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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,

Chitwan

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Sinnamangal, Kathmandu) for the District Development Committee (DDC) and District
Technical Office (DTO), Chitwan with Technical Assistance from the Department of
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Government of Nepal
Ministry Of Federal Affairs and Local Development
Office of the District Development Committee
Chitwan

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FOREWORD

It is my pleasure to introduce this District Transport Master Plan (DTMP) of Chitwan 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, 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.

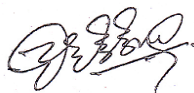
Therefore, it is most crucial in expanding rural road networks in a planned way as per the District Transport Master Plan (DTMP) by considering the framework of available resources in DDC comprising both internal and external sources. Considering these aspects, Rural Transport Infrastructure (RTI) Sector Maintenance Pilot / DoLIDAR 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 duplication in resources allocation under the rural road network development of Chitwan District.

In the course of finalizing DTMP, some additional roads which are also important from the district perspective are also included in the report as per the discussion and suggestion obtained from the final workshop organized in DDC Chitwan to allocate the resources in the situation of availability of fund in future in addition to the District Core Network (DRCN) roads.

I would like to thank to Er. Ram Chandra Dangal, DTO Chief, Er. Punya Ram Sulu, Engineer 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 SIDeF team - Er. Hare Ram Shrestha, Project Director, Er. Chuda Mani Ghimire, Team Leader, Er. Yadu Kishor Shrestha, Engineer and Binod Dhakal, GIS expert for their continuous dedication, and cooperation in bringing this DTMP to final stage.

My special thank goes to all the representatives of political parties and other District Project Coordination Committee (DPCC) 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.



Tilak Paudel
Local Development Officer
District Development Committee, Chitwan, Nepal.

ACKNOWLEDGEMENT

This Final report on the Preparation of District Transport Master Plan (DTMP) of Chitwan District has been prepared under the contract agreement between RTI Sector Maintenance Pilot, DoLIDAR and SDeF, Kathmandu.

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

We would like to extend our heartfelt gratitude to the District Development Committee (DDC) Chitwan for providing cooperation to carry out this task.

SDeF would like to express our gratitude to Mr. Tilak Paudel, Local Development Officer, Er. Ram Chandra Dangal, Chief DTO, Er. Punya Ram Sulu, DTO 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.

Thank goes to our team of Er. Chuda Mani Ghimire, Team Leader, Er. Yadu Kishor Shrestha, Binod Dhakal, GIS expert who continuously worked to finalize the DTMP.

Hare Ram Shrestha

Project Director
On behalf of
SDeF

EXECUTIVE SUMMARY

Chitwan district is located in Narayani Zone of Central Development Region of Nepal. It Borders with Makawanpur and Parsa districts to the east, Nawalparasi to the West, Tanahu, Gorkha and Dhading to the North and India to the south. The district consists 2 municipalities and 36 VDCs. Topographic location of Chitwan district is 83° 55' to 84° 48' north longitude and 27° 21' to 27° 46' east latitude. Total area of Chitwan district is 2238.39 Km². Elevation above mean sea level ranges from 144 m. (min.) to 1947 m. (max.). The annual rainfall is 2400 mm, the maximum temperature is 41.5° C and minimum temperature 3.5° C.

The main sources of occupations and livelihood of the district population are agriculture, livestock, small to medium industries, tourism industry and trading etc. The total population size is 579984 (male 279087, female 300897). The population density of the District is 261.49 per sq. km. The Average household size is 4.38 persons. The literacy rate of the district population is 77%. Chitwan district has multi ethnicity and the composition: majorities are Bramin 29.31%, Tharu 12.74%, Chhetri 10.95%, Tamng 7.36%, Gurung 6.73%, Newar 5.43%, Chepang 4.5%, Kami 4.45%, Magar 4.1%, Damai 2.24%, Kumal 1.61%, Darai 1.52%, Others 9.06%.

The major languages spoken in the Chitwan district are: Nepali 68.96%, Tharu 12.15%, Tamang 5.24%, Gurung 2.91%, Chepang 2.56%, Newar 2.29%, Magar 1.55%, Darai 1.22%, Bhojpuri 0.74%, Hindi 0.69%, Bote 0.25%, Maithali 0.23% and others 1.21%.

Chitwan district headquarter Bharatpur is connected by East-West highway and also accessed from Dhading, Gorkha, Tanahun by Prithvi Highway / Mugling Narayanghat Highway and accessed to Nawalparasi and Makawanpur by East-West highway.

In the Chitwan district total length of road is 2632.11 km where 96 km is SRN roads, 1065 km is Urban roads, 303.65 km is DRCN roads and 1167.46 km is Village roads.

The total length of DDC approved DRCN road is 303.65 Km out of which 67.77 km is blacktop, 160.66 km is gravel and 75.22 km is earthen. The table ES1 gives overall picture of road inventory of Chitwan.

Table ES1.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	96.00	96.00	-	-
Urban roads	1,065.00	330.00	530.00	205.00
District road core network	303.65	67.77	160.66	75.22
Village roads	1,167.46	54.28	1,017.24	95.94
Total	2,632.11	548.05	1,707.90	376.16

The total estimated cost for long list of conservation, improvement and new construction for DRCN selected in the district is NPR 1534348000.00. The cost for conservation is NPR 646609000.00, cost for improvement is NPR 763629000.00 and that for new construction is NPR 124110000.00 are worked out for DRCN roads.

Table ES2.

Improvement type	Requirement	Cost (NPR)
Bridges	125 M	71,875,000
Slab culverts	20 M	4,000,000
Causeways	39 M	2,925,000
Hume pipes	0 units	-
Masonry retaining walls	1192 m ³	11,920,000
Gabion retaining walls	6020 m ³	21,070,000
Lined drains	201350 M	201,350,000
Widening	2170 M	3,255,000
Rehabilitation	12.15 Km	1,458,000
Gravelling	83.22 Km	149,796,000
Blacktopping	100.36 Km	295,980,000
New construction	19.70 Km	124,110,000
Total		887,739,000

For 5-years planning the total budget estimated is NPR 706982000.00. As per the DDC decision, 70% of the total road sector budget has to be taken for DRCN roads which come to be NPR 494888000.00 where as the total estimated cost of DRCN road is NPR 1534348000.00. This clearly shows that budget allocation is not sufficient for all interventions. Hence, budget allocation is done based on the ranking priority as well as the priority that are envisaged from DDC authority to give high priority for improvement of DRCN of hilly area VDCs whatsoever the ranking result arrive at.

Since budget is not sufficient to allocate for all the inventions for DRCN roads as estimated, budget has been allocated to some realistic basis and worked out manually.

For 5-years planning, the total budget allocated for conservation is NPR 221078000.00, for improvement is NPR 223768000.00 and for new construction is NPR 50043000.00.

At end of DTMP period, the percentage changes of road condition are seen. The fair weather road length is reduced from 27% to 3%, all weather gravel road is improved from 50% to 74% and blacktop road remained unchanged. 1 VDC was not accessed by road at the start of DTMP. All VDCs will be accessed to road network at the end of DTMP period. Likewise, 4 VDCs (7% of population) were accessed to fair weather road, will be reduced to 1 VDC (1% of population). 31 VDCs (92 % of population) were accessed to all weather roads, will be accessed to 35 VDCs (99% of population) at the end of DTMP.

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
DPCC	District Project Coordination Committee
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
DTO	District Technical Office
DRCN	District Road Core Network
GIS	Geographical Information system
GPS	Global Positioning System
GON	Government of Nepal
LGCDP	Local Governance and Community Development Programme
RTI	Rural Transport Infrastructure
MFALD	Ministry of Federal Affairs and Local Development
SWAp	Sector Wide Approach
VDC	Village Development Committee

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1. INTRODUCTION

Chitwan district is located in Narayani Zone of Central Development Region of Nepal. It Borders with Makawanpur and Parsa districts to the east, Nawalparasi to the West, Tanahu, Gorkha and Dhading to the North and India to the south. The district consists 2 municipalities and 36 VDCs. Topographic location of Chitwan district is $83^{\circ} 55'$ to $84^{\circ} 48'$ north longitude and $27^{\circ} 21'$ to $27^{\circ} 46'$ east latitude. Total area of Chitwan district is 2238.39 Km². Elevation above mean sea level ranges from 144 m. (min.) to 1947 m. (max.). The annual rainfall is 2400 mm, the maximum temperature is 41.5⁰ C and minimum temperature 3.5⁰ C.

Figure 1 **Location of the Chitwan district**



The main sources of occupations and livelihood of the district population are agriculture, livestock, small to medium industries, tourism industry and trading etc. The total population size is 579984 (male 279087, female 300897). The population density of the District is 261.49 per sq. km. The Average household size is 4.38 persons. The literacy rate of the district population is 77%. Chitwan district has multi ethnicity and the composition: majorities are Bramin 29.31%, Tharu 12.74%, Chhetri 10.95%, Tamng 7.36%, Gurung 6.73%, Newar 5.43%, Chepang 4.5%, Kami 4.45%, Magar 4.1%, Damai 2.24%, Kumal 1.61%, Darai 1.52%, Others 9.06%.

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Chitwan district headquarter Bharatpur is connected by East-West highway and also accessed from Dhading, Gorkha, Tanahun by Prithvi Highway / Mugling Narayanghat Highway and accessed to Nawalparasi and Makawanpur by East-West highway.

2. DISTRICT ROAD CORE NETWORK (DRCN)

In the course of DTMP preparation, the entire road inventory existing in the district has been taken. A minimum network of rural roads that provides access to all VDC headquarters linking directly with district headquarter or to the SRN roads are identified to form the district road core network (DRCN). In the process of selecting DRCN, some DRCN roads are extended beyond the VDC headquarters and some roads are added to provide access to agriculturally potential areas as well as tourism potential areas as DDC members insisted to incorporate some extra roads in DRCN even if the VDC is already linked with DRCN. Some SRN roads are taken as DRCN roads since DDC is investing in those roads as well.

The total length of SRN Road is 96 km, Urban road is 1065 km and Rural road is 1471.11 km.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	96.00	96.00	-	-
Urban roads	1,065.00	330.00	530.00	205.00
Rural roads	1,471.11	122.05	1,177.90	171.16
Total	2,632.11	548.05	1,707.90	376.16

2.1 NATIONAL HIGHWAYS AND FEEDER ROAD

The total length of SRN road within Chitwan is 193 km where 151 km is blacktop and 42 km is gravel. Since the SRN Roads like Hakim Chok Madi Thori 65 km, Chaubiskothi Rampur Meghauri 25 km and Sauraha Road 7 km are included in the DRCN / Road inventory list also, these Road lengths are not shown in SRN total length as shown in table below. Hence total length of SRN considered is 96 km only.

Table 2.1.1 National Highways and Feeder Roads (km)

Code	Name of Road	Total length	Black Top	Gravel	Earthen
H04	Moa Khola Mugling PRM	17.00	17.00		
H05	Mugling Narayanghat	36.00	36.00		
H01	Narayanghat Lothar MRM	35.00	35.00		
F37	Bharatpur By Pass Road	4.50	4.50		
H05	Aanptari Devghat	3.50	3.50		
D35	Hakim Chok Mandi Thori	65.00	32.00	33.00	
F113	Chaubiskothi Rampur Meghauri	25.00	16.00	9.00	
F111	Sauraha Road	7.00	7.00		
	Total	96.00	96.00	0.00	0.00

2.2 DISTRICT ROAD CORE NETWORK

We developed inventory map using GIS software. After preparation of the inventory map for the identification of DRCN based on the criteria set out by DTMP Guidelines, DRCN was selected in consultation with DTO engineers and the technicians. Second meeting of DDC was called by DDC Chitwan on the 09 April 2013 for approval of DRCN. Some of the roads were extended and some of the roads were added in the proposed DRCN list as per the suggestions of political parties present in the meeting of DDC. Finally the DRCN was approved by DDC with some additions. The Approved List of the DRCN road is shown in the table below containing 20 nos. of roads.

The total length of approved DRCN road is 303.65 Km out of which 67.77 km is blacktop, 160.66 km is gravel and 75.22 km is earthen.

In the Chitwan district total length of road is 2632.11 km where 96 km is SRN roads, 1065 km is Urban roads, 303.65 km is DRCN roads and 1167.46 km is VRCN roads which are shown in the respective tables 2.3.1 and 2.3.2 as shown below.

Table 2.2.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	96	96	-	-
Highways	91.5	91.5		
Feeder roads	4.5	4.5		
Urban roads	1,065.00	330.00	530.00	205.00
Bharatpur Municipality	535.00	180.00	250.00	105.00
Ratnanagar Municipality	530.00	150.00	280.00	100.00
District road core network	303.65	67.77	160.66	75.22
Village roads	1,167.46	54.28	1,017.24	95.94
Total	2632.11	548.05	1,707.90	376.16

Table 2.2.2 District road core network (km)

Code	Description	Total length	Black Top	Gravel	Earthen	All weather	Fair weather
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - Mangalpur Ga Bi Sa - Bijayanagar – Beluwa	7.20	1.10	6.10		7.20	-
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur	19.20	0.30	18.90		19.20	
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	27.10	13.00	14.10		27.10	
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar – Rampur - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	12.50	13.30		25.80	
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	25.20	36.70		61.90	
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	0.94	9.56		10.50	-
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	3.20	0.30	2.90		3.20	-
35DR008	Bhorle-Dahakhani	18.9		18.90		18.90	-
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96		0.96		0.96	-
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10			24.10	-	24.10
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor	21.60		8.00	13.60	8.00	13.60
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	1.6	15.2		16.80	-
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	2.20	1.70		3.90	-
35DR014	Santi Chok (Highway) – Pithuwa	3.20	3.20			3.20	-
35DR015	Chainpur Chok (Highway) – Chainpur	2.30	1.66	0.64		2.30	-
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	5.40	3.50	1.90		5.40	-
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	0.89			0.89	-
35DR018	Khurkhure (Highway) – Kathar	2.60	0.70	1.90			
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20		8.90	9.30		
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	0.68	1	28.22		
	Total	303.65	67.77	160.66	75.22	215.25	37.70

Note: While taking length of DRCN road, the lengths which lie inside Municipality area are excluded for the roads which start from municipality area.

In the course of finalizing DTMP, some additional roads which are also important from the district perspective are also included in the report as per the discussion and suggestion obtained from the final workshop organized in DDC Chitwan to allocate the resources in the situation of availability of fund in future in addition to the District Core Network (DRCN) roads. Hence we recommend the following roads which are also important for Chitwan district.

No.	Name of Roads	Length (km)
1	Chitwan ring road.	135.00
2	Tikauli (Ratnanagar) – Bishajar tal – Gitanagar – Bhagwanpur – Kamalpokhari – Devi chok.	21.00
3	Mahendra highway – Tulsipur – Badauli – Sisahani – Janakpur (Kumroj).	6.50
4	MRM (Chainpur chok) – Ramgola (Chainpur) – Sivalaya chok – Niureni.	9.00
5	Hardi (MRM) – Shanti Bazar – Sundarbasti – Hajipur – Belsi (MRM).	10.00
6	Pidrahani – Kathar – Shanti Bazar – Khurkhure (MRM) – Dabadi Chok (Birendranagar).	7.50
7	Purano parsa – Surtana (Khairahani) – Badgau – Kapiya.	5.00
8	Shivaghat – Shanti chok – Dairy chok – Beluwa.	9.50
9	Dhungre Khola – Jhuwani – Tarauli – Phasera – Japkauli – Sinchai Pachhadi – Purano parsa – Naya parsa – Highway.	9.00
10	Naya parsa – Magani – Tungara – Rasauli.	7.50
11	Naya parsa – Unai Tole – Ladari – Patihani – Siddhi Boundary	7.50
12	Ganeshsthan – Khetbari - Dahakhani	10.00

2.3 VILLAGE ROADS

After the identification of DRCN roads, all other roads (1167.46km) that do not belong to the DRCN roads are classified as village roads and fall under the responsibility of the VDCs. The planning for these roads is not included in the DTMP, as they are not the responsibility of the district. The management of these roads will be the responsibility of the VDC and any planned interventions will be included in the annual work programme of the VDCs. Funding for these interventions will come from VDC grant, community contributions and the additional funding (30% as decided by DDC meeting) made available from DDC through rural roads project. VDCs will be responsible for emergency and routine/recurrent maintenance of these roads.

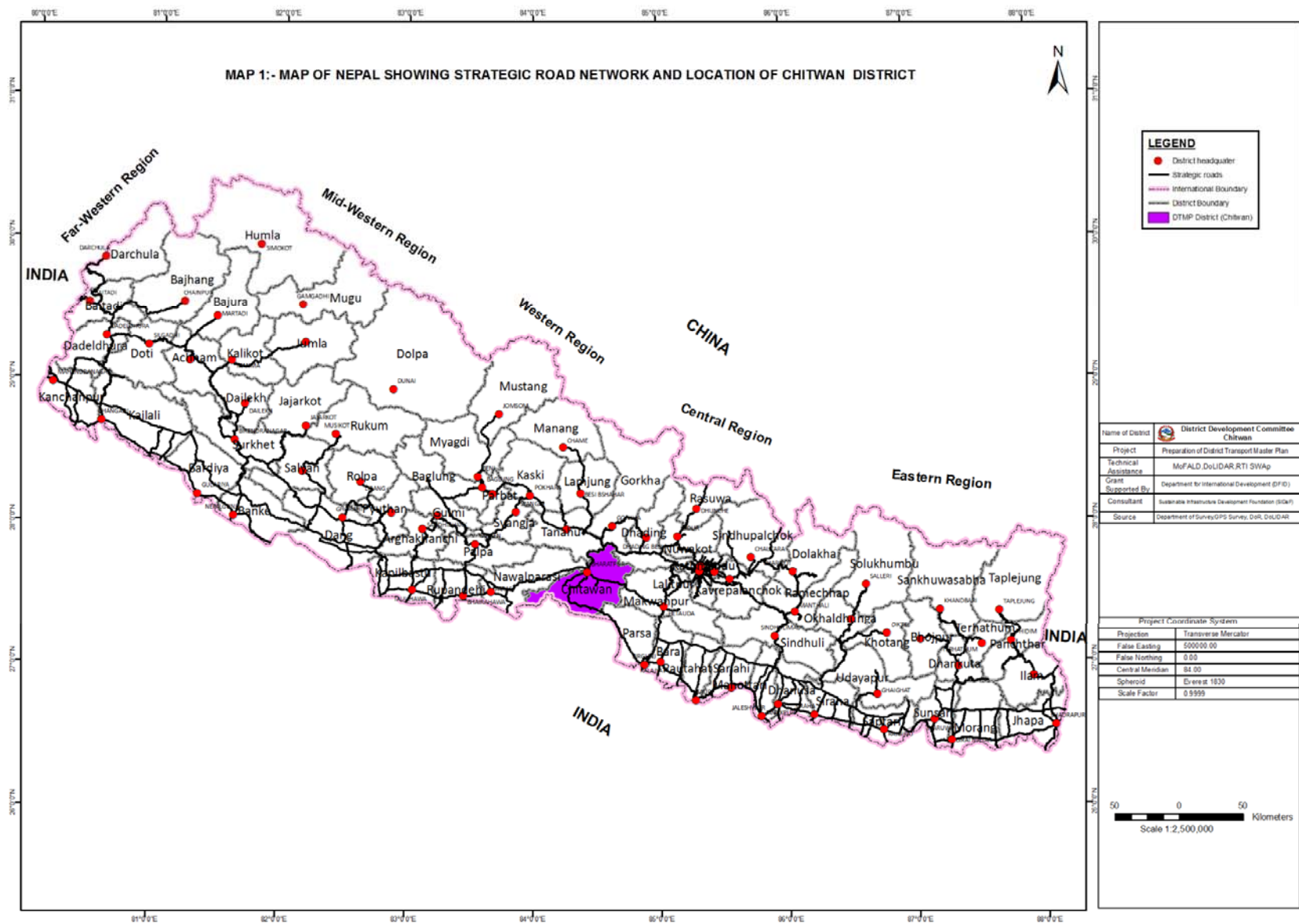


Figure 2 Total road inventory

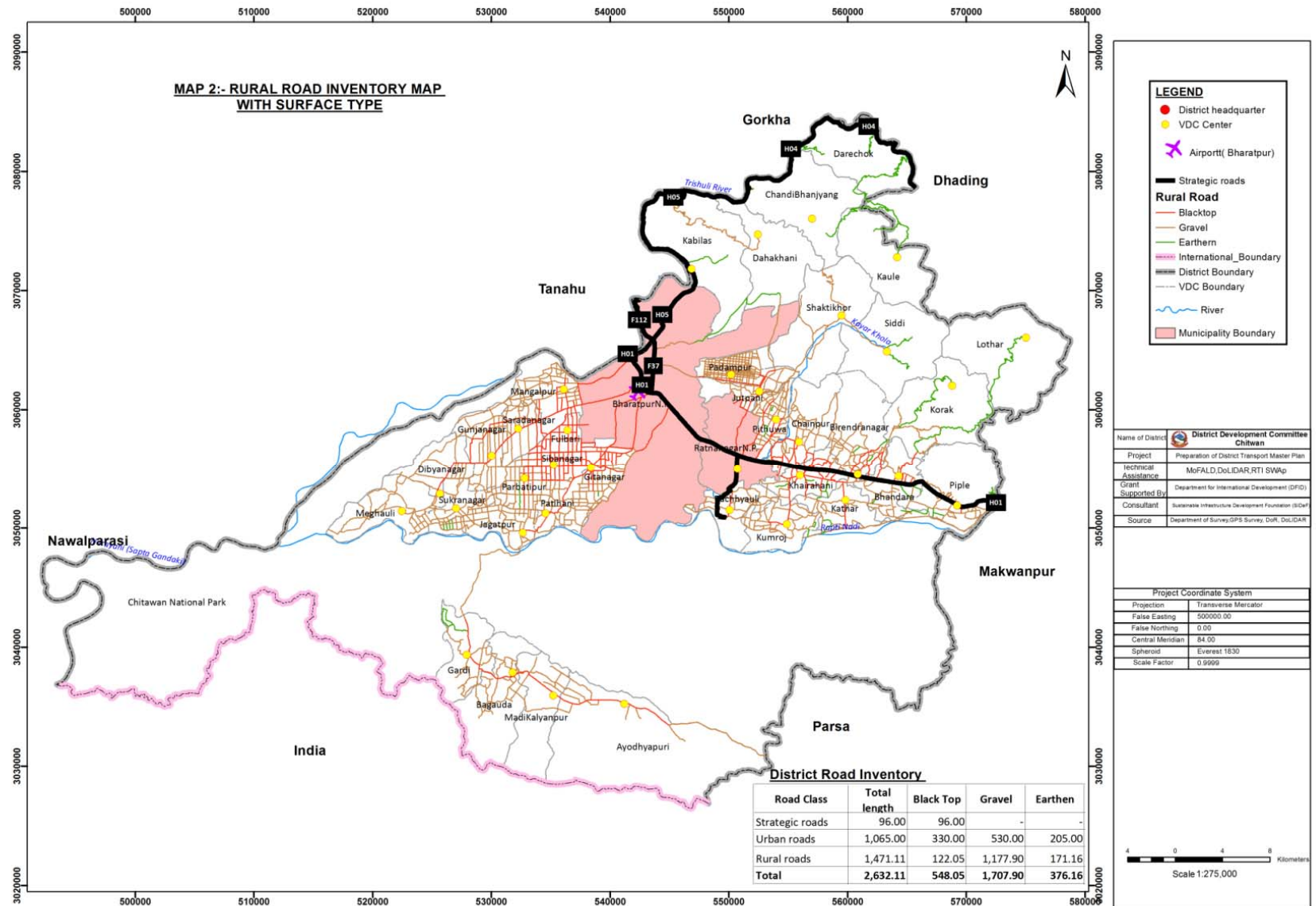
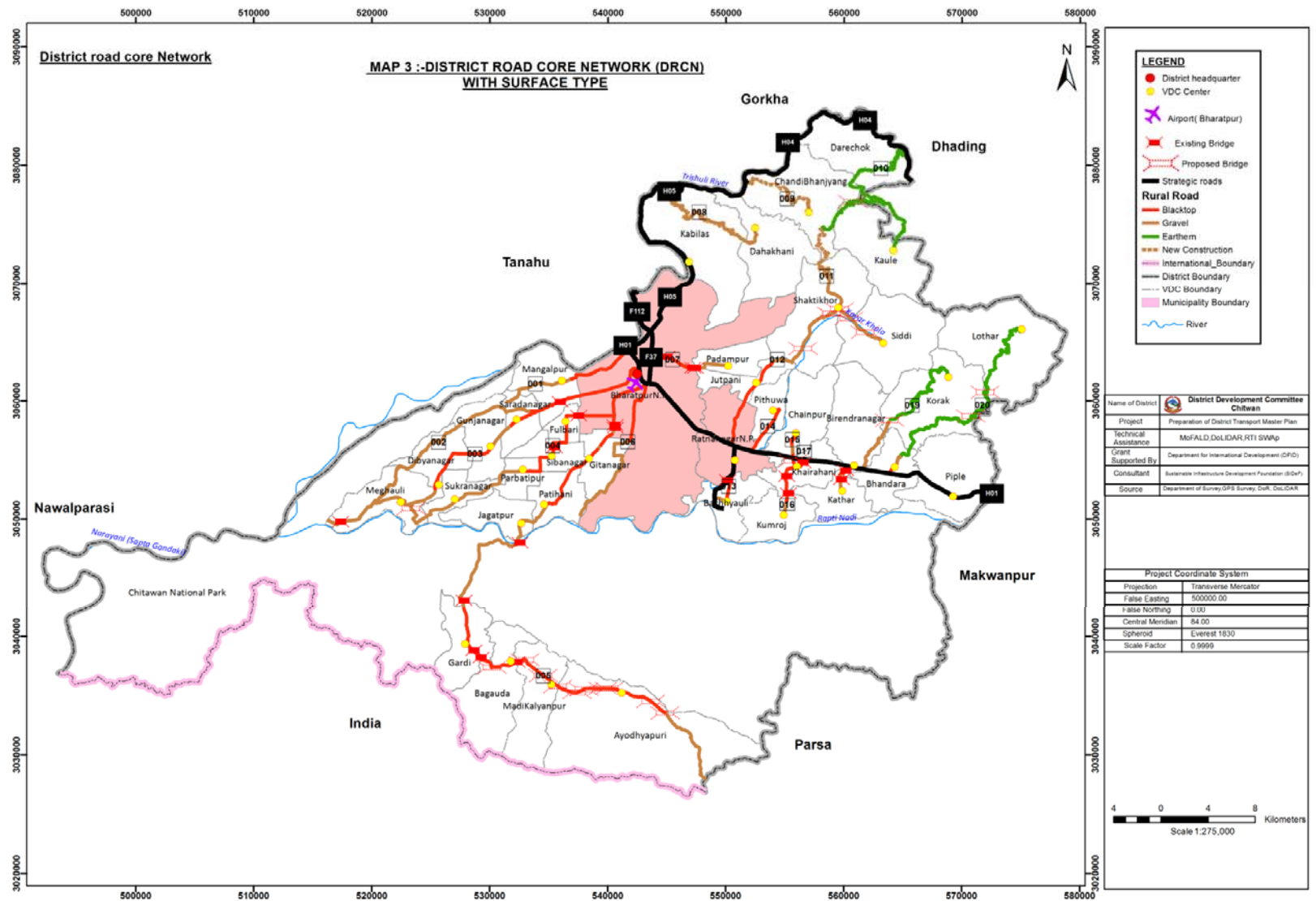


Figure 3 District Road Core Network (DRCN)



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

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

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
35DR001	7.20	7.20	7.20	7.20
35DR002	19.20	19.20	19.20	19.20
35DR003	27.10	27.10	27.10	27.10
35DR004	25.80	25.80	25.80	25.80
35DR005	61.90	61.90	61.90	61.90
35DR006	10.50	10.50	10.50	10.50
35DR007	3.20	3.20	3.20	3.20
35DR008	18.90	18.90	18.90	18.90
35DR009	0.96	0.96	0.96	0.96
35DR010	24.10	24.10	24.10	24.10
35DR011	21.60	21.60	21.60	21.60
35DR012	16.80	16.80	16.80	16.80
35DR013	3.90	3.90	3.90	3.90
35DR014	3.20	3.20	3.20	3.20
35DR015	2.30	2.30	2.30	2.30
35DR016	5.40	5.40	5.40	5.40
35DR017	0.89	0.89	0.89	0.89
35DR018	2.60	2.60	2.60	2.60
35DR019	18.20	18.20	18.20	18.20
35DR020	29.90	29.90	29.90	29.90
Total	303.65	303.65	303.65	303.65

3.2 IMPROVEMENT

For the road improvements, separate tables are prepared to show the required interventions for rehabilitation, gravelling (upgrading to gravel standard), cross drainage, protective structures, widening and blacktopping. For this purpose, the Tables 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5 and 3.2.6 are prepared.

3.2.1 REHABILITATION

Rehabilitation and upgrading refer to the existing road network where the roads are found to be in poor condition, to require technical improvement (curves, gradients, etc) or to require an improved road surface. During field survey the rehabilitation works to be carried out is found to be 12.15 km out of the entire length of DRCN roads.

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Name of Road	Total length (km)	Rehabilitation (km)
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa	7.20	
35DR002	Rampur - Taun - Simari Taun - Sajhapur - Jitpur	19.20	
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	27.10	
35DR004	Prem Basti Chok - Fulbari Chok - Sibnagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	0.4
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	3.20	
35DR008	Bhorle-Dahakhani	18.90	3
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	0.05
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	4.97
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	21.60	0.84
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	0.85
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	
35DR014	Santi Chok (Highway) – Pithuwa	3.20	
35DR015	Chainpur Chok (Highway) – Chainpur	2.30	
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	5.40	
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	
35DR018	Khurkhure (Highway) – Kathar	2.60	
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	0.21
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	1.83
Total		303.65	12.15

3.2.2 GRAVELLING

To improve the surface condition of the existing earthen roads considered in DRCN, 83.22 km will have to be converted into gravel standard to maintain as all weather condition.

Table 3.2.2 Sections of the district road core network requiring gravelling

Code	Name of Road	Total length (km)	Gravelling (km)
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar - Beluwa	7.20	-
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur	19.20	-
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	27.10	-
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	-
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	-
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	-
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	3.20	-
35DR008	Bhorle-Dahakhani	18.90	-
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	-
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	24.10
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	21.60	21.60
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	-
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	-
35DR014	Santi Chok (Highway) – Pithuwa	3.20	-
35DR015	Chainpur Chok (Highway) – Chainpur	2.30	-
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	5.40	-
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	-
35DR018	Khurkhure (Highway) – Kathar	2.60	-
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	9.30
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	28.22
	Total		83.22

3.2.3 CROSS DRAINAGE

To maintain the road in all weather condition, the required cross drainage structures are listed during the DRCN survey. The required cross drainage structures are shown in table below.

Table 3.2.3 Required cross drainage structures

Code	Name of Road	Bridge (m)	Slab culvert (m)	CC Cause way (m)	Stone Cause way (m)	Pipe culvert (units)
35DR001	Pulchok (Narayanghat) - Sivaghat - Praticchyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa					
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur					
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur - Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur - Golaghat					
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport					
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road					
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai					
35DR007	Bisal Chok (by pass) - Bhojad - Padampur					
35DR008	Bhorle-Dahakhani			15		
35DR009	Jalbire - Pangre (Chandivanjyang)					
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)					
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor	100	20	24		
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi					
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)					
35DR014	Santi Chok (Highway) – Pithuwa					
35DR015	Chainpur Chok (Highway) – Chainpur					
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	25				
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa					
35DR018	Khurkhure (Highway) – Kathar					
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)					
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)					
Total		125	20	39	-	-

3.2.4 PROTECTIVE STRUCTURES

To maintain the road in all weather condition, the required protective structures are listed during the DRCN survey. The required protective structures are shown in table below.

Table 3.2.4 Required protective structures

Code	Name of Road	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa			9000
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur			
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat			
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport			
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road			90000
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai			16000
35DR007	Bisal Chok (by pass) - Bhojad – Padampur			5000
35DR008	Bhorle-Dahakhani		100	21000
35DR009	Jalbire - Pangre (Chandivanjyang)			900
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	1000	1500	22000
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor		120	9000
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	15	4000	5000
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)			1100
35DR014	Santi Chok (Highway) – Pithuwa			4800
35DR015	Chainpur Chok (Highway) – Chainpur			1800
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj			5000
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa			1000
35DR018	Khurkhure (Highway) – Kathar			1000
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	77		2300
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	100	300	6450
	Total	1,192	6,020	201,350

3.2.5 WIDENING

To maintain the road in all weather condition, the required widening of each DRCN roads are listed during the DRCN survey. The required widening lengths to overcome the necking of the roads are shown in table below.

Table 3.2.5 Sections of the district road core network requiring widening

Code	Name of Road	Total length (km)	VPD	Widening (m)
35DR001	Pulchok (Narayanghat) - Sivaghat - Praticchhyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar - Beluwa	7.20	135.00	
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur	19.20	110.00	
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	27.10	165.00	
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	115.00	
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	275.00	
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	67.00	
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	3.20	40.00	
35DR008	Bhorle-Dahakhani	18.90	3.00	
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	-	
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	4.00	300
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	21.60	1.00	
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	23.00	530
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	52.00	
35DR014	Santi Chok (Highway) – Pithuwa	3.20	34.00	
35DR015	Chainpur Chok (Highway) – Chainpur	2.30	25.00	
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	5.40	33.00	250
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	46.00	
35DR018	Khurkhure (Highway) – Kathar	2.60	31.00	
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	11.00	
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	31.00	1090
Total				2,170

3.2.6 BLACKTOPPING

To improve the surface condition of the DRCN roads based on the PCU greater than 150, the required blacktopping of DRCN roads are listed during the DRCN survey. The required blacktopping length of the roads is shown in table below.

Table 3.2.6 Sections of the district road core network requiring blacktopping

				PCU	150
Code	Name of Road	Total length (km)	Blacktop (km)	Traffic (PCU)	Black topping (km)
35DR001	Pulchok (Narayanghat) - Sivaghat - Praticchhyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa	7.20	1.10	385	6.10
35DR002	Rampur - Taun - Simari Taun - Sajhapur - Jitpur	19.20	0.30	320	18.90
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	27.10	13.00	465	14.10
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	12.50	335	13.30
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	25.20	670	36.70
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	0.94	208	9.56
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	3.20	0.30	150	-
35DR008	Bhorle-Dahakhani	18.90	-	7	-
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	-	1	-
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	-	8	-
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor	21.60	-	2	-
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	1.60	133	-
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	2.20	232	1.70
35DR014	Santi Chok (Highway) – Pithuwa	3.20	3.20	154	-
35DR015	Chainpur Chok (Highway) – Chainpur	2.30	1.66	114	-
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	5.40	3.50	150	-
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	0.89	246	-
35DR018	Khurkhure (Highway) – Kathar	2.60	0.70	126	-
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	-	32	-
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	0.68	120	-
Total					100.36

3.3 NEW CONSTRUCTION

In Chitwan District one VDC headquarter is not connected with road network and one more road is not completed that are selected in DRCN. Hence these roads are proposed for new construction, which are shown in the table below.

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

Code	Name of Road	New VDCs	Existing length	New length	Bridge (m)
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa		7.20		
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur		19.20		
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat		27.10		
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport		25.80		
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road		61.90		
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai		10.50		
35DR007	Bisal Chok (by pass) - Bhojad – Padampur		3.20		
35DR008	Bhorle-Dahakhani		18.90		
35DR009	Jalbire - Pangre (Chandivanjyang)		0.96	18.00	
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)		24.10		
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor		21.60	1.70	
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi		16.80		
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)		3.90		
35DR014	Santi Chok (Highway) – Pithuwa		3.20		
35DR015	Chainpur Chok (Highway) – Chainpur		2.30		
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj		5.40		
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa		0.89		
35DR018	Khurkhure (Highway) – Kathar		2.60		
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)		18.20		
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)		29.90		
	Total		303.65	19.70	

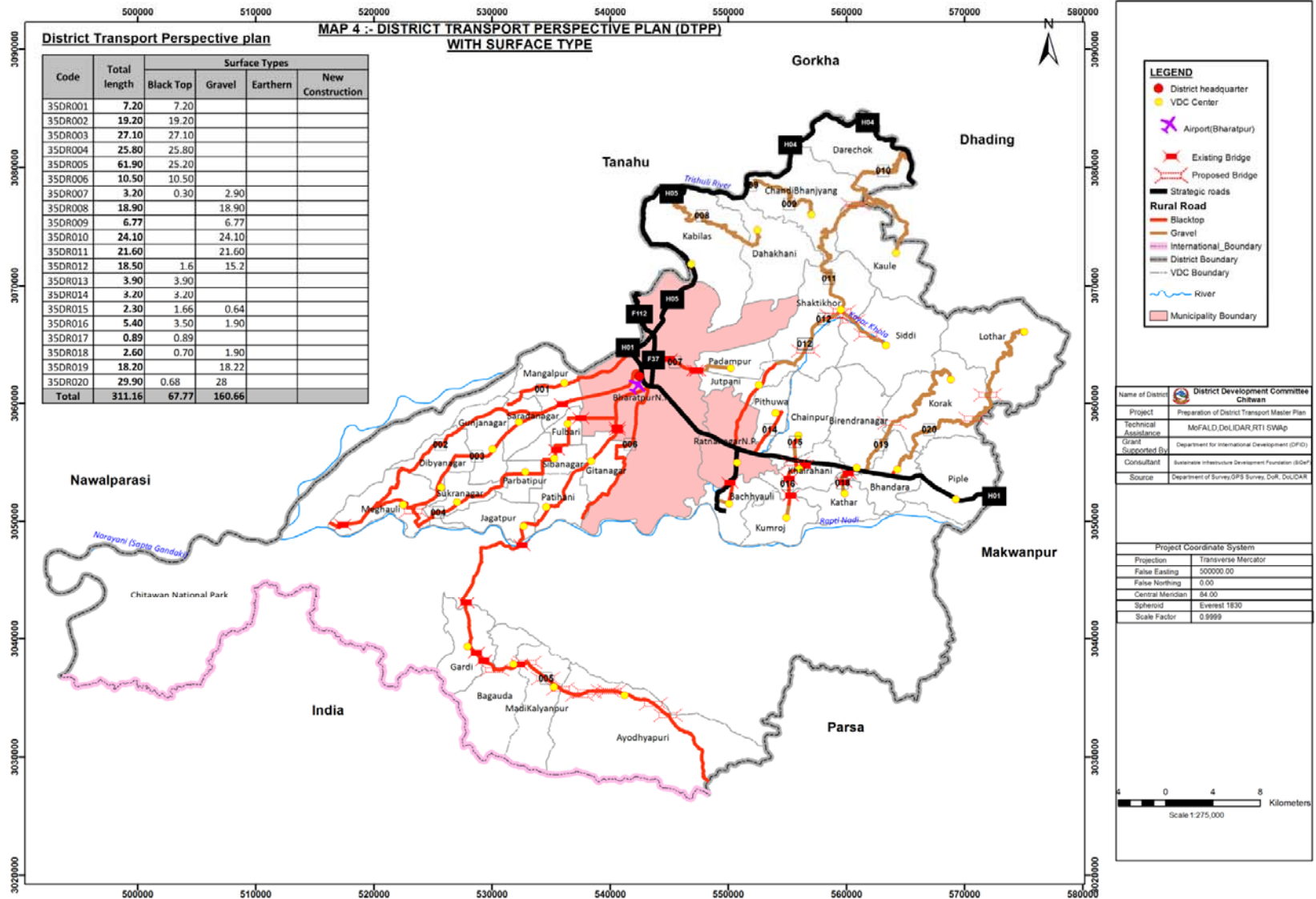
3.4 DISTRICT TRANSPORT PERSPECTIVE PLAN

The list of all the 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 are identified. 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 are worked out. The list of all the perspective interventions required are listed in the table 3.4.1 as listed below.

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)
35DR001	7.20	7.20	7.20	7.20	-	-	6.10	-	-	-	-	-	-	-	-	9,000.00	-
35DR002	19.20	19.20	19.20	19.20	-	-	18.90	-	-	-	-	-	-	-	-	-	-
35DR003	27.10	27.10	27.10	27.10	-	-	14.10	-	-	-	-	-	-	-	-	-	-
35DR004	25.80	25.80	25.80	25.80	-	-	13.30	-	-	-	-	-	-	-	-	-	-
35DR005	61.90	61.90	61.90	61.90	0.40	-	36.70	-	-	-	-	-	-	-	-	90,000.00	-
35DR006	10.50	10.50	10.50	10.50	-	-	9.56	-	-	-	-	-	-	-	-	16,000.00	-
35DR007	3.20	3.20	3.20	3.20	-	-	-	-	-	-	-	-	-	-	-	5,000.00	-
35DR008	18.90	18.90	18.90	18.90	3.00	-	-	-	-	-	15.00	-	-	-	100.00	21,000.00	-
35DR009	0.96	0.96	0.96	0.96	0.05	-	-	-	-	-	-	-	-	-	-	900.00	18.00
35DR010	24.10	24.10	24.10	24.10	4.97	24.10	-	300.00	-	-	-	-	-	1,000.00	1500.00	22,000.00	-
35DR011	21.60	21.60	21.60	21.60	0.84	21.60	-	-	100.00	20.00	24.00	-	-	-	120.00	9,000.00	1.70
35DR012	16.80	16.80	16.80	16.80	0.85	-	-	530.00	-	-	-	-	-	15.00	4,000.00	5,000.00	-
35DR013	3.90	3.90	3.90	3.90	-	-	1.70	-	-	-	-	-	-	-	-	1,100.00	-
35DR014	3.20	3.20	3.20	3.20	-	-	-	-	-	-	-	-	-	-	-	4,800.00	-
35DR015	2.30	2.30	2.30	2.30	-	-	-	-	-	-	-	-	-	-	-	1,800.00	-
35DR016	5.40	5.40	5.40	5.40	-	-	-	250.00	25.00	-	-	-	-	-	-	5,000.00	-
35DR017	0.89	0.89	0.89	0.89	-	-	-	-	-	-	-	-	-	-	-	1,000.00	-
35DR018	2.60	2.60	2.60	2.60	-	-	-	-	-	-	-	-	-	-	-	1,000.00	-
35DR019	18.20	18.20	18.20	18.20	0.21	9.30	-	-	-	-	-	-	-	77.00	-	2,300.00	-
35DR020	29.90	29.90	29.90	29.90	1.83	28.22	-	1,090.00	-	-	-	-	-	100.00	300.00	6,450.00	-
Total	303.65	303.65	303.65	303.65	12.15	83.22	100.36	2,170	125	20	39	-	-	1,237	6,020	201,350	19.70

figure 4 District Transport Perspective Plan (DTPP)



4. COST ESTIMATION

The required interventions are determined from detailed survey of the DRCN roads. The costs necessary for conservation, improvement and new construction are calculated separately using actual average standard costs of the district.

4.1 CONSERVATION

The conservation costs are calculated for the first year to arrive at the amount of funding required. The costs are calculated by multiplying the lengths of roads requiring conservation by the relevant standard costs for different types of surfaces and type of maintenance. The Standard unit costs for conservation are listed in table 4.1.1 as below.

Table 4.1.1 Standard unit costs for conservation

Activity	Unit	Unit cost (NPR)
Emergency maintenance	km	40,000
Routine maintenance	km	25,000
Recurrent maintenance (blacktop)	km	750,000
Recurrent maintenance (gravel)	km	180,000
Recurrent maintenance (earthen)	km	150,000
Periodic maintenance (blacktop)	km	400,000
Periodic maintenance (gravel)	km	120,000

The total conservation cost for the first year is NPR 129322000.00. Consequently the 5-year cost is 646609000.00. This calculation is shown in the table 4.1.2 as below. These costs for later year will vary slightly due to changes to the road network in terms of upgrading and new construction.

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
35DR001	7.20	1.10	6.10	-	288	180	825	1,098	-	440	732	3,563	17,815
35DR002	19.20	0.30	18.90	-	768	480	225	3,402	-	36	2,268	7,179	35,895
35DR003	27.10	13.00	14.10	-	1,084	678	9,750	2,538	-	-	1,692	15,742	78,708
35DR004	25.80	12.50	13.30	-	1,032	645	9,375	2,394	-	-	1,596	15,042	75,210
35DR005	61.90	25.20	36.70	-	2,476	1,548	18,900	6,606	-	-	4,404	33,934	169,668
35DR006	10.50	0.94	9.56	-	420	263	705	1,721	-	-	1,147	4,256	21,278
35DR007	3.20	0.30	2.90	-	128	80	225	522	-	-	348	1,303	6,515
35DR008	18.90	-	18.90	-	756	473	-	3,402	-	-	2,268	6,899	34,493
35DR009	0.96	-	0.96	-	38	24	-	173	-	-	115	350	1,752
35DR010	24.10	-	-	24.10	964	603	-	-	3,615	-	-	5,182	25,908
35DR011	21.60	-	-	21.60	864	540	-	-	3,240	-	-	4,644	23,220
35DR012	16.80	1.60	15.20	-	672	420	1,200	2,736	-	-	1,824	6,852	34,260
35DR013	3.90	2.20	1.70	-	156	98	1,650	306	-	-	204	2,414	12,068
35DR014	3.20	3.20	-	-	128	80	2,400	-	-	-	-	2,608	13,040
35DR015	2.30	1.66	0.64	-	92	58	1,245	115	-	-	77	1,587	7,933
35DR016	5.40	3.50	1.90	-	216	135	2,625	342	-	-	228	3,546	17,730
35DR017	0.89	0.89	-	-	36	22	668	-	-	-	-	725	3,627
35DR018	2.60	0.70	1.90	-	104	65	525	342	-	-	228	1,264	6,320
35DR019	18.20	-	8.90	9.30	728	455	-	1,602	1,395	-	1,068	5,248	26,240

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
35DR020	29.90	0.68	1.00	28.22	1,196	748	510	180	4,233	-	120	6,987	34,933
Total	303.65	67.77	152.66	75.22	12,146	7,591	50,828	27,479	11,283	476	18,319	129,322	646,609

4.2 IMPROVEMENT

The improvement costs are calculated by multiplying the standard costs as given in table 4.2.1 with the intervention lengths and volumes as shown in next table 4.2.2 as below.

Table 4.2.1 Standard unit costs for improvement activities

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	120,000
Widening	m	1,500
Gravelling	km	1,800,000
Blacktopping	km	3,000,000
Bridge construction	m	575,000
Slab culvert construction	m	200,000
CC Causeway construction	m	75,000
Stone Causeway construction	m	7,500
Pipe culvert placement	unit	25,000
Masonry wall construction	m ³	10,000
Gabion wall construction	m ³	3,500
Lined drain construction	m	1,000

The estimated cost for the improvement of the existing DRCN is the cost to maintain the DRCN to a maintainable all-weather standard. The total cost for improvement is NPR 763629000.00 as shown in table 4.2.2 as 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
35DR001	7.20	-	-	-	18,300	-	-	-	-	-	-	-	9,000	27,300
35DR002	19.20	-	-	-	56,700	-	-	-	-	-	-	-	-	56,700
35DR003	27.10	-	-	-	42,300	-	-	-	-	-	-	-	-	42,300
35DR004	25.80	-	-	-	39,900	-	-	-	-	-	-	-	-	39,900
35DR005	61.90	48	-	-	110,100	-	-	-	-	-	-	-	90,000	200,148
35DR006	10.50	-	-	-	28,680	-	-	-	-	-	-	-	16,000	44,680
35DR007	3.20	-	-	-	-	-	-	-	-	-	-	-	5,000	5,000
35DR008	18.90	360	-	-	-	-	-	1,125	-	-	-	350	21,000	22,835
35DR009	0.96	6	-	-	-	-	-	-	-	-	-	-	900	906
35DR010	24.10	596	450	43,380	-	-	-	-	-	-	10,000	5,250	22,000	81,676
35DR011	21.60	101	-	38,880	-	57,500	4,000	1,800	-	-	-	420	9,000	111,701
35DR012	16.80	102	795	-	-	-	-	-	-	-	150	14,000	5,000	20,047
35DR013	3.90	-	-	-	-	-	-	-	-	-	-	-	1,100	1,100
35DR014	3.20	-	-	-	-	-	-	-	-	-	-	-	4,800	4,800

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
35DR015	2.30	-	-	-	-	-	-	-	-	-	-	-	1,800	1,800
35DR016	5.40	-	375	-	-	14,375	-	-	-	-	-	-	5,000	19,750
35DR017	0.89	-	-	-	-	-	-	-	-	-	-	-	1,000	1,000
35DR018	2.60	-	-	-	-	-	-	-	-	-	-	-	1,000	1,000
35DR019	18.20	25	-	16,740	-	-	-	-	-	-	770	-	2,300	19,835
35DR020	29.90	220	1,635	50,796	-	-	-	-	-	-	1,000	1,050	6,450	61,151
Total	303.65	1,458	3,255	149,796	295,980	129,375	4,000	2,925	-	-	11,920	21,070	201,350	763,629

4.3 NEW CONSTRUCTION

The cost for new construction is calculated by using standard unit costs as given in table 4.3.1 as given below.

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Opening up	Km	4,500,000
Gravelling	Km	1,800,000
Bridge construction	M	575,000

The new construction required to complete the DRCN is identified. In Chitwan only one VDC of Chandibhangyang is not accessed by road network and one more roads is yet to be completed that is selected in DRCN.

In new construction the required bridge in Hakim Chok-Madi- Thori road is not taken in the cost calculation since this road is actually SRN, but being maintained by DDC itself and bridge construction is not in the scope of DDC.

The new construction cost calculated is NPR 124110000.00 which is shown in table 4.3.2 as below.

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

Code	Description	Length (km)	Opening up	Gravelling	Bridges	Total cost
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar – Beluwa	-	-	-	-	-
35DR002	Rampur - Taun - Simari Taun - Sajhapur – Jitpur	-	-	-	-	-
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur – Rampur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur – Golaghat	-	-	-	-	-
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Meghauli Airport	-	-	-	-	-
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	-	-	-	-	-
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	-	-	-	-	-
35DR007	Bisal Chok (by pass) - Bhojad – Padampur	-	-	-	-	-
35DR008	Bhorle-Dahakhani	-	-	-	-	-
35DR009	Jalbire - Pangre (Chandivanjyang)	18.00	81,000	32,400	-	113,400
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	-	-	-	-	-
35DR011	Bashpur - Mayatar - Terse - Upardangadi – Saktikhor	1.70	7,650	3,060	-	10,710
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	-	-	-	-	-
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	-	-	-	-	-
35DR014	Santi Chok (Highway) – Pithuwa	-	-	-	-	-
35DR015	Chainpur Chok (Highway) – Chainpur	-	-	-	-	-
35DR016	Chainpur Chok (Highway) - Khaireni – Kumroj	-	-	-	-	-
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	-	-	-	-	-
35DR018	Khurkhure (Highway) – Kathar	-	-	-	-	-
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	-	-	-	-	-
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	-	-	-	-	-
	Total	19.70	88,650	35,460		124,110

4.4 DTPP COSTS

The DTPP cost is the required cost for long list of conservation, improvement and new construction for DRCN selected in the district. Projected 5-year Budget will not be sufficient to meet all the cost. The total DTPP cost calculated is NPR 1534348000.00 which is shown in the table 4.4.1 as below.

Table 4.4.1 DTPP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
35DR001	17,815	27,300	-	45,115
35DR002	35,895	56,700	-	92,595
35DR003	78,708	42,300	-	121,008
35DR004	75,210	39,900	-	115,110
35DR005	169,668	200,148	-	369,816
35DR006	21,278	44,680	-	65,958
35DR007	6,515	5,000	-	11,515
35DR008	34,493	22,835	-	57,328
35DR009	1,752	906	113,400	116,058
35DR010	25,908	81,676	-	107,584
35DR011	23,220	111,701	10,710	145,631
35DR012	34,260	20,047	-	54,307
35DR013	12,068	1,100	-	13,168
35DR014	13,040	4,800	-	17,840
35DR015	7,933	1,800	-	9,733
35DR016	17,730	19,750	-	37,480
35DR017	3,627	1,000	-	4,627
35DR018	6,320	1,000	-	7,320
35DR019	26,240	19,835	-	46,075
35DR020	34,933	61,151	-	96,083
Total	646,609	763,629	124,110	1,534,348

5. RANKING

Ranking of the DRCN roads are based on the cost calculation of the intervention and population served basis. Prioritization is done according to the cost per capita and ranking is carried out for conservation, improvement and new construction. The cost of all the interventions under conservation, improvement, new construction is added up for each road and this total cost is divided by the population served by the road. The population data for the VDCs linked by the road concerned are shown in Annex 2.

5.1 CONSERVATION

The ranking for conservation is based on per capita cost for conservation cost. The ranking for conservation is shown in table 5.1.1 as below.

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)
35DR017	0.89	36	22	668	-	-	-	-	725	21,530	34
35DR018	2.60	104	65	525	342	-	-	228	1,264	31,226	40
35DR009	0.96	38	24	-	173	-	-	115	350	4,978	70
35DR007	3.20	128	80	225	522	-	-	348	1,303	14,924	87
35DR015	2.30	92	58	1,245	115	-	-	77	1,587	16,786	95
35DR016	5.40	216	135	2,625	342	-	-	228	3,546	29,612	120
35DR002	19.20	768	480	225	3,402	-	36	2,268	7,179	49,062	146
35DR001	7.20	288	180	825	1,098	-	440	732	3,563	19,066	187
35DR014	3.20	128	80	2,400	-	-	-	-	2,608	12,579	207
35DR013	3.90	156	98	1,650	306	-	-	204	2,414	10,905	221
35DR003	27.10	1,084	678	9,750	2,538	-	-	1,692	15,742	68,128	231
35DR019	21.60	864	540	-	-	3,240	-	-	4,644	20,010	232
35DR012	18.20	728	455	-	1,602	1,395	-	1,068	5,248	21,484	244
35DR020	16.80	672	420	1,200	2,736	-	-	1,824	6,852	27,569	249
35DR010	29.90	1,196	748	510	180	4,233	-	120	6,987	27,718	252
35DR011	24.10	964	603	-	-	3,615	-	-	5,182	20,199	257
35DR006	10.50	420	263	705	1,721	-	-	1,147	4,256	13,929	306
35DR004	25.80	1,032	645	9,375	2,394	-	-	1,596	15,042	40,248	374
35DR005	61.90	2,476	1,548	18,900	6,606	-	-	4,404	33,934	74,307	457
35DR008	18.90	756	473	-	3,402	-	-	2,268	6,899	10,618	650

5.2 IMPROVEMENT

The ranking for improvement is based on per capita cost for improvement cost. The ranking for improvement is shown in table 5.2.1 as below.

Table 5.2.1 Ranking of improvement works (NPR '000)

Code	Total length (km)	Gravelling (km)	Blacktopping (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
35DR018	2.60	-	-	1,000	31,226	32
35DR017	0.89	-	-	1,000	21,530	46
35DR013	3.90	-	1.70	1,100	10,905	101
35DR015	2.30	-	-	1,800	16,786	107
35DR009	0.96	-	-	906	4,978	182
35DR007	3.20	-	-	5,000	14,924	335
35DR014	3.20	-	-	4,800	12,579	382
35DR003	27.10	-	14.10	42,300	68,128	621
35DR016	5.40	-	-	19,750	29,612	667
35DR012	16.80	-	-	20,047	27,569	727
35DR019	18.20	9.30	-	19,835	21,484	923
35DR004	25.80	-	13.30	39,900	40,248	991
35DR002	19.20	-	18.90	56,700	49,062	1,156
35DR001	7.20	-	6.10	27,300	19,066	1,432
35DR008	18.90	-	-	22,835	10,618	2,151
35DR005	29.90	28.22	-	61,151	27,718	2,206
35DR020	61.90	-	36.70	200,148	74,307	2,694
35DR006	10.50	-	9.56	44,680	13,929	3,208
35DR010	24.10	24.10	-	81,676	20,199	4,044
35DR011	21.60	21.60	-	111,701	20,010	5,582

5.3 NEW CONSTRUCTION

The ranking for new construction is based on per capita cost for new construction cost. The ranking for new construction is shown in table 5.3.1 as below.

Table 5.3.1 Ranking of new construction works (NPR '000)

Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
35DR001	-	-	19,066	-
35DR002	-	-	49,062	-
35DR003	-	-	68,128	-
35DR004	-	-	40,248	-
35DR006	-	-	13,929	-
35DR007	-	-	14,924	-
35DR008	-	-	10,618	-
35DR010	-	-	20,199	-
35DR012	-	-	27,569	-
35DR013	-	-	10,905	-
35DR014	-	-	12,579	-
35DR015	-	-	16,786	-
35DR017	-	-	21,530	-
35DR018	-	-	31,226	-
35DR019	-	-	21,484	-
35DR020	-	-	27,718	-
35DR005	-	-	74,307	-
35DR016	-	-	29,612	-
35DR011	1.70	10,710	20,010	535
35DR009	18.00	113,400	4,978	22,780

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

In the process of preparing DTMP, balancing of the available budget and the estimated costs of the required interventions, to determine which interventions can be carried out in the 5-year DTMP period are worked out.

6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

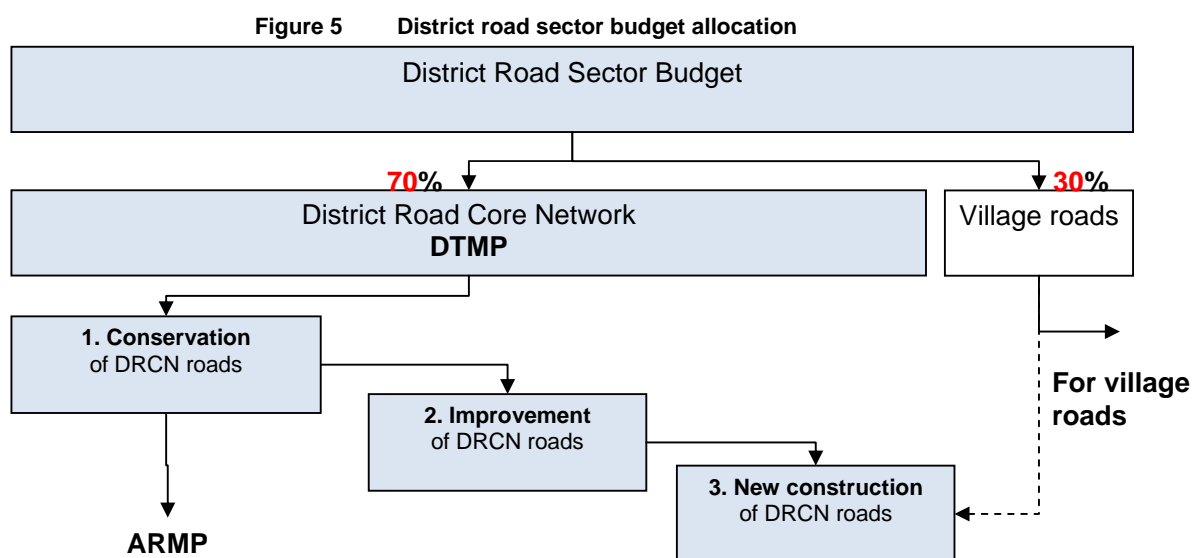
The estimation of the financial resources available at district level for investments in the road sector has been carried out which is shown in Table 6.1.1 below. The expected fund for next five year is worked out by projecting the last years available budget at an average of 20% increment of the budget.

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
Internal Revenue	9,920	11,904	14,285	17,142	20,571
Argricultural Road	14,160	16,992	20,390	24,468	29,362
Road Board	6,780	8,136	9,763	11,716	14,059
International Development Grant	6,780	8,136	9,763	11,716	14,059
Constituency Area Development Program	519	623	747	897	1,076
LGCDP	3,619	4,342	5,211	6,253	7,504
Sadak Kendra Anusuchi - 5	696	835	1,002	1,203	1,443
Sadak Kendra Anusuchi - 6	13,560	16,272	19,526	23,432	28,118
RRRSDP	20,000	40,000	60,000	80,000	90,000
Total	76,034	107,241	140,689	176,827	206,192
Grand total	706,982				

6.2 BUDGET ALLOCATION

The percentage of budget allocation for DRCN road is 70% and 30% is allocated in village roads as decided by DPCC/DDC meeting held in the district.



The budget allocation for next five year is done based on the ranking of the road and the priority given by DDC authority. Due to budget constraint, full budget for conservation of DRCN roads could not be allocated. Few roads are subjected to improve into gravel surface

condition and budget is allocated to complete new construction which will complete the DRCN. Thus this will make all the VDCs accessible by road network in next five years. The detail of allocation of budget for next five year is shown in the table 6.2.1 as below.

Table 6.2.1 DTMP investment plan

(Budget in NPR '000)

Item				Year														
Fiscal year				2070/71			2071/72			2072/73			2073/74			2074/75		
Total budget				76,034			107,241			140,689			176,827			206,192		
Village roads				22,810			32,172			42,207			53,048			61,858		
Core road network budget (DTMP)				53,224			75,069			98,482			123,779			144,334		
Core network length (km)				303.65			303.65			303.65			303.65			303.65		
Blacktop (km)				67.77			67.77			67.77			67.77			67.77		
Gravel (km)				160.66			160.66			171.77			184.76			200.20		
Earthen (km)				75.22			75.22			64.11			51.12			35.68		
Conservation (NRs)				33,137			34,607			35,376			60,186			57,771		
Emergency				6,267			6,267			6,267			6,267			6,267		
Routine				7,591			5,000			7,109						7,591		
Recurrent (blacktop)				19,279						15,000			15,000			15,000		
Recurrent (gravel)							23,340									25,000		
Recurrent (earthen)										7,000						3,913		
Periodic (blacktop)													28,919					
Periodic (gravel)													10,000					
Improve ment	Cost	BT	GR	20,087	B T	GR	40,462	B T	GR	63,106	B T	GR	63,593	B T	GR	86,563	B T	GR
35DR018	1,000	-	-		-	-		-	-		-	-		-	-		-	-
35DR017	1,000	-	-		-	-		-	-		-	-		-	-		-	-
35DR013	1,100	1.70	-		-	-		-	-		-	-		-	-		-	-
35DR015	1,800	-	-		-	-		-	-		-	-		-	-		-	-
35DR009	906	-	-		-	-		-	-		-	-		-	-		-	-
35DR007	5,000	-	-		-	-		-	-		-	-		-	-		-	-
35DR014	4,800	-	-		-	-		-	-		-	-		-	-		-	-
35DR003	42,300	14.10	-		-	-		-	-		-	-		-	-		-	-
35DR016	19,750	-	-		-	-		-	-		-	-		-	-		-	-
35DR012	20,047	-	-	102	-	RE		-	-		-	-		-	-		-	-
35DR019	19,835	-	9.30	11,009	-	5.16	8,826	-	4.14		-	-		-	-		-	-
35DR004	39,900	13.30	-		-	-		-	-		-	-		-	-		-	-
35DR002	56,700	18.90	-		-	-		-	-		-	-		-	-		-	-
35DR001	27,300	6.10	-		-	-		-	-		-	-		-	-		-	-
35DR008	22,835	-	-	360	-	RE		-	-		-	-		-	-		-	-
35DR020	61,151	-	28.22	220	-	RE		-	-		-	-	43,648	-	20.14	17,503	-	8.08
35DR005	200,148	36.70	-	48	R E	-		-	-		-	-		-	-		-	-
35DR006	44,680	9.56	-		-	-		-	-		-	-		-	-		-	-
35DR010	81,676	-	24.10	596	-	RE	31,635	-	9.33	36,961	-	10.91		-	-	13079	-	3.86
35DR011	111,701	-	21.60	101	-	RE		-	-		-	-	19,945	-	3.86	39,734	-	7.68
Total improvement				12,436	-	5.16	40,462	-	13.47	36,961	-	10.91	63,593	-	24.00	70,316	-	19.62

Table 6.2.1 DTMP investment plan contd.....*(Budget in NPR '000)*

Item			Year									
Fiscal year			2070/71		2071/72		2072/73		2073/74		2074/75	
Construc tion	Cost	GR	7,651	GR	-	GR	26,145	GR	-	GR	-	GR
35DR001		-		-	-	-	-	-	-	-	-	-
35DR002	-	-		-	-	-	-	-	-	-	-	-
35DR003	-	-		-	-	-	-	-	-	-	-	-
35DR004	-	-		-	-	-	-	-	-	-	-	-
35DR006	-	-		-	-	-	-	-	-	-	-	-
35DR007	-	-		-	-	-	-	-	-	-	-	-
35DR008	-	-		-	-	-	-	-	-	-	-	-
35DR010	-	-		-	-	-	-	-	-	-	-	-
35DR012	-	-		-	-	-	-	-	-	-	-	-
35DR013	-	-		-	-	-	-	-	-	-	-	-
35DR014	-	-		-	-	-	-	-	-	-	-	-
35DR015	-	-		-	-	-	-	-	-	-	-	-
35DR017	-	-		-	-	-	-	-	-	-	-	-
35DR018	-	-		-	-	-	-	-	-	-	-	-
35DR019	-	-		-	-	-	-	-	-	-	-	-
35DR020	-	-		-	-	-	-	-	-	-	-	-
35DR005	-	-		-	-	-	-	-	-	-	-	-
35DR016	-	-		-	-	-	-	-	-	-	-	-
35DR011	10,710	1.70	7651	1.70		-		-		-		-
35DR009	113,400	18.00				-	26,145	5.81		-	16,247	2.58
Total new construction			7,651	1.70	-	-	26,145	5.81	-	-	-	2.58
Remaining budget			- 0		0		0		- 0		0	

6.3 DTMP OUTPUTS

The output of the DTMP will be of conservation 303.65 km, improvement to gravel will be 73.16 km and new construction will be 10.09 km as shown in table 6.3.1 below.

Table 6.3.1 DTMP Output

Conservation	Improvement gravel	Improvement blacktop	New construction
303.65	73.16	-	10.09

The budget allocated for next five years are; NPR 221078000.00 for conservation, NPR 223768000.00 for improvement and NPR 50043000.00 for new construction.

6.4 DTMP OUTCOME

After the DTMP fair weather roads are decreased from 27% to 3%, all weather gravel roads are increased from 50% to 74% and all weather black top roads will remain unchanged after DTMP, since budget is not sufficient, which is shown in the table 6.4.1 as below.

Table 6.4.1 Standard of DRCN roads

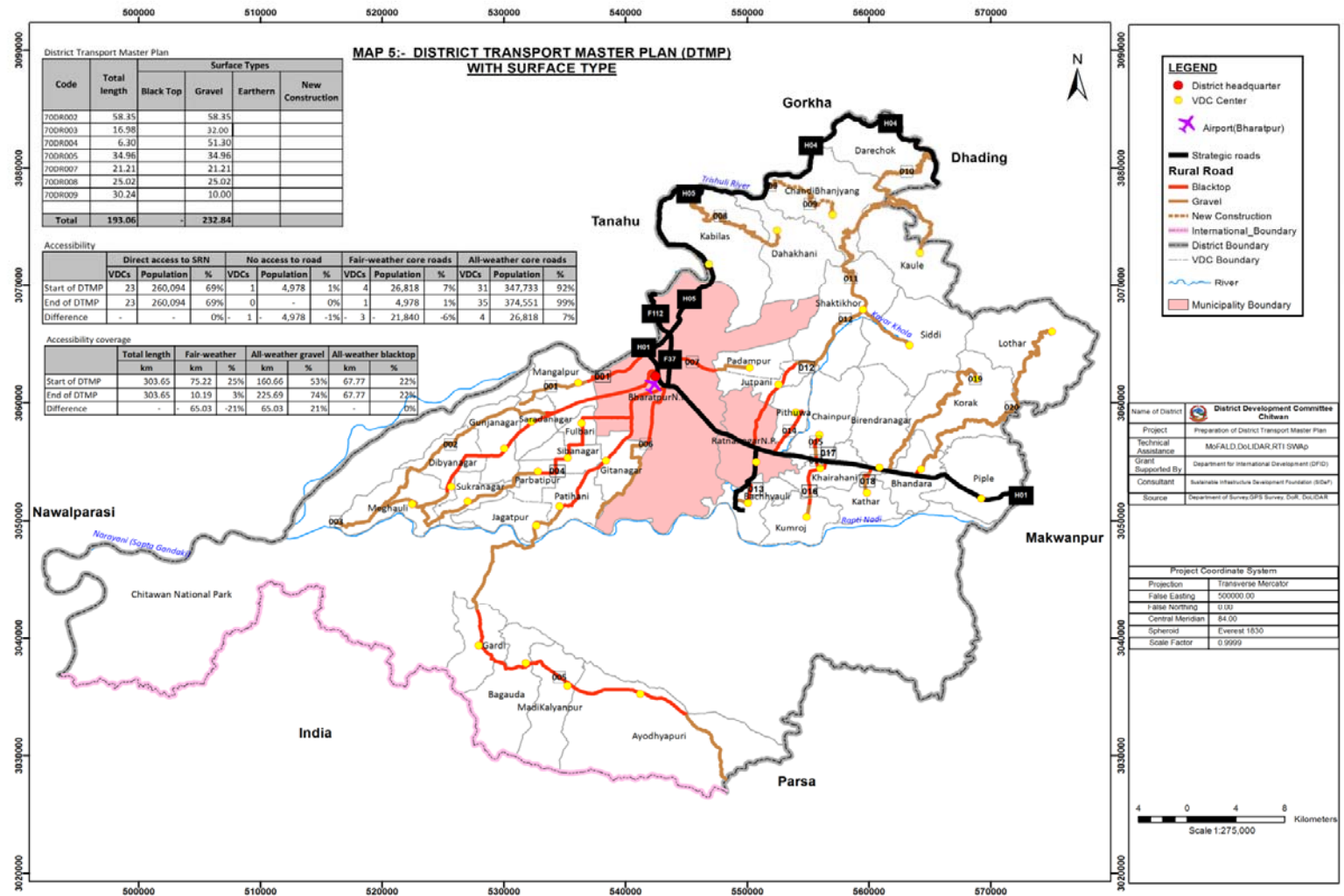
	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	303.65	83.22	27%	152.66	50%	67.77	22%
End of DTMP	303.65	10.06	3%	225.82	74%	67.77	22%
Difference	-	- 73.16	-24%	73.16	24%	-	0%

1 VDC was not accessed by road at the start of DTMP. All VDCs will be accessed to road network at the end of DTMP period. Likewise, 4 VDCs (7% of population) were accessed to fair weather road, will be reduced to 1 VDC (1% of population). 31 VDCs (92 % of population) were accessed to all weather roads, will be accessed to 35 VDCs (99% of population) at the end of DTMP. After DTMP the access condition to VDC population is presented in table 6.4.2 below.

Table 6.4.2 Population with access to road network

	Direct access to SRN			No access to road			Fair-weather core roads			All-weather core roads		
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	23	260,094	69%	1	4,978	1%	4	26,818	7%	31	347,733	92%
End of DTMP	23	260,094	69%	0	-	0%	1	4,978	1%	35	374,551	99%
Difference	-	-	0%	- 1	- 4,978	- 1%	- 3	- 21,840	- 6%	4	26,818	7%

Figure 6 District Transport Master Plan (DTMP)



ANNEX 1 TRAFFIC DATA

Table A1.2 Traffic Data

Code	Description	Total Length (km)	Motorcycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU	VPD
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichhyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar - Beluwa	7.20	60	45	25	65	385	135
35DR002	Rampur - Taun - Simari Taun - Sajhapur - Jitpur	19.20	90	25	45	40	320	110
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur - Sardanagar - Gunjanagar - Divyanagar - Meghauli - Jitpur - Golaghat	27.10	100	45	55	65	465	165
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	90	30	40	45	335	115
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	400	150	90	35	670	275
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	140	20	35	12	208	67
35DR007	Bisal Chok (by pass) - Bhojad - Padampur	3.20	140	20	10	10	150	40
35DR008	Bhorle-Dahakhani	18.90	5	2	1		7	3
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	2				1	-
35DR010	Fishing - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	8	4			8	4
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	21.60	2	1			2	1
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	160	7	9	7	133	23
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	250	25	13	14	232	52
35DR014	Santi Chok (Highway) - Pithuwa	3.20	180	18	9	7	154	34
35DR015	Chainpur Chok (Highway) - Chainpur	2.30	120	8	11	6	114	25
35DR016	Chainpur Chok (Highway) - Khaireni - Kumroj	5.40	180	18.0	9	6	150	33
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	300	20.0	14	12	246	46
35DR018	Khurkhure (Highway) - Kathar	2.60	120	12.0	11	8	126	31
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	20	4.0	5	2	32	11
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	120	12.0	14	5	120	31
Total		303.65						

ANNEX 2 POPULATION SERVED

Table A2.1 Population Served

#	VDC / municipality	Population	Road																				SRN
			35DR001	35DR002	35DR003	35DR004	35DR005	35DR006	35DR007	35DR008	35DR009	35DR010	35DR011	35DR012	35DR013	35DR014	35DR015	35DR016	35DR017	35DR018	35DR019	35DR020	
1	Ayodhyapuri	10,693					X																X
2	Bachheuli	10,905												X									X
3	Bagauda	10,913					X																X
4	Bhandara	16,121																			X		X
5	Bharatpur municipality	0	X		X	X	X	X															X
6	Birendranagar	14,934																		X			X
7	Chainpur	16,786														X							X
8	Chandi Bhanjyang	4,978								X	X	X											
9	Dahakhani	4,803							X														
10	Darechok	9,607									X												X
11	Dibyanagar	8,334		X	X																		X
12	Fulbari	3,862				X																	
13	Gardi	9,241					X																X
14	Gitanagar	13,929					X	X															X
15	Gunjanagar	15,071		X	X																		X
16	Jagatpur	11,195					X																X
17	Jutpani	14,324								X				X									X
18	Kabilash	5,815								X													X
19	Kathar	9,696																	X				
20	Kaule	5,614									X	X											
21	Khaireni	21,530															X	X	X				X
22	Korak	6,550																		X	X		
23	Kumroj	8,082															X						
24	Lothar	5,047																			X		
25	Madi Kalyanpur	6,836					X																X
26	Mangalpur	19,066	X		X																		X
27	Megghauli	14,149		X	X	X																	X
28	Padampur	14,924							X														
29	Parbatipur	6,506				X																	X
30	Patihani	11,500					X																X
31	Piple	15,455																					X
32	Pithuwa	12,579														X							
33	Ratnanagar Municipality	0												X	X	X							X
34	Sardanagar	11,508		X	X																		X
35	Saktikhor	9,418											X	X									
36	Sibanagar	7,674				X																	
37	Siddi	3,827											X										
38	Sukranagr	8,057				X																	
	Total population	379,529	19,066	49,062	68,128	40,248	74,307	13,929	14,924	10,618	4,978	20,199	20,010	27,569	10,905	12,579	16,786	29,612	21,530	31,226	21,484	27,718	260,094
	Total VDCs /municipalities	38	2	4	6	6	8	2	2	2	1	3	3	4	2	2	1	2	1	2	2	3	2

Source: Population census 2012

ANNEX 3 LOCATION OF PROPOSED INTERVENTIONS

Table A3.1 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)	Causeway (m)	Pipe culvert (units)	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
35DR001	Pulchok (Narayanghat) - Sivaghat - Pratichhyalaya - Aashram - mangalpur Ga Bi Sa - Bijayanagar - Beluwa	7.20	0+000				0.15									1200
35DR002	Rampur - Taun - Simari Taun - Sajhapur - Jitpur	19.20	0+000	19+200		0.72										
35DR003	Chaubis Kothi (Bharatpur) - Mangalpur - Sardanagar - Gunjanagar - Divyanagar - Megghauli - Jitpur - Golaghat	27.10	0+000	27+100		4.42	2.36									
35DR004	Prem Basti Chok - Fulbari Chok - Sibanagar - Parbatipur - Sukranagar - Budhanagar - Lebar Nagar - Megauli Airport	25.80	0+000	25+800		1.47	1.65									
35DR005	Hakkim Chok (Bharatpur) - Gitanagar - Patihani - Jagatpur - Gardi - Bagauda - Kalyanpur - Ayodhyapuri - Badarjhula - Thori Road	61.90	0+000	61+900		0.4	2.1		1480							100000
35DR006	Hakkim Chok (Bharatpur) - Pandey Ghumti - Deri Chok - Sita Mai	10.50	0+000	10+500		0.6	0.3									30000
35DR007	Bisal Chok (by pass) - Bhojad - Padampur	3.20	0+000	3+200		0.6	1.87									14120
35DR008	Bhorle-Dahakhani	18.90	0+000	18+900		1.5					15				100	21000
35DR009	Jalbire - Pangre (Chandivanjyang) proposed	18.00	0+000	18+000												
35DR009	Jalbire - Pangre (Chandivanjyang)	0.96	0+000	0+960												900
35DR010	Fishling - Tolang - Bashpur - Kot - Hattibang (Kaule)	24.10	0+000	24+100	16.80			300						140	220	22000
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	9.60	0+000	9+600	3.90				40		9				120	9000
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor1	12.00	0+000	12+000		3			160	20	15					7500
35DR011	Bashpur - Mayatar - Terse - Upardangadi - Saktikhor	1.70	0+000	1+700												
35DR012	Bakular (Ratnanagar) -Jutpani-Saktikhor-Siddi	16.80	0+000	16+800		2.6		530						15	4000	5000
35DR013	Sauraha Chok (Ratnanagar) - Mainaha - Dorangi - Sauraha (Bachheuli)	3.90	0+000	3+900			1.85									1100
35DR014	Santi Chok (Highway) - Pithuwa	3.20	0+000	3+200			3.1									4800
35DR015	Chainpur Chok (Highway) - Chainpur	2.30	0+000	2+300			0.2									1800
35DR016	Chainpur Chok (Highway) - Khaireni - Kumroj	5.40	0+000	5+400			2.14	250	25							5000
35DR017	Chaubis Kothi (Khaireni, Highway) - Purano Parsa	0.89	0+000	0+890			0.25									1000
35DR018	Khurkhure (Highway) - Kathar	2.60	0+000	2+600		0.25	0.46									1000
35DR019	Khurkhure (Highway) - Samitar - Thakurivanjyang (Korak)	18.20	0+000	18+200	9.30	2.5	0.2							77		2300
35DR020	Bhandara-Korak-Lothar - Malekhu (Chepang Marga)	29.90	0+000	29+900	28.22		0.8	1090						1005	3040	6450
	Total	323.35			58.22	18.06	17.43	2170	1705	20	39	0	0	1237	7480	234170

ANNEX 4 OVERALL ROAD INVENTORY

Chitwan