Nisdi Rural Municipality

Office of Rural Municipal Executive

Palpa District

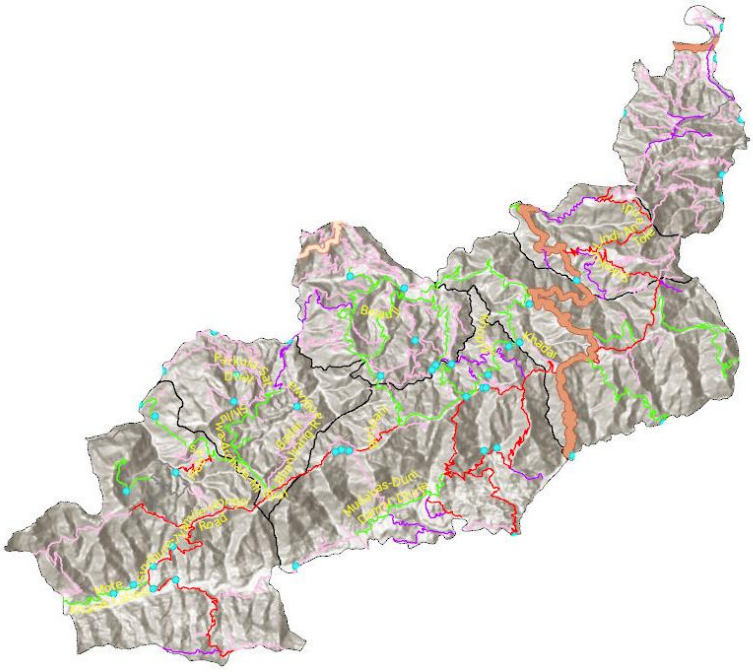
Lumbini Province, Nepal

Final Report

On

Nisdi Rural Municipal Transport Master Plan (R-MTMP)

Volume I: Main Report



Consultant

Civil Work Consultancy Pvt. Ltd.

Madhyapur Thimi, Bhaktapur

2081 B.S.

Letter of Submission

Nisdi Rural Municipality

Office of the Municipal Executive

Palpa District

Lumbini Province, Nepal

This document is the Final Report prepared for the Title of Consulting Services, **"Nisdi Rural Municipal Transport Master Plan (R-MTMP)"** undertaken by, Nisdi Rural Municipality Office, Mittyal, Palpa District This document has been prepared by Civil Work Consultancy Pvt. Ltd. The opinions, findings, and conclusions that have been expressed herein are those of the consultancy and do not necessarily reflect those of the Rural Municipality.

Reproduction of materials contained in this document and in case, where maps, diagrams, data, images, and photos from the report or accompanying DVD ROM are used, the following citation shall be used as: Civil Work Consultancy Pvt. Ltd. *"Rural Municipal Transport Master Plan (RMTMP) of Nisdi Rural Municipality".*

Data Sources and Credits

Reports, Datasets, Drawings, GIS Maps, and other miscellaneous data have been produced & developed by Civil Work during the fiscal year 2080/81. These data are owned by Nisdi Rural Municipality, Office of Rural Municipal Executive, Palpa. Authorization from the owner is required for the usage and/or publication of the data in part or completely.

Project Description and Structure

Altogether, the study, analysis, and planning of the RMTMP of Nisdi Rural Municipality have been compiled in three volumes including GIS Maps. This report is volume one that presents the overall study outcome in the form of data, analysis, and the proposed plans and proposals. The total compilation is presented including the project description below;

Project Descriptions and Structures	
Title of Consulting Service	Preparation of Nisdi Rural Municipal Transport Master Plan (RMTMP)
Local Level	Nisdi Rural Municipality Palpa District Lumbini Province, Nepal
Date	2081
Report Volume-I	Main Report (Final Report)
Report Volume-II	GIS Maps and Drawings (RMTMP- Maps) /Quantity and Estimates
DVD/USB	Soft Copy
Consultant	Civil Work Consultancy Pvt. Ltd.

Acknowledgment

The RMTMP report has been developed based on an extensive field study and study of relevant documents guidelines such as DoLIDAR Guideline and Manual 2014 A.D., Nepal Road Standards 2070 B.S, Nepal Urban Road Standards-2076 (NURS-2076 BS), Urban Planning Norm and Standard 2015 A.D., interactions with the local government, people representatives, stakeholders in the Rural Municipality and ward levels and as per the ToR provided along with the contract agreement with the Nisdi Rural Municipality. We would like to express gratitude to the Nisdi Rural Municipality for providing an opportunity to study and prepare of Rural Municipal Transport Master Plan (RMTMP).

The consultant would like to express its appreciation to the officials from Nisdi Rural Municipality are highly grateful for the support. We Consultant would like to extend sincere gratitude to Mrs. Mukta Bahadur Saru, Rural Municipal Chairperson, and Mrs. Tiran Kumari Shrestha, Deputy municipal chairperson of Nisdi Rural Municipality. We would also like to express our gratitude to Mr. Madan Aryal Chief Administrative officer of the rural Municipality, members of the steering committee, head of the technical section, planning Section, and other concerned sections of the Rural Municipality for their valuable time, support, valuable comments and suggestions during the preparation of R-MTMP. We would like to express special thanks to the chairman of all wards and ward members, the representatives from different political parties, and volunteers for their support and contribution to making the working environment easy and pleasant for their coordination during the field visit and project identification.

I, the Consultant, am also grateful to all technical and management teams involved in the preparation of R-MTMP. The acknowledgment will be incomplete if we ignore the support obtained from every individual in the rural Municipality. Finally, we would like to thank all the helping hands involved directly or indirectly in the preparation of this report.

Acronyms/Abbreviations

MTMP	Municipal Transport Master Plan
BT	Black Topped
CBS	Central Bureau of Statistics
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DoR	Department of Road
DRCN	District Road Core Network
DTMP	District Transport Master Plan
DUDBC	Department of Development of Building Construction
ER	Earthen Road
FR	Feeder Road
GIS	Geographic Information System
GPS	Global Positioning System
GR	Graveled Road
IAP	Integrated Accessibility Planning
IDP	Integrated Development Plan
IDPM	Indicative Developmental Potential Map
INGO	International Non-Governmental Organization
IRC	Indian Road Congress
KM	Kilometer
LGOA	Local Government operation Act
MIM	Municipal Inventory Map
MoFALD	Ministry of Federal Affair and Local Development
MoUD	Ministry of Urban Development
MRCC	Municipal Roads Coordination Committee
MRCN	Municipal Road Core Network
MTPP	Municipal Transport Perspective Plan
NGO	Non-Governmental Organization
NH	National Highway
NMT	Non- Motorized Transport
NPC	National Planning Commission
NRS	Nepal Road Standard

NTPCO	New Town Project Co-ordination Committee
NUDS	National Urban Development Strategic
NURS	Nepal Urban Road standard
OD	Origin and Destination
PCU	Passenger Car Unit
RCUP	Resource Conservation Utilization Project
RBN	Road Board Nepal
RoW	Right of Way
RMTMP	Rural Municipal Transport Master Plan
RTO	Regional Transport Organization
SRM	Nisdi rural Municipality
SOR	Socially Oriented and Responsibility
TIMP	Transport Infrastructure Master Plan
TDF	Town Development Fund
ToR	Term of Reference
VDC	Village Development Committee

Table of Contents

List of Figures

List of Tables

Chapter 1. Introduction

1.1 Context and Background

Population growth and rapid urbanization are major issues for local (rural municipal) development. Providing transportation, mobility, and infrastructure for organized urbanization is a significant challenge for stakeholders and administrations. As the number of migrants increases, planning and managing infrastructure for urban development becomes difficult, and local authorities struggle to provide adequate facilities. Therefore, a well-managed urbanization plan and road network are needed.

Physical infrastructure development in Nepal, especially at the local level, has been very slow due to ongoing political instability and transition. Developing transportation infrastructure is crucial because it lays the foundation for other development opportunities. A proper transportation system allows people to access larger markets, service centers, and economic sectors. Road development also promotes the growth of urban centers with amenities such as hospitals, schools, and markets. Roads create important links with larger neighboring villages, enhancing economic activity and human interactions. Such connections are vital for rural development. Therefore, developing transportation, mainly through road linkages, is essential for the Rural Municipality. It has prioritized creating a sustainable Rural Municipal Transport Master Plan to improve mobility and foster overall development.

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

Chiefly, this RMTMP aims to assess the present status of roads and transportation within the Rural Municipality through extensive field survey and inventorying of the details of existing roads and transport situation. The study has also revealed the problems and essential needs related to roads and transportation, along with recommending key interventions for the sustainable development of these networks. The planning Approach adopted by the consultant is fundamentally bottom-up and participatory. Study and analysis of existing road status and need assessment have been the basis for this overall planning.

RMTMP is a long-term visionary plan which aims to systematize the road and transport development processes in the Rural Municipality. It identifies the roads and creates a complete inventory of the roads. It categorizes the roads into four classes A, B, C, and D according to their importance. It prioritizes the interventions and allocates the estimated budget for the necessary interventions. Above all, it systematizes the process of road and transportation development according to the need of the Rural Municipality. The consultant has followed all the current rules and standards for planning. It is based on the Approach Manual prepared by DoLIDAR and RMTMP guidelines prepared by the then MoFALD. It has determined the Municipal Road Core Network (MRCN) as practical in the planning process of DTMP/RMTMP and has identified the key linkages with another road network. A complete road network has been identified to make a basis for the future development of roads which primarily helps to develop transport access to all

the settlements in the rural municipality meeting the national standard of nominal duration to reach the core road network or all-weather roads.

A broader perspective on urban transportation is proposed in National Urban Development Strategy 2017 A.D. 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 broader perspective that has focused on in the strategy. In prioritized regions, the provision of high-speed inter-urban transport infrastructure is also proposed.

Local Government 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 the formulation of such a development plan. The main objective of this plan is to invest in planned development within each of the local bodies' territories. Ultimately, development endeavours help attain sustainable livelihood and improved the 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 been recommended as an effective tool to access the existing situation of the services and facilities. A strategic road network is important for national income while local roads are for poverty reduction (Worku, 2011). The interventions derived from the accessibility planning have represented the real needs and priorities of the local people.

Nepal Government, Ministry of Federal Affairs and Local Development stepped up to bring forward a 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 the creation of 753 local bodies with new municipalities in various steps. There are altogether 6 Metropolitan, 11 Sub-Metropolitan, 276 Municipalities, and 460 Rural Municipalities, in October 2017. Since this Rural Municipality is at an early stage of infrastructure development, they require an appropriate long-term plan so that organized and beautiful cities shall be developed. RMTMP has been considered an objective tool for prioritizing the projects and it will fulfil partially the lacking part of LGOA. 2074. Therefore, the Nisdi Rural Municipality is intended to prepare MTMP for sustainable transport development in the city.

1.2 Objectives

The overall objective of the consulting services is to prepare the Rural Municipal Transport Master Plan (RMTMP) of the Nisdi Rural Municipality. The RMTMP/MTMP has been 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:

- To collect demands for new/rehabilitation transport linkages from municipalities/ Settlements based on the city development plan.
- To analyse the accessibility situation.

- To identify and prioritize the interventions based on the accessibility situation.
- To prepare Indicative Developmental Potential Map (IDPM).
- To prepare the Municipal Inventory Map (MIM) of Road networks.
- To prepare the Perspective Plan of transport services and facilities.
- To synchronize the draft Perspective Plans of adjoining VDCs/Municipalities/districts.
- To develop scoring criteria and their approval from Rural Municipality.
- To prepare the five years Rural Municipal Transport Master Plan (RMTMP)
- To prepare a realistic physical and financial implementation plan for prioritized roads for the MTMP period; and
- To prepare Municipal Transport Perspective Plan (MTPP).

1.3 Scope and Limitation of RMTMP

The consulting service has provided high-quality professional services for the preparation of the Rural Municipal Transport Master Plan (RMTMP), harmonized with the approach Manual of the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR). The scope of services carried out by the consultant broadly includes, but not be limited to, the following:

- Assist in the formulation of the Municipal Roads Coordination Committee (MRCC).
- Secondary Sources of Information and Review of the existing RMTMP.
- Accessibility data collection and analysis.
- Developing Scoring Criteria and approval from rural Municipality.
- Road classification and nomenclature.
- Analyse fund availability for Roads.
- Preparation of Perspective Plan of interventions of services and facilities.
- Preparation of the Rural Municipal Transport Master Plan (RMTMP).
- Prepare a realistic Physical and Financial Implementation Plan for prioritized roads for the RMTMP implementation period.

Limitation

This transport master plan is limited to the territory of the Nisdi Rural Municipality. Since the data collected for the planning has been based on the information provided by the local people at the ward levels, they may have supplied limited information. Although enumerators have attempted their best to reach all the roads for the necessary data, there are chances of missing the data to some extent. The misnaming of the road may occur due to pronunciation errors or hearing problems by the respondent as well as enumerators. Chances of error may occur during data entry and tabulation. The scale used to work on GIS is also likely to generate some errors. Though such limitations and errors are obvious, attempts have been made to minimize such errors by taking precautions in the error-prone areas. The field survey has been conducted through GPS Survey.

1.4 Output and Deliveries

Rural Municipal Transport Master Plan has been prepared with a complete picture of the Municipal Road Core Network (MRCN). The plan supports municipal development and a well-managed urban perspective. The complete in-depth analysis of the development potentials of the study areas includes the following outputs:

- Study of existing road networks and mobility situations.
- Analysis of additional and potential road networks.
- Prepare existing road network inventory maps and develop location maps.
- Road grading, coding, and prioritization with the nomenclature of each road network.
- Develop 5-Year horizon road inventory development plan.
- Develop 5-Year horizon budget development plan.
- Development of final GIS road inventory plan maps.

Chapter 2. Project Methodology

2.1 General and Technical Methodology Approach

Rural Municipal Transport Master Plan has been prepared using a participatory bottom-up approach from the settlement level. We, experts, incorporate in the planning process, where active participation from representatives of the municipal chairperson, deputy municipal chairperson of the Rural Municipality, ward members, political parties, line agencies, and Rural Municipality officials is crucial. The Rural Municipality Road Coordination Committee (MRCC) has been constituted as an authorized legislative body of the Rural Municipality.

The consultant studied thoroughly the objective and ToR for the preparation of the Rural Municipal Transport Master Plan (RMTMP).

Accessibility is the 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 the accessibility index of the settlements to the concerned SOR sector. The accessibility Indicator is a measurement of accessibility.

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

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

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

The phases proposed in the technical approach have been further broken down into task series and specific tasks according to the intended content of the task, to help ease in comprehending the methodology planned for carrying out the task. The analysis will be carried out for the input requirements of discipline experts and the output expected for each task. Since the methodology has been developed in the form of phases formulated in the Technical Approach, their compatibility has been assured. The problems that normally come up in such projects were identified. The phase included in the approach and methodology addresses them adequately. Task and sub-tasks are organized in a sequence, to run in series or parallel process.

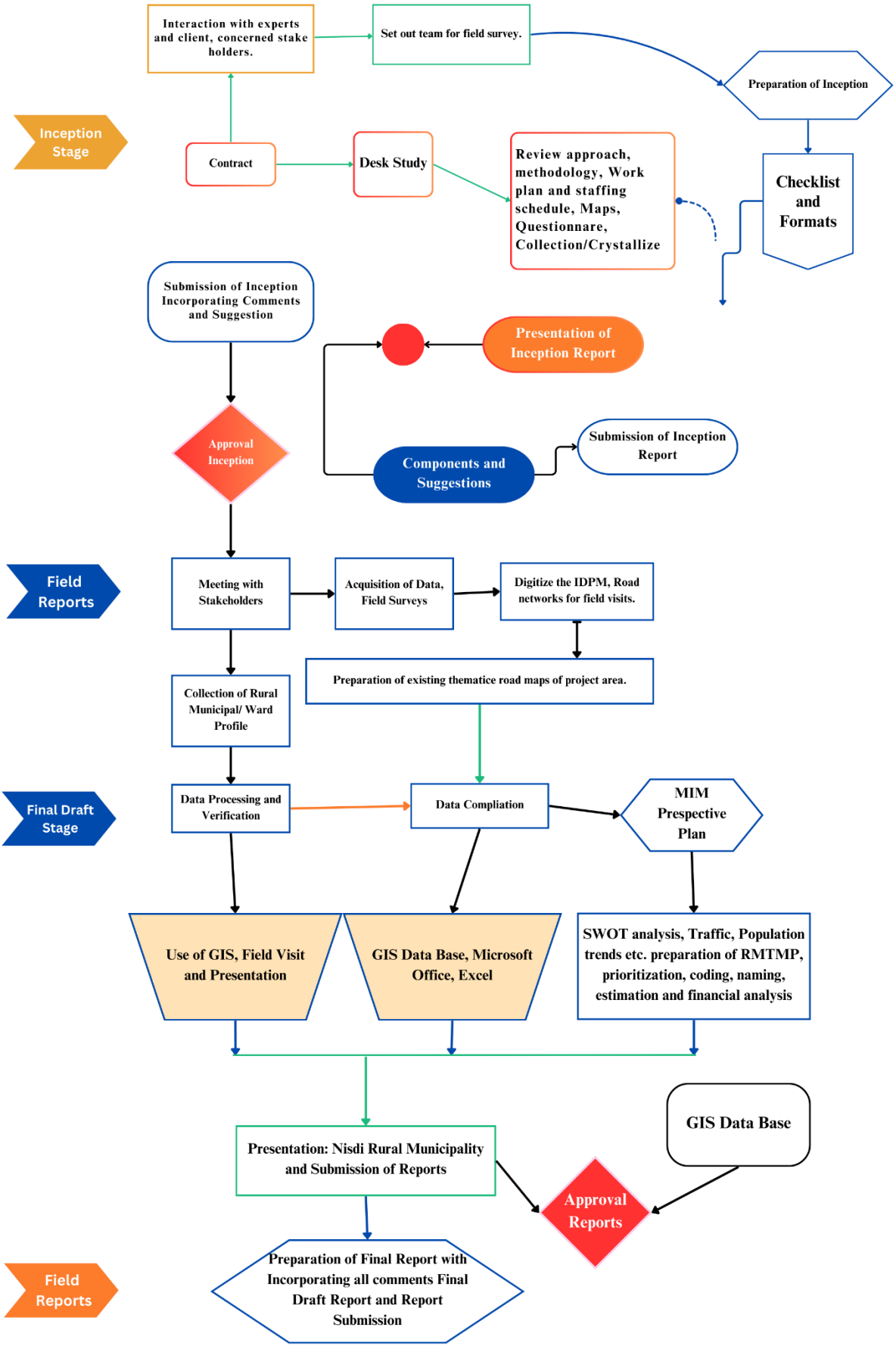


Figure No 2.1: Flow Chart of Project Methodology

Table No 2.1: Methodology Involved during RMTMP Preparation

S.N	List of Task	Activities to be done	Output
1.	Data Collection		
1.1	Desk Study	The existing data, reports, and information on the study area were collected. The collected data were compiled, analyzed, and thoroughly reviewed before carrying out further work.	General rural municipal information, locations, etc.
1.2	Review of secondary source of information	Collection of secondary information/Maps from the various Municipal based line agencies, I/NGOs, and other regional and central-level related institutions.	Obtain information about the municipal situation in general, ready to proceed further steps.
1.3	Literature Reviews	Study of the proposed project and collection of information through internet surfing, planning norms, government policies, planning policies, guidebooks, articles, etc. Moreover, other relevant information has also been collected from MoUD, NPC, DOR, MoFALD, DUDBC, DoLIDAR, NURS, and other libraries. Detailed study of the periodic planning report. A case study of similar projects and the best examples of proper MTMP/RMTMP has been carried out.	Ideas of best Planning approach, National guidelines, policies, and way of planning. Relation between vicinities local level, potential development, and importance of MTMP in the Rural Municipality.
1.4	Review of existing MTMP (if any)	Review of available existing MTMP. Data collection about the yearly allocated budget for MTMP road and progress report of Rural Municipality. Interaction with Municipal Technician and other Officials.	Implementation trend of MTMP Planning and constraints of implementation will be found out.
1.5	Accessibility Data Collection, GPS Survey	Data were collected through enumerators/field supervisors including drone surveys. Develop field data collection data sheets and related arrangements. Verification of secondary data in the field. Collection of road data using GPS, Measuring Tapes, etc., Collection of access situation of every settlement in the prescribed form, collection Minutes and field photos, etc.	Find out the access situation of every settlement and market area, and identification of gaps with the reference to Town.
2	Analysis of Data	Data entry-storage of collected data in the computer using MS Excel software. Preparation of Location maps, Road Inventory Maps Calculation of accessibility index	Compilation of data, Accessibility index of all Wards of the rural Municipality

S.N	List of Task	Activities to be done	Output
3	IDPM Preparation	Assess the various potentiality of development of the Rural Municipality Organize Rural Municipality/MRCC meeting GIS map preparation	IDPM report, Finalization of Growth Centres, identification and ranking of existing/potential areas and services.
4	MIM Preparation	Assess the inventory of existing transportation linkage Reconnaissance survey Identification of required intervention Map preparation	MIM report, identify the existing transport situation, and verification of MIM through discussion with the Municipal Board.
5	Area workshop Ward/Municipal level	Participatory workshop in each ward Discussion about criteria of prioritization. Standardize the accessibility indicator Synchronize interventions at the Rural Municipality level Validation of access data Prioritization of interventions.	Prioritization of interventions and projects
6	Perspective Plan	Compile the result Accessibility analysis. Area workshops. Identify and prioritize the interventions in every service and facility based on approved Rural Municipality Road standards. 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	MTMP/RMTMP Preparation	Assess the financial resources Priorities the perspective plan Preparation or updating RMTMP	First five-year Rural Municipal Road planning.
8	Approval of MTMP	Presentation of draft RMTMP in the Rural Municipal council through MRCC and Rural Municipality Meetings.	Final RMTMP Report
9	Final Report Submission	Incorporate all the comments (if any) from draft reports	Final report Completion the Project

2.2 Literature Review and Guidelines

I, the consultant studied the proposed project and collection of information through the internet, planning norms, government policies, planning policies, guidebooks, articles, etc. Moreover, other relevant information was also collected from MoUD, NPC, DOR, MoFALD, DUDBC, DoLIDAR, and other libraries. Case studies of similar projects and best examples of proper MTMP were carried out. The urban linkage between the vicinity settlements, inter-relationship with neighboring towns, and regional context were analyzed and the probable economical potentialities helping road networks be ascertained.

2.2.1 Historical Sketch of Road Transport in Nepal

The historical evidence shows that the Gorkhali rulers had devised several arrangements for maintaining lines of transport and communications from Kathmandu to different districts. As mentioned by Regmi (1987) these arrangements could be described under two main headings: An east-west track through the hill region and a postal service for the transportation of official mail and supplies. However, Rana rulers (until 1950), according to Regmi (1987), refrained from constructing large-scale transportation infrastructure because they were afraid that economic development should provide a motive for the British to annex the Kingdom. Road construction initiatives took place after the fall of the Rana Regime. The major emphasis on the construction of a strategic road network during the period of 1950 – 1975 gradually changed and the country started to focus on constructing roads of regional importance.

Nepal's first highway Tribhuwan Rajpath connecting Birgunj and Kathmandu was constructed with the help of the Government of India and completed in 1956. The agreement among the Governments of India, the United States of America, and Nepal in 1958 to establish the Regional Transportation Organization (RTO) for the construction of roads in an organized and planned way on a long-term basis, was the first effort in the history of Nepalese motorized road construction in Nepal (Zimmermann and Rajbhandari, 1995). The RTO formulated a 20-year program to build north-south roads connecting with Indian cities and railheads along the border. After the collapse of RTO in 1962, Nepal continued its effort to invite donors and build roads. The second highway Siddhartha Rajmarga connecting Sunauli and Pokhara was constructed with the help of the Government of India. The earlier policy of emphasizing north-south roads was replaced by east-west roads like the East-West Highway (1026 km) and Prithivi Raj Marg (Kathmandu - Pokhara, 176 km). With internal resources of Nepal and contributions received from major donor countries and agencies like India, China, USSR, UK, USA, Switzerland, Japan, World Bank (WB), and Asian Development Bank (ADB), Nepal developed the present strategic road networks. *(Source: International Conference on Sustainable Development of Transport System 20 -22 October 2011)*

District Transport Planning Initiatives in Nepal

The main national focus since 1990 was the development of district-level roads through mobilizing the local governments and maintenance of the strategic road networks. Regional and district-level projects were implemented in various districts e.g. Rapti Integrated Project, Koshi Hill Integrated Development Project, RCUP, Dhading Development Project (DDP/GTZ), etc.

Early Initiatives in District Transport Planning

The first DTMP was prepared for Dhading District in 1993 by DDP/GTZ. It was named as Transport Infrastructure Master Plan (TIMP). The idea of preparing TIMP was first conceived by DDP/GTZ IN 1987. As part of the policy of supporting the construction of district roads that 'the road program should be executed in line with the overall infrastructure master plan of the district to be prepared and approved by the district'. The basic strategy adopted was to cover the district with a combination of roads, road bridges, trails, and trail bridges networks to reach most of the (80%) area from the nearest road or mule trail within two hours of walking distance, (Five kilometers of aerial distance was taken as two hours walking distance). The following basic concepts were utilized in proposing the networks and priorities of the master plan:

- Alignment is to pass through a maximum of village settlements lying along the ridges or mid-hill slopes rather than the valley bottom.
- Avoid as much as rivers and streams so that construction costs can be kept low.
- Alignment to pass through the geologically stable area.
- Preference to alignment, where peoples' participation and resource conservation approach could be adopted.
- Open up economically active areas to better market access.
- Selection of routes that make it possible for local people to extend the proposed alignment to other villages through local resource mobilization.
- Roads and trails are so planned that is possible to interconnect with other road networks within the district or neighboring districts to achieve inter-district road networks.

TIMP was produced as part of DDP/GTZ support to the two rural road projects in the Dhading district. TIMP made the plan in two categories – medium-term and long-term. The medium-term plan was assumed to be completed within 25 years and long-term after completion of medium-term plan. Later, during 1994 – 1998, Pilot Labour Based District Road Rehabilitation and Maintenance Project (PLRP) prepared DTMPs of 4 project districts – Sindhuli, Kapilvastu, Rupandehi, and Nawalparasi in a systematic process of rural transport planning. Intending to strengthen local governments, the PLRP (Shrestha, 1997a), initiated the concept of the "District Transport Master Plan (DTMP)". After a successful implementation of the master plan in four pilot districts, GoN circulated the national policy to prepare a master plan for each district of the country. Realizing its significance, the GoN established the Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) under the MOLD in 1998 (DOLIDAR, 1998). *(Source: International Conference on Sustainable Development of Transport System 20 -22 October 2011).*

Note: Later on annexing of the VDC into Rural Municipality (2073 B.S), the DTMP has been replaced by MTMP/MTMP to make the planning of urban roads in the municipal level.

2.2.2 DoLIDAR/MTMP Guidelines and Manual

The guideline and Manual of Rural Municipal Transport Master Plan (RMTMP) have been prepared by DoLIDAR (2014 A.D.). The main objective of the manual is to guide the preparation and formulation of the MTMP Final Report. The guideline defines the MTMP process and overall planning overviews in detail. The shortlist of the guideline and steps has been given here as.

- MTMP definition and overviews
- Objectives and scopes
- Expected output and limitation in MTMP Implementation
- Formulation of Rural Municipality Road Coordination Committee (MRCC)

- Road inventory data collection sheets, demand analysis, and map preparation.
- Requirements of transport linkages between wards and settlements, upgradation/ rehabilitation of urban roads etc.
- Develop Scoring Criteria and Approval from Rural Municipality
- Road Classification (A, B, C, D, Municipal Ring Road (if any) and Nomenclature.
- Transport services and facilities intervention and accessibility
- Analysis of fund availability for urban roads and perspective budget planning by developing 5-years horizon
- Preparation of RMTMP with GIS Maps color code, legends etc.

2.2.3 Nepal Road Standard-2070 BS

Nepal Road Standards - 2027 (Second Revision 2070), in short, called NRS-2070, shall apply to all Strategic Roads in rural areas being constructed within Nepal. For non-strategic (Local Roads) and urban roads separate standards shall be considered.

To achieve consistency in road design and construction, NRS was first introduced by DOR in 2027 B.S. and was revised in 2045 B. S. Minor revisions were made in 2051 B.S and in 2054 B.S to incorporate certain changes, which were relevant at the time of revisions. But those revisions were treated separately, not as an official version of the NRS-2027.

The NRS 2070 is the main guideline for the design of any type of road in Nepal. NRS defines road types (Administration Roads: National Highway, Feeder Roads, District Roads, and Urban Roads and Technical Classification), vehicle dimensions, vehicle types and equivalency factors level of service (LOS), terrain classification, design speed, etc. The standard provides design criteria for a cross-section of roads such as carriageway, shoulder, medians, curbs, formation width, RoW, horizontal and vertical curves, gradient, vertical and horizontal clearance, road drainage, camber, superelevation, sight distances, intersections, grade separation, road humps, traffic signs and safety consideration, bicycles tracks, footpaths, pedestrian crossing, road markings, hairpin bends, road tunnels and flyover, pass, etc. In addition, the standard has also considered road aesthetics, lighting, roadside arboriculture, environmental aspect, etc. The manual has developed some typical section of roads which has been given below as,

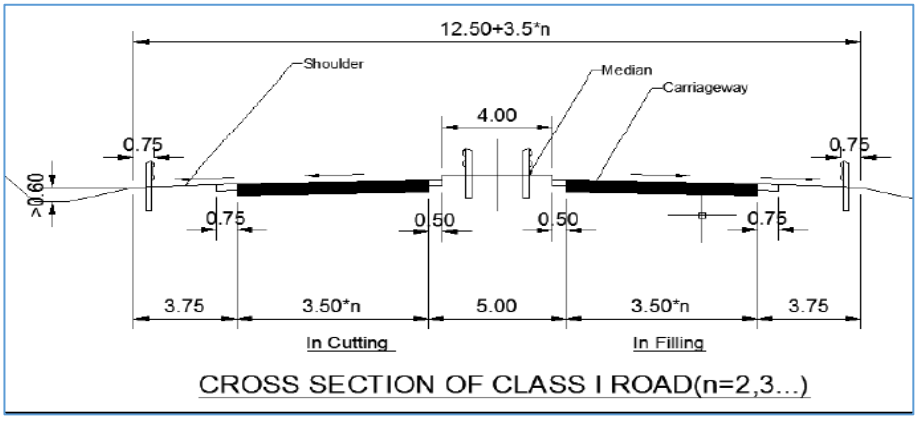


Figure No 2.2: Typical Cross Section of Road

2.2.4 Nepal Urban Road Standard- 2076

Nepal Urban Road Standards-2076 (NURS-2076) can apply to all urban roads being constructed within the urban areas of Nepal. These standards may be relaxed by the Government of Nepal to meet special circumstances. Road network is the major urban infrastructure in terms of its required financial resources, land consumption, and land-use planning in the urban area. Furthermore, the aesthetic appearance of the city is mainly dependent on the urban road pattern. The growth of the urban area is mainly guided by the urban road hierarchy and its alignment.

In this context, growing urbanization in Nepal is a major challenge for the urban planner as well as municipal authorities. Such a situation has created a challenging situation for the safe movement of vulnerable road users especially pedestrians and non-motorized vehicles leading to the poor road safety situation. The recent situation demands safer travel and accessibility to all while considering urban mobility. Urban mobility and accessibility mainly depend upon urban road network planning and their technical parameters. To achieve consistency in road design and construction, Nepal Road Standard, (NRS) had been introduced. According to the four administrative classifications given in Nepal Road Standard-2070, the urban road is one of them but, these standards were applicable only for the design of strategic roads and are not applicable to address all the urban needs. Therefore, it became very essential to develop the 'Nepal Urban Road Standard'.

The standard incorporates major technical as well as planning aspects for urban roads. Classifications of urban roads, design criteria, elements of cross-section, clearance, etc., are major parts of this standard.

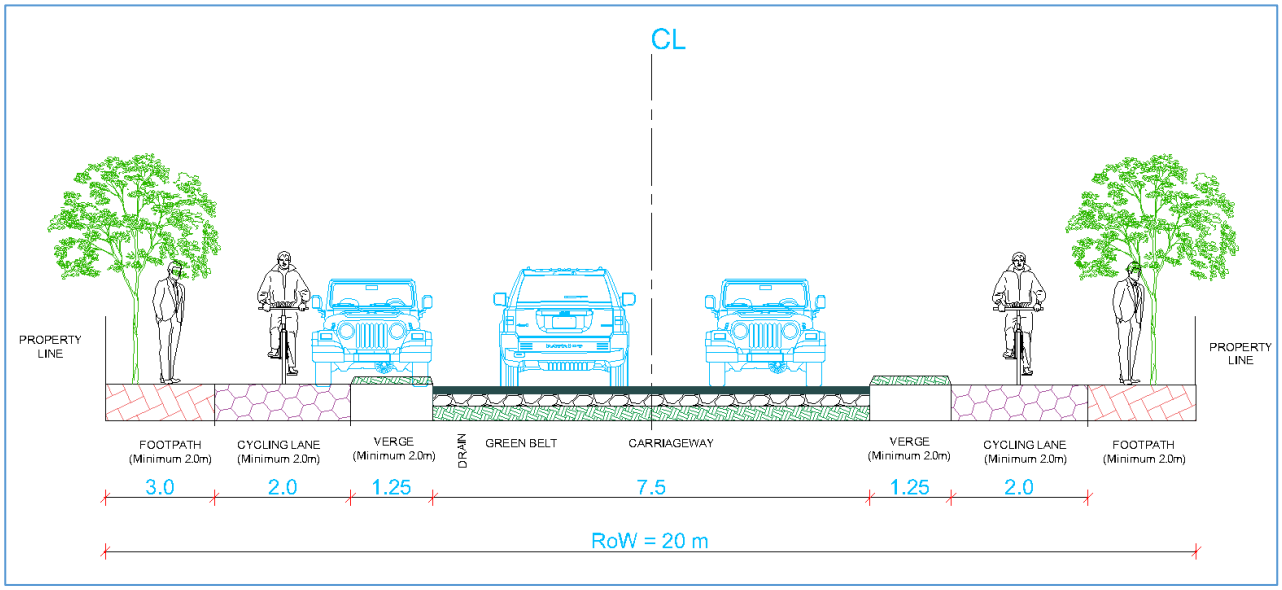


Figure No 2.3: Typical Cross Section of Collector Road

2.2.5 Nepal Rural Road Standard-2071

Nepal Rural Road Standard-2071 (NRRS-2071) outlines comprehensive guidelines for the construction and maintenance of rural roads across Nepal, ensuring sustainable and consistent development. These standards, which can be adjusted by the Government of Nepal to accommodate specific local conditions, highlight the critical role of rural road networks in resource allocation, land use, and the overall development of rural areas. The NRRS-2071 emphasizes the importance of safe and accessible travel, particularly for vulnerable road users such as pedestrians and non-motorized vehicles, addressing road safety and accessibility issues.

The standards provide detailed technical specifications for road design, including classifications, cross-section elements, and clearances, to achieve uniformity in construction and maintenance. Recognizing the challenges posed by Nepal's diverse terrain and climatic conditions, NRRS-2071 proposes appropriate construction techniques and materials to mitigate these challenges. By focusing on improving connectivity and accessibility for rural communities, these standards support the socio-economic development of rural areas, ensuring that road infrastructure meets the needs of all users.

2.3 Primary Data Collection

A primary information of present household and trip characteristics, traffic characteristics, existing accessibility and mobility level of settlements, and prioritized road network required for each ward were collected via various reliable methods such as drone survey for clear image and land use calculation, questionnaire survey, ward level meetings, and workshops, etc. Tracking of the existing road network along with detailed information on its width, surface type, and possible intervention required for the effectiveness of services were carried out.

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

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

The questionnaire method was used to conduct the ***Origin and Destination Survey*** which gives the number of information reflecting, personal, household, and trip-making characteristics. This survey has also helped to visualize the accessibility and mobility scenario of the road network and public transportation from the settlement/wards.

Road Inventory Survey was conducted to collect data on the condition of road networks, road linkage, road safety status, and issues that need to be highlighted. It helps in field validation of base maps and assists in the preparation of road inventory maps, nomenclature, and coding/grading of the road linkages and proposed various interventions.

Road Demand Survey comprises an interactive session with the members of the ward representative, and local people followed by ward level workshop to fill up the demand survey form, which will include demand for new facilities or interventions to improve existing roads based on priority.

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

The public Transport and Services Study highlights the services provided by the public transportation system and the location of various services and facilities. It has been carried out by directly interviewing the route operators.

2.4 Data Processing, Field Verification and Analysis

After verifying the municipal boundaries, ward boundaries, and other necessary data, data collected from the field was used as base data. All the complete and reliable sets of data were transformed into useable information and the present scenario of the Rural Municipality has been shown through charts, graphs, figures, and tables. For roads, fields have been added in the attribute table for total width, carriageway width, surface type, road name, etc. Data obtained from field inventory and verification for roads and land use has been manually entered for all roads using the Editor Tool in Arc GIS. GPS and google image have been used for recording place names, buildings, culverts, and bridges in the field. This google image and GPS data have been converted using "GPS conversion tools" and then used in Arc GIS. Similarly, those which has been entered into the GIS database provide various types of maps. Population and traffic have been forecasted for the RMTMP and MTPP Period. And, finally, various intervention has been proposed and their economic analysis is also performed.

2.5 Indicative Municipal Development Potential Map (IDPM)

The Municipal Indicative Development Potential has been prepared based on a visionary city as the development plan of the Rural Municipality. Further, the visionary city development plan will help to prepare based on the characteristics of the location along with the consultation with the people and MRCC. The final potential map is validated through the MRCC and Rural Municipality. The development potential of the Rural Municipality in agriculture, horticulture, livestock, cottage, small industries, markets centers, etc. has been compiled and prepared on the **map 1:25000 scale.** The maps have been prepared showing:

- Location maps/administrative/political boundaries of Rural Municipality/ward.
- Large/ major settlements and market centers.
- National strategic roads, urban roads, trails, bridges, etc.
- Important historical, cultural, religious, and preserved places.
- Important water bodies, forests, cultivable land, and other lands.

- Institutions, line agencies, commercial, economic development areas, industries, tourism, urban linkages, etc.
- Other potential development Areas.

2.6 Municipal Road Inventory Map (MIM)

Municipal Road Inventory Map (MIM) has been prepared based on the field inventory survey. The field survey was 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 carried out a reconnaissance survey of the trails, bridges, and roads with the help of a checklist and updated the maps

All roads are plotted under separate legends categories by intervention type in MIM. Information regarding inter-urban roads /trails will also be included and used drawing planning process.

2.7 Perspective Road Interventions of Services and Facilities

The study and planning team has prepared a perspective plan of interventions of services and facilities, which are identified from the accessibility analysis and municipal-level workshops. All the identified interventions have been screened and rated based on approved criteria. The team discussed with the municipal technical team and the R-MRCC relating to interventions of services and facilities for the improvement of the access situation and forwarded to the municipal council meeting with a recommendation.

In the transportation sector, a list of roads, bridges, and required interventions for respective roads along with bridges have been identified to improve accessibility to goods and services. The perspective plan of the road has been prepared for 20 years. All the identified interventions were screened and graded based on the criteria of the approach manual. Accordingly, the final perspective plan of urban roads is developed. The perspective plan has been shown in GIS maps also.

2.8 Rural Municipal Transport Master Plan (RMTMP)

Considering the perspective plan, the prioritization of the perspective plan has been done according to the DoLIDAR approach manual. This plan provides urban road grading, specific coding, nomenclatures, and all road inventory information like length in km., width, RoW, etc. Subsequently, the five-year horizon RMTMP has been prepared by selecting interventions (maintenance, upgrading, and new construction of main trails, trail bridges, and roads) that have top priority in the perspective plan. The plan should be implemented in the next 5-Year horizon period. The plan depends upon cost estimation of maintenance, upgrading, rehabilitation, and new construction of MRCN, trails, bridges, and other urban roads according to the availability of financial resources.

The consultant has also prepared indicative cost estimates of improvements (Routine maintenance, recurrent maintenance & upgrading) and new construction of representative trails,

bridges, and urban roads. The cost estimate has been prepared separately for various classes of urban roads.

All the planned road inventory maps and related GIS maps have been developed as separate Volume (II): Urban Road Inventory Plan Maps- MTMP.

Before going through Rural Municipal Transport Master Plan (RMTMP), it is fundamental to know about the present condition of the municipal profiles and existing urban inventory. The summarized municipal profile has been given in the following Chapters. The chapter includes the existing road and roadside infrastructure along with their current condition. The major demographic data, physical, social, economic, institutional, and environmental infrastructures which have an indirect effect on the transportation system such as urbanization, and apartment system have also been assessed.

Chapter 3. Review of Existing Situation

3.1 General Overview

Municipal and ward-level surveys have revealed that the overall transport infrastructure, primarily the road network appears to be in the medium state in Nisdi Rural Municipality. Despite being located in hilly terrain and geographically accessible regions; the Rural Municipality lags far behind in terms of well-developed road infrastructures. The major characteristics of the roads in the Rural Municipality are manifested as muddy during the rainy/wet seasons and entirely dusty during the winter/dry seasons. At present condition, Madan Bhandari Highway (NH 09) passes the Rural Municipality which is the most important road linkage as a key to transportation and mass mobility. Most of the roads in the Rural Municipality have been observed as fair-weather roads and need to be improved and upgraded to bring them into operation around the year.

Most of the roads do not have basic road furniture and lack basic components like culverts, bridges, cross structures, drains, etc. It indicates that the overall development of road transportation and mass mobility is at the elementary stage which requires interventions from the medium level and requires a huge investment.

3.2 Visionary Municipal Development Plan

The road network is the major backbone of the development of every city and country. Because, it plays a vital role in the development of the social sector, and economic sectors. It makes easier for people to move around within a Rural Municipality from one place to another place in a short time. It makes also easier to transport goods from one place to another. Ii also helps in the health sector and education sectors.

The Nisdi Rural Municipality has prepared **Periodic Plan** for horizon 2078/79 to 2082/83 which has chiefly focused on the physical, social, economic, institutional, and environmental infrastructures development. However, the development of the road and transportation sector is the foremost sector to attain its long-term vision and goals. The periodic plan for the development of Nisdi Rural Municipality is the strategic response to the 5-year growth of the Rural Municipality. This strategic plan delivers on the long-term vision of the Rural Municipality:

Long-Term Vision: "शिक्षा, स्वास्थ्य र रोजगार, पर्यटन सहितको पूर्वाधार !

प्रकृति र मगर संस्कृति निस्दीको आधार !"

It is expected to meet the lead sector by raising economic activity through organic agriculture production, animal husbandry, tourism, industry, business, commerce, cooperatives, financial management, Intuitional Management, Tourism development, and sufficient Urban Infrastructures development.

Visionary as prosperity Nisdi of periodic plan gives a brief picture of the potential areas of growth that will bring social and economic prosperity to the Rural Municipality. It has identified the potential areas of economic growth and helps guide other planning efforts to compatibly support those areas. This brings rapid development of the Rural Municipality in all sectors.

In the case of Nisdi Rural Municipality, mostly people are concentrated in the market area which lies on the left side of the Madan Bhandari Highway; like Dhungana Besi, Mittyal, Baka Malang, Sahalkot, Jhirubas, Archale, Jyamire, Ghurli Kharak, Bhorma, Khoplak, Geja and Chhapakdi. The settlements are scattered along the existing road. Hence, urban transport management has to focus on this issue.

3.3 Visionary Rural Municipal Transport Master Plan

Current life is living in a rural municipal area-i.e., organized and planned human settlements, which are mostly referred to as communities are only possible if people have good mobility daily. Settlements are separated from workplaces, major shopping is concentrated in identifiable centers, and larger entertainment and relaxation facilities are found at specific locations. They have to have good accessibility.

According to the "Planning Standard and Norms 2017", road density shall be 5 km/sq.km (NUDS 2017) for the newly formed municipal body. The road density is 6.6 km/ sq.km per usable area i.e. the road density in the Rural Municipality is slightly more than the standard value. Thus, it can be concluded, the Rural Municipality now needs to take action for upgrading all existing roads to all-weather roads from fair-weather roads. The existing road networks need major intervention in maintenance and upgrading tasks. The periodic plan has proposed the preparation of the Municipal Transport Master Plan, operation of public transportation, maintenance and upgradation works, construction of the bus stops and waiting for places, development of the tourism development routes, and management.

The periodic plan has aimed to set up the Right of Way (RoW) of the roads, and road connectivity to all settlements. The length of the blacktopped road will be increased from 0 km to 50 km, the gravel road will be 150 km from 0 km and the total length of the road will be 500 km. with 25 numbers of motorable bridges (*Base Year: 2077/78 to 2082/83*). Other concern matters related to this road network such as bus stops, bus bays, parking area ring roads, etc. have been also planned.

Transportation issues are of foremost importance to support the passengers and freight mobility requirements of settlement agglomerations.

In Nisdi Rural Municipality most of the area of the ward remains in a rural state. There is no smooth transportation mobility in such an area. The people of such areas are facing transportation problems at the time of emergencies like the delivery case, and serious health patient. With the greater possibility of mass transportation, the Rural Municipality doesn't have a proper bus park or bus stations. The transportation facility is only available in the morning time from urban settlements to the village and the evening from the city to urban settlements. Many citizens are travelling by foot to reach bazar. The transportation service is weak in the locality and available services are jeep, motorcycle and buses in highway areas. To overcome the transportation services problems, the Rural Municipality should initiate municipal bus services immediately.

The settlements seem as a linear pattern which is mostly along the river side areas and in the typical village area, settlements are compact-type settlements. The people from the local level are migrating towards the market areas in search of better lives and opportunities. All wards are suitable for residential purposes. The major economic development sector is agriculture, business/trade, and eco-tourism. Majorly, agriculture and livestock farming have a great opportunity within the rural Municipality. Agriculture products can be easily exported via. major

districts road and highway to the major cities like Rampur, Butuwal. The agriculture-based industries like cow farms, goat farms, pig farming, bee farming, rice mills, and furniture are major industries with in the rural Municipality. In general, most of the sectors are connected by urban/village roads.

The proposed road hierarchy and its network has been designed to support the growth of these potential lead sectors of the Rural Municipality. Through, well-connected roads these sectors will have proper access to the market and settlements in the neighborhood of the municipalities.

The minimum road density at the existing municipal level has planned to make at least 5 km/sq.km area. Again, 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

3.4 Constraints in the Implementation of RMTMP

The road network is believed to be the lifeline of infrastructure. The doors of other physical, social, economic, institutional, and environmental infrastructure development possibilities are unlocked through the proper development of roads and transportation. Since the existing condition of roads in the Rural Municipality is a medium stage and large in length it requires a huge portion of the budget to address the problem of road upgradation and maintenance. This budgetary problem is purely a major obstacle to the timely implementation of the RMTMP. Besides these other possible constraints are:

- Scatter settlements

- Lack of drainage networks
- The problem of landslides due to steep slope
- Finalization of standard RoW from the base level is problematic
- Lack of technology and information
- Poor pavement management system (PMS)
- Lengthy procurement process for construction work
- Lack of qualified manpower and labor force
- Lack of smooth and reliable availability of construction materials
- Lack of stable and favorable working environment.
- Social issues and beliefs
- Lack of financial support.

Chapter 4. Indicative Development Potential Map

4.1 Introduction of Study Area

Nisdi Rural Municipality lies in Palpa District of Lumbini Province along the Madan Bhandari Highway. Nisdi Rural Municipality was declared a Rural Municipality by annexing all wards of the former V.D.C Bakamalang (1), Sahalkot (2), Jhirubas (3), Mittyal (4), Galdha (5), Archale (6) and Jyamire (7). Topographically, Nisdi Rural Municipality entails 27°46′12.4″ N and 83°55′25.67″ E which is situated at an altitude of 1661 m being highest point and 345 m being the lowest point, from sea level. Arun Khola, Nisdi Khola, Sarangi Khola, Purba Khola, Boudi Khola, Gabu Khola, Kukhuro khola, Belauji khola, Pagaro Khola are major major streams flowing through the Rural Municipality. Further, The Nisdi river is the northern boundary of the Rural Municipality.

According to CBS 2078, Nisdi rural Municipality has 18,120 populations with 8345 males and 9775 females population. The rural Municipality has 7 wards and 195 sq.km administrative boundary area.

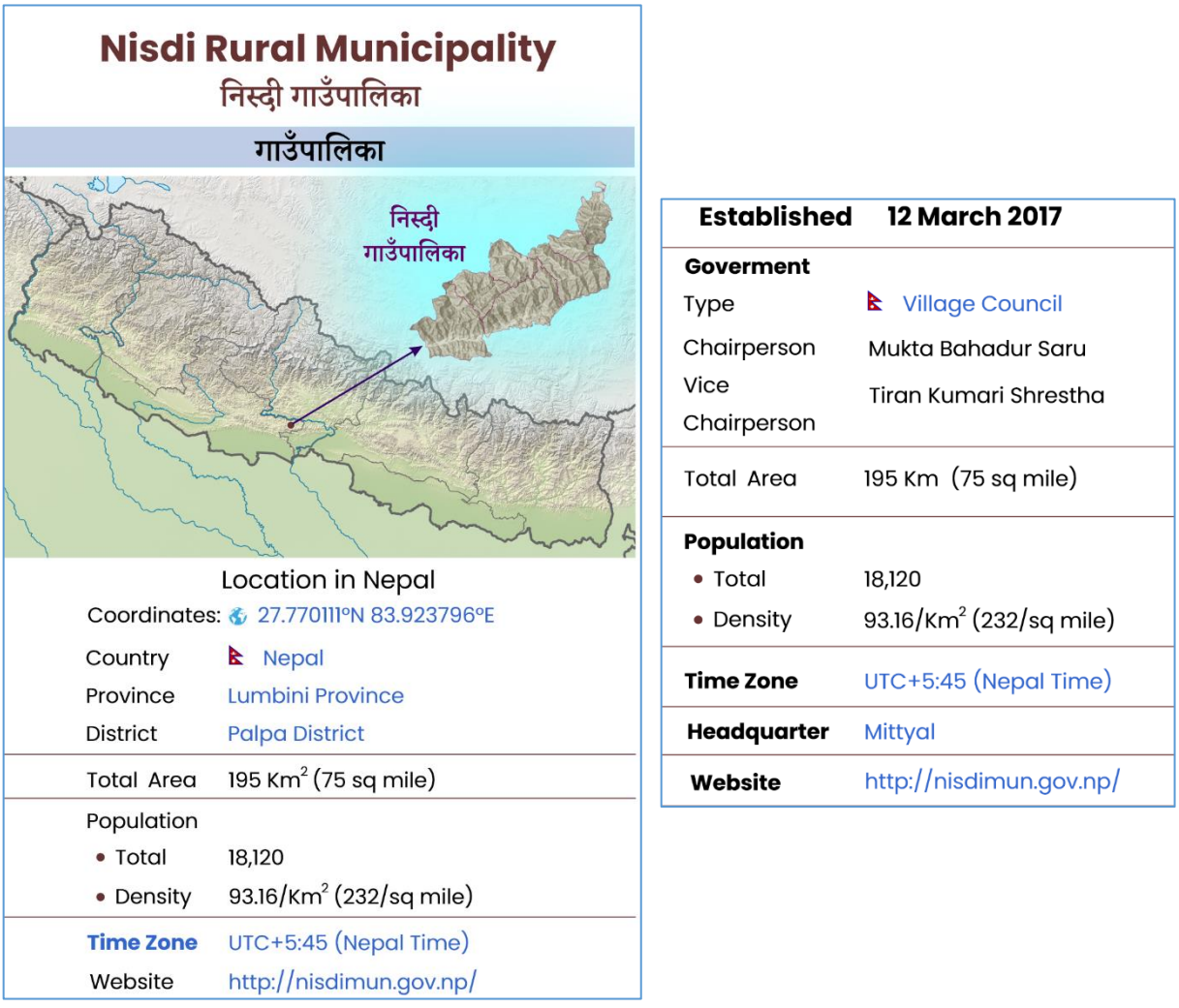


Figure No 4.1: Location Map, Nisdi Rural Municipality

Table No 4.1: Political Boundary, Nisdi Rural Municipality

East :	Bungdikali Rural Municipality
West :	Mathagadhi Rural Municipality
North :	Rampur Municipality, Purba Khola Rural Municipality, Ghiring Rural Municipality
South :	Binayi Triveni Rural Municiaplity, Hupsekot Rural Municipality and Mandyabindhu Municipality

Source: MoFALD, 2073

4.2 Summary of Municipal Profile

4.2.1 Landuse, 2081

The total area of the rural Municipality is 195 sq. km. Out of the total area, 58 % area is used by forest area and cultivatable/agricultural land is 27.94% of the total land. The Rural Municipality has a dense settlement in major core areas like Dhungana Besi, Mittyal, Baka Malang, Sahalkot, Jhirubas, Archale, Jyamire, Ghurli Kharak, Bhorma, Khoplak, Geja and Chhapakdi etc. The details of land use have been listed in the table below.

Table No 4.2: Municipal Landuse

S.N	Landuse Class	Area sq.km	Percentage
1	Forest	115.53	58.27
2	Cultivation	55.38	27.93
3	Bush	23.53	11.87
4	Riverbed	1.21	0.61
5	Grass	4.64	3.00
6	Builtup	1.83	0.93
7	Waterbody	0.78	0.39
Total	-	198.27	100.00

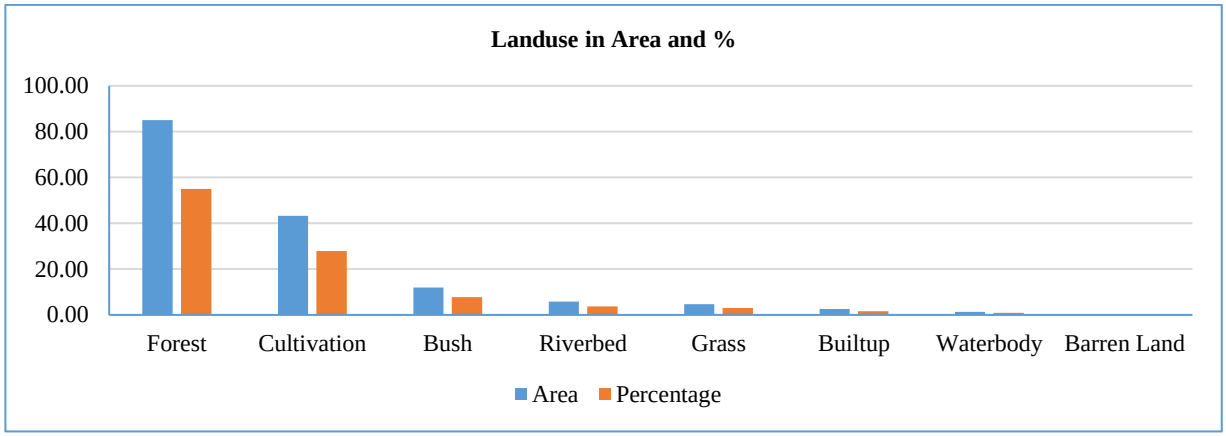


Figure No 4.2: Existing Landuse, 2081

Figure No 4.3: Wind Power Project

Figure No 4.4: Cultivation-Road Accessibility

4.2.2 Socio-Economic and Demographic Status

Nisdi Rural Municipality is following the way of urbanization, modernization, and development as an urban-rural linkage approach city. Local people have been involved in economic activities includes for participation, and open markets claim more freedoms, more choices, and more options. Local government has been providing training, skills, knowledge, and expertise to backward groups, women, and youth as well for poverty reduction, employment generation, and gender equality with technical assistance, monitoring, and evaluation.

Change in population impacts, its future population, and requirement of infrastructures like physical, social, economic, environmental, etc. The demography of the Rural Municipality helps to forecast the population change pattern and its proper management. Total population, population density, household structure, literacy rate status, health, education., economic status, existing infrastructures, topography, climate changes, environment conditions, natural resources, and their characteristics are some of the major pillars for better understanding of the locality. Detailed study of demography is also one of the major guidelines for government investment for local development, utility planning, and infrastructure through the local authority.

4.2.3 Population and Population Density

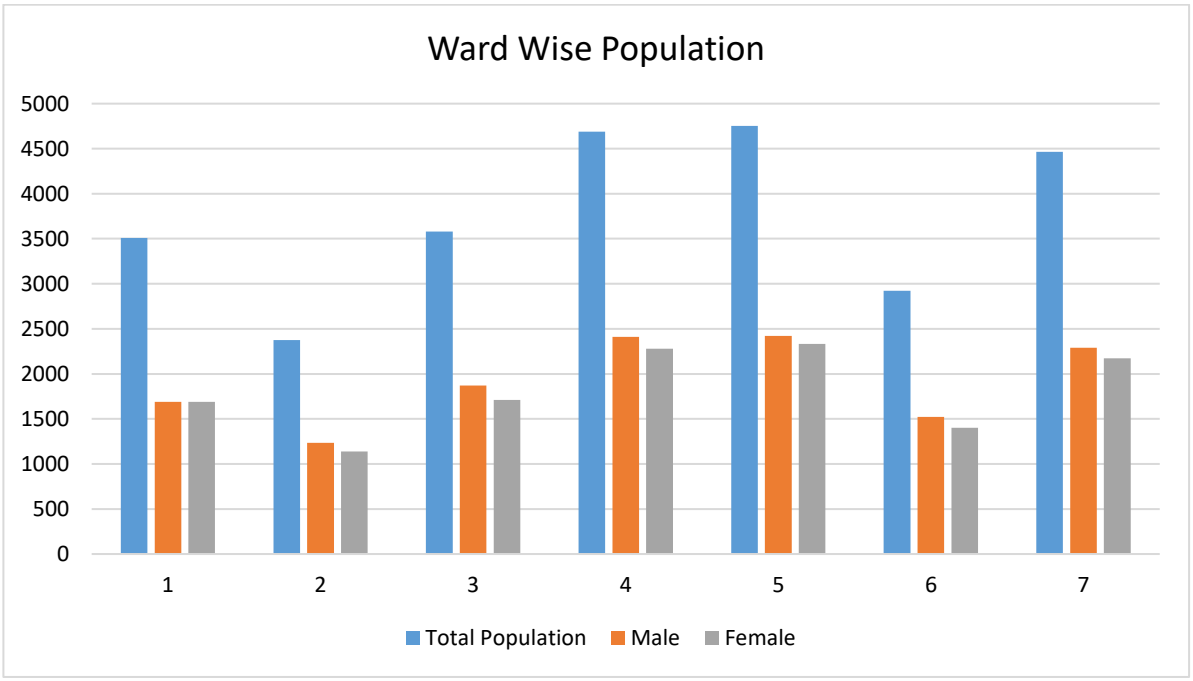
The population density of the Rural Municipality is 93.16 people per square kilometer and average family size is around 2.5.

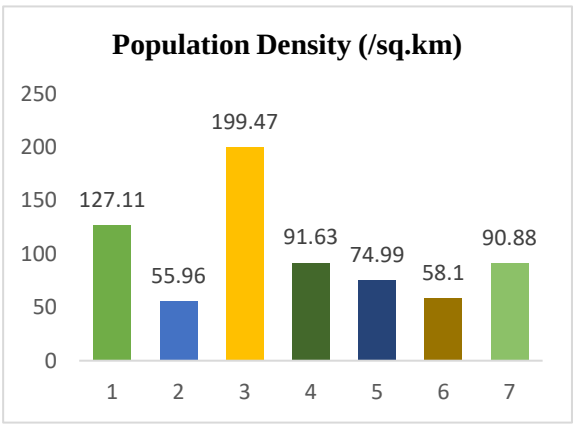
As seen from the table and chart below, there is a distinct variation in population distribution among 7 wards. Population density lies in the range of 199 persons per sq. km. in ward 3 to 58 persons per sq. km in ward 6. The socio-demographic details of each ward have been given in the table below.

Table No 1: Description of Demography and Household

Ward	Total Population	Male	Female	Area (sq.km)	Population Density (/sq.km)
1	3510	1688	1688	20.49	127.11
2	2375	1235	1140	12.46	55.96
3	3579	1869	1710	31.09	199.47
4	4688	2410	2278	42.79	91.63
5	4753	2420	2333	20.52	74.99
6	2922	1521	1401	23.77	58.10
7	4465	2291	2174	43.43	90.88
Total	**26292**	**13568**	**12724**	**154.68**	**87.72**

Source: Nisdi RM Website, 2075





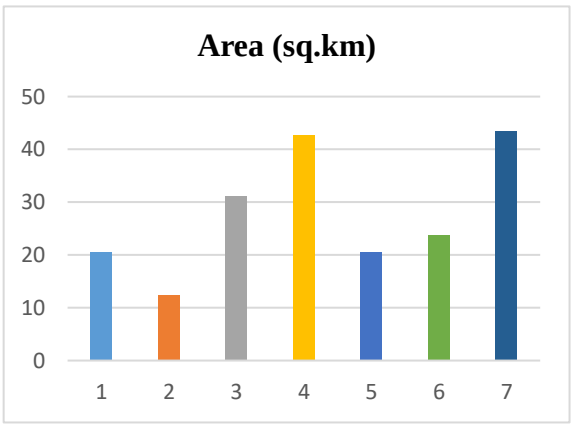


Figure No 4.5: Ward-Wise Population and Population Density

Table No 4.3: Summary of Municipal Profile, Nisdi

Aspect	Key Findings
Location and Regional Connectivity	• Name of Project area/Rural Municipality: Nisdi Rural Municipality, Palpa, Nepal • Total administrative boundary area: 195 sq. km. • The total number of wards is 7. • Located in the Palpa district of Lumbini province • Altitude Range: Highest:1660m, Lowest: 345m from sea level. • Geographic Location: Topographically, Nisdi rural Municipality entails 27°46′12.4″ N and 83°55′25.67″. • Strategically located on the cross-road of Madan Bhandari Highway and more urban roads accessibility. • Surrounded by Bungdikali Rural Municipality in the East, Mathagadhi Rural Municipality in the West, Rampur Municipality, Purba Khola Rural Municipality, Ghiring Rural Municipality in the North, Binayi Triveni Rural Municiaplity, Hupsekot Rural Municipality and Mandyabindhu Municipality in the south.
Demography	• Population- populations with male and female population. 22611 total, among this male (10707) and female (10162), total households (3757), Preliminary Population Survey, 2078 • By CBS 2078 BS; • Total Population: 22611; male (10707) and female (10162) • Family size (3.5) • Population density (195 /sq.km) • The population of age between 0-14 years (20.65%), 15-45 years (48.8%), 45 – 59 years (12.91%), and 59+ (9.91%). • Population by Castes: Magar (86.8%), Dalit (7.14%), Brahmin (7.14%), Newar (1.12 %) and others 1.88 % are Thakuri, Rai etc. • Population by Mother Tongue/Language: Nepali (18.16%), Magar (85.0 %), and others are Newar etc. • Population by Major Festivals: Dashain, Tihar, Loshar, Buddha Purnima, etc. • Major Religions: Hindu, Bouddha, Christianity and others. • Economically active age group (15-59 years) 48.8%
Physical Infrastructure	**Land use:** • 27 % of the land is suitable for agriculture, and 58.27 % land is covered by forest land including barren land, bushes, grass lands etc. **Major Settlements** • Dhungana Besi, Mittyal, Baka Malang, Sahalkot, Jhirubas, Archale, Jyamire, Ghurli Kharak, Bhorma, Khoplak, Geja and Chhapakdi etc. **Housing:** • 70.15% of households are mud masonry • Construction materials vary from wood, cement, soil, mud, slates, Galvanized iron sheets, hatches etc. **Road and Transportation:** • Strategically located on the cross-road of Madan Bhandari Highway and more urban roads accessibility. • Settlements are linked by urban roads and other major identified routes. • The proposed right of way (RoW) is as 10m, 8m, 7m, and 6m according to the importance of urban/village roads. • Road surface conditions: Mostly earthen.

Aspect	Key Findings
	• Transportation services: Public transportation in Madan Bhandari Highway and major route of each ward centers and settlements. • Available transport services are: bus, tipper, tractor, jeep, motorcycle etc. **Water Supply:** • 25.135% of the households have piped connection access. • Presence of community-level lifting water supply schemes, supported by the financial assistance of district/province drinking water supply, water supply corporation, national planning commission, Rural Municipality, and water supply division. **Sewerage and Sanitation:** • No sewerage network. • Only 95.57 % of households have toilet facilities. • Declared ODF. **Hydropower Projects:** • 14 KW, 1.5 KW (ward 5) micro hydro projects are in operation. • Wind (10 KW) and Solar Energy (15KW) **Energy Use:** • 30% of households use electricity as a source of light. **Cooking Fuel Use:** • 90.58% of households use fuel as a source. **Communication:** • Population by use: Mobile Phone (51.30%), Radio (66.67%) and internet (15%). • Numbers of Post offices: Atirikta Hulak Office on all 7 wards. • Wifi Provider: Techminds Network Pvt Ltd , and Mobile Phones. Household have access to F.M., radios. Likewise NTC-4G/3G, Ncell, networks are internet facilities available.
Social Infrastructure	**Education:** • Literacy rate - 86.86%, where 9.02% are illetrate and 4.12% can only read. • Situated educational institutes in the core areas and major settlements. **Health:** • 9 numbers of health institutions and services such as primary health posts, Health Posts. • Major available services are patient admit services, Outpatient Service, In-Patient Service, Emergency Service, Dressing, Plaster, lab/ Laboratory Service, ECG, women's diseases services, khop, early child health services, Emergency Obstetric Care etc. • 1 number of ambulances. **Crime and Security:** • Municipal police bits. **Social Institutions:** • Rural Municipality office, wards offices. • Post office.
Conservation, Cultural and Tourism Developments	**Temples and Religious Institutions** • Raika Devi Temple, Maula Kalika Temple, Shiva Temple, Kharka Baraju Than, Durga Temple etc. **Tourism Development**

Aspect	Key Findings
	• Lekh Danda, Sat Dwat, Bihani Park, Kauleban, Bageshwori View Point.
Economy	• 27.93 % of the total land is suitable for agricultural purposes. • Only about 20% of employment rate of age (15-59) years. • A substantial population is engaged in agriculture (45.53%) followed by business & commerce (43.15%) and services (1.4%). • Rice/Paddy, maize, mustard, musuro, turmeric, yam, vegetables, and tomatoes are the major food and cash crops in the Rural Municipality. • Households were found to be inclined to professional animal farms with many people making it their profession. • The agriculture pocket areas are as: Ginger, Potato, Vegetables (all over the rural municipality), mushroom, and bee farming have high possibilities in the municipal area. • Markets: Rampur, Butuwal, Tansen, Pokhara, Kawasoti and Local markets.
Environment Setting	• 54 % of the total area is covered by forest area including barren, grasslands, bushes etc. **Rivers and Streams** • Arun Khola, Nisdi Khola, Sarangi Khola, Purba Khola, Boudi Khola, Gabu Khola, Kukhuro khola, Belauji khola, Pagaro Khola are the major streams and river. • Pollution - Air and noise pollution are assumed to be within acceptable levels due to a smaller number of industries and vehicles. However, urbanization and development, degradation of soil due to the loss of vegetation cover, overexploitation and inappropriate agricultural systems, drought, lack of solid waste management, etc have triggered soil, water, and air pollution in the rural Municipality. • Land degradation: The rural Municipality lies in hilly terrain, so the slope of the geography is quite steep. Due to this, there is the possibility of land degradation. • The possible natural hazards recorded as earthquake, landslide, floods, wildfires, disease spread, rock fall, thunder etc. • Open space – School's grounds, public parks, etc.
Population Migration	• With the ongoing trend of land transactions in Nisdi, urban growth is likely to gain momentum in all the major settlements. One of the reasons for this might be the introduction of the federal system and people in search of a better facility. Nisdi Rural Municipality has a direct approach from Rampur, Butuwal, Pokhara via. Madan Bhandari Highway and Terai and other rural villages of the vicinity municipalities through several roads. So, the Rural Municipality is predicted to receive a few numbers of inward migrants from these places. • In the present situation, outward migration is being seem more than inward migration. • The study shows that the total increase in population is due to migration though doesn't reflect the real status of the migration. Similarly, birth and death rate records show that there is an increase in population.

4.2.4 Physical Infrastructure

Road Network

The Madan Bhandari Highway passes from the side of the Nisdi rural municipality ward 1. The settlements developing along the highway are a linear pattern. These settlements are major commercial areas in the Rural Municipality. Nisdi Rural Municipality has altogether 464.35 km of road length including the proposed new track which consists of roads like the National

Highway (25.98 km), Feeder Road (2.95 km), and Municipal Road length (435.41 Km) Most of the roads have to be found earthen. National highway passing through ward 1 i.e Madan Bhandari and road passing the Dhungana Besi Bajar sections are blacktopped.

Figure No 4.6: Rural Road Condition

The ward-wise road inventory network detailed has been given in Chapter 5 Below.

Sanitation and Drainage System

There is no integrated sewerage network system in rural Municipality and without a sewerage system, personnel hygiene and environmental sanitation cannot be achieved. During the field study, it has found that storm water drainage is along the National Highway.

The storm water drainage has been constructed at only the major urban roads of Madan Bhandari Highway and the district roads section. Due to the topography of the rural municipality, it is challenging to construct and manage drains in the city area compared to the countryside. So, it is needed to be planned within the core city area and needed to extend to the peripheral area in continuation.

The main problems in the urban/village side drainage in the city are:

- The tendency of people to throw solid waste into drains with the perception that it will be washed away during high discharge.
- Multiple agencies/authorities have built drain; however, it's constructed with a lack of coordination, planning, and improper design on a piecemeal basis.

- Many natural drains are encroached leaving no space for cleaning.

Figure No. 1. 1 Sanitation and Drainage Condition

Tele-Communication

The use of communication has made a huge change in the lifestyle of people and the town. The use of these modes is increasing day by day. Newspapers, e-newspapers, radio, and television are being used an extensive amount as the primary mode of communication for information while Nepal telecom and Ncell are providing telecommunication services in the rural Municipality.

Most people are using mobile phones with NTC and NCELL networks where telecommunication is provided and available of dish home facility. One elaka post office and the other 6 Atirikta post offices are located within rural Municipality.

4.2.5 Social Infrastructure

Educational Institutions

The education sector has been considered a powerful medium of human resources development for poverty reduction and four-point development in planning. The education sector can be determined by various educational programs operated in that area. The rural Municipality is facilitated with a total of 29 numbers of schools including government and private schools. Educational institutions have been providing education from the Montessori level to the higher secondary level. Along with this, there is 1 campus-level institution that has been providing

education up to the bachelor level. After getting SEE level education, students have been moving to cities like Banepa, and even Kathmandu for better and higher education.

Table No 4.4: List of Educational Institutions

S.N.	Name of Institutions	Ward	Locations	Road Network
1	Shree Radhakrishna Higher Secondary School	1	Bakamalang	Pur Malang-Baka-Geja-Boudi Khola
2	Shree Laliguras Primary School	1	Liting Pring	Damara-Rahuban-Liting Pring
3	Shree Jana Shikshya Primary School	1	Dokha Danda	Pur Malang-Dokha Danda
4	Shree Saraswati Primary School	1	Lekh Malang	Bhotaha-Khutte-Damara-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang
5	Shree Baka Geja Chhap Danda School	1	Chhapakdi	Siddhi Bhanjyang-Baka Pokhara-Hatti Bhanjyang
6	Balhit Secondary School	2	Jure	Lakuri Bhanjyang-Jure
7	Shree Anshuburma Secondary School	2	Lindi Bhanjyang	Gomari Khola-Lakuri Bhanjyang
8	Puranthar Primary School	2	Puranthar	Lindi-Sherdanda-Lotari
9	Bhangbari Primary School	2	Bhangbari	Sukekot-Lindi-Anandi Tole
10	Laxmi Primary School	2	Jhirubas	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola
11	Shree Janak Secondary School	3	Khadar	Mittyal-Khadar-Dharkesing-Jherudi-Sahalkot
13	Shree Janak Primary School	3	Dundanda	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola
14	Shree Muna Primary School	3	Mohariya	Jherudi-Mohariya-Sarki Danda
15	Shree Janakalyan Primary School	4	Khoplak	Rukse Bhanjyang-Khoplak-Bhaluwa
16	Shree Gauri Shankar Secondary School	4	Rukse Bhanjyang	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda
17	Shree Mauladevi Basic School	4	Ghyansinbas	Rukse Bhanjyang-Aam Danda
18	Mittyal Primary School	4	Jhaltung	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda
19	Shree Gorakhbath Primary School	4	Bhirpani	Jhaltung-Bhirpani-Archale-Jyamire

S.N.	Name of Institutions	Ward	Locations	Road Network
20	Shree Janapriya Secondary School	4	Arhamara Phat	Arhamare Phat
21	Jal Devi Basic School	4	Goth Danda	Baru Bhanjyang-Mudabas-Arun Khola
22	Shree Saraswati Secondary School	4	Belauji	Kolbhanjyang-Dhungana Besi
23	Raikot Basic School	5	Raikot	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar
24	Brihaspati Primary School	5	Galdha Phat	Saniswara-Galdha Phat-Kewara Paani
25	Shree Janata Secondary School	5	Dhungana Besi	Pipal Bhanjyang-Dhungana Besi
26	Shree Janata Basic School	5	Pipal Bhanjyang	Pipal Bhanjyang-Geja
27	Langari Primary School	5	Sattra Saya	Sattra Saya-Tham Pokhara
28	Akala Primary School	5	Ripthar	Kolbhanjyang-Dhungana Besi
29	Child Development Centre	5	Gabudanda	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar
30	Shree Akala Secondary School	6	Parkula	Parkula-Bahun Danda
31	Shree Goraknath Secondary School	6	Archale	Shiluwa-Archale-Mittyal
32	Shree Janapriya Secondary School	7	Jyamire	Jyamire-Hongsi Road
33	Shree Janapriya Primary School	7	Labedi	Jyamire-Hongsi Road
34	Shree Saraswati Secondary School	7	Ghurli Kharak	Gurung Danda-Jyamire-Bhir Danda
35	Shree Shrero Devi Primary School	7	Ghurli Kharak	Gurung Danda-Jyamire-Bhir Danda
36	Shree Shristi Primary School	7	Hubas	Hubas
37	Pragati Basic School	7	Bebake	Bahauni Kharak-Bebake

Healthcare Centres

The constitution of Nepal has confirmed health services as a fundamental right for every Nepali citizen from the state and is equally accessible to everyone. In typical village areas, most people have not been able to take health services easily. The health care centers are far from the settlements and poor in transportation conditions as well. The health services have been mainly established at Mittyal bazar. Health centers have less ability the treatment of health-related problems in their centres due to a lack of adequate medical teams and medicines.

As per the ministry of health and population, almost half of the population seems to be taking health services from non-governmental and private sectors. Only economically and financially sound people are merely successful in consuming such health services. There are some health centres in the vicinity of the rural Municipality. But lack of medicines and equipment in health institutions seems to be the main problem in rural areas. Families living in remote areas have to spend a lot of time on healthcare and there is a more difficult situation during the rainy season. Local health services are provided through 6 Government health centres. The detailed status of health institutions within Nisdi rural municipality has been listed in the table below. People have to rely on the hospitals of Tansen and Rampur in case of serious health conditions.

Table No 4.5: Healthcare Centers Detail

S.N.	Name of Health Institutions	Location	Ward No.	Road Network
1	Bakamalang Health Post	Bakamalang	1	Adhmara
2	Bhotaha Community Health Unit	Bhotaha	1	Bhotaha-Khutte-Damara-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang
3	Sahalkot Health Post	Sahalkot	2	Gomari Khola-Lakuri Bhanjyang
4	Jhirubas Health Post	Jhirubas	3	Mittyal-Khadar-Dharkesing-Jherudi-Sahalkot
5	Galdha Hospital	Galdha Phat	5	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar
6	Archale Health Clinic	Archale	6	Shiluwa-Archale-Mittyal
7	Jyamire Health Clinic	Jyamire	7	Jyamire-Hongsi Road
8	Hubas Health Unit	Hubas	7	Ghorle Kharak-Dhobala-Charghare-Hubas-Sarangi Khola
9	Triratna Hospital (15 Bedded)	Rukse Bhanjyang	4	Rukse Bhanjyang-Hospital

Crime and Citizen Security Service

Public security is the function of governments that ensures the protection of citizens in their territory, organizations, and institutions against threats to their well-being and the prosperity of their communities. To meet the increasing challenges in the public security area, responsible public institutions and organizations can tap into their intelligence to successfully address possible threats in advance. They optimize their internal structures, use synergies and carefully balance the costs and benefits of their measures.

Public safety organizations include law enforcement, fire, natural disasters, and emergency medical services. The public safety issues that a rural municipality, state, or federal jurisdiction might grapple with are narcotic use, trespassing, burglary, harassment, juvenile delinquency, unauthorized living, noise, littering, inappropriate social behavior, inebriation, and other quality-of-life issues. Generally, organizations are involved in the prevention of and protection from events that could endanger the safety of the general public from significant danger, injury, or

property damage, such as crimes or disasters (natural or human-made). The description of public security offices has been listed in the table below.

Table No 4.6: List of Public Security Services

S.N.	Public Security Services Offices	Location	Ward No.	Road Network
1	Rukse Bhanjyang Police Station	Rukse Bhanjyang	4	Rukse Bhanjyang-Aam Danda

Heritage, Culture, and Religion Tourism Potential Areas

Nisdi rural municipality is one of the destinations for tourists in Lumbini Province due to the suitable climate, forest, vegetation, wildlife, and cultural diversity that has formed a specific geographical structure. The attractive hill sides, rock gardening, rivers streams, ponds, natural caves, and diverse forests are natural resources of the rural Municipality. There are also attractive aspects of tourism like diverse cultures, castes, traditions or festivals, and lifestyles in short range. Tourism can certainly bring a significant contribution to the economic prosperity of the local people in the vicinity by utilizing all of these touristic assets.

People belonging to different cultural groups celebrate their festivals. The Hindus observe Dashian and Tihar as the main festivals, and the Buddhist visits Stupa, Koyobo, etc. The detailed religious sites have been given in the table, below.

Table No 4.7: Major Religious Sites

S.N.	Name of Religious Sites	Ward	Road Access
1	Raika Devi Temple	1	Bhotaha-Khutte-Damara-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang
2	Maula Kalika Temple	1	Maula Kalika
3	Shiva Temple	5	-
4	Kharka Baraju Than	4,5,6	-
5	Durga Temple	5	-

Public Service Centers

The local level Nisdi rural municipality is one of the municipalities of the Palpa district, from Lumbini Province. The Rural Municipality lies in the hilly territory and is connected by Madan Bhandari Highways which are divided into 7 wards. The rural Municipality is linked with village/urban roads and highways that make to setup municipal offices, health posts, police, etc. The detailing of public service centers has been listed below in the table.

Table No 4.8: Public Service Centers

Ward No.	Local Government Bodies	Location	Road Network
4	Rural Municipality Office	Rukse Bhanjyang	Rukse Bhanjyang-Aam Danda
1	Ward Office -1	Bakamalanag	Pur Malang-Baka-Geja-Boudi Khola

Ward No.	Local Government Bodies	Location	Road Network
2	Ward Office -2	Sahalkot	Gomari Khola-Lakuri Bhanjyang
3	Ward Office-3	Jhirubas	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola
4	Ward Office -4	Rukse Bhanjyang	Rukse Bhanjyang-Aam Danda
5	Ward Office -5	Kathai Danda	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar
6	Ward Office-6	Archale	Shiluwa-Archale-Mittyal
7	Ward Office-7	Jyamire	Jyamire-Hongsi Road

Open Space and Parks

The parks and gardens have been developed in different areas of the rural Municipality. To strengthen the ecosystem, open areas are necessary to protect and develop. These areas support creating a clean environment with the addition of beauty to the rural Municipality.

People require daily exercise for recreation, entertainment, and mental refreshment. Different ways of recreation include fun and relaxation through a clean and natural environment. For recreation and relaxation, the rural Municipality has one park located in Dhungechaur, ward 4. Also, there are some internal tourists can spend time having entertainment. The list of existing and recreational infrastructures has been given in the table below.

Table No 4.9: List of Open Spaces and Recreational Sites

S.N.	Name of sites	Location	Ward No	Road Access
1	Bihani Park	Rukse Bhanjyang	4	Rukse Bhanjyang-Aam Danda
2	Bageshwori View Point	-	1	Village/Urban Road
3	Caves	-	1,2,3	Foot Trail

4.2.6 Economic Status

The rural Municipality economy is mainly focused on the sectors like agriculture, forest by-products, small-scale factories, business, wholesale, retail markets, hotels, tourism, and services. Due to the suitable climate and fertile soil, the land is suitable for agriculture. Most of the households in the rural Municipality are directly or indirectly involved in agricultural business. Due to strategic and village/urban road networks in all wards, access to the road to all the settlements has been connected. However, the roads constructed are haphazard and poor. Similarly, water, forestry, and biological diversity along with the rivers have added additional potential to the development of the economy. There are some small and domestic industries which include agricultural mills, crusher industries, poultry farming, bee farming, animal husbandry, etc. Local people are looking for the development of industries and businesses like furniture, herbal, industry, etc. The main economic fundamentals of the rural Municipality are agriculture, trade, local employment, and remittance.

Agriculture

Agriculture is the main source of the economy of the rural Municipality. Almost 95.3% of the population has involved in agriculture while 33.51% of the land is used by agricultural land. Orange/lemon, potato, tomato, paddy, wheat, maize, vegetables, and herbal products are the major crops that have been cultivated. Although the rural Municipality has rivers, streams, and spring sources, the irrigation facility is not good enough due to the terrain and settlements being on the higher areas. Thus, most of the rolling and steep agricultural land has been converted to barren land and ultimately developed as bushes and forests. The local level is giving subsidies to develop water ponds, seeds shades, tunnels, technical assistance, and also managing markets, training, etc. to the farmers. These practices have encouraged the local farmers and youth.

As per local farmers, the agricultural land is partially fertile but due to a lack of irrigation facilities, farmers have faced many problems in growing crops, fruits & vegetables, and animal husbandry as well. Nisdi rural Municipality produces a number of food crops, herbals, and cereals. The production is mainly exported to nearby local markets like Butuwal, Rampur, and places within the rural municiplaity. The production of crops, meats, dairy products, fruits, vegetables etc. isn't enough for the local people. Thus, a huge amount of food has been imported from nearby local markets and Rampur and Tansen.

Major Production of Agriculture Crops

The agricultural land is fertile which helps to increase the economy of the local people. The rural Municipality is also suitable for agriculture, and livestock farming. The major agricultural products in the Rural Municipality are paddy, maize, wheat, cash crops, vegetables, fruits, cereal crops, etc. Off-seasonal vegetable farming, commercial orange farming, commercial honey-bee farming, commercial food farming, commercial mushroom farming, etc has been growing interest.

Industry

The rural Municipality has been dominated by agriculture-based industries like cow farms, goat farms, bee farming, etc. The field study has identified hotel and business industries which include the crusher industry on the bank of Nisdi river. These industries are around the different wards of the Rural Municipality. Besides this, there are a few furniture, poultry farm, rice mills, etc. The list of industries has been listed in the table below.

Table No 4.10: List of Industries

S.N.	Industries	Location
1	Animal Husbandry, Bee Farms	Rural Municipality
2	Agriculture Fields	Rural Municipality
3	Baka Sugarcane Pocket Area	Along the Madan Bhandari Highway
4	Bhangbari Vegetable Pocket Area	Ward 2
5	Bahatari Agriculture Farm	Ward 5
6	Pig Farm	-

S.N.	Industries	Location
7	Poultry Farm, Goat Farm	-

4.2.7 Environment Status

Nisdi rural Municipality has fertile land that is rich for agriculture as well. Nisdi is home to various water birds and aquatic animals. More than dozens of rivers, streams, and ponds provide water for irrigation as well as for drinking purposes. Haphazard urbanization and development are taking a toll on these water bodies and thus it is necessary to conserve them and promote ecotourism.

A wide range of vegetation is practiced in Nisdi rural Municipality which includes *Shorea robusta, Shrikhand, Elaeocarpus ganitrus,* Pinus *wallichiana, Diploknema butyracea, Bombax ceiba,* Toona ciliate, *Acacia catechu,* Juglans regia, *Rhododendron arboretum, Ribes uva-crispa, Zanthoxylum piperitum,* Swertia *chirayita, Asparagus Officinalis,* etc. Forest encroachment, deforestation, grazing, and forest fires are the issues regarding forest management which are looked after by the forest conservation committee and forest users committee.

Urban environmental problems are mostly inadequate and unsafe water supply, wastewater, solid waste, excess use/lack of energy sources, loss of green and natural spaces, urban sprawl, pollution of soil, air, traffic, noise, etc. Nisdi rural municipality also faces similar kinds of environmental problems. In this new emerging rural Municipality, the prevailing environmental problems and issues are: -

Environmental Issues	Situations Analysis
Air Pollution	There is still the practice of burning organic fuels such as vehicle fuel for transportation, firewood, charcoal, dried dung, agricultural wastes, etc. as a source of energy for cooking and various other purposes.
Land Pollution	The land is polluted by the spoiling of mobile, and grease of vehicles, and the land is highly used while expanding the road networks.
Lack of Solid Waste Management	Current waste generation in Nisdi rural Municipality is 0.20 kg/capita/day with an average design waste generation of 0.22 kg/capita/day including a 1% increment with the development of the standard of life. The total average waste generation is 4.0 tons/day and the total waste collection is almost nil. municipal waste contains biodegradable waste, paper, plastics, metal, glass, textile, inert, etc
Waste Water Pollution	The problem emerging from wastewater, especially the degradation of water quality of rivers and other water bodies due to haphazard disposal of wastewater, blockage of sources due to the haphazard road network development, and the associated health and livelihood consequences indicates a lack of planning and infrastructures for the management of wastewater. The production of wastewater is through domestic, commercial, and industrial routes. Waste water produced from the domestic routes includes grey water and black water generated during washing, cleaning, bathing, and sanitary uses.
Disaster Management	Although there is a disaster management committee currently working with a specific disaster management fund in the rural Municipality, there is a lack of technical approaches.

Environmental Issues	Situations Analysis
Drinking Water Quality Degradation	As in parts of the hill, the drinking water source is a spring source. Due to the haphazard development of the road network, a few sources have been clogged.
Noise Pollution	The main source of noise pollution in rural Municipality is due to vehicles and industries. Especially in the Madan Bhandari Highway corridor, noise generation is higher due to the movement of heavily loaded vehicles.

Core Problems Associated with Disaster

The rural Municipality is rich in mines and minerals such as sand, gravel, boulder, stones, etc. However, their rampant and unscientific mining and extraction of these cause erosion and slope instability in the hill areas, flooding thereby also threatening the ecological balance. Landslides are the major vulnerable hotspot in Nisdi rural Municipality. and falls under the high-hazard probability area. The geological and climatic conditions could be responsible for landslides, debris flow, flooding, and wildfires. There are some common problems associated with disasters in the Rural Municipality as listed below-

Disasters	Situation Analysis
Soil Erosion and Landslide	As the rural municipality lies in a hilly area, it is prone to soil erosion and landslides. The high part of the rural Municipality is prone to soil erosion and landslide because of steep land and fragile environment which may cause loss of cultivable land, damage and destruction of road networks, and damaging settlements. The erosion is being seem along the Nisdi corridor.
Fire	Fire is another hazard prevalent in Nisdi rural Municipality. Many of the areas of this new municipal have rural-style traditional homes which are generally made of stone clay and thatched roofs, which makes it more vulnerable to the impacts of fire hazards.
Epidemic	The outbreak of air and waterborne diseases is common in the Rural Municipality, especially during summer.
Earthquake	There have been recent phenomena of the earthquake (2072) in the rural Municipality, there is always a risk as the whole of Nepal lies in a seismically active zone. Thus, preparedness for an earthquake is important as well, to keep the casualties and loss of properties low as possible, even when they occur in large magnitude.

4.3 Development Potential Area

There is a major highway such as Madan Bhandari Highway passes through the rural Municipality. The strategic road network offers many developments an opportunity in the rural Municipality such as:

4.3.1 Settlement and Market Centers

The land topography is the hill that makes some difficulty for the development of the settlements and markets all over the rural Municipality. Thus, few of the areas are suitable for future developments and settlements. The existing road networks are almost developed in the settlement and need to be upgraded.

The settlements of the town follow a cluster-wise development pattern in the municipal area and along the highway the pattern of settlement is linear. The other settlements in each ward are

scattered with low population density. The buildings constructed along the highway are mostly RCC-framed structures and use for commercial and residential purposes. The urban road access is sufficient but the road width is narrow than standards. The residents along the highway are a high population density and an altitude of low land topography. Detailed information on major settlements and markets area has been listed in the table below.

Table No 4.11: Major Settlements and Market Centres

Ward No.	Name/ Location	Types Settlements	Road Network	Road Code
5	Galdha Phat	Small Market	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar	506RM10B018
4	Mittyal Bazar	Medium Market	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda	506RM10B015
6	Archale	Settlement/Market	Badar Bhanjyang-Ranguwa	506RM10D125
5	Dhungana Besi	Settlement	Dhungana Besi-Khare Khola	506RM10D080
7	Jyamire	Settlement	Jyamire-Hongsi Road	506RM10A012
1	Bakamalang	Settlement	Adhmara	506RM10D001
1	Armalang	Settlement	Bhotaha-Khutte-Damara-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang	506RM10C004
1	Damara	Market/Settlement	Bhotaha-Khutte-Damara-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang	506RM10C004
1	Baka	Market/Settlement	Pur Malang-Baka-Geja-Boudi Khola	506RM10D029
2	Tham	Settlement	Sukekot-Tham	506RM10D044
2	Bhangbari	Settlement	Sukekot-Lindi-Anandi Tole	506RM10A002
3	Mohariya	Settlement	Jherudi-Mohariya-Sarki Danda	506RM10B007
3	Khadar	Market	Mittyal-Khadar-Dharkesing-Jherudi-Sahalkot	506RM10A003
3	Jhirubas	Market/Settlement	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola	506RM10B011
4	Bhorma	Market/Settlement	Rukse Bhanjyang-Khoplak-Bhaluwa	506RM10B010
4	Khoplak	Settlement	Rukse Bhanjyang-Khoplak-Bhaluwa	506RM10B010
4	Arya Bhanjyang	Settlement	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda	506RM10B019
5	Gabudanda	Settlement	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar	506RM10B018
6	Chidiya	Settlement	Parkula-Sat Dwat	506RM10D121
6	Sat Dwat	Settlement	Parkula-Sat Dwat	506RM10D121
7	Ghurli Kharak	Market/Settlement	Gurung Danda-Jyamire-Bhir Danda	506RM10A013

Ward No.	Name/ Location	Types Settlements	Road Network	Road Code
7	Simaldanda	Market/Settlement	Gurung Danda-Jyamire-Bhir Danda	506RM10A013
7	Hubas	Settlement	Hubas	506RM10D135
7	Ghodi Kharka	Small Market/Settlement	Gurung Danda-Jyamire-Bhir Danda	506RM10A013

4.3.2 Administration Center and Service

The municipal executive office of Nisdi rural municipality is located at Rukse Bhanjyang, ward no 4. The municipal office is situated in the almost mid part of the rural municipality which has been connected via village/urban road networks. This may offer a high possibility to develop as an institutional zone in the rural Municipality.

4.3.3 Industry

The rural municipality can develop a large number of small to medium industries such as food processing, dairy processing, agro-processing, and others which may serve the local people and other municipalities and the whole district.

4.3.4 Agriculture/Forestry and Its Processing

With the suitable topography and climate available in the rural municipality, agricultural production especially orange, lemon, vegetables, cash crops, herbal products, livestock, and fruits can be given higher priority and the processing of agricultural products is a potential for the economic development of the rural municipality.

Chapter 5. Municipal Inventory Map of Road Network

The road inventory survey has been 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 has been done with the help of, google image maps survey and a GPS survey. A road inventory survey has been completed from one nodal point to another in each road section collecting information related to the road surface, crossing structure, road condition, and linkages to the large settlements, economically active spaces, existing service centers, 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 has been prepared. And based on the earlier study of potential areas and MIM, IDPM is developed.

5.1 Overview of Road Network

The Madan Bhandari Highway passes from the centre of the Nisdi rural Municipality crossing all wards. The settlements developing along the highway are linear patterns. These settlements are major commercial areas in the Rural Municipality. Nisdi Rural Municipality has altogether 464 km of road length including the proposed new track which consists of roads like the National Highway (25.98 km), District Road (19.01 km), and Municipal Road length (431.061 Km). Most of the roads have to be found earthen. The only the national highway and settlement on Dhungana Besi Bajar section are blacktopped.

Table No 5.1: Existing Road Inventory

Road Types and Surface Types	Road length, Km
Blacktop	**0.24**
District Road	-
Municipal Road	0.24
Earthen	**423.49**
Feeder Road	2.955
District Road	13.28
Municipal Road	412.074
National Highway	1.932
Gravel	**37.747**
Municipal Road	13.699
National Highway	24.047
RCC	**1.644**
Municipal Road	1.644
Proposed	**7.76**
Municipal Proposed Road	7.76
Grand Total	**465.71**

Table No 5.2: Road Length by Road Width

Road Class Type, Road Width, M	Road length, Km
0	**8.40**
Municipal Proposed Road	8.40
1.5	**4.95**
Municipal Road	4.95
2	**2.03**
Municipal Road	2.03
2.5	**6.51**
Municipal Road	6.51
3	**200.85**
District Road	10.42
Municipal Road	190.42
4	**121.11**
District Road	2.85
Municipal Road	118.25
5	**30.91**
Municipal Road	30.91
6	**34.48**
Municipal Road	34.48
7	**20.27**
Municipal Road	17.31
Feeder Road	2.95
8	**34.22**
Municipal Road	10.17
National Highway	24.04
10	**1.93**
National Highway	1.93
Grand Total	**465.71**

The table shows that the rural Municipality has 200.85 km of road width below 3m.

5.2 Accessibility and Mobility

The rural Municipality has basic accessibility, i.e. All the people of the rural Municipality have access to the road within 30-40-minute walking distance. In the modern concept, accessibility is defined as access to services and facilities, not derived from travel. Access to urban roads is not a problem in the rural Municipality, but access to the services and facilities such as bus stops, city buses, roadside infrastructures, etc. is questionable in village/urban areas. The average travel

time to access urban transport is about 2-3 hours (maximum) using a motorcycle, jeep, bus, etc. This hinders their mobility and thus renders the services and facilities inaccessible. The average time required to reach the nearest bus stop is about 60 minutes. The unreliability of public vehicles has hindered village/urban mobility, which has increased dependence on privately owned motorcycles.

Each day more than 500 light and heavy vehicles pass across the Nisdi rural Municipality via. Madan Bhandari Highway. There is a direct bus and micro bus service from Kathmandu to the rural Municipality. With the possibility of mass transportation, the rural Municipality doesn't have a proper bus park and bus stations. Due to such a scenario, buses and other public transport means are seen to be parked along the side of the road which obstructs the traffic flow, creating unpleasing congestion. So, the rural Municipality has to plan for the construction of a well-facilitated bus terminal which has been proposed in Nisdi rural municipality, and a sufficient number of bus stands.

The Dhungana Besi and Mittyal Bajar is centre of the rural municipality where the mass flow is high. The settlements of each ward have been linked by village/urban roads to the center. Mostly, urban roads are earthen and have poor transportation facilities i.e. not regular. The transportation facility is only available in the morning time from urban settlements to the center and in the evening from the city to village/urban settlements. Many citizens are traveling by foot to reach markets, schools, health posts etc. The transportation service is weak in the locality and available services are jeep, motorcycle, pickup, and buses, in bajar areas. To overcome the transportation services problems, the rural Municipality should initiate municipal bus services immediately.

Although the rural Municipality has connectivity with different parts of Nepal and its nearest cities and towns, it has not any bus stations and parking plots due to which vehicles are parking along the roadside which may cause congestion and increase road accidents. The bus park is one of the most important infrastructures in the town. Therefore, the rural Municipality needs to either expand or search for another alternative.

Public transportation facilities especially jeep, micro, and bus services are available from Kathmandu via. Madan Bhandari Highway while the rest of the wards are connected with the core market through jeep and other transportation services. Most of the municipal roads are earthen & in poor condition.

The Nisdi rural Municipality is connecting to the major cities via. National Highways and its details have been listed in the table below.

Table No 5.3: Connectivity to Major Cities

	Places	Distance (Km)	Highway	Code	Remarks
Connectivity	Rampur	11.3	Madan Bhandari Highway	NH09	Palpa
	Tansen	60.2	Aryabhanjyang-Dhobadi-Rampur	-	Palpa
	Kawasoti	92.1	Bhimad-Rampur-Mittyal-Arung Khola	NH68	Nawalpur
	Butwal	89.7	Mahendra Highway	NH01	Major City, Rupandehi

	Deukhuri	211	Mahendra Highway	NH01	Province Capital
	Pokhara	87.5	Bhimad-Rampur-Mittyal-Arung Khola-Prithvi Highway	NH 68	Major City, Kaski

5.3 Traffic Volume Study

Generally, a traffic volume study has been done the establishment of the relative importance of the road. It helps to decide the priority of improvement and expansion of roads and to allocate funds accordingly. It will also help in the analysis of traffic patterns. Inventory of road traffic and physical features has been done by use of GPS, GIS Maps, and manual vehicle counting methods. This method has identified traffic volume as well as vehicle classification

Mostly, people from the area have made the trip on walking. Besides this, people are using motorbikes and jeeps, and pickups, as a trip option due to less availability of public vehicles in urban areas whereas trucks are for transport freights and construction materials.

5.3.1 Traffic Vehicle Count

The traffic vehicle count per hour has been done at the following stations which are listed in the table below:

Table No 5.4: Location and Route for Vehicular Count

SN	Count Station	Location	Name of Road Linkage	Road Code
1	Baka Pokhara	Baka Pokhara	Khutte-Damara-Raika-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang	506RM10C002
2	Lindi Bhanjyang	Lindi Bhanjyang	Sukekot-Lindi-Anandi Tole	506RM10A002
3	Jhirubas	Jhirubas	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola	506RM10B011
4	Mittyal Bajar	Rukse Bhanjyang	Mittyal Bajar-Lame Damar-Juluke	506RM10A006
5	Dhungana Besi	Dhungana Besi Bajar	Dhungana Besi-Pipal Bhanjyang-Sadakbas - Rukse Bhanjyang	506RM10B017
6	Jhirubas	Mittyal	Mittyal-Khadar-Dharkesing-Jherudi-Sahalkot	506RM10A003
7	Archale	Archale	Shiluwa-Archale-Mittyal	506RM10B013
8	Jyamire	Jyamire	Gurung Danda-Jyamire-Bhir Danda	506RM10A013

Table No 5.5: Vehicle count per Day

S.N	Station	Mode Chioce					
		Motorbike	Jeep/Car	Tractor	Tripper/ Truck	Bus	Total (PCU)
1	Baka Pokhara	41	5	13	0	0	45
2	Lindi Bhanjyang	47	11	8	4	2	64.5
3	Jhirubas	65	2	5	2	0	48
4	Mittyal Bajar	33	6	12	5	2	61.5
5	Dhungana Besi	45	13	16	10	2	95.5
6	Archale	107	2	10	2	2	82.5
7	Jyamire	86	0	0	460	2	1429
Total Vehicle		**424**	**39**	**64**	**483**	**10**	**1826**
PCU/Day		**212**	**39**	**96**	**1449**	**30**	**1826**

Table No 5.6: Modes of Transportation Services

Modes of Transportation	PCU/Day	%
Motorcycles	**Error! Reference source not found.**	**11.61**
Jeep	39	**2.14**
Tractors	96	**5.26**
Truck/Trippers	1449	**79.35**
Bus	30	**1.64**
Total, PCU/Day	1826	**100**

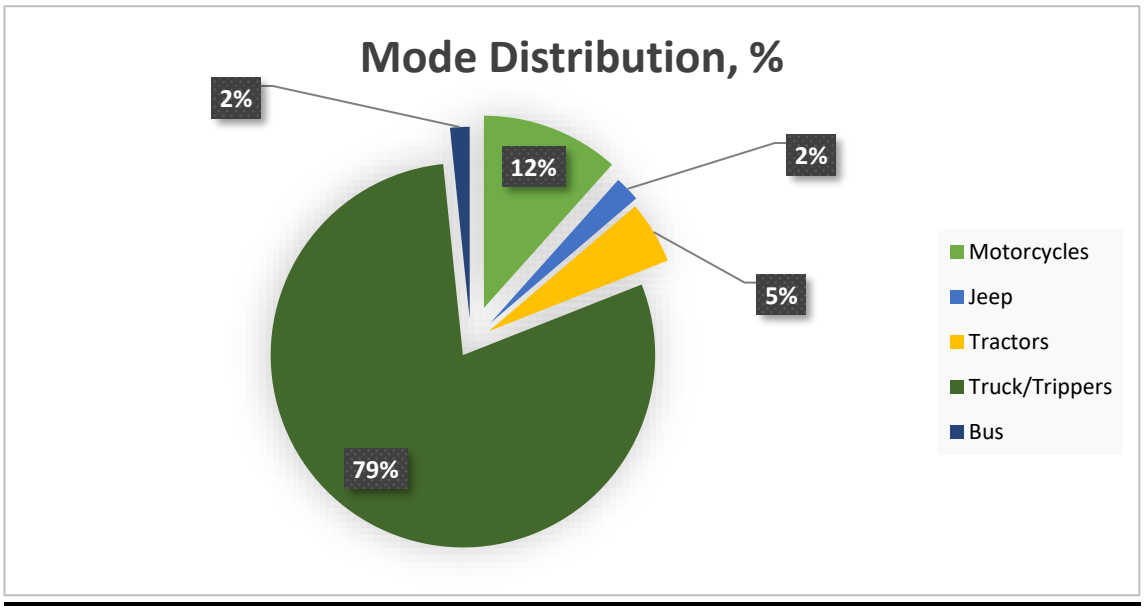


Figure No 5.1: Modes of Transportation Services

The composition of the vehicle shows that the major vehicle that plies on the major village/urban roads. Among the station, the transport facility is motorbike (7.78 %). Other than these, 3.52 % of traffic is occupied by tractors, 86.17 % by trippers, and 1.43% is private jeeps and cars.

5.3.2 Active and Passive Transport User

Active transport is also called Non-Motorized Transport, NMT, and human-powered transport It 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 (Litman, 2015). Passive transport users prefer to travel by bus, car, etc. The sample survey shows that nearly 19% or above of the daily trips are done via an active mode of transport. The 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.

5.3.3 Public Transportation

The use of public transportation for daily trips is limited to the Madan Bhandari Highway and Aryabhanjyang-Dhobadi-Rampur. Except for highways, the rural municipality has no formal form of public transportation as it does not have a defined schedule and is not reliable. There is no public transport along other road sections of the Rural Municipality. Mobility relies on privately owned vehicles or has to walk himself. It is prime time to implement interventions to introduce proper public transport routes and services so that a sustainable proper public transportation can be established and an increase in the number of private vehicles can be controlled in the future.

5.3.4 Safety Status and Issues

The data provided by the key interviewer's information shows that the majority of vehicles involved in the accidents are motorbikes due to road conditions, negligence and speeding is the major cause.

The rural municipal roads are mainly used by motorbikes, jeep users, and pedestrians. The use of motorized vehicles is very limited as the ownership of motor vehicles is low. Thus, with the majority of slow vehicles plying on municipal roads, the roads are safer.

But the situation is not very friendly along the highway and village roads which supports all sorts of high-speed motor vehicles. The Madan Bhandari Highway passes through the market area of wards 1. Market development along these highways is highly risky because of the carriageway section in the bridge and highway which is shared by all sorts of vehicles including pedestrians. Motorcyclists and pedestrians are at the highest risk along these sections and rural roads. Therefore, proper urban road infrastructure should be provided along the highway as it is a part of an urban road network.

5.4 Forecast and Planning

This clause deals with the future projection of population and vehicles along with the allocation of potential development areas. It also formulates the hierarchy of urban roads for proposed different classes of roads. It has considered the relationship between land use and future transportation planning. It also deals with various infrastructure planning and how they will help to enhance the mobility and accessibility scenario. Finally, it covers the aspect of short-term and long-term urban road networks and transportation planning.

5.4.1 Population and Traffic Forecasting

The population and population density of the rural Municipality is obviously in increasing order migration is the chief factor. The factors for migration may be the desire for better economic opportunities, the desire for better living or housing conditions (this applies particularly to short-distance migration within the locality), trips for reasons of health, education, retirement, etc., and others. For a sustainable supply of transport infrastructure, it is crucial to forecast the future population and required infrastructures for traffic management.

Population forecast is considered for areas showing stability in the size of their populations for several decades, and change in the economic and social conditions; whereas it becomes extremely difficult and complex for areas having sharp fluctuations in the direction or rate of population change. The population can be forecasted via various methods, which include arithmetic, geometric, arithmetic incremental method, logistic curve method, and so on.

According to records from CBS 2078, the population of the municipal area seems to be decreased. But we assume that the population will also be increasing in the coming years. To forecast the population of the rural Municipality, the geometric method has been used considering the urbanization of the area. For this the following formula is used:

$$P_n = P\,(1+ I_G/100)^{\wedge n}$$

Where, IG = geometric mean (%)

P = Present population

n = no. of year.

P_n= population at the end of the nth year

By using this method, we found that the average increase rate of population in this rural Municipality is on average 0.35 % per year. Based on this trend, the minimum projected population of this Rural Municipality in the year 2084/85 BS will be 18,278.

The population prediction for the Rural Municipality has been made for the following years: 2081, 2080, 2081, 2082, and 2083, 2084/85 BS which has been given in the table and chart below.

Table No 5.7: Population Forecast

Projected Year	Population	Remarks
2068	22,611	**Census Population (CBS)**
2078	18120	**Census Population (CBS)**
2079	18183	**Projected Population**
2080	18247	**Projected Population**
2081	18311	**Projected Population**
2082	18375	**Projected Population**
2083/84	18440	**Projected Population**
2084/85	18503	**Projected Population**

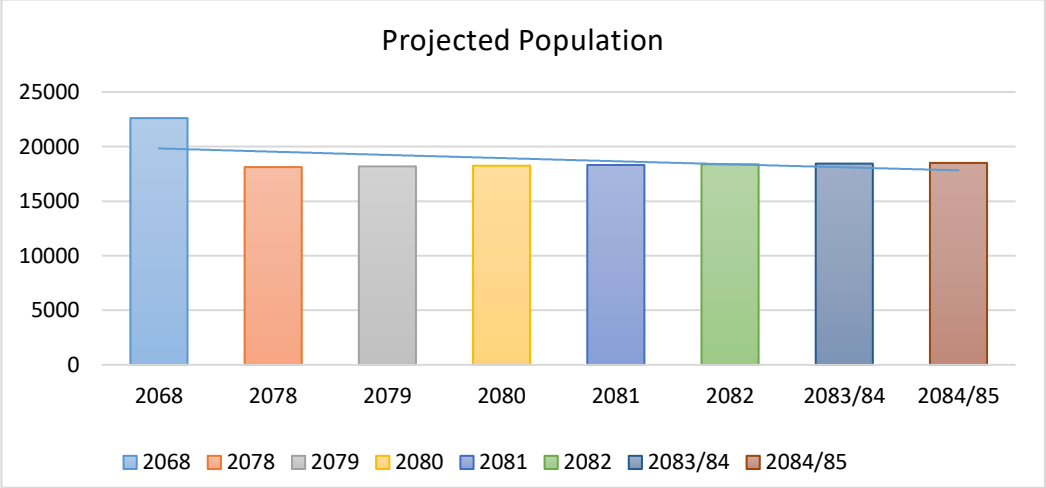


Figure No 5.2: Population Forecast

5.4.2 Traffic Forecast

Transportation forecasting is the process of estimating the number of people or vehicles that will use a specific transportation facility. Hence, it will provide benchmarks for developing overall transportation policy, planning, design, and operation for efficient mass mobility and transportation system.

The transport infrastructure and facilities pave the path for the development of the area. Thus, the existing trend of infrastructure development and land use are considered to plan the transport

facilities requirements in the future. In the planning process of the transport infrastructures, the projection of the traffic is the most crucial factor. Traffic forecasting for planning projects determines the required number of lanes and road width to meet the future anticipated traffic demands. Transportation demand will depend upon demographic and geographic factors, including population size and age, economic and employment growth, urban road network, operating conditions, and land use policy, including the cost of travel.

Thus, the data collected during the study is used for forecasting the traffic in the rural Municipality. Present-day traffic can be interpreted based on the OD survey. To forecast the traffic flow, it is assumed that about 15 to 24 % of the population makes daily trips. The projected traffic is based on an extreme case of population.

Table No 5.8: Projection of Mode Shares

Years	Motorcycle (%)	Motorcycle Increased Rate, %	Jeep/Pickups (%)	Jeeps Increased Rate, %	Tractor (%)	Tractors Increased Rate, %	Trippers/Trucks (%)	Trucks Increased Rate, %	Bus (%)	Bus Increased Rate, %	Total	Walking
2081	52.99	1	13.51	0	29.09	-1	2.34	0	2.08	0.00	100	25
2080	53.99	1	13.51	1	28.09	-1	2.34	-1	2.08	0	100	23
2081	54.99	0.5	14.51	0.5	27.09	-1	1.34	0	2.08	0	100	24
2082	55.49	0.5	15.01	0	26.09	0	1.34	-0.5	2.08	0	100	23
2083/84	55.99	0.5	15.01	0.5	26.09	-1.5	0.84	0	2.08	0.5	100	22
2084/85	56.49	-	15.51	-	24.59	-	0.84	-	2.58	-	100	20

Table No 5.9: Projected Trip Generation

Projection			Daily Trip, Mode Share					
Year (B.S.)	Projected Population	Trip Maker	Motorcycle	Tractor	Car/ Jeep	Bus	Trippers /Trucks	Walking
Assume	**%**	**15**	**52.99**	**29.09**	**13.51**	**2.08**	**2.34**	**25**
2081	18160	2,724	1443	792	368	57	64	4540
Assume	**%**	**17**	**53.99**	**28.09**	**13.51**	**2.08**	2.34	**23**
2080	18,183	**3,091**	1669	868	418	64	72	4182
Assume	**%**	**20**	**54.99**	**27.09**	**14.51**	**2.08**	1.34	**24**
2081	18,207	**3,641**	2002	986	528	76	49	4370
Assume	**%**	**22**	**55.49**	**26.09**	**15.01**	**2.08**	1.34	**23**
2082	18,230	**4,011**	2225	1046	602	83	54	4193
Assume	**%**	**23**	**55.99**	**26.09**	**15.01**	**2.08**	0.84	**22**
2083	18,254	**4,198**	2351	1095	630	87	35	4016
Assume	**%**	**24**	**56.49**	**24.59**	**15.51**	**2.58**	0.84	**20**
2084	18,278	**4,387**	2478	1079	680	113	37	3656

The above table shows that the motorcycle contributes about 53% of trips and assuming a 4.5% increase in bike ownership in the next five years, we can use the growth factor of about 2% in the trip making. The increase in trips of motorcycles reduces the trips of tractors and walking.

Without any intervention in public transport routes, the public transportation usage level will more or less remain the same. But interventions during the first five years should demand public vehicles during the plan. Assuming increasing in the trips by 1%, we will come up with the above fact. There will increase in private car/jeep ownership and public vehicles in the rural Municipality. At the same time, there will decrease in walking trips, which are taken up by motorbikes, car/jeep trips, and public vehicles. Though, its usage changes to the initial one as people have to walk to the nearest bus stops and so on. And, the provision of pedestrian facilities will help to maintain mass mobility in proportion.

5.5 Formulation of Road Network Hierarchy

Village/Urban roads facilitate a variety of functions, including direct access to pedestrians and motorcycles, bus routes, and catering through traffic. Many roads serve more than one function to varying degrees, but the mixing of incompatible functions can lead to problems. Thus, it is important to distinguish roads into different classes or types based on various criteria.

An urban road hierarchy is a means of defining each roadway in terms of its function along with appropriate objectives. The roadway can be setup and appropriate design criteria can be implemented. It is an important tool for road network and land use planning to asset management. Road hierarchy restricts or reduces direct connections between certain types of links, for example, residential streets and arterial roads, and allows connections between similar-order streets (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.). 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-planned road hierarchy will reduce the overall impact of traffic by concentrating longer distance flow onto routes in less sensitive locations, ensuring land uses and activities. These networks are incompatible with traffic flow and restricted from routes where traffic movement should predominate and preserving areas where traffic is discouraged.

There are some different levels of road hierarchy in India and Nepal Such as:

- Indian Road Congress (IRC) has classified urban roads into four classes: Arterial, Sub-Arterial, Collector, and Local Street.
- NRS 2070 has classified road into four types that includes Class I, II, III, and IV roads based on technical/functional classification, and highlight the fact that this class is almost equivalent to expressways, arterial roads, collector roads, and local roads respectively.
- NURS 2076 has classified urban roads into five categories, i.e. Expressway, Arterial, Sub-Arterial, Collector, and Local Roads.

The road hierarchy principles will support orderly planning and provision of public transport routes, and pedestrian and bicycle routes. It also identifies the effects of development decisions on surrounding areas. It also facilitates urban design principles such as accessibility,

connectivity, efficiency, amenity, safety, and road furniture and preserves landscaping. This study also formulates the road hierarchy for the various roads. After going through the literature, the study has proposed four-level hierarchy roads namely Class A, B, C, and D.

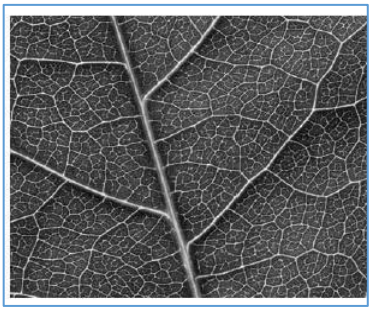


Figure No 5.3: Conceptual Hierarchy

Figure No 5.4: Road Network Hierarchy

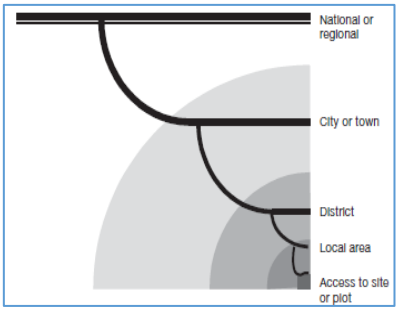


Figure No 5.5: Urban Road Hierarchy

5.5.1 Right of Way (RoW)

The RoW is the width of land to be acquired for the road along its alignment. The Nepal Road Standard 2070 has proposed roads under the category of National Highway (NH), Feeder Roads (FR), District Roads (DRCN), and Urban roads within the Rural Municipality area. The RoW of these roads is 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 respectively. The guideline has clearly stated about the setback distance for these roads (having RoW ≥ 20.0) is 6.0 m on either side. All of these standards shall be applied to the Rural Municipality accordingly.

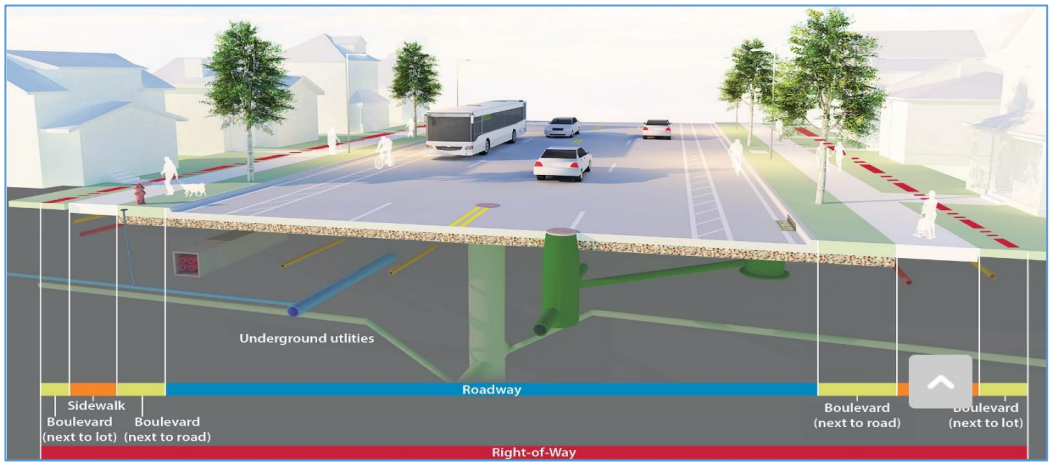


Figure No 5.6: Definition of RoW

Table No 5.10: Urban Road Class and Features

Road Class	Descriptions	Minimum RoW (m)	Minimum Set-back Distance (m)	Remarks
NH	National Highway	50	As Prescribed	NRS 2070
FR	Feeder Road	30		
DRCN	District Road	20		
Municipal Ring Road	Municipal Road	20	5 & 5	MTMP 2081
A	Arterial Road	10	1.5 & 1.5	

Road Class	Descriptions	Minimum RoW (m)	Minimum Set-back Distance (m)	Remarks
B	Sub-Arterial Road	8	1.5 & 1.5	
C	Collector Road	7	1.5 & 1.5	
D	Local Road	6	1.5 & 1.5	

Based on MTMP guidelines, the building line or setback shall be maintained at 6.0 m for roads having RoW equal to or more than 20.0 m and 2.0 to 5.0 m for other roads. However, Nepal Road Standards-2070 has considered the setback distance at curved sections only and that should be sufficient to provide 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 is 1.5 m on either side. Again, the minimum Row of roads has been set as 6.0 m. i.e. 3.0 m on either side from the centreline. A portion of this guideline has been presented herewith.

5.5.2 Road Classification

Urban roads are the roads serving within the Rural Municipality. The classification practices of urban roads are guided by the functional hierarchy of roads. In the context of Nepal, Nepal Urban Road Standard- 2076 has classified urban roads as Arterial, Sub-arterial, Collector, and Local/ Residential Streets. The ToR provided for the preparation of MTMP has formulated the class of roads into A, B, C, and D.

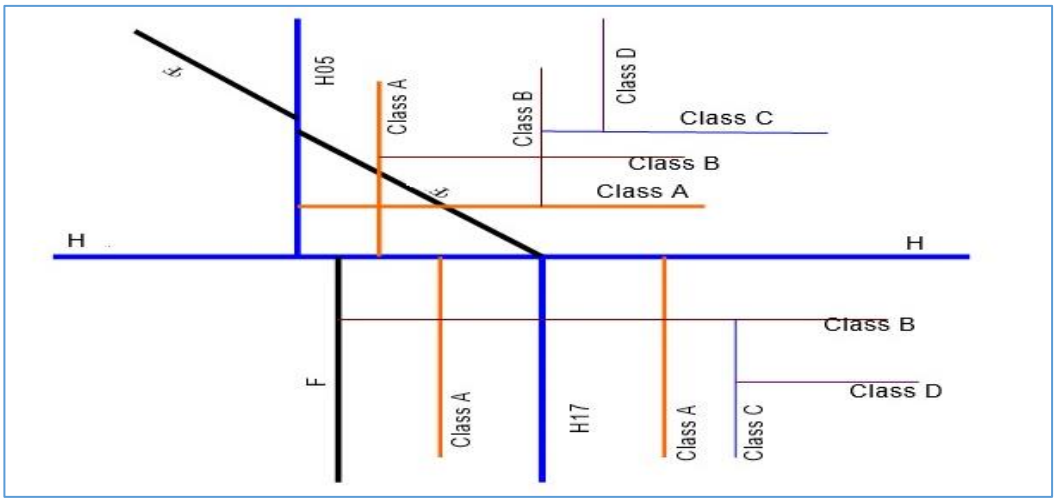


Figure No 5.7: Detail Description of Road Class

The fundamental parameters of the urban road are shown in Figure No 5.6. The Rural Municipality has a complete road network hierarchy consisting of national highways, feeder roads, and urban roads of all four classes. The conceptual layout based on the functional hierarchy of the entire road network is shown in Figure No 5.3,5.4,5.5.

5.5.3 National Highways

National Highways are the main roads connecting East to West and North to South of the Nation. These serve directly the greater portion of the long-distance travel, provide a consistently higher level of service in terms of travel speeds, and bear the inter-community mobility. These roads shall be the main arterial routes passing through the length and breadth of the country as a whole. They are designated by the letter "H" followed by a two-digit number. For example, Madan Bhandari Highway (NH09) with RoW 50 m.

5.5.4 Feeder Roads

Feeder roads are important roads of localized nature. These serve the community's wide interest and connect district headquarters, Major economic centres, and tourism centers to National Highways or other feeder roads. They are designated by the letter "F" followed by a 3-digit number.

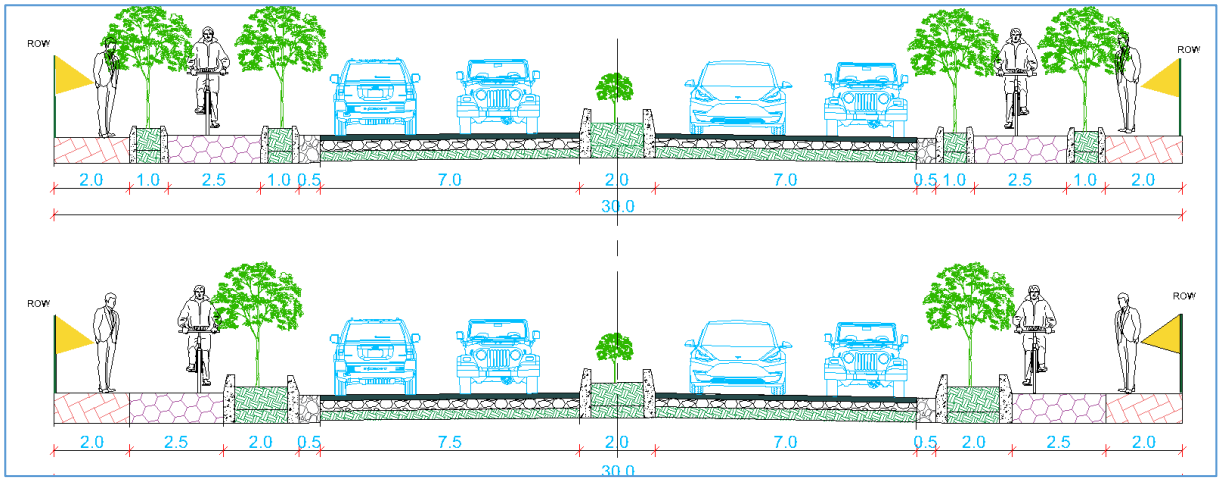


Figure No 5.8: Typical Cross Section of Feeder Road

5.5.5 District Roads

District Roads are important roads within a district serving area of production and markets, and connecting or with the main highways.

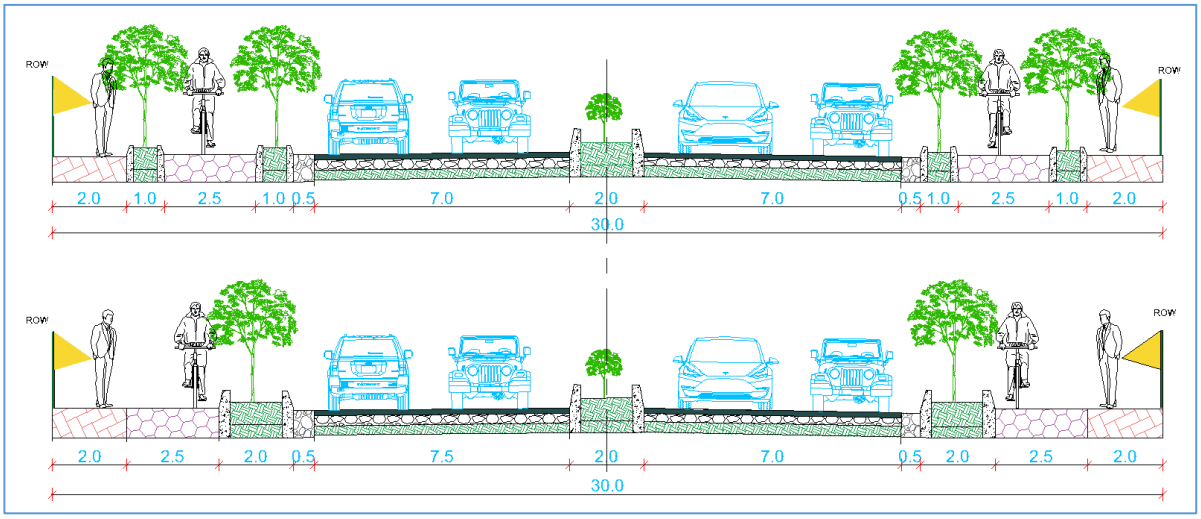


Figure No 5.9: Typical Cross Section of District Road

5.5.6 Rural Municipal Village Roads

Arterial Roads (*Path*)- Class "A": These roads are generally meant for thorough traffic usually on a continuous route. These roads are wider, basically with a total right of way of 10 m, and principally serve the purpose of mobility. However, in the case of Nisdi rural Municipality, these roads have been designed with a Right of Way of 10 m. These roads are high-standard roads with a longer length and serve a large population and are considered highways of the Rural Municipality. They connect one or more major growth centers or have a direct linkage to SRN or LRN and thus it has high network coverage. The design speed of 40-50 Kmph has been set for class A roads. These roads are equipped with proper facilities for vehicles, pedestrians, cyclists, and greenbelts. Pedestrians are allowed to cross only at intersections or at designated crossings.

All major roads which connect one or more major growth centers (market, tourism Centre, industry, etc.) or several wards with any one of the following:

- ❖ High network coverage
- ❖ The right of way is at least 10 m.
- ❖ Directly or through the national strategic road network, or district road.
- ❖ Complete access to public transport with segregated NMT facilities.
- ❖ Underground facilities, i.e. cable, electric lines, sewer lines, water supply, gas lines, etc.

Typical sections of Arterial are shown in the figures of two types. Type II, the rural road has been prescribed for the Nisdi rural municipality.

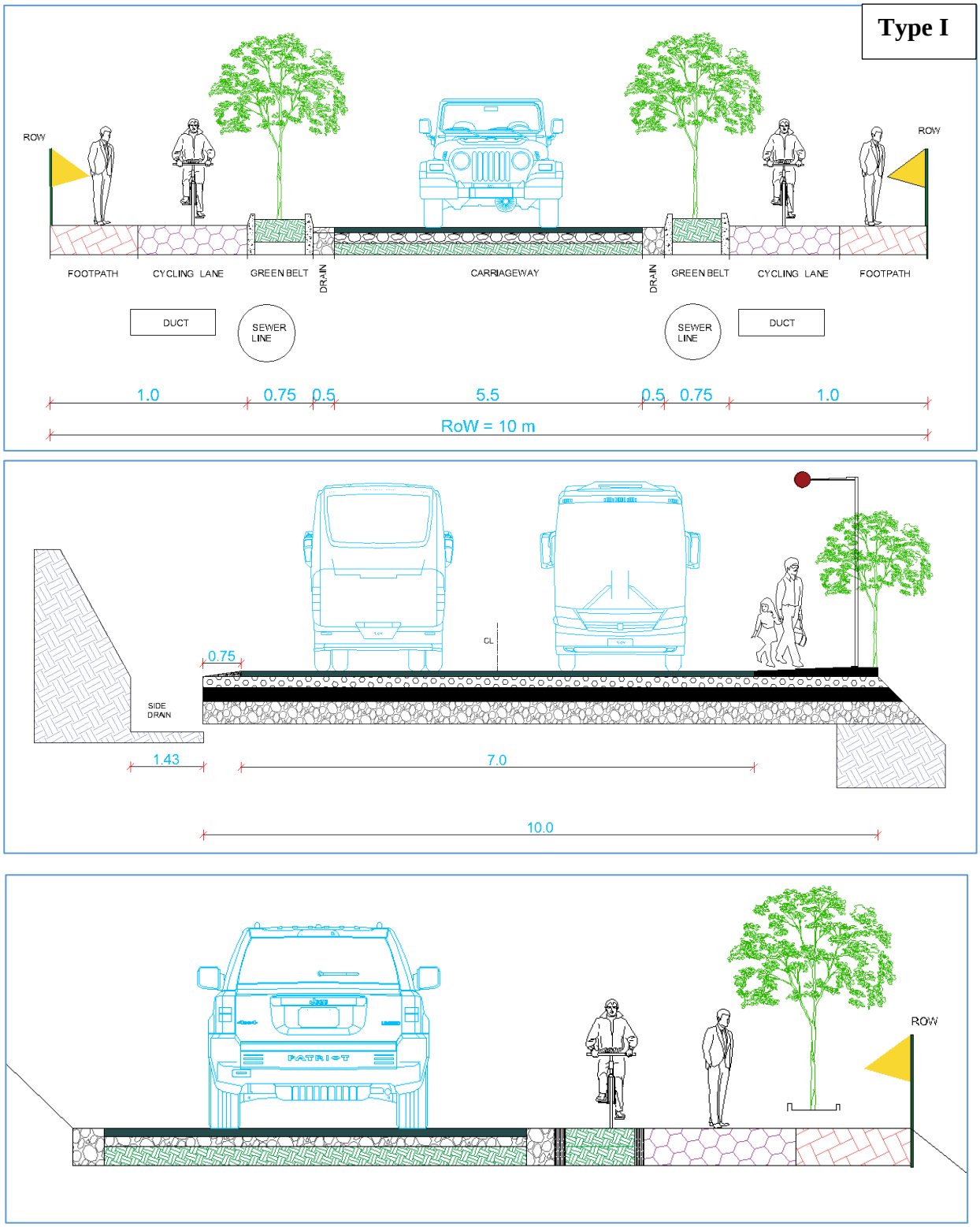


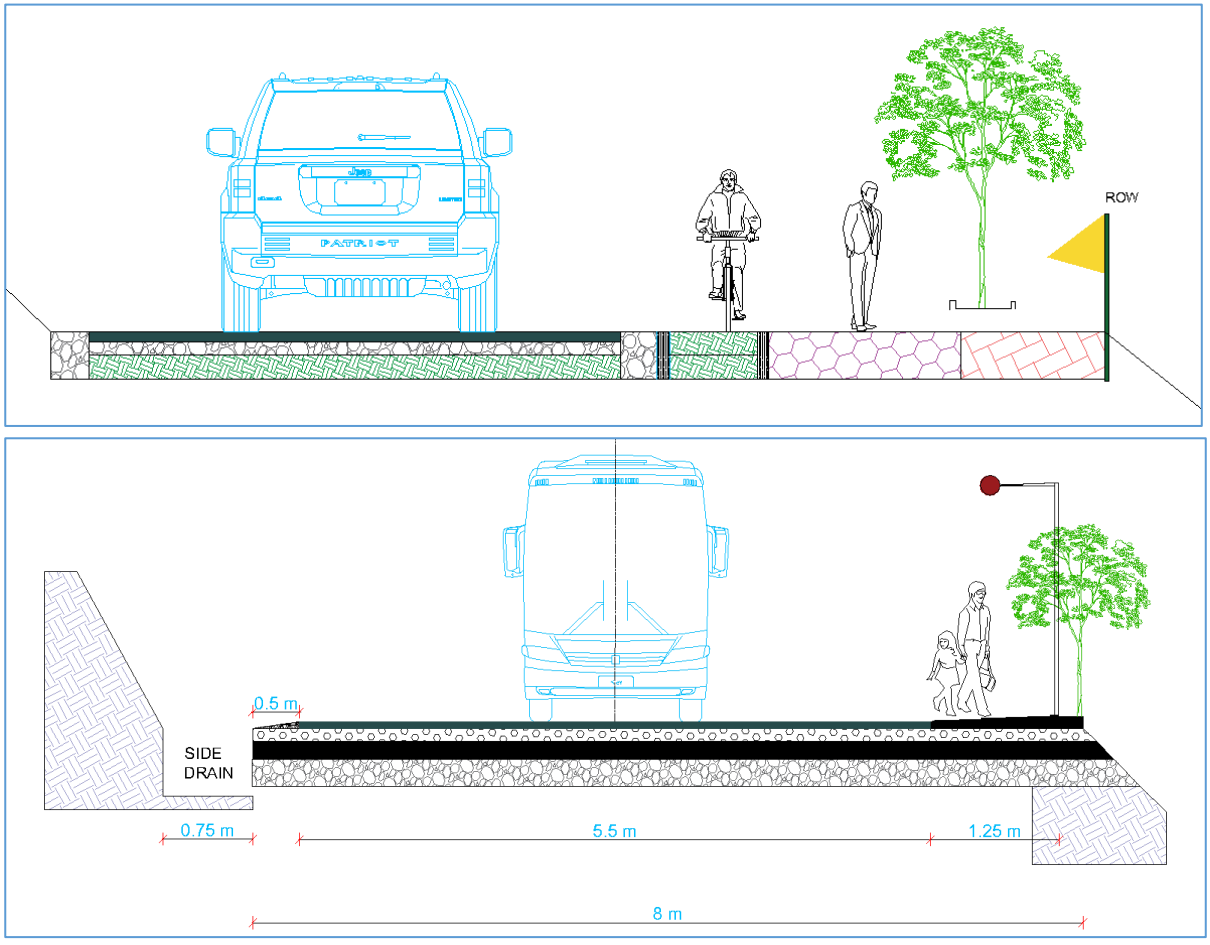
Figure No 5.10: Typical Cross Section of Arterial Road (Class A)

Sub-Arterial Roads (Sadak)-Class "B": These are roads with a somewhat lower level of travel mobility than arterial roads. The emphasis on access to the adjoining area is more in the case of these roads than in the case of arterial roads. These roads have been designed with a total right of way of **8 m** which can be considered as feeder roads of the rural Municipality. These roads connect major road networks and other roads of similar hierarchy with either major growth centers or provide access between class A and class C roads. Mobility is also the main function and purpose of these roads too and is designed with similar facilities for all road users including drivers, pedestrians, and cyclists. The Design Speed of 30-40 Kmph has been set for class B roads. Pedestrians are allowed to cross only at intersections or at designated crossings.

All roads which connect to a major road network and other roads of similar hierarchy with any one of the following:

- A road connecting major growth center of the same or neighboring wards provide access between Class A and class C road.
- The right of way is at least 8 m.
- Access to public transport with segregated NMT facilities.
- Underground facilities, i.e. cable, electric lines, sewer line, water supply, gas lines, etc.

Typical sections of Sub-Arterial Road are shown in the figures given below:



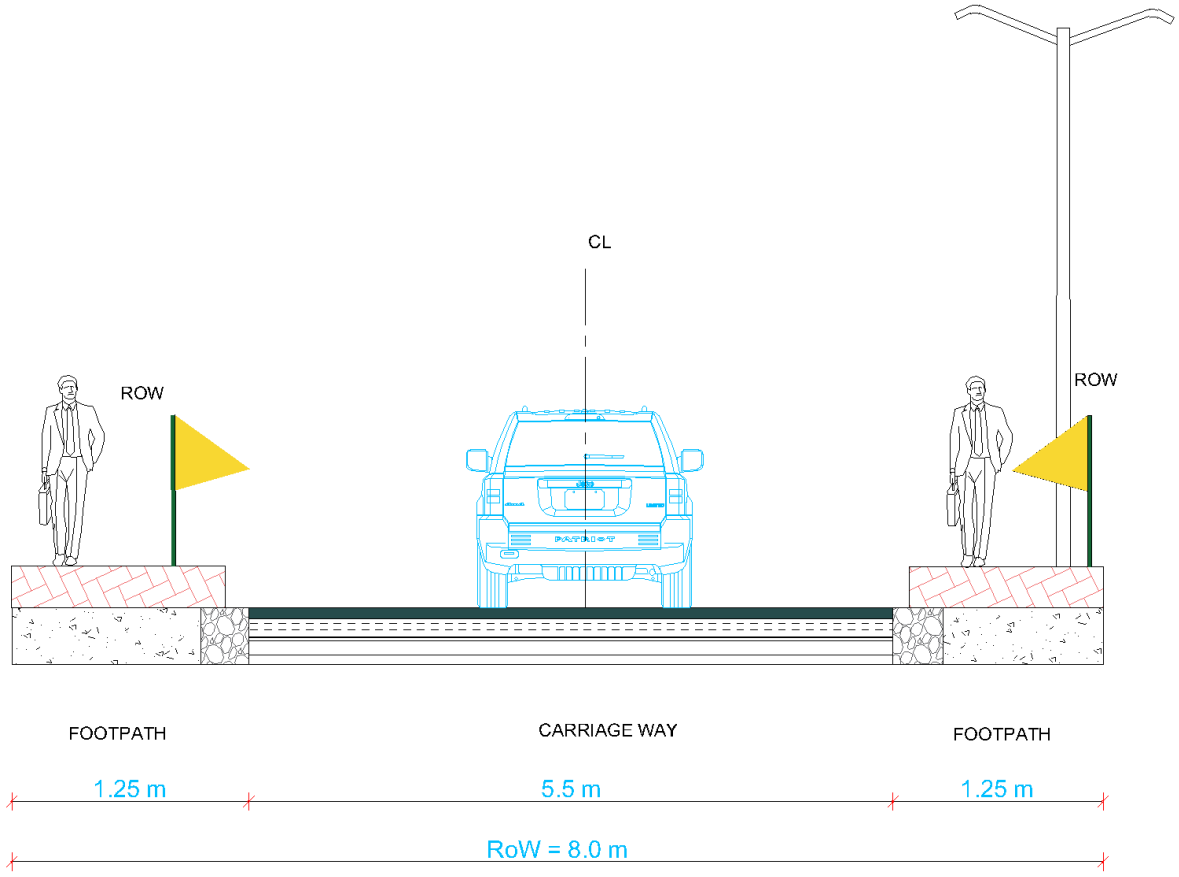
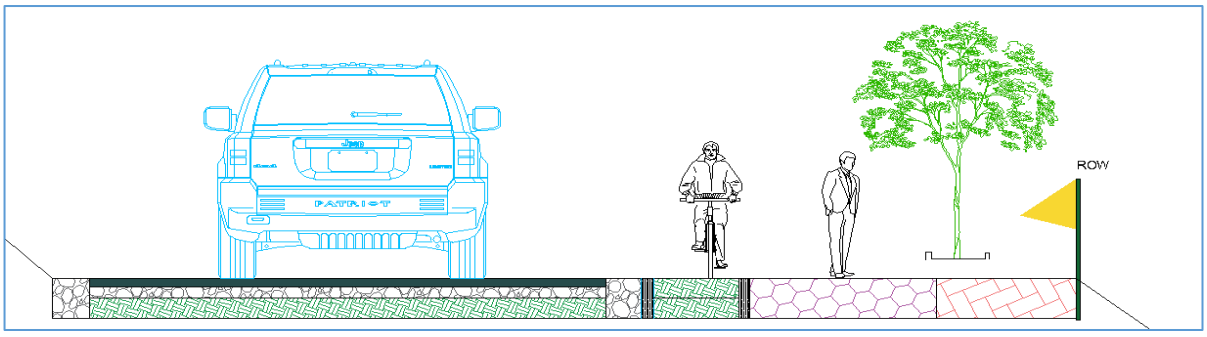


Figure No 5.11: Typical Cross Section of Arterial Road (Class B)

Collector Road (Marg)- Class "C": A collector road is one intended for collecting and distributing the traffic to and from local roads and also for providing access to arterial/sub-arterial roads. They may be located in residential neighborhoods, business areas, and industrial areas. Normally full access is allowed on these roads from abutting properties. A typical section of Collector Road is shown in the figure given below:

All roads which provide connection to higher order roads with any one of the following:

- All agricultural roads which connect a farm with a mini-market Centre or an agro-based production Centre
- The right of way is **7 m**, Roads for the mobility of local trips.
- Underground facilities, i.e. cable, electric lines, sewer line, water supply, gas lines etc.



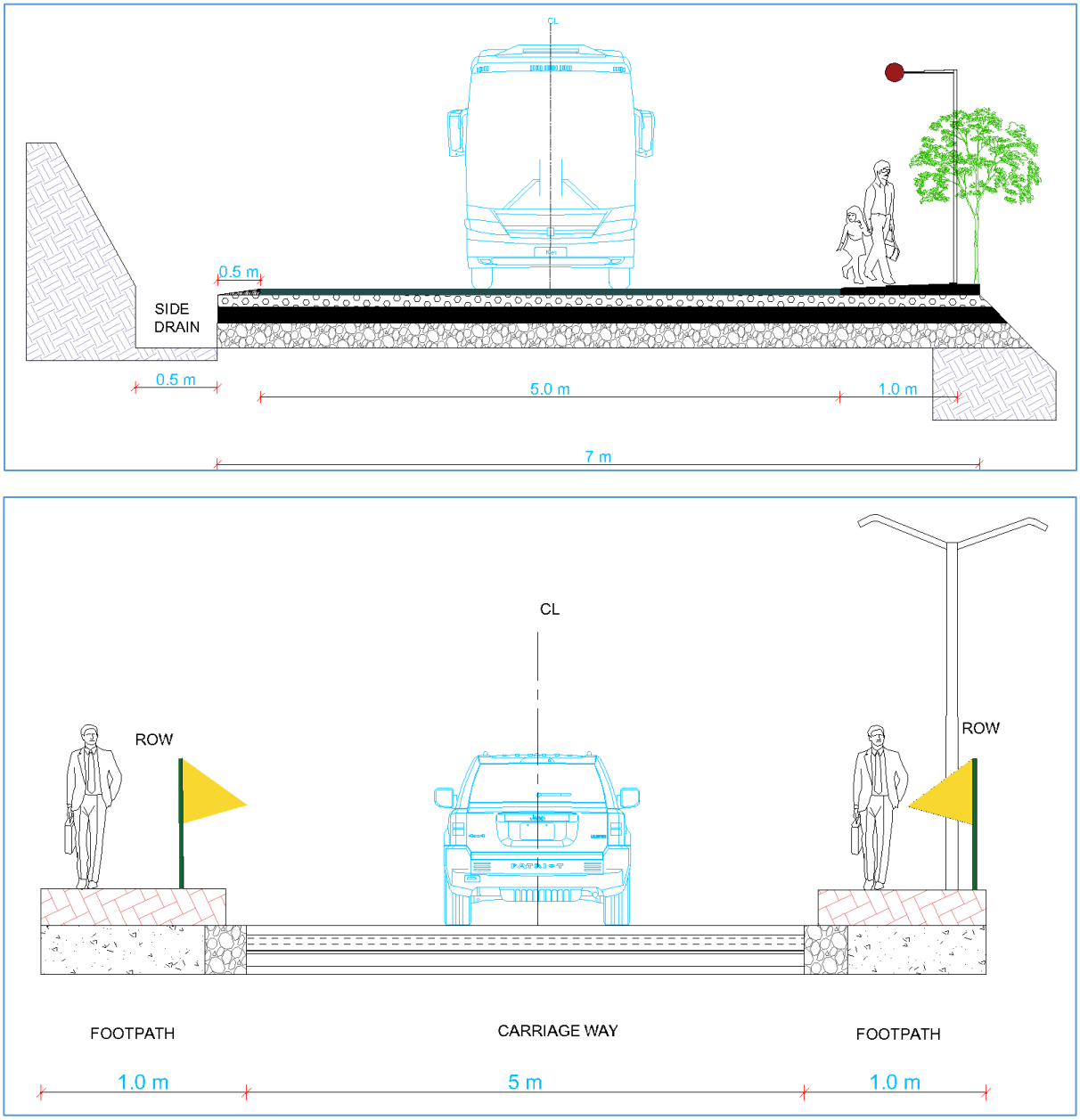
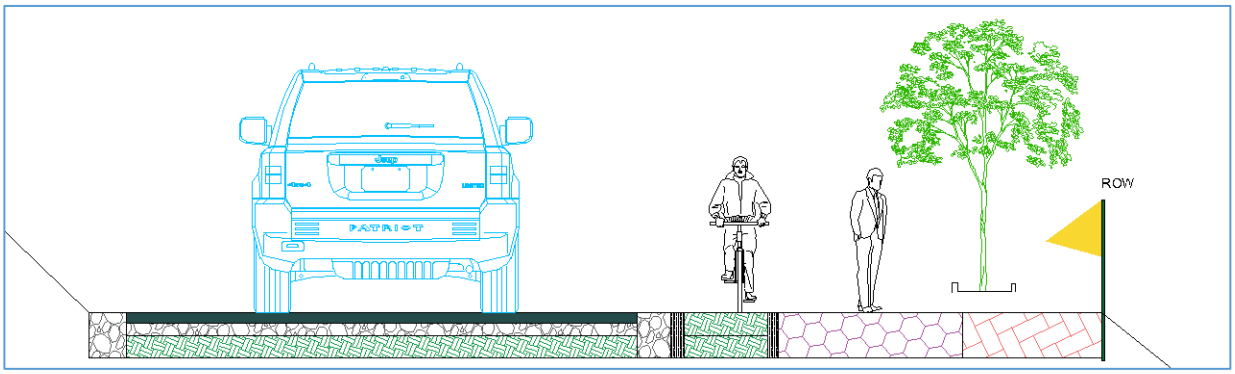
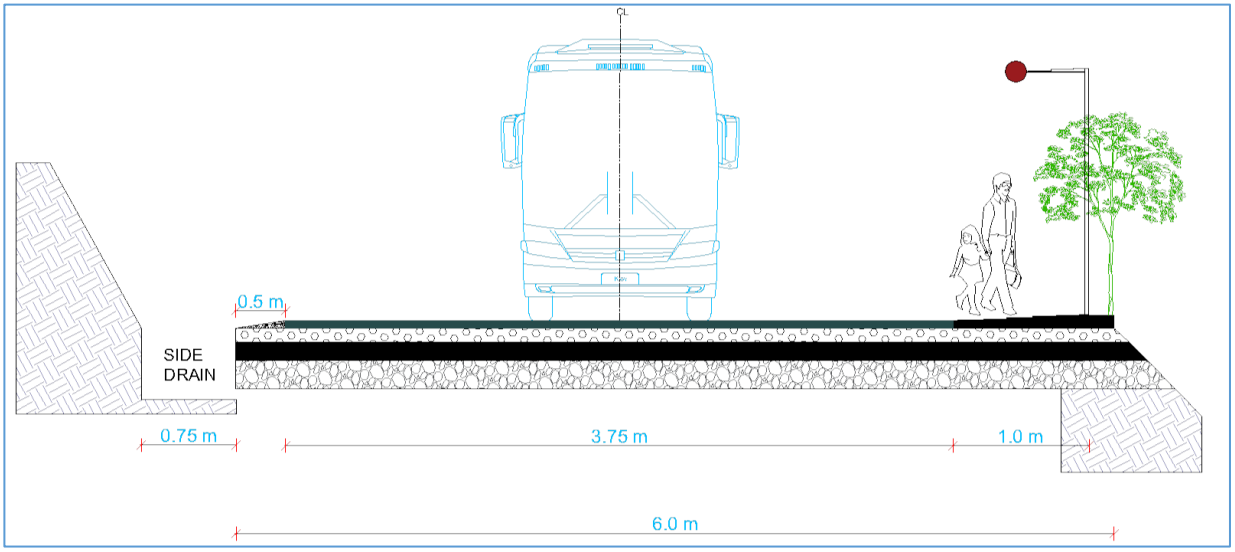


Figure No 5.12: Typical Cross Section of Collector Road (Class C)

Local Road (Upamarg)-Class "D": A local road is one primarily intended for access to the residence, business, or other abutting property. Such a road normally does not carry a large volume of traffic. The traffic carried either originates or terminates along its length. A local road may be residential, commercial, or industrial, depending upon the prominent use of the adjoining land. A typical section of the local road is shown in the given figure:





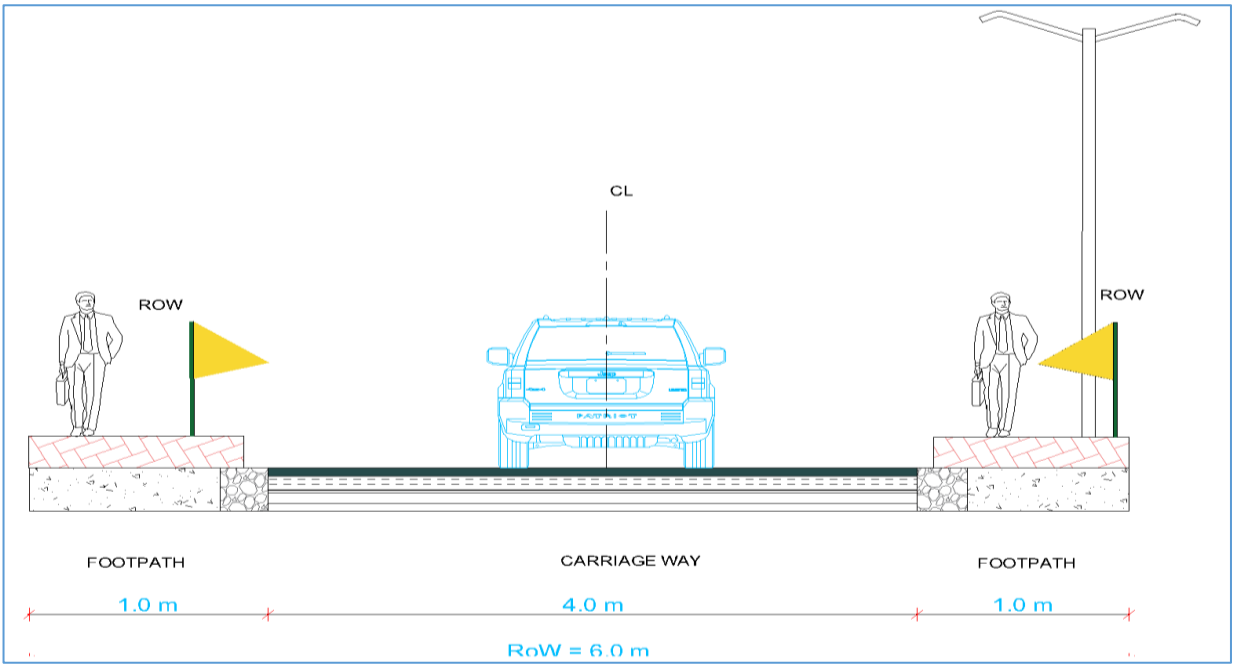


Figure No 5.13: Typical Cross Section of Local Road (Class D)

Municipal Inventory Map of Road Network

Criteria	Arterial Road (Path): - Class A	Sub-Arterial Road (Sadak): - Class B	Collector Road (Marg): - Class C	Local Road (Upa-Marg) Class D	Rural Municipal Ring Road
Purpose	Mobility	Mobility and control access	Access and mobility	Access	Mobility, control access, and access
Function	Through long-distance movement	The connection between Class A and C roads; and also provide alternative connection routes between Class A	Connects higher order roads and mobility to local trips	Connect local trips to higher-level roads	Through an overall distance movement
	High network coverage	Support through the movement of traffic	Access to property	direct access to property	High network coverage
	Segregated NMT facilities and Bus laybys	Segregated NMT facilities and Bus laybys	Segregated NMT facilities	Local NMT movement	Segregated NMT facilities and Bus laybys
	Complete access to public transport	High access to public transport	Limited access to public transport	-	Complete access to public transport
Maintenance/Responsibility	Rural Municipality	Rural Municipality	Rural Municipality & Community	Community	Rural Municipality/Province
Public transport services	Mass Transit facilities	Mass transit, local public transport	No public transportation	No public transportation	Mass Transit facilities
Minimum Right of Way (ROW) m	10	8	7	6	20
Design Speed (Kmph)	40-50	30-40	20-30	10-20	50-60
Radius (m)	60-70 and 90-105	30-40 and 60-70	15-20 and 30-40	9-20	>105
Stopping Sight Distance, m	45-65	30-45	20-30	10-20	>65
Decision Sight Distance (m)	160-195	120-160	80-120	40-80	>195
Setback, m	1.5	1.5	1.5	1.5	3
Street Light pole height, m	10-12	10-12	9-10	9-10	>12
Street Light Pole Spacing, m	30-35	30-35	25-30	25-30	30-35
Footpath, m	0.5	1.25	1.0	1.0	2
Cycle Track, m	0.5	0.5	-	-	2
Vertical Clearance, m	5	5	5	5	6

Discussion on Road Hierarchy and Proposed RoW

During RMTMP preparation, a series of discussions was held with Nisdi Rural Municipal Board members/MRCC, stakeholders on related to MTMP. One of the major issue was road hierarchy and RoW. The matter was discussed during field report presentation. It is an obvious fact that people welcome any possibility of investment in their locality. But when the people's contribution demanded especially with their own land and house for the road, they tend not to support such plans. With existing road width of about 8 m or less, the proposed road network with 10 m and 8 m RoW roads were not welcomed whole heartedly.

The necessity of road infrastructures such as pedestrian way and cycle tracks with green belt was accepted as necessary roadside infrastructures by all the people at both ward level meetings and at the rural municipal meetings. The main issue was the possible social, economic and emotional loss due to loss of only plot of land/house owned by individuals along the proposed wider roads. As such comments could divert the discussion, class of roads with their function and purpose were first introduced during field report presentation and discussion with all the representatives. It was followed by proposed road network of class A and class B. All the participants had a common consensus on the necessity of the proposed road sections with proper pedestrian way, cycle tracks, green belt and road space.

After the consensus on the road network was met, the proposed minimum RoW of the roads was explained to accommodate the proposed infrastructures. The proposed RoW of 10 m for class A and 8 m for class B roads was not easily accepted. The necessity of such wider roads were clarified with the examples of developed cities of Nepal such as Kathmandu, Biratnagar, Butwal, etc. where with urbanization, wider roads were enforced at the loss of huge built-up infrastructures including houses. With time, number of people with small plot of land and house along the major roads will increase making expansion socially more unacceptable. The necessity of minimum RoW of 6 m was also emphasized by giving an examples of fire in Asan Indrachowk area, Kathmandu. There was slight change in road network during the initial discussion and final discussion at the rural municipality.

As the necessity of road infrastructure and the RoW accommodating those infrastructure was accepted necessary for the sustainable development of all sectors, the main issue was as to how the loses (social, economic and emotional) would be addressed. To address this, issue a number of possible tools were put forward. Such tools are direct compensation (by the municipality or through other sources) which will ensure economic security to the people whose land and house are located along the road. Such compensation cannot ensure protection of social and economic loss. The best way to ensure minimum loss of all sort is through land pooling; where all the land and population that uses the road are identified in a buffer/catchment zone; all those in the buffer zone contribute for the road. In such provision, all the land owners in the buffer zone contributes certain percentage of his/her land for the development of the road so that the person whose land is located directly along the road do not suffer the all the loses and is shared by all those who use the road. After explaining such possible provisions to address loses, the participants agreed on the proposed RoW.

It is clear that, all the representatives and people understand the need and necessity of wider roads and proper road side infrastructure. But without proper compensation to those land/house owners along the roads, implementation of wider roads will be challenging.

Neither such compensation nor the land pooling at the local level is not a common practice in Nepal, expansion of such roads in a built up area is only possible if proper compensation is ensured for those who lose their property. But, it is not completely new (foreign) tool. Land acquisition has been an issue in many major projects in Nepal. So, proper policies and working plans should be prepared by the central level institution to implement these tools. It is utmost necessary as the amount of possible

5.6 Nomenclature and Coding of Rural Roads

All urban road links within the Rural Municipality have been given their names and unique code number consisting of ten digits. The coding system for particular road link is described below:

- The first digit (1 to 7) represents the number of provinces. Code 1 stands for Province 1, 2, 3, 4 5,6, and 7 indicating Province 2, **Province 3**, Province 4, Province 5**,** Province 6 Province 7 respectively.
- The second and third digits represent a particular district (1 to 77). Palpa district is coded by **11.**
- The fourth code RM represents the Rural Municipality.
- The fifth and sixth digits represent the particular names (1 to 753 for particular municipalities) of the Rural Municipality in the district. i.e. **Nisdi** Rural Municipality is coded by **06.**
- The seventh code indicates the letter A to D for a particular Class of road.
- The next three digits (001 to 999) represent the particular transport linkage.

The following guideline shall be followed for Road Coding.

i.e.,

Table No 5.11: Coding Guideline of Municipal Roads

5	Lumbini Province					
5	**06**	Palpa District				
5	**06**	**RM**	Rural Municipality			
5	**06**	**RM**	**10**	Nisdi Rural Municipality		
5	**06**	**RM**	**10**	**A**	Class Of Road	
5	**06**	**RM**	**10**	**A**	**001**	Number of Roads

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

5	**0**	**6**	**RM**	**1**	**0**	**A**	**0**	**0**	**1**

(506RM10A001: Gomari Khola-Lakuri Bhanjyang)

Note: The all MRCN, Road Code with Nomenclature has been listed in Annex I: below.

Chapter 6. Perspective Plan of Municipal Transport Network

6.1 Accessibility and Trip Pattern

The ultimate goal of most transportation is "access," people's ability to reach their destination, and get services and activities in time. 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. Thus, land use and transportation are interdependent. Mobility, especially in the form of motorized transport requires an increasing share of land. For, long-term sustainability it should be considered by altering the urban structure itself. As we fell, transportation demands are concentrated in town areas which can be dispersed to sub-centers by developing markets and economic activities. The dispersal of the settlement and economic activities will help in relieving congestion and promoting the development of a more balanced society.

Roads are often built or improved to allow greater access to new development and settlements. The road improvement makes other lands along the road more accessible and attractive for further development. With more housing and services along the road, traffic volumes increase. This results 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 Rural 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.

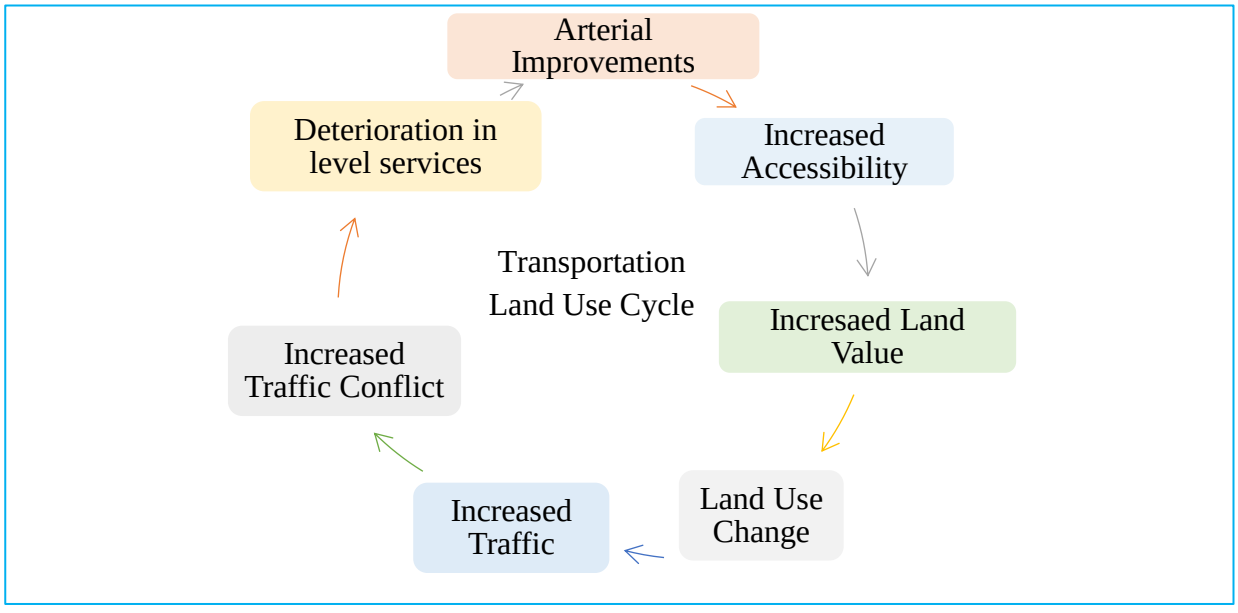


Figure No 6.1: Transportation Land Use Cycle

Land use patterns affect mobility and accessibility in various ways:

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.

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.

Non-motorized conditions: The existence and quality of walking and cycling facilities can have a major effect on accessibility, particularly for non-drivers.

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 favor different types of transport users and modes, different land use patterns, and different solutions to transport problems. Vehicle traffic is the 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 the most difficult to measure because it requires much effort for taking into account land use, mobility, and mobility substitutes, but most accurately reflects the ultimate goal of transportation, and allows the 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).

6.2 Process and Procedure for Collection of Demand

Ward-level meeting in every ward or ward cluster has been done. From, where information on RMTMP is collected. Demand forms for each ward are provided. Later on, these forms have been collected after the form are duly filled at the given time. As road demand from the settlement level has also been collected bottom-up approach to planning 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, and major road linkages have been done. Similarly, all the roads demanded in demand form are verified in the field, GIS base maps by the survey team.

6.3 Scoring System for Screening, Grading, and Prioritization

Transport linkage in an urban area has greater importance for its overall development. A transport network consists of several links. It is not possible to construct all roads at a time due to resource and time constraints. Therefore, each link in a network needs to be scored for screening, grading, and ranking them. The basic criteria that have been used for prioritization include existing population within the urban of influence, present road demand, future potential route, accessibility situation, land use pattern, environmental and social safeguard, proximity to the

market/service centers, and religious and tourism places. The finalized scoring criteria based on the rigorous study are set in front of the Rural Municipality and MRCC for its approval. Each road link is allocated several points corresponding to the fulfillment of the particular criteria. The weighted average of the score that each intervention receives leads to a ranking/prioritization of the intervention options. The consultant has worked out the following weights for the criteria for the prioritization of road links. The following criteria were used as a prioritization indicator.

Table No 6.1: Criteria for Prioritization

S.N.	Criteria	Scoring Unit	Method of Measurement	Score (ToR)	Score
1.	Link providing service to large settlement areas/ population.	Population served/km (continuously Scored); ward-wise population	Measurement of served HH from the map and multiplying with HH occupancy of respective wards	10-25	25
2.	The link provides service to areas with high potential for agriculture, horticulture, and livestock production.	Annual production equivalent to NRs/km (continuously Scored) (used area-based method)	Measurement of Agriculture land area from the map, livestock from inventory, and multiplying with the unit rate of production.	10-20	20
3.	Link providing service to existing market centers: commerce and business centers or market sites (local haatbazar) tourism attraction centers Areas having agro-based and cottage industries Other obligatory centers as decided by the Rural Municipality.	Estimated annual transaction in these centres equivalent to NR/km (continuously Scored)	An inventory survey along with consultation with people (MRCC) and a land cover map is used to identify their location and transactions.	5-10	10
4.	Link Providing Service to the Existing Service Centers: Health Centers, Education Centers (School/Campus, Office (Rural Municipality/ Government) Communication Centre (Post Office, Communication)	The population served by these service centers is expressed as persons per km per year. (continuously Scored)	An inventory survey, Map along with consultation with people (MRCC) identifies their location and served population.	5-10	10
5.	Link providing service to the potential future development	It is technically sound to score these	Consultation with MRCC and IDPM shall also be	5-10	10

S.N.	Criteria	Scoring Unit	Method of Measurement	Score (ToR)	Score
	sites such as: Potential town growth Land pooling Potential industrial area Waste Management Sites Forming ring road to Rural Municipality	services discretely based on existence. For each service centers, a score of 2.5 is allocated.	used		
6.	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 = 10 Important = 5 less important = 3 (Scored discretely)	An inventory survey along with consultation with local people identifies their location and Importance.	3-10	10
7.	The direct link with another linkage	National Highway=15 Feeder Roads=10 District Roads=10 Neighboring Rural Municipality/district= 5 Otherwise= 0	Road Network Map and attribute table.	5 - 15	15

The prioritize/rank of the roads has been developed based on criteria as above described which is proposed by MoFALD and approved by MRCC meetings. The ranking of roads has been done in the following formulae.

Table No 6.2: Urban Road Prioritization Calculation

Criteria	Scoring Criteria
Criteria 1: Population Served per km (25)	25
Above 5000	20
3000-5000	15
2000-3000	10
2000-1000	5
Less than 1000	3
Criteria 2: Agriculture potential growth centers (20)	(Ward Wise Area Per Sq.Km/Total Area Per Sq.Km)*Score
Total Area Per Sq.Km =	
Area Per Sq.Km Ward Wise	

Criteria	Scoring Criteria
Criteria 3: Existing Market Centers, Tourism, Industries (10)	(Ward Wise Market Centers, Tourism, Industries /Total Market Centers)*Score
Total Market Centers, Tourism, Industries	
Market Centers Ward Wise	
Criteria 4: Service Centers (10)	(Ward Wise Service Centers/Total Service Centers)*Score
Total Service Centers	
Service Centers Ward Wise	
Criteria 5: Potential Site (10)	(Ward Wise Potential Site /Total Potential Site)*Score
Total Potential Site	
Potential Site Ward Wise	
Criteria 6: Socially Important, Backwards Areas (10)	(Services sites/Total Sites)*Score
Total Sites	
Service Routes	
Criteria 7: Road Linkages (15)	Scoring Criteria
National Highway	15
Feeder Roads	10
District Roads	10
Neighbouring District	5
Otherwise	0
Note: the list of prioritization of the roads has been listed in Appendices II Below	

The MRCC and ToR have decided to prioritize the class D Class Roads based on the available budget during the implementation of RMTMP.

6.4 Feasible New Linkage

The concept of RMTMP is the integrated development of a rural municipal road core network with economic, social, physical, environmental, and institutional including future land use plans and future settlement expansion plans, religious cultural, and tourism plans, etc., and other development infrastructures which will influence the vehicular trip nature and pattern. These development areas have to be connected with high-class roads to achieve the objective of Nisdi rural Municipality as a town. There are feasible new linkages that have been identified through MRCC meetings in consultation with ward representatives.

The list of new feasible road links has been given in the table below.

Table No 6.3: Proposed Routes Development

Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
Puranthar-Kandur Khola	Proposed Road	6	Earthen	Puranthat	Kandur Khola	2	0.926
Sukekot-Manbas-Ghusiyani	Proposed Road	6	Earthen	Sukekot	Ghusiyani	2	3.402
Tangbari-Kaidal	Proposed Road	6	Earthen	Tangbari	Kaidal	2	3.432

Table No 6.4: List of Connectivity, Ward Centre

Ward	Ward Name		CRN	MRCN Connectivity		
	English	Location		1st Connecting Road	2nd Connecting Road	3rd Connecting Road
4	Rural Municipality Office, Nisdi	Rukse Bhanjyang	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda	Mittyal Bajar-Lame Damar-Juluke	Dhungana Besi-Pipal Bhanjyang-Sadakbas - Rukse Bhanjyang	Rukse Bhanjyang-Khoplak-Bhaluwa
1	Ward Office -1	Baka Malang	Khutte-Damara-Raika-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang	Pur Malang-Baka-Geja-Boudi Khola	Adhmara	-
2	Ward Office -2	Lindi Bhanjyang	Gomari Khola-Lakuri Bhanjyang	Sukekot-Lindi-Anandi Tole	Tangbari-Kaidal	-
3	Ward Office-3	Jhirubas	Bhimad-Rampur-Mittyal-Arung Khola	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola	Jhirubas Tole	Jhirubas-Mohoriya-Sharki Danda
4	Ward Office -4	Mittyal Bajar	Jhyaltung-Ghurlikharak-Chhap Danda-Bahun Danda	Mittyal Bajar-Lame Damar-Juluke	Dhungana Besi-Pipal Bhanjyang-Sadakbas - Rukse Bhanjyang	Rukse Bhanjyang-Khoplak-Bhaluwa
5	Ward Office -5	Dhungana Besi	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar	Khare Khola-Kathai Danda	Dhomadi-Bohori Kharak-Dhanbase	Ghansari Sadak
6	Ward Office-6	Archale	Shiluwa-Archale-Mittyal	Badar Bhanjyang-Ranguwa	Archale-Sisaghat-Galdha	Parkula-Sat Dwat

Ward	Ward Name		CRN	MRCN Connectivity		
	English	Location		1st Connecting Road	2nd Connecting Road	3rd Connecting Road
7	Ward Office-7	Jyamire	Jyamire-Hongsi Road	Gurung Danda-Jyamire-Bhir Danda	Sindhure-Jyamire-Hongsi Road	Jyamire-Health Post

6.5 Public Transportation

Public transport is a means of mobility for local people. The high proportion of active transport users justifies the necessity of public transport to increase their mobility and thus access to wider services and facilities within the perceived travel time budget. Proper public transport routes are vital for sustainable transport development.

The travel pattern of people in the rural Municipality from settlements to market, institutional area i.e Municipal center while from settlements to Mittyal and other markets in the 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 must follow the main road and the link roads that help to access the public with the municipal head office and wards centre. Strategic development of such roads will not only create demand for public transport (greater mobility) but also develop a proper road network that public transport vehicles can access. For a better mobility and transportation system, the local government should introduce city buses.

Thus, these road networks link the village/urban roads and Madan Bhandari National Highway. The link roads are important for inter-linkages with other routes within the rural Municipality as well.

Table No 6.5: Proposed Public Transportation Route

S. N.	Proposed Public Transport Route	Origin	Destination	Ward Pass	Length (km)

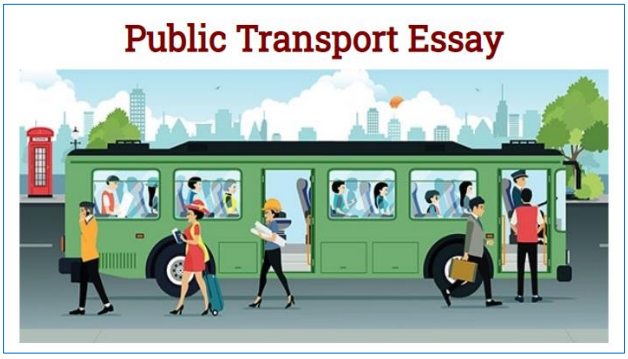


Figure No 6.2: Typical Public Transport Mode

Figure No 6.3: Typical Public Transportation

6.6 Basic Road Infrastructure

The roadway is used either by pedestrians or motors or both, and the proportion of active transport users such as motorcyclists, and pedestrians are high, and the road infrastructure is necessary to support these users. Such perception and the construction of road infrastructure accordingly will lead to a high rate of motorization which creates problems to manage the generated traffic, pollution, and congestion. Their use assists in the proper operation, and management of the roads and other roadside infrastructures. As the road development process, the use of road markings, traffic signs, and signals (i.e., refer to Traffic signs manuals Vol-I and Vol-II published by DOR) should also be upgraded. The use of signals is necessary after the higher hierarchy roads are completed and a high volume of traffic plies on those roads. These signs and signals also assist in enforcing road discipline as well.

For better and smooth mobility, cycle lanes, pedestrian crossing, road humps, footpaths, roadside drains, street lights (i.e. near settlements, bridges, culverts, bus stops, etc.) public toilets, and other facilities should be constructed along the road section. Similarly, the landscaping of the road sections with proper greenbelt will increase the greenery in the city. This provides shade to the active users, segregates different users, and a pleasant traveling environment for all the users. Proper buses are necessary elements for better mobility of the public transport system. Every bus stop should have, proper road network hierarchy maps, displays of routes, sheltering furniture, seating benches, lighting system, trash boxes, information boards, schedule of buses, properly connected pedestrian ways and zebra crossings, etc.

In the context of Nisdi rural Municipality, cycle lanes will have constructed along highways, city areas, the class A, and class B road networks in plain terrain.

6.6.1 Foot Path

Footpaths are provided to promote safe and comfortable pedestrian mobility. Together with other elements such as road furniture and landscaping they constitute the primary public space of a urban and are accessible to all road users regardless of age, gender, or special needs. Footpaths are critical elements of streetscape unless traffic calming makes footpaths unnecessary. In urban areas footpaths should be provided as per the number of pedestrians estimated for the future. The minimum clear width of the footpath should be 1.5 m, though its width should be preferred to 2.0 m, at least in the arterial and sub-arterial road for easy movement of differently-able people. They should have a well-maintained surface with cross-fall neither so flat as to be difficult to drain nor as steep as to be dangerous to walk upon. The cross falls within the range of 2.5 to 3 percent and should meet this requirement. Those parts of the footpath immediately adjoining the building, fences, trees, and other obstructions should be disregarded while calculating the widths required. A good footpath should incorporate.

- No breaks or obstructions at property entrances and side streets.
- Continuous shade through tree cover.
- No railing or barrier that prevents sideways movement on and off the footpath.

- Elevation over the carriageway should be equal to 150 mm and has an adequate cross slope for storm water runoff. At the same time, the elevations should be low enough for pedestrians to step on and off the footpath.

The width should be increased by 1 meter in business and shopping areas to allow for the dead width. Footpaths adjoining shopping frontage should be 2.5 m and a minimum of 3.5 m is desirable adjoining longer shopping frontages. At points of possible congestion such as bus stops or entrances of large shops and public buildings, footpaths may be wider. Where space is available, the provision of a verge between the footpath and carriageway to increase the safety of pedestrians is desirable. When deciding the width of the footpath and verges, the width required to accommodate underground services clear of the carriageway should be taken into account. When on slopes or in the case of ramps, the capacity should be suitably reduced.

The table below gives the capacity guidelines for designing footpaths.

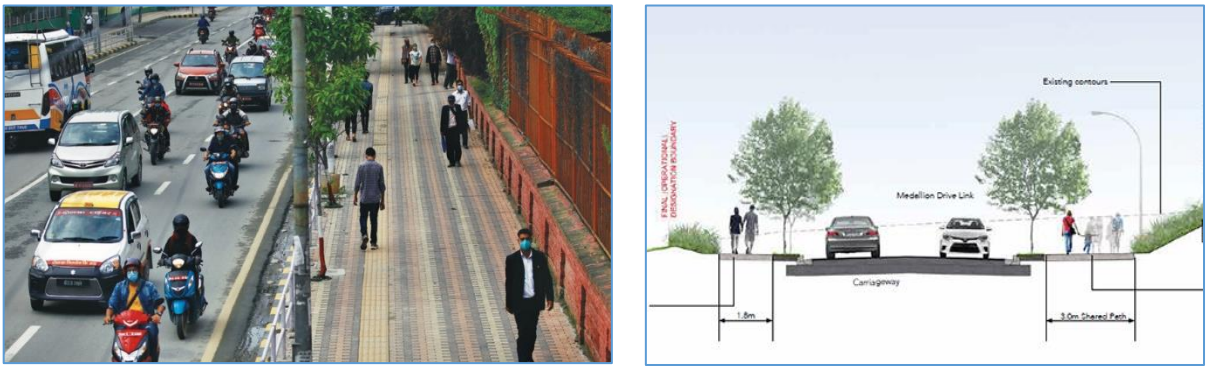


Figure No 6.4: Typical Section of Footpath

6.6.2 Cycle Lane

Cycle tracks should be continuous and provide uninterrupted movement. They are physically separated from the main carriageway to ensure both comfort and safety and are protected from encroachment by parked vehicles, pedestrians, and street vendors as shown in the figure. The minimum width of the cycle track should be 2 m. Each additional lane where required should be 1 m. Separate cycle tracks should be provided when the peak hour cycle traffic is 400 or more on route with a motor vehicle traffic of 100-200 vehicles per hour. When the number of motor vehicles using the route is more than 200 per hour, separate cycle tracks are justified even if cycle traffic is only 100 per hour.

For better efficiency cycle track should incorporate the following:

- Continuity to allow for reasonable speed.
- A smooth surface material, asphalt, or concrete paving blocks are to be avoided.

  Manhole covers should be avoided and if unavoidable should be at the same level as the riding surface.

- Continuous shade through tree cover.
- Elevation above the carriageway e.g. +150mm that allows for stormwater runoff.
- A buffer of 0.6m between the cycle track and parking area or the carriageway.
- At property access points, the cycle track remains at the same level and vehicle access is provided by a ramp in the buffer.

Figure No 6.5: Typical Plan/Section of Cycle Lane

6.6.3 Street Lighting

Street lighting enables motor vehicle drivers, cyclists, and pedestrians to move safely and comfortably by reducing the risk of traffic accidents and improving personal safety. From a traffic point of view, street lighting is important in potential colliding points such as intersections, driveways, and public transportation stops. Additionally, it also helps road users to avoid potholes and missing drain covers. It is also essential for mitigating the pedestrian sense of isolation and reducing the risk of theft and sexual assault. Further, it is equally important in isolation spaces such as under overpasses and walkways next to the park and blank facades. Lighting systems need regular upkeep in the form of electricity maintenance, bulb replacement, and dust cleaning to remain effective. A smart street light shall be installed which can save electric power. The following consideration should be considered.

Table No 6.6: Street Light Pole Height and Spacing

S. N	Urban Road Types	Pole Height (m)	Spacing (m)	Remarks
1	Municipal Ring Road	10-12	30-35	Additional lighting should be provided at junction points.
2	Arterial or Sub-arterial	10-12	30-35	
3	Local street or Collector	9-10	25-30	

Figure No 6.6: Provision of Street Light

6.6.4 Parking Lanes

Parking lanes width for parallel parking should be 2.5 m to 3.0m.

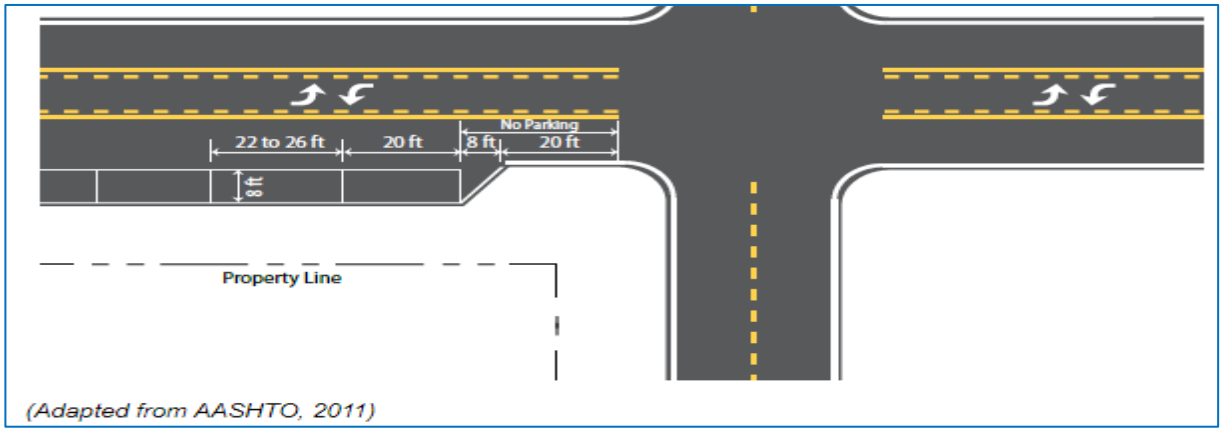


Figure No 6.7: Typical Layout of street parking

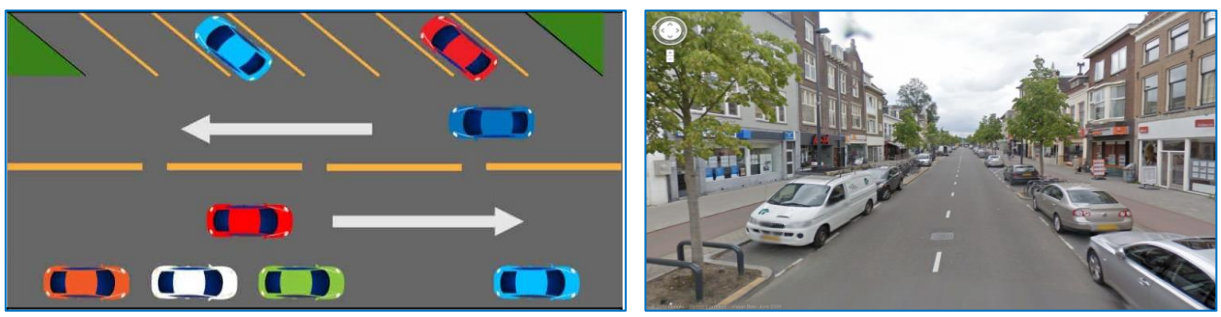


Figure No 6.8: Provision of Street Parking Lane

6.6.5 Taxi/Car Stand

Taxi stands should preferably be located 20 m before an intersection in a 2.5 m deep recess. If space is limited, 2.0 m wide and 3.0 long space per car shall be marked on the pavement and the side drain covered.

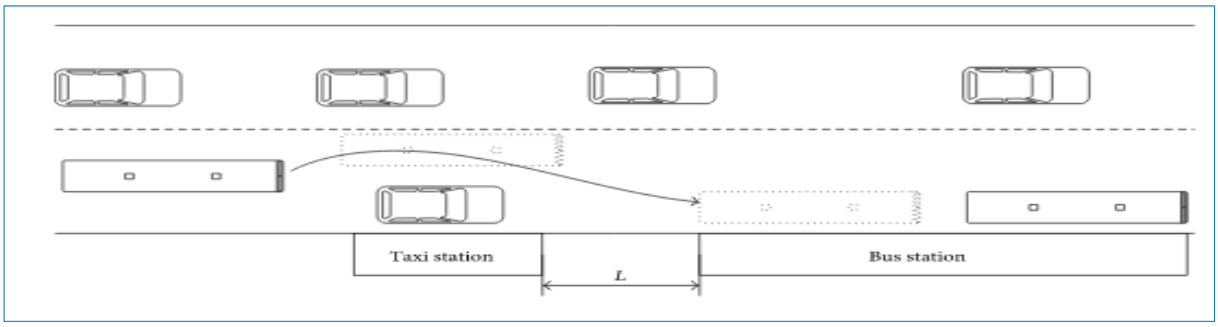
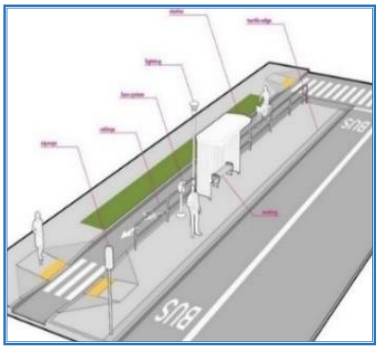


Figure No 6.9: Typical Layout of Taxi Stand

6.6.6 Bus Stops and Bus-Bays

Bus stops should be the interface between the street and a city's public transport system. Spacing in busy commercial zones is typically closer than in residential areas interval between stops range from 200-400 m in city areas and for rural area, it would be 500-700 m apart. Stops should be located near cross streets and always provide safe pedestrian crossing.

Bus stops should be placed adjacent to the bus linear line of travel so that the bus does not need to pull over to the left. Ideally, a raised bus stop is to be integrated with the footpath and other raised elements so that passengers can reach the stop and board the bus directly from the footpath without the need to step on the carriageway. The road side infrastructures should be constructed as pedestrian-friendly paths.



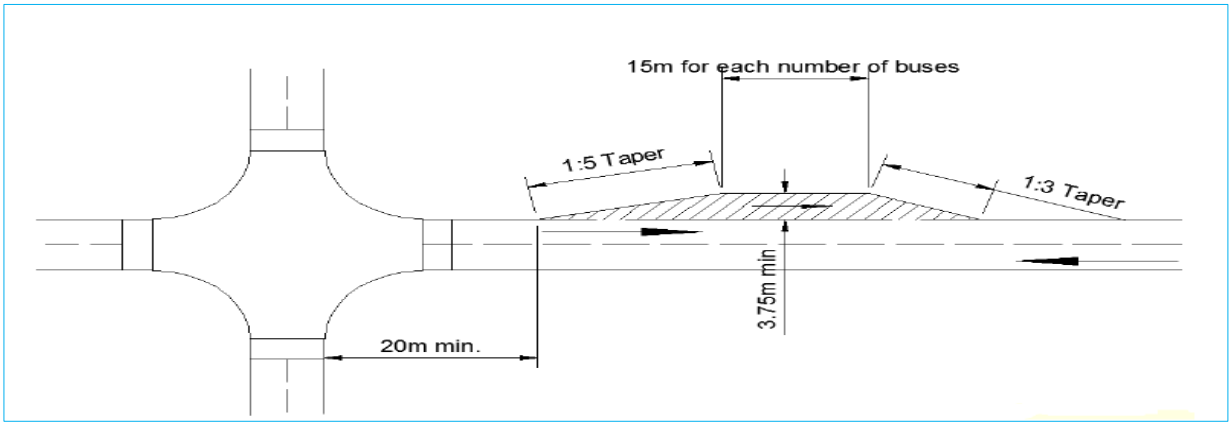


Figure No 6.10: Typical Plan of Bus Stop & Bus Bys

6.6.7 Cross Pedestrians

The pedestrian crossing should allow pedestrians to cross-busy the street safely and conveniently. The pedestrian crossings should be indicated by painted zebra markings. Raised crosswalks should be located at all intersections and at frequent intervals (e.g. every 150-200m). Crosswalks should be as wide as the adjacent footpath and never narrower than 2.5 m. Where fences are to be installed to prevent crossing informal crossing in the form of barriers wherever is demand. The fence should be broken for at least 2 m to create a refuge island so that pedestrians do not spill over into the main carriageway.

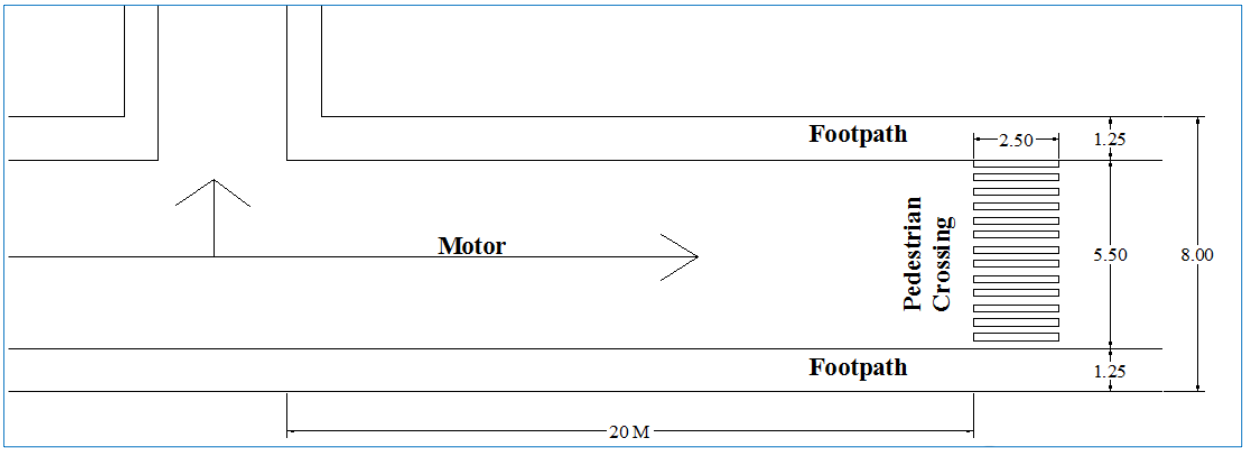


Figure No 6.11: Typical Plan of Pedestrian Crossing, C. Class Road

6.6.8 Electricity lines, Cable Poles

The overhead electrical lines shall be at least 5.5 m above the road pavement when along the road and 6.0m above at road crossing with poles at the inner edge of the walkways on the median strip. Also, the underground electric cable should be at least 2.0 m from the building line and at 1.5 m depth under the walkways or median strip.

The overhead cables other than that for electricity (telephone, data, TV, etc.) shall be at least 5.0 m above the pavement level when along the road and 5.5 m above at road crossings on the same poles as that for electricity. The poles shall be erected at the inner edge of the walkways or on the median strip. The underground cable ducts should be 1.0 m from the building line and at 1.0 m depth under the walkways or the median strip.

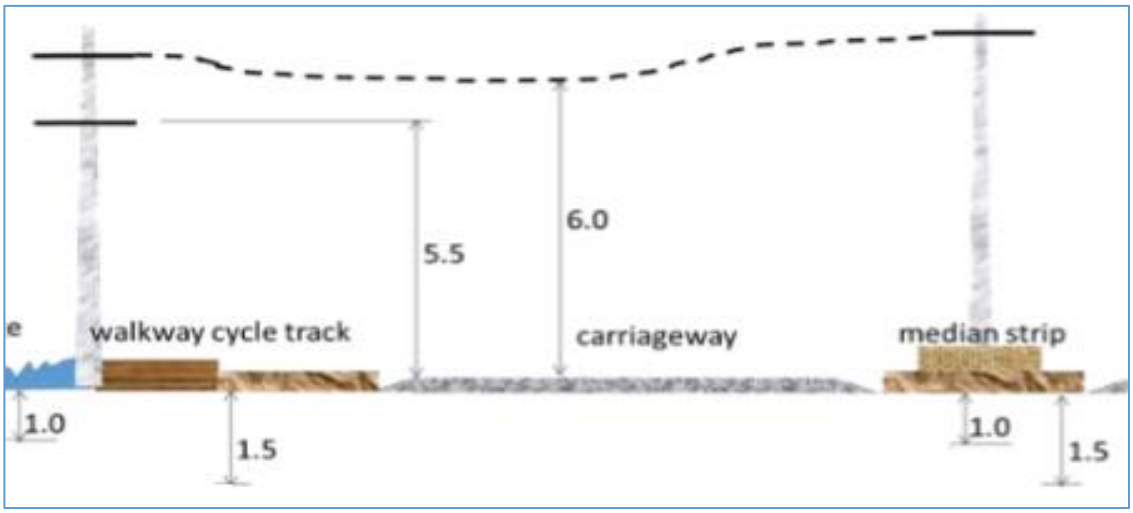
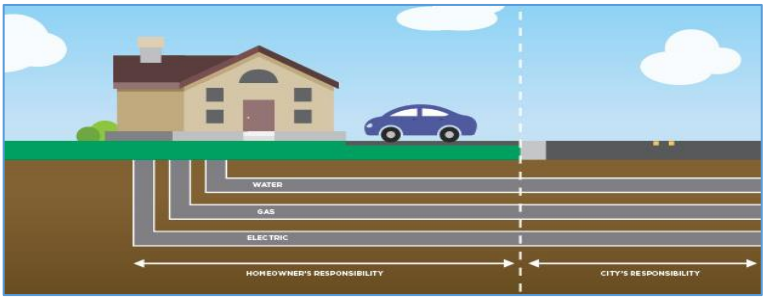


Figure No 6.12: Electricity lines and Cable Poles

6.6.9 Underground Utilities

The placement of utilities above and below the ground at the appropriate location in the right of the way ensures unconstrained movement as well as easy access for maintenance. Streets are the conduits for major services including electricity, water, sewer communication, gas, etc. The physical infrastructure may occur in form of pipelines telephone lines and fiber cable ducts and poles. Some utilities such as telecommunications cables require frequent access for expansion and maintenance. Utilities are generally placed at the edge of the right of way. Separate pipes shall be required for electric cables, other cables, and water mains. Provisioning of such utilities should follow:



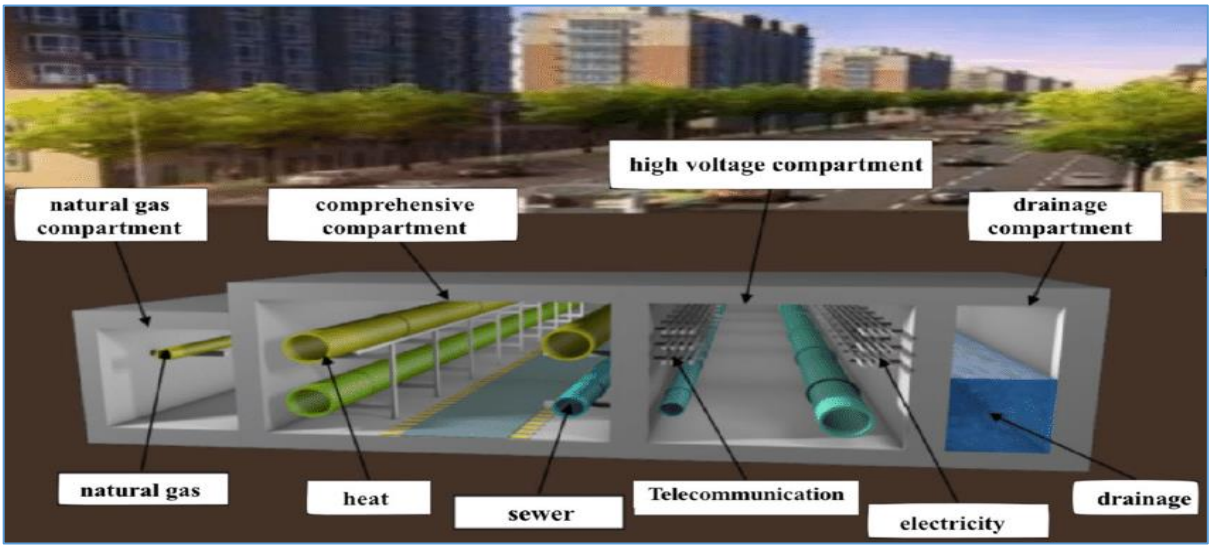


Figure No 6.13: Provision of Underground Utilities

6.6.10 Road Side Drainage

A stormwater drainage system is a mechanism that prevents waterlogging and erosion. Streets without stormwater drainage systems result in major longitudinal stormwater flow which may erode the street surface. Such deteriorated surfaces may cause an accident and thus imply costs beyond direct maintenance expenses. In flooded areas, pedestrians and cyclists are forced to make their way on the invisible ground under the water's surface, which makes them uncomfortable and potentially to accidents. Side drains along the pavement edge shall be "tick" shaped. The collector drains under the walkways could either could be of concrete pipes or covered U channel.

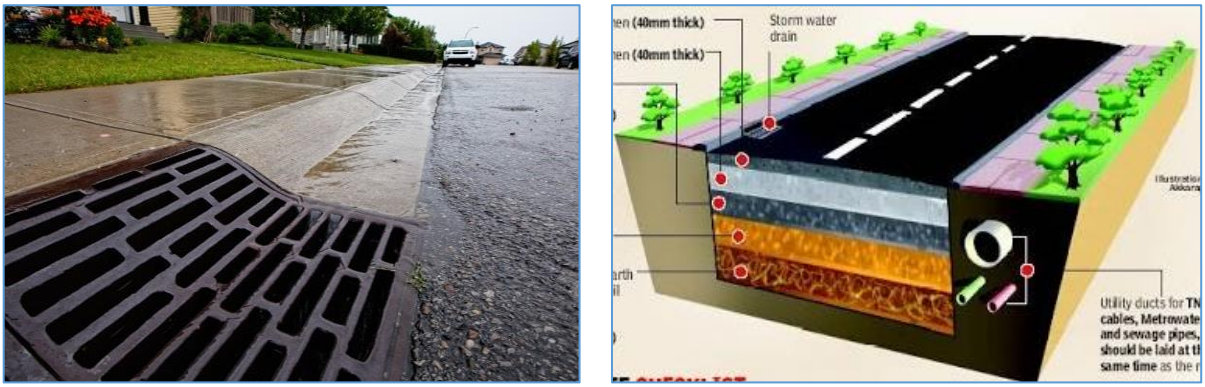
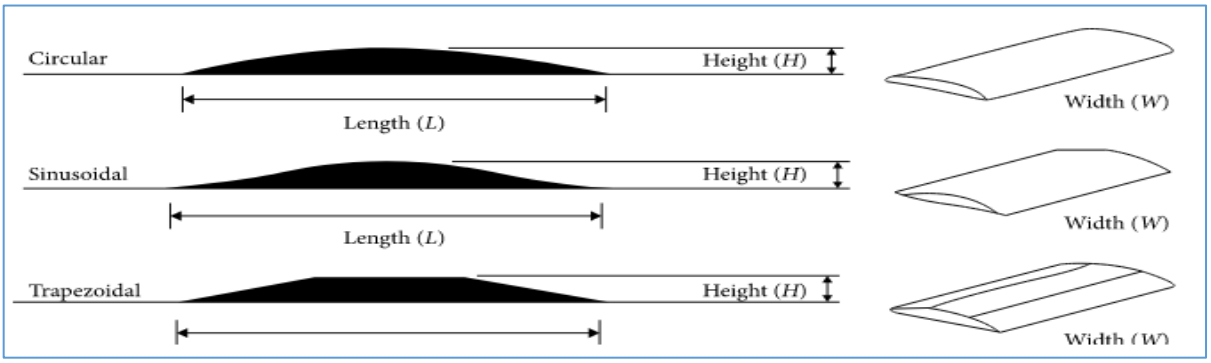


Figure No 6.14: Typical Conceptual Plan of Road Side Drainage

6.6.11 Traffic Calming Elements (Road Hump)

Traffic calming elements such as road humps should ensure pedestrian and vehicle safety by reducing the speed and volume of a motor vehicle. Such elements are particularly important in places where large numbers of children are present such as schools, parks, and residential areas. At such places, the speed breaker (hump) is to be provided to control the speed of the vehicle to enhance safety for non-motorized road users.

The most commonly used element is road speed humps and raised pedestrian crossing which relies on vertical displacement to reduce speed.



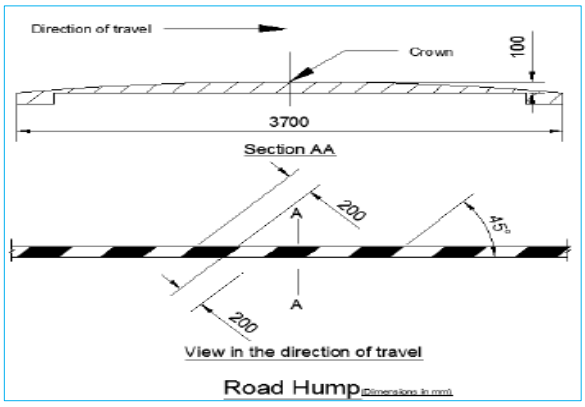


Figure No 6.15: Typical Plan & Section of Road Hump

6.6.12 Green Belt

The urban area is categorized by the density of population is high, high traffic volume, and dense built-up area. A green belt is a green space between the roadway and the building line. The road space is most frequently used as public space. The provision of green belts along the urban roads creates safer and more pleasant walking spaces, which acts as a medium to separate motorists from each other and the NMT users. It also reduces the roadside air temperature and absorbs more pollutants generated from the motor vehicles on street than other distant trees. Green belts can also absorb precipitation and reduce the size of required drainage. The trees also act as a screen and result in the attenuation of air, noise, and light pollution alongside the urban roads. Thus, a green belt between the motorists and NMT users and in the median strip is a compulsory infrastructure in the urban roads. The green belt can also be used as space to integrate other facilities such as drainage, water supply pipeline, and electric poles.

Landscaping and green belt improves livability and enhances the aesthetic qualities of the street. It plays a functional role in providing shade to pedestrians, cyclists, vendors, and public transport passengers. Effective greening with street trees reduces the street temperature, making it comfortable for people to walk, cycle riders, or gather for social activities. It also promotes a sense of ownership among nearby residents or shop owners towards upkeep. It can also incorporate fruit-bearing and medicinal or religious trees and shrubs.

Figure No 6.16: Typical Green Belt

6.6.13 Traffic Regulations and Control

To have safe traffic operation on roads, it is desirable to impose adequate traffic regulations and traffic control with the help of standard traffic control devices. The traffic regulations and controls must have legal backing by enacting appropriate acts, suitable laws, and rules which are given in Traffic signs manuals Vol-I and Vol-II published by DOR.

A traffic sign is a device mounted on a fixed or portable support whereby a specific message is conveyed using words or symbols to regulate, warn, or guide traffic. The signs should be placed such that they could be seen and recognized by road users in time. The edge of the sign adjacent to the road is not less than 0.6 m away from the edge of the carriageway. The reverse side of all the sign plates should be painted gray or black.

Traffic signals are generally used at the intersection of the roadway for the control of conflicting streams of vehicular and pedestrian traffic. The arrangement draws attention and responses that make minimum waste of time and reduce accidents.

Figure No 6.17: Traffic Regulations and Signs

6.6.14 Road Side Furniture

Urban road furniture are points to the pieces of goods that we found in the urban environment like streets, parks, and other public areas. But it's not just benches and bins, urban furniture can refer to a whole range of items, including bike racks, bus stops, bollards, planters, seats, picnic tables, water fountains, streetlights, parasols; the list goes on. These items allow people to enjoy a more comfortable experience in the outdoors. They can considerably improve the quality of life for the inhabitants of a city or town.

Having enough street furniture also promotes equality of opportunity, as it provides rest places for the elderly and people with mobility issues that support increased social interaction. Parents of small children can use it in public spaces and amenities, to keep a watchful eye on their youngsters, making accessibility and use more assured.

Figure No 6.18: Road Side Seating Furniture

6.6.15 Bus Terminal and City Bus Station

A bus terminal is a point at the start/end of a bus route, where the vehicles stop, reverse and wait, before departing on the return journey. It also serves as a station for passengers to board and alight. Evidently, at a bus terminal, parameters addressing passenger and operator requirements overlap. It is the site for interchange between a large volume of bus and passenger traffic. This demands that the facilities at a bus terminal be planned systematically and that user requirements are addressed in such planning, or else the lack of an efficient and functional environment will lead to friction, ultimately compromising the attractiveness of the bus system.

Reliable, safe and comfortable public transport systems are a precondition for developing sustainable transport systems. Bus systems, in particular, are extremely relevant since they form the majority of public transport trips. Improved bus services and developing state-of-the-art supporting infrastructure like bus terminals, depots, and bus stops can attract users and increase ridership.

Currently, Nisdi rural Municipality has not been a bus station yet. Due to the space limitation and facilities, other vehicles such as auto rikshaw, motorcycles, cars, and trucks can be seen parking along the sides of the road. The existing bus park and station are insufficient for accommodating existing public vehicles. Therefore, a city bus park is essential for managing public vehicles. Since a large bus terminal to accommodate all the existing vehicles requires large space, that can be very difficult to acquire. However, it's practical to construct one bus terminal and one bus station based on the necessity and proximity within the city. This will minimize congestion, delay in mobility, and more accidents. This situation in the Rural Municipality has also increased the aesthetic of overall urban road networks. For better mobility and transportation system, 1 bus terminal and 1 city bus station have been proposed in the following locations within the Rural Municipality. i.e.,

Table No 6.7: Bus Terminal and City Station

S.N.	Bus Station	Location	Ward No	Capacity	Area	Situation	Intervention
1	Bus Terminal	Bakamalang, Nisdi		8 Buses	-	Proposed	Planned
2	Bus Station	Mittyal, Nisdi		6 Buses	-	Proposed	Planned
4	Helipad	At least 1 in each ward	All wards				

Figure No 6.19: Typical Conceptual Plan of Bus Terminal-I

Source: Bus Terminal Design guidelines, 2015, SGArchitects, New Delhi

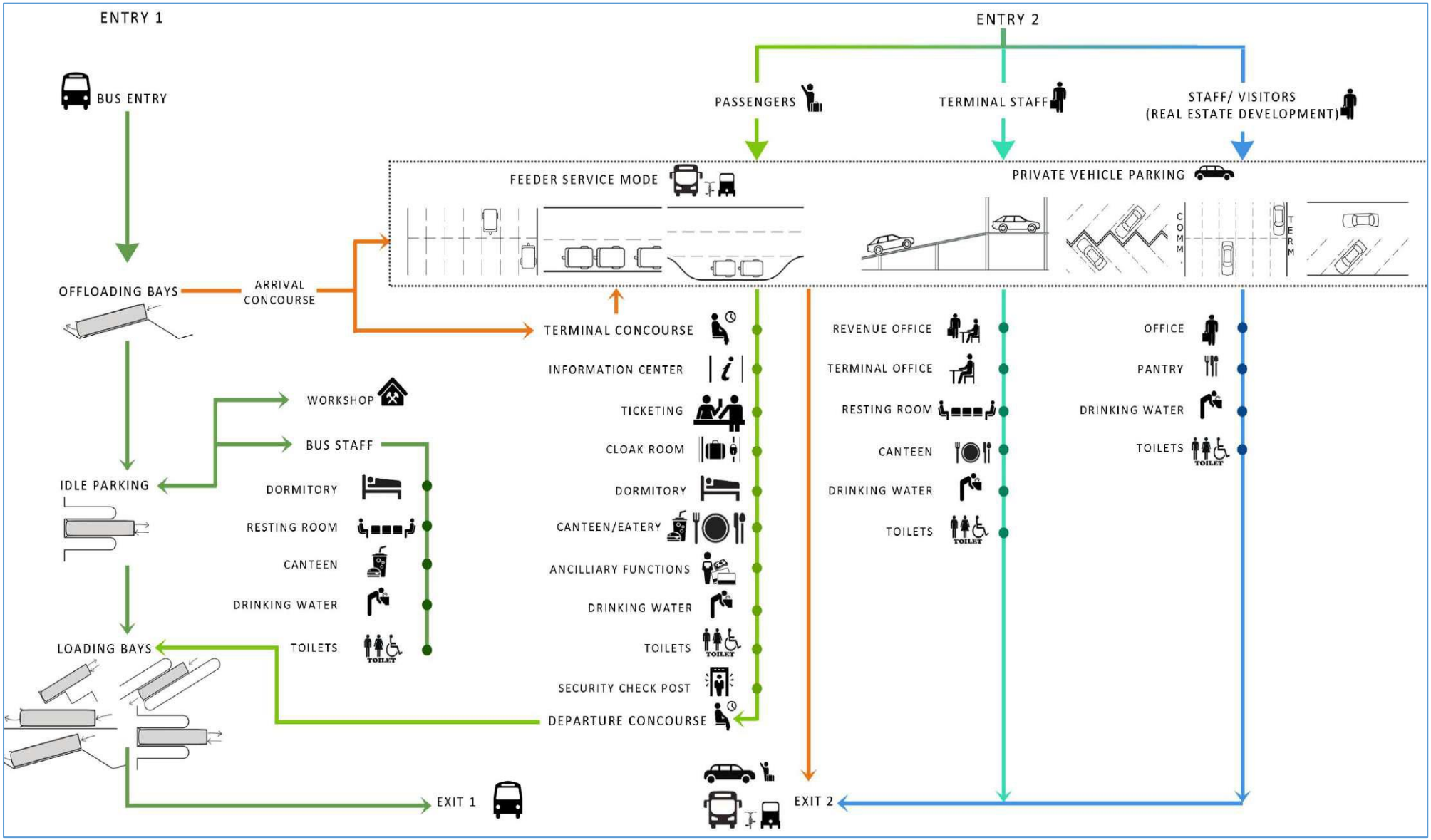


Figure No 6.20: Typical Functional Arrangement of Bus Terminal

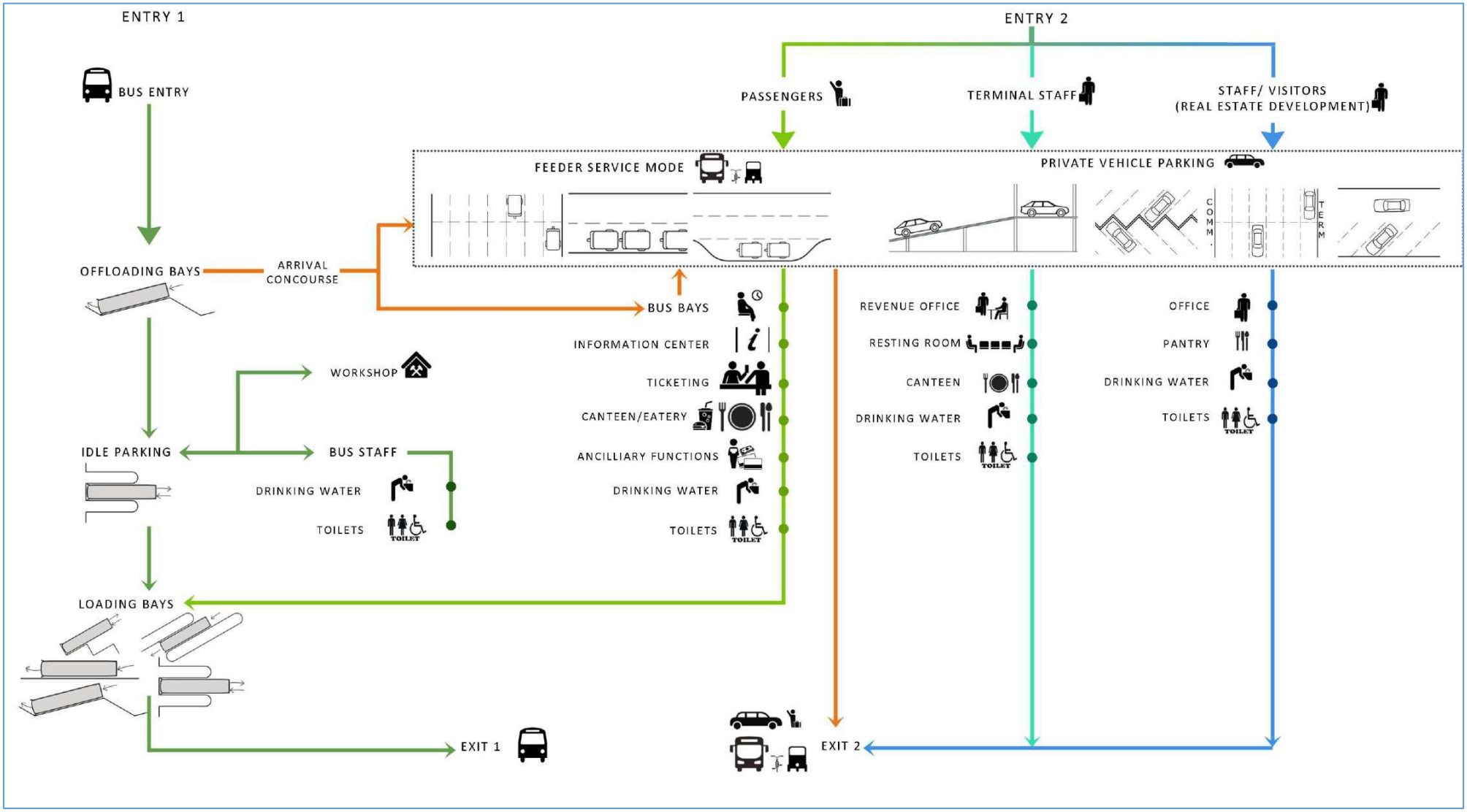


Figure No 6.21: Typical Functional Arrangement of City Bus Station

6.7 Transportation Management and Safety

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

Drainage system

Drainage is one of the most important components in mass mobility and road maintenance. Roadside drains are an integral part of the roads and an essential means of preventing structural damage to the roads and inundation. From general observation, it is apparent that design and construction are not given as standards and guidelines enough in the rural Municipality resulting in problems. Most village/urban roads do not have roadside drainage in the Rural Municipality.

Parking Area

Parking place is a very important part of transportation management. In the absence of a parking area, the city may fall into greater problems like mobility, security, road crashes, road congestion, city aesthetic view, etc. Therefore, the city needs to develop long-time parking and short-time parking to avoid the above problems. The long-time parking area needs to park heavy vehicles like buses, minibuses, trucks, etc. which should be in a separate place and should come far from the downtown area. The short-time parking area is essential for shopping, official work, etc. which should be within the city either in the underground park or on the ground surface. Inside the rural Municipality also, the number of vehicles are in increasing order. And while planning the parking area, future traffic forecasting should be considered. Various criteria for parking areas are studied as follows:

- Decide the capacity, location, and type of future parking facilities
- Determine the congestion in the city or town areas
- Access the suppressed parking demand
- Estimate the desire and demands of the public parking facility.

Road Furniture

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

Traffic Management

- Installation of sufficient signs and signals of standards
- Conduct awareness programs
- Research in the trend of accidents and improvement in policies, laws, and updated machinery.
- Proper coordination among government agencies and other agencies.
- Establish emergency response system etc.

6.8 Road Pavement

Road pavement is a specified space, required for the movement of traffic/vehicles below or above the ground. The space required by the road pavement is considered in longitudinal as well as transverse directions to enable fast-moving vehicles to move safely and comfortably at the design speed. The life of vehicles, fuel consumption, maintenance, comfort, and fatigue to the passengers are mainly affected by the nature of pavements. The nature of pavements is differing concerning cost, maintenance, service, design, etc. The road pavement is generally its thickness and characteristics of pavement layer materials.

A pavement consists of one or more layers, normally sub-grade, sub-base, base course, and surface course wearing course. The topmost layer is the surfacing course, the purpose of which is to provide a smooth, abrasion-resistant, resisting surface water infiltration and strong layer. The base course layer is a layer of graded materials located below the wearing course to transfer the stress to the subgrade through the pavement sub-base. The aggregate/gravel located between the pavement subgrade and base course, which provide additional support is sub-base. Next to this, the deepest/ lowest pavement layer is subgrade which transfers arrived vehicle load to the soil beneath.

The selection of pavement type is determined based on the traffic volume, axel wheel load and composition, soil characteristics, weather, performance of pavements in the area, availability of materials, energy conservation, initial cost, and the overall annual maintenance and service-life cost. The pavement surface type should be consistent with the selected design speed for the highway.

Note1: For the selection and design of road pavements guidelines published by the Department of Roads shall be followed.

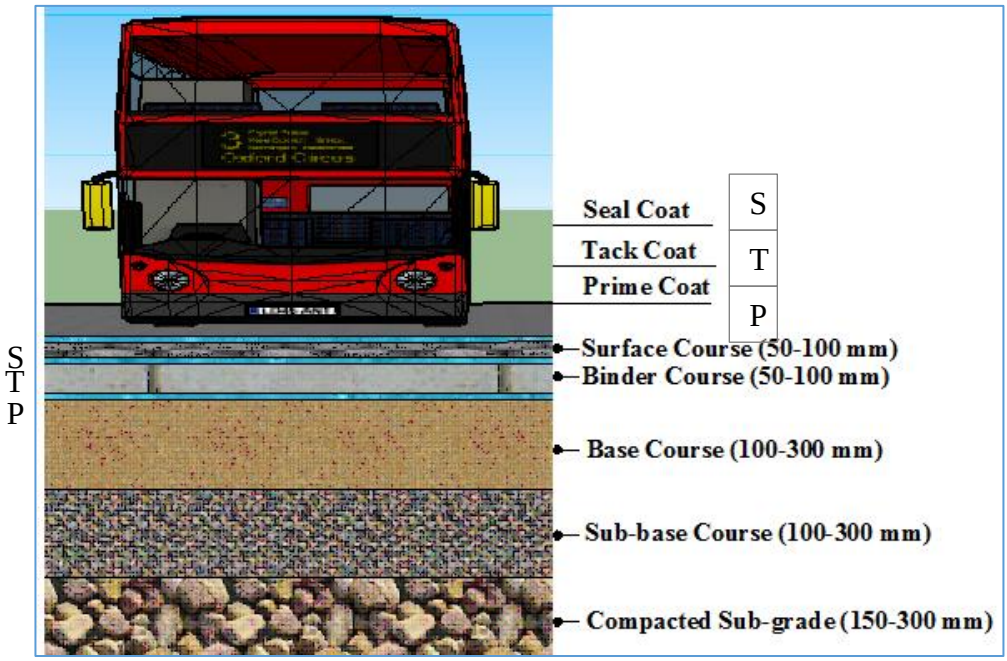


Figure No 6.22: Typical Pavement Thickness

Note 2: Pavement thickness and material selection should be as Final DPR of urban roads.

6.9 Urban Road Maintenance and Rehabilitation

Maintenance is a series of interdependent activities carried out for preserving and keeping the road in serviceable condition, furniture, structures, and others facilities in the best possible condition to provide satisfactory and safe transportation along the road within the optimum cost. Maintenance ensures that it reduces road deterioration, lowers vehicle operating costs, keeps the road smooth mobility and always open, safe, etc. It also considers environmental issues.

Routine Maintenance

Maintenance operations of localized nature are required continually on MRCN. The works are generally carried out by either forced labor or petty contractor. The activities include routine maintenance are:

- Sweeping of MRCN.
- Maintenance of shoulders
- Cutting of grasses
- Cleaning of culverts, bridges, pipes, etc.
- Cleaning minor landslides, road furniture and side drains.
- Minor reshaping of drains.

Recurrent Maintenance

Maintenance operations of localized nature of a limited extent are carried out at a more or less regular interval of six months to years with a frequency that depends on traffic volume. The works

are generally carried out by contract by use of minor equipment. It covers the activities like pothole patching, edge repairs, holes and ruts, repair of depression, local reconstruction, crack sealing, maintenance of drains, repairs of road furniture, etc.

Periodic Maintenance

Maintenance operations to a large extent are required at intervals of several years. In general, 6 years in the case of black top and 4 years in the case of gravel road depending upon the traffic volume. It covers activities like the renewal of wearing surfaces, repairing the damaged portions of side drains, repairing earth retaining walls, repairing parapet walls and fencing at bridges and culverts, resealing, etc.

Emergency Maintenance

The urgent maintenance includes removing landslides and repairing damage to the road that inhibits the proper use of the road and makes it impassable. The activities mainly take place during and after the rainy season.

Rehabilitation

The reinstatement of the road after the critical period is over by reconstruction of pavements, structures, and drainage of road alignment is rehabilitation. It measures improving the structural strength of the pavement and roadside structures.

Chapter 7. Five-Year Municipal Transport Master Plan

The five-Year Rural Municipal Transport Master Plan has been developed to guide the municipal investments in road infrastructure through 2080-2084/85 B.S. The plan will help the rural Municipality towards the medium and long-term plan as outlined. The RMTMP refers to the maintenance and upgrading of the existing road networks to the proposed standards to support the present and future (5 years) transport demand. It also includes the construction of new road linkages which are necessary to support the current road network and the envisaged road network for the future. The interventions are applied to the road sections based on their priorities and the annual budget. The plan has also addressed the immediate need for NMT facilities within the municipal area along the MRCN.

As such, the five-year plan has focused on the accessibility of all the settlements, moving towards mobility to increase access to wider services, thus paving the way for the development of proper sustainable public transport services within and around the Rural Municipality. The strategy and investment plans for the 5-year Rural Municipal Transport Master Plan have been elaborated below.

7.1 Five-Year Projected Financial Plan

The plan has made provision for annual budget expenditure for new construction, upgrading, maintenance, rehabilitation, and landscaping of MRCN. The financial sources and expenditures in urban roads have been thoroughly studied by the Rural Municipality. The financial budget plan is developed based on available municipal budgets and forecasted for future requirements based on the preceding year's budgets.

The current budget plan of the rural Municipality will be presented and forecasted. The very high amount of budget is granted by the Government of Nepal. The government of Nepal has intended to increase the total budget of each local body by 15-20% each year to meet the physical development.

Table No 7.1: Projection of Municipal Budget Investment in the Road Sector

S.N	Fiscal Years	Total Municipal Budget(NRS)	Total Budget Increment %	Development Budget (DB)	Development Budget %	Total Expenditure in Road Sectors	Road Sector (%), DB	Remark
1	2076/077	451600000	-	252900000	56.00	60100000	23.76	Existing
2	2077/078	520300000	15.21	291400000	56.01	72000000	24.71	
3	2078/079	583700000	12.19	317500000	54.39	87600000	27.59	
4	2081/080	648600000	11.12	365000000	56.27	110300000	30.22	
Average Budget Increment (Assuming)			>10	-	>50	-	>24	Forecast
Assuming		Increment 12% Per Year			-	-	-	Projection
1	2080/081	714800000	10.21	403700000	56.48	128700000	31.88	

S.N	Fiscal Years	Total Municipal Budget(NRS)	Total Budget Increment %	Development Budget (DB)	Development Budget %	Total Expenditure in Road Sectors	Road Sector (%), DB	Remark
2	2081/082	755000000	5.62	435000000	57.62	128400000	29.52	
3	2082/083	800000000	10.87	445800000	55.73	128000000	28.71	
4	2083/084	889840000	11.23	499378208	56.24	132100000	26.45	
5	2084/085	999468288	12.32	559702241	56.26	139925560	25.00	

The table above shows that the total municipal budget has been increased by 5 to 13% per year in the present situation. Here, it is assumed that 10 % of the total budget will be increased from 2080 to 2084 BS. Also, the development budget is on average 56 % of the total municipal budget. To, Municipal Annual Book (2076-2081 BS), the expenditure in the road sector is 28 % of the development budget. The expenditure in the road sector should be increased to achieve the RMTMP goals. Therefore, it has been taken that the investment in the road sector will be increased by25 to 30 % per year up to 2084 BS. The expenditure in the road sector will be 25 to 35% of the development budget.

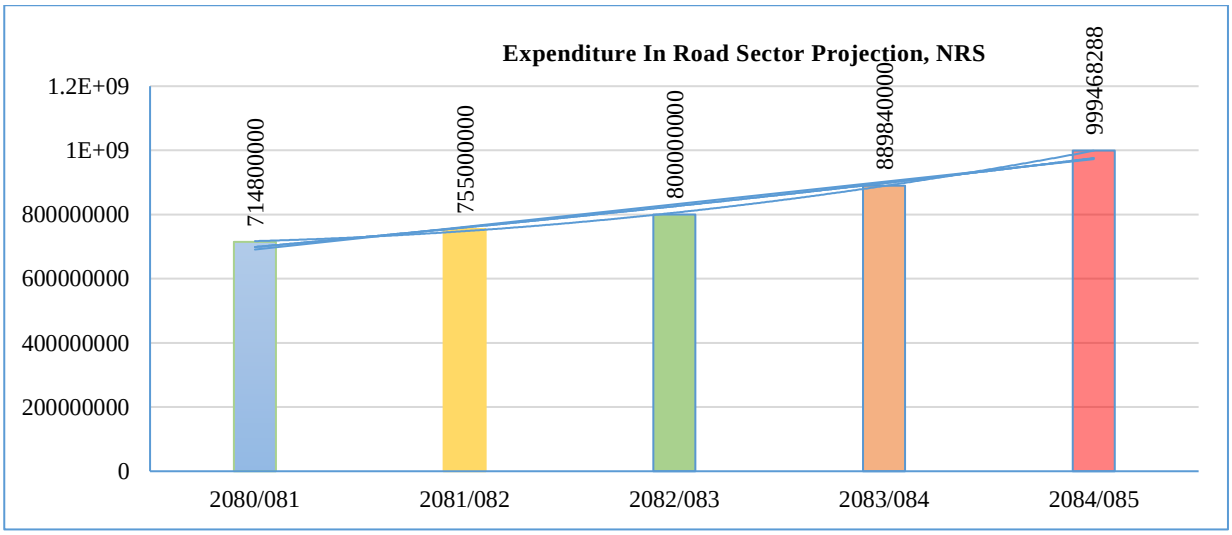


Figure No 7.1: Municipal Expenditure in Road Sector

7.2 Sharing of Municipal Fund

The financial plan and the finalization of the RMTMP have been done based on the Terms of Reference as given by the Rural Municipality. During the preparation of MTMP, the investment from total available resources under the road sector for different classes of the road can be distributed as Apportion 30% for maintenance at first, and the remaining 70% has been distributed for construction, upgrading and rehabilitation. The MoFALD (2014 A.D.) guidelines have set the different views for budget distribution in a different class of road:

- Class A road, ≥ 40%
- Class B road, ≤ 30%

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

Although MoFALD has set guidelines for the distribution of the budget, it has been adjusted by making discussions with local authorities based on local conditions and the requirement of the Rural Municipality. The rural Municipality has decided to invest the 70% in construction/Upgradation and 30% in the maintenance of the road for the next 5 fiscal years. The construction budget of the road sector is invested with 40% in A-Class and Municipal, 30% in B-class, 20% in C-class, and 10% in D-class.

The estimate of the budget required for the five years is prepared based on 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 roads are to be made single lane and municipal ring road will be four lanes. Due to the 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 are expected to be completed within this period by external sources. For approximate costing, the construction rate of road appurtenances is assumed to be equal to that of graveling cost and for the short term, the minimum width of 3 m is assumed if the existing road width doesn't exist. Similarly, longitudinal drainage on both sides of the roadway is considered in this plan.

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

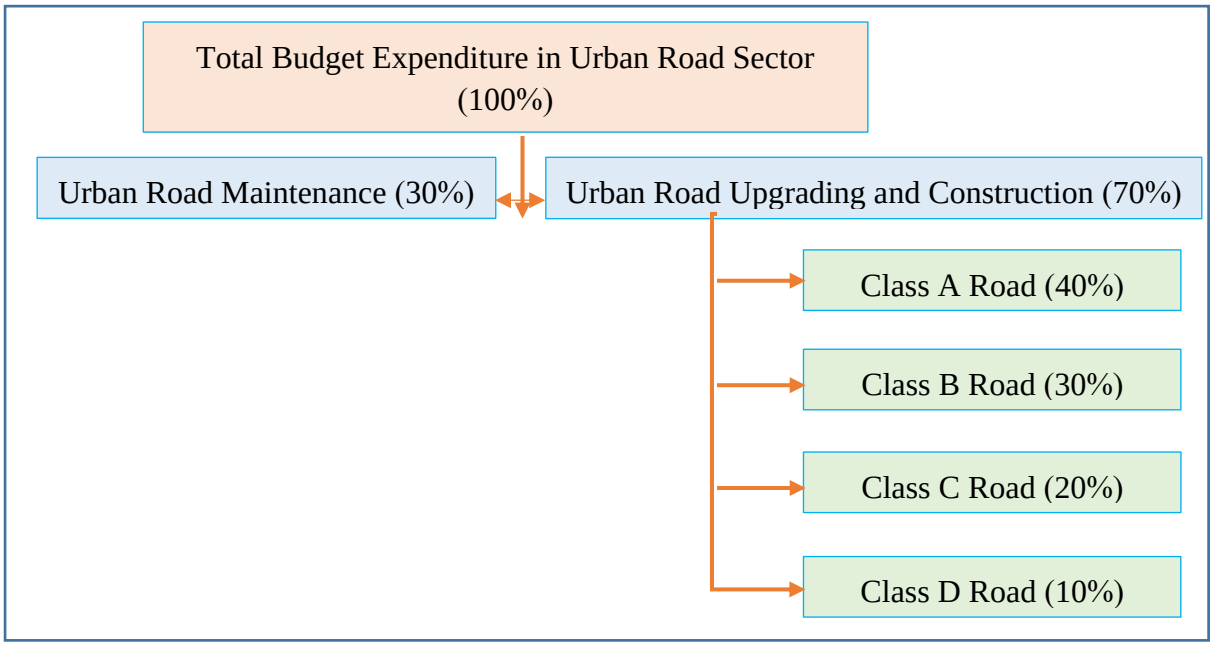


Figure No 7.2: Budget Share for Different Intervention and Class of Road

Interventions that needs can't be completed in the predetermined year should be the next priority in the coming year. If a certain road, which was targeted to complete in the first year could not be finished in the first year, need to be given priority in next year's expenditure plan. If there is a

deficit in annual expenditure, the rural Municipality needs to incorporate that particular heading in the next year at any cost. They can look for grants, and assistance from the district or even the central level or they can incorporate them by shifting the budget from a less important item/heading.

Table No 7.2: Sharing of Municipal Budget on MRCN Class

S.N.	Fiscal Years	Total Municipal Probable Budget in Road	#Construction Budget(NRS)	Maintenance Budget (NRS)	Class A(NRS)	Class B(NRS)	Class C(NRS)	Class D(NRS)
Sharing of Fund			**70%**	**30%**	**40% of #**	**30% of #**	**20% of #**	**10% of #**
1	2080/081	128700000	90090000	38610000	36036000	27027000	18018000	9009000
2	2081/082	128400000	89880000	38520000	35952000	26964000	17976000	8988000
3	2082/083	128000000	89600000	38400000	35840000	26880000	17920000	8960000
4	2083/084	132100000	92470000	39630000	36988000	27741000	18494000	9247000
5	2084/085	139925560	97947892	41977668	39179157	29384368	19589578	9794789
Total		657125560	459987892	197137668	183995157	137996368	91997578	45998789

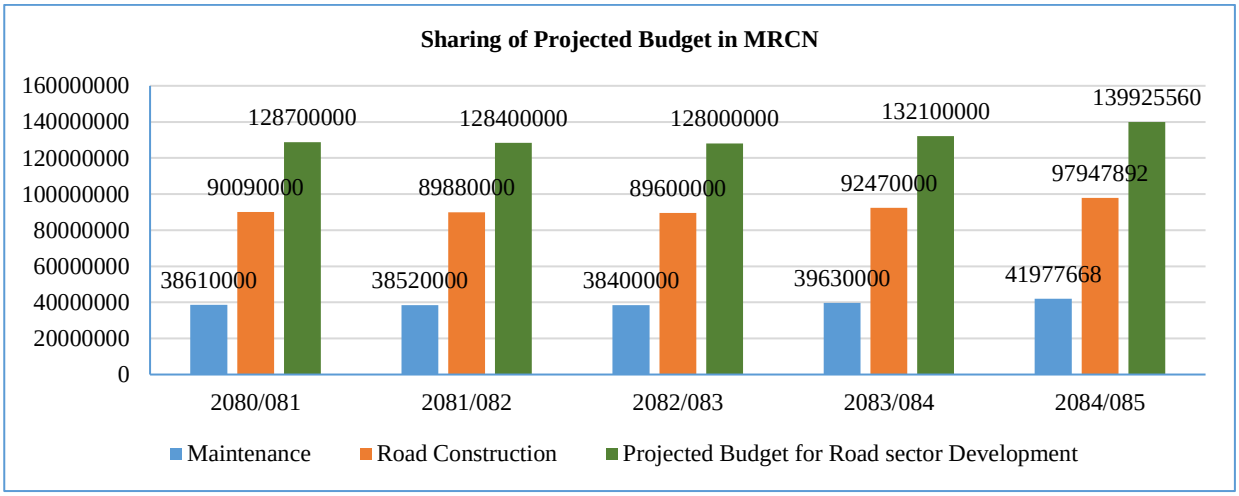


Figure No 7.3: Budget Projection in Road Development Sector and Maintenance

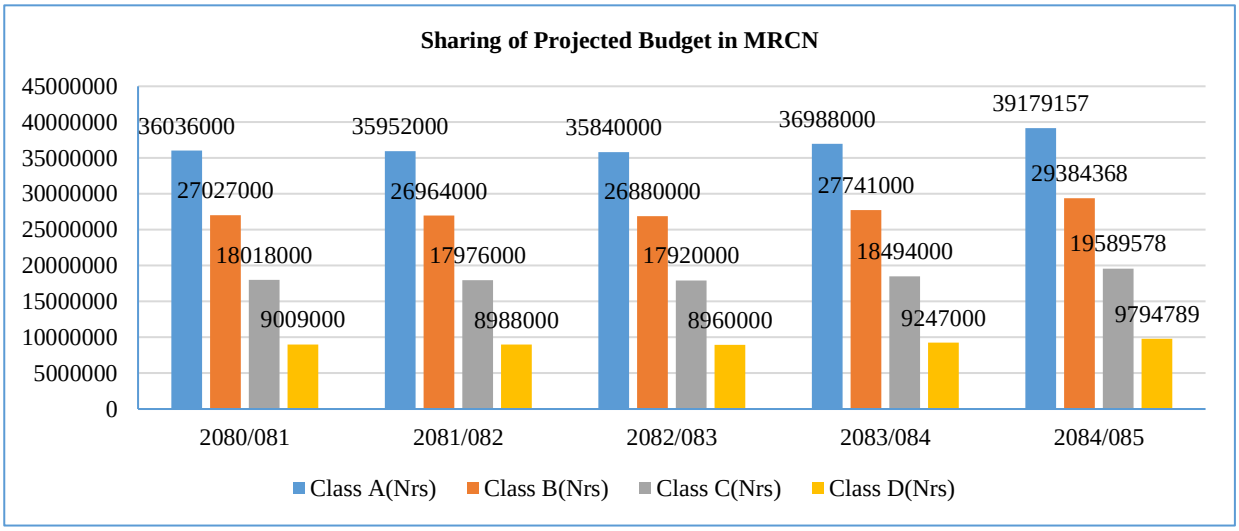


Figure No 7.4: Projection of Sharing of Municipal Budget in MRCN

7.3 Intervention on MRCN and Cost Estimation

The financial plan of RMTMP has been developed as per the following intervention in Municipal Road Core Network. The intervention includes construction (bridge, culverts, new track opening, graveling, blacktopping, longitudinal drains, footpaths, cycle lanes, street lights, etc.), upgradation, and maintenance of the urban roads. The summary of the total length of roads has been listed in Table below and intervention by road classification has been listed below table.

The probable cost of each road section has been prepared based on the district rate (2081) and MoFALD [2014]. The unit cost of the construction is listed below Vol I [Annex III]. The cost interventions and cost estimate of the MRCN are summarized below and detailed probable cost has been given in Separate Volume II [Annex II].

Table No 7.3: Total Length By MRCN Proposed Class

S. N	MRCN Class	Existing Road Length, Km			Proposed Road Length Km	Upgrade Length Km	Total Road length Km	Proposed		
		Earthen	Gravel	Blacktop/ RCC				Longitudinal Road Side Drain, km	Footpath and Cycle Lane, km	Green Belt, km
1	Class A	65.31	11.38	0	0	65.31	76.69	65.31	65.31	65.31
2	Class B	91.9	2.25	0	0	91.9	94.15	91.9	91.9	91.9
3	Class C	37.61	0	0.94	0	37.61	46.32	37.61	37.61	37.61
4	Class D	205.31	0.067	0.24	0	205.31	206.32	205.31	205.31	205.31
5	Proposed Road	0	0	0	7.76	0	7.76	0	0	0
Grand Total		326.41	13.69	0.936	7.76	326.41	423.49	326.41	326.41	326.41

7.4 Five-Year Implementation Plan

The detailed five years and abstract of the twenty-year implementation plan have been prepared. The implementation plan has been prepared based on the priority/rank obtained from the prioritization criteria and as per suggestion from the municipal authority. The total expected length of road for blacktopping within the RMTMP period is 57.414 km as prescribed standards. The summary of implementation plan is given in Table below, and the year wise implementation plan has been tabulated in Table below.

Note: The MRCC has decided to Plan Class D roads making discussions with local stakeholder during Budget Preparation.

Table No 7.4: Intervention on MRCN Class for Twenty Years

S.N	MRCN Class	Existing Road Length, Km			Proposed Road Length Km	Upgrade Length Km	Total Road length Km	Proposed		
		Earthen	Gravel	Blacktop				Longitudinal Road Side Drain, km	Footpath and Cycle Lane, km	Green Belt, km
1	Class A	65.31	11.38	0	0	65.31	63.518	65.31	65.31	65.31
2	Class B	91.9	2.25	0	0	91.9	119.685	91.9	91.9	91.9
3	Class C	37.61	0	0.94	0	37.61	79.704	37.61	37.61	37.61
4	Class D	205.31	0.067	0.24	0	205.31	66.203	205.31	205.31	205.31
5	Proposed Road	0	0	0	7.76	0	14.033	0	0	0
Grand Total		326.41	13.69	0.936	7.76	326.41	465.711	326.41	326.41	326.41

7.5 Policy and Strategy

- Policy for Integrated Development Approach (co-ordination of line agencies) shall be developed.
- Policy for road class C and D shall be constructed by mobilization of the User's Committee.
- Policy for the construction of ring roads and class A roads by taking aid from donor agencies.
- Policy for the construction of class B roads by coordinating municipal own source and line agencies and donor agencies.
- All line agencies, NGOs, and INGOs who work on the urban roads have to manage their program as per approved MTMP.
- Policy for operating city buses and electric vehicles shall be prepared.
- A policy of promoting pedestrian-friendly paths, and pedestrian crossings is to be kept a top priority followed by cycling and other motor vehicles.
- Facility, security, and guarantee to be provided for the investment of the private sector in urban roads.
- The policy of urban road landscaping, green belt, and beautification shall be prepared.
- Effective regulatory mechanism for public transportation is to be prepared.
- Policy for road accident management and rescue mechanism shall be developed.

7.6 Suggestion

- Implement the road construction as per prioritized by the Rural Municipal Transport Master Plan (MTMP).
- Minimum basic guidelines for roadside infrastructures, bicycle tracks, pedestrian facilities, curbs, bus lay bays, lighting and drainage should be followed as per the guidelines set by., Nepal Road Standards 2070 BS, Nepal Urban Road Standards-2076 (NURS-2076 BS).
- If different guidelines are provisioned for the same infrastructure, then the standard, which explains the pedestrian-friendly transportation most, is to be adopted.
- The RMTMP should be revised after every 5 years.

Chapter 8. Conclusion

In Nisdi Rural Municipality, the population increase rate is 0.35 % per year. The Rural Municipality is developing as an emerging **rural linkage development town**. A sustainable MRCN is required for better urbanization and market center development in the Rural Municipality. The development of transport infrastructures and traffic mobility should be smooth. By considering the better future in transport facilities of the Rural Municipality, 5-year RMTMP has been prepared.

The plan starts with present scenarios, the team has analysed the present status of urban roads by conducting field inventory, collecting primary and secondary data, interacting with various stakeholders at various levels, planning the necessary interventions, and prioritization the roads. The study has identified active transport users as a major trip-making group and therefore the road classes hierarchy addresses those users with interconnected pedestrian facilities and cycle tracks. Mobility has to be considered as the majority of people are dependent on privately owned vehicles or walking for daily trips. The feasible linkage routes, public city bus routes, etc. have been also developed in the plan. Most of the roads need maintenance and upgrading.

The data are then coded in a GIS software for developing the maps. Finally, the inventory map is prepared and the land use map has also been prepared. The potential development map and the visionary plan has used for the preliminary classification of the roads. The classification of the road is validated through MRCC meetings. The classes validated are A, B, C, D by defining Right of Way (RoW) 10m, 8m, 7m, and 6m respectively. The proposed prioritization criteria have been validated through MRCC and the rural municipal office. Again, the financial, as well as implementation plan, has been prepared in the report.

The total length of MRCN in the rural Municipality will be 423.492 km including a new track opening 7.76 km. Among these, the proposed length of MRCN-validated classes A, B, C, D, are 76.69 km, 94.15 km, 46.32 km, and 206.32 km respectively.

The cost for the upgradation and construction of each road has been estimated based on the rate provided in the District rate and guidelines. The budget available is less than the required. Therefore, the rural Municipality should take aid from the provincial government, federal, road departments, INGOs, donors, and line agencies.

Chapter 9. References

Central Bureau of Statistics. (2013). National Census 2021. Kathmandu: Government of Nepal, National Planning Commission Secretariat.

District Transport Master Plan, guideline 2012 A.D.

DoR: Nepal Roads Standards (2027): First Revision 2045, BS

DoR: Nepal Roads Standard 2070, Kathmandu,

DoR: Traffic Signs Manuals Vol-I and Vol -II, Kathmandu, 1997

GoN. (2014). Government of Nepal Ministry of Federal Affairs and Local Development (MoFALD) Rural Municipality Transport Master Plan Preparation Guidelines and Terms of Reference for Hiring Consultant Infrastructure Development Division, (IDD)/MoFALD RURAL MUNICIPALITY TRANSPORT MASTER PLAN PREPARATION GUIDELINES AND TERMS OF REFERENCE FOR HIRING CONSULTANTS RURAL MUNICIPALITY TRANSPORT MASTER PLAN (MTMP).

Government of Nepal. (*2015*). *National Urban Development Strategy* (*NUDS*). *kathmandu, Nepal*.

Litman Todd. (2003). Measuring Transportation Traffic, Mobility and Accessibility.

Ministry of Federal Affairs and Local Development. (2017). गाउँपालिका कायमगर्ने गरि उक्त एकाईहरुको नाम, संख्या, सीमाना, केन्द्र र वडाको सीमाना सहितको विवरण *.Kathmandu, RAJPATRA.pdf.*

National Transport Policy, His Majesty's Government Ministry of Physical Planning and Works 2058 (2001/2002)

Nepal Rural Road Standards- 2070,

Nepal Urban Road Standards 2071, Concept Paper

Nepal Urban Road Standard- 2076, Jestha, Government of Nepal Ministry of Urban Development Singhadurbar, Kathmandu.

Statistics of Local Road Network (SLRN) 2016, Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR), Babarmahal Kathmandu Planning Norm and Standard 2015 A.D, DUDBC, Babarmahal Kathmandu

.

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
1	1	NH09	Madan Bhandari Highway	National Highway	50	Earthen	Madan Bhandari Highway	Madan Bhandari Highway	1	1.93
2	2	NH68	Bhimad-Rampur-Mittyal-Arung Khola	National Highway	50	Gravel	Bhimad	Arung Khola	2	24.05
3	3	F197	Aryabhanjyang-Dhobadi-Rampur	Feeder Road	30	Earthen	Aryabhanjyang	Rampur	5	2.96
4	4	47DR038	Siddhi Bhanjyang-Anandi Bhanjyang	District Road	20	Earthen	Siddhi Bhanjyang	Anandi BHanjyang	1	1.34
5	5	47DR038	Khutte-Damara-Raika-Aramalang-Purmalang-Lekh Malang-Siddhi Bhanjyang	District Road	20	Earthen	Khutte	Siddhi Bhanjyang	1	8.47
6	6	47DR037	Gomari Khola-Lakuri Bhanjyang	District Road	20	Earthen	Gomari Khola	Lakuri Bhanjyang	2	2.61
7	7	47DR036	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola	District Road	20	Earthen	Dhungana Besi	Murali Khola	3,5	7.62
8	8	47DR035	Dhungana Besi-Pipal Bhanjyang	District Road	20	Blacktop	Dhungana Besi	Pipal Bhanjyang	5	0.13
9	9	47DR035	Dhungana Besi-Khare Khola	District Road	20	Earthen	Dhungana Besi	Khare Khola	5	5.69
10	10	47DR035	Dhungana Besi-Pipal Bhanjyang- Sadakbas - Rukse Bhanjyang	District Road	20	Earthen	Dhungana Besi	Rukse Bhanjyang	5	8.12
11	11	47DR034	Budhikot-Galdha Phat-Kathai Danda-Dhanbase-Gabudanda-Pataksar	District Road	20	Earthen	Ringdi	Kathai Dada	5	7.07
12	12	47DR032	Shiluwa-Archale-Mittyal	District Road	20	Earthen	Shiluwa	Mittyal	6	6.41
13	13	47DR030	Jyamire-Sarangi Khola-Purwa Khola	District Road	20	Earthen	Jyamire	Purwa Khola	7	11.30
								Total		**87.69**
14	1	506RM10A001	Sukekot-Lindi-Anandi	Class:A	10	Earthen	Sukekot	Anandi Tole	2	10.18
15	2	506RM10A002	Khadar-Dharkesing-Jherudi-Sahalkot	Class:A	10	Earthen	Mittyal	Sahalkot	3	5.06
16	3	506RM10A003	Mittyal Bajar-Lame Damar-Juluke	Class:A	10	Earthen	Mittyal	Juluke	4	11.69
17	4	506RM10A004	Rukse Bhanjyang-Aam Danda-Biruwa	Class:A	10	Earthen	Rukse Bhanjyang	Aam Danda	4	8.53
18	5	506RM10A005	Archale-Mittyal	Class:A	10	Earthen	Shiluwa	Mittyal	4,6	5.97
19	6	506RM10A006	Mityal-Jhaltung-Bhirpani-Jyamire	Class:A	10	Earthen	Mityal	Jyamire	4,7	11.58
20	7	506RM10A007	Jyamire-Hongsi Road	Class:A	10	Gravel	Jyamire	Hongsi Road	7	2.06
21	8	506RM10A008	Sindhure-Jyamire-Hongsi Road	Class:A	10	Earthen	Shiluwa	Mittyal	7	11.57
22	9	506RM10A009	Gurung Danda-Jyamire-Bhir Danda	Class:A	10	Earthen	Gurung Danda	Bhir Danda	7	5.04
			Total							**71.69**
23	1	506RM10B001	Lotari-Serdada	Class:B	8	Earthen	Lotari	Serdada	2	0.72
24	2	506RM10B002	Hupsekot Simana	Class:B	8	Earthen	Hupsekot Simana	Hupsekot Simana	3	1.66
25	3	506RM10B003	Jhirubas-Mohoriya-Sharki Danda	Class:B	8	Earthen	Jhirubas	Sharki Danda	3	3.41

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
26	4	506RM10B003	Jhirubas-Mohoriya-Sharki Danda	Class:B	8	Earthen	Jherudi	Sarki Danda	3	6.85
27	5	506RM10B004	Khalabari-Bhaluwa-Mittyal	Class:B	8	Earthen	Khalabari	Mityal	3,4	6.84
28	6	506RM10B005	Rukse Bhanjyang-Ghyansinbas-Khadar	Class:B	8	Earthen	Rukse Bhanjyang	Khadar	3,4	4.61
29	7	506RM10B006	Dhungana Besi-Kyangrun-Jhirubas-Dhundanda-Murali Khola	Class:B	8	Earthen	Dhungana Besi	Murali Khola	3,5	7.14
30	8	506RM10B007	Mudabas-Khani Damar-Arhamare-Gyajdar-Lamakharak	Class:B	8	Earthen	Mudabas	Dhirje	4	13.22
31	9	506RM10B008	Lame Damar-Ripa-Mudabas	Class:B	8	Earthen	Lame Damar	Mudabas	4	4.38
32	10	506RM10B009	Kathai Danda-Dhanbase-Gabudanda-Pataksar	Class:B	8	Earthen	Budhikot	Pataksar	4,5	7.14
33	11	506RM10B010	Kolbhanjyang-Dhungana Besi	Class:B	8	Earthen	Kolbhanjyang	Dhungana Besi	5	6.17
34	12	506RM10B011	Khare Khola-Kathai Danda	Class:B	8	Earthen	Khare Khola	Kathai Danda	5	1.55
35	13	506RM10B012	Dhungana Besi-Pipal Bhanjyang	Class:B	8	Blacktop	Dhungana Besi	Pipal Bhanjyang	5	0.11
36	14	506RM10B013	Mote Kharak-Labedi	Class:B	8	Earthen	Mote Kharak	Labedi	7	3.85
37	15	506RM10B014	Jyamire-Pokharichhap-Madanpur-Simal Danda	Class:B	8	Earthen	Jyamire	Simal Danda	7	3.03
38	16	506RM10B015	Ghorle Kharak-Dhobala-Charghare-Hubas-Sarangi Khola	Class:B	8	Earthen	Ghorle Kharak	Sarangi Khola	7	4.53
39	17	506RM10B016	Jyamire-Mathagadhi	Class:B	8	Earthen	Jyamire	Mathagadhi	7	5.26
			Total							**223.84**
40	1	506RM10C001	Armalang-Fulpati-Pokhari Thok	Class:C	7	RCC	Armalang	Pokhari Thok	1	0.63
41	2	506RM10C002	Bagaicha Chowk-Bhotaha Chowk	Class:C	7	Earthen	Bagaicha Chowk	Bhotaha Chowk	1	0.81
42	3	506RM10C003	Aramalang-Purmalang-Lekh Malang	Class:C	7	Earthen	Bhotaha	Siddhi Bhanjyang	1	1.66
43	4	506RM10C004	Puranthar-Kandur Khola	Class:C	7	New Track	Puranthar	Khandur Khola	2	0.93
44	5	506RM10C005	Sukekot-Manbas-Ghusiyani	Class:C	7	New Track	Sukekot	Ghusiyani	2	3.40
45	6	506RM10C006	Tangbari-Kaidal	Class:C	7	New Track	Tangbari	Kaidal	2	4.02
46	7	506RM10C007	Khalabari	Class:C	7	Earthen	Khalabari	Khalabari	3	0.34
47	8	506RM10C008	Anandi Tole-Rollabas	Class:C	7	Earthen	Anandi Tole	Rollabas	3	1.31
48	9	506RM10C009	Belkharak-Arun Khola	Class:C	7	Earthen	Belkharak	Arun Khola	4	1.69
49	10	506RM10C010	Goth Danda-Belkharak-Matiyar Danda	Class:C	7	Earthen	Goth Danda	Matiyar Danda	4	3.32
50	11	506RM10C011	Mathillo Kafal-Tallo Kafal-Piplak	Class:C	7	Earthen	Mathillo Kafal	Tallo Kafal	4	0.98
51	12	506RM10C012	Mudabas-Goth Danda	Class:C	7	Earthen	Mudabas	Goth Danda	4	1.40
52	13	506RM10C013	Archabhanjyang Chautari-Hupseghat	Class:C	7	Earthen	Archabhanjyang Chautari	Hupseghat	4	1.34

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
53	14	506RM10C014	Kathai Danda-Dhomadi-Archale	Class:C	7	Earthen	Kathai Danda	Archale	5	4.54
54	15	506RM10C015	Pipal Bhanjyang-Khoplak-Bhorma-Ghyansinbas	Class:C	7	Earthen	Pipal Bhanjyang	Ghyansinbas	5	6.19
55	16	506RM10C016	Archale-Sisaghat-Galdha	Class:C	7	Earthen	Archale	Galdha	6	3.80
56	17	506RM10C017	Bahauni Kharak-Bebake	Class:C	7	Earthen	Bahauni Kharak	Bebake	7	2.29
			Total							**38.64**
57	1	506RM10D001	Adhmara	Class:D	6	Earthen	Adhmara	Adhmara	1	0.42
58	2	506RM10D002	Adhmara-Liting Pring	Class:D	6	Earthen	Adhmara	Liting Pring	1	1.58
59	3	506RM10D003	Armalang-Thulo Bari-Baudikhola	Class:D	6	Earthen	Armalang	Baudikhola	1	1.16
60	4	506RM10D004	Armalang Tole	Class:D	6	Earthen	Armalang Tole	Armalang Tole	1	0.31
61	5	506RM10D005	Sankhardi	Class:D	6	Earthen	Sankhardi	Sankhardi	1	0.30
62	6	506RM10D005	Sankhardi	Class:D	6	Earthen	Sankhardi	Sankhardi	1	0.11
63	7	506RM10D006	Raika Bus Stop-Baudikhola	Class:D	6	Earthen	Raika Bus Stop	Baudikhola	1	1.21
64	8	506RM10D007	Damara Khet	Class:D	6	Earthen	Damara Khet	Damara Khet	1	0.24
65	9	506RM10D008	Damara-Rahuban	Class:D	6	Earthen	Damara	Rahuban	1	0.78
66	10	506RM10D009	Damara-Rahuban-Adhmara	Class:D	6	Earthen	Damara	Adhmara	1	4.24
67	11	506RM10D010	Dokha Danda	Class:D	6	Earthen	Dokha Danda	Dokha Danda	1	0.18
68	12	506RM10D011	Duighare-Lekh Malang	Class:D	6	Earthen	Duighare	Lekh Malang	1	0.57
69	13	506RM10D012	Geja-Duighare Motor Way	Class:D	6	Earthen	Geja	Duighare Motor Way	1	3.20
70	14	506RM10D013	Lekh Malang	Class:D	6	Earthen	Lekh Malang	Lekh Malang	1	0.17
71	15	506RM10D014	Maula Kalika	Class:D	6	Earthen	Maula Kalika	Maula Kalika	1	0.34
72	16	506RM10D015	Pokhari Thok	Class:D	6	Earthen	Pokhari Thok	Pokhari Thok	1	0.41
73	17	506RM10D016	Pokhari Thok- Raj Brikshya-Sakhardu Khola	Class:D	6	Earthen	Pokhari Thok	Sakhardu Khola	1	1.78
74	18	506RM10D017	Pokhari Thok-Besi	Class:D	6	Earthen	Pokhari Thok	Besi	1	0.34
75	19	506RM10D018	Pur Malang-Dokha Danda	Class:D	6	Earthen	Pur Malang	Dokha Danda	1	3.09
76	20	506RM10D019	Raika Bhanjyang-Kaligandaki	Class:D	6	Earthen	Raika Bhanjyang	Kaligandaki	1	1.08
77	21	506RM10D020	Raj Brikshya	Class:D	6	Earthen	Raj Brikshya	Raj Brikshya	1	0.18
78	22	506RM10D021	Thulo Bari-Armalang	Class:D	6	Earthen	Thulo Bari	Armalang	1	0.50
79	23	506RM10D022	Purmalang sadak	Class:D	6	Earthen	Purmalang sadak	Purmalang sadak	1	0.45

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
80	24	506RM10D023	Damara-Bungdikali Simana	Class:D	6	Earthen	Damara	Bungdikali Simana	1	0.90
81	25	506RM10D024	Sankhardi-Raj Brikshya-Adhmara-Armalang	Class:D	6	Earthen	Liting Pring	Armalang	1	3.79
82	26	506RM10D025	Geja-Badhare-Chappakdi	Class:D	6	RCC	Geja	Chappakdi (RCC)	1	0.21
83	27	506RM10D026	Baka-Baka Pokhara	Class:D	6	Earthen	Baka	Baka Pokhara	1	1.61
84	28	506RM10D027	Baka-Boudi Khola	Class:D	6	Earthen	Baka	Boudi Khola	1	2.93
85	29	506RM10D028	Pur Malang-Baka-Geja-Boudi Khola	Class:D	6	Earthen	Pur Malang	Boudi Khola	1	6.08
86	30	506RM10D029	Siddhi Bhanjyang-Baka Pokhara-Hatti Bhanjyang	Class:D	6	Earthen	Siddhi Bhanjyang	Hatti Bhanjyang	1	4.38
87	31	506RM10D030	Geja-Badhare-Chappakdi	Class:D	6	Earthen	Geja	Chappakdi	1	2.11
88	32	506RM10D031	Bhotaha-Kamdi Khola	Class:D	6	Earthen	Bhotaha	Kamdi Khola	1	0.87
89	33	506RM10D032	Bhotaha Chowk- Ghat	Class:D	6	Earthen	Bhotaha Chowk	Ghat	1	0.65
90	34	506RM10D033	Bhotaha Chowk- Jholunge Pul	Class:D	6	Earthen	Bhotaha Chowk	Jholunge Pul	1	0.31
91	35	506RM10D034	Bhotaha Dil	Class:D	6	Earthen	Bhotaha Dil	Bhotaha Dil	1	0.34
92	36	506RM10D035	Pur Malang-Baka-Geja-Boudi Khola	Class:D	6	Earthen	Pur Malang	Boudi Khola	1	0.73
93	37	506RM10D036	Tham	Class:D	6	Earthen	Tham	Tham	1,2	0.75
94	38	506RM10D037	Siddhi Bhanjyang-Sukekot	Class:D	6	Earthen	Siddhi Bhanjyang	Hatti Bhanjyang	1,2	2.57
95	39	506RM10D038	Hugril Danda	Class:D	6	Earthen	Hugril Danda	Hugril Danda	2	0.58
96	40	506RM10D039	Jure	Class:D	6	Earthen	Jure	Jure	2	0.50
97	41	506RM10D040	Mathillo Bhangbari-Tallo Bhangbari-Jure	Class:D	6	Earthen	Mathillo Bhangbari	Jure	2	4.24
98	42	506RM10D041	Sahalkot Tole	Class:D	6	Earthen	Sahalkot Tole	Sahalkot Tole	2	0.28
99	43	506RM10D042	Sukekot-Tham	Class:D	6	Earthen	Sukekot	Tham	2	1.22
100	44	506RM10D043	Lakuri Bhanjyang-Jure	Class:D	6	Earthen	Lakuri Bhanjyang	Jure	2	2.37
101	45	506RM10D044	Anandi-Buda Khola	Class:D	6	Earthen	Anandi	Buda Khola	2,3	0.93
102	46	506RM10D045	Tallo Bhangbari-Damar	Class:D	6	Earthen	Tallo Bhangbari	Damar	2,3	2.98
103	47	506RM10D046	Bhaluwa	Class:D	6	Earthen	Bhaluwa	Bhaluwa	3	0.30
104	48	506RM10D047	Dharkeshing-Khadar Chuli	Class:D	6	Earthen	Dharkeshing	Khadar Chuli	3	1.38
105	49	506RM10D048	Labed	Class:D	6	Earthen	Labed	Labed	3	0.82
106	50	506RM10D049	Jhirubas Tole	Class:D	6	Earthen	Jhirubas Tole	Jhirubas Tole	3	0.25
107	51	506RM10D050	Kaule Danda	Class:D	6	Earthen	Kaule Danda	Kaule Danda	3	1.17

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
108	52	506RM10D051	Khadar	Class:D	6	Earthen	Khadar	Khadar	3	1.14
109	53	506RM10D052	Khadar Chuli	Class:D	6	Earthen	Khadar Chuli	Khadar Chuli	3	0.92
110	54	506RM10D053	Dandathar Sadak	Class:D	6	Earthen	Dandathar Sadak	Dandathar Sadak	3	0.61
111	55	506RM10D054	Khadar Sadak	Class:D	6	Earthen	Khadar sadak	Khadar sadak	3	0.48
112	56	506RM10D055	Satabar Sadak	Class:D	6	Earthen	Satabar Sadak	Satabar Sadak	3	1.37
113	57	506RM10D056	Sarki Danda	Class:D	6	Earthen	Sarki Danda	Sarki Danda	3	0.37
114	58	506RM10D057	Dhakrebas	Class:D	6	Earthen	Dhakrebas	Dhakrebas	3	0.53
115	59	506RM10D058	Bhirpani	Class:D	6	Earthen	Bhirpani	Bhirpani	4	0.48
116	60	506RM10D058	Bhripani	Class:D	6	Earthen	Bhripani	Bhripani	4	0.59
117	61	506RM10D059	Dhirje	Class:D	6	Earthen	Dhirje	Dhirje	4	0.65
118	62	506RM10D060	Ghyansin Danda	Class:D	6	Earthen	Ghyansin Danda	Ghyansin Danda	4	1.61
119	63	506RM10D061	Jana Kalyan School-Khamauri Tole	Class:D	6	Earthen	Jana Priya School	Khamauri Tole	4	0.13
120	64	506RM10D062	Khani Damar	Class:D	6	Earthen	Khani Damar	Khani Damar	4	0.48
121	65	506RM10D063	Khoplak-Pipal Bhanjyang	Class:D	6	RCC	Khoplak	Khoplak	4	0.49
122	66	506RM10D064	Aamdanda-Sirbhuk	Class:D	6	Earthen	Rukse Bhanjyang	Sirgu	4	0.58
123	67	506RM10D065	Pataksar	Class:D	6	Earthen	Pataksar	Pataksar	4	0.19
124	68	506RM10D066	Ghongsibar-Lame Damar	Class:D	6	Earthen	Ghongsibar	Lame Damar	4	0.22
125	69	506RM10D067	Mudabas-Duni Damar-Dhirje	Class:D	6	Earthen	Rukse Bhanjayang	Duni Damar	4	4.20
126	70	506RM10D068	Arhamare Phat	Class:D	6	Earthen	Arhamare Phat	Arhamare Phat	4	0.89
127	71	506RM10D069	Ghyansinbas	Class:D	6	Earthen	Ghyansinbas	Ghyansinbas	4	0.71
128	72	506RM10D070	Rukse Bhanjyang-Hospital	Class:D	6	Earthen	Rukse Bhanjyang	Hospital	4	0.54
129	73	506RM10D071	Rukse Bhanjyang Road	Class:D	6	Earthen	Rukse Bhanjyang Road	Rukse Bhanjyang Road	4	0.73
130	74	506RM10D072	Arya Bhanjayang-Chyuribas	Class:D	6	Earthen	Arya Bhanjayang	Chyuribas	4	1.04
131	75	506RM10D073	Duni Damar Phat	Class:D	6	Earthen	Duni Damar Phat	Duni Damar Phat	4	0.57
132	76	506RM10D074	Rukse Bhanjyang-Hospital Backside	Class:D	6	Earthen	Rukse Bhanjyang	Hospital Backside	4	0.42
133	77	506RM10D075	Lame Damar-Ripa-Mudabas	Class:D	6	Earthen	Lame Damar	Mudabas	4	0.65
134	78	506RM10D076	Lame Damar-Kholmuk	Class:D	6	Earthen	Lame Damar		4	1.67
135	79	506RM10D077	Jhyaltung-Bhaldi	Class:D	6	Earthen	Jhyaltung	Bhaldi	4	1.09

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
136	80	506RM10D078	Sattra Saya-Ramche Sadak	Class:D	6	Earthen	Sattra Saya	Ramche Sadak	4,5	2.23
137	81	506RM10D079	Belauji	Class:D	6	Earthen	Belauji	Belauji	5	0.53
138	82	506RM10D080	Dhanbase	Class:D	6	Earthen	Dhanbase	Dhanbase	5	0.14
139	83	506RM10D081	Khare Khola Pul-Badhare	Class:D	6	Earthen	Khare Khola Pul	Badhare	5	0.81
140	84	506RM10D082	Dhungana Besi-Nisdi Khola	Class:D	6	Earthen	Dhungana Besi	Nisdi Khola	5	0.64
141	85	506RM10D083	Ghachur	Class:D	6	Earthen	Ghachur	Ghachur	5	0.25
142	86	506RM10D084	Kathai Danda Ward office Marga	Class:D	6	Earthen	Kathai Danda Ward office	Kathai Danda Ward office	5	0.06
143	87	506RM10D085	Kothar-Dhanu Bas	Class:D	6	Earthen	Kothar	Dhanu Bas	5	1.37
144	88	506RM10D086	Simal Kharak-Puchhar	Class:D	6	Earthen	Simal Kharak	Puchhar	5	0.52
145	89	506RM10D087	Saniswara-Galdha Phat-Kewara Paani	Class:D	6	Earthen	Saniswara	Kewara Paani	5	2.41
146	90	506RM10D088	Galdha Phat-Kharak-Bankarak	Class:D	6	Earthen	Galdha Phat	Bankarak	5	3.15
147	91	506RM10D089	Kharak Tole	Class:D	6	Earthen	Kharak Tole	Kharak Tole	5	0.28
148	92	506RM10D090	Ramche	Class:D	6	Earthen	Ramche	Ramche	5	0.28
149	93	506RM10D091	Ghansari Sadak	Class:D	6	Earthen	Ghansari Sadak	Ghansari Sadak	5	0.68
150	94	506RM10D092	Dhomadi-Bohori Kharak-Dhanbase	Class:D	6	Earthen	Dhomadi	Dhanbase	5	1.66
151	95	506RM10D093	Dhungana Besi-Bahapur-Archaledada	Class:D	6	Earthen	Dhungana Besi	Archaledada	5	3.86
152	96	506RM10D094	Pipal Bhanjyang - Ramche Sadak	Class:D	6	Earthen	Pipal Bhanjyang	Ramche Sadak	5	1.20
153	97	506RM10D095	Beldada-Pagdi-Namsurga	Class:D	6	Earthen	Beldada	Namsurga	5	3.63
154	98	506RM10D096	Badjhyal-Ghachur	Class:D	6	Earthen	Badjhyal	Ghachur	5	1.96
155	99	506RM10D097	Bahapur	Class:D	6	Earthen	Bahapur	Bahapur	5	0.81
156	100	506RM10D098	Gabudada-Kharak Dada-Dhanu Bas	Class:D	6	Earthen	Gabudada	Dhanu Bas	5	1.55
157	101	506RM10D099	Galdha Phat-Sadhe Gaira	Class:D	6	Earthen	Galdha Phat	Sadhe Gaira	5	1.84
158	102	506RM10D100	Dhungana Besi-Badhare	Class:D	6	Earthen	Dhungana Besi	Badhare	5	0.22
159	103	506RM10D101	Kaliban Sadak	Class:D	6	Earthen	Kaliban Sadak	Kaliban Sadak	5	2.11
160	104	506RM10D102	Kathaidada Pari	Class:D	6	Earthen	Kathaidada pari	Kathaidada pari	5	1.09
161	105	506RM10D103	Gejdanda-Tamasgiri	Class:D	6	Earthen	Gejdanda	Tamasgiri	5	0.73
162	106	506RM10D104	Dhanu Bas-Archale	Class:D	6	Earthen	Dhanu Bas	Archale	5	3.14
163	107	506RM10D105	Muda Bhanjyang	Class:D	6	Earthen	Muda Bhanjyang	Muda Bhanjyang	5	1.02

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
164	108	506RM10D106	Potaksar-Sadakbas	Class:D	6	Earthen	Potaksar	Sadakbas	5	3.28
165	109	506RM10D107	Raikot-Dhanubas	Class:D	6	Earthen	Raikot	Dhanubas	5	1.51
166	110	506RM10D108	Simal Kharak-Domadi	Class:D	6	Earthen	Simal Kharak	Domadi	5	1.78
167	111	506RM10D109	Pipal Bhanjyang-Geja-Tamasgiri	Class:D	6	Earthen	Pipal Bhanjyang	Tamasgiri	5	2.78
168	112	506RM10D110	Baglang-Tham Pokhara-Satra Saya	Class:D	6	Earthen	Baglang	Satra Saya	5	3.38
169	113	506RM10D111	Aranthar	Class:D	6	Earthen	Aranthar	Aranthar	6	0.46
170	114	506RM10D112	Bhogadi-Parkula-Sat Dwat-Archale	Class:D	6	Earthen	Bhogadi	Archale	6	0.29
171	115	506RM10D113	Jarmane Warpar-Gharti Tole	Class:D	6	Earthen	Jarmane	Gharti Tole	6	0.97
172	116	506RM10D114	Nipirak Dhara-Tallo Sadhan	Class:D	6	Earthen	Nipirak Dhara	Tallo Sadhan	6	1.18
173	117	506RM10D115	Parkula-Bahun Danda	Class:D	6	Earthen	Parkula	Bahun Danda	6	1.87
174	118	506RM10D116	Nipirak-Chidiya Tole	Class:D	6	Earthen	Nipirak Dhara	Chidiya	6	1.39
175	119	506RM10D117	Sisinga-Firfire	Class:D	6	Earthen	Sisinga	Firfire	6	1.92
176	120	506RM10D118	Aran Thar-Lekh Danda	Class:D	6	Earthen	Aran Thar	Lekh Danda	6	4.77
177	121	506RM10D119	Sadhan Dada-Dumrighat-Sisinga	Class:D	6	Earthen	Sadhan Dada	Sisinga	6	2.07
178	122	506RM10D120	Badar Bhanjyang-Ranguwa	Class:D	6	Earthen	Badar Bhanjyang	Ranguwa	6	6.52
179	123	506RM10D121	Parkula-Sat Dwat	Class:D	6	Earthen	Parkula	Sat Dwat	6	1.72
180	124	506RM10D122	Arun Khola	Class:D	6	Earthen	Arun Khola	Arun Khola	7	0.49
181	125	506RM10D123	Bahauni Kharak- Lama Pokharak	Class:D	6	Earthen	Bahauni Kharak	Lama Pokharak	7	1.26
182	126	506RM10D124	Darling Bas	Class:D	6	Earthen	Darling Bas	Darling Bas	7	0.54
183	127	506RM10D125	Gyajdar	Class:D	6	Earthen	Gyajdar	Gyajdar	7	0.48
184	128	506RM10D126	Jyamire	Class:D	6	Earthen	Jyamire	Jyamire	7	0.43
185	129	506RM10D127	Jyamire-Health Post	Class:D	6	Earthen	Jyamire	Health Post	7	0.19
186	130	506RM10D128	Labedi	Class:D	6	Earthen	Labedi	Labedi	7	0.32
187	131	506RM10D129	Simal Danda-Besar Danda	Class:D	6	Earthen	Simal Danda	Besar Danda	7	2.20
188	132	506RM10D130	Chhetri Kharak	Class:D	6	Earthen	Chhetri Kharak	Chhetri Kharak	7	0.66
189	133	506RM10D131	Chhetri Kharak-Rollabas	Class:D	6	Earthen	Chhetri Kharak	Rollabas	7	2.26
190	134	506RM10D132	Hubas	Class:D	6	Earthen	Hubas	Hubas	7	2.31
191	135	506RM10D133	Bhutuke-Jharlangdi - Labedi	Class:D	6	Earthen	Bhutuke	Labedi	7	4.61

Annex I: List of Rural Municipal Road Core Network (MRCN)

Sn:	Sn	Road Code	Road Name	Road Class	ROW	Surface	Origin	Destination	Ward Pass	Road Length (km)
			Total							**181.07**
168	1	-	Puranthar-Kandur Khola	Class C	7	New Track	Puranthar	Khandur Khola	2	0.93
169	2	-	Sukekot-Manbas-Ghusiyani	Class C	7	New Track	Sukekot	Ghusiyani	2	3.40
170	3	-	Tangbari-Kaidal	Class C	7	New Track	Tangbari	Kaidal	2	3.43
			Total							**7.76**
			Grand Total							**459.56**

Annex II: List of Scoring of (MRCN)

MRCN Scoring and Prioritization							
Class A							
Road Code	Prioritization Criteria					Total Score	Rank
	Population Served (30)	Market Along (20)	Ward Priority (20)	Service Centers (20)	Special Community (10)		
506RM10A001	0	0	1	0	0	6.67	12
506RM10A002	636	1	2	7	0	86.89	2
506RM10A003	550	1	1	5	0	71.92	3
506RM10A004	440	1	1	8	0	64.32	5
506RM10A005	0	0	0	0	0	0	13
506RM10A006	500	1	1	5	0	57.61	6
506RM10A007	452	1	3	3	0	68.53	4
506RM10A008	0	0	0	0	0	0	14
506RM10A009	3128	1	1	6	0	100	1
506RM10A010	164	1	3	5	0	37.94	9
506RM10A010	164	1	3	5	0	37.94	10
506RM10A011	92	1	3	5	0	21.98	11
506RM10A012	250	1	1	7	0	53.33	7
506RM10A012	250	1	1	7	0	53.33	8

MRCN Scoring and Prioritization							
Class B							
Road Code	**Prioritization Criteria**					Total Score	**Rank**
	Population Served (30)	**Market Along (20)**	**Ward Priority (20)**	**Service Centers (20)**	**Special Community (10)**		
506RM10B001	0	0	0	0	0	0.0	18
506RM10B002	0	0	0	0	0	0.0	19
506RM10B003	0	0	0	0	0	0.0	20
506RM10B004	0	0	0	0	0	0.0	21
506RM10B005	0	0	0	0	0	0.0	22
506RM10B006	0	0	0	0	0	0.0	23
506RM10B007	0	0	0	0	0	0.0	24
506RM10B008	0	0	0	0	0	0.0	25
506RM10B009	300	1	0	1	0	1.1	15
506RM10B010	400	1	0	14	0	1.5	13
506RM10B011	1640	4	0	10	0	5.9	6
506RM10B011	1640	4	0	10	0	5.9	7
506RM10B012	900	1	0	1	0	5.8	8
506RM10B013	565	2	0	10	0	3.7	9

Annex II: List of Scoring of (MRCN)

MRCN Scoring and Prioritization							
Class B							
Road Code	Prioritization Criteria					Total Score	Rank
	Population Served (30)	Market Along (20)	Ward Priority (20)	Service Centers (20)	Special Community (10)		
506RM10B014	3128	1	0	6	0	12.3	3
506RM10B014	3128	1	0	6	0	12.3	4
506RM10B014	3128	1	0	6	0	12.3	5
506RM10B015	121	0	0	5	0	0.8	16
506RM10B016	182	0	0	3	0	1.2	14
506RM10B017	2020	2	0	13	0	12.8	2
506RM10B018	2500	2	0	7	0	15.8	1
506RM10B019	565	2	0	10	0	3.6	10
506RM10B019	565	2	0	10	0	3.6	11
506RM10B020	0	0	0	0	0	0.0	26
506RM10B021	585	1	0	3	0	2.4	12
506RM10B022	0	0	0	0	0	0.0	27
506RM10B023	35	0	0	1	0	0.2	17
506RM10B024	0	0	0	0	0	0.0	28

MRCN Scoring and Prioritization							
Class C							
Road Code	Prioritization Criteria					Total Score	Rank
	Population Served (30)	Market Along (20)	Ward Priority (20)	Service Centers (20)	Special Community (10)		
506RM10C001	0	0	0	0	0	0.0	7
506RM10C002	854	3	0	9	0	7.4	2
506RM10C002	854	3	0	9	0	7.4	3
506RM10C002	854	3	0	9	0	7.4	4
506RM10C003	0	0	0	0	0	0.0	8
506RM10C004	854	2	0	8	0	7.4	5
506RM10C004	854	2	0	8	0	7.4	6
506RM10C005	0	0	0	0	0	0.0	9
506RM10C006	0	0	0	0	0	0.0	10
506RM10C007	0	0	0	0	0	0.0	11
506RM10C008	0	0	0	0	0	0.0	12
506RM10C009	0	0	0	0	0	0.0	13
506RM10C010	0	0	0	0	0	0.0	14

Annex II: List of Scoring of (MRCN)

MRCN Scoring and Prioritization							
Class C							
Road Code	**Prioritization Criteria**					Total Score	**Rank**
	Population Served (30)	**Market Along (20)**	**Ward Priority (20)**	**Service Centers (20)**	**Special Community (10)**		
506RM10C011	0	0	0	0	0	0.0	15
506RM10C012	0	0	0	0	0	0.0	16
506RM10C013	0	0	0	0	0	0.0	17
506RM10C014	0	0	0	0	0	0.0	18
506RM10C015	0	0	0	0	0	0.0	19
506RM10C016	1928	2	0	8	0	19.9	1
506RM10C017	0	0	0	0	0	0.0	20
506RM10C001	0	0	0	0	0	0.0	7
506RM10C002	854	3	0	9	0	7.4	2
506RM10C002	854	3	0	9	0	7.4	3
506RM10C002	854	3	0	9	0	7.4	4

Annex III: Consider Unit Cost for Different Interventions

Activities	Unit	Unit Rate, Nrs.				Source	Remarks
		Class A	Class B	Class C	Class D		
Blacktopping	Km	9352000.00	7348000.00	7348000.00	4665300	Palpa District Rate Analysis [2080/81 B.S]	
Bridge Construction	M	600000	600000	600000	600000	Mo FALD [2014 A.D]	
Cycle Lane and Footpath Construction	Km	3278996	1639498	2049373	1639498	Palpa District Rate Analysis [2080/81 B.S]	Single Sides
Street Lighting	KM	1260000	1260000	1260000	1260000	Palpa District Rate Analysis [2080/81 B.S]	Single Sides
Emergency Maintenance	Km	30000	30000	30000	30000	Mo FALD [2014 A.D]	
Gravelling and upgrading	Km	32200000	25300000	25300000	13200000	Palpa District Rate Analysis [2080/81 B.S]	Single Sides
Green Belt Construction	Km	508478	762717	0	0	Palpa District Rate Analysis [2080/81 B.S]	Single Sides
Longitudinal lined drain	Km	3789886	3789886	3789886	3872126	Palpa District Rate Analysis [2080/81 B.S]	Single Sides
Periodic Maintenance BT	Km	200000	200000	140000	200000	Mo FALD [2014 A.D]	
Periodic Maintenance Gravel	Km	250000	250000	175000	250000	Mo FALD [2014 A.D]	
Pipe Culvert	No.	10000	10000	10000	10000	Mo FALD [2014 A.D]	
Recurrent Maintenance BT	Km	500000	500000	500000	500000	Mo FALD [2014 A.D]	
Recurrent Maintenance Earthen	Km	250000	250000	250000	250000	Mo FALD [2014 A.D]	
Recurrent Maintenance Gravel	Km	400000	400000	280000	400000	Mo FALD [2014 A.D]	
Routine Maintenance	Km	20000	20000	20000	20000	Mo FALD [2014 A.D]	
Slab Culvert Construction	M	150000	150000	150000	150000	Mo FALD [2014 A.D]	
Track Opening	Km	4000000	4000000	2800000	2800000	Mo FALD [2014 A.D]	
widening	M	25000	25000	25000	25000	Mo FALD [2014 A.D]	

Annex IV: Field Photographs















Annex V: Minutes

PAGE NO.
DATE / /

निस्दी वडा नं. १

आज मिति २०८१/०२१ गते पालिका यातायात योजना बनाउने सम्बन्धमा सिभिल वोकर्स कन्सल्टेन्सी प्रा. लि [Civil works Consultancy Pvt. Ltd.] को प्राविधिक सहयोगमा यस निस्दी गाँउपालिका वडा नं. ०१ भित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा अध्यक्ष श्री यम बहादुर राना ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.सं.	नाम	पद	हस्ताक्षर
१.	यम बहादुर राना	वडा अध्यक्ष	
२.	प्रताप सिं थापा	जि.स.स. सदस्य	
३.	जुन बहादुर थापा	वडा सदस्य	
४.	अकलेश्वर नाथ चौधरी	वडा सचिव	
५.	इन्द्रजीत महतो	अ.सब-इन्जिनियर	
६.	गणेश फाल	" "	
७.	सालिकराम पाण्डे	बेस नेपाल- कार्यकारी निर्देशक	
८.	वेग बहादुर आले	इलाका कर्मचारी	
९.	भुवन सिं सोती		
१०.	देव प्रसाद पाण्डे		देव प्रसाद
११.	टिकाशिंघो पोखरेल	टिका सौर्घो	
१२.	अनिल बानियाँ		
१३.	विशाद उपाध्याय		

PAGE NO.
DATE / /

प्रस्तावहरु

प्रस्ताव नं. १) सडकको प्राथमिकिकरण, नक्साङ्कन तथा वर्गिकरण सम्बन्धमा विषय नं. १)
प्रस्ताव नं. १ माथि छलफल गर्दा यस निस्दी गाउँपालिका वडा नं. १ भित्रका सडकहरुको वर्गिकरण र प्राथमिकरण निम्न अनुसार गरिने निर्णय गरियो,

१) गोजा - दुईघरे मोटर बाटो जसको हालको चौडाई ३ मि. रहेको र लम्बाई ३ कि.मि लाई वर्गिकरण गर्दा घ वर्गमा वर्गिकरण गरियो,

२) पुरमुलाङ - बाँका मो.बा. जसको लम्बाई ३.६ कि.मि. भन्दा माथि र चौडाई ४ मि. लाई वर्गिकरण गर्दा 'घ' वर्गमा गरियो र साथै प्राथमिकतामा दोस्रो स्थानमा राखियो,

३) बाका - बौधीखोला मो.बा. जसको चौडाई ४ र लम्बाई ३.१ कि.मि. रहेकोमा यसलाई घं वर्गमा वर्गिकरण र प्राथमिकतामा दोस्रो स्थानमा राखियो,

४) गोजा - बड्हरे - छपाक्दी - हात्ती भन्ज्याङ मो.बा जसको चौडाई ४ र लम्बाई ३.५ कि.मि. लाई वर्गिकरण गर्दा घं वर्गमा वर्गिकरण गरियो,

५) बाका - बाकापोखरी मो.बा जसको चौडाई ४ मि र लम्बाई १.५ कि.मि लाई वर्गिकरण गर्दा घं वर्गमा वर्गिकरण गरियो,

[signatures] वेद प्रसाद

६) सिद्धी मन्जथाङ - बाकापोखरी - झपाक्दी मो.बा. जसको चौडाई ४ मि. र लम्बाई ३.३ कि.मि लाई वर्गिकरण गर्दा घ वर्गमा र प्राथमिकतामा बाकापोखरी सम्मको लागि तेस्रो स्थानमा राखियो,

७) पुरमुलाङ - लोकमलाङ - सिद्धि मन्जथाङ मो.बा. जसको लम्बाई २.५ कि.मि. र चौडाई ५ मि लाई वर्गिकरण गर्दा ङ वर्गमा राखियो।

८) बागेश्वरी - दोरवर डाँडा मो.बा जसको चौडाई ३ मि र लम्बाई २.५ कि.मि लाई वर्गिकरण गर्दा ङ वर्गमा राखियो,

९) अरमलाङ - फुलपाती - पोखरीथोक मो.बा जसको लम्बाई १.४ कि.मि र चौडाई ३ मि लाई वर्गिकरण गर्दा ङ वर्गमा राखियो,

१०) पोखरीथोक - राज वृक्ष - सारबुदे खोला जसको लम्बाई १.६ कि.मि र चौडाई ३ मि लाई वर्गिकरण गर्दा ङ वर्गमा राखियो,

११) अरमलाङ - अघमारा - राज वृक्ष मो.बा जसको लम्बाई ३.३ कि.मि र चौडाई ३ मि लाई ङ वर्गमा वर्गिकरण गरियो।

१२) अघमारा - तेह्रमाने - चारघरे - पच्चीसठार करीडोर मो.बा जसको लम्बाई ५.६ कि.मि र चौडाई ३ मि लाई ङ वर्गमा राखियो।

१३) लितिङ्ग विरीङ - राङ्कुवन - डमरा मो.बा जसको लम्बाई ६.७ कि.मि र चौडाई ३ मि लाई घ वर्गमा राखियो।

PAGE NO.
DATE / /

१४) खुदे - डमरा - राईका - ठूलो बारी - अरमलाङ मो.बा जसको लम्बाई ६.२ कि.मि. र चौडाई ४ मि लाई गं वर्गमा र प्राथमिकतामा पहिलो स्थानमा राखियो।

१५) राईका भन्ज्याङ - बौदी खोला मो.बा जसको लम्बाई १.२ कि.मि. र चौडाई ३ मि लाई वर्गिकरण गर्दा घं वर्गमा राखियो।

१६) खुदे बगैंचा - डमरा मो.बा जसको लम्बाई २.४ कि.मि र चौडाई ६ मि लाई वर्गिकरण गर्दा गं वर्गमा र प्राथमिकतामा पहिलो स्थानमा राखियो।

१७) पोजा - बौदीखोला मो.बा जसको लम्बाई २ कि.मि र चौडाई ३ मि लाई वर्गिकरण गर्दा घं वर्गमा राखियो।

१८) अरमलाङ - पुरमलाङ मो.बा जसको लम्बाई २ कि.मि. र चौडाई ४ मि लाई वर्गिकरण गर्दा गं वर्गमा र प्राथमिकतामा पहिलो स्थानमा राखियो।

निस्दी वडा नं. २

PAGE NO.
DATE / /

आज मिति २०८७/०२/४ गते पालिका यातायात योजना बनाउने सम्बन्धमा सिम्भिल वोर्कस कन्सल्टेन्सी प्रा.लि. [Civil Works Consultancy pvt. Ltd.] को प्राविधिक सहयोगमा यस निस्दी गाउँपालिका वडा नं. ०२ भित्रका सडकहरुको पहिचान, नाम्ाङ्कन, नकसाङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा प्रतिनिधि श्री टेक बहादुर चुहान ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.स.	नाम	पद	हस्ताक्षर
१.	टेक बहादुर चुहान	वडा प्रतिनिधि(कार्यवाहक)	
२.	भुम बहादुर राना	वुद्ध सदस्य	
३.	बोमा कुमारी कमे	वडा महिला सदस्य	
४.	नारायण सी शिर्पाली		
५.	भिवनलाल पुलामी		
६.	खडक वि राना		
७.	मन बहादुर राना		
८.	संगिता चुहान		
९.	नामडर संजाल	(कृषि प्राविधिक)	
१०.	मित बहादुर धामी	(सब-इन्जिनियर)	
११.	दिपिलाल मल्हाडी	आ.ज.	
१२.	अनिल बानिया	Civil work Consultancy	
१३.	विशाल उपाध्याय	Civil work consultancy	
१४	गणेश दर्लामी		
१५.	उमेश कुमार भाट		
१६	दीप ए० थापा		

निस्दी वडा नं. २

आज मिति २०८१/०२/४ गते पालिका यातायात योजना बनाउने सम्बन्धमा सिभिल वोकर्स कन्सलटेन्सी प्रा. लि. [Civil Works Consultancy Pvt. Ltd.] को प्राविधिक सहयोगमा यस निस्दी गाउँपालिका वडा नं. ०२ भित्रका सडकहरूको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा प्रतिनिधि श्री टेक बहादुर चुहान ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरूको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरू माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.सं.	नाम	पद	हस्ताक्षर
१.	टेक बहादुर चुहान	वडा प्रतिनिधि (कार्यबाहक)	[signature]
२.	भुम बहादुर राना	वडा सदस्य	[signature]
३.	बोमा कुमारी कर्मे	वडा महिला सदस्य	[signature]
४.	नारायण सी थिंगाली		[signature]
५.	जिवनलाल पुलामी		[signature]
६.	खडक वि राना		खड्क वि राना
७.	मन बहादुर राना		[signature]
८.	संगिता चुहान		संगिता
९.	नामबर संज्याल	(कृषि प्राविधिज्ञ)	[signature]
१०.	मित बहादुर थामी	(सब-इन्जिनियर)	[signature]
११.	देविलाल मझाङ्गी	ख्या. जि.	[signature]
१२.	अनिल बानियाँ	Civil work Consultancy	[signature]
१३.	विशद उपाध्याय	Civil work consultancy	[signature]
१४	गणेश दर्लामी		[signature]
१५.	उमेश कुमार माहत		[signature]
१६	भरत ब० थापा		[signature]

निस्दी वडा नं.-३

PAGE NO.
DATE / /

आज मिति २०८१।०२।०१ गते पालिका यातायात योजना बनाउने सम्बन्धमा सिभिल वर्कस कन्सल-टेन्सी प्रा.लि. [Civil Works Consultancy Pvt. Ltd] को प्राविधिक सहयोगमा यस निस्दी गाउँपालिका वडा नं. ०३ मित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरणको सम्बन्धमा यस वडाका वडा अध्यक्ष श्री नविन्द्र थापा सौंती ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारी-हरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.स.	नाम	पद	हस्ताक्षर
१.	नविन्द्र थापा सौंती	वडा अध्यक्ष	
२.	सुरज चौधरी	कृषि प्रा०	
३.	[illegible]	वडा सहायक	
४.	[illegible]		
५.	[illegible]	वडा सचिव	
६.	विशाल उपाध्याय	Civil Works Con.	
७.	अनिल बानियाँ	Civil Works Con.	

PAGE NO.
DATE / /

प्रस्ताबहरु

प्रस्ताब नं.१) सडकको प्राथमिकिकरण सम्बन्धमा विषय नं.१) प्रस्ताब नं.१ माथि छलफल गर्दा यस निस्दी गाउँपालिका वडा नं. ३ भित्रका सडकहरुको प्राथमिकिकरण निम्न अनुसार गरिने निर्णय गरियो।

१) डुङ्गाना बेसी - क्यानगाल्ङ - भिउरीडाँस - धुनडाँडा - मुखली रुवोला मोटर बाटो करिब २१ कि.मि जसको चौडाई ४ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'ख' वर्गमा वर्गीकरण गरिएको छ।

२) रेम्भे रुवोला - दर्व्रा - रुवदर मोटर बाटो करिब १० कि.मि जसको चौडाई ४ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'ख' वर्गमा वर्गीकरण गरिएको छ।

३) सतावर - धाकोसिङ मोटर बाटो करिब २ कि.मि जसको चौडाई ४ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'घ' वर्गमा वर्गीकरण गरिएको छ।

४) भिरुदी - मोहोरिया - साकी डाँडा मोटर बाटो करिब '४' कि.मि जसको चौडाई ४ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'ख' वर्गमा वर्गीकरण गरिएको छ।

५) लाकुरे भन्जयाङ - रोल्लाडाँस मोटर बाटो करिब २ कि.मि जसको चौडाई ३ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'ग' वर्गमा वर्गीकरण गरिएको छ।

६) धाकोसिङ - लाम्पेट मोटर बाटो करिब २ कि.मि जसको चौडाई ३ मि. [हाल] रहेको छ। यस मोटर बाटोलाई 'घ' वर्गमा वर्गीकरण गरिएको छ।

७) भिरुबोंस - लाम्प्रेट मोटर बाटो करिब २ कि.मि जसको चौडाई ३ मि. (हाल) रहेको छ। यस मोटर बाटोलाई 'घ' वर्गमा वर्गीकरण गरिएको छ।

८) डबरा - घोसिबार मोटर बाटो करिब ३ कि.मि जसको चौडाई ५.२ मि (हाल) रहेको छ। यस मोटर बाटोलाई 'घ' वर्गमा वर्गीकरण गरिएको छ।

९) रवलबारी - भल्तुवा मिल्याल मोटर बाटो करिब ७ कि.मि जसको चौडाई ३ मि (हाल) रहेको छ। यस मोटर बाटोलाई 'रव' वर्गमा वर्गीकरण गरिएको छ।

१०) रवथानगाउ. - औहिरेघाट मोटर बाटो करिब १० कि.मि जसको चौडाई ५.२ मि (हाल) रहेको छ। यस मोटर बाटोलाई 'क' वर्गमा वर्गीकरण गरिएको छ।

११) मिल्याल - रवदर - धर्कोसिड. - भिरुनी - सालकोट मोटर बाटो करिब २० कि.मि जसको चौडाई ४ मि (हाल) रहेको छ। यस मोटर बाटोलाई 'क' वर्गमा वर्गीकरण गरिएको छ।

निस्दी वडा नं. ४

PAGE NO.
DATE ०१ । २६ । २०८१

आज मिति २०८१/०१/२६ गते पालिका यातायात गुरु योजना बनाउने सम्बन्धमा निस्दी गाउँ पालिका वडा नं. ४ भित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडा का वडा अध्यक्ष श्री सहन विर सुनारी ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो ।

उपस्थिती

क्र.सं	नाम	पद	हस्ताक्षर
१.	सहन बिर सुनारी	वडा अध्यक्ष	[illegible]
२.	हेम कुमारी सुनारी	का.पा. सदस्य	[illegible]
३.	विक्रम लाई	वडा सदस्य	[illegible]
४	रोमकला वि.क.	वडा सदस्य	रोमकला
५.	कृष्ण बहादुर वि.क.		[illegible]
६.	भुवन थापा मगर	समाज सेवी	[illegible]
७.	मीन बहादुर सुनारी	" (फुलवास)	[illegible]
८.	राम बहादुर गाहा	का. प. (क्याल्टुङ)	[illegible]
९.	धन बहादुर सुनारी	खोलाल्टा	[illegible]
१०.	सहबिर रवगाहा		[illegible]
११.	नविना साम	(कृषि प्राविधिक)	[illegible]
१२.	हेम बहादुर	यम बहादुर	यम बहादुर
१३.	पान [illegible] स्रोत		[illegible]
१४.	विशाद उपाध्याय		[illegible]
१५.	अनिल बानियाँ		[illegible]
१६.	शेर बहादुर रखाम्चा		[illegible]
१७.	पदम परियार		[illegible]

PAGE NO.
DATE / /

प्रस्तावहरु

प्रस्ताव नं. १) सडकको प्राथमिकिकरण सम्बन्धमा
विषय नं. १) प्रस्ताव नं. १ माथि छलफल गर्दा यस निस्दी गाउँपालिका वडा नं. ४ भित्रका सडकहरुको प्राथमिकिकरण निम्न अनुसार गरिने निर्णय गरियो।

१. रुकसेभञ्ज्याङ – खोपलाक – भलुवा मोटर बाटो करिब ६.१ कि.मि. (Km) लाई बर्गिकरण 'ख' वर्गमा गरियो।

२. माथिल्लो काफल – तल्लो काफल मोटर बाटो करिब १.५ कि.मि. (Km) लाई वर्गिकरण 'ग' वर्गमा गरियो।

३. अनौरी देखी – प्याग्री मोटर बाटो करिब २.५ कि.मि (Km) लाई 'ग' वर्गमा गरियो।

४. मिल्थाल बजार – लामेदमार हुदै डलुके मोटर बाटो करिब १२ कि.मि. लाई 'क' वर्गमा वर्गिकरण गरियो।

५. रुकसेभञ्ज्याङ – आमडाडा हुदै विरुवा मोटर बाटो करिब ३.४ कि.मि. (Km) लाई 'क' वर्गमा वर्गिकरण गरियो।

६. मैथालटुङ्गा – च्युर्लिखरक धापडाँडा हुदै बाहुनडाँडा मोटर बाटो करिब २.५ कि.मि (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

७. धापडाँडा हुदै फुवाघाँ बिरुवा मोटर बाटो करिब ७ कि.मि. (Km) लाई 'ग' वर्गमा वर्गिकरण गरियो।

रोमकला यम बहादुर

PAGE NO.
DATE / /

८. सिरभुङ रूक्सेभञ्ज्याङ: मोटर बाटो करिब ५ किलो-मिटर (Km) लाई 'ग' वर्गमा वर्गीकरण गरियो।

९. पिपलभञ्ज्याङ: ,स्वोपलाक भौमा हुदै घंङसिंवार मोटर बाटो करिब ३.७ किलोमिटर (Km) लाई 'ग' वर्गमा वर्गिकरण गरियो।

१०. रूक्सेभञ्ज्याङ: हुदै घंङसिंवार स्वदर सिमाना सम्म मोटर बाटो करिब ३.७ किलोमिटर (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

११. रूक्सेभञ्ज्याङ: दोरि मौलाघर तल्लो मोटर बाटो करिब ५.२ किलोमिटर (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

१२. इचाल्टुङ: दोरि भिरपानी हुदै अर्चले ज्यामिरे मोटर बाटो करिब ४.६ किलोमिटर (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

१३. घुङसिंवार हुदै चौकिभंवाङ पोखरदह्र मोटर बाटो करिब ३.८ किलोमिटर (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

१४. इचालटुङ: हुदै भल्दी सम्मको मोटर बाटो करिब ५ कि.मी लाई 'ग' वर्गमा वर्गिकरण गरियो।

१५. धाक्रेदमार हुदै पाकरीदमार मोटर बाटो करिब २ किलोमिटर (Km) लाई 'ग' वर्गमा वर्गिकरण गरियो।

१६. अर्चभञ्ज्याङ: चौतारी देखी हत्सेघाट मोटर बाटो करिब ७ किलोमिटर (Km) लाई 'ख' वर्गमा वर्गिकरण गरियो।

अध्यक्ष
सोमकला

PAGE NO.
DATE / /

१७. मुढाबाँस - डुनिदमार - घिर्जे मो. बा. जसको चौडाई ४ मि र लम्बाई ३ कि.मि. जसको वर्गिकरण गर्दा श्व वर्गमा राखियो,

१८. बरु मन्जयाङ - मुढाबाँस - अरुनरवोला मो. बा जसको चौडाई ३मि र लम्बाई ३.कि.मि. रहेको छ, यसलाई वर्गिकरण गर्दा के वर्गमा राखियो,

१९. गोठडाँडा - बेलश्वरुक - मटियार डाँडा मो.बा. जसको लम्बाई १.४ कि.मि र चौडाई ४ मि लाई वर्गिकरण गर्दा ग वर्गमा राखियो,

२०. जलुके - श्वोर्मोक मोटर बाटो जसको लम्बाई १.४ कि.मि र चौडाई ३मि लाई वर्गिकरण गर्दा ग वर्गमा राखियो,

२१. भैसासुर डाँडा - रिपथर मो.बा. जसको लम्बाई २.कि.मि. र, चौडाई ३मि लाई वर्गिकरण गर्दा ग वर्गमा राखियो,

२२. थाङ-सिङ-बास मो.बा जसको चौडाई ३ मि र ६ किलोमा वर्गिकरण गर्दा घ वर्गमा राखियो,

२३. पौरवशथर - धोर्मा मो.बा जसको चौडाई ३मि लाई घ वर्गमा राखियो,

२४. मौला थर मो.बा जसको चौडाई ३मि. लाई घे वर्गमा राखियो।

PAGE NO.
DATE / /

२५. ठुलुके - धार्के दमार (खिपा) मो. बा जसको चौडाई ३ मि लाई ख वर्गमा राखियो ।

२६. मुढाबास - बाशाने मो. बा जसको चौडाई ३ मि लाई घ वर्गमा राखियो ।

२७. ह्याङ.सिङ डाँडा मो. बा जसको चौडाई ३ मि लाई घ वर्गमा राखियो ।

२८. किरुलुकाढी मो. बा जसको चौडाई ३ मि छैको घ, लाई ग वर्गमा राखियो ।

२९. थाम पोर्गा मो. बा जसको चौडाई ४ मि. लाई घ वर्गमा राखियो ।

३०. धाकरे दमार मो. बा. जसको चौडाई ४ मि लाई घ वर्गमा राखियो ।

३१. केमराज मार्ग - निशानी मन्दिर मो. बा जसको चौडाई ६ मि. लाई घ मा राखियो ।

३२. केमराज - टेठेनमान मो. बा. जसको चौडाई ३ मि. लाई घ वर्गमा राखियो ।

३३. डुल्निदमार - बाङ. दुन्गा धाट मो. बा जसको चौडाई ३ मि. लाई घ वर्गमा राखियो ।

३४. डुल्निदमार - सिरान टोल मो. बा जसको चौडाई ३ मि. लाई घ वर्गमा राखियो ।

३५. डुल्निदमार - खमोरी टोल मो. बा जसको चौडाई ३ मि लाई घ वर्गमा राखियो ।

[signatures] रोमकला

PAGE NO. ____ DATE / /

निस्दी वडा नं. ०५

आज मिति २०८१।०१।३० गते पालिका यातायात गुरुयोजना बनाउने सम्बन्धमा सिभिल वोर्क्स कन्सल्टेन्सी प्रा. लि. [civil works consultancy pvt. Ltd.] को प्राविधिक सहयोगमा यस निस्दी गाउँपालिका वडा नं. ०५ भित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा अध्यक्ष श्री दुर्गा बहादुर सोमै ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.सं.	नाम	पद	हस्ताक्षर
१.	श्री दुर्गा बहादुर सोमै	वडा अध्यक्ष	
२.	श्री छलिसरा राई	वडा सदस्य	छलिसरा
३.	श्री पुनी सरा अर्या	"	पुनिसरा
४.	श्री कृष्ण प्रसाद ज्ञवाली	"	
५.	श्री देव बहादुर लामाछाहा	"	
६.	श्री रिकलाल थापा	गाउँपालिका सदस्य	रिकलाल
७.	श्री विक्रम बहादुर जर्घा		
८.	श्री इन्द्र नारायण अर्याल		इन्द्रनारायण
९.	श्री शिव प्रसाद अर्याल		
१०.	श्री थकै बहादुर थापा		थापा
११.	श्री पम बहादुर साउ		
१२.	श्री जगत बहादुर बुढाथोकी		
१३.	श्री बि.कि. मल्ल		
१४.	श्री राजन ढोंगा		
१५.	श्री रामचन्द्र अर्याल		रामचन्द्र
१६.	श्री धनमाया काउ		धनमाया
१७	एकराज अर्याल		
१८.	विशाक उपाध्याय		
१९.	अनिल जानिया		

PAGE NO.
DATE / /

२० उमेश ओली

२१. सम्झना टेकलोटा — Samjhana

२२ राज वयम्बु

२३ पाखुरेन पंगेनी

२४- जगत बहादुर सुनार — Jagat

२५ जगत बहादुर सुनार

२६ यम बहादुर आले

२७ यमुना नाके कब्याहा

निस्दी वडा नं. ५

PAGE NO.
DATE / /

आज मिति २०८१/०१/३१ गते पालिका यातायात योजना बनाउने सम्बन्धमा सिभिल वोकर्स कन्सलटेन्सी प्रा. लि. [Civil works Consultancy Pvt. Ltd.] को प्राविधिक सहयोगमा यस निस्दी गाउपालिका वडा नं. ०५ भित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा अध्यक्ष श्री भैरव बहादुर सुनारी ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिति

क्र.सं.	नाम	पद	हस्ताक्षर
१.	श्री भैरव बहादुर सुनारी	वडा अध्यक्ष	[signature]
२.	श्री मिश्री थापा (का.पा. सदस्य)		[signature]
३.	श्री कृष्ण बहादुर सोमै (वडा सदस्य)		[signature]
४.	श्री प्रकाश राना (वडा सदस्य)		[signature]
५.	श्री मिन बहादुर राना (वडा सचिव)		[signature]
६.	श्री मनविर नेपाली (पशु प्राविधिक)		[signature]
७.	श्री मिश्री राना (बालमैत्री सहजकर्ता)		[signature]
८.	श्री सुमित्रा सारु थिंजाली (को.प.)		[signature]
९.	श्री सिर्जना खड्का		[signature]
१०.	श्री टिकाराम खनाल		[signature]
११.	श्री महेन्द्र थापा		[signature]
१२.	श्री ललिमाया	पि.ऊ.	[signature]
१३.	श्री त्रिलोकराम राई (कालादेवी प्र.)		[signature]
१४.	अनिल बानियाँ		[signature]
१५.	विशाल उपाध्याय	Civil works consultancy	[signature]
१६			
१७			
१८.			

PAGE NO.
DATE / /

प्रस्ताबहरु

प्रस्ताब नं. १) सडकको प्राथमिकिकरण सम्बन्धमा विषय नं. १) प्रस्ताब नं. १ माथि छलफल गर्दा यस निस्की गाउँपालिका वडा नं. ६ भित्रका सडक हरुको प्राथमिकिकरण निम्न अनुसार गरिने निर्णय गरियो ।

१) सिलुवा - अर्चले - मिल्याल मोटर बाटो कालिब २१.४ कि.मि. जसको चौडाई ४ मि [हाल] रहेको छ । यस मोटर बाटोलाई 'ख' वर्गमा वर्गिकरण गरिएको छ ।

२) अर्चले - सिसाघाट गल्या मोटर बाटो जसको चौडाई ३ मि. रहेको २ धुरि [लम्बाई] ८ कि.मि. रहेको छ । यस खण्डलाई ग वर्गमा वर्गिकरण गरिएको छ ।

३) आरुथार - लेकडाँडा मोटर बाटो जसको लम्बाई ७.५ कि.मि २ चौडाई २.५ मि. रहेको छ । यस खण्डलाई घ वर्गमा विभाजन गरियो ।

४) वडहर भइडयाङ - रनगुवा मोटर बाटो जसको लम्बाई ४ कि.मि. २ चौडाई २.५ कि.मि. रहेको छ । यस मोटर बाटोलाई घ वर्गमा वर्गिकरण गरियो ।

५) पारकुला - साल्दोबाट मोटर बाटो जसको लम्बाई ७.८ कि.मि २ चौडाई २.८ मि रहेको छ । यस मोटर बाटोलाई 'घ' वर्गमा वर्गिकरण गरियो ।

सही लाला

PAGE NO.
DATE / /

५) साधनडाँडा - डुम्रीचाद - शिशिकुरा मोटर बाटो जसको कुल लम्बाई ५.२ कि.मि र चौडाई २.५ मि रहेको छ। यस मोटर बाटोलाई "घ" वर्गमा वर्गिकरण गरियो।

७) थोकसिकुरा खवाक - फिरफिरे मोटर बाटो जसको कुल लम्बाई २.८ कि.मि र चौडाई २ मि. रहेको छ। यस खण्डलाई "घ" वर्गमा वर्गिकरण गरियो।

८) जम्रुने - वारपार - चर्तिटोल मोटर बाटो जसको कुल लम्बाई १.५ कि.मि. र चौडाई १.८ मि लाई "घ" वर्गमा वर्गिकरण गरियो।

९) च्युमास डाँडा - चुविसा मोटर बाटो जसको कुल लम्बाई १.४ कि.मि रहेको छ र चौडाई १.५ मि लाई "घ" वर्गमा वर्गिकरण गरियो।

१०) निपिरक धारा - चिडिया - माथिल्लो मोटर बाटो जसको कुल लम्बाई ०.४५ कि.मि र चौडाई १.५ मि. लाई घ वर्गमा वर्गिकरण गरियो।

११) अर्चुले - मुडुकदीघाट - रनगुवा मोटर बाटो जसको कुल लम्बाई ५ कि.मि र चौडाई १.५ मि. लाई "घ" वर्गमा वर्गिकरण गरियो।

१२) पारकुला खेत - बाहुनडाँडा मोटर बाटो जसको कुल लम्बाई ३ कि.मि. र चौडाई १.५ मि लाई "घ" वर्गमा वर्गिकरण गरियो।

[signatures]

PAGE NO. ......
DATE / /

निस्दी वडा नं.-७

आज मिति २०८१/०१/२८ गते पालिका यातायात गुरु योजना बनाउने सम्बन्धमा सिभिल वोर्क्स कन्सलटेन्सी प्रा.लि. [Civil works consultancy pvt. Ltd] को प्राविधिक सहयोगमा यस निस्दी गाउँपालिका वडा नं. ७ भित्रका सडकहरुको पहिचान, नामाङ्कन, नक्साङ्कन साथै प्राथमिकिकरण सम्बन्धमा यस वडाका वडा अध्यक्ष श्री मुक्त बहादुर पाठा ज्यूको अध्यक्षतामा तपसिल बमोजिमका पदाधिकारीहरुको उपस्थितिमा निम्न बमोजिमका प्रस्तावहरु माथि छलफल गरी निर्णय गरियो।

उपस्थिती

क्र.सं.	नाम	पद	हस्ताक्षर
१.	श्री मुक्त बहादुर पाठा	वडा अध्यक्ष	[signature]
२.	श्री धन बहादुर सोमै	वडा सदस्यहरु	[signature]
३.	श्री हुम बहादुर च्योहान	"	[signature]
४.	श्री पुनीसरा साउ	"	पुनी
५.	श्री धनमाया वि.क.	"	धनमाया
६.	" सुकिसा जर्घा राना		[signature]
७.	" रुकम बहादुर साउ		[signature]
८.	" जोगु बहादुर जर्घा		[signature]
९.	" तिर बहादुर राना		[signature]
१०.	" टुगा बहादुर वि.क.		[signature]
११.	" कुमार साउ		[signature]
१२.	" तुल बहादुर साउ		[signature]
१३.	" इनिसरा गाहा		इनि
१४.	" आनन्दी राना		आनन्दी
१५.	" भिमकुमारी बराल		भिमकुमारि
१६.	" मानिसरा आले		मानि
१७.	" उनीसरा फाल		उनी
१८.	" हरिमाया आले		हरि
१९.	" मनिषा आले		Manisha
२०.	" कमला वि.क.		कमला

[signatures] धनमाया [signature]

PAGE NO.
DATE / /

२१. अनिल बानियाँ civilworks con.
२२. विशाष उपाध्याय civil works cons.

प्रस्तावहरु

प्रस्ताव नं. १) सडकको प्राथमिकिकरण सम्बन्धमा
विषय नं. १) प्रस्ताव नं. १ माथि छलफल गर्दा यस निस्दी गाउँपालिका वडा नं. ७ भित्रका सडकहरुको प्राथमिकिकरण निम्न अनुसार गरिने निर्णय गरियो ।

१. ड्यामिरे देखि पोखरीछाप हुदैं मदनपुर बाट सिमल डाँडा सम्म जाने मोटर बाटो करिब कि.मि. लाई 'ख' वर्गमा वर्गिकरण गरियो ।

२. धोबला देखि चारघरे बाट हुबास हुदैं धोलेखरक देखि साङ्गी खोला सम्म जाने मोटर बाटो करिब कि.मि लाई 'ख' वर्गमा वर्गिकरण गरियो ।

३. सिन्दुरे हुदैं ड्यामिरे देखि होइसी रोड सम्म जाने मोटर बाटो करिब कि.मि. लाई 'क' वर्गमा वर्गिकरण गरियो ।

४. गुरुङ डाँडा हुदैं ड्यामिरे देखि ड्यामिरे भिर डाँडा सम्म जाने मोटर बाटो करिब कि.मि लाई 'क' वर्गमा वर्गिकरण गरियो ।

५. क्षेत्री खरक हुदैं शेलाबाँस सम्म जाने मोटर बाटो करिब कि.मि. लाई 'घ' वर्गमा वर्गिकरण गरियो ।

PAGE NO.............
DATE / /

५. क्षेत्री खरक देखि बेवाके सम्मको मोटर बाटो करिब कि.मि. लाई 'ग' वर्गमा वर्गिकरण गरियो,

६. मोटे खरक देखि लाबेदी सम्मको मोटर बाटो करिब कि.मि. लाई 'ख' वर्गमा वर्गिकरण गरियो,

८. सिमलडाँडा देखि बेसार डाँडा सम्मको मोटर बाटोलाई करिब कि.मि लाई 'घ' वर्गमा वर्गिकरण गरियो,

९. बाहुनी खरक देखि ग्याजदर सम्मको मोटर बाटोलाई करिब कि.मि. लाई 'घ' वर्गमा वर्गिकरण गरियो,

१०. ड्यामिरे हुदै साईडी खोला देखि पूर्वखोला सम्मको मोटर बाटो करिब कि.मि. लाई 'क' वर्गमा वर्गिकरण गरियो,

[signatures]

Annex VI: Priority

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी - ०१

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनरुत्थान गर्ने	अबधिक मर्मत	
क	भोटाहा - रुकुवे - डमरा - राईका - अरमलाङ - फुरमलाङ - लेप्चमलाङ - सिद्धि भन्जयाङ	४		✓			१
ख	फुरमलाङ - बाक्का - गोजा - बौदीरवोला मो·बा	४		✓			२
ग	सिद्धि भन्जयाङ - बाक्का - पोखरा - हात्ती भन्जयाङ			✓			३
घ	लिति ङ्पिरीङ - चारघरे - अरमलाङ मो·बा			✓			४
ङ	डमरा - राकुवन - लिति ङ्पिरीङ			✓			५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता ....२०७१/०२/०३..... मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	भोटाहा, ३६, १५०। रुकुवे, ६, २५। डमरा, ४६, २१६। राईका, ७, ३१। अरमलाङ, ५२, २१३। फुरमलाङ, ५५, २१३
ख	बाक्का, ४०, १५६। गोजा, १४, ५७।
ग	सिद्धिभन्जयाङ, ७५, ३०० । बाक्का पोखरा, ६५, २६१
घ	लितिङ्पिरीङ, ४, १६ । चारघरे, ६०, १६१
ङ	राकुवन, ४२, १६५

** २ न. तालिका अनुसार भर्नुहोस्

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : ०२

२. प्राथमिकताका आधारमा तालिका भर्नुहोस : बाकी

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनरुत्थान गर्ने	अबधिक मर्मत	
क	गमारी खोला - लाकुरी भन्ज्याङ्	८		✓			१
ख	लिम्दी - सुकेकोट - आनन्दी मो.बा	८		✓			२
ग	तल्लो भाइ्बारी - माथिल्लो भाइ्बारी - जुरे	४		✓			३
घ	लाकुरी भन्ज्याङ् - जुरे मो.बा	४		✓			४ Short
ङ	ताइ्बारी - कैदल मो.बा.	-	✓				५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता २०८१/०२/०४ मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	गमारी खोला, लाकुरी भन्ज्याङ्
ख	लिम्दी, ४१, २०८ / सुकेकोठ, ५०, २८० / आनन्दी, ४०, १६०
ग	तल्लो भाइ्बारी, ३६, १८० / माथिल्लो भाइ्बारी, ३७, १९० जुरे, २५, १९०
घ	लाकुरी भन्ज्याङ्, जुरे
ङ	~~ताइ्बारी, ६५, २५०~~ / कैदल, ६५, २००

** २ न. तालिका अनुसार भर्नुहोस्

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी - ३ नं. वडा

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनर्स्थापन गर्ने	अबधिक मर्मत	
क	मिल्याल - खदर - थर्कसिङ - भिरुदी - सालकोट मो.बा	५		✓			१
ख	डुङगानाबेसी - क्यानगुरुङ - भिरुवास - धुतडाँडा - मुरली खोला मो.बा	५		✓			२
ग	डबारा - धोसिबार मो.बा.	१.५	✓				३
घ	क्यानगुरुङ - ओहिरे घाट मो.बा	१.५	✓				४
ङ	खलबारी - भलुबा - मिल्याल मो.बा.	३		✓			५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता २०८१/०२/०१ मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	खदर, ८०, ४०० | थर्कसिङ, १५, १०० भिरुदी, ६०, ५०
ख	डुङगानाबेसी, ६५, ४०० | क्यानगुरुङ, १३०, ७०० भिरुवास, ४८, 220, धुतडाँडा, ४८, 220
ग	डबारा, 20, ८० | धोसिबार, १०, ४०
घ	क्यानगुरुङ ओहिरे घाट - ३०, २००
ङ	खलबारी - २०, १५० भलुबा - २०, १५०

** २ न. तालिका अनुसार भर्नुहोस्

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी - ८ नं. वडा

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम *
			नयाँ बाटो खोल्ने	स्तरोन्नति गर्ने	पुनःस्थापना गर्ने	[illegible]	
क	मित्याल्ल बजार - लामेदमार - जल्लुके	६		✓			१
ख	रुकसेभञ्ज्याङ - खोपल्ताक - भलुवा मो.बा	३		✓			२
ग	रुकसेभञ्ज्याङ - आमडाँडा मो.बा	४		✓			३
घ	मुढाबाँस - डुनियमार - धिर्जे मो.बा	४		✓			४
ङ	झ्याल्टुङ - धुलिखरक - घापडाँडा - बाहुन डाँडा	४		✓			५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता २०७९/०१/३६ मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी जनसंख्या
क	मित्याल्ल, लामेदमार, जल्लुके, १२५
ख	रुकसेभञ्ज्याङ, खोपल्ताक, भलुवा, १००
ग	रुकसेभञ्ज्याङ, आमडाँडा, विरुवा, ११३
घ	मुढाबाँस - डुनियमार, धिर्जे, २२५
ङ	झ्याल्टुङ, धुलिखरक, घापडाँडा, बाहुनडाँडा १४०

** २ न. तालिका अनुसार भर्नुहोस्

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी – ५

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनरुत्थान गर्ने	अवधिक मर्मत	
क	बुढिकोट देखी गल्धा फाँट कठैडाडा हुँदै धनुवास गबुडाडा पराकसम्म मो.बा.			✓			९
ख	कोल्मे भन्ज्याङ, देखी ढुंगानेबेशी बजार सम्म मो.बा			✓			२
ग	सनिस्वरा गल्धा फाँट केरा पानी मो.बा			✓			३
घ	पिपलभन्ज्याङ्, गेजा मो.बा			✓			४
ङ	खहरे कठैडाडा मो.बा.			✓			५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता 2079/09/30 मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	Budikot, Galdha phat, kathaidanda, Dhanubas, Gabudanda, 400, 2500
ख	Kolbhanjyang, Dhunganabesi
ग	Sanisawara, Galdha Phat, Kewara Pani
घ	Pipal bhanjyang, Geja, 75, 280
ङ	Khare, Kathai danda, 45, 182

** २ न. तालिका अनुसार भर्नुहोस्

Junction

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी - ५

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनरुत्थान गर्ने	अबधिक मर्मत	
क	सिलुवा अर्चले फिल्याहे मो. वी.			✓			1
ख	अर्चले सिस्नाघाट गल्धा मो. वी.			✓			2
ग	आरुथर- लेकडाडा मो. वा.			✓			3
घ	बडहर भडङ्याङ, रुलगुवा मो. वी.			✓			4
ङ	पारकुल्ला-सातदोबाट			✓			5

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता २०८१/०१/३१ मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	सिलुवा, ३००, १२०० अर्चले, ४६२, १९२८
ख	अर्चले, ४६२, १९२८ सिस्नाघाट, - -
ग	आरुथर, ४३, १३० लेकडाडा,
घ	बडहर भडङ्याङ, १७, ५० रुलगुवा, २८, ८५
ङ	पारकुल्ला सातदोबाट } २०, ८५

** २ न. तालिका अनुसार भर्नुहोस्

माग फारम (सडकका लागि अनुरोध)

१. वडाको नाम : निस्दी गाउँपालिका वडा नं. ७

२. प्राथमिकताका आधारमा तालिका भर्नुहोस :

कोड	बाटोको नाम	चौडाई	बाटोको प्रकार				प्राथमिकता क्रम. *
			नया बाटो खोल्ने	स्तरोन्नति गर्ने	पुनरुत्थान गर्ने	अबधिक मर्मत	
क	गुरुङ डाँडा - ज्यामिरे भिरे डाडा			✓			१
ख	ज्यामिरे - सारुङ्गी खोला - पूर्वखोला			✓			२
ग	सिन्धुरे - ज्यामिरे - हाई.सी रोड			✓			३
घ	धोवला - चारघरे - हुबास - धोर्लेखरक - सारुङ्गी खोला			✓			४
ङ	मोटरखरक - लाबेदी			✓			५

पहिलो प्राथमिकताका लागि १, दोस्रोका लागि २ भर्नुहोस्

३. माथिको प्राथमिकता २०८१/०१/२७ मितीमा बसेको वडा बैठकबाट तोकिएको हो।

४. लाभान्वित बस्ती :

कोड **	बस्तीको नाम, घरधुरी/ जनसंख्या
क	ज्यामिरे, ५३, २५०
ख	पोखरी थाप, ४६, १५०
ग	सिमल डाँडा, ३०, ९१
घ	चारघरे, ८५, ३१५
ङ	हुबास, ८०, २७०

** २ न. तालिका अनुसार भर्नुहोस्