



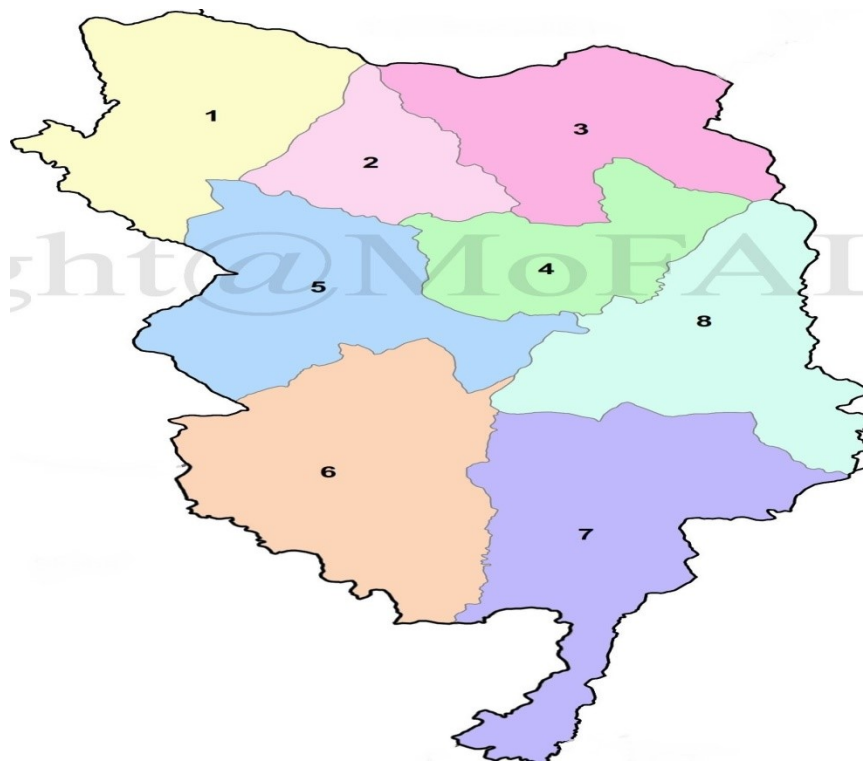
Udayapurgadhi Rural Municipality  
Office Of The Rural Municipal Executive  
Udayapurgadhi,Udayapur  
1 no. Pradesh,Nepal

2020

Final Report

On

## Rural Municipality Transport Master Plan (RMTMP)



Submitted By

Ellipse Engineering Consultancy (P) Ltd.  
Kathmandu,Nepal

## **PREFACE / ACKNOWLEDGEMENTS**

This MTMP Report for Udayapurgadhi Rural Municipality has been prepared on the basis of *Municipality Transport Master Plan Preparation Guidelines and terms of reference prepared by the Ministry of federal affairs and Local development, Infrastructure Development Division, (IDD), Singhadurbar, Kathmandu, November 2014*, and as per the ToR provided along with the contract agreement with the Udayapurgadhi Rural Municipality.

The job was entrusted to the Ellipse Engineering Consultancy (P) Ltd. This report is prepared and submitted as draft report.

The consultants would like to express its appreciation to the officials from Udayapurgadhi Rural Municipality are highly grateful for the support. We are very grateful with the Executive officer who directly and indirectly contributes during this study and field survey.

Finally, the project team would like to express thanks to all staffs and colleagues of Ellipse Engineering Consultancy (P) Ltd. for their anxious support for this study.

## **DECLARATION LETTER**

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

## EXECUTIVE SUMMARY

Udayapurgadhi Rural Municipality is located in Udayapur district in Province No:1. It lies in eastern part of Hetauda Sub-metropolitan City and covers an area of 269.51 square kilometer within latitude 26°55'44"N and longitude 85°40'00"E. This municipality was established merging three VDCs namely Panchawato, bhalayadanda, Tawasri, dumre and Barre. The municipality stands at the elevation of approximately 1161m.

According to the national census 2011, the total population of the municipality is 30,731. Udayapurgadhi Rural municipality has an average population density of around 110 person per sq. km. There are people of various religious beliefs, Hinduism, Buddhism, Islam, Christianity etc. but Hinduism is the major religion followed.

Inner mobility and other development activities fully depend on expansion of rural road network within the district. Udayapurgadhi Rural municipality has all-weather and also non-weather transport facilities as most of the rural municipal roads are earthen.

S.N.	Road Name	Length (Km)			Total length (KM)
		BT	GR	ER	
1.	Strategic road network				
a					
b					
c.					

Road inventory was conducted manually and study shows that Udayapurgadhi Rural municipality has 85 municipal roads. Most of the municipal roads have earthen surface restricting their operations in only fair weather. Moreover, construction quality of the road was found to be poor and people over there demand the upgrading of existing road condition to all weather roads to increase accessibility and improve overall transport situation of the municipality. Some roads were temporarily impassable flooding. Many road passes through markets and since width of market roads are 8m they are classified under road class C.

According to traffic survey conducted, it was found that people uses private vehicles mostly motorcycle for travelling purpose. In case of short distance people preferred walking. Due to lack of good roads, use of modes of public transport like bus for travelling purpose was found to be very less. Few numbers of trucks were found to be used for the purpose of transportation of goods, agricultural products.

Preparation of MTMP is an attempt of preparing municipal development plan for the sustainable development of a municipality. Since transportation infrastructure plays vital role to foster economic development, proper planning of road network is required along with parallel development of other sectors in order to achieve the goal of visionary city development plan.

MTPP cost of all roads is around 773.22 million and all roads. The first five-year financial plan is prepared based on the assumption that each year budget will increase and intervention is assumed to be completed in 24 years. The budget allocated for road for upcoming five fiscal years and year wise target along with the breakdown in survey and design, conservation and improvement are tabulated below.

Source of Budget	Fiscal Year				
	2076/77	2077/78	2078/79	2079/80	2080/81
Total budget	40000	44000	48400	53240	58564
Survey and design	2000	2200	2420	2662	2928
Conservation (NRs)	2000	2200	2420	2662	2928
Improvement	8000	8800	9680	10648	11713
New Construction	28000	30800	33880	37268	40995

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## ABBREVIATIONS

DDC	District Development Committee
DoLIDAR	Department of Local Infrastructure Development and Agriculture Road
DoR	Department of Road
DTICC	District Transport Infrastructure Coordination Committee
DTMP	District Transport Master Plan
DTPP	District Transport Perspective Plan
GIS	Geographical Information system
GPS	Global Positioning System
GON	Government of Nepal
LGCDP	Local Governance and Community Development Programme
MoFALD	Ministry of Federal Affairs and Local Development
MTICC	Municipality Transport Infrastructure Coordination Committee
MTMP	Municipality Transport Master Plan
RAP	Rural Access Program
SOR	Socially oriented responsibility
SWAp	Sector Wide Approach
VDC	Village Development Committee

## **1.1 BACKGROUND**

This report on Rural Municipality Transport Master Plan of Udayapurgadhi Rural municipality is the outcome of study carried out by Engineering Consultancy for Ellipse Engineering Consultancy (P) Ltd. as per the agreement between the Office of Udayapurgadhi Rural municipality and the consultant. This Rural Municipality Transport Master Plan (RMTMP) has been prepared following the Municipality Transport Master Plan preparation guide lines and terms of reference prepared by MoFALD. This report has been prepared with intensive field visit of Transport planner, Engineer, Social mobilizers, Enumerators and other professionals.

Nepal having least developed rural countryside communities, rural development is one of the main agenda for the overall development of the nation. The ultimate goal of rural development is attainment of sustainable livelihood and improved well-being of rural people. In the absence of better access to the goods and services; the people suffers. Rural people's needs for sustainable livelihood and improved well-being are possible only when they have better access to information, markets and opportunities; they need better access to health, education and other goods and services. The MTMP is designed to take account of the real needs of the rural population for easy access to infrastructure.

Integrated Rural Accessibility Planning (IRAP) could be an effective tool to assess the existing situation of the services and facilities in rural areas. The access situation of the services and facilities including the infrastructure for each settlement will indicate the interventions to improve the access situation. The interventions derived from the Integrated Rural Accessibility Planning will represent the real needs and priorities of the local people. The planning approach should be participatory and Bottom-up, Demand Driven Approach from the settlement level. The implementations of such projects will certainly be more participatory and owned by the local communities. That makes the plan and project sustainable in the long run.

Local self-Governance Act 2055 and the Regulation 2056, has provisioned DDC and VDC for local level planning process to identify, prioritize and development of various sectoral plan and programs according to need-based and public participatory approach. Accordingly, the act has provisioned to formulate the periodic plan of the district with the visions, mission and strategy of the district vis-à-vis integrated Plan of the various sectors and sub sector agencies. Municipality Transport Master Plan (MTMP) is infrastructure development plan of district to identify the Rural Road Interventions it contains the perspective plan of Rural Road and holds the prioritized Rural Roads investment for five-year period.

Municipality Transport Perspective Plan (MTPP) is a long-term transport plan of feasible rural linkages based on the socio-economic, geo-physical structure, development potentialities, as well as accessibility conditions of the district. The Rural Roads linkages are scored, graded and classified according to the Approach for the development of Rural and Agriculture Roads - DoLIDAR. A total Road Network is prepared to provide transport access to the settlements within the national standard of minimum hour to reach the all-weather Roads.

## **1.2 OBJECTIVE OF MTMP**

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

- Finalize visionary city development plan if Comprehensive Town development plan is not prepared
- Analyze the accessibility situation.
- Identify and priorities the interventions based on the accessibility situation
- Prepare Indicative Developmental Potential Map (IDPM)
- Prepare the Municipality Inventory Map (MIM) of Road networks.
- Collection of demands for new/rehabilitation transport linkages from Municipalities / Settlements based on city development plan.
- Prepare the Perspective Plan of transport services and facilities;
- Synchronies the Final Perspective Plans of adjoining VDCs/Municipalities/districts
- Develop scoring criteria and its approval from Municipality.
- Prepare the five year Municipality Transport Master Plan (MTMP)
- Prepare a realistic physical and financial implementation plan of prioritized roads for the MTMP period; and
- Prepare Municipal Transport Perspective Plan (MTPP)

## **1.3 SCOPE AND LIMITATION OF MTMP**

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

- Assist for the formation of the municipality roads coordination committee (MRCC)
- Secondary sources of information and review of the existing MTMP (if any)
- Accessibility data collection and analysis
- Prepare the Indicative Municipality Development Potential Map (IDPM)
- Prepare the Municipality Inventory Map (MIM) of Urban Road, Main Trails and Bridges
- Collection of Demands for New/Upgrading/Rehabilitation Transport Linkages from Wards/Settlements
- Developing Scoring Criteria and it's Approval from Municipality
- Road Classification and Nomenclature
- Preparation of Perspective Plan of Interventions of Services and Facilities
- Analyze Fund Availability for Roads
- Preparation of the Municipality Transport Master Plan (MTMP)
- Prepare a Realistic Physical and Financial Implementation Plan of Prioritized Roads for the MTMP Period

## **1.4 APPROACH AND METHODOLOGY**

### **1.4.1 General approach**

The team has gone through the objective and ToR for preparation of the Municipality Transport Master Plan (MTMP). The ToR was itself sufficient for the execution of the work.

It is participatory and bottom-up approach. Active involvement of community people and local authorities in every step is essential. The consultant facilitated the community people and local authorities in their needs identification, project prioritization and visionary development planning process.

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

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

#### 1.4.2 Methodology

The methodology comprises with the Planning tools for the accessibility planning and manual/ Guideline for the roads for the preparation of the MTMP with some modification as per Municipality situation and based on the ToR provided by the Municipality and as directed by the project in-charge of the client.

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

Table 1: The general methodology of the study is outlined below

S N	List of Task	Activities	Outputs
<b>1.0</b>	<b>Data Collection</b>		
1.1	Review of secondary source of information Review of existing MTMP	<ul style="list-style-type: none"> <li>Collection of secondary information/Maps from the various Municipality based line agencies, I/NGOs and other regional and central level related institutions.</li> <li>Review of available existing MTMP if any</li> <li>Data collection about year wise budgeting for MTMP road and progress report of Municipality</li> <li>Interaction with Municipality technician and other officials</li> </ul>	Obtain information about Municipality situation in general, ready to precede further steps. Trend of implementation of MTMP planning , constraint of implementation will be found out
1.2	Accessibility data collection	Through enumerators/field supervisor: <ul style="list-style-type: none"> <li>Verification of secondary data in the field.</li> <li>Collection of road data using GPS</li> <li>Collection of access situation of every settlement in prescribed format.</li> </ul>	find out the access situation of every settlement , identification of gaps with the reference to Comprehensive City Development Plan
2	Analysis of Data	<ul style="list-style-type: none"> <li>Data entry -storage of collected data in computer using MS Excel software.</li> <li>Base map preparation</li> <li>Calculation of accessibility index</li> </ul>	Compilation of data, Accessibility index of all Wards of the Municipality
3	IDPM preparation	<ul style="list-style-type: none"> <li>Assess the various potentiality of development of the Municipality</li> </ul>	IDPM report, Finalization of Growth

		<ul style="list-style-type: none"> <li>Organized Municipality/MRCC meeting</li> <li>GIS map preparation</li> </ul>	Centers, identification and ranking of existing/potential areas and services
4	<b>MIM preparation</b>	<ul style="list-style-type: none"> <li>Assess the inventory of existing transportation linkage</li> <li>Reconnaissance survey</li> <li>Identification of required intervention</li> <li>Map preparation</li> </ul>	MIM report, identify the existing transport situation, verification of MIM through discussion with the municipality
5	<b>Area workshop Ward/VDC level</b>	<ul style="list-style-type: none"> <li>Participatory workshop in each wards</li> <li>Discussion about criteria of prioritization.</li> <li>Standardize the accessibility indicator</li> <li>Synchronize of interventions at Municipality level</li> <li>Validation of access data</li> <li>Prioritization of interventions.</li> </ul>	Prioritization of interventions and projects.
6	<b>Perspective Plan</b>	<ul style="list-style-type: none"> <li>Compile the result from                             <ul style="list-style-type: none"> <li>Accessibility analysis.</li> <li>Area workshops</li> </ul> </li> <li>Identify and prioritize the interventions in every services and facilities based on approved Municipality standard.</li> <li>Extract required interventions in transport linkage from the perspective plan of services and facilities</li> </ul>	Perspective Plan of service and facilities including Municipality road network
7	<b>MTMP Preparation</b>	<ul style="list-style-type: none"> <li>Assess the financial resources</li> <li>Priorities the perspective plan</li> <li>Preparation or updating MTMP</li> </ul>	First five year Municipality road planning
8	<b>Approval of MTMP</b>	<ul style="list-style-type: none"> <li>Presentation of Final MTMP on Municipality council through MRCC and Municipality meetings.</li> </ul>	Final MTMP report

### 1.4.3 Desk Study

#### *Project Sensitization to Team*

After signing the contract, the consultant has arranged a meeting of the proposed team and orient towards the objectives and scope of the work along with the working and manning schedules so that all the personnel will work as a team. The consultant has proposed a study team consisting of Transport Planner as a Team Leader, Socio-economist, who are competent and established professionals in their field of work. The study team was mobilized for further study

### Task 1 Data Collection

#### a) **Collection and Review of Secondary Information**

The information about demographic data of Municipality, maps, service flow pattern, various maps showing service centers or the location of SOR facilities, transport infrastructure inventory, past plans and sectoral study reports, sectoral standards and policy targets were collected from the secondary sources like Ministries, Departments, Municipality, line agencies of Municipality, central Bureau of Statistics, Topographical Survey Branch, Local NGOs. The details are given below:

**List of documents/information shall have been collected and reviewed**

- Previous reports of MTMP prepared by the Municipalities (if any)
- MTMP of neighboring Municipality (if available).
- District/Municipality periodic plan prepared by the DDC/Municipality
- Annual reports /publications of line agencies of Municipality
- District/Municipality profile of the DDCY/Municipality
- Traffic data of the Municipality rural roads and strategic roads (if available)
- Annual plan, Programme and Budgetary allocations of last 5 years
- Expenditure in infrastructure development including roads in last 5 years
- Report on settlement pattern and market centers of the Municipality
- Rural road statistics of neighboring Municipalities and strategic road Networks
- Financial and technical Data of ongoing rural road projects in the Municipalities and schedule including bilateral and multilateral funded projects.
- Demographic Statistics and socio-economic feature of the Municipality
- Other relevant reports

**Collection of Maps**

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

The main agencies for sources of information are

- District Development Committees (DDC),
- Municipality
- Line agencies/office of the district about road, Municipality Soil Conservation office, Forest, Agriculture Development, Livestock Service, Irrigation, Health, Education, Water Supply and sanitation, cottage industries, Municipality Technical Office, Municipality Chamber of Commerce and Industries office etc.
- National or Municipality Research Organizations,
- Local and national NGO and INGO's working in development fields,
- District /Municipality Chamber of Commerce and Industries office
- National Bureau of Statistics.
- Department of survey
- Other relevant office

The secondary information collected from above mentioned sources has been critically reviewed. The data were verified by and Cross checking of information of various sources and discussion with informants and local community people at unofficial and official meetings, workshops on the process of primary data collection.

The consultant has reviewed the available existing MTMP and assesses the achievements during the last MTMP period.

**b) Primary Data collection**

The relevant SOR sectors have been identified as per purpose of study. Primary information was taken from concerned community people, VDC/ward officials, and school teachers about real accessibility situation of settlements in special format developed for this purpose.

**c) Municipality Accessibility Planning and MTMP Orientation**

One-day orientation program has been carried out in the Municipality for the MTMP preparation. The participants were Municipality body, ex-Municipality body, line

agencies, stakeholders, and representatives of national political parties and representatives from women, Dalit, local NGOs. The field visit of enumerators has been arranged to:

- Verify the secondary data in the field.
- Collect data of access situation of every settlement in prescribed format.

## **Task 2 Analysis of Data**

Compilation of data/Information collected from primary and secondary sources has been done by storing the data on computer. The data was entered in spreadsheet and prepare tables calculating the indicator/ criteria approved by Municipality. The analysis has been done on the basis of time and quality factors.

## **Task 3 Indicative Development Potential Map (IDPM) preparation**

The development potential of the Municipality in agriculture, horticulture, livestock, cottage and small industries, other potentiality of the Municipality has been compiled and prepared on the base map 1:25000 scale.

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

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

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

- Areas with extensive agriculture,
- Areas with extensive horticulture,
- Areas with extensive Livestock farming,
- Areas with extensive fisheries,
- Areas with extensive high value cash crops,
- Areas with extensive business markets,
- Potential Areas with tourism development,
- Potential Areas with development of large industries like hydropower, mining develop,
- Potential service center
- And other potential development areas

**c) Plotting of the development potential areas on the Municipality base map has been done and the finalized map was prepared on GIS.**

## **Task 4 Preparation of MIM**

The Team has plot the trail, bridge and road network of the Municipality in 1:25000 and GIS maps from Municipality level secondary sources. The Team then carry out reconnaissance survey in the trails, bridges and roads with the help of checklist and update the map. The consultant has also prepared indicative cost estimates of improvements (Routine maintenance, recurrent maintenance & upgrading) and new construction of representative trails, bridges and road in the Municipality. The consultant has prepared a support document of MIM and validates the MIM and the document in MRCC. MIM has been prepared with reference to Annex (Reference to Annex 3). The economic data was collect by conducting PRA.

The consultant has prepared list of all existing transport linkage under the category of routing maintenance, recurrent maintenance, periodic maintenance and upgrading. These

lists have been prepared separately for various classes of roads. The consultant then prepared indicative cost estimate for improvement.

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

- Section requiring routine maintenance
- Section requiring periodic maintenance
- Section requiring rehabilitation
- Unordered section (new construction)

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

### **Task 5 Perspective Plan**

The required of interventions of services and facilities has been identified from the accessibility analysis and compilation of ward level workshops. During the final Municipality level workshop, the Municipality standard of time and quality accessibility for every service and facilities has been decided. The required intervention of every services and facilities has been identified and finalized on workshop on the basis of accessibility indicator. The Prioritized sector of services and prioritization of wards for every sector was done at Municipality level based on AI.

In transportation sector, list of roads, bridges and required interventions for respective roads and bridges has been identified to improve accessibility to goods and services within the Municipality. The perspective plan of Municipality road has been prepared for 20-25 years. All the identified interventions screened and graded on the basis of criteria 'B' of the approach manual. The interventions of services and facilities for the improvement of the access situation was discussed first with the Municipality technical team and the MRCC, and only upon their recommendation it was forwarded to Municipality Council meetings, hence the final perspective plan of Municipality roads has been developed. The perspective plan has been shown in GIS maps also.

### **Task 6 MTMP Preparation**

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

#### **1.4.4 Process and Activities in detail:**

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

- a. New construction
  - b. Upgrading
  - c. Rehabilitation
  - d. Recurrent maintenance
  - e. Periodic maintenance
- These lists have been prepared separately for various classes (Municipality Road, Village Road, Main Trial, and Village Trial).



- On the basis of Criteria (for prioritization), the consultant has ranked all the above projects
- The financial resources of Municipality on road sector has been analyzed first
- The Consultant has prepared next Five Year's Projected Financial Plan by accounting all possible financial resources of Municipality and concerned wards and VDCs.
- The consultant has prepared Five Year Financial Plan of the Municipality based on likely availability of financial resources in next five year. (All consolidated financial resource has been projected based on the past 3- 5 yeas data.
- The Consultant will determine the tentative lengths that could be under taken by each year, in each category and under each class. These lengths shall be documented and presented.
- The Consultant has prepared all ranked lists of transport linkages to the Municipality development Committee for the selection of year - wise priority lists which should be implemented in the first, second and fifth year.
- All ranked lists of transport linkages; the Consultant has selected the year-wise priority lists to be included in the "*Five Year Master Plan*".
- Based on the approved year-wise priority lists, the Consultant has prepared Five Year Rural Road Master Plan.
- Synchronizing of the Final Perspective Plans with adjoining Municipality was done
- The Final report of MTMP was presented on Municipality and MRCC in a workshop. Incorporating the suggestions and recommendations from the Municipality and MRCC, the final report has been prepared. Subsequently, the Municipality will present the final MTMP report to the Municipality council for formal approval

#### **1.4.5 Organization of Workshop**

Following workshop was organized

##### **1) Municipality accessibility planning and MTMP Orientation**

One day orientation program was carried out in the Municipality for the accessibility planning and MTMP preparation. The participants were Municipality body, ex- Municipality body, line agencies, stakeholders, representatives of national political parties and representatives from women, Dalit, local NGO.

##### **2) Accessibility Data collection training**

One day orientation training for enumerators was organized for them about efficient data collection using accessibility planning tools at the consultant's office.

##### **3) Ward/ VDC/cluster level workshop**

The consultant has organized ward/ cluster level workshop in each ward in which ward secretaries, representatives of political parties, women, NGO's, disadvantaged peoples representations, davits, traders, industries were presented. The workshop primarily focused on following aspects.

- Access situation within the area
- Validation of accessibility data
- Identification of interventions of every services and facilities.
- Access situation within the area
- Assess the local prioritization

##### **4) Final workshop at Municipality level**

The final validation workshop at Municipality level was organized at Municipality. The workshop was primarily focus on following aspects:

- Verification and update of secondary information and data's
- Finalizing IDPM, MIM, Accessibility profiles.

- Standardize accessibility indicator.
- Finalization of intervention required and prioritized at Municipality level.
- Identifying new viable transportation linkages and standard.
- Problem identification in the rural transport linkage and required intervention on this.
- Identifying required intervention (i.e. routine maintenance, periodic maintenance, rehabilitation and upgrading length) for each transportation linkages and bridges.
- Responsibility of ward and Municipality regarding maintenance, rehabilitation and upgrading works.
- Financial recourse mobilization for the achievement of the set target.

**5) Final workshop at Ministry level**

The final workshop at Ministry level was organized at MoFALD. The workshop was primarily focus on the technical aspects of the planning.

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

### **2.1 ACCESSIBILITY SITUATION OF THE MUNICIPALITY**

This municipality is formed with the eight wards. In this present situation the people of the all wards has access with road head. Since the people has access with the road head it's assumed that people has access with the services and facilities including the utilities. Though; the local people have few difficulties for the access situation due to irregular public transportation facilities in the local level. On above of that most of the roads are not all weather.

### **2.2 RISK SENSITIVITY SITUATION OF THE MUNICIPALITY**

Risk sensitivity analysis will not eliminate the uncertain risk but it can reduce those risk to the minimum and provide the tools for minimizing risk as the action goes forward. People suffer a relentless cycle of periodic destruction of homes, livelihoods, schools and disruption of life given the country's geographical vulnerability to frequent natural disaster.

In the recent days the nation has faced the severe threats from the earthquake devastation. Likewise, the landslide, fire, floods, soil erosion and other are of prime importance to consider before preparation of any development plan of the city or town. During our field visit we find some of the roads pass by the landslide prone zone and some of they passes by the flood plain too. Therefore, before implementing and having detailed design and survey all of the roads should study in detail for the risk sensitivity.

Disaster resilience infrastructure should be made in order to ensure sustainable development of a municipality. To create a wider safety net for the entire community, local government, communities and other organizations should collectively address such issues.

**3.1 MUNICIPALITY PROFILE****3.1.1 Background**

Udayapurgadhi Rural Municipality is located in Udayapur district in Province No:1. It lies in Northern part of Triyuga Municipality and covers an area of 269.51 square kilometer within latitude 26°55'00" N and longitude 86°40'00" E. This municipality was established merging three VDCs namely Panchawato, bhalayadanda, Tawasri, dumre and Barre. The municipality stands at the elevation of approximately 1161m.

According to the national census 2011, the total population of the municipality is 30,731. Udayapurgadhi Rural municipality has an average population density of around 110 people per sq. km. There are people of various religious beliefs, Hinduism, Buddhism, Islam, Christianity etc. but Hinduism is the major religion followed.

Inner mobility and other development activities fully depend on expansion of rural road network within the district. Udayapurgadhi Rural municipality has all-weather and also non-weather transport facilities as most of the rural municipal roads are earthen.

**3.1.2. Physical location and geographical Characteristics**

Udayapurgadhi Rural municipality is located in the Eastern part of Nepal and covers an area of around 269.51 square kilometers. Topographically Udayapurgadhi Rural municipality entails 26°55'00" N and longitude 86°40'00" E longitudes.

**3.1.3. Socio economic**

The Demographic features and other social characteristics of the Municipality have been presented here;

Table 2: Demography

S.N.	Description	Year 2011
1	Total Population	30567
2	Female	14730
3	Male	15837
4	No. of household	6697
5	Population Density Per Sq.KM	113.4
6	Average household size	4.56

Table 3: Population in Udayapurgadhi Rural Municipality

S.N.	VDC	Population			Total no of Household
		Total	Male	Female	
1	Bwanse	2555	1328	1227	843
2	Mansintar Ghata	2922	1515	1407	587
3	Jaruwa	3341	1705	1636	595
4	Dumre	2088	975	1113	406
5	Udayapurgadhi	4761	2493	2268	925
6	Nepaltar	5470	2824	2646	1129
7	Hadebas	4714	2453	2261	1286
8	Naretar	4716	2406	2310	926

❖ **Festivals**

The festivities such as the Dashain, Tihar, Shivaratri and many more are observed by all Hindu and Buddhist communities of Udayapurgadhi. Some of the traditional festivals observed in Udayapurgadhi apart from those previously mentioned, are Bada Dashain, Tihar, Maghe Sankranti, Naga Panchami, Janai Poornima, Teej/Rishi Panchami.

❖ **Ethnic groups**

The largest ethnic groups are Chhetree, Brahmin-hill, Newar, Kami, and Tamang etc. The major languages are Nepali, Newari, Tamang. English is understood by limited number of people. The major religions are Hinduism, Buddhism and Christianity.

❖ **Literacy rate**

Table 4: Population aged 5 years and above by literacy status and sex

S.N.	VDC	Population aged 5 years & above	People who			Literacy (%)
			can read & write	can read only	can't read & write	
1	Bwanse	2400	1456	777	167	60.66
2	Mansintar Ghata	2750	1,862	340	548	67.7
3	Jaruwa	3341	2100	294	947	62.85
4	Dumre	2000	1112	85	803	57.47
5	Udayapurgadhi	4600	2300	1200	1100	50
6	Nepaltar	5410	3240	1420	750	59.88
7	Hadebas	4670	3350	1100	220	71.73
8	Naretar	4700	3600	800	300	76.59

Source: CBS

**3.4 TRAFFIC VOLUME STUDY**

According to traffic survey conducted, it was found that people uses private vehicles mostly motorcycle for travelling purpose. In case of short distance people preferred walking. Due to lack of good roads, use of modes of public transport like bus for travelling purpose was found to be very less. Few number of trucks were found to be used for the purpose of transportation of goods, agricultural products etc. to and from the production area and market center.

Walking still constitutes an important mode of transport in urban areas. It will contribute in controlling pollution and also in reduction of fuels. Beside walking, cycling is another best option mainly in case of terai region. Since this municipality lies in terai region and the plain terrain is a plus point for cycling, it will be beneficiary to promote the use of cycle than other motorized two wheelers for short route. For this cycle lane should be provided in the roads. Also, Public transport remains the primary mode of transport for most of the livelihood Nepal. So, emphasis should be given to public transport rather than private transport.

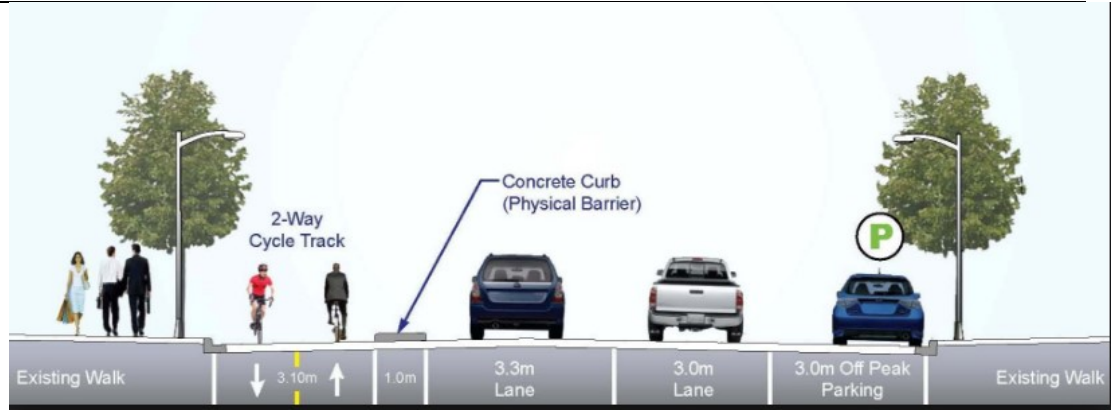


Figure 1: Typical cross section of road with cycle lane

### 3.4.1 Mode choice

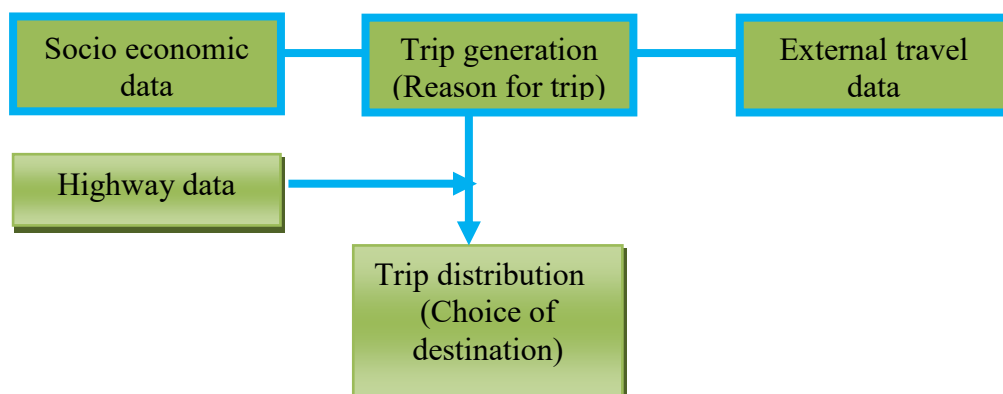
People choose the mode of transportation as per their convenience and their requirement. Different factors affect the mode choice. Some of them are:

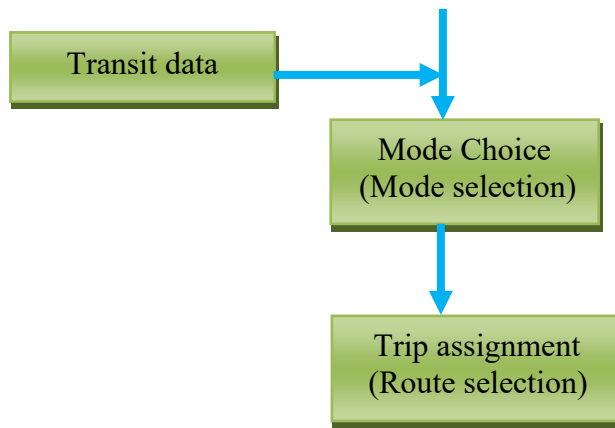
- Household characteristics
  - ✓ Income
  - ✓ Household structures
- Zone characteristics
  - ✓ Land use
  - ✓ Land price
- Residential density, rate of urbanization
- Accessibility
- Vehicle ownership
- Quality of local public transit
- Purpose of travel, nature of work
- Travel time, cost and distance

### 3.4.2 Future traffic forecast

Traffic forecasting is the process of estimating the number of vehicles or people that are likely to use different transportation facilities in the future. Forecasting and estimation of growth in vehicular population of any major transportation engineering development requires capturing the past trend and using it to predict the future trend based on qualified assumptions, simulations and models created using explanatory variables.

Figure 2: Flow chart of travel demand forecasting





From the traffic survey conducted over Udayapurgadhi Rural municipality following traffic data were collected and future traffic were forecasted taking growth rate 7% using following formulae:

$$F = P(1+r)^n$$

Where;

F = Future traffic

n = number of years

r = growth rate

P = Present traffic

Table 5: Future traffic forecast

S.N.	Vehicle	Present traffic	Future traffic forecast			
			5 years	10 years	15 years	20 years
1	Motor cycle	152	213	299	419	588
2	Car-Jeep-Minibus	25	35	49	69	97
3	Truck-bus	15	21	30	41	58

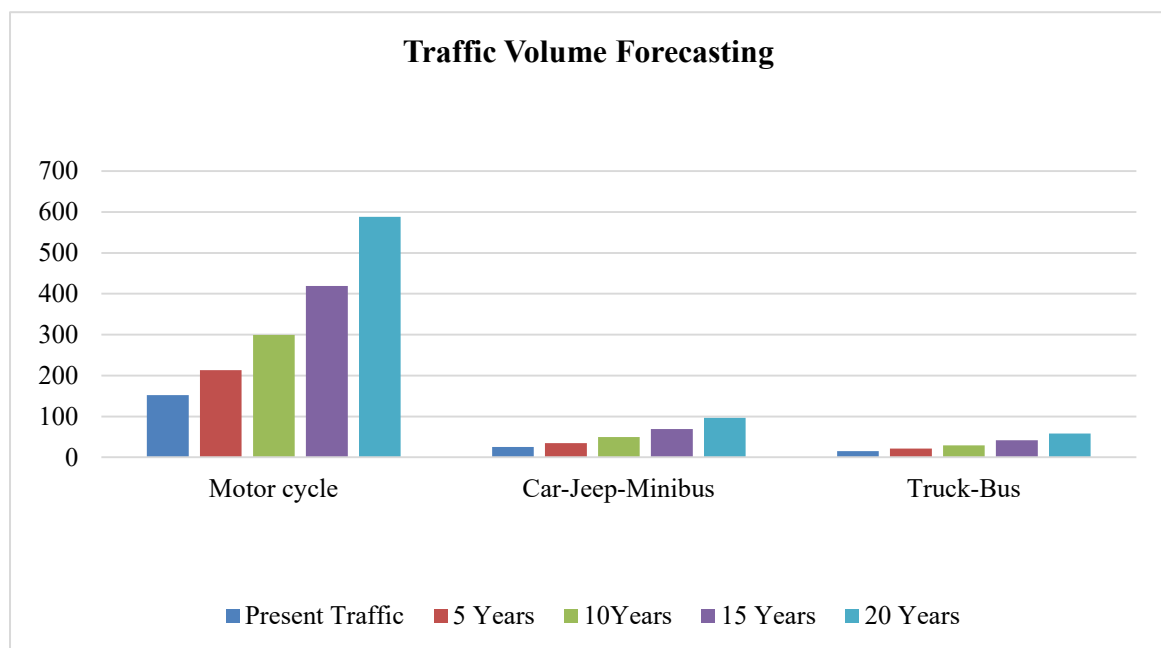


Figure 3: Traffic volume forecasting

From the above table, it is clear that the number of vehicles will be doubled after 10 years. Knowledge of future traffic flow is an essential input in planning, implementation and development of transportation system. These traffic forecast data are used for various

operation like roadway and intersection level of service, delay, measure of effectiveness, road design etc. so while planning transport networking, future forecast have to be considered along the past trend analysis.

### **3.4.3 Population projection**

Population projections are estimates of the population for future dates. Projections illustrate possible courses of population change based on assumptions about future births, deaths, net international migration, and domestic migration. However, unpredictable factors can change fertility rates, mortality rates (Certain government policies are making it easier and more socially acceptable to use contraception and abortion methods). or migration rates, which can cause difficulty in forecasting.

The population of Nepal has been steadily rising recent decades. Population is one of the major influencing factor of traffic forecasting. So, it has been considered here while preparing municipal transport master plan.

After the declaration of the municipality, it is expected to increase the population. Population growth rate for upcoming years are calculated using following formula:

$$\text{Population growth rate} = \frac{P(t_2) - P(t_1)}{P(t_1)(t_2 - t_1)}$$

Here, population growth rate is considered the same for all the year. Population projection of upcoming year are as follows:

As a whole since this is a new rural municipality, urbanization will take place resulting in population growth. So, while preparing transport master plan these population forecast has been considered.

### **3.4.4 Transportation management**

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

#### **1. Drainage system:**

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

#### **2. Parking area:**

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

#### **3. Road furniture**

Different objects and equipment should be installed on roads for various purpose e.g. traffic signals, traffic signs, street light, traffic barriers, bus stands, bus stops etc. Road furniture will

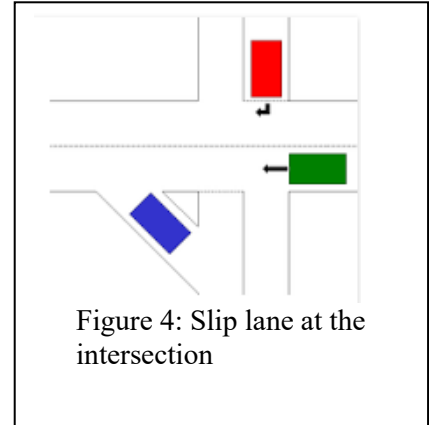
- Ensure the most efficient and effective use of resources
- Building the aesthetics in surrounding area
- Ensure traffic safety
- Provide comfort to the pedestrian (bus stand, benches)



- Control and regulates traffic flow

So while installing road furniture following elements should be considered:

- Standard road sign
- Junction improvement i.e. entry and exit through slip lanes with proper acceleration and deceleration lane
- Provision of raised footpath for pedestrian
- Inside widening for sharp curves
- Adequate off set distance from natural



### 3.5 ROAD CLASSIFICATION

Various methods of road classification are as follows:

Table 6: Road classification criteria

Criteria	Class A	Class B	Class C	Class D
<b>Purpose</b>	Mobility	Mobility and control access	Access and mobility	Access
<b>Function</b>	Through and long distance movement	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
	High network coverage	Support through movement of traffic	Access to property	Direct access to property
	Segregated NMT facilities and Bus lay bays	Segregated NMT facilities and Bus lay bays	Segregated NMT facilities	Local NMT movement
	Complete access to public transport	High access public transport	Access limited to public transport	
<b>Maintenance Responsibility</b>	Municipality	Municipality	Municipality and local people	Local people
<b>Speed (kmph)</b>	80-100	60-80	50-60	40-50
<b>Capacity (PCU/hr.)</b>	4000-4800	2400-3600	1500-2400	Less than 1500

<b>Access Control</b>	Full control	Partial control	No	No
<b>Public transport services</b>	Mass transit facilities	Mass transit, Local public transport	Access to public transport	No public transportation
<b>Right of way</b>	Minimum 14 m	Minimum 10m	Minimum 6m	Minimum 4m

Here for the classification of road, guideline has been followed i.e. Right of way has been considered for road classification.

### 3.6 MUNICIPAL AND DIGITAL NAME CODING

Digital Naming and the coding of the road have been done as prescribed by the MTMP Preparation guideline. As per this, the digital name of the roads has been carried out starting from the SRN. And the coding of the road has been done for all roads starting from the district code. The Digital name are assigned so that,

- first digit represents roads under strategic road network
- followed by a digit which indicates the number of collector road
- Then following digit indicates the nth sub collector road.
- Since there is no strategic road network in this municipality, class A roads are taken as main roads for naming.
- In case of this municipality due to absence of SRN Road class A area assumed as major roads for digital naming.

Once the roads are finalized, each municipal roads are assigned a road code. During assignment of road code guideline has been followed. As per the guide line, road code is made up of nine digit where first two digit represent the district, third digit letter 'M' represents municipality, fourth and fifth digit represents number of particular municipality, sixth digit represents class of the road and next three digits represents the particular transport linkage.

Digital name are assigned in such a way that first digit represents roads under strategic road network followed by a digit which indicates the number of collector road then following digit indicates the n<sup>th</sup> sub collector road. Since there is no strategic road network in this municipality, class A roads are taken as main roads for naming.

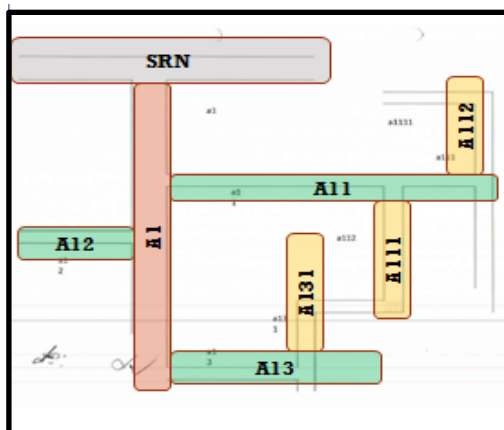


Figure 5: Digital naming of road

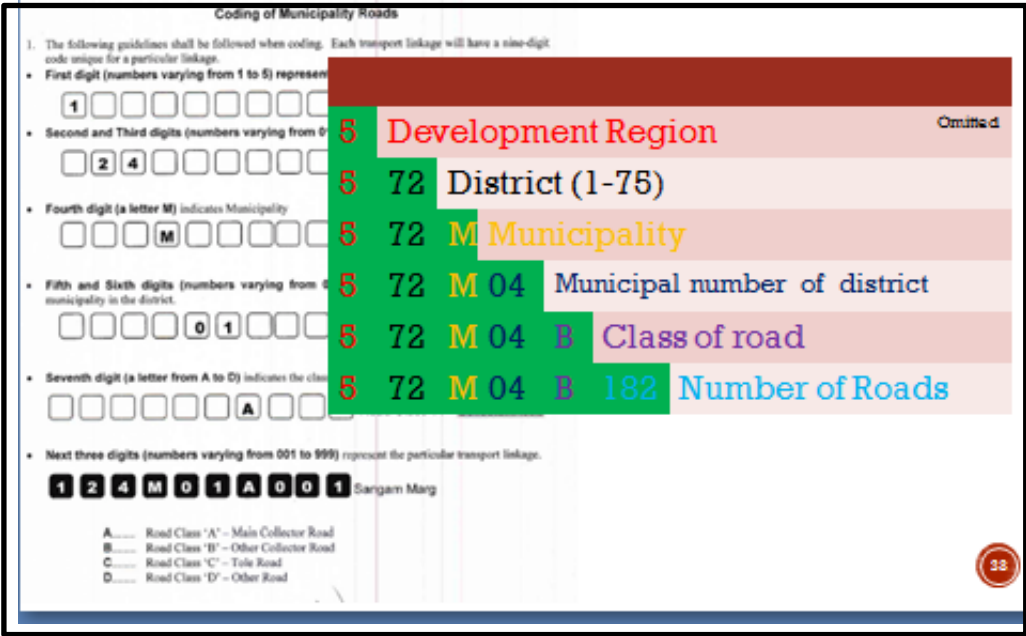


Figure 6: Coding of municipal roads

## CHAPTER 4: MUNICIPALITY INVENTORY MAP OF ROAD NETWORK

### 4.1 EXISTING TRANSPORT SITUATION

Udayapurgadhi Rural municipality has no air transport service to complement the surface transport facilities. Inner mobility and other development activities fully depend on expansion of rural road network within the district. Udayapurgadhi Rural municipality has no all-weather transport facilities as most of the municipal roads are earthen.

Table 7: Road network of municipality

S.N.	Road Name	Length (Km)			Total length (KM)
		BT	GR	ER	
1.	Strategic road network				
a					
b					
c.					

Study and analysis shows that Udayapurgadhi Rural municipality has 85 municipal roads. Most of the roads have earthen and surface restricting their operations in only fair weather. Moreover, construction quality of the road is poor and has to be upgraded to all weather roads to increase transport accessibility of the people and improve the overall transport situation of the municipality. Different roads need different type of interventions.

Table 8: Summary of Road inventory according to the class of roads

Road Class	No.s	Length (km)
A	9	52.275
B	19	77.905
C	57	119.766
<b>Total</b>	<b>85</b>	<b>249.946</b>

Based on the road type following inventory has been made.

Table 9: summary of Road inventory according to the type of roads

Road type	Length (km)
Black topped	11.6
Gravel	28.958
Earthen	209.378
<b>Total</b>	<b>249.946</b>

### 4.2 SUMMARY OF ROAD CLASS A

Among the 85 municipal roads, following 9 roads are the roads with right of way greater than 14m hence categorized as road class “A”. These roads are also the major roads of the municipality connecting various major markets.

Table 10: List of Road class “A”

Code	Name of Road	Total length (km)	Black Top (km)	Gravel (km)	Earthen (km)	All weather (km)	Fair weather (km)
31M01A001	अधेरी - भुटिया	9.6		1.00	10.60	अधेरी - भुटिया	9.6
31M01A023	नाग्रंगे - अधेरी			7.70	7.70	नाग्रंगे - अधेरी	
31M01A034	गौरी भन्ज्यांग - आमबोटे - च्यांगेल			7.10	7.10	गौरी भन्ज्यांग - आमबोटे - च्यांगेल	
31M01A058	नरेटार - चुरुम्फा - दरे गौडा - माथिलो चुरुम्फा			14.775	14.775	नरेटार - चुरुम्फा - दरे गौडा - माथिलो चुरुम्फा	
31M01A067	डुम्रे- जरुवा			2.30	2.30	डुम्रे- जरुवा	
31M01A070	पाडे भन्ज्यांग - मजुवा			1.60	1.60	पाडे भन्ज्यांग - मजुवा	
31M01A072	भुटिया संदाने - झालुंगे पुल			5.30	5.30	भुटिया संदाने - झालुंगे पुल	
31M01A074	तित्रिबोट - सासुटार - भलयडाडा			1.50	1.50	तित्रिबोट - सासुटार - भलयडाडा	
31M01A077	फलाटे - तोरीबारी - कामन			1.40	1.40	फलाटे - तोरीबारी - कामन	

### **Brief Description of Road Class “A”**

Roads with Right of Way greater than or equal to 14m are categorized as Road Class “A”. These are the main collector road of the municipality. Generally class A roads are linked with strategic road network, highly dense settlement, major growth area, higher level market centre, service centers etc. These roads are facilitated with various road furniture, green belts for all road users i.e. vehicles, pedestrian, cycle etc. as shown in Figure no. 17.

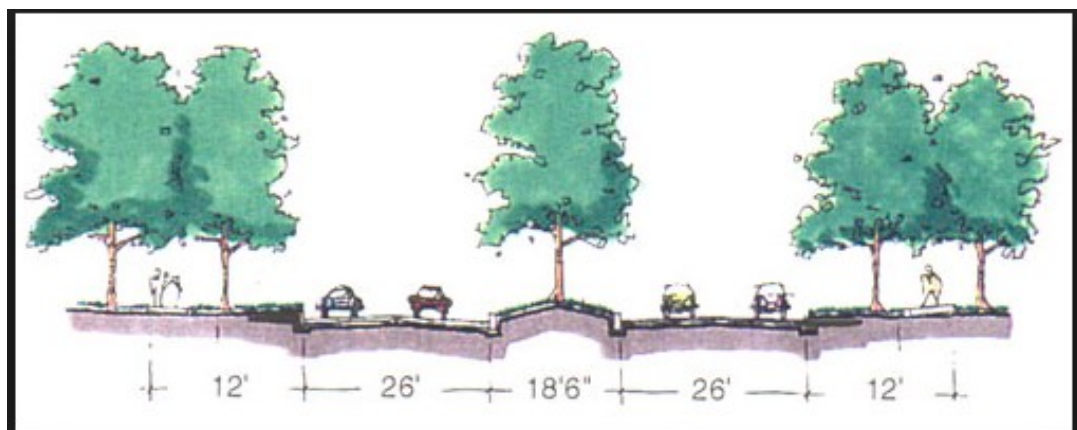


Figure 7: Typical cross section of Road Class "A"

### **4.3 SUMMARY OF ROAD CLASS B**

Roads with Right of Way greater than or equal to 10m are categorized as Road Class “B”. These are the other collector road beside main collector roads of the municipality. Generally class B roads are linked with road class “A”, settlement, various market centre, service centers etc. these roads are facilitated with various road furniture, green belts for all road users i.e. vehicles, pedestrian, cycle etc. as shown in Figure no. 18



Figure 8: Typical cross section of Road Class "B"

In this municipality, there are all together nineteen roads which are categorized under road class “B”. List of road class B and individuals brief description are as follows:

Table 11: List of Road class “B”

Code	Name of Road	Total length (km)	Black Top (km)	Gravel (km)	Earthen (km)	All weather (km)	Fair weather (km)
31M01B003	अधेरी - भुटिया	9.6		1.00	10.60	अधेरी - भुटिया	9.6
31M01B005	ज्यामिरे - अधेरी - हाडिवास			6.30	6.30	ज्यामिरे - अधेरी - हाडिवास	
31M01B005	तिल्किने मगरती - बलान भन्ज्यांग			9.20	9.20	तिल्किने मगरती - बलान भन्ज्यांग	
31M01B009	नेपालटार बजार - ढाडेचौरी	2		6.60	8.60	नेपालटार बजार - ढाडेचौरी	2
31M01B010	वर् भन्ज्यांग - कुर्कुनटार			5.48	5.48	वर् भन्ज्यांग - कुर्कुनटार	
31M01B014	नेपालटार गडी - कुर्कुम्टार-पुरानो गडी		8.64	0.40	9.05	नेपालटार गडी - कुर्कुम्टार-पुरानो गडी	
31M01B018	बरे -हिले खोला			8.40	8.40	बरे -हिले खोला	
31M01B020	चिउरी भन्ज्यांग - बेतिनी			1.65	1.65	चिउरी भन्ज्यांग - बेतिनी	
31M01B021	गडी-कुरुम्टार		3.836	0.25	4.09	गडी-कुरुम्टार	
31M01B027	बन्चरे - कुर्कुनचा		0.53		0.53	बन्चरे - कुर्कुनचा	
31M01B028	डुम्रेटार			1.023	1.023	डुम्रेटार	
31M01B032	डुम्रेटार - वलमपकिटोल			0.212	0.212	डुम्रेटार - वलमपकिटोल	
31M01B032	हदेवास वार्ड कार्यालय - थापातर			1.30	1.30	हदेवास वार्ड कार्यालय - थापातर	
31M01B033	नकटि - धवसे फुलबारी - थापाटार			4.00	4.00	नकटि - धवसे फुलबारी -	

						थापाटार	
31M01B035	नकटि - माथिल्लो फुलबारी - थापाटार			1.90	1.90	नकटि - माथिल्लो फुलबारी - थापाटार	
31M01B037	मैनाटार - थाकलडाडा			0.219	0.219	मैनाटार - थाकलडाडा	
31M01B038	मातेखोला - देवान - सरुने			1.30	1.30	मातेखोला - देवान - सरुने	
31M01B041	गौरी भन्ज्यांग - भदौरे			1.95	1.95	गौरी भन्ज्यांग - भदौरे	
31M01B042	फुस्रे - सुरी - वलायेडाडा			2.10	2.10	फुस्रे - सुरी - वलायेडाडा	

#### 4.2 SUMMARY OF ROAD CLASS C

Roads with Right of Way greater than or equal to 6m are categorized as Road Class “C”. These are the main tole roads of the municipality. Generally class C roads are market roads etc. connecting various local markets and service centres. Typical cross section of road class C is as shown in figure 19.





Figure 9: Typical Cross Section of Road Class "C"

Table 12: List of Road class “C”

Code	Name of Road	Total length (km)	Black Top (km)	Gravel (km)	Earthen (km)	All weather (km)	Fair weather (km)
31M01C002	अधेरी - भुटिया	9.6		1.00	10.60	अधेरी - भुटिया	9.6
31M01C004	खत्रिटार - बर्दमार		15.948		15.95	खत्रिटार - बर्दमार	
31M01C006	बोहोरे - संदाने - बर्दमार			13.20	13.20	बोहोरे - संदाने - बर्दमार	
31M01C007	आहाले - केसे - बस्तीपुर			8.60	8.60	आहाले - केसे - बस्तीपुर	
31M01C008	साज्बोटे - मजुवा - वर्गाडी			7.00	7.00	साज्बोटे - मजुवा - वर्गाडी	
31M01C011	ताराखोला- मजुवा - चुलाहुंगा- डारे भन्ज्यांग			3.80	3.80	ताराखोला- मजुवा - चुलाहुंगा- डारे भन्ज्यांग	
31M01C012	राग भन्ज्यांग -बेतिनी			0.50	0.50	राग भन्ज्यांग - बेतिनी	
31M01C013	स्वस्थे चौकी- ढकाल चोक			0.20	0.20	स्वस्थे चौकी- ढकाल चोक	
31M01C015	पाडे भन्ज्यांग - गजेठुमका			1.20	1.20	पाडे भन्ज्यांग - गजेठुमका	
31M01C016	चुली डाडा - कोल्बोटे			0.75	0.75	चुली डाडा - कोल्बोटे	
31M01C017	चुली डाडा - धहर			0.90	0.90	चुली डाडा - धहर	
31M01C019	जल्केनी - ठकुरी पाखा			1.60	1.60	जल्केनी - ठकुरी पाखा	
31M01C022	माझ गाउँ - मजुवा फेदी			2.70	2.70	माझ गाउँ - मजुवा फेदी	

31M01C024	जल्केनी - सिरुबानी			0.45	0.45	जल्केनी - सिरुबानी	
31M01C025	हेमनते चुवा डाडा - रिठा खोला			1.2	1.2	हेमनते चुवा डाडा - रिठा खोला	
31M01C026	पक्कि पुल - बासघारी			0.42	0.42	पक्कि पुल - बासघारी	
31M01C029	वर भन्ज्यांग			1.60	1.60	वर भन्ज्यांग	
31M01C030	धराना भन्ज्यांग - वर् भन्ज्यांग			1.74	1.74	धराना भन्ज्यांग - वर् भन्ज्यांग	
31M01C031	वर् भन्ज्यांग - तिन खोप्रे			0.98	0.98	वर् भन्ज्यांग - तिन खोप्रे	
31M01C036	कुर्कुनटार - ब्यसे			0.32	0.32	कुर्कुनटार - ब्यसे	
31M01C039	कुर्कुनटार - सिरुटार			0.81	0.81	कुर्कुनटार - सिरुटार	
31M01C040	भन्ज्यांग - निमुरे			0.74	0.74	भन्ज्यांग - निमुरे	
31M01C044	कुर्कुनटार - बन्चरे			1.47	1.47	कुर्कुनटार - बन्चरे	
31M01C045	रातेमाटो - डुम्रेटार - क्युरेनी			1.20	1.20	रातेमाटो - डुम्रेटार - क्युरेनी	
31M01C046	डुम्रेटार- लोयोटोल			0.816	0.816	डुम्रेटार- लोयोटोल	
31M01C047	डुम्रेटार - कनयाखोला			1.465	1.465	डुम्रेटार - कनयाखोला	
31M01C049	डुम्रेटार - क्युरेनी			3.1	3.1	डुम्रेटार - क्युरेनी	
31M01C050	सत्यवती - नाग्बेले			4.00	4.00	सत्यवती - नाग्बेले	
31M01C052	दुर्गे - रुम्जाटार			1.60	1.60	दुर्गे - रुम्जाटार	
31M01C053	गैया - हात्तीढुंगा			0.20	0.20	गैया - हात्तीढुंगा	
31M01C054	विध्यनाथ झुलुंगे पुल - आइतबारे			2.00	2.00	विध्यनाथ झुलुंगे पुल - आइतबारे	
31M01C055	भकुन्डे चौरी - काली खोला सम्म			2.20	2.20	भकुन्डे चौरी -	

						काली खोला सम्म	
31M01C056	भुमारे - बेटाहा			1.67	1.67	भुमारे - बेटाहा	
31M01C057	भुमारे - अदारे			0.55	0.55	भुमारे - अदारे	
31M01C059	भुमारे - अर्नेटार			0.40	0.40	भुमारे - अर्नेटार	
31M01C061	भुमारे - मतितार			1.28	1.28	भुमारे - मतितार	
31M01C062	गिर्गिनी - ठुलो नाग्रेली			2.243	2.243	गिर्गिनी - ठुलो नाग्रेली	
31M01C063	पिडिबाट - रामझाटार - नागबेली - सत्यवती			1.05	1.05	पिडिबाट - रामझाटार - नागबेली - सत्यवती	
31M01C064	फुलामी टोल- अर्ने			1.50	1.50	फुलामी टोल- अर्ने	
31M01C065	पानी टंकी- थापाटार फुलबारी ध्वसे			3.00	3.00	पानी टंकी- थापाटार फुलबारी ध्वसे	
31M01C066	बलान भन्ज्यांग - बतासे - चिउरी बास			1.40	1.40	बलान भन्ज्यांग - बतासे - चिउरी बास	
31M01C068	हर्दिया - सहर			4.90	4.90	हर्दिया - सहर	
31M01C069	अर्जिगरे - सिस्नेघारी			1.24	1.24	अर्जिगरे - सिस्नेघारी	
31M01C071	पात्लेवास - इन्द्रवोती - मैनातर			0.3	0.3	पात्लेवास - इन्द्रवोती - मैनातर	
31M01C075	मैनाटार -कृषि			0.416	0.416	मैनाटार -कृषि	
31M01C076	मैनाटार - सानाचोरी			0.644	0.644	मैनाटार - सानाचोरी	
31M01C079	घाम्पे - गौरिटार			0.94	0.94	घाम्पे - गौरिटार	
31M01C080	पौवा खोला - तिन्ने बोट			1.70	1.70	पौवा खोला - तिन्ने बोट	

31M01C082	घैया बारी - खोल्मे गैडा खोर			3.80	3.80	घैया बारी - खोल्मे गैडा खोर	
31M01C085	चुरुम्फा घोट डाडा - धारे खोला			2.80	2.80	चुरुम्फा घोट डाडा - धारे खोला	
31M01C085	घोट डाडाटोल - धारा खोला			0.80	0.80	घोट डाडाटोल - धारा खोला	
31M01C086	गैडा खोर - बिर्ता गाउँ			0.90	0.90	गैडा खोर - बिर्ता गाउँ	
31M01C087	पौवा खोला - ठाडो बाटो			1.30	1.30	पौवा खोला - ठाडो बाटो	
31M01C089	मिलान्चोक् नरेटार - कयेर पनि गडेरे			1.3	1.3	मिलान्चोक् नरेटार - कयेर पनि गडेरे	
31M01C089	गडेरे - पोखरी			1.9	1.9	गडेरे - पोखरी	
31M01C090	तल्लो चुरुम्फा - वाईवाघर - बसेरी			0.8	0.8	तल्लो चुरुम्फा - वाईवाघर - बसेरी	
31M01C091	लाकुरे भन्ज्यांग - बौलाटार - खोला छेउ			2.449	2.449	लाकुरे भन्ज्यांग - बौलाटार - खोला छेउ	
31M01C092	सिम्ले - बौलाटार - मुर्कुची - चुरुम्फा			5.074	5.074	सिम्ले - बौलाटार - मुर्कुची - चुरुम्फा	
31M01C093	नारेटार - तित्रीबोट			3.3	3.3	नारेटार - तित्रीबोट	
31M01C093	अधेरी - भुटिया	9.6		1.00	10.60	अधेरी - भुटिया	9.6
31M01C094	खत्रिटार - बर्दमार		15.948		15.95	खत्रिटार - बर्दमार	
31M01C097	बोहोरे - संदाने - बर्दमार			13.20	13.20	बोहोरे - संदाने - बर्दमार	
31M01C098	आहाले - केसे - बस्तीपुर			8.60	8.60	आहाले - केसे -	

						बस्तीपुर	
31M01C099	साज्बोटे - मजुवा - वर्गाडी			7.00	7.00	साज्बोटे - मजुवा - वर्गाडी	
31M01C100	ताराखोला- मजुवा - चुलाहुंगा- डारे भन्ज्यांग			3.80	3.80	ताराखोला- मजुवा - चुलाहुंगा- डारे भन्ज्यांग	
31M01C102	राग भन्ज्यांग -बेतिनी			0.50	0.50	राग भन्ज्यांग - बेतिनी	
31M01C103	स्वस्थे चौकी- ढकाल चोक			0.20	0.20	स्वस्थे चौकी- ढकाल चोक	
31M01C104	पाडे भन्ज्यांग - गजेठुमका			1.20	1.20	पाडे भन्ज्यांग - गजेठुमका	
31M01C105	चुली डाडा - कोल्बोटे			0.75	0.75	चुली डाडा - कोल्बोटे	

## CHAPTER 5: PERSPECTIVE PLAN OF MUNICIPALITY TRANSPORT NETWORK

### 5.1 PROCESS AND PROCEDURE FOR COLLECTION OF DEMAND

Ward level meeting were held in each wards and demand forms were filled as per the demand and priority of the local people. From the discussion held in wards, various demands of people regarding requirement or upgrading of infrastructures were listed out and were prioritized. The hearings from public play a major role in planning the transportation network in future.

### 5.2 SCORING SYSTEM FOR SCREENING, GRADING AND PRIORITIZATION

A network consists of several links. It is not possible to construct all roads at a time due to resource gap, time constraint and limited management capacity. Therefore, each link in a network should be prioritized. Each road link is then allocated the number of points corresponding to the fulfillment of the particular criteria. The aggregate number of points that each intervention receives is computed by simple adding the points allocated per indicator. The result of this process leads to a ranking of the investment options. The following criteria are used for prioritization of new transport linkages:

Table 13: Scoring system for prioritization

S.N.	Criteria	Scoring Unit	Score
1	Link providing service to large settlement areas/population	Population served/km	15
2	Link providing service to areas with high potential for agriculture, horticulture, livestock production	Per Km income	10
3	Link providing service to existing Commerce and business centres, Market sites, Tourist attraction areas, areas having agro-based and cottage industries, other growth centres  a) Estimated annual transaction in these centres equivalent to NRs.../km	Per Km, Amount	20
4	Population served by service centers	Population served/km	15
5	Link providing service to the potential growth or service centres identified by the District Development Committee and shown in the Indicative Development Potential Map of the District	Per Km Pop.	5
6	Link providing service to the potential future development sites such as hydropower development sites, mines, etc. as indicated in the IDPM of the district	Per Km Financial turn over	10
7	Special social Consideration center		15
8	Linkages with another Transport Linkages		10

### 5.3 POSSIBLE INTER MUNICIPALITY LINKAGE

In this municipality, there are some rural roads which in future will be possible inter-municipality link roads. After completing the target of planned roads, there will be good transport facilities for the people of two municipalities. Municipality should give priority for constructing the planned road which will be inter-municipality linkage and MTMP should be updated regularly. List of possible inter-municipality link roads are as follows:

### 5.4 PERSPECTIVE PLAN OF MUNICIPALITY TRANSPORT NETWORK WITH THE RESPECTIVE SCORE AND RANKING

Perspective plan of the municipality is the development plan that includes the plan of development of all roads hierarchy within the municipality. MTMP is short term Municipality Transportation Master Plan generally of 5 years which includes the prioritized road demands whereas perspective plan is a long term plan which includes the overall road demand of the municipality.

Perspective plan identifies all the infrastructure demands of the municipality. The proposed road networks and road infrastructure will help to enhance the overall transportation network of the municipality result in increased accessibility and mobility. The visionary development plan i.e. the municipal development plan will help to develop other sectors of the municipality along with the development of transportation sector. The well facilitated and well-connected road will facilitate safe, comfortable and efficient trips to the road user. Also increase in transportation facility will help to boost the economic development of that particular municipality which will contribute in overall economic activities of the nation. MTPP cost of all roads is around 773.22 million and all roads. The first five year financial plan is prepared based on the assumption that the each year budget will increase and intervention is assumed to be completed in 24 years.

Activity	Unit	Unit cost (NPR)
Rehabilitation	km	800,000
Widening	m	25,000
Gravelling	km	2,200,000
Blacktopping	km	5,700,000
Bridge construction	m	600,000
Slab culvert construction	m	150,000
CC Causeway construction	m	100,000
Stone Causeway construction	m	10,000
Pipe culvert placement	unit	10,000
Masonry wall construction	m <sup>3</sup>	10,000
Gabion wall construction	m <sup>3</sup>	2,500
Lined drain construction	m	1,000

Table 14: Standard Cost of Improvement

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

Table 15: Standard cost of conservation



Table 16: List of road for Municipality Perspective Plan

S.N.	Road Code	Name of the Roads	Length	Criteria-1, Mark-15	Criteria-2, Mark-10	Criteria-3 Mark-20	Criteria-4, Mark-15	Criteria-5, Mark-5	Criteria-6, Mark-10	Criteria-7, Mark-15	Criteria-8, Mark-10	Total Weighted score	Rank
1	31M01A023	अधेरी - भुटिया	10.60	12	7	10	12	4	7	12	2	67	1
2	31M01A001	नाग्रंगे - अधेरी	7.70	7	6	5	7	2	12	14	9	62	2
3	31M01A034	गौरी भन्ज्यांग - आमबोटे - च्यांगेल	7.10	6	5	5	7	2	10	15	10	60	3
4	31M01A067	नरेटार - चुरुम्फा - दरे गौडा - माथिलो चुरुम्फा	14.775	7	5	4	6	2	9	15	10	59	4
5	31M01B051	ज्यामिरे - अधेरी - हाडिवास	6.30	0	16	14	0	1	1	15	10	57	5
6	31M01B042	तिल्किने मगरती - बलान भन्ज्यांग	9.20	7	6	6	9	4	7	8	8	56	6
7	31M01C105	खत्रिटार - बर्दमार	15.95	7	2	6	9	2	4	15	10	56	7
8	31M01B018	नेपालटार बजार - ढाडेचौरी	8.60	7	8	6	9	3	4	11	7	55	8
9	31M01C039	बोहोरे - संदाने - बर्दमार	13.20	7	5	6	8	2	1	15	10	53	9
10	31M01B060	वर् भन्ज्यांग - कुर्कुनटार]	5.482	7	6	5	7	0	1	15	10	50	10
11	31M01B041	नेपालटार गडी - कुर्कुम्टार-पुरानो गडी	9.05	13	4	10	13	4	4	2	1	50	11
12	31M01B021	बर्ने -हिले खोला	8.40	8	9	7	10	3	3	6	4	50	12
13	31M01C104	आहाले - केसे - बस्तीपुर	8.60	11	4	9	12	4	4	2	1	46	13
14	31M01A070	डुम्रे- जरुवा	2.30	7	5	6	8	3	5	6	6	46	14
15	31M01C103	साज्बोटे - मजुवा - बर्गाडी	7.00	11	4	9	11	4	3	2	1	45	15
16	31M01C102	ताराखोला- मजुवा - चुलाढुंगा- डारे भन्ज्यांग	3.80	10	4	9	11	4	3	2	1	45	16

17	31M01C100	राग भन्ज्यांग -बेतिनी	0.50	10	4	9	11	4	3	2	1	44	17
18	31M01B009	चिउरी भन्ज्यांग - बेतिनी	1.65	5	3	3	6	2	3	14	9	44	18
19	31M01C099	स्वस्थे चौकी- ढकाल चोक	0.20	10	4	9	11	4	3	2	1	44	19
20	31M01C098	पाडे भन्ज्यांग - गजेठुमका	1.20	10	4	9	11	3	3	2	1	43	20
21	31M01A058	पाडे भन्ज्यांग - मजुवा	1.60	7	5	4	6	2	3	9	7	43	21
22	31M01C094	चुली डाडा - कोल्बोटे	0.75	10	4	8	10	3	3	2	1	42	22
23	31M01C093	चुली डाडा - धहर	0.90	9	3	8	10	3	3	2	1	41	23
24	31M01C090	जल्केनी - ठकुरी पाखा	1.60	9	3	8	11	4	3	2	1	41	24
25	31M01C093	माझ गाउँ - मजुवा फेदी	2.70	9	3	8	10	3	3	2	1	41	25
26	31M01C092	जल्केनी - सिरुबानी	0.45	9	3	8	10	4	3	2	1	40	26
27	31M01C089	हेमनते चुवा डाडा - रिठा खोला	1.2	9	3	8	11	4	3	2	1	40	27
28	31M01C089	पक्कि पुल - बासघारी	0.42	9	3	7	11	3	3	2	1	39	28
29	31M01B037	गढी-कुरुम्टार	4.09	6	4	6	8	3	2	6	4	39	29
30	31M01C087	वर भन्ज्यांग	1.60	8	3	7	11	3	3	2	1	39	30
31	31M01C086	धराना भन्ज्यांग - वर् भन्ज्यांग	1.74	8	3	7	10	3	3	2	1	38	31
32	31M01C085	वर् भन्ज्यांग - तिन खोप्रे	0.98	8	3	7	10	3	3	2	1	37	32
33	31M01C085	कुर्कुनटार - ब्यसे	0.32	8	3	7	10	3	3	2	1	37	33
34	31M01C082	कुर्कुनटार - सिरुटार	0.81	8	3	7	10	3	3	2	1	36	34
35	31M01C080	भन्ज्यांग - निमुरे	0.74	8	3	7	10	3	2	2	1	35	35
36	31M01C097	कुर्कुनटार - बन्चरे	1.47	7	3	6	9	3	3	2	1	35	36
37	31M01B038	बन्चरे - कुर्कुनचा	0.53	4	3	3	5	2	7	8	4	35	37
38	31M01C079	रातेमाटो - डुम्रेटार - क्युरेनी	1.20	7	3	6	9	3	2	2	1	35	38
39	31M01C076	डुम्रेटार- लोयोटोल	0.816	7	3	6	9	3	2	2	1	34	39
40	31M01B078	डुम्रेटार	1.023	5	3	3	7	4	6	5	1	34	40
41	31M01B028	डुम्रेटार - वलमपकिटोल	0.212	7	3	6	9	3	2	2	1	34	41

42	31M01C075	डुम्रेटार - कनयाखोला	1.465	7	3	6	9	3	2	2	1	33	42
43	31M01C071	डुम्रेटार - क्युरेनी	3.1	7	3	6	9	3	2	2	1	33	43
44	31M01C069	सत्यवती - नागबेले	4.00	7	2	6	9	3	2	2	1	32	44
45	31M01C068	दुर्गे - रुम्जाटार	1.60	7	2	6	8	3	2	2	1	31	45
46	31M01C065	गैया - हात्तीढुंगा	0.20	6	2	5	8	2	2	2	1	30	46
47	31M01C064	विध्यनाथ झुलुंगे पुल - आइतबारे	2.00	6	2	5	8	2	2	2	1	30	47
48	31M01C066	भकुन्डे चौरी - काली खोला सम्म	2.20	6	2	5	8	2	2	2	1	29	48
49	31M01A001	भुटिया संदाने - झालुंगे पुल	5.30	1	1	1	1	0	1	15	10	28	49
50	31M01C062	भुमारे - बेटाहा	1.67	6	2	5	7	2	2	2	1	28	50
51	31M01C057	भुमारे - अदारे	0.55	7	2	5	7	2	2	2	1	28	51
52	31M01C091	भुमारे - अर्नेटार	0.40	7	2	4	6	2	3	2	1	28	52
53	31M01C059	भुमारे - मतितार	1.28	6	2	5	7	2	2	2	1	27	53
54	31M01C063	गिर्गिनी - ठुलो नाग्रेली	2.243	7	2	4	6	2	2	2	1	27	54
55	31M01C053	पिडिबाट - रामझाटार - नागबेली - सत्यवती	1.05	6	2	4	7	2	2	2	1	26	55
56	31M01C055	फुलामी टोल- अर्ने	1.50	6	2	4	7	2	2	2	1	26	56
57	31M01B010	हदेवास वार्ड कार्यालय - थापाटार	1.30	6	1	4	6	2	2	5	1	26	57
58	31M01B014	नकटि - ध्वसे फुलबारी - थापाटार	4.00	3	1	2	4	1	1	9	5	26	58
59	31M01B048	नकटि - माथिल्लो फुलबारी - थापाटार	1.90	2	0	2	3	3	4	7	5	26	59
60	31M01C052	पानी टंकी- थापाटार फुलबारी ध्वसे	3.00	6	2	4	6	2	1	2	1	25	60
61	31M01C047	बलान भन्ज्यांग - बतासे - चिउरी बास	1.40	6	1	4	7	2	1	2	1	25	61
62	31M01C040	हर्दिया - सहरे	4.90	6	1	5	7	1	1	2	1	25	62
63	31M01C054	अर्जिगरे - सिस्नेघारी	1.24	6	2	4	6	2	2	2	1	25	63
64	31M01C045	पाल्लेवास - इन्द्रवोती - मैनातर	0.3	5	1	3	7	2	2	2	1	24	64
65	31M01C044	मैनाटार - कृषि	0.416	5	1	3	6	3	2	2	1	24	65
66	31M01B073	मैनाटार - थाकलडाडा	0.219	2	0	1	3	5	6	2	5	24	66
67	31M01C029	मैनाटार - सानाचोरी	0.644	6	1	4	7	2	1	2	1	24	67
68	31M01C029	घाम्पे - गौरिटार	0.94	6	1	4	7	2	1	2	1	24	68
69	31M01C046	पौवा खोला - तिन्ने बोट	1.70	5	1	3	7	2	1	2	1	23	69
70	31M01B033	मातेखोला - देवान - सरुने	1.30	4	3	3	5	2	1	3	3	22	70
71	31M01C017	घैया बारी - खोल्मे गैडा खोर	3.80	6	1	4	7	1	0	2	1	22	71

72	31M01C017	चुरुम्फा घोट डाडा - धारे खोला	2.80	6	1	4	7	1	0	2	1	22	72
73	31M01C056	घोट डाडाटोल - धारा खोला	0.80	5	1	3	6	2	2	2	1	22	73
74	31M01C061	गैडा खोर - बिर्ता गाउँ	0.90	5	1	3	6	2	2	2	1	22	74
75	31M01B020	गौरी भन्ज्यांग - भदौरे	1.95	3	1	2	4	1	1	6	4	22	75
76	31M01B005	फुस्रे - सुरी - बलायेडाडा	2.10	2	1	1	3	1	1	6	5	21	76
77	31M01C031	पौवा खोला - ठाडो बाटो	1.30	4	1	3	5	2	1	2	1	19	77
78	31M01A072	तिन्नीबोट - सासुटार - भलयडाडा	1.50	2	1	2	4	1	2	5	2	18	78
79	31M01A074	फलाटे - तोरीबारी - कामन	1.40	1	0	1	2	1	1	8	5	18	79
80	31M01C008	मिलान्चोक् नरेटार - कयेर पनि गडेरे	1.3	4	1	3	5	1	0	2	1	17	80
81	31M01C008	गडेरे - पोखरी	1.9	4	1	3	5	1	0	2	1	17	81
82	31M01C025	तल्लो चुरुम्फा - वाईवाघर - बसेरी	0.8	4	1	3	5	1	0	2	1	17	82
83	31M01C025	लाकुरे भन्ज्यांग - बौलाटार - खोला छेउ	2.449	4	1	3	5	1	0	2	1	17	83
84	31M01C002	सिम्ले - बौलाटार - मुर्कुची - चुरुम्फा	5.074	4	1	3	5	1	0	2	1	17	84
85	31M01C002	नारेटार - तिन्नीबोट	3.3	4	1	3	5	1	0	2	1	17	85

## CHAPTER 6: FIRST FIVE YEAR MUNICIPALITY TRANSPORT MASTER PLAN

### 6.1 FIVE YEAR PROJECTED FINANCIAL PLAN

The first five-year financial plan is prepared based on the assumption that the each year budget will increase by 10% from previous year budget. The budget allocated for road for upcoming five fiscal year and year wise target along with the breakdown in survey and design, conservation and improvement are tabulated below:

Table 17: Five year projected financial project

Source of Budget	Fiscal Year				
	2076/77	2077/78	2078/79	2079/80	2080/81
<b>Total budget</b>	40000	44000	48400	53240	58564
<b>Survey and design</b>	2000	2200	2420	2662	2928.2
<b>Conservation (NRs)</b>	2000	2200	2420	2662	2928.2
<b>Improvement</b>	8000	8800	9680	10648	11712.8
<b>New Construction</b>	28000	30800	33880	37268	40994.8

### 6.2 YEAR WISE TARGET

The annual targets for various interventions to be achieved within the upcoming five years are included in year wise target. The work equivalent to the budget allocated for that particular year will be accomplished within that year. Since all the work cannot be carried out within the five year period due to various resource constrain, only the prioritized one will be included in the year wise target. For this particular municipality, year wise target is tabulated below:

Total Annual Budget (NRs. '000')
244204
100%

New construction
170943
70 %

Survey and design
12210
5 %

Conservation
12210
5%

Improvement
48841
20%

### 6.3 PRIORITIZED MUNICIPALITY ROAD FOR MTMP

All the road surveyed are prioritized in descending order according the score obtained in various criteria i.e. Higher the score higher will be the priority. And those with the higher priorities are included in five year plan. For this municipality, following are the prioritized road which are included in five year plan:

Table 18: List of prioritized existing transport

S.N	Road Code	Name of the Roads	Length	Criteria-1, Mark-15	Criteria-2, Mark-10	Criteria-3 Mark-20	Criteria-4, Mark-15	Criteria-5, Mark-5	Criteria-6, Mark-10	Criteria-7, Mark-15	Criteria-8, Mark-10	Total Weighted score	Rank
1	31M01A023	अधेरी - भुटिया	10.60	1 2	7 0	1 0	1 2	4 4	7 7	1 2	2 7	6 7	1
2	31M01A001	नाग्रंगे - अधेरी	7.70	7	6	5	7	2	1 2	1 4	9 2	6 2	2
3	31M01A034	गौरी भन्ज्यांग - आमबोटे - च्यांगेल	7.10	6	5	5	7	2	1 0	1 5	1 0	6 0	3
4	31M01A067	नरेटार - चुरुम्फा - दरे गौडा - माथिलो चुरुम्फा	14.77 5	7	5	4	6	2	9	1 5	1 0	5 9	4
5	31M01B051	ज्यामिरे - अधेरी - हाडिवास	6.30	0	1 6	1 4	0	1	1	1 5	1 0	5 7	5
6	31M01B042	तिलिकने मगरती - बलान भन्ज्यांग	9.20	7	6	6	9	4	7	8	8	5 6	6
7	31M01C105	खत्रिटार - बर्दमार	15.95	7	2	6	9	2	4	1 5	1 0	5 6	7
8	31M01B018	नेपालटार बजार - ढाडेचौरी	8.60	7	8	6	9	3	4	1 1	7 5	5 5	8
9	31M01C039	बोहोरे - संदाने - बर्दमार	13.20	7	5	6	8	2	1	1 5	1 0	5 3	9
10	31M01B060	वर् भन्ज्यांग - कुर्कुनटार]	5.482	7	6	5	7	0	1	1 5	1 0	5 0	10
11	31M01B041	नेपालटार गडी - कुर्कुम्टार-पुरानो गढी	9.05	1 3	4 0	1 0	1 3	4 4	4 4	2 2	1 1	5 0	11

Table 19: Year wise target of prioritized road of MTMP

Item				Year											
Fiscal Year				2073/74			2074/75		2075/76		2076/77		2077/78		
Road Network Budget (MTMP)				40000			44000		48400		53240		58564		
Conservation (NRs)				1000			1100		1210		1331		1464		
Improvement	Cost	BT	GR	8000	BT	GR	8800	GR	9680	GR	10648	GR	11713	GR	
31M01A001	8,569	0	6.54	3895		2.97	2,567	1.96	2106	1.61					
31M01A067	4,269		5.34	2562		3.20	1708	2.13							
31M01A023	1,543	0	1.93	1543		1.93									
31M01A034	10,476	0	4.76				4525	2.06	3254	1.48	2697	1.23			
31M01A067	4,269	0	5.34						3201	4.00	1068	1.34			
31M01B042	5,321		1.77						1119	0.37	4202	1.40			
31M01B018	1,373	0	1.72										687	0.86	
31M01B051	3,268	0	1.09										654	0.22	
31M01B060	20,371		6.79								2681	0.89	9169	3.06	
31M01C039	1,133		0.38										1133	0.38	
31M01C105	70		0.09										70	0.09	

The above year wise target does not meet the demand and the major reason budget constrain. So if the municipality could either raise funds from various donor agencies or collect loans from other agencies then the resource gap could be fulfilled which will help to meet the target in limited time. Some of the sources for budget may be as follows:

- Donor agencies
- Revenue collection
- Tax collection
- People participation
- Loans

- Government grants
- Service charges/tariffs
- Fines
- Public Private Partnership



## CHAPTER 7 LANDUSE PLAN AND CITY DEVELOPMENT PLAN

### 7.1 LANDUSE PLAN

Land-use planning means the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities.

Land-use planning often leads to land-use regulation, which typically encompasses zoning. Zoning is the process of categorizing land tracts according to their intended use. Common types of zones include commercial, industrial, recreational, and various levels of residential

A proper land use system is required for increasing agricultural production, environmental sustainability and bio-diversity conservation. At present there is no strict norms regarding the land use system which has led to haphazard location of settlements and industries in places where food production is very feasible.

### 7.2 EXISTING LANDUSE PATTERN

Land use involves the management and modification of natural environment or wilderness into built up pattern such as settlement. Land use typically refers to the changes we make to the natural environment to create homes, subdivisions, offices, urban areas, manufacturing centers, etc. Urban land use comprises two elements; the nature of land use which relates to which activities are taking place where, and the level of spatial accumulation, which indicates their intensity and concentration.

Existing land use pattern of this municipality is as follows:

S.N.	Category	Area (sq. km)	%
1	Barren Land	0.25	0.2
2	Cliff	0.16	0.1
3	Cultivation	58.18	39.1
4	Forest	80.36	54.0
5	Grass and Bush	6.23	4.2
6	Sand	3.15	2.1
7	Waterbody	0.39	0.3

Table 20: Existing Land use Pattern

Majority of the land is covered by forest and cultivation area. Out of total area of the municipality 54% of land use is covered by forest and 39.1% is covered by cultivation area. Detail about land use is provided in land use map (Volume III Maps- Map 4)

### 7.2 PUBLIC LAND

Public land is the land owned in common by all, represented by the government. Public land in Nepal is not owned by an individual but is informally used as a traditionally managed land resource: road sides, wells, springs, ponds and bunds, grazing fields, cemeteries, Parti Ailani (barren unregistered land), Pati Pauwa (inn), Chautara (platforms under a tree or at crossroads), religious and sacred places, temples, memorials, Chowk (public yard), Dabali (public entertainment sites), drainage ditches/canals, Haat Bazaar (local market sites), playing fields, and those lands which are declared as public lands by the Government of Nepal (GoN)

from time to time are called public lands (Napi Janch Ain 2019). Description of public land is provided in Annex 5

### 7.3 MUNICIPAL DEVELOPMENT PLAN

Municipal Development Plan includes the vision for land use and development over next few years. This master plan outlines the goals and objectives for the future and is the principal guide directing land use policy and decision making. It will help in growth of city and provides a reliable basis for public and private investment. This plan will present a vision for land use and development in coming years.

For the successful implementation of this plan following steps are to be included:

- Revision of municipal ordinances and bylaws in order to ensure the proper reflection of plan's goal and policies
- Development of a capital budget and program to outline long term public investments need and commitments
- To offer detail about the various area of the municipality
- Continuing community involvement in the planning and governing

Identification of major existing and potential areas are required for proper planning of the city. During preparation of the MTMP of this municipality also the major potential areas are identified and future planning has been done accordingly and is shown in below figure:

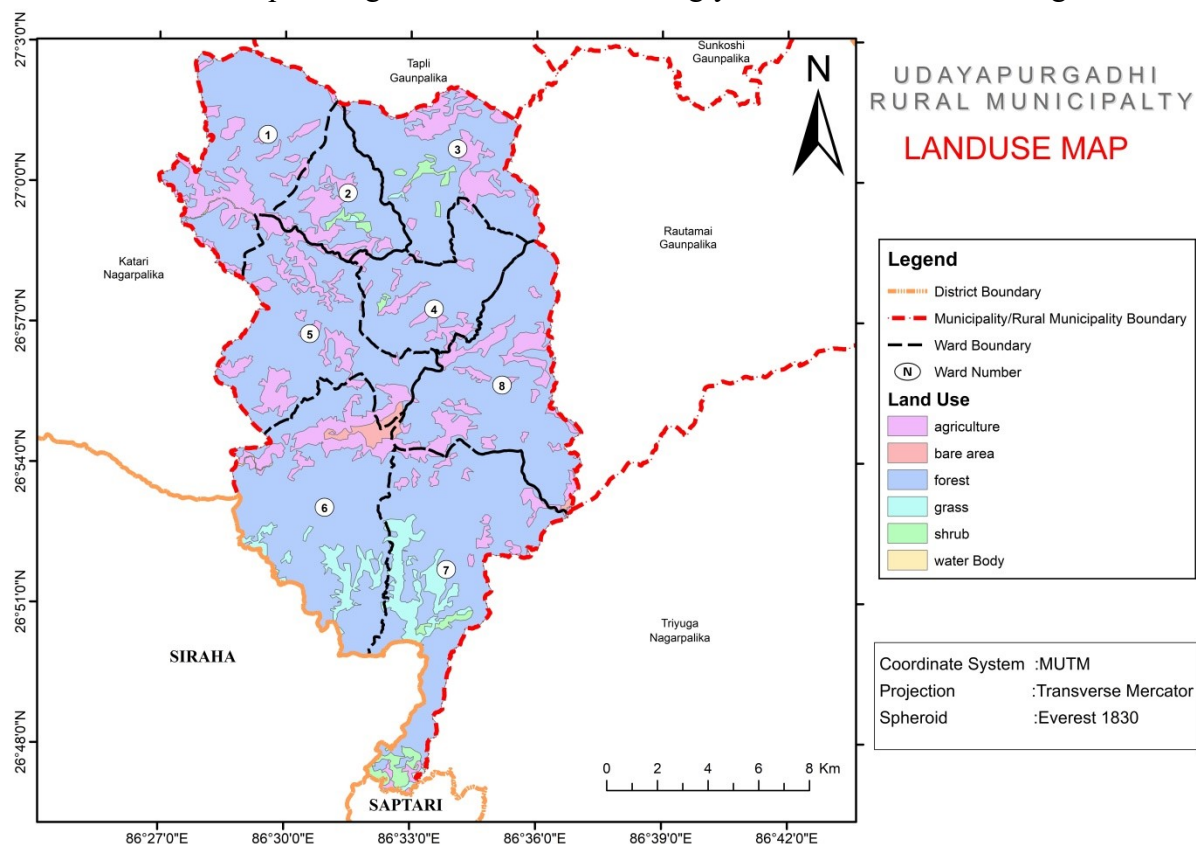


Figure 10: Map showing existing/potential areas

### 7.4 UDAYAPURGADHI RURAL MUNICIPALITY GOALS AND OBJECTIVES

Guiding principal of this vision;

- ❖ Sustainable development of the city
- ❖ Preservation of the natural environment

- ❖ Preservation of the cultural and religious monuments
- ❖ Preservation of social cohesion
- ❖ Qualitative economic development
- ❖ Encouraging the local people for the better accessibility in the services & facilities
- ❖ Encouraging the peoples participation in the development process
- ❖ Encouraging the disadvantaged and backwards peoples

**Lead sector;**

**The lead sector of this municipality for the overall development is the urban agriculture and village tourism. To promote this the rural urban linkage is of the prime importance of the development sector. To promote this lead sector in this rural municipality government should focus on the financing, cooperatives and training in the community level in the agriculture and tourism. That will be a milestone for the overall upliftment of the economic sector in this municipality.**

Goals of Udayapurgadhi Rural Municipality Transportation Master Plan are:

1. To create an inter-connected street system
  - Enhance connectivity
  - Coordinate with a adjacent communities
2. To provide multi modal transportation opportunities
  - Creating linkage with regional transit system
  - Creating a more walk able city
  - Providing an inter-connected system of trails for regional activity centers
3. To provide a transportation system which compliments land uses in city
  - Providing street cross section which vary by adjacent land use
  - Providing street cross section which maintain and enhance the character of historic areas
4. To create a transportation system for the future
  - Providing a network for all modes of travel
  - Considering options for future generations and future transportation demands
  - Considering funding in development of plan
5. To manage the parking spaces
  - Assesses future parking needs based on planned institutional growth
  - Evaluation of potential locations for future parking facilities and assesses the appropriate scale of these facilities
  - Quantification of existing parking supply and demand
  - Review of facilities vehicle and loading/ service area location

Plan of various sectors should include in the municipal plan

A. Land use Plan

- Various settlements will be linked to each other via a network of greens paces, public transit

- Everyday services such as markets, medicines etc will be concentrated in higher density settlements
- Religious, educational and medical institutions will have respected place in the community
- There will be protection of natural areas from harmful and incompatible development and maintain the integrity of natural systems
- There will be support to the development of relationship between agriculture and industries

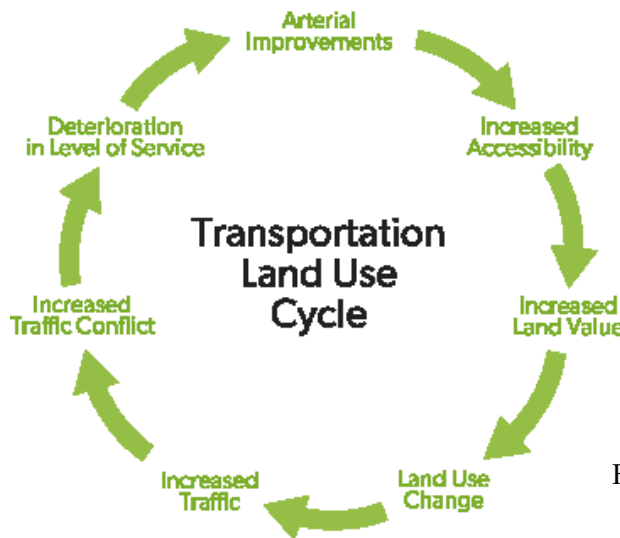


Figure 11: Transportation Land use Cycle

In this regards, this municipality has the following type of existing land- use situation (refer land-use map i.e. map no. 4). For further planning this municipality should think for the probable settlement extension area.

**B. Natural environment**

- Will work toward relationship with the natural environment
- Protection of natural resources from degradation
- Will preserve scenic viewpoints and insure public access to natural areas where appropriate

**C. Transportation Plan**

- Will offers a range of choices that are safe, affordable and convenient for residents
- Will use the roadway as efficiency as possible

**D. Community facilities and services plan**

- Will make the most effective and efficient use of existing services, buildings, utilities and facilities
- Will coordinate land use and development with the availability and capacity of public services, facilities and utilities
- Will concentrate city administrative functions and public services to the greatest extent possible
- Will ensure that existing public property, buildings will receive regular maintenance, upgrade and replacement or expansion based on approved standards

**E. Economic development plan**

- Will support sustainable development activities in target area so the character of the neighborhood
- Will promote and support locally owned and controlled small business including home occupation appropriate
- Will work with neighboring communities, regional agencies and government to promote land use and development policies

**F. Educational Plan**

- Will ensure excellent and diverse educational opportunities, services
- Will support and maintain schools where children live in close proximity and school serves wide range of community
- Will ensure safe access to school facilities

**G. Built Environment**

- Will protect the scenic view by proper management of hoarding boards
- Will discourage haphazard vendors shops and will allocate specific market centers

## CHAPTER 8: CONCLUSION

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Road transportation is most crucial for socio-economic development of district. Municipality should give more emphasis on resource collection and its proper allocation and efficient mobilization. This MTMP will guide for this purpose too. The MTMP is the result of studies considering socio-economic, environmental analysis and potentiality of various sectors as well as the accessibility to transport facilities in the municipality, which will draw the future scenario of the municipality and rural road development. MTMP focuses on existing transportation situation, expected future road network accessibility and socio-economic benefits. It provides directives on utilization of the local resources by local institutions as well as other development agencies in line with the decentralization and local self-government act. In addition, it will provide Government and other donor agencies a rational basis on which to decide on future investments efficiently that will improve district transport accessibility situation.

The proposed interventions are reflection of the requirement of Municipality to improve accessibility of people on goods and services and planned on current trend of financial resource availability.

It is strongly recommended that municipality shall strictly follow the MTMP particularly in the Perspective Plan of Municipality Road Network in deciding the sub-projects to be undertaken for development for future even beyond the five-year period. Strong commitment from all stakeholders is necessary for its implementation. It is also suggested that the MTMP shall be revised at the end of every fifth year evaluating the previous planning and implementation. Municipality should go ahead with required revisions if the Municipality development potentials have changed tremendously.

**ANNEXES**

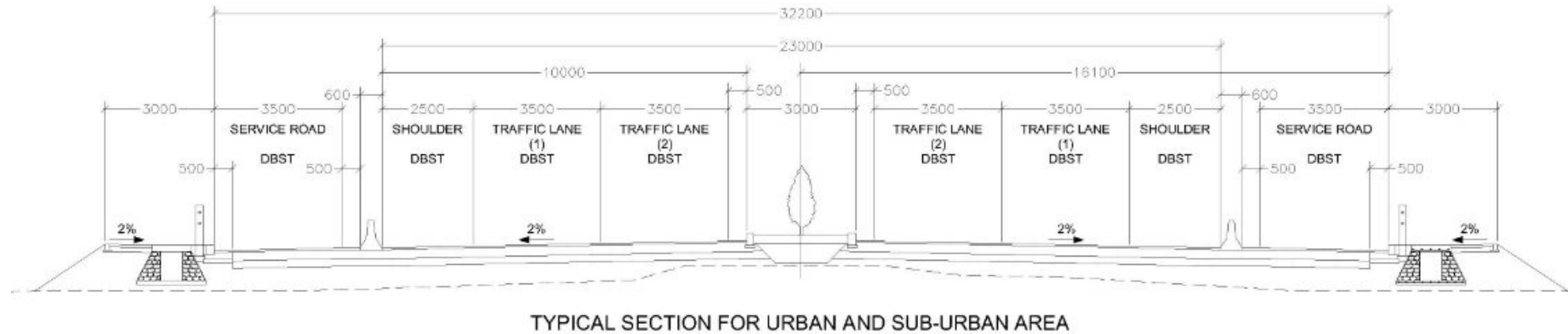
**ANNEX 1 MEETING MINUTES**



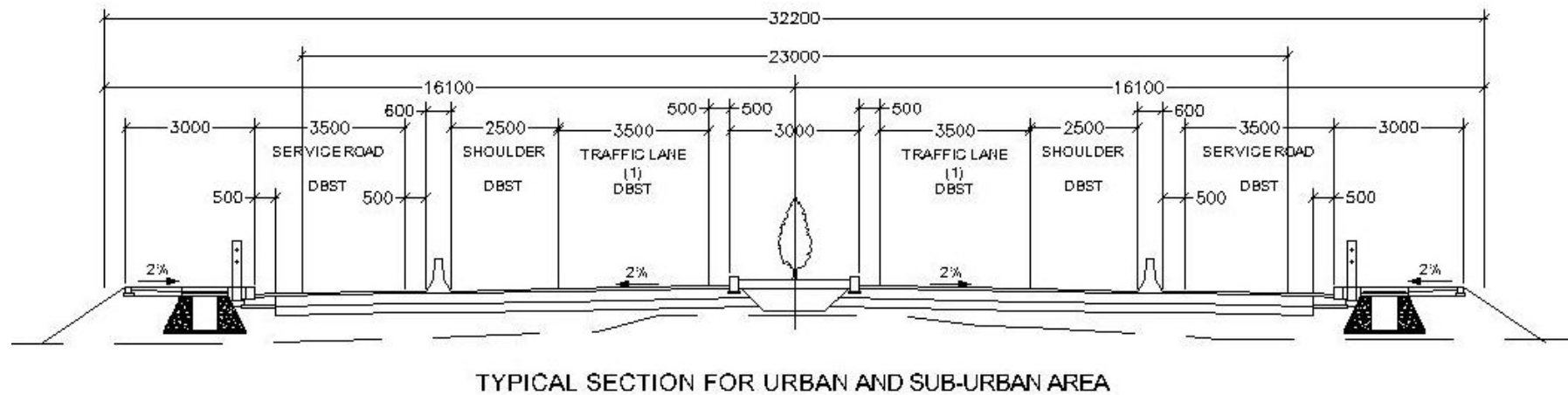
**ANNEX 2 FIELD PHOTOGRAPHS**

**ANNEX 3 DRAWING OF TYPICAL CROSS SECTION**

Road Class “A”



Road Class “B”



24650

15490

14100

3000

3500

600

2500

3500

2500

600

3500

3000

SERVICE ROAD

SHOULDER

TRAFFIC LANE (1)

DBST

DBST

DBST

DBST

DBST

500

500

500

500

2%

2%

2%

TYPICAL SECTION FOR URBAN AND SUB-URBAN AREA

**ANNEX 4 SCORING CRITERIA, SCORES & RANK**

S.N.	Road Code	Name of the Roads	Length	Criteria-1, Mark-15	Criteria-2, Mark-10	Criteria-3 Mark-20	Criteria-4, Mark-15	Criteria-5, Mark- 5	Criteria-6, Mark-10	Criteria-7, Mark-15	Criteria- 8, Mark-10	Total Weighted score	Rank
1	31M01A023	अधेरी - भुटिया	10.60	12	7	10	12	4	7	12	2	67	1
2	31M01A001	नाग्रंगे - अधेरी	7.70	7	6	5	7	2	12	14	9	62	2
3	31M01A034	गौरी भन्ज्यांग - आमबोटे - च्यांगेल	7.10	6	5	5	7	2	10	15	10	60	3
4	31M01A067	नरेटार - चुरुम्फा - दरे गौडा - माथिलो चुरुम्फा	14.775	7	5	4	6	2	9	15	10	59	4
5	31M01B051	ज्यामिरे - अधेरी - हाडिवास	6.30	0	16	14	0	1	1	15	10	57	5
6	31M01B042	तिल्किने मगरती - बलान भन्ज्यांग	9.20	7	6	6	9	4	7	8	8	56	6
7	31M01C105	खत्रिटार - बर्दमार	15.95	7	2	6	9	2	4	15	10	56	7
8	31M01B018	नेपालटार बजार - ढाडेचौरी	8.60	7	8	6	9	3	4	11	7	55	8
9	31M01C039	बोहोरे - संदाने - बर्दमार	13.20	7	5	6	8	2	1	15	10	53	9
10	31M01B060	वर् भन्ज्यांग - कुर्कुनटार]	5.482	7	6	5	7	0	1	15	10	50	10
11	31M01B041	नेपालटार गडी - कुर्कुम्टार-पुरानो गढी	9.05	13	4	10	13	4	4	2	1	50	11
12	31M01B021	बरे -हिले खोला	8.40	8	9	7	10	3	3	6	4	50	12
13	31M01C104	आहाले - केसे - बस्तीपुर	8.60	11	4	9	12	4	4	2	1	46	13
14	31M01A070	डुम्रे- जरुवा	2.30	7	5	6	8	3	5	6	6	46	14
15	31M01C103	साजबोटे - मजुवा - वर्गाडी	7.00	11	4	9	11	4	3	2	1	45	15
16	31M01C102	ताराखोला- मजुवा - चुलाढुंगा- डारे भन्ज्यांग	3.80	10	4	9	11	4	3	2	1	45	16
17	31M01C100	राग भन्ज्यांग -बेतिनी	0.50	10	4	9	11	4	3	2	1	44	17
18	31M01B009	चिउरी भन्ज्यांग - बेतिनी	1.65	5	3	3	6	2	3	14	9	44	18

19	31M01C099	स्वस्थे चौकी- ढकाल चोक	0.20	10	4	9	11	4	3	2	1	44	19
20	31M01C098	पाडे भन्ज्यांग - गजेठुमका	1.20	10	4	9	11	3	3	2	1	43	20
21	31M01A058	पाडे भन्ज्यांग - मजुवा	1.60	7	5	4	6	2	3	9	7	43	21
22	31M01C094	चुली डाडा - कोल्बोटे	0.75	10	4	8	10	3	3	2	1	42	22
23	31M01C093	चुली डाडा - धहर	0.90	9	3	8	10	3	3	2	1	41	23
24	31M01C090	जल्केनी - ठकुरी पाखा	1.60	9	3	8	11	4	3	2	1	41	24
25	31M01C093	माझ गाउँ - मजुवा फेदी	2.70	9	3	8	10	3	3	2	1	41	25
26	31M01C092	जल्केनी - सिरुबानी	0.45	9	3	8	10	4	3	2	1	40	26
27	31M01C089	हेमनते चुवा डाडा - रिठा खोला	1.2	9	3	8	11	4	3	2	1	40	27
28	31M01C089	पक्कि पुल - बासघारी	0.42	9	3	7	11	3	3	2	1	39	28
29	31M01B037	गढी-कुरुम्टार	4.09	6	4	6	8	3	2	6	4	39	29
30	31M01C087	वर भन्ज्यांग	1.60	8	3	7	11	3	3	2	1	39	30
31	31M01C086	धराना भन्ज्यांग - वर् भन्ज्यांग	1.74	8	3	7	10	3	3	2	1	38	31
32	31M01C085	वर् भन्ज्यांग - तिन खोप्रे	0.98	8	3	7	10	3	3	2	1	37	32
33	31M01C085	कुर्कुनटार - व्यसे	0.32	8	3	7	10	3	3	2	1	37	33
34	31M01C082	कुर्कुनटार - सिरुटार	0.81	8	3	7	10	3	3	2	1	36	34
35	31M01C080	भन्ज्यांग - निमुरे	0.74	8	3	7	10	3	2	2	1	35	35
36	31M01C097	कुर्कुनटार - बन्चरे	1.47	7	3	6	9	3	3	2	1	35	36
37	31M01B038	बन्चरे - कुर्कुनचा	0.53	4	3	3	5	2	7	8	4	35	37
38	31M01C079	रातेमाटो - डुम्रेटार - क्युरेनी	1.20	7	3	6	9	3	2	2	1	35	38
39	31M01C076	डुम्रेटार- लोयोटोल	0.816	7	3	6	9	3	2	2	1	34	39
40	31M01B078	डुम्रेटार	1.023	5	3	3	7	4	6	5	1	34	40
41	31M01B028	डुम्रेटार - वलमपकिटोल	0.212	7	3	6	9	3	2	2	1	34	41
42	31M01C075	डुम्रेटार - कनयाखोला	1.465	7	3	6	9	3	2	2	1	33	42
43	31M01C071	डुम्रेटार - क्युरेनी	3.1	7	3	6	9	3	2	2	1	33	43

44	31M01C069	सत्यवती - नागबेले	4.00	7	2	6	9	3	2	2	1	32	44
45	31M01C068	दुर्गे - रुम्जाटार	1.60	7	2	6	8	3	2	2	1	31	45
46	31M01C065	गैया - हात्तीढुंगा	0.20	6	2	5	8	2	2	2	1	30	46
47	31M01C064	विध्यनाथ झुलुंगे पुल - आइतबारे	2.00	6	2	5	8	2	2	2	1	30	47
48	31M01C066	भकुन्डे चौरी - काली खोला सम्म	2.20	6	2	5	8	2	2	2	1	29	48
49	31M01A001	भुटिया संदाने - झालुंगे पुल	5.30	1	1	1	1	0	1	15	10	28	49
50	31M01C062	भुमारे - बेटाहा	1.67	6	2	5	7	2	2	2	1	28	50
51	31M01C057	भुमारे - अदारे	0.55	7	2	5	7	2	2	2	1	28	51
52	31M01C091	भुमारे - अर्नेटार	0.40	7	2	4	6	2	3	2	1	28	52
53	31M01C059	भुमारे - मतितार	1.28	6	2	5	7	2	2	2	1	27	53
54	31M01C063	गिर्गिनी - ठुलो नाग्रेली	2.243	7	2	4	6	2	2	2	1	27	54
55	31M01C053	पिडिबाट - रामझाटार - नागबेली - सत्यवती	1.05	6	2	4	7	2	2	2	1	26	55
56	31M01C055	फुलामी टोल- अर्ने	1.50	6	2	4	7	2	2	2	1	26	56
57	31M01B010	हृदेवास बार्ड कार्यालय - थापाटार	1.30	6	1	4	6	2	2	5	1	26	57
58	31M01B014	नकटि - ध्वसे फुलबारी - थापाटार	4.00	3	1	2	4	1	1	9	5	26	58
59	31M01B048	नकटि - माथिल्लो फुलबारी - थापाटार	1.90	2	0	2	3	3	4	7	5	26	59
60	31M01C052	पानी टंकी- थापाटार फुलबारी ध्वसे	3.00	6	2	4	6	2	1	2	1	25	60
61	31M01C047	बलान भन्ज्यांग - बतासे - चिउरी बास	1.40	6	1	4	7	2	1	2	1	25	61
62	31M01C040	हर्दिया - सहरे	4.90	6	1	5	7	1	1	2	1	25	62
63	31M01C054	अजिंगे - सिस्नेघारी	1.24	6	2	4	6	2	2	2	1	25	63
64	31M01C045	पाल्लेवास - इन्द्रवोती - मैनातर	0.3	5	1	3	7	2	2	2	1	24	64
65	31M01C044	मैनाटार -कृषि	0.416	5	1	3	6	3	2	2	1	24	65
66	31M01B073	मैनाटार - थाकलडाडा	0.219	2	0	1	3	5	6	2	5	24	66
67	31M01C029	मैनाटार - सानाचोरी	0.644	6	1	4	7	2	1	2	1	24	67
68	31M01C029	घाम्पे - गौरिटार	0.94	6	1	4	7	2	1	2	1	24	68
69	31M01C046	पौवा खोला - तिन्ने बोट	1.70	5	1	3	7	2	1	2	1	23	69
70	31M01B033	मातेखोला - देवान - सरुने	1.30	4	3	3	5	2	1	3	3	22	70
71	31M01C017	चैया बारी - खोल्मे गैडा खोर	3.80	6	1	4	7	1	0	2	1	22	71
72	31M01C017	चुरुम्फा घोट डाडा - धारे खोला	2.80	6	1	4	7	1	0	2	1	22	72
73	31M01C056	घोट डाडाटोल - धारा खोला	0.80	5	1	3	6	2	2	2	1	22	73
74	31M01C061	गैडा खोर - बिर्ता गाउँ	0.90	5	1	3	6	2	2	2	1	22	74



75	31M01B020	गौरी भन्ज्यांग - भदौरे	1.95	3	1	2	4	1	1	6	4	22	75
76	31M01B005	फुस्रे - सुरी - बलायेडाडा	2.10	2	1	1	3	1	1	6	5	21	76
77	31M01C031	पौवा खोला - ठाडो बाटो	1.30	4	1	3	5	2	1	2	1	19	77
78	31M01A072	तित्रिबोट - सासुटार - भलयडाडा	1.50	2	1	2	4	1	2	5	2	18	78
79	31M01A074	फलाटे - तोरीबारी - कामन	1.40	1	0	1	2	1	1	8	5	18	79
80	31M01C008	मिलान्चोक् नरेटार - कयेर पनि गडेरे	1.3	4	1	3	5	1	0	2	1	17	80
81	31M01C008	गडेरे - पोखरी	1.9	4	1	3	5	1	0	2	1	17	81
82	31M01C025	तल्लो चुरुम्फा - बाईवाघर - बसेरी	0.8	4	1	3	5	1	0	2	1	17	82
83	31M01C025	लाकुरे भन्ज्यांग - बौलाटार - खोला छेउ	2.449	4	1	3	5	1	0	2	1	17	83
84	31M01C002	सिम्ले - बौलाटार - मुकुची - चुरुम्फा	5.074	4	1	3	5	1	0	2	1	17	84
85	31M01C002	नारेटार - तित्रिबोट	3.3	4	1	3	5	1	0	2	1	17	85

**ANNEX 6 FIELD FORMS**

**ANNEX 7 MAPS**

**ANNEX 8 DATA COLLECTION AND GIS PROCESSING****A. DATA COLLECTION PROCESS**

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

**B. GIS PROCESSING FOR MAP PREPARATION**

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

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

Latitude of origin	E84
Scale factor	0.9999
False easting	500000 Meter
False northing	0 Meter
Select Datum	WGS84

After collection of the data in waypoint and track format, it is imported to computer by DNR Garmin Software and exported in KML and GPX format. The KML or GPX data is added to ARC GIS 10.3.1 and exported to Shape file. Added Shape file of Track is edited and append in **Road \_ Inventor . shp** whose property is given below,

Projected Coordinate System:	UTM-84
Projection:	Transverse_Mercator
False _ Easting:	500000.00000000
False _ Northing:	0.00000000
Central _ Meridian:	84.00000000
Scale _ Factor:	0.99990000
Latitude _ Of _ Origin:	0.00000000
Linear Unit:	Meter
Geographic Coordinate System:	GCS_Everest_1830
Datum:	D_Everest_Adj_1937
Prime Meridian:	Greenwich
Angular Unit:	Degree

While performing geographic transformation from WGS to MUTM, following parameters were incorporated:

X= -295  
Y= -736  
Z= -257