**Geruwa Rural Municipality**

**Office of the Rural Municipal Executive**

**Pashupatinagar, Bardiya, Province No. 5**

# Rural Municipality Transport Master Plan (RMTMP)

**A Final Report**

## Submitted By


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# Letter of Submission

**Geruwa Rural Municipality**

**Office of the Rural Municipal Executive**

**Pasupatinagar, Bardiya**

**June 2018**

## Final Report

This document is the Final Report prepared for the project, "Rural Municipality Transport Master Plan (RMTMP)" undertaken by, Geruwa Rural Municipality Office, Pasupatinagar, Bardiya. This document has been prepared by Intensive Study and Research Centre for Geruwa Rural Municipality Office, Pasupatinagar, Bardiya. The opinions, findings and conclusions expressed herein are those of the Consultant and do not necessarily reflect those of the Rural Municipality.

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# Preface / Acknowledgement

This RMTMP Report for Geruwa Rural Municipality has been prepared based on Municipality Transport Master Plan Preparation Guidelines and terms of reference prepared by the Ministry of federal affairs and Local Development, Infrastructure Development Division, (IDD), Singha durbar, Kathmandu, November 2014, and as per the ToR provided along with the contract agreement with the Geruwa Rural Municipality.

The job was entrusted to Intensive Study and Research Centre P. Ltd. This report is prepared and submitted as Final Report.

The consultants would like to express its appreciation to the officials from Geruwa Rural Municipality are highly grateful for the support. We are very grateful with the **Mr. Jaman Singa K C,** Chairman of Rural Municipality, Executive officer **Mr. Bhim Bahadur Khatri**, and other personnel of the Rural Municipality and local peoples who directly and indirectly contributes during this study and field survey. We would also like to present our gratitude to the members of the *wada nagarik manch*, the representatives from different political parties and volunteers for their support and contribution for making the working environment easy and pleasant. Also, we would like to acknowledge engineering section providing suggestion regarding finalization of road class. During Preperation of this Final Report, we have incorporated all the suggestions and comments obtained over Draft report came from presentation of draft report from different personal's.

Finally, the project team would like to express thanks to all staffs and colleagues of Intensive Study and Research Centre P. Ltd for their anxious support for this study.

# Project & Submission Description

| | |
|---|---|
| **Name of the Project** | Rural Municipal Transport Master Plan (RMTMP) of Geruwa Rural Municipality |
| **Project Executing Agency** | Geruwa Rural Municipality,<br>Office of the Rural Municipal Executive<br>Pashupatinagar,Bardiya |
| **Implementing Agency** | Geruwa Rural Municipality,<br>Office of the Rural Municipal Executive<br>Pashupatinagar,Bardiya |
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Official Stamp

# Declaration Letter

We hereby declare that we have conducted the study for Rural Municipal Transport Plan (RMTMP) of **Geruwa Rural Municipality** professionally using MoFALD guideline and other acceptable standard Methodologies. To the best of our knowledge, study findings are correct. Rural Municipality Transport Master Plan has been prepared as per standard engineering tools, norms and practices. The visionary city development has been finalized based on the discussion with the stakeholders. We would like to assure you that the RMTMP is reliable, practicable and adequate to the overall development of municipality transport system. We shall be accountable for any misleading information in any part of this report in respective area of study.

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# Executive Summary

Rural Municipality Transport Master Plan (RMTMP) shall be defined as the process of Identification, classification and prioritization of roads within municipality; construction, upgrading, maintenance and rehabilitation of prioritized roads on the basis of approved criteria with calculation of financial budget. Preparation of RMTMP is an attempt of preparing municipal development plan for the sustainable development of a municipality. Since transportation infrastructure plays vital role to foster economic development, proper planning of road network is required along with parallel development of other sectors to achieve the goal of visionary city development plan.

The basic approach for the preparation of RMTMP is the bottom up and participatory approach. The ultimate goal of most transportation is "access," people's ability to reach desired goods, services and activities. Transportation decisions often involve trade-off's between different forms of access. The pattern of traffic at morning peak and evening peak is just opposite. The Right of Way (RoW) and the carriageway width of the existing Municipal roads are about 4 to 6 m only. For the development of city with efficient transportation system it is inherent to provide appropriate roadway width. Thus, the major constraint for the implementation of RMTMP is to provide sufficient right of way to the roads.

Geruwa Rural Municipality is located in Bardiya district in Province 5 locating on Bheri zone covers an area of 78.41 square kilometre. This Rural Municipality was established merging existing Patvar, Gola, Pasupatinagar and Manau V.D.C. (Ministry of Federal Affairs and Local Development, 2017). According to the national census 2011 projection the total population of the Geruwa Rural Municipality is 34,871 comprising 16,434 (47.13 %) male and 18,437 (52.87%) female residing in 6,135 households. Geruwa Rural Municipality has an average population density of around 445 people per sq. km. Tharu (Ethnic Group) is the dominant caste with 22,457 individuals which will be 64.40% of the total population. Secondly Cheetri with 13.79% & Brahmin (Hilly) ranked third with 7.89 %.

The main trading centre for Geruwa Rural municipality is Santibazzar (ward 3), Pashupatinagar (ward 5). There are limited number of shops in some other market area of wards like Gola, Bindri, and most of them sells daily consumed material, Clothes, etc. In recent times, the shopping market is found to be expanding due to increase in trading activity like Hardware for house construction, Electronic. Next to these Trading Centre, the biggest market area for Geruwa Rural municipality is Rajapur, Gulariya and Nepalgunj. These are comparatively bigger market than other where people rely to sell their agricultural and several products and also to buy several items.

Geruwa Rural Municipality has directly linked with Rajapur Municipality and Tikapur area in Kailali District via Existing District road followed by Postal Road. The Rural Municipality is adjacent to the East-West National Highway (H01) which can be approached just through boat or across Tikapur Municipality lying in western part of Municipality. The DTMP Report of Bardiya District has enlisted some roads under DRCN which connects the Geruwa Rural Municipality namely 58DR001, 58DR002,(DoLIDAR, 2016) . The above-mentioned roads were supposed to be gravelled to make these roads as all-weather roads by the end of 2018. But most of the roads within wards are found to be Earthen with dust and undulating surface while the road connecting Rajapur ring road and Manpurtapara -Gola was found to be Gravelled in most of section and Blacktop in Rajapur area.

The municipality inventory identified just over 232.32 km of roads. Study and analysis shows that Manahari Rural Municipality has more than 209municipal roads. Most of the roads in Geruwa Rural Municipality are Earthen (44%)followed by Gravelled (47%) road but none of the roads were found to be Metallic. Further, New construction of 23.72 Km of road need to be carried out to meet the road access up to public access of road network. A few kilometres of road are Gravelled or paved by Stones and boulders while other roads are earthen as they have been newly constructed. About 70% of the roads are below 6 m wide while 20% of Road section are wider than 8 meter and most of this section falls under ring road. This figure reflects that most of the section of ring road posses sufficient road width while 9 % of the road have road width between 6m to 8m. Most of the roads are earthen and are very narrow (<5.0 m) to address the trip generated from various area. Again, the ward wise distribution of road and land-use pattern has been presented. The road density as observed for total area of Rural Municipality is found as 3.50 km road per square km area. Again, the density of road per 1000 population is found as 7.93 km. The road density is varying in up to 2 units, however this shall not have replicated the very worst to very good accessibility situation.

The short term and long term financial plan was forecasted. The Projected financial plan for five year showed that the rural municipality is going to invest NRS 19.73 Million of Budget. The cost for the construction each road has determined based on the rate provided in the DTMP guideline and local rates. The total cost of construction excluding SRN and Class ‘D’ Road of municipality was found as NPR 1,309,243,656 for the length of 166.23 km out of 225.82 km of road. As accordance of planning norms, all or 90% of houses need to be within 2km from motorable Road. Most of the community of Rural municipality were not in reach of road. Hence, the study identified that there need to construct further 23.41 km of new track for those communities. The detailed of five year and abstract of twenty year implementation plan has been developed. The implementation plan has prepared based on the priority/rank obtained from the prioritization criteria. Within 5 year budget period with investment of NRs 19.73 Million rural muncicipality is going to construct 6.00 km of Blacktopped road and 31.19 Km of roads will be Gravelled.

# Acronyms / Abbreviations

| | |
|---|---|
| DDC | District Development Committee |
| DOLIDAR | Department of Local Infrastructure Development and Agricultural Roads |
| DTMP | District Transport Master Plan |
| GIS | Geographic Information System |
| GPS | Global Positioning 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 | Rural 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

Rural Municipality Transport Master Plan (RMTMP) shall be defined as the process of Identification, classification and prioritization of roads within Rural Municipality; construction, upgrading, maintenance and rehabilitation of prioritized roads based on approved criteria with calculation of financial budget. The background for preparation of transport master plan along with the objectives and the scope of planning has stated in this chapter. The basic approach for the preparation of RMTMP is the bottom up and participatory approach.

## 1.1 Background

This report on Rural Municipality Transport Master Plan of Geruwa Rural Municipality is the outcome of study carried out Intensive Study and Research Centre (P) Ltd. as per the agreement between the Office of Geruwa Rural Municipality and the consultant. This Rural Municipality Transport Master Plan (RMTMP) has been prepared following the Rural Municipality Transport Master Plan preparation guide lines and terms of reference prepared by MoFALD. This report has been prepared with intensive field visit of Transport planner, Engineer, Social mobilizes, Enumerators and other professionals.

A broader perspective on urban transportation is proposed in National Urban Strategy 2015. The strategies include the integration of land use and transportation in urban as well as regional planning and development of related institutional mechanisms and capacity. The provision of hierarchically balanced urban road infrastructure; promotion of sustainable urban public transport, and preparation and implementation of comprehensive transport management standards and plans for urban areas are the boarder perspective that has focused in the strategy. In prioritized regions the provision of high- speed inter-urban transport infrastructure is also proposed(Government of Nepal, 2015).

Local Governance Operation Act (2074) provisions formulation of local development plan according to needs-based, bottom-up and participatory approach. It has prominently defined tangible steps for formulation of such development plan. The main objective of this plan is to make investment for planned development within each of the local bodies' territory. Ultimately, development endeavours help attaining sustainable livelihood and improved well-being of people. People's needs for sustainable livelihood and improved well-being are such that they require better access to information, markets and opportunities; they need better access to health, education and

other goods and services. Hence, as a part of RMTMP preparation, accessibility planning has recommended as an effective tool to access the existing situation of the services and facilities. Strategic road network is important for national income while local roads are for poverty reduction (Worku, 2011). The interventions derived from the accessibility planning has shall represent the real needs and priorities of the local people(GoN, 2014).

Ministry of Federal Affairs and Local Development stepped up to bring forward proposal to create New Municipalities including Municipalities from those urban and semi-urban settlements by combining prevalent Village Development Committees approved the proposal leading to creation of 753 local bodies with new municipalities in various steps. There are altogether 6 Metropolitan,11 Sub-Metropolitan, 276 Municipalities and 460 Rural Municipality. in Nepal till October,2017. Geruwa Rural Municipality is one, which has established through agglomeration of Patavar, Gola, Pasupatinagar and Manau Village Development Committees. Since these rural municipalities are at an early stage of infrastructure development they require appropriate long-term plan so that organized and beautiful cities shall be developed. RMTMP has considered as an objective tool for prioritizing the projects and it will fulfil partially the lacking part of LGOA.

## 1.2 Objective of RMTMP

The overall objective of the consulting services is to prepare the Rural Municipality Transport Master Plan (RMTMP) of the Geruwa Rural Municipality. The RMTMP will be prepared as per the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)"s Approach Manual and ToR provided by the client. The specific objectives, but not necessarily limited to the following, are:

- Finalize visionary city development plan if Comprehensive Town Development Plan is not prepared.
- Analyse the accessibility situation.
- Identify and priorities the interventions based on the accessibility situation.
- Prepare Indicative Developmental Potential Map (IDPM).
- Prepare the Rural Municipality Inventory Map (MIM) of Road networks.
- Collection of demands for new/rehabilitation transport linkages from Municipalities/Settlements based on city development plan.
- Prepare the Perspective Plan of transport services and facilities.
- Synchronize the Final Perspective Plans of adjoining VDCs/Municipalities/districts.
- Develop scoring criteria and its approval from Rural Municipality.
- Prepare the five years Rural Municipality Transport Master Plan (RMTMP)

- ❖ Prepare a realistic physical and financial implementation plan of prioritized roads for the RMTMP period; and
- ❖ Prepare Municipal Transport Perspective Plan (MTPP).

## 1.3 Scope and Limitation of RMTMP

The consulting services is to provide high quality professional services for the preparation of the Rural Municipality Transport Master Plan (RMTMP), harmonized with the approach Manual of Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)'s. The scope of services carried out by the consultant shall broadly include, but not be limited to, the following:

a) Assist in the Formulation of the Municipality Roads Coordination Committee (MRCC).
b) Secondary Sources of Information and Review of the existing RMTMP.
c) Accessibility data collection and analysis.
d) Prepare the Indicative Municipality Development Potential Map (IDPM).
e) Prepare MIM of urban roads, main trails and bridges within the Rural Municipality.
f) Collection of demands for new/upgrading/rehabilitation transport linkages from wards/settlements.
g) Developing Scoring Criteria and its Approval from Municipality.
h) Road classification and nomenclature.
i) Analyse Fund Availability for Roads.
j) Preparation of Perspective Plan of interventions of services and facilities.
k) Preparation of the Rural Municipality Transport Master Plan (RMTMP).
l) Prepare a realistic Physical and Financial Implementation Plan of prioritized roads for the RMTMP period.

## 1.4 Approach

Municipal Transport Master Plan is prepared using participatory bottom-up approach from the settlement level. Techno-Political interface is incorporated in the planning process, where active participation from representatives of Chief of Rural Municipality, Ward Member, political parties, line agencies, Rural Municipality officials is crucial. The Rural Municipality Road Coordination Committee (RMRCC) is constituted as an authorized legislative body of Rural Municipality.

### 1.1.1 General Approach

The Consultant has gone through the objective and ToR for Consultancy Services for preparation of the Rural Municipality Transport Master Plan (RMTMP). The ToR was itself sufficient for the execution of the work.

Integrated Accessibility Planning (IRAP) is an integrated approach to solving problems by combining transport as well as non-transport interventions. It is participatory and bottom-up approach. Active involvement of community people and local authorities in every step is essential. The consultant facilitated the community people and local authorities in their needs identification, project prioritization and visionary development planning process.

The accessibility is function of distance and traveling time, frequency of travel, transport infrastructure difficulty factor, physical facilities of Socially Oriented and Responsibility (SOR), and management of SOR provision and viability of service provision. The degree of accessibility problem was assessed in terms of accessibility index of the settlements to concerned SOR sector. Accessibility Indicator is measurement of accessibility.

The required interventions shall be identified for improving accessibility of every settlement based on easing and reducing travel time, improving physical facilities for SOR and improving management of SOR provision in an integrated fashion.

## 1.5 Methodology

The methodology comprises with the Integrated Accessibility Planning (IAP) tools for the accessibility planning and DoLIDAR's Approach manual for the roads for the preparation of the RMTMP with some modification as per Rural Municipality situation and based on the ToR provided by the Rural Municipality and as directed by the project in-charge of the client.

The Consultant's efforts were comprehensively streamlined to meet the objectives of the assignment by covering scope of services outlined in the prescribed Terms of Reference. The consultant has followed the following specific process to accomplish the assignment as specified in the objectives and scopes of work in the TOR.

***Table 1:*** *Methodology to be Involved during RMTMP Preparation*

| S.N | List of Task | Activities | Output |
|---|---|---|---|
| **1.** | Data Collection | | |
| **1.1** | Review of secondary | ❖ Collection of secondary information/Maps from the various Rural Municipality | ❖ Obtain information about Rural Municipality situation |

| S.N | List of Task | Activities | Output |
|---|---|---|---|
| | source of information | based line agencies, I/NGOs and other regional and central level related institutions. | in general, ready to precede further steps. |
| | Review of existing RMTMP | ❖ Review of available existing RMTMP if any.<br>❖ Data collection about year budgeting for RMTMP road and progress report of Rural Municipality.<br>❖ Interaction with Rural Municipality Technician and other Officials. | ❖ Trend of implementation of RMTMP Planning, constraint of implementation will be found out. |
| **1.2** | Accessibility Data Collection | Through enumerators/field supervisor:<br>❖ Verification of secondary data in the field.<br>❖ Collection of road data using GPS Collection of access situation of every settlement in prescribed form. | ❖ find out the access situation of every settlement ,identification of gaps with the reference to Comprehensive City Development Plan. |
| **2** | Analysis of Data | Data entry -storage of collected data in computer using MS Excel software.<br>❖ Base map preparation<br>❖ Calculation of accessibility index | ❖ Compilation of data, Accessibility index of all Wards of the Rural Municipality |
| **3** | IDPM Preparation | Assess the various potentiality of development of the Rural Municipality<br>❖ Organize Rural Municipality/MRCC meeting<br>❖ GIS map preparation | IDPM report, Finalization of Growth Centres, identification and ranking of existing/potential areas and services. |

| S.N | List of Task | Activities | Output |
|---|---|---|---|
| **4** | MIM preparation | Assess the inventory of existing transportation linkage<br>❖ Reconnaissance survey<br>❖ Identification of required intervention<br>❖ Map preparation | MIM report, identify the existing transport situation, verification of MIM through discussion with the Sub-Metropolitan City. |
| **5** | Area workshop Ward/VDC level | Participatory workshop in each wards<br>❖ Discussion about criteria of prioritization.<br>❖ Standardize the accessibility indicator<br>❖ Synchronize of interventions at Rural Municipality level<br>❖ Validation of access data<br>❖ Prioritization of interventions. | Prioritization of interventions and projects |
| **6** | Perspective Plan | ❖ Compile the result from<br>• Accessibility analysis.<br>• Area workshops.<br>❖ Identify and prioritize the interventions in every services and facilities based on approved Rural Municipality road standard.<br>❖ Extract required interventions in transport linkage from the perspective plan of services and facilities. | Perspective Plan of service and facilities including Rural Municipality Road network. |
| **7** | RMTMP Preparation | ❖ Assess the financial resources<br>❖ Priorities the perspective plan<br>❖ Preparation or updating RMTMP | First five year Rural Municipality road planning. |

| S.N | List of Task | Activities | Output |
|---|---|---|---|
| **8** | Approval of RMTMP | ❖ Presentation of Final RMTMP on Rural Municipality council through<br>❖ MRCC and Rural Municipality<br>❖ meetings. | Final RMTMP report |

### 1.5.1 Secondary Data Collection

Any sorts of data that are collected from secondary sources are called secondary data. These data have been collected from annual report published by district level offices and consultation with various concerned stakeholders. Municipal Road Coordination Committee (MRCC), which compromises 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 Rural Municipality that includes collection of data regarding high development potential areas such as extensive agriculture, horticulture, livestock farming, high value cash crops, cottage and Agricultural based industries, centre for business/commerce/markets places, tourism area, service centres (hospital, health post, agriculture service sub-centre etc.). The information about demographic data of Rural Municipality, various maps showing service centres, 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, Rural Municipality etc. Digitized topographic maps, administrative map of Rural Municipality, strategic road network map prepared by DoR, etc. were some other secondary data that were used during the study. The details are given below:

**List of documents/information will be collected and reviewed**

- ❖ Previous reports of RMTMP prepared by the Rural Municipalities (if any).
- ❖ RMTMP of neighbouring Rural Municipality (if available).
- ❖ District/ Rural Municipality periodic plan prepared by the DDC/ Rural Municipality.
- ❖ Annual reports /publications of line agencies of Rural Municipality.
- ❖ District/ Rural Municipality profile of the DDC/ Rural Municipality.
- ❖ Traffic data of the Rural Municipality roads and strategic roads (if available).
- ❖ Annual plan, Programme and Budgetary allocations of last 5 years.
- ❖ Expenditure in infrastructure development including roads in last 5 years.
- ❖ Report on settlement pattern and market centres of the Rural Municipality.
- ❖ road statistics of neighbouring Municipalities and strategic road Networks.

- Financial and technical Data of ongoing road projects in the Municipalities and schedule including bilateral and multilateral funded projects.
- Demographic Statistics and socio-economic feature of the Rural Municipality.
- Other relevant reports.

**Collection of Maps**

- Toppo maps the 1:25000 scales, which will be used as base map.
- Rural Municipality administrative map of Rural Municipality.
- Arial photographs.
- Rural Municipality Trail Map.
- Map of strategic road Networks of Nepal.
- Other Thematic maps.

### 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 has been 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 were:**

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

Questionnaire method has been used to conduct ***Origin and destination survey*** which gave number of information reflecting, personal, household and trip making characteristics. This survey has also helped 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.

*Figure 1 : Rural Municipality Transport Master Plan ward level discussion*

***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 helped in field validation of base maps and assisted in the preparation of road inventory map, nomenclature and coding of the road linkages and proposed various interventions.

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

***Classified vehicle count*** was conducted to reflect the usage of various vehicles in the certain route, especially where maximum volume occurs. Twelve-hour count has been done at required location and the vehicles have been classified to different types and finally traffic volume have been converted to passenger car unit (PCU) to visualize the exact condition.

***Public Transport and Services Study*** highlighted 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 and Analysis

Data collected at field were used as a base data. All the complete and reliable sets of data were transformed into useable information and the present scenario of Rural 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 MTPP Period. Various transportation models were used for interpretation and forecasting. And, finally various intervention was purposed and their economic analysis were also performed.

### 1.5.4 Preparation of the Indicative Rural Municipality Development Potential Map (IDPM)

The Rural Municipality's Indicative Development Potential has prepared based on visionary city development plan of Rural Municipality. The visionary city Development plan has prepared based the characteristics of the location along with the consultation with the people and MRCC. The final potential map shall be validated trough the MRCC and Rural Municipality. The development potential of the Rural Municipality in agriculture, horticulture, livestock, cottage and small industries, other potentiality of the Rural Municipality has been compiled and prepared on the base map 1:25000 scale.

**a) Rural Municipality base map has been prepared showing:**

- Administrative/political boundaries of Rural Municipality/Ward.
- Large settlement.
- National strategic roads, Rural Municipality roads, roads, trails, bridges.
- Important historical, cultural, religious and preserved places.
- Important water bodies, forest and other lands.

**b) The Consultant has analysed the potentiality of the Rural Municipality from secondary information collected from Rural Municipality line agencies. The development potential area has been defined as:**

- Area with Extensive Agriculture
- Area with Extensive horticulture
- Area with Extensive Live stocking
- Area with Extensive Fisheries
- Area with Extensive High Value Cash Crops
- Area with Extensive Business Market
- Potential area with Tourism Markets
- Potential areas with development of large industries like hydropower, mining development, Potential service centre.
- Other potential development Areas.

### 1.5.5 Preparation of the Rural Municipality Inventory Map (MIM)

Rural Municipality Inventory Map (MIP) has prepared based on field inventory survey. The field survey has been carried out by mobilizing enumerators via walkover surveys. The Inventory includes the roadway length, width, surface type, carriageway width, drainage condition, number of served population, administrative buildings, educational offices and hospitals/health posts. The consultant then carry out reconnaissance survey in the trails, bridges and roads with the help of checklist and update the map. The consultant has also prepared indicative cost estimates of improvements (Routine maintenance, recurrent maintenance & upgrading) and new construction of representative trails, bridges and road in the Rural Municipality.

The consultant has prepared list of all existing transport linkage under the category of routing maintenance, recurrent maintenance, periodic maintenance and upgrading. These lists have been prepared separately for various classes of roads. The consultant then prepared indicative cost estimate for improvement.

Based on linkage inventory and condition of the linkage, easy linkage has been subdivided into maximum four types of section i.e.

- Section Requiring Routine Maintenance
- Section Requiring Periodic Maintenance
- Section requiring rehabilitation
- Unordered section (New construction)

All roads have been plotted under separate legends category by intervention type in MIM. List of roads having gravelled road street cars has been prepared separately. Information regarding inter Rural Municipality road /trails also be included and used drawing planning process.

### 1.5.6 Preparation of Perspective Plan of Interventions of Services and Facilities

The study and planning team has Prepared perspective plan of interventions of services and facilities, which are identified from the accessibility analysis and Rural Municipality level workshops. All the identified interventions have been screened and rated based on approved criteria. The team has discussed with the Rural Municipality technical team and the MRCC relating to interventions of services and facilities for the improvement of the access situation and will forward to Municipal Council meeting with recommendation.

In transportation sector, list of roads, bridges and required interventions for respective roads and bridges has been identified to improve accessibility to goods and services within the Rural Municipality. The perspective plan of Rural Municipality road has been prepared for 20-25 years. All the identified interventions screened and graded based on criteria 'B' of the approach

manual. Accordingly, the final perspective plan of Rural Municipality roads has been developed. The perspective plan shall be shown in GIS maps also.

### 1.5.7 Preparation of the Rural Rural Municipality Transport Master Plan (RMTMP)

Considering the Perspective Plan, the prioritization of the Perspective Plan has been done according to the DoLIDAR Approach Manual. Subsequently, the five-year RMTMP of the Rural Municipality was prepared by selecting interventions (maintenance, upgrading and new construction of main trails, trail bridges and roads) that have top priority in the Perspective Plan and that could be implemented in the next five years period, based on cost estimates of maintenance, upgrading, rehabilitation and new construction of main trails, trail bridges and roads and available financial resources.

**Process and Activities in detail**

The Consultant has listed out all transport linkages given in the Perspective Plan, under the following categories;

a. New construction
b. Upgrading
c. Rehabilitation
d. Recurrent maintenance
e. Periodic maintenance

- These lists have been prepared separately for various classes (Rural Municipality Road, Village Road, Main Trial, and Village Trial).
- On the basis of criteria (for prioritization), the consultant has ranked all the above Projects.
- The financial resources of Rural Municipality on road sector has been analysed first.
- The consultant has prepared next Five Year's Projected Financial Plan by accounting all possible financial resources of Rural Municipality and concerned wards and VDCs.
- The consultant has prepared Five Year Financial Plan of the Rural Municipality based on likely availability of financial resources in next five years. (All consolidated financial resource has been projected based on the past 3-5 years data).
- The consultant will determine the tentative lengths that could be under taken by each year, in each category and under each class. These lengths shall be documented and presented.
- The consultant has prepared all ranked lists of transport linkages to the Rural Municipality Development Committee for the selection of year - wise priority lists which should be implemented in the first, second and fifth year.

- All the ranked lists of transport linkages; the Consultant has selected the year-wise priority lists to be included in the *"Five Year Master Plan"*
- Based on the approved year-wise priority lists, the Consultant has prepared Five Year Road Master Plan.
- Synchronizing of the Final Perspective Plans with Adjoining Rural Municipality was done.
- The Field Report of RMTMP was presented on Rural Municipality and MRCC in a workshop. Incorporating the suggestions and recommendations from the Rural Municipality and MRCC, the Field Report has been prepared. Subsequently, the Municipality will present the final RMTMP report to the Rural Municipality council for formal approval.

# Chapter 2

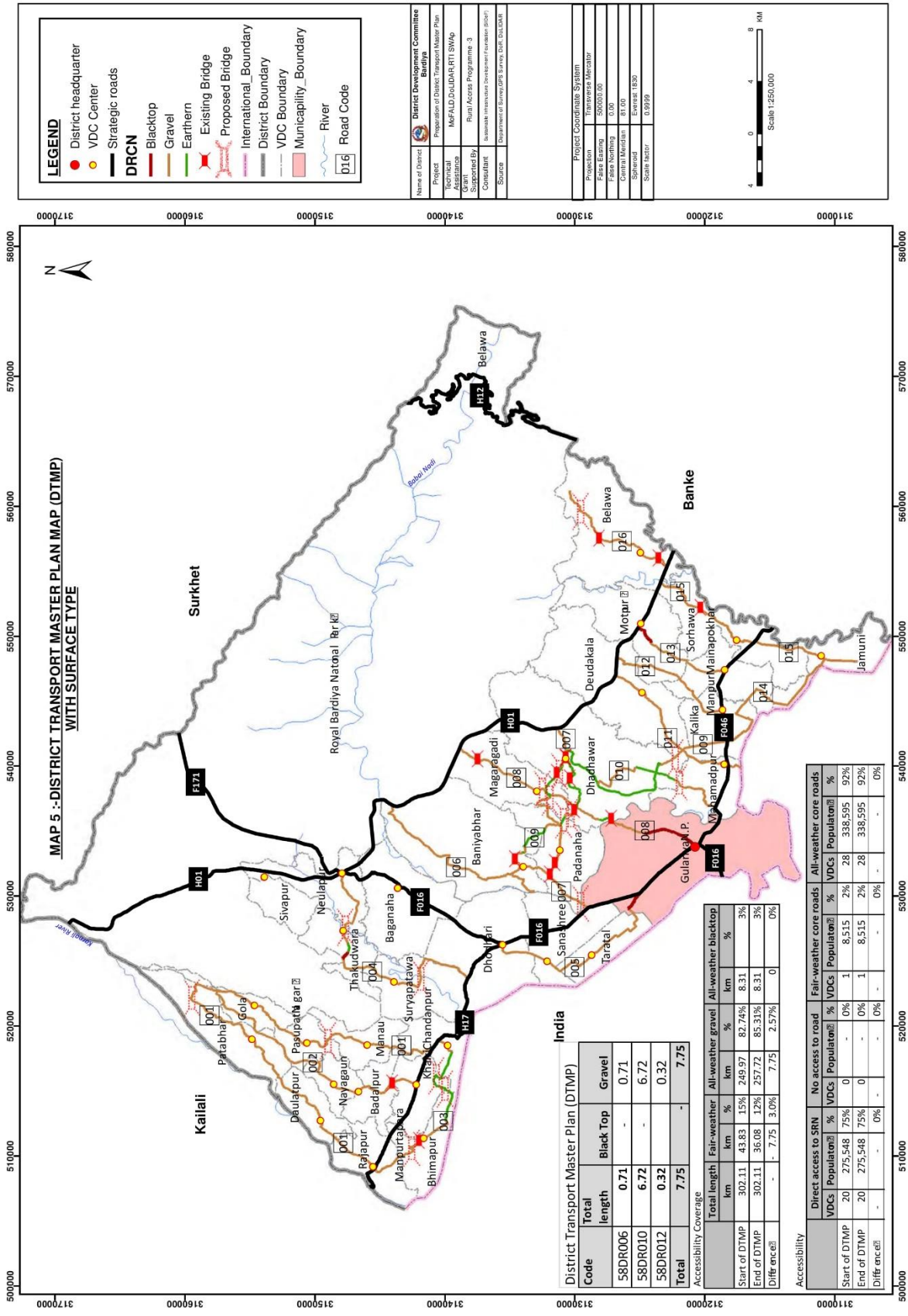
# Review of Existing Infrastructure Situation

Before going through Rural Municipality Transport Master Planning (RMTMP), it is fundamental to know about the present condition transport infrastructure. This chapter includes the existing road and roadside infrastructure along with their current condition. The physical infrastructure which has indirect effect to the transportation system such as urbanization, apartment system has also been assessed.

The existing transportation network of Geruwa Rural Municipality was studied during this inventory survey. Condition of various structures of roads was also studied. Most of the roads were found to be fair weather road. Condition of structures like masonry walls, culverts, drains etc were found to be in poor state. All roads and cross drainage structures requires proper regular maintenance to keep them in full functioning state. Also, lack of cross drainage structures has created difficulties in road crossing. It is required to upgrade all existing roads to all weather roads.

## 2.1 Assessment of Existing Infrastructure Situation

Geruwa Rural Municipality has directly linked with Rajapur Municipality and Tikapur area in Kailali District via Existing District road followed by Postal Road. The Rural Municipality is adjacent to the East-West National Highway (H01) which can be approached just through boat or across Tikapur Municipality lying in western part of Municipality. The DTMP Report of Bardiya District has enlisted some roads under DRCN which connects the Geruwa Rural Municipality namely 58DR001, 58DR002,(DoLIDAR, 2016) . The above-mentioned roads were supposed to be gravelled to make these roads as all-weather roads by the end of 2018. But most of the roads within wards are found to be Earthen with dust and undulating surface while the road connecting Rajapur ring road and Manpurtapara -Gola was found to be Gravelled in most of section and Blacktop in Rajapur area. The Rural Municipality is important based on Agricultural and tourism point of view as Geruwa posses a fertile land for agriculture and Karnali River on western part of Rural Municipality which can attract local and foreign tourist. Hence, Rural Municipality has great importance and possibility of Agricultural based tourism industry. (Field Study, 2018)




| Code | Total length | Black Top | Gravel |
|---|---|---|---|
| 58DR006 | 0.71 | - | 0.71 |
| 58DR010 | 6.72 | - | 6.72 |
| 58DR012 | 0.32 | | 0.32 |
| Total | 7.75 | - | 7.75 |

| | Total length | | Fair-weather | | All-weather gravel | | All-weather blacktop | |
|---|---|---|---|---|---|---|---|---|
| | km | km | % | km | % | km | % |
| Start of DTMP | 302.11 | 43.83 | 15% | 249.97 | 82.74% | 8.31 | 3% |
| End of DTMP | 302.11 | 36.08 | 12% | 257.72 | 85.31% | 8.31 | 3% |
| Difference | - | - 7.75 | 3.0% | 7.75 | 2.57% | 0 | 0% |

| | Direct access to SRN | | | No access to road | | | Fair-weather core roads | | | All-weather core roads | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VDCs | Population | % | VDCs | Population | % | VDCs | Population | % | VDCs | Population | % |
| Start of DTMP | 20 | 275,548 | 75% | 0 | - | 0% | 1 | 8,515 | 2% | 28 | 338,595 | 92% |
| End of DTMP | 20 | 275,548 | 75% | 0 | - | 0% | 1 | 8,515 | 2% | 28 | 338,595 | 92% |
| Difference | - | - | 0% | - | - | 0% | - | - | 0% | - | - | 0% |

*Figure 2: District Road Core Network*

***Source : Rural Access Program, 2014***

### 2.1.1 Strategic Road Network (SRN)

There is one National Highway which passes through northern part of the Rural Municipality area across Geruwa River while it doesnot passes through within the Rural Municipality. However, during transportation planning the existing strategic road in neighbour Municipality and district shall play as an instrumental role for providing service to the Rural Municipality.

### 2.1.2 District Road Core Network (DRCN)

These are the roads connecting old VDCs centres of the district with SRN. The planning of these roads was carried out by the district itself. According to the final report of DTMP of the district, the district roads that passes through this Rural Municipality are listed in Table 3.

***Table 2:*** *List of existing DRCN in Geruwa Rural Municipality*

| S. N. | Name of Road | Class | Road Code | Length (km) |
|---|---|---|---|---|
| **1** | Rajapur-Geruwa ring road | DRCN | 58DR001 | 45.10 |
| **2** | Manpurtapara-Badarpur-Nayagaun-Gola | DRCN | 58DR002 | 21.22 |

***Source:- DoLIDAR, 2016***

Based on NRRS-2012 (Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR), 2012), the minimum RoW of DRCN is 20 m, i.e. 10.0 m on either side. These roads served as feeder for SRN however as a collector from Rural Municipality roads. The Figure 3 & Figure 4 shows Typical cross- section Of DRCN Road.

**Typical cross sections of DRCN Roads**

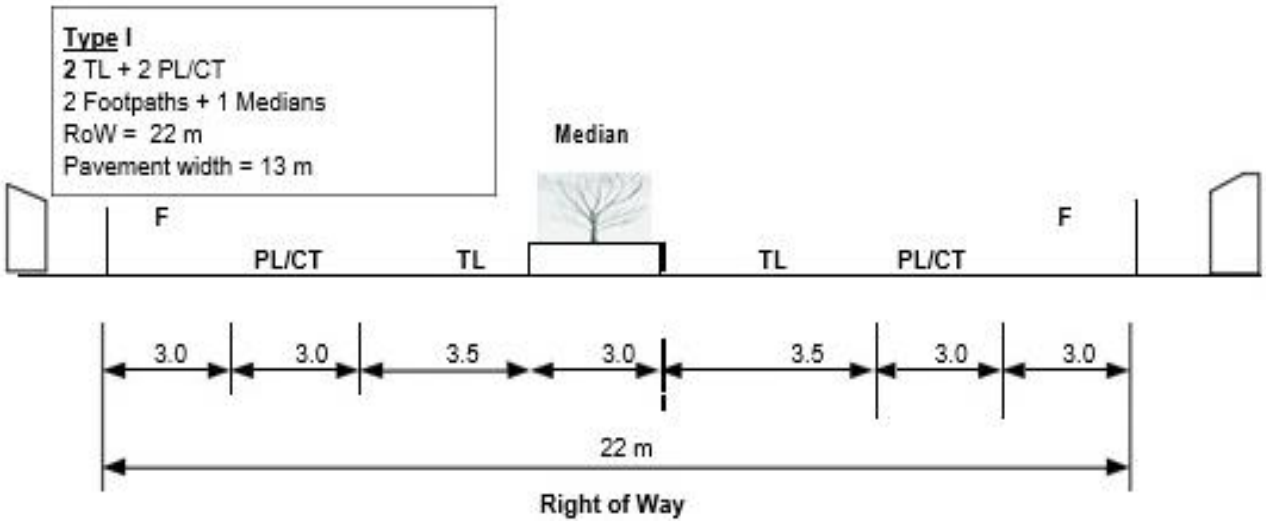



*Figure 3 : Typical Cross-section for DCRN Roads (with RoW 22m)*

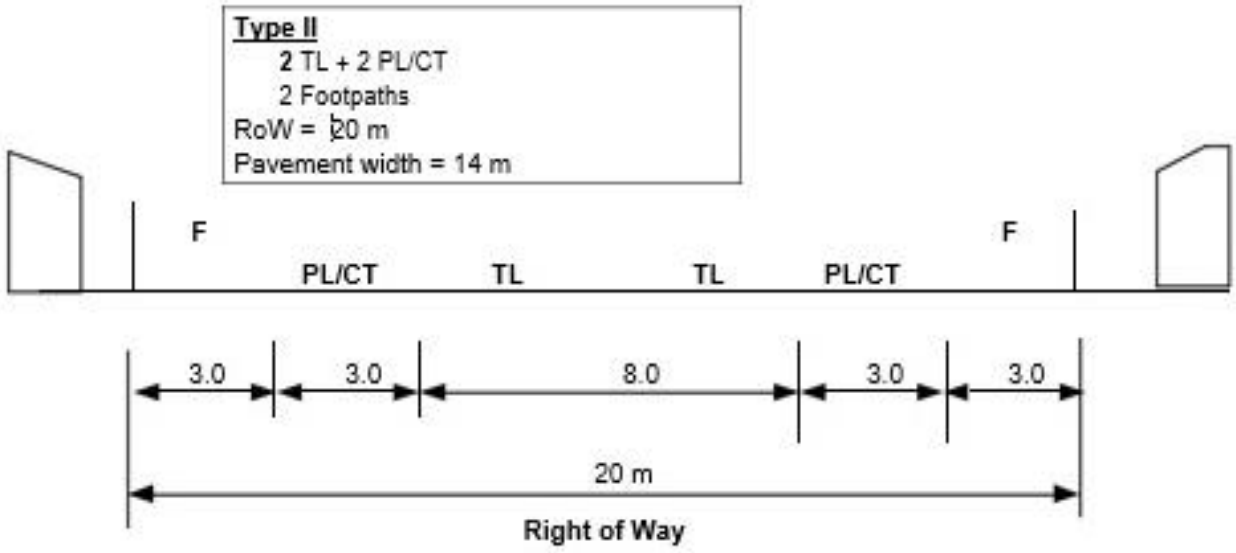



*Figure 4 : Typical Cross-section for DCRN Roads (with RoW 20m)*

### 2.1.3 Village Road Core Network

During the the identification of the DRCN, all other roads that do not belong to the DRCN, the strategic road network or the urban road network (except for large urban areas such as Kathmandu, Lalitpur and Bhaktapur), were classified and coded as village roads and fall under the responsibility of those VDCs. An analysis of a few districts shows that the length of village roads is likely to be less than 20km in most cases (much lower in the case of Hills districts). This length of roads will be easy to manage by the VDC level.

The planning for these roads were not included in the DTMP, as they are not the responsibility of the district. Instead, a separate Village Road Core Network (VRCN) will need to be identified, which will include the more important roads in the VDC. The management of these roads will be the responsibility of the VDC, and any planned interventions will be included in the Annual Work Programme of the VDC. Funding, for those interventions will largely come from VDC grants and community contributions, but some limited additional funding will also be made available from district level and through rural road projects.

The purpose of these VRCN roads is to provide access from the different settlements in the VDC to the DRCN and ultimately the SRN. However, there will also be village roads that do not extend the access to other settlements in the VDC, but only to a few households or to agricultural land. Although those roads were also considered as village roads, they should be excluded from the VRCN and their management should become the responsibility of the communities themselves.

***Table 3:*** *List of the Village Road*

| S. N. | Name of Road | Class | Road Code | Length (km) |
|---|---|---|---|---|
| 1 | Manau(parsaini)-rajapur Road | VR | 58VR002 | 7.48 |
| 2 | Gola Ghattatole (Ring Road)-Bindra-Pashupatinagar-Guhari(Nayagaun) | VR | 58VR007 | 5.51 |
| 3 | Patavbhar-Bankatti-Thapapur-Kathmandu-Janaknagar-Gola | VR | 58VR014 | 2.26 |
| 4 | Patabhar-Kalika Mandir -Bhairampur-RajapurPahadi Tol | VR | 58VR015 | 4.29 |
| 5 | Gola-Patabhar-6-Janaknagar-Aanokhariya | VR | 58VR030 | 4.51 |
| 6 | Bankatti School-Way to Tikapur | VR | 58VR039 | 2.08 |
| 7 | Bankatti-Tikapur Ghat | VR | 58VR044 | 1.78 |
| 8 | Govindapur-Mainapokhar-Khonpur | VR | 58VR050 | 5.26 |
| 9 | Mainapokhar-Kanpurwa-Palakpur-Gidarpur | VR | 58VR060 | 2.65 |
| 10 | Bindra-Lahurpur | VR | 58VR063 | 3.36 |

## 2.2 Review of Rural Municipality Strategy and Goal

The minimum road density on existing Rural Municipality has planned to make at least 7.5 km/sq.km area. Again, the clause number-40 has described the overall strategy of municipal roads. It has focused on:

- Integration of land use and transportation
- Provision of hierarchical and balanced urban road infrastructure development
- Sustainable urban public transportation system
- Standards for urban road management
- Intercity high-speed transportation system

४०. सडक/परिवहन: शहरी यातायात संबन्धमा एउटा फराकिलो दृष्टिकोण राखिएको छ । यस अन्तर्गत प्रमुख रुपमा भूउपयोग र यातायात/परिवहनलाई शहरी तथा क्षेत्रीय योजना तर्जुमा प्रकृयामा एकीकृत गर्दै तत्सम्बन्धी संस्थागत संयन्त्र र क्षमताको विकास गर्ने, तहगत र सन्तुलित शहरी सडक पूर्वाधारको प्राबधान गर्ने, दिगो शहरी सार्वजनिक परिवहनको प्रबन्ध गर्ने, शहरी यातायात व्यवस्थापनका लागि मानकहरुका साथै बिस्तृत योजना तयार/कार्यान्वयन गर्ने, र प्राथमिकता प्राप्त प्रदेशहरुमा उच्च-गति अन्तर-शहरी यातायात पूर्वाधारको प्रावधान गर्ने जस्ता रणनीतिहरु रहेका छन् ।

***Source: Nepal Urban Development Strategy, 2015***

## 2.3 Visionary City Development Plan

The definition of visionary is someone or something that thinks about the future or advancements in a creative and imaginative way. A person who is ahead of his time and who has a powerful plan for change in the future is an example of a visionary.

Geruwa Rural Municipality, is a Rural Municipality with prosperous for Tourism and Agricultural sector. The visionary plan includes its future development pattern, the possible income sources of Rural Municipality and the future land use pattern. The Rural Municipality is found quite developed as compared to other Rural Municipality nearby Municipality while still there is a lot of work that should be incorporated for sustainable development. The identified sources of income along with the taxes of market are the tourist service. It is going to be late for planning the land-use pattern even after Earthquake. However, still there are various ways for proper land use plane development and implementation. Detail of land use plan is necessary however this will be out of scope of the study. But it is the pioneer driver for the trip pattern and the transportation system. So, this must address for the future trip pattern.

The visionary plan of the city is mixed type as the different kind of land use and the development potentials. The visionary city plan has identified the major development potential in following sector.

1. Planned Settlement for development of settlement area.
2. Agriculture and Agro-based industries for the production of perishable foods.
3. Inter-linkages among neighbour districts and municipalities.

## 2.4 Constraints in Implementation of RMTMP

The Geruwa Rural Municipality has directly connected with the Tikapur Municipality, Headquarter of Kailali District. The existing Right of Way (RoW) and the carriageway width of the existing road are about 4-6 m. For the development of Rural Municipality with efficient transportation system it is inherent to provide appropriate roadway width. Thus, the major constraint for the implementation of RMTMP is to provide sufficient right of way of the roads. Again, the cost of Gravelling and blacktopping for a unit length of road (per kilometre) is 57 lakh and 22 lakh Respectively(DOLIDAR, 2012). and the budget per year of the Rural Municipality for road construction is few crores. Thus, the budget constraint is also the main constraints for the implementation of the RMTMP. In a year the available budget shall only be sufficient for a few (1 to 2) kilometres only. For the implementation of the master plan the participation of local people is also quite often challenging for the Rural Municipality.

# Chapter 3

# Indicative Development Potential Map

## 3.1 Rural Municipality Profile

### 3.1.1 Background

Geruwa Rural Municipality is located in Bardiya district in Mid-western Development Region of Bheri zone covers an area of 78.41 square kilometre. This Rural Municipality was established merging existing Patvar, Gola, Pasupatinagar and Manau V.D.C. (Ministry of Federal Affairs and Local Development, 2017). According to the national census 2011 projection the total population of the Geruwa Rural Municipality is 34,871 comprising 16,434 (47.13 %) male and 18,437 (52.87%) female residing in 6,135 households. Geruwa Rural Municipality has an average population density of around 445 person per sq. km. Tharu (Ethnic Group) is the dominant caste with 22,457 individual which will be 64.40% of the total population. Secondly Cheetri with 13.79% & Brahmin (Hilly) ranked third with 7.89 %. Religious and cultural festivities form a major part of the lives of people residing in Geruwa. Most of the people followed Hinduism rest of Hinduism there are various religious beliefs Christianity, Islam, Bahai, Buddhism, as well giving Geruwa a cosmopolitan culture. Several languages are spoken in the Rural Municipality including Tharu, Nepali, Sonaha and other several languages.

### 3.1.2 Physical location and geographical Characteristics

Geruwa Rural Municipality is located in the Western part of Nepal in Province No. 5 and covers an area of around 78.41 square kilometres. Topographically Geruwa Rural Municipality entails longitude of 81° 8' 45" to 81°12' 29" East & latitude of 28°24 '36" to 28° 35' 38" North. Karnali and Geruwa Rivers are major rivers flowing beside Geruwa Rural Municipality.

**Boarders:**

**East:** Bardiya National Park

**West:** Rajapur Municipality

**North:** Kailali District

**South:** Rajapur Municipality

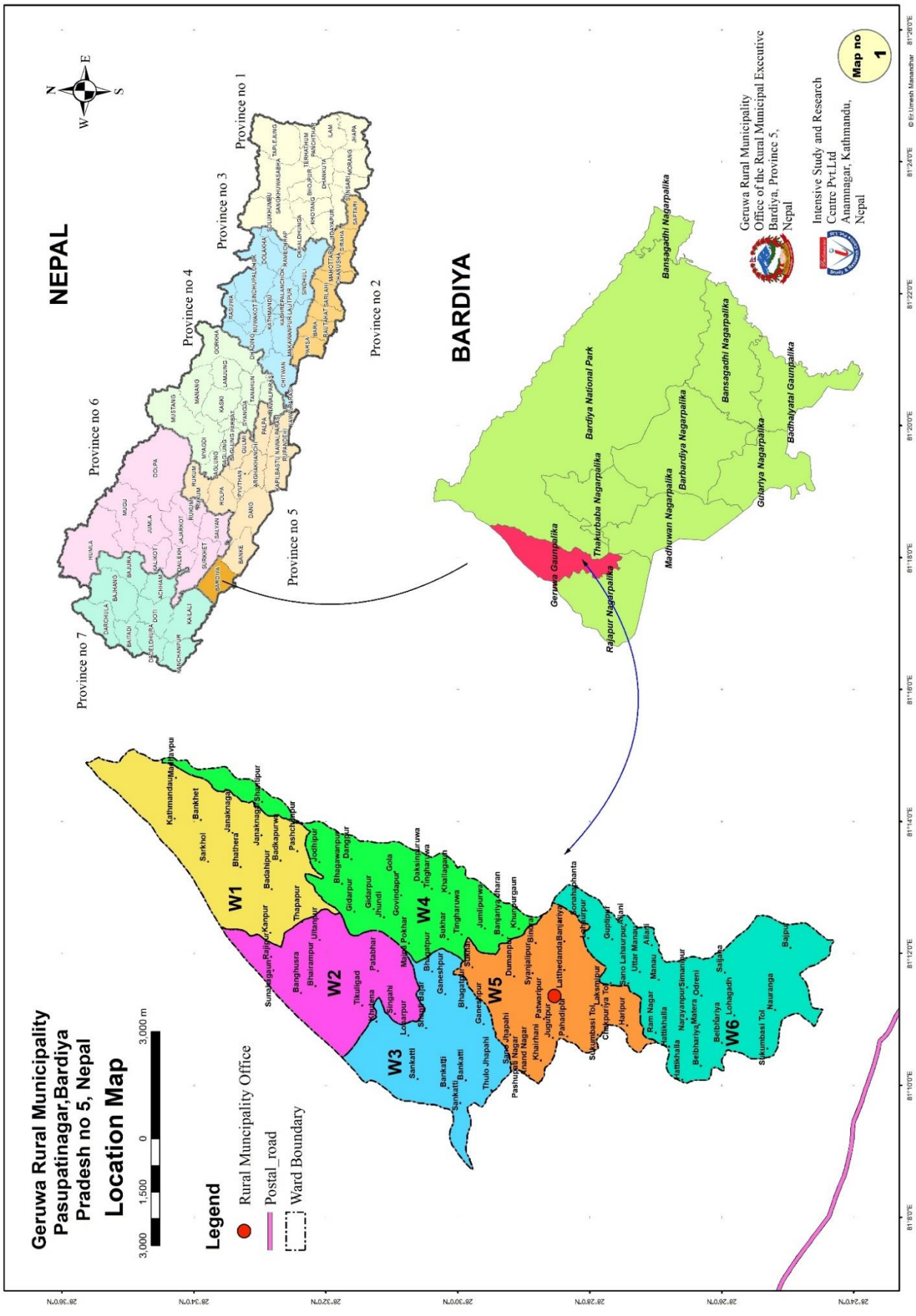



*Figure 5 : Location Map of Geruwa Rural Municipality*

### 3.1.3 Socio Economic

The Demographic features and other social characteristics of the Rural Municipality have been presented in Table Below.

***Table 4:*** *Population Distribution*

| S.N | Particulars | 2068 |
|---|---|---|
| **1** | Total Population | 34871 |
| **2** | Male | 16434 |
| **3** | Female | 18437 |
| **4** | Sex Ratio | 89.14 |
| **5** | Total Household | 6,135 |
| **6** | Average Household | 5.68 |
| **7** | literacy rate (6 years and above) | 66.09 |
| **8** | Population Density per sq.km | 445 |

***Source: Central Bureau of Statistics, 2011***

The Demographic features and other social characteristics of the Rural Municipality have been presented in Table 1 Population & density of the Rural Municipality**Error! Reference source not found.** :

The Rural Municipality is formed merging existing Five V.D.C. The population distribution in newely formed wards are listed in **Error! Reference source not found.** & Table 1 below:-

***Table 5:*** *Population Distribution In each wards*

| Ward No | Merged V.D.C / Rural Municipality | Previous Wards | Population |
|---|---|---|---|
| **1** | Patavar | 1, 6-8 | 5,088 |
| **2** | Patavar | 3-5 | 4,848 |
| **3** | Patavar | 2,9 | 4,819 |
| **4** | Gola | 1-9 | 6,814 |
| **5** | Pasupatinagar | 1-9 | 6,945 |

| | | | |
|---|---|---|---|
| **6** | Manwu | 1-9 | 6,357 |

***Source: Central Bureau of Statistics, 2012; MoFALD, 2017***

***Table 6:*** *Table 1 Population & density of the Rural Municipality*

| Ward No. | Total Area | Average Households | Total Households | Male | Female | Total Population | Density |
|---|---|---|---|---|---|---|---|
| **1** | 14.36 | 5.63 | 904 | 2394 | 2694 | 5,088 | 8.79 |
| **2** | 10.47 | 5.85 | 829 | 2272 | 2576 | 4,848 | 6.19 |
| **3** | 11.13 | 5.79 | 832 | 2287 | 2532 | 4,819 | 8.43 |
| **4** | 13.71 | 5.84 | 1,166 | 3234 | 3580 | 6,814 | 8.39 |
| **5** | 12.03 | 5.62 | 1,236 | 3227 | 3718 | 6,945 | 6.30 |
| **6** | 16.95 | 5.44 | 1,168 | 3020 | 3337 | 6,357 | 9.49 |
| **Total** | 78.65 | 5.68 | 6,135 | 16,434 | 18,437 | 34,871 | 445 |

The list of population of each individual V.D.C forming new Geruwa Rural Municipality is shown in **Error! Reference source not found.**.

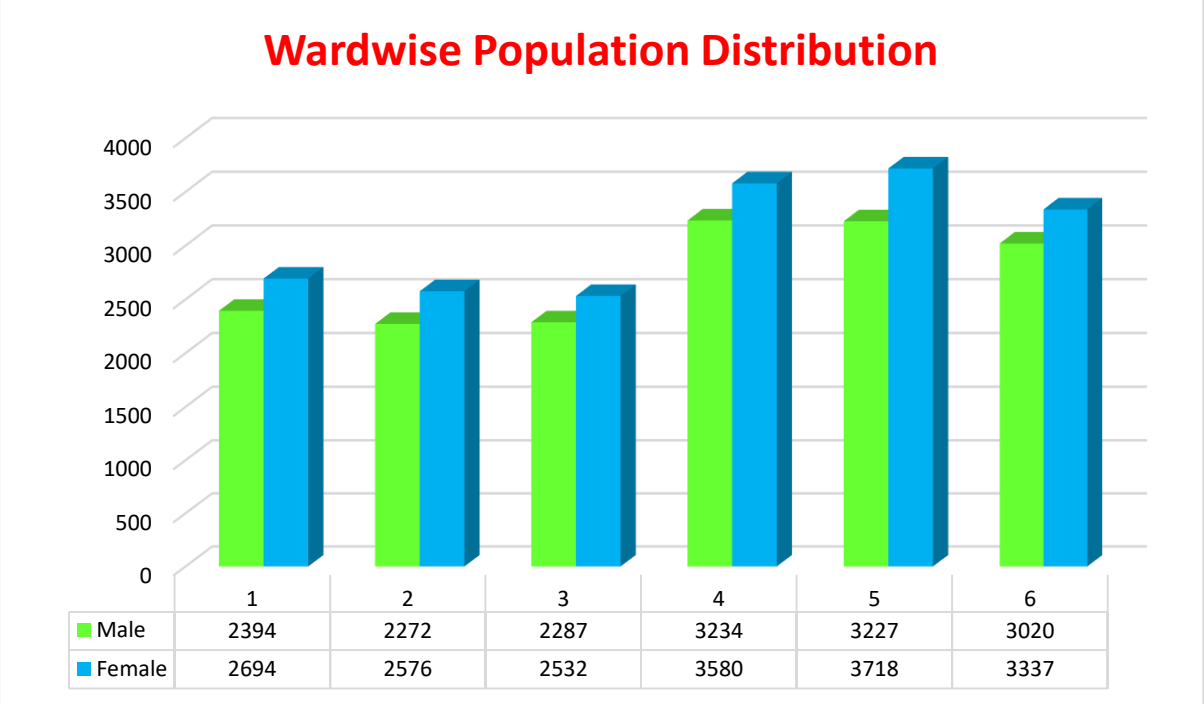



*Figure 5 Population in Different Rural Municipality*

## Religion

More than Most of the population in this Rural Municipality are Hindu with 98.41% of total population. Next to Hindu religion, Christian is most popular with 1.41 % Islam is with 0.12 % and at the same time Buddhist is least popular with Just 2 followers in whole Rural Municipality. The Figure 6 shows religion wise population in Geruwa Rural Municipality.

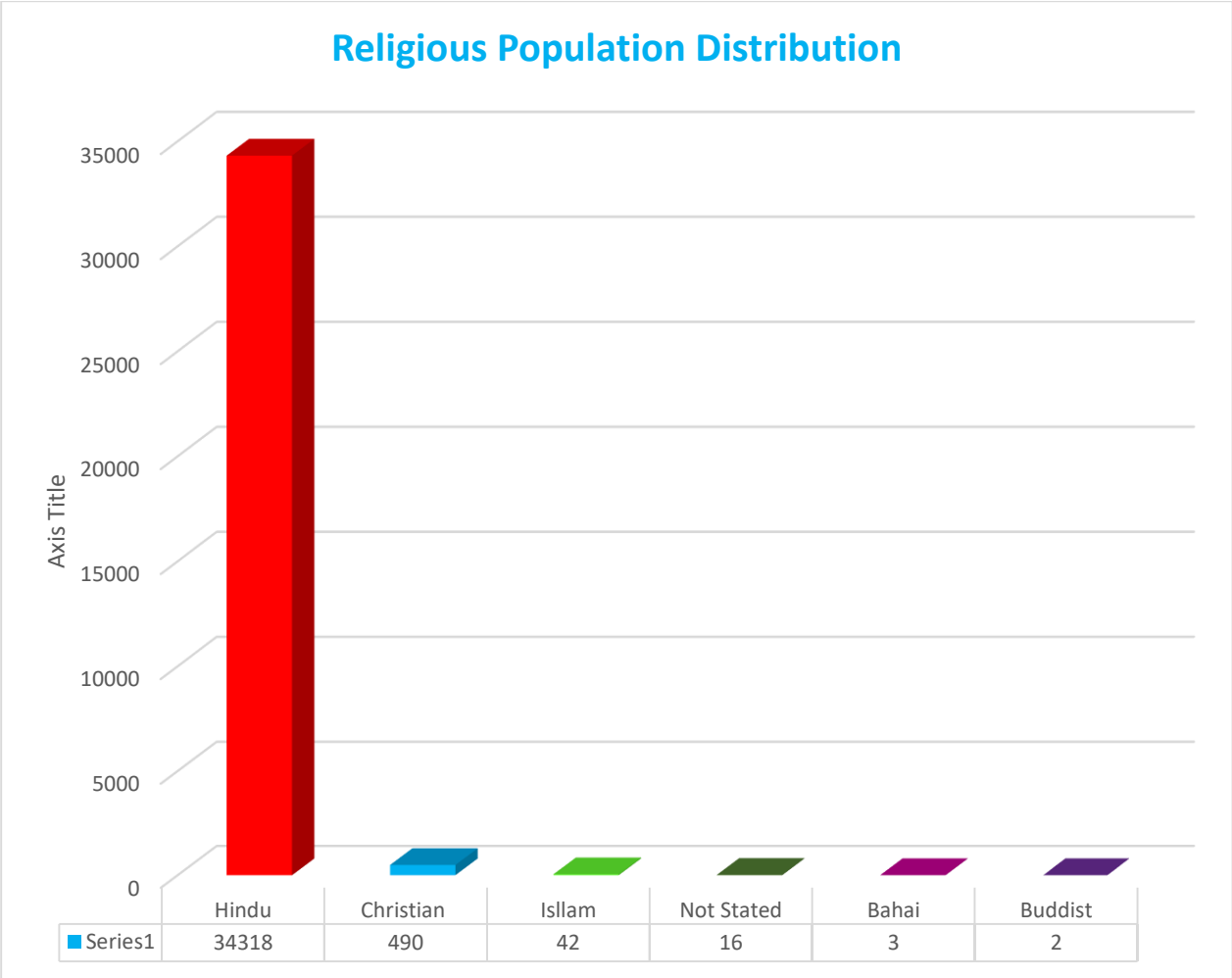



*Figure 6 Religion wise Population*

## Castes

In Geruwa Rural Municipality, IndigenousTharu has dominant population with 64.40 % which is followed by Cheetri with 13.79 %. Newar consists of least population with 162 No's of population which is almost 0.46% of total population. During study it was found that there are 80.68 % Indigenous people in Geruwa.

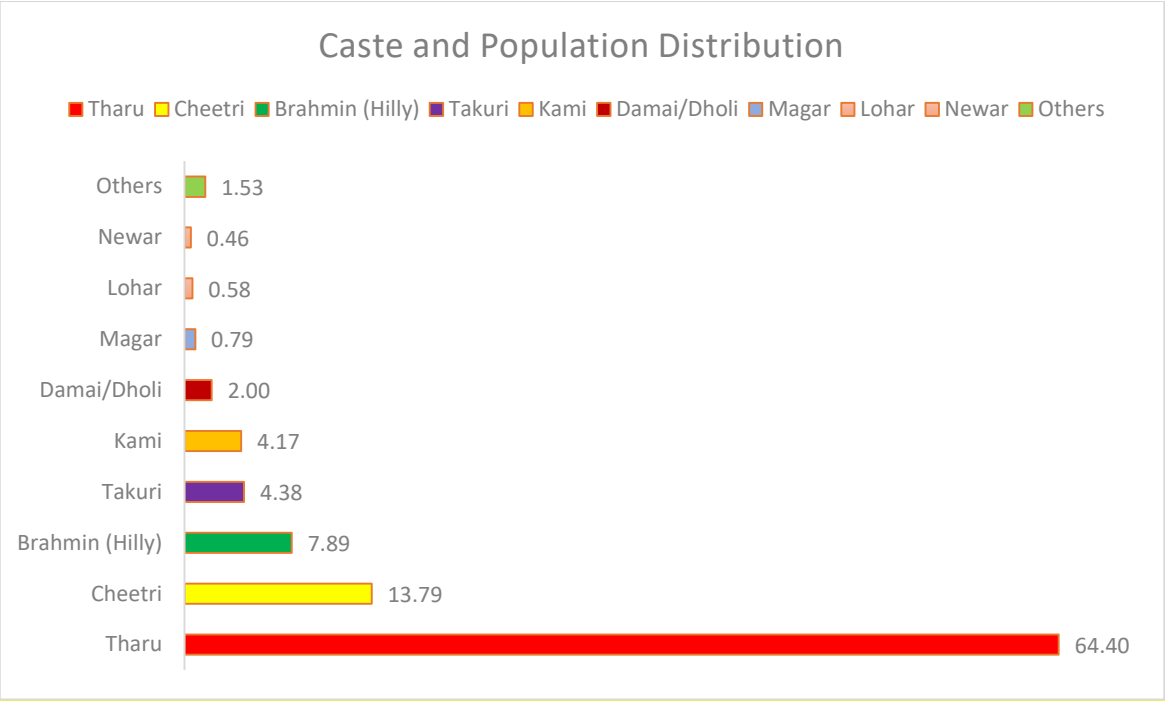



*Figure 7 Population Distribution Based on Caste*

Most of the people in Geruwa Rural Municipality has acquired Tharu as Mother Tongue which is almost 63.19 of the total population and Nepali is Secondly ranked spoken language as mother Tongue which is 35.52% of the total population. Sonha, Newar, Hindi and others mother tongue are in less number spoken in Rural Municipality.

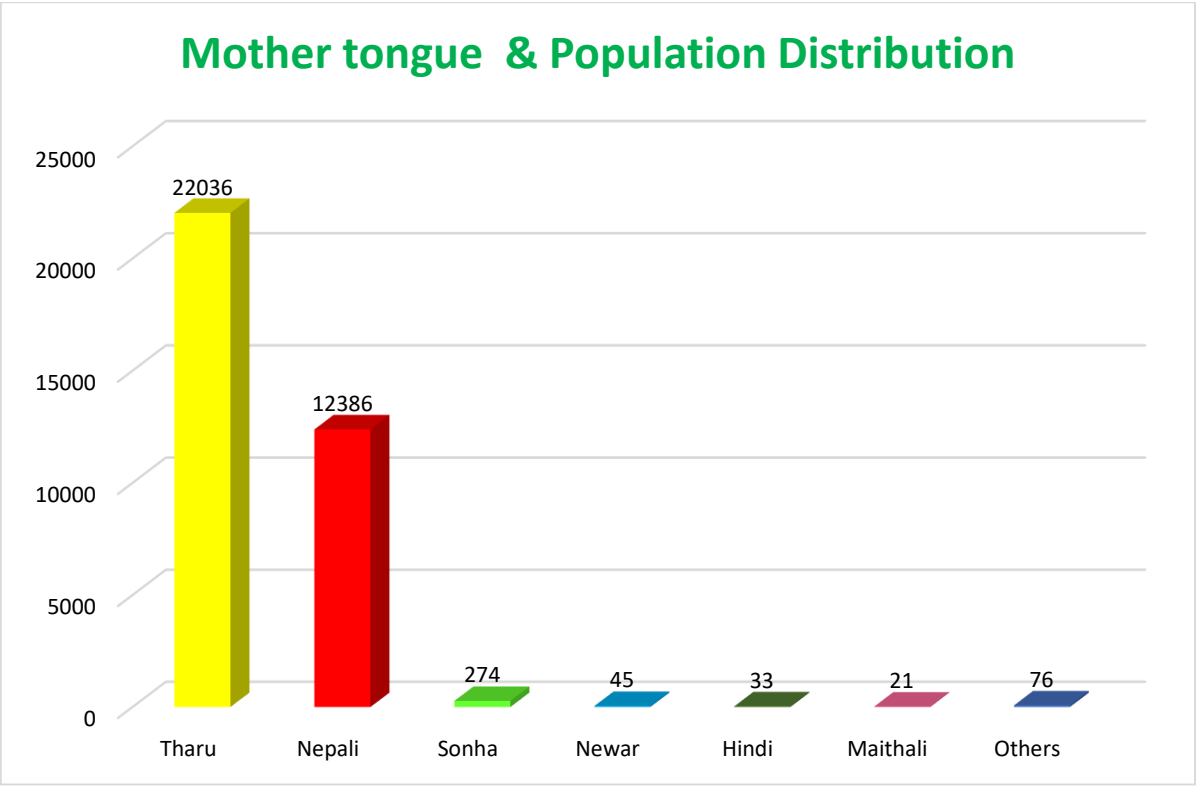



*Figure 8 Distribution of Population By Mother Tongue*

## Festival

The festivities such as the Dashain, Tihar,Chat Parva, Christmas Day, Bakar-Eid, Shivaratri and many more are observed by all Hindu, Christian, Islam and Buddhist communities of Geruwa . Some of the traditional festivals observed in Geruwa apart from those previously mentioned Dashain, Tihar, Christmas day, Buddha Purnima, Maghe Sankranti, Naga Panchami, Janai Poornima, Teej/Rishi Panchami, Gai Jatra, Chat Parva etc.

## Literacy Rate

The literacy rate of Bardiya district is 56.54 % according to Nepal Human Development Report 2014 whereas according to National census 2011 Geruwa Rural Municipality itself has literacy rate of 66.09 %. The literacy late of male is 75.39 % and female is 57.96%. Due to the fact that, development of significant number of School and colleges, Geruwa Rural Municipality possess 22 No. of Primary School and 4 Secondary School and 1 No. of higher secondary school. The human resource in different sector in Geruwa Rural Municipality is shown in **Error! Reference source not found.**Figure 9.

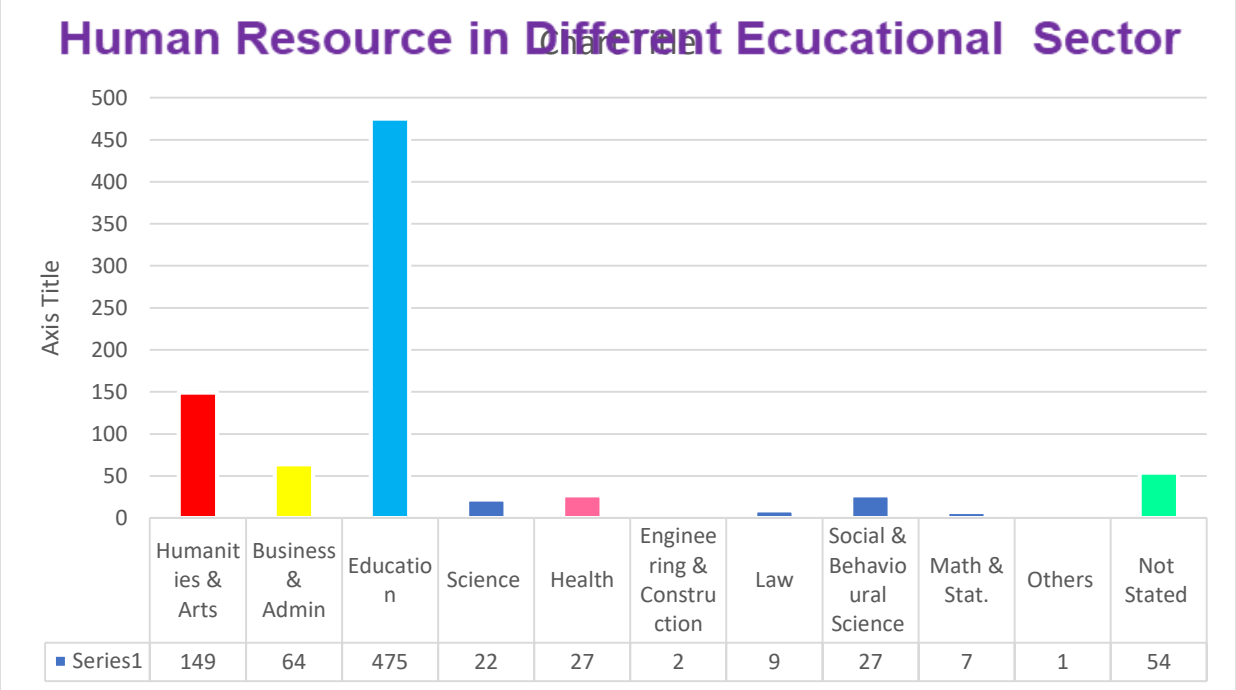



*Figure 9 : Distribution of Human Resource in Geruwa Rural Municipality*

### 3.1.4 Population projection

The underlying assumption for the preparation of RMTMP is that, the recently designated Rural Municipal area has a growing population and has also fulfilled the population criteria (one

of many criterions to be a Rural Municipality) to be a Rural Municipality. As such the Rural municipality is a Rural area or an urbanizing area. One of the characteristics of an urban area or Rural Municipality is higher population densities and corresponding higher demand for services and facilities all of which directly demands proper transport infrastructure. For sustainable supply of transport infrastructure, it is pertinent to forecast the population in the future so that the infrastructures can be planned and constructed accordingly.

A population forecast requires certain information on historic population counts, births, deaths, other rates which affect population change. Population forecasting is essentially a matter of judgment in selecting the kind of forecast to present, in determining the procedures for making it, and in appraising effects of the factors that induce population changes. The problem, of course, is much simpler for areas which have shown marked stability in the size of their populations for several decades, and for which no great change in the economic and social conditions of the locality seems likely. On the other hand, it may be extremely difficult and complex for areas which have had sharp fluctuations in the direction or rate of population change in the past, and which may continue to have them.

The main factors affecting the population projection are birth rate, death rate and migration to the city/town concerned. Out of these factors, the migration is chief factor. The factors for migration may be the desire for better economic opportunities, desire for better living or housing conditions (this applies particularly to short distance migration within the same general locality), movement for reasons of health, education, or retirement etc. The level of national economic activity also affects the direction of migration. When employment is high or rising, the movement is generally from rural area within Municipality and Nearby small villages to the medium-size and larger cities, because of the relatively larger rate of wages and economic opportunities in urban areas.In the present time, According to CBS 2011 and 2001 the Forecasted population of Geruwa Rural Municipality will be increasing in coming years due to migration of people from rural places to bigger cities like Rajapur, Bhedetar, Gulariya and NepalGunj. To forecast the population in the Rural Municipality for the preparation of RMTMP the geometric method has been used considering the rapid urbanization of the area. For this the following formula is used:

$$\mathbf{P_n = P\left(1 + \frac{I_G}{100}\right)^n}$$

Where, $I_G$ = geometric mean (%)

P = Present population

n = no. of decades.

$P_n$=population at the end of nth decade

By using this method we found that the average Increase rate of population in this Rural Municipality is on average 0.16 % as shown in Population Projection in Municipality . Based on this trend, the minimum projected population of this municipality on the year 2036 A.D will be 32,902.

***Table 7:*** *Population Projection in Municipality*

| S.N | List Of V.D.C | Census Population 2001 | Census Population 2011 | Projected Population 2015 | Projected Population 2017 | Projected Population 2021 | Projected Population 2026 | Projected Population 2031 | Projected Population 2036 |
|---|---|---|---|---|---|---|---|---|---|
| **1** | Patabhar | 14,105 | 14,755 | 15,023 | 15,159 | 15,505 | 15,858 | 16,219 | 16,589 |
| **2** | Gola | 6,679 | 6,814 | 6,869 | 6,896 | 6,966 | 7,036 | 7,106 | 7,178 |
| **3** | Pasupatinagar | 6,250 | 6,945 | 7,244 | 7,399 | 7,799 | 8,221 | 8,666 | 9,135 |
| **4** | Manwu | 7,054 | 6,357 | 6,098 | 5,972 | 5,670 | 5,382 | 5,109 | 4,850 |
| | **Total** | 34,088 | 34,871 | 35,234 | 35,426 | 35,939 | 36,497 | 37,101 | 37,752 |

### 3.1.5 List of Potential Development Area's

#### a. Existing/Potential Area for Small/Major Irrigation

Karnali, Geruwa River, Budikola, ,are major perennial rivers flowing through Western, Eastern and Middle part Boundary of Geruwa Rural Municipality. Subba Kulo ,Tapara Kulo,Pathraiya Kulo,Manau kulo,Maila Nala,Tiuni Kulo,Patabar Kulo are small irrigation channel.

#### b. Existing/Potential Area for Tourism, Religious and Historical Place

There are very few places which possess a religious importance to attract local and foreign tourist. One of the most important matter to attract tourist in that area is maghi festival which is celebrated by tharu community for one week. Other than this some tourist can be attracted to fresh fish of karnali river for which some good resort need to be established where people can enjoy their holidays. Although there are tourism potential areas but they have not been identified by Government and Local body.

#### c. Existing/Potential Area for Cottage and Agro based Industries

There are few small scale Agro based industries like Poultry Farm, Rice mill, Dairy are also found on Geruwa Rural Municipality. The wards of Geruwa Rural Municipality have potential of establishment of small scale industries as well favourable for agro-based industry.

### 3.1.6 Service Centres and Facilities

#### a. Health

In Geruwa Rural Municipality, health institution with full facilities are not easily accessible but some local medical institution are available in Santinagar area but for better diagnosis and dialysis people depends on big hospitals of Kohalpur. The health institutions available in this Municipality are enlisted in Table 11.

***Table 8:*** *List of Heath Institution*

| S.N | Name of Health Instution | Location |
|---|---|---|
| **1** | Health Post | Gobindapur, |
| **2** | Health Post | Ganeshpur |
| **3** | Health Post | parsanipur |
| **4** | Health Post | patharaiya |
| **5** | Health Post | Bihanibazzar |
| **6** | Pashuswasthe Office | Narayanpur |

#### b. Market centre

The main trading centre for Geruwa Rural Municipality is SantiBazzar Area which is in ward no 3 of Rural Municipality. There are limited number of shops and hotels most of them sells daily consumed material and provides lodging and eating facility to tourist. In recent times, the shopping market is found to be expanding due to increase in trading activity like Hardware for house construction, Electronic shop and some resorts due to increase of tourist flow in that area. Mulpani Bindra, Pathraiya, Bihani, Kholti, Parsenipur, Bazzar are comparatively bigger market where people rely to sell their agriculutural, and several products, buy several items and for banking activity. Gulariya and Nepalgunj are regarded as an important market centre for trade and marketing of province no 5. Usually, Bigger Businessman directly sells their goods buying from local costumers to Santibazar, Gulariya and Upto Nepalgunj.

*Figure 10 Santi Bazzar Area*

Various other small markets do exist on other wards which have potential to grow to large market. These small markets are major pocket area of the extensive agriculture. It is very famous for the cash crops like Alaichi, Lemon, Amrisho, Vegetables etc.

### c. Post office

During the study 4 No's of the Post Office were identified. The details of these post box office are list in Table 12.

***Table 9:*** *Post office*

| S.N | Name | Location |
|---|---|---|
| **1** | Post Office | Ward 4,Gola |
| **2** | Post office | Ward 3,Santibazzar |
| **3** | Post office | Ward 6,parsenipur |
| **4** | Post office | Ward 5,Pathraiya |

### d. Telecommunication

Mobile Telephone facilities are available in all wards of the Rural Municipality. Nepal telecom and Ncell are the major service providers. Smart Cell is providing mobile telecommunication service which is not quite Popular as compared to Nepal telecom and Ncell. CDMA and GSM mobile service are available in every VDCs of the Rural Municipality. Internet/ email services are not easily available for the public. But some internet service provider like World Link, SUBISHU are providing internet service through wireless telecommunication method.

## 3.1.7 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 help 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 immediately after the collection.

Walking constitutes an important mode of transport in areas. Besides walking, most of the people use motorbike as another best option mainly due to less availability of public vehicle in Hilly region.

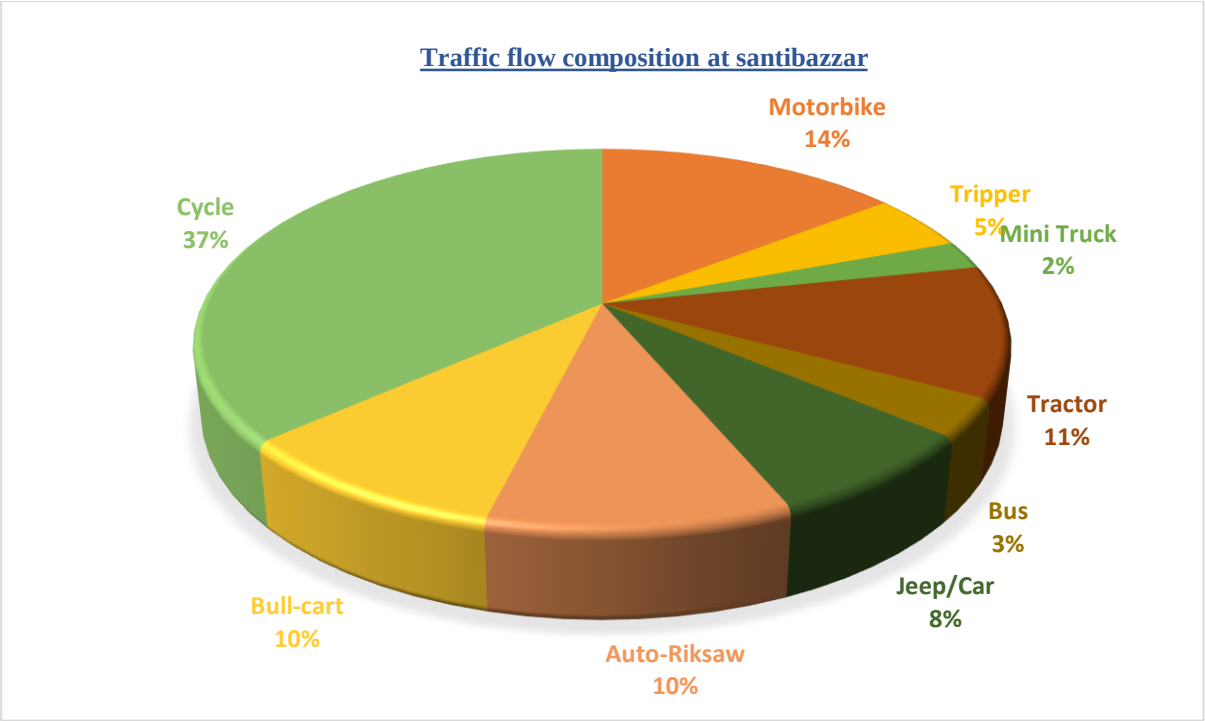
### a. Traffic Vehicle Count

The traffic vehicle count was done at the following stations which are listed in Table 10.

***Table 10:*** *Location and Route for Vehicular Count*

| SN | Count station name | Location | Name of road Linkage |
|---|---|---|---|
| **1** | Santibazzar | Santibazzar | Santibazzar-Rajapur |
| **2** | Pasupatinagar | Santibazzar | Pasupatinagar-Rajapur |

The Traffic Volume composition of Rural Municipality shows that the major vehicle that plies on the roads of Geruwa Rural Municipality is cycle (32%), Motorbike (16%) followed by Tractor (13%). Other than these, Bus, Tripper, Minitruck, Auto-Riksaw and Private Jeep/car has a share above 28% while 12 % of traffic is occupied by Bull-Cart.



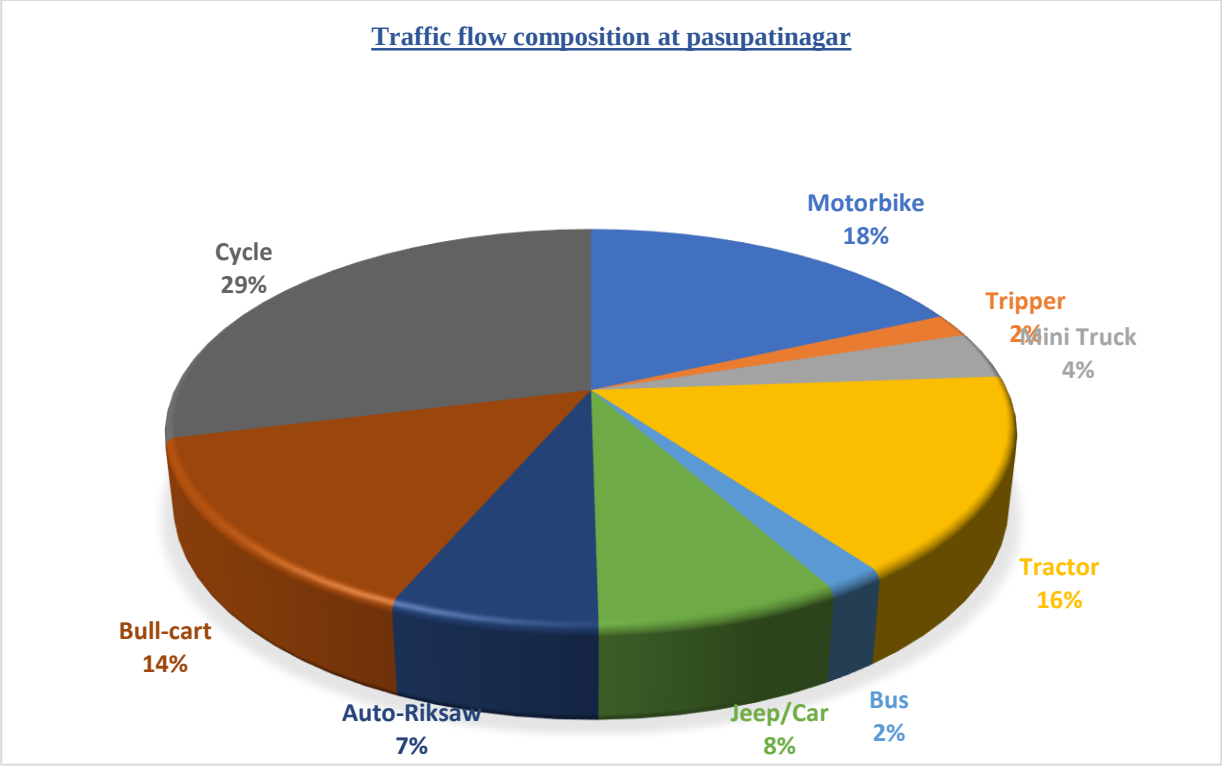
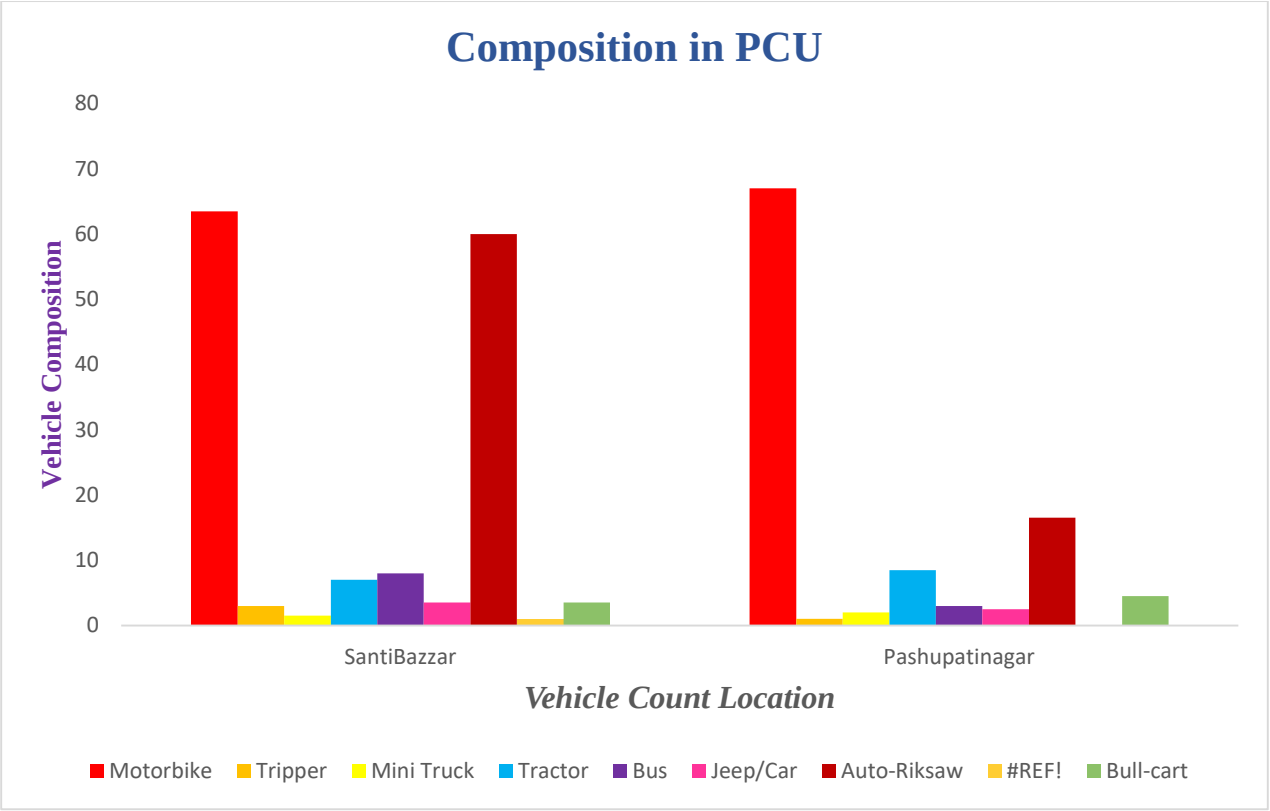




*Figure 11 : Vehicle Composition at Different Places*

## b. Origin and Destination Survey

From the origin and destination survey carried out the following places are found to be major destination points (Rank-wise) are shown in Figure 12 : Major Destination for Geruwa Rural Municipality.



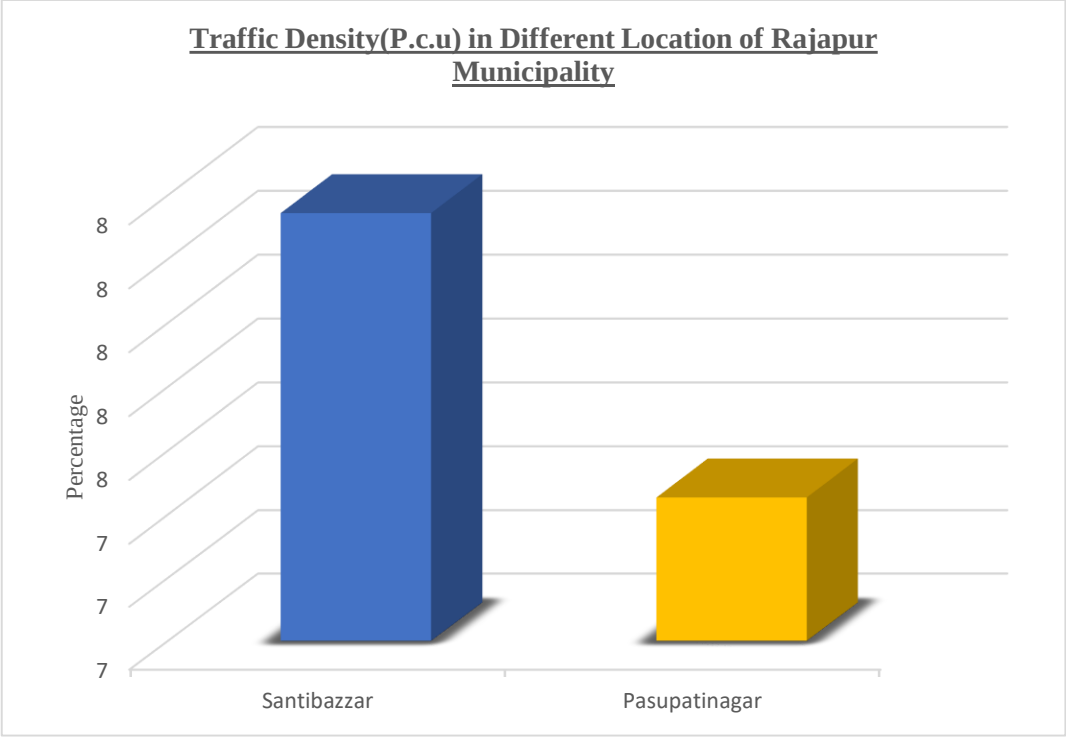




*Figure 12 : Major Destination for Geruwa Rural Municipality*

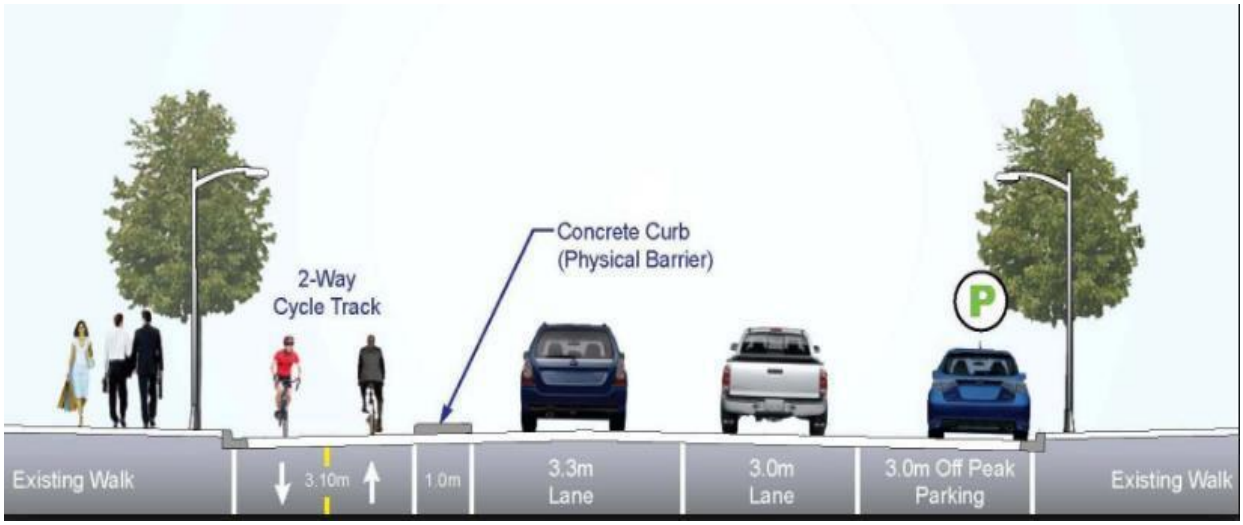



*Figure 13 : Typical cross section of road with cycle lane*

### c. 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 Municipality of Bardiya District, this rural municipality has been less affected by rapid urbanization resulting in very few number of traffic mostly private vehicles. In most of cases, people preferred Walking for reaching market centre and within wards. Use of modes of public transport like bus is used for travelling purpose. Motorbike are the dominant form of transportation. Comparatively maximum number of trucks were found to be used for transportation of goods, agricultural products etc to and from the production area and market centre.

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

### d. 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 98% 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.

Motorcycle and cycle is being used in nearly 82% of the trips and public vehicles in nearly 13% of the trips. 6% of population was facilitated by modes of transport which is either through public or private mode of transportation. This leaves the remaining 94 people (every 100 people) are not access of transportation if they need to travel. Without proper access to public vehicles, they are left out with no option but to walk. Thus, nearly 94% of the trips are made on foot within Rural municipality.

## 3.2 Transportation Management

Various components are included in a transportation system. For the proper functioning of the whole system, each and every component should work properly. Some of the major components of transportation system are as follows:

### 1. Drainage system

Drainage is one of the most important factor in road maintenance. Side drains are the integral part of the roads and are essential means of preventing structural damage to the road. From general observation, it is apparent that their design and construction is not given enough thought in Nepal resulting in problems. This case implies in the case of this Rural Municipality also.

### 2. Parking area

Parking is a part of an overall transportation system and is one of the serious problem that confront the urban planner and traffic engineer. Traffic usually travels towards a destination and a vehicle must be parked while some business. As the number of automobiles increases exponentially around the market and business area, the need to house them in close proximity to destinations creates a challenging design problem.

Inside the Municipality, number of vehicles are in increasing order. And while planning the parking area, future traffic forecasting should be considered. Various purpose of parking studies area as follows:

- To decide the capacity, location and type of future parking facilities.
- To determine the congestion in the city or town areas.
- To access the suppressed parking demand.
- To estimate the desire and demands of the public parking facility

### 3. Road furniture

- Different objects and equipment should be installed on roads for various purpose e.g. traffic signals, traffic signs, street light, traffic barriers, bus stands, bus stops etc. Road furniture will
- Ensure the most efficient and effective use of resources.
- Building the aesthetics in surrounding area.
- Ensure traffic safety.
- Provide comfort to the pedestrian (bus stand, benches).
- Control and regulates traffic flow.

## 3.3 Indicative Development Potential

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 Rural Municipality as the basis of network planning.

For the Geruwa Rural Municipality the following area have been proposed for the potential development area. Indicative development potential map is shown in ***VOL-II.***

***Table 11:*** *Indicative development potential plan of Rajapur*

| S.N. | Development Potential | Area | Ward |
|---|---|---|---|
| **1** | Small scale Industrial area | Santibazzar,Gola,PasupatinagarBazzar area | 3, 4, 5 |
| **2** | Institutional | Santibazzar, Pasupatinagar | 3,5 |
| **3** | Touristic | Pokhariya Intake | 1 |
| | | Naba jyoti Bazzar | 4 |
| **4** | Agricultural area | All wards of Rural municipality had possibility of agriculture activity. | |
| **5** | Commercial area | SantiBazzar | 3 |
| | | Pasupatinagar | 5 |
| **7** | High density residential area | SantiBazzar | 3 |
| | | Pasupatinagar | 1 |

### 3.3.1 Visionary city development plan

Lead sectors for visionary development of Geruwa Rural Municipality are:

1. Business/Trade
2. Residential/Service/Market Center
3. Industry
4. Agriculture/Forestry and its processing
5. Tourism
6. Education and hospitality center

#### 1. Business/Trade

Geruwa Rural Municipality lie within Two Existing District Road, which indicate the potential of this Rural municipality into a transit point of export/import business. This Rural Municipality is near to the Rajapur, Tikapur and Karnali chisapani.

#### 2. Residential/Service/Market Center

As this Rural Municipality lies in the west of the Bardiya National Park and South of Karnali Chisapani, Santibazzar, Pasupatinagar, Bindra, Bihanibazzar, Nabajyotibazzar area are some residential and market areas as well.

#### 3. Industry

This Rural Municipality can develop large number of small to medium industry such as food processing, dairy processing, herbs processing and others which may serve the local people and whole District.

#### 4. Agriculture/Forestry and its processing

With the suitable topography and climate available in the Geruwa Rural Municipality, the agricultural production especially the vegetables can be given higher priority and the processing of agricultural products may a potential for the economic development of the city.

#### 5. Tourism

As this rural municipality is easily accessible through the land as well as can develop some picnic spots, which may be a potential to attract the domestic as well as foreign tourists to stay at day here. This may Include building eco-home stay along the Rural Municipal area.

# Chapter 4

# Municipal Inventory Map of Road Network

Road Inventory Survey was done with the help of the earlier prepared GIS base map of the Rural Municipality and Road inventory form. Field verification of the base map was done with the help of GPS survey. Road inventory survey was done from one nodal point to another in each road sections collecting information related to road surface, crossing structure, road condition, and linkages to the large settlements, economically active spaces, existing service centres, potential growth centres, potential areas of development, areas of special considerations and direct link to another linkage. From data of the road inventory survey, MIM is prepared. And based on the earlier study of Potential areas and MIM, IDPM was prepared.

## 4.1 Overview of Road Inventory

The municipality inventory identified just over 232.32 km of roads. Study and analysis shows that Manahari Rural Municipality has more than 209municipal roads. Most of the roads in Geruwa Rural Municipality are Earthen (44%)followed by Gravelled (47%) road but none of the roads were found to be Metallic. Further, New construction of 23.72 Km of road need to be carried out to meet the road access up to public access of road network. A few kilometres of road are Gravelled or paved by Stones and boulders while other roads are earthen as they have been newly constructed. About 70% of the roads are below 6 m wide while 20% of Road section are wider than 8 meter and most of this section falls under ring road. This figure reflects that most of the section of ring road posses sufficient road width while 9 % of the road have road width between 6m to 8m .The summary of the roads are presented in Figure 14 &Figure 15.

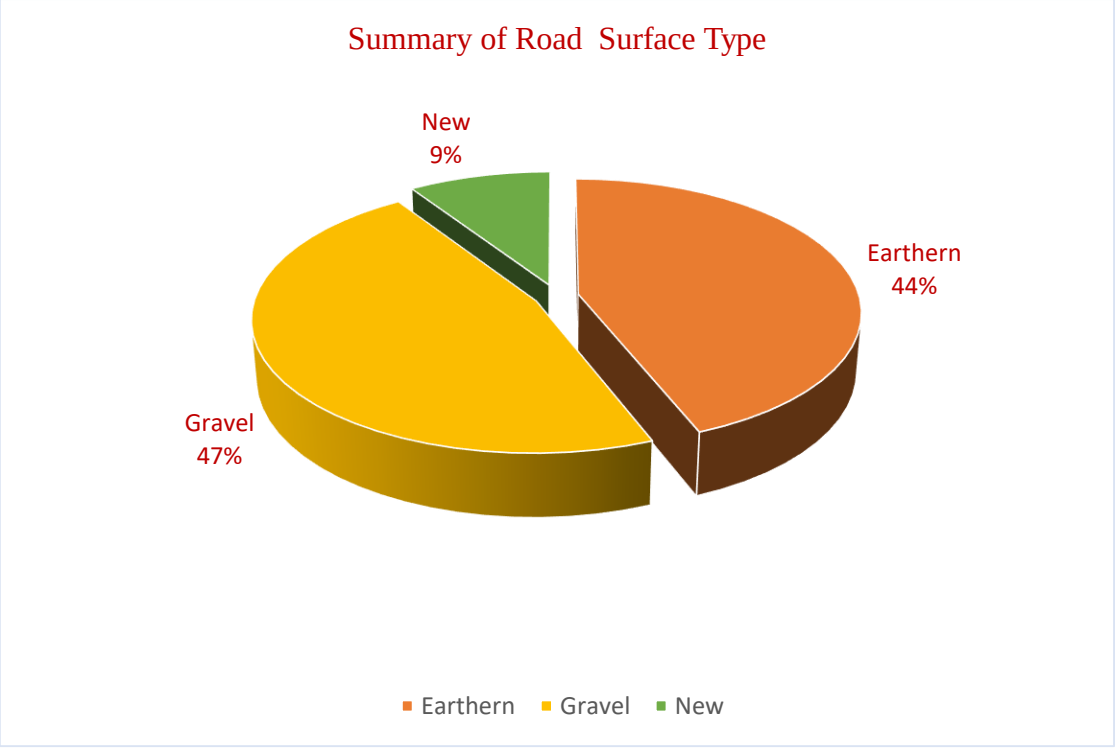



*Figure 14 : Road Length According to surface type(source:- Field Survey,2018)*

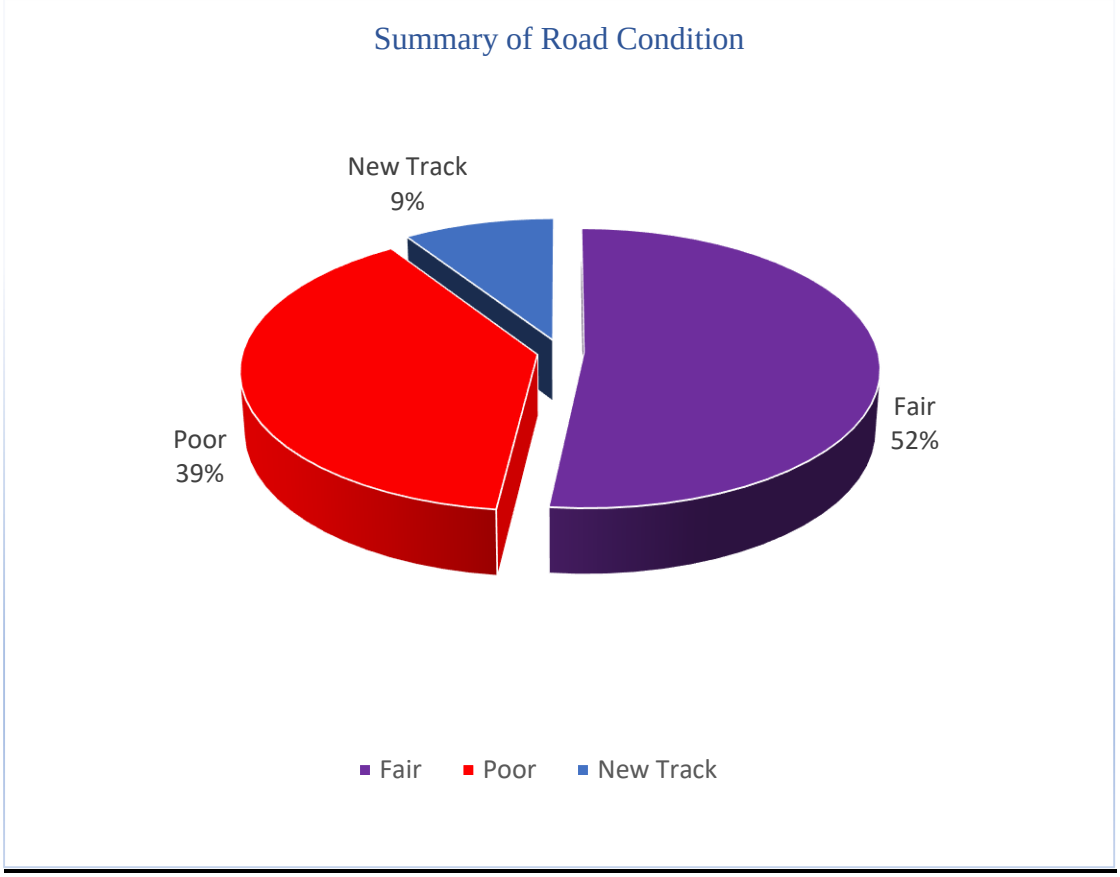



*Figure 15 : Percentage of Road distribution by Width*

## 4.2 Land use and Road Density

### 4.2.1 Land use

Landuse and transportation are interdependent. Mobility, especially in the form of motorized transport requires an increasing share of land. Long term sustainability should be considered by altering the urban structure itself. Like Transportation demands that are concentrated in down town areas can be dispersed to city sub centres which will help in relieving congestion and promoting development of a more balanced society.

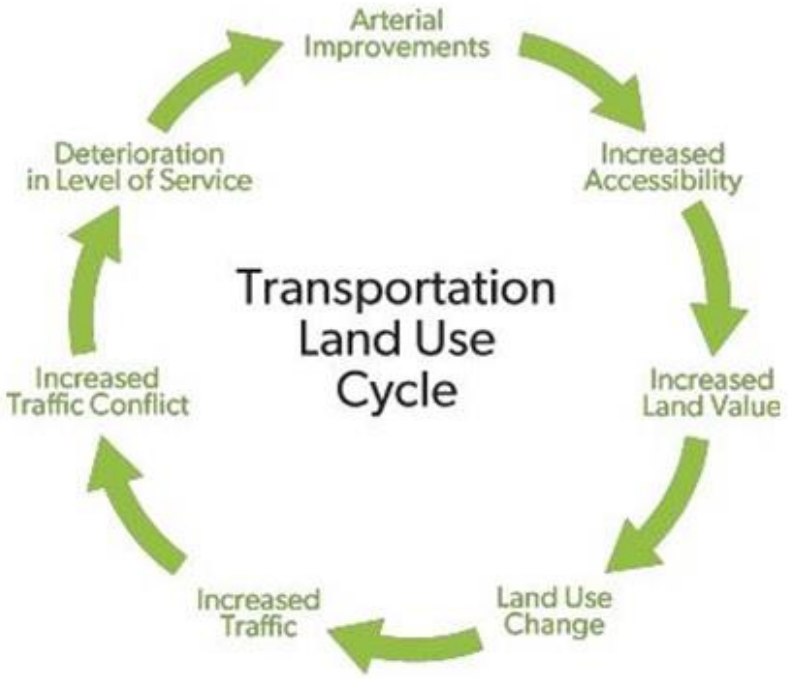



*Figure 16 Transportation Land use Cycle*

Roads are often built or improved to allow greater access to new development. The road improvement makes other land along the road more accessible and attractive for further development. With more housing and services along the road, traffic volumes increase resulting in more congestion and decreased road capacity. Eventually the reduced efficiency of the road necessities more roadway improvements which can lead to additional development along the road and restart the land use transportation cycle.

When the land use transportation cycle occurs over and over in a newly developed city, the pressure of road capacity increases. The municipality transport master plan is one among the many planning efforts which will reflect the efforts to define where we work, play and how we move from one place to another. Both population and traffic volume forecasting are considered during the planning.

In this regards, this Municipality has the following type of existing land- use situation (refer land-use map i.e. **Error! Reference source not found.**). For further planning this municipality should think for the probable settlement extension area.

***Table 12:*** *Table 2 Details of Land cover in the Rural Municipality*

| Wards | Built up area | cultivation | Forest | River | Sand | Grand Total |
|---|---|---|---|---|---|---|
| **1** | 0.87 | 7.95 | 3.25 | 1.07 | 1.23 | 14.36 |
| **2** | 0.91 | 7.31 | 1.17 | 0.73 | 0.35 | 10.47 |
| **3** | 0.76 | 7.57 | 0.99 | 1.13 | 0.66 | 11.13 |
| **4** | 1.25 | 11.34 | 0.37 | 0.32 | 0.43 | 13.71 |
| **5** | 1.21 | 10.58 | | 0.23 | 0.01 | 12.03 |
| **6** | 0.80 | 13.03 | | 0.79 | 2.33 | 16.95 |
| **Grand Total** | 5.81 | 57.79 | 5.78 | 4.27 | 5.01 | 78.65 |

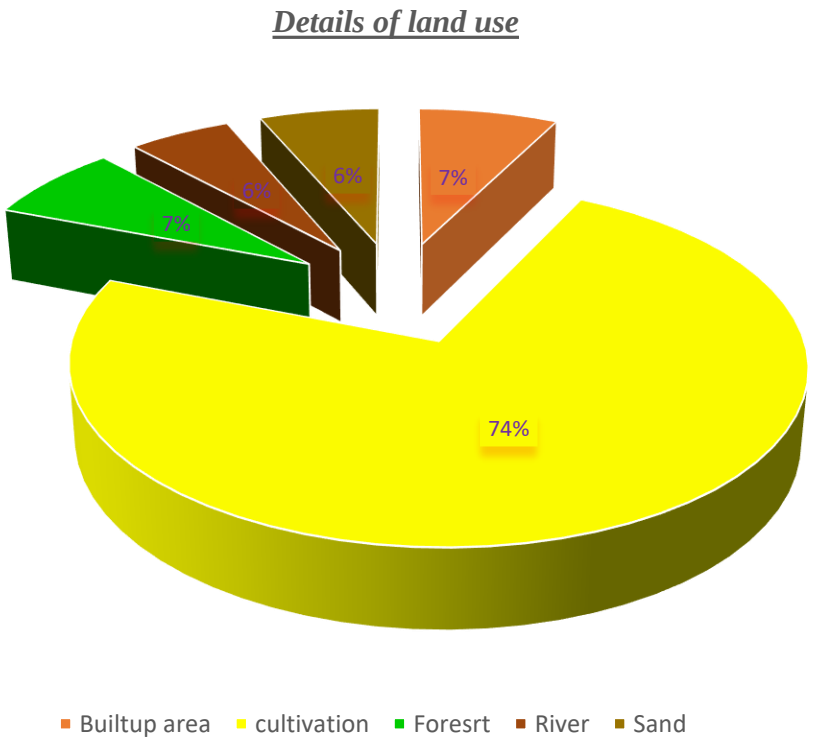



*Figure 17 Details of land use*

### 4.2.2 Road Density

According to National urban strategy, the target of urban road density is 7.5 km per square km land area. The most of the roads are earthen and are very narrow (<5.0 m) to address the trip generated from various area. Again, the ward wise distribution of road and land-use pattern has been presented. The road density as observed for total area of Rural Municipality is found as 3.50 km road per square km area. Again, the density of road per 1000 population is found as 7.93 km. The road density is varying in up to 2 units, however this shall not have replicated the very worst to very good accessibility situation. The varying level of density (based on area) shall be checked by using density based on population served. The density based on population replicates that the density so high and low is not of real difference in usable area of land. Again, the density of the road in Rural Municipality is not found to meet the national strategy. However, the major challenge for the development of road is to make them more operational.

*Figure 18 Road condition in Santi Bazzar*

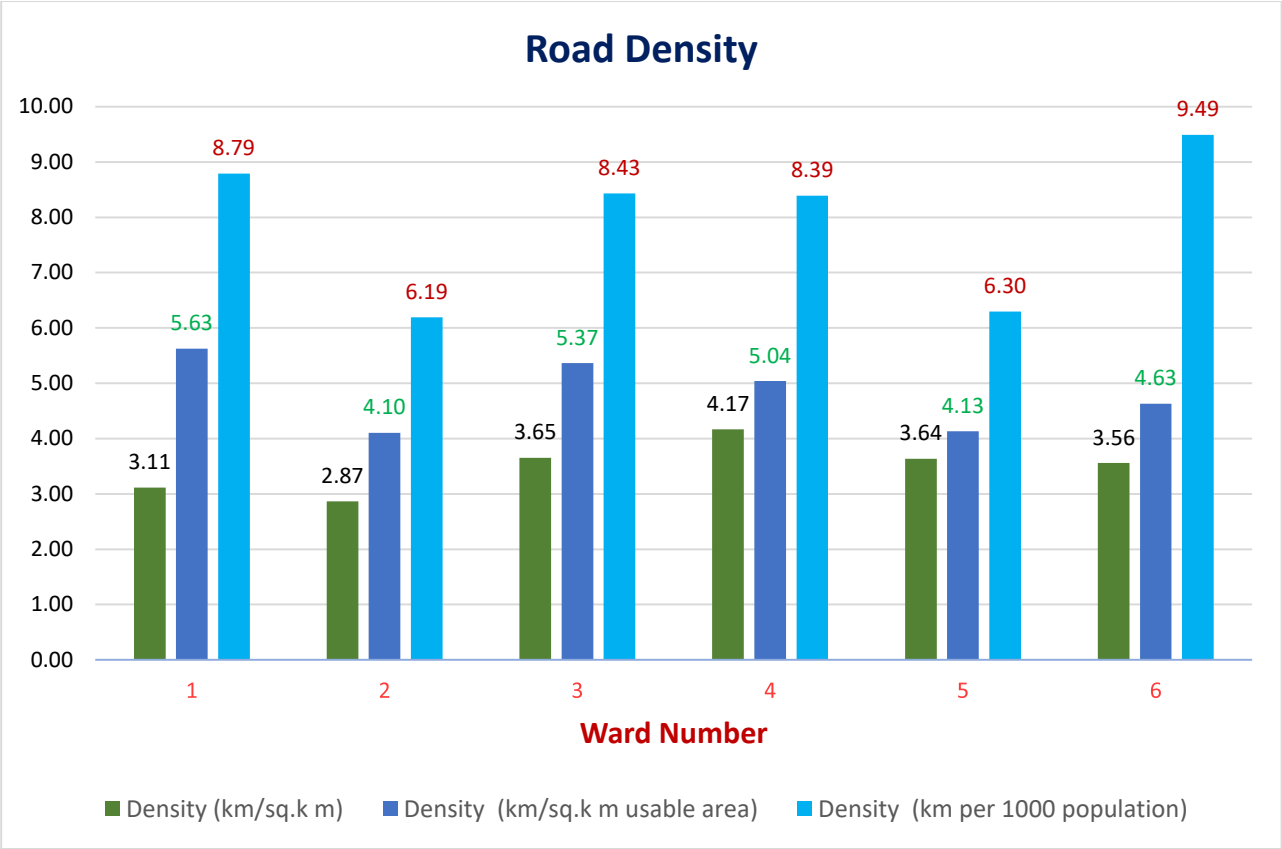



***Table 13:*** *Ward-Wise Population, Area and Road Density*

| Ward No. | Length of Road (km) | Area (sq. km) | Usable Area (sq. km) | Total Population (2011) | Density (km/sq.k m usable area) | Density (km/sq.k m) | Density (km per 1000 population) |
|---|---|---|---|---|---|---|---|
| **1** | 44.73 | 14.36 | 7.95 | 5,088 | 5.63 | 3.11 | 8.79 |
| **2** | 30.01 | 10.47 | 7.31 | 4,848 | 4.10 | 2.87 | 6.19 |
| **3** | 40.63 | 11.13 | 7.57 | 4,819 | 5.37 | 3.65 | 8.43 |
| **4** | 57.17 | 13.71 | 11.34 | 6,814 | 5.04 | 4.17 | 8.39 |
| **5** | 43.73 | 12.03 | 10.58 | 6,945 | 4.13 | 3.64 | 6.30 |
| **6** | 60.33 | 16.95 | 13.03 | 6,357 | 4.63 | 3.56 | 9.49 |
| **Total** | 276.61 | 78.65 | 57.79 | 34,871 | | | |
| **Average** | | | | | 4.82 | 3.50 | 7.93 |

## 4.3 Grading and Nomenclature of Roads

Road network serve for direct access to the particular land-use by the provision of pedestrian footpaths, bicycle tracks, bus and vehicle routes and cater through traffic that is not related to immediate land uses. Functional provisions of passenger and goods movement mainly define the hierarchy of roads and their classification. On the basis of this concept, roads are classified as per their function. Road class is related to the technical standard and functional requirements. Therefore, road classification should be based on its functional hierarchy. It is important to distinguish roads in different class or type based on various criteria. A road hierarchy is a means of defining each roadway in terms of its function such that appropriate objectives for that roadway can be set and appropriate design criteria can be implemented. It is an important instrument of road network and land use planning.

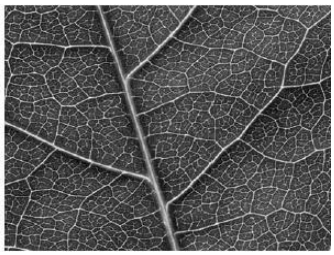


*Figure 1919 : Conceptual Hierarchy*

*Figure 20 : Road Network Hierarchy*

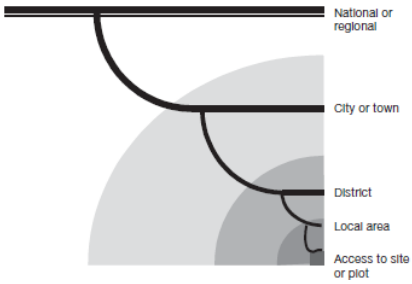



*Figure 20 : Urban Road Hierarchy*

There are restrictions of direct linkage between various kinds of road-hierarchy. In other words, direct connections between certain types of road links should be reduced, for example residential streets and arterial roads. Connections between similar order streets should be made (e.g. arterial to arterial) or between street types that are separated by one level in the hierarchy (e.g. arterial to highway and collector to arterial.). This conceptual framework can be seen from **Error! Reference source not found.**,Figure 20 &Figure 21. These hierarchical distinctions of road types become clearer when considering the recommended design specifications for the number of through lanes, design speed, intersection spacing and driveway access.

A well-formed road hierarchy increases the performance and efficiency of the particular type of road as well as of the entire road network. Furthermore, it reduces overall impact of traffic by concentrating longer distance flow onto routes in less sensitive locations, ensuring land uses and activities that are incompatible with traffic flow are restricted from routes where traffic movement should predominate and preserving areas where through traffic is discouraged.

The concepts of road hierarchy assist in planning of overall road network and its transport services. Different hierarchy of road has different effect in surrounding areas and other roadways. Hierarchies of roads enable urban design principles such as accessibility, connectivity, efficiency, amenity and safety. Further, it also identifies treatments such as barriers, buffers and landscaping to preserve amenity for adjacent land uses. Thus, a proper plan should accommodate all users of the urban streets in planning, designing and construction of the road infrastructure and furniture. Rural Municipality road network can be conceptualized by considering the functional hierarchy as arterial, sub-arterial and urban roads of various categories such as Class A, Class B, Class C and Class D.

### 4.3.1 Right of Way for Roads of different Classes

The DTMP guideline has expected roads under category of National Highway (NH), Feeder Roads (FR) and District Roads (DRCN) within the Rural Municipality area. 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 ≥ 20.0) as 6.0 m on either side. All of these standards shall be applied to the Rural Municipality accordingly.

***Table 14:*** *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 | 25 | **6.0 &6.0** |
| **B** | Other Collector | 20 | **6.0 & 6.0** |
| **C** | Main Tole Road | 12 | **2.0 & 1.5** |
| **D** | Tole Road | 8 | **2.0 & 1.5** |
| **E** | **Other Tole Road** | **6** | **2.0 & 1.5** |

Based on DTMP guideline, the building line or setback shall be maintained 6.0 m for roads having RoW equal to or more than 20.0 m and 2.0 m for other roads. However, Nepal Road Standards-2070 has considered the setback distance at curved section only and that should be sufficient to provide the adequate sight distance. It is silent about the building line.

१४.३१ अब निर्माण हुने सडकको कुनै पनि बाटोको न्यूनतम चौडाई ६ मी. हुनु पर्नेछ र नापी तथा मालपोत कार्यालयहरुलाई सोही बमिजिमले सेस्ता, नक्सा तथा अभिलेखहरुमा बाटो कायम गरी यस व्यवस्थाको कार्यन्वयन गर्न लेखि पठाउनु पर्नेछ। । यस्ता बाटोमा भवन निर्माण स्वीकृत दिंदा केन्द्रबाट कम्तिमा ३ मीटर सडकको क्षेत्राधिकार (RoW) र सडक क्षेत्राधिकार सिमाबाट १.५ मीटर सेट ब्याक छाडेर मात्र निर्माण स्वीकृति दिनु पर्नेछ । तर हिमाली/पहाडी जिल्लाका उपत्यका (valley) एवं समथल भू-भाग देखि बाहेकका भिरालो क्षेत्रमा प्राविधिकरुपमा उक्त ६ मिटर चौडाई कायम गर्न सम्भव नभएमा प्राविधिकको प्रतिवेदनको आधारमा सम्बन्धित स्थानीय निकायको परिषद्को निर्णयबाट ४ मिटरमा नघट्ने गरी निर्धारण गर्न सक्नेछ।

१४.३६ नगरपालिका क्षेत्रमा सडक सम्बन्धी ऐन लगायत प्रचलित कानूनले तोकेमा सोही अनुसार र सो नभएमा नगर यातायात गुरुयोजनाले निर्धारण गरे अनुरुप सेटब्याक कायम हुनेछ। तर नगरपालिकाले यस्तो सेटब्याक सडक किनारबाट १.५ मिटर भन्दा कम हुने गरी निर्धारण गर्न छैन।

१४.३८ नयाँ बाटोको घुम्ति वा मोडको न्यूनतम अर्धव्यास बाटोको चौडाई भन्दा २०% ले बढी चौडा भएको हुनु पर्नेछ।

***Source : Fundamental Guidelines for Settlement Development, Urban Planning and Building Construction - 2072 (2015 AD)***

However, according to **Fundamental Guidelines for Settlement Development, Urban Planning and Building Construction-2072 (2015 AD),** the minimum setback distance for urban roads as 1.5 m on either side. Again, the minimum of Row of roads has set as 6.0 m. i.e 3.0 m on either side form the centreline. A portion of this guideline has presented herewith.

### 4.3.2 Urban Road Classification

Roads under jurisdiction of Municipal authority are referred as urban roads. The classification practices of urban roads basically are guided by the functional hierarchy of roads. In the context of Nepal, Department of Roads (DoR) has classified urban roads as Arterial, Sub-arterial, Collector and Local/Residential Street in its Urban Road Standard 2068 (draft). The ToR provided for the preparation of RMTMP has formulated the class of roads into A, B, C and D.

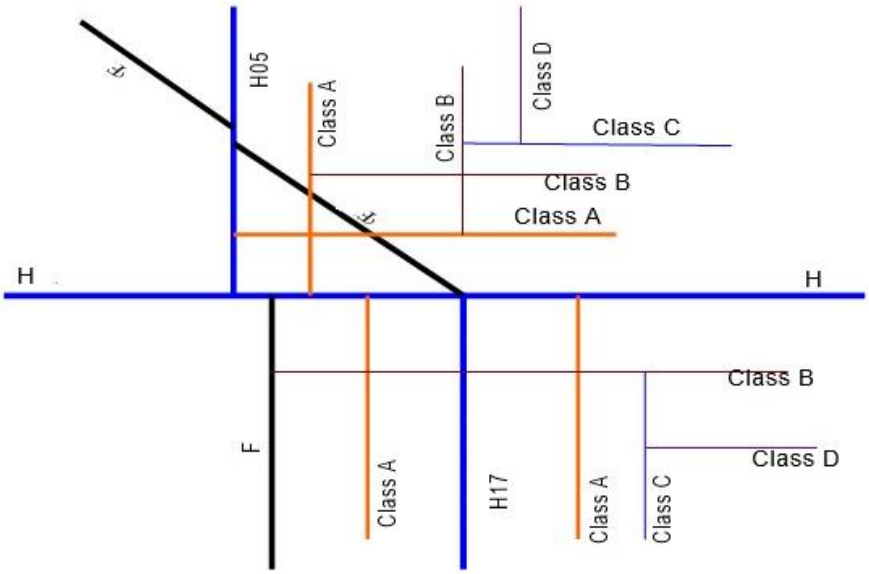



*Figure 21 : Detail description of Road class*

The fundamental parameters of the urban road are shown in Figure 21.Rural Municipality has a complete road network hierarchy consisting of National Highways, Feeder Roads, District Roads and Urban Roads of all four classes. The conceptual layout based on the functional hierarchy of the entire road network is shown in **Error! Reference source not found.**.

### National Highways

Arterial roads in Rural Municipality are taken as the links of National Highways. The technical standards of these roads are taken from the DoR directives for Right of Way (RoW) and other features.

### Feeder Roads

Feeder roads are taken as the sub-arterial road in Rural Municipality. The technical standards for this category are taken as mentioned by the DoR road Standard. These roads have relatively higher traffic with through movement of local vehicles.

### Class A Roads

Class A roads serve as the major collector roads. These roads start either from the Arterial or Sub-Arterial road. These roads are of relatively long distance which connect big market or settlement areas or two or more wards centres within the Rural Municipality.

### Class B Roads

Class B roads are of secondary type of collector roads. These may serve as the collector to the Class A roads with the relatively lower geometric standard. Intersection and other parameters may be taken as similar as Class A roads.

### Class C and Class D Roads

Class C roads are residential street and they provide access to the private property and small industrial or public place. These roads serve mainly for small/light vehicular movement for low volume intensity. If these roads connect one or more residential blocks then they are taken as Class C. If they collect from or end to the single residential block then they are referred as Class D roads. These serve for internal traffic movement without through traffic movement.

## 4.3.3 Coding of Rural Municipality Roads

All road links within the Rural Municipality are given unique code number consisting of ten digits. The coding system for particular road link is described below:

- First digit (1 to 7) represents the number of Province. Code 1 stands for Province 1, 2, 3, 4 5,6 and 7 indicate province 2, province 3, province 4, province 5, province 6 province 7 respectively.
- Second and third digits represent district (1 to 77). Bardiya District is coded by 12.
- Fourth code RM represents for the Rural Municipality.
- Fifth and sixth digits represent particular name (1 to 99 for particular municipality) of the municipality in the district. Geruwa Rural Municipality is coded by 4.
- Seventh code indicates letter A to D for particular Class of road.
- Next three digits (001 to 999) represent the particular transport linkage

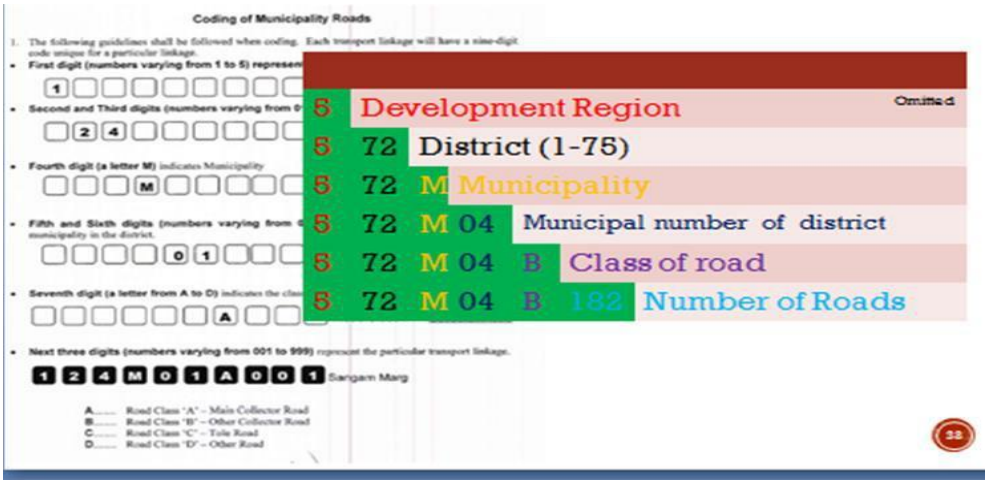



*Figure 22: Coding of Municipal Roads*

After all the code numbers, road name is written. An example of the code number and road in Geruwa Rural Municipality is shown as



(Geruwa Ringroad)

## 4.4 Summary of Road Class A

Roads with Right of Way greater than or equal to 14m are categorized as Road Class "A". These are the main collector road of the Rural Municipality. These roads are assumed to have higher traffic and they pass through along the east to west or north to south of the municipal area. Generally, class A roads are linked with strategic road network, highly dense settlement, major growth area, higher level market centre, service centres etc. These roads are facilitated with various road furniture, green belt for all road users i.e. Vehicles, pedestrian, cycle etc. as shown in Figure 23. The MRCC has decided to keep 24 m ROW for this road class.

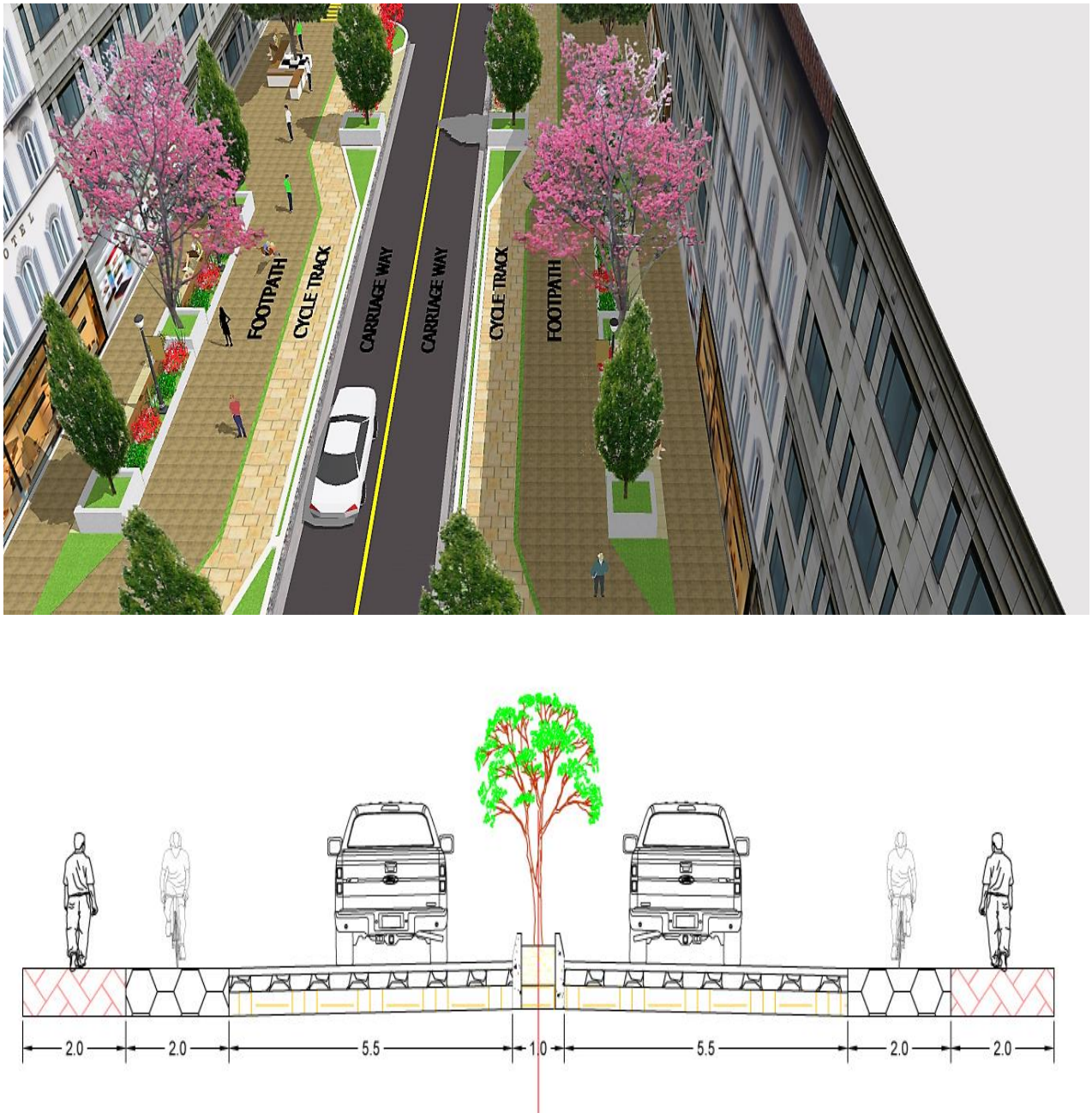
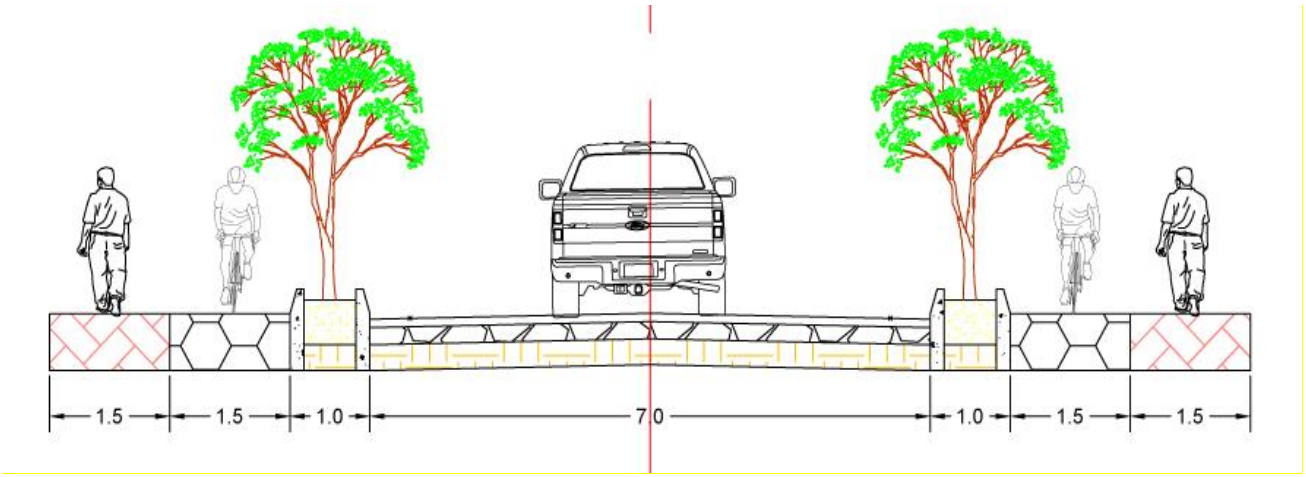



*Figure 23 : Typical Cross-section for Class A Roads (with RoW more than 20 m)*

| Road code | Road Name | Ward pass | Road Width | Surface type | | | | Road condition | | | | Intervention | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ER | GR | New Track | Total | Fair | Poor | New track | Grand Total | Upgrade | New Track | Total |
| **512M04A001** | Rajapur Ringroad | 3,2,1,4,5,6 | 6.39 | | 31.83 | | 31.83 | 31.83 | | | 31.83 | 31.83 | | 31.83 |
| **512M04A002** | Jhabahi Sinchai Sadak | 5,3,4 | 7.01 | | 10.61 | | 10.61 | 10.61 | | | 10.61 | 10.61 | | 10.61 |
| **512M04A003** | Geruwa By-pass sadak | 1,4 | 6.54 | 4.527 | 4.65 | 1.87 | 11.04 | 4.65 | 4.52 | 1.87 | 11.04 | 9.17 | 1.87 | 11.04 |
| **512M04A004** | Jaypur-Hattikhalla-Belbariya sadak | 6 | 6.41 | | 1.49 | | 1.49 | 0.41 | 1.08 | | 1.49 | 1.49 | | 1.49 |
| **512M04A005** | Sonpur Jhabahi Sadak Khanda | 5 | 5.97 | | 0.50 | | 0.50 | 0.50 | | | 0.50 | 0.50 | | 0.50 |

## 4.5 Summary of Road Class B

Roads with Right of Way greater than or equal to 10m are categorized as Road Class "B". These are the other collector road beside main collector roads of the Rural Municipality. Generally, class B roads are linked with road class "A", settlement, various market centre, service centres etc. these roads are facilitated with various road furniture, green belts for all road users i.e. vehicles, pedestrian, cycle etc. as shown in Figure 24. The MRCC has decided to keep 20 m as ROW for this road.




**Type III**

- **2** TL
- 2 Footpaths
- RoW = 14 m
- Pavement width = 7.0 m

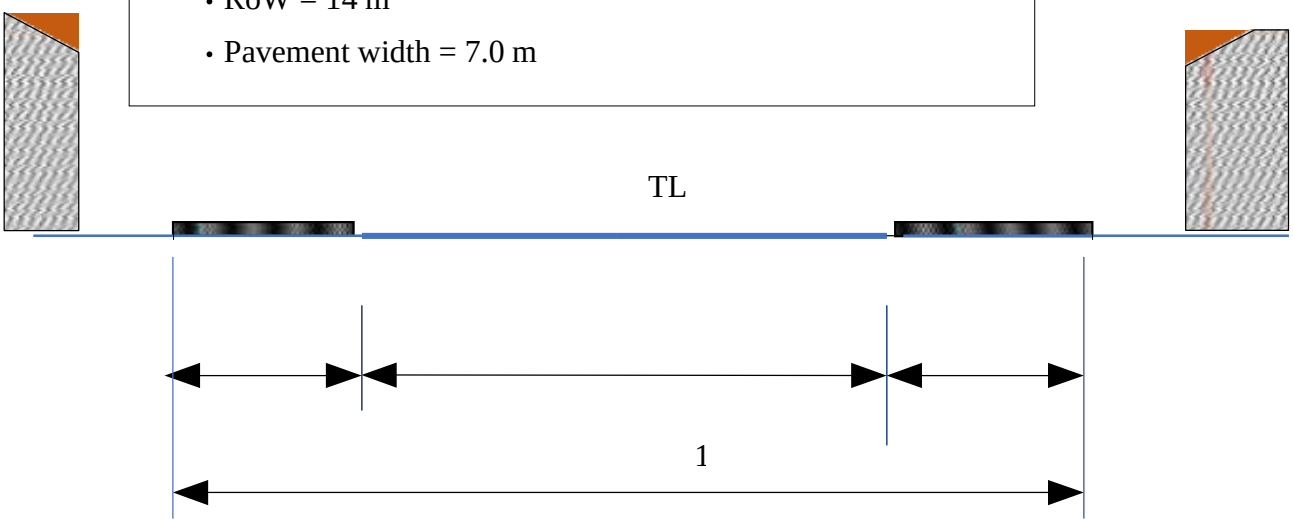



*Figure 24 : Typical Cross-section for Class B Roads (with RoW 14 m)*

| Road code | Road Name | ward pass | Road Width | Surface type | | | | Road condition | | | | Intervention | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ER | GR | New Track | Total | Fair | Poor | New track | Total | Upgrade | New Track | Total |
| **512M04B001** | Nauranga-Belbhariya-Hatti Khalla-Ramnagar-Manau Chautara-Geruwa Khola | 6 | 6.07 | 0.24 | 6.04 | | 6.27 | 5.66 | 0.61 | | 6.27 | 6.27 | | 6.27 |
| **512M04B002** | Hattikhalla-Narayanpur-Prasenipur-Saijanaghat | 6 | 8.03 | | 2.48 | | 2.48 | | 2.48 | | 2.48 | 2.48 | | 2.48 |
| **512M04B003** | Chulchuliya Ghat-Ultanpur To Rajipur | 2 | 5.81 | 2.11 | | | 2.11 | | 2.11 | | 2.11 | 2.11 | | 2.11 |
| **512M04B004** | Laxmipur-Haripur-Barghadahi | 5 | 6.65 | | 1.76 | | 1.76 | 1.76 | | | 1.76 | 1.76 | | 1.76 |
| **512M04B005** | Bishnu Bhattrai Ko Ghar To Sichai Sadak Road(Rajapur Nagarpalika) | 5 | 5.28 | | 1.14 | | 1.14 | 1.14 | | | 1.14 | 1.14 | | 1.14 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04B006** | Thapa Mill-Manau-Loharpur-Sayaulibazaar-Banjariaya-Latthedanda | 6,5 | 5.21 | | 3.13 | | 3.13 | 1.34 | 1.79 | | 3.13 | 3.13 | | 3.13 |
| **512M04B007** | Patahraiya-Latthedanda-Bindra | 5 | 6.16 | | 2.50 | | 2.50 | 2.50 | | | 2.50 | 2.50 | | 2.50 |
| **512M04B008** | Tihuni-Thulo Jhabahi | 3 | 5.69 | 0.65 | | | 0.65 | 0.65 | | | 0.65 | 0.65 | | 0.65 |
| **512M04B009** | Shraswati School To Karnali River | 3 | 4.54 | | 1.41 | | 1.41 | 1.41 | | | 1.41 | 1.41 | | 1.41 |
| **512M04B010** | Kishan Pra Vi To Vhakhari Bajar Sadak | 4 | 6.56 | 3.33 | | | 3.33 | | 3.33 | | 3.33 | 3.33 | | 3.33 |
| **512M04B011** | Patabhar,Transformer Chowk To Bangursa Ghat | 2 | 5.21 | | 3.56 | | 3.56 | 3.56 | | | 3.56 | 3.56 | | 3.56 |
| **512M04B012** | Ringroag-Shantibazaar-Satmoriya-Ganeshpur-Santibazzar-Ringroad | 3,5 | 6.31 | 1.38 | 1.14 | | 2.52 | 2.52 | | | 2.52 | 2.52 | | 2.52 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04B013** | Jhabahi-Pasupatinagar-Patharaiya | 5 | 5.52 | | 2.31 | | 2.31 | 2.31 | | | 2.31 | 2.31 | | 2.31 |
| **512M04B014** | Nepal Rastriya Adharbhut School-Govindapur-Geruwa Khola(Nera School To Geruwa Khola Sadak) | 4 | 5.00 | | 1.90 | | 1.90 | | 1.90 | | 1.90 | 1.90 | | 1.90 |
| **512M04B015** | Geruwa Khola Corridor Road Ward 6,5,4 | 6,5,4 | 6.30 | 0.74 | 8.78 | 5.29 | 14.82 | | 9.52 | 5.29 | 14.82 | 9.52 | 5.29 | 14.82 |
| **512M04B016** | Bijaya Pun Ko Ghar To Jayapur Pul Samma | 6 | 5.29 | 0.44 | | | 0.44 | | 0.44 | | 0.44 | 0.44 | | 0.44 |
| **512M04B017** | Narayan Chowk To Ringroad | 2 | 8.17 | 0.24 | | | 0.24 | | 0.24 | | 0.24 | 0.24 | | 0.24 |

## 4.6 Summary of Road Class C

Roads with Right of Way greater than or equal to 8m are categorized as Road Class "C". These are the main tole roads of the Rural Municipality. Generally, class C roads are market roads etc. connecting various local markets and service centres. Typical cross section of road class C is as shown in

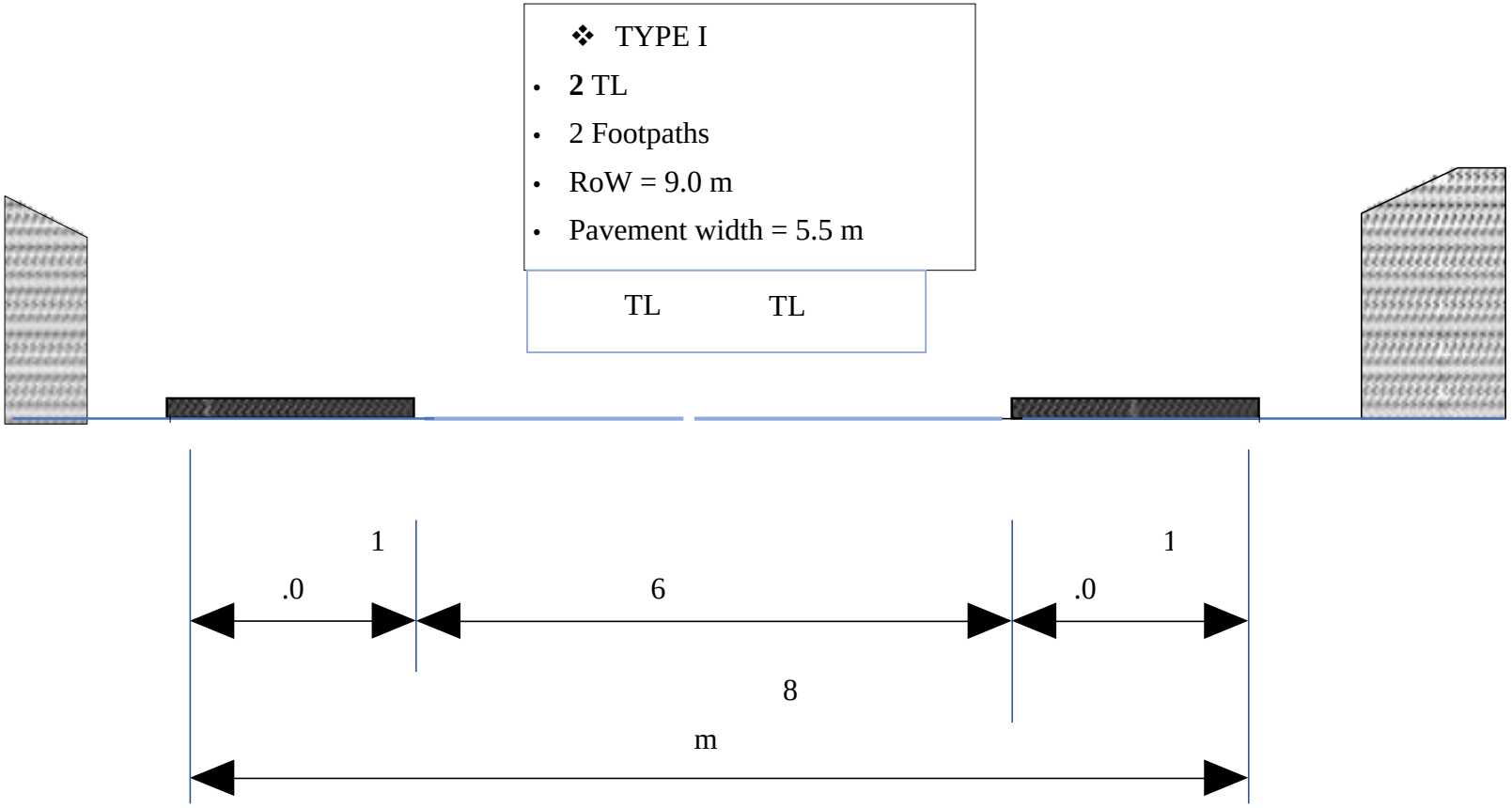



*Figure 25 : Typical Cross-section for Class C Roads (with RoW 8m)*

| Road code | Road Name | Ward pass | Road Width | Surface type | | | | Road condition | | | | Intervention | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ER | GR | New Track | Total | Fair | Poor | New track | Total | Upgrade | New Track | Total |
| **512M04C001** | Gopal Giri Ko Ghar To Police Post- Sitatharu Ko Ghar Hudai Santhos Poudel Ko Ghar - Belbhariya School Samma | 6 | 4.66 | 0.32 | 0.78 | 0.47 | 1.57 | | 1.10 | 0.47 | 1.57 | 1.10 | 0.47 | 1.57 |
| **512M04C002** | Krishi Sadak To Janak Gyawali Hudai Kulo Bata Police Post | 6 | 4.15 | 0.35 | | 0.30 | 0.65 | | 0.65 | | 0.65 | 0.35 | 0.30 | 0.65 |
| **512M04C003** | Rajapur Ring Road,Nauranga-Mangal Tharu Ko Ghar Bata-Bajpur | 6 | 4.50 | 0.69 | 0.92 | | 1.61 | 0.92 | 0.69 | | 1.61 | 1.61 | | 1.61 |
| **512M04C004** | Uttar Manau,Ringroad Bata-Bhim Bahadur Khadka Ko Ghar Divya Jhoti School | 6 | 4.48 | | 0.38 | 0.77 | 1.15 | 0.38 | | 0.77 | 1.15 | 0.38 | 0.77 | 1.15 |
| **512M04C005** | Laharpur Transform To Maan Bahadur Ko Ghar Sammma | 6 | 3.84 | | 0.96 | | 0.96 | | 0.96 | | 0.96 | 0.96 | | 0.96 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04C006** | Sona Fhata Culvert To Lahorpur Karmasahi Ghar Sammma | 6 | 3.73 | | 1.44 | | 1.44 | | 1.44 | | 1.44 | 1.44 | | 1.44 |
| **512M04C007** | Daniramko Ghar To Intake Samma | 5 | 5.56 | 0.95 | | | 0.95 | | 0.95 | | 0.95 | 0.95 | | 0.95 |
| **512M04C008** | Sonahaphanta-Rambdr Ko Ghar Hundai-Geruwa Khola | 6 | 4.22 | 0.26 | 0.60 | | 0.86 | | 0.86 | | 0.86 | 0.86 | | 0.86 |
| **512M04C009** | Mukesh Pandey Ko Ghar - Sonahaphanta-Geruwa Kho | 6 | 4.17 | 0.82 | | | 0.82 | | 0.82 | | 0.82 | 0.82 | | 0.82 |
| **512M04C010** | Laxmipur To Chotan Dait Ko Ghar Sammma | 5 | 4.25 | | 0.56 | | 0.56 | 0.56 | | | 0.56 | 0.56 | | 0.56 |
| **512M04C011** | Dumanpur-Patwaripur-Jugutpur-Pahadipu | 5 | 6.50 | | 3.72 | | 3.72 | 3.72 | | | 3.72 | 3.72 | | 3.72 |
| **512M04C012** | Kuwanr Ko Ghar To Krishna Sahi Ko Ghar Sammma | 5 | 5.90 | | 1.22 | | 1.22 | 1.22 | | | 1.22 | 1.22 | | 1.22 |
| **512M04C013** | Purenataal To Pahadipur Chowck | 5 | 5.18 | 0.88 | | | 0.88 | | 0.88 | | 0.88 | 0.88 | | 0.88 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04C014** | Jhabai Budikula Chowck To Tingharuwxa Chowck Hudai Rajapur Nagarpalika Jodne Sadak | 5 | 5.37 | | 0.70 | | 0.70 | | 0.70 | | 0.70 | 0.70 | | 0.70 |
| **512M04C015** | Baishi Bakhra Farm To Nagarpalika Jodne Bato | 5 | 5.24 | | 0.16 | | 0.16 | | 0.16 | | 0.16 | 0.16 | | 0.16 |
| **512M04C016** | Lal Bahadur Ko Ghar School Hudai Kalika Mandir Hudai | 5 | 5.37 | | 1.36 | | 1.36 | | 1.36 | | 1.36 | 1.36 | | 1.36 |
| **512M04C017** | Patabahr-Tribeni Chowck To Samudayik Ban | 2 | 3.92 | 2.09 | | | 2.09 | | 2.09 | | 2.09 | 2.09 | | 2.09 |
| **512M04C018** | Mitralal Chowck Torajaram Chowck | 2 | 4.18 | 0.61 | | | 0.61 | | 0.61 | | 0.61 | 0.61 | | 0.61 |
| **512M04C019** | Bankatti-Singahi-Damala Chowk | 3,2 | 4.99 | 1.10 | 1.25 | | 2.35 | 2.35 | | | 2.35 | 2.35 | | 2.35 |
| **512M04C020** | Patabhar Vatthi To Bahdur Rawal Ko Ghar Samma | 2 | 4.41 | 1.01 | | | 1.01 | | 1.01 | | 1.01 | 1.01 | | 1.01 |
| **512M04C021** | Khadka Ko Ghar To Trimurti Chowck | 2 | 4.55 | | 0.48 | | 0.48 | 0.48 | | | 0.48 | 0.48 | | 0.48 |
| **512M04C022** | Khalla Tol Sadak | 2 | 4.33 | 0.43 | | | 0.43 | | 0.43 | | 0.43 | 0.43 | | 0.43 |

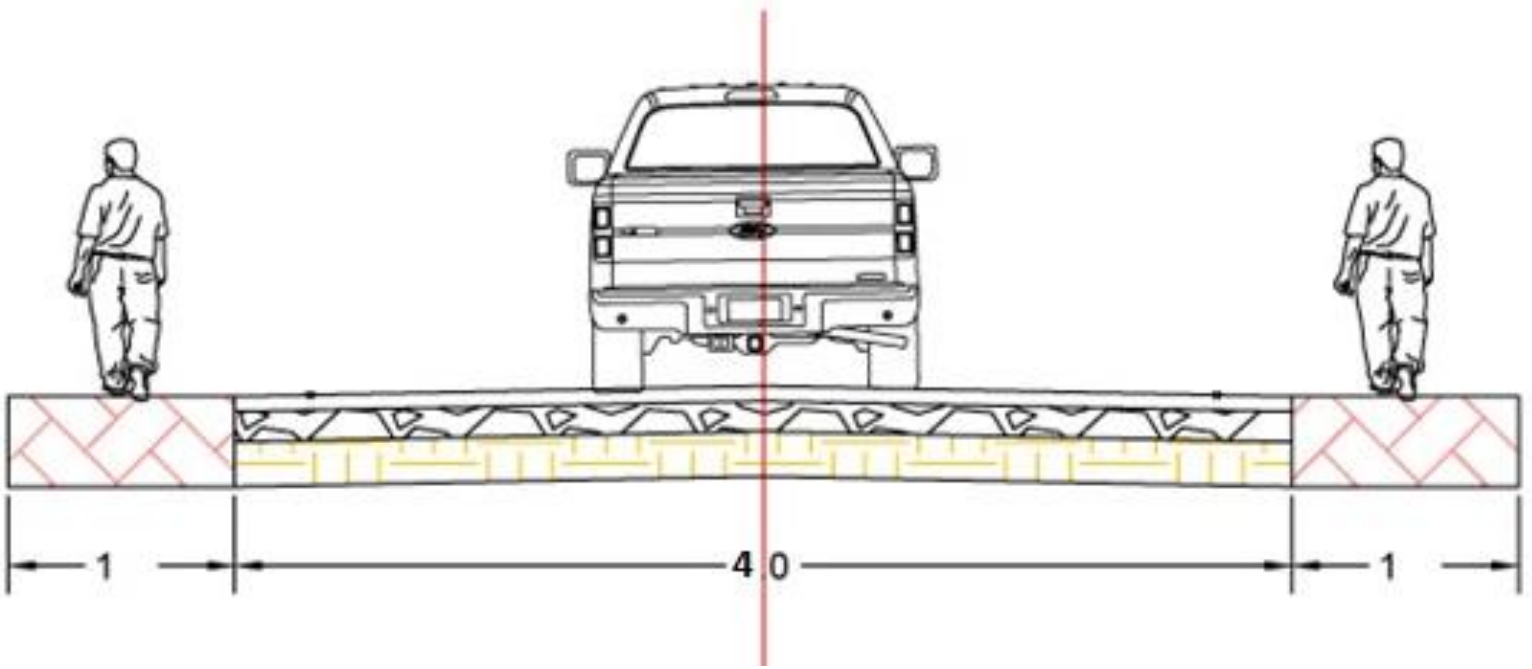
| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04C023** | Santibajar To Satmori | 3,2 | 6.78 | | 1.04 | | 1.04 | 1.04 | | | 1.04 | 1.04 | | 1.04 |
| **512M04C024** | Khonpur To Mainapokhar Samma Ko Sadak | 4 | 4.19 | 1.73 | | | 1.73 | | 1.73 | | 1.73 | 1.73 | | 1.73 |
| **512M04C025** | Dhanu Tharu Ko Ghar To Gobindapur Chowck Sadak | 4 | 6.10 | 1.34 | | | 1.34 | | 1.34 | | 1.34 | 1.34 | | 1.34 |
| **512M04C026** | Bichari Ko Ghar To Ring Road(Purvigobindapur Tol) | 4 | 5.08 | 0.76 | | | 0.76 | | 0.76 | | 0.76 | 0.76 | | 0.76 |
| **512M04C027** | Santi Chowck To Khet Samma,(Karneko Khet Samma) | 4 | 5.16 | 1.10 | | | 1.10 | | 1.10 | | 1.10 | 1.10 | | 1.10 |
| **512M04C028** | Ringroad To Ekpriya Jodne Bato | 2 | 4.64 | | 0.11 | | 0.11 | | 0.11 | | 0.11 | 0.11 | | 0.11 |
| **512M04C029** | Vhakari Bajar To Nadi Samma | 4 | 4.88 | 0.91 | | | 0.91 | | 0.91 | | 0.91 | 0.91 | | 0.91 |
| **512M04C030** | Utarpurba Ringroad To Sichai Road Ghidarpur | 4 | 4.49 | 1.30 | | | 1.30 | | 1.30 | | 1.30 | 1.30 | | 1.30 |
| **512M04C031** | Sabdaha Jane Bato | 4 | 5.49 | 0.23 | | | 0.23 | | 0.23 | | 0.23 | 0.23 | | 0.23 |
| **512M04C032** | Jhodipur Chowck To Dangpur(Ring Road) Samma, | 5 | 4.85 | 1.36 | | | 1.36 | | 1.36 | | 1.36 | 1.36 | | 1.36 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04C033** | Satmoriya-Mainapur-Budikula Kinar Hundai Navajyoti Bazaar | 4,1 | 5.45 | 3.43 | 0.63 | | 4.06 | 0.63 | 3.43 | | 4.06 | 4.06 | | 4.06 |
| **512M04C034** | Ringroad-Thapapur - Bihani Bajar-Kalika Mandir-Badahipur-Bhatjhera-Ringro | 1 | 4.97 | | 3.34 | | 3.34 | 3.34 | | | 3.34 | 3.34 | | 3.34 |
| **512M04C035** | Ring Road Kanpur Chauraha To Barkapuruwa Sichai Road-Ring Road | 1 | 5.96 | | 2.62 | | 2.62 | 2.62 | | | 2.62 | 2.62 | | 2.62 |
| **512M04C036** | Bhairampur To Ultanpur | 2 | 3.85 | 1.07 | | | 1.07 | | 1.07 | | 1.07 | 1.07 | | 1.07 |
| **512M04C037** | Patabhar Kulapul To Ratantharuko Ghar | 2 | 4.37 | 0.55 | | | 0.55 | | 0.55 | | 0.55 | 0.55 | | 0.55 |
| **512M04C038** | Bhairampur Belvharaam Ghar To Rajipur Panifekuwa Tool | 2 | 5.27 | 1.97 | | | 1.97 | | 1.97 | | 1.97 | 1.97 | | 1.97 |
| **512M04C039** | Ramu Chaura To Ward Office | 1 | 6.68 | 0.59 | | | 0.59 | 0.59 | | | 0.59 | 0.59 | | 0.59 |
| **512M04C040** | Samudayik Bhawan,Badahipur-Shinvir Ko Ghat -Phachakpur-Kathamandau | 1 | 3.95 | 2.97 | | 1.50 | 4.46 | 2.97 | | 1.50 | 4.46 | 2.97 | 1.50 | 4.46 |

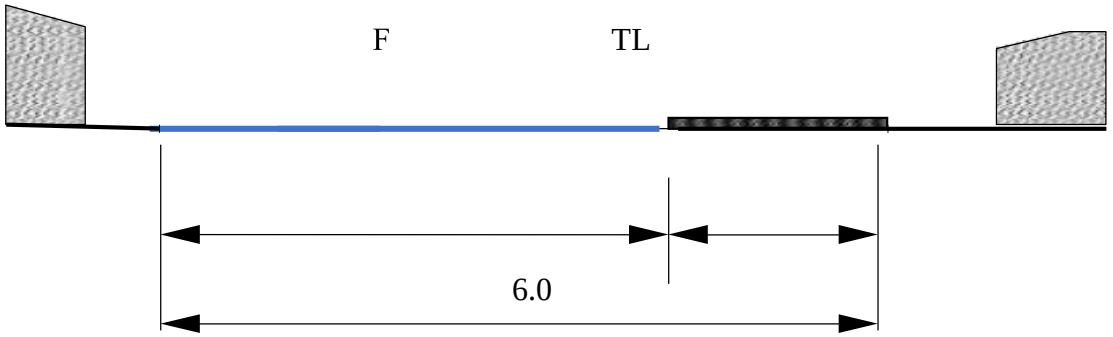
| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04C041** | Jhodipur Ring Road To Santipur Sichai Sadak | 4 | 6.06 | 1.89 | | | 1.89 | | 1.89 | | 1.89 | 1.89 | | 1.89 |
| **512M04C042** | Santipur To Buspark Saddak | 4 | 4.33 | 0.39 | | | 0.39 | | 0.39 | | 0.39 | 0.39 | | 0.39 |
| **512M04C043** | Kalusingha Ko Ghar Ko Bato | 6 | 4.22 | | 0.20 | | 0.20 | | 0.20 | | 0.20 | 0.20 | | 0.20 |
| **512M04C044** | Khalla Ghau To Puspalal Chowck Sadak | 4 | 5.00 | 0.75 | | | 0.75 | | 0.75 | | 0.75 | 0.75 | | 0.75 |
| **512M04C045** | Divya Jhoti School To Ram Bahadur Ko Ghar Sammma | 6 | 4.79 | | 0.31 | | 0.31 | 0.31 | | | 0.31 | 0.31 | | 0.31 |
| **512M04C046** | Satmoriya Chowck To Ganeshpur Chowck | 3,4 | 5.86 | 1.50 | | | 1.50 | 1.50 | | | 1.50 | 1.50 | | 1.50 |
| **512M04C047** | Manau Intake To Bharat B K Ko Ghar Sammm | 6,5 | 5.14 | 1.03 | | | 1.03 | | 1.03 | | 1.03 | 1.03 | | 1.03 |

## 4.7 Summary of Road Class D

These types of roads are constructed only in residential areas. Minimum RoW for such roads is 4 m. However, the RoW for new or planned Class D roads (residential roads) should have at least 6 m RoW. Typical cross section for such road is shown in Figure 26& Figure 27. In this MRCC the proposed ROW for Class ‘D’ road is 8 m.




**Right of Way**



- **1** TL
- 1 Footpath
- RoW = 6 m
- Pavement width = 4 m

1 TL
- 2 Footpaths
- RoW = 6 m
- Pavement width = 4 m

*Figure 26 : Typical Cross class C Roads (RoW 6 m)*

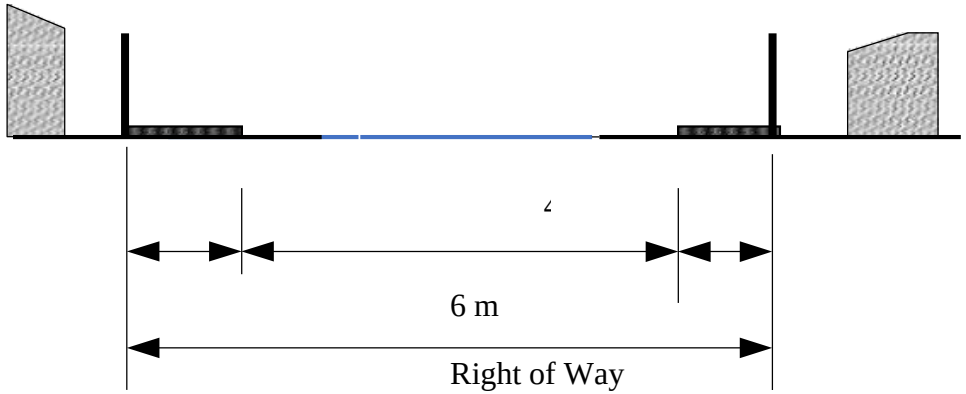



*Figure 27 : Typical Cross class C Roads (RoW 6 m)*

| Road code | Road Name | Ward pass | Road Width | Surface type | | | | Road condition | | | | Intervention | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ER | GR | New Track | Total | Fair | Poor | New track | Total | Upgrade | New Track | Total |
| **512M04D001** | Salikram Rimal Ko Ghar To Intake Samma | 6 | | | | 0.87 | 0.87 | | | 0.87 | 0.87 | 0.00 | 0.87 | 0.87 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D002** | Bishnu Shrestha Ko Ghar To Nathuram Ko Ghar Samma | 6 | | 0.57 | | | 0.57 | | 0.57 | | 0.57 | 0.57 | | 0.57 |
| **512M04D003** | Lohargadha Chautara To Geruwa Nadhi Sammma | 6 | | 0.43 | | | 0.43 | | 0.43 | | 0.43 | 0.43 | | 0.43 |
| **512M04D004** | Belvhariya Chautara To Rajapur Simana | 6 | | 1.89 | | | 1.89 | | 1.89 | | 1.89 | 1.89 | | 1.89 |
| **512M04D005** | Amarsahid Pra Vi To Belvhariya Khusiram Nun Buba Ko Ghar Samma | 6 | | 1.06 | | | 1.06 | | 1.06 | | 1.06 | 1.06 | | 1.06 |
| **512M04D006** | Datxin Belvhariya Moti Tharu Ko Ghar To Ramsworup Tharuko Ghar Samma | 6 | | 1.25 | | | 1.25 | | 1.25 | | 1.25 | 1.25 | | 1.25 |
| **512M04D007** | Krishna Basnet Ko Ghar To Buddhi Ram Ko Ghar Sammma | 6 | | | 0.23 | | 0.23 | | 0.23 | | 0.23 | 0.23 | | 0.23 |
| **512M04D008** | Culvert To Resham Thapa Ko Ghar Sammma | 6 | | 0.32 | | | 0.32 | | 0.32 | | 0.32 | 0.32 | | 0.32 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D009** | Khusiram Ko Ghar To Akrajkumar K Ghar Sammma | 6 | | 0.23 | | | 0.23 | | 0.23 | | 0.23 | 0.23 | | 0.23 |
| **512M04D010** | Hari Jhici Ko Ghar To Belvhariya School Samma | 6 | | | 0.87 | | 0.87 | | 0.87 | | 0.87 | 0.87 | | 0.87 |
| **512M04D011** | Rajesh Thapa Ko Ghar To Jayapur Jodne Pul Samma | 6 | | 1.33 | | | 1.33 | | 1.33 | | 1.33 | 1.33 | | 1.33 |
| **512M04D012** | Ramnagar Ragendra Sir K Ghar To Pashuswasthe,Narayanpur | 6 | | 0.67 | | | 0.67 | | 0.67 | | 0.67 | 0.67 | | 0.67 |
| **512M04D013** | Munni Roka(Krantipur) Ko Ghar To Krishi Sadak Samma | 6 | | 0.59 | | | 0.59 | | 0.59 | | 0.59 | 0.59 | | 0.59 |
| **512M04D014** | Nain Bahadur Sahi Ko Ghar To Danbahadur Ko Ghar Samma | 6 | | | | 0.74 | 0.74 | | | 0.74 | 0.74 | 0.00 | 0.74 | 0.74 |
| **512M04D015** | Jholunge Pul To Befaiya Ghar Samma | 5 | | 0.27 | 0.33 | | 0.60 | 0.60 | | | 0.60 | 0.60 | | 0.60 |
| **512M04D016** | Datxin Manau Ko Vhitri Sadak | 6 | | 0.24 | | | 0.24 | 0.24 | | | 0.24 | 0.24 | | 0.24 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D017** | Utar Manau Culvert To Rajanihan Tol Samma | 6 | | 0.22 | | | 0.22 | 0.22 | | | 0.22 | 0.22 | | 0.22 |
| **512M04D018** | Kabiraj Ko Ghar(Ramnagar) To Maila Nala Samma | 6 | | 0.46 | | | 0.46 | | 0.46 | | 0.46 | 0.46 | | 0.46 |
| **512M04D019** | Birendra Sahi Ko Ghar To Geruwa Kinar | 6 | | | | 0.37 | 0.37 | | | 0.37 | 0.37 | 0.00 | 0.37 | 0.37 |
| **512M04D020** | Divya Jhoti School To Shelter House Samma | 6 | | | | 0.45 | 0.45 | | | 0.45 | 0.45 | 0.00 | 0.45 | 0.45 |
| **512M04D021** | Laharpur Balasinga Ko Ghar To Bir Bahadur Chand Ko Ghar Sammma | 6 | | | | 0.40 | 0.40 | | | 0.40 | 0.40 | 0.00 | 0.40 | 0.40 |
| **512M04D022** | Laxmi Shaha Ko Ghar ,Than Hudai Chitdu Tharuko Ghar Samma | 5 | | 1.22 | | | 1.22 | | 1.22 | | 1.22 | 1.22 | | 1.22 |
| **512M04D023** | Laharpur School To Jay Bahadur Sahiko Khet Sammma | 6 | | | | 0.46 | 0.46 | | | 0.46 | 0.46 | 0.00 | 0.46 | 0.46 |
| **512M04D024** | Mukunda Pandey Ko Ghar To Intake | 6,5 | | 0.71 | | | 0.71 | | 0.71 | | 0.71 | 0.71 | | 0.71 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D025** | Clinic Vhawan To Thaggu Tharu Ko Ghar Samma | 5 | | | 0.35 | | 0.35 | 0.35 | | | 0.35 | 0.35 | | 0.35 |
| **512M04D026** | Daniram Ko Ghar To Mukta Tol Hudai 6 No Simana | 5 | | 0.54 | | | 0.54 | | 0.54 | | 0.54 | 0.54 | | 0.54 |
| **512M04D027** | Patharaiya Clinic To Banjariya Syampatiko Ghar | 5 | | 2.04 | | | 2.04 | | 2.04 | | 2.04 | 2.04 | | 2.04 |
| **512M04D028** | Kanxibhusalni Ko Ghar To Rampure Ko Ghar Sammma | 5 | | 0.57 | | | 0.57 | | 0.57 | | 0.57 | 0.57 | | 0.57 |
| **512M04D029** | Ward Office To Pewar Ba Ko Ghar Samma | 5 | | | 0.19 | | 0.19 | 0.19 | | | 0.19 | 0.19 | | 0.19 |
| **512M04D030** | Laxmi Shaha Ko Ghar To Bista Ko Ghar Samma | 5 | | 0.45 | | | 0.45 | | 0.45 | | 0.45 | 0.45 | | 0.45 |
| **512M04D031** | Birendra Shaha Ko Mill To Sichai Road Jodne | 5 | | | 0.56 | | 0.56 | | 0.56 | | 0.56 | 0.56 | | 0.56 |
| **512M04D032** | Rangilal Tharu Ko Ghar To Simana Samma | 3 | | | | 1.11 | 1.11 | | | 1.11 | 1.11 | 0.00 | 1.11 | 1.11 |
| **512M04D033** | Sichai Road Purvi Sadak,(New Track) | 5 | | | | 0.14 | 0.14 | | | 0.14 | 0.14 | 0.00 | 0.14 | 0.14 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D034** | Mulpanitikkune Sadak | 3 | | 0.51 | | | 0.51 | | 0.51 | | 0.51 | 0.51 | | 0.51 |
| **512M04D035** | Chandrika Chadary To Ranabahadur Kadyar Ko Ghar Samma(New Track) | 3 | | 0.14 | | 1.19 | 1.33 | 0.14 | | 1.19 | 1.33 | 0.14 | 1.19 | 1.33 |
| **512M04D036** | Sankharmisri Ko Ghar To Jhabai Simana | 3 | | 1.16 | | 0.43 | 1.59 | | 1.59 | | 1.59 | 1.16 | 0.43 | 1.59 |
| **512M04D037** | Jholunge Pul Tomulpanibato | 3 | | 1.96 | | | 1.96 | 1.96 | | | 1.96 | 1.96 | | 1.96 |
| **512M04D038** | Bijaya Hotel To Jholunge Pul | 3 | | 1.05 | | | 1.05 | | 1.05 | | 1.05 | 1.05 | | 1.05 |
| **512M04D039** | Chotki Chauraha To Ring Road Jodne Sadak | 3 | | 0.46 | | | 0.46 | 0.46 | | | 0.46 | 0.46 | | 0.46 |
| **512M04D040** | Khusiram Ko Ghar To Karambahadur Tharu Ko Ghar Jodne Sadak | 3 | | | | 0.31 | 0.31 | | | 0.31 | 0.31 | 0.00 | 0.31 | 0.31 |
| **512M04D041** | Santibajar Tallo Chauraha To Naya Ghau Intake | 3 | | 0.57 | | | 0.57 | 0.57 | | | 0.57 | 0.57 | | 0.57 |
| **512M04D042** | Bankatti Kalika Temple To Khatena 2 No.Simana | 3 | | 1.01 | | | 1.01 | 1.01 | | | 1.01 | 1.01 | | 1.01 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D043** | Tika Bahadur Pun Ghar To Chaina Tol Sadak | 3 | | | | 0.50 | 0.50 | | | 0.50 | 0.50 | 0.00 | 0.50 | 0.50 |
| **512M04D044** | Gopitharu Ko Ghar To Jhapai Kulo Samma | 3 | | | | 0.63 | 0.63 | | | 0.63 | 0.63 | 0.00 | 0.63 | 0.63 |
| **512M04D045** | Santibajar Datxinpul To Jhabai Simana Samma | 3 | | | | 1.42 | 1.42 | | | 1.42 | 1.42 | 0.00 | 1.42 | 1.42 |
| **512M04D046** | Police Station To Hamal Ghar Sadak | 3 | | 0.36 | | | 0.36 | 0.36 | | | 0.36 | 0.36 | | 0.36 |
| **512M04D047** | Bus Park To Nayaghau Ko Baad Samma | 3 | | | | 1.13 | 1.13 | | | 1.13 | 1.13 | 0.00 | 1.13 | 1.13 |
| **512M04D048** | Sivhamadhir To Baspark(Budikulo) | 3 | | 0.87 | | | 0.87 | 0.87 | | | 0.87 | 0.87 | | 0.87 |
| **512M04D049** | Shiva Mandhir To Hamal Chowck Sadak | 3 | | 0.36 | | | 0.36 | 0.36 | | | 0.36 | 0.36 | | 0.36 |
| **512M04D050** | Santibajar To Loharpur | 3 | | 0.77 | | | 0.77 | 0.77 | | | 0.77 | 0.77 | | 0.77 |
| **512M04D051** | Ring Road, New Track,D(Arjun Ko Ghar To Dwarpal Ko Ghar Samma) | 3 | | | | 0.38 | 0.38 | | | 0.38 | 0.38 | 0.00 | 0.38 | 0.38 |
| **512M04D052** | Sankati,Sona Ghau Hudai Loharpur Sadak | 3 | | 1.69 | | | 1.69 | 1.69 | | | 1.69 | 1.69 | | 1.69 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D053** | Loharpur To Sabdaha Greha Sadak | 3 | | 1.71 | | | 1.71 | 1.71 | | | 1.71 | 1.71 | | 1.71 |
| **512M04D054** | Khotena Partichayalaya To Karnali Nadisadak | 3 | | 1.14 | | | 1.14 | 1.14 | | | 1.14 | 1.14 | | 1.14 |
| **512M04D055** | Ghatchal Tol Sadak | 2 | | 0.76 | | | 0.76 | | 0.76 | | 0.76 | 0.76 | | 0.76 |
| **512M04D056** | Siurantol Sadak | 2 | | 0.17 | | | 0.17 | | 0.17 | | 0.17 | 0.17 | | 0.17 |
| **512M04D057** | Patabhar Samudayik Vhawan To Budi Kulo Samma | 2 | | 0.53 | | | 0.53 | | 0.53 | | 0.53 | 0.53 | | 0.53 |
| **512M04D058** | Kopila Ban To Ring Road Jodne Sadak | 2 | | 2.21 | | | 2.21 | | 2.21 | | 2.21 | 2.21 | | 2.21 |
| **512M04D059** | Lal Bahadur Dangi Ko Ghar To Ward Adakxya Ko Ghar Samma | 5 | | 1.48 | | | 1.48 | | 1.48 | | 1.48 | 1.48 | | 1.48 |
| **512M04D060** | Naresh Ko Ghar To Shairam Ko Pasal Sammma | 5 | | 0.53 | | | 0.53 | | 0.53 | | 0.53 | 0.53 | | 0.53 |
| **512M04D061** | Samudayik Vhawan To Baburamko Pasal Sammma | 5 | | | 0.25 | | 0.25 | 0.25 | | | 0.25 | 0.25 | | 0.25 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D062** | Khonpur Bich Ghau Ko Chowck To Vhitri Sadak | 4 | | | | 0.47 | 0.47 | | | 0.47 | 0.47 | 0.00 | 0.47 | 0.47 |
| **512M04D063** | Kishan Pra Vi To Nadi Tira Ko Bato | 4 | | 0.16 | | | 0.16 | | 0.16 | | 0.16 | 0.16 | | 0.16 |
| **512M04D064** | Kamal Tharuko Ghar To Field Samma | 5 | | | 0.45 | | 0.45 | 0.45 | | | 0.45 | 0.45 | | 0.45 |
| **512M04D065** | Khalla Ghau Ko Vhitri Sadak | 4 | | 0.37 | | | 0.37 | | 0.37 | | 0.37 | 0.37 | | 0.37 |
| **512M04D066** | Chakra Dhami Ghar To 5 No Jodne Sadak | 3 | | | | 0.61 | 0.61 | | | 0.61 | 0.61 | 0.00 | 0.61 | 0.61 |
| **512M04D067** | Krishana Rahud Ko Ghar To Ranga Bahadur Ko Ghar Samm | 4 | | | 0.88 | | 0.88 | 0.88 | | | 0.88 | 0.88 | | 0.88 |
| **512M04D068** | Keshadevkota Ko Ghar To Krishna Rahud Ko Ghar Sammma | 3,5 | | | 0.49 | | 0.49 | | 0.49 | | 0.49 | 0.49 | | 0.49 |
| **512M04D069** | Kaluram Ko Ghar To Jhoghi Lal Ko Ghar Samma | 4 | | | 0.08 | | 0.08 | 0.08 | | | 0.08 | 0.08 | | 0.08 |
| **512M04D070** | Tingharuwa Ghau Ko Vhitri Sadak | 4 | | | 0.16 | | 0.16 | 0.16 | | | 0.16 | 0.16 | | 0.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D071** | Bal Bahadurko Ghar To Pipal Chowk | 4 | | 0.18 | | 0.75 | 0.93 | | 0.18 | 0.75 | 0.93 | 0.18 | 0.75 | 0.93 |
| **512M04D072** | Baman Ko Ghar To Bhim Dammi Ko Ghar Samma | 4 | | 0.43 | | | 0.43 | | 0.43 | | 0.43 | 0.43 | | 0.43 |
| **512M04D073** | Bichari Ko Ghar To Bajar Tharuko Ghar Samma | 4 | | 0.23 | | | 0.23 | 0.23 | | | 0.23 | 0.23 | | 0.23 |
| **512M04D074** | Janata Ma Vi To Vhutai Tol Sadak | 4 | | 0.50 | | | 0.50 | | 0.50 | | 0.50 | 0.50 | | 0.50 |
| **512M04D075** | Bashudev Ko Ghar To Jhodipur Samma | 4 | | 1.54 | | | 1.54 | | 1.54 | | 1.54 | 1.54 | | 1.54 |
| **512M04D076** | Muktakamaitol To Dahidan Tol Sammma | 4 | | 0.40 | | | 0.40 | 0.40 | | | 0.40 | 0.40 | | 0.40 |
| **512M04D077** | Muktakamaiya Tol | 4 | | 0.27 | | | 0.27 | 0.27 | | | 0.27 | 0.27 | | 0.27 |
| **512M04D078** | Sarawati Aa Vi To Vhagwanpur Jane Bato | 4 | | 0.57 | | | 0.57 | | 0.57 | | 0.57 | 0.57 | | 0.57 |
| **512M04D079** | New Track,D,Jhodipur To Rajip | 4 | | | | 0.72 | 0.72 | | | 0.72 | 0.72 | 0.00 | 0.72 | 0.72 |
| **512M04D080** | Gidarpur,Krishne Tharu Ko Ghar To Paschim Bdi Khola Samma | 4 | | 0.83 | | | 0.83 | 0.05 | 0.78 | | 0.83 | 0.83 | | 0.83 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D081** | Gidarpur,Krishne Tharu Ko Ghar Bata 260M Paschim Bata Uttar | 4 | | 0.24 | | | 0.24 | 0.24 | | | 0.24 | 0.24 | | 0.24 |
| **512M04D082** | New Track(Nirmal Aacharya Ko Ghar To Thauka Ghar Samma | 4 | | 0.29 | | | 0.29 | | 0.29 | | 0.29 | 0.29 | | 0.29 |
| **512M04D083** | Sijhali Ko Ghar To Dilli Aacharya Ko Ghar Samma | 4 | | 0.20 | | | 0.20 | | 0.20 | | 0.20 | 0.20 | | 0.20 |
| **512M04D084** | Indra Dakal Ko Ghar Samma | 4 | | 0.12 | | | 0.12 | 0.12 | | | 0.12 | 0.12 | | 0.12 |
| **512M04D085** | Budikula To Maan Bahadur Maghi Ko Sammma | 4 | | 0.27 | | | 0.27 | | 0.27 | | 0.27 | 0.27 | | 0.27 |
| **512M04D086** | Budikula Todillichalauni Ghar Samma | 4 | | 0.35 | | | 0.35 | | 0.35 | | 0.35 | 0.35 | | 0.35 |
| **512M04D087** | Budikula To Lalsinga Buda Ko Ghar Samma | 4 | | 0.12 | | | 0.12 | | 0.12 | | 0.12 | 0.12 | | 0.12 |
| **512M04D088** | Jingaiya Tol Sadak | 2 | | 0.61 | | | 0.61 | | 0.61 | | 0.61 | 0.61 | | 0.61 |
| **512M04D089** | Ultahan Tol Sadak | 2 | | 0.36 | | | 0.36 | | 0.36 | | 0.36 | 0.36 | | 0.36 |
| **512M04D090** | Jotpurantol Sadak | 2 | | 0.33 | | | 0.33 | | 0.33 | | 0.33 | 0.33 | | 0.33 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D091** | Bihani Bajar To South Dada | 1 | | 0.32 | | | 0.32 | 0.32 | | | 0.32 | 0.32 | | 0.32 |
| **512M04D092** | School Chowck To Pavi Devi Ban Ghar | 1 | | 0.33 | | | 0.33 | 0.33 | | | 0.33 | 0.33 | | 0.33 |
| **512M04D093** | Vhangabadi Budikula To Bihani Bajar Samma | 4 | | 0.22 | | | 0.22 | | 0.22 | | 0.22 | 0.22 | | 0.22 |
| **512M04D094** | Sichai Road To Vhitri Sadak Lohotitol | 4 | | 0.16 | | | 0.16 | | 0.16 | | 0.16 | 0.16 | | 0.16 |
| **512M04D095** | Homestay Janaknagar To Paschimpurva Ghau | 1 | | | 0.50 | | 0.50 | 0.50 | | | 0.50 | 0.50 | | 0.50 |
| **512M04D096** | Nabajyoti Bajar | 4,1 | | | 0.57 | | 0.57 | 0.57 | | | 0.57 | 0.57 | | 0.57 |
| **512M04D097** | Prem Bahadur Rahul Ko Ghar To Raju B K Ko Ghar Sammma | | | 0.58 | | | 0.58 | 0.58 | | | 0.58 | 0.58 | | 0.58 |
| **512M04D098** | Ghurihhhan Ghar To Kanpur Churaha | | | 1.41 | | | 1.41 | 1.41 | | | 1.41 | 1.41 | | 1.41 |
| **512M04D099** | Simana To Jhanjhatpur Chowck | | | 0.58 | | | 0.58 | 0.58 | | | 0.58 | 0.58 | | 0.58 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M04D100** | Rajipur To Sonaha Ghau Hudai Tosunkesa Sahi Ghar Samma | | | 1.81 | | | 1.81 | | 1.81 | | 1.81 | 1.81 | | 1.81 |
| **512M04D101** | Datxin Sona Ghau Sadak | | | 0.20 | | | 0.20 | | 0.20 | | 0.20 | 0.20 | | 0.20 |
| **512M04D102** | Shantipur Sadak Ka | | | 0.35 | | | 0.35 | | 0.35 | | 0.35 | 0.35 | | 0.35 |
| **512M04D103** | Ring Road To Budi Kulo Jane Bato | | | | | 0.14 | 0.14 | | | 0.14 | 0.14 | 0.00 | 0.14 | 0.14 |
| **512M04D104** | Janaki Ma Vi School Jane Bato | | | 0.08 | | | 0.08 | 0.08 | | | 0.08 | 0.08 | | 0.08 |
| **512M05D105** | Ring Road To Bohora Ghar Jane Bato | | | 0.23 | | | 0.23 | 0.23 | | | 0.23 | 0.23 | | 0.23 |
| **512M06D106** | Janakibazaar-Janakinagar-Intake | | | 1.44 | | | 1.44 | | 1.44 | | 1.44 | 1.44 | | 1.44 |
| **512M07D107** | Santipur To Sichai Sadak | | | 0.37 | | | 0.37 | | 0.37 | | 0.37 | 0.37 | | 0.37 |
| **512M08D108** | Ring Road To Patwari Tol | | | 0.53 | | | 0.53 | 0.53 | | | 0.53 | 0.53 | | 0.53 |
| **512M09D109** | Tikaram Sir Ko Ghar Tointakae | | | 0.98 | | | 0.98 | 0.98 | | | 0.98 | 0.98 | | 0.98 |
| **512M10D110** | Chandramaan Ko Ghar Tokarma Ko Ghar Sammma | | | 0.73 | | | 0.73 | 0.73 | | | 0.73 | 0.73 | | 0.73 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **512M11D111** | Ring Road Bata Tikaram Sir Ko Ghar To Intake | | | 1.74 | | | 1.74 | 1.74 | | | 1.74 | 1.74 | | 1.74 |
| **512M12D112** | Madavpurto Utarpurva Road | | | 0.67 | | | 0.67 | 0.67 | | | 0.67 | 0.67 | | 0.67 |
| **512M13D113** | Bhatera Tokathmandu | | | | 3.89 | | 3.89 | 3.89 | | | 3.89 | 3.89 | | 3.89 |
| **512M14D114** | Utarpurva To Bankhet Samma | | | 0.30 | | | 0.30 | 0.30 | | | 0.30 | 0.30 | | 0.30 |
| **512M15D115** | Khalla To Sunaha Ghau Jane Bato | | | 1.26 | | | 1.26 | 1.26 | | | 1.26 | 1.26 | | 1.26 |
| **512M16D116** | Church To Bankhet Sammmaa | | | | 0.90 | | 0.90 | 0.90 | | | 0.90 | 0.90 | | 0.90 |
| **512M17D117** | Sonatol Sadak | | | 0.46 | | | 0.46 | 0.46 | | | 0.46 | 0.46 | | 0.46 |
| **512M18D118** | Kathmandu Chowck To Hansa Karki Ko Ghar Sammma | | | | 0.79 | | 0.79 | 0.79 | | | 0.79 | 0.79 | | 0.79 |
| **512M19D119** | Jaghatram Ko Ghar To Fhachakpur | | | 0.41 | | | 0.41 | 0.41 | | | 0.41 | 0.41 | | 0.41 |
| **512M20D120** | Tek Bahadur Ko Ghar Todurga Nagarkotiko Ghar Sammma | | | 0.27 | | | 0.27 | 0.27 | | | 0.27 | 0.27 | | 0.27 |

## 4.8 Summary of Other Toll Road

These are the roads which do not fall under any classes (Class A, B, C and D). In case of Geruwa Municipality, these roads as consider based on reality that those roads which shall not meet the criteria as set by MTMP road classification in which widening is technically not possible to meet other class of road. However, the municipality has decided to keep these roads as Class 'E' with minimum row of 6m.

| Road code | Road Name | Ward pass | Road Width | Surface type | | | | Road condition | | | | Intervention | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ER | GR | New Track | Total | Fair | Poor | New track | Total | Upgrade | New Track | Total |
| **E001** | Gaucharan Tol To Rajapur Jhapti Jodne Sadak | 6 | | 0.12 | | | 0.12 | | 0.12 | | 0.12 | 0.12 | | 0.12 |
| **E002** | Krishna Madir To Ganga Madam Ko Khet Samma | 6 | | 0.55 | | | 0.55 | | 0.55 | | 0.55 | 0.55 | | 0.55 |
| **E003** | Vhikhu Tharu Ko Ghar To Depak Tharuko Ghar Samma | 6 | | 0.36 | | | 0.36 | | 0.36 | | 0.36 | 0.36 | | 0.36 |
| **E004** | Ganesh Tharu Ko Ghar To Ramprasad Ko Ghar Sammma | 6 | | 0.46 | | | 0.46 | | 0.46 | | 0.46 | 0.46 | | 0.46 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **E005** | Gobinda Lamichane Ghar To Chaitu Ko Ghar Samma | 6 | | 0.19 | | | 0.19 | | 0.19 | | 0.19 | 0.19 | | 0.19 |
| **E006** | Tejuko Ghar To Dayaram Ko Ghar Samma | 6 | | 0.31 | | | 0.31 | | 0.31 | | 0.31 | 0.31 | | 0.31 |
| **E007** | Parseni Muktakamaiya Tol Sadak | 6 | | 0.23 | | | 0.23 | | 0.23 | | 0.23 | 0.23 | | 0.23 |
| **E008** | Sonaha Ghau Sadak | 6 | | 0.23 | | | 0.23 | | 0.23 | | 0.23 | 0.23 | | 0.23 |
| **E009** | Girdari Sigdel Ko Ghar To Mukta Kamaiya Tol Samma | 6 | | 0.27 | | | 0.27 | | 0.27 | | 0.27 | 0.27 | | 0.27 |
| **E010** | Toran Bhadari Ko Ghar To Chamfa Tharu Ko Ghar Samm | 6 | | 0.27 | | | 0.27 | 0.15 | 0.12 | | 0.27 | 0.27 | | 0.27 |
| **E011** | Chotkipur Chauraha To Nera Pra Vi | 3 | | 1.30 | | | 1.30 | 1.30 | | | 1.30 | 1.30 | | 1.30 |
| **E014** | Caturlal Ko Ghar To Karnalitikapur Sadak | 3 | | 0.56 | | | 0.56 | 0.56 | | | 0.56 | 0.56 | | 0.56 |
| **E015** | Ramkishun Tharu Ko Ghar To Ramlal Tharu(Vhadalitol) Sadak | 3 | | | | 0.31 | 0.31 | | | 0.31 | 0.31 | 0.00 | 0.31 | 0.31 |
| **E017** | Parimal Ghar To Ilaka Police Sadak | 3 | | 0.17 | | | 0.17 | 0.17 | | | 0.17 | 0.17 | | 0.17 |
| **E018** | Santibajar Vhitri Sadak | 3 | | 0.20 | | | 0.20 | 0.20 | | | 0.20 | 0.20 | | 0.20 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **E019** | Santibajar Vhitri Sadak | 3 | | 0.23 | | | 0.23 | 0.23 | | | 0.23 | 0.23 | | 0.23 |
| **E020** | Vhitri Bato | 3 | | 0.26 | | | 0.26 | 0.26 | | | 0.26 | 0.26 | | 0.26 |
| **E021** | Santibajar (Sukumbasi)Sadak | 3 | | 0.08 | | | 0.08 | 0.08 | | | 0.08 | 0.08 | | 0.08 |
| **E022** | Madhavpur Sadak | 1 | | 0.45 | | | 0.45 | 0.45 | | | 0.45 | 0.45 | | 0.45 |
| **E023** | Mukti Tol | 1 | | 0.26 | | | 0.26 | 0.26 | | | 0.26 | 0.26 | | 0.26 |

## 4.9 Municipal Inventory Map of Road Network

Road inventory survey was conducted through the municipality as far as possible except the new construction considered. In the inventory survey, the surface condition, width of road, and intervention required were collected. These data are presented in municipality inventory map of road by surface condition, by width and invention needed. Similarly, the map of road infrastructure is also prepared. Refer Vol.II of this report for map in detail.

***Table 15:*** *Present Road Condition*

| S.N | Rural Municipality Roads | SRN Roads | Grand Total |
|---|---|---|---|
| **Metalled** | - | - | - |
| **Earthern** | 112.84 | - | 112.40 |
| **Gravel** | 119.48 | - | 119.48 |
| **New Track** | 23.72 | . | 23.72 |
| **Total** | 256.04 | - | 256.60 |

***Table 16:*** *Summary of Different Road Classification and Planning for new Road*

| Road Type for the Construction Work | Base year (2017/2018 | | | | |
|---|---|---|---|---|---|
| | Earthen | Gravelled | Black top | New Construction | Total |
| **Class "A" Roads** | 4.53 | 49.07 | - | 1.87 | 55.46 |
| **Class "B" Roads** | 9.14 | 36.14 | - | 5.29 | 50.57 |
| **Class "C" Roads** | 34.37 | 22.79 | - | 3.03 | 60.19 |
| **Class "D" Roads** | 58.30 | 11.48 | - | 13.22 | 83.00 |
| **Toll Road** | 6.50 | - | - | 0.31 | 6.81 |
| **Total** | 112.84 | 119.48 | - | 23.72 | 256.04 |

# Chapter-5

# Perspective Plan of Municipal Transport Network

## 5.1 Accessibility and Trip Pattern

The ultimate goal of most transportation is "access," people's ability to reach desired goods, services and activities. Transportation decisions often involve trade-offs between different forms of access. How transport is measured can have a major impact on these trade-offs [(Litman Todd, 2003). Land use patterns affect mobility and accessibility in various ways:

1. *Density* (number of people or jobs per unit of land area) increases the proximity of common destinations, and the number of people who use each mode, increasing demand for walking, cycling and transit.
2. *Land use mix* (locating different types of activities close together, such as shops and schools within or adjacent to residential neighbourhoods) reduces the amount of travel required to reach common activities.
3. *Non-motorized conditions*. The existence and quality of walking and cycling facilities can have a major effect on accessibility, particularly for non-drivers.
4. *Network connectivity* (more roads or paths that connect one geographic area with another) allows more direct travel.

There are many ways to measure transportation system performance, each reflecting particular perspectives concerning who, what, where, how, when and why. Different methods favour different types of transport users and modes, different land use patterns, and different solutions to transport problems. Vehicle traffic is easiest to measure, but this approach only considers a narrow range of transportation problems and solutions. Mobility is more difficult to measure, since it requires tracking people's travel behaviour. It still considers physical movement an end in itself, rather than a means to an end, but expands the range of problems and solutions considered to include alternative modes such as transit, ridesharing, cycling and walking. Accessibility is most difficult to measure, because it requires much effort for taking into account of land use, mobility and mobility substitutes, but most accurately reflects the ultimate goal of transportation, and allows widest range of transport problems and solutions to be considered. For example, an accessibility perspective may identify low-cost solutions to transportation problems, such as improving local walkability; encouraging land use mix so common destinations such as stores, schools and parks are located near residential areas; and improving communications services for isolated people and communities (Litman Todd, 2003).

## 5.2 Procedure for collecting demands from wards

Ward level meeting in every ward or ward cluster is done where information on RMTMP are collected. Demand form for each ward are provided which are later on collected after the form are duly filled in given time. As road demand from the settlement level is collected bottom up approach of planning is applied.

### Data Analysis and Field Verification of the Roads from Demand Form

Analysis of data regarding the accessibility situation in each settlement, population forecasting for each sector, major road linkages will be done. Similarly, all the roads demanded in demand form are verified in field by the survey team.

## 5.3 Scoring System for Screening

Development of the scoring criteria and prioritization criteria based on the provided guidelines are prepared and its approval from the Rural Municipality and MRCC is done.

Transport linkage in an urban area has greater importance for its overall development. The development of road transport linkages to each plot of land or each residential unit is ideal approach for transport planner. Various types of land use pattern require different category of road transport linkage. The development of road linkage requires tremendous amount of public fund. However, the public authorities doesn't have adequate amount of funding. Therefore, a prioritization approach should be adopted for the rational allocation of limited funds for the construction, maintenance and rehabilitation of various categories of road linkage. Conventionally, each construction or maintenance projects are justified on the basis of cost-benefit ratio. This conventional approach disregards the benefit due to non-monetary aspects of the transport projects. Therefore, a multi-criteria approach for the selection of transport linkage is adopted as an justified approach for the project selection.

Transportation services are highly demanded infrastructure for urban as well as areas. The objective of the transport linkage is to provide accessibility for the given degree of mobility. Accessibility and mobility requirements are guided by the people’s demand for better living standard and economic opportunities. The objectives and importance of individual roads should guide the development of scoring criteria for the project selection for implementation. A term of Reference (ToR) for the preparation of RMTMP has formulated the criteria and their respective weights for the evaluation. Consultant has worked out the following weights for the criteria for the prioritization of road links. These scores for the particular criteria are needed to be discussed and approved by MRCC.

***Table 17:*** *Criteria for Priotrization*

| S. No. | Criteria | Scoring Unit | Method of Measurement | Score (ToR) | Score |
|---|---|---|---|---|---|
| 1. | Link providing service to large settlement areas/ population. | Population served/km (continuously Scored) | Measurement of served HH from map and multiplying with HH occupancy of respective wards | 15-20 | 15 |
| 2. | Link providing service to areas with high potential for agriculture, horticulture, livestock production. | Annual production equivalent to NRs……/km (continuously Scored) | Measurement of Agriculture land area from map, livestock from inventory and multiplying with unit rate of production | 5 -10 | 10 |
| 3. | Link providing service to existing market centers:<br>1. commerce and business centers or market sites (local haat)<br>2. tourism attraction centers<br>3. Areas having agro-based and cottage industries<br>4. Other obligatory centers as decided by the Rural Municipality. | Estimated annual transaction in these centres equivalent to NRs……./km<br>(continuously Scored) | Inventory survey along with consultation with people (MRCC) and land cover map are used to identify their location and transactions. | 20 - 25 | 20 |

| | | | | | |
|---|---|---|---|---|---|
| 4. | Link Providing Service To The Existing Service Centers:<br>1. Health Centers,<br>2. Education Centers (School/Campus,<br>3. Office (Rural Municipality/ Government)<br>4. Communication Centre (Post Office, Communication) | Population served by these service centres expressed as persons per km per year. (continuously Scored) | Inventory survey, Map along with consultation with people (MRCC) identifies their location and served population. | 15-20 | 15 |
| 5. | Link providing service to the potential growth or service centers identified by Rural Municipality (IDPM) such as Waste management site. | Anticipated number of people to be directly benefited expressed as persons per km per. (scored continuously) | Consultation with MRCC and IDPM shall also be used | 5-15 | 5 |
| 6. | Link providing service to the potential future development sites such as:<br>1. Potential town growth<br>2. Land pooling<br>3. Potential industrial area<br>4. Forming ring road to Rural Municipality | It is technically sound to score these service discretely based on existence. For each service centers, a score of 2.5 is allocated. | Consultation with MRCC and IDPM shall also be used | 10-20 | 10 |

| | | | | | |
|---|---|---|---|---|---|
| 7. | Link providing service to the areas recognized 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. | • Very important =5<br>• Important =2.5<br>• less important =0<br>(Scored discretely) | Inventory survey along with consultation with local people identifies their location and Importance. | 10 -15 | 15 |
| 8. | Direct link with another linkage | • National Highway=10<br>• Feeder Roads=8<br>• District Roads=6<br>• Neighboring Rural Municipality/ district= 4<br>• Otherwise= 0 | Road Network Map and attribute table. | 5 - 10 | 10 |

## 5.4 List of Feasible New Linkages

Rural Municipality do not have a clear plan for developing land planning, auditorium, play ground, Hospitals and other developments that shall influence the trip nature and pattern. These development areas should be connected with high class roads. The feasible new linkages were identified through MRCC meetings and consultation with ward representatives. The route of Outer ring road and By-pass shall also lie in the Rural municipality area.

### Proposed Corridors

There is possibility of two new routes, one act as Ring Road and passes from centre of the Rural Municipality touching each wards and another along the side of the Geruwa and Karnali River which works as a By-pass for Proposed Ring Road. The construction of the corridor will help to connect the Rural municipality adjacent Municipality i.e Rajapur Municipality and Tikapur Municipality if other Rural municipality take any action to construct bridge across Karnali River.

| S. N. | Proposed Corrider | Class | RoW (M) | Length (km) |
|---|---|---|---|---|
| **1.** | Geruwa Ring Road | A | 25 | 31.83 |
| **2.** | Geruwa Ring Road By-Pass | A | 25 | 11.04 |

## 5.5 Public Transportation

The travel pattern of people in the municipality area is to go towards Market and institutional area i.e Rural Municipality centre "Pashupati", Santi Bazzar, Rajapur and upto Tikapur, Gulariya and Nepalgunj at morning and reverse at evening peak time. This travel pattern is fundamental for the planning of public transport routes. In this regard the proposed route of public transportation routes must follows main road and the link roads which helps to access the Public with Municipal Head office, wards Centre, North South feeder road and East west National highway. For short to medium term planning the routes of public transportation follow short term or main road. However, the long term planning the public transportation route shall follow both the route of road. These Link roads are important for inter-linkages with other routes within Rural Municipality.

***Table 18:*** *Proposed Public Transportation Route*

| S. N. | Proposed Public Transportation route | Ward Passes | Length (km) |
|---|---|---|---|
| **1.** | Geruwa Ring Road | 1,2,3,4,5,6 | 31.83 |
| **2.** | Geruwa By-Pass | 1,4 | 11.05 |
| **3.** | Jhabahi Sinchai Sadak | 4,5 | 10.61 |

## 5.6 Road Safety and Vehicle Parking

Rural Municipality should think about the facilitation of parking area and the measures for enhancing safety along Feeder road. While preparing parking strategy/policy evidence based research on parking demand and occupancy of parking space should be carried out. Conventional approach of solving parking problems by providing more parking spaces should be avoided and market-based or responsive approach should be adopted.

## 5.7 Perspective Plan of Municipal Transport Network with Respective Scoring System and Ranking

The rank of the road has developed based on criteria given in Terms of References and that that has been proposed by MoFALD and approved by MRCC meetings. The MRCC has decided to priotrize the class C Roads based on available budget during the implementation of RMTMP.Hence, Rest of road other than Class A & Class B has not Considered.The summary of

scores and the rank has presented in **Error! Reference source not found.**,**Error! Reference source not found.** .

***Table 19:*** *Scoring System and Ranking of Class A Roads*

| S.N | Municipal Code | Population Served Per Km | Potential Growth Centre | Existing Market Centre | Service Centre | Future Service Centre | Potential Site | Special Consideration | Road Connection | Total Score | Rank | Rank In Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Score** | | 15 | 10 | 20 | 15 | 5 | 10 | 15 | 10 | 100 | | |
| **1** | A001 | 6.66 | 10 | 12 | 15 | 5 | 5 | 15 | 10 | 78.66 | 2 | 1 |
| **2** | A002 | 6.70 | 5 | 8 | 7.5 | 2.5 | 5 | 0 | 5 | 39.70 | 33 | 5 |
| **3** | A003 | 2.60 | 5 | 12 | 7.5 | 2.5 | 10 | 7.5 | 5 | 52.10 | 10 | 2 |
| **4** | A004 | 14.31 | 5 | 8 | 7.5 | 0 | 0 | 0 | 10 | 44.81 | 22 | 3 |
| **5** | A005 | 10.85 | 5 | 8 | 7.5 | 2.5 | 0 | 0 | 10 | 43.85 | 24 | 4 |

***Table 20:*** *Scoring System and Ranking of Class B Roads*

| S.N | Municipal Code | Population Served Per Km | Potential Growth Centre | Existing Market Centre | Service Centre | Future Service Centre | Potential Site | Special Consideration | Road Connection | Total Score | Rank | Rank In Class |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Score** | | 15 | 10 | 20 | 15 | 5 | 10 | 15 | 10 | 100 | | |
| **1** | B001 | 5.91 | 5 | 12 | 15 | 2.5 | 5 | 0 | 10 | 55.41 | 6 | 3 |
| **2** | B002 | 8.84 | 5 | 4 | 7.5 | 2.5 | 0 | 7.5 | 5 | 40.34 | 30 | 7 |
| **3** | B003 | 5.59 | 5 | 8 | 7.5 | 0 | 0 | 7.5 | 5 | 38.59 | 35 | 9 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **4** | B004 | 4.04 | 5 | 8 | 7.5 | 2.5 | 5 | 0 | 5 | 37.04 | 38 | 10 |
| **5** | B005 | 2.52 | 2.5 | 4 | 7.5 | 0 | 0 | 0 | 5 | 21.52 | 63 | 17 |
| **6** | B006 | 7.10 | 5 | 8 | 7.5 | 0 | 0 | 0 | 5 | 32.60 | 43 | 12 |
| **7** | B007 | 9.57 | 5 | 8 | 7.5 | 0 | 0 | 7.5 | 5 | 42.57 | 28 | 6 |
| **8** | B008 | 6.41 | 2.5 | 8 | 0 | 2.5 | 5 | 0 | 5 | 29.41 | 53 | 14 |
| **9** | B009 | 3.42 | 2.5 | 4 | 7.5 | 0 | 0 | 0 | 5 | 22.42 | 62 | 16 |
| **10** | B010 | 4.17 | 2.5 | 8 | 7.5 | 0 | 0 | 7.5 | 0 | 29.67 | 52 | 13 |
| **11** | B011 | 7.00 | 5 | 16 | 7.5 | 0 | 5 | 7.5 | 10 | 58.00 | 3 | 1 |
| **12** | B012 | 7.23 | 7.5 | 12 | 15 | 0 | 5 | 0 | 10 | 56.73 | 4 | 2 |
| **13** | B013 | 4.99 | 5 | 8 | 7.5 | 2.5 | 5 | 0 | 10 | 42.99 | 26 | 5 |
| **14** | B014 | 4.46 | 5 | 8 | 15 | 0 | 5 | 0 | 10 | 47.46 | 13 | 4 |
| **15** | B015 | 1.23 | 2.5 | 8 | 7.5 | 0 | 5 | 0 | 5 | 29.23 | 54 | 15 |
| **16** | B016 | 2.28 | 2.5 | 8 | 7.5 | 2.5 | 5 | 7.5 | 5 | 40.28 | 31 | 8 |
| **17** | B017 | 16.82 | 2.5 | 8 | 0 | 2.5 | 0 | 0 | 5 | 34.82 | 40 | 11 |

## 5.8 Cost of Road Interventions

Strategic Roads and District Roads are excluded for determining the cost of interventions, as the road standard and per unit cost of it also quite different than local level roads. The cost for the construction has determined based on these interventions. The interventions have categorized into two parts: one is road geometry while the other one is the road surface interventions. The road geometry interventions include requirement of widening while the surface type interventions include all interventions other than widening. The cost of interventions required is then determined based on interventions thus determined from the field inventory (other than maintenance). All the costs associated have determined adopting rate of interventions given by Dolidar Guidelines for DTMP Preparation and district rate and has been presented in **Error! Reference source not found.**,

| Road Code | Road Name | Ward Passes | Total Length | widening and Surface Preparation | Gravelling cost(exculuding other road structure) | Blacktop Including all subgrade (excluding Road structure) | Longitudinal lined drain | Cost of Intervention | Total Maintanence Cost | Total Construction Cost | Construction Cost Per Km |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04A001 | Geruwa Ringroad | 3, 2, 1, 4, 5, 6 | 31.83 | 6,365,195.40 | 3,819,117.24 | 178,886,401.26 | 63,651,954.00 | 7,319,987.36 | 22,278,183.90 | 256,223,538.02 | 8050767.40 |
| 512M04A002 | Jhabhahi Sinchai Sadak | 5, 3, 4 | 10.61 | 2,122,088.34 | 1,697,670.67 | 70,249,262.26 | 21,220,883.40 | 12,260,080.30 | 7,427,309.19 | 105,852,314.30 | 9976240.13 |
| 512M04A003 | Geruwa By-Pass Sadak | 1, 4 | 11.04 | 2,208,402.00 | 1,766,721.60 | 73,106,575.42 | 22,084,020.00 | 12,168,150.75 | 4,703,757.00 | 109,567,148.17 | 9922753.93 |
| 512M04A004 | Jaypur-Hattikhalla-Belbariya sadak | 6 | 1.49 | 297,843.60 | 238,274.88 | 8,370,547.39 | 2,978,436.00 | 1,100,000.00 | 1,042,452.60 | 12,746,826.99 | 8559409.70 |
| 512M04A005 | Sonpur Jhabahi Sadak Khanda | 5 | 0.50 | 99,058.20 | 79,246.56 | 2,783,915.31 | 990,582.00 | 19,905.82 | 346,703.70 | 3,893,461.33 | 7860957.15 |
| 512M04B001 | Nauranga-Belbhariya-Hatti Khalla-Ramnagar-Manau Chautara-Geruwa Khola | 6 | 6.27 | 941,125.71 | 7,557,521.80 | 35,893,072.73 | 10,038,674.25 | 2,761,125.71 | 4,302,804.85 | 49,633,998.40 | 7910845.14 |
| 512M04B002 | Hattikhalla-Narayanpur-Prasenipur-Saijanaghat | 6 | 2.48 | 372,034.65 | 2,987,549.85 | 14,188,823.66 | 3,968,369.60 | 2,212,034.65 | 1,736,161.70 | 20,741,262.56 | 8362633.38 |
| 512M04B003 | Chulchuliya Ghat-Ultanpur To Rajipur | 2 | 2.11 | 317,001.00 | 2,545,613.13 | 12,089,925.73 | 3,381,344.00 | 2,070,000.00 | 682,032.45 | 17,858,270.73 | 8450259.18 |
| 512M04B004 | Laxmipur-Haripur-Barghadahi | 5 | 1.76 | 211,761.60 | 2,125,636.47 | 10,095,323.11 | 2,823,488.00 | 20,000.00 | 1,235,276.00 | 13,150,572.71 | 7452100.50 |
| 512M04B005 | Bishnu Bhattrai Ko Ghar To Sichai Sadak Road(Rajapur Nagarpalika) | 5 | 1.14 | 136,882.80 | 1,374,012.44 | 6,525,621.71 | 1,825,104.00 | 10,000.00 | 798,483.00 | 8,497,608.51 | 7449533.62 |
| 512M04B006 | Thapa Mill-Manau-Loharpur- | 6,5 | 3.13 | 375,052.00 | 3,764,725.14 | 17,879,876.08 | 5,000,693.39 | 2,334,407.50 | 2,187,803.36 | 25,590,028.98 | 8187673.82 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sayaulibazaar-Banjariaya-Latthedanda | | | | | | | | | | |
| 512M04B007 | Patahraiya-Latthedanda-Bindra | 5 | 2.50 | 300,295.21 | 3,014,325.80 | 14,315,991.16 | 4,003,936.16 | 1,337,684.51 | 1,751,722.07 | 19,957,907.04 | 7975314.79 |
| 512M04B008 | Tihuni-Thulo Jhabahi | 3 | 0.65 | 78,373.68 | 786,705.20 | 3,736,313.02 | 1,044,982.40 | 0.00 | 210,777.70 | 4,859,669.10 | 7440767.00 |
| 512M04B009 | Shraswati School To Karnali River | 3 | 1.41 | 168,613.20 | 1,692,518.22 | 8,038,306.92 | 2,248,176.00 | 1,040,000.00 | 983,577.00 | 11,495,096.12 | 8180922.58 |
| 512M04B010 | Kishan Pra Vi To Vhakhari Bajar Sadak | 4 | 3.33 | 399,112.80 | 4,006,244.40 | 19,026,927.80 | 5,321,504.00 | 1,080,000.00 | 1,073,371.55 | 25,827,544.60 | 7765487.23 |
| 512M04B011 | Patabhar,Transformer Chowk To Bangursa Ghat | 2 | 3.56 | 426,602.40 | 4,282,181.57 | 20,337,441.10 | 5,688,032.00 | 2,110,000.00 | 2,488,514.00 | 28,562,075.50 | 8034293.90 |
| 512M04B012 | Ringroad-Shantibazaar-Satmoriya-Ganeshpur-Santibazzar-Ringroad | 3,5 | 2.52 | 302,752.48 | 3,038,991.51 | 14,433,136.45 | 4,036,699.68 | 50,000.00 | 1,244,180.03 | 18,822,588.60 | 7460585.17 |
| 512M04B013 | Jhabahi-Pasupatinagar-Patharaiya | 5 | 2.31 | 276,624.54 | 2,776,722.55 | 13,187,537.83 | 3,688,327.20 | 1,050,000.00 | 1,613,643.15 | 18,202,489.57 | 7896258.04 |
| 512M04B014 | Nepal Rastriya adharbhut-Govindapur-Geruwa Khola(Nera School Dekhi Geruwa Khola Sadak) | 4 | 1.90 | 228,538.68 | 2,294,042.70 | 10,895,137.82 | 3,047,182.40 | 40,000.00 | 1,333,142.30 | 14,210,858.90 | 7461770.01 |
| 512M04B015 | Geruwa Khola Corridor Road Ward 6,5,4 | 6,5,4 | 14.82 | 1,777,954.82 | 17,846,888.28 | 84,760,544.04 | 23,706,064.32 | 29,764,253.93 | 6,651,649.68 | 140,008,817.11 | 9449654.08 |
| 512M04B016 | Bijaya Pun Ko Ghar To Jayapur Pul Samma | 6 | 0.44 | 52,617.96 | 528,172.51 | 2,508,459.08 | 701,572.80 | 20,000.00 | 141,510.42 | 3,282,649.84 | 7486378.80 |
| 512M04B017 | Narayan Chowk To Ringroad | 2 | 0.24 | 28,983.72 | 290,934.96 | 1,381,742.57 | 386,449.60 | 64,344.48 | 92,586.88 | 1,861,520.37 | 7707169.55 |
| 512M04C001 | Gopal Giri Ko Ghar To Police Post- Sitatharu Ko Ghar Hudai Santhos | 6 | 1.57 | 187,914.72 | 1,886,264.47 | 7,235,917.81 | 2,505,529.60 | 372,340.10 | 692,569.22 | 10,301,702.23 | 6578538.75 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Poudel Ko Ghar - Belbhariya School Samma | | | | | | | | | | |
| 512M04C002 | Krishi Sadak To Janak Gyawali Hudai Kulo Bata Police Post | 6 | 0.65 | 78,356.04 | 786,528.14 | 3,017,208.37 | 1,044,747.20 | 10,000.00 | 149,845.35 | 4,150,311.61 | 6356081.71 |
| 512M04C003 | Rajapur Ring Road,Nauranga-Mangal Tharu Ko Ghar Bata-Bajpur | 6 | 1.61 | 192,973.08 | 1,937,039.66 | 7,430,697.00 | 2,572,974.40 | 20,000.00 | 906,627.20 | 10,216,644.48 | 6353203.97 |
| 512M04C004 | Uttar Manau,Ringroad Bata- Bhim Bahadur Khadka Ko Ghar Divya Jhoti School | 6 | 1.15 | 137,769.60 | 1,382,914.02 | 5,305,010.18 | 1,836,928.00 | 20,000.00 | 303,201.50 | 7,299,707.78 | 6358187.39 |
| 512M04C005 | Laharpur Transform To Maan Bahadur Ko Ghar Sammma | 6 | 0.96 | 115,631.40 | 1,160,693.54 | 4,452,547.98 | 1,541,752.00 | 20,000.00 | 674,516.50 | 6,129,931.38 | 6361522.61 |
| 512M04C006 | Sona Fhata Culvert To Lahorpur Karmasahi Ghar Sammma | 6 | 1.44 | 172,458.00 | 1,731,111.85 | 6,640,735.29 | 2,299,440.00 | 1,020,000.00 | 1,006,005.00 | 10,132,633.29 | 7050505.02 |
| 512M04C007 | Daniramko Ghar To Intake Samma | 5 | 0.95 | 113,815.92 | 1,142,469.98 | 4,382,640.39 | 1,517,545.60 | 233,404.85 | 363,578.63 | 6,247,406.76 | 6586853.68 |
| 512M04C008 | Sonahaphanta-Rambdr Ko Ghar Hundai-Geruwa Khola | 6 | 0.86 | 103,041.00 | 1,034,312.68 | 3,967,737.10 | 1,373,880.00 | 20,000.00 | 518,063.72 | 5,464,658.10 | 6364058.70 |
| 512M04C009 | Mukesh Pandey Ko Ghar -Sonahaphanta-Geruwa Kho | 6 | 0.82 | 98,867.28 | 992,417.40 | 3,807,022.21 | 1,318,230.40 | 205,376.15 | 315,826.03 | 5,429,496.04 | 6590041.97 |
| 512M04C010 | Laxmipur To Chotan Dait Ko Ghar Sammma | 5 | 0.56 | 67,275.60 | 675,304.06 | 2,590,540.60 | 897,008.00 | 136,141.75 | 392,441.00 | 3,690,965.95 | 6583604.08 |
| 512M04C011 | Dumanpur-Patwaripur-Jugutpur-Pahadipu | 5 | 3.72 | 446,979.91 | 4,486,728.46 | 17,211,583.47 | 5,959,732.13 | 1,090,000.00 | 2,607,382.81 | 24,708,295.51 | 6633397.60 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04C012 | Kuwanr Ko Ghar To Krishna Sahi Ko Ghar Sammma | 5 | 1.22 | 146,680.80 | 1,472,363.54 | 5,648,148.33 | 1,955,744.00 | 305,026.50 | 855,638.00 | 8,055,599.63 | 6590310.09 |
| 512M04C013 | Purenataal To Pahadipur Chowck | 5 | 0.88 | 105,698.52 | 1,060,988.53 | 4,070,068.61 | 1,409,313.60 | 20,000.00 | 337,648.05 | 5,605,080.73 | 6363473.09 |
| 512M04C014 | Jhabai Budikula Chowck To Tingharuwxa Chowck Hudai Rajapur Nagarpalika Jodne Sadak | 5 | 0.70 | 84,541.68 | 848,618.82 | 3,255,395.04 | 1,127,222.40 | 198,515.65 | 493,159.80 | 4,665,674.77 | 6622543.73 |
| 512M04C015 | Baishi Bakhra Farm To Nagarpalika Jodne Bato | 5 | 0.16 | 19,162.44 | 192,350.18 | 737,876.42 | 255,499.20 | 10,000.00 | 111,780.90 | 1,022,538.06 | 6403389.51 |
| 512M04C016 | Lal Bahadur Ko Ghar School Hudai Kalika Mandir Hudai | 5 | 1.36 | 162,646.80 | 1,632,628.25 | 6,262,941.38 | 2,168,624.00 | 930,000.00 | 948,773.00 | 9,524,212.18 | 7026916.37 |
| 512M04C017 | Patabahr-Tribeni Chowck To Samudayik Ban | 2 | 2.09 | 250,438.08 | 2,513,866.14 | 9,643,466.80 | 3,339,174.40 | 30,000.00 | 800,010.53 | 13,263,079.28 | 6355141.81 |
| 512M04C018 | Mitralal Chowck Torajaram Chowck | 2 | 0.61 | 72,614.76 | 728,897.88 | 2,796,132.39 | 968,196.80 | 20,000.00 | 231,963.82 | 3,856,943.95 | 6373818.13 |
| 512M04C019 | Bankatti-Singahi-Damala Chowk | 3,2 | 2.35 | 281,949.01 | 2,830,168.96 | 10,856,839.18 | 3,759,320.19 | 910,000.00 | 1,296,455.89 | 15,808,108.38 | 6728071.07 |
| 512M04C020 | Patabhar Vatthi To Bahdur Rawal Ko Ghar Samma | 2 | 1.01 | 121,663.08 | 1,221,238.80 | 4,684,806.26 | 1,622,174.42 | 258,118.28 | 388,645.95 | 6,686,762.03 | 6595356.91 |
| 512M04C021 | Khadka Ko Ghar To Trimurti Chowck | 2 | 0.48 | 58,077.36 | 582,973.28 | 2,236,349.57 | 774,364.80 | 10,000.00 | 338,784.60 | 3,078,791.73 | 6361429.10 |
| 512M04C022 | Khalla Tol Sadak | 2 | 0.43 | 51,579.84 | 517,751.99 | 1,986,153.52 | 687,731.20 | 10,000.00 | 164,768.93 | 2,735,464.56 | 6364031.90 |
| 512M04C023 | Santibajar To Satmori | 3,2 | 1.04 | 124,512.72 | 1,249,843.12 | 4,794,535.56 | 1,660,169.60 | 263,461.35 | 726,324.20 | 6,842,679.23 | 6594679.71 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04C024 | Khonpur To Mainapokhar Samma Ko Sadak | 4 | 1.73 | 208,180.80 | 2,089,692.85 | 8,016,291.42 | 2,775,744.00 | 440,339.00 | 665,022.00 | 11,440,555.22 | 6594588.10 |
| 512M04C025 | Dhanu Tharu Ko Ghar To Gobindapur Chowck Sadak | 4 | 1.34 | 160,309.20 | 1,609,163.71 | 6,172,928.84 | 2,137,456.00 | 40,000.00 | 512,098.83 | 8,510,694.04 | 6370709.14 |
| 512M04C026 | Bichari Ko Ghar To Ring Road(Purvigobindapur Tol) | 4 | 0.76 | 90,807.48 | 911,514.13 | 3,496,668.39 | 1,210,766.40 | 20,000.00 | 290,079.45 | 4,818,242.27 | 6367196.54 |
| 512M04C027 | Santi Chowck To Khet Samma,(Karneko Khet Samma) | 4 | 1.10 | 132,009.60 | 1,325,095.86 | 5,083,213.36 | 1,760,128.00 | 50,000.00 | 421,697.33 | 7,025,350.96 | 6386218.24 |
| 512M04C028 | Ringroad To Ekpriya Jodne Bato | 2 | 0.11 | 13,402.68 | 134,534.43 | 516,088.85 | 178,702.40 | 10,000.00 | 78,182.30 | 718,193.93 | 6430301.33 |
| 512M04C029 | Vhakari Bajar To Nadi Samma | 4 | 0.91 | 108,773.28 | 1,091,852.59 | 4,188,466.52 | 1,450,310.40 | 30,000.00 | 347,470.20 | 5,777,550.20 | 6373863.36 |
| 512M04C030 | Utarpurba Ringroad To Sichai Road Ghidarpur | 4 | 1.30 | 155,672.40 | 1,562,620.09 | 5,994,382.41 | 2,075,632.00 | 940,000.00 | 497,286.83 | 9,165,686.81 | 7065365.58 |
| 512M04C031 | Sabdaha Jane Bato | 4 | 0.23 | 27,130.20 | 272,329.56 | 1,044,686.11 | 361,736.00 | 10,000.00 | 86,665.92 | 1,443,552.31 | 6384998.15 |
| 512M04C032 | Jhodipur Chowck To Dangpur(Ring Road) Samma, | 5 | 1.36 | 163,731.60 | 1,643,517.33 | 6,304,713.12 | 2,183,088.00 | 40,000.00 | 523,031.50 | 8,691,532.72 | 6370083.27 |
| 512M04C033 | Satmoriya-Mainapur-Budikula Kinar Hundai Navajyoti Bazaar | 4,1 | 4.06 | 487,135.53 | 4,889,805.53 | 18,757,831.42 | 6,495,140.37 | 1,615,000.00 | 1,756,505.41 | 27,355,107.32 | 6738602.90 |
| 512M04C034 | Ringroad-Thapapur - Bihani Bajar-Kalika Mandir-Badahipur-Bhatjhera-Ringro | 1 | 3.34 | 400,999.56 | 4,025,183.46 | 15,441,046.12 | 5,346,660.80 | 1,300,249.89 | 167,083.15 | 22,488,956.37 | 6729869.64 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04C035 | Ring Road Kanpur Chauraha To Barkapuruwa Sichai Road-Ring Road | 1 | 2.62 | 313,998.00 | 3,151,872.67 | 12,090,929.97 | 4,186,640.00 | 1,140,000.00 | 119,450.07 | 17,731,567.97 | 6776438.56 |
| 512M04C036 | Bhairampur To Ultanpur | 2 | 1.07 | 127,918.80 | 1,284,032.92 | 4,925,691.41 | 1,705,584.00 | 920,000.00 | 247,842.68 | 7,679,194.21 | 7203814.50 |
| 512M04C037 | Patabhar Kulapul To Ratantharuko Ghar | 2 | 0.55 | 66,113.16 | 663,635.64 | 2,545,779.23 | 881,508.80 | 10,000.00 | 128,094.25 | 3,503,401.19 | 6358917.70 |
| 512M04C038 | Bhairampur Belvharaam Ghar To Rajipur Panifekuwa Tool | 2 | 1.97 | 236,487.26 | 2,373,829.60 | 9,106,271.21 | 3,153,163.52 | 483,413.62 | 458,194.07 | 12,979,335.62 | 6586064.08 |
| 512M04C039 | Ramu Chaura To Ward Office | 1 | 0.59 | 70,990.08 | 712,589.55 | 2,733,571.82 | 946,534.40 | 150,853.92 | 137,543.28 | 3,901,950.22 | 6595767.00 |
| 512M04C040 | Samudayik Bhawan,Badahipur-Shinvir Ko Ghat - Phachakpur-Kathamandau | 1 | 4.46 | 535,775.28 | 5,378,045.29 | 20,630,772.78 | 7,143,670.40 | 1,434,578.65 | 757,577.73 | 29,744,797.11 | 6662076.03 |
| 512M04C041 | Jhodipur Ring Road To Santipur Sichai Sadak | 4 | 1.89 | 226,519.20 | 2,273,771.41 | 8,722,437.04 | 3,020,256.00 | 454,723.50 | 438,880.95 | 12,423,935.74 | 6581659.69 |
| 512M04C042 | Santipur To Buspark Saddak | 4 | 0.39 | 47,065.70 | 472,439.65 | 1,812,330.43 | 627,542.72 | 98,248.20 | 91,189.80 | 2,585,187.05 | 6591263.27 |
| 512M04C043 | Kalusingha Ko Ghar Ko Bato | 6 | 0.20 | 24,469.32 | 245,619.98 | 942,225.22 | 326,257.60 | 0.00 | 9,308.54 | 1,292,952.14 | 6340767.00 |
| 512M04C044 | Khalla Ghau To Puspalal Chowck Sadak | 4 | 0.75 | 89,776.08 | 901,161.07 | 3,456,952.90 | 1,197,014.40 | 22,444.02 | 173,941.16 | 4,766,187.40 | 6370767.00 |
| 512M04C045 | Divya Jhoti School To Ram Bahadur Ko Ghar Sammma | 6 | 0.31 | 37,642.92 | 377,854.93 | 1,449,493.02 | 501,905.60 | 90,580.48 | 14,319.99 | 2,079,622.02 | 6629524.01 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04C046 | Satmoriya Chowck To Ganeshpur Chowck | 3,4 | 1.50 | 180,504.12 | 1,811,877.79 | 6,950,562.34 | 2,406,721.60 | 388,445.23 | 349,726.73 | 9,926,233.29 | 6599007.24 |
| 512M04C047 | Manau Intake To Bharat B K Ko Ghar Sammm | 6,5 | 1.03 | 123,220.45 | 1,236,871.49 | 4,744,774.99 | 1,642,939.36 | 920,000.00 | 238,739.63 | 7,430,934.80 | 7236722.16 |

# Chapter-6

# First Five Year Municipal Transport Master Plan

The previous year budget of the municipality shall be collected and the growth rated shall be then determined. Then short term and long term financial plan shall be forecasted. The Projected financial plan for five year shall be prepared. Since, this Rural Municipality has newly formed and hence previous year Budget cannot be accurately determined to forecast the expected budget. In this condition we have considered only one year Budget.

## 6.1 Five year Projected Financial Plan

The current budget plan of the municipality has presented in **Error! Reference source not found.**. Based on the growth pattern, the growth factor is determined and the budget for coming year has forecasted as shown in below. The composition of source of budget in municipality shows heterogeneous in nature. The very high amount of budget is granted by the Government of Nepal. So, if there is any changes occurred in granted amount by government, there result will be significant change in the municipality budget. The government of Nepal has intended to increase the total budget of each local bodies by 15-20% each year to meet the physical development of these bodies. Hence, In case of Rural Municipality the growth rate that has been used in all the calculations is 15%, as it is used for general purpose when we don't have precise growth rate.

***Table 21:*** *Budget Amount of Municipality*

| Fiscal Year | Amount (NRs.) | Rate of Increment (%) | Remarks |
|---|---|---|---|
| 2016/17 | | | Revised Budget |
| 2017/18 | 2,25,50,000 | 15% | Estimated Budget by Municipality |

## 6.2 Sharing of Fund

The financial plan and the finalization of the RMTMP shall be done based on terms of reference as given by ministry. During preparation of RMTMP, the investment from total available resources under road sector for different classes of the road can be distributed as Apportion 30% for maintenance at first and remaining 70% shall be distributed .The MoFALD guidelines has set different view for budget distribution in different class of road:

- Class A road, ≥ 50%

- Class B road, ≤ 30%
- Class C road, ≤ 20%
- Class D road, ≤ 10%

Although, MoFALD has set guidelines for the distribution of budget, it was adjusted by making discussion with local authorities based on local condition and requirement of Rural Muncipality. Chaubise Rural Municipality has decided to invest the 70% in construction and 30% in Maintenance of road for next 5 fiscal years. The construction sector Budget shall be invested with 50% in A-Class, 30% in B-class, 20% in C-class.

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 lanes, Class B road is to be made intermediate lane and Class C and Class D road is to be made single lane and lane considered are assumed to be gravelled. 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 gravelling cost and for short term the minimum width of 3m is assumed if existing road width doesn't exists. Similarly longitudinal drainage on both side of roadway is considered in this plan.

MTMP mainly deals with Class A, B and C roads, and Class D roads but private owned Roads are not given any consideration. Interventions on those roads need to be incorporated in annual budget plan. As compared to the present budget of Municipality, the estimated budget is more and the deficit amount should be managed from outer sources.

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, municipality 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.

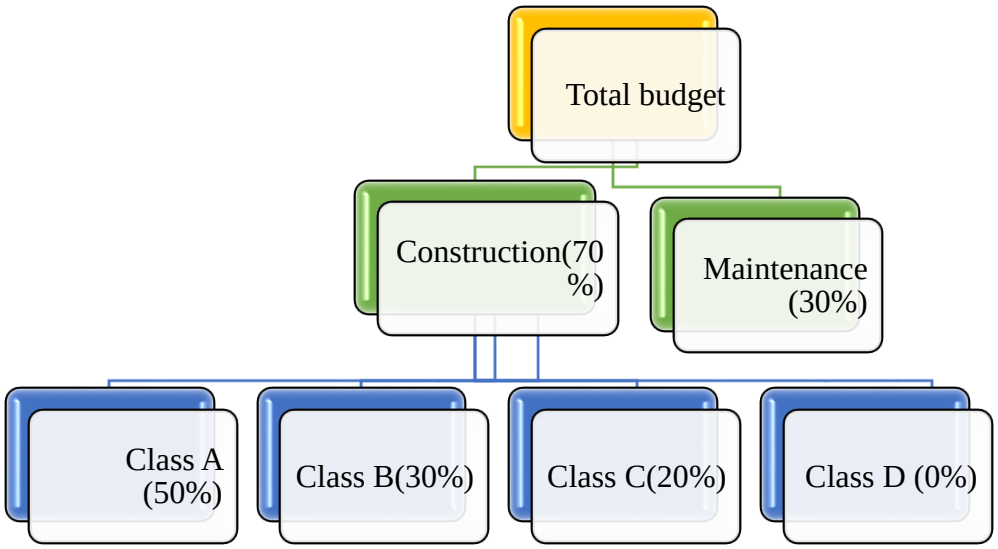



*Figure 28 : Budget Allocation as Per Interest of Local Authorities over Planning of Municipal Road (source : MoFALD MTMP preperation Guidelines)*

Figure 29 presents municipal revenue composition of Nepal as found by MoLD and GTZ in 2008.

For research they have considered various municipalities from different districts since 1991/92 to 2005/6.

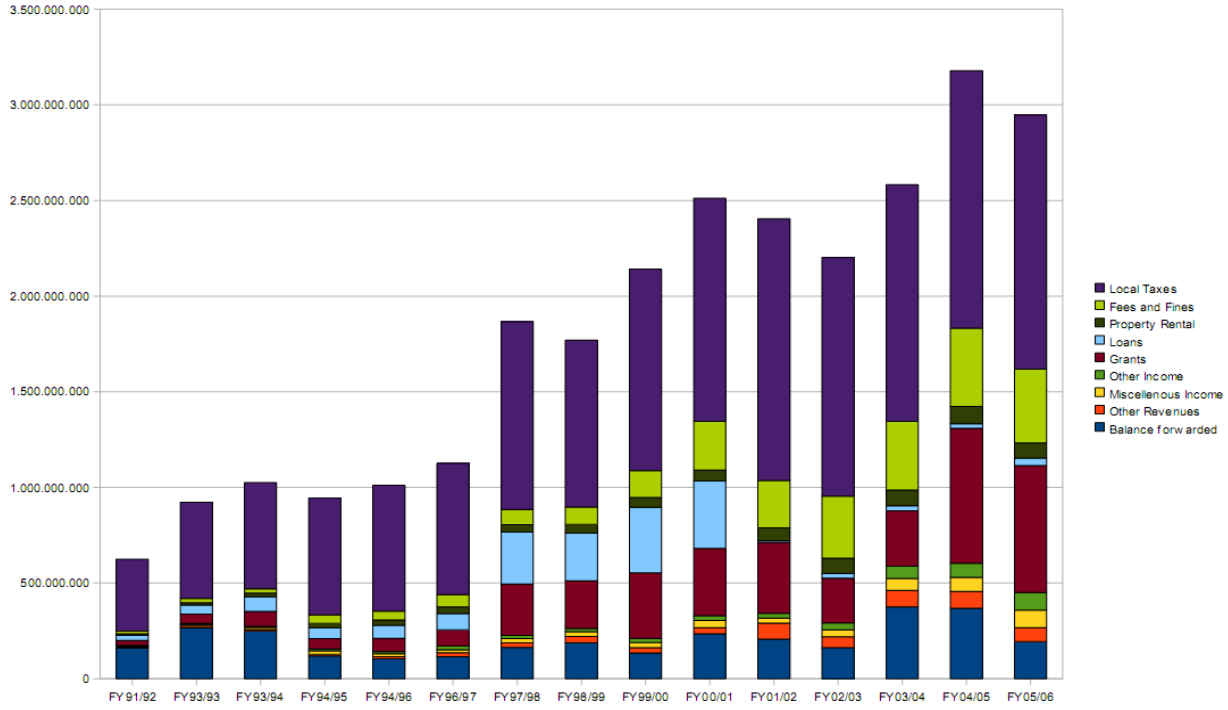



*Figure 29 : Municipal Revenue Composition in Nepal*

The details of the budget sharing of interventions and maintenance and also for class A, B, C and D has presented in Table 28.

***Table 22:*** *Forecasted Budget for Chaubise Rural Municipality*

| Budget | Probable Budget | Construction(70%) | Maintainance(30%) | Class A(50%) | Class B(30%) | Class C(20%) | Total Cost For Construction |
|---|---|---|---|---|---|---|---|
| **Base Year** | 22,550,000 | 15,785,000 | 6,765,000 | 7,892,500 | 4,735,500 | 3,157,000 | 15,785,000 |
| **first Year** | 25,932,500 | 18,152,750 | 7,779,750 | 9,076,375 | 5,445,825 | 3,630,550 | 18,152,750 |
| **Second Year** | 29,822,375 | 20,875,663 | 8,946,713 | 10,437,831 | 6,262,699 | 4,175,133 | 20,875,663 |
| **Third Year** | 34,295,731 | 24,007,012 | 10,288,719 | 12,003,506 | 7,202,104 | 4,801,402 | 24,007,012 |
| **Fourth Year** | 39,440,091 | 27,608,064 | 11,832,027 | 13,804,032 | 8,282,419 | 5,521,613 | 27,608,064 |
| **Fifth Year** | 45,356,105 | 31,749,273 | 13,606,831 | 15,874,637 | 9,524,782 | 6,349,855 | 31,749,273 |
| **Total** | | | | 69,088,881 | 41,453,328 | 27,635,552 | 138,177,761 |

***Table 23:*** *Forecasted Budget in Road Sector*

| Base Year | | Forecasted Year (Amount in NRs. ) | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | | 0 | 1 | 2 | 3 | 4 | 5 |
| **F/Y** | | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| **Amount** | | 22,550,000 | 25,932,500 | 29,822,375 | 34,295,731 | 39,440,091 | 45,356,105 |
| **Intervention Type** | Construction | 15,785,000 | 18,152,750 | 20,875,663 | 24,007,012 | 27,608,064 | 31,749,273 |
| | Maintenance | 6,765,000 | 7,779,750 | 8,946,713 | 10,288,719 | 11,832,027 | 13,606,831 |

***Table 24:*** *Forecasted Financial Plan of the Municipality in Road Sector*

| Base Year | Forecasted Year (Amount in NRs. ) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Base Year | 1 year | 2 year | 3 year | 4 year | 5 year | 10 year | 20 year |
| **2018/19** | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | 2028/29 | 2038/39 |
| **Amount** | 22,550,000 | 25,932,500 | 29,822,375 | 34,295,731 | 39,440,091 | 45,356,105 | 260,797,601 | 2,999,172,415 |
| **Cumulative Budget** | 22,550,000 | 48,482,500 | 78,304,875 | 112,600,606 | 152,040,697 | 197,396,802 | | |

## 6.3 Year-wise Targets

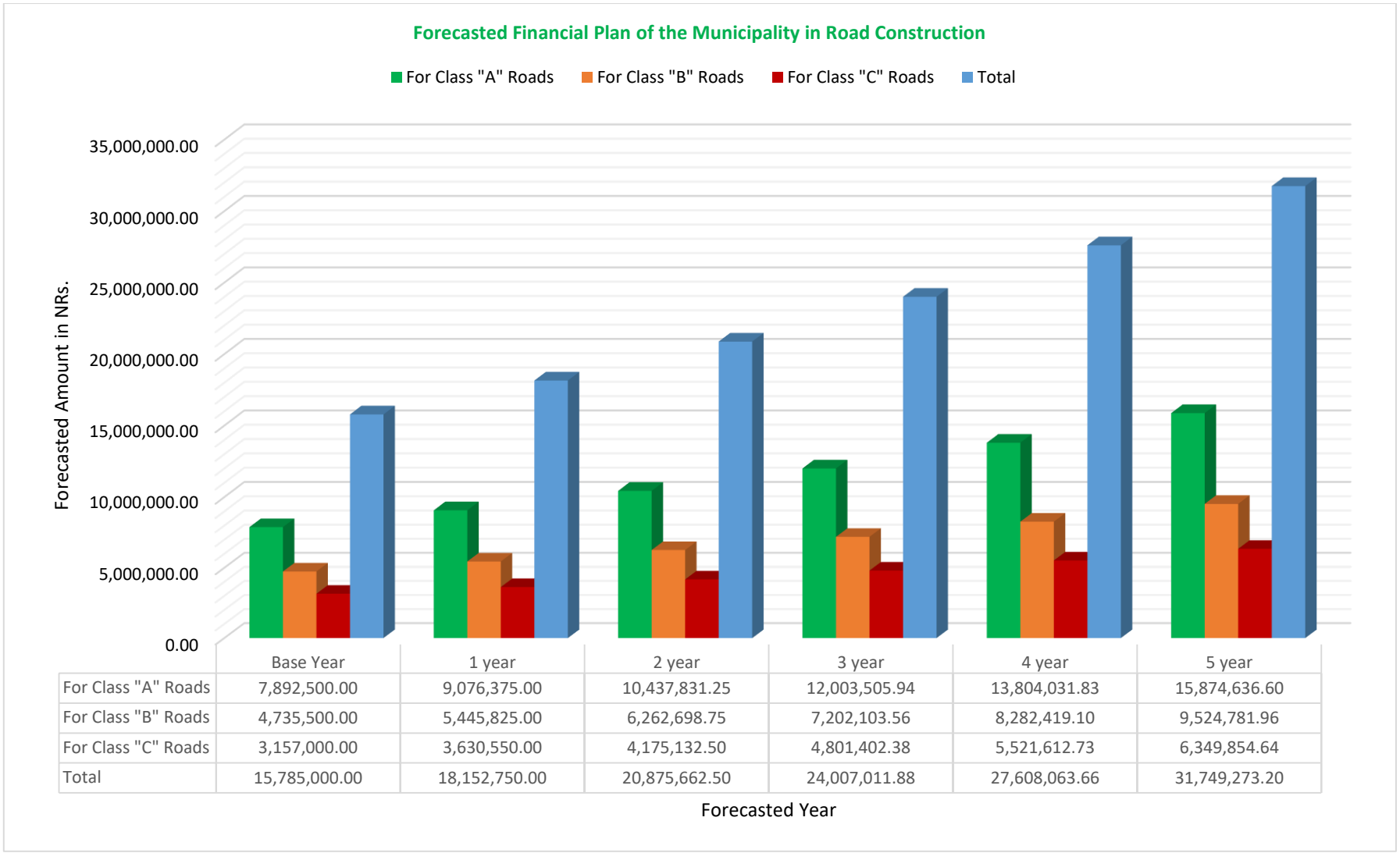
Year wise target shall be developed based on available budgets.

***Table 25:*** *Forecasted Financial Plan of the Municipality in Road Construction*

| Forecasted Year (Amount in NRs. ) | | | | | | |
|---|---|---|---|---|---|---|
| **Road Type for the Construction Work** | **Base Year** | **1 year** | **2 year** | **3 year** | **4 year** | **5 year** |
| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| **For Class "A" Roads** | 7,892,500 | 9,076,375 | 10,437,831 | 12,003,506 | 13,804,032 | 15,874,637 |
| **For Class "B" Roads** | 4,735,500 | 5,445,825 | 6,262,699 | 7,202,104 | 8,282,419 | 9,524,782 |
| **For Class "C" Roads** | 3,157,000 | 3,630,550 | 4,175,133 | 4,801,402 | 5,521,613 | 6,349,855 |
| **Total for Construction** | 15,785,000 | 18,152,750 | 20,875,663 | 24,007,012 | 27,608,064 | 31,749,273 |

***Table 26:*** *Forecasted Financial Plan of the Municipality in Road Maintenance*

| Forecasted Year (Amount in NRs. ) | | | | | | |
|---|---|---|---|---|---|---|
| **Road Type for the Construction Work** | **Base Year** | **1 year** | **2 year** | **3 year** | **4 year** | **5 year** |
| | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 |
| **For Class "A" Roads** | 2,706,000 | 3,111,900 | 3,578,685 | 4,115,488 | 4,732,811 | 5,442,733 |
| **For Class "B" Roads** | 2,029,500 | 2,333,925 | 2,684,014 | 3,086,616 | 3,549,608 | 4,082,049 |
| **For Class "C" Roads** | 1,353,000 | 1,555,950 | 1,789,343 | 2,057,744 | 2,366,405 | 2,721,366 |
| **For Class "D" Roads** | 676,500 | 777,975 | 894,671 | 1,028,872 | 1,183,203 | 1,360,683 |
| **Total for Construction** | 6,765,000 | 7,779,750 | 8,946,713 | 10,288,719 | 11,832,027 | 13,606,831 |




| | Base Year | 1 year | 2 year | 3 year | 4 year | 5 year |
|---|---|---|---|---|---|---|
| For Class "A" Roads | 7,892,500.00 | 9,076,375.00 | 10,437,831.25 | 12,003,505.94 | 13,804,031.83 | 15,874,636.60 |
| For Class "B" Roads | 4,735,500.00 | 5,445,825.00 | 6,262,698.75 | 7,202,103.56 | 8,282,419.10 | 9,524,781.96 |
| For Class "C" Roads | 3,157,000.00 | 3,630,550.00 | 4,175,132.50 | 4,801,402.38 | 5,521,612.73 | 6,349,854.64 |
| Total | 15,785,000.00 | 18,152,750.00 | 20,875,662.50 | 24,007,011.88 | 27,608,063.66 | 31,749,273.20 |

*Figure 30 Forcasted Financial Plan of the Municipality for construction of road*

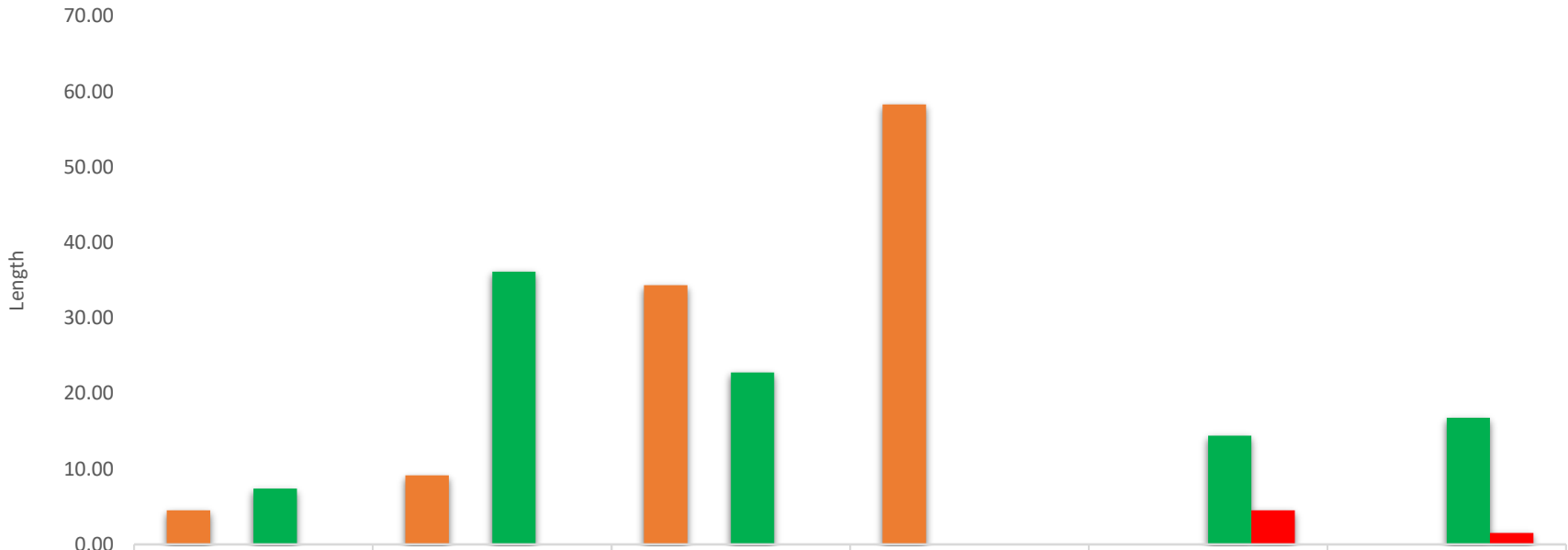
## 6.4 Implementation Plan

The detailed of five year and abstract of twenty year implementation plan has been developed. The implementation plan has prepared based on the priority/rank obtained from the prioritization criteria. Total expected length of road for Blacktopping within MTMP period is 6.00km, and remaining graveled road with complete structure will be 31.19 km Which can be metalled in next fiscal year after end of existing MTMP. During the planning of MTMP Class C and D roads were not planned individually because most of them are short and toll roads which doesnot make great impact on total economy of the Municipality. Also, the Rural Municipality has deceided do Planning of these roads making discussion with local stake holder during Budget Preperation. The other roads shall be constructed in upcoming years. The details of 5 years planning is shown in Table 27.

***Table 27:*** *Forecasted Plan of the Municipal Road Construction*

| Road Type for the Construction Work | Base year(2017/2018) | | | | | MTMP Period | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 year | | 2 year | | 3 year | | 4 year | | 5 year | |
| | | | | | | 2019/20 | | 2020/21 | | 2021/22 | | 2022/23 | | 2023/24 | |
| | ER | GR | BT | Total | NT Demand | GR | BT | GR | BT | GR | BT | GR | BT | GR | BT |
| **Class "A" Roads** | 4.53 | 49.07 | - | 53.6 | 1.87 | 4.62 | 0.00 | 5.30 | 0.00 | 2.00 | 1.00 | 2.50 | 1.10 | 0.00 | 2.40 |
| **Class "B" Roads** | 9.14 | 36.14 | - | 45.28 | 5.29 | 3.30 | 0.00 | 3.20 | 0.00 | 3.65 | 0.00 | 6.20 | 0.00 | 0.42 | 1.50 |
| **Class "C" Roads** | 34.37 | 22.79 | - | 57.16 | 3.03 | The Rural Municipality has deceided do Planning of these roads making discussion with local stake holder during Budget Preperation. | | | | | | | | | |
| **Class "D" Roads** | 58.3 | 11.48 | - | 69.78 | 13.22 | | | | | | | | | | |
| **SRN** | 6.5 | 0 | 0 | 6.5 | 0.31 | | | | | | | | | | |
| **Total for Construction** | 106.34 | 119.48 | 0.00 | 225.82 | 23.41 | 7.92 | 0.00 | 8.50 | 0.00 | 5.65 | 1.00 | 8.70 | 1.10 | 0.42 | 3.90 |

## Forecasted Plan of the Municipality in Road Construction




| | Class "A" Roads | Class "B" Roads | Class "C" Roads | Class "D" Roads | Class "A" Roads End of MTMP Period (2023/24) | Class "B" Roads |
|---|---|---|---|---|---|---|
| Earthen | 4.53 | 9.14 | 34.37 | 58.30 | | |
| Earthen | 0.00 | | | | | |
| Gravelled | 7.41 | 36.14 | 22.79 | | 14.42 | 16.77 |
| Blacktop | 0.00 | | | | 4.50 | 1.50 |

*Figure 31 Planning Of Road Construction Within MTMP Period*

***Table 28:*** *Table 3 Forecasted Plan of the Municipality in Road Construction*

| Road Type for the Construction Work | Base year (2017/2018) | | | | | End of MTMP Period (2023/24) | |
|---|---|---|---|---|---|---|---|
| | ER | GR | BT | Total | NT Demand | GR with Drain | BT |
| **Class "A" Roads** | 4.53 | 7.41 | - | 11.94 | 1.87 | 14.42 | 4.50 |
| **Class "B" Roads** | 9.14 | 36.14 | - | 45.28 | 5.29 | 16.77 | 1.50 |
| **Class "C" Roads** | 34.37 | 22.79 | - | 57.16 | 3.03 | The Rural Municipality has deceided do Planning of these roads making discussion with local stake holder during Budget Preperation. | |
| **Class "D" Roads** | 58.30 | 11.48 | - | 69.78 | 13.22 | | |
| **Toll Road** | 6.50 | 0.00 | - | 6.50 | 0.31 | | |
| **Total for Construction** | 112.84 | 77.82 | | 190.66 | 23.41 | 31.19 | 6.00 |

### 6.4.1 Implementation Plan for Class 'A' Roads

In MTMP period, about 4.50 km road under class ‘A’ shall be Blacktopped and 14.42 Km will be gravelled with Drain structure which are either of Gravelled and Earthen at present. The details of Implementation plan are Presented in Table Below

| General information | | | | Year 1 | | | Year 2 | | | Year 3 | | | Year 4 | | | Year 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Road Code | Road Name | Wards passes | Total | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention |
| 512M04A001 | Geruwa Ringroad | 3,2,1,4,5,6 | 31.83 | The Detailed Project Report was done By District Technical office intending to make Blacktop within comming fiscal year.Hence, Rural Municipality will not invest Budget in this road. | | | | | | | | | | | | | | |
| 512M04A003 | Geruwa By-Pass Sadak | 1,4 | 11.04 | 2.00 | 3,630,550.00 | Surface Preperation and Drain construction | 2.30 | 4,175,132.50 | Surface Preperation and Drain construction | 1.00 | 6,001,752.97 | Gravelling and complete Blacktop | 1.10 | 6,902,015.91 | Gravelling and Blacktop | 1.20 | 7,937,318.30 | Blacktop |
| 512M04A004 | Jaypur-Hattikhalla-Belbariya sadak | 6 | 1.49 | 1.51 | 2,722,912.50 | Surface Preperation and Drain construction | 1.50 | 1,774,431.31 | | | - | | | - | - | 1.20 | 7,937,318.30 | Blacktop |
| 512M04A005 | Sonpur Jhabahi Sadak Khanda | 5 | 0.50 | 0.50 | 907,637.50 | Surface Preperation and Drain construction | - | - | | | - | | | - | | | - | |
| 512M04A002 | Jhabhahi Sinchai Sadak | 5,3,4 | 10.61 | 0.60 | 1,815,275.00 | surface Preperation, Drain construction and Gravelling | 1.50 | 4,488,267.44 | surface Preperation, Drain construction and Gravelling | 2.00 | 6,001,752.97 | surface Preperation, Drain construction and Gravelling | 2.50 | 6,902,015.91 | surface Preperation, Drain construction and Gravelling | | - | |

### 6.4.2 Implementation Plan for Class 'B' Roads

In MTMP period, about 1.50 km of the road under class ‘B’ will be Blacktopped while 16.77 km of road will be gravelled with other complete structure which are either Gravelled and Earthen at present. The details of Implementation plan are Presented in Table Below.

| Road Code | Road Name | Ward passes | Total | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention | Length Of Construction | Budget Allocated | intervention |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04B011 | Patabhar,Transformer Chowk To Bangursa Ghat | 2 | 3.56 | 1.30 | 2178330.00 | Surface preperation And Drain Construction | 1.35 | 2254571.55 | Surface preperation And Drain Construction | 1.00 | 1800525.89 | Surface preperation And Drain Construction | 3.50 | 3478616.02 | Gravelling | 1.00 | 4762390.98 | Blacktop |
| 512M04B012 | Ringroad-Shantibazaar-Satmoriya-Ganeshpur-Santibazzar-Ringroad | 3,5 | 2.52 | 1.00 | 1633747.50 | Surface preperation And Drain Construction | 0.75 | 2129317.58 | Surface preperation , Gravelling And Drain Construction | 0.75 | 2160631.07 | Surface preperation , Gravelling And Drain Construction | - | - | | 0.50 | 2381195.49 | Blacktop |
| 512M04B001 | Nauranga-Belbhariya-Hatti Khalla-Ramnagar-Manau Chautara-Geruwa Khola | 6 | 6.27 | 1.00 | 1633747.50 | Surface preperation And Drain Construction | 1.10 | 1878809.63 | Surface preperation And Drain Construction | 1.50 | 2520736.25 | Surface preperation And Drain Construction | 1.70 | 2898846.68 | Surface preperation And Drain Construction | 0.42 | 2381195.49 | Surface preperation And Drain Construction |
| 512M04B014 | Nepal Rastriya adharbhut-Govindapur-Geruwa Khola(Nera School Dekhi Geruwa Khola Sadak) | 4 | 1.90 | | | | | | | 0.40 | 720210.36 | Surface preperation And Drain Construction | 1.00 | 1904956.39 | Surface preperation And Drain Construction | | - | |
| 512M04B013 | Jhabahi-Pasupatinagar-Patharaiya | 5 | 2.31 | | | | | | | | | | - | - | | | - | |
| 512M04B007 | Patahraiya-Latthedanda-Bindra | 5 | 2.50 | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 512M04B002 | Hattikhalla-Narayanpur-Prasenipur-Saijanaghat | 6 | 2.48 | | | | | | | | | | | | | | | |
| 512M04B016 | Bijaya Pun Ko Ghar To Jayapur Pul Samma | 6 | | | | | | | | | | | | | | | | |
| 512M04B003 | Chulchuliya Ghat-Ultanpur To Rajipur | 2 | 2.11 | | | | | | | | | | | | | | | |
| 512M04B004 | Laxmipur-Haripur-Barghadahi | 5 | 1.76 | | | | | | | | | | | | | | | |
| 512M04B006 | Thapa Mill-Manau-Loharpur-Sayaulibazaar-Banjariaya-Latthedanda | 6,5 | 3.13 | | | | | | | | | | | | | | | |
| 512M04B010 | Kishan Pra Vi To Vhakhari Bajar Sadak | 4 | 3.33 | | | | | | | | | | | | | | | |
| 512M04B008 | Tihuni-Thulo Jhabahi | 3 | 0.65 | | | | | | | | | | | | | | | |
| 512M04B015 | Geruwa Khola Corridor Road Ward 6,5,4 | 6,5,4 | 14.82 | | | | | | | | | | | | | | | |
| 512M04B009 | Shraswati School To Karnali River | 3 | 1.41 | | | | | | | | | | | | | | | |
| 512M04B005 | Bishnu Bhattrai Ko Ghar To Sichai Sadak Road(Rajapur Nagarpalika) | 5 | 1.14 | | | | | | | | | | | | | | | |

### 6.4.3 Implementation Plan for Class 'C' and Class 'D' Roads

The MRCC has decided do planning of these roads making discussion with local stake holder during Budget Preperation.So, MTMP has not included the planning of class 'C' and class 'D' roads.

# Chapter-7

# Discussion and Conclusion

In Nepal the area occupied by urban area is increasing rapidly with the declaration of new municipalities. More than 80 Percent of the area within the Rural municipality has been occupied by open space and agriculture land, thus the planning at this stage is very important. As every plan starts with present scenarios, the team has determined present status of roads by conducting field inventory and the data are then coded in GIS software for developing the maps. Finally the inventory map was prepared and the land cover map has also been prepared. The potential development map and visionary plan has used for the preliminary classification of the roads. The classification of the road shall be validated through MRCC meetings. The proposed prioritization criteria have been validated through MRCC and municipal office.

The road density reveals that the accessibility of the road in municipality is near to that of minimum level as set by government i.e 11% of total area and 4.82 Km/ useable area . Most of the roads are serviceable in all weather as 52% of roads which are Gravel and all weather while requires proper permanent drainage, crossing Because No's of seasonal rivers which disturbs the traffic due to lack of those sufficient crossing structure's. Few Km of the roads (20% of toatl) are very sufficient Wider(<8m) to cater the traffic while 71% % of road can cater single way traffic . The travel pattern of people in the Rural municipality area is to go towards CBD area at morning peak and reverse at evening peak time. All the wards don't have accessibility of public vehicle route. Hence, Geruwa-Ring road and Geruwa By-pass Transport route was proposed which will make interconncetion of differnt wards of Rural municipality. These Link roads are important for inter-linkages as the routes of long-term ring road shall be sufficient for public transport route up to 20 years perspective plan however low occupancy vehicles shall be used for other small routes via linkage roads.

The short term and long term financial plan was forecasted. The Projected financial plan for five year showed that the rural municipality is going to invest NRS 19.73 Million of Budget. The cost for the construction each road has determined based on the rate provided in the DTMP guideline and local rates. The total cost of construction excluding SRN and Class 'D' Road of municipality was found as NPR 1,309,243,656 for the length of 166.23 km out of 225.82 km of road. As accordance of planning norms, all or 90% of houses need to be within 2km from motorable Road. Most of the community of Rural municipality were not in reach of road. Hence, the study identified that there need to construct further 23.41 km of new track for those communities. The detailed of five year and abstract of twenty year implementation plan has been developed. The implementation plan has prepared based on the priority/rank obtained from the prioritization criteria. Within 5 year budget period with investment of NRs 19.73 Million rural muncicipality is going to construct 6.00 km of Blacktopped road and 31.19 Km of roads will be Gravelled.

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# Photographs

*Figure 32 :SantiBazzar Bazzar area*

*Figure 33 : Existing DRCN Rajapur Ring Road*

*Figure 34 : Fair Weather Earthen Municipal Road*

*Figure 35 : Road Traffic Situation*

*Figure 36 Municipal Roads with Proper Road Structure*

*Figure 37 Ward level RMTMP Meeting*

*Figure 38 Public Transport Condition*


*Figure 39 Development of Financial Institution in Pashupatinagar*


*Figure 40 Transport Pattern and road condition in Geruwa By-pass Road*