



Government of Nepal



District Transport Master Plan (DTMP)

Ministry of Federal Affairs
and Local Development

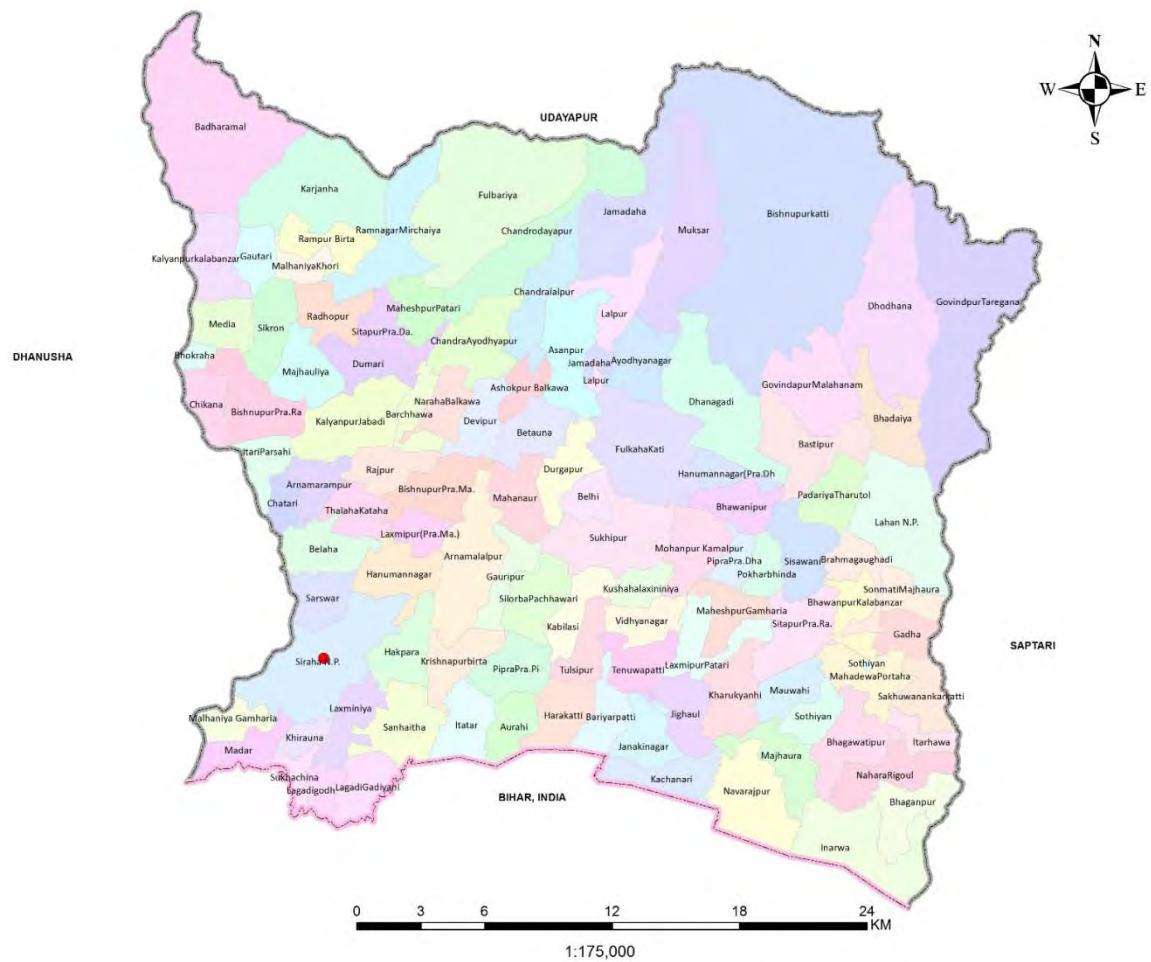
Department of Local
Infrastructure Development and
Agricultural Roads (DoLIDAR)
District Development
Committee, **Siraha**

Vol I Main Report

November 2014

Submitted by GOEC Nepal Pvt. Ltd. for the District Development Committee (DDC) and District Technical Office (DTO), of Siraha 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 through Rural Access Programme 3 (RAP 3)

DISTRICT TRANSPORT MASTER PLAN SIRAHĀ DISTRICT



2014

FOREWORD



Government of Nepal
Ministry of Federal Affairs and Local Development
Office of the District Development Committee
Siraha

Ph. No:- 033-520116
Fax: 033-520071

Ref No: 2071/072
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FOREWORD

It is my great pleasure to introduce this revised District Transport Master Plan (DTMP) of Siraha district which was concurred by the district stakeholder's meeting held on 2070-12-24. and approved by the DDC Council on 2070-12-24. Based on the DTMP Guideline 2012, all together 36 District Road Core Network (DRCN) aiming to connect all Village Development Committee (VDC) headquarters, either directly or through strategic road network (SRN) have been selected. By bringing the DRCN to a maintainable and all-weather standard, year-round access to all VDCs headquarters can be ensured.

I believe this document will be helpful to materialize Rural Transport Infrastructure Sector Wide Approach (RTI-SWAP) through sustainable planning, resources mobilization, implementation and monitoring of the road development. The document is anticipated to generate substantial employment opportunities for rural people through conversion, improvement and new construction activities of the existing road network. DRCN plays an important role to strengthen and promote overall economic growth of the district through established and improved year round transport services reinforcing intra and inter-district linkages. It is most crucial to expand DRCN in a planned way as per the DTMP recommendations by considering the framework of available resources in DDC. This document is very essential in lobbying the donor agencies through central government to attract fund gap. Furthermore, this document will be supportive in avoiding prevailing duplication in resources allocation in road network development by considering basket fund approach.

I would, firstly like to express my gratitude to RTI Sector Maintenance Pilot for financial and technical support. Secondly, my thanks go to District Technical Office (DTO-Chief), Mr.Pashupati Sah, Program Officer (DDC) and other DDC/DTO Staff for their valuable efforts in the process of producing this document. My special thank goes to all the representatives of political parties, who played crucial role in providing constructive feedbacks and valuable support in preparing this document successfully.

Last but not least, I would like to express my heartfelt gratitude to Ministry of Federal Affairs and Local Development (MoFALD) and Department of Local Infrastructure Development and Agriculture Road (DoLIDAR) for providing valuable suggestions and cooperation to produce this report. Any pioneering and constructive suggestions regarding this document will be highly appreciated.

(Gopal Kumar Adhikari)
Local Development Officer



नेपाल सरकार
संघिय मामिला तथा स्थानीय विकास मन्त्रालय
जिल्ला विकास समितिको कार्यालय
सिरहा

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विषय : जिल्ला यातायात गुरुयोजना सम्बन्धमा।

श्री स्थानीय पूर्वाधार विकास तथा ग्रामीण सडक विभाग
ग्रामिण पहुँच कार्यक्रम (RAP-III)
श्रीमहल पुल्चोक, ललितपुर।

उपरोक्त सम्बन्धमा, RAP-III र GOEC Nepal (P) Ltd. काठमाण्डौ बीच सिराहा जिल्लाको यातायात गुरुयोजना तयार गर्नका लागि भएको सम्झौता बमोजिम मिति २०७०१२२४ गते जि.वि.स.सिरहा कार्यशाला गोष्ठीमा यस जिल्लाका राजनैतिक दल एवं प्रतिनिधि, जि.वि.स. जिल्ला प्राविधिक कार्यालय र अन्य सरोकारवालाहरुको विचमा विस्तृत छलफल पश्चात यस जिल्लाको यातायात गुरुयोजना पारित भएको व्यहोरा जानकारीका लागि अनुरोध गरिन्छ।

(गोपाल कुमार अधिकारी)
स्थानीय विकास अधिकारी
गोपाल कुमार अधिकारी
स्थानीय विकास अधिकारी

PREFACE / ACKNOWLEDGEMENTS

The District Transport Master Plan of Siraha District has been prepared for the District Development Committee, Siraha under the Contract Agreement between RAP3 and GOEC Nepal (P) Ltd. (Contract No: RTI Sector DTMP/001/2012 amendment no. 2) to carry out the task of preparing of DTMP of Siraha District of Nepal. We would like to convey our indebtedness to RTI Sector Maintenance Pilot and RAP3 for entrusting us the responsibility to carry out the task of preparing of DTMP of Siraha District.

We would like to express our sincere gratitude to the Project Coordinator Mr. Ganga Bahadur Basnet (SDE) of DoLIDAR, and Program Manager Mr. Michael Green, Deputy Programme Manager Mr. Dilli Prakash Sitaaula and Central Asset Management Engineer Mr. Laxman Bhakta Dahi Shrestha of RAP3, whose valuable co-operation and suggestions guided us to accomplish the agreed task to this level. We would also like to express our sincere thanks to LDO of Siraha DDC, Mr. Gopal Kumar Adhikari, Program Officer Mr Pashupati Shah, DTO Chief Mr. Raj Kumar Goit, Planning Officer Mr Indra Dev Yadav, Engineers, Sub-engineers and other staffs of DDC and DTO Office of Siraha for their extended help and regular support and coordination at different levels while working at the field level.

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

Finally, we would like to thank the DTMP team members for their valuable efforts to bring the study report in this stage.

**Team Leader
GOEC Nepal Pvt. Ltd.**

EXECUTIVE SUMMARY

Siraha district is located in Sagarmatha zone in Eastern Development Region and covers an area of 1228 square kilometer within latitude 26°33'N to 26°55'N and longitude 86°06'E to 86°26'E. The District is bordered with Saptari district in the East, Udayapur district in the North, Bihar province of India in the South and Dhanusa district in the West. The district has 3 Municipalities, 99 VDCs and 6 constituency areas. The district lies in Terai. The lowest elevation point is 76 m and the highest elevation point is 885m from the mean sea level. As a result of the small elevation difference, the district has only one type of climate i.e. tropical. The annual average rainfall is about 1467 mm and temperature varies from 10.7°C to 40°C. Subsistence agriculture farming, small scale livestock is the main source of occupation and livelihood of the majority of the population.

The district inventory identified over 950 km of roads, including about 145 km of strategic roads and 834 km of rural roads. In coordination with the DTICC/DRCC and DDC, 36 rural roads with a length of 384.5 km were identified as making up the district road core network (DRCN) from existing road, and the remaining 449.70km were classified as village roads. The existing DRCN roads linked up all 108 VDC headquarters. Majority of the DRCN roads are earthen and thus fair-weather status.

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	144.93	111.93	19.00	14.00
District road core network	384.50	-	151.00	233.50
Village roads	449.70	-	92.20	357.50
Total	979.13	111.93	262.20	605.00

Annual conservation costs are estimated at NPR 175.75 million based on the first year, and will be updated in the Annual Asset Management Plan (AAMP) based on actual annual maintenance needs as determined in the annual road condition survey. For the full five-year period the conservation costs will come to NPR 878.75 million. An analysis of the road network identified the need for improvement of all the DRCN roads in order to bring them to a maintainable all-weather standard and provide them with a proper road surface in light of existing traffic volumes. The required improvements and their estimated costs are listed below.

SN	Improvement type	Requirement	Cost (NPR)
1	Bridges	930 m	697,500,000
2	Slab culverts	78 m	15,600,000
3	Causeways	86 m	12,900,000
4	Hume pipes	39 units	1,170,000
5	Masonry retaining walls	0 m ³	-
6	Gabion retaining walls	2289 m ³	9,156,000
7	Lined drains	0 m	-
8	Widening	0 m	-
9	Rehabilitation	50 km	40,000,000
10	Gravelling	175 km	437,500,000
11	Blacktopping	159.5 km	877,250,000
12	New construction	- km	-
Total			2,091,076,000

The available budget for the road sector for the coming five years (fiscal year 2070/71 to 2074/75) is estimated to be NPR 829.5 million. Allocation to the district road core network was set at 80% of the total road sector budget (NPR 664 million), which was subsequently

allocated firstly to the annual maintenance needs, secondly to the improvement needs and lastly to new construction. This budget is insufficient to cover all the estimated costs of conservation, improvements. However, it allows all conservation requirements to be covered throughout the DTMP period and some improvement works to be completed before the end of the DTMP period. The remaining improvement works will be carried out in the next DTMP. There is no new DRCN construction in the Siraha district.

Within the DTMP period 7.31km of roads will be gravelled (2%) and brought to a maintainable all-weather standard. VDC headquarters with access to all-weather DRCN roads or the SRN will increase from 12 to 14, while the percentage of the district population with such access will increase from 12% to 13%.

ABBREVIATIONS

AAMP	Annual Asset Management Plan
ARAMP	Annual Road Maintenance Plan
DDC	District Development Committee
DOLIDAR	Department of Local Infrastructure Development and Agriculture Road
DOR	Department of Road
DRCN	District Road Core Network
DTICC	District Transport Infrastructure Coordination Committee
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GPS	Global Positioning System
GON	Government of Nepal
LGCDP	Local Governance and Community Development Programme
MoFALD	Ministry of Federal Affairs and Local Development
NPR	Nepalese Rupees
RAP	Rural Access Program
SRN	Strategic Road Network
SWAp	Sector Wide Approach
VDC	Village Development Committee

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1. INTRODUCTION

Siraha district is located in Sagarmatha zone in Eastern Development Region and covers an area of 1228 square kilometer within latitude 26°33'N to 26°55'N and longitude 86°06' E to 86°26' E. The District is bordered with Saptari district in the East, Udayapur district in the North, Bihar province of India in the South and Dhanusa district in the West. The district has 3 Municipalities, 99 VDCs and 6 constituency areas. The district lies in Terai. The lowest elevation point is 76 m and the highest elevation point is 885m from the mean sea level. As a result of the no significant elevation differences, the district has only one type of climate i.e. tropical. The annual average rainfall is about 1467 mm and temperature varies from 10.7°C to 40°C. Subsistence agriculture farming, small scale livestock is the main source of occupation and livelihood of the majority of the population.

Figure 1 Location of the district



According to the national census 2011, the total population of the district is 637,328 comprising 310,101 (48.7%) male and 327,227 (51.3%) females residing in 117,962 households. Siraha district has an average population density of around 519 people per sq.km. The average family size is 5.40 and the gender ratio 94.8 (100 female: 94.8 male). Life expectancy of the people is 52 years. The average literacy rate is about 42.2%. Siraha district is dominated by Yadav and followed by Tharu, Brahmin /Chhetri, Magar, Newar, and others. Actually different caste commonly uses Maithali language for communication which follows by Tharu, Nepali, Urdu, Magar, Newari and others.

Siraha district has no air transport service to complement the surface transport facilities. Inner and inter district mobility and as such the development activities fully depend on expansion of rural road network within the district. All weather transport facilities are providing in the district through Mahendra Highway, Chaurahawa-Siraha-Madar and Mirchaimaya-Katari feeder roads.

2. DISTRICT ROAD CORE NETWORK (DRCN)

This chapter gives an overview of the existing roads in Siraha District, distinguishing between strategic roads and rural roads. It goes on to identify those rural roads that make up the district road core network (DRCN) that will form the basis for this DTMP. The remaining rural roads are classified as village roads

2.1 TOTAL ROAD NETWORK

Siraha district has an estimated road network of 979.13 kilometers, including 144.93 kilometers of strategic roads managed by DOR and 834.20 kilometers of rural roads managed by Siraha DDC and the 99VDCs. Most of the strategic roads are bituminous surface and majority of rural roads are fair weather status (around 70%). A map of the total road network in Siraha district is shown in Figure 2 at the end of this chapter.

Table 2.1.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic roads	144.93	111.93	19.00	14.00
Urban roads	-	-	-	-
Rural roads	834.20		243.20	591.00
Total	979.13	111.93	262.20	605.00

2.2 NATIONAL HIGHWAYS AND FEEDER ROADS

Siraha district has two highway and four feeder road. H01 (Balan to Kamala Section of MRM) serves as inter-district connection road, connecting two districts Saptari and Dhanusha with Siraha. The total road length of this section is 43.27 km with bituminous surface. All feeder roads like F055 (Lahan–Bhgawanpur–Thadi), F067 (Dhangadahi–Vidhyapur–Bariarpatti), F005 (Chauharawa–Siraha–Madar) and F052 (Mirchiya–Jyamire) are connected with Mahendra Highway (MRM). All highways and feeder roads are bituminous except H17 Siraha-Balan(Postal Highway).

Table 2.2.1 National Highways and Feeder Roads (km)

Code	Description	Total length	Black Top	Gravel	Earthen
H01	Mahendra Highway (Balan to Kamala Section)	43.27	43.27	-	-
H17	Siraha – Balan (Postal Road)	33.00	-	19	14
F005	Chauharwa-Siraha-Madar	26.66	26.66	-	-
F052	Mirchiya (MRM)-Jyamire (District Border)	7.00	7.00	-	-
F055	Lahan (MRM)-Bhagwanpur-Thadi	18.00	18.00	-	-
F067	Dhangadhi (MRM)-Vidyanagar-Bariarpatti	17.00	17.00	-	-
Total		144.93	111.93	19.00	14.00

2.3 DISTRICT ROAD CORE NETWORK

As part of the preparation of this DTMP, the District Road Core Network (DRCN) was identified together with the DTICC and DDC. This DRCN is the minimum network that allows all VDC headquarters to be connected with the strategic road network and the district headquarters, either directly or through other VDCs. In the selection of the DRCN roads, account was taken of the road conditions and the existing traffic levels. The identified DRCN roads were subsequently provided with road codes according to national standards. Road codes have been assigned to village roads also (village roads data as available in old DTMP and data provided by DDC/DTO).

The resulting District Road Core Network in Siraha district is shown in figure 3 at the end of this chapter. The DRCN selected from rural roads covers all VDCs. The DRCN selected

from existing rural roads consists of 36 district roads with a total length of 384.50km and no new roads are necessary/created as such all VDCs are accessible by existing road network. The remaining 449.70km of rural roads are not considered to be DRCN roads and are classified as village roads under the responsibility of the VDCs (see also section 2.3). Most of the DRCN roads (around 61%) are earthen roads and are considered fair-weather roads and remaining roads (39%) are graveled and can be considered as all-weather roads (see Table 2.3.1). A complete list of the DRCN roads and their characteristics is provided in Table 2.3.2.

Table 2.3.1 Total road length (km)

Road Class	Total length	Black Top	Gravel	Earthen
Strategic road network	144.93	111.93	19.00	14.00
Highways	76.27	43.27	19.00	14.00
Feeder roads	68.66	68.66		
Urban roads	-	-	-	-
District road core network	384.50	-	151.00	233.50
Village roads	449.70	-	92.20	357.50
Total	979.13	111.93	262.20	605.00

Table 2.3.2 District road core network (km)

Code	Description	Total length	BT	GR	ER	All weather	Fair weather
16DR001	BadaharmahalBandipur- Kamala-UttarbahiniSadak	3.50		3.50		-	3.50
16DR002	Bastipur-ChiknaSadak pr-1	15.50		15.50		-	15.50
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post – MalhaniyaChowk	7.00		1.00	6.00	1.00	6.00
16DR004	Chickna - Kalyanpur - Gadha Road	46.50		26.50	20.00	26.50	20.00
16DR005	KalyanpurJabdi -Bishnupur (Pra.Ra)- NirdhanaSadak	6.00		6.00		-	6.00
16DR006	ArnamaSanchiraiya – ItariprashaiNirdhana - Chikna Road	7.00		7.00		-	7.00
16DR007	BaniniyaChowk - ItariParsai Road	4.50		4.50		-	4.50
16DR008	MadarBasiyainar - Fulbadiya - Ma. Gaamhariya	2.50		2.50		-	2.50
16DR009	Mirchhaiya- Kalyanpur -Siraha Road	22.00		22.00	-	22.00	-
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - SuksenaSadak	12.00		2.00	10.00	2.00	10.00
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	3.00		3.00		-	3.00
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	10.00		10.00		-	10.00
16DR013	BishnupurPra. Ma. - Rajpur - Bhokraha - KalyanpurJabadi (karuniyah)Road	5.00		5.00		-	5.00
16DR014	Thana Chowk- Mirchhaiya Bazar	1.00		1.00		-	1.00
16DR015	SirahaLaxminiya- SikajyotiKadamchowk Road	5.50		5.50		-	5.50
16DR016	Siraha - Sukhipur Road	18.50		3.50	15.00	3.50	15.00
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	13.00		13.00		-	13.00
16DR018	M. Rajmarga - Kamaldaha Road	5.00		1.00	4.00	1.00	4.00
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	3.00		3.00		-	3.00
16DR020	Jamdh-Lagadhi- Gadhiani	34.50		26.00	8.50	26.00	8.50
16DR021	Asanpur(NipaniyaChowk)- Lalpur Road	3.50		3.50		-	3.50
16DR022	Kasha - Mukshar Road	7.50		3.00	4.50	3.00	4.50
16DR023	Ayodhyanagar-Pipra- Aurahi Road	19.50		19.50	-	19.50	-
16DR024	DarahiyaHarkatti - Kabilasi Road	4.00		4.00		-	4.00
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti - KushahaLaxminiya	10.00		2.00	8.00	2.00	8.00
16DR026	Zeromile-Sare -Ambash	10.50		10.50		10.50	-

Code	Description	Total length	BT	GR	ER	All weather	Fair weather
16DR027	KusahaLaxmaniniya - Hanumannagar (Pra.Dha) Road	8.00		1.00	7.00	1.00	7.00
16DR028	Dhangadi - PatariJijhaul - Kachnari Road	18.00			18.00	-	18.00
16DR029	Ganeshchowk-Manikdaha Road	4.50		4.50		4.50	-
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00		4.00		4.00	-
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)- Nagribhadari	15.00		1.00	14.00	1.00	14.00
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	13.50		2.00	11.50	2.00	11.50
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	4.50			4.50	-	4.50
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00		12.00		12.00	-
16DR035	Lahan - Sahidchowk - JhanjharpattiSadak	20.00		9.50	10.50	9.50	10.50
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa- Mani Chowk Road	5.00			5.00	-	5.00
Total		384.50	-	151.00	233.50	151.00	233.50

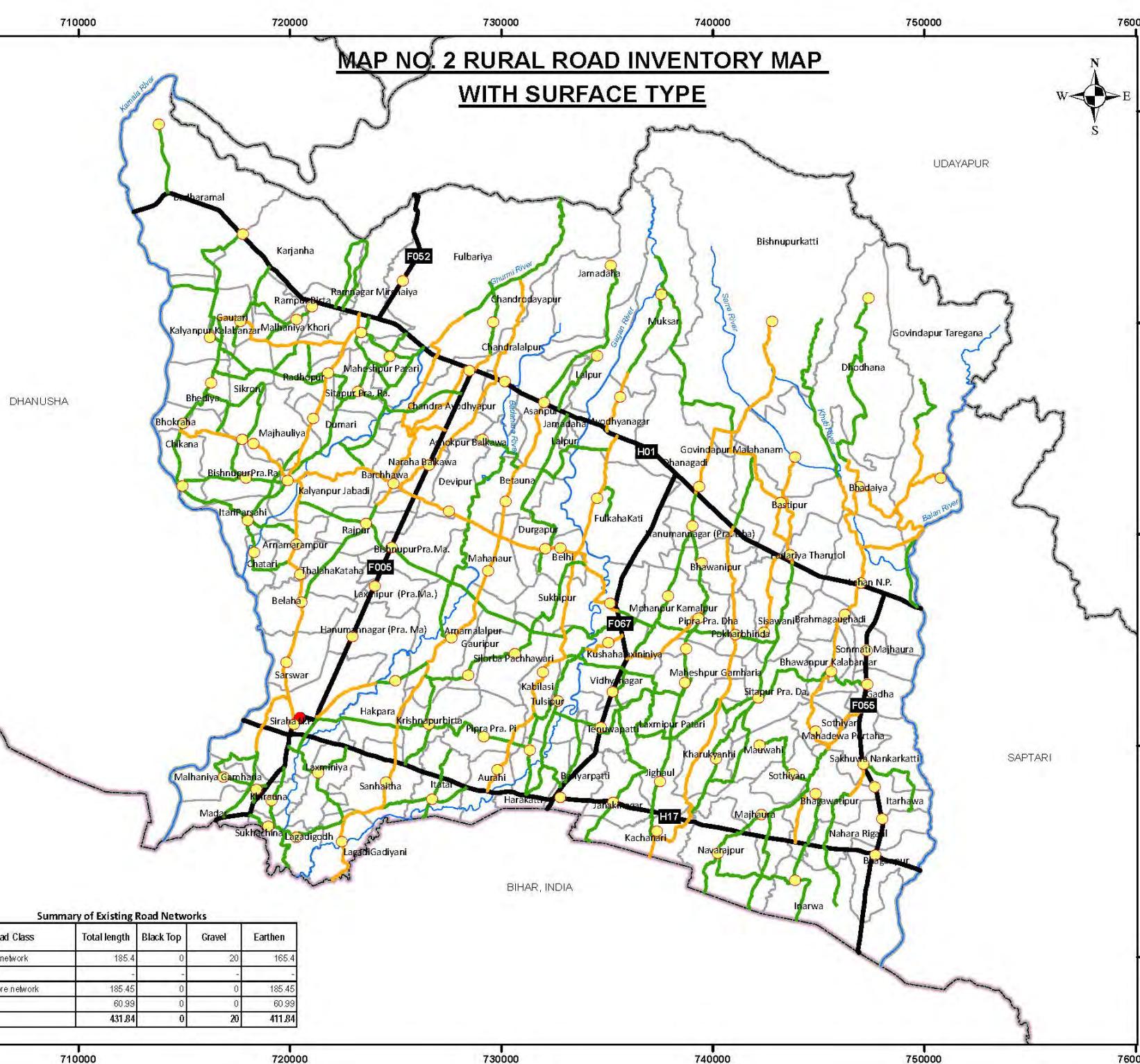
2.4 VILLAGE ROADS

The 449.70kmof remaining roads that do not form part of the identified district road core network (DRCN) are classified as village roads and are under the responsibility of the 99 VDCs and 3 Municipalities in Siraha district. These are roads of a lower importance that do not form the main link between the VDC headquarters and the district headquarters or strategic road network. Instead they provide additional access to other parts of the VDCs.

On average each VDC and Municipalities will thus be responsible for 4.2 km of village roads. It is recommended that the VDCs organise maintenance workers to carry out the emergency and routine/recurrent maintenance of these roads to ensure they remain accessible. Any upgrading or new construction of village roads falls outside the scope of this DTMP and is the responsibility of the VDCs.

Funding for these roads will mainly come from the VDC grants. Some district funding will also be allocated to the village roads. However, the district funding will be mainly for maintenance, especially emergency maintenance and routine/recurrent maintenance to keep the village roads open.

MAP NO. 2 RURAL ROAD INVENTORY MAP WITH SURFACE TYPE



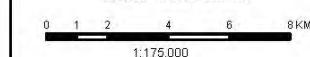
Legend

- VDC Centre
- District Headquarter
- SRN Road
- River
- District Boundary
- VDC Boundary
- Rural Road Inventory**
- Earthen Road
- Gravel Road

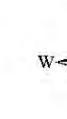
Name of District	District Development Committee, Siraha
Project	Preparation of District Transport Master Plan
Technical Assistance	MoFALD, DoLIDAR, RTISWAP
Grant Supported By	Department For International Development (DFID) thru Rap 3
Consultant	GOEC Nepal Pvt. Ltd., Buddhanagar, Kathmandu
Source	Department of Survey, GPS Survey, DoR, DoLIDAR

Projected Co-ordinate System	
Projection	Transverse Mercator
False Easting	500000 m
False Northing	0 m
Central Meridian	87
Spheroid	Everest 1830

Scale Information



MAP NO. 3 DISTRICT ROAD CORE NETWORK (DRCN) MAP WITH SURFACE TYPE



Legend

- VDC Centre
- District Headquarter
- SRN Road
- River
- District Boundary
- VDC Boundary
- District Road**
- Earthen Road
- Gravel Road

DHANUSA

UDAYAPUR

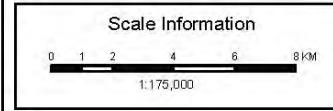
SAPTA

BIHAR, INDIA

Summary of DRCN Roads				
Code	Name of Road	Total length	Gravel	Earthen
HDR001	Kalaburam-Bodhpur-Kalaburam-Sekar	3.00	3.00	0
HDR002	Bajracharya-Sekar pti	15.69	0	15.69
HDR003	Kalyanpur (Bkt) - Gauder - Mahendranath-Health Post	7.00	1	6.00
HDR004	Chitwan - Kalyanpur - Gauda Road	46.59	26.2	20.39
HDR005	Ajnapur - Balai - Bishnupur (Pra.Ma) - Nirmala - Saptari	6.00	0	6.00
HDR006	Ajnapur - Gokharia - Bishnupur (Pra.Ma) - Chitwan	7.00	0	7.00
HDR007	Bisneti - Chitwan - Bishnupur Road	4.50	0	4.50
HDR008	Mader - Bishnupur - Pobidya - Gauripur	2.00	0	2.00
HDR009	Mehrauli - Kalyanpur - Saptari Road	22.00	22	0.00
HDR010	Ajnapur Mai - Kalyanpur - Kalmoti - Saptari Sekar	12.00	2	10.00
HDR011	Mahanya - Sakheda - Lalgadh Road	3.00	0	3.00
HDR012	Obdilika - Chitwan - Mahendranath - Kalyanpur - Saptari	18.00	0	18.00
HDR013	Bisneti Pti Ma - Rajgarh - Bishnupur - Pobidya	5.00	0	5.00
HDR014	Thana - Chitwan - Skayal - Kalyanpur Road	1.00	0	1.00
HDR015	Sikha - Laxmiya - Skayal - Kalyanpur Road	5.00	0	5.00
HDR016	Sikha - Saptari Road	18.50	5.2	13.00
HDR017	Sikha - Pitha (Pti Pt) - Haritali Road	13.00	0	13.00
HDR018	M. Rajgarh - Kalyanpur - Saptari Road	5.00	1	4.00
HDR019	Malan - Lalgadh - Saptari - Sakheda - Bishnupur Road	3.00	0	3.00
HDR020	Adhikot - Lalgadh - Gauripur Road	4.50	0	4.50
HDR021	Asanpur (Nalayi) - Chitwan - Lalgadh Road	5.00	0	5.00
HDR022	Kalba - Mukhbari Road	7.00	3	4.00
HDR023	Ajyothiapur-Riya - Ajnali Road	13.00	13.0	0.00
HDR024	Osarapati - Harkat - Kalikot Road	4.00	0	4.00
HDR025	Balayadav - Taldipur - Renuwadi - Kuchhula	10.00	2	8.00
HDR026	Zimla - Saptari - Bishnupur	19.20	19.2	0.00
HDR027	Kosha Laxminiyya - Halumangarh (Pti.Dha) - Pti	2.00	1	1.00
HDR028	Chitwan - Chitwan - Bishnupur Road	15.00	0	15.00
HDR029	M. Rajgarh - Saptari - Bishnupur Road	4.50	4.0	0.50
HDR030	Kailesh Chokh-Bisalayi-D Tuk-Shripur(Pti.Dha)-Naghati	15.00	0	14.00
HDR031	Lambat - Gajdepur - Dholma - Bishnupur	13.00	2	11.00
HDR032	Tulsi - Tulsipur - Bishnupur - Saptari	4.00	4	0.00
HDR033	Lehara - Tulsipur - Bishnupur - Saptari	12.00	10	2.00
HDR034	Lahan - Tulsipur - Mithagarh - Bishnupur	20.00	3.2	16.80
HDR035	Bisnupur (T.Sa) Chitwan - Gauripur-Matrai - Chauhanpur	5.00	0	5.00
Total Km		304.50	151.00	253.50

Name of District	 District Development Committee, Siraha
Project	Preparation of District Transport Master Plan
Technical Assistance	MofALD, DoLiDAR, RTISWAP
Grant Supported By	Department For International Development (DFID) thru Rap 3
Consultant	GOEC Nepal Pvt. Ltd., Budhanagar, Kathmandu
Source	Department of Survey, GPS Survey, DoR, DoLiDAR

Projected Co-ordinate System	
Projection	Transverse Mercator
False Easting	500000 m
False Northing	0 m
Central Meridian	87
Spheroid	Everest 1830



3. DISTRICT TRANSPORT PERSPECTIVE PLAN (DTPP)

This chapter looks at the required interventions regarding conservation, improvement and new construction of the district road core network. It provides a complete list of all works required in the DRCN, which together form the District Transport Perspective Plan (DTPP). For the works forming part of the DTPP, chapter 4 will subsequently provide cost estimation, while chapter 5 will rank the works according to priority and chapter 6 will select those priority works that can be carried out in the next 5 years and thus form part of the District Transport Master Plan (DTMP).

3.1 CONSERVATION

Conservation refers to the actions required to repair a road and keep it in good and passable condition. For DTMP planning purposes standard costs per kilometre for each maintenance type are applied to the entire district road core network, whereby for certain maintenance type's distinction is made according to the surface type of the road. Identification of the actual maintenance requirements of each road is made annually in the ARAMP. Conservation activities include:

1. Emergency maintenance - Basic repairs aimed at removing landslides and repairing damage to the road that inhibit the proper use of the road and make it impassable. This mainly takes place during and after the rainy season. A provisional lump sum is reserved for the entire district road core network based on the network length. Allocation to specific road sections is based on the actual need for clearing landslides or repairing washouts and cuts in the road.
2. Routine maintenance - General maintenance of the road aimed at preventing damage by ensuring the proper working of the different road elements (retaining walls, drainage system, carriageway, etc.) and cutting vegetation. This is carried out each year on a more or less continuous basis. Routine maintenance is required for the entire district road core network. The specific requirements for routine maintenance are determined on an annual basis through the road condition survey and defined in the ARAMP.
3. Recurrent maintenance - Repairs of minor damage to the road surface and road structures to bring them back to good condition. This is generally carried out once or twice a year. Recurrent maintenance is required for the entire district road core network, whereby distinction is made according to the surface type. The specific requirements for recurrent maintenance are determined on an annual basis through the road condition survey and defined in the ARAMP.
4. Periodic maintenance - Larger repairs to the road largely aimed at renewing the road surface through re-gravelling, resealing or overlays. It is generally carried out with several years interval. Although periodic maintenance is only required for specific sections of the district road core network, a lump sum allocation is made for the entire district road core network based on average annual requirements, distinguishing between different surface types. The specific periodic maintenance requirements are determined on an annual basis through the annual road condition survey and defined in the ARAMP.

The length of roads to be included under each conservation type for the first year is indicated below. This is basically the entire district road core network in as far as it does not require rehabilitation.

Table 3.1.1 Conservation requirements

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)
16DR001	3.50	3.50	3.50	3.50
16DR002	15.50	15.50	15.50	15.50
16DR003	7.00	7.00	7.00	7.00
16DR004	46.50	46.50	46.50	46.50
16DR005	6.00	6.00	6.00	6.00
16DR006	7.00	7.00	7.00	7.00
16DR007	4.50	4.50	4.50	4.50
16DR008	2.50	2.50	2.50	2.50
16DR009	22.00	22.00	22.00	22.00
16DR010	12.00	12.00	12.00	12.00
16DR011	3.00	3.00	3.00	3.00
16DR012	10.00	10.00	10.00	10.00
16DR013	5.00	5.00	5.00	5.00
16DR014	1.00	1.00	1.00	1.00
16DR015	5.50	5.50	5.50	5.50
16DR016	18.50	18.50	18.50	18.50
16DR017	13.00	13.00	13.00	13.00
16DR018	5.00	5.00	5.00	5.00
16DR019	3.00	3.00	3.00	3.00
16DR020	34.50	34.50	34.50	34.50
16DR021	3.50	3.50	3.50	3.50
16DR022	7.50	7.50	7.50	7.50
16DR023	19.50	19.50	19.50	19.50
16DR024	4.00	4.00	4.00	4.00
16DR025	10.00	10.00	10.00	10.00
16DR026	10.50	10.50	10.50	10.50
16DR027	8.00	8.00	8.00	8.00
16DR028	18.00	18.00	18.00	18.00
16DR029	4.50	4.50	4.50	4.50
16DR030	4.00	4.00	4.00	4.00
16DR031	15.00	15.00	15.00	15.00
16DR032	13.50	13.50	13.50	13.50
16DR033	4.50	4.50	4.50	4.50
16DR034	12.00	12.00	12.00	12.00
16DR035	20.00	20.00	20.00	20.00
16DR036	5.00	5.00	5.00	5.00
Total	384.50	384.50	384.50	384.50

3.2 IMPROVEMENT

Improvement refers to actions required to improve a road to bring it to a maintainable all-weather standard. It includes the following actions, which for Siraha are described in more detail in the subsequent sections.

1. Rehabilitation - Significant repairs required to bring a very poor road back to a maintainable standard. This does not include any changes to the original surface type.
2. Gravelling - Placement of a gravel layer to make it all-weather and ensure that the road remains passable during the rainy season.

3. Cross drainage - Placement of suitable cross-drainage structures with the aim of making the road all-weather and ensuring that the road remains passable even during the rainy season
4. Protective structures - Placement of retaining walls and lined side drains to avoid excessive damage to the road during the rainy season and bring it to a maintainable standard.
5. Blacktopping - Placement of a blacktop layer in roads with traffic volumes exceeding 100 passenger car units (PCU) to reduce damage to the road surface
6. Widening - Increase of the road width in roads with traffic volumes exceeding 500 passenger car units (PCU) to ensure the proper flow of traffic.

3.2.1 REHABILITATION

The rehabilitation works are required in the constructed gravel road for keeping the surface as in condition without changing the original surface condition. For this purpose following 11 district core network (DRCN) length about 50 km were identified for rehabilitation works.

Table 3.2.1 Sections of the district road core network requiring rehabilitation

Code	Description	Total length (km)	Gravelling (km)
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - MalhaniyaChowk	7.00	1.00
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - SuksenaSadak	12.00	2.00
16DR018	M. Rajmarga - Kamaldaha Road	5.00	1.00
16DR023	Ayodhyanagar-Pipra- Aurahi Road	19.50	19.50
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti - KushahaLaxminiya	10.00	2.00
16DR027	KusahaLaxmaniniya - Hanumannagar (Pra.Dha) Road	8.00	1.00
16DR029	Ganeshchowk-Manikdaha Road	4.50	4.50
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00	4.00
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)- Nagribhadari	15.00	1.00
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	13.50	2.00
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00	12.00
Total		110.50	50.00

3.2.2 GRAVELLING

As the entire district road core network needs to be brought to an all-weather status, gravelling of the road surface is required for all the earthen sections in the DRCN. For Siraha, this concerns 25 earthen surface DRCN roads (175 km) need to be gravelled totalling to 233.50 km including 151 km of existing DRCN roads.

Table 3.2.2 Sections of the district road core network requiring gravelling

Code	Description	Total length (km)	Gravelling (km)
16DR001	BadaharmahalBandipur- Kamala- UttarbahiniSadak	3.50	3.50
16DR002	Bastipur-ChiknaSadak pr-1	15.50	15.50
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - MalhaniyaChowk	7.00	6.00
16DR004	Chickna - Kalyanpur - Gadha Road	46.50	-
16DR005	KalyanpurJabdi -Bishnupur (Pra.Ra)-NirdhanaSadak	6.00	6.00
16DR006	ArnamaSanchiraiya – ItariprashaiNirdhana - Chickna Road	7.00	7.00
16DR007	BaniniyaChowk - ItariParsai Road	4.50	4.50
16DR008	MadarBasiyainar - Fulbadiya - Ma. Gaamhariya	2.50	2.50
16DR009	Mirchaiya- Kalyanpur -Siraha Road	22.00	-
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir – SuksenaSadak	12.00	10.00

Code	Description	Total length (km)	Gravelling (km)
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	3.00	3.00
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	10.00	10.00
16DR013	BishnupurPra. Ma. - Rajpur - Bhokraha – KalyanpurJabadi (karuniyahi)Road	5.00	5.00
16DR014	Thana Chowk- Mirchaiya Bazar	1.00	1.00
16DR015	SirahaLaxminiya- SikajyotiKadamchowk Road	5.50	5.50
16DR016	Siraha - Sukhipur Road	18.50	-
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	13.00	13.00
16DR018	M. Rajmarga - Kamaldaha Road	5.00	4.00
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	3.00	3.00
16DR020	Jamdh-Lagadhi- Gadhiyani	34.50	-
16DR021	Asanpur(NipaniyaChowk)- Lalpur Road	3.50	3.50
16DR022	Kasha - Mukshar Road	7.50	-
16DR023	Ayodhyanganagar-Pipra- Aurahi Road	19.50	-
16DR024	DarahiyaHarkatti - Kabilasi Road	4.00	4.00
16DR025	Bariarpatti - Tulshipur - Tenuwapatti - KushahaLaxminiya	10.00	8.00
16DR026	Zeromile-Sare -Ambash	10.50	-
16DR027	KusahaLaxmaniniya - Hanumannagar (Pra.Dha) Road	8.00	7.00
16DR028	Dhangadi - PatariJijhaul - Kachnari Road	18.00	18.00
16DR029	Ganeshchowk-Manikdaha Road	4.50	-
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00	-
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)-Nagribhadari	15.00	14.00
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	13.50	11.50
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	4.50	4.50
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00	-
16DR035	Lahan - Sahidchowk - JhanjharpattiSadak	20.00	-
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa-Mani Chowk Road	5.00	5.00
Total		384.50	175.00

3.2.3 CROSS DRAINAGE

The need for cross drainage was identified for the different DRCN roads. The total length of 930m bridge, 78m total length of slab culvert, 86m total length of cement concrete causeway and 39units of pipe culvert were identified as being required.

Table 3.2.3 Required cross drainage structures

Code	Description	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)
16DR001	BadaharmahalBandipur- Kamala-UttarbahiniSadak	-	-	-	-	-
16DR002	Bastipur-ChiknaSadak pr-1	-	6	-	-	1
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post – MalhaniyaChowk	30	-	-	-	-
16DR004	Chickna - Kalyanpur - Gadha Road	190	6	-	-	3
16DR005	KalyanpurJabdi -Bishnupur (Pra.Ra)- NirdhanaSadak	20	-	-	-	-
16DR006	ArnamaSanchiraiya – ItariprashaiNirdhana - Chikna Road	30	-	-	-	-
16DR007	BaniniyaChowk - ItariParsai Road	20	-	-	-	-
16DR008	MadarBasiyainar - Fulbadiya - Ma. Gaamhariya	-	-	-	-	-
16DR009	Mirchaiya- Kalyanpur -Siraha Road	-	-	-	-	-
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir – SuksenaSadak	25	-	-	-	-
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	-	-	-	-	-
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna	-	-	-	-	1

Code	Description	Bridge (m)	Slab culvert (m)	CC Causew ay (m)	Stone Causew ay (m)	Pipe culvert (units)
	Road					
16DR013	BishnupurPra. Ma. - Rajpur - Bhokraha - KalyanpurJabadi (karuniyahai)Road	25	-	-	-	-
16DR014	Thana Chowk- Mirchaiya Bazar	-	-	-	-	-
16DR015	SirahaLaxminiya- SikajyotiKadamchowk Road	-	-	-	-	-
16DR016	Siraha - Sukhipur Road	25	6	-	-	-
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	55	-	3	-	-
16DR018	M. Rajmarga - Kamaldaha Road	50	-	3	-	-
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	50	6	-	-	2
16DR020	Jamdhya-Lagadhi- Gadhiyani	30	12	12	-	2
16DR021	Asanpur(NipaniyaChowk)- Lalpur Road	-	-	-	-	5
16DR022	Kasha - Mukshar Road	15	-	3	-	1
16DR023	Ayodhyanganagar-Pipra- Aurahi Road	50	-	-	-	-
16DR024	DarahiyaHarkatti - Kabilasi Road	50	-	-	-	-
16DR025	Bariarpatti - Tulshipur - Tenuwapatti – KushahaLaxminiya	60	6	-	-	1
16DR026	Zeromile-Sare -Ambash	30	12	50	-	5
16DR027	KusahaLaxmaniniya - Hanumannagar (Pra.Dha) Road	-	-	-	-	-
16DR028	Dhangadi - PatariJijhaul - Kachnari Road	30	-	-	-	2
16DR029	Ganeshchowk-Manikdaha Road	100	-	-	-	-
16DR030	M. Rajmarga - Siswani - Barchawa Road	-	-	-	-	1
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)- Nagribhadari	-	-	-	-	-
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	-	6	15	-	5
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	-	12	-	-	4
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	45	-	-	-	-
16DR035	Lahan - Sahidchowk - JhanjharpattiSadak	-	6	-	-	5
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa- Mani Chowk Road	-	-	-	-	1
	Total	930	78	86	-	39

3.2.4 PROTECTIVE STRUCTURES

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

Table 3.2.4 Required protective structures

Code	Description	Masonry walls (m³)	Gabion walls (m³)	Lined drain (m)
16DR001	BadaharmahalBandipur-Kamala-UttarbahiniSadak	-	42	-
16DR002	Bastipur-ChiknaSadak pr-1	-	75	-
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - MalhaniyaChowk	-	65	-
16DR004	Chickna - Kalyanpur - Gadha Road	-	163	-
16DR005	KalyanpurJabdi -Bishnupur (Pra.Ra)- NirdhanaSadak	-	61	-
16DR006	ArnamaSanchiraiya – ItariprashaiNirdhana - Chikna Road	-	33	-
16DR007	BaniniyaChowk - ItariParsai Road	-	49	-
16DR008	MadarBasiyainar - Fulbadiya - Ma. Gaamhariya	-	8	-
16DR009	Mirchaiya- Kalyanpur -Siraha Road	-	195	-
16DR010	AurahiMa.Vi-Kamalpur-Kalimandir- SuksenaSadak	-	82	-

Code	Description	Masonry walls (m³)	Gabion walls (m³)	Lined drain (m)
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	-	18	-
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	-	16	-
16DR013	BishnupurPra. Ma. - Rajpur - Bhokraha - KalyanpurJabadi (karuniyahi)Road	-	55	-
16DR014	Thana Chowk- Mirchaiya Bazar	-	2	-
16DR015	SirahaLaxminiya- SikajyotiKadamchowk Road	-	57	-
16DR016	Siraha - Sukhipur Road	-	71	-
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	-	170	-
16DR018	M. Rajmarga - Kamaldaha Road	-	39	-
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	-	37	-
16DR020	Jamdha-Lagadhi- Gadhiyani	-	160	-
16DR021	Asanpur(NipaniyaChowk)- Lalpur Road	-	10	-
16DR022	Kasha - Mukshar Road	-	39	-
16DR023	Ayodhyanagar-Pipra- Aurahi Road	-	101	-
16DR024	DarahiyaHarkatti - Kabilasi Road	-	37	-
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti – KushahaLaxminiya	-	72	-
16DR026	Zeromile-Sare -Ambash	-	171	-
16DR027	KusahaLaxmaniniya- Hanumannagar(Pra.Dha) Road	-	16	-
16DR028	Dhangadi - PatariJijhaul - Kachnari Road	-	51	-
16DR029	Ganeshchowk-Manikdaha Road	-	74	-
16DR030	M. Rajmarga - Siswani - Barchawa Road	-	40	-
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)-Nagribhadari	-	52	-
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	-	62	-
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	-	24	-
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	-	84	-
16DR035	Lahan - Sahidchowk – JhanjharpattiSadak	-	38	-
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha- Inarwa-Mani Chowk Road	-	20	-
Total		-	2,289	-

3.2.5 WIDENING

An analysis of the traffic data for the different roads making up the district road core network shows that there are no roads that are eligible for widening to a higher standard.

Table 3.2.5 Sections of the district road core network requiring widening

Code	Description	Total length (km)	Widening (m)
Total			

3.2.6 BLACKTOPPING

For Black topping in plain/Teraiarea, traffic volume exceeding 100 PCU for the different roads in district core network are suitable. The blacktopping of these roads will be treated as a second phase of improvement after they have been gravelled. In Siraha, following 7 roads are eligible for blacktopping and further traffic survey should be conducted to get exact traffic data and subsequent blacktopping needs accordingly in future and the results to be incorporated while preparing ARAMP.

Table 3.2.6 Sections of the district road core network requiring blacktopping

Code	Description	Total length (km)	Blacktop (km)	Traffic (VPD)	Blacktopping (km)
16DR004	Chickna - Kalyanpur - Gadha Road	46.50	-	145	46.50
16DR009	Mirchaiya- Kalyanpur -Siraha Road	22.00	-	302	22.00
16DR016	Siraha - Sukhipur Road	18.50	-	140	18.50
16DR020	Jamdhwa-Lagadhi- Gadhiyani	34.50	-	174	34.50
16DR022	Kasha - Mukshar Road	7.50	-	140	7.50
16DR026	Zeromile-Sare -Ambash	10.50	-	144	10.50
16DR035	Lahan-Sahidchowk- JhanjharpattiSadak	20.00	-	114	20.00
Total					159.50

3.3 NEW CONSTRUCTION

New construction of DRCN roads is not required to connect the VDC centres. As such all the VDC centres are linked with the identified district roads and strategic road.

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

Code	Description	New VDCs	Existing length, km	New length, km	Bridge (m)
Total					

3.4 DISTRICT TRANSPORT PERSPECTIVE PLAN

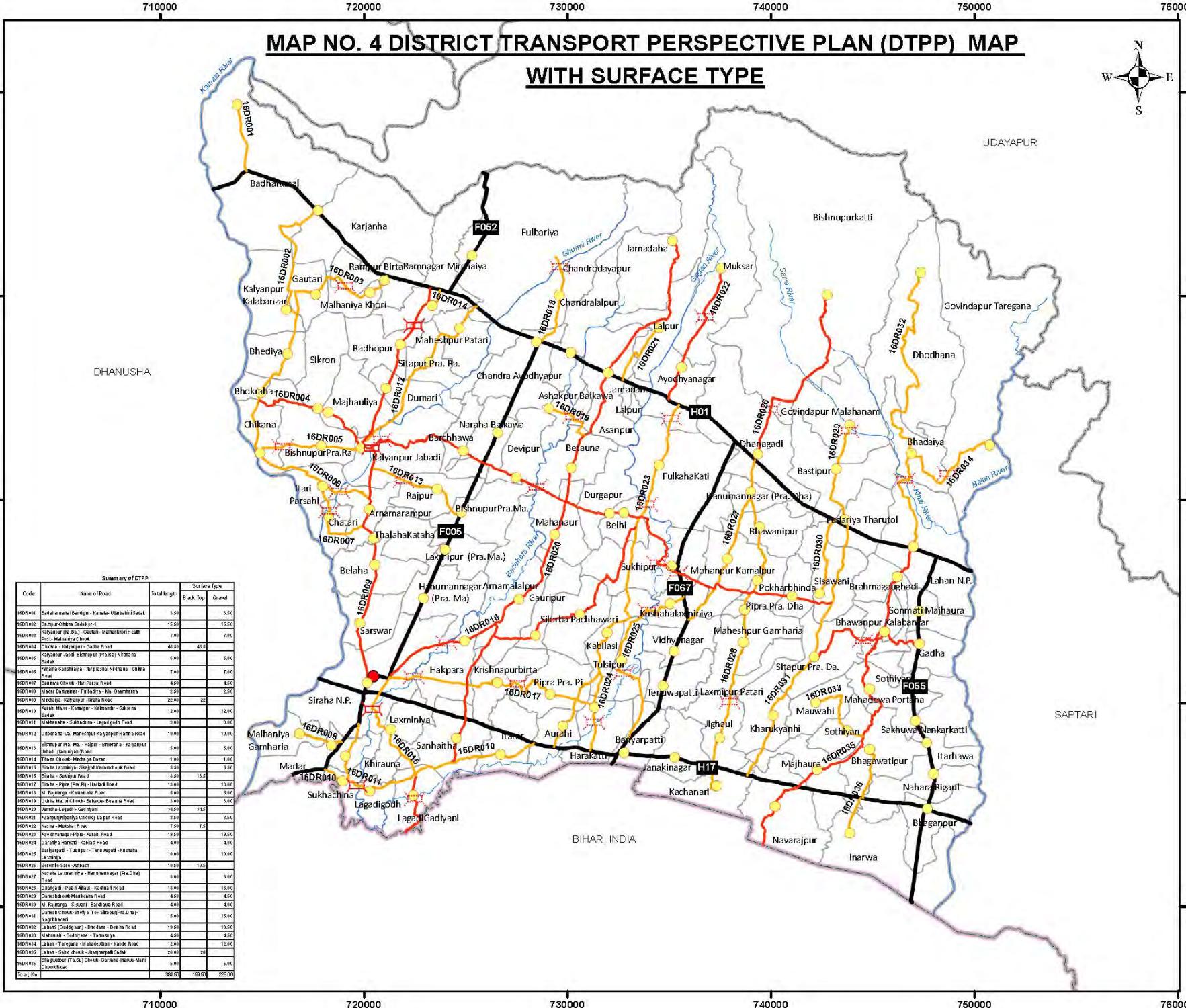
The DTTPP foresees bringing the entire existing district road core network to maintainable all-weather status, and provide access to all VDC headquarters. For this purpose, 159.50km will be blacktopped, 175.0km will be gravelled, 50.0km will be rehabilitatedand a number of different cross drainage and protective structures will be constructed for providing all weather access to all VDC HQs. The district road core network will subsequently consist of 384.50km of maintainable all-weather roads. The following table lists the required interventions, while the proposed network is shown in the DTTPP map in figure 4.

Table 3.4.1 District Transport Perspective Plan

Code	Emergency maintenance (km)	Routine maintenance (km)	Recurrent maintenance (km)	Periodic maintenance (km)	Rehabilitation (km)	Gravelling (km)	Blacktopping (km)	Widening (m)	Bridge (m)	Slab culvert (m)	CC Causeway (m)	Stone Causeway (m)	Pipe culvert (units)	Masonry walls (m3)	Gabion walls (m3)	Lined drain (m)	New construction (km)
16DR001	3.50	3.50	3.50	3.50	-	3.50	-	-	-	-	-	-	-	-	42	-	-
16DR002	15.50	15.50	15.50	15.50	-	15.50	-	-	-	6	-	-	1	-	75	-	-
16DR003	7.00	7.00	7.00	7.00	1.00	6.00	-	-	30	-	-	-	-	-	65	-	-
16DR004	46.50	46.50	46.50	46.50	-	-	46.50	-	190	6	-	-	3	-	163	-	-
16DR005	6.00	6.00	6.00	6.00	-	6.00	-	-	20	-	-	-	-	-	61	-	-
16DR006	7.00	7.00	7.00	7.00	-	7.00	-	-	30	-	-	-	-	-	33	-	-
16DR007	4.50	4.50	4.50	4.50	-	4.50	-	-	20	-	-	-	-	-	49	-	-
16DR008	2.50	2.50	2.50	2.50	-	2.50	-	-	-	-	-	-	-	-	8	-	-
16DR009	22.00	22.00	22.00	22.00	-	-	22.00	-	-	-	-	-	-	-	195	-	-
16DR010	12.00	12.00	12.00	12.00	2.00	10.00	-	-	25	-	-	-	-	-	82	-	-
16DR011	3.00	3.00	3.00	3.00	-	3.00	-	-	-	-	-	-	-	-	18	-	-
16DR012	10.00	10.00	10.00	10.00	-	10.00	-	-	-	-	-	-	1	-	16	-	-
16DR013	5.00	5.00	5.00	5.00	-	5.00	-	-	25	-	-	-	-	-	55	-	-
16DR014	1.00	1.00	1.00	1.00	-	1.00	-	-	-	-	-	-	-	-	2	-	-
16DR015	5.50	5.50	5.50	5.50	-	5.50	-	-	-	-	-	-	-	-	57	-	-
16DR016	18.50	18.50	18.50	18.50	-	-	18.50	-	25	6	-	-	-	-	71	-	-
16DR017	13.00	13.00	13.00	13.00	-	13.00	-	-	55	-	3	-	-	-	170	-	-
16DR018	5.00	5.00	5.00	5.00	1.00	4.00	-	-	50	-	3	-	-	-	39	-	-
16DR019	3.00	3.00	3.00	3.00	-	3.00	-	-	50	6	-	-	2	-	37	-	-
16DR020	34.50	34.50	34.50	34.50	-	-	34.50	-	30	12	12	-	2	-	160	-	-
16DR021	3.50	3.50	3.50	3.50	-	3.50	-	-	-	-	-	-	5	-	10	-	-
16DR022	7.50	7.50	7.50	7.50	-	-	7.50	-	15	-	3	-	1	-	39	-	-
16DR023	19.50	19.50	19.50	19.50	19.50	-	-	-	50	-	-	-	-	-	101	-	-
16DR024	4.00	4.00	4.00	4.00	-	4.00	-	-	50	-	-	-	-	-	37	-	-
16DR025	10.00	10.00	10.00	10.00	2.00	8.00	-	-	60	6	-	-	1	-	72	-	-
16DR026	10.50	10.50	10.50	10.50	-	-	10.50	-	30	12	50	-	5	-	171	-	-

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)
16DR027	8.00	8.00	8.00	8.00	1.00	7.00	-	-	-	-	-	-	-	-	16	-	-
16DR028	18.00	18.00	18.00	18.00	-	18.00	-	-	30	-	-	-	2	-	51	-	-
16DR029	4.50	4.50	4.50	4.50	4.50	-	-	-	100	-	-	-	-	-	74	-	-
16DR030	4.00	4.00	4.00	4.00	4.00	-	-	-	-	-	-	-	1	-	40	-	-
16DR031	15.00	15.00	15.00	15.00	1.00	14.00	-	-	-	-	-	-	-	-	52	-	-
16DR032	13.50	13.50	13.50	13.50	2.00	11.50	-	-	-	6	15	-	5	-	62	-	-
16DR033	4.50	4.50	4.50	4.50	-	4.50	-	-	-	12	-	-	4	-	24	-	-
16DR034	12.00	12.00	12.00	12.00	12.00	-	-	-	45	-	-	-	-	-	84	-	-
16DR035	20.00	20.00	20.00	20.00	-	-	20.00	-	-	6	-	-	5	-	38	-	-
16DR036	5.00	5.00	5.00	5.00	-	5.00	-	-	-	-	-	-	1	-	20	-	-
Total	384.50	384.50	384.50	384.50	50.00	175.00	159.50	-	930	78	86	-	39	-	2,289	-	-

MAP NO. 4 DISTRICT TRANSPORT PERSPECTIVE PLAN (DTPP) MAP WITH SURFACE TYPE



Legend

- VDC Centre
- District Headquarter
- VDC Boundary
- District Boundary
- River
- SRN Road
- Bridge (Existing)
- Bridge (Proposed)
- District Road**
- Black Top (DRCN)
- Gravel (DRCN)

Name of District  District Development Committee, Siraha

Project Preparation of District Transport Master Plan

Technical Assistance MoFALD, DoLiDAR, RTISWAP

Grant Supported Department For International Development (DFID) thru Rap 3

Consultant GOEC Nepal Pvt. Ltd., Budhanagar, Kathmandu

Source Department of Survey, GPS Survey, DoR, DoLiDAR

Projected Co-ordinate System

Projection	Transverse Mercator
False Easting	500000 m
False Northing	0 m
Central Meridian	87
Spheroid	Everest 1830

Scale Information

0 1 2 4 6 8 KM
1:175,000

4. COST ESTIMATION

For the cost estimation, use has been made of standard costs for the different activities required. For the conservation activities this results in an estimation of annual costs, while for improvement and new construction activities this result in an estimation of the total costs required.

4.1 CONSERVATION

The costs of the required conservation measures have been calculated using the following standard costs. These standard costs have been applied to the entire district road core network, whereby distinction is made based on the surface type in the case of recurrent and periodic maintenance. It must be noted here that the standard costs for periodic maintenance are the average annual costs, but that the cost for applying periodic maintenance in a specific section every several years will be higher (the cumulative cost of several years). The estimated costs for the first year are presented below, while the costs for subsequent years will vary slightly as road surface types change as a result of improvements. Detailed cost estimations for the actual maintenance needs in any given year will be presented in the ARAMP.

Table 4.1.1 Standard unit costs for conservation

Activity	Unit	Unit cost (NPR/km)
Emergency maintenance	km	30,000
Routine maintenance	km	20,000
Recurrent maintenance (blacktop)	km	500,000
Recurrent maintenance (gravel)	km	400,000
Recurrent maintenance (earthen)	km	250,000
Periodic maintenance (blacktop)	km	200,000
Periodic maintenance (gravel)	km	250,000

For the first year the estimated costs for conservation of the DRCN come to NPR 175.75 million. Based on this cost for the first year, the costs for conservation of the DRCN for the next 5 years are estimated at NPR 878.75 million. These costs will change slightly as the roads are improved and the standard conservation costs change. This will be updated in the ARAMP on an annual basis. If the conservation costs estimated in this report is not necessary according to detailed assessment the remaining fund can be utilized for improvement.

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

Code	Total length (km)	Gravel (km)	Earthen (km)	Emergency	Routine	Recurrent (gravel)	Recurrent (earthen)	Periodic (gravel)	Total annual cost	Total 5-year cost
16DR001	3.50	-	3.50	105	70	-	875	-	1,050	5,250
16DR002	15.50	-	15.50	465	310	-	3,875	-	4,650	23,250
16DR003	7.00	1.00	6.00	210	140	400	1,500	250	2,500	12,500
16DR004	46.50	26.50	20.00	1,395	930	10,600	5,000	6,625	24,550	122,750
16DR005	6.00	-	6.00	180	120	-	1,500	-	1,800	9,000
16DR006	7.00	-	7.00	210	140	-	1,750	-	2,100	10,500
16DR007	4.50	-	4.50	135	90	-	1,125	-	1,350	6,750
16DR008	2.50	-	2.50	75	50	-	625	-	750	3,750
16DR009	22.00	22.00	-	660	440	8,800	-	5,500	15,400	77,000
16DR010	12.00	2.00	10.00	360	240	800	2,500	500	4,400	22,000
16DR011	3.00	-	3.00	90	60	-	750	-	900	4,500
16DR012	10.00	-	10.00	300	200	-	2,500	-	3,000	15,000
16DR013	5.00	-	5.00	150	100	-	1,250	-	1,500	7,500
16DR014	1.00	-	1.00	30	20	-	250	-	300	1,500

Code	Total length (km)	Gravel (km)	Earthen (km)	Emergency	Routine	Recurrent (gravel)	Recurrent (earthen)	Periodic (gravel)	Total annual cost	Total 5- year cost
16DR015	5.50	-	5.50	165	110	-	1,375	-	1,650	8,250
16DR016	18.50	3.50	15.00	555	370	1,400	3,750	875	6,950	34,750
16DR017	13.00	-	13.00	390	260	-	3,250	-	3,900	19,500
16DR018	5.00	1.00	4.00	150	100	400	1,000	250	1,900	9,500
16DR019	3.00	-	3.00	90	60	-	750	-	900	4,500
16DR020	34.50	26.00	8.50	1,035	690	10,400	2,125	6,500	20,750	103,750
16DR021	3.50	-	3.50	105	70	-	875	-	1,050	5,250
16DR022	7.50	3.00	4.50	225	150	1,200	1,125	750	3,450	17,250
16DR023	19.50	19.50	-	585	390	7,800	-	4,875	13,650	68,250
16DR024	4.00	-	4.00	120	80	-	1,000	-	1,200	6,000
16DR025	10.00	2.00	8.00	300	200	800	2,000	500	3,800	19,000
16DR026	10.50	10.50	-	315	210	4,200	-	2,625	7,350	36,750
16DR027	8.00	1.00	7.00	240	160	400	1,750	250	2,800	14,000
16DR028	18.00	-	18.00	540	360	-	4,500	-	5,400	27,000
16DR029	4.50	4.50	-	135	90	1,800	-	1,125	3,150	15,750
16DR030	4.00	4.00	-	120	80	1,600	-	1,000	2,800	14,000
16DR031	15.00	1.00	14.00	450	300	400	3,500	250	4,900	24,500
16DR032	13.50	2.00	11.50	405	270	800	2,875	500	4,850	24,250
16DR033	4.50	-	4.50	135	90	-	1,125	-	1,350	6,750
16DR034	12.00	12.00	-	360	240	4,800	-	3,000	8,400	42,000
16DR035	20.00	9.50	10.50	600	400	3,800	2,625	2,375	9,800	49,000
16DR036	5.00	-	5.00	150	100	-	1,250	-	1,500	7,500
Total	384.5	151.0	233.50	11,535	7,690	60,400	58,375	37,750	175,750	878,750

4.2 IMPROVEMENT

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

Table 4.2.1 Standard unit costs for improvement activities

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	800,000
Widening	m	25,000
Gravelling	km	2,500,000
Blacktopping	km	5,500,000
Bridge construction	m	750,000
Slab culvert construction	m	200,000
CC Causeway construction	m	150,000
Stone Causeway construction	m	10,000
Pipe culvert placement	unit	30,000
Masonry wall construction	m^3	10,000
Gabion wall construction	m^3	4,000
Lined drain construction	m	1,000

The resulting estimated costs come to NPR 2091million as indicated in the table below.

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

Code	Total length (km)	Rehabilitation	Gravelling	Blacktopping	Bridges	Slab Culvert	CC causeways	Pipe culvert	Gabion walls	Total cost

Code	Total length (km)	Rehabilitation	Gravelling	Blacktopping	Bridges	Slab Culvert	CC causeways	Pipe culvert	Gabion walls	Total cost
16DR001	3.50	-	8,750	-	-	-	-	-	168	8,918
16DR002	15.50	-	38,750	-	-	1,200	-	30	300	40,280
16DR003	7.00	800	15,000	-	22,500	-	-	-	260	38,560
16DR004	46.50	-	-	255,750	142,500	1,200	-	90	652	400,192
16DR005	6.00	-	15,000	-	15,000	-	-	-	244	30,244
16DR006	7.00	-	17,500	-	22,500	-	-	-	132	40,132
16DR007	4.50	-	11,250	-	15,000	-	-	-	196	26,446
16DR008	2.50	-	6,250	-	-	-	-	-	32	6,282
16DR009	22.00	-	-	121,000	-	-	-	-	780	121,780
16DR010	12.00	1,600	25,000	-	18,750	-	-	-	328	45,678
16DR011	3.00	-	7,500	-	-	-	-	-	72	7,572
16DR012	10.00	-	25,000	-	-	-	-	30	64	25,094
16DR013	5.00	-	12,500	-	18,750	-	-	-	220	31,470
16DR014	1.00	-	2,500	-	-	-	-	-	8	2,508
16DR015	5.50	-	13,750	-	-	-	-	-	228	13,978
16DR016	18.50	-	-	101,750	18,750	1,200	-	-	284	121,984
16DR017	13.00	-	32,500	-	41,250	-	450	-	680	74,880
16DR018	5.00	800	10,000	-	37,500	-	450	-	156	48,906
16DR019	3.00	-	7,500	-	37,500	1,200	-	60	148	46,408
16DR020	34.50	-	-	189,750	22,500	2,400	1,800	60	640	217,150
16DR021	3.50	-	8,750	-	-	-	-	150	40	8,940
16DR022	7.50	-	-	41,250	11,250	-	450	30	156	53,136
16DR023	19.50	15,600	-	-	37,500	-	-	-	404	53,504
16DR024	4.00	-	10,000	-	37,500	-	-	-	148	47,648
16DR025	10.00	1,600	20,000	-	45,000	1,200	-	30	288	68,118
16DR026	10.50	-	-	57,750	22,500	2,400	7,500	150	684	90,984
16DR027	8.00	800	17,500	-	-	-	-	-	64	18,364
16DR028	18.00	-	45,000	-	22,500	-	-	60	204	67,764
16DR029	4.50	3,600	-	-	75,000	-	-	-	296	78,896
16DR030	4.00	3,200	-	-	-	-	-	30	160	3,390
16DR031	15.00	800	35,000	-	-	-	-	-	208	36,008
16DR032	13.50	1,600	28,750	-	-	1,200	2,250	150	248	34,198
16DR033	4.50	-	11,250	-	-	2,400	-	120	96	13,866
16DR034	12.00	9,600	-	-	33,750	-	-	-	336	43,686
16DR035	20.00	-	-	110,000	-	1,200	-	150	152	111,502
16DR036	5.00	-	12,500	-	-	-	-	30	80	12,610
Total	384.50	40,000	437,500	877,250	697,500	15,600	12,900	1,170	9,156	2,091,076

4.3 NEW CONSTRUCTION

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

Table 4.3.1 Standard unit costs for new construction

Activity	Unit	Unit cost (NPR)
Opening up	km	4,000,000
Gravelling	km	2,500,000
Bridge construction	m	750,000

No new construction of road is needed for Sirahaas such all VDCs have been already accessed and linked by existing roads.

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

Code	Description	Length (km)	Opening up	Gravel	Bridges	Total cost
Total						

4.4 DTPP COSTS

The total costs for the District Transport Perspective Plan come to NPR 2,969.826 million as indicated in the table below.

Table 4.4.1 DTPP costs (NPR '000)

Code	Conservation	Improvement	New construction	Total
16DR001	5,250	8,918	-	14,168
16DR002	23,250	40,280	-	63,530
16DR003	12,500	38,560	-	51,060
16DR004	122,750	400,192	-	522,942
16DR005	9,000	30,244	-	39,244
16DR006	10,500	40,132	-	50,632
16DR007	6,750	26,446	-	33,196
16DR008	3,750	6,282	-	10,032
16DR009	77,000	121,780	-	198,780
16DR010	22,000	45,678	-	67,678
16DR011	4,500	7,572	-	12,072
16DR012	15,000	25,094	-	40,094
16DR013	7,500	31,470	-	38,970
16DR014	1,500	2,508	-	4,008
16DR015	8,250	13,978	-	22,228
16DR016	34,750	121,984	-	156,734
16DR017	19,500	74,880	-	94,380
16DR018	9,500	48,906	-	58,406
16DR019	4,500	46,408	-	50,908
16DR020	103,750	217,150	-	320,900
16DR021	5,250	8,940	-	14,190
16DR022	17,250	53,136	-	70,386
16DR023	68,250	53,504	-	121,754
16DR024	6,000	47,648	-	53,648
16DR025	19,000	68,118	-	87,118
16DR026	36,750	90,984	-	127,734
16DR027	14,000	18,364	-	32,364
16DR028	27,000	67,764	-	94,764
16DR029	15,750	78,896	-	94,646
16DR030	14,000	3,390	-	17,390
16DR031	24,500	36,008	-	60,508
16DR032	24,250	34,198	-	58,448
16DR033	6,750	13,866	-	20,616
16DR034	42,000	43,686	-	85,686
6DR035	49,000	111,502	-	160,502
16DR036	7,500	12,610	-	20,110
Total	878,750	2,091,076	-	2,969,826

5. RANKING

The ranking of the required interventions determines the order in which they will be carried out. This ranking is done separately for conservation, improvement and new construction. Ranking is done according to the cost per person served, whereby the costs are the estimated costs of the previous chapter. For the calculation of the population served, use is made of the population data for the VDCs linked by the road concerned. This data is presented in 0.

5.1 CONSERVATION

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

Table 5.1.1 Ranking of conservation works (NPR '000)

Code	Total length (km)	1. Emergency	2. Routine	3. Recurrent (paved)	4. Recurrent (gravel)	5. Recurrent (earth)	6. Periodic (blacktop)	7. Periodic (gravel)	Total cost (NPR '000)	Population served	Cost/person (NPR)
16DR014	1.00	30	20	-	-	250	-	-	300	13,477	22
16DR011	3.00	90	60	-	-	750	-	-	900	34,875	26
16DR015	5.50	165	110	-	-	1,375	-	-	1,650	38,650	43
16DR021	3.50	105	70	-	-	875	-	-	1,050	16,836	62
16DR001	3.50	105	70	-	-	875	-	-	1,050	16,482	64
16DR008	2.50	75	50	-	-	625	-	-	750	11,438	66
16DR013	5.00	150	100	-	-	1,250	-	-	1,500	19,871	75
16DR018	5.00	150	100	-	400	1,000	-	250	1,900	23,313	81
16DR017	13.00	390	260	-	-	3,250	-	-	3,900	46,067	85
16DR019	3.00	90	60	-	-	750	-	-	900	10,204	88
16DR012	10.00	300	200	-	-	2,500	-	-	3,000	32,771	92
16DR036	5.00	150	100	-	-	1,250	-	-	1,500	15,819	95
16DR005	6.00	180	120	-	-	1,500	-	-	1,800	18,244	99
16DR028	18.00	540	360	-	-	4,500	-	-	5,400	50,215	108
16DR016	18.50	555	370	-	1,400	3,750	-	875	6,950	64,345	108
16DR024	4.00	120	80	-	-	1,000	-	-	1,200	10,706	112
16DR031	15.00	450	300	-	400	3,500	-	250	4,900	41,299	119
16DR007	4.50	135	90	-	-	1,125	-	-	1,350	10,344	131
16DR027	8.00	240	160	-	400	1,750	-	250	2,800	18,925	148
16DR035	20.00	600	400	-	3,800	2,625	-	2,375	9,800	63,901	153
16DR003	7.00	210	140	-	400	1,500	-	250	2,500	15,946	157
16DR002	15.50	465	310	-	-	3,875	-	-	4,650	29,412	158
16DR010	12.00	360	240	-	800	2,500	-	500	4,400	27,617	159
16DR009	22.00	660	440	-	8,800	-	-	5,500	15,400	84,332	183
16DR006	7.00	210	140	-	-	1,750	-	-	2,100	11,273	186
16DR034	12.00	360	240	-	4,800	-	-	3,000	8,400	44,986	187
16DR033	4.50	135	90	-	-	1,125	-	-	1,350	7,217	187
16DR029	4.50	135	90	-	1,800	-	-	1,125	3,150	13,650	231
16DR030	4.00	120	80	-	1,600	-	-	1,000	2,800	11,746	238
16DR004	46.50	1,395	930	-	10,600	5,000	-	6,625	24,550	88,221	278
16DR025	10.00	300	200	-	800	2,000	-	500	3,800	12,976	293
16DR023	19.50	585	390	-	7,800	-	-	4,875	13,650	44,016	310
16DR020	34.50	1,035	690	-	10,400	2,125	-	6,500	20,750	65,735	316
16DR026	10.50	315	210	-	4,200	-	-	2,625	7,350	22,816	322
16DR022	7.50	225	150	-	1,200	1,125	-	750	3,450	7,936	435
16DR032	13.50	405	270	-	800	2,875	-	500	4,850	10,620	457

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

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

5.2 IMPROVEMENT

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

Table 5.2.1 Ranking of improvement works (NPR '000)

Code	Total length (km)	Gravelling (km)	Blacktopping (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
16DR014	1.00	1.00	-	2,508	13,477	186
16DR011	3.00	3.00	-	7,572	34,875	217
16DR030	4.00	-	-	3,390	11,746	289
16DR015	5.50	5.50	-	13,978	38,650	362
16DR021	3.50	3.50	-	8,940	16,836	531
16DR001	3.50	3.50	-	8,918	16,482	541
16DR008	2.50	2.50	-	6,282	11,438	549
16DR012	10.00	10.00	-	25,094	32,771	766
16DR036	5.00	5.00	-	12,610	15,819	797
16DR031	15.00	14.00	-	36,008	41,299	872
16DR027	8.00	7.00	-	18,364	18,925	970
16DR034	12.00	-	-	43,686	44,986	971
16DR023	19.50	-	-	53,504	44,016	1,216
16DR028	18.00	18.00	-	67,764	50,215	1,349
16DR002	15.50	15.50	-	40,280	29,412	1,370
16DR009	22.00	-	22.00	121,780	84,332	1,444
16DR013	5.00	5.00	-	31,470	19,871	1,584
16DR017	13.00	13.00	-	74,880	46,067	1,625
16DR010	12.00	10.00	-	45,678	27,617	1,654
16DR005	6.00	6.00	-	30,244	18,244	1,658
16DR035	20.00	-	20.00	111,502	63,901	1,745
16DR016	18.50	-	18.50	121,984	64,345	1,896
16DR033	4.50	4.50	-	13,866	7,217	1,921
16DR018	5.00	4.00	-	48,906	23,313	2,098
16DR003	7.00	6.00	-	38,560	15,946	2,418
16DR007	4.50	4.50	-	26,446	10,344	2,557
16DR032	13.50	11.50	-	34,198	10,620	3,220
16DR020	34.50	-	34.50	217,150	65,735	3,303
16DR006	7.00	7.00	-	40,132	11,273	3,560
16DR026	10.50	-	10.50	90,984	22,816	3,988
16DR024	4.00	4.00	-	47,648	10,706	4,451

Code	Total length (km)	Gravelling (km)	Blacktopping (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)
16DR004	46.50	-	46.50	400,192	88,221	4,536
16DR019	3.00	3.00	-	46,408	10,204	4,548
16DR025	10.00	8.00	-	68,118	12,976	5,250
16DR029	4.50	-	-	78,896	13,650	5,780
16DR022	7.50	-	7.50	53,136	7,936	6,696

5.3 NEW CONSTRUCTION

Since there is no need of new construction, ranking is also absent.

Table 5.3.1 Ranking of construction works (NPR '000)

Code	Length (km)	Total cost (NPR '000)	Population served	Cost/person (NPR)

6. DISTRICT TRANSPORT MASTER PLAN (DTMP)

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

6.1 FIVE YEAR PROJECTED FINANCIAL RESOURCES

The projected financial resources for the next five years are estimated by considering all possible funding sources. The funding levels are based on the existing trend of funding in the district. An annual increase in funding of 10% is assumed for all funding sources. The total district budget for the road sector is NPR 829.53 million for the five-year period.

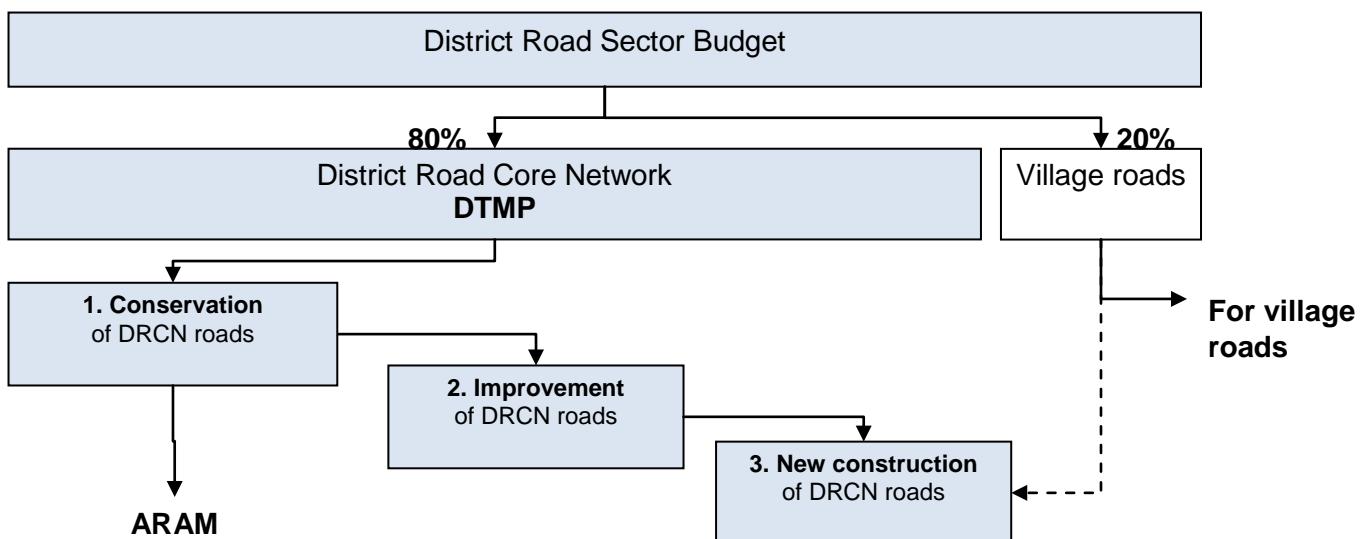
Table 6.1.1 Estimated funding levels (roads) for next five years (in NPR '000)

Funding source	2070/71	2071/72	2072/73	2073/74	2074/75
DDC Grant (30% of Total)	2,320	2,552	2,807	3,088	3,397
VDC Grant (30% of Total)	40,169	44,186	48,605	53,465	58,812
RAIDP	40,450	44,495	48,945	53,839	59,223
RTISWAP	15,950	17,545	19,300	21,229	23,352
Road Boards	4,000	4,400	4,840	5,324	5,856
Central Roads	1,200	1,320	1,452	1,597	30,128
Fund of Members of Parliaments (10% of total)	500	550	605	666	35,474
People's contribution (20%)	20,918	23,010	25,311	27,842	30,807
Total	125,507	138,057	151,863	167,050	247,049
Grand total					829,526

6.2 BUDGET ALLOCATION

The distribution of the available district road sector budget is indicated in the figure below. Due to the low priority to village roads, 80% of the total budget is reserved for the district road core network. The remaining 20% is to be used by the DDC for the village roads, giving priority to emergency maintenance and routine/recurrent maintenance. Alternatively, this 20% may be used for the new construction of DRCN roads where this is considered a priority by the district. The 80% of the district road sector budget for the DTMP is allocated firstly to conservation, secondly improvement and no new construction required.

Figure 5 District road sector budget allocation



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

Table 6.2.1 DTMP investment plan

Item	Year																	
	2070/71			2071/72			2072/73			2073/74			2074/75					
Fiscal year	2070/71			2071/72			2072/73			2073/74			2074/75					
Total budget	125,507			138,057			151,863			167,050			247,049					
Non-DRCN roads	25,101			27,611			30,373			33,410			49,410					
DRCN budget	100,405			110,446			121,491			133,640			197,639					
Core network length (km)	384.50			384.50			384.50			384.50			384.50					
Blacktop (km)	-			-			-			-			-					
Gravel (km)	151.00			151.00			151.00			151.00			151.00					
Earthen (km)	233.50			233.50			233.50			233.50			233.50					
Conservation (NPR '000)	100,405			110,446			121,491			133,640			175,750					
Emergency	11,535			11,535			11,535			11,535			11,535					
Routine	7,690			7,690			7,690			7,690			7,690					
Recurrent (blacktop)	-			-			-			-			-					
Recurrent (gravel)	60,400			60,400			60,400			60,400			60,400					
Recurrent (earthen)	20,780			30,821			41,866			54,015			58,375					
Periodic (blacktop)	-			-			-			-			-					
Periodic (gravel)	-			-			-			-			-		37,750			
Improvement	Cost	BT	GR	0	BT	GR	0	BT	GR	0	BT	GR	0	BT	GR	21,889	BT	GR
16DR014	2,508	-	1.00	-	-	-	-	-	-	-	-	-	-	-	2,508	-	1.00	
16DR011	7,572	-	3.00	-	-	-	-	-	-	-	-	-	-	-	7,572	-	3.00	
16DR030	3,390	-	-												3,390	-	-	
16DR015	13,978	-	5.50												8,419	-	3.31	
16DR021	8,940	-	3.50															
16DR001	8,918	-	3.50															
16DR008	6,282	-	2.50															
16DR012	25,094	-	10.00															
16DR036	12,610	-	5.00															
16DR031	36,008	-	14.00															
16DR027	18,364	-	7.00															
16DR034	43,686	-	-															
16DR023	53,504	-	-															
16DR028	67,764	-	18.00															
16DR002	40,280	-	15.50															
16DR009	121,780	22.00	-															
16DR013	31,470	-	5.00															
16DR017	74,880	-	13.00															
16DR010	45,678	-	10.00															
16DR005	30,244	-	6.00															
16DR035	111,502	20.00	-															
16DR016	121,984	18.50	-															
16DR033	13,866	-	4.50															
16DR018	48,906	-	4.00															
16DR003	38,560	-	6.00															
16DR007	26,446	-	4.50															
16DR032	34,198	-	11.50															
16DR020	217,150	34.50	-															
16DR006	40,132	-	7.00															
16DR026	90,984	10.50	-															
16DR024	47,648	-	4.00															
16DR004	400,192	46.50	-															
16DR019	46,408	-	3.00															
16DR025	68,118	-	8.00															
16DR029	78,896	-	-															
16DR022	53,136	7.50	-															
Total improvement															21,889	-	7.31	

6.3 DTMP OUTPUTS

Based on the investment plan presented above, all DRCN roads will be conserved for the duration of the DTMP period. A further 7.31 km will be improved to gravel standard. All of these roads will also receive the cross drainage and protective structures required to make them maintainable all-weather roads. The remaining 377.19 km of roads at the end of the DTMP period will be improved in the next DTMP. The same goes for the new construction which will only take place after the existing DRCN roads have been improved to maintainable all weather standards (some of these roads may be constructed using VDC funding). The conservation requirement should be identified by conducting condition surveys in each year prior to preparation of ARAMP. This will determine actual requirement of conservation cost and will decide for other improvement works with the available resources.

Table 6.3.1 DTMP output

Conservation	Improvement gravel	Improvement blacktop	New construction
384.50	7.31	-	-

Of the total DTMP budget, NPR 641.7 million will be spent on conservation and NPR 21.8 million on improvement. This will use up the entire DTMP budget for the five-year period.

6.4 DTMP OUTCOME

As a result of the activities planned in this DTMP, the percentage of all-weather maintainable DRCN roads increases by 2% from 151km to 158.31km, with 59% (226.19km) remaining fair weather.

Table 6.4.1 Standard of DRCN roads

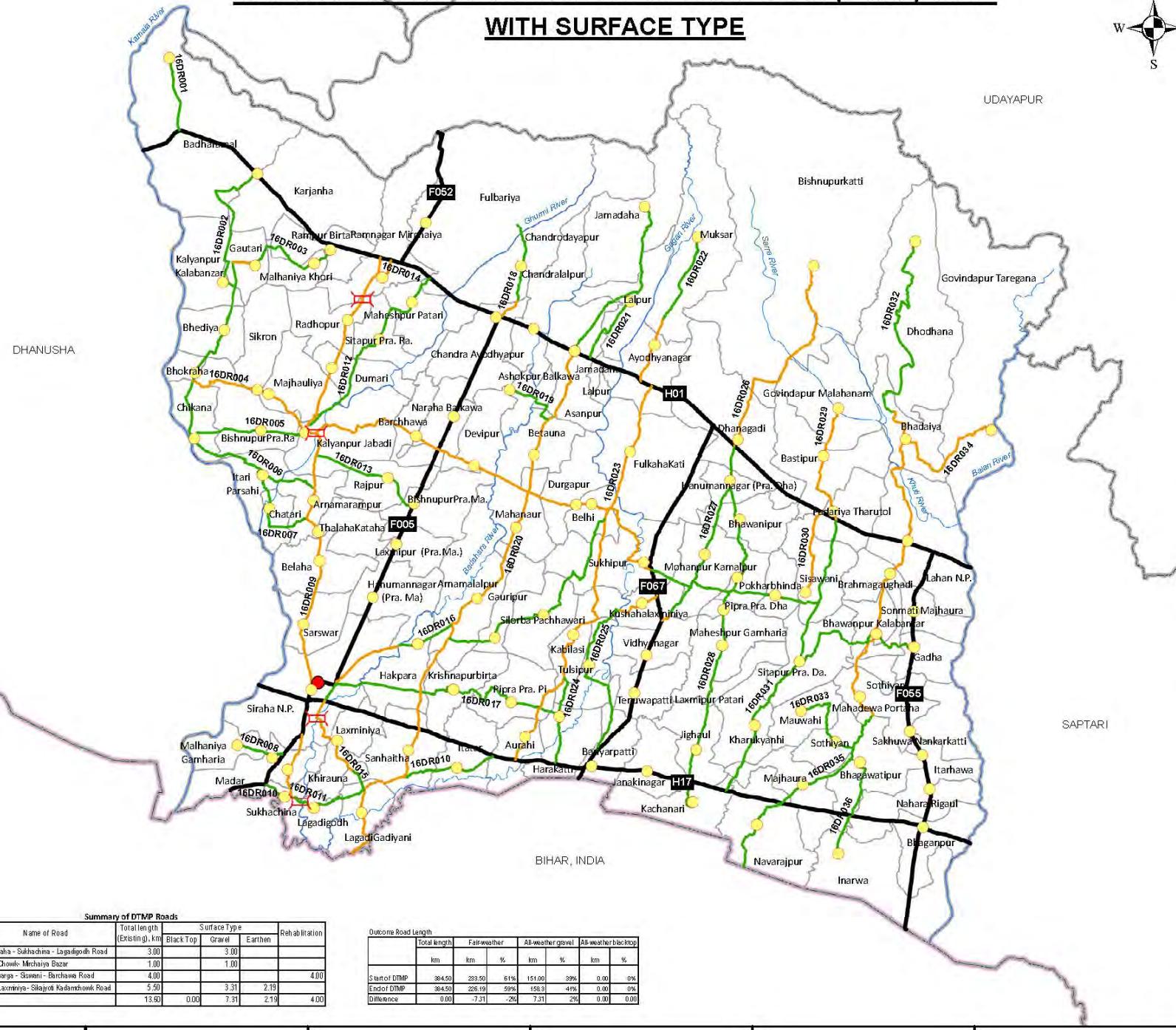
	Total length	Fair-weather		All-weather gravel		All-weather blacktop	
	km	km	%	km	%	km	%
Start of DTMP	384.50	233.50	61%	151.00	39%	-	0%
End of DTMP	384.50	226.19	59%	158.31	41%	-	0%
Difference	-	-7.31	-2%	7.31	2%	-	0%

The number of VDC headquarters with access to the SRN or all-weather DRCN roads will increase from 12 to 14 and the district population with access to the SRN or all-weather DRCN roads will increase from 12% to 13%.

Table 6.4.2 Population with access to road network

	Direct access to SRN			Access to fair-weather DRCN roads			Access to all-weather DRCN roads			No access to DRCN		
	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%	VDCs	Population	%
Start of DTMP	21	170,532	27%	75	388,458	61%	12	76,637	12%	0	-	0%
End of DTMP	21	170,532	27%	73	380,527	60%	14	84,568	13%	0	-	0%
Difference	-	-	0%	-2	-7,931	-1%	2	7,931	1%	-	-	0%

MAP NO. 5 DISTRICT TRANSPORT MASTER PLAN (DTMP) MAP WITH SURFACE TYPE



Legend

- VDC Centre
- District Headquarter
- VDC Boundary
- District Boundary
- River
- SRN Road
- ☒ Bridge (Existing)
- District Road**
- Earthen (DRCN)
- Gravel (DRCN)

Name of District		District Development Committee, Siraha
Project	Preparation of District Transport Master Plan	
Technical Assistance	MoFALD, DoLiDAR, RTISWAP	
Grant Supported By	Department For International Development (DFID) thru Rap 3	
Consultant	GOEC Nepal Pvt Ltd, Budhanagar, Kathmandu	
Source	Department of Survey, GPS Survey, DoR, DoLiDAR	

Projected Co-ordinate System		
Projection	Transverse Mercator	
False Easting	500000 m	
False Northing	0 m	
Central Meridian	87	
Spheroid	Everest 1830	

Scale Information		
0	1	2
4	6	8 KM

1:175,000

ANNEXES

ANNEX 1 TRAFFIC DATA

Traffic Data

Code	Description	Total length (km)	Motor-cycle	Car-Jeep-Minibus	Tractor	Truck-Bus	PCU
16DR001	BadaharmahalBandipur- Kamala- UttarbahiniSadak	3.50	6	0	3	0	9
16DR002	Bastipur-ChiknaSadak pr-1	15.50	80	3	13	0	69
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - MalhaniyaChowk	7.00	40	0	13	0	46
16DR004	Chickna - Kalyanpur - Gadha Road	46.50	150	0	35	0	145
16DR005	KalyanpurJabdi -Bishnupur (Pra.Ra)-NirdhanaSadak	6.00	15	0	2	0	12
16DR006	ArnamaSanchiraiya – ItariprashaiNirdhana - Chikna Road	7.00	10	0	2	0	9
16DR007	BaniniyaChowk - ItariParsai Road	4.50	15	0	2	0	12
16DR008	MadarBasiyainar - Fulbadiya - Ma. Gaamhariya	2.50	20	0	4	0	18
16DR009	Mirchaiya- Kalyanpur -Siraha Road	22.00	180	36	30	29	302
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir – SuksenaSadak	12.00	15	0	4	0	16
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	3.00	10	0	4	0	13
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	10.00	6	0	2	0	7
16DR013	BishnupurPra. Ma. - Rajpur - Bhokraha – KalyanpurJabadi (karuniyahi)Road	5.00	10	0	6	0	17
16DR014	Thana Chowk- Mirchaiya Bazar	1.00	12	2	2	0	12
16DR015	SirahaLaxminiya- SikajyotiKadamchowk Road	5.50	10	0	4	0	13
16DR016	Siraha - Sukhipur Road	18.50	125	7	35	0	140
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	13.00	50	4	8	0	45
16DR018	M. Rajmarga - Kamaldaha Road	5.00	8	0	4	0	12
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	3.00	10	0	2	0	9
16DR020	Jamdhya-Lagadhi- Gadhiyani	34.50	80	20	25	16	174
16DR021	Asanpur(NipaniyaChowk)- Lalpur Road	3.50	10	2	2	0	11
16DR022	Kasha - Mukshar Road	7.50	100	0	45	0	140
16DR023	Ayodhyanagar-Pipra- Aurahi Road	19.50	50	14	10	8	91
16DR024	DarahiyaHarkatti - Kabilasi Road	4.00	10	0	2	0	9
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti – KushahaLaxminiya	10.00	15	0	5	0	18
16DR026	Zeromile-Sare -Ambash	10.50	110	13	20	9	144
16DR027	KusahaLaxmaniniya - Hanumannagar (Pra.Dha) Road	8.00	20	2	4	0	20
16DR028	Dhangadi - Patarijjhau - Kachnari Road	18.00	95	5	15	1	87
16DR029	Ganeshchowk-Manikdaha Road	4.50	20	0	16	0	42
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00	30	5	14	0	48
16DR031	Ganesh Chowk-BhotiyaTol- Sitrapur(Pra.Dha)- Nagribhadari	15.00	45	5	14	0	56
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	13.50	30	0	15	0	45
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	4.50	25	0	5	0	23
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00	15	0	5	0	18
16DR035	Lahan - Sahidchowk - JhanjharpattiSadak	20.00	80	6	30	2	114
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa-Mani Chowk Road	5.00	10	0	5	0	15
Total		384.5					

ANNEX 2 POPULATION SERVED

POPULATION SERVED:

S.N.	VDC/Municipality	Population	Road																																					
			16DR001	16DR002	16DR003	16DR004	16DR005	16DR006	16DR007	16DR008	16DR009	16DR010	16DR011	16DR012	16DR013	16DR014	16DR015	16DR016	16DR017	16DR018	16DR019	16DR020	16DR021	16DR022	16DR023	16DR024	16DR025	16DR026	16DR027	16DR028	16DR029	16DR030	16DR031	16DR032	16DR033	16DR034	16DR035	16DR036	SRN	
1	Arnamalalpur	9,241															X			X																				
2	Arnamarampur	3,529				X	X		X																															
3	Asanpur	12,926																					X	X												X				
4	Ashokpur Balkawa	5,127																					X																	
5	Aurahi	5,685										X													X															
6	Ayodhyanganagar	4,433																						X	X															
7	Badharamal	16,482	X	X																																				
8	Barchhawa	3,701				X																																		
9	Bariyarpatti	5,129																																			X			
10	Bastipur	6,361																																						
11	Belaha	6,240										X																												
12	Balahi	4,014				X																	X																	
13	Betauna	5,077																					X	X																
14	Bhadaiya	5,739																																	X	X				
15	Bhagwanpur	4,157																																				X		
16	Bhagawatipur	4,495																																				X	X	
17	Bhawanipur	5,497																																						
18	Bhawanipur Kalabanzar	3,796				X																																	X	
19	Bhokraha	1,757	X																																					
20	Bishnupur Pra.Ma.	5,208																X																				X		
21	Bishnupur Pra.Ra	5,020																																						
22	Bishnupurkatti	11,554																																						

S.N.	VDC/Municipality	Population	Road																																				
			16DR001	16DR002	16DR003	16DR004	16DR005	16DR006	16DR007	16DR008	16DR009	16DR010	16DR011	16DR012	16DR013	16DR014	16DR015	16DR016	16DR017	16DR018	16DR019	16DR020	16DR021	16DR022	16DR023	16DR024	16DR025	16DR026	16DR027	16DR028	16DR029	16DR030	16DR031	16DR032	16DR033	16DR034	16DR035	16DR036	SRN
45	Inarwa	11,324																																X					
46	Itarhawa	4,131																															X						
47	Itari Parsahi	4,104				X	X																																
48	Itatar	4,261								X																													
49	Jamadaha	5,660																							X														
50	Janakinagar	4,411																																X					
51	Jighaul	4,996																																					
52	Kabilasi	3,574																								X	X												
53	Kachanari	6,480																																X					
54	Kalyanpur Jabadi	9,584			X	X				X		X	X																										
55	Kalyanpurkalabanzar	3,329	X	X																																			
56	Karjanha	7,467																																		X			
57	Kharukyanhi	4,981																																		X			
58	Khirauna	3,452									X																												
59	Krishnapur Birta	4,277																	X	X																			
60	Kushahalaxiniya	3,770																									X	X											
61	Lagadi Gadiyani	5,729								X		X								X																			
62	Lagadigoth	3,765									X																												
63	Lahan Municipality	33,653																																	X	X	X		
64	Lalpur	3,910																			X	X																	
65	Laxminiya	4,479																X																					
66	Laxmipur (Pra.Ma.)	3,805																																		X			
67	Laxmipur Patari	4,658																																					

S.N.	VDC/Municipality	Population	Road																																			
			16DR001	16DR002	16DR003	16DR004	16DR005	16DR006	16DR007	16DR008	16DR009	16DR010	16DR011	16DR012	16DR013	16DR014	16DR015	16DR016	16DR017	16DR018	16DR019	16DR020	16DR021	16DR022	16DR023	16DR024	16DR025	16DR026	16DR027	16DR028	16DR029	16DR030	16DR031	16DR032	16DR033	16DR034	16DR035	16DR036
68	Madar	8,950							X																													
69	Mahadewa Portaha	3,963																																X				
70	Mahanaur	6,365			X																																	
71	Maheshpur Gamharia	4,423																																X				
72	Maheshpur Patari	4,396												X																								
73	Majhauliya	4,649									X																											
74	Majhaura	5,794			X																												X					
75	Malhaniya Gamharia	2,488									X																											
76	Malhaniyakhori	3,913		X																																		
77	Mauwahi	3,473																																X				
78	Bhedia	4,204		X																																		
79	Mohanpur Kamalpur	5,257			X																												X					
80	Muksar	3,503																								X												
81	Nahara Rigoul	5,476																																	X			
82	Naraha Balkawa	4,476																																		X		
83	Navarajpur	8,730																																		X		
84	Padariya Tharutol	6,073																																X	X			
85	Pipra Pra.Dha	4,087			X																																	
86	Pipra Pra.Pi	5,968																			X				X													
87	Pokharbhinda	3,995			X																																	
88	Raghopur	3,949												X								X																
89	Rajpur	5,079																																				

S.N.	VDC/Municipality	Population	Road																																					
			16DR001	16DR002	16DR003	16DR004	16DR005	16DR006	16DR007	16DR008	16DR009	16DR010	16DR011	16DR012	16DR013	16DR014	16DR015	16DR016	16DR017	16DR018	16DR019	16DR020	16DR021	16DR022	16DR023	16DR024	16DR025	16DR026	16DR027	16DR028	16DR029	16DR030	16DR031	16DR032	16DR033	16DR034	16DR035	16DR036	SRN	
90	Ramnagar Mirchaiya	13,477							X																															
91	Rampur Birta	5,015		X																																				
92	Sakhuwanankarka tti	3,247													X																		X							
93	Sanhaitha	5,196								X																														
94	Sarwar	6,180								X																														
95	Sikron	3,195				X																																		
96	Silorba Pachhawari	5,254																																						
97	Siraha Municipality	28,442								X	X					X																	X							
98	Sisawani	5,673				X																																		
99	Sitapur Pra.Da.	5,937			X																												X							
100	Sitapur Pra.Ra.	4,769										X																												
101	Sonmati Majhaura	4,449																																						
102	Sothiyan	3,744																																	X					
103	Sukhachina	2,981									X	X																												
104	Sukhipur	10,040			X												X							X																
105	Tenuwapatti	4,240																X																	X					
106	Thalahata Kataha	4,430								X																														
107	Tulsipur	4,077																																						
108	Vidhyanagar	4,974																																						
	Total population	635,627	16,482	29,412	15,946	88,221	18,244	11,273	10,344	11,438	84,332	27,617	34,875	32,771	19,871	13,477	38,650	64,345	46,067	23,313	10,204	65,735	16,836	7,936	44,016	10,706	12,976	22,816	18,925	50,215	13,650	11,746	41,299	10,620	7,217	44,986	63,901	15,819	170,532	X

S.N.	VDC/Municipality	Population	Road																																									
			16DR001	16DR002	16DR003	16DR004	16DR005	16DR006	16DR007	16DR008	16DR009	16DR010	16DR011	16DR012	16DR013	16DR014	16DR015	16DR016	16DR017	16DR018	16DR019	16DR020	16DR021	16DR022	16DR023	16DR024	16DR025	16DR026	16DR027	16DR028	16DR029	16DR030	16DR031	16DR032	16DR033	16DR034	16DR035	16DR036	SRN					
	Total VDCs/municipalities	108	1	5	4	1	7	3	3	3	2	1	0	6	3	5	3	1	3	7	5	3	2	1	2	2	7	3	3	2	4	9	2	2	2	7	2	2	3	7	2	2	2	1

ANNEX 3 LOCATION OF PROPOSED INTERVENTIONS

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)
16DR001	Badaharmahal Bandipur- Kamala- Uttarbahini Sadak	3.50	0+000	3+500		3.50									42	
16DR002	Bastipur-Chikna Sadak pr-1	15.50	0+000	15+500		15.50			6			1		75		
16DR003	Kalyanpur(ka.Ba.)-Gautari-Malhankhori Health Post-Malhaniya Chowk	7.00	0+000	7+000	1.00	6.00		30						65		
16DR004	Chickna - Kalyanpur - Gadha Road	46.50	0+000	46+500			46.5	190	6			3		163		
16DR005	Kalyanpur Jabdi -Bishnupur (Pra.Ra)-Nirdhana Sadak	6.00	0+000	6+000		6.00		20						61		
16DR006	Arnama Sanchiraiya - Itariprashai Nirdhana - Chikna Road	7.00	0+000	7+000		7.00		30						33		
16DR007	Baniniya Chowk - Itari Parsai Road	4.50	0+000	4+500		4.50		20						49		
16DR008	Madar Basiyainar - Fulbadiya - Ma. Gaamhariya	2.50	0+000	2+500		2.50								8		
16DR009	Mirchaiya- Kalyanpur -Siraha Road	22.00	0+000	22+000			22							195		
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - Suksena Sadak	12.00	0+000	12+000	2.00	10.00		25						82		
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	3.00	0+000	3+000		3.00								18		
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	10.00	0+000	10+000		10.00						1		16		

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)
16DR013	Bishnupur Pra. Ma. - Rajpur - Bhokraha - Kalyanpur Jabadi (karuniyahi)Road	5.00	0+000	5+000		5.00		25						55		
16DR014	Thana Chowk- Mirchayia Bazar	1.00	0+000	1+000		1.00								2		
16DR015	Siraha Laxminiya- Sikajyoti Kadamchowk Road	5.50	0+000	5+500		5.50								57		
16DR016	Siraha - Sukhipur Road	18.50	0+000	18+500			18.5		25	6				71		
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	13.00	0+000	13+000		13.00		55		3			170			
16DR018	M. Rajmarga - Kamaldaha Road	5.00	0+000	5+000	1.00	4.00		50		3				39		
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	3.00	0+000	3+000		3.00		50	6				2		37	
16DR020	Jamdha-Lagadhi- Gadhiyani	34.50	0+000	34+500			34.5		30	12	12		2		160	
16DR021	Asanpur(Nipaniya Chowk)- Lalpur Road	3.50	0+000	3+500		3.50							5		10	
16DR022	Kasha - Mukshar Road	7.50	0+000	7+500			7.5		15		3		1		39	
16DR023	Ayodhyanagar-Pipra- Aurahi Road	19.50	0+000	19+500	19.50			50						101		
16DR024	Darahiya Harkatti - Kabilasi Road	4.00	0+000	4+000		4.00		50						37		
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti - Kushaha Laxminiya	10.00	0+000	10+000	2.00	8.00		60	6				1		72	
16DR026	Zeromile-Sare -Ambash	10.50	0+000	10+500			10.5		30	12	50		5		171	
16DR027	Kusaha Laxmaniniya - Hanumannagar (Pra.Dha) Road	8.00	0+000	8+000	1.00	7.00								16		
16DR028	Dhangadi - Patari Jijhaul - Kachnari Road	18.00	0+000	18+000		18.00		30					2		51	
16DR029	Ganeshchowk-Manikdaha Road	4.50	0+000	4+500	4.50			100						74		
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00	0+000	4+000	4.00	0.00							1		40	

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)
16DR031	Ganesh Chowk-Bhotiya Tol-Sitrapur(Pra.Dha)-Nagribhadari	15.00	0+000	15+000	1.00	14.00									52	
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	13.50	0+000	13+500	2.00	11.50			6	15		5		62		
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	4.50	0+000	4+500		4.50			12			4		24		
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00	0+000	12+000	12.00			45						84		
16DR035	Lahan - Sahid chowk - Jhanjharpatti Sadak	20.00	0+000	20+000			20		6			5		38		
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa-Mani Chowk Road	5.00	0+000	5+000		5.00						1		20		
Total		384.5			50	175	159.5	0	930	78	86	0	39	0	2289	0

ANNEX 4 OVERALL ROAD INVENTORY

OVERALL ROAD INVENTORY

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Gravel	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition - Temporarily Impassable	Condition - Permanently Impassable	Remarks	
16DR001	Badaharmahal Bandipur- Kamala- Uttarbahini Sadak	3.50	0+000	3+500			3.50		3.50		3.50			Earthen	
16DR002	Bastipur-Chikna Sadak pr-1	15.50	0+000	15+500			15.50		15.50		15.50			Earthen	
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - Malhaniya Chowk	1.00	0+000	1+000			1.00		1.00		1.00			Earthen	
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - Malhaniya Chowk	1.00	1+000	2+000		1.00		1.00			1.00			Gravel	
16DR003	Kalyanpur (ka.Ba.) - Gautari - Malhankhori Health Post - Malhaniya Chowk	5.00	2+000	7+000			5.00		5.00		5.00			Earthen	
16DR004	Chickna - Kalyanpur - Gadha Road	26.50	0+000	26+500		26.50		26.50			26.50			Gravel	
16DR004	Chickna - Kalyanpur - Gadha Road	20.00	26+500	46+500			20.00		20.00		20.00			Earthen	
16DR005	Kalyanpur Jabdi -Bishnupur (Pra.Ra)-Nirdhana Sadak	6.00	0+000	6+000			6.00		6.00		6.00			Earthen	
16DR006	Arnama Sanchiraiya - Itariprashai Nirdhana - Chikna Road	7.00	0+000	7+000			7.00		7.00		7.00			Earthen	
16DR007	Baniniya Chowk - Itari Parsai Road	4.50	0+000	4+500			4.50		4.50		4.50			Earthen	
16DR008	Madar Basiyainar - Fulbadiya - Ma. Gaamhariya	2.50	0+000	2+500			2.50		2.50		2.50			Earthen	
16DR009	Mirchaiya- Kalyanpur -Siraha Road	22.00	0+000	22+000		22.00		22.00		22.00		22.00	0.00		Gravel
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - Suksena Sadak	4.50	0+000	4+500			4.50		4.50		4.50			Earthen	
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - Suksena Sadak	2.00	4+500	6+500		2.00		2.00			2.00			Gravel	
16DR010	Aurahi Ma.vi - Kamalpur - Kalimandir - Suksena Sadak	5.50	6+500	12+000			5.50		5.50		5.50			Earthen	
16DR011	Makhanaha - Sukhachina - Lagadigodh Road	3.00	0+000	3+000			3.00		3.00		3.00			Earthen	

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition -Temporarily Impassable	Condition -Permanently Impassable	Remarks
16DR012	Dhodhana-Ga. Maheshpur-Kalyanpur-Ramna Road	10.00	0+000	10+000		10.00		10.00		10.00			Earthen
16DR013	Bishnupur Pra. Ma. - Rajpur - Bhokraha - Kalyanpur Jabadi (karuniyahi) Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16DR014	Thana Chowk- Mirchaiya Bazar	1.00	0+000	1+000		1.00		1.00		1.00			Earthen
16DR015	Siraha Laxminiya- Sikajyoti Kadamchowk Road	5.50	0+000	5+500		5.50		5.50		5.50			Earthen
16DR016	Siraha - Sukhipur Road	3.50	0+000	3+500		3.50		3.50		3.50			Gravel
16DR016	Siraha - Sukhipur Road	15.00	3+500	18+500		15.00		15.00		15.00			Earthen
16DR017	Siraha - Pipra (Pra.Pi) - Harkatti Road	13.00	0+000	13+000		13.00		13.00		13.00			Earthen
16DR018	M. Rajmarga - Kamaldaha Road	1.00	0+000	1+000		1.00		1.00		1.00			Gravel
16DR018	M. Rajmarga - Kamaldaha Road	4.00	1+000	5+000		4.00		4.00		4.00			Earthen
16DR019	Uchha Ma. vi Chowk- Belkawa- Betauna Road	3.00	0+000	3+000		3.00		3.00		3.00			Earthen
16DR020	Jamdhaha-Lagadhi- Gadhiyani	8.50	0+000	8+500		8.50		8.50		8.50			Earthen
16DR020	Jamdhaha-Lagadhi- Gadhiyani	26.00	8+500	34+500		26.00		26.00		26.00			Gravel
16DR021	Asanpur(Nipaniya Chowk)- Lalpur Road	3.50	0+000	3+500		3.50		3.50		3.50			Earthen
16DR022	Kasha - Mukshar Road	3.00	0+000	3+000		3.00		3.00		3.00			Gravel
16DR022	Kasha - Mukshar Road	4.50	3+000	7+500		4.50		4.50		4.50			Earthen
16DR023	Ayodhyanganagar-Pipra- Aurahi Road	19.50	0+000	19+500		19.50		19.50		19.50			Gravel
16DR024	Darahiya Harkatti - Kabilasi Road	4.00	0+000	4+000		4.00		4.00		4.00			Earthen
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti - Kushaha Laxminiya	8.00	0+000	8+000		8.00		8.00		8.00			Earthen
16DR025	Bariyarpatti - Tulshipur - Tenuwapatti - Kushaha Laxminiya	2.00	8+000	10+000		2.00		2.00		2.00			Gravel
16DR026	Zeromile-Sare -Ambash	10.50	0+000	10+500		10.50		10.50		10.50			Gravel

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition -Temporarily Impassable	Condition -Permanently Impassable	Remarks
16DR027	Kusaha Laxmaniniya - Hanumannagar (Pra.Dha) Road	1.00	0+000	1+000		1.00		1.00		1.00			Gravel
16DR027	Kusaha Laxmaniniya - Hanumannagar (Pra.Dha) Road	7.00	1+000	8+000		7.00		7.00		7.00			Earthen
16DR028	Dhangadi - Patari Jijhaul - Kachnari Road	18.00	0+000	18+000		18.00		18.00		18.00			Earthen
16DR029	Ganeshchowk-Manikdaha Road	4.50	0+000	4+500		4.50		4.50		4.50			Gravel
16DR030	M. Rajmarga - Siswani - Barchawa Road	4.00	0+000	4+000		4.00		4.00		4.00			Gravel
16DR031	Ganesh Chowk-Bhotiya Tol- Sitrapur(Pra.Dha)- Nagribhadari	1.00	0+000	1+000		1.00		1.00		1.00			Gravel
16DR031	Ganesh Chowk-Bhotiya Tol- Sitrapur(Pra.Dha)- Nagribhadari	14.00	1+000	15+000		14.00		14.00		14.00			Earthen
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	2.00	0+000	2+000		2.00		2.00		2.00			Gravel
16DR032	Lahan9 (Guddigaun) - Dhodana - Betaha Road	11.50	2+000	13+500		11.50		11.50		11.50			Earthen
16DR033	Mahuwahi - Sodhiyane - Tamasuiya	4.50	0+000	4+500		4.50		4.50		4.50			Earthen
16DR034	Lahan - Taregana - Mahadevthan - Kabde Road	12.00	0+000	12+000		12.00		12.00		12.00			Gravel
16DR035	Lahan - Sahid chowk - Jhanjharpatti Sadak	9.50	0+000	9+500		9.50		9.50		9.50			Gravel
16DR035	Lahan - Sahid chowk - Jhanjharpatti Sadak	10.50	9+500	20+000		10.50		10.50		10.50			Earthen
16DR036	Bhagwatipur (Ta.Su) Chowk- Garsaha-Inarwa-Mani Chowk Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR001	Karjanaha 4 - Kalyanpur 6 - Bherwa Tole Road	15.00	0+000	15+000		15.00		15.00		15.00			Earthen
16VR002	Bheriya - Kalyanpur Jabadi Road	8.00	0+000	8+000		8.00		8.00		8.00			Earthen
16VR003	Nirdhana - Bishnupur - Kalyanpur Road	2.00	0+000	2+000		2.00		2.00		2.00			Earthen
16VR004	Mirchaiya - Kuthanama - Bhedia Road	7.00	0+000	7+000		7.00		7.00		7.00			Earthen
16VR005	Kalyanpur Ka.Ba - Premnagar - Raghopur Gachiya Road	9.00	0+000	9+000		9.00		9.00		9.00			Earthen

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition -Temporarily Impassable	Condition -Permanently Impassable	Remarks
16VR006	Gautam - Mahendra Rajmarg	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR006	Gautam - Mahendra Rajmarg	5.00	5+000	10+000		5.00		5.00		5.00			Earthen
16VR007	Mahadewa - Chamartole - Belshot Road	12.00	0+000	12+000		12.00		12.00		12.00			Earthen
16VR008	Badaharamal - Sitapur- Chauharwa (New chowk) Road	3.50	0+000	3+500		3.50		3.50		3.50			Gravel
16VR008	Badaharamal - Sitapur- Chauharwa (New chowk) Road	10.00	3+500	13+500		10.00		10.00		10.00			Earthen
16VR009	Kalabanjar - Malahaniyakhori health post - M.Rajmargh	12.00	0+000	12+000		12.00		12.00		12.00			Earthen
16VR010	Kalyanpur - Itari - Parsai Road	2.50	0+000	2+500		2.50		2.50		2.50			Earthen
16VR011	Itari Parsai - Majholiya Road	8.00	0+000	8+000		8.00		8.00		8.00			Earthen
16VR012	Mirchayia - Kuthanama - Bhedia Road	2.50	0+000	2+500		2.50		2.50		2.50			Gravel
16VR013	Belshot - Bhotetole -Mahadewa Road	20.00	0+000	20+000		20.00		20.00		20.00			Earthen
16VR014	Itari - Parsai - Nirdhana Road	1.00	0+000	1+000		1.00		1.00		1.00			Earthen
16VR015	Kuthunuwa - Sickron - Bhadiya - Rampur Road	2.00	0+000	2+000		2.00		2.00		2.00			Earthen
16VR016	Belha - Chandraayodhyapur - Mahendra Rajmarg	10.00	0+000	10+000		10.00		10.00		10.00			Earthen
16VR016	Belha - Chandraayodhyapur - Mahendra Rajmarg	8.50	10+000	18+500		8.50		8.50		8.50			Gravel
16VR017	Kalyanpur- Sitapur - Mahendra Rajmarg	10.00	0+000	10+000		10.00		10.00		10.00			Earthen
16VR018	Mahendra Rajmarg - Mahespur	2.00	0+000	2+000		2.00		2.00		2.00			Earthen
16VR019	Manahwara - Gotari Road	3.00	0+000	3+000		3.00		3.00		3.00			Earthen
16VR020	Baluwa- Chandruodhyopur Road	9.50	0+000	9+500		9.50		9.50		9.50			Gravel
16VR020	Baluwa- Chandruodhyopur Road	10.00	0+000	10+000		10.00		10.00		10.00			Earthen
16VR021	Dhangadi-Bariyarpatti Road	2.00	0+000	2+000		2.00		2.00		2.00			Earthen

Road code	Road Name	Length (km)	Start chainage (km) or XY-coordinate	End chainage (km) or XY-coordinate	Surface Type: Black Top	Surface Type : Earth	All Weather	Fair Weather	Condition - Good/ Fair	Condition - Poor	Condition -Temporarily Impassable	Condition -Permanently Impassable	Remarks
16VR022	Old Choharwa - Panbari - Lalbhiya Road	13.00	0+000	13+000		13.00		13.00		13.00			Gravel
16VR023	VDC Sitapur to Pra.Pa. Soni gaun - Dokhaba Road	3.00	0+000	3+000		3.00		3.00		3.00			Earthen
16VR024	Bisanpur Pr. Ma. - Pipra - Sukhipur Road	16.00	0+000	16+000		16.00		16.00		16.00			Earthen
16VR025	Ramana - Dokaha Road	1.50	0+000	1+500		1.50		1.50		1.50			Earthen
16VR026	Hakpada Pipra Auraha - Tarapatti chowk - Tarapatti - Laxminiya Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR027	Madar Custom to M.Gamhariya to Kharlashwa - Manpur Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR028	Khaitoka Custom - Sarswar Road	3.50	0+000	3+500		3.50		3.50		3.50			Gravel
16VR029	Khaitoka Custom - Sarswar Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR030	Police post - Madar Hatiya - Khertoka - Sarshwar Road	1.00	0+000	1+000		1.00		1.00		1.00			Earthen
16VR031	Budhaura Jogiya India Border Road	2.50	0+000	2+500		2.50		2.50		2.50			Earthen
16VR032	Golbazar Belkawa - Debipur Road	4.00	0+000	4+000		4.00		4.00		4.00			Earthen
16VR033	Rariyaha - Arnama Pra. Pi.- Khoriyatol Road	16.00	0+000	16+000		16.00		16.00		16.00			Earthen
16VR034	Golbazar - Durgapur - Belhi Road	7.00	0+000	7+000		7.00		7.00		7.00			Earthen
16VR035	Khajanpur - New Kamalpur Road	5.50	0+000	5+500		5.50		5.50		5.50			Earthen
16VR036	Kashaha - Tulshipur - Harkatti Road	8.00	0+000	8+000		8.00		8.00		8.00			Earthen
16VR036	Kashha - Gauraha- Gamharia Road	9.00	0+000	9+000		9.00		9.00		9.00			Earthen
16VR037	Bariyarpatti - Tulshipur - Kushaha Laxminiya Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR038	Tenuwapatti Tulshipur kashaha Aurahi sadak VDC Pokharia chowk Road	4.50	0+000	4+500		4.50		4.50		4.50			Earthen
16VR039	Laxmipur Patari - Kushaha - Aurahi Road	5.00	0+000	5+000		5.00		5.00		5.00			Earthen
16VR040	Kushha Laxminiya - Dhangadhi Road	4.50	0+000	4+500		4.50		4.50		4.50			Gravel

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	Remarks
16VR041	Kashaha chowk -Mothiyahi Road	2.00	0+000	2+000			2.00		2.00		2.00			Earthen
16VR042	Bastipur - Gobindpur - Mukshargola Road	9.00	0+000	9+000			9.00		9.00		9.00			Earthen
16VR042	Bastipur - Gobindpur - Mukshargola Road	5.00	0+000	5+000		5.00		5.00			5.00			Gravel
16VR043	Raghunitole - Chaprari - Negri Road	4.00	0+000	4+000			4.00		4.00		4.00			Earthen
16VR044	Dhangadhi-Patahari Jighaul -Kajnari	18.50	0+000	18+500		18.50		18.50			18.50			Gravel
16VR045	Tenuwapatti - Laxmipur - Sitapur Road	12.00	0+000	12+000			12.00		12.00		12.00			Earthen
16VR046	Bidyanagar-Sohanpur- Gargambha Road	8.00	0+000	8+000			8.00		8.00		8.00			Earthen
16VR047	Khairbona chowk - Inarwa Road	9.00	0+000	9+000			9.00		9.00		9.00			Earthen
16VR048	Manikdah - Ganeshpur - Shalhesh Phulbari Road	3.50	0+000	3+500		3.50		3.50			3.50			Gravel
16VR049	Navrajpur - Devnagar - Inerwa (Garsaha tole) Road	8.00	0+000	8+000			8.00		8.00		8.00			Earthen
16VR050	M.Rajmarg - Ganeshpur - Sitapur - Barhari Bazar Road	14.00	0+000	14+000			14.00		14.00		14.00			Earthen
16VR051	Bathnaha - Jagatpur Phulbaria - Kushandi Road	3.00	0+000	3+000		3.00		3.00			3.00			Gravel
16VR051	Bathnaha - Jagatpur Phulbaria - Kushandi Road	12.00	3+000	15+000			12.00		12.00		12.00			Earthen
16VR052	Bhagwatipur - Tamasuiya Road	2.45	0+000	2+450		2.45		2.45			2.45			Gravel
16VR053	Khairbona chowk - Inarwa Road	1.50	0+000	1+500		1.50		1.50			1.50			Gravel
16VR054	Lahan -9 - Pakdhiyagha - Govindpur Road	2.25	0+000	2+250		2.25		2.25			2.25			Gravel
16VR054	Lahan -9 - Pakdhiyagha - Govindpur Road	2.00	2+250	4+250		2.00		2.00			2.00			Gravel
16VR054	Lahan -9 - Pakdhiyagha - Govindpur Road	8.00	4+250	12+250			8.00		8.00		8.00			Earthen
16VR055	Lahan - Taregana - Mahadevthan Road	9.00	0+000	9+000		9.00		9.00			9.00			Gravel
16VR055	Lahan - Taregana - Mahadevthan Road	4.00	0+000	4+000			4.00		4.00		4.00			Earthen
16VR056	Bus Terminal Mahendra.Rajmarg - Hospital chowk (Lahan) Road	4.00	0+000	4+000			4.00		4.00		4.00			Earthen

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	Remarks
16VR057	Khairibona-Harharwa Road	5.00	0+000	5+000			5.00		5.00		5.00			Earthen
Total		834.2			0.00	243.2	591.0	243.2	591.0	22.	812.2	0.00	0.00	

ANNEX 5 DATA COLLECTION AND GIS PROCESSING

A. DATA COLLECTION PROCESS

As mentioned in DTMP Guidelines 2012, the data collection procedure has been conducted. Some of the general data such as district area, population, hydrological and metrological data, SRN status have been collected from secondary sources like Central Bureau of Statistics Nepal, Profile of Nepal 2013 and DoR Publications. For Primary data collection, i.e. Existing Road Inventory; GPS (model C60s and C62s) and Motorcycle has been used. Further for DRCN (new roads), Topographic maps (1:25000) in hard copy and soft copy with aid of Google Earth has been used.

B. GIS PROCESSING FOR MAP PREPARATION

The map preparation process is governed by the field work and field work is ruled by the proper adjustment in GPS. For setting the GPS, we have followed the following steps

1. Set the GPS for units and time
2. For position, select USER UTM Grid defined from the list for grid and define the properties as below:

Latitude of origin	E87
Scale factor	0.9999
False easting	500000 Meter
False northing	0 Meter
Select Datum	WGS84

After collection of the data in waypoint and track format, it is imported to computer by DNR Garmin Software and exported in KML and GPX format. The KML or GPX data is added to ARC GIS 9.3 and exported to Shape file. Added Shape file of Track is edited and append in **Road_Inventory.shp** whose property is given below,

Projected Coordinate System:	UTM-87
Projection:	Transverse_Mercator
False_Easting:	500000.000000000
False_Northing:	0.00000000
Central_Meridian:	87.00000000
Scale_Factor:	0.99990000
Latitude_Of-Origin:	0.00000000
Linear Unit:	Meter
Geographic Coordinate System:	GCS_Everest_1830
Datum:	D_Everest_Adj_1937
Prime Meridian:	Greenwich
Angular Unit:	Degree

Now, for transferring the **Road_Inventory.shp** does not require to transform in Google Earth format, it will directly overlay above the Google Earth with some minimum error. But for remaining general shape file, they should be transformed from Topo to Google Earth