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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,

Bardiya

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



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FOREWORD

ACKNOWLEDGEMENT

This Final report on the Preparation of District Transport Master Plan (DTMP) of Bardiya District has been prepared under the contract agreement between RAP-3, DoLIDAR and SIDeF, 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) Bardiya for providing cooperation to carry out this task.

SIDeF would like to express our gratitude to Mr Shiva Regmi, Local Development Officer, Baikuntha Nath Aryal, DTO Chief, Er. Tanka Khanal, 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 Kishwar Shrestha, Engineer, Er. Raghunatah Rimal, Engineer and GIS expert who continuously worked to finalize the DTMP.

Er. Hare Ram Shrestha

Project Director
On behalf of
SIDeF

EXECUTIVE SUMMARY

Bardiya district is located in Bheri zone, Mid-Western Region of Nepal. It covers 2025 square kilometers and it borders with Banke district to the east, Surkhet to the north, Kailali district to the west and India to the south.

Bardiya has fertile, Terai, plains, covered with agricultural land and forest. The northernmost part of the district extends into the Churiya or Siwalik Hills. Bardiya National Park covers 968 km², occupies most of the northern half of the district. This park is the largest undisturbed wilderness in Nepal's Terai. It provides forest, grassland and riverine habitat for engendered mammal, bird and reptile species. More than 30 species of mammals and more than 250 of birds have been recorded in this National Park.

Most of the people living in this district are farmers. The district headquarters Gulariya lies on bank of Babai River. The Karnali, one of the largest rivers of Nepal, divided into multiple branches when it reaches the Terai. The westernmost branch forms the boundary between Bardiya and Kailali districts. An eastern branch is called the Geruwa. The endangered Gangetic dolphin was often seen in karnali river

Major languages spoken in the Bardiya district are: Nepali, Hindi Tharu and their local language. Bardiya District is connected by Mahendra highway and district headquater Gulariya is connected to East- West Highway by Bhurigaun – Kothiyaghat – Gulariya Feeder Road from Bhurigaun and also accessed from Nepalgunj by Man Bridge – Gulariya Feeder Road

Total length of road in Bardiya district is 1047.84 km where 211.42 km is SRN roads, 190.00 km is Urban roads, 302.11 km is DRCN roads and 344.31 km is Village roads.

The total length of DRCN road is 302.11 Km, approved by Bardiya DTICC in 17 Baisakh 2071, given in **Annex 5**. where 8.31 km Road is Blacktop, 249.97 km is Gravel 43.83 km is Earthen. The table ES1 gives overall picture of road inventory of Bardiya.

Table ES1.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	211.42	121.43	60.99	29.00
Urban roads	190.00	34.00	98.00	58.00
District road core network	302.11	8.31	249.97	43.83
Village roads	344.31	-	284.82	59.48
Total	1,047.84	163.74	693.78	190.31

Source of urban road: Gulariya Municipality

The total estimated cost for long list of conservation, improvement and new construction for DRCN selected in the district is NPR 2,085,835,000. The cost for conservation is NPR 1,234,808,000.00, cost for improvement is NPR 851,027,000.00 and no new construction Budget is worked out for DRCN roads.

Table ES2.

Improvement type	Requirement	Cost (NPR)
Bridges	935 M	794,750,000
Slab culverts	33 M	7,425,000
Causeways	0 M	-
Hume pipes	16 Units	192,000
Masonry retaining walls	0 m ³	-
Gabion retaining walls	0 m ³	-
Lined drains	0 M	-
Rehabilitation	47.45 Km	40,332,500
Gravelling	43.83 Km	8,327,700
Blacktopping	0 Km	-
New construction	- Km	-
Total		851,027,200

For 5-years planning (2071/072 to 2075/076) the total budget estimated is NPR 1,331,611,000.00. As per the DDC's decision 80% of the total road sector budget has to be taken for DRCN roads which come to be NPR 1,065,288,800.00 where as the total estimated cost required for DRCN road NPR 2,085,850,000 s. This clearly shows that budget allocation is not sufficient for all interventions Hence, budget allocation for five years planning is done based on the ranking priority as conservation, improvement and new construction. Budget has been allocated as table **6.2.1(AUTO)** in this report.

For 5-years DTMP, total budget allocated for conservation is NPR 1,022,787,000.00, NPR 42,502,000.00 for improvement and no budget for new construction which is shown in table 6.2.1(AUTO).

At the end of five year period fair weather roads are decreased from 15% to 12%, All VDCs are access by road at the start of DTMP. 28 VDCs (92 % of population) will be accessed by all weather roads.

ABBREVIATIONS

DDC	District Development Committee
CC	Cement Concrete
DoLIDAR	Department of Local Infrastructure Development and Agriculture Road
DOR	Department of Road
DRCN	District Road Core Network
DRILIP	Decentralized Rural Infrastructure And livelihood Project
DTICC	District Transport Infrastructure Coordination Committee
DTMP	District Transport Master Plan
DTO	District Technical Office
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GON	Government of Nepal
GPS	Global Positioning System
LGCDP	Local Governance and Community Development Programme
MFALD	Ministry of Federal Affairs and Local Development
PAF	Poverty Alleviation Fund
RAIDP	Rural Access Improvement and Decentralization Project
RCIW	Rural community Infrastructure Work
SWAp	Sector Wide Approach
VDC	Village Development Committee
VPD	Vehicle per Day

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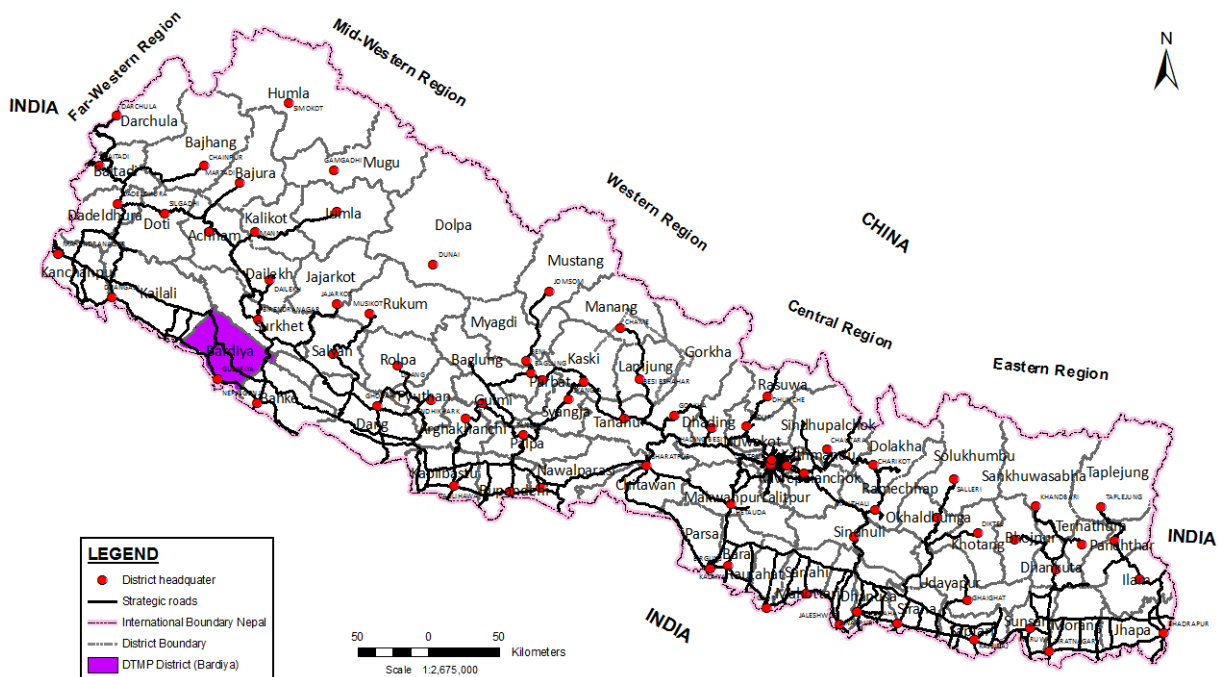
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1. INTRODUCTION

Bardiya district is located in Bheri zone of Mid Western Development Region of Nepal. It Borders with Banke to the east, Kailali to the West, Surkhet to the North and India to the south. The district consists 1 municipality and 31 VDCs till 2070 BS. Topographic location of Bardiya district is $28^{\circ} 18'$ north longitude and $81^{\circ} 22'$ east latitude. Total area of Bardiya district is 2025 Km². Elevation above mean sea level ranges from 390 m. (min.) to 2950 m. (max.). The annual rainfall is 438 mm, the maximum temperature is 38° C and minimum temperature 6° C

Figure 1 Location of the Bardiya District



Main sources of occupations and livelihood of the district population are agriculture, livestock, Business, etc. The total population size is 367864. The population density of the District is 210 per sq. km. The Average household size is 5.55 persons Bardiya district has multi ethnicity and the composition: majorities are Bramin, Chhetri, Thakuri, Janajati, Dalit, Tharu. Major languages spoken in the Bardiya district are: Nepali, Tharu and Hindi.

Bardiya District is connected by Mahendra highway and district headquarter Guleriya is connected to East- West highway by Bhurigaun – Kothiyaghat – Guleriya Feeder Road from Bhurigaun and also accessed from Nepalgunj by Man Bridge – Guleriya Feeder Road.

2. DISTRICT ROAD CORE NETWORK (DRCN)

In the course of DTMP preparation, the entire road inventory existing in the district has been taken from the previous DTMP report. 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.

The total length of SRN Road is 211.42 km, urban road is 190.00 km and rural road except municipal road is 646.42 km, among which 302.11 is DRCN which was approved by DTICC meeting of Bardiya district held on 2071/01/17 given in **Annex 5**.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	211.42	121.43	60.99	29.00
Urban roads	190.00	34.00	98.00	58.00
Rural roads	646.42	8.31	534.79	103.31
Total	1,047.84	163.74	693.78	190.31

2.1 NATIONAL HIGHWAYS AND FEEDER ROAD

The total length of SRN road within Bardiya is 211.42 km. Surface type of the SRN Road is tabulated in Table 2.2.1 below.

Table 2.2.1 National Highways and Feeder Roads (km)

Code	Name of Road	Total length	Black Top	Gravel	Earthen
H01	Man River-Bhuregaun	41.63	41.63	0.00	0.00
H01	Bhuregaun-Karnali	22.71	22.71	0.00	0.00
H12	Deurali-Harre	23.55	23.55	0.00	0.00
F016	Bhuregaun-Junction, road to	14.67	0.00	14.67	0.00
F016	Junction, road to –Gulariya	17.64	6.58	11.06	0.00
F016	Gulariya-Murthihawa	3.00	3.00	0.00	0.00
F017	Rajapur- Bhimapur(IB)	6.00	0.00	0.00	6.00
F046	Man bridge- Gulariya	19.82	19.82	0.00	0.00
F168	Bansgadhi(MRM)- Mainapokhar	8.40	0.74	7.66	0.00
F169	Koyhiya- Thakurdwara- Amreni(MRM)	21.00	2.40	12.60	6.00
F171	Bhuregaun(MRM)- Telpani	21.00	1.00	4.00	16.00
F192	Rajapur- Daulatpur	-	0.00	0.00	0.00
F203	Gulariya- Bagahighat- Jabdi- Rammapur	-	0.00	0.00	0.00
H17	Beluwa- Rajapur (Postal)	12.00	0.00	11.00	1.00
Total		211.42	121.43	60.99	29.00

2.2 DISTRICT ROAD CORE NETWORK

The inventory map developed using GIS software in the previous DTMP has been used for the identification of DRCN based on the criteria set out by DTMP Guidelines; Firstly DRCN was selected in consultation with DTO engineers and the technicians. Second meeting of DTICC was called by DDC Bardiya on 17 Baisakh, 2071 BS 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 DTICC. Finally the DRCN was approved by DTICC with some additions. The Approved List of the DRCN road is shown in the table below containing 16 nos. of road.

The total length of approved DRCN Road is 302.11 Km out of which 8.31 km are blacktop, 249.97 km are Gravel and 43.83 km are Earthen and all DRCN Roads are existing Road. The table 2.3.1 and 2.3.2 shows overall picture of Bardiya district which is presented as below.

Table 2.3.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	211.42	121.43	60.99	29.00
Highways	99.89	87.89	11.00	1.00
Feeder roads	111.53	33.54	49.99	28.00
Urban roads	190.00	34.00	98.00	58.00
Guleriya Municipality	190.00	34.00	98.00	58.00
District road core network	302.11	8.31	249.97	43.83
Village roads	344.31	-	284.82	59.48
Total	1,047.84	163.74	693.78	190.31

Source: DoR and Municipality

Table 2.3.2 District road core network (km)

Code	Name of Road	Total existing length	Black Top	Gravel	Earthen	All weather	Fair weather	New construction
58DR001	Rajapur Ring Road	45.10	-	45.10		45.10	-	
58DR002	Manpur - Badarpur - Nayagaun – Gola	21.22	-	21.22		21.22	-	
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.02	-	9.68	7.34	9.68	7.34	
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.58	0.69	20.19	0.70	20.88	0.70	
58DR005	Puspala Marg	16.52	1.46	15.06		16.52	-	
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.77	-	16.06	0.71	16.06	0.71	
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat	18.94	-	15.65	3.29	15.65	3.29	
58DR008	Guleriya - Magaragadi – Rammapur	21.31	4.48	15.51	1.32	19.99	1.32	
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.46	-	13.99	20.47	13.99	20.47	
58DR010	Suryapur - Kumbar – Baidi	12.59	-	2.91	9.68	2.91	9.68	
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.64	-	13.64		13.64	-	
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.49	-	10.17	0.32	10.17	0.32	
58DR013	Mainapokhar – Bashgadhi	8.25	1.68	6.57		8.25	-	
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni	14.29	-	14.29		14.29	-	
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.38	-	18.38		18.38	-	
58DR016	Beluwa – Ranjha	11.55	-	11.55		11.55	-	
Total		302.11	8.31	249.97	43.83	258.28	43.83	-

Note: Road code 58DR003, 58DR008 and 58DR013 are also the SRN

2.3 VILLAGE ROADS

After the identification of DRCN roads, all other roads that do not belong to the SRN road, DRCN roads and urban roads are classified as village roads. These roads fall under the responsibility of VDCs. The total length of village road is 344.31 Km in Bardiyai district. Planning for these roads is not included in the DTMP, as they are not the responsibility of District Development Committee. The management of these roads will be the responsibility of the VDCs 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 additional funding (20% as decided by DTICC meeting of the district) which will be available from DDC through rural roads project. VDCs will be responsible for emergency and routine / recurrent maintenances of these roads.

Figure 2 : Total road inventory

Figure 3 : District Core Road 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 are determined in the ARMP which are commonly prepared by DTO of the district.

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
58DR001	45.10	45.10	45.10	45.10
58DR002	21.22	21.22	21.22	21.22
58DR003	17.02	17.02	17.02	17.02
58DR004	21.58	21.58	21.58	21.58
58DR005	16.52	16.52	16.52	16.52
58DR006	16.77	16.77	16.77	16.77
58DR007	18.94	18.94	18.94	18.94
58DR008	21.31	21.31	21.31	21.31
58DR009	34.46	34.46	34.46	34.46
58DR010	12.59	12.59	12.59	12.59
58DR011	13.64	13.64	13.64	13.64
58DR012	10.49	10.49	10.49	10.49
58DR013	8.25	8.25	8.25	8.25
58DR014	14.29	14.29	14.29	14.29
58DR015	18.38	18.38	18.38	18.38
58DR016	11.55	11.55	11.55	11.55
Total	302.11	302.11	302.11	302.11

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, presented in table 3.2.1 as below

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Name of Road	Total length (km)	Rehabilitation (km)
58DR001	Rajapur Ring Road	45.10	0.70
58DR002	Manpur - Badarpur - Nayagaun – Gola	21.22	1.40
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.02	2.00
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.58	0.50
58DR005	Puspalal Marg	16.52	1.30
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.77	2.30
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha - Kusumghat	18.94	4.55
58DR008	Guleriya - Magaragadi – Rammapur	21.31	5.60
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.46	5.80
58DR010	Suryapur - Kumbar – Baidi	12.59	1.00
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.64	0.50
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.49	2.00
58DR013	Mainapokhar – Bashgadhi	8.25	4.70
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni	14.29	7.80
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.38	5.80
58DR016	Beluwa – Ranjha	11.55	1.50
Total		302.11	47.45

3.2.2 GRAVELLING

To improve the surface condition of the existing earthen roads considered in DRCN, 43.83 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)
58DR001	Rajapur Ring Road	45.10	-
58DR002	Manpur - Badarpur - Nayagaun – Gola	21.22	-
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.02	7.34
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.58	0.70
58DR005	Puspalal Marg	16.52	-
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.77	0.71
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha - Kusumghat	18.94	3.29
58DR008	Guleriya - Magaragadi – Rammapur	21.31	1.32
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.46	20.47
58DR010	Suryapur - Kumbar – Baidi	12.59	9.68
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.64	-
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.49	0.32
58DR013	Mainapokhar – Bashgadhi	8.25	-
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni	14.29	-
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.38	-
58DR016	Beluwa – Ranjha	11.55	-
Total			43.83

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 Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
58DR001	Rajapur Ring Road	100				1
58DR002	Manpur - Badarpur - Nayagaun – Gola					
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	115				3
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	300	2			
58DR005	Puspalal Marg					
58DR006	EW Hihway - Baniyabhar – Ghorpitta		13			
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat	290				
58DR008	Guleriya - Magaragadi – Rammapur	25	2			
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	55	8			5
58DR010	Suryapur - Kumbar – Baidi	25	2			5
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)					
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa		2			2
58DR013	Mainapokhar – Bashgadhi					
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni					
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe					
58DR016	Beluwa – Ranjha	25	4			
Total		935	33	-	-	16

3.2.4 PROTECTIVE STRUCTURES

To maintain the road in all weather condition, there are no any required protective structures during the DRCN survey as shown in table below.

Table 3.2.4 Required protective structures

Code	Name of Road	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
58DR001	Rajapur Ring Road			
58DR002	Manpur - Badarpur - Nayagaun – Gola			
58DR003	Rajapur - Bhimapur - Khairi Chandanpur			
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)			
58DR005	Puspall Marg			
58DR006	EW Hihway - Baniyabhar – Ghorpitta			
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat			
58DR008	Guleriya - Magaragadi – Rammapur			
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock			
58DR010	Suryapur - Kumbar – Baidi			
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)			
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa			
58DR013	Mainapokhar – Bashgadhi			
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni			
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe			
58DR016	Beluwa – Ranjha			
Total		-	-	-

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)
-	-	-	-	-
Total	-	-	-	-

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 lengths of the roads are shown in table below.

Table 3.2.6 Sections of the district road core network requiring blacktopping

Code	Name of Road	Total length (km)	Blacktop (km)	PCU	150
				Traffic (PCU)	Blacktopping (km)
58DR001	Rajapur Ring Road	45.10	-	66	-
58DR002	Manpur - Badarpur - Nayagaun – Gola	21.22	-	57	-
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.02	-	24	-
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.58	0.69	14	-
58DR005	Puspalal Marg	16.52	1.46	70	-
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.77	-	33	-
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat	18.94	-	58	-
58DR008	Guleriya - Magaragadi – Rammapur	21.31	4.48	42	-
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.46	-	57	-
58DR010	Suryapur - Kumbar – Baidi	12.59	-	18	-
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.64	-	69	-
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.49	-	34	-
58DR013	Mainapokhar – Bashgadhi	8.25	1.68	73	-
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni	14.29	-	24	-
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.38	-	89	-
58DR016	Beluwa – Ranjha	11.55	-	60	-
Total					-

3.3 NEW CONSTRUCTION

In Bardiya district, all VDCs headquarters are access with DCRN. Hence there is no any requirement 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)
58DR001	Rajapur Ring Road		45.10		
58DR002	Manpur - Badarpur - Nayagaun – Gola		21.22		
58DR003	Rajapur - Bhimapur - Khairi Chandanpur		17.02		
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)		21.58		
58DR005	Puspalal Marg		16.52		
58DR006	EW Hihway - Baniyabhar – Ghorpitta		16.77		
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat		18.94		
58DR008	Guleriya - Magaragadi – Rammapur		21.31		
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock		34.46		
58DR010	Suryapur - Kumbar – Baidi		12.59		
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)		13.64		
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa		10.49		
58DR013	Mainapokhar – Bashgadhi		8.25		
58DR014	Pancha Bazar - Kanthapur - Futaha – Jamuni		14.29		
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe		18.38		
58DR016	Beluwa – Ranjha		11.55		
Total			302.11	-	-

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 lists of all the perspective interventions required are listed in the table 3.4.1.

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)
58DR001	45.10	45.10	45.10	45.10	0.70	-			100.00	-			1.00				
58DR002	21.22	21.22	21.22	21.22	1.40	-			-	-			-				
58DR003	17.02	17.02	17.02	17.02	2.00	7.34			115.00	-			3.00				
58DR004	21.58	21.58	21.58	21.58	0.50	0.70			300.00	2.00			-				
58DR005	16.52	16.52	16.52	16.52	1.30	-			-	-			-				
58DR006	16.77	16.77	16.77	16.77	2.30	0.71			-	13.00			-				
58DR007	18.94	18.94	18.94	18.94	4.55	3.29			290.00	-			-				
58DR008	21.31	21.31	21.31	21.31	5.60	1.32			25.00	2.00			-				
58DR009	34.46	34.46	34.46	34.46	5.80	20.47			55.00	8.00			5.00				
58DR010	12.59	12.59	12.59	12.59	1.00	9.68			25.00	2.00			5.00				
58DR011	13.64	13.64	13.64	13.64	0.50	-			-	-			-				
58DR012	10.49	10.49	10.49	10.49	2.00	0.32			-	2.00			2.00				
58DR013	8.25	8.25	8.25	8.25	4.70	-			-	-			-				
58DR014	14.29	14.29	14.29	14.29	7.80	-			-	-			-				
58DR015	18.38	18.38	18.38	18.38	5.80	-			-	-			-				
58DR016	11.55	11.55	11.55	11.55	1.50	-			25.00	4.00			-				
Total	302.11	302.11	302.11	302.11	47.45	43.83			935	33			16				

Figure 4 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 provided by Bardiya district 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	35,000
Routine maintenance	km	15,000
Recurrent maintenance (blacktop)	km	750,000
Recurrent maintenance (gravel)	km	550,000
Recurrent maintenance (earthen)	km	300,000
Periodic maintenance (blacktop)	km	500,000
Periodic maintenance (gravel)	km	300,000

The total conservation cost for the first year is NRs 246,962,000.00. Consequently the 5-year cost is NRs 1,234,808,000.00. 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 maintenance	Routine maintenance	Recurrent maintenance (blacktop)	Recurrent maintenance (gravel)	Recurrent maintenance (earthen)	Periodic maintenance (blacktop)	Periodic maintenance (gravel)	Total first year cost	Total 5-year cost
58DR001	45.10	-	45.10	-	1,579	677	-	24,805	-	-	13,530	40,590	202,950
58DR002	21.22	-	21.22	-	743	318	-	11,671	-	-	6,366	19,098	95,490
58DR003	17.02	-	9.68	7.34	596	255	-	5,324	2,202	-	2,904	11,281	56,405
58DR004	21.58	0.69	20.19	0.70	755	324	518	11,105	210	-	6,057	18,968	94,840
58DR005	16.52	1.46	15.06	-	578	248	1,095	8,283	-	-	4,518	14,722	73,610
58DR006	16.77	-	16.06	0.71	587	252	-	8,833	213	-	4,818	14,703	73,513
58DR007	18.94	-	15.65	3.29	663	284	-	8,608	987	-	4,695	15,237	76,183
58DR008	21.31	4.48	15.51	1.32	746	320	3,360	8,531	396	-	4,653	18,005	90,025
58DR009	34.46	-	13.99	20.47	1,206	517	-	7,695	6,141	-	4,197	19,756	98,778
58DR010	12.59	-	2.91	9.68	441	189	-	1,601	2,904	-	873	6,007	30,035
58DR011	13.64	-	13.64	-	477	205	-	7,502	-	-	4,092	12,276	61,380
58DR012	10.49	-	10.17	0.32	367	157	-	5,594	96	-	3,051	9,265	46,325
58DR013	8.25	1.68	6.57	-	289	124	1,260	3,614	-	-	1,971	7,257	36,285
58DR014	14.29	-	14.29	-	500	214	-	7,860	-	-	4,287	12,861	64,305
58DR015	18.38	-	18.38	-	643	276	-	10,109	-	-	5,514	16,542	82,710
58DR016	11.55	-	11.55	-	404	173	-	6,353	-	-	3,465	10,395	51,975
Total	302.11	8.31	249.97	43.83	10,574	4,532	6,233	137,484	13,149	-	74,991	246,962	1,234,808

4.2 IMPROVEMENT

The improvement costs are calculated by multiplying the standard costs as given in table 4.2.1(Provided by Bardiya DDC/DTO) 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	850,000
Widening	M	30,000
Gravelling	km	1,900,000
Blacktopping	km	4,500,000
Bridge construction	m	850,000
Slab culvert construction	m	225,000
CC Causeway construction	m	100,000
Stone Causeway construction	m	11,500
Pipe culvert placement	unit	12,000
Masonry wall construction	m ³	11,500
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 851,042,000.00 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
58DR001	45.10	595		-		85,000	-			12				85,607
58DR002	21.22	1,190		-		-	-			-				1,190
58DR003	17.02	1,700		1,395		97,750	-			36				100,881
58DR004	21.58	425		133		255,000	450			-				256,008
58DR005	16.52	1,105		-		-	-			-				1,105
58DR006	16.77	1,955		135		-	2,925			-				5,015
58DR007	18.94	3,868		625		246,500	-			-				250,993
58DR008	21.31	4,760		251		21,250	450			-				26,711
58DR009	34.46	4,930		3,889		46,750	1,800			60				57,429
58DR010	12.59	850		1,839		21,250	450			60				24,449
58DR011	13.64	425		-		-	-			-				425
58DR012	10.49	1,700		61		-	450			24				2,235
58DR013	8.25	3,995		-		-	-			-				3,995
58DR014	14.29	6,630		-		-	-			-				6,630
58DR015	18.38	4,930		-		-	-			-				4,930
58DR016	11.55	1,275		-		21,250	900			-				23,425
Total	302.11	40,333	-	8,328	-	794,750	7,425	-		192	-	-	-	851,027

4.3 NEW CONSTRUCTION

The cost for new construction is calculated by using standard unit costs as given in table 4.3.1 provided by Bardiya DDC/ DTO.

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Track opening	km	1,500,000
Gravelling	km	1,900,000
Bridge construction	m	850,000

New construction is not required to access in any VDC in Bardiya District for DTMP. So new construction cost is not calculated, as shown in table below:

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

Code	Name of Road	New length (km)	Opening up (NPR)	Gravelling (NPR)	Bridges (NPR)	Total cost (NPR)
58DR001	Rajapur Ring Road	-	-	-	-	-
58DR002	Manpur - Badarpur - Nayagaun - Gola	-	-	-	-	-
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	-	-	-	-	-
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	-	-	-	-	-
58DR005	Puspalal Marg	-	-	-	-	-
58DR006	EW Hihway - Baniyabhar - Ghorpitta	-	-	-	-	-
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha - Kusumghat	-	-	-	-	-
58DR008	Guleriya - Magaragadi - Rammapur	-	-	-	-	-
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	-	-	-	-	-
58DR010	Suryapur - Kumbar - Baidi	-	-	-	-	-
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	-	-	-	-	-
58DR012	Kakaura(PCO Chock) - Juraina - Damauli - Pachasa	-	-	-	-	-
58DR013	Mainapokhar - Bashgadhi	-	-	-	-	-
58DR014	Pancha Bazar - Kanthapur - Futaha - Jamuni	-	-	-	-	-
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	-	-	-	-	-
58DR016	Beluwa - Ranjha	-	-	-	-	-
Total		-	-	-	-	-

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 2,085,835,000.00 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
58DR001	202,950	85,607	-	288,557
58DR002	95,490	1,190	-	96,680
58DR003	56,405	100,881	-	157,286
58DR004	94,840	256,008	-	350,848
58DR005	73,610	1,105	-	74,715
58DR006	73,513	5,015	-	78,527
58DR007	76,183	250,993	-	327,175
58DR008	90,025	26,711	-	116,736
58DR009	98,778	57,429	-	156,207
58DR010	30,035	24,449	-	54,484
58DR011	61,380	425	-	61,805
58DR012	46,325	2,235	-	48,560
58DR013	36,285	3,995	-	40,280
58DR014	64,305	6,630	-	70,935
58DR015	82,710	4,930	-	87,640
58DR016	51,975	23,425	-	75,400
Total	1,234,808	851,027	-	2,085,835

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)
58DR010	12.59	441	189	-	1,601	2,904	-	873	6,007	47,367	127
58DR012	10.49	367	157	-	5,594	96	-	3,051	9,265	62,594	148
58DR007	18.94	663	284	-	8,608	987	-	4,695	15,237	68,330	223
58DR009	34.46	1,206	517	-	7,695	6,141	-	4,197	19,756	81,565	242
58DR013	8.25	289	124	1,260	3,614	-	-	1,971	7,257	29,820	243
58DR011	13.64	477	205	-	7,502	-	-	4,092	12,276	43,706	281
58DR003	17.02	596	255	-	5,324	2,202	-	2,904	11,281	29,970	376
58DR014	14.29	500	214	-	7,860	-	-	4,287	12,861	33,826	380
58DR005	16.52	578	248	1,095	8,283	-	-	4,518	14,722	36,490	403
58DR008	21.31	746	320	3,360	8,531	396	-	4,653	18,005	41,815	431
58DR004	21.58	755	324	518	11,105	210	-	6,057	18,968	33,509	566
58DR015	18.38	643	276	-	10,109	-	-	5,514	16,542	25,581	647
58DR001	45.10	1,579	677	-	24,805	-	-	13,530	40,590	62,312	651
58DR002	21.22	743	318	-	11,671	-	-	6,366	19,098	28,873	661
58DR016	11.55	404	173	-	6,353	-	-	3,465	10,395	15,568	668
58DR006	16.77	587	252	-	8,833	213	-	4,818	14,703	17,682	831

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)
58DR011	13.64	-	-	425	43,706	10
58DR005	16.52	-	-	1,105	36,490	30
58DR012	10.49	0.32	-	2,235	62,594	36
58DR002	21.22	-	-	1,190	28,873	41
58DR013	8.25	-	-	3,995	29,820	134
58DR015	18.38	-	-	4,930	25,581	193
58DR014	14.29	-	-	6,630	33,826	196
58DR006	16.77	0.71	-	5,015	17,682	284
58DR010	12.59	9.68	-	24,449	47,367	516
58DR008	21.31	1.32	-	26,711	41,815	639
58DR009	34.46	20.47	-	57,429	81,565	704
58DR001	45.10	-	-	85,607	62,312	1,374
58DR016	11.55	-	-	23,425	15,568	1,505
58DR003	17.02	7.34	-	100,881	29,970	3,366
58DR007	18.94	3.29	-	250,993	68,330	3,673
58DR004	21.58	0.70	-	256,008	33,509	7,640

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)
58DR003	-	-	29,970	-
58DR001	-	-	62,312	-
58DR004	-	-	33,509	-
58DR015	-	-	25,581	-
58DR014	-	-	33,826	-
58DR010	-	-	47,367	-
58DR007	-	-	68,330	-
58DR012	-	-	62,594	-
58DR005	-	-	36,490	-
58DR008	-	-	41,815	-
58DR009	-	-	81,565	-
58DR016	-	-	15,568	-
58DR011	-	-	43,706	-
58DR002	-	-	28,873	-
58DR006	-	-	17,682	-
58DR013	-	-	29,820	-

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

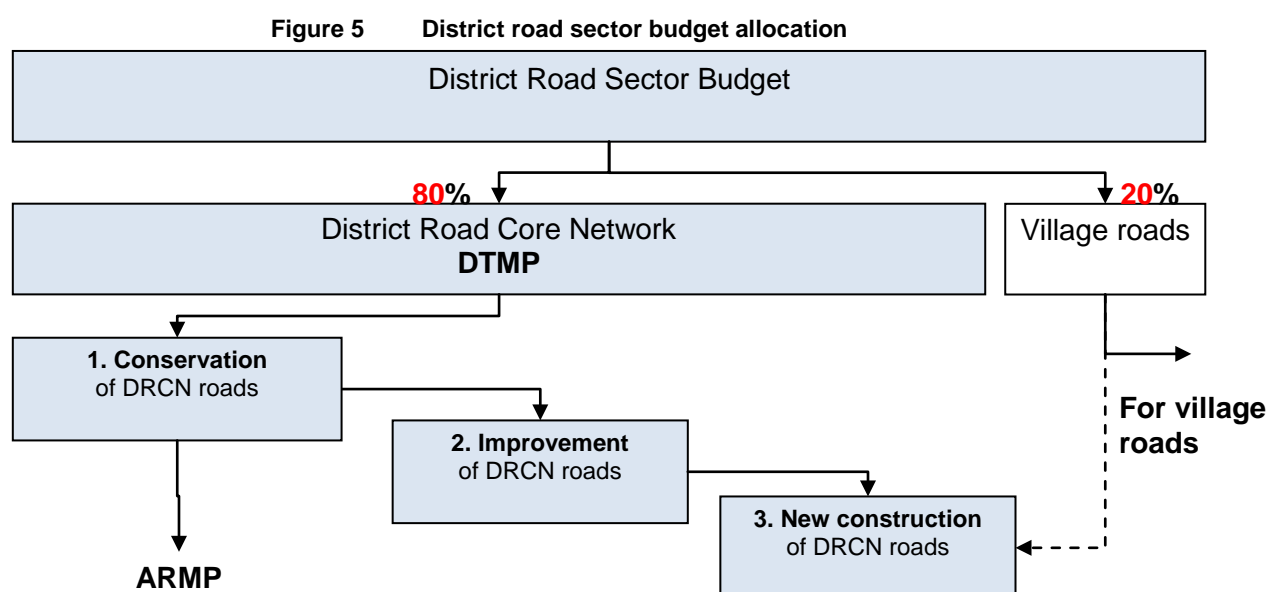
The estimation of the financial resources available at district level for investments in the road sector has been carried out which is shown in Table 6.1.1 below. The expected fund for next five year is worked out by projecting the last year's available budget on the basis of their increment of the budget.

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

Funding source	2071/72	2072/73	2073/74	2074/75	2075/76
Local Transport Road and Bridge	31800	38160	45792	54950.4	65940.48
DDC Internal Sources	14007.6	16809.1	20170.94	24205.1	29046.16
Road Board	4500	5400	6480	7776	9331.2
SNRTP	96000	115200	138240	165888	199065.6
Election	10247	10247	10247	10247	10247
LGCDP	12801.6	15361.9	18434.3	22121.2	26545.4
Disadvantaged Group Special Progarmme	4080.6	4896.72	5876.064	7051.28	8461.532
Central Grant	8866.8	10640.2	12768.19	15321.8	18386.2
Total	182,304	216,715	258,009	307,561	367,024
Grand total	1,331,611				

6.2 BUDGET ALLOCATION

The percentage of budget allocation for DRCN road is 80% and 20% is allocated in village roads as decided by DTICC/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 on the basis of cost/ person. Due to budget constraint, More budget is allocated for conservation of DRCN roads in this planning then budget is allocated to improve some road into gravel surface condition. No new construction cost is required to complete the DRCN road due to no new construction road in DRCN. 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

Item				Year											
Fiscal year				2071/72		2072/73		2073/74		2074/75		2075/76			
Total budget				182,304		216,715		258,009		307,561		367,024			
Village roads				36,461		43,343		51,602		61,512		73,405			
Core road network budget (DTMP)				145,843		173,372		206,407		246,049		293,619			
Core network length (km)				302.11		302.11		302.11		302.11		302.11			
Blacktop (km)				8.31		8.31		8.31		8.31		8.31			
Gravel (km)				249.97		249.97		249.97		249.97		249.97			
Earthen (km)				43.83		43.83		43.83		43.83		43.83			
Conservation (NRs)				145,843		173,372		206,407		246,049		251,117			
Emergency				10,574		10,574		10,574		10,574		10,574			
Routine				4,532		4,532		4,532		4,532		4,532			
Recurrent (blacktop)				6,233		6,233		6,233		6,233		6,233			
Recurrent (gravel)				124,505		137,484		137,484		137,484		137,484			
Recurrent (earthen)						13,149		13,149		13,149		13,149			
Periodic (blacktop)						1,401		4,155		4,155		4,155			
Periodic (gravel)								30,281		69,923		74,991			
Improvement	Cost	BT	GR	BT	GR	BT	GR	BT	GR	BT	GR	42,502	BT	GR	
58DR011	425											425			
58DR005	1,105											1,105			
58DR012	2,250		0.32									2,250		0.32	
58DR002	1,190											1,190			
58DR013	3,995											3,995			
58DR015	4,930											4,930			
58DR014	6,630											6,630			
58DR006	5,015		0.71									5,015		0.71	
58DR010	24,449		9.68									16,963		6.72	
58DR008	26,711		1.32												
58DR009	57,429		20.47												
58DR001	85,607														
58DR016	23,425														
58DR003	100,881		7.34												
58DR007	250,993		3.29												
58DR004	256,008		0.70												
Total improvement												42,502		1.79	
Construction		Cost		GR	GR		GR		GR		GR		GR		
58DR013															
Total new construction															
Remaining budget															

Village roads

DRCN roads

DRCN length

Blacktop length

Gravel length

Earthen length

Conservation

6.3 DTMP OUTPUTS

The output of the DTMP will be of conservation 302.11 km, improvement to gravel will be 7.75 km and there will not any new construction which is as shown in table 6.3.1 below.

Table 6.3.1 DTMP output

Conservation	Improvement gravel	Improvement blacktop	New construction
302.70	7.75	-	-

The budget allocated for next five years are; NPR 1,022,787,000.00 for conservation, NPR 42,502,000.00 for improvement and no Budget for new construction.

6.4 DTMP OUTCOME

After the DTMP fair weather roads are decreased from 15% to 12%, 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	302.11	43.83	15%	249.97	83%	8.31	3%
End of DTMP	302.11	36.08	12%	257.72	85%	8.31	3%
Difference	-	- 7.75	-1.0%	7.75	-1.0%		0.0%

All VDCs are access by road at the start of DTMP.2% of population were accessed to fair weather road. 92 % of population were accessed to all weather roads.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	20	275,548	75%	0	-	0%	1	8,515	2%	28	338,595	92%
End of DTMP	20	275,548	75%	0	-	0%	1	8,515	2%	28	338,595	92%
Difference	-	-	0%	-	-	0%	-	-	0%	-	-	0%

Figure 6 District Transport Master Plan (DTMP)

ANNEX 1 TRAFFIC DATA

Table A1.2 Traffic Data

Code	Total Length (km)	Motorcycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU	VPD
58DR001	45.10	30	5	15	4	66	24
58DR002	21.22	25	4	14	3	57	21
58DR003	17.02	8	2	5	2	24	9
58DR004	21.58	5	1	3	1	14	5
58DR005	16.52	35	6	15	4	70	25
58DR006	16.77	12	1	9	2	33	12
58DR007	18.94	20	4	12	5	58	21
58DR008	21.31	15	2	10	3	42	15
58DR009	34.46	30	6	10	4	57	20
58DR010	12.59	8	2	4	1	18	7
58DR011	13.64	30	4	15	5	69	24
58DR012	10.49	10	3	9	2	34	14
58DR013	8.25	30	8	13	6	73	27
58DR014	14.29	8	2	5	2	24	9
58DR015	18.38	35	5	17	8	89	30
58DR016	11.55	30	5	10	5	60	20
Total	302.11						

ANNEX 2 POPULATIONS SERVED

Table A2.1 Population Served

#	VDC/municipality	Populat ion	Road																SRN
			58DR001	58DR002	58DR003	58DR004	58DR005	58DR006	58DR007	58DR008	58DR009	58DR010	58DR011	58DR012	58DR013	58DR014	58DR015	58DR016	
1	Badalpur	6,881		X															
2	Baganaha	13,048																	X
3	Baniyabhar	17,682						X			X								X
4	Belawa	15,568																X	X
5	Bhimapur	10,053			X														X
6	Daulatpur	7,524	X																
7	Deudakala	19,221											X	X					X
8	Dhadhawar	22,882							X	X	X	X							X
9	Dhodhari	10,059					X												X
10	Gola	6,814	X	X															
11	Jamuni	11,539														X	X		
12	Kalika	13,553									X	X	X	X		X			X
13	Khairi Chandanpur	7,115	X		X														X
14	Magaragadi	18,933							X	X	X								X
15	Mahamadpur	10,932										X	X						X
16	Manau	6,357	X																
17	Manpur Mainapokhar	8,734												X	X	X			X
18	Manpur Tapara	9,395		X															X
19	Motipur	21,086												X	X				X
20	Naya Gaun	5,783		X															
21	Neulapur	14,790				X													X
22	Padanaha	8,515							X		X								
23	Pasupatinagar	6,945	X																
24	Patabhar	14,755	X																
25	Rajapur	12,802	X		X														X
26	Sanoshree	18,000					X		X										X
27	Sivapur	7,706																	X
28	Sorhawa	14,042															X		X
29	Suryapatawa	9,947				X													X
30	Taratal	8,431					X												
31	Thakudwara	8,772				X													
	Total population	367,864	62,312	28,873	29,970	33,509	36,490	17,682	68,330	41,815	81,565	47,367	43,706	62,594	29,820	33,826	25,581	15,568	275,548
	Total VDCs/municipalities	31	7	4	3	3	3	1	4	2	5	3	3	4	2	3	2	1	19

source: Population census 2012

#	VDC/municipality	No access DRCN start DTMP	No access DRCN end DTMP	Fair-weather DRCN start DTMP	Fair-weather DRCN end DTMP	All-weather DRCN start DTMP	All-weather DRCN end DTMP	Direct access to SRN
1	Badalpur					X	X	
2	Baganaha					X	X	X
3	Baniyabhar					X	X	X
4	Belawa					X	X	X
5	Bhimapur					X	X	X
6	Daulatpur					X	X	
7	Deudakala					X	X	X
8	Dhadhawar					X	X	X
9	Dhodhari					X	X	X
10	Gola					X	X	
11	Jamuni					X	X	
12	Kalika					X	X	X
13	Khairi Chandanpur					X	X	X
14	Magaragadi					X	X	X
15	Mahamadpur					X	X	X
16	Manau					X	X	
17	Manpur Mainapokhar					X	X	X
18	Manpur Tapara					X	X	X
19	Motipur					X	X	X
20	Naya Gaun					X	X	
21	Neulapur					X	X	X
22	Padanaha					X	X	
23	Pasupatinagar					X	X	
24	Patabhar					X	X	
25	Rajapur					X	X	X
26	Sanoshree					X	X	X
27	Sivapur					X	X	X
28	Sorhawa					X	X	X
29	Suryapatawa					X	X	X
30	Taratal					X	X	
31	Thakudwara					X	X	
	Total population	-	-	367,864	367,864	367,864	367,864	275,548
	Total VDCs	0	0	31	31	31	31	20

ANNEX3 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)	Stone Causeway (m)	Pipe culvert (units)	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)
58DR001	Rajapur Ring Road	45.1	0+000	45+100	0.70	0			100				1			
58DR002	Manpur - Badalpur - Nayagaun – Gola	21.3	0+000	21+300	1.40	0										
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.1	0+000	17+100	2.00	11.1			115				3			
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.6	0+000	21+600	0.50	0.94			300	2						
58DR005	Puspalal Marg	16.6	0+000	16+600	1.30	0										
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.8	0+000	16+800	2.30	0.71				13						
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat	19	0+000	19+000	4.55	3.62			290							
58DR008	Guleriya - Magaragadi – Rampur	21.3	0+000	21+300	5.60	1.71			25							
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.5	0+000	34+500	5.80	17.3			55	8			4			
58DR010	Suryapur - Kumbar – Baidi	12.6	0+000	12+600	1.00	9.65			25	2			5			
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.7	0+000	13+700	0.50	0										
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.5	0+000	10+500	2.00	0		1,000		2			2			
58DR013	Mainapokhar – Bashgadhi	8.3	0+000	8+300	4.70	0										
58DR014	Pancha Bazar - Kanthapur - Fataha – Jamuni	14.3	0+000	14+300	7.80	0										
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.4	0+000	18+400	5.80	0										
58DR016	Beluwa – Ranjha	11.6	0+000	11+600	1.50	0			25	4						
Total		302.70			47	45.03	0	1000	935	31	0	0	15	0	0	0

ANNEX4 OVERALL INVENTORY

Table A4.1 Overall Inventory lists

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Gravel	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition - Temporarily Impassable	Condition - Permanently Impassable
58DR001	Rajapur Ring Road	45.10	0+000	45+100	0	45.1	0	45.1	0	45.1		0.00	
58DR002	Manpur - Badalpur - Nayagaun – Gola	21.22	0+000	21+300	0	21.22	0	21.22	0	21.22		0	
58DR003	Rajapur - Bhimapur - Khairi Chandanpur	17.02	0+000	17+100	0	9.68	7.34	9.68	7.34	6.02		11	
58DR004	Khata - Thakurdwara - Godana - Neulapur(Bhurigaun)	21.58	0+000	21+600	0.69	20.19	0.7	20.88	0.7	20.66		0.92	
58DR005	Puspalal Marg	16.52	0+000	16+600	1.46	15.06	0	16.52	0	16.52		0	
58DR006	EW Hihway - Baniyabhar – Ghorpitta	16.77	0+000	16+800	0	16.06	0.71	16.06	0.71	16.09		0.68	
58DR007	Baidi Chock(MRM) - Dhadawar - Magaragadi - Padnaha – Kusumghat	18.94	0+000	19+000	0	15.65	3.29	15.65	3.29	15.38		3.56	
58DR008	Guleriya - Magaragadi – Rampur	21.31	0+000	21+300	4.48	15.51	1.32	19.99	1.32	19.59		1.72	
58DR009	Lathuwaghat - Padnaha - Phachuwa - Baidi - Pachchabazar Chock	34.46	0+000	34+500	0	13.99	20.47	13.99	20.47	17.18		17.28	
58DR010	Suryapur - Kumbar – Baidi	12.59	0+000	12+600	0	2.91	9.68	2.91	9.68	2.95		9.64	
58DR011	Laxmana - Gauripara - Ganeshpur - Bhansar (India Boarder)	13.64	0+000	13+700	0	13.64	0	13.64	0	13.64		0	
58DR012	Kakaura(PCO Chock) - Juraina - Damauli – Pachasa	10.49	0+000	10+500	0	10.17	0.32	10.17	0.32	10.49		0	
58DR013	Mainapokhar – Bashgadhi	8.25	0+000	8+300	1.68	6.57	0	8.25	0	8.25		0	
58DR014	Pancha Bazar - Kanthapur - Fataha – Jamuni	14.29	0+000	14+300	0	14.29	0	14.29	0	14.29		0	
58DR015	Puspa Chock(MRM) - Dakshin Bhakari - Butaha - Phulbari Khola - Bholagaudi - Satpatiya Danfe	18.38	0+000	18+400	0	18.38	0	18.38	0	18.38		0	
58DR016	Beluwa – Ranjha	11.55	0+000	11+600	0	11.55	0	11.55	0	11.55		0	
58VR001	Dhobinpur(Lalitapur) Budikulo-Badalpur-8-Bashanta-3,2,1-Jhandi-5,6,7,9,4-Manau-8(Ringroad)	9.64	0+000	9+640		9.64		9.64		9.64			
58VR002	Manau(parsaini)-rajapur road	7.48	0+000	7+480		7.48		7.48		7.48			
58VR003	Thakurdwara-Banugaun-Sivapur-Hattisar-Bandrahawa-Tadawachok	13.91	0+000	13+910		13.91		13.91		13.91			
58VR004	Basgadi-Materiya-Belwa-MRM	4.47	0+000	4+470			4.47		4.47		4.47	4.47	
58VR005	Basgadi-Damauli-Deudakala Radha Krishna Chowk	9.45	0+000	9+450		9.45		9.45		9.45			
58VR006	Chotkipur-Manpuri-Daulatpur-Tikapur Ghat	8.61	0+000	8+610		8.61		8.61		8.61			
58VR007	Gola Ghattatole (Ring road)-Bindra-Pashupatinagar-Guhari (Nayagau)	5.51	0+000	5+510		5.51		5.51		5.51			

58VR008	Dhobinpur-Katarniyaghat	2.09	0+000	2+090		2.09		2.09		2.09			
58VR009	Basgadi-Mainapokhar-Phulpur Pachasa Chowk	3.30	0+000	3+300		3.30		3.30		3.30			
58VR010	BeluwaWard No-1-Rajha-Sub health post- Chauki-Banmuruwa Gaun-Aamaya	5.16	0+000	5+160		5.16		5.16		5.16			
58VR011	Badhi Chowk-Khairapur-Janapukha	7.11	0+000	7+110			7.11		7.11		7.11	7.11	
58VR012	Bhurigaun Ringroad (Damrani Saunbar ,Khailar,Baganaha,Neulapur,Ranipur,Karmala)	16.45	0+000	16+450			16.45		16.45		16.45	16.45	
58VR013	Bhimapur-9-Chainpur-Manpur tapara-4-Sukhard-7-Badalpur-5 Muraiya Link Road	7.13	0+000	7+130		7.13		7.13		7.13			
58VR014	Patabhar-Bankatti-Thapapur-Kathmandu-Janaknagar-Gola	2.26	0+000	2+260		2.26		2.26		2.26			
58VR015	Patabhar-Kalika Mandir-Bhairampur-Rajapur Pahadi Tol	4.29	0+000	4+290		4.29		4.29		4.29			
58VR016	Thakurdwara-Madhela-Bakuwa-Tulsipur-Motipur-Ambasa	13.41	0+000	13+410		13.41		13.41		13.41			
58VR017	Basgadi-Laxmanapur-Madha-Bathuwa-Amaiya	9.33	0+000	9+330			9.33		9.33		9.33	9.33	
58VR018	Machhagad-Paraspur-Toraiya	6.76	0+000	6+760		6.76		6.76		6.76			
58VR019	Rajapur-Badalpur-5	4.63	0+000	4+630		4.63		4.63		4.63			
58VR020	Mainapokhar-Ranipur-Padariya-Futaha	3.02	0+000	3+020		3.02		3.02		3.02			
58VR021	Mayur Basti-Banchauki-Bakotiya-Kalabanzar-Chhotki Dewdakala	5.41	0+000	5+410		5.41		5.41		5.41			
58VR022	Bagnaha chok-Bagnaha gaun-Jutpani-Mirchaiya-Thakurdwara	6.39	0+000	6+390			6.39		6.39		6.39	6.39	
58VR023	Kothiyaghat-Dhanaura-Khata-Oralibazar	3.43	0+000	3+430		3.43		3.43		3.43			
58VR024	Rampur-Banyabhar-Muktakamiyabasti-Manikapur	6.44	0+000	6+440		6.44		6.44		6.44			
58VR025	Basgadi-Bathuwa-Ashnari	5.47	0+000	5+470			5.47		5.47		5.47	5.47	
58VR026	Simara-Tamaulipur-Futaha	5.53	0+000	5+530		5.53		5.53		5.53			
58VR027	Mainapokhar-Jagatiya-Basgadi	8.79	0+000	8+790		8.79		8.79		8.79			
58VR029	Baganaha-Khailar-Baniyabhar	3.92	0+000	3+920			3.92		3.92		3.92	3.92	
58VR030	Lalitapur-Phattepur-Murayna-Chainpur	4.25	0+000	4+250		4.25		4.25		4.25			
58VR031	Gola-Patabhar-6-Janaknagar-Aanokhariya	4.51	0+000	4+510		4.51		4.51		4.51			
58VR032	Mainapokhar-Janaganagar	2.70	0+000	2+700			2.70		2.70		2.70	2.70	
58VR033	Bairiyaghat-Bairiyagaun-Padnaha VDC Bhawan	7.45	0+000	7+450		7.45		7.45		7.45			
58VR034	Sindra-Badalpur	2.59	0+000	2+590		2.59		2.59		2.59			
58VR035	Talpur-Tulishpur Road	3.87	0+000	3+870		3.87		3.87		3.87			
58VR036	Khairi-Kushumbhaghat	2.56	0+000	2+560		2.56		2.56		2.56			
58VR037	Khusalpatuwa-Suryapatuwa-Taduwa	5.46	0+000	5+460		5.46		5.46		5.46			
58VR038	Daulatpur(VDC)-Murgawa-Himalipur	3.78	0+000	3+780		3.78		3.78		3.78			
58VR039	Panditpur-Joshipur(kumber Road)	4.91	0+000	4+910		4.91		4.91		4.91			
58VR040	Bankatti School-Way to Tikapur	2.08	0+000	2+080		2.08		2.08		2.08			
58VR041	Chhodkideuda-Mainapokhar	2.49	0+000	2+490		2.49		2.49		2.49			
58VR042	Ratnapur-Kalabanzar-Tekari	4.79	0+000	4+790		4.79		4.79		4.79			
58VR043	Bairiyaghat-Bairiyagaun-Barabardiya (Pipal chowk)	3.09	0+000	3+090		3.09		3.09		3.09			

58VR044	Bangaudi(nayabasti)-Gaurichok	4.69	0+000	4+690		4.69		4.69		4.69			
58VR045	Bankatti-Tikapur ghat	1.78	0+000	1+780		1.78		1.78		1.78			
58VR046	Bhansar sadak (Taratal-Lalsing chok)	4.25	0+000	4+250		4.25		4.25		4.25			
58VR047	Bhaura-Bhogpur-Chainpur	5.79	0+000	5+790		5.79		5.79		5.79			
58VR048	Bindra-Lahurpur	4.84	0+000	4+840		4.84		4.84		4.84			
58VR049	Dafe-Shantipur-sitapur	5.88	0+000	5+880		5.88		5.88		5.88			
58VR050	Daulatpur- Tikapur ghat	1.87	0+000	1+870		1.87		1.87		1.87			
58VR051	Govindapur-Mainapokhar-Khonpur	5.26	0+000	5+260		5.26		5.26		5.26			
58VR052	Gulariya-Khunpur-Jabdahawa-Tarkapur	4.15	0+000	4+150		4.15		4.15		4.15			
58VR053	Haripur (Ring road)-Chainpur-Ghurahi- Nangapur	8.83	0+000	8+830		8.83		8.83		8.83			
58VR054	Hulaki Sadak(Rajapur)-Giri Tol-Padariya Gaun	1.11	0+000	1+110		1.11		1.11		1.11			
58VR055	Jaynagar-Manikapur-Harnawa-Shihuneya	7.50	0+000	7+500		7.50		7.50		7.50			
58VR056	Jhapti-Dhobinpur	3.10	0+000	3+100		3.10		3.10		3.10			
58VR057	Kalika (Shitalabazar) paschim-Jaykalika Ma.Vi-Munalbasti-Mahamadpur	2.54	0+000	2+540		2.54		2.54		2.54			
58VR058	Kusumba bazar-Pragati bazaar	2.88	0+000	2+880		2.88		2.88		2.88			
58VR059	Lalpur-India Border Road	1.50	0+000	1+500		1.50		1.50		1.50			
58VR060	Lokharpur (Sarbodaya pra bi)-Gidarpur-Banbirpur-Motipur (Damauli)	0.98	0+000	1+980		0.98		0.98		0.98			
58VR061	Mainapokhar-Kanpurwa-Phalakpur-Gidarpur	2.65	0+000	2+650		2.65		2.65		2.65			
58VR062	Indrapur Milan chok-Giri chok (Taratal)	3.16	0+000	3+160		3.16		3.16		3.16			
58VR063	Pachasa Chowk (Hulaki sadak)-Fulpur-Gidarpur-Bhadohi-Banbir-Damauli-Juraina	1.10	0+000	1+100		1.10		1.10		1.10			
58VR064	Bindra-Lahurpur	3.36	0+000	3+360		3.36		3.36		3.36			
58VR065	Hulaki Sadak(Rajapur)-Giri Tol-Padriya Gaun	2.65	0+000	2+650		2.65		2.65		2.65			
58VR066	Rajapur-Purva kanpur(Patavar 8)	2.02	0+000	2+020		2.02		2.02		2.02			
58VR067	Ratnachauki-Purnapur(Sanoshree)	6.17	0+000	6+170		6.17		6.17		6.17			
58VR068	Sorahawa VDC Office-Badhahiya Gaun-Jagitya	3.65	0+000	5+650			3.65		3.65		3.65	3.65	
58VR069	Sukhad-Ganeshpur	1.11	0+000	1+110		1.11		1.11		1.11			
58VR070	Tamaulipur-Bhawanipur-Gobrepur-Satapatiya Chowk	3.44	0+000	3+440		3.44		3.44		3.44			
58VR071	Lakxmipur-Guwari	1.22	0+000	1+220		1.22		1.22		1.22			
58VR072	Way to Forest	1.00	0+000	1+000		1.00		1.00		1.00			
58VR073	Way to Teshanpur	0.69	0+000	1+690		0.69		0.69		0.69			
58VR074	Pasupatibazar-Padriya-Ranipur	1.24	0+000	1+240		1.24		1.24		1.24			
TOTAL		646.42			8.31	534.79	103.31	543.10	103.31	542.13	59.48	104.28	

ANNEX 5 MINUTE OF MEETINGS