Government of Nepal
Ministry of Local Development

District Development Committee
Sankhuwasabha

DISTRICT TRANSPORT MASTER PLAN

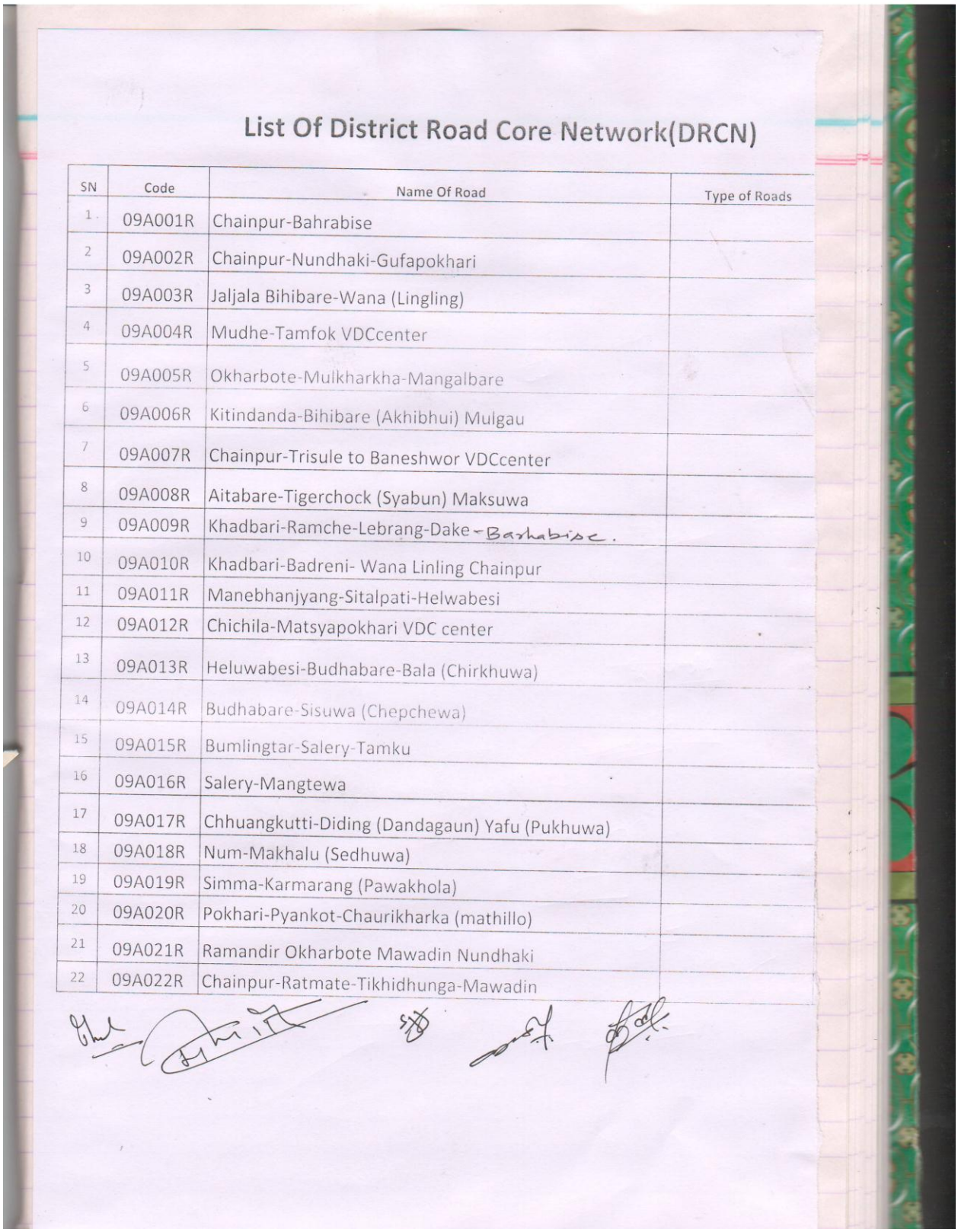
DECEMBER 2012

DoLIDAR

RTI Sector
Maintenance Pilot
Sankhuwasabha

FOREWORD

The District Road Core Network is finalized during District Annual Review workshop by DTICC member. Its scan copy is as follow:



List Of District Road Core Network(DRCN)

SN	Code	Name Of Road	Type of Roads
1	09A001R	Chainpur-Bahrabise	
2	09A002R	Chainpur-Nundhaki-Gufapokhari	
3	09A003R	Jaljala Bihibare-Wana (Lingling)	
4	09A004R	Mudhe-Tamfok VDCcenter	
5	09A005R	Okharbote-Mulkharkha-Mangalbare	
6	09A006R	Kitindanda-Bihibare (Akhibhui) Mulgau	
7	09A007R	Chainpur-Trisule to Baneshwor VDCcenter	
8	09A008R	Aitabare-Tigerchock (Syabun) Maksuwa	
9	09A009R	Khadbari-Ramche-Lebrang-Dake-Barhabise.	
10	09A010R	Khadbari-Badreni- Wana Linling Chainpur	
11	09A011R	Manebhanjyang-Sitalpati-Helwabesi	
12	09A012R	Chichila-Matsyapokhari VDC center	
13	09A013R	Heluwabesi-Budhabare-Bala (Chirkhuwa)	
14	09A014R	Budhabare-Sisuwa (Chepchewa)	
15	09A015R	Bumlingtar-Salery-Tamku	
16	09A016R	Salery-Mangtewa	
17	09A017R	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	
18	09A018R	Num-Makhalu (Sedhuwa)	
19	09A019R	Simma-Karmarang (Pawakhola)	
20	09A020R	Pokhari-Pyankot-Chaurikharka (mathillo)	
21	09A021R	Ramandir Okharbote Mawadin Nundhaki	
22	09A022R	Chainpur-Ratmate-Tikhidhunga-Mawadin	

PREFACE / ACKNOWLEDGEMENTS

District Transport Master Plan (DTMP) of Sankhuwasabha District has been prepared with support from UK AID/DFID, Technical Assistance by RTI Sector Maintenance Pilot and close coordination with DoLIDAR.

We would like to express our gratitude to Mrs Lila Adhikari, Local Development Officer (LDO), Mr Sanjay Prasad Sah, District Technical Officer (DTO), Mr. Ram Priya Yadav, DTO Engineers, DTO overseers and other DDC and DTO staff for their valuable suggestions and co-operation for the preparation of this report.

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

The DTMP for Sankhuwasabha was prepared by Mr. Bishnu Ram Bista, RTI Pilot District Asset Management Engineer and Mr. Jagdish Kumar Singh, RTI Pilot Sub Asset Management Engineer. The authors are grateful to all the local people and leaders who have rendered their valuable assistance to the team during the preparation of the DTMP.

Michael Green
Team Leader

RTI SWAp Maintenance Pilot

Executive summary

Sankhuwasabha is located in Khoshi Zone of the eastern Development Region of Nepal. It borders with Taplejung and Terahthum district in the east, Solukhumbu and Bhojpur districts in the west, Dhankuta district in the south and Tibet the autonomous region of China in the north. The district has 1 municipality, 33 VDCs, 11 Ilakas and 2 constituency areas. The total area of the district is 3,468.38 km^2. The district extends within latitude of 27º 06' to 27º 55' latitudes and longitude of 87º 57' to 87º 40' E. The lowest elevation point is 250 meter and the highest elevation point is 8463 meter from mean sea level. Subsistence agriculture farming, mainly small scale livestock is the main source of occupation and livelihood of the majority of the population, with 77.62% 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. Total population of the district is *179,068 of which female is 90,502 (50.54%) and male is 88,566 (49.46%)* residing in 36,883 households. Population density of the district is 52 persons/ $km^{2.}$ Average household size 4.33 person and life expectancy is 64years. Literacy rate of the district is 54.17%. Koshi highway (Basantapur-chainpur-tumlingtar-Khandbari-Num is the main access road of the district and leguwa-Tumling road is also another important access of the district.

The district inventory identified just over 526.64 km of roads, including 144km of strategic road network; 349.2 km of district road core network (DRCN) was identified in coordination with the DTICC and DDC, where 22 rural roads were included. Out of which 242.2 km road need to conservation and improvement and 107km of road required new construction and 105 km of village road network. The existing DRCN roads link up 33 VDC headquarters with district headquarter. All of the DRCN roads are earthen fair-weather roads.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	162.05	51.00	25.00	86.05
Urban roads	17.45	1.08	-	16.37
District road core network	242.20	-	-	242.20
Village roads	104.94	-	6.09	98.85
Total	**526.64**	**52.08**	**31.09**	**443.47**

Annual conservation costs are estimated at NPR 73 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 363 million. An analysis of the road network identified the need for improvement of all the DRCN roads in order to bring them to a maintainable all-weather standard and provide them with a proper road surface in light of existing traffic volumes. The required improvements and their estimated costs are listed below.

Improvement type	Requirement	Cost (NPR)
Bridges	m	834,000,000
Slab culverts	m	78,000,000
Causeways	m	14,420,700
Hume pipes	units	640,000
Masonry retaining walls	m^3	4,723,782
Gabion retaining walls	m^3	49,243,550
Lined drains	m	2,776,347
Widening	m	-
Rehabilitation	km	3,320,000
Gravelling	km	532,840,000
Blacktopping	km	-
New construction	km	1,125,400,000
Total		**2,645,364,379**

The available budget for the road sector for the coming five years (fiscal year 2069/70 to 2073/74) is estimated to be NPR 278.00 million. Allocation to the district road core network was set at 95% 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 almost all 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 242.2km of roads will be gravelled (63%) and resulting in a total of 105km being brought to a maintainable all-weather standard. VDC headquarters with access to all-weather DRCN roads or the SRN will increase from 21 to 34.

ABBREVIATIONS

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
LGCDP	Local Governance and Community Development Programme
MFALD	Ministry of Federal Affairs and Local Development
SWAp	Sector Wide Approach
VDC	Village Development Committee
RTI SWAp	Rural Transport Infrastructure Sector Wide Approach
AMSL	Above Mean Sea Level
DIM	District Inventory Map
DRCN	District Road Core Network
DR	District Road
VR	Village Road

CONTENTS

TABLES

FIGURES

1. INTRODUCTION

Sankhuwasabha District is located in Koshi Zone of the eastern Development Region of Nepal. It borders with Taplejung and Terahthum district in the east, Solukhumbu and Bhojpur districts in the west, Dhankuta district in the south and Tibet the autonomous region of China in the north.. The district has 1 municipality, 33 VDCs, 11 Ilakas and 2 constituency areas. The total area of the district is 3,468.38 km2. The district extends within latitude of 27º 06' to 27º 55' latitudes and longitude of 87º 57' to 87º 40' E. The lowest elevation point is 250 meter and the highest elevation point is 8463 meter from mean sea level. Subsistence agriculture farming, mainly small scale livestock, is the main source of occupation and livelihood of the majority of the population, with 77.62% 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 Sankhuwasabha district

According to the the DDC profile 2012 projection, the total population of the district is 179,068 comprising *90,502 (50.54%) and male is 88,566 (49.46%) residing in 36,883 households*. Sankhuwasabha district has an average population density of around 52 people per square km. The average family size is 4.33. Life expectancy of the people is 64 years. The average literacy rate is about 54.17% (45.08% female and 63.73% male are literate). Sankhuwasabha district has a multi ethnic composition with Rai,Chhetri, Tamang, Brahman, Magar,Gurung,Sherpa,Newar,Limbu,kami,yakkha,Magar,Bhote,Damai,Sarki,,Sanyashi,Ghrti, Kumal,Tharu & Sunuwar. The common language is Nepali (46.46%) followed by Bantawa (14.23%) and Tamang (8.56 %).

Although accessibility to Sankhuwasabha is limited, this is improving rapidly. The district has access to the Koshi Highway (Basantapur-khandbari) which is currently being upgraded to bituminous standard by DOR. Except koshi highway Hile-Legwa-Tumling is also providing access to the district.

2. DISTRICT ROAD CORE NETWORK (DRCN)

This chapter gives an overview of the existing roads in Sankhuwasabha 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

Sankhuwasabha district has an estimated road network of 526.61 kilometres, including 162 km of strategic roads managed by DOR and 347.14 km of rural roads managed by Sankhuwasabha DDC and the VDCs. Most of the strategic roads and all of the rural roads have an earthen surface. A map of the total road network in Sankhuwasabha district is shown in Figure 2 at the end of this chapter.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	162.05	51.00	25.00	86.05
Urban roads	17.45	1.08	-	16.37
Rural roads	347.14	-	6.09	341.05
Total	**526.64**	**52.08**	**31.09**	**443.47**

2.2 NATIONAL HIGHWAYS AND FEEDER ROADS

Sankhuwasabha district has 1 highway (Koshi Highway) roads totalling 244 km planed length.its aim to connect basantapur with Kimathanka on north part of district. This is also called as south-north highway. Out of which 144km road length is earthen and connect upto Num and remaining 100km need track opening. The Koshi Highway has already been blacktop upto Chainpur and two contract packages were awarded to make black from Chainpur to Khandbari by DOR. Lehuwa-Tumlintar feeder road is providing access to the district.

Table 2.2.1 National Highways and Feeder Roads (km)

Code	Description	Total length	Black Top	Gravel	Earthen
H1	Koshi Highway (Basantapur - Khandbari-Num)	**144.00**	51.00	25.00	68.00
F1	Leguwa-Tumlingtar Road	**18.05**			18.05
Total		**162.05**	**51**	**25**	**86.05**

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 Sankhuwasabha district is shown in Figure 3 at the end of this chapter. The DRCN consists of 22 district roads with a total length of 349.2 km.In DRCN 242.2 km of road length are existing earthen and 107km need new construction. The remaining 105 km of existing rural roads are not considered to be DRCN roads and are classified as village roads under the responsibility of the VDCs (see also section 2.3). All DRCN roads are currently earthen roads and are considered fair-weather only (see Table 2.3.1). A complete list of the DRCN roads and their characteristics is provided in Table 2.3.2.

Table 2.3.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	**162.05**	**51.00**	**25.00**	**86.05**
Highways	144.00	51.00	25.00	68.00
Feeder roads	18.05			18.05
Urban roads	**17.45**	**1.08**	**-**	**16.37**
Gidde-Manakamana	3.44			3.44
Manebhanjyang-Chewabesi	7.78			7.78
Manebhanjyang-Mathillo Malta	2.65			2.65
Bhanuchowk-District Post office,Link Road	0.18	0.18		
Pokhari Bazar -Kabita hotel-Municipality Officer	0.35	0.35		
Sumanchowk -Pokhari Bazar-DDc-Tundikhel	3.05	0.55		2.50
District road core network	**242.20**	-	-	242.20
Village roads	**104.94**	-	6.09	98.85
Total	**526.64**	**52.08**	**31.09**	**443.47**

Table 2.3.2 District road core network (km)

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
09A001DR	Chainpur-Bahrabise	36.20	-	-	36.20	-	36.20
09A002DR	Chainpur-Nundhaki-Gufapokhari	21.00	-	-	21.00	-	21.00
09A003DR	Jaljala Bihibare-Wana (Lingling)	12.00	-	-	12.00	-	12.00
09A004DR	Mudhe-Tamfok VDCcenter	9.00	-	-	9.00	-	9.00
09A005DR	Okharbote-Mulkharkha-Mangalbare	18.00	-	-	18.00	-	18.00
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	10.00	-	-	10.00	-	10.00
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	-	-	-	-	-	-
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	10.00	-	-	10.00	-	10.00
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	27.00	-	-	27.00	-	27.00
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	31.00	-	-	31.00	-	31.00
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	14.00	-	-	14.00	-	14.00
09A012DR	Chichila-Matsyapokhari VDC center	8.00	-	-	8.00	-	8.00
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	4.00	-	-	4.00	-	4.00
09A014DR	Budhabare-Sisuwa (Chepchewa)	-	-	-	-	-	-
09A015DR	Bumlingtar-Salery-Tamku	-	-	-	-	-	-
09A016DR	Salery-Mangtewa	-	-	-	-	-	-
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	-	-	-	-	-	-
09A018DR	Num-Makhalu (Sedhuwa)	-	-	-	-	-	-
09A019DR	Simma-Karmarang (Pawakhola)	-	-	-	-		-
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	14.00	-	-	14.00		14.00
09A021DR	Ramandir Okharbote Mawadin Nundhaki	21.00	-	-	21.00		21.00
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	7.00	-	-	7.00		7.00
Total		242.20	-	-	242.20	-	242.20

2.4 VILLAGE ROADS

The 105 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 33 VDCs in Sankhuwasabha district. These are roads of a lower importance that do not form the

main link between the VDC headquarters and the district headquarters or strategic road network. Instead they provide additional access to other parts of the VDCs.

On average each VDC will thus be responsible for 3.18 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 (see also chapter 6). However, this district funding will be mainly for maintenance, especially emergency maintenance and routine/recurrent maintenance to keep the village roads open.

Figure 1 Total road inventory

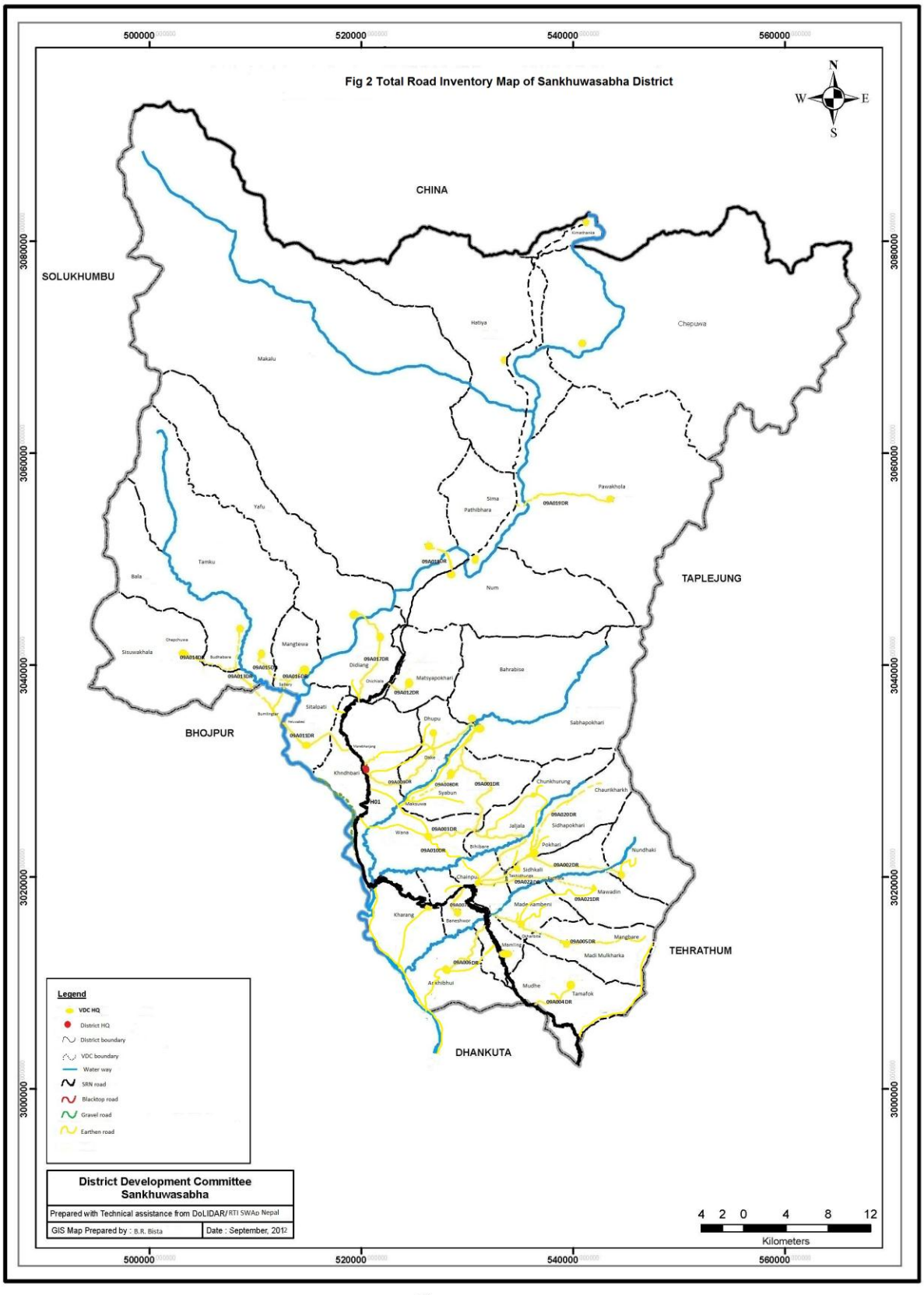
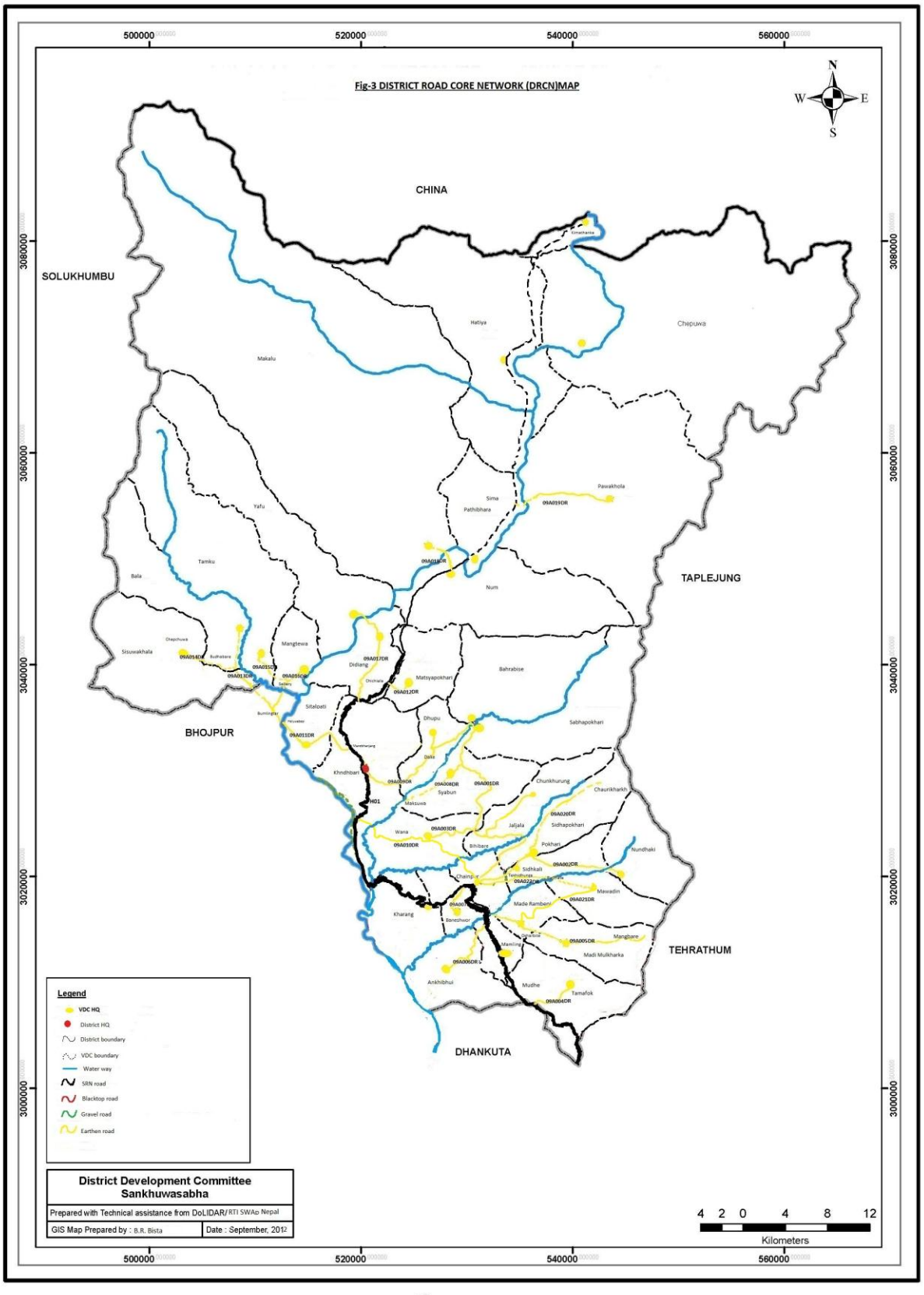


Figure 2 District Road Core Network (DRCN)



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 lumpsum 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 in 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)
09A001DR	36.20	36.20	36.20	36.20
09A002DR	21.00	21.00	21.00	21.00
09A003DR	12.00	12.00	12.00	12.00
09A004DR	9.00	9.00	9.00	9.00
09A005DR	18.00	18.00	18.00	18.00
09A006DR	10.00	10.00	10.00	10.00
09A007DR	-	-	-	-
09A008DR	10.00	10.00	10.00	10.00
09A009DR	27.00	27.00	27.00	27.00
09A010DR	31.00	31.00	31.00	31.00
09A011DR	14.00	14.00	14.00	14.00
09A012DR	8.00	8.00	8.00	8.00
09A013DR	4.00	4.00	4.00	4.00
09A014DR	-	-	-	-
09A015DR	-	-	-	-
09A016DR	-	-	-	-
09A017DR	-	-	-	-
09A018DR	-	-	-	-
09A019DR	-	-	-	-
09A020DR	14.00	14.00	14.00	14.00
09A021DR	21.00	21.00	21.00	21.00
09A022DR	7.00	7.00	7.00	7.00
Total	**242.2**	**242.2**	**242.2**	**242.2**

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 Sankhuwasabha 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

In the case of Sankhuwasabha in some of DRCN road required rehabilitation. Such as grade cutting and improvement of hair pin bend (switchback) to bring in minimum standard as per DOLIDAR norms.

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Description	Total length (km)	Rehabilitation (km)
09A001DR	Chainpur-Bahrabise	36.20	0.5
09A002DR	Chainpur-Nundhaki-Gufapokhari	21.00	0.3
09A003DR	Jaljala Bihibare-Wana (Lingling)	12.00	0.3
09A004DR	Mudhe-Tamfok VDCcenter	9.00	0.2
09A005DR	Okharbote-Mulkharkha-Mangalbare	18.00	
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	10.00	0.2
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	-	
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	10.00	0.2
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	27.00	0.4
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	31.00	0.5
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	14.00	0.4
09A012DR	Chichila-Matsyapokhari VDC center	8.00	0.3
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	4.00	
09A014DR	Budhabare-Sisuwa (Chepchewa)	-	
09A015DR	Bumlingtar-Salery-Tamku	-	
09A016DR	Salery-Mangtewa	-	
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	-	
09A018DR	Num-Makhalu (Sedhuwa)	-	
09A019DR	Simma-Karmarang (Pawakhola)	-	
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	14.00	0.4
09A021DR	Ramandir Okharbote Mawadin Nundhaki	21.00	0.3
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	7.00	0.2
Total		**242.20**	**4.15**

3.2.2 GRAVELLING

As the entire district road core network needs to be brought to an all-weather status, gravelling of the road surface is required for all the earthen sections in the DRCN. For Sankhuwasabha this concerns the total of 242.2 km of DRCN roads.

Table 3.2.2 Sections of the district road core network requiring gravelling

Code	Description	Total length (km)	Gravelling (km)
09A001DR	Chainpur-Bahrabise	36.20	36.20
09A002DR	Chainpur-Nundhaki-Gufapokhari	21.00	21.00
09A003DR	Jaljala Bihibare-Wana (Lingling)	12.00	12.00
09A004DR	Mudhe-Tamfok VDCcenter	9.00	9.00
09A005DR	Okharbote-Mulkharkha-Mangalbare	18.00	18.00
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	10.00	10.00
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	-	-
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	10.00	10.00
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	27.00	27.00
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	31.00	31.00
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	14.00	14.00
09A012DR	Chichila-Matsyapokhari VDC center	8.00	8.00
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	4.00	4.00
09A014DR	Budhabare-Sisuwa (Chepchewa)	-	-
09A015DR	Bumlingtar-Salery-Tamku	-	-
09A016DR	Salery-Mangtewa	-	-
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	-	-
09A018DR	Num-Makhalu (Sedhuwa)	-	-
09A019DR	Simma-Karmarang (Pawakhola)	-	-
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	14.00	14.00
09A021DR	Ramandir Okharbote Mawadin Nundhaki	21.00	21.00
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	7.00	7.00
Total		**242.20**	**242.20**

3.2.3 CROSS DRAINAGE

The need for cross drainage was identified for the different DRCN roads. A total of 14 bridges with a total length of 1390m, 520m slab culvert, 72 stone causeways with a total length of 1442m, and 64 pipe culverts were identified as being 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)
09A001DR	Chainpur-Bahrabise	100	80		32.00	
09A002DR	Chainpur-Nundhaki-Gufapokhari	0	40		360	
09A003DR	Jaljala Bihibare-Wana (Lingling)	0	40		76	
09A004DR	Mudhe-Tamfok VDCcenter	0	-		50	
09A005DR	Okharbote-Mulkharkha-Mangalbare	60	-			
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	0	20		61.00	
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	0	-			
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	0	-		63	

09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	80	-		107	10.00
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	200	20		302	30.00
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	40	20		70.00	24.00
09A012DR	Chichila-Matsyapokhari VDC center	40	20		50	
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	220	120			
09A014DR	Budhabare-Sisuwa (Chepchewa)	60	20			
09A015DR	Bumlingtar-Salery-Tamku	70	-			
09A016DR	Salery-Mangtewa	0	20			
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	120	20			
09A018DR	Num-Makhalu (Sedhuwa)	120	40			
09A019DR	Simma-Karmarang (Pawakhola)	120	20		76	
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	80	20		94	
09A021DR	Ramandir Okharbote Mawadin Nundhaki	0	20		50	
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	80	-		50	
Total		**1,390**	**520**	**-**	**1,442**	**64**

3.2.4 PROTECTIVE STRUCTURES

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

Table 3.2.4 Required protective structures

Code	Description	Masonry walls (m^3)	Gabion walls (m^3)	Lined drain (m)
09A001DR	Chainpur-Bahrabise	72	868.00	424
09A002DR	Chainpur-Nundhaki-Gufapokhari	52	240	303
09A003DR	Jaljala Bihibare-Wana (Lingling)	24	1,064	141
09A004DR	Mudhe-Tamfok VDCcenter	16	710	94
09A005DR	Okharbote-Mulkharkha-Mangalbare			
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	98.70	1013.76	216
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter			
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	20	887	117
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	34	1258.00	191.36
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	15	6719.00	257.60
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	24.00	2105.00	342.24
09A012DR	Chichila-Matsyapokhari VDC center	16	710	94
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)			
09A014DR	Budhabare-Sisuwa (Chepchewa)			
09A015DR	Bumlingtar-Salery-Tamku			
09A016DR	Salery-Mangtewa			

Code	Description	Masonry walls (m^3)	Gabion walls (m^3)	Lined drain (m)
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)			
09A018DR	Num-Makhalu (Sedhuwa)			
09A019DR	Simma-Karmarang (Pawakhola)	24	1,064	141
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	30	930.60	176
09A021DR	Ramandir Okharbote Mawadin Nundhaki	24	1,064	141
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	24	1,064	141
Total		**472**	**19,697**	**2,776**

3.2.5 WIDENING

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

Table 3.2.5 Sections of the district road core network requiring widening

Code	Description	Total length (km)	Widening (m)
09A001DR	Chainpur-Bahrabise	36.20	-
09A002DR	Chainpur-Nundhaki-Gufapokhari	21.00	-
09A003DR	Jaljala Bihibare-Wana (Lingling)	12.00	-
09A004DR	Mudhe-Tamfok VDCcenter	9.00	-
09A005DR	Okharbote-Mulkharkha-Mangalbare	18.00	
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	10.00	-
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	-	-
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	10.00	-
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	27.00	-
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	31.00	-
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	14.00	-
09A012DR	Chichila-Matsyapokhari VDC center	8.00	-
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	4.00	-
09A014DR	Budhabare-Sisuwa (Chepchewa)	-	
09A015DR	Bumlingtar-Salery-Tamku	-	-
09A016DR	Salery-Mangtewa	-	-
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	-	-
09A018DR	Num-Makhalu (Sedhuwa)	-	-
09A019DR	Simma-Karmarang (Pawakhola)	-	-
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	14.00	-
09A021DR	Ramandir Okharbote Mawadin Nundhaki	21.00	-
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	7.00	-
Total		**242.2**	**-**

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 not any roads that are eligible for blacktopping (traffic volume exceeds 50 PCU). The blacktopping of these roads will be treated as a second phase of improvement after they have been gravelled.

Table 3.2.6 Sections of the district road core network requiring blacktopping

Code	Description	Total length (km)	Blacktop (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 12 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)
09A001DR	Chainpur-Bahrabise		36.20		
09A002DR	Chainpur-Nundhaki-Gufapokhari		21.00		
09A003DR	Jaljala Bihibare-Wana (Lingling)		12.00		
09A004DR	Mudhe-Tamfok VDCcenter		9.00		
09A005DR	Okharbote-Mulkharkha-Mangalbare		18.00		60
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau		10.00		
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter		-	5.00	0
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa		10.00		
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise		27.00		
09A010DR	Khadbari-Badreni- Wana Linling Chainpur		31.00		
09A011DR	Manebhanjyang-Sitalpati-Helwabesi		14.00		
09A012DR	Chichila-Matsyapokhari VDC center		8.00		
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)		4.00	16.00	220
09A014DR	Budhabare-Sisuwa (Chepchewa)		-	8.00	60
09A015DR	Bumlingtar-Salery-Tamku		-	15.00	70
09A016DR	Salery-Mangtewa		-	9.00	0
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)		-	7.00	120
09A018DR	Num-Makhalu (Sedhuwa)		-	27.00	120
09A019DR	Simma-Karmarang (Pawakhola)		-	12.00	120
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)		14.00		
09A021DR	Ramandir Okharbote Mawadin Nundhaki		21.00		
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin		7.00	8.00	
Total			**242.20**	**107.00**	**770**

3.4 DISTRICT TRANSPORT PERSPECTIVE PLAN

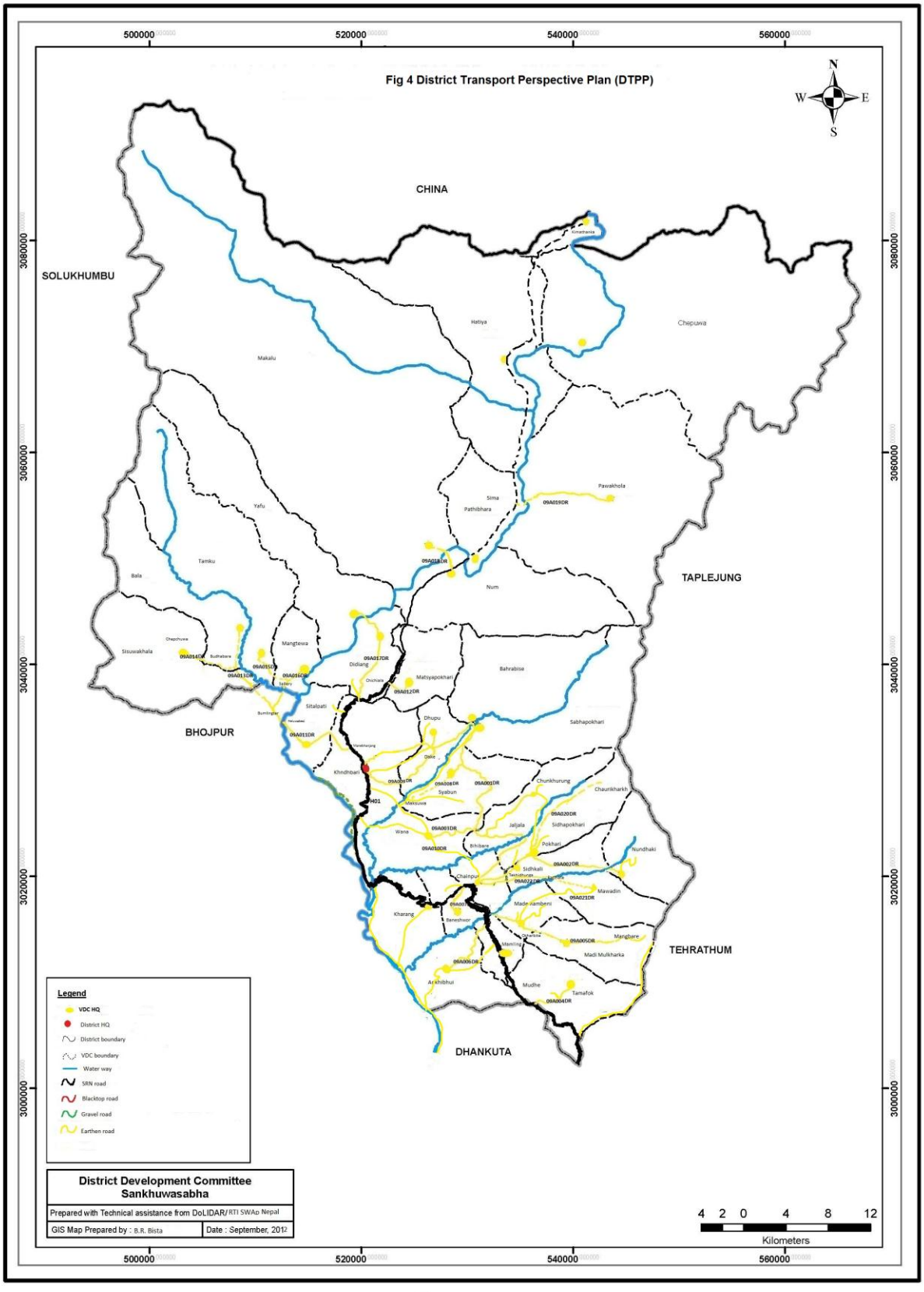
The DTPP foresees bringing the entire existing district road core network to maintainable all-weather status, and expanding it to provide access to an additional 12 VDC headquarters. For this purpose, all 242.2 km will be gravelled and a number of different cross drainage and protective structures will be constructed. A further 105 km of new road will be constructed to maintainable all-weather gravel standard providing access to 12 additional VDC HQs. The district road core network will subsequently consist of 349.2 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 3.

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)
09A001DR	36.20	36.20	36.20	36.20	0.50	36.20	-	-	100.00	80.00	-	32.00	-	72.24	868.00	423.90	-
09A002DR	21.00	21.00	21.00	21.00	0.30	21.00	-	-	-	40.00	-	360.00	-	51.50	240.00	303.05	-
09A003DR	12.00	12.00	12.00	12.00	0.30	12.00	-	-	-	40.00	-	75.54	-	23.88	1,064.28	140.52	-
09A004DR	9.00	9.00	9.00	9.00	0.20	9.00	-	-	-	-	-	50.36	-	15.92	709.52	93.68	-
09A005DR	18.00	18.00	18.00	18.00	-	18.00	-	-	120.00	-	-	-	-	-	-	-	-
09A006DR	10.00	10.00	10.00	10.00	0.15	10.00	-	-	-	20.00	-	61.00	-	98.70	1,013.76	216.00	-
09A007DR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00
09A008DR	10.00	10.00	10.00	10.00	0.20	10.00	-	-	-	-	-	62.95	-	19.90	886.90	117.10	-
09A009DR	27.00	27.00	27.00	27.00	0.40	27.00	-	-	80.00	-	-	107.02	10.00	33.83	1,258.00	191.36	-
09A010DR	31.00	31.00	31.00	31.00	0.50	31.00	-	-	200.00	20.00	-	302.16	30.00	15.00	6,719.00	257.60	-
09A011DR	14.00	14.00	14.00	14.00	0.40	14.00	-	-	40.00	20.00	-	70.00	24.00	24.00	2,105.00	342.24	-

09A012DR	8.00	8.00	8.00	8.00	0.30	8.00	-	-	40.00	20.00	-	50.36	-	15.92	709.52	93.68	-
09A013DR	4.00	4.00	4.00	4.00	-	4.00	-	-	440.00	120.00	-	-	-	-	-	-	16.00
09A014DR	-	-	-	-	-	-	-	-	120.00	20.00	-	-	-	-	-	-	8.00
09A015DR	-	-	-	-	-	-	-	-	140.00	-	-	-	-	-	-	-	15.00
09A016DR	-	-	-	-	-	-	-	-	-	20.00	-	-	-	-	-	-	9.00
09A017DR	-	-	-	-	-	-	-	-	240.00	20.00	-	-	-	-	-	-	7.00
09A018DR	-	-	-	-	-	-	-	-	240.00	40.00	-	-	-	-	-	-	27.00
09A019DR	-	-	-	-	-	-	-	-	240.00	20.00	-	75.54	-	23.88	1,064.28	140.52	12.00
09A020DR	14.00	14.00	14.00	14.00	0.40	14.00	-	-	80.00	20.00	-	94.43	-	29.85	930.60	175.65	-
09A021DR	21.00	21.00	21.00	21.00	0.30	21.00	-	-	-	20.00	-	50.36	-	23.88	1,064.28	140.52	-
09A022DR	7.00	7.00	7.00	7.00	0.20	7.00	-	-	80.00	-	-	50.36	-	23.88	1,064.28	140.52	8.00
Total	**242.20**	**242.20**	**242.20**	**242.20**	**4.15**	**242.20**	**-**	**-**	**2,160**	**520**	**-**	**1,442**	**64**	**472**	**19,697**	**2,776**	**107.00**

Figure 3 District Transport Perspective Plan (DTPP)



4. COST ESTIMATION

For the cost estimation, use has been made of standard costs for the different activities required. For the conservation activities this results in an estimation of annual costs, while for improvement and new construction activities this result 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. 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	30,000
Routine maintenance	km	20,000
Recurrent maintenance (blacktop)	km	500,000
Recurrent maintenance (gravel)	km	400,000
Recurrent maintenance (earthen)	km	250,000
Periodic maintenance (blacktop)	km	200,000
Periodic maintenance (gravel)	km	250,000

For the first year the estimated costs for conservation of the DRCN come to NPR 73 million. Based on this cost for the first year, the costs for conservation of the DRCN for the next 5 years are estimated at NPR 363 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	Routine	Recurrent (blacktop)	Recurrent (gravel)	Recurrent (earthen)	Periodic (blacktop)	Periodic (gravel)	Total annual cost	Total 5-year cost
09A001 DR	36.20	-	-	36.20	1,086	724	-	-	9,050	-	-	**10,860**	**54,300**
09A002 DR	21.00	-	-	21.00	630	420	-	-	5,250	-	-	**6,300**	**31,500**
09A003 DR	12.00	-	-	12.00	360	240	-	-	3,000	-	-	**3,600**	**18,000**
09A004 DR	9.00	-	-	9.00	270	180	-	-	2,250	-	-	**2,700**	**13,500**
09A005 DR	18.00	-	-	18.00	540	360	-	-	4,500	-	-	**5,400**	**27,000**
09A006													

Code	Total length (km)	Blacktop (km)	Gravel (km)	Earthen (km)	Emergency	Routine	Recurrent (blacktop)	Recurrent (gravel)	Recurrent (earthen)	Periodic (blacktop)	Periodic (gravel)	Total annual cost	Total 5-year cost
DR	10.00	-	-	10.00	300	200	-	-	2,500	-	-	**3,000**	**15,000**
09A007 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A008 DR	10.00	-	-	10.00	300	200	-	-	2,500	-	-	**3,000**	**15,000**
09A009 DR	27.00	-	-	27.00	810	540	-	-	6,750	-	-	**8,100**	**40,500**
09A010 DR	31.00	-	-	31.00	930	620	-	-	7,750	-	-	**9,300**	**46,500**
09A011 DR	14.00	-	-	14.00	420	280	-	-	3,500	-	-	**4,200**	**21,000**
09A012 DR	8.00	-	-	8.00	240	160	-	-	2,000	-	-	**2,400**	**12,000**
09A013 DR	4.00	-	-	4.00	120	80	-	-	1,000	-	-	**1,200**	**6,000**
09A014 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A015 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A016 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A017 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A018 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A019 DR	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**
09A020 DR	14.00	-	-	14.00	420	280	-	-	3,500	-	-	**4,200**	**21,000**
09A021 DR	21.00	-	-	21.00	630	420	-	-	5,250	-	-	**6,300**	**31,500**
09A022 DR	7.00	-	-	7.00	210	140	-	-	1,750	-	-	**2,100**	**10,500**
Total	**242.20**	**-**	**-**	**242.20**	**7,266**	**4,844**	**-**	**-**	**60,550**	**-**	**-**	**72,660**	**363,300**

4.2 IMPROVEMENT

The costs of the required improvement measures have been calculated using the following standard costs. These standard costs have been applied to the identified improvement requirements presented in the previous chapter.

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	2,200,000
Blacktopping	km	5,700,000
Bridge construction	m	600,000
Slab culvert construction	m	150,000
CC Causeway construction	m	100,000
Stone Causeway construction	m	10,000
Pipe culvert placement	unit	10,000
Masonry wall construction	m^3	10,000
Gabion wall construction	m^3	2,500
Lined drain construction	m	1,000

The resulting estimated costs come to NPR 1,519 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
09A001 DR	36.20	400	-	79,640	-	60,000	12,000	-	320	-	722	2,170	424	**155,676**
09A002 DR	21.00	240	-	46,200	-	-	6,000	-	3,600	-	515	600	303	**57,458**
09A003 DR	12.00	240	-	26,400	-	-	6,000	-	755	-	239	2,661	141	**36,435**
09A004 DR	9.00	160	-	19,800	-	-	-	-	504	-	159	1,774	94	**22,490**
09A005 DR	18.00	-	-	39,600	-	36,000	-	-	-	-	-	-	-	**75,600**
09A006 DR	10.00	120	-	22,000	-	-	3,000	-	610	-	987	2,534	216	**29,467**
09A007 DR	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
09A008 DR	10.00	160	-	22,000	-	-	-	-	630	-	199	2,217	117	**25,323**
09A009 DR	27.00	320	-	59,400	-	48,000	-	-	1,070	100	338	3,145	191	**112,565**
09A010 DR	31.00	400	-	68,200	-	120,000	3,000	-	3,022	300	150	16,798	258	**212,127**
09A011	14.00													

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
DR		320	-	30,800	-	24,000	3,000	-	700	240	240	5,263	342	**64,905**
09A012DR	8.00	240	-	17,600	-	24,000	3,000	-	504	-	159	1,774	94	**47,370**
09A013DR	4.00	-	-	8,800	-	132,000	18,000	-	-	-	-	-	-	**158,800**
09A014DR	-	-	-	-	-	36,000	3,000	-	-	-	-	-	-	**39,000**
09A015DR	-	-	-	-	-	42,000	-	-	-	-	-	-	-	**42,000**
09A016DR	-	-	-	-	-	-	3,000	-	-	-	-	-	-	**3,000**
09A017DR	-	-	-	-	-	72,000	3,000	-	-	-	-	-	-	**75,000**
09A018DR	-	-	-	-	-	72,000	6,000	-	-	-	-	-	-	**78,000**
09A019DR	-	-	-	-	-	72,000	3,000	-	755	-	239	2,661	141	**78,795**
09A020DR	14.00	320	-	30,800	-	48,000	3,000	-	944	-	299	2,327	176	**85,865**
09A021DR	21.00	240	-	46,200	-	-	3,000	-	504	-	239	2,661	141	**52,984**
09A022DR	7.00	160	-	15,400	-	48,000	-	-	504	-	239	2,661	141	**67,104**
Total	**242.20**	**3,320**	**-**	**532,840**	**-**	**834,000**	**78,000**	**-**	**14,421**	**640**	**4,724**	**49,244**	**2,776**	**1,519,964**

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	2,200,000
Bridge construction	m	600,000

The resulting estimated costs for new construction come to NPR 1,299 million.

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

Code	Description	Length (km)	Opening up	Gravelling	Bridges	Total cost
09A001DR	Chainpur-Bahrabise	-	-	-	-	**-**
09A002DR	Chainpur-Nundhaki-Gufapokhari	-	-	-	-	**-**
09A003DR	Jaljala Bihibare-Wana (Lingling)	-	-	-	-	**-**
09A004DR	Mudhe-Tamfok VDCcenter	-	-	-	-	**-**
09A005DR	Okharbote-Mulkharkha-Mangalbare	-	-	-	36,000	**36,000**
09A006DR	Kitindanda-Bihibare (Akhibhui) Mulgau	-	-	-	-	**-**
09A007DR	Chainpur-Trisule to Baneshwor VDCcenter	5.00	20,000	11,000	-	**31,000**
09A008DR	Aitabare-Tigerchock (Syabun) Maksuwa	-	-	-	-	**-**
09A009DR	Khadbari-Ramche-Lebrang-Dake Barhbise	-	-	-	-	**-**
09A010DR	Khadbari-Badreni- Wana Linling Chainpur	-	-	-	-	**-**
09A011DR	Manebhanjyang-Sitalpati-Helwabesi	-	-	-	-	**-**
09A012DR	Chichila-Matsyapokhari VDC center	-	-	-	-	**-**
09A013DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	16.00	64,000	35,200	132,000	**231,200**
09A014DR	Budhabare-Sisuwa (Chepchewa)	8.00	32,000	17,600	36,000	**85,600**
09A015DR	Bumlingtar-Salery-Tamku	15.00	60,000	33,000	42,000	**135,000**
09A016DR	Salery-Mangtewa	9.00	36,000	19,800	-	**55,800**
09A017DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	7.00	28,000	15,400	72,000	**115,400**
09A018DR	Num-Makhalu (Sedhuwa)	27.00	108,000	59,400	72,000	**239,400**
09A019DR	Simma-Karmarang (Pawakhola)	12.00	48,000	26,400	72,000	**146,400**
09A020DR	Pokhari-Pyankot-Chaurikharka (mathillo)	-	-	-	-	**-**
09A021DR	Ramandir Okharbote Mawadin Nundhaki	-	-	-	-	**-**
09A022DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	8.00	32,000	17,600	-	**49,600**
Total	**0**	**107.00**	**428,000**	**235,400**	**462,000**	**1,125,400**

4.4 DTPP COSTS

The total costs for the District Transport Perspective Plan come to NPR 3,009 million as indicated in the table below

Table 4.4.1 DTPP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
09A001DR	54,300	155,676	-	209,976
09A002DR	31,500	57,458	-	88,958
09A003DR	18,000	36,435	-	54,435
09A004DR	13,500	22,490	-	35,990
09A005DR	27,000	75,600	36,000	138,600
09A006DR	15,000	29,467	-	44,467
09A007DR	-	-	31,000	31,000
09A008DR	15,000	25,323	-	40,323
09A009DR	40,500	112,565	-	153,065
09A010DR	46,500	212,127	-	258,627
09A011DR	21,000	64,905	-	85,905
09A012DR	12,000	47,370	-	59,370
09A013DR	6,000	158,800	231,200	396,000
09A014DR	-	39,000	85,600	124,600
09A015DR	-	42,000	135,000	177,000
09A016DR	-	3,000	55,800	58,800
09A017DR	-	75,000	115,400	190,400
09A018DR	-	78,000	239,400	317,400
09A019DR	-	78,795	146,400	225,195
09A020DR	21,000	85,865	-	106,865
09A021DR	31,500	52,984	-	84,484
09A022DR	10,500	67,104	49,600	127,204
Total	**363,300**	**1,519,964**	**1,125,400**	**3,008,664**

5. RANKING

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

5.1 CONSERVATION

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

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)
09A005DR	-	-	-	-	-	-	-	-	-	5,134	-
09A007DR	-	-	-	-	-	-	-	-	-	8,970	-
09A013DR	-	-	-	-	-	-	-	-	-	30,647	-
09A014DR	-	-	-	-	-	-	-	-	-	2,447	-
09A015DR	-	-	-	-	-	-	-	-	-	5,148	-
09A016DR	-	-	-	-	-	-	-	-	-	8,192	-
09A017DR	-	-	-	-	-	-	-	-	-	7,112	-
09A018DR	4.00	120	80	-	-	1,000	-	-	1,200	11,626	103
09A019DR	14.00	420	280	-	-	3,500	-	-	4,200	32,932	128
09A011DR	9.00	270	180	-	-	2,250	-	-	2,700	14,925	181
09A009DR	10.00	300	200	-	-	2,500	-	-	3,000	13,634	220
09A004DR	31.00	930	620	-	-	7,750	-	-	9,300	38,843	239
09A006DR	27.00	810	540	-	-	6,750	-	-	8,100	32,375	250
09A003DR	18.00	540	360	-	-	4,500	-	-	5,400	21,309	253
09A001DR											

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)
	12.00	360	240	-	-	3,000	-	-	3,600	12,349	292
09A010DR	21.00	630	420	-	-	5,250	-	-	6,300	18,878	334
09A002DR	36.20	1,086	724	-	-	9,050	-	-	10,860	31,981	340
09A020DR	14.00	420	280	-	-	3,500	-	-	4,200	10,092	416
09A008DR	10.00	300	200	-	-	2,500	-	-	3,000	6,420	467
09A012DR	8.00	240	160	-	-	2,000	-	-	2,400	5,089	472
09A021DR	7.00	210	140	-	-	1,750	-	-	2,100	4,193	501
09A022DR	21.00 -	630 -	420 -	- -	- -	5,250 -	- -	- -	6,300 -	6,744 5,134	934 -

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

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

5.2 IMPROVEMENT

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

Table 5.2.1 Ranking of improvement works (NPR '000)

Code	Total length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
09A007DR	-	-		-
09A016DR	-	-		3,000
09A015DR	-	-		42,000
09A005DR	9.00	9.00		22,490
09A004DR	14.00	14.00		64,905
09A011DR	10.00	10.00		29,467
09A006DR	12.00	12.00		36,435
09A009DR	21.00	21.00		57,458
09A003DR	27.00	27.00		112,565
09A002DR	18.00	18.00		75,600
09A014DR	10.00	10.00		25,323
09A001DR	-	-		39,000
09A021DR	36.20	36.20		155,676
09A008DR	31.00	31.00		212,127
09A010DR	21.00	21.00		52,984
09A020DR	14.00	14.00		85,865
09A018DR	8.00	8.00		47,370
09A012DR	-	-		78,000
09A019DR	-	-		78,795
09A013DR	4.00	4.00		158,800
09A017DR	-	-		75,000
09A022DR	7.00	7.00		67,104

5.3 NEW CONSTRUCTION

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

Table 5.3.1 Ranking of construction works (NPR '000)

Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
09A001DR	-	-	31,981	-
09A002DR	-	-	18,878	-
09A003DR	-	-	12,349	-
09A004DR	-	-	14,925	-
09A006DR	-	-	13,634	-
09A008DR	-	-	6,420	-
09A009DR	-	-	32,375	-
09A010DR	-	-	38,843	-
09A011DR	-	-	32,932	-
09A012DR	-	-	5,089	-
09A020DR	-	-	10,092	-
09A021DR	-	-	6,744	-
09A005DR	-	36,000	21,309	1,689
09A015DR	15.00	135,000	30,647	4,405
09A007DR	5.00	31,000	5,134	6,038
09A014DR	8.00	85,600	8,970	9,543
09A022DR	8.00	49,600	4,193	11,829
09A013DR	16.00	231,200	11,626	19,886
09A019DR	12.00	146,400	7,112	20,585
09A017DR	7.00	115,400	5,148	22,416
09A016DR	9.00	55,800	2,447	22,803
09A018DR	27.00	239,400	8,192	29,224

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

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

6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

The projected financial resources for the next five years are estimated by considering all possible funding sources. The funding levels are based on the existing trend of funding. An annual increase in funding of 10% is assumed for all funding sources. The total district budget for the road sector is NPR 26 million for the five-year period.

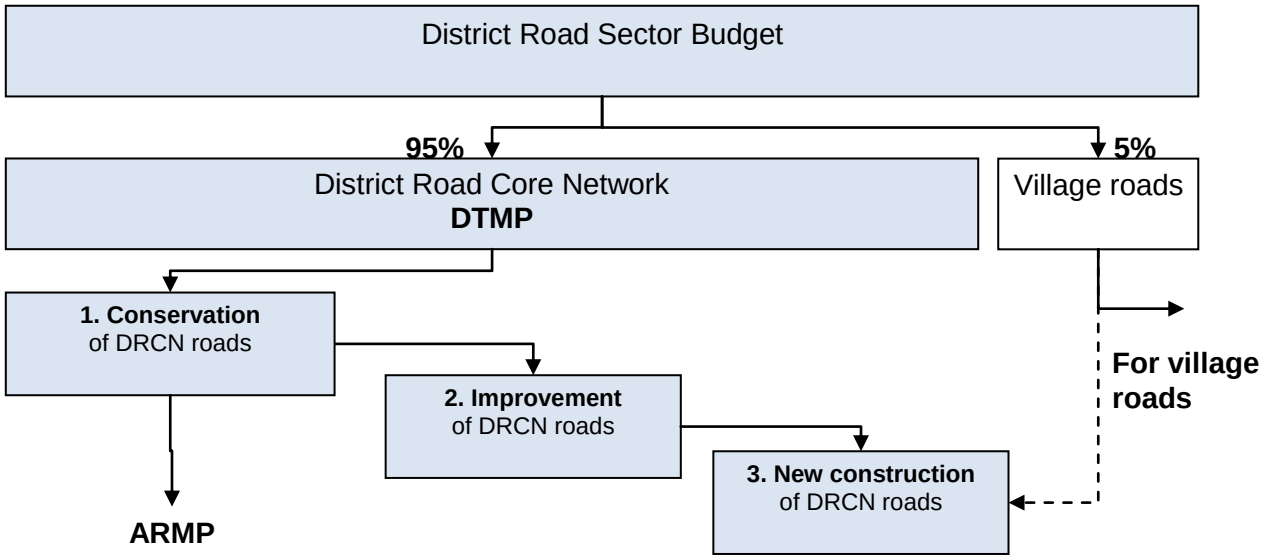
Table 6.1.1 Estimated funding levels (roads) for next five years (in NPR '000)

Funding source					
RTI SWAp Regular +additional+pujigat	16,700	18,370	20,207	22,228	24,450
RAP	2,400	0	0	0	0
RBN	1,500	1,650	1,815	1,997	2,196
DDC Funding	700	770	847	932	1,025
DFID	8,300	9,130	10,043	11,047	12,152
Other Doner Fund		15,000	20,250	27,338	36,906
Total	**29,600**	**44,920**	**53,162**	**63,541**	**76,729**
Grand total	**267,952**				

6.2 BUDGET ALLOCATION

The distribution of the available district road sector budget is indicated in the figure below. Due to the low number of village roads, 80% of the total budget is reserved for the district road core network. The remaining 20% is to be used by the DDC for the village roads, giving priority to emergency maintenance and routine/recurrent maintenance. Alternatively, this 20% may be used for the new construction of DRCN roads where this is considered a priority by the district. The 80% of the district road sector budget for the DTMP is allocated firstly to conservation, secondly improvement, and any remaining funding is allocated to new construction.

Figure 4 District road sector budget allocation



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

Table 6.2.1 DTMP investment plan

Item	Year				
Fiscal year	29,600	44,920	53,162	63,541	76,729
Total budget	1,480	2,246	2,658	3,177	3,836
Non-DRCN roads	**28,120**	**42,674**	**50,504**	**60,364**	**72,893**
DRCN budget	**242.20**	**242.20**	**242.20**	**242.20**	**242.20**
Core network length (km)	-	-	-	-	-
Blacktop (km)	-	12.00	12.00	33.00	33.00
Gravel (km)	242.20	230.20	230.20	209.20	209.20
Earthen (km)	**12,110**	**12,110**	**12,110**	**12,110**	**12,110**
Conservation (NPR '000)	7,266	7,266	7,266	7,266	7,266
Emergency	4,844	4,844	4,844	4,844	4,844
Routine	-	-	-	-	-
Recurrent (blacktop)	-				
Recurrent (gravel)					
Recurrent (earthen)	-	-	-	-	-
Periodic (blacktop)	-				
Periodic (gravel)	29,600	44,920	53,162	63,541	76,729
Improvement **Cost** **BT** **GR**		**BT** **GR**		**BT** **GR**		**BT** **GR**		**BT** **GR**		**BT** **GR**

09A007DR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
09A016DR	3,000	-	-		-	-		-	-		-	-		-	-		-	-	
09A015DR	42,000	-	-		-	-		-	-		-	-		-	-		-	-	
09A004DR	22,490	-	9.00		-	-		-	-		-	-		-	-		-	-	
09A011DR	64,905	-	14.00		-	-		-	-		-	-		-	-		-	-	
09A006DR	29,467	-	10.00		-	-		-	-		-	-		-	-		-	-	
09A003DR	36,435	-	12.00	36,435	-	12.00		-	-	-	-	-	-	-	-	-	-	-	
09A002DR	57,458	-	21.00		-	-		-	-	57,458	-	21.00	-	-	-	-	-	-	
09A009DR	112,565	-	27.00		-	-		-	-		-	-		-	-		-	-	
09A005DR	75,600	-	18.00		-	-		-	-		-	-		-	-		-	-	
09A008DR	25,323	-	10.00		-	-		-	-		-	-		-	-		-	-	
09A014DR	39,000	-	-		-	-		-	-		-	-		-	-		-	-	
09A001DR	155,676	-	36.20		-	-		-	-		-	-		-	-		-	-	
09A010DR	212,127	-	31.00		-	-		-	-		-	-		-	-		-	-	
09A021DR	52,984	-	21.00		-	-		-	-		-	-		-	-	52,984	-	21.00	
09A020DR	85,865	-	14.00		-	-		-	-		-	-		-	-		-	-	
09A012DR	47,370	-	8.00		-	-		-	-		-	-		-	-		-	-	
09A018DR	78,000	-	-		-	-	78,000	-	-		-	-		-	-		-	-	
09A019DR	78,795	-	-		-	-		-	-		-	-		-	-		-	-	

09A013DR	158,800	-	4.00		-	-		-	-		-	-		-	-		-	-
09A017DR	75,000	-	-		-	-		-	-		-	-	75,000	-	-		-	-
09A022DR	67,104	-	7.00		-	-		-	-		-	-		-	-		-	-
Total improvement				**36,435**	**-**	**12.00**	**78,000**	**-**	**-**	**57,458**	**-**	**21.00**	**75,000**	**-**	**-**	**52,984**	**-**	**21.00**
Construction	**Cost**	**GR**	**-20,425**	**GR**		**- 47,436**	**GR**		**-19,064**	**GR**		**-26,746**	**GR**		**7,799**	**GR**		
09A001DR	-	-																
09A002DR	-	-																
09A003DR	-	-																
09A004DR	-	-																
09A006DR	-	-																
09A008DR	-	-																
09A009DR	-	-																
09A010DR	-	-																
09A011DR	-	-																
09A012DR	-	-																
09A020DR	-	-																
09A021DR	-	-																
09A005DR	36,000	-																
09A015DR	135,000	15.00																
09A007DR	31,000	5.00																
09A014DR	85,600	8.00																
09A022DR	49,600	8.00																
09A013DR	231,200	16.00																
09A019DR	146,400	12.00																
09A017DR																		

	115,400	7.00										
09A016DR	55,800	9.00										
09A018DR	239,400	27.00										
Total new construction												
Remaining budget			**-20,425**		**- 47,436**		**-19,064**		**-26,746**		**7,799**	

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 54. 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. The remaining 188.2 km of earthen roads at the end of the DTMP period will be improved in the next DTMP. The same goes for the new construction which will only take place after the existing DRCN roads have been improved to maintainable all weather standards (some of these roads may be constructed using VDC funding).

Table 6.3.1 DTMP output

Conservation	Improvement gravel	Improvement blacktop	New construction
242.20	54.00	-	-

Of the total DTMP budget, NPR 610 million will be spent on conservation and NPR 61million on improvement. This will use up the entire DTMP budget for the five-year period.

6.4 DTMP OUTCOME

As a result of the activities planned in this DTMP, the percentage of all-weather maintainable DRCN roads increases by 22% from 0km to 54km, with only 94% (188.2km) remaining fair weather.

Table 6.4.1 Standard of DRCN roads

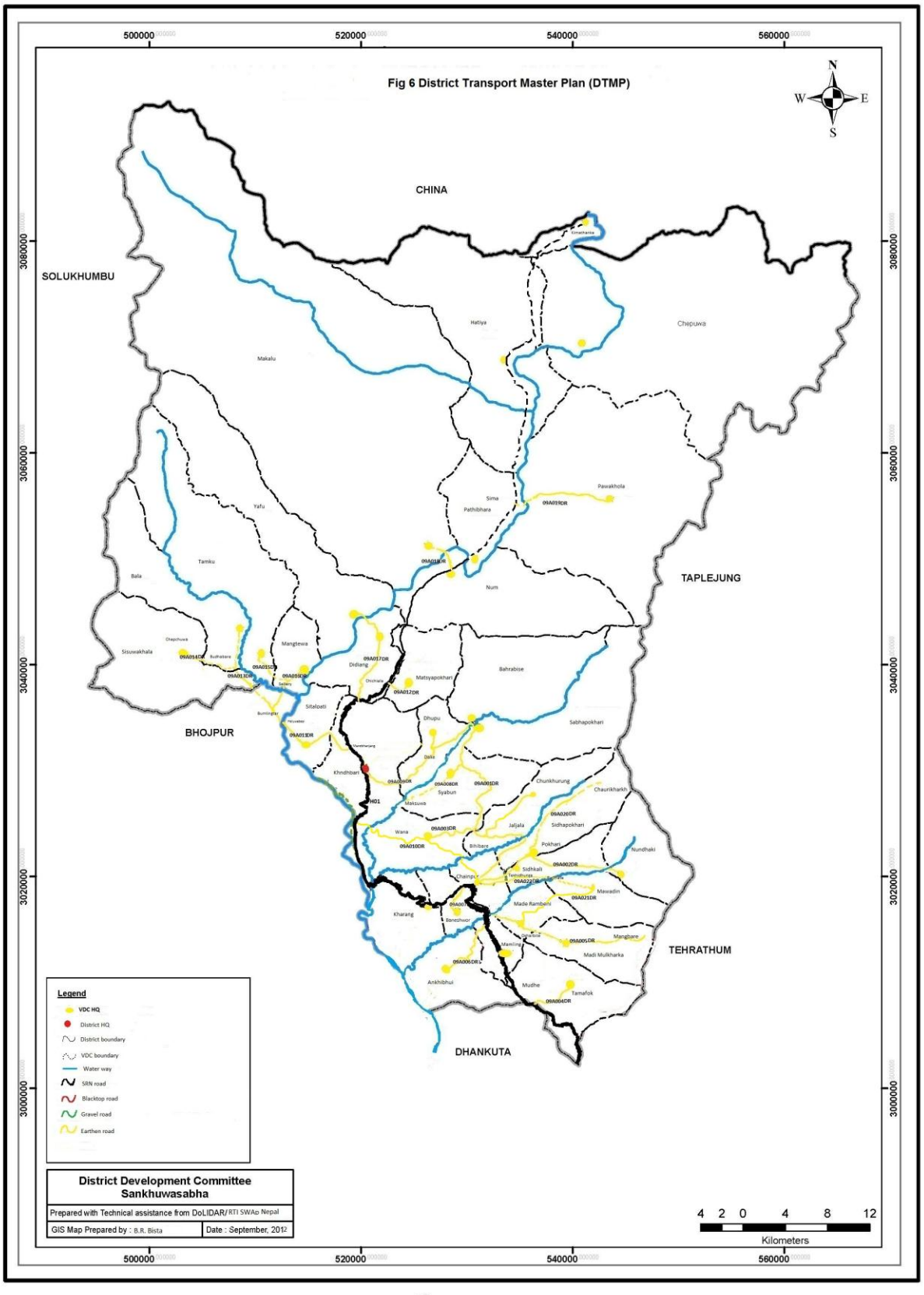
	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	242.20	242.20	100%	-	0%	-	0%
End of DTMP	242.20	188.20	78%	54.00	22%	-	0%
Difference	-	- 54.00	-22%	54.00	22%	-	0%

The number of VDC headquarters with access to the SRN or all-weather DRCN roads will increase from 21 to 34

Table 6.4.2 Population with access to road network

	Direct access to SRN			Access to fair-weather DRCN roads			Access to all-weather DRCN roads			No access to DRCN		
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	9	76,572	43%	22	143,124	80%	22	143,124	80%	6	19,566	11%
End of DTMP	9	76,572	43%	0	-	0%	0	-	0%	6	16,378	9%
Difference	-	-	0%	- 22	- 143,124	-80%	- 22	- 143,124	-80%	-	- 3,188	-2%

Figure 5 District Transport Master Plan (DTMP)



ANNEX 1 TRAFFIC DATA

Code	Total length (km)	Motor-cycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU
09A001DR	36.20	2	6	4	1	**19**
09A002DR	21.00	2	6	4	1	**19**
09A003DR	12.00	2	5	6	1	**22**
09A004DR	9.00	2	6	4	1	**19**
09A005DR	18.00					**-**
09A006DR	10.00	2	6	3	1	**17**
09A007DR	0.00					**-**
09A008DR	10.00	2	5	4	1	**18**
09A009DR	27.00	2	6	2	1	**15**
09A010DR	31.00	3	4	6	1	**22**
09A011DR	14.00	1	2	3	1	**13**
09A012DR	8.00	2	4	5	1	**19**
09A013DR	4.00					**-**
09A014DR	0.00					**-**
09A015DR	0.00					**-**
09A016DR	0.00					**-**
09A017DR	0.00					**-**
09A018DR	0.00					**-**
09A019DR	0.00					**-**
09A020DR	14.00	2	4	5	1	**19**
09A021DR	21.00	2	5	6	1	**22**
09A022DR	7.00	3	4.0	4	1	**18**
Total						

ANNEX 2 POPULATION SERVED

	VDC	Population	DRCN roads																								SRN
			09A001DR	09A002DR	09A003DR	09A004DR	09A005DR	09A006DR	09A007DR	09A008DR	09A009DR	09A010DR	09A011DR	09A012DR	09A013DR	09A014DR	09A015DR	09A016DR	09A017DR	09A018DR	09A019DR	09A020DR	09A021DR	09A022DR			
1	Ankhyibhui	8,824						x																			
2	Barbise	3,120	x									x															
3	Bala	3,591																									
4	Bana	5,925	x		x										x												
5	Baneshwor	5,134							x																		
6	Chainpur	6,424	x	x	x																						
7	Chepuwa	1,808																									
8	Dhupu	5,144									x	x															
9	Diding	3,416															x										
10	Hatiya	3,406																									
11	Jaljala	6,744	x																			x	x				
12	Keemathanka	451																									
13	Khadbari N. P	27,231									x	x	x				x										
14	Kharang	6,814																									
15	Madi Mulkharka	6,953					x																				
16	Madi rambeni	5,922				x	x																				
17	Makalu	4,380																		x							
18	Mamling	4,810				x		x																			
19	Mangtewa	2,447																x	x								
20	Matsya pokhari	5,089												x													
21	Mawadin	4,193				x																		x			
22	Num	3,812																		x							
23	Nundhaki	3,160		x																							
24	Pathibhara	3,259																			x						

	VDC	Population	DRCN roads																							SRN
			09A001DR	09A002DR	09A003DR	09A004DR	09A005DR	09A006DR	09A007DR	09A008DR	09A009DR	09A010DR	09A011DR	09A012DR	09A013DR	09A014DR	09A015DR	09A016DR	09A017DR	09A018DR	09A019DR	09A020DR	09A021DR	09A022DR			
25	Pawakhola	3,853																			x					
26	Sabhapokhari	3,348	x	x								x										x				
27	Siddhakali	5,946		x																						
28	Siddha pokhari	3,976																								
29	Siswakhola	3,269														x										
30	Sitalpati	5,701											x		x	x										
31	Syabun	6,420	x							x																
32	Tamathok	8,434					x																			
33	Tamkhu	3,363																								
34	Yafu	2,701																	x							
	Total population	**179,068**	31,981	18,878	12,349	14,925	21,309	13,634	5,134	6,420	32,375	38,843	32,932	5,089	11,626	8,970	30,647	2,447	5,148	8,192	7,112	10,092	6,744	4,193			76,572
	Total VDCs/municipalities	**34**	**6**	**4**	**2**	**3**	**3**	**2**	**1**	**1**	**2**	**4**	**2**	**1**	**2**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**1**			**9**

Source: Latest VDC Profile 2068

ANNEX 3 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)
09A001 DR	Chainpur-Bahrabise	36.2	0+000	36+00	0.5	36.20	-	500	100	80	-	32.00	-	72	868.00	424
09A002 DR	Chainpur-Nundhaki-Gufapokhari	21.0	0+00	43+000	0.3	25.88	-	200	0	40	-	360	-	52	240	303
09A003 DR	Jaljala Bihibare-Wana (Lingling)	12.0	0+000	12+000	0.3	12.00	-	100	0	40	-	76	-	24	1,064	141
09A004 DR	Mudhe-Tamfok VDCcenter	9.0	0+000	8+000	0.2	8.00	-	200	0	-	-	50	-	16	710	94
09A005 DR	Okharbote-Mulkharkha-Mangalbare	18.0	10+000	28+000	-	-	-	-	60	-	-	-	-	-	-	-
09A006 DR	Kitindanda-Bihibare (Akhibhui) Mulgau	10.0	0+000	8+000	0.2	8.00	-	200	0	20	-	61.00		98.70	1013.76	216
09A007 DR	Chainpur-Trisule to Baneshwor VDCcenter	5.0	0+000	7+000	-	-	-	-	0	-	-	-	-	-	-	-
09A008 DR	Aitabare-Tigerchock (Syabun) Maksuwa	10.0	3+000	13+000	0.2	10.00	-	500	0	-	-	63	-	20	887	117
09A009 DR	Khadbari-Ramche-Lebrang-Dake Barhbise	27.0	0+000	27+000	0.4	17.00	-	200	80	-	-	107	10.00	34	1258.00	191.36
09A010 DR	Khadbari-Badreni-Wana Linling Chainpur	31.0	0+000	31+000	0.5	48.00	-	500	200	20	-	302	30.00	15	6719.00	257.60
09A011	Manebhanjyang-	14.0	0+000	14+000	0.4	13.00			40	20		70.00	24.00	24.00	2105.	342.2

DR	Sitalpati-Helwabesi						-	300			-				00	4
09A012 DR	Chichila-Matsyapokhari VDC center	8.0	0+000	8+000	0.3	8.00	-	200	40	20	-	50		16	710	94
09A013 DR	Heluwabesi-Budhabare-Bala (Chirkhuwa)	4.0	2+500	18+500	-	-	-	-	220	120	-	-	-	-	-	-
09A014 DR	Budhabare-Sisuwa (Chepchewa)	8.0	0+000	8+000	-	-	-	-	60	20	-	-	-	-	-	-
09A015 DR	Bumlingtar-Salery-Tamku	15.0	3+500	18+500	-	-	-	-	70	-	-	-	-	-	-	-
09A016 DR	Salery-Mangtewa	9.0	0+000	9+000	-	-	-	-	0	20	-	-	-	-	-	-
09A017 DR	Chhuangkutti-Diding (Dandagaun) Yafu (Pukhuwa)	7.0	4+000	11+000	-	-	-	-	120	20	-	-	-	-	-	-
09A018 DR	Num-Makhalu (Sedhuwa)	50.0	0+000	50+000	-	-	-	-	120	40	-	-	-	-	-	-
09A019 DR	Simma-Karmarang (Pawakhola)	12.0	0+000	12+000	0.3	-	-	200	120	20	-	76	-	24	1,064	141
09A020 DR	Pokhari-Pyankot-Chaurikharka (mathillo)	14.0	0+000	14+000	0.4	15.00	-	300	80	20	-	94	-	30	930.60	176
09A021 DR	Ramandir Okharbote Mawadin Nundhaki	20.0	0+000	20+000	0.3	12.00	-	250	0	20	-	50	-	24	1,064	141
09A022 DR	Chainpur-Ratmate-Tikhidhunga-Mawadin	6.5	0+000	6+500	0.2	12.00	-	200	80	-	-	50	-	24	1,064	141
Total					**4.4**	**225.08**	**0**	**3850**	**1390**	**520**	**0**	**1442.07**	**64**	**472.3782**	**19697.42**	**2776.347**