



Government of Nepal



District Transport Master Plan (DTMP)

VOLUME- I MAIN REPORT



Ministry of Federal Affairs
and Local Development

Department of Local
Infrastructure Development and
Agricultural Roads (DOLIDAR)



District Development
Committee,

Dolakha

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Submitted by: Sustainable Infrastructure Development Foundation (SIDeF), Sinamangal, Kathmandu, for the District Development Committee (DDC) and District Technical Office (DTO), Dolakha with Technical Assistance from the Department of Local Infrastructure and Agricultural Roads (DOLIDAR) Ministry of Federal Affairs and Local Development and grant supported by DFID. Ministry of Federal Affairs and Local Development and grant supported by DFID.



Office of District Development Committee Dolakha

Ref :

Date : 5th June, 2013,

FOREWORD

It is my pleasure to introduce this District Transport Master Plan (DTMP) of Dolakha district. I believe that this document will be helpful in backstopping to Rural Transport Infrastructure Sector through sustainable planning, resources mobilization, implementation and monitoring of the rural road sub-sector development. The document is anticipated to generate substantial employment opportunities for rural people through increased and reliable accessibility in on-farm and off-farm livelihood diversification and commercialization and industrialization of agriculture sector. In this context, rural road sector will play a fundamental role to strengthen and promote overall economic growth of this district through established and improved year round transport services reinforcing intra and inter-district linkages .

Therefore, it is most crucial in expanding rural road networks in a planned way as per the District Transport Master Plan (DTMP) by considering the framework of available resources in DDC comprising both internal and external sources. Considering these aspects, DDC Dolakha has prepared the DTMP by focusing most of the available resources into upgrading and maintenance of the existing road networks. It is expected that this DTMP will be helpful in lobbying and facilitating the donor agencies through central government generating resources required through basket fund approach. Furthermore, this document will be supportive in avoiding pervasive duplication approach in resources allocation under the rural road network development of Dolakha District.

I would like to thank to Mr. Mahesh Chandra Neupane, Chief, District Technical Office, Engineer Narayan Sivakoti and other DDC and DTO staffs who directly and indirectly supported in the process of preparing this document.

I would, like to express my gratitude to SDeF team - Mr. Hare Ram Shrestha, Project Director, Mr. Prabin Basnet, Team Leader/Engineer, Mr. Raghunath Rimal, Engineer and Mr. Mohan Shrestha Engineer, for their field work and continuous dedication, in bringing this DTMP to final stage.

My special thank goes to all the representatives of political parties and other DRCC members who played central role in providing constructive and valuable supports in preparing this document.

Any innovative and constructive suggestions regarding this document will be highly appreciated.

.....
Local Development Officer
District Development Committee
Dolakha, Nepal

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The consultant has prepared this report after extensive documentary consultation/ field work, road inventory study and interaction with stakeholders of the district.

We would like to extend our heartfelt gratitude to the RTI SECTOR Maintenance Pilot for entrusting us to carry out this task and extend our thanks to all the team of RTI sector Maintenance for the cooperation and guidance in accomplishing the work.

SIDeF would like to express our gratitude to Mr. Duba Raj Pokhrel, Local Development Officer; Mr. Mahesh Chandra Neupane, Chief DTO, Mr. Narayan Sivakoti, Engineer, Sushil Kumar Shrestha, Engineer and all the DDC and DTO staffs for their valuable suggestions and co- operation for the preparation of this report.

We also extend our sincere thanks to the representatives of political parties for their active and valuable participation in the process of DTMP preparation. We are grateful to all the local people and leaders who have rendered their valuable accompany to our team during execution of the works.

We thanks to our own team - Mr. Prabin Basnet, Team Leader/Engineer, Mr. Raghunath Rimal, Engineer and Mr Mohan Shrestha Sub-engineer, Chandra B. Shrestha GIS expert and other support staffs who worked continuously to finalise the DTMP.

Executive Director
SIDeF

EXECUTIVE SUMMARY

Dolakha district lies in Central Development Region and has total area of 2191 Sq. kilometres, which covers 1.49% of total area of Nepal. The adjacent districts are Ramechhap and Solukhumbu in the East, Sindhupalchok in the West and Tibet in the North and Ramechhap and Sindhupalchok in the South. The district lies between 27° 28' to 28° North latitude and 85° 50' to 86° 32' East longitude. The elevation of the district is 732 to 7148 meters from the mean sea level. The average temperature of the district varies from 8°C to 19°C. The average annual rainfall is 2043.5mm. The total population of the Dolakha district is 186557 as per the 2011 census.

The district inventory identified 1,009.04 km of roads, including 206.50 km of strategic roads and 781.54 km of rural roads. In coordination with the DTICC and DDC, 15 rural roads with a length of 316.14 km of existing and 91.85 km of new construction roads were identified for the district road core network (DRCN), and remaining 465.4 km was classified as village roads. The existing DRCN roads link up 50 of the VDC headquarters. All of the DRCN roads are fair-weather roads.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	206.50	107.00	57.00	42.50
Urban roads	21.00	4.00	2.00	15.00
District road core network	316.14	-	91.70	224.44
Village roads	465.40	0.50	96.89	368.01
Total	1,009.04	111.50	247.59	649.95

The total estimated cost of the total DRCN road is Rs. 2,588,274,000 in which Rs 705,031,000, Rs. 1,164,548,000 and Rs. 718,695,000 for conservation, improvement and new construction respectively.

Improvement type	Requirement		Cost (NPR)
Bridges	481	m	194,000,000
Slab culverts	38	m	15,200,000
Causeways	1606	m	82,820,000
Hume pipes	28	units	280,000
Masonry retaining walls	430	m ³	4,300,000
Gabion retaining walls	82650	m ³	330,600,000
Lined drains	207300	m	207,300,000
Widening	0	m	-
Rehabilitation	75.9	km	60,720,000
Gravelling	224.44	km	269,328,000
Blacktopping	0	km	-
New construction	91.85	km	718,695,000
Total			1,883,243,000.00

The total estimated budget for the five year DTMP period is Rs. 312,275,865 and its 80% budget is allocated to DRCN and 20% budget allocated for the village roads. The order of priority is given to allocate the conservation, improvement and new construction. Due to the insufficient budget source of the district, all DRCN roads will not be in the all-weather standard of the DRCN roads. According to priority for conservation, improvement and new construction will be done from the 80% budget of estimated budget of five-year DTMP period.

ABBREVIATIONS

ARMP	Annual Road Maintenance Plan
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

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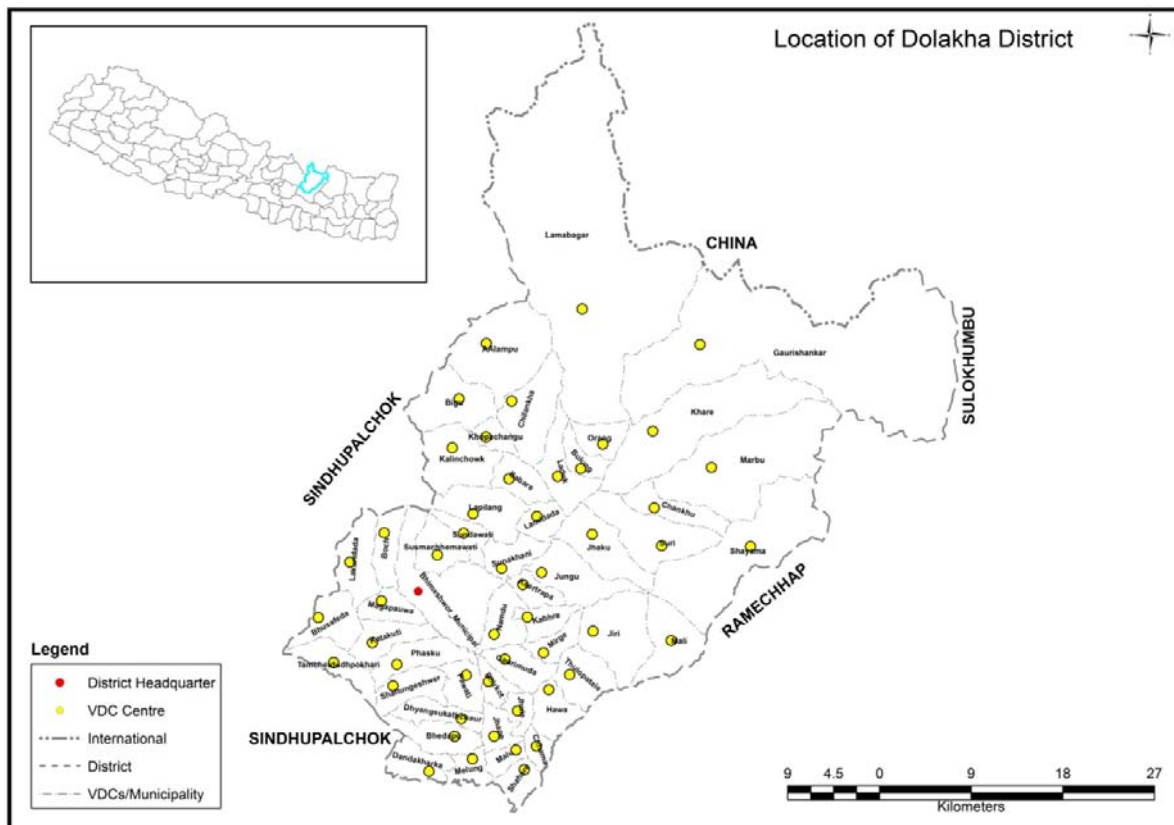
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1. INTRODUCTION

'Dolakha' is a mountainous district of Janakpur zone, which lies in the central development region of Nepal. It has one municipality and 51 VDCs. The total area is about 2,191 km², among which 26.45% is agricultural land, 47.37% is forest area, 13.77% is cattle pasture land, 2.64% is covered by snow, 3.33% is covered by water and rest 6.44% is other. Its borders with Solukhumbu and Ramechhap District in the east, Ramechhap and Sindhupalchok District in the south, Sindhupalchok in the west and with the Tibet Autonomous Region of People's Republic of China in the north. Sitali, the lowest part of the district is 732m above sea level whereas Mt. Gaurishankar, the highest part of the district is 7148m above sea level. The average temperature of the district varies from 8°C to 19°C. The average annual rainfall is 2043.5mm. The total population of the Dolakha district is 186557 as per the latest census (2011).

Figure 1 Location of the district



Dolakha District has a total population of 186557 as per the latest census, out of which 87003 are male and 99554 are female. Average number of people living per sq. km i.e. population density is 85 people per sq. km, household size is 4.08 person, life expectancy rate is 61 years, literacy rate is 55.37%.

Various ethnic groups with their language are as under.

Chhetri- Nepali, Brahmin- Nepali, Tamang- Tamang, Rai- Rai, Sherpa- Sherpa, Kami- Nepali, Newar-Nepal, Limbu-Limbu, Thakuri- Nepali, Gurung – Gurung, Damai/Dholi- Nepali, Sarki- Nepali, Magar-Magar.

Dolakha is mainly accessed through Khadichaur of Sindhupalchok District which is the link road of Ariniko Highway connecting Dolakha District to Capital city Kathmandu. This link road is Strategic road named as 'Lamosangu - Jiri Road'. This road is blacktopped single lane road passing through hilly terrain and has a big problem for the vehicle crossing each other due to the fact that there is less space and place for overtaking due to less extra widening allocated to regular interval of time. Due to the adverse condition of the topography the stopping sight distance and overtaking sight distance are of hindrance.

2. DISTRICT ROAD CORE NETWORK (DRCN)

District Road Core Network (DRCN) Compromises all the road existing in the district which serve the maximum population of the district such that road will pass through each and every VDC along with other service providing institution and tourist places and serve the population of the district such that people living in remote villages don't have to travel more than four hours to get access to the district core road network throughout the year.

2.1 TOTAL ROAD NETWORK

The length of the total road network is 1009.04 Km in the district and strategic road is 206.5 Km, urban road is 21 Km and rural road is 781.54Km.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	206.50	107.00	57.00	42.50
Urban roads	21.00	4.00	2.00	15.00
Rural roads	781.54	0.50	188.59	592.45
Total	1,009.04	111.50	247.59	649.95

2.2 NATIONAL HIGHWAYS AND FEEDER ROADS

Dolakha district has the six strategic roads they are Lamosangu- Jiri road, Tamakoshi-Manthali road, Jiri- Mali- Shyama road, Dolakha- Singati road, Singati- Lamabagar road and Jiri- Those road all SRN road are all weather.

Table 2.2.1 National Highways and Feeder Roads (km)

Code		Total length	Black Top	Gravel	Earthen
F106	Dolakha- Singati	35.00		35.00	
F106	Singati-Lamabagar	30.00		15.00	15.00
F033	Mude- Jiri	82.00	82.00		
F201	Jiri- Mali- Shyama	25.00		2.50	22.50
F202	Jiri- Those- (Dolakha section)	9.50		4.50	5.00
F032	Tamakoshi- Manthali	25.00	25.00		
	Total	206.50	107.00	57.00	42.50

2.3 DISTRICT ROAD CORE NETWORK

For the identification of the DRCN, all existing roads were first mapped in order to be able to select those that will make up the DRCN. Secondly, the most suitable candidate road to form the DRCN was selected from the existing rural road network with coordination and was approved by DTICC/DDC. Map is prepared indicating the existing DRCN roads. All DRCN roads are fair weather. The DRCN provides the access to 50 VDCs out of 51 VDCs.

Table 2.3.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	206.50	107.00	57.00	42.50
Highways	107.00	107.00		
Feeder roads	99.50		57.00	42.50
Urban roads	21.00	4.00	2.00	15.00
Total	21.00	4.00	2.00	15.00
District road core network	316.14	-	91.70	224.44
Village roads	465.40	0.50	96.89	368.01
Total	1,009.04	111.50	247.59	649.95

Table 2.3.2 District road core network (km)

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
22DR001	Bhorle- Jaintipur- Marbu	16.00		4.00	12.00	4.00	12.00
22DR002	Singati- Bulung- Gagar	18.50		3.00	15.50	3.00	15.50
22DR003	Singati- Sorung Sangwa	7.07		0.20	6.87	0.20	6.87
22DR004	Sunkhani- Sangwa	28.92		19.69	9.23	19.69	9.23
22DR005	Kalinchok- Bigu	7.50			7.50		7.50
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23		7.50	20.73	7.50	20.73
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00		2.50	6.50	2.50	6.50
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00		5.00	10.00	5.00	10.00
22DR009	Khawa- Chhaude	19.30		6.20	13.10	6.20	13.10
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00		11.00	14.00	11.00	14.00
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50		3.00	30.50	3.00	30.50
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00		5.12	9.88	5.12	9.88
22DR013	Nayapul- Pawati- Dandakharka	28.12		4.49	23.63	4.49	23.63
22DR014	Mude- Melung- Sitali	51.00		15.00	36.00	15.00	36.00
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00		5.00	9.00	5.00	9.00
	Total	316.14	0	91.70	224.44	91.70	224.44

2.4 VILLAGE ROADS

All existing road except Strategic roads, urban roads, and DRCN roads are classified as village roads. These roads are not selected to form the DRCN. The total length of the village roads is 465.4 Km Where most of the existing village road are earthen i.e. 368.01 Km, rest 96.89 Km are of stone soling and termed as gravel roads and 0.5km of village road is blacktop road.

Figure 2 Total road inventory

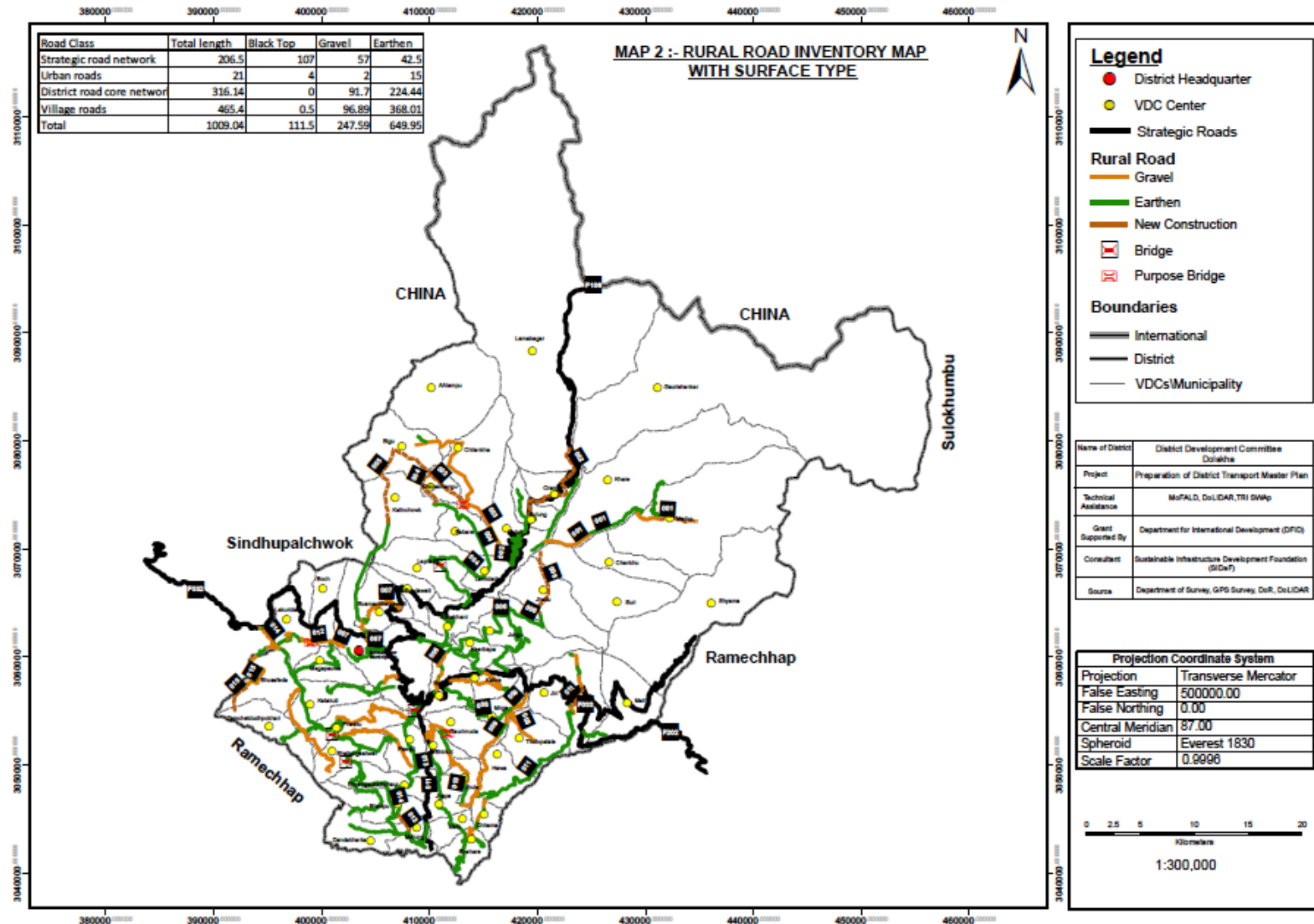
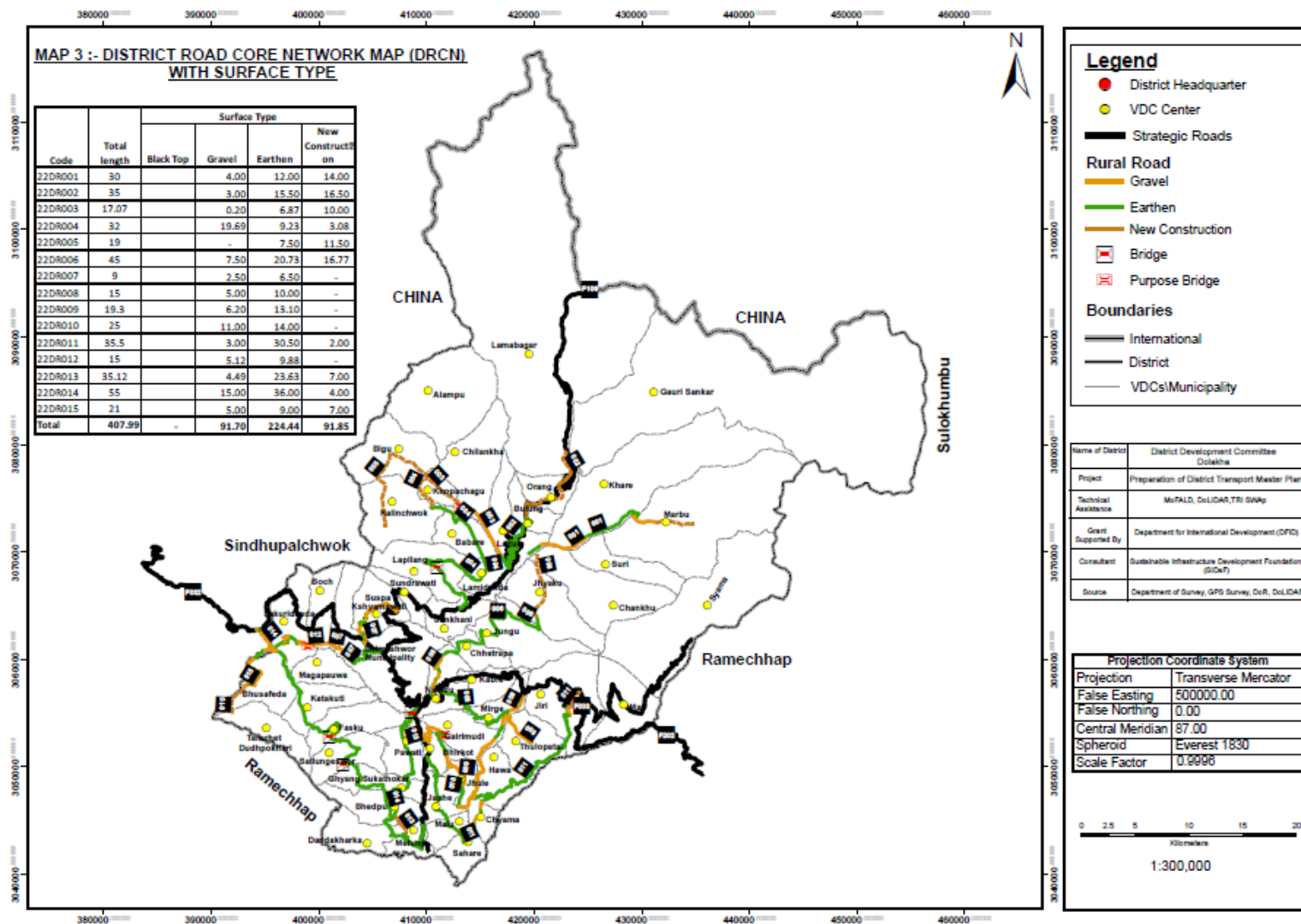


Figure 3 District Road Core Network (DRCN)



3. DISTRICT TRANSPORT PERSPECTIVE PLAN (DTPP)

The District Transport Perspective Plan is simply the list of all the identified interventions that are necessary to bring the roads to a maintainable all-weather standard and keep them there, as well as the construction of any new roads considered necessary to complete the DRCN. As such it is the summation of the interventions identified which are required to improve the road to the proper standard, as well as the conservation requirements to keep the roads at this standard.

3.1 CONSERVATION

Allocations to conservation has been done in order of priority: emergency maintenance – routine – recurrent (blacktop) – recurrent (gravel) – periodic (blacktop) – periodic maintenance (gravel). And reduction in allocation should be applied to the lowest priority type of conservation. The requirement of the emergency maintenance, routine maintenance, recurrent maintenance and periodic maintenance is taken as total length of DRCN roads i.e. 316.14 km.

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
22DR001	16.00	16.00	16.00	16.00
22DR002	18.50	18.50	18.50	18.50
22DR003	7.07	7.07	7.07	7.07
22DR004	28.92	28.92	28.92	28.92
22DR005	7.50	7.50	7.50	7.50
22DR006	28.23	28.23	28.23	28.23
22DR007	9.00	9.00	9.00	9.00
22DR008	15.00	15.00	15.00	15.00
22DR009	19.30	19.30	19.30	19.30
22DR010	25.00	25.00	25.00	25.00
22DR011	33.50	33.50	33.50	33.50
22DR012	15.00	15.00	15.00	15.00
22DR013	28.12	28.12	28.12	28.12
22DR014	51.00	51.00	51.00	51.00
22DR015	14.00	14.00	14.00	14.00
Total	316.14	316.14	316.14	316.14

3.2 IMPROVEMENT

Improvement of the DDRCN road includes rehabilitation, gravelling, application of required cross drainage and protective structures, blacktopping and widening, which gives the DRCN roads in all weather standard.

Rehabilitation refers to existing road network where the roads are in poor condition, to require an improved road surface. Gravelling refer in existing earthen road to make them all weather standards. Similarly blacktopping refers in existing gravel road to improve its standard. Cross drainage structure (causeway, pipe culvert, slab culvert, bridge), protective structures (gabion wall, masonry wall, dry wall) are required to meet the all weather standard of the DRCN roads.

3.2.1 REHABILITATION

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Description	Total length (km)	Rehabilitation (km)
22DR001	Bhorle- Jaintipur- Marbu	16.00	4.00
22DR002	Singati- Bulung- Gagar	18.50	6.00
22DR003	Singati- Sorung Sangwa	7.07	-
22DR004	Sunkhani- Sangwa	28.92	10.10
22DR005	Kalinchok- Bigu	7.50	6.00
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23	8.00
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00	0.30
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00	8.00
22DR009	Khawa- Chhaude	19.30	7.00
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	15.00
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50	3.50
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00	0.50
22DR013	Nayapul- Pawati- Dandakharka	28.12	1.00
22DR014	Mude- Melung- Sitali	51.00	1.50
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00	5.00
Total		316.14	75.90

3.2.2 GRAVELLING

Table 3.2.2 Sections of the district road core network requiring gravelling

Code	Description	Total length (km)	Gravelling (km)
22DR001	Bhorle- Jaintipur- Marbu	16.00	12.00
22DR002	Singati- Bulung- Gagar	18.50	15.50
22DR003	Singati- Sorung Sangwa	7.07	6.87
22DR004	Sunkhani- Sangwa	28.92	9.23
22DR005	Kalinchok- Bigu	7.50	7.50
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23	20.73
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00	6.50
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00	10.00
22DR009	Khawa- Chhaude	19.30	13.10
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	14.00
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50	30.50
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00	9.88
22DR013	Nayapul- Pawati- Dandakharka	28.12	23.63
22DR014	Mude- Melung- Sitali	51.00	36.00
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00	9.00
Total		316.14	224.44

3.2.3 CROSS DRAINAGE

Table 3.2.3 Required cross drainage structures

Code	Description	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
22DR001	Bhorle- Jaintipur- Marbu	16	-	100	50	2
22DR002	Singati- Bulung- Gagar	-	-	80	80	2
22DR003	Singati- Sorung Sangwa	-	-	20	-	-
22DR004	Sunkhani- Sangwa	15		260	20	
22DR005	Kalinchok- Bigu	-	-	30		
22DR006	Namdu- Jugu- Jhyaku- Bhorle	37	12	70	70	10
22DR007	Makaibari- Deurali- Panighat- Kshemawati	-	6	70	20	-
22DR008	Busti- Putalikath- Thulopatal Laharemane	-	-	36		-
22DR009	Khawa- Chhaude	-	-	-	-	-
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	27	10	20		-
22DR011	Bhirkot- Sahare- Hawa- Jiri	-	-	10	10	-
22DR012	Ghyawapani- Sera- Surke - Nigale	50	-	50	40	4
22DR013	Nayapul- Pawati- Dandakharka	24		100	50	2
22DR014	Mude- Melung- Sitali	25	10	120	100	3
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	-	-	110	90	5
Total		194	38	1,076	530	28

3.2.4 PROTECTIVE STRUCTURES

Table 3.2.4 Required protective structures

Code	Description	Masonry walls (m ³)	Gabion walls (m ³)	Lined drain (m)
22DR001	Bhorle- Jaintipur- Marbu	-	8,000	16,000
22DR002	Singati- Bulung- Gagar	-	9,000	18,000
22DR003	Singati- Sorung Sangwa	-	1,200	6,500
22DR004	Sunkhani- Sangwa	150	10,000	8,000
22DR005	Kalinchok- Bigu	50	8,000	4,200
22DR006	Namdu- Jugu- Jhyaku- Bhorle	30	1,450	19,100
22DR007	Makaibari- Deurali- Panighat- Kshemawati	50	5,000	9,000
22DR008	Busti- Putalikath- Thulopatal- Laharemane	50	7,000	13,500
22DR009	Khawa- Chhaude		2,500	17,000
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	100	10,000	8,000
22DR011	Bhirkot- Sahare- Hawa- Jiri	-	2,000	24,000
22DR012	Ghyawapani- Sera- Surke - Nigale	-	3,000	13,500
22DR013	Nayapul- Pawati- Dandakharka		500	12,500
22DR014	Mude- Melung- Sitali	-	11,000	25,000
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	-	4,000	13,000
Total		430	82,650	207,300

3.2.5 WIDENING

Table 3.2.5 Sections of the district road core network requiring widening

Code	Description	Total length (km)	Widening (m)
22DR001	Bhorle- Jaintipur- Marbu	16.00	
22DR002	Singati- Bulung- Gagar	18.50	
22DR003	Singati- Sorung Sangwa	7.07	
22DR004	Sunkhani- Sangwa	28.92	
22DR005	Kalinchok- Bigu	7.50	
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23	
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00	-
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00	-
22DR009	Khawa- Chhaude	19.30	-
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	-
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50	-
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00	-
22DR013	Nayapul- Pawati- Dandakharka	28.12	-
22DR014	Mude- Melung- Sitali	51.00	-
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00	-
Total		316.14	-

3.2.6 BLACKTOPPING

Table 3.2.6 Sections of the district road core network requiring blacktopping

Code	Description	Total length (km)	Blacktop (km)	Traffic (VPD)	Blacktopping (km)
22DR001	Bhorle- Jaintipur- Marbu	16.00	-	2.00	-
22DR002	Singati- Bulung- Gagar	18.50	-	6.00	-
22DR003	Singati- Sorung Sangwa	7.07	-	16.00	-
22DR004	Sunkhani- Sangwa	28.92	-	18.00	-
22DR005	Kalinchok- Bigu	7.50	-	5.00	-
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23	-	7.00	-
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00	-	4.00	-
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00	-	4.00	-
22DR009	Khawa- Chhaude	19.30	-	8.00	-
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	-	4.00	-
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50	-	11.00	-
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00	-	6.00	-
22DR013	Nayapul- Pawati- Dandakharka	28.12	-	12.00	-
22DR014	Mude- Melung- Sitali	51.00	-	16.00	-
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00	-	8.00	-
Total		316.14	-		-

3.3 NEW CONSTRUCTION

Table 0.1 Sections of the district road core network requiring new construction

Code	Description	New VDCs	Existing length	New length	Bridge (m)
22DR001	Bhorle- Jaintipur- Marbu		16.00	14.00	0
22DR002	Singati- Bulung- Gagar		18.50	16.50	36
22DR003	Singati- Sorung Sangwa	Alampu, Bigu	7.07	10.00	37
22DR004	Sunkhani- Sangwa	Khopachagu, Bigu	28.92	3.08	45
22DR005	Kalinchok- Bigu	Bigu	7.50	11.50	15
22DR006	Namdu- Jugu- Jhyaku- Bhorle	Suri	28.23	16.77	27
22DR007	Makaibari- Deurali- Panighat- Kshemawati		9.00	-	0
22DR008	Busti- Putalikath- Thulopatal- Laharemane		15.00	-	0
22DR009	Khawa- Chhaude		19.30	-	0
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa		25.00	-	0
22DR011	Bhirkot- Sahare- Hawa- Jiri		33.50	2.00	49
22DR012	Ghyawapani- Sera- Surke - Nigale		15.00	-	0
22DR013	Nayapul- Pawati- Dandakharka		28.12	7.00	27
22DR014	Mude- Melung- Sitali		51.00	4.00	15
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari		14.00	7.00	36
Total			316.14	91.85	287

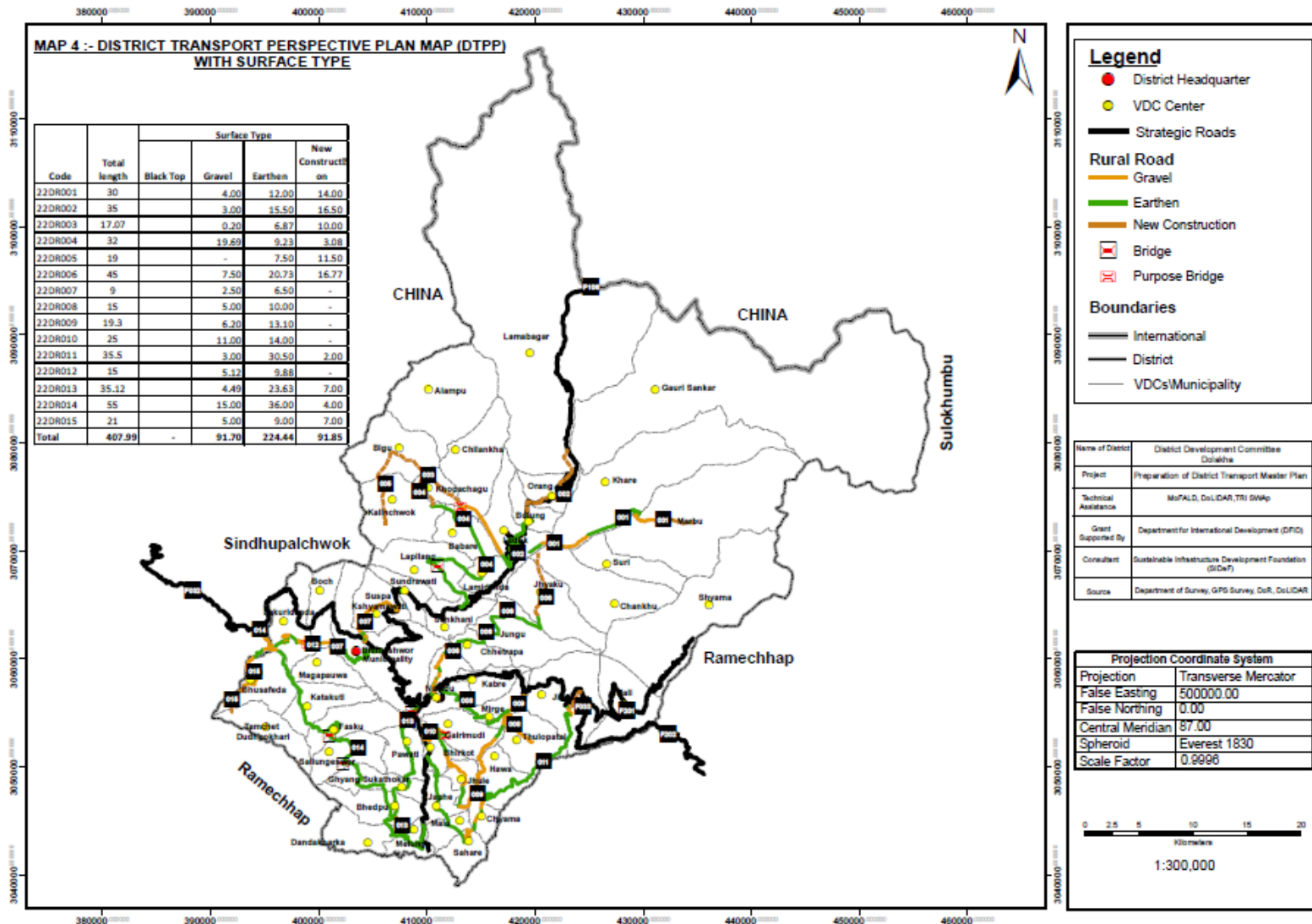
3.4 DISTRICT TRANSPORT PERSPECTIVE PLAN

The DTPP looks at the DTPP at the new construction, rehabilitation, and upgrading works deemed necessary, which are ranked according to the specific criteria. New construction is required where the existing network does not provide sufficient accessibility. Whereas the roads are found to be in poor condition upgrading is required. All of the DRCN roads of Dolakha district are fair weather. To make them all weather 224.44 Km roads should be gravelled, 481 m bridge, 38m slab culvert, 1076m cc causeway, 530m stone causeway, 28 no. of pipe culvert, 430 cubic meter masonry wall, 82,650 cubic meter gabion wall and 207,300m line drain is to be constructed.

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)
22DR001	16.00	16.00	16.00	16.00	4.00	12.00	-	-	16.00	-	100.00	50.00	2.00	-	8,000.00	16,000.00	14.00
22DR002	18.50	18.50	18.50	18.50	6.00	15.50	-	-	36.00	-	80.00	80.00	2.00	-	9,000.00	18,000.00	16.50
22DR003	7.07	7.07	7.07	7.07	-	6.87	-	-	37.00	-	20.00	-	-	-	1,200.00	6,500.00	10.00
22DR004	28.92	28.92	28.92	28.92	10.10	9.23	-	-	60.00	-	260.00	20.00	-	150.00	10,000.00	8,000.00	3.08
22DR005	7.50	7.50	7.50	7.50	6.00	7.50	-	-	15.00	-	30.00	-	-	50.00	8,000.00	4,200.00	11.50
22DR006	28.23	28.23	28.23	28.23	8.00	20.73	-	-	64.00	12.00	70.00	70.00	10.00	30.00	1,450.00	19,100.00	16.77
22DR007	9.00	9.00	9.00	9.00	0.30	6.50	-	-	-	6.00	70.00	20.00	-	50.00	5,000.00	9,000.00	-
22DR008	15.00	15.00	15.00	15.00	8.00	10.00	-	-	-	-	36.00	-	-	50.00	7,000.00	13,500.00	-
22DR009	19.30	19.30	19.30	19.30	7.00	13.10	-	-	-	-	-	-	-	-	2,500.00	17,000.00	-
22DR010	25.00	25.00	25.00	25.00	15.00	14.00	-	-	27.00	10.00	20.00	-	-	100.00	10,000.00	8,000.00	-
22DR011	33.50	33.50	33.50	33.50	3.50	30.50	-	-	49.00	-	10.00	10.00	-	-	2,000.00	24,000.00	2.00
22DR012	15.00	15.00	15.00	15.00	0.50	9.88	-	-	50.00	-	50.00	40.00	4.00	-	3,000.00	13,500.00	-
22DR013	28.12	28.12	28.12	28.12	1.00	23.63	-	-	51.00	-	100.00	50.00	2.00	-	500.00	12,500.00	7.00
22DR014	51.00	51.00	51.00	51.00	1.50	36.00	-	-	40.00	10.00	120.00	100.00	3.00	-	11,000.00	25,000.00	4.00
22DR015	14.00	14.00	14.00	14.00	5.00	9.00	-	-	36.00	-	110.00	90.00	5.00	-	4,000.00	13,000.00	7.00
Total	316.14	316.14	316.14	316.14	75.90	224.44	0	0	481	38	1,076	530	28	430	82,650	207,300	91.85

Figure 4 District Transport Perspective Plan (DTPP)



4. COST ESTIMATION

With the DTPP providing the full list of required interventions to bring the DRCN to a maintainable all-weather standard and keep it there, the costs of these interventions is calculated using the standard costs determined.

The conservation, improvement, new construction costs are calculated for the first year as an indication of the amount of funding required. The costs are estimated by multiplying the length of roads requiring conservation, improvement, new construction by the relevant standard cost, taking into account the surface type for recurrent and periodic maintenance. These estimated costs reflect the costs for the first year of keeping the existing DRCN in good condition. A cost for later years varies due to changes to the road network in terms of upgrading and new construction.

4.1 CONSERVATION

The conservation costs are calculated by multiplying the length of roads requiring conservation by the standard cost provided by Dolakha DTO, taking into account the surface type for recurrent and periodic maintenance.

Table 4.1.1 Standard unit costs for conservation

Activity	Unit	Unit cost (NPR/km)
Emergency maintenance	km	50,000
Routine maintenance	km	30,000
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

The total conservation costs for the first year is Rs 141,006,000 the total estimated conservation cost for the five year is Rs 705,031,000. Due to the road length and road surface, the cost will be changed in later year.

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
22DR001	16.00	-	4.00	12.00	800	480	-	1,600	3,000	-	1,000	6,880	34,400
22DR002	18.50	-	3.00	15.50	925	555	-	1,200	3,875	-	750	7,305	36,525
22DR003	7.07	-	0.20	6.87	354	212	-	80	1,718	-	50	2,413	12,066
22DR004	28.92	-	19.69	9.23	1,446	868	-	7,876	2,308	-	4,923	17,420	87,098
22DR005	7.50	-	-	7.50	375	225	-	-	1,875	-	-	2,475	12,375
22DR006	28.23	-	7.50	20.73	1,412	847	-	3,000	5,183	-	1,875	12,316	61,580
22DR007	9.00	-	2.50	6.50	450	270	-	1,000	1,625	-	625	3,970	19,850
22DR008	15.00	-	5.00	10.00	750	450	-	2,000	2,500	-	1,250	6,950	34,750
22DR009	19.30	-	6.20	13.10	965	579	-	2,480	3,275	-	1,550	8,849	44,245
22DR010	25.00	-	11.00	14.00	1,250	750	-	4,400	3,500	-	2,750	12,650	63,250
22DR011	33.50	-	3.00	30.50	1,675	1,005	-	1,200	7,625	-	750	12,255	61,275
22DR012	15.00	-	5.12	9.88	750	450	-	2,048	2,470	-	1,280	6,998	34,990
22DR013	28.12	-	4.49	23.63	1,406	844	-	1,796	5,908	-	1,123	11,076	55,378
22DR014	51.00	-	15.00	36.00	2,550	1,530	-	6,000	9,000	-	3,750	22,830	114,150
22DR015	14.00	-	5.00	9.00	700	420	-	2,000	2,250	-	1,250	6,620	33,100
Total	316.14	-	91.70	224.44	15,807	9,484	-	36,680	56,110	-	22,925	141,006	705,031

4.2 IMPROVEMENT

The improvement costs are calculated by multiplying the length of roads requiring to the standard cost provided by the DDC Dolakaha, taking into account the surface type for recurrent and periodic maintenance.

Table 4.2.1 Standard unit costs for improvement activities

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	800,000
Widening	m	2,500
Gravelling	km	1,200,000
Blacktopping	km	5,700,000
Bridge construction	m	1,000,000
Slab culvert construction	m	400,000
CC Causeway construction	m	75,000
Stone Causeway construction	m	4,000
Pipe culvert placement	unit	10,000
Masonry wall construction	m ³	10,000
Gabion wall construction	m ³	4,000
Lined drain construction	m	1,000

The total estimated cost for the different improvement measure for the DRCN roads of Dolakha is Rs. 1,164,548,000.

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
22DR001	16.00	3,200	-	14,400	-	16,000	-	7,500	200	20	-	32,000	16,000	89,320
22DR002	18.50	4,800	-	18,600	-	-	-	6,000	320	20	-	36,000	18,000	83,740
22DR003	7.07	-	-	8,244	-	-	-	1,500	-	-	-	4,800	6,500	21,044
22DR004	28.92	8,080	-	11,076	-	15,000	-	19,500	80	-	1,500	40,000	8,000	103,236
22DR005	7.50	4,800	-	9,000	-	-	-	2,250	-	-	500	32,000	4,200	52,750
22DR006	28.23	6,400	-	24,876	-	37,000	4,800	5,250	280	100	300	5,800	19,100	103,906
22DR007	9.00	240	-	7,800	-	-	2,400	5,250	80	-	500	20,000	9,000	45,270
22DR008	15.00	6,400	-	12,000	-	-	-	2,700	-	-	500	28,000	13,500	63,100
22DR009	19.30	5,600	-	15,720	-	-	-	-	-	-	-	10,000	17,000	48,320
22DR010	25.00	12,000	-	16,800	-	27,000	4,000	1,500	-	-	1,000	40,000	8,000	110,300
22DR011	33.50	2,800	-	36,600	-	-	-	750	40	-	-	8,000	24,000	72,190
22DR012	15.00	400	-	11,856	-	50,000	-	3,750	160	40	-	12,000	13,500	91,706
22DR013	28.12	800	-	28,356	-	24,000	-	7,500	200	20	-	2,000	12,500	75,376
22DR014	51.00	1,200	-	43,200	-	25,000	4,000	9,000	400	30	-	44,000	25,000	151,830
22DR015	14.00	4,000	-	10,800	-	-	-	8,250	360	50	-	16,000	13,000	52,460
Total	316.14	60,720	-	269,328	-	194,000	15,200	80,700	2,120	280	4,300	330,600	207,300	1,164,548

4.3 NEW CONSTRUCTION

The costs for new construction are calculated by multiplying the standard costs with the estimated new construction length

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Track opening	km	3,500,000
Gravelling	km	1,200,000
Bridge construction	m	1,000,000

The total estimated new construction costs for five year is Rs. 718,695,000.

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

Code	Description	Length (km)	Opening up	Gravelling	Bridges	Total cost
22DR001	Bhorle- Jaintipur- Marbu	14.00	49,000	16,800	-	65,800
22DR002	Singati- Bulung- Gagar	16.50	57,750	19,800	36,000	113,550
22DR003	Singati- Sorung Sangwa	10.00	35,000	12,000	37,000	84,000
22DR004	Sunkhani- Sangwa	3.08	10,780	3,696	45,000	59,476
22DR005	Kalinchok- Bigu	11.50	40,250	13,800	15,000	69,050
22DR006	Namdu- Jugu- Jhyaku- Bhorle	16.77	58,695	20,124	27,000	105,819
22DR007	Makaibari- Deurali- Panighat- Kshemawati	-	-	-	-	-
22DR008	Busti- Putalikath- Thulopatal- Laharemane	-	-	-	-	-
22DR009	Khawa- Chhaude	-	-	-	-	-
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	-	-	-	-	-
22DR011	Bhirkot- Sahare- Hawa- Jiri	2.00	7,000	,400	49,000	58,400
22DR012	Ghyawapani- Sera- Surke - Nigale	-	-	-	-	-
22DR013	Nayapul- Pawati- Dandakharka	7.00	24,500	,400	27,000	59,900
22DR014	Mude- Melung- Sitali	4.00	14,000	4,800	15,000	33,800
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	7.00	24,500	8,400	36,000	68,900
Total		91.85	321,475	110,220	287,000	718,695

4.4 DTPP COSTS

The total estimated cost for all DTPP interventions is Rs 2,588,274,000 for the DRCN roads of Dolakha.

Table 4.4.1 DTPP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
22DR001	34,400	89,320	65,800	189,520
22DR002	36,525	83,740	113,550	233,815
22DR003	12,066	21,044	84,000	117,110
22DR004	87,098	103,236	59,476	249,810
22DR005	12,375	52,750	69,050	134,175
22DR006	61,580	103,906	105,819	271,305
22DR007	19,850	45,270	-	65,120
22DR008	34,750	63,100	-	97,850
22DR009	44,245	48,320	-	92,565
22DR010	63,250	110,300	-	173,550
22DR011	61,275	72,190	58,400	191,865
22DR012	34,990	91,706	-	126,696
22DR013	55,378	75,376	59,900	190,654
22DR014	114,150	151,830	33,800	299,780
22DR015	33,100	52,460	68,900	154,460
Total	705,031	1,164,548	718,695	2,588,274

5. RANKING

The roads are ranked according to priority. Prioritization is according to the cost per capita, whereby a separate ranking is carried out for conservation, improvement and new construction. The cost of all the interventions under conservation, improvement or new construction is summed up for each road, and this total cost is divided by the population served by the road. The population served is defined as the total population of all VDCs linked by the road (excluding VDCs of which the headquarters are linked directly to the strategic road network)

5.1 CONSERVATION

For ranking of conservation, “Cost/person” and selecting “Sort smallest to largest”, the roads will be ranked in order of increasing cost per capita. The road with the highest priority (most benefit in relation to cost) will be at the top and the road with the lowest priority at the bottom. Then actual allocation to the different maintenance types will be determined in the ARMP.

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)
22DR003	7.07	354	212	-	80	1,718	-	50	2,413	8,488	284
22DR014	51.00	2,550	1,530	-	6,000	9,000	-	3,750	22,830	39,048	585
22DR013	28.12	1,406	844	-	1,796	5,908	-	1,123	11,076	16,644	665
22DR002	18.50	925	555	-	1,200	3,875	-	750	7,305	9,961	733
22DR006	28.23	1,412	847	-	3,000	5,183	-	1,875	12,316	15,912	774
22DR011	33.50	1,675	1,005	-	1,200	7,625	-	750	12,255	14,046	872
22DR008	15.00	750	450	-	2,000	2,500	-	1,250	6,950	7,760	896
22DR010	25.00	1,250	750	-	4,400	3,500	-	2,750	12,650	12,865	983
22DR012	15.00	750	450	-	2,048	2,470	-	1,280	6,998	6,512	1,075
22DR004	28.92	1,446	868	-	7,876	2,308	-	4,923	17,420	15,513	1,123
22DR007	9.00	450	270	-	1,000	1,625	-	625	3,970	3,437	1,155
22DR001	16.00	800	480	-	1,600	3,000	-	1,000	6,880	5,735	1,200
22DR015	14.00	700	420	-	2,000	2,250	-	1,250	6,620	4,541	1,458
22DR005	7.50	375	225	-	-	1,875	-	-	2,475	1,612	1,535
22DR009	19.30	965	579	-	2,480	3,275	-	1,550	8,849	5,247	1,686

5.2 IMPROVEMENT

For ranking of improvement, “Cost/person” and selecting “Sort smallest to largest”, the roads are ranked in order of increasing cost per capita. The road with the highest priority is at the top and the road with the lowest priority at the bottom. The actual allocation to the different maintenance types will be determined in the ARMP.

Table 5.2.1 Ranking of improvement works (NPR '000)

Code	Total length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
22DR003	7.07	21,044	8,488	2,479
22DR014	51.00	151,830	39,048	3,888
22DR013	28.12	75,376	16,644	4,529
22DR011	33.50	72,190	14,046	5,140
22DR006	28.23	103,906	15,912	6,530
22DR004	28.92	103,236	15,513	6,655
22DR008	15.00	63,100	7,760	8,131
22DR002	18.50	83,740	9,961	8,407
22DR010	25.00	110,300	12,865	8,574
22DR009	19.30	48,320	5,247	9,209
22DR015	14.00	52,460	4,541	11,553
22DR007	9.00	45,270	3,437	13,171
22DR012	15.00	91,706	6,512	14,083
22DR001	16.00	89,320	5,735	15,575
22DR005	7.50	52,750	1,612	32,723

5.3 NEW CONSTRUCTION

For ranking of new construction, “Cost/person” and selecting “Sort smallest to largest”, the roads will be ranked in order of increasing cost per capita. The road with the highest priority will be at the top and the road with the lowest priority at the bottom.

Table 5.3.1 Ranking of construction works (NPR '000)

Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
22DR007	-	-	3,437	-
22DR008	-	-	7,760	-
22DR009	-	-	5,247	-
22DR010	-	-	12,865	-
22DR012	-	-	6,512	-
22DR014	4.00	33,800	39,048	866
22DR013	7.00	59,900	16,644	3,599
22DR004	3.08	59,476	15,513	3,834
22DR011	2.00	58,400	14,046	4,158
22DR006	16.77	105,819	15,912	6,650
22DR003	10.00	84,000	8,488	9,896
22DR002	16.50	113,550	9,961	11,399
22DR001	14.00	65,800	5,735	11,473
22DR015	7.00	68,900	4,541	15,173
22DR005	11.50	69,050	1,612	42,835

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

The balancing of the available budget and the estimated costs of the required interventions, to determine which interventions can be carried out in the 5-year is the district transport master plan (DTMP). The 80% budget is allocated for the DRCN roads of Dolakha District and left 20% budget is allocated for village roads.

In the allocation of the DTMP budget, priority is given to conservation works, followed by improvement works and finally new construction. That is to say, any DTMP funding is first allocated to conservation, and remaining funds is allocated for improvement of the existing DRCN roads for maintainable all weather standards, and remaining allocated for new construction of DRCN roads, if there is still funding left over at the end of this process, this may be allocated to village roads. But in case of this 'Dolakha' district expected outcomes cannot be reach due to insufficient funding source.

6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

The financial resource is projected by taking the growth rate in particular funding source from the last year's budget. The total estimated amount is Rs. 312,275,865 for the 5-years DTMP period.

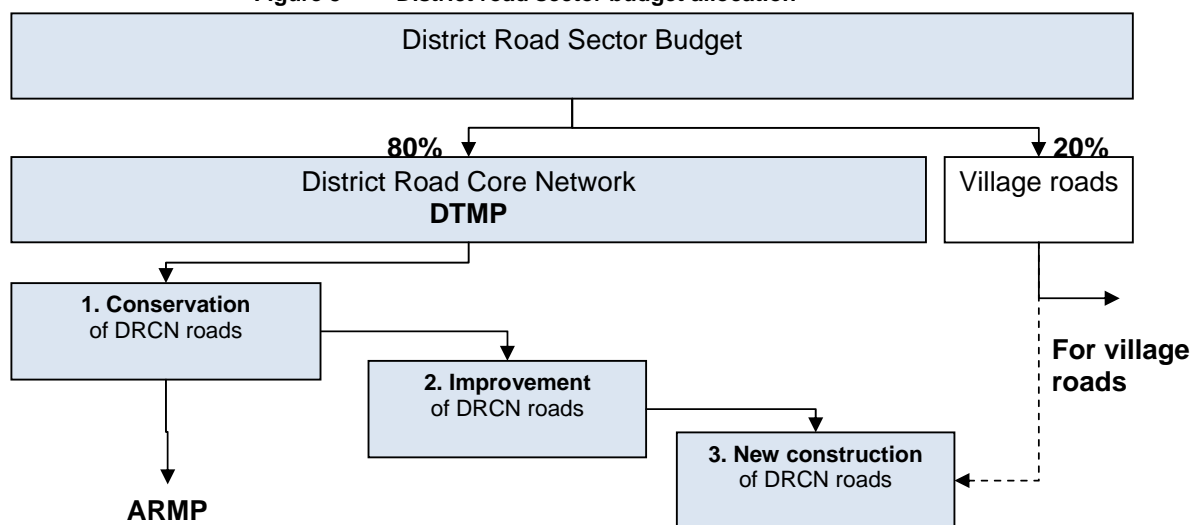
Table 6.1.1 Estimated funding levels (roads) for next five years (in NPR '000)

Funding source	2070/71	2071/72	2072/73	2073/74	2074/75
DDC Grant	5,500.00	6,050.00	6,655.00	7,320.50	8,052.55
LGCDP Grant	8,800.00	9,680.00	10,648.00	11,712.80	12,884.08
DDC Internal Revenue	3,300.00	3,630.00	3,993.00	4,392.30	4,831.53
Royalty Management	13,200.00	14,520.00	15,972.00	17,569.20	19,326.12
RTISWAP	17,710.00	19,481.00	21,429.10	23,572.01	25,929.21
Road Board Nepal	2,640.00	2,904.00	3,194.40	3,513.84	3,865.22
District Road Support Program	-	-	-	-	-
	-	-	-	-	-
RRRSDP	-	-	-	-	-
Total	51,150.00	56,265.00	61,891.50	68,080.65	74,888.72
Grand total	312,275.87				

6.2 BUDGET ALLOCATION

In the Dolakha district, 80% of the total estimated budget is allocated for the DRCN roads for the DTMP and rest 20% of the total budget is allocated for the village roads.

Figure 5 District road sector budget allocation



The DTMP completed with knowing costs of the different interventions, the roads can be ranked according to priority. Prioritization is according to the cost per capita, whereby a separate ranking is carried out for conservation, improvement and new construction. For the first year Rs. 40,920,000 budget is allocated for the DRCN roads and similarly Rs. 45,012,000, Rs. 49,513,000, Rs. 54,465,000, Rs. 59,911,000 for consequent year for the different intervention. For conservation Rs. 249,821,000 is allocated in five- year DTMP period.

Table 6.2.1 DTMP investment plan

Item				Year															
Fiscal year				2070/71			2071/72			2072/73			2073/74			2074/75			
Total budget				51,150			56,265			61,892			68,081			74,889			
Village roads				10,230			11,253			12,378			13,616			14,978			
Core road network budget (DTMP)				40,920			45,012			49,513			54,465			59,911			
Core network length (km)				316.14			316.14			316.14			316.14			316.14			
Blacktop (km)				-			-			-			-			-			
Gravel (km)				91.70			91.70			91.70			91.70			91.70			
Earthen (km)				224.44			224.44			224.44			224.44			224.44			
Conservation (NRs)				40,920			45,012			49,513			54,465			59,911			
Emergency				15,807			15,807			15,807			15,807			15,807			
Routine				9,484			9,484			9,484			9,484			9,484			
Recurrent (blacktop)				-			-			-			-			-			
Recurrent (gravel)				15,629			19,721			24,222			29,173			34,620			
Recurrent (earthen)				-			-			-			-			-			
Periodic (blacktop)				-			-			-			-			-			
Periodic (gravel)				-			-			-			-			-			
Improvement	Cost	BT	GR	0	BT	GR	0	BT	GR	0	BT	GR	0	BT	GR	0	BT	GR	
22DR003	21,044	-	6.87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR014	151,830	-	36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR013	75,376	-	23.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR011	72,190	-	30.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR006	103,906	-	20.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR004	103,236	-	9.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR008	63,100	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22DR002	83,740	-	15.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

22DR010	110,300	-	14.00	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR009	48,320	-	13.10	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR015	52,460	-	9.00	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR007	45,270	-	6.50	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR012	91,706	-	9.88	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR001	89,320	-	12.00	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR005	52,750	-	7.50	-	-	-	-	-	-	-	-	-	-	-	-	-
Total improvement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction	Cost	GR	-	GR	-	GR	-	GR	-	GR	-	GR	-	GR	-	GR
22DR007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR014	33,800	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR013	59,900	7.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR004	59,476	3.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR011	58,400	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR006	105,819	16.77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR003	84,000	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR002	113,550	16.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR001	65,800	14.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR015	68,900	7.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22DR005	69,050	11.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total new construction			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Remaining budget			-	-	-	-	-	-	-	-	-	-	-	-	-	-

6.3 DTMP OUTPUTS

The 316.14 km of the DRCN roads is conserved during DTMP period and Due to insufficient funding no improvement and new construction is allocated and incomplete works will complete in rest of the years.

Table 6.3.1 DTMP output			
Conservation	Improvement gravel	Improvement blacktop	New construction
316.14	-	-	-

The total budget for the five- years DTMP period for DRCN roads of Dolakha is Rs. 249,821,000 (80% of the total estimated budget) all of the estimated budget of DDC Dolakha will spent for conservation.

6.4 DTMP OUTCOME

At the end of DTMP works, 29% of DRCN roads will be in all weather gravel roads. All DTPP interventions that cannot be completed within the DTMP period due to insufficient funding source.

Table 6.4.1 Standard of DRCN roads

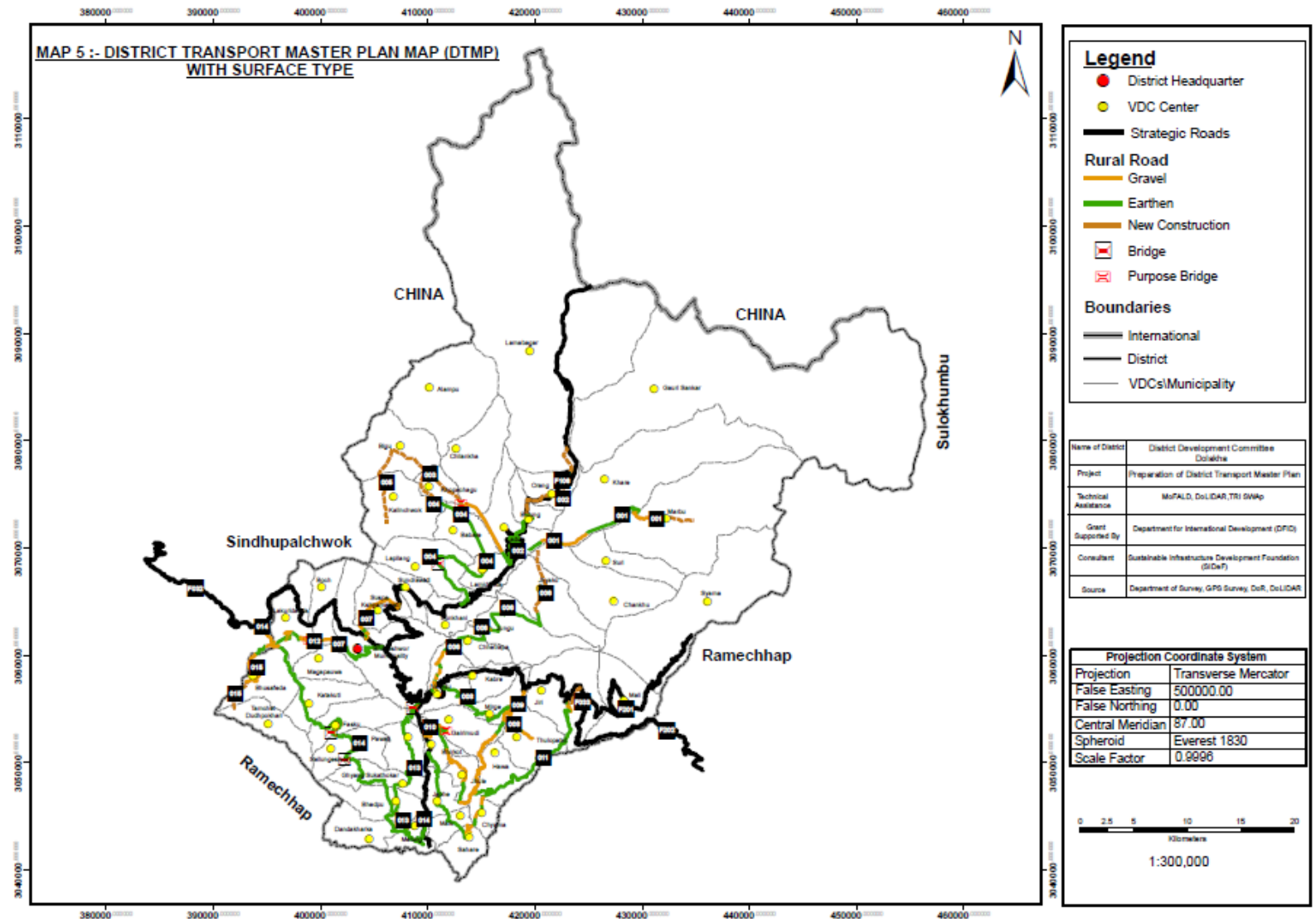
	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	316.14	224.44	71%	91.70	29%	-	0%
End of DTMP	316.14	224.44	71%	91.70	29%	-	0%
Difference	-	-	0%	-	0%	-	0%

19 VDCs are accessible through SRN roads which serves 46% of total population and 56% (35 VDCs) are accessible through the fair weather roads, 44% of total population are accessible through all weather DRCN roads at the start and end of the DTMP period. But one VDC (Gaurishankar) is not accessible after DTMP due to very high altitude of difficult topography.

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	19	85,690	46%	35	103,423	56%	16	80,701	44%	1	975	1%
End of DTMP	19	85,690	46%	35	103,423	56%	16	80,701	44%	1	975	1%
Difference	-	-	0%	-	-	0%	-	-	0%	-	-	0%

Figure 6 District Transport Master Plan (DTMP)



ANNEX 1 TRAFFIC DATA

Annex 1 Traffic data

Code	Description	Total length (km)	Motor-cycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU
22DR001	Bhorle- Jaintipur- Marbu	16.00	1		2		5
22DR002	Singati- Bulung- Gagar	18.50	2	3		3	16
22DR003	Singati- Sorung Sangwa	7.07	10	2	2	12	59
22DR004	Sunkhani- Sangwa	28.92	12	5	5	8	53
22DR005	Kalinchok- Bigu	7.50	25	3	1	1	22
22DR006	Namdu- Jugu- Jhyaku- Bhorle	28.23	5	2	2	3	21
22DR007	Makaibari- Deurali- Panighat- Kshemawati	9.00	5	2		2	13
22DR008	Busti- Putalikath- Thulopatal- Laharemane	15.00	4		2	2	14
22DR009	Khawa- Chhaude	19.30	8	2	3	3	24
22DR010	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	4	2		2	12
22DR011	Bhirkot- Sahare- Hawa- Jiri	33.50	11	2	5	4	34
22DR012	Ghyawapani- Sera- Surke - Nigale	15.00	3	2		4	20
22DR013	Nayapul- Pawati- Dandakharka	28.12	7	3	4	5	35
22DR014	Mude- Melung- Sitali	51.00	10	3	3	10	54
22DR015	Nigale-Bagkhor- Bhusafeda- Tamchet- Dudhpokhari	14.00	3	2	1	5	26
Total		316.14					

ANNEX 2 POPULATION SERVED

Annex 2 Population served

SN	VDC	Population	DRCN roads															SRN
			22DR001	22DR002	22DR003	22DR004	22DR005	22DR006	22DR007	22DR008	22DR009	22DR010	22DR011	22DR012	22DR013	22DR014	22DR015	
1	Alampu	1,803			X													
2	Babare	3,533				X												
3	Bhedpu	3,705													X	X		
4	Bhimeshwor Municipality	22,537																X
5	Bhirkot	2,562									X							X
6	Bhusafeda	2,091														X	X	
7	Bigu	1,612			X		X											
8	Boch	2,799												X				X
9	Bulung	2,043		X														X
10	Chankhu	1,272	X															
11	Kshetraba	2,447						X										
12	Chilankha	2,875			X													
13	Chyama	2,733											X					
14	Dandakharka	4,136													X	X		
15	Tamchet Dudhpokhari	2,450														X	X	
16	Fasku	4,338														X		
17	Gairimudi	4,278								X		X						
18	Gaurisankar	975																
19	Ghyangsukathokar	4,230													X	X		
20	Hawa	1,721									X		X					
21	Japhe	3,784										X	X					X
22	Jhule	2,241										X						
23	Jhyaku	4,637						X										
24	Jiri	7,373																X

SN	VDC	Population	DRCN roads															SRN
			22DR001	22DR002	22DR003	22DR004	22DR005	22DR006	22DR007	22DR008	22DR009	22DR010	22DR011	22DR012	22DR013	22DR014	22DR015	
25	jungu	3,882						X										
26	kabre	4,723																X
27	Kalinchok	2,806				X												
28	Katakuti	3,738														X		
29	Khare	1,833																
30	Khopachagu	2,198			X													
31	Laduk	3,663		X														X
32	Lakuridanda	3,713												X		X		X
33	Lambagar	2,098		X														X
34	Lamidanda	4,232				X												X
35	Lapilang	4,942				X												
36	Magapauwa	2,950														X		
37	Mali	2,749																X
38	Malu	2,482											X					
39	Marbu	1,409	X															
40	Melung	3,566														X		X
41	Mirge	3,482								X								
42	Namdu	4,946						X										X
43	Orang	2,157		X														X
44	Pawati	4,573													X			
45	Sahare	3,326											X					
46	Sailungeshwor	4,131														X		
47	Sunkhani	4,675																X

SN	VDC	Population	DRCN roads															SRN
			22DR001	22DR002	22DR003	22DR004	22DR005	22DR006	22DR007	22DR008	22DR009	22DR010	22DR011	22DR012	22DR013	22DR014	22DR015	
48	Sundrawati	2,766																X
49	Suri	3,054	X															
50	Suspa Kshemawati	3,437							x									X
51	Shyama	1,867																X
52	Thulopatal	3,526									X							
	Total population	185,099	5,735	9,961	8,488	15,513	1,612	15,912	3,437	7,760	5,247	12,865	14,046	6,512	16,644	39,048	4,541	85,690
	Total VDCs/municipalities	52	3	4	4	4	1	4	1	2	2	4	5	2	4	11	2	19

Source: Census 2011, CBS Nepal.

ANNEX 3 LOCATION OF PROPOSED INTERVENTIONS

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)
22DR01	Bhorle- Jaintipur- Marbu	16.00	0+000	16+000	4	12	-	-	16	-	100	50	2	-	8,000	16,000
22DR02	Singati- Bulung- Gagar	18.50	0+000	18+500	6	15.5	-	-	-	-	80	80	2	-	9,000	18,000
22DR03	Singati- Sorung Sangwa	7.07	0+000	7+070	0	6.87	-	-	-	-	20	-	-	-	1,200	6,500
22DR04	Sunkhani- Sangwa	28.92	0+000	28+920	10.1	9.23	-	-	15	-	260	20	-	150	10,000	8,000
22DR05	Kalinchok- Bigu	7.50	0+000	7+500	6	7.5	-	-	-	-	30	-	-	50	8,000	4,200
22DR06	Namdu- Jugu- Jhyaku- Bhorle	28.23	0+000	28+230	8	20.73	-	-	37	12	70	70	10	30	1,450	19,100
22DR07	Makaibari- Deurali- Panighat- Kshemawati	9.00	0+000	9+000	0.3	6.5	-	-	-	6	70	20	-	50	5,000	9,000
22DR08	Busti- Putalikath- Thulopatal- Laharemane	15.00	0+000	15+000	8	10	-	-	-	-	36	-	-	50	7,000	13,500
22DR09	Khawa- Chhaude	19.30	0+000	19+300	7	13.1	-	-	-	-	-	-	-	-	2,500	17,000
22DR10	Bhirkot- Gairimudi- Chhaude- Hawa	25.00	0+000	25+000	15	14	-	-	27	10	20	-	-	100	10,000	8,000
22DR11	Bhirkot- Sahare- Hawa- Jiri	33.50	0+000	33+500	3.5	30.5	-	-	-	-	10	10	-	-	2,000	24,000
22DR12	Ghyawapani- Sera- Surke- Nigale	15.00	0+000	15+000	0.5	9.88	-	-	50	-	50	40	4	-	3,000	13,500
22DR13	Nayapul- Pawati- Dadakharka	28.12	0+000	28+120	1	23.63	-	-	24	-	100	50	2	-	500	12,500
22DR14	Mude- Melung- Sitali	51.00	0+000	51+000	1.5	36	-	-	25	10	120	100	3	-	11,000	25,000
22DR15	Nigale-Bagkhor- Bhusefeda- Tamchet- Dudhpokhari	14.00	0+000	14+000	5	9	-	-	-	-	110	90	5	-	4,000	13,000
Total		316.14			75.90	224.44	0	0	194	38	1076	530	28	430	82650	207300

