



Local Government

Laljhadi Rural Municipality

Office of the Rural Municipal Executive

Shankarpur, Kanchanpur

Sudurpaschim Province, Nepal

Rural Municipality Transport Master Plan (RMTMP)



Main Report-Final, Vol-I

Submitted By:

Mappers Nepal Pvt. Ltd.

ACKNOWLEDGEMENT

The Consultant team would like to express our deep sense of gratitude to Rural Municipality President Nirmal Rana, Former RM president Madhan Sen Badayak, Deputy President Sapana Chaudhari Rana, Chief Administrative Officer Mahendra Singh Rawal, Account Officer Bashant Dhanuk and Engineer Ram Prasad Awasthi of Laljhadi Rural Municipality Office for providing us the opportunity for the “**Preparation of Rural Municipal Transport Master Plan for Laljhadi Rural Municipality**”.

We would also like to present our gratitude to all the staff members of the rural municipality, all the members of the *ward committee*, the representatives from different political parties and volunteers for their support and contribution for making the working environment easy and pleasant.

We would like to thank all the citizens for their patience and friendly environment who were directly and indirectly involved in the data collection process. We are greatly thankful to everyone who helped in facilitating us for data collection. We thank the volunteers who helped for traffic vehicle count on the major road linkages.

The study team

EXECUTIVE SUMMARY

Transport facilities help in developing access with the rural-urban linkages. Road accessibility can reduce isolation, stimulate crop production and marketing activities, encourage public services and help to transfer technology. Road building has been seen to bring about notable enthusiasm and visible changes in rural life. Road infrastructure is considered as “the infrastructure for infrastructure”. However, in the absence of notable criteria and rational guidelines, road construction is carried out in adverse manner resulting in haphazard use and wastage of limited resources. Rural Municipal Transport Master Plan is prepared for assessing and planning the present road and transport infrastructures and facilities within the RM and the surrounding municipality. Laljhadi Rural Municipality is located in Kanchanpur District, a Terai district of Sudurpaschim Province, covering an area of 154.65 square kilometers with 6 numbers of wards and population of 22,569 according to CBS 2011.

This study also formulated the road hierarchy for the various roads namely Class A, B, C and D. Class C and basically deal with access while Class A and B basically deal with mobility and accessibility to higher services. The total lengths of Class A, B, C and D roads are 58.89Km, 24.16Km, 58.62Km and 30.82Km respectively. Class A, B, C and D roads are proposed with appropriate cycle track, footpath, and green belt the cost of which is calculated as equivalent to the cost of gravelling.

Due to the limitation of the municipality budget, the roads are required to be ranked based on the provision of ToR. For the short-term implementation of RMTMP, it is assumed that roads are constructed upto gravel. And the budget capacity of municipality increases by 7.5% each year. Based on these assumptions, five-year implementation plan is prepared. This shows the budget required for the first five year as 578.5 million rupees. There is gap between the estimated budget and the present RM budget. For example, in the case of first year plan, the estimated budget is 99.6 million whereas the projected budget of RM for this year is 81.7 million rupees. This gap in budget should be fulfilled by outer sources.

Non-motorized travel mode and green belt are given consideration while designing different class of roads. Median strip is used to separate opposing traffic flow and hence provide safety. Also, separate footpath and cycle track is provided to facilitate the active user. Preparation of RMTMP is the first effort for the planned development of the municipal area. This is an opportunity for implementing a sustainable transport system in the RM. The study being its first should be periodically reviewed and revised along with integration with other plans. This will ensure efficient use of available resources and proper development of the municipality. For effective RMTMP, it needs to be compatible with comprehensive town planning and land use policy.

ACRONYMS/ABBREVIATIONS

DDC	District Development Committee
DOLI	Department of Local Infrastructure
DTMP	District Transport Master Plan
GIS	Geographic Information System
GPS	Global Positioning System
Ha	Hectare
HH	Household
IDPM	Indicative Development Potential Map
Km.	Kilometre
MIM	Municipality Road Inventory Map
Min.	Minute
MRCC	Municipality Road Coordination Committee
MTPP	Municipality Transport Perspective Plan
MTPP	Municipality Transport Perspective Plan
NMT	Non- Motorized Transport
OD	Origin and Destination
PCU	Passenger Car Unit
PT	Public Transport
RMTMP	Municipality Transport Master Plan
Sq. km	Square Kilometre
ToR	Terms of Reference
VDC	Village Development Committee
VDCs	Village Development Committees

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CHAPTER 1: INTRODUCTION

This chapter briefly explains the background and study of the study area along with the scopes and objectives associated with the preparation of Municipal Transport Master Plan of Laljhadi Rural Municipality, Shankarpur, Kanchanpur.

1.1 Background

The Constitution of Nepal has envisioned Federal Democratic Republicanism as the essence of its governance system. Rights of the local government have been enlisted on Annex -8 of the constitution. Local Government Operation Act 2074 elaborates and specifies those rights to be exercised by the local government. Article 11, Sub-Articles 2(G) and (K) specify the rights of the local government to devise and implement policies and plans regarding roads, transportation and other relevant development projects directly concerned with the local level.

As a local government, Laljhadi Rural Municipality had allocated fund, endorsed by the village Assembly, for the preparation of Rural Municipal Transport Master Plan. Therefore, this report is the product of an extensive field study and study of relevant documents, interactions with the villagers, people representatives and stakeholders in the Rural Municipality and ward levels for the preparation of Rural Municipal Transport Master Plan (RMTMP).

Physical infrastructure development has been extremely sluggish esp. in rural level in Nepal since long due to extended political turmoil and transition. Development of transportation infrastructure is one of the most essential groundworks for opening other avenues of development. Proper development of transportation system opens accessibility of the people to larger markets, service centers and overall economic sectors. Development of roads also leads to the development of urban centers with amenities like hospitals, schools, markets, services etc. Roads establish significant linkages with the large neighboring cities with vibrancy of economy, human activities and transactions. This sort of linkage is a key for the development of rural areas. Therefore, development of transportation basically through the development of road linkages is a fundamental necessity of this Rural Municipality. It has prioritized the development of sustainable Rural Municipal Transport Master Plan which is expected to address the need of opening an easy access to people's mobility in particular and inception of avenues of all kinds of development in general.

Chiefly this RMTMP aims to assess the present status of roads and transportation within the Rural Municipality through extensive field survey and inventorying the details of existing roads and transport situation. The study has also unfolded the problems and genuine necessities on road and transportation along with the recommendation of key interventions to be made for the sustainable

development of road and transportation network. Planning approach adopted by the consultant is fundamentally bottom up and participatory. Study and analysis of existing road status and need assessment have been the basis for this overall planning.

RMTMP is a long-term visionary plan which aims to systematize the road and transport development processes in the Rural Municipality. It identifies the roads and creates a complete inventory of the roads. It categorizes the roads into four classes A, B, C, and D according to their importance. It prioritizes the interventions and allocates the estimated budget for the necessary interventions. Above all, it systematizes the process of road and transportation development according to the need of the Rural Municipality. The consultant has followed all the prevailing norms and standards for the planning. It is based on the Approach Manual prepared by DOLIDAR and MTMP guidelines prepared by the then MoFALD. It has determined the Rural Municipal Road Core Network as practical in planning process of DTMP and has identified the key linkages with other road networks. A complete road network has been identified to make a basis for future development of roads which primarily helps to develop the transport access to all the settlements in the Rural Municipality meeting the national standard of nominal duration to reach the core road network or all-weather roads.

1.2 Objective

The prime objective of this study is to prepare the Rural Municipal Transport Master Plan (RMTMP). The planning approach is participatory and bottom-up from the settlement level. It includes a constructive plan to incorporate all present and tomorrow's transportation needs. The specific objectives of the RMTMP as indicated in ToR are as follows:

1. Prepare the Municipality Inventory Map (MIM) of all road networks.
2. Identify the major road networks linking the municipality with the surrounding areas.
3. Prepare Indicative Development Potential Map (IDPM).
4. Prepare visionary city development plan
5. Collection of demands for new/rehabilitation transport linkages from Municipalities/settlements based on city development plan.
6. Analyze the present mobility and accessibility situation.
7. Identify and prioritize the interventions based on mobility and accessibility situation.
8. Develop scoring criteria and its approval from Municipality.
9. Prepare the Perspective Plan of transport services and facilities (Municipal Transport Perspective Plan)

10. Prepare physical and financial implementation plan of prioritized roads for the RMTMP period.
11. Prepare a five years Rural Municipality Transport Master Plan (RMTMP).

1.3 Scope of the Work

The scope of the consulting service includes:

- Preliminary presentation of overall planning process in the Rural Municipality level
- Assist the formation of Rural Municipality Roads Coordination Committee (RMRCC)
- Field survey and data collection in ward levels
- Collection of demands
- O-D Survey
- GIS work for the finalization of all sorts of maps
- Preparation of Indicative Rural Municipality Development Potential Map
- Preparation of Rural Municipality Road Inventory Map
- Preparation of Base Map
- Study of all relevant secondary data and information including previous RMTMP (If any)
- Prepare field report
- Road classification coding and nomenclature
- Categorization of roads according to standard criteria
- Collect feedback and necessary corrections from the stakeholders Prepare the final report of RMTMP
- Recommend for the approval from the village Assembly for the implementation

1.4 Limitation

This transport master plan is limited within the territory of the Rural Municipality. Since the data collected for the planning were based on the information provided by the villagers in the ward levels, they may have supplied limited information. Although Enumerators have attempted their best to reach all the roads for the necessary data, there are chances of missing the data to some extent. Misnaming of the road may occur due to the pronunciation error or hearing problem by the respondent as well as enumerators. Chances of error may occur during

data entry and tabulation. The scale used to work on GIS is also likely to generate some errors. Though such limitation and errors are obvious, attempts have been made to minimize such errors taking precautions in the error prone areas.

1.5 Approach and Methodology

Municipal Transport Master Plan has been prepared using participatory bottom-up approach and differs from conventional practices of trickle-down approach. Techno-Political interface has been incorporated in the planning process, where active participation from representatives of political parties, line agencies, RM officials is crucial. The Municipal Road Coordination Committee (MRCC) has been constituted as authorized legislative body of municipality. This body, comprising all political parties' representatives and concerned technical officials, helps in necessary policy decisions during the RMTMP preparation and implementation process.

The study started with preliminary planning or desk study where basic background of RM is studied with help of secondary data including census data, GIS data. The study got acceleration with formation of MRCC and inception report. Various field surveys were carried out with objective of collecting primary data on transportation network, trip characteristics and service facilities. Along with the primary data, demands for various transportation projects (construction/upgrading/maintenance) were obtained from each ward. Also, potential areas/locations for various facilities were also identified based on interaction with local people and MRCC. The scoring criteria for prioritizing road network was identified based on ToR and will be approved by RM. Then, the hierarchy of roads will be proposed and perspective plan of various interventions will be proposed and analysed based on available fund and finally physical and financial implementation plan of prioritized roads for RMTMP period. After analysis, the study will come up with potential roads, that need immediate intervention and roads that need to be given consideration for effective future planning.

All the above-mentioned strategy adopted for data collection, processing and analysis is summarized in the following figure in next page.

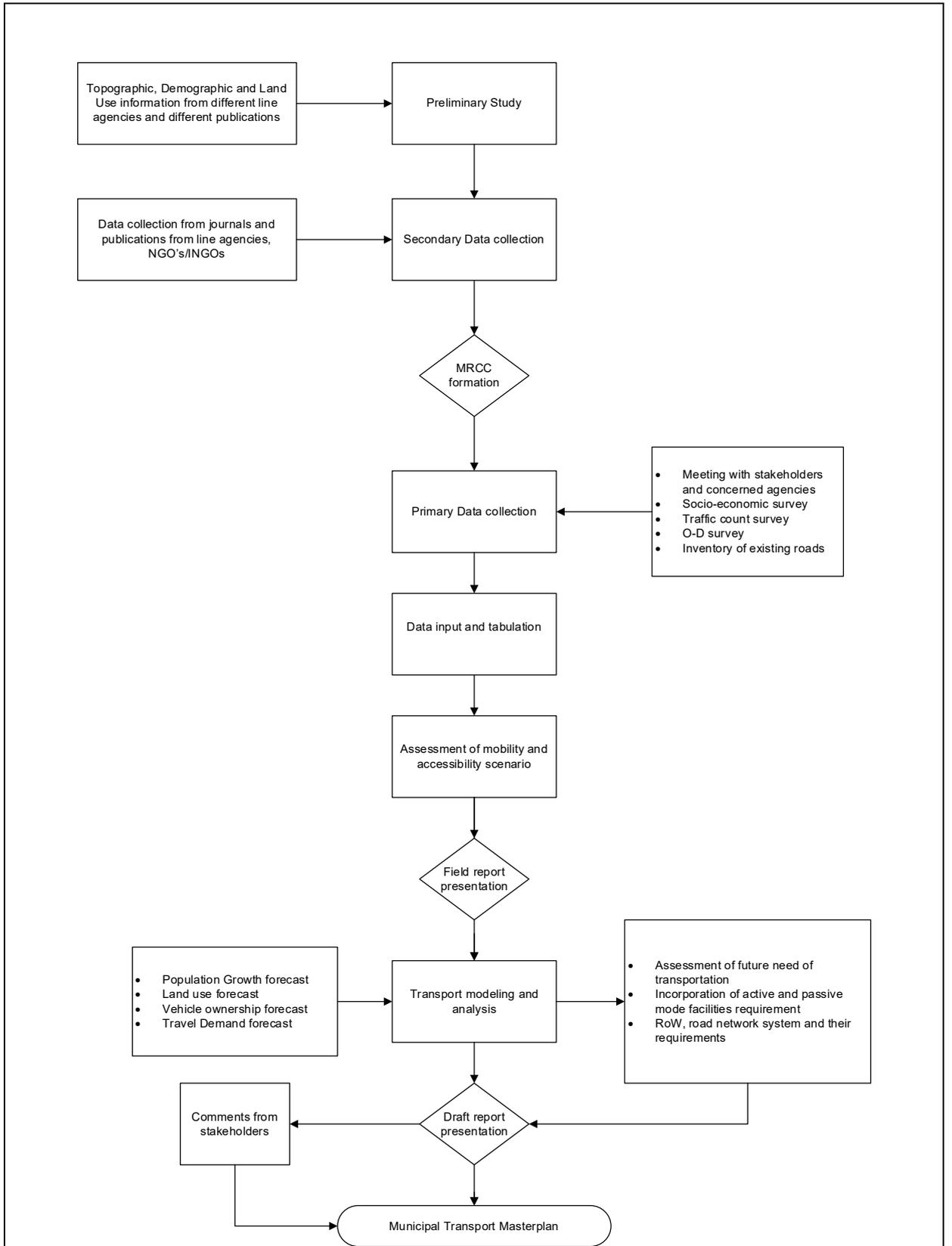


Figure 1: Methodological Framework for MTMP

1.5.1 Secondary Data Collection

Any sorts of data that were collected from secondary sources are called secondary data. These data were collected from annual report published by district level offices and consultation with various concerned stakeholders. Municipal Road Coordination Committee (MRCC), which comprises people from various fields and political parties, is the next source for various secondary data. Field study was also carried out for general socio-economic assessment of the RM that includes collection of data regarding high development potential areas such as extensive agriculture, horticulture, livestock farming, high value cash crops, cottage and agro-based industries, centre for business/commerce/markets places, tourism area, service centers (hospital, health post, agriculture service sub-centre etc.). The information about demographic data of RM, various maps showing service centers, transport infrastructure inventory, past plans and sector study reports, sector standards and policy targets were collected from the secondary sources, which includes Bureau of Statistics, Survey Department, Local NGOs, line agencies, DDC, municipality etc. Digitized topographic maps, administrative map of municipality, strategic road network map prepared by DoR, etc. were some other secondary data that were used during the study.

1.5.2 Primary Data Collection

Primary information on present household and trip characteristics, traffic characteristics, existing accessibility and mobility level of settlements, prioritized road network required for each ward are obtained via various reliable methods. Tracking of the existing road network along with detail information of its width, surface type and possible intervention required for the effectiveness of services is also carried out.

The primary data collection methods carried out in the field was:

- Origin and Destination (OD) Survey
- Road Inventory Survey
- Demand Survey
- Public Transport and Services Study

Household questionnaire method is used to conduct the OD surveys which gave various information on questionnaire reflecting personal, household and trip making characteristics. This survey will also help to visualize the accessibility and mobility scenario of road network and to public transportation from the settlement/wards. As all the household can't be covered a realistic and statistically significant sample size was calculated based on probabilistic method.

Road inventory survey was conducted to collect data on its condition of road, road linkage, road safety status and issues that need to be highlight. It helps in field validation of base maps and also assists in preparation of road inventory map, nomenclature and coding of the road linkages and to propose various interventions.

Road Demand survey comprised of interaction session with the members of *wada nagarik manch* followed by asking them to fill up demand survey form, which includes demand of new facility or interventions to improve existing roads based on priority.

Classified vehicle count will be conducted so as to reflect the usage of various vehicles in the certain route, especially where maximum volume occurs. Twelve-hour count has been planned at required location and the vehicles have to be classified to different types and finally traffic volume have to be converted to passenger car unit (PCU) to visualize the exact condition. This is not yet conducted due to less volume of traffic on the roads due to blockade in the fuels in market which don't gives the real condition of traffic.

Public Transport and Services Study highlights the services provided by public transportation and location of various services and facilities. It was carried out by directly interviewing the route operators.

1.5.3 Data Processing, Analysis and Presentation of Reports

Data collected at field were first entered at MS office tools (MS excel and Word) and GIS database. All the complete and reliable sets of data were transformed into useable information and the present scenario of municipality are shown through graphs, figures and tables. Similarly, those which were entered into GIS database provide various types of maps. Population and traffic were forecasted for the RMTMP and RMTTP time period. Various transportation models were used for interpretation and forecasting. And, finally various interventions were proposed and their economic analysis were also performed.

1.5.4 Preparation of Visionary City Development Plan

A creative description of Laljhadi's future, the vision guides our decisions, helps us set direction and encourages us to align our priorities as we work to make Laljhadi the city we want it to become in the year 2092/93 is the visionary city development plan. This will be finalised by the RM. Based on this vision, the urban transportation planning is to be done.

1.5.5 Preparation of Indicative Development Potential Map (IDPM)

IDPM is basically the indication of the existing and potential market/service centres (key growth centers) and the areas having various development potentials such as high value cash crops, agro-based industries and tourism. Thus, IDPM shows the areas of high value cash crops, tourism potential, extensive agriculture, extensive horticulture, livestock farming, fisheries, hydropower location and the other social service centers areas such as hospital, post office, telecommunication, school, campus, ward centers, security offices and large settlements, important historic and religious places. Finally, it indicates the grading of various markets of the district thus providing the basis of network planning.

1.5.6 Scoring Criteria

A network consists of several links. It is not possible to construct and maintain all roads at a time due to resource and time constraint. Therefore, each link in a network needs to be prioritized. After developing a municipal level network, the cost estimate of the road is prepared. Existing population within the zone of influence, present road demand, future potential route, accessibility situation, land use pattern, environmental and social safeguard, proximity to the market/service centers, religious and tourism places were taken as the indicators for prioritization. The scoring criteria will be finalized after rigorous study and approval from RM and RMRCC.

Table 1: Scoring Criteria for prioritization of municipal roads

S.N	Scoring Criteria	Scoring Unit	Score
1	Link providing service to large settlement areas/population	Population served/km	30
2	Link providing service to existing <ul style="list-style-type: none"> · Market center · Tourist attraction areas · Other obligatory centres as decided by the Rural Municipality 	No of areas	20
3	Link providing service to the existing service centres such as health centres, education centres (schools/campuses), offices (Rural Municipality office/Government office, etc.),	Number of different service sector	20

4	Priority of ward	Ranking of priority from 1 to 5	20
5	Link providing service to the areas recognised by the Rural Municipality as areas for special consideration, such as areas inhabited by backward and poor ethnic groups/communities, isolated remote areas, historic sites, religious sites etc	Connection to the settlement of such criteria	10
Sub Total			100

1.5.7 Presentation of Results

The results obtained can only be perceived well by the readers if presented properly. Presentation tools such as charts, graphs, maps and reports have been used to present the analysis and results obtained. The specific presentations of results are summarized below:

- Reports: The analyzed results have been properly explained in the reports. Report of the analysis has been presented at different levels as inception report, field report, draft report and final report. Any questions raised or clarifications demanded after the submission of draft report have been included in the final report.
- Charts and graphs: Relevant type of charts, tables and graphs have been used in the reports to present the information. Charts are especially useful to deliver the information more effectively.
- Maps: As the ToR demands, maps of road inventory, indicative development potential map, land use map and municipality transport prospective plan map has been prepared.
- In addition to the reports, the obtained results have been shared via presentation and electronic copy of GIS maps.

The analyzed data and obtained results in the form of numbers/ tables and maps have been collected in and presented as final report in two volumes. The results have been presented and discussed among the RM authorities and other stakeholders before preparing the final report.

1.6 Organization of Report

Section 1 presents the concept and context of RMTMP and lists out the objectives and scope of the same.

Section 2 briefly explains the method used to conduct the study, analyze the data and presentation of the findings.

Section 3 presents the basic profile of the study area through the available census data and sample data collected and the existing scenario of the study municipality with reference to transport in the municipality.

Section 4 gives the comprehensive forecast of the population, transport and other development scenario. It also gives the picture of the implications that may arise and the transport infrastructure to meet the demand and accelerate the development. It also describes the short term, medium term and long-term plan. It also describes the formulation of road hierarchy and name and description of different classes of roads

Section 5 is dedicated to the five year (short term) rural municipality transport master plan (RMTMP). It gives the comprehensive strategic framework, perspective plan of the municipal roads, budget expenditure, financial institution, capital investment plan and the staging implementation plan.

Section 6 summarizes the report and gives necessary recommendations.

CHAPTER 2: REVIEW OF EXISTING INFRASTRUCTURE STATUS

2.1 General Overview

Municipal and ward level surveys have revealed that the overall transport infrastructure, primarily road network appears to be in weak as well as vulnerable state in Laljhadi Rural Municipality. Despite being located in plain and geographically accessible region, this RM lags far behind in terms of road infrastructures. The major characteristics of the roads in this RM is manifested by muddy ones during the rainy/wet seasons and entirely dusty during the winter/dry seasons. The RM is bordered by **East-West highway** in the north. **Kaluwapur-Shreepur-Belauri road** (feeder) passes through the western side of the RM. At present, **Bani-Dekhatbhuli-Shankarpur** road is the only DRCN road in this Rural Municipality. Most of the roads in this Rural Municipality have been observed as fair-weather roads and need to be improved and upgraded in order to bring into operation round the year.

Most of the roads do not have basic road furniture and lack basic components like culverts, bridges, cross structures, drains and the like. This very fact indicates that the overall development of road transportation is at the elementary stage in this RM that requires interventions from the basic level and incurs a huge investment.

2.2 Existing Transportation Infrastructure Situation

Laljhadi Rural Municipality is one of the Rural Municipalities of Kanchanpur District of Sudurpaschim province. Laljhadi Rural Municipality was established by merging then existing three Village Development Committees (VDCs) i.e. Baise Bichhawa, Shankarpur and Dekhatbhuli. This RM is touched by East-West highway with high potential of future development.

Geographically this RM is extended in 154.65 sq. km area where forest alone covers upto 58% of its entire area followed by some 37% areas as agricultural area. Remaining 3% area is covered by rivers and about 2% area are covered by residential/settlements. (Source: Land use map)

The field survey indicates that a total of 159.99 km road serves the entire population of this Rural Municipality in which the share of **gravel road stands to be 67% followed by 30% earthen roads while the blacktopped or bituminous road constitutes only upto 3%** in the totality. The condition of gravel road is not satisfactory at all. They have been affected by water and overloaded vehicular movement via tractors, heavy trucks etc. The wooden wheels of bull

carts also contribute significantly in eroding/worsening of gravel as well as earthen roads. In fact, the gravels are rarely seen in most of the gravel roads which makes the operations clumsy and difficult during the monsoon/rainy season. Regarding earthen roads, they come under operations only during the fair weather and almost impossible to pass through due to deep muddy reels, and excessive slippery.

The blacktopped road passes only through 2 wards viz. 5 and 6 among which only extends through a length of 5.23 km as of now. The earthen roads pass through all of the wards of this RM but the major portion of this type is shared between wards 1, 2 and 4. Ward No. 1 holds the longest portion of earthen road which is 13.67 km long and together with ward 2 and 4 covers almost 80% of the total earthen road portion of Laljhadi Rural Municipality. Likewise, the gravel road passes through each of the ward from this Rural Municipality. However, wards 3, and 4 together hold more than half the length of the entire gravel roads. In terms of gravel road, ward no. 3 holds the longest stretch while ward no. 6 shares the shortest stretch of 5.91 km and the remaining wards share in between.

For the purpose of RMTMP, the entire roads of Laljhadi Rural Municipality have been classified into four categories viz. Class 'A', Class 'B', Class 'C' and Class 'D'. In total 58.89 km of the road stretch falls under Class "A" as per the field survey while Class "B" holds 24.16 km; Class "C" 58.62 km and Class "D" 30.82 km of the total road length.

Class "A" Road: Class "A" roads pass through all of the wards of Laljhadi Rural Municipality. Ward no. 3 holds the longest stretch of Class "A" road i.e. 16.72 km followed by 12.65 km (ward no.2) and 12 km (ward no. 1) respectively. Likewise, ward no. 6 holds the shortest stretch of Class "A" road which is calculated as 2.05km.

Class "B" Road: Class "B" roads pass through all of the wards of Laljhadi Rural Municipality. Ward no. 4 holds the longest stretch of Class "B" road i.e. 9.51 km followed by 4.54 km (ward no.5) and 3.95 km (ward no. 2) respectively. Ward no. 6 and ward no 3 hold the shortest stretch of Class "B" road which is computed as 1.51 km.

Class "C" Road: Class "C" roads pass through all of the wards of Laljhadi Rural Municipality. Ward no. 4 holds the longest stretch of Class "C" road that is calculated as 15.61 km followed by 12.76 km (ward no.1) and 11.86 km (ward no. 3) respectively. Ward no. 5 shares the shortest stretch of Class "C" road which is calculated as 2.67 km.

Class "D" Road: Class "D" roads pass through all of the wards of Laljhadi Rural Municipality. Ward no. 4 holds the longest stretch of Class "D" road that is calculated as 8.72 km followed by 6.0 km (ward no.1) and 4.64 km (ward no.3) respectively. Ward no. 5 shares the shortest stretch of Class "D" road which is calculated as 2.67 km.

Table 2: General Summary according to road type (in km)

Road Types	Km
Metalled	5.23
Gravelled	115.56
Earthen	51.7
Grand Total	172.49

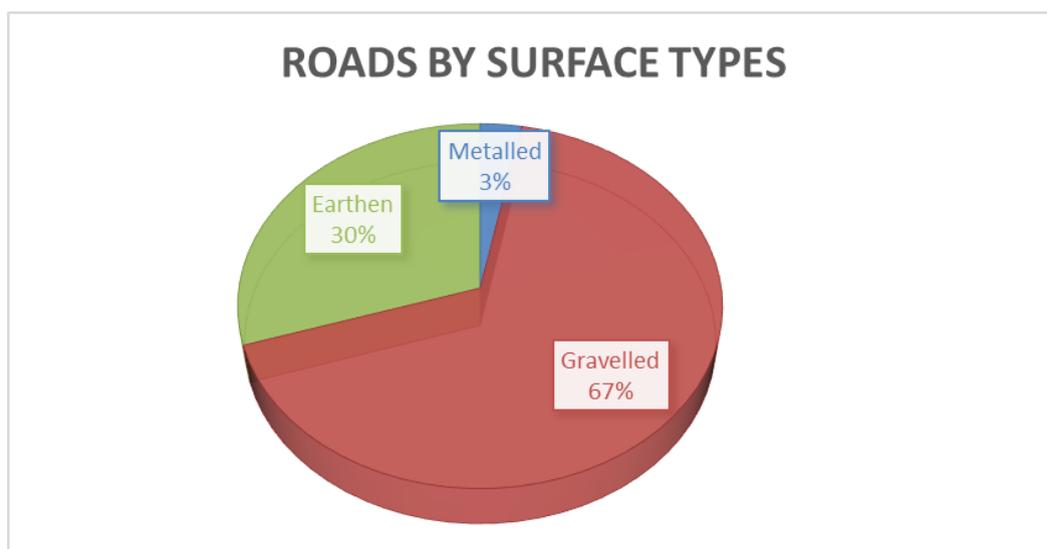


Table 3: Summary according to road Category (in km)

Road Classes	Road length in Wards (km)						Total (km)
	1	2	3	4	5	6	
Class A	12	12.65	16.72	8.65	6.82	2.05	58.89
Class B	3.14	3.95	1.51	9.51	4.54	1.51	24.16
Class C	12.76	11.06	11.86	15.61	2.67	4.66	58.62
Class D	6	4.49	4.64	8.72	2.67	4.3	30.82
Grand Total	33.9	27.66	30.09	33.77	14.03	8.22	172.49

Table 4: Ward wise road summary (in km)

Road Types	Road length in Wards (km)						Total (km)
	1	2	3	4	5	6	
Metalled					2.11	3.12	5.23
Gravelled	20.23	19.25	30.1	28.88	11.19	5.91	115.56
Earthen	13.67	13	4.73	13.64	3.43	3.23	51.7
Grand Total	33.9	32.25	34.83	42.52	16.73	12.26	172.49

2.3 Visionary City Development Plan

Physical Infrastructures are the backbone for development of any region and every Municipality and RM do their best to incorporate a well-planned strategy for enhancing their capacity to do so. Laljhadi Rural Municipality is no exception in this case. The annual plan and programs of fiscal year 2078/2079 envisions optimum utilization of natural as well as human capitals and foresee partnership amongst different stakeholders including the RM staff and bodies, local people, national and international non-government organizations, central and provincial government agencies to materialize its long-term vision of prosperous and beautiful Laljhadi. The major emphasis is basically on the development of agriculture, tourism and commerce sectors to attain its long-term vision as mentioned earlier. The RM cannot ignore its basic social services like health and education as well to achieve its long-term goal. However, development of road and transportation sector is the foremost condition to attain its long-term vision and goals. The long-term vision of the Rural Municipality in road sector is about providing accessibility to all of its people thereby encouraging inclusive and sustainable development.

2.4 Major Plans, Policies and Programs in terms of visionary city development

2.4.1 Transportation Sectors

Policies and programs set for the fiscal-year 2077/078 have taken the agenda of upgrading the existing roads that connect the RM center with all of its ward centers; connection of RM center with strategic roads like National highway or Feeder roads. Similarly, emphasis was laid on the upgrade of those roads that connect ward centers with the RM Center. This Rural Municipality is committed to join all the major settlements in its territory with reliable road network within 5 years' time and it intends to get developed into a smart rural municipality with quality infrastructures in the next 15 years. The RM has also made a strategy to negotiate with the transport entrepreneurs to run public transport services from RM centers to different wards and the RM center with major destinations like Belauri, Bani, and neighboring highways. The RM is also in the process to develop a mechanism of rapid responses in case of any hindrances on the main roads during rainy season so that those roads could be termed as "all weather" roads. Preparation of RMTMP is also one of the key steps taken by the RM to move ahead sustainably for the sake of road and transportation development. The key objectives taken by the long-term plans are:

- Upgrade all the major roads in the RM into safe and smooth all weather roads
- Increase an easy access of the RM in National Highway Network so that access to large cities will be ensured
- Install and maintain basic road furniture in the prioritized roads

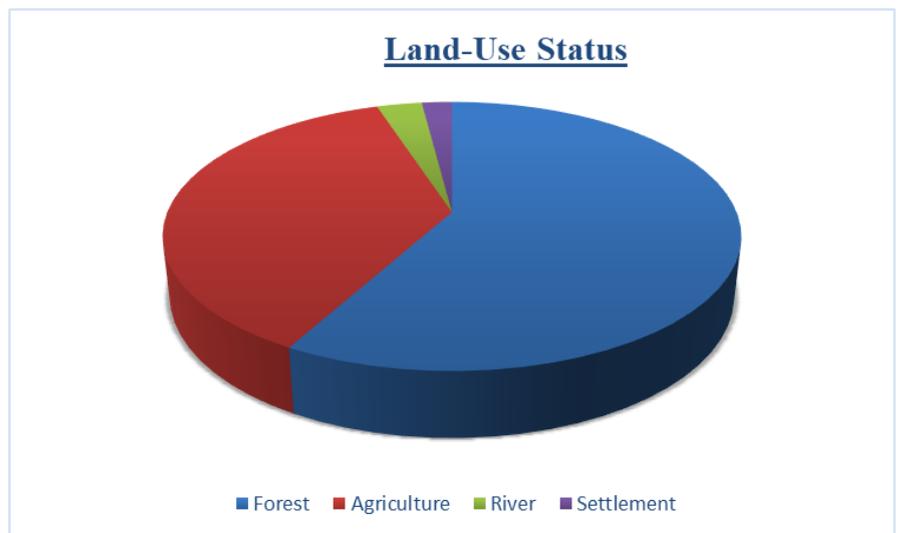
- Explore possibilities of mutual cooperation and partnership with private sectors in order to ensure safe, economic and reliable transport services and overall management of public transportation in an efficient manner
- Conduct feasibility studies to check the viability of other modes of alternative transportation like metro and mono rails, and air shuttle during emergencies
- Establish a mechanism that ensures routine maintenance to keep the road in regular operation.
- Make transportation system easy, safe and smooth from all aspects
- Opening of new tracks, construction of culverts and bridges etc. as per the need

2.4.2 Land Use Pattern

The Visionary City Development Plan requires study of existing settlement pattern along with possibility of its future expansion. As per the present land cover status arable land covers 37%, forest area covers 58%, settlement areas cover 2% and water bodies cover 3%.

Table 5: Existing Land Use Status

Land Use	% Cover
Forest	58
Agriculture	37
River	3
Settlement	2



Road Network With Types of Laljhadi Rural Municipality



Legend	
Ward Offices	Schools
Road Class	Hospitals
District Road	Agriculture Land
A	Forest
B	River
C	Settlement Area
D	Municipal Boundary

1:70,000

0 0.5 1 2 3 4 Kilometers

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree



Prepared By :
Mappers Nepal Pvt. Ltd
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Figure 2: Map showing existing Land-use of Laljhadi Rural Municipality

2.4.3 Market Centers/Village Centers

People visit the following village centers/market centers to purchase normal household commodities. They also travel up to Belauri, Dhangadhi or nearby Indian border markets for especial or huge purchase.

SN	Wards	Village Centers
1	1	Nauranga, Nabodaya, Binbari
2	2	Kanja Chauraha, Baijnath tole, Kasuwa
3	3	Nandagaun, Dunga, Mangal Chowk, Balmi, Chhoti Parsiya, Sikalpatti
4	4	Parsiya, Motarghat, Belchauraha, Dandajain, Kuliya
5	5	Annapurna tole, Bhamkapatti
6	6	Khargariya, Chandev

2.4.4 Prospective areas for future settlement

There seems to be recent changes in settlement areas probably due to issues related to floods. The areas around the major roads are being gradually crowded. Itaha baba mandir area of ward no 4 has been identified one of the major religious and touristic area of the RM. Similarly, Sukkhad park in ward 1, Shova lake in ward 3 are also identified potential tourist areas. Border area of ward 1 and 2 are identified as possible agro-based industry hubs. There are brick-factories (kiln) in Baijanath and Kasuwa tole. These areas may be developed as potential industrial area by further study. Chandev of ward 6, Ghamkapatti of ward 5, Sikalpatti of ward 4 and Nauranga tole of ward 1 are identified as potential commercial areas. The integration of sparsely scattered settlements into organized clusters not only help develop settlements in integrative manner but also facilitates efficient services. Other prospective areas in this pursuit include RM Centre, ward centers, both sides of proposed ring road, Bani-Dekhatbhuli-Shankarpur road corridor among others.

2.5 Constraints in the Implementation of RMTMP

Road network is believed to be the lifeline of infrastructure. The doors of other physical as well as social development possibilities are unlocked through the proper development of roads and transportation. Since the existing condition of roads in the RM is very poor, large portion of budget is required to address the problem of road upgrade and maintenance. This budgetary problem is surely a major obstacle for the timely implementation of the RMTMP. Besides these, other possible constraints are:

- Problem of connecting the sparse settlements with roads which is expensive
- Lack of natural drainage due to minimal land slopes
- Problem of waterlogging and flash floods
- Finalization of standard ROW from the base level is problematic
- Lack of technology
- Lengthy procurement process for hiring construction work
- Lack of qualified manpower and labor force
- Lack of smooth and reliable supply of construction materials
- Lack of stable and favorable working environment

CHAPTER 3: INDICATIVE DEVELOPMENT POTENTIAL MAP(IDPM)

3.1 Municipal Profile

Laljhadi Rural Municipality is extended into 154.65 sq. km area where Ward no. 4 holds the largest area i.e., 55.09 sq. km followed by ward no. 1 and 2 respectively with 53.64 sq. km and 23.68 sq. km respectively. Area wide ward no.5 is the smallest one holding only 2.87 sq. km area. Ward no. 6 is second smallest that occupies 7.66 sq. km in total.

Regarding avg. household size, ward 1 holds the biggest size with 7.39/HH followed by ward no. 2 - (6.96/HH), ward no.3-(6.68/HH) and ward no. 3-(6.23/HH) respectively. Ward no. 6 retains the lowest household size i.e. 4.59/HH.

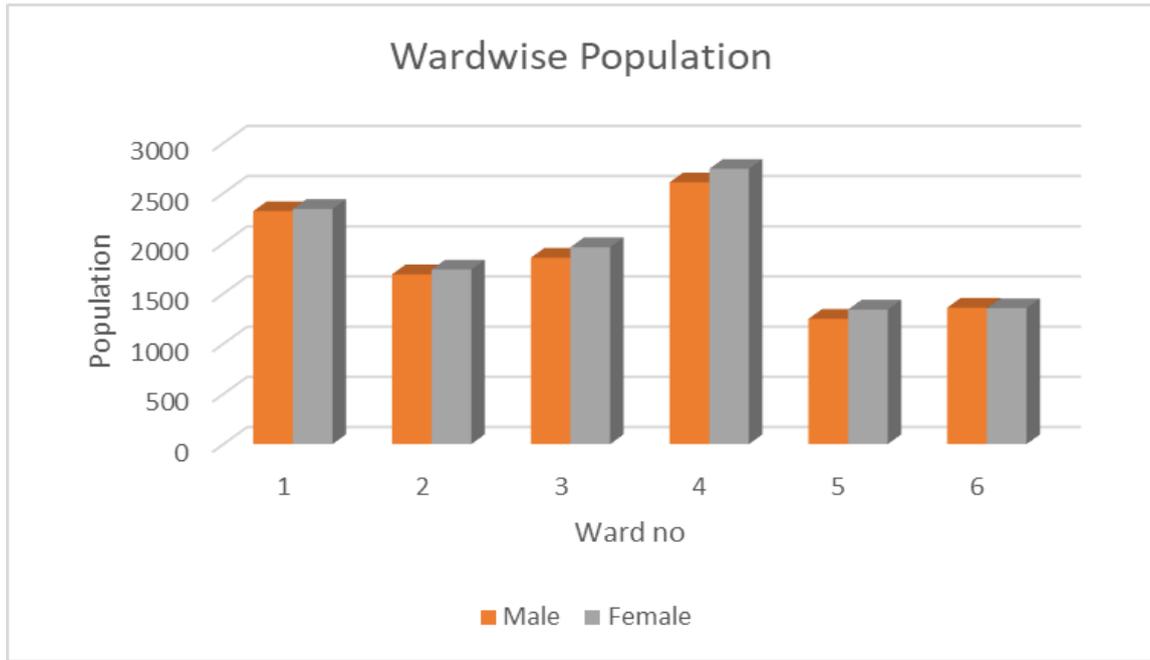
Likewise in terms of number of households, ward no. 4 retains the highest size with 859 HHs followed by ward no. 1 and ward no. 6 respectively with 631 and 592 HHs whereas ward no. 2 and ward no. 5 hold the lowest number of households i.e., only 493.

In terms of population, ward no. 4 retains the highest number of population (5350) followed by ward no. 1 (4664). Ward no. 5 is the least populated ward with meagre 2589 population. The total male population has been recorded as 11086 against 11483 of their female counterparts. Thus, the total male to female population ratio of this entire RM stands at 0.9654.

In terms of density of the populations, ward no. 5 has been identified as the most densely populated ward with 902 population in the area of 2.87 sq. km while ward 1 is the least densely populated one with 87 population in the area of 53.64 sq. km. The average population density of Laljhadi Rural Municipality stands at 146 population in its total area of 154.65 sq. km.

Table 6: Ward wise population, households (HH) and population density

Wards	Area	Male	Female	Total	HH	Avg. HH	Pop. Density
1	53.64	2321	2343	4664	631	7.39	87
2	23.68	1692	1740	3432	493	6.96	145
3	11.71	1857	1962	3819	572	6.68	326
4	55.09	2608	2742	5350	859	6.23	97
5	2.87	1248	1341	2589	493	5.25	902
6	7.66	1360	1355	2715	592	4.59	354
Total	154.65	11086	11483	22569	3640	6.20	146



Location Map of the Area

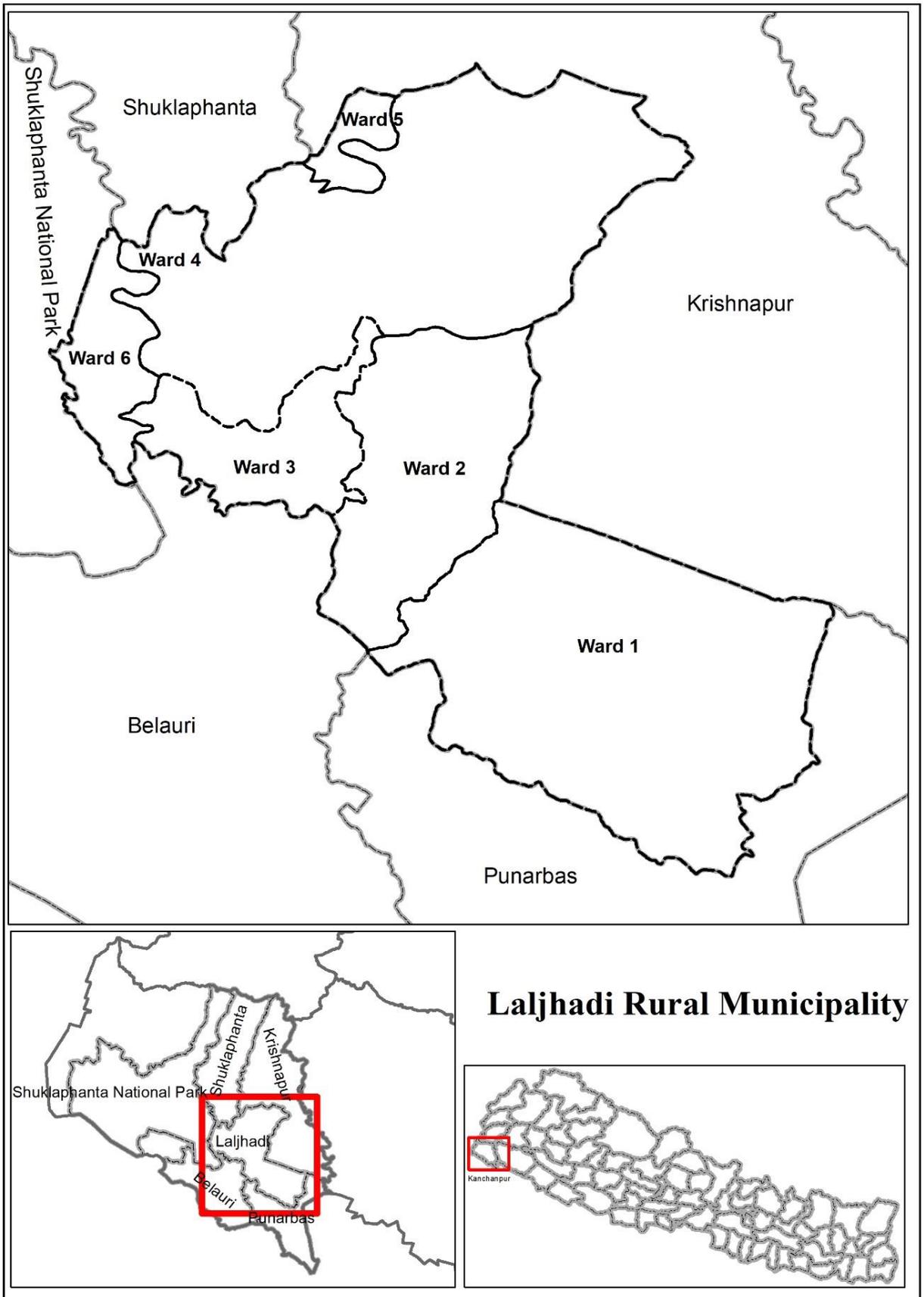


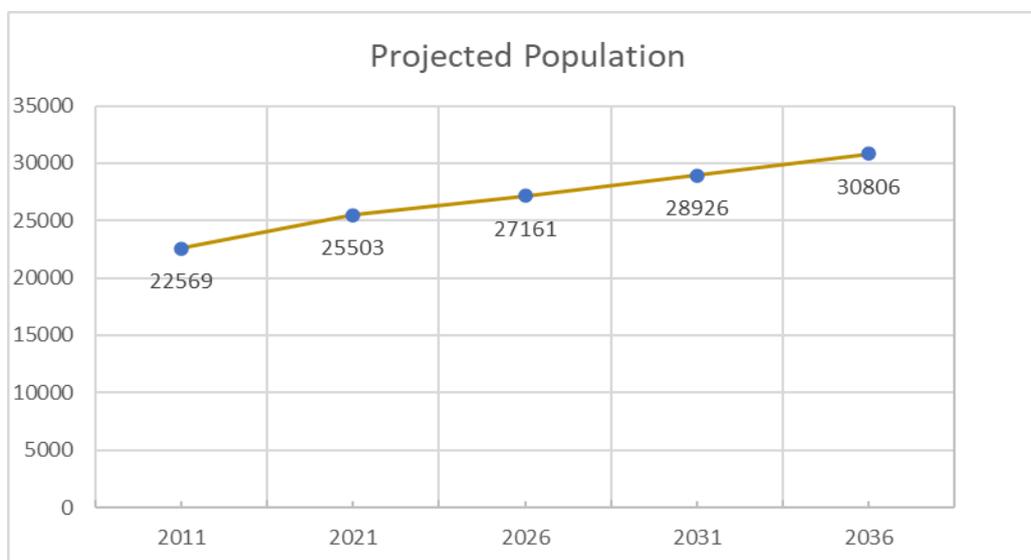
Figure 3: Location map of Laljhadi Rural Municipality

3.2 Demographic Status

The wretched state of physical infrastructure for e.g., weak road networks, unemployment, dearth of social and other basic services, slow economic activities, etc. result into the meagre growth of rate of population of Laljhadi Rural Municipality as compared to other parts of southern plain area of the country. However, lack of social awareness, reluctance towards family planning, preference to male child etc. contribute to the growth of population in this RM to some extent. This particular trend is not going to change in the near future contributing to the growth of population size of this RM. That is the reason for the slight growth rate of population of Laljhadi RM. The population growth rate of the RM is 1.13%. On the basis of population growth from 2001 to 2011 and then 2018, the population projection status for next 15 years has been shown in the projection table as below. From this projection, the size of population of this RM is expected to be 30806 in the year 2036 as shown in the tables below.

Table 7: Population projection of Laljhadi Rural Municipality

Year	2011	2021	2026	2031	2036
Projected Population	22569	25503	27161	28926	30806



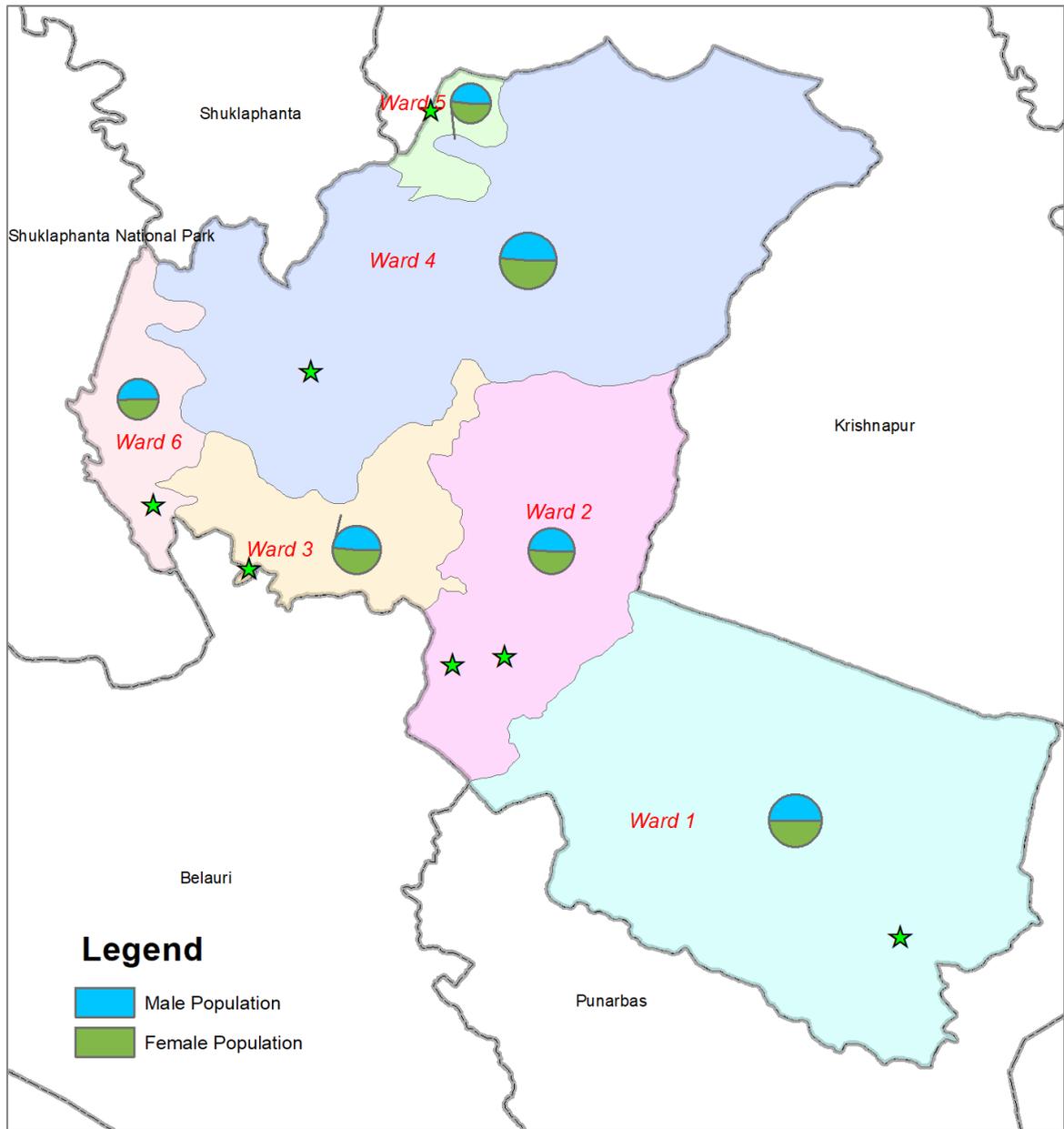


Figure 4: Ward wise Population Map

3.2.1 Age wise Distribution of Population

According to national census 2011, the economically most active populace i.e., within the age group of 15-59 years, the total percentage of the population is calculated as 56.64%. Similarly, lower sex ratios of male populace in the youth categories like age groups indicate that male youth populace migrating elsewhere for seasonal and permanent work opportunities. Secondly, the table below also shows that number of active populations has remained higher in this RM which indicates that the degree of mobility being higher in comparison to dependent or passive population. This age specific data keeps high significance in road and transportation planning like other planning.

Table 8: Age wise population constitution

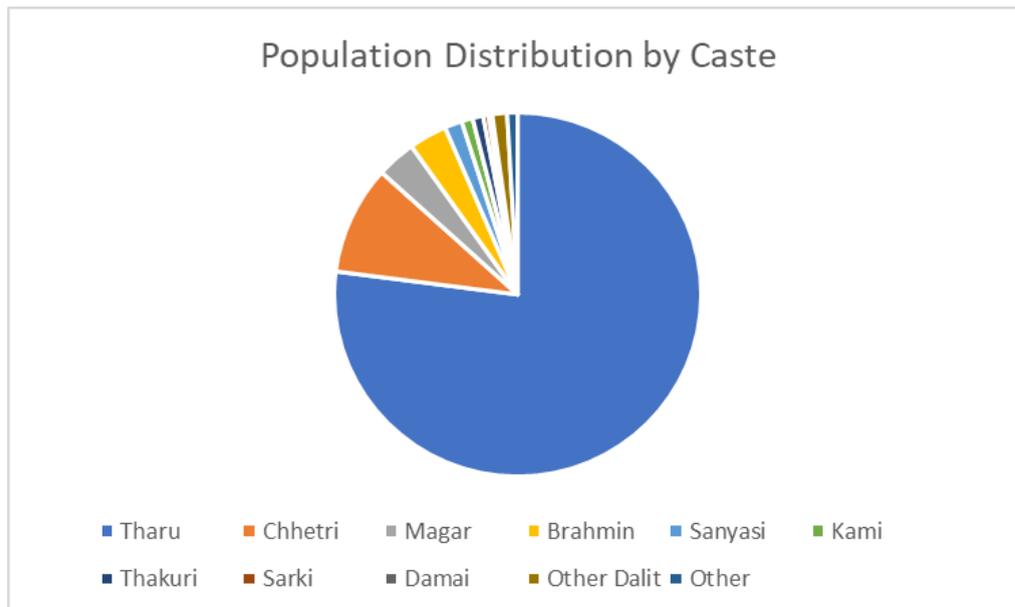
Wards	Age Group								
	0-14			15-59			60+		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1	853	825	1678	1326	1387	2713	142	131	273
2	601	602	1203	962	1014	1976	129	124	253
3	697	687	1384	1035	1139	2174	125	136	261
4	1034	1038	2072	1412	1544	2956	162	160	322
5	536	499	1035	635	770	1405	77	72	149
6	487	464	951	759	800	1559	114	91	205

3.2.2 Caste/Ethnicity

Out of the total population constitution of Laljhadi RM, Tharu dominates the others in terms of caste with a total of 17385 populace (77.03%) followed by Chhetri 2183 (9.67%) and Magar 781 (3.46%) respectively. The other dominant caste includes Brahmin (3.35%), Sanyasi (1.53%). The remaining caste have been calculated as less than 1% and mentioned in the table below. Ethnicity wide, in the total population constitution, the percentage of Aryan people is more than 90% whereas the population constitution of Mangolian people is less than 5%. Ethnic composition also affects the mobility of people. Past history shows that indigenous population have lesser mobility in comparison to other ethnic groups.

Table 9: Population constitution in terms of caste

Caste	Population	%
Tharu	17385	77.03
Chhetri	2183	9.67
Magar	781	3.46
Brahmin	757	3.35
Sanyasi	346	1.53
Kami	222	0.98
Thakuri	212	0.94
Sarki	106	0.47
Damai	74	0.33
Other Dalit	294	1.30
Other	209	0.93



3.2.3 Religious Composition

Out of the total population constitution Hindus dominates the others in this Rural Municipality by 92.53% followed by 6.34% Christian people. The Buddha and Islam religion are followed by very few populations, 0.05% and 0.01% respectively. Few Prakriti believers also reside in this RM which is calculated as 0.58% and remaining 0.11% have not mentioned their particular religion. (Source: Local Level Profile, Kanchanpur, 2074)

3.3 Traffic Volume Study

Generally, traffic volume study is done to establish a relative importance of any road. This will help to decide the priority of improvement and expansion of road and to allocate fund accordingly. This will also guide to make analysis of traffic pattern. Inventory of road traffic physical features was done with the use of GPS. Also, manual vehicle counting method was carried out as a part of traffic volume survey. By this method traffic volume as well as vehicle classification was held properly.

Walking constitutes an important mode of transport in rural areas. Besides walking, most of the people use cycle as another best options mainly due to less availability and costly public vehicle but bicycles have not been taken into consideration for counting.

3.3.1 Traffic Vehicle Count

The traffic vehicle count was done at the two stations: one in district roads passing through ward 5 and another road stretching S-N through ward 6. In all of these three vehicles counting points,

motorcycles dominate the other vehicles followed by tractor. The volume of traffic through these roads is very low. The volume of traffic in other roads are almost negligible. The reason behind this can be majorly attributed to the unavailability of motorable crossing structures over the rivers.

3.3.2 Vehicle Types

The main Vehicle types are motorbikes, bus, jeep (Bolero/TATA), trucks/mini trucks and tractors for passenger and goods transportation. The main transportation routes from the observation are District Road through Baijnath tole and Roads through Chandev chowk. Along with these, the possible major transportation routes, if crossing structures provided over the rivers, are as following:

Table 10: Main Transportation Routes

Patkariya, Punarbas 10 to end of ward number 1
Siddhababa Marga
Health post to Sarada Ma Vi Nauranga Tole
Ward office north to gau link road at nauranga
Playground to south connecting road at Nauranga
Khelmaidan Road Nauranga
Sarada Ma Vi side road Nauranga
Hariyali Marga
Inner Road to connect Hariyali marga
Road to Ban Nala
Shambhu Marga
Nabodaya School to Bhuiya
Ban Nala Marga

3.4 Origin and Destination Survey

The main purpose of transportation is to connect farm land, market centers and other service centers. Among the respondents of Origin and Destination Survey, almost 27 % were found to have used road for agricultural purpose followed by the school/college going students (22%). Similarly, 17% reported to have used roads to acquire health related services. Likewise, (15%) reported that they regularly travel to go to office or to seek other livelihood opportunities and remaining 19% happened to use road for marketing, business and other recreational purposes.

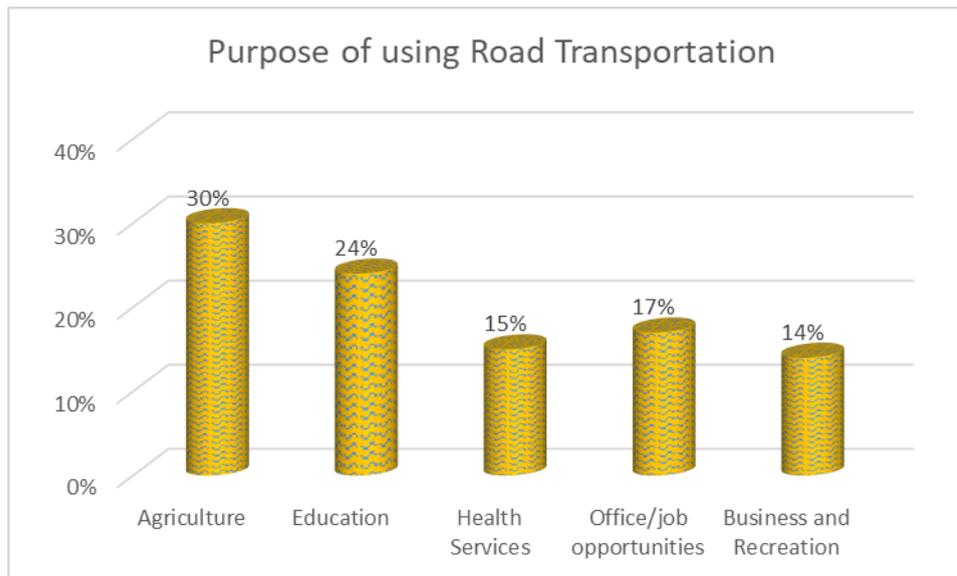


Figure 5: Purpose of using road transportations

3.5 Mode Choice

People choose the mode of transportation as per their convenience and their requirement. Different factors affect the mode choice. Being one of Rural Municipalities of Terai region, this RM has been somehow affected by rapid urbanization resulting into relatively high number of traffic mostly private vehicles. In most of cases, people preferred walking for reaching market center and within wards. Use of modes of public transport like bus is used for travelling purpose. Motorbikes are the dominant form of transportation. Comparatively maximum number of trucks were found to be used for the purpose of transportation of goods, agricultural products etc. to and from the production area and market center.

People choose the mode of transportation as per their convenience and their requirement. Different factors affect the mode choice. Some of them are:

- Household characteristics
- Zone characteristics
- Residential density, rate of urbanization
- Accessibility
- Vehicle ownership
- Quality of local public transit
- Purpose of travel, nature of work
- Travel time, cost and distance

3.6 Active and Passive Transport User

Active transport (also called Non-motorized transport, NMT and human powered transport) refers to walking, cycling, and variants such as wheelchair, scooter and handcart use. It includes both utilitarian and recreational travel activity, plus stationary uses of pedestrian environments such as standing on sidewalks and sitting at bus stops. The sample household survey shows that nearly 90% of the daily trips are done via active mode of transport. Active mode of transport is beneficial in many aspects: this mode can be used by people of any age group irrespective of gender and economic status, it consumes human energy and does not depend on fossil fuel, and it is environment friendly and provides many health benefits to the user. Bicycle lanes is recommended in the prospective roads linking the major health and educational facilities so that the youth could have access over it. These lanes are also shown in typical drawings of different classes of roads.

Motorcycle is used in nearly 60% of the trips and public vehicles in nearly 8% of the trips. 1 motorcycle is owned by every 75 people. This leaves the remaining 25 people (in every 100 people) remain without any vehicle. Without proper access to public vehicles, they are left out with no option but to walk or opt for public facilities. Thus, nearly 75% of the trips are made either on foot or via public transportation if available within the Rural Municipality.

3.7 Alternative transportation feasibility

There are many ways to measure transportation system feasibility, each reflecting particular perspectives concerning who, what, where, how, when and why. Different methods favor different types of transport users and modes, different land use patterns, and different solutions to transport problems in Rural Municipality. Some transportation system may be economic and some may be non-economic and non-beneficial to the users and authorities. We do not see any transportation system feasible other than roadway transportation for the present situation until next five years. However, there is a possibility of water transportation for recreational purposes on Doda river which remains to be studied. The possibility of mono rail and metro rails could not be avoided in the near future as this RM lies along the strategic position.

3.8 Parking Space

Parking space is one of the major components of transport management. Unlike in urban areas human activities and traffic intensity is not that congested in this Rural Municipality. Therefore, parking space has yet not been a serious problem so far. However systematic parking spaces and bus bays will be necessary for future expansion zones mentioned before.

3.9 Bus Parks and Bus Terminals

As in the case of parking space there are no systematically planned bus terminal as well as bus parks in the Rural Municipality but necessity of both has been felt strongly. Likewise, where there is possibility of road transport services some stop over, rest shed, and public toilets need to be constructed. At least one Helipad in each ward is required for the emergency cases. The main roads should be accompanied by at least a cycle lane and foot path.

Table 11: Proposed area for bus parks and bus terminals

Ward No	Proposed Area
1	Nauranga Tole
4	Sikalpatti
5	Ghamkapatti

3.10 Bridges and Culverts

Bridges, and culverts are most essential components of road and trail transport. Normally road is not complete without bridges in the country like Nepal where we encounter rivers and brooks in every few kilometers. This RM does not have sufficient number of bridges and cross drainages in terms of access to convenience. The number of existing bridges and culverts are shown in the table as below:

Table 12: Number of cross drainages

SN	Ward No.	Number of Bridges	Number of Slab Culverts
1	1	3	19
2	2	1	7
3	3	4(one in ward 6-3 boundary)	9
4	4	3	6
5	5	-	7
6	6	1	4
Total		12	52

In totality 64 cross drainage structures (CDS) were recorded in this RM. Ward No. 1 consists of maximum number of CDSs i.e., 22 consisting of 19 slab culverts and 3 bridges while lowest number was recorded in Ward No. 6 i.e., 5 consisting of 4 slab culverts and 1 bridge. The recorded CDSs mainly comprise of bridge and slab culverts. There are numerous minor cross drainage structures like pipe culvert. Kharra Nala bridge in Baijnath Tole(25m), Hegnala Bridge (10m) near Sukkhad Park, Baan Nala bridge in Dadabichuwa tole-ward 1 (25m) and Bridge at Doda river-ward 3 are some of the major bridges of this Rural Municipality.

3.11 Drainage System

Good drainage system is an internal part of road management. Often Terai plain areas of this Rural Municipality lack natural drainage of water. Thus, proper drainage needs to be installed according to the standard specifications. Similarly, lack of drainage triggers damages in the roads increasing the cost of maintenance. Such unsustainable development leads to environmental destruction and regular obstacles during vehicular movement. Most of the roads in the RM do not have proper drainage. Therefore, construction and maintenance of drainage is equally important as the construction and maintenance of roads.

3.12 Irrigation Canal

A couple of minor canals like Baan Nala, Kharra Nala, Syali Nala, Heg Nala, Ghangeswor Nala etc are present mainly in wards 1,2,3 and 4.

3.15 Road Furniture

Different sorts of objects which are installed in several places of a road to improve smoothness of travel and ensure safety are collectively called road furniture. They include objects like street light, lane signs, zebra crossing, all kinds of traffic signals, milestones, traffic barriers, bus stands, and passenger's lot etc. These objects enhance the aesthetic dimension of the roads in one hand and improve the safety of travel on the other. They equally provide comfort to pedestrian and control and regulate the traffic. Even very basic road furniture seemed missing in most of the roads in this Rural Municipality. Therefore, installing road furniture after the completion of major construction is essential.

3.16 Indicative Development Potential Map (IDPM)

IDP is basically the indication of the existing and potential market center/service centers (key growth centers) and the areas having various development potentials such as agro-based industries, high value cash crops and tourism. Thus, IDP shows high value cash crops, tourism area, and area of service centers such as hospital, post office, telecommunication, school, campus, security offices and large settlements, important historic and religious places. Finally, it prepares the ranking of the markets of the municipality as the basis of network planning.

For Laljhadi Rural Municipality the following area have been proposed for the potential development area.

Table 13: Potential Development Area

S.N.	Potential	Area	Ward
1	Industrial	Sugar Mill ward 1, Southern part of Ward 2	2,1
2	Institutional	Southern part of district road. (72A006R)	2,4
3	Touristic/Religious	Itaha baba Mandir ward 4, Sukkhad Park ward 1, Shova Lake in ward 3, Proposed Mandir in ward 3, Ranatharu Museum of Ward no. 2 southern part of which also have resorts opened for hospitality	2,3,4,1
4	Agricultural area	All wards within the municipality have agricultural area	1,2,3,4,5,6
5	Commercial area	Agrobased Industry in Dadakanja-Sukkhad Park Nauranga tole ward 1	1,2
		Northern part of Kanja tole, Siddhanath tole	2
		Balmi tole, Chhoti Parsiya, Parsiya	3
		North-West part of Dadajhai tole, Existing bajaar at Sikalpatti tole	4
		Annapurna Tole	5
		Chandev Bajaar	6
6	Residential area	Nauranga Tole, Nabodaya Tole, Bimbari Tole, Dada Kanja Tole	1
		Kanja Tole, Baijanath Tole, Siddhanath Tole	2
		Kasuwa Tole, Nanda Tole, Balmi Tole, Chhoti Parsiya Tole	3
		Kuliya Tole, Dadajhai Tole, Sikalpatti tole	4
		Bhuli tole, Annapurna Tole	5
		Khargariya tole, Chandev tole	6

CHAPTER 4: RURAL MUNICIPALITY INVENTORY MAP OF ROAD NETWORK

4.1 Existing Road Inventory

Existing road inventory has been prepared on the basis of ward wise road survey for the verification of existing roads on GIS for the preparation of maps. Rural Municipality Road inventory forms were used to collect the information. The survey was conducted from one nodal point to another in each road section collecting information on surface condition, cross structures road condition, road type, linkages established by the road. On the basis of these information Rural Municipal Road Inventory Map (RMRIM) has been prepared.

4.2 Municipal Roads

Summary of Class "A" Roads

These roads are major transport corridors within the municipal territory. These roads are assumed to have higher traffic and they connect major settlements or market areas within the municipality. Functionally these roads carry the traffic from major settlements, tourist areas to the SRN linkages. It is highly recommended to have separate segment for pedestrian and cycle track. At the same time, these roads need to have adequate median strip to segregate vehicles coming from different directions.

These roads link the Feeder Road with the strategic roads of the Rural Municipality with relatively significant traffic flow. The RoW for Class "A" road has been stipulated minimum of 14 m but at least 15m is recommended for plain Terai conditions. A minimum of 2 m set back is required on either side of the road. The typical cross section of such road has been shown in figure 6 mentioned above. These roads have been categorized based on public demand as well as keeping in view the future need of the Rural Municipality. These roads will be served by relatively bigger and medium public transport modes. In this RM, there are 13 Class "A" roads including DRCN roads which pass through all the wards. In class A, the total length of black topped road is calculated as 2.05 km whereas gravel road is calculated as 56.95 km recommended for upgrading. No earthen road and new construction have been recorded in this category.

Table 14: Ward wise Road Classes Summary

Wards	Road Class				Total
	A	B	C	D	
1	12	3.14	12.76	6	33.9
2	12.65	3.95	11.06	4.49	32.15
3	16.72	1.51	11.86	4.64	34.73
4	8.65	9.51	15.61	8.72	42.49
5	6.82	4.54	2.67	2.67	16.7
6	2.05	1.51	4.66	4.3	12.52
Total	58.89	24.16	58.62	30.82	172.49

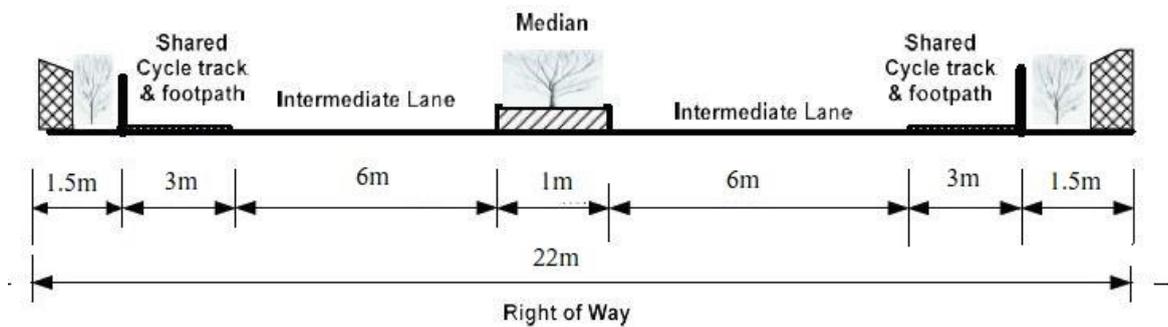


Figure 6: Typical Cross section of Road Class "A"

The following table contains lists of class "A" roads within the RM.

Table 15: Lists of Road Class "A"

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
1	R101	72A006R	Patkariya, Punarbas 10 to end of ward number 1	16	12.00	G
2	R201	709RM06A01	Siddhababa Marga	12	5.18	G
2	R203	72A006R	Health post to Sarada Ma Vi Nauranga Tole	12	6.28	G
2	R217	709RM06A02	Ward office north to gau link road at nauranga	8	1.19	G
3	R301	72A006R	Playground to south connecting road at Nauranga	12	4.56	G
3	R302	709RM06A03	Khelmaidan Road Nauranga	12	4.74	G
3	R303	709RM06A04	Sarada Ma Vi side road Nauranga	8	0.78	G
3	R309	709RM06A05	Hariyali Marga	5	2.78	G

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
3	R314	709RM06A06	Inner Road to connect Hariyali marga	10	3.96	G
4	R401	72A006R	Road to Ban Nala	12	4.98	G
4	R415	709RM06A07	Shambhu Marga	12	3.67	G
5	R501	709RM06A08	Nabodaya School to Bhuiya	6	6.83	G
6	R606	709RM06A09	Ban Nala Marga	6	2.05	BT

Summary of Class "B" Roads

These roads serve for the purpose of collectors from relatively small settlements with less traffic flow. The RoW for such class of road is minimum of 10m and at least 2m set back is required on either side of the road. The typical cross section of such road is shown in figure 7 below. These roads serve as linkage to Class "A" roads. These roads have been categorized based on public demand as well as keeping in view the future need of the Rural Municipality. These roads will be served by smaller public transport modes. There are in total 16 road sections under Class "B". The total length of earthen road is calculated as 0.83 km, 21.84 km as gravel and 1.52 km as black topped road under Class "B" as shown in the Table below. These roads pass through all the wards among which two sections pass through ward no 1, three sections pass through ward no.2 and one section passes through ward no.3, four sections pass through ward no. 4, five sections pass through ward no 5 and one section through ward no. 6.

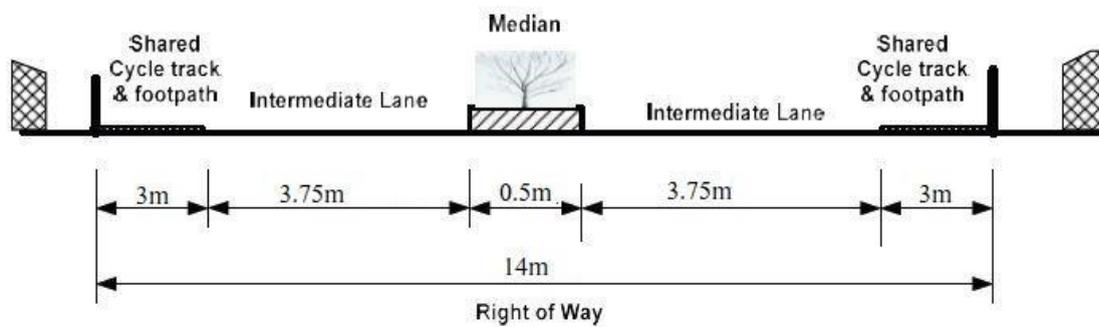


Figure 7: Typical Cross Section of Road Class "B"

Table 16: List of Road class "B"

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
1	R103	709RM06B01	Dada Bichuwa Road I connect to Ban Nala Marga	10	1.33	G
1	R120	709RM06B02	Shiva Mandir to Ban Nala Dada Bichuwa	10	1.81	G
2	R202	709RM06B03	Shiva Mandir to Doda River	12	1.70	G
2	R204	709RM06B04	Road east of Bishnu mandir at Dada Bichuwa forming small loop	5	0.83	E
2	R210	709RM06B05	Bishnu Mandir Marga	14	1.42	G

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
3	R308	709RM06B06	Connecting road west of Bishnu Mandir at Binabari	6	1.51	G
4	R402	709RM06B07	Binabari Khola Culvert to Durga Mandir	12	3.25	G
4	R403	709RM06B08	Shiva Parbati Marga	8	3.29	G
4	R416	709RM06B09	Connecting road west of shiva parbati marga at Binabari	10	2.28	G
4	R431	709RM06B10	Binabari Road 3	6	0.72	G
5	R506	709RM06B11	Binabari Road 4	6	0.71	BT
5	R507	709RM06B12	Road east of Mahadev Marga at Binabari	6	0.81	BT
5	R508	709RM06B13	Mahadev Marga	6	0.77	G
5	R509	709RM06B14	Health post to ban nala to doda river	6	1.40	G
5	R510	709RM06B15	South road of Nauranga Khel maidan	6	0.85	G
6	R608	709RM06B16	Link road to connect siddhababa marga	5	1.51	G

Summary of Class "C" Roads

These types of roads are for the purpose of residential access. Residential streets are designed for lower traffic volumes for especially private transport. Therefore, RoW for this class is designed for single lane pavement. Minimum RoW for such class of roads is allocated as 6m.as per the MTMP guideline but 8m is recommended for roads with future prospects. Another 2 m setback is recommended after the right of way for the construction of permanent structures along the road of this category. These roads pass through all the wards among which 18 roads pass through ward 1, 14 roads through ward 2, 9 roads through ward 3, 16 roads through ward 4, 3 roads through ward 5 and 6 roads through ward 6. Altogether 66 number of Class "C" road pass through all of the wards of this Rural Municipality. Altogether 1.63 km of blacktopped road, 25.47 km of earthen road and 31.62 km of gravel road fall under the category. No new construction has been recommended under this road class. Typical cross section of such road is shown below. Only earthen roads and new trails fall under Class "C" type.

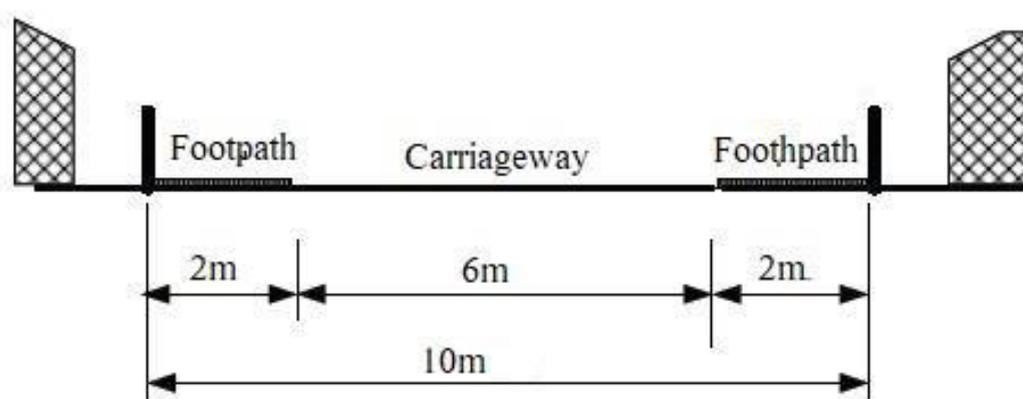


Figure 8: Typical Cross Section of Road Class "C"

Table 17: List of Road Class "C"

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
1	R102	709RM06C01	Dead end road from west of shiva mandir west at binabari	10	0.41	G
1	R105	709RM06C02	Road east of Bishnu mandir	10	0.48	G
1	R107	709RM06C03	Dada bichuwa ban nala to house	10	1.30	G
1	R108	709RM06C04	South of Ban nala chowk to house	12	0.90	G
1	R109	709RM06C05	Road west of shiva parbati marga @Binabari tole	8	0.38	E
1	R110	709RM06C06	Forest office to agriculture field to doda	6	0.92	E
1	R111	709RM06C07	Binabari khola culvert to khet road	7	1.10	E
1	R112	709RM06C08	Kanja to Suspension Bridge to Kharranala Corridor to Kharranala Bridge	10	0.78	E
1	R113	709RM06C09	Ward No 2 office to Gaupalika	12	0.58	G
1	R114	709RM06C10	Dada Kanja to Baijanath School to Kharra Nala Bridge	5	0.54	E
1	R115	709RM06C11	Dada Kanja culvert to east of siddhabaijanath school through rice mill	5	1.39	E
1	R117	709RM06C12	Dada kanja culvert to kanja tole road east of rice mill	5	1.16	E
1	R118	709RM06C13	Kanja Chowk to Belauri	6	0.64	G
1	R121	709RM06C14	Baijanath Mandir to Doda River RCC bridge	6	0.23	G
1	R122	709RM06C15	Kanja to Doda River	8	0.29	E
1	R124	709RM06C16	Khola kanja road connecting through ag land	8	0.35	E
1	R126	709RM06C17	Gaunpalika to HP to School	8	0.39	G
1	R127	709RM06C18	Resort road	8	0.92	E
2	R205	709RM06C19	Resort Road to Kanj Shiva Mandir	4	0.45	E
2	R206	709RM06C20	Link Road to Doda River Road	10	1.66	E
2	R208	709RM06C21	Ward 2 offc to school road	7	0.84	E
2	R209	709RM06C22	Linking Road Rana Krishi Firm	7	1.11	E
2	R211	709RM06C23	Tank to Ward 2	10	0.59	G
2	R212	709RM06C24	Gaupalika Office Back to Kharra Nala	8	0.98	G
2	R213	709RM06C25	Ward 2 Office to Kharra Nala	8	0.47	G
2	R214	709RM06C26	Link Road Siddhanath tole	10	1.31	E
2	R215	709RM06C27	Link Road Baijanath Tole	8	0.50	E
2	R216	709RM06C28	Road to Play ground near Doda	6	0.64	E
2	R218	709RM06C29	Road from North of Orchid Academy	10	1.09	G
2	R222	709RM06C30	Kasuwa Tole to Kharra Nala Road	6	0.44	E
2	R223	709RM06C31	Connecting road North of Brick factory at kasuwa	10	0.62	E
2	R224	709RM06C32	Dada kanja mandir to houses	6	0.46	E
3	R304	709RM06C33	Siddha baijanath school to jungle road	12	0.71	G
3	R305	709RM06C34	Mini bridge near siddhabaijanath mandir to khet road	10	0.51	G

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
3	R306	709RM06C35	Link road to police station	7	0.76	E
3	R310	709RM06C36	Kharranala to brick factory road	6	2.84	G
3	R311	709RM06C37	Dada kasuwa gau road connect to brick factory road	8	2.83	G
3	R312	709RM06C38	Kasuwa Tole to Parsia Tole (Forest Route)	6	0.86	G
3	R315	709RM06C39	Kasuwa Tole to Parsia Tole (River Route)	6	0.56	G
3	R318	709RM06C40	Road from bridge to Ghangheshor nala to gaun	8	1.94	G
3	R319	709RM06C41	Road to connect Parsiya tole through Ghangeshwor nala	4	0.85	G
4	R404	709RM06C42	Link road to connect gaunghar clinic at Parsiya tole	10	1.74	G
4	R405	709RM06C43	Danda Parsia Wooden Bridge to Parsia Basti	10	0.63	G
4	R406	709RM06C44	Link road from east of Ghangeshwor culvert at Nanda Gaun	10	0.70	G
4	R407	709RM06C45	Chhya smriti marga	6	1.57	E
4	R409	709RM06C46	Ward 3 office to Balmi Tole to RCC bridge construction Doda River	6	0.40	E
4	R410	709RM06C47	Syali Nala Route to RCC bridge construction at Doda River	8	0.53	E
4	R413	709RM06C48	Ward 3 office to Anamol Krishi Sahakari to RCC bridge at Doda River	5	1.19	E
4	R414	709RM06C49	Syali Nala Culvert to Balmi Tole	7	0.91	G
4	R417	709RM06C50	Connecting road north of syali nala at Balmi tole	10	1.50	G
4	R421	709RM06C51	Ward 3 Office to Dunga to Syali Khola	8	1.10	G
4	R423	709RM06C52	Way to Balmi Gaun	8	0.68	G
4	R424	709RM06C53	Saraswoti Ma Vi to Balmi Gaun	7	1.64	E
4	R425	709RM06C54	Connecting road east of saraswoti school at dunga chhoti parsiya	6	0.52	G
4	R427	709RM06C55	RCC bridge ward 3 and 6 boarder through Syali Nala Route	7	0.80	G
4	R428	709RM06C56	Syali Nala to Chhoti Parsia	5	0.73	E
4	R432	709RM06C57	Parsiya tole road behind the church	8	0.97	G
5	R502	709RM06C58	Parsiya church to jungle road	6	1.78	E
5	R505	709RM06C59	Parsiya church east to jungle road	6	0.32	G
5	R511	709RM06C60	Gaunghar clinic to school road	6	0.57	BT
6	R601	709RM06C61	West of krishi sahakari to house link road	6	1.01	E
6	R602	709RM06C62	Parsia Tole (Boarder to 3 and 4) to RCC bridge under construction at Doda (Bhuli)	6	1.06	BT
6	R603	709RM06C63	Swotantra Ma Vi to ward 4 office	5	0.99	G
6	R607	709RM06C64	Dadajhai Doda River Side Road	4	0.77	G
6	R609	709RM06C65	Ward 1 Office to Doda River	4	0.60	G
6	R610	709RM06C66	Connecting road north of play ground to connect suspension bridge at Dadajhai	5	0.23	G

Summary of Class "D" Roads

These types of roads are for the purpose of residential access. Residential streets are designed for lower traffic volumes for especially private transport. Therefore, RoW for this class is designed for single lane pavement. Minimum RoW for such class of road as per MTMP guideline is 4m but 6m recommended considering the case of plain area of Terai. At least another 2 m setback is recommended after the right of way for the construction of permanent structures along the road of this category. Altogether 67 number of Class “D” road pass through all of the wards of this Laljhadi Rural Municipality. Most of the Class “D” roads are earthen ones followed by trails and nominal gravel road. The total length of the earthen road under this class of road has been calculated as 25.40 km, gravel road as 5.15 km.

Table 18: List of Road Class "D"

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
1	R104	709RM06D01	Road behind the ward office at Dadajhai	8	0.16	G
1	R106	709RM06D02	Brick Factory Road	8	0.15	E
1	R116	709RM06D03	Dadajhai Tole Road to connect doda nadi	5	1.31	E
1	R119	709RM06D04	Road to connect ward office behind Baijanath School	5	0.24	E
1	R123	709RM06D05	Road to connect doda from ward office road to doda at dadajhai	8	0.22	E
1	R125	709RM06D06	Dadajhai Doda Side Road to Agricultural Field	8	0.30	E
1	R128	709RM06D07	Dadajhai Tole Road 5	5	0.11	E
1	R129	709RM06D08	Way to Itaha Baba mandir	5	0.23	E
1	R130	709RM06D09	Parsia Basti to Doda River	4	0.14	E
1	R131	709RM06D10	Motorghat to Doda River	4	0.24	E
1	R132	709RM06D11	School - Belchowk - Suklaphata Simana	4	0.11	E
1	R133	709RM06D12	Motorghat to baijanath school	4	0.08	E
1	R134	709RM06D13	Road to Agriculture Field	4	0.19	E
1	R135	709RM06D14	Road to Khola	4	1.39	E
1	R136	709RM06D15	Road to Khola	4	1.13	E
2	R207	709RM06D16	Adharbhut School to Bridge	5	1.60	E
2	R219	709RM06D17	Road south of Janachetana school at sikalpatti	6	0.06	E
2	R220	709RM06D18	Motorghat road to Macha Pokhari near Durga Mandir	6	0.08	G
2	R221	709RM06D19	Motorghat to Janachetana School	6	0.29	E
2	R225	709RM06D20	Sikalpatti Tole Road 2 near motorghat	4	0.27	E
2	R226	709RM06D21	Road extending east from main road at sikalpatti	4	0.52	E
2	R227	709RM06D22	Sikalpatti Tole Road 4 (Ending near Vidhut Griha)	4	0.58	E
2	R228	709RM06D23	Durga Mandir to Baijanath School	5	0.27	G
2	R229	709RM06D24	Durga Mandir to Shiva Mandir	4	0.62	E
2	R230	709RM06D25	Suklaphata Boader to Doda River	4	0.20	E

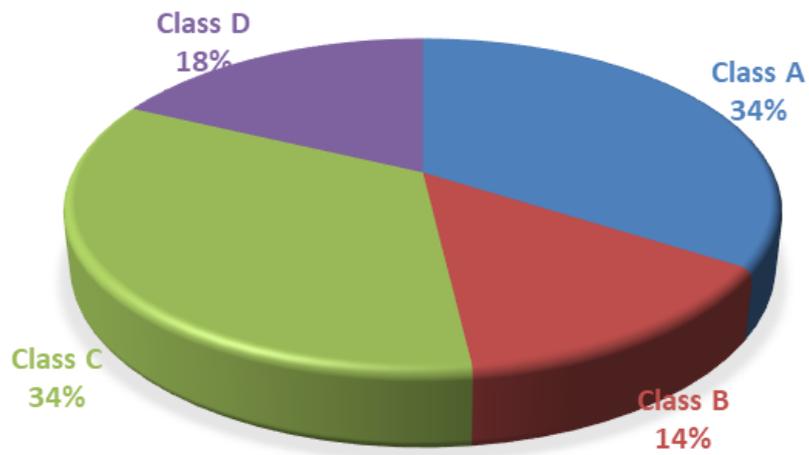
WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
3	R307	709RM06D26	Suklaphata Boader Bridge to District Road Act Bhuli	5	0.24	G
3	R313	709RM06D27	Bhuli Tole to Doda River	6	0.43	G
3	R316	709RM06D28	Road from District road to doda at Bhuli tole	5	1.63	E
3	R317	709RM06D29	Road right of Bhuli tole boarder bridge	4	0.71	E
3	R320	709RM06D30	Bel chowk to khet dead end road	3	0.24	E
3	R321	709RM06D31	Road behind janachetana school	3	0.42	E
3	R322	709RM06D32	Link road behind ward office	2	0.33	E
3	R323	709RM06D33	Link road behind ward office	3	0.26	E
3	R324	709RM06D34	Connecting link road	4	0.39	E
4	R408	709RM06D35	Bani Road Ghamkapatti to Annapurna Tole to Gadbijuwa Taal	5	0.83	E
4	R411	709RM06D36	Bani Road to Forest Office at Annapurna Tole	6	0.81	E
4	R412	709RM06D37	Connecting road through khelmaidan at Ghamkapatti tole	6	0.30	G
4	R418	709RM06D38	Mahavir Khalan Gaun Road	6	1.26	E
4	R419	709RM06D39	Forest Office Road Annapurna Tole	10	0.62	E
4	R420	709RM06D40	Baijanath Mandir at Bani Road to Doda River	10	0.72	E
4	R422	709RM06D41	Road connect district road to doda north of satsang at Baijanath tole	5	0.56	E
4	R426	709RM06D42	Road from district road to Gadbijuwa lake at Baijanath tole	6	0.45	E
4	R429	709RM06D43	Road from east of panitanki to Gadbijuwa lake	6	0.21	E
4	R430	709RM06D44	Road to connect Baijanath Ma Vi school	5	0.41	E
4	R433	709RM06D45	Baijanath Tole Road 5	6	0.26	G
4	R434	709RM06D46	Connecting road from church at ghamkapatti tole	6	0.58	G
4	R435	709RM06D47	Ghamkapatti culvert link road	5	0.24	E
4	R436	709RM06D48	Road behind pani tank to connect satsang	4	0.55	E
4	R437	709RM06D49	Shiva Taal Bahu Udeshiya Sahakari to Khadgariya Tole	4	0.50	E
4	R438	709RM06D50	Chandev Chowk to Shiva Mandir Khadgariya Tole	3	0.29	E
4	R439	709RM06D51	Khadgariya Tole to Radha Tole	5	0.13	E
5	R503	709RM06D52	Connecting road west of Chandev chowk towards North	6	1.22	E
5	R504	709RM06D53	Small dead end road from west of Chandev chowk to south	6	0.54	G
5	R512	709RM06D54	Chandev Chowk to Saraswoti Marga to Forest End	5	0.29	E
5	R513	709RM06D55	Road through ward 6 office	4	0.14	E
5	R514	709RM06D56	Saraswoti Marga to Shiva Taal Bahu Udeshiya Sahakari through Syali Nala	4	0.48	G
6	R604	709RM06D57	Bhulbhule taal to aadharbhut swasthe kendra road	4	0.39	G
6	R605	709RM06D58	Sushant Tole Church Road	4	0.21	G
6	R611	709RM06D59	Dead End road to Syali Nala	4	0.31	E
6	R612	709RM06D60	Syali Nala Road 2	4	0.21	G
6	R613	709RM06D61	To Forest	4	0.71	G

WARD	CODE	DIGITAL NAME	ROAD NAME	WIDTH	LENGTH	SURFACE TYPE
6	R614	709RM06D62	To Forest	5	0.29	G
6	R615	709RM06D63	Connecting road to home	5	0.10	E
6	R616	709RM06D64	Connecting road to home south of chandev chowk	3	0.24	E
6	R617	709RM06D65	Shiva taal sahakari to syali nala to doda river	5	0.76	E
6	R618	709RM06D66	Syali culvert north connecting road	4	0.52	E
6	R619	709RM06D67	Syali culvert north to connecting road to doda river	4	0.30	E

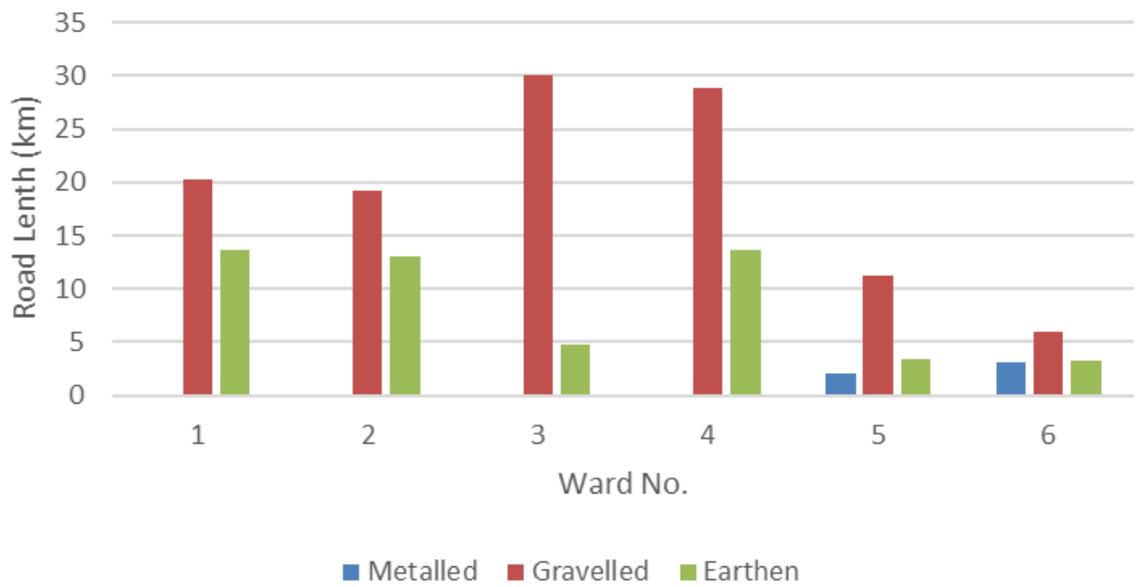
RMTMP survey reveals that RM has altogether 172.49KM roads. Out of the total road length, 5.23 km -blacktopped, 115.56 km - gravel where rest of the road comes under earthen category and accounts for 51.7 km. Except the nominal level of the gravel part of the roads other roads are only fair-weather roads. The major challenge in transportation sector seems to be the upgradation of fair-weather roads and budgetary management. Other relevant figures on road class and ward wide distribution have been shown in the table.



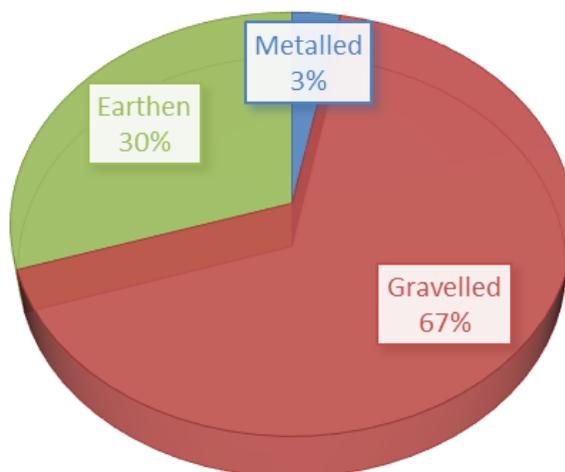
ROAD CLASSES



Wardwise Road Surface Type



ROADS BY SURFACE TYPES



Road Types	Road length in Wards (km)						Total (km)
	1	2	3	4	5	6	
Metalled	0	0	0	0	2.11	3.12	5.23
Gravelled	20.23	19.25	30.1	28.88	11.19	5.91	115.56
Earthen	13.67	13	4.73	13.64	3.43	3.23	51.7
Grand Total	33.9	32.25	34.83	42.52	16.73	12.26	172.49

Road Classes	Road length in Wards (km)						Total (km)
	1	2	3	4	5	6	
Class A	12	12.65	16.72	8.65	6.82	2.05	58.89
Class B	3.14	3.95	1.51	9.51	4.54	1.51	24.16
Class C	12.76	11.06	11.86	15.61	2.67	4.66	58.62
Class D	6	4.49	4.64	8.72	2.67	4.3	30.82
Grand Total	33.9	27.66	30.09	33.77	14.03	8.22	172.49

4.3 Digital Naming or coding (Road Nomenclature)

Once the roads are finalized, each municipal roads are assigned a road code. Coding of road is done based on the guidelines of DTMP and MTMP. Few provisions of those guidelines have been slightly modified so as to fit with the new federal set up of the country retaining the essence the guideline to the fullest. The sample code breakdown may be as following:

709 RM 06 A 01

- First digit 3 digits represent district along with province number. In this case, Province no. 7 and 09th district which is Kanchanpur.
- The letters following the number represents type of local government. RM => Rural Municipality.
- The two numbers following the letters represent the local level name. In this case 06 represents laljhad.
- The letter following the local level name code represents class of road.
- Next numbers represent serial number of the road

4.4 Methods of Road Classification

Table 19: Road Classification Method

Criteria	Class A	Class B	Class C	Class D
Purpose	Mobility	Mobility and Control access	Access and mobility	Access
Function	Thorough and long-distance movement	Connection between class A and C roads and also provide alternative connection routes between class A and C	Connects higher order mobility to local trips	Connect local trips to higher level roads
	High network coverage	Support thorough traffic movement	Access to property	Direct access to property
	Segregated NMT facilities and Bus lay-bys	Segregated NMT facilities and Bus lay-bys	Segregated NMT facilities	Local NMT movement
	Complete access to public transport	High access to public transport	Access limited to public transport	
Maintenance Responsibility	RM	RM	RM and local people	Local people
Speed (kmph)	80-100	60-80	50-60	40-50
Capacity (PCU/hr)	4000-4800	2400-3600	1500-2400	less than 1500
Access control	Full control	partial control	No	No

Criteria	Class A	Class B	Class C	Class D
Public Transport Services	Mass transit facilities	Mass transit, Local public transport	Access to public transport	no public transportation
Right of Way	Min. 14m	Min. 10m	Min. 6m	Min. 4m

4.5 Right of Way for Roads of different Classes

The MTMP guideline has expected roads under category of National Highway (NH), Feeder Roads (FR) and District Roads (DRCN) within the RM area to comply with their respective guidelines. The RoW of these roads are considered as per respective Guidelines. i.e. the RoW of National Highways, Feeder Roads and District Roads are 50.0 m, 30.0 m and 20.0 m. The guideline has clearly stated about the setback distance for these roads (having RoW \geq 20.0) as 6.0 m on either side. All of these standards shall be applied to the RM accordingly.

Table 20: Urban Road Class and Features

Road Class	Descriptions	Minimum RoW (m)	Minimum Set-back Distance (m)
NH	National Highways	As Prescribed	As Prescribed
FR	Feeder Roads		
DRCN	District Roads		
A	Main Collector	14	2
B	Other Collector	10	2 and 1.5
C	Main Tole Road	6	2 and 1.5
D	Other Tole Road	4	2 and 1.5

CHAPTER 5: FIVE YEARS MUNICIPAL TRANSPORT MASTER PLAN

5.1 Perspective plan of municipal road network

Perspective plan of municipal road network includes the maintenance of the access and collector roads and development of higher hierarchy road corridors supporting mobility of the roads. First five years should focus on development of existing access roads and their maintenance. It also incorporates construction of new road linkages to provide basic access to the settlements. Roads of Class “C” will also be widened to its functional width providing proper cycle tracks and pedestrian ways, where permitted by the available road space. During this period formulated road hierarchy will be implemented in terms of policy and enforcement of bylaws. Within 2 years other complementary plans of land use and city development will be developed. In the third year, the RMTMP and its perspective plan should be revised in coordination with the other plans formulated and changes captured during this period.

Year five to ten will then implement the higher hierarchy roads in stages of clearing of the required ROW road space and construction of necessary infrastructure. Proper development stages of roads should be planned (construction of Class “A” roads to the standards of Class “C”, then gradually upgrading to Class “B” and then to Class “A”). Other implementation strategies should also be developed and finalized at the end of this period. The road network developed during this period shall complete construction of Class “C” roads. This will demand higher class roads to support the local road networks. Gradual upgrading of the higher hierarchy road networks during year ten to twenty will be justified by the traffic generated and level of mobility demanded to support the emerging economy.

Financial institution and capital investment plan

To determine how much of the proposed work can be carried out in the 5-year RMTMP period, it is necessary to estimate the budget available in this period. This is done by estimating the amount of money available from different sources based on the actual amounts of the current or last financial year, assuming certain growth rates for each funding source.

It is recommended that the planning section of RM should incorporate funding source from different line agencies as well as NGOs, INGOs, people’s contribution fund for proper management, infrastructure development and maintenance of road within the RM.

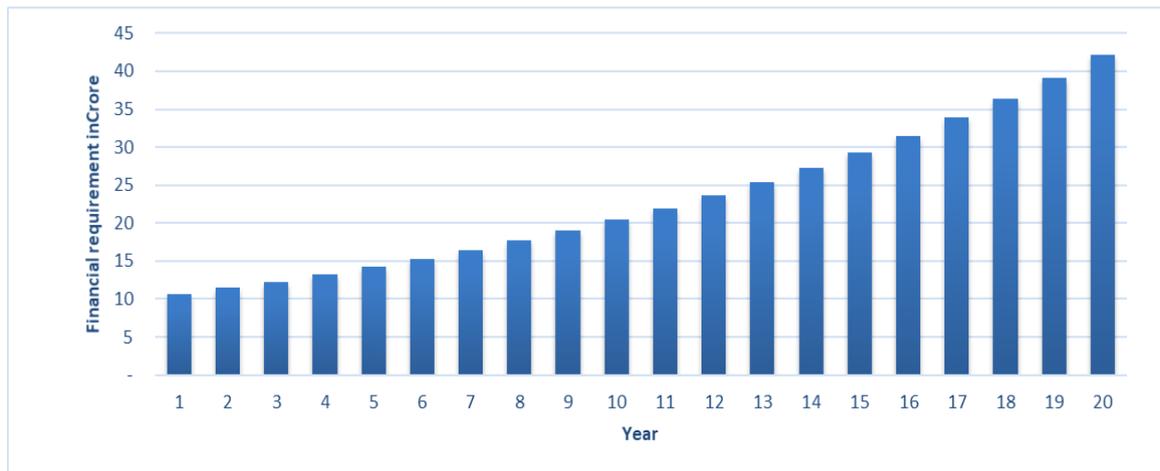


Figure 9: Twenty Years budget forecast

5.2 Scoring Criteria and Score

As there are limited resources for the construction and maintenance of road infrastructure for the RM, roads should be ranked based on some standard rule. For this purpose, the scoring purpose given by the ToR is used with some suggestion from the local people and concerned bodies. The scoring criterion used in this RMTMP is described in detail in annex of this report. Five-year budget expenditure

One of the final outcomes of this study is to provide annual budget expenditure for proposed intervention (new construction, upgrading, maintenance and rehabilitation).

- For the allocation of yearly budget, the total cost required for twenty years is first calculated and this amount is distributed to twenty year assuming that budget spending capacity of RM is expected to grow at the rate of 7.5% per year.
- The estimate of budget required for the five years is prepared based on the assumption that the Class A road is to be made two lane, and Class B and C road is to be made single lane and lane considered are assumed to be track opened and gravelled or single level of intervention.
- Due to limitation of budget, the roads are assumed to have simple cross drainage structures within this period whereas cross drainage structures such as Bridges are not included in this budget and expected to be completed within this time period by external sources.
- For approximate costing, the construction rate of road appurtenances is assumed to be equal to that of gravelled cost and for short term the minimum width of 2m is assumed if existing road width doesn't exist.

- Interventions on those roads need to be incorporated in annual budget plan. Intervention that needs can't be completed in predetermined year should be the next priority in coming year. If a certain road, which was targeted to complete in first year could not be finished in first year, need to be given first priority in next year expenditure plan.
- If there is deficit in annual expenditure, RM need to incorporate that particular heading in next year at any cost. They can look for grant, assistance from district or even central level or they can incorporate them by shifting budget from less importance item/heading.

Total budget is first broken down to 70% for road construction and 30% for maintenance as per the Terms of Reference. Of the total budget available for construction of roads, 50% are allocated for construction of class A roads, 30% for class B and 20% are allocated for Class C roads.

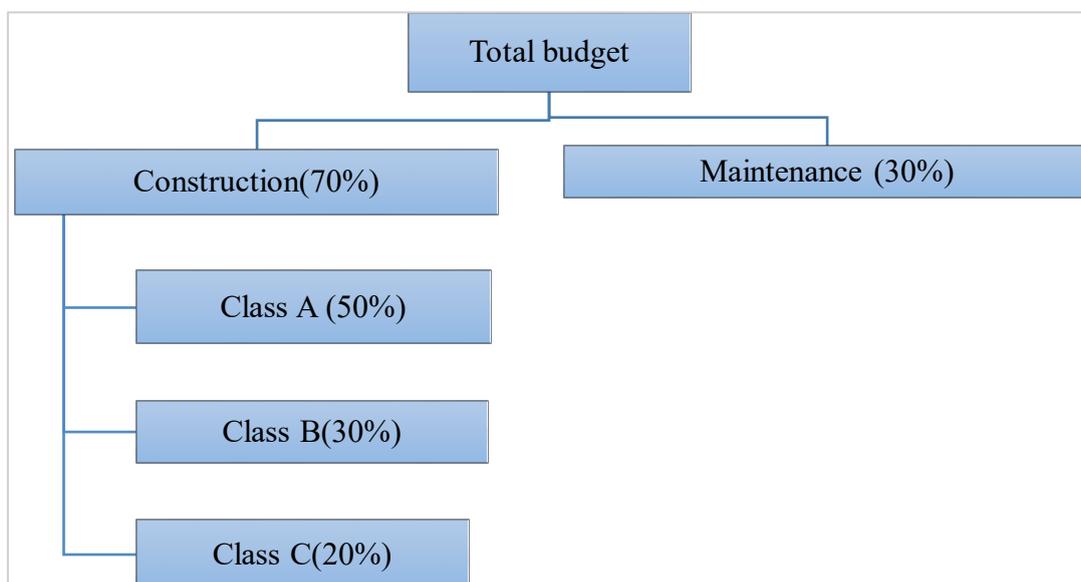


Figure 10: Budget Allocation

5.3 Gap in the Budget

It was found that in the year of 78/79 the budget for road sector of this RM was about 76.88 million and that was estimated to be 81.7 million for the fiscal year 79/80. Based on these facts, the projected budget for road sector is far less than the budget required to meet the planned goals for road sector development within the RM. This gap can be projected as shown below in the figure:

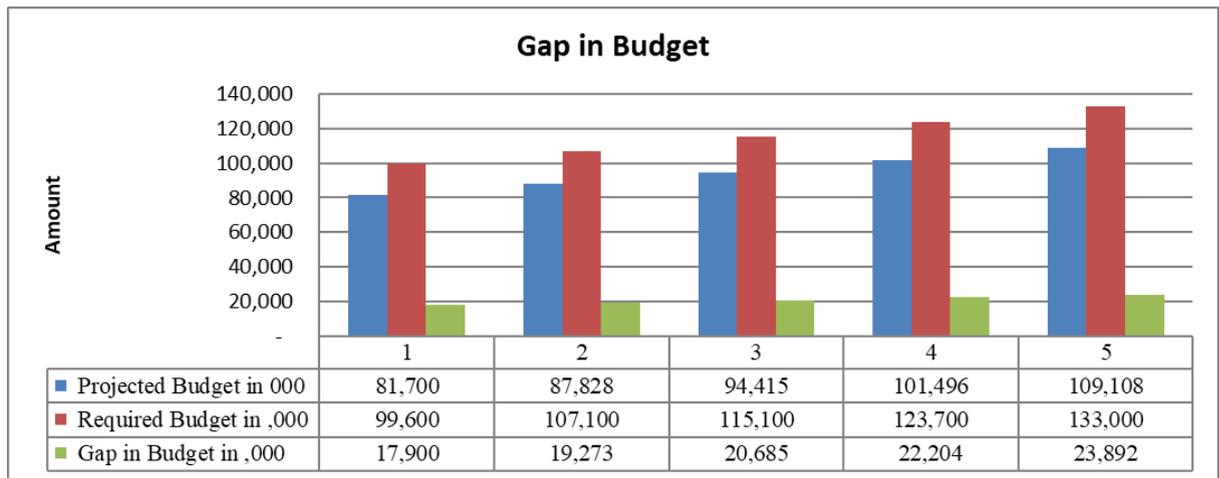


Figure 11: Gap in Budget for first five years

5.4 Staging Implementation

Mid period review

In light of present context without proper land use and city development plans of the RM, the formulated municipal transport plan for five years and long-term perspective plan cannot be complete. Comprehensive drainage plan and layout also guides the placement of cross drainage structures along the roads. Therefore, a mid-period review is necessary. This review follows the formulation of comprehensive city development plan and land use plan. These plans will bolster the transport master plan and also suggest necessary deviations and revisions. The surveys conducted to prepare this RMTMP are baseline survey for future planning. In reference to these surveys, the mid period review will track the changes and its effect on the formulated five year plan and long term perspective plan. Based on the recommendations of land use and city development plan, and the changes during the first two years in the road infrastructure and road traffic the mid period review will guide RMTMP in the later stages.

The next RMTMP will be prepared in the sixth year which will create a void in continuity of transport infrastructure development during the sixth year. The mid period year shall also formulate implementation and investment plan for that period which will be carried over the next RMTMP.

Yearly Maintenance Plan

According to the yearly progress of transport infrastructure development and construction, yearly maintenance plan should be prepared. This maintenance plan addresses the recurrent maintenance, specific maintenance and emergency maintenance requirements of the municipal roads.

Stages of development of Roads

Visualization of stages of development of roads is very important aspect of long-term municipality transport master plan (perspective plan). Current land use and road side development may not allow immediate implementation of wider roads. These restrictions should be addressed in various stages. The stages can be visualized in reference to various variables.

The prime stage is the formulation of policy and plans. This stage formulates the hierarchy and their geometric and physical characteristics, purpose and functions along with necessary ROW. With the formulation of road hierarchy, road bylaws will be enforced. It should be followed by formulation of proper implementation strategies for/and use of various tools for land acquisition and compensation, method and stages of construction of roads and road side infrastructures and enforcement of road discipline and right of users. Development of such policies will support continuous development of the roads. The next stage is to clear the total right of way so that other infrastructures integrated with road can be developed. Until the end of clearing of proper right of way, the policies should be strong and well-informed. This will mark the entry to the next stage which is construction of full phase of all hierarchy roads.

Construction of higher hierarchy roads should be done in stages according to the necessity as guided by the developed lower hierarchy roads and corresponding demand of higher hierarchy roads they generate. The first stage should connect the pedestrian path and cycle tracks along with double lane carriageway for all higher hierarchy roads. The development of Class “A” roads should follow construction of road space to the standard of Class “C” then gradually expanding to Class “B” and finally to Class “A”. Class “B” roads should also follow the same development stages. Construction of well-connected pedestrian way, cycle tracks and green belt along the edges of the ROW restricts any possible encroachment of the road space.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

Rural Municipality Transport Master Plan has been prepared for Laljhadi Rural Municipality. A series surveys for data collection, series of different level interaction with the locals and various authorities was conducted. The study has identified all the roads of the RM, their status and interventions required. The map of IDPM, MIM, MTPP and other maps are prepared. Detail implementation strategy and budgeted expenditure plans have been prepared. The inventory shows that majority of roads are narrow and needs maintenance and upgrading. This is in line with the demand by the wards. The accessibility of roads has addressed most of the settlements but their mobility is very low. Access to facilities is hindered due to lack of reliable and safe public transport services within the RM. Introduction of proper city buses and public transport is pertinent to fuel the development process at earliest.

The study has formulated hierarchy of roads which is necessary for long term rapid development of the RM area. The report presents the necessary functions of the roads and their characteristics. Possible cross sections are also recommended. The study has shown high proportion of active road users which have been addressed thorough provision of pedestrian facilities and bicycle tracks in all roads except access roads. This is necessary to be implemented as the developed cities are having trouble to address the demand of active mode user friendly urban road infrastructures, Laljhadi Rural Municipality has the opportunity to sustain the road users and create a sustainable and well-planned urban road network and infrastructure. As the implementation strategy suggests, the RM needs to develop proper framework and policies for the implementation of the perspective plans, built the capacity of the RM and the local organizations and committees and proper stages of development of the roads.

This study, being first of its type for the RM, should be revised and integrated with other plans that will be developed in coming years. Periodic review and update of the plans is necessary according to the change in land use and traffic that occurs in the future. A mid period review in the third year and five yearly RMTMP should be prepared every five years. Any comments and suggestions suggested during the draft report presentation will be incorporated in the final report.

GLOSSARY

Active transport user	Active transport (also called non-motorized transport, NMT and human powered transport) refers to walking, cycling, and variants such as wheelchair, scooter and handcart use. It includes both utilitarian and recreational travel activity, plus stationary uses of pedestrian environments such as standing on sidewalks and sitting at bus stops
Capacity	The maximum number of vehicles that can pass over a given section of a lane or roadway in one direction (or in both directions for a two-lane or three-lane highway) during conditions.
Collector road	Collector roads provide both access and movement within residential, commercial and industrial areas. They are typically discontinuous between residential areas, so as to avoid traffic infiltration through neighbourhoods. Lower density developments and community land uses such as schools and convenience retail are often located on collector streets.
Emergency maintenance	Maintenance works that are to be carried out due to unexpected and sudden blockage of roads that stop vehicular movement due to natural disaster
Forecasting	The process of determining the future values of land use, socioeconomic, and trip making variables within the study area.
Local road	Local roads provide direct property access in residential, industrial, commercial and downtown areas. With local streets connecting primarily to collector roads, travel distances are short, speeds are relatively low and volumes are modest, as their primary function of accommodating traffic from adjacent lands.
Maintenance	The process of preserving the original condition or function of an asset
RMTMP	The RMTMP is a strategic planning document designed to identify and address the municipality's needs to the year 2020 and beyond. The RMTMP is the documents that identify, classify and prioritize the municipal roads; identify possible sources of funds and materials for the construction of the prioritized roads according to their respective standards and scientific mobilization of the available resource.

Network	Set of nodes and connecting links that represent transportation facilities in an area.
New construction	The work of building
Origin	The location of the beginning of a trip or the zone in which a trip begins.
Periodic maintenance	Maintenance works to be carried out in intervals of years and of large-scale
Recurrent maintenance	Small maintenance works not falling under routine maintenance that are carried out a few times a year in all roads to repair minor damage resulting from traffic and rainfall
Routine maintenance	Small maintenance works that are to be carried out in all the seasons on all roads on a regular basis
Specific maintenance	Spot treatments and repairs that do not occur every year or in every road, and which are very specific in nature and location.
Trip	A one-direction movement which begins at the origin at the start time, ends at the destination at the arrival time, and is conducted for a specific purpose.
Upgrading	The process of addition or change that makes something better than it was before

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ANNEX

Annex 1: Proposed Interventions and Cost Estimate

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
1	72A006R	12.00		-	-	2,400.00	9,000.00	12,000	7.00	9.00	244,800,000.00
2	709RM06A01	5.18		-	-	1,036.00	3,885.00	5,180	7.00	9.00	105,672,000.00
3	72A006R	6.28		-	-	1,256.00	4,710.00	6,280	7.00	9.00	128,112,000.00
4	709RM06A02	1.19		-	-	238.00	892.50	1,190	7.00	9.00	24,276,000.00
5	72A006R	4.56		-	-	912.00	3,420.00	4,560	7.00	9.00	93,024,000.00
6	709RM06A03	4.74		-	-	948.00	3,555.00	4,740	7.00	8.50	96,696,000.00
7	709RM06A04	0.78		-	-	156.00	585.00	780	7.00	8.50	15,912,000.00
8	709RM06A05	2.78		-	-	556.00	2,085.00	2,780	7.00	8.50	56,712,000.00
9	709RM06A06	3.96		-	-	792.00	2,970.00	3,960	7.00	8.50	80,784,000.00
10	72A006R	4.98		-	-	996.00	3,735.00	4,980	7.00	8.50	101,592,000.00
11	709RM06A07	3.67		-	-	734.00	2,752.50	3,670	7.00	8.50	74,868,000.00
12	709RM06A08	6.83		-	-	1,366.00	5,122.50	6,830	7.00	8.50	139,332,000.00
13	709RM06A09	-		2.05	-	410.00	1,537.50	2,050	7.00	8.50	19,270,000.00
14	709RM06B01	1.33		-	-	266.00	997.50	1,330	5.50	7.00	23,883,000.00
15	709RM06B02	1.81		-	-	362.00	1,357.50	1,810	5.50	7.00	32,502,428.57
16	709RM06B03	1.70		-	-	340.00	1,275.00	1,700	5.50	7.00	30,527,142.86
17	709RM06B04	0.83		-	-	166.00	622.50	830	5.50	7.00	10,339,428.57
18	709RM06B05	1.42		-	-	284.00	1,065.00	1,420	5.50	7.00	25,499,142.86
19	709RM06B06	1.51		-	-	302.00	1,132.50	1,510	5.50	7.00	27,115,285.71
20	709RM06B07	3.25		-	-	650.00	2,437.50	3,250	5.50	7.00	58,360,714.29

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
21	709RM06B08	3.29		-	-	658.00	2,467.50	3,290	5.50	7.00	59,079,000.00
22	709RM06B09	2.28		-	-	456.00	1,710.00	2,280	5.50	7.00	40,942,285.71
23	709RM06B10	0.72		-	-	144.00	540.00	720	5.50	7.00	12,929,142.86
24	709RM06B11	-		0.71	-	142.00	532.50	710	5.50	7.00	6,613,142.86
25	709RM06B12	-		0.81	-	162.00	607.50	810	5.50	7.00	7,544,571.43
26	709RM06B13	0.77		-	-	154.00	577.50	770	5.50	7.00	13,827,000.00
27	709RM06B14	1.40		-	-	154.00	577.50	770	5.50	7.00	19,470,000.00
28	709RM06B15	0.85		-	-	280.00	1,050.00	1,400	5.50	7.00	20,213,571.43
29	709RM06B16	1.51		-	-	170.00	637.50	850	5.50	7.00	21,175,285.71
30	709RM06C01	0.41		-	-	302.00	1,132.50	1,510	3.75	5.25	16,093,928.57
31	709RM06C02	0.48		-	-	82.00	307.50	410	3.75	5.25	6,621,428.57
32	709RM06C03	1.30		-	-	96.00	360.00	480	3.75	5.25	12,259,285.71
33	709RM06C04	0.90		-	-	180.00	675.00	900	3.75	5.25	13,596,428.57
34	709RM06C05	0.38		-	-	76.00	285.00	380	3.75	5.25	4,315,714.29
35	709RM06C06	0.92		-	-	184.00	690.00	920	3.75	5.25	10,448,571.43
36	709RM06C07	1.10		-	-	220.00	825.00	1,100	3.75	5.25	12,492,857.14
37	709RM06C08	0.78		-	-	156.00	585.00	780	3.75	5.25	8,858,571.43
38	709RM06C09	0.58		-	-	116.00	435.00	580	3.75	5.25	8,762,142.86
39	709RM06C10	0.54		-	-	108.00	405.00	540	3.75	5.25	6,132,857.14
40	709RM06C11	1.39		-	-	278.00	1,042.50	1,390	3.75	5.25	15,786,428.57
41	709RM06C12	1.16		-	-	232.00	870.00	1,160	3.75	5.25	13,174,285.71
42	709RM06C13	0.64		-	-	128.00	480.00	640	3.75	5.25	9,668,571.43
43	709RM06C14	0.23		-	-	46.00	172.50	230	3.75	5.25	3,474,642.86
44	709RM06C15	0.29		-	-	58.00	217.50	290	3.75	5.25	3,293,571.43
45	709RM06C16	0.35		-	-	70.00	262.50	350	3.75	5.25	3,975,000.00

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
46	709RM06C17	0.39		-	-	78.00	292.50	390	3.75	5.25	5,891,785.71
47	709RM06C18	0.92		-	-	184.60	692.25	923	3.75	5.25	10,482,642.86
48	709RM06C19	0.45		-	-	90.00	337.50	450	3.75	5.25	5,110,714.29
49	709RM06C20	1.66		-	-	332.00	1,245.00	1,660	3.75	5.25	18,852,857.14
50	709RM06C21	0.84		-	-	168.00	630.00	840	3.75	5.25	9,540,000.00
51	709RM06C22	1.11		-	-	222.00	832.50	1,110	3.75	5.25	12,606,428.57
52	709RM06C23	0.59		-	-	118.00	442.50	590	3.75	5.25	8,913,214.29
53	709RM06C24	0.98		-	-	196.00	735.00	980	3.75	5.25	14,805,000.00
54	709RM06C25	0.47		-	-	94.00	352.50	470	3.75	5.25	7,100,357.14
55	709RM06C26	1.31		-	-	262.00	982.50	1,310	3.75	5.25	14,877,857.14
56	709RM06C27	0.50		-	-	100.00	375.00	500	3.75	5.25	5,678,571.43
57	709RM06C28	0.64		-	-	128.00	480.00	640	3.75	5.25	7,268,571.43
58	709RM06C29	1.09		-	-	218.00	817.50	1,090	3.75	5.25	16,466,785.71
59	709RM06C30	0.44		-	-	88.00	330.00	440	3.75	5.25	4,997,142.86
60	709RM06C31	0.62		-	-	124.00	465.00	620	3.75	5.25	7,041,428.57
61	709RM06C32	0.46		-	-	92.00	345.00	460	3.75	5.25	5,224,285.71
62	709RM06C33	0.71		-	-	142.00	532.50	710	3.75	5.25	10,726,071.43
63	709RM06C34	0.51		-	-	102.00	382.50	510	3.75	5.25	7,704,642.86
64	709RM06C35	0.76		-	-	152.00	570.00	760	3.75	5.25	8,631,428.57
65	709RM06C36	2.84		-	-	568.00	2,130.00	2,840	3.75	5.25	42,904,285.71
66	709RM06C37	2.83		-	-	566.00	2,122.50	2,830	3.75	5.25	42,753,214.29
67	709RM06C38	0.86		-	-	172.00	645.00	860	3.75	5.25	12,992,142.86
68	709RM06C39	0.56		-	-	112.00	420.00	560	3.75	5.25	8,460,000.00
69	709RM06C40	1.94		-	-	388.00	1,455.00	1,940	3.75	5.25	29,307,857.14
70	709RM06C41	0.85		-	-	170.00	637.50	850	3.75	5.25	12,841,071.43

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
71	709RM06C42	1.74	-	-	-	348.00	1,305.00	1,740	3.75	5.25	26,286,428.57
72	709RM06C43	0.63	-	-	-	126.00	472.50	630	3.75	5.25	9,517,500.00
73	709RM06C44	0.70	-	-	-	140.00	525.00	700	3.75	5.25	10,575,000.00
74	709RM06C45	1.57	-	-	-	314.00	1,177.50	1,570	3.75	5.25	17,830,714.29
75	709RM06C46	0.40	-	-	-	80.00	300.00	400	3.75	5.25	4,542,857.14
76	709RM06C47	0.53	-	-	-	106.00	397.50	530	3.75	5.25	6,019,285.71
77	709RM06C48	1.19	-	-	-	238.00	892.50	1,190	3.75	5.25	13,515,000.00
78	709RM06C49	0.91	-	-	-	182.00	682.50	910	3.75	5.25	13,747,500.00
79	709RM06C50	1.50	-	-	-	300.00	1,125.00	1,500	3.75	5.25	22,660,714.29
80	709RM06C51	1.10	-	-	-	220.00	825.00	1,100	3.75	5.25	16,617,857.14
81	709RM06C52	0.68	-	-	-	136.00	510.00	680	3.75	5.25	10,272,857.14
82	709RM06C53	1.64	-	-	-	328.00	1,230.00	1,640	3.75	5.25	18,625,714.29
83	709RM06C54	0.52	-	-	-	104.00	390.00	520	3.75	5.25	7,855,714.29
84	709RM06C55	0.80	-	-	-	160.00	600.00	800	3.75	5.25	12,085,714.29
85	709RM06C56	0.73	-	-	-	146.00	547.50	730	3.75	5.25	8,290,714.29
86	709RM06C57	0.97	-	-	-	194.00	727.50	970	3.75	5.25	14,653,928.57
87	709RM06C58	1.78	-	-	-	356.00	1,335.00	1,780	3.75	5.25	20,215,714.29
88	709RM06C59	0.32	-	-	-	64.00	240.00	320	3.75	5.25	4,834,285.71
89	709RM06C60	-	-	0.57	-	114.00	427.50	570	3.75	5.25	5,252,142.86
90	709RM06C61	1.01	-	-	-	202.00	757.50	1,010	3.75	5.25	11,470,714.29
91	709RM06C62	-	-	1.06	-	212.00	795.00	1,060	3.75	5.25	9,767,142.86
92	709RM06C63	0.99	-	-	-	198.00	742.50	990	3.75	5.25	14,956,071.43
93	709RM06C64	0.77	-	-	-	154.00	577.50	770	3.75	5.25	11,632,500.00
94	709RM06C65	0.60	-	-	-	120.00	450.00	600	3.75	5.25	9,064,285.71
95	709RM06C66	0.23	-	-	-	46.00	172.50	230	3.75	5.25	3,474,642.86

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
96	709RM06D01	0.16		-	-	32.00	120.00	160	3.75	5.25	2,417,142.86
97	709RM06D02	0.15		-	-	30.00	112.50	150	3.75	5.25	1,703,571.43
98	709RM06D03	1.31		-	-	262.00	982.50	1,310	3.75	5.25	14,877,857.14
99	709RM06D04	0.24		-	-	48.00	180.00	240	3.75	5.25	2,725,714.29
100	709RM06D05	0.22		-	-	44.00	165.00	220	3.75	5.25	2,498,571.43
101	709RM06D06	0.30		-	-	60.00	225.00	300	3.75	5.25	3,407,142.86
102	709RM06D07	0.11		-	-	22.20	83.25	111	3.75	5.25	1,260,642.86
103	709RM06D08	0.23		-	-	46.40	174.00	232	3.75	5.25	2,634,857.14
104	709RM06D09	0.14		-	-	27.80	104.25	139	3.75	5.25	1,578,642.86
105	709RM06D10	0.24		-	-	48.20	180.75	241	3.75	5.25	2,737,071.43
106	709RM06D11	0.11		-	-	22.60	84.75	113	3.75	5.25	1,283,357.14
107	709RM06D12	0.08		-	-	15.56	58.35	78	3.75	5.25	883,585.71
108	709RM06D13	0.19		-	-	37.80	141.75	189	3.75	5.25	2,146,500.00
109	709RM06D14	1.39		-	-	277.40	1,040.25	1,387	3.75	5.25	15,752,357.14
110	709RM06D15	1.13		-	-	225.80	846.75	1,129	3.75	5.25	12,822,214.29
111	709RM06D16	1.60		-	-	320.00	1,200.00	1,600	3.75	5.25	18,171,428.57
112	709RM06D17	0.06		-	-	12.00	45.00	60	3.75	5.25	681,428.57
113	709RM06D18	0.08		-	-	16.00	60.00	80	3.75	5.25	1,208,571.43
114	709RM06D19	0.29		-	-	58.00	217.50	290	3.75	5.25	3,293,571.43
115	709RM06D20	0.27		-	-	53.60	201.00	268	3.75	5.25	3,043,714.29
116	709RM06D21	0.52		-	-	104.00	390.00	520	3.75	5.25	5,905,714.29
117	709RM06D22	0.58		-	-	116.20	435.75	581	3.75	5.25	6,598,500.00
118	709RM06D23	0.27		-	-	54.40	204.00	272	3.75	5.25	4,109,142.86
119	709RM06D24	0.62		-	-	123.60	463.50	618	3.75	5.25	7,018,714.29
120	709RM06D25	0.20		-	-	40.60	152.25	203	3.75	5.25	2,305,500.00

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
121	709RM06D26	0.24		-	-	48.00	180.00	240	3.75	5.25	3,625,714.29
122	709RM06D27	0.43		-	-	86.00	322.50	430	3.75	5.25	6,496,071.43
123	709RM06D28	1.63		-	-	326.00	1,222.50	1,630	3.75	5.25	18,512,142.86
124	709RM06D29	0.71		-	-	142.00	532.50	710	3.75	5.25	8,063,571.43
125	709RM06D30	0.24		-	-	48.00	180.00	240	3.75	5.25	2,725,714.29
126	709RM06D31	0.42		-	-	83.60	313.50	418	3.75	5.25	4,747,285.71
127	709RM06D32	0.33		-	-	65.00	243.75	325	3.75	5.25	3,691,071.43
128	709RM06D33	0.26		-	-	51.40	192.75	257	3.75	5.25	2,918,785.71
129	709RM06D34	0.39		-	-	78.40	294.00	392	3.75	5.25	4,452,000.00
130	709RM06D35	0.83		-	-	166.00	622.50	830	3.75	5.25	9,426,428.57
131	709RM06D36	0.81		-	-	162.00	607.50	810	3.75	5.25	9,199,285.71
132	709RM06D37	0.30		-	-	60.00	225.00	300	3.75	5.25	4,532,142.86
133	709RM06D38	1.26		-	-	252.00	945.00	1,260	3.75	5.25	14,310,000.00
134	709RM06D39	0.62		-	-	124.00	465.00	620	3.75	5.25	7,041,428.57
135	709RM06D40	0.72		-	-	144.00	540.00	720	3.75	5.25	8,177,142.86
136	709RM06D41	0.56		-	-	112.00	420.00	560	3.75	5.25	6,360,000.00
137	709RM06D42	0.45		-	-	90.00	337.50	450	3.75	5.25	5,110,714.29
138	709RM06D43	0.21		-	-	42.00	157.50	210	3.75	5.25	2,385,000.00
139	709RM06D44	0.41		-	-	82.00	307.50	410	3.75	5.25	4,656,428.57
140	709RM06D45	0.26		-	-	52.00	195.00	260	3.75	5.25	3,927,857.14
141	709RM06D46	0.58		-	-	116.00	435.00	580	3.75	5.25	8,762,142.86
142	709RM06D47	0.24		-	-	47.40	177.75	237	3.75	5.25	2,691,642.86
143	709RM06D48	0.55		-	-	109.60	411.00	548	3.75	5.25	6,223,714.29
144	709RM06D49	0.50		-	-	100.80	378.00	504	3.75	5.25	5,724,000.00
145	709RM06D50	0.29		-	-	58.40	219.00	292	3.75	5.25	3,316,285.71

SN	Road Code	Proposed Improvement				Structure		Drainage	Pavement Width	Gravelling width	Total cost
		Upgrading	Rehabilitation	Periodic Maintenance	Re-Const	Gabion	Masonry				
146	709RM06D51	0.13		-		26.60	99.75	133	3.75	5.25	1,510,500.00
147	709RM06D52	1.22		-		244.00	915.00	1,220	3.75	5.25	13,855,714.29
148	709RM06D53	0.54		-		108.00	405.00	540	3.75	5.25	8,157,857.14
149	709RM06D54	0.29		-		57.20	214.50	286	3.75	5.25	3,248,142.86
150	709RM06D55	0.14		-		28.40	106.50	142	3.75	5.25	1,612,714.29
151	709RM06D56	0.48		-		95.80	359.25	479	3.75	5.25	7,236,321.43
152	709RM06D57	0.39		-		78.00	292.50	390	3.75	5.25	5,891,785.71
153	709RM06D58	0.21		-		42.00	157.50	210	3.75	5.25	3,172,500.00
154	709RM06D59	0.31		-		62.00	232.50	310	3.75	5.25	3,520,714.29
155	709RM06D60	0.21		-		42.00	157.50	210	3.75	5.25	3,172,500.00
156	709RM06D61	0.71		-		142.00	532.50	710	3.75	5.25	10,726,071.43
157	709RM06D62	0.29		-		58.00	217.50	290	3.75	5.25	4,381,071.43
158	709RM06D63	0.10		-		19.70	73.88	99	3.75	5.25	1,118,678.57
159	709RM06D64	0.24		-		47.20	177.00	236	3.75	5.25	2,680,285.71
160	709RM06D65	0.76		-		151.20	567.00	756	3.75	5.25	8,586,000.00
161	709RM06D66	0.52		-		104.60	392.25	523	3.75	5.25	5,939,785.71
162	709RM06D67	0.30		-		59.00	221.25	295	3.75	5.25	3,350,357.14
			86,232,650.00	-		-	-	-			3,015,271,871.43

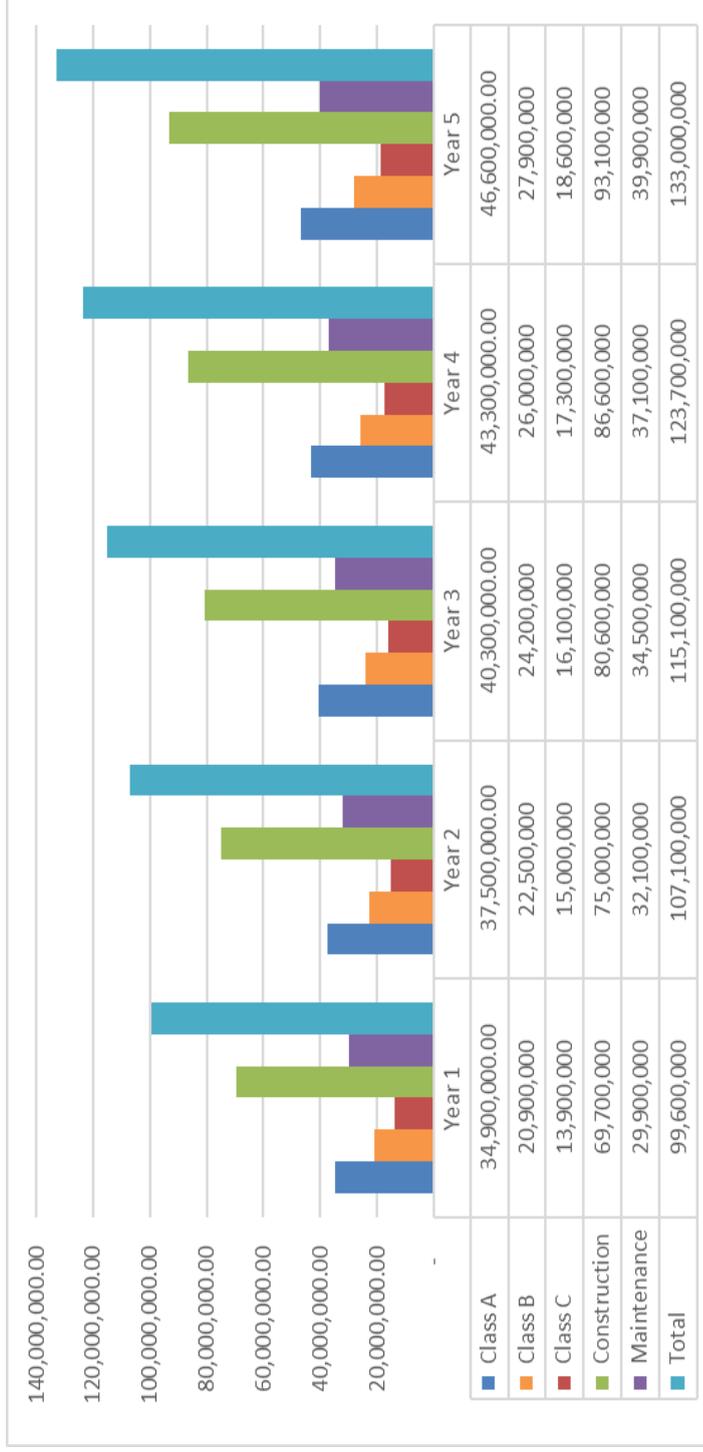
Annex 2: Twenty-year budget requirement considering time value

Year	Budget Requirement	Class A	Class B	Class C
1	69,738,418.73	34,900,000.00	20,900,000.00	13,900,000.00
2	74,968,800.13	37,500,000.00	22,500,000.00	15,000,000.00
3	80,591,460.14	40,300,000.00	24,200,000.00	16,100,000.00
4	86,635,819.66	43,300,000.00	26,000,000.00	17,300,000.00
5	93,133,506.13	46,600,000.00	27,900,000.00	18,600,000.00
6	100,118,519.09	50,100,000.00	30,000,000.00	20,000,000.00
7	107,627,408.02	53,800,000.00	32,300,000.00	21,500,000.00
8	115,699,463.62	57,800,000.00	34,700,000.00	23,100,000.00
9	124,376,923.39	62,200,000.00	37,300,000.00	24,900,000.00
10	133,705,192.65	66,900,000.00	40,100,000.00	26,700,000.00
11	143,733,082.10	71,900,000.00	43,100,000.00	28,700,000.00
12	154,513,063.25	77,300,000.00	46,400,000.00	30,900,000.00
13	166,101,543.00	83,100,000.00	49,800,000.00	33,200,000.00
14	178,559,158.72	89,300,000.00	53,600,000.00	35,700,000.00
15	191,951,095.63	96,000,000.00	57,600,000.00	38,400,000.00
16	206,347,427.80	103,200,000.00	61,900,000.00	41,300,000.00
17	221,823,484.89	110,900,000.00	66,500,000.00	44,400,000.00
18	238,460,246.25	119,200,000.00	71,500,000.00	47,700,000.00
19	256,344,764.72	128,200,000.00	76,900,000.00	51,300,000.00
20	275,570,622.07	137,800,000.00	82,700,000.00	55,100,000.00

Annex 3: Budget details for next five Years

	Class A	Class B	Class C	Construction	Maintenance	Total
Year 1	34,900,000.00	20,900,000	13,900,000	69,700,000	29,900,000	99,600,000
Year 2	37,500,000.00	22,500,000	15,000,000	75,000,000	32,100,000	107,100,000
Year 3	40,300,000.00	24,200,000	16,100,000	80,600,000	34,500,000	115,100,000

	Class A	Class B	Class C	Construction	Maintenance	Total
Year 4	43,300,000.00	26,000,000	17,300,000	86,600,000	37,100,000	123,700,000
Year 5	46,600,000.00	27,900,000	18,600,000	93,100,000	39,900,000	133,000,000
Total	202,600,000.00	121,500,000	80,900,000	405,000,000	173,500,000	578,500,000



Annex 4: Road Priorities

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R101	72A006R	Patkariya, Punarbas 10 to end of ward number 1	3	A	<u>3</u>
R201	709RM06A01	Siddhababa Marga	2	A	<u>2</u>
R203	72A006R	Health post to Sarada Ma Vi Nauranga Tole	1	A	<u>1</u>
R217	709RM06A02	Ward office north to gau link road at nauranga	38	A	12
R301	72A006R	Playground to south connecting road at Nauranga	55	A	13
R302	709RM06A03	Khelmaidan Road Nauranga	10	A	7
R303	709RM06A04	Sarada Ma Vi side road Nauranga	11	A	8
R309	709RM06A05	Hariyali Marga	32	A	10
R314	709RM06A06	Inner Road to connect Hariyali marga	9	A	6
R401	72A006R	Road to Ban Nala	5	A	<u>4</u>
R415	709RM06A07	Shambhu Marga	13	A	9
R501	709RM06A08	Nabodaya School to Bhuiya	37	A	11
R606	709RM06A09	Ban Nala Marga	7	A	<u>5</u>
R103	709RM06B01	Dada Bichuwa Road 1 connect to Ban Nala Marga	65	B	10
R120	709RM06B02	Shiva Mandir to Ban Nala Dada Bichuwa	4	B	<u>1</u>
R202	709RM06B03	Shiva Mandir to Doda River	149	B	14
R204	709RM06B04	Road east of Bishnu mandir at Dada Bichuwa forming small loop	155	B	16
R210	709RM06B05	Bishnu Mandir Marga	150	B	15
R308	709RM06B06	Connecting road west of Bishnu Mandir at Binabari	120	B	13
R402	709RM06B07	Binabari Khola Culvert to Durga Mandir	98	B	12
R403	709RM06B08	Shiva Parbati Marga	35	B	<u>4</u>
R416	709RM06B09	Connecting road west of shiva parbati marga at Binabari	36	B	<u>5</u>
R431	709RM06B10	Binabari Road 3	95	B	11
R506	709RM06B11	Binabari Road 4	49	B	9
R507	709RM06B12	Road east of Mahadev Marga at Binabari	47	B	7
R508	709RM06B13	Mahadev Marga	48	B	8

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R509	709RM06B14	Health post to ban nala to doda river	6	B	<u>2</u>
R510	709RM06B15	South road of Nauranga Khel maidan	46	B	6
R608	709RM06B16	Link road to connect siddhababa marga	22	B	<u>3</u>
R102	709RM06C01	Dead end road from west of shiva mandir west at binabari	73	C	27
R105	709RM06C02	Road east of Bishnu mandir	34	C	9
R107	709RM06C03	Dada bichuwa ban nala to house	63	C	20
R108	709RM06C04	South of Ban nala chowk to house	75	C	28
R109	709RM06C05	Road west of shiva parbati marga @Binabari tole	62	C	19
R110	709RM06C06	Forest office to agriculture field to doda	40	C	11
R111	709RM06C07	Binabari khola culvert to khet road	78	C	30
R112	709RM06C08	Kanja to Suspension Bridge to Kharranala Corridor to Kharranala Bridge	71	C	26
R113	709RM06C09	Ward No 2 office to Gaupalika	67	C	23
R114	709RM06C10	Dada Kanja to Bajjanath School to Kharra Nala Bridge	66	C	22
R115	709RM06C11	Dada Kanja culvert to east of siddhabaijanath school through rice mill	77	C	29
R117	709RM06C12	Dada kanja culvert to kanja tole road east of rice mill	67	C	23
R118	709RM06C13	Kanja Chowk to Belauri	61	C	18
R121	709RM06C14	Bajjanath Mandir to Doda River RCC bridge	83	C	31
R122	709RM06C15	Kanja to Doda River	67	C	23
R124	709RM06C16	Khola kanja road connecting through ag land	59	C	17
R126	709RM06C17	Gaupalika to HP to School	39	C	10
R127	709RM06C18	Resort road	64	C	21
R205	709RM06C19	Resort Road to Kanj Shiva Mandir	142	C	56
R206	709RM06C20	Link Road to Doda River Road	141	C	55
R208	709RM06C21	Ward 2 offc to school road	145	C	58
R209	709RM06C22	Linking Road Rana Krishi Firm	154	C	64
R211	709RM06C23	Tank to Ward 2	143	C	57
R212	709RM06C24	Gaupalika Office Back to Kharra Nala	145	C	58
R213	709RM06C25	Ward 2 Office to Kharra Nala	156	C	65

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R214	709RM06C26	Link Road Siddhanath tole	148	C	61
R215	709RM06C27	Link Road Baijanath Tole	153	C	63
R216	709RM06C28	Road to Play ground near Doda	151	C	62
R218	709RM06C29	Road from North of Orchid Academy	147	C	60
R222	709RM06C30	Kasuwa Tole to Kharra Nala Road	158	C	66
R223	709RM06C31	Connecting road North of Brick factory at kasuwa	140	C	54
R224	709RM06C32	Dada kanja mandir to houses	138	C	53
R304	709RM06C33	Siddha baijanath school to jungle road	131	C	52
R305	709RM06C34	Mini bridge near siddhabaijanath mandir to khet road	128	C	51
R306	709RM06C35	Link road to police station	33	C	8
R310	709RM06C36	Kharranala to brick factory road	122	C	46
R311	709RM06C37	Dada kasuwa gau road connect to brick factory road	124	C	48
R312	709RM06C38	Kasuwa Tole to Parsia Tole (Forest Route)	121	C	45
R315	709RM06C39	Kasuwa Tole to Parsia Tole (River Route)	125	C	49
R318	709RM06C40	Road from bridge to Ghangeshor nala to gaun	126	C	50
R319	709RM06C41	Road to connect Parsiya tole through Ghangeshwor nala	123	C	47
R404	709RM06C42	Link road to connect gaunghar clinic at Parsiya tole	100	C	38
R405	709RM06C43	Danda Parsia Wooden Bridge to Parsia Basti	90	C	34
R406	709RM06C44	Link road from east of Ghangeshwor culvert at Nanda Gaun	92	C	35
R407	709RM06C45	Chhya smriti marga	104	C	41
R409	709RM06C46	Ward 3 office to Balmi Tole to RCC bridge construction Doda River	112	C	44
R410	709RM06C47	Syali Nala Route to RCC bridge construction at Doda River	94	C	36
R413	709RM06C48	Ward 3 office to Anamol Krishi Sahakari to RCC bridge at Doda River	103	C	40
R414	709RM06C49	Syali Nala Culvert to Balmi Tole	42	C	13
R417	709RM06C50	Connecting road north of syali nala at Balmi tole	102	C	39
R421	709RM06C51	Ward 3 Office to Dunga to Syali Khola	97	C	37
R423	709RM06C52	Way to Balmi Gaun	41	C	12
R424	709RM06C53	Saraswoti Ma Vi to Balmi Gaun	107	C	42

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R425	709RM06C54	Connecting road east of saraswati school at dunga chhoti parsiya	110	C	43
R427	709RM06C55	RCC bridge ward 3 and 6 boarder through Syali Nala Route	89	C	33
R428	709RM06C56	Syali Nala to Chhoti Parsia	88	C	32
R432	709RM06C57	Parsiya tole road behind the church	14	C	<u>2</u>
R502	709RM06C58	Parsiya church to jungle road	45	C	15
R505	709RM06C59	Parsiya church east to jungle road	43	C	14
R511	709RM06C60	Gaughar clinic to school road	52	C	16
R601	709RM06C61	West of krishi sahakari to house link road	27	C	7
R602	709RM06C62	Parsia Tole (Boarder to 3 and 4) to RCC bridge under construction at Doda (Bhuli)	8	C	<u>1</u>
R603	709RM06C63	Swotatra Ma Vi to ward 4 office	23	C	6
R607	709RM06C64	Dadajhai Doda River Side Road	20	C	<u>4</u>
R609	709RM06C65	Ward 1 Office to Doda River	21	C	<u>5</u>
R610	709RM06C66	Connecting road north ofplay ground to connect suspension bridge at Dadajhai	15	C	<u>3</u>
R104	709RM06D01	Road behind the ward office at Dadajhai	79	D	26
R106	709RM06D02	Brick Factory Road	84	D	30
R116	709RM06D03	Dadajhai Tole Road to connect doda nadi	74	D	24
R119	709RM06D04	Road to connect ward office behind Baijanath School	79	D	26
R123	709RM06D05	Road to connect doda from ward office road to doda at dadajhai	58	D	20
R125	709RM06D06	Dadajhai Doda Side Road to Agricultural Field	60	D	21
R128	709RM06D07	Dadajhai Tole Road 5	56	D	18
R129	709RM06D08	Way to Itaha Baba mandir	79	D	26
R130	709RM06D09	Parsia Basti to Doda River	82	D	29
R131	709RM06D10	Motorghat to Doda River	57	D	19
R132	709RM06D11	School - Belchowk - Suklaphata Simana	85	D	31
R133	709RM06D12	Motorghat to baijanath school	12	D	<u>1</u>
R134	709RM06D13	Road to Agriculture Field	70	D	22
R135	709RM06D14	Road to Khola	72	D	23
R136	709RM06D15	Road to Khola	76	D	25

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R207	709RM06D16	Adharbhut School to Bridge	144	D	61
R219	709RM06D17	Road south of Janachetana school at sikalpatti	136	D	58
R220	709RM06D18	Motorghat road to Macha Pokhari near Durga Mandir	161	D	66
R221	709RM06D19	Motorghat to Janachetana School	137	D	59
R225	709RM06D20	Sikalpatti Tole Road 2 near motorghat	160	D	65
R226	709RM06D21	Road extending east from main road at sikalpatti	159	D	64
R227	709RM06D22	Sikalpatti Tole Road 4 (Ending near Vidhut Griha)	157	D	63
R228	709RM06D23	Durga Mandir to Bajjanath School	162	D	67
R229	709RM06D24	Durga Mandir to Shiva Mandir	139	D	60
R230	709RM06D25	Suklaphata Boder to Doda River	152	D	62
R307	709RM06D26	Suklaphata Boder Bridge to District Road Act Bhuli	129	D	52
R313	709RM06D27	Bhuli Tole to Doda River	135	D	57
R316	709RM06D28	Road from District road to doda at Bhuli tole	127	D	51
R317	709RM06D29	Road right of Bhuli tole boarder bridge	131	D	54
R320	709RM06D30	Bel chowk to khet dead end road	129	D	52
R321	709RM06D31	Road behind janachetana school	133	D	55
R322	709RM06D32	Link road behind ward office	134	D	56
R323	709RM06D33	Link road behind ward office	118	D	49
R324	709RM06D34	Connecting link road	119	D	50
R408	709RM06D35	Bani Road Ghampakatti to Annapurna Tole to Gadbijuwa Taal	108	D	41
R411	709RM06D36	Bani Road to Forest Office at Annapurna Tole	101	D	38
R412	709RM06D37	Connecting road through khelmaidan at Ghampakatti tole	116	D	47
R418	709RM06D38	Mahavir Khalan Gaun Road	105	D	39
R419	709RM06D39	Forest Office Road Annapurna Tole	99	D	37
R420	709RM06D40	Bajjanath Mandir at Bani Road to Doda River	95	D	36
R422	709RM06D41	Road connect district road to doda north of satsang at Bajjanath tole	87	D	33
R426	709RM06D42	Road from district road to Gadbijuwa lake at Bajjanath tole	109	D	42
R429	709RM06D43	Road from east of panitanki to Gadbijuwa lake	114	D	45

Road Code	Digital Code	Road Name	Rank	Road Class	Rank in Class
R430	709RM06D44	Road to connect Bajjanath Ma Vi school	93	D	35
R433	709RM06D45	Bajjanath Tole Road 5	110	D	43
R434	709RM06D46	Connecting road from church at ghamkapatti tole	91	D	34
R435	709RM06D47	Ghamkapatti culvert link road	113	D	44
R436	709RM06D48	Road behind pani tank to connect satsang	86	D	32
R437	709RM06D49	Shiva Taal Bahu Udeshiya Sahakari to Khadgariya Tole	106	D	40
R438	709RM06D50	Chandev Chowk to Shiva Mandir Khadgariya Tole	115	D	46
R439	709RM06D51	Khadgariya Tole to Radha Tole	117	D	48
R503	709RM06D52	Connecting road west of Chandev chowk towards North	51	D	15
R504	709RM06D53	Small dead end road from west of Chandev chowk to south	43	D	13
R512	709RM06D54	Chandev Chowk to Saraswoti Marga to Forest End	54	D	17
R513	709RM06D55	Road through ward 6 office	49	D	14
R514	709RM06D56	Saraswoti Marga to Shiva Taal Bahu Udeshiya Sahakari through Syali Nala	53	D	16
R604	709RM06D57	Bhulbhule taal to aadharbhut swasthe kendra road	28	D	9
R605	709RM06D58	Sushant Tole Church Road	29	D	10
R611	709RM06D59	Dead End road to Syali Nala	24	D	6
R612	709RM06D60	Syali Nala Road 2	29	D	10
R613	709RM06D61	To Forest	19	D	<u>5</u>
R614	709RM06D62	To Forest	16	D	<u>2</u>
R615	709RM06D63	Connecting road to home	31	D	12
R616	709RM06D64	Connecting road to home south of chandev chowk	25	D	7
R617	709RM06D65	Shiva taal sahakari to syali nala to doda river	18	D	<u>4</u>
R618	709RM06D66	Syali culvert north connecting road	26	D	8
R619	709RM06D67	Syali culvert north to connecting road to doda river	17	D	<u>3</u>

