,807**
Emergency	9,240	9,240	9,240	9,240	9,240
Routine	6,160	6,160	6,160	6,160	6,160
Recurrent (blacktop)	-	-	-	-	-
Recurrent (gravel)	-	4,062	11,203	19,875	31,437
Recurrent (earthen)	77,004	74,719	70,702	65,824	59,320
Periodic (blacktop)	-	-	-	-	-
Periodic (gravel)	-	2,539	7,002	12,422	19,648

Item				Year														
Fiscal year				2070/71			2071/72			2072/73			2073/74			2074/75		
Improvement	Cost	BT	GR	28,015	BT	GR	50,141	BT	GR	57,530	BT	GR	64,012	BT	GR	69,549	BT	GR
69DR004	1,096	-	0.50		-	-		-	-		-	-		-	-		-	-
69DR038	4,970	-	1.70		-	-		-	-		-	-		-	-		-	-
69DR034	2,445	-	1.04		-	-		-	-		-	-		-	-		-	-
69DR036	5,913	-	2.10		-	-		-	-		-	-		-	-		-	-
69DR037	1,580	-	0.50		-	-		-	-		-	-		-	-		-	-
69DR039	2,210	-	1.04		-	-		-	-		-	-		-	-		-	-
69DR020	2,250	-	1.10		-	-		-	-		-	-		-	-		-	-
69DR035	12,213	-	4.30	12,213	-	4.30	-	-	-	-	-	-	-	-	-	-	-	-
69DR015	7,973	-	3.30	7,973	-	3.30	-	-	-	-	-	-	-	-	-	-	-	-
69DR017	37,815	-	12.34	7,830	-	2.56	29,985	-	9.78	-	-	-	-	-	-	-	-	-
69DR022	6,810	-	2.80		-	-		-	-		-	-		-	-		-	-
69DR014	10,658	-	4.46		-	-	10,658	-	4.46	-	-	-	-	-	-	-	-	-
69DR033	7,760	-	2.33		-	-	7,760	-	2.33	-	-	-	-	-	-	-	-	-
69DR027	10,210	-	3.50		-	-	1,739		0.60	8,471	-	2.90	-	-	-	-	-	-
69DR023	20,225	-	8.28		-	-		-	-	20,225	-	8.28	-	-	-	-	-	-
69DR021	5,130	-	1.90		-	-		-	-		-	-		-	-		-	-
69DR013	13,890	-	4.40		-	-		-	-		-	-		-	-		-	-
69DR026	14,368	-	5.70		-	-		-	-	14,368	-	5.70	-	-	-	-	-	-
69DR001	5,418	-	1.80		-	-		-	-	5,418	-	1.80	-	-	-	-	-	-
69DR025	72,050	-	32.45		-	-		-	-	9,049	-	4.08	63,001	-	28.37	-	-	-
69DR018	29,313	-	11.87		-	-		-	-		-	-	1,011	-	0.41	28,302	-	11.46
69DR028	9,775	-	3.22		-	-		-	-		-	-		-	-	9,775	-	3.22

Item				Year														
Fiscal year				**2070/71**			**2071/72**			**2072/73**			**2073/74**			**2074/75**		
69DR032	30,955	-	12.02		-	-		-	-		-	-		-	-	30,955	-	12.02
69DR019	9,880	-	3.21		-	-		-	-		-	-		-	-	518	-	0.17
69DR011	72,908	-	30.27		-	-		-	-		-	-		-	-		-	-
69DR012	58,028	-	19.75		-	-		-	-		-	-		-	-		-	-
69DR006	33,330	-	10.20		-	-		-	-		-	-		-	-		-	-
69DR003	21,838	-	5.80		-	-		-	-		-	-		-	-		-	-
69DR007	32,328	-	11.63		-	-		-	-		-	-		-	-		-	-
69DR030	68,795	-	26.17		-	-		-	-		-	-		-	-		-	-
69DR016	117,643	-	36.75		-	-		-	-		-	-		-	-		-	-
69DR009	4,625	-	1.90		-	-		-	-		-	-		-	-		-	-
69DR005	22,955	-	9.00		-	-		-	-		-	-		-	-		-	-
69DR029	8,995	-	4.16		-	-		-	-		-	-		-	-		-	-
69DR008	69,123	-	27.70		-	-		-	-		-	-		-	-		-	-
69DR024	28,000	-	11.96		-	-		-	-		-	-		-	-		-	-
69DR002	34,235	-	9.99		-	-		-	-		-	-		-	-		-	-
69DR010	10,643	-	2.30		-	-		-	-		-	-		-	-		-	-
69DR031	28,870	-	8.80		-	-		-	-		-	-		-	-		-	-
Total improvement				**28,015**	**-**	**10.16**	**50,142**	**-**	**17.17**	**57,530**	**-**	**22.76**	**64,012**	**-**	**28.78**	**69,550**	**-**	**26.87**

Item			Year									
Fiscal year			2070/71		2071/72		2072/73		2073/74		2074/75	
Construction	Cost	GR	-	GR	-	GR	-	GR	-	GR	-	GR
69DR016	9,900	1.65	-	-	-	-	-	-	-	-	-	-
69DR012	14,160	2.36	-	-	-	-	-	-	-	-	-	-
69DR027	7,260	1.21	-	-	-	-	-	-	-	-	-	-
69DR034	18,540	3.09	-	-	-	-	-	-	-	-	-	-
69DR015	22,860	3.81	-	-	-	-	-	-	-	-	-	-
69DR037	13,080	2.18	-	-	-	-	-	-	-	-	-	-
69DR013	24,840	4.14	-	-	-	-	-	-	-	-	-	-
69DR011	81,180	4.53	-	-	-	-	-	-	-	-	-	-
69DR033	18,900	3.15	-	-	-	-	-	-	-	-	-	-
69DR030	79,380	11.23	-	-	-	-	-	-	-	-	-	-
69DR002	33,840	5.64	-	-	-	-	-	-	-	-	-	-
69DR006	53,460	5.91	-	-	-	-	-	-	-	-	-	-
69DR014	45,000	3.50	-	-	-	-	-	-	-	-	-	-
69DR044	14,460	2.41	-	-	-	-	-	-	-	-	-	-
69DR008	96,600	16.10	-	-	-	-	-	-	-	-	-	-
69DR039	26,880	0.48	-	-	-	-	-	-	-	-	-	-
69DR036	116,640	13.44	-	-	-	-	-	-	-	-	-	-
69DR023	88,140	10.69	-	-	-	-	-	-	-	-	-	-
69DR038	132,120	13.02	-	-	-	-	-	-	-	-	-	-
69DR043	36,120	3.02	-	-	-	-	-	-	-	-	-	-
69DR035	154,620	25.77	-	-	-	-	-	-	-	-	-	-
69DR004	56,040	9.34	-	-	-	-	-	-	-	-	-	-
69DR041	73,620	6.27	-	-	-	-	-	-	-	-	-	-
69DR042	57,420	3.57	-	-	-	-	-	-	-	-	-	-
69DR040	75,960	5.16	-	-	-	-	-	-	-	-	-	-
Total new construction			-	-	-	-	-	-	-	-	-	-

6.3 DTMP OUTPUTS

Based on the investment plan presented above, all DRCN roads will be conserved for the duration of the DTMP period. A further 106 km will be improved to gravel standard. All of these roads will also receive the cross drainage and protective structures required to make them maintainable all-weather roads. Remaining 236 km of earthen roads at the end of the DTMP period will be improved in the next DTMP. Same way new construction will only take place after the existing DRCN roads have been improved to maintainable all weather standard (some of these roads may be constructed using VDC funding).

Table 6.3.1 DTMP output

Conservation	Improvement gravel	Improvement blacktop	New construction
342.24	105.74	-	-

Out of the total DTMP budget, NRs 532.76 million will be spent on conservation and NRs 269.24 million on improvement. The DTMP budget will spend in entire period of five-year.

6.4 DTMP OUTCOME

As a result of the activities planned in the DTMP, the percentage of all-weather maintainable DRCN roads increases by 31% from 0 km to 106 km and 69% (236 km) leftovers as fair weather.

Table 6.4.1 Standard of DRCN roads

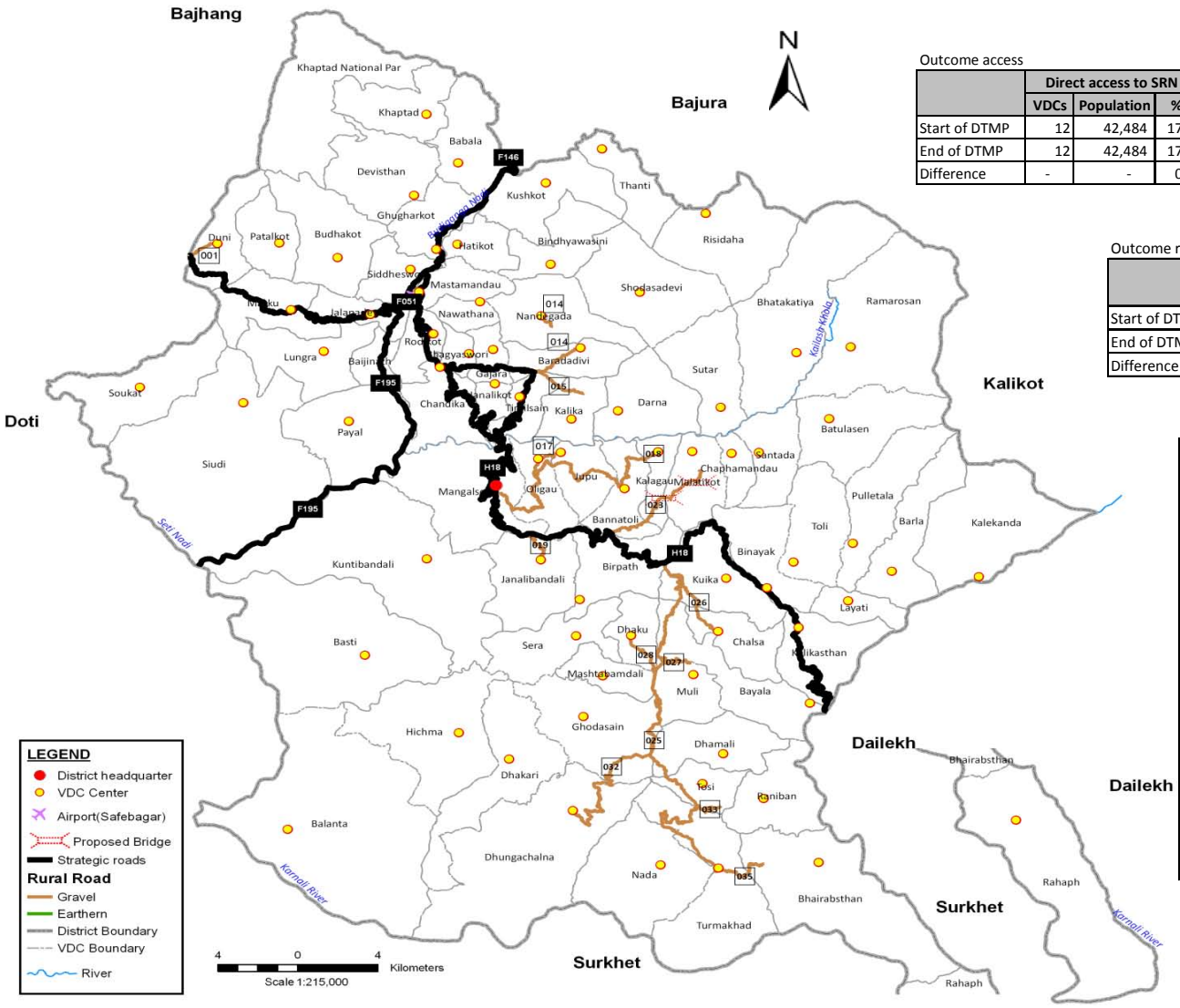
	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	342.24	342.24	100%	-	0%	-	0%
End of DTMP	342.24	236.50	69%	105.74	31%	-	0%
Difference	-	- 105.74	-31%	105.74	31%	-	0%

The number of VDC headquarters with access to the SRN or all-weather DRCN roads will increase from 12 to 24 and the district population with access to the SRN or all-weather DRCN roads will increase from 17% to 33%. The number of VDC headquarters with no access to DRCN roads will remain at 28, while the percentage of the district population with no access to DRCN roads will remain at 38%.

Table 6.4.2 Population with access to road network

	Direct access to SRN			No access to DRCN			Access to Fair-weather DRCN roads			Access to All-weather DRCN roads		
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	12	42,484	17%	28	97,042	38%	35	116,662	46%	0	-	0%
End of DTMP	12	42,484	17%	28	97,042	38%	23	76,710	30%	12	39,952	16%
Difference	-	-	0%	-	-	0%	-12	-39,952	-16%	12	39,952	16%

Figure 6 : District Transport Master Plan (DTMP)



Outcome access

	Direct access to SRN			No access to road			Fair-weather core roads			All-weather core roads		
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	12	42,484	17%	28	97,042	38%	35	116,662	46%	0	-	0%
End of DTMP	12	42,484	17%	28	97,042	38%	23	76,710	30%	12	39,952	16%
Difference	-	-	0%	-	-	0%	- 12	- 39,952	-16%	12	39,952	16%

Outcome road length

	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	342.24	342.24	100%	-	0%	-	0%
End of DTMP	342.24	236.50	69%	105.74	31%	-	0%
Difference	-	- 105.74	-31%	105.74	31%	-	0%

Code	Total length	Surface Type			
		Black Top	Gravel	Earthern	New Construction
69DR001	1.8	-	1.8	-	-
69DR014	7.96	-	4.46	-	-
69DR015	7.11	-	3.3	-	-
69DR017	12.34	-	12.34	-	-
69DR018	11.87	-	11.87	-	-
69DR019	3.21	-	3.21	-	-
69DR023	18.97	-	8.28	-	-
69DR025	32.45	-	32.45	-	-
69DR026	5.7	-	5.7	-	-
69DR027	4.71	-	3.5	-	-
69DR028	3.22	-	3.22	-	-
69DR032	12.02	-	12.02	-	-
69DR033	5.48	-	2.33	-	-
69DR035	30.07	-	4.3	-	-
Total	**156.91**	**-**	**108.78**	**-**	**-**

ANNEX 1 GIS FILE PROJECTION AND COORDINATE SYSTEM

GPS Setting

Grid: **Lat/Long hdd.ddd** and Datum **Indian Bangaladesh** and Unit in **metric** system has been considered in GPS during field survey. Garmin Etrex 30 GPS receiver was used in GPS field survey.

Defining the coordinate systems and reprojecting data in ArcGIS

We can define a coordinate system for data using the following options in ArcGIS using the Define Projection tool in the Data Management toolbox. If the data has a coordinate system definition, but it does not match the typical coordinate system used by an organization, we can reproject the data using the Project tool in the Data Management toolbox. We need to use the corresponding projection parameters while defining the coordinate system or reprojecting the data.

Projection and coordinate System used in GIS Shape file

- Projection type: Conformal (preserving shape)
- Projected coordinate system: Transverse Mercator
- Parameters of the coordinate system:
- *False_Easting: 500000*
- *False_Northing: 0*
- *Cental_Meridian: 81 for Western of Nepal*
- *Scale_Factor: 0.9999*
- *Latitude_Of_Origin: 0*
- *Spheroid: Everest 1830*
- Associated Geographic Coordinate System: *Everest-India and Nepal.prj* under *Asia*

ANNEX 2 TRAFFIC DATA

Code	Description	Total length (km)	Motor-cycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU
69DR001	Chaukhutte-Duni VDC	1.80	1				1
69DR002	Gairilek -Sokat	9.99	3		1		4
69DR003	Kirtikham-Lungra VDC	5.80	2		1		3
69DR004	Budhabagar-Babala-Khaptad	0.50	0				-
69DR005	Ghughurkot (Thantibazar)-Devisthan	9.00	3	1	1		5
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	10.20	3	1	1		5
69DR007	Mastamadu-Hattikot	11.63	4	1	3		9
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha	27.70	3	1	2		7
69DR009	Chillepipal-Bhageshwor VDC	1.90	2				1
69DR010	Kotgar-Gajra VDC	2.30	2				1
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	30.27	5	1	4		12
69DR012	Mangalsen-Kunti-Basti-Lodeghat	19.75	3	1	2		7
69DR013	Nandegada-Mellekh-Kuskot	4.40	2		1		3
69DR014	Jayagadh-Nandegadh-Mellekh	4.46	2				1
69DR015	Jayagadh-Kalika-Majhthana-Darna	3.30	2		1		3
69DR016	Timalsen-Sallisain-Ramaroshan	36.75	3	1	4		11
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	12.34	5	1	3		10
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan	11.87	3		2		6
69DR019	Thulasain-Janalibandali-Syaule	3.21	2				1
69DR020	Shodashadevi VDC Link road	1.10	2		1		3
69DR021	Nagarikban-Birkham (Kalika)	1.90	1				1
69DR022	Dhongneta-Hichma VDC	2.80	2		1		3
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	8.28	1		2		5
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat	11.96	3		2		6
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	32.45	5	4	4		15
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	5.70	1				1
69DR027	Kamalbazar-Muli-Bayala	3.50	2				1
69DR028	Kamalbazar-Dugala-Syaule	3.22	2				1
69DR029	Timalgaira-Mastabandali VDC	4.16	1				1
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	26.17	2		1		3
69DR031	Punyapata-Dhamali	8.80	2	1	1		4
69DR032	Punyapata-Dhungachalna	12.02	6	1	2		8
69DR033	Baskada-Raniban	2.33	0				-
69DR034	Turmakhand-Nada VDC	1.04	0				-
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.30	0				-
69DR036	Binayak-Toli-Pulletola-Barala	2.10	0				-
69DR037	Binayak-Kuika	0.50	0				-
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.70	0				-
69DR039	Kuchi-Todkesal-Bayala	1.04	1				1
Total		**342.24**					

ANNEX 3 POPULATION SERVED

#	VDC/municipality	Population	Road																																												
			61DR001	61DR002	61DR003	61DR004	61DR005	61DR006	61DR007	61DR008	61DR009	61DR010	61DR011	61DR012	61DR013	61DR014	61DR015	61DR016	61DR017	61DR018	61DR019	61DR020	61DR021	61DR022	61DR023	61DR024	61DR025	61DR026	61DR027	61DR028	61DR029	61DR030	61DR031	61DR032	61DR033	61DR034	61DR035	61DR036	61DR037	61DR038	61DR039	61DR040	61DR041	61DR042	61DR043	61DR044	SRN
1	Babala	2,813				x																																									
2	Baijanath	1,271																																													
3	Balata	4,078																													x																
4	Bannatoli	2,933																	x	x					x																						
5	Baradadevi	4,452														x	x																														
6	Barla	3,735																																			x		x								
7	Basti	3,716												x																																	
8	Batulasen	4,199																x																										x			
9	Bayala	3,948																									x		x												x						
10	Bhagyaswor	1,091									x																																				
11	Bhairabsthan	4,382																																		x											
12	Bhatakatiya	4,653																																								x					
13	Binayak	5,611																																			x		x								x
14	Bindhyabasini	3,222							x						x																																
15	Birpath	2,875																								x																					
16	Budhakot	2,877						x																																							
17	Chalsa	2,564																									x	x																			
18	Chandika(Bayalpata)	2,111																																													x
19	Chaphamandau	1,281																x	x						x																						
20	Darna	4,387																x																													
21	Devisthan	2,215					x																																								
22	Dhakari	4,036																													x																
23	Dhaku	1,801																												x																	
24	Dhamali	3,801																									x						x														
25	Ghodasain	4,782																									x					x		x													
26	Ghugharakot	3,124					x																																								x
27	Dhungachalna	5,656																																x													
28	Duni	2,457	x																																												
29	Gajra	1,599										x																																			
30	Hattikot	1,847							x																																						
31	Hichma	5,355																						x							x																
32	Jalapadevi	2,613																																													x
33	Janalibandali	3,304																			x																										
34	Janalikot	1,780																																													x
35	Jupu	2,891																	x	x																											
36	Kalagau	2,708																x	x	x					x																						
37	Kalekanda	3,490																																					x								
38	Kalika	3,081																x					x				x																				
39	Kalikasthan	3,423																																													x
40	Khaptad	1,695				x																																									
41	Kuika	4,281																										x											x								
42	Kuntibandali	3,169												x																																	
43	Kushkot	4,654													x																																
44	Layati	2,575																																					x								
45	Lungra	3,855			x								x																																		
46	Malatikot	2,630																x	x						x																						
47	Mangalsen	10,458											x	x					x																												x
48	Marku	2,156			x																																										x
49	Mashtabandali	1,932																									x			x	x																
50	Mastamandau	3,441																																													x
51	Muli	2,779																									x		x																		
52	Nada	2,848																									x									x											
53	Nandegada	3,780							x	x						x	x																														
54	Nawathana	2,005								x																																					
55	Oligau	3,328																	x	x																											
56	Patalkot	2,825						x																																							
57	Payal	4,994											x																																		
58	Pulletala	3,148																																			x										
59	Rahaph	4,557																																		x											
60	Ramarosan	5,989																x	x																												
61	Raniban	2,837																																	x												
62	Ridikot	1,539																																													x
63	Risidaha	4,560								x																																					
64	Santada	2,800																x							x																						
65	Sera	2,716																								x																					
66	Siddheswor	4,168						x																																							x
67	Shodasadevi	3,934								x												x																									
68	Siudi	5,032											x																																		
69	Sokat	6,655		x																																											
70	Sutar	3,614																																									x				
71	Thanti	2,673																																							x						
72	Timilsain	2,060																x																													x
73	Toli	4,000																																			x										
74	Tosi	2,282																									x								x											x	
75	Turmakhad	4,057																									x									x	x										
	Total population	**256,188**	2,457	6,655	6,011	4,508	5,339	9,870	8,849	14,279	1,091	1,599	24,339	17,343	7,876	8,232	8,232	29,135	32,218	11,860	3,304	3,934	3,081	5,355	12,352	5,591	32,074	6,845	6,727	3,733	1,932	18,251	3,801	10,438	5,119	6,905	12,996	16,494	4,281	15,411	3,948	2,673	4,653	3,614	4,199	2,282	42,484
	Total VDCs/municipalit	**75**	**1**	**1**	**2**	**2**	**2**	**3**	**3**	**4**	**1**	**1**	**4**	**3**	**2**	**2**	**2**	**9**	**8**	**4**	**1**	**1**	**1**	**1**	**5**	**2**	**10**	**2**	**2**	**2**	**1**	**4**	**1**	**2**	**2**	**2**	**3**	**4**	**1**	**4**	**1**	**1**	**1**	**1**	**1**	**1**	**12**

ANNEX 4 LOCATION OF PROPOSED INTERVENTIONS

Road code	Road Name	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)
69DR001	Chaukhutte-Duni VDC	1.8			0	1.8	0	0	0	0	0	41	6	0	515	60
69DR002	Gairilek -Sokat	9.99			0	9.99	0	315	0	0	0	65	3	0	2280	0
69DR003	Kirtikham-Lungra VDC	5.8			0	5.8	0	150	0	8	0	107	8	0	1495	400
69DR004	Budhabagar-Babala-Khaptad	0.5			0.12	0.5	0	0	0	0	0	0	0	0	0	0
69DR005	Ghughurkot (Thantibazar)-Devisthan	9			0	9	0	100	0	0	0	50	0	0	622	400
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	10.2			0	10.2	0	335	0	0	0	151	0	0	650	1420
69DR007	Mastamadu-Hattikot	11.63			0	11.63	0	25	0	0	50	166	6	0	553	340
69DR008	Safe-Nawathana-Nandegadh-Shodasha-Rishidaha	27.7			0	27.7	0	45	0	0	56	250	45	0	679	2350
69DR009	Chillepipal-Bhageshwor VDC	1.9			0	1.9	0	0	0	0	0	24	6	0	190	50
69DR010	Kotgar-Gajra VDC	2.3			0.2	2.3	0	210	0	0	0	17	0	0	185	0
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	30.27			0	30.27	0	205	90	0	0	213	3	0	1245	1970
69DR012	Mangalsen-Kunti-Basti-Lodeghat	19.75			0	19.75	0	270	11	0	14	86	16	0	983	300
69DR013	Nandegada-Mellekh-Kuskot	4.4			0	4.4	0	140	0	0	0	80	0	0	276	100
69DR014	Jayagadh-Nandegadh-Mellekh	4.46			0	4.46	0	0	20	0	0	59	6	0	383	130
69DR015	Jayagadh-Kalika-Majhthana-Darna	3.3			0	3.3	0	0	0	0	0	74	0	0	205	120
69DR016	Timalsen-Sallisain-Ramaroshan	36.75			0	36.75	0	90	60	0	42	38	10	0	365	300
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	12.34			0	12.34	0	155	0	8	27	145	16	20	1292	320
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan	11.87			0	11.87	0	0	0	8	18	103	14	0	285	690
69DR019	Thulasain-Janalibandali-Syaule	3.21			0	3.21	0	50	0	0	15	12	6	0	112	250

Road	Road Name	Length (km)	[illegible] (km)	[illegible] (km)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
69DR020	Shodashadevi VDC Link road	1.1			0	1.1	0	0	0	0	0	5	0	0	0	0
69DR021	Nagarikban-Birkham (Kalika)	1.9			0	1.9	0	45	0	0	0	18	0	0	10	0
69DR022	Dhongneta-Hichma VDC	2.8			0	2.8	0	33	0	0	0	0	0	0	154	0
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	8.28			0	8.28	0	0	40	0	0	140	16	0	818	60
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat	11.96			0	11.96	0	0	0	15	0	93	8	0	328	0
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	32.45			0	32.45	0	135	0	0	19	53	31	0	140	685
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	5.7			0	5.7	0	40	0	6	0	45	3	25	135	0
69DR027	Kamalbazar-Muli-Bayala	3.5			0	3.5	0	94	0	0	0	29	0	0	160	170
69DR028	Kamalbazar-Dugala-Syaule	3.22			0	3.22	0	55	0	6	0	32	3	40	124	0
69DR029	Timalgaira-Mastabandali VDC	4.16			0	4.16	0	25	0	0	0	5	0	0	0	0
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	26.17			0	26.17	0	277	12	0	0	65	16	0	608	0
69DR031	Punyapata-Dhamali	8.8			0	8.8	0	284	0	0	27	23	6	37	272	130
69DR032	Punyapata-Dhungachalna	12.02			0	12.02	0	58	0	7	6	160	6	108	378	130
69DR033	Baskada-Raniban	2.33			0	2.33	0	84	0	0	0	18	0	0	248	200
69DR034	Turmakhand-Nada VDC	1.04			0	1.04	0	0	0	0	0	6	0	0	122	0
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.3			0.3	4.3	0	45	0	0	0	36	0	0	671	210
69DR036	Binayak-Toli-Pulletola-Barala	2.1			0	2.1	0	0	60	8	0	24	3	0	57	100
69DR037	Binayak-Kuika	0.5			0	0.5	0	0	0	0	0	12	0	37	36	0
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.7			0.3	1.7	0	51	90	0	0	0	0	0	22	0
69DR039	Kuchi-Todkesal-Bayala	1.04			0	1.04	0	0	0	0	0	6	0	0	28	0
69DR040	Rithhabazar-Thanti	5.16			0	0	0	0	75	0	0	0	0	0	0	0
69DR041	Baskhet-Bhatakatiya	6.27			0	0	0	0	60	0	0	0	0	0	0	0
69DR042	Mujabagar-Sutar	3.57			0	0	0	0	60	0	0	0	0	0	0	0
69DR043	Khal-Batulasain	3.02			0	0	0	0	30	0	0	0	0	0	0	0
69DR044	Gaire-Tosi	2.41			0	0	0	0	0	0	0	0	0	0	0	0
	Total				**0.92**	**342.24**	**0**	**3316**	**608.00**	**66.00**	**274**	**2451**	**237.00**	**267**	**16626**	**10885**

ANNEX 5 OVERALL ROAD INVENTORY

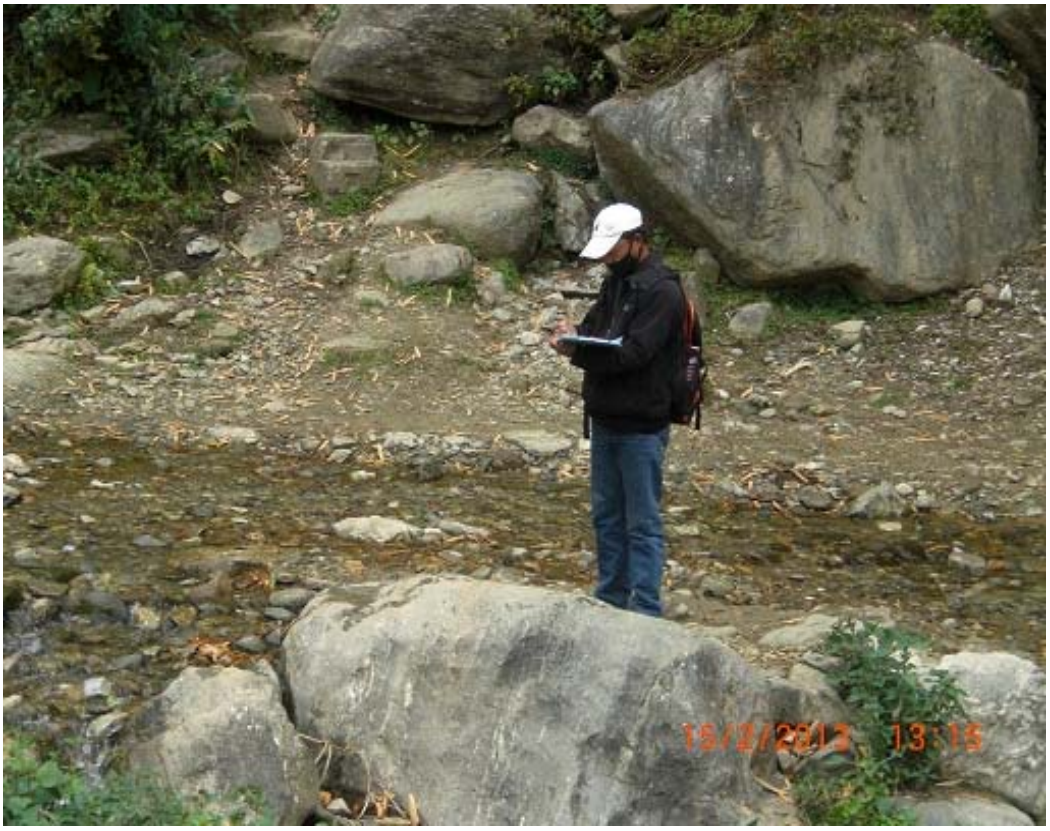
Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Gravel	Surface Type : Earth	All Weather	Fair Weather	Conditiom - Good/ Fair	Condition - Poor	Condition - Temporarily Impassable	Condition - Permanently Impassable
69DR001	Chaukhutte-Duni VDC	1.80					√		√			√	
69DR002	Gairilek -Sokat	9.99					√		√			√	
69DR003	Kirtikham-Lungra VDC	5.80					√		√			√	
69DR004	Budhabagar-Babala-Khaptad	0.50					√		√				√
69DR005	Ghughurkot (Thantibazar)-Devisthan	9.00					√		√		√		
69DR006	Safe-Siddheshwor-Budhakot-Patalkot	10.20					√		√		√		
69DR007	Mastamadu-Hattikot	11.63					√		√			√	
69DR008	Safe-Nawathana-Nandegadh-Shodasha- Rishidaha	27.70					√		√		√		
69DR009	Chillepipal-Bhageshwor VDC	1.90					√		√			√	
69DR010	Kotgar-Gajra VDC	2.30					√		√				√
69DR011	Mangalsen-Chitre-Payal-Chaurpati-Siudi	30.27					√		√		√		
69DR012	Mangalsen-Kunti-Basti-Lodeghat	19.75					√		√		√		
69DR013	Nandegada-Mellekh-Kuskot	4.40					√		√		√		
69DR014	Jayagadh-Nandegadh-Mellekh	4.46					√		√			√	
69DR015	Jayagadh-Kalika-Majhthana-Darna	3.30					√		√			√	
69DR016	Timalsen-Sallisain-Ramaroshan	36.75					√		√		√		
69DR017	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	12.34					√		√		√		
69DR018	Oligaun-Bannatoli-Kalagaun-Santada-Ramaroshan	11.87					√		√		√		
69DR019	Thulasain-Janalibandali-Syaule	3.21					√		√			√	
69DR020	Shodashadevi VDC Link road	1.10					√		√		√		

Road code	Road Name	Length (km)	dinate	coordinate	Black Top	: Gravel	Type : Earth	All Weather	Weather	d/ Fair	- Poor	Impassable	tly Impassable
69DR021	Nagarikban-Birkham (Kalika)	1.90					√		√				√
69DR022	Dhongneta-Hichma VDC	2.80					√		√			√	
69DR023	Thantikhand-Malatikot-Chaphamandu-Santada	8.28					√		√		√		
69DR024	Gairitand (Choitekhal)-Syaule-Phaltane-Sera-Lodeghat	11.96					√		√		√		
69DR025	Gairitad-Kamalbazar-Turmakhand-Jangalghat	32.45					√		√		√		
69DR026	Gairitad (Bhimegaira)-Kuika-Chalsa	5.70					√		√		√		
69DR027	Kamalbazar-Muli-Bayala	3.50					√		√		√		
69DR028	Kamalbazar-Dugala-Syaule	3.22					√		√			√	
69DR029	Timalgaira-Mastabandali VDC	4.16					√		√		√		
69DR030	Motarkatte-Ghodasain-Galwal-Benighat	26.17					√		√			√	
69DR031	Punyapata-Dhamali	8.80					√		√			√	
69DR032	Punyapata-Dhungachalna	12.02					√		√		√		
69DR033	Baskada-Raniban	2.33					√		√				√
69DR034	Turmakhand-Nada VDC	1.04					√		√				√
69DR035	Turmakhand-Bahairabsthan-Rahaph	4.30					√		√				√
69DR036	Binayak-Toli-Pulletola-Barala	2.10					√		√				√
69DR037	Binayak-Kuika	0.50					√		√				√
69DR038	Binayak-Layati-Talagad-Rakam-Kalekada	1.70					√		√			√	
69DR039	Kuchi-Todkesal-Bayala	1.04					√		√			√	
VR													
69VR001	Caukhutte-Khaptad	1.00					√		√				√
69VR002	Chaurmandu-Chirkatte-Caukhutte	9.23					√		√		√		
69VR003	Chirkatte-Sokat	10.00					√		√			√	
69VR004	Gairilek-Biuni	2.00					√		√			√	
69VR005	Caurapati-Lungra-Baijanath	3.70					√		√			√	
69VR006	Gailapani-Gail	2.00					√		√			√	
69VR007	Pitrena-Vartola (Payal)	11.70					√		√		√		
69VR008	Maijali-Kakadasandh	3.00					√		√				√
69VR009	Dhagarugada-Nandegada Link road	1.00					√		√				√

Road code	Road Name	Length (km)	dinate	coordinate	Black Top	: Gravel	Type : Earth	All Weather	Weather	d/ Fair	- Poor	Impassable	tly Impassable
69VR010	Nawathana 9 link road	0.17					√		√				√
69VR011	Janalikot-Salyan-Timilsain	2.30					√		√				√
69VR012	Bimkot-Mellekh	5.20					√		√			√	
69VR013	Bazar-Hospital road	1.80					√		√	√			
69VR014	Buspark-Lachhimana-Ragolote	2.70					√		√			√	
69VR015	Jayagadh Chhatasain-Sutar-Bhatakatiya-Ramaroshan	3.70					√		√			√	
69VR016	Jayagadh (Sukibagh)-Lidi-Bahungaun	2.90					√		√			√	
69VR017	Kailashkhola-Oligaun	4.10					√		√		√		
69VR018	Thulasain-Ganga Ma vi-Kuntibandali-Lode	3.90					√		√			√	
69VR019	Thantikandh-Kalagaun	1.60					√		√				√
69VR020	Thantikhand-Bannatoli	4.10					√		√		√		
69VR021	Thatikhand-Sainkhet-Syaule	0.70					√		√				√
69VR022	Mangalsen-Oligaun-Jupu-Sila-Santada-Ramaroshan	3.66					√		√			√	
69VR023	Gairitad-Malatikot-Ramaroshan	0.20					√		√				√
69VR024	Ratethal-Gadkhadka-Binayak	0.60					√		√				√
69VR025	Gairitand (Bhimegaira)-Kuika-Belkhet	5.80					√		√		√		
69VR026	Kamalbazar-Pachuli-Gairitad	0.80					√		√				√
69VR027	Kamalbazar-Dugala-Syaule	4.30					√		√			√	
69VR028	Melpokhara-Galwal	3.20					√		√			√	
69VR029	Dhungachalna(Khamba)-Nada	1.70					√		√				√
69VR030	Turmakhand-Tholu-Dhungachalna	1.80					√		√				√
69VR031	Turmakhand(Sudenigauda)-Kollimora	3.50					√		√			√	
69VR032	Turmakhand-Jangalghat	14.75					√		√		√		
69VR033	Binayak-Santada-Batulasain-Ramaroshan	1.30					√		√				√
69VR034	Punyapata-Dhamali-Raniban-Belkhet	6.00					√		√			√	
69VR035	Kailash -Jupu	0.70					√		√			√	
69VR036	Timalsen-Sallisain-Ramaroshan	6.35					√		√		√		
69VR037	Kolgadedanda-Rakam	0.70					√		√				√
Total		**474.40**			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DTMP INTRODUCTION WORKSHOP HELD ON 13th FEBRUARY 2013

PARTICIPANTS PAYING ATTENTION ON INTRODUCTION WORKSHOP



FIELD DATA COLLECTION AND OBSERVING ROAD CONDITION

FIELD DATA COLLECTION AND OBSERVING ROAD CONDITION

SECOND LEVEL WORKSHOP ORGANISED ON 4TH MARCH 2013 THAT APPROVED DRCN OF ACHHAM DISTRICT

DISCUSSION ON SECOND LEVEL WORKSHOP

ROAD DAMAGED BY TRACTOR: CONSEQUENCE OF HIGH GRADIENT & ABSENCE OF SIDE DRAIN

PANAROMIC VIEW OF DRCN IN ACHHAM

FINAL WORKSHOP OBSERED ON 12 March, 2013 THAT PASSED THE DTMP OF ACHHAM