



R

M

T

M

P

Omsatiya Rural Municipality

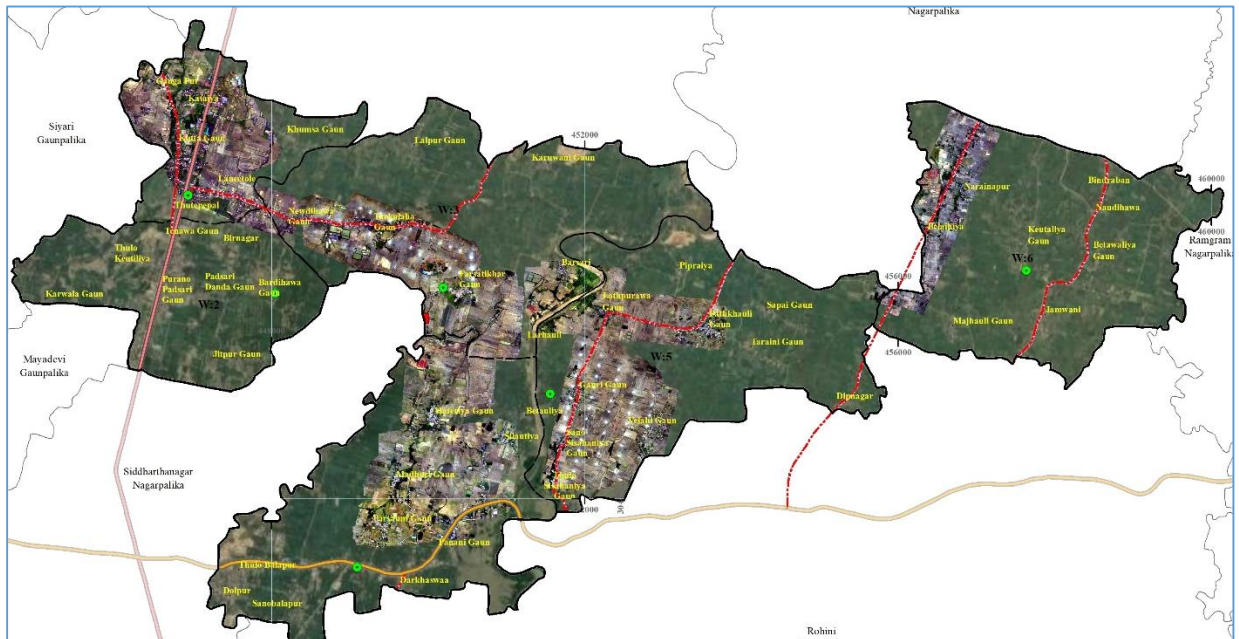
Office of the Rural Municipal Executive

Rupandehi, Lumbini Province

Final Report On

Omsatiya Rural Municipal Transport Master Plan (R-MTMP)

Volume I: Main Report



Consultant

Ramgram Multiple Pvt. Ltd.

Ramnagar, Parasi

2078 B.S.

Letter of Submission

Omsatiya Rural Municipality

Office of the Rural Municipal Executive

Rupandehi, Lumbini Province

This document is the Final Report prepared for the Title of Consulting Services, “**Omsatiya Rural Municipal Transport Master Plan (R-MTMP)**” undertaken by, Omsatiya Rural Municipality Office, Rupandehi District This document has been prepared by Ramgram Multiple Pvt. Ltd, Parasi. The opinions, findings and conclusions has been expressed herein are those of the Consultancy and do not necessarily reflect those of the Rural Municipality.

Reproduction of materials contained in this document and in case, where maps, diagrams, data, images and photos from the report or accompanying DVD ROM are used, the following citation shall be used as: Ramgram Multiple Pvt. Ltd, Parasi “*Rural Municipal Transport Master Plan (R-MTMP) of Omsatiya Rural Municipality*”.

Data Sources and Credits

Reports, Datasets, Drawings, GIS Maps and other miscellaneous data have been produced & developed by Ramgram Multiple Pvt. Ltd, Parasi during fiscal year 2077/78. These data are owned by Omsatiya Rural Municipality, Office of Municipal Executive, Rupandehi. Authorization from the owner is required for the usage and/or publication of the data in part or whole.

Project Description and Structure

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

Project Descriptions and Structures	
Title of Consulting Service	Preparation of Omsatiya Rural Municipal Transport Master Plan (R-MTMP)
Local Level	Omsatiya Rural Municipality, Rupandehi, Lumbini Province
Date	2078
Report Volume-I	Main Report
Report Volume-II	GIS Maps and Drawings (R-MTMP- Maps) /Quantity and Estimates
DVD/USB	Soft Copy
Consultant	Ramgram Multiple Pvt. Ltd. Ramnagar, Parasi

Acknowledgement

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

The consultant would like to express its appreciation to the officials from Omsatiya Rural Municipality are highly grateful for the support. We Consultant would like to extend sincere gratitude to Mr. Hira Kewat Rahul, Chairman and Mrs. Sundarmati Kumari Harijan, Vice-Chairman of Omsatiya Rural Municipality. We would also like to express our gratitude to Mr. Durga Poudel Chief Administrative officer of Rural Municipality, members of steering committee, Head of Technical Section, Planning Section and other concerned section of the municipality for their valuable time, support, valuable comments and suggestions during preparation of R-MTMP. We would like to express special thanks to chairman of all wards and ward members, the representatives from different political parties and volunteers for their support and contribution for making the working environment easy and pleasant for their coordination during field visit and project identification.

We Consultant are also grateful to all technical and management team involved in preparation of R-MTMP. The acknowledgement will be incomplete if we ignore the support obtained from each and every individual of the rural municipality. Finally, we would like to thank all the helping hands involved directly or indirectly in the preparation of this report.

Acronyms/Abbreviations

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

NUDS	National Urban Development Strategic
NURS	Nepal Urban Road standard
OD	Origin and Destination
PCU	Passenger Car Unit
RCUP	Resource Conservation Utilization Project
RoW	Right of Way
RTO	Regional Transport Organization
SOR	Socially Oriented and Responsibility
TIMP	Transport Infrastructure Master Plan
TDF	Town Development Fund
ToR	Term of Reference
VDC	Village Development Committee

कार्यकारी सारांश

तीव्ररूपमा वृद्धि भइरहेको जनसंख्या र सहरीकरणले गर्दा नेपालको स्थानीय तहहरूमा आवश्यक पूर्वाधारहरूको विकास गर्न चुनौतीपूर्ण बन्दै गएको छ। यस अवस्थामा स्थानीय तहहरूले सहरवासीहरूको लागि आवश्यक पूर्वाधारहरू पुऱ्याउन सकिरहेको छैन। यसको व्यवस्थापनका लागि सहरी सडक सञ्जालको योजनाको आवश्यक पर्दछ।

नगर (गाउँपालिका सडक) गुरुयोजना भन्नाले सहरी सडकहरूको पहिचान, वर्गीकरण, र प्राथमिककरण गर्ने प्रक्रिया हो। यातायात पूर्वाधार विकास अन्य विकास कार्यको लागि एउटा अति आवश्यक आधार हो। यसैलाई दृष्टिगत गरी ओमसतिया गाउँपालिकाले सहरी यातायात गुरुयोजना तयार गर्ने जमर्को गरिएको हो।

नेपाल सरकारले २०७३ सालमा साविक पडसरी, हाटीफर्साटिकर, बसन्तपुर, पट्खौली, छोटी रामनगर गाविस क्षेत्रहरूलाई गाभि पुर्नसंरचना गरी हालको ६ वटा वडामा विभाजित गाउँपालिका गठन गरीएको थियो। यसक्षेत्रलाई सम्भावित विकास केन्द्र मानिन्छ। यी क्षेत्रलाई दिगो विकास गर्न विकास योजनाको आवश्यक हुन्छ, ती मध्ये नगर यातायात गुरुयोजना एउटा योजनावद्ध विकास प्रक्रियाको पहिलो चरण मानिन्छ। नगरमा स्थानीय जनताहरूको लागि आवश्यक यातायात सेवा सुविधाको पहुँच पुऱ्याउन र नगरलाई गतिशिलता प्रदान गर्ने यातायातका व्यवस्था एक प्रमुख घटक हो। नगरको गतिशिलतालाई वृद्धिगरी गाउँपालिका को वडा कार्यालयहरू, सेवा केन्द्रहरू, अस्पतालहरू, स्कूलहरू, पर्यटन स्थलहरू, बजारकेन्द्रहरू ब्यवसायिक क्षेत्रहरू, उद्योगहरू, वरपरका स्थानीय वस्तीहरू आदिमा यातायात पहुँच पुऱ्याउन नगर यातायात गुरुयोजना आवश्यक पर्दछ, जसमा मध्यकालिन, दिर्घकालिन सडक योजनाहरू तय गरिन्छ।

लुम्बिनी प्रदेशको, रूपन्देही जिल्ला मा अवस्थित यस ओमसतिया गाउँपालिका पूर्व-पश्चिम राजमार्ग र हुलाकी राजमार्गमा फैलिएको छ। काठमाडौँ देखि २६२.३६ कि.मी. पश्चिम, बुटवलबाट १९.२६ कि.मी पूर्वमा पर्ने यस ओमसतिया गाउँपालिका कूल जनसंख्या ३५,४५१ (के.त.वि. २०७६) र जनघनत्व ७६९ प्रति वर्ग कि.मी रहेको छ। औषतमा ५.४२ जनाको संख्या प्रति परिवार रहेको देखिन्छ, भने कूल घरपरिवार संख्या ६,५३९ रहेको देखिन्छ।

विभिन्न जातजाती तथा भाषाभाषी, एवं संस्कृति भएका मानिसहरूको मिश्रित बसोवास भएको यस गाउँपालिकामा ओमसतिया मन्दिर जस्तो प्रसिद्ध ऐतिहासिक, धार्मिक क्षेत्र जस्तो पर्यटकीय क्षेत्र रहेको छ।

यसक्षेत्रमा कूल १ वटा उच्च माध्यामिक विद्यालय सहित कूल २३ वटा विद्यालयहरू संचालनमा रहेको र ४ वटा स्वास्थ्यसेवा केन्द्रहरू संचालित छन्।

कूल क्षेत्रफल ४८.५३ वर्ग कि.मी. (गाउँपालिका बाट उपलब्ध गराएको नक्सा अनुसार) रहेको यस गाउँपालिका को ८४.३८ प्रतिशत खेतियोग्य जमिन रहेको छ। करिव ५० वटा कृषिमा आधारित उद्योग तथा कल कारखानहरू छन्, साथै ६ वटा इटा उद्योगहरू संचालित रहेको देखिन्छ। यस गाउँपालिका भित्र १८ वटा सहकारी संस्था तथा बाणिज्य तथा विकास बैंकहरू संचालनमा छन्। यी बैंकहरूले व्यापार व्यवसायमा बाहेक पूर्वाधार निर्माणमा लगानी गर्ने नगरेको बुझिन्छ।

यस क्षेत्रमा शुद्ध खानेपानीको कमि र वायु लगायत अन्य प्रदुषणहरूका कारण वातावरणीय समस्या रहेको देखिन्छ। वर्षादको समयमा समथर जमिनमा बाढी तथा डुवान हुने समस्या रहेको बुझिन्छ।

उत्तरमा बुटवल र दक्षिणमा भैरवहा जस्ता ठुला सहर तथा समथर मैदान रहेको भू धरातलका कारण वस्ती विकास तथा आर्थिक विकासका सम्भावना रहेका यसक्षेत्रमा विभिन्न भौतिक पूर्वाधारहरू जस्तै खानेपानी, सडक आदि भौतिक विकास कार्यहरू हुँदै आएको देखिन्छ। कूल ११ वटा मुख्य बजारकेन्द्रहरू जस्तै ठुटेपिपल, पदासरी, बालापुर रहेको यसक्षेत्रमा प्रायः वस्ती तथा बजारकेन्द्रहरू सिद्धार्थ राजमार्ग र हुलाकी राजमार्गको आसपासमा केन्द्रित रहेको देखिन्छ। प्रायः सबै वस्ती तथा बजारकेन्द्रहरूमा सडक सञ्जालको पहुँच पुगिसकेको देखिन्छ, भने सो मध्येका केही क्षेत्रहरूमा पर्यटन विकास तथा कृषी विकासको प्रचुर सम्भावना समेत रहेको देखिन्छ।

कूल २०१.९०८ कि.मी. लम्बाईको विभिन्न स्तरका सडकहरू निर्माण भैसकेको मध्ये सिद्धार्थ राजमार्ग ४.१७९ कि.मी., हुलाकी राजमार्ग ४.४३१ कि.मी र बाँकी अन्य सडकहरू रहेकोमा १७२.७३२ कि.मी. बाटा गाउँपालिकाको सहरी सडक जस मध्य १२३.०६८ कि.मी. ग्राभेले, ५३.६१० कि.मी. कालोपत्रे र बाँकी २४.८५८ कि.मी. धूले सडक रहेको देखिन्छ। गाउँपालिकाको सडकको घनत्व हालको अवस्थामा ४.७२ कि.मी/ वर्ग कि.मी रहेको छ, भने NUDS-2015 अनुसार सहरी सडक घनत्व 5 कि.मी/ वर्ग कि.मी भन्दा बढी हुनु पर्ने रहेको छ/ तर गाउँपालिकाको सबै वस्ती र खेती योग्य भुमी लगायत समपुर्ण ठाउँहरूमा सहरी सडकको राम्रो पहुँच रहेका हुनाले रोहीनी खोला कोरीडर बाहेक अन्य सडक प्रस्ताव गरीएको छैन। गाउँपालिकाको सडक विस्तार र विकासका लागि ट्रायाक खोली सकेका समपुर्ण सडकको स्थर उन्नति गर्ने र विकास गर्नु पर्ने देखिन्छ।

यातायातको हकमा सबै वडामा तथा स्थानहरूमा ५ देखि १० मिनेटको पैदलमै यातायातको सुविधा पाउन सक्ने देखिन्छ । यातायात सेवाको लागि सिद्धार्थ र हुलाकी सडकमा बस तथा माइक्रो बस संचालनमा रहेको बुझिन्छ । त्यस्तै ५०/६० वटा अटोरिक्सा संचालनमा रहेको बुझिन्छ । यातायात व्यवस्थापनको लागि बसपार्क संचालनमा रहेको देखिदैन । राष्ट्रिय राजमार्गहरूमा बस तथा माइक्रोबस संचालित छन् भने भित्रि सहर बजारमा अटो रिक्साले सेवा पुऱ्यारहेको देखिन्छ ।

स्थानीय ट्राफिक प्रहरीको रेकर्ड अनुसार सवारी अनुशासन उल्लंघन र तीव्र गतिका कारण बढीमा मोटरसाइकल दुर्घटना हुने गरेको बुझिन्छ । साथै बाटोमा हिंडने बटुवाहरूको लागि तीव्रगतिमा आउने सवारी साधनहरूबाट सुरक्षित नरहेको बुझिन्छ ।

नेपाल सरकारले निर्दिष्ट गरेका सडक निर्माण सम्बन्धी विभिन्न ऐन, कानून, नीति निर्देशिका तथा नर्म्सको आधारमा यस नगर यातायात गुरुयोजना तयार पारिएको छ ।

यस प्रतिवेदनमा मुलतः आगामी ५ वर्षमा हुने जनसंख्या वृद्धिको आधारमा सडक र यातायातको अनुमानित आवश्यकता प्रक्षेपण गरी तयार गरेको छ । ती मध्ये जनसंख्या वृद्धिदर ०.५२ प्रतिशत (विगतमा वृद्धि भएको जनसंख्याको आधारमा) प्रति वर्षको दरले हालको ३५,४५१ बाट वृद्धिभई आर्थिक वर्ष २०८२/०८३ सम्ममा ३६,५७२ पुग्ने देखिन्छ । यसरी वृद्धिहुने जनसंख्याका आधारमा सवारी साधन लगायत अन्य पूर्वाधारहरू पनि वृद्धिहुने निश्चित छ, त्यसकारण सो को व्यवस्थापनका लागि आवश्यक सडक यातायातको थप पूर्वाधारहरूको प्रस्ताव गरिएको छ ।

यस योजनामा सवारी आवागमनको प्रक्षेपणका लागि कूल जनसंख्याको करिब ५० देखि ६० प्रतिशत मानिसहरूले दैनिकरूपमा आवतजावत गर्छ भन्ने अनुमान गरी सडक तथा यातायातको पूर्वाधारहरू प्रस्ताव गरिएको छ । जस अनुसार दैनिक २१,९४३ जनाले विभिन्न माध्यमबाट यात्रा गर्छ जस्तै १,३१७ जनाले अटो रिक्सा (टेम्पो)बाट यात्रा गर्छ भने ६,१४४ जनाले साइकलबाट, १९,०६८ जनाले मोटरबाइकबाट, २,४१४ जनाले जिप तथा कारबाट, ३,२९१ जनाले सार्वजनिक यातायातबाट (बस तथा माइक्रोबस) र १,९७५ जनाले पैदलयत्रा गर्छ भन्ने आधारमा योजना तयार गरी प्रतिवेदन तयार गरिएकोछ ।

सहरी सडकले यात्रुहरूलाई साइकल, बस, पैदल आदिको माध्यमबाट बजारकेन्द्रहरू,स्कूलहरू, अस्पतालहरू तथा आवासिय क्षेत्रहरूमा आवागमन गर्न सहज तुल्याउनुका साथै आपतकालिन अवस्थामा एम्बुलेन्स, दमकल तथा अन्य उद्धार सामाग्रिहरू समयमै पुऱ्याउन मद्दत गर्छ । यसकालागि नेपाल सरकारले विभिन्न सेवाका लागि आवश्यक सहरी सडकहरूको लागि स्वीकृत गरिएको सडक वर्गीकरण निर्देशिका तथा नर्म्सहरू अनुरूप प्रस्तावित सहरी सडकहरूलाई 'A' (Path) , 'B' (Sadak), 'C' (Marg) र 'D' (Upamarg) गरी ४ वटा वर्गमा वर्गीकरण गरिएको छ । सडकको क्षेत्राधिकार(Right of Way) विगत २०७७ मा यस नगरपालिकामा योजनाको प्रारम्भिक प्रतिवेदनको प्रस्तुतीकरण गरेपश्चात भएको छलफलबाट तय भए बमोजिम क्रमशः १६ मी., १३ मी. ८ मी. र ६ मी. हुने कायम गरेको छ । तर सिद्धार्थ राजमार्ग, हुलाकी राजमार्ग, सहायक राजमार्ग तथा जिल्ला सडकको हकमा गाउँपालिकाको कार्यक्षेत्र भित्र नपर्ने भएकोले ती सडकहरूको क्षेत्राधिकार यथास्थितमै कायम गरिएको छ । स्थानीय वडा भेलाबाट प्राप्त प्रस्ताव तथा रायसुभाब अनुसार सबै सहरी सडकहरूको नामाकरण गरी सडकेत नम्बर (जस्तै 508RM09A001: हुलाकी राजमार्ग - भेलाही गाउँ-पाकखउली गाउँ- तरैनि गाउँ - दिपनगर पथ) समेत दिइएको छ ।

यस नगर यातायात गुरुयोजनाले विद्यमान सडकहरूको स्तरोन्नतीका साथै विस्तार एवं नयाँ थप निर्माणको प्रस्तावहरू गरिएको छ । जस्तै रोहीनी खोला कोरीडर 12.60 कि.मी (जम्मा दुवै तर्फ गरी) बाटो 'A' वर्गको नयाँ थप प्रस्थाव गरिएको छ । प्रस्तावित तथा स्तरोन्नती हुने बाटोहरूमा पर्ने खोला, खहरे तथा खोल्सीहरूमा गरी जम्मा १ वटा आर.सी.सी.पूलहरू, २ वटा कल्भर्टहरू र २३१ वटा पाइप कल्भर्टहरू (Hume Pipe) निर्माण गर्नु पर्ने देखि प्रस्ताव गरिएको छ । साथै सतह ढल २०१.९०८ कि.मी.सडकको दुवै तर्फ निर्माणको समेत योजनामा समावेस गरिएको छ ।

उपरोक्त सडक सञ्जालको साथै यातायात व्यवस्थापनको योजना पनि तयार गरिएको छ । जसमध्ये यातायात व्यवस्थापनका लागि अति आवश्यक पर्ने सहरी बस स्टेशनहरू १ स्थानमा (वडा नं.४ को फर्साटिकर र बस टर्मिनल वडा नं.२ ठुटेपिपल १ स्थानमा प्रस्ताव गरिएको छ । त्यस्तै सडक पूर्वाधारहरूमा सडक बत्तिहरू, फुटपाथहरू, बस वे, साइकल ट्रायक, ग्रिनबेल्ड, सहरी सेवाका लागि केवल डक्टहरू, अपाङ्गमैत्री फुटपाथहरू आदि निर्माण गर्ने प्रस्ताव गरिएको छ ।

उपरोक्त विभिन्न वर्गका सडकहरूमा सवारी गुड्ने मार्ग (Carriage Way) को पीचको डिजाइन सडक वर्गीकरण अनुसारको चौडाई प्रस्ताव गरिएको छ । प्रस्तावित सडकहरू निर्माण गरिसकेपछि निरन्तर सुलभ आवागमनको लागि सडकलाई दुरुस्त राख्न अति आवश्यक हुने भएकोले सो को लागि चरणबद्ध मर्मत सम्भार कार्यको प्रस्ताव गरिएको छ

। जस्तै Routine maintenance, Recurrent maintenance, Periodic maintenance, Emergency maintenance and Rehabilitation System को प्रस्ताव गरिएको छ ।

उपरोक्त प्रस्तावित योजनाहरूको कार्यान्वयन, योजनाको प्राथमिकता तथा विगतमा गाउँपालिकाले सहरी सडक निर्माणमा खर्च गरिएको बजेट र आगामी वर्षहरूमा उपलब्ध हुन सक्ने बजेटको आधारमा आगामी ५ वर्षमा गर्न सक्ने योजनाहरू छनौट गरी प्रतिवेदन तयार गरिएको छ । जस्तै पुरानो सडकहरूका विस्तार तथा स्तरोन्नती गर्ने र नयाँ थप निर्माण समेत गरी जम्मा १८३.४३८ कि.मी. लम्बाईको विभिन्न वर्गको सडक निर्माणको लागि कूल जम्मा रु. ६,३८,०७,६५,०८०.०० (६ अर्ब ३८ करोड ७ लाख ६५ हजार ०८० रुपैयाको) खर्च लाग्ने अनुमान गरिएको छ ।

जसमध्ये आगामी ५ वर्ष भित्र १९.६९७ कि.मी., 'A' वर्गको सडक, 'B' वर्गको ११.२१६ कि.मी., 'C' वर्गको १९.३९१ कि.मी. समेत गरी जम्मा ५०.३०५ कि.मी. सडक निर्माण सम्पन्न गर्ने लक्ष राखिएकोमा 'D' वर्गका सडकहरू यसमा समावेश गरिएको छैन । उपरोक्त सडकहरू चरणबद्ध निर्माण गर्नको लागि आ.व. ०७८/७९मा रु.११,९२,३०,११५.००, आ.व. ०७९/८०मा रु. २०,९५,७२,४३९.०० , आ.व.०८०/८१मा रु.३६,१८,०१,८८०.००, आ.व.०८१/८२मा रु. र आ.व.०८२/८३मा रु.४६,२६,३८,८४८.०० रु. ५६,३८,००,३९२.०० गरी कूल रु.१ अर्ब ७१ करोड ७० लाख ४३ हजार ६ सय ६६ रुपैयाको व्यवस्थापन गर्नुपर्ने देखिन्छ ।

उपरोक्त रु.१ अर्ब ७१ करोड ७० लाख ४३ हजार ६ सय ६६ रुपैया मध्ये गाउँपालिकाको आन्तरिक स्रोतबाट रु. ७१,७६,७६,६७५.०० जुट्न सक्ने देखिन्छ भने बाँकी रु.९९,९३,६६,९९१.०० रुपैया विभिन्न सरकारी तथा गैह्र सरकारी एवं दातृ निकायहरूबाट अनुदान तथा ऋण सहयोग एवं स्थानीय जनसमुदायको सहभागिता जुटाई निर्माण गर्नु पर्ने देखिन्छ ।

Executive Summary

Population growth and rapid urbanization has become the greatest noteworthy scenario in the context of the local level (R-Municipal) development in Nepal. With the increased in population, provision of well-planned and well managed such infrastructure for urban development has become a challenge, and the local authority is unable to provide required infrastructures, thus proper managed urbanization and urban road network plan is required.

Rural Municipal Transport Master Plan (R-MTMP) is defined as the process of identification, classification and prioritization of roads within municipality; Development of transportation infrastructure is one of the most essential groundwork for opening other avenues of development. Therefore, keeping this in view, Omsatiya Rural Municipality is envisaged to prepare Rural Municipal Transport Master Plan.

Preparation of rural municipal transport master plan is the first step in planned development process. The R-MTMP provides information on the existing status and proposes the necessary interventions for the comprehensive accessibility and mobility within the municipality and with the adjoining areas. The Rural Municipal Transport Master Plan (R-MTMP) offers medium and long term perspective plan for the development of urban roads network in the municipality.

The project area, Omsatiya Rural Municipality is one of the newly designated rural municipal area identified as potential growth centre. which lies in Rupandehi District Lumbini province along the Siddhartha Highway (North-South) and Postal (Hulaki) Highway corridor at Southern. The main city/market area of rural municipality is along the highway located at 262.36 km (Approx.) West of Kathmandu and 19.62 Km East of Butwal City.

According to the municipal profile 2076 BS, the total population of Omsatiya rural municipality is 35,451 with 6,539 households. The population density is 769 people per square kilometres. The average family size of the municipality is around 5.40. The total administrative boundary area of rural municipality is 48.53 sq. km with 14 numbers of wards.

Due to heterogeneous society with people of different community, culture and beliefs, there is no such typical language, culture, tradition or festivals in that area. It is the uniqueness of the area. There are 14 major religious and tourism sites including Hindu, Muslim and temples like Omsatiya, ponds having urban roads access.

There are 23 Educational Institutions including Private and Government schools. Among them, one is providing Higher Secondary Education up to Campus level. Health services are available through 4 health institutions including Government and Community based health institutions. All these institutions are within the road access.

Agriculture is the mainstay of the economy of the rural municipality. 51% of the total population is involved in Agriculture.

Most of the part of the rural municipality is covered with cultivable land (i.e., 84.38% of total land). This indicates that the major source of income of the people is agriculture and agro-based industry. More than 50 industries based on agriculture including 6 numbers of brick industries. The study found that 18 No's of co-operative, finance and offices (Money Transfer) are in operation at present with huge annual transaction. There are 2 commercial & development banks

which are mostly located in the ward 1 area on National highway or near it. The banks and cooperatives are investing in industries and business, but not on development works.

Urban environmental problems are mostly inadequate and unsafe water supply, waste water, solid waste, excess use/lack of energy sources, loss of green and natural spaces, urban sprawl, pollution of soil, air, traffic, noise, etc. Omsatiya rural municipality also faces similar kind of environmental problems. In this rural municipality, the prevailing environmental problems and issues are including Air and others pollution, besides of disasters, flood, inundation, landslide, erosion are the major problem in the rural municipality.

The land topography of Omsatiya is plain terrain. The most of the part is plain area that is suitable for the development of settlement in the rural municipality. Some of them have developed as either settlements or market centers, which are suitable for further expansion or development. There are all together 11 market centers and major settlements have developed including Thutepile, Padasari, Balapur etc. Most of the markets centers and settlements area has developed on the Siddhartha Highway and Postal Highway. The existing road network are almost developed in these settlement and need to be upgraded. Some of settlements area have potential to develop as tourism, industrial, market centers, agricultural, forestry etc.

The Siddhartha Highway (4.179 km) passes through ward 1 and 2 at North to South and Postal (Hulaki) is crossing ward number 4 at Southern and traditional linear pattern of settlement can be noticed along the highway corridor. The rural municipality has total 201.908 km of road altogether, which consist of all kinds of roads including Postal Highway (4.431 km) , Siddhartha Highway (4.179 Km) while length of district road is 18.682 and the length of urban road category is 172.732 km. Among total road length, 53.610 km road is black topped, RCC 2.854 km, 123.068 km is gravelled and 24.858 km road is found earthen.

Rural municipality has basic accessibility of transportation, i.e. all the people of rural municipality have access with all-weather road in 5-10-minute walking distance.

There is no any bus terminal except one small bus park at Thutepile, which is managing for 15/17 nos. buses and micro buses. All most all transportation means are focused only on Siddhartha highway and Postal highway and there is no public transport along other road sections of the rural municipality.

According to data of traffic, majority of accidents occurs due to high speed and negligence of traffic rules. Although, there are majority of Bicycle, motorbike users and pedestrians, there is no any safety provision on highways for these users.

Besides, of Forecast and Planning, this clause deals with future projection of population and vehicle along with allocation of potential development areas. It also formulates the hierarchy of urban roads, relationship of land use and future transportation planning, various infrastructure planning and how they will help to enhance the mobility and accessibility scenario. Finally, it covers the aspect of short term and long term urban road network and transportation planning.

The population of the rural municipality is in increasing order. The migration is chief factor. For sustainable supply of transport infrastructure, it is crucial to forecast the future population and required infrastructures for traffic management.

According to population census record of CBS 2068, municipal profile 2076, which shows that the growth rate is 0.52 in this period. The present population is 35451 (*Source, Omsatiya Rural Municipal Profile 2076 BS.*), the population of municipality seems in increasing trend. This population will be reached 36,572 in 2083 BS, (that is after five years).

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

In the planning process of the transport infrastructures, projection of the traffic is the most crucial factor. To forecast the traffic flow, it assumed that about 50 to 60% of the populations make the daily trips. The projected traffic based on extreme case of population. From calculation, total 21,943 trips make by the people in a day with various means, that are 1317 trips by Auto Rise, 6,144 trip by bicycles, 19,068 by motorcycles, 2414 trips by car and jeeps, 3291 trips by public vehicle and 1975 trips by walking. (Daily, 2083 BS.)

Urban roads facilitate a variety of functions, including as a direct access to pedestrian and bicycle paths, bus routes and catering for through traffic. Many roads serve more than one function and to varying degrees, but it is clear that the mixing of incompatible functions can lead to problems. Thus it is important to distinguish road in different class or type based on various criteria. As per guidelines the study has divided the roads in 4 hierarchical Class A, B, C, and D with different RoW. like 16m, 13m, 8m, and 6m respectively.

All urban road links within the rural municipality have given their names and unique code number consisting of ten digits, for example, (508RM09A001: Hulaki Rajmarga-Velahi Gaun-Pahkhauli Gaun-Taraini Gaun–Dipnagar Path).

The ultimate goal of most transportation is “access,” people’s ability to reach their destination, and get services and activities in time. Land use patterns affect mobility and accessibility in various ways.

Process and procedure adopted for collection of demand from ward level through meeting in every ward or ward cluster has been done.

Public transport is a means for mobility of local people that from settlements to market, institutional area etc. Travel pattern is fundamental for the planning of public transport routes. For the better mobility and transportation system, local government should be introduced city buses.

The road way is used either pedestrian or motor or both, the proportion of active transport users such as cyclist, pedestrian is very high, the road infrastructure necessary to support these users, for examples: roadside infrastructures with road markings, traffic signs and signals, bus stops, bus bays street lighting, parking lances, taxi stands, cross pedestrians, electricity lines, cable poles, underground utilities, roadside drainage. footpath, traffic calming elements (road hump), green belt, bus terminal and city bus station etc.

Various components are included in a transportation system. For the proper functioning of the whole system, each component should work properly, which are drainage system, parking area,

road furniture and traffic management. Road pavement is a specified space, required for the movement of traffic/vehicle below at or above the ground.

The maintenance is series of interdependent activities carried out for preserving and keeping road at serviceable condition, furniture, structures and others facilities in the best possible condition to provide satisfactory and safe transportation along the road within the optimum cost. Maintenance ensures that which reduces road deterioration, lowering vehicle operating cost, keeping road smooth mobility and always open, safe etc. It also considers environmental issues. Types of maintenance are routine maintenance, recurrent maintenance, periodic maintenance, emergency maintenance and rehabilitation.

The intervention has to be applied to the road sections based on their priorities and the annual budget. The plan has also addressed the immediate need of NMT facilities within the municipal area along the MRCN.

The five-year Rural Municipal Transport Master Plan has been developed to guide the municipal investments on road infrastructure through 2077/78-2082/83 BS. The financial budget plan is developed on the basic of available municipal budgets and forecasted for future requirement on the basic of preceding year's budgets. The total budget required for first 5 years are as NRs. 11,92,30,115 for first fiscal 078/079, NRs. 20,95,72,431 for fiscal year 079/080, NRs. 36,18,01,880 for 080/081, NRs. 46,26,38,848 for 081/082, and 56,38,00,392 for fiscal year 082/083. Therefore, the total budget required for coming 5 years is NRs. 1,71,70,43,666. The available of total municipal budget (Municipal internal source) will be NRs. 71,76,76,675 for upcoming 5 fiscal years. The deficit amount is NRs. 99,93,66,991, the deficit amount has to be managed from external sources to achieve to goals and objectives as R-MTMP.

The proposed Road class is listed as:

S.N	Proposed MRCN Class	RoW, M	Track Opening, Km	Road Length	Total Road Length by Class, KM
1	Class A	16	-	34.105	34.105
2	Class B	13	-	22.939	22.939
3	Class C	8	-	39.483	39.483
4	Class D	6	-	74.31	74.31
5	Rohini Khola Corridor	16	12.60	12.60	12.60
Grand Total				183.438	183.438

During preparation of MTMP, the investment from total available resources under road sector for different classes of the road can be distributed as Apportion 30% for maintenance at first and remaining 70% has been distributed for construction, upgrading and rehabilitation. Further, divided the construction budget allocated for road sector are invested with 40% in A-Class and Municipal, 30% in B-class, 20% in C-class and 10% in D-class.

Besides, of internal source, the other required budget has to be managed from external side like, federal government, provincial government, donor agencies, grants and people contribution.

Table of Contents

Letter of Submission.....	i
Project Description and Structure.....	ii
Acknowledgement.....	iii
Acronyms/Abbreviations.....	iv
कार्यकारी सारांश.....	vi
Executive Summary.....	ix
Table of Contents.....	xiii
List of Charts.....	xvii
List of Figures.....	xviii
List of Tables.....	xix
List of Maps.....	xx
Chapter: 1 Introduction.....	1
1.1 Context and Background.....	1
1.2 Objectives.....	2
1.3 Scope and Limitation of R-MTMP.....	3
1.4 Expected Output.....	4
Chapter: 2 Study Methodology.....	5
2.1 General Approach.....	5
2.2 Literature Review and Guidelines.....	8
2.2.1 Historical Sketch of Road Transport in Nepal.....	8
2.2.2 DoLIDAR-MTMP Guidelines and Manual.....	10
2.2.3 Nepal Road Standard-2070 BS.....	10
2.2.4 Nepal Urban Road Standard- 2076.....	11
2.3 Primary Data Collection.....	12
2.4 Data Processing, Field Verification and Analysis.....	13
2.5 Indicative Municipal Development Potential Map (IDPM).....	13
2.6 Municipal Road Inventory Map (MIM).....	14
2.7 Perspective Road Interventions of Services and Facilities.....	14
2.8 Rural Municipal Transport Master Plan (R-MTMP).....	14
Chapter: 3 Review of Existing Situation.....	15
3.1 General Overview.....	15

3.2	Visionary New Town Development Plan	15
3.3	Visionary Rural Municipal Transport Master Plan.....	17
3.4	Constraints in the Implementation of R-MTMP.....	18
Chapter: 4 Indicative Development Potential Map		20
4.1	Introduction of Study Area	20
4.2	Landuse, 2077	21
4.3	Summary of Municipal Profile	23
4.3.1	Socio-Economic and Demographic Status	23
4.3.2	Physical Infrastructure	27
4.3.3	Social Infrastructure	30
4.3.4	Economic Status	34
4.3.5	Environment Status	37
4.4	Development Potential Area	39
4.4.1	Settlement and Market Centers	39
4.4.2	Administration Center and Service	40
4.4.3	Industry.....	40
4.4.4	Agriculture/Forestry and Its Processing	41
4.4.5	Tourism.....	41
Chapter: 5 Municipal Inventory Map of Road Network		42
5.1	Overview of Road Network.....	42
5.2	Accessibility and Mobility.....	45
5.3	Traffic Volume Study	46
5.3.1	Traffic Vehicle Count.....	47
5.3.2	Traffic	48
5.3.3	Active and Passive Transport User.....	49
5.3.4	Public Transportation	49
5.3.5	Safety Status and Issues.....	49
5.4	Forecast and Planning	50
5.4.1	Population and Traffic Forecasting	50
5.4.2	Traffic Forecast	51
5.5	Formulation of Road Network Hierarchy	52
5.5.1	Right of Way (RoW)	53

5.5.2	Road Classification.....	55
5.5.3	National Highways	55
5.5.4	Feeder Roads	55
5.5.5	District Roads	56
5.5.6	Municipal Urban Roads.....	56
5.6	Nomenclature and Coding of Urban Roads	62
Chapter: 6 Perspective Plan of Municipal Transport Network		63
6.1	Accessibility and Trip Pattern.....	63
6.2	Process and Procedure for Collection of Demand	64
6.3	Scoring System for Screening, Grading and Prioritization.....	64
6.4	Feasible New Linkage	66
6.5	Public Transportation.....	68
6.6	Basic Road Infrastructure	69
6.6.1	Street Lighting	69
6.6.2	Parking Lanes	70
6.6.3	Taxi Stand.....	71
6.6.4	Bus Stops and Bus-Bays.....	71
6.6.5	Cross Pedestrians.....	72
6.6.6	Electricity lines, Cable Poles	72
6.6.7	Underground Utilities	73
6.6.8	Road Side Drainage	74
6.6.9	Traffic Calming Elements (Road Hump)	75
6.6.10	Green Belt.....	75
6.6.11	Traffic Regulations and Control.....	76
6.6.12	Road Side Furniture.....	77
6.6.13	Bus Terminal and City Bus Station	77
6.7	Transportation Management and Safety	81
6.8	Road Pavement	82
6.9	Urban Road Maintenance and Rehabilitation	83
Chapter: 7 Five Year Rural Municipal Transport Master Plan		84
7.1	Five Year Projected Financial Plan	84
7.2	Sharing of Municipal Fund	85

7.3	Intervention on MRCN and Cost Estimation.....	87
7.4	Five –Year Implementation Plan	90
7.1	Policy and Strategy	95
7.2	Suggestion.....	95
Chapter: 8 Conclusion		96
References		97
Annex I: List of Existing Municipal Road Core Network (MRCN)		98
Annex II: List of Scoring of (MRCN).....		115
Annex III: Consider Unit Cost for Different Interventions		119
Annex IV: Field Photographs		120
Annex V: Minutes		121

List of Charts

Chart No 2.1: Phase Wise Development of RMTMP	6
Chart No 4.1: Existing Landuse, 2077	22
Chart No 4.2: Description of Demography	24
Chart No 4.3: Caste Detail.....	25
Chart No 4.4: Religion Detail.....	25
Chart No 4.5: Education Status of the Rural Municipality	26
Chart No 4.6: Migration Detail	26
Chart No 4.7: Water Supply System	27
Chart No 4.8: Irrigation System	28
Chart No 4.9: Electricity Facility	28
Chart No 4.10: Sanitation Status	29
Chart No 4.11: Ward Wise Involvement in Economic Activity, Households.....	35
Chart No 4.12: Involvement of People in Economic Sector, %	35
Chart No 5.1: Existing Road Inventory	43
Chart No 5.2: Ward Wise Road Network.....	43
Chart No 5.3: Ward Level Road Density	44
Chart No 5.4: Ward Level Population Road Density	44
Chart No 5.5: Road Length by Road Width	45
Chart No 5.6: Composition of Vehicle Count	48
Chart No 5.7: Vehicle Composition at Different Places	48
Chart No 5.8: Traffic Detailed.....	49
Chart No 5.9: Population Forecast	51
Chart No 6.1: Transportation Land Use Cycle	63
Chart No 7.1: Municipal Expenditure in Road Sector	85
Chart No 7.2: Budget Share for Different Intervention and Class of Road	86
Chart No 7.3: Budget Projection in Road Development Sector and Maintenance	87
Chart No 7.4: Projection of Sharing of Municipal Budget in MRCN.....	87
Chart No 7.5: Proposed Road Class	88

List of Figures

Figure No 2.1: Typical Cross Section of Road.....	11
Figure No 2.2: Typical Cross Section of Urban Road.....	12
Figure No 5.1: Urban Road Condition at Ward 5	44
Figure No 5.2: Urban Road Condition at Ward 6	44
Figure No 5.3: Conceptual Hierarchy	53
Figure No 5.4: Road Network Hierarchy	53
Figure No 5.5: Urban Road Hierarchy	53
Figure No 5.6: Definition of RoW	54
Figure No 5.7: Detail Description of Road Class.....	55
Figure No 5.8: Typical Cross Section of Feeder Road.....	56
Figure No 5.9: Typical Cross Section of District Road.....	56
Figure No 5.10: Typical Cross Section of Arterial Road (Class A).....	57
Figure No 5.11: Typical Cross Section of Arterial Road (Class B)	58
Figure No 5.12: Typical Cross Section of Collector Road (Class C).....	58
Figure No 5.13: Typical Cross Section of Local Road (Class D)	59
Figure No 6.1: Typical View of Bagmati Corridor	67
Figure No 6.2: Typical Views of Dhobikhola Corridor	67
Figure No 6.3: Typical Public Transport Mode	69
Figure No 6.4: Typical Public Road.....	69
Figure No 6.5: Provision of Street Light	70
Figure No 6.6: Typical Layout of street parking.....	70
Figure No 6.7: Provision of Street Parking Lane	71
Figure No 6.8: Typical Layout of Taxi Stand	71
Figure No 6.9: Typical Plan of Bus Stop & Bus Bys	72
Figure No 6.10: Typical Plan of Pedestrian Crossing, C. Class Road	72
Figure No 6.11: Electricity lines and Cable Poles.....	73
Figure No 6.12: Provision of Underground Utilities.....	74
Figure No 6.13: Typical Conceptual Plan of Road Side Drainage.....	74
Figure No 6.14: Typical Plan & Section of Road Hump	75
Figure No 6.15: Green Belt	76
Figure No 6.16: Traffic Regulations and Signs.....	76
Figure No 6.17: Road Side Seating Furniture	77
Figure No 6.18: Typical Conceptual Plan of Bus Terminal-I	78
Figure No 6.19: Typical Conceptual Plan of Bus Terminal-II.....	78
Figure No 6.20: Typical Functional Arrangement of Bus Terminal	79
Figure No 6.21: Typical Functional Arrangement of City Bus Station	80
Figure No 6.22: Typical Pavement Thickness	82

List of Tables

Table No 2.1: Methodology Involved during R-MTMP Preparation.....	7
Table No 4.1: Political Boundary, Omsatiya Rural Municipality	20
Table No 4.2: Annexing Wards Forming Rural Municipality	20
Table No 4.3: Existing Landuse, 2077	22
Table No 4.4: Ward wise Landuse	22
Table No 4.5: Description of Demography and Household	24
Table No 4.6: Elevated Tank Detail	27
Table No 4.7: Educational Intuitions Detailing	30
Table No 4.8: Healthcare Centers Detail.....	31
Table No 4.9: Citizen Security Services.....	32
Table No 4.10: Major Religious Sites	32
Table No 4.11: Public Service Centers.....	33
Table No 4.12: Public Spaces and Open Spaces	33
Table No 4.13: Major Agro farms, Industries and Factories.....	36
Table No 4.14: Bank and Finances.....	37
Table No 4.15: Major Settlements and Markets.....	39
Table No 5.1: Existing Road Inventory.....	42
Table No 5.2: List of District Road	42
Table No 5.3: Distribution of Ward Wise Road Length and Density	43
Table No 5.4: Road Length by Road Width.....	45
Table No 5.5: Road Condition.....	45
Table No 5.6: Transport Facility	46
Table No 5.7: Connectivity of Major Cities	46
Table No 5.8: Location and Route for Vehicular Count	47
Table No 5.9: Vehicle count per Hour	47
Table No 5.10: Traffic Condition.....	48
Table No 5.11: Population Forecast	51
Table No 5.12: Traffic Forecast	52
Table No 5.13: Urban Road Class and Features.....	54
Table No 5.14: Coding Guideline of R-Municipal Roads.....	62
Table No 6.1: Criteria for Prioritization	65
Table No 6.2: Proposed Route for Corridor Development.....	66
Table No 6.3: List of Connectivity , Ward Centre	68
Table No 6.4: Proposed Public Transportation Route.....	68
Table No 6.5: Street Light Pole Height and Spacing	70
Table No 6.6: Recommendation of Depth of Laying Underground utilities.....	73
Table No 6.7: Bus Terminal and City Station	78
Table No 7.1: Projection of R-Municipal Budget Investment in Road Sector.....	84
Table No 7.2: Sharing of Municipal Budget on MRCN Class.....	86
Table No 7.3: Total Length By MRCN Class	88
Table No 7.4: Intervention on MRCN Class for Twenty Years	91
Table No 0.1: Field Photographs.....	120

List of Maps

Map No 4.1: Location Map, Omsatiya Rural Municipality	20
Map No 4.2: Location Map, RMTMP	21
Map No 4.3: Administrative Boundary Map.....	21
Map No 4.4: Landuse Map	23
Map No 4.5: Demographic Map.....	25
Map No 4.6: Physical Infrastructures Map.....	30
Map No 4.7: Social Infrastructures Map	34
Map No 4.8: Major Market and Settlements	40
Map No 4.9: Administrative Centers and Service Map	40
Map No 5.1: Urban Road Network	44
Map No 6.1: Major Feasible New Linkage	67
Map No 7.1: Proposed Road Class Map	88
Map No 7.2: Sample Maps of Proposed Road Class.....	89
Map No 7.3: Five Year Plan Map	90

Chapter: 1 Introduction

1.1 Context and Background

Population growth and rapid urbanization has become the greatest noteworthy scenario in the context of the local level (Municipal) development. Provisions for the transportation, mobility and supportive infrastructures for the well-organized urbanization has become the prominent challenge for most of the stakeholders and administrations. With the increased in number of migrants, provision of well-planned and well managed such infrastructure for urban development has become a challenge, and the local authority is unable to provide proper infrastructures, thus proper managed urbanization and urban road network plan is required.

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

Chiefly, this R-MTMP aims to assess the present status of roads and transportation within the Rural Municipality through extensive field survey and inventorying the details of existing roads and transport situation. The study has also unfolded the problems and genuine necessities on road and transportation along with the recommendation of key interventions to be made for the sustainable development of road and transportation network. Planning Approach adopted by the consultant is fundamentally bottom up and participatory. Study and analysis of existing road status and need assessment have been the basis for this overall planning.

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

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

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

Local Government Operation Act (2074) provisions formulation of local development plan according to needs-based, bottom-up and participatory approach. It has prominently defined tangible steps for formulation of such development plan. The main objective of this plan is to make investment for planned development within each of the local bodies' territory. Ultimately, development endeavours help attaining sustainable livelihood and improved well-being of people. People's needs for sustainable livelihood and improved well-being are such that they require better access to information, markets and opportunities; they need better access to health, education and other goods and services. Hence as a part of R-MTMP preparation, accessibility planning has recommended as an effective tool to access the existing situation of the services and facilities. Strategic road network is important for national income while local roads are for poverty reduction (Worku, 2011). The interventions derived from the accessibility planning has shall represent the real needs and priorities of the local people.

Nepal Government, Ministry of Federal Affairs and Local Development stepped up to bring forward proposal to create New Municipalities including Municipalities from those urban and semi-urban settlements by combining prevalent Village Development Committees approved the proposal leading to creation of 753 local bodies with new municipalities in various steps. There are altogether 6 Metropolitan, 11 Sub-Metropolitan, 276 Municipalities and 460 Rural Municipalities, October, 2017. Since, this Rural Municipality are at an early stage of infrastructure development they require appropriate long-term plan so that organized and beautiful cities shall be developed. R-MTMP has considered as an objective tool for prioritizing the projects and it will fulfil partially the lacking part of LGOA. 2074. Therefore, the Omsatiya Rural Municipality is intended to prepare R-MTMP for sustainable transport development in the city.

1.2 Objectives

The overall objective of the consulting services is to prepare the Rural Municipal Transport Master Plan (R-MTMP) of the Rural Municipality. The R-MTMP has been prepared as per the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR)'s Approach Manual and ToR provided by the client. The specific objectives, but not necessarily limited to the following, are:

- To collect of demands for new/rehabilitation transport linkages from Rural Municipality/Settlements based on city development plan.
- Analyse the accessibility situation.
- Identify and priorities the interventions based on the accessibility situation.
- Prepare Indicative Developmental Potential Map (IDPM).
- Prepare the Municipal Inventory Map (MIM) of Road networks.
- Prepare the Perspective Plan of transport services and facilities.
- Synchronize the draft Perspective Plans of adjoining VDCs/Municipalities/districts.
- Develop scoring criteria and its approval from Rural Municipality.
- Prepare the five years Rural Municipal Transport Master Plan (R-MTMP)
- Prepare a realistic physical and financial implementation plan of prioritized roads for the R-MTMP period; and
- Prepare Municipal Transport Perspective Plan (MTPP).

1.3 Scope and Limitation of R-MTMP

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

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

Limitation

This transport master plan is limited within the territory of the Rural Municipality. Since the data collected for the planning has been based on the information provided by the local people in the ward levels, they may have supplied limited information. Although enumerators have attempted their best to reach all the roads for the necessary data, there are chances of missing the data to some extent. Misnaming of the road may occur due to the pronunciation error or hearing problem by the respondent as well as enumerators. Chances of error may occur during data entry and tabulation. The scale used to work on GIS is also likely to generate some errors. Though such limitation and errors are obvious, attempts have been made to minimize such errors taking precautions in the error prone areas. The field survey has been conducted through Drone Survey but the rural municipality lies within domestic flight range that may restrict the drone flight and hence it may give incomplete drone image and data.

1.4 Expected Output

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

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

Chapter: 2 Study Methodology

2.1 General Approach

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

The Consultant studied thoroughly the objective and ToR for preparation of the Rural Municipal Transport Master Plan (R-MTMP).

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

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

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

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

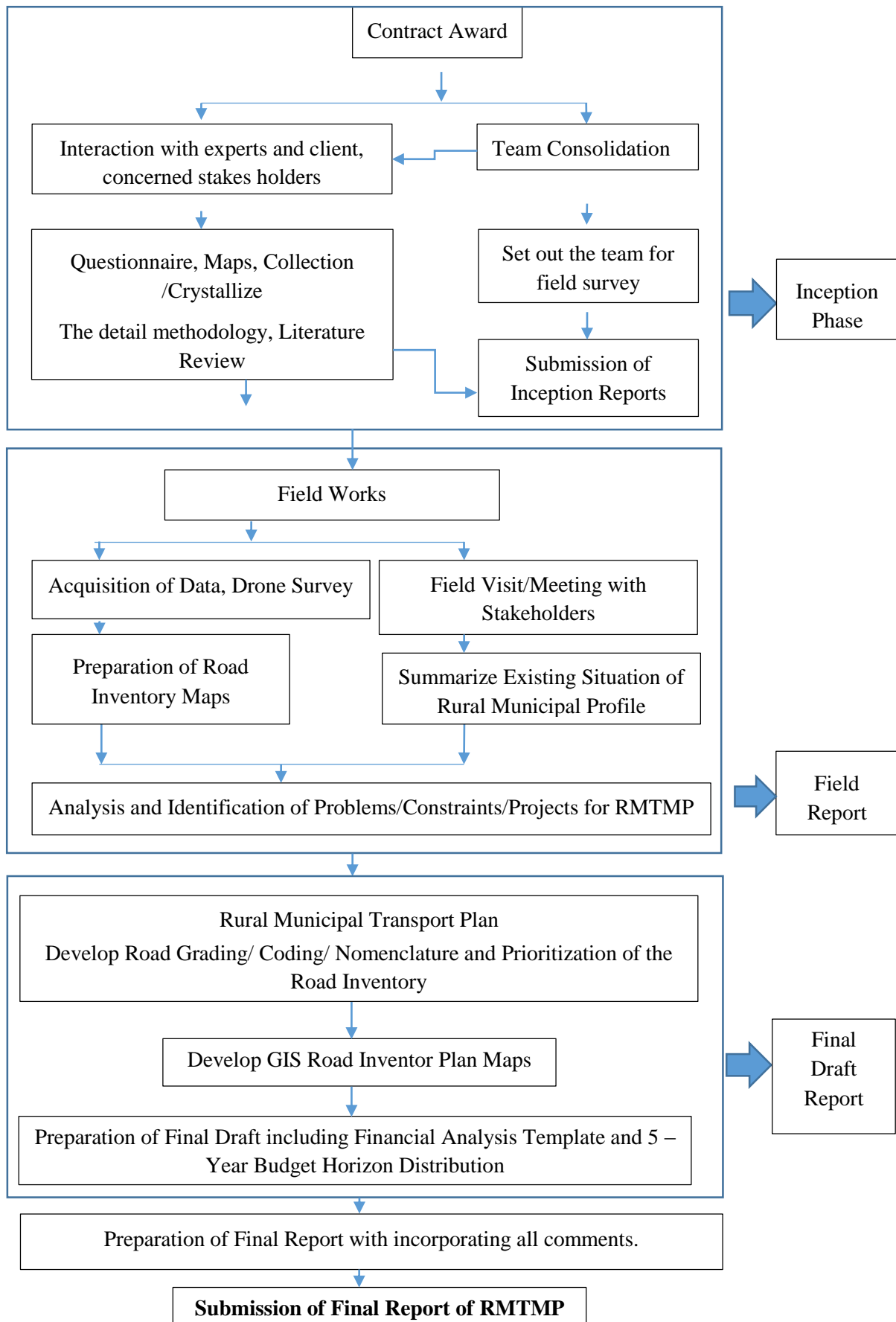


Chart No 2.1: Phase Wise Development of RMTMP

Table No 2.1: Methodology Involved during R-MTMP Preparation

S.N	List of Task	Activities to be done	Output
1.	Data Collection		
1.1	Desk Study	The existing data, reports and information of the study area will be collected. The collected data's will be compiled, analyzed and thoroughly reviewed before carrying out further works.	General municipal information, locations etc.
1.2	Review of secondary source of information	Collection of secondary information/Maps from the various Municipal based line agencies, I/NGOs and other regional and central level related institutions.	Obtain information about Municipal situation in general, ready to precede further steps.
1.3	Literature Reviews	Study of the proposed project and collection of information through internet surfing, planning norms, government policies, planning policies, guidebooks, articles etc. Moreover, other relevant information has also been collected from MoUD, NPC, DOR, MoFALD, DUDBC, DoLIDAR, NURS and other libraries. Case study of similar projects and best examples of proper R-MTMP has been carried out.	Ideas of best Planning approach, National guidelines, policies and way of planning. Relation between vicinities local level, potential development and importance of RMTMP in the Municipality.
1.4	Review of existing R-MTMP (if any)	Review of available existing R-MTMP. Data collection about yearly allocated budget for R-MTMP road and progress report of Rural Municipality. Interaction with Rural Municipal Technician and other Officials.	Implementation trend of R-MTMP Planning, constraint of implementation will be found out.
1.5	Accessibility Data Collection, Drone Survey	Data collect through enumerators/field supervisor including drone survey. Develop field data collection data sheets and related arrangement. Verification of secondary data in the field. Collection of road data using GPS, Measuring Tapes etc., Collection of access situation of every settlement in prescribed form, collect Minutes and field photos etc.	Find out the access situation of every settlement and market areas, identification of gaps with the reference to Plan City.
2	Analysis of Data	Data entry-storage of collected data in computer using MS Excel software. Preparation Location map, Road Inventory Maps Calculation of accessibility index	Compilation of data, Accessibility index of all Wards of the Municipality
3	IDPM Preparation	Assess the various potentiality of development of the Rural Municipality Organize Rural Municipality/MRCC meeting GIS map preparation	IDPM report, Finalization of Growth Centres, identification and ranking of existing/potential areas and services.
4	MIM Preparation	Assess the inventory of existing transportation linkage Reconnaissance survey Identification of required intervention	MIM report, identify the existing transport situation, verification of MIM through discussion with the R-Municipal Board.

S.N	List of Task	Activities to be done	Output
		Map preparation	
5	Area workshop Ward/Municipal level	Participatory workshop in each wards Discussion about criteria of prioritization. Standardize the accessibility indicator Synchronize of interventions at Rural Municipality level Validation of access data Prioritization of interventions.	Prioritization of interventions and projects
6	Perspective Plan	Compile the result from Accessibility analysis. Area workshops. Identify and prioritize the interventions in every services and facilities based on approved Rural Municipality road standard. Extract required interventions in transport linkage from the perspective plan of services and facilities.	Perspective Plan of service and facilities including R-Municipality Road network.
7	R-MTMP Preparation	Assess the financial resources Priorities the perspective plan Preparation or updating R-MTMP	First five year Rural Municipal road planning.
8	Approval of R-MTMP	Presentation of draft R-MTMP in the Municipal council through MRCC and Rural Municipality meetings.	Final R-MTMP Report
9	Final Report Submission	Incorporate all the comments (if any) from draft reports	Final report Completion the Project

2.2 Literture Review and Guidelines

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

2.2.1 Historical Sketch of Road Transport in Nepal

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

strategic road network during the period of 1950 – 1975 gradually changed and the country started to focus on constructing roads of regional importance.

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

District Transport Planning Initiatives in Nepal

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

Early Initiatives in District Transport Planning

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

- Alignment is to pass through maximum of village settlements lying along the ridges or mid hill slopes rather than valley bottom.
- Avoid as much as rivers and streams so that construction cost can be kept low.
- Alignment to pass through geologically stable area.
- Preference to alignment, where peoples' participation and resource conservation approach could be adopted.
- Open up economically active areas to better market access.
- Selection of routes that make possible for local people to extend the proposed alignment to other villages through local resources mobilization.

- Roads and trails so planned that are possible to interconnect with other road networks within the district or neighbouring districts so as to achieve an inter district road networks.

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

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

2.2.2 DoLIDAR-MTMP Guidelines and Manual

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

- MTMP Definition and overviews
- Objectives and scopes
- Expected output and limitation in MTMP Implementation
- Formulation of Municipality Road Coordination Committee (MRCC)
- Road inventory data collection sheets, demand analysis and map preparation.
- Requirements of transport linkages between wards and settlements, upgradation/Rehabilitation of urban roads etc.
- Develop Scoring Criteria and Approval from Rural Municipality
- Road Classification (A, B, C, D, Municipal Ring Road (if any) and Nomenclature.
- Transport services and facilities intervention and accessibility
- Analysis fund availability for urban roads and perspective budget planning by developing 5-years horizon
- Preparation of MTMP with GIS Maps colour code, legends etc.

2.2.3 Nepal Road Standard-2070 BS

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

With the objectives of achieving consistency in road design and construction, NRS was first introduced by DOR in B.S. 2027 and was revised in B. S 2045. Minor revisions were made in

B.S 2051 and in 2054 B.S to incorporate certain changes, which were relevant at the time of revisions. But those revisions were treated separately, not as an official version of the NRS-2027.

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

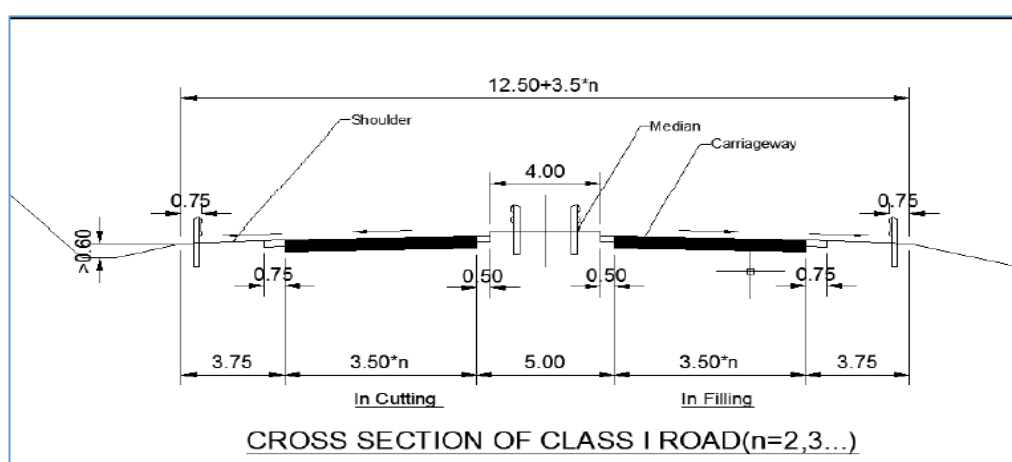


Figure No 2.1: Typical Cross Section of Road

2.2.4 Nepal Urban Road Standard- 2076

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

In this context, growing urbanization in Nepal is major challenge for the urban planner as well as municipal authorities. Such situation has created a challenging situation for safe movement of vulnerable road user specially the pedestrians and non-motorized vehicles leading to poor road safety situation. The recent situation demands safer travel and accessibility to all while considering the urban mobility. The urban mobility and accessibility mainly depend upon the urban road network planning and their technical parameters. With the objectives of achieving consistency in road design and construction, Nepal Road Standard, (NRS) had been introduced. According to four administrative classification given in Nepal Road Standard-2070, urban road is one of them but, these standards were applicable only for the design of strategic roads and are

not applicable to address all the urban needs. Therefore, it became very essential to develop the ‘Nepal Urban Road Standard’.

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

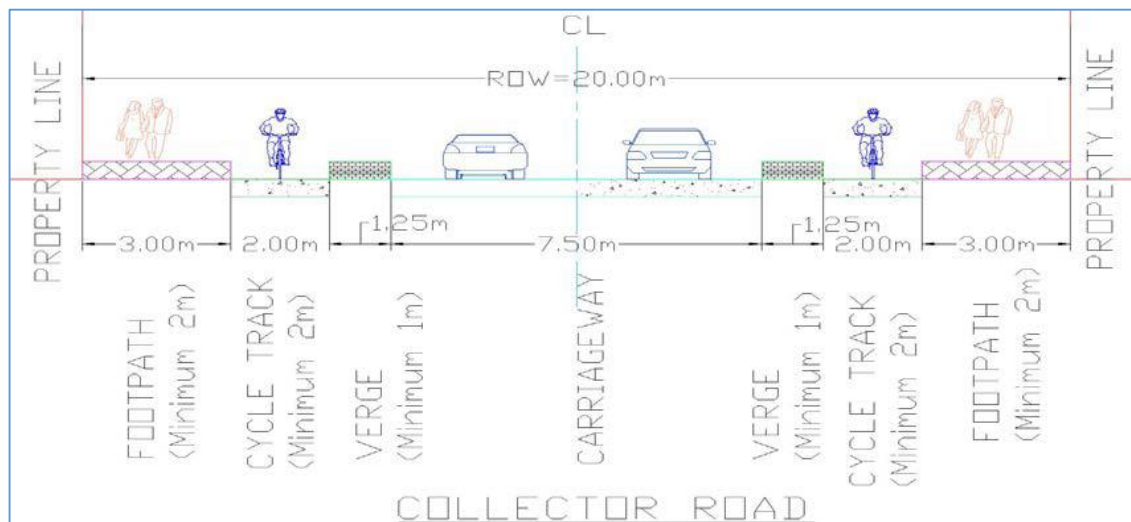


Figure No 2.2: Typical Cross Section of Urban Road

2.3 Primary Data Collection

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

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

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

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

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

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

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

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

Drone Survey: for accurate land use and clear image, drone survey was conducted throughout the rural municipality as far as possible. The satellite image helps to verify the existing data and to prepare the land use map.

2.4 Data Processing, Field Verification and Analysis

After verify the Rural Municipal Boundaries, Ward boundaries and other necessary data, Data collected from field was used as a base data. All the complete and reliable sets of data were transformed into useable information and present scenario of Rural Municipality has been shown through charts, graphs, figures and tables. For Roads, fields have been added in attribute table for Total Width, Carriageway Width, Surface type, road name etc. Data obtained from field inventory and verification for roads, land use has been manually entered for all roads using Editor Tool in Arc GIS. GPS and drone image has been used for recording place names, Buildings, Culverts and Bridges in the field. This drone image, GPS data have been converted using “GPS Conversion tools” and then used in Arc GIS. Similarly, those which has been entered into GIS database provides various types of maps. Population and traffic has been forecasted for the R-MTMP and MTPP Period. And, finally various intervention has been proposed and their economic analysis is also performed.

2.5 Indicative Municipal Development Potential Map (IDPM)

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

- Location Maps/Administrative/Political Boundaries of Rural Municipality/Ward.
- Large/ Major settlements and Market Centres.
- National Strategic Roads, Urban Roads, Trails, Bridges etc.
- Important historical, cultural, religious and preserved places.
- Important water bodies, forest, cultivable land and other lands.
- Institutions, Line agencies, commercial, economic development areas, Industries, Tourism and Urban Linkages etc.

- Other potential development Areas.

2.6 Municipal Road Inventory Map (MIM)

R-Municipal Road Inventory Map (MIM) has been prepared based on field inventory survey. The field survey has been carried out by mobilizing enumerators via walkover surveys. The Inventory includes the roadway length, width, surface type, carriageway width, drainage condition, number of served population, administrative buildings, educational offices and hospitals/health posts. The consultant then carries out reconnaissance survey in the trails, bridges and roads with the help of checklist and updated the maps

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

2.7 Perspective Road Interventions of Services and Facilities

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

In transportation sector, list of roads, bridges and required interventions for respective roads along with bridges have been identified to improve accessibility to goods and services. The perspective plan of road has been prepared for 20-25 years. All the identified interventions screened and graded based on criteria of the approach manual. Accordingly, the final perspective plan of urban roads is developed. The perspective plan has been shown in GIS maps also.

2.8 Rural Municipal Transport Master Plan (R-MTMP)

Considering the Perspective Plan, the prioritization of the Perspective Plan will be done according to the DoLIDAR Approach Manual. This plan provides Urban road grading, specific coding, nomenclatures and all road inventory information likes length in km., width, RoW, etc. Subsequently, the five-year horizon R-MTMP has been prepared by selecting interventions (maintenance, upgrading and new construction of main trails, trail bridges and roads) that have top priority in the Perspective Plan. The plan should be implemented in the next 5-Year horizon period The plan depends upon cost estimation of maintenance, upgrading, rehabilitation and new construction of MRCN, Trail, Bridges and others urban roads according to available of financial resources.

The consultant has also prepared indicative cost estimates of improvements (Routine maintenance, recurrent maintenance & upgrading) and new construction of representative trails, bridges and urban roads. The cost estimate has been prepared separately for various classes of urban roads.

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

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

Chapter: 3 Review of Existing Situation

3.1 General Overview

Rural Municipal and ward level surveys have revealed that the overall transport infrastructure, primarily road network appears to be in medium state in Omsatiya Rural Municipality. Despite being located in plain and geographically accessible region; rural municipality lags far behind in terms of well-developed road infrastructures. The major characteristics of the roads in rural municipality is manifested by muddy ones during the rainy/wet seasons and entirely dusty during the winter/dry seasons. At present condition, Siddhartha Highway (H10) and Hulaki Highway passes the r-municipality that are most important roads linkage as a key of the transportation and mass mobility. Most of the roads in rural municipality have been observed as fair weather roads and need to be improved and upgraded in order to bring into operation round the year.

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

3.2 Visionary New Town Development Plan

The local level, Omsatiya rural municipality lies in plain terrain that makes sure the great opportunities for the development. But, due to the lack of financial support, low literacy rate, poverty, social discriminations, Omsatiya is facing huge challenges in the sector of development. The rural municipality has aimed to make city as a SMART CITY by selecting the major settlements. The programs have been listed which was presented by Chairman of rural municipality during 5th *Gaunshawa* the presented report has chiefly focused on the physical, social, economic, institutional and environmental infrastructures. However, development of road and transportation sector is the foremost sector to attain its long term vision and goals. The long term vision of the Rural Municipality is " *The development foundation of Omsatiya is an Agriculture, Tourism Industry and Infrastructures* "

ओमसतियाको विकासको आधार
कृषि, पर्यटन, उद्योग र पूर्वाधार

Visionary as SMART CITY Development plan of the rural municipality gives a brief picture of the potential areas of growth that will bring social and economic prosperity in the municipality. It has identified the potential areas of economic growth and helps guide other planning efforts to compatibly support those areas. This brings rapid development of the rural municipality in all sectors. The presented report during 5th *Gaunshawa*, rural municipality highlighted as a lead sector is *Agriculture and Eco-Tourism of the development of Omsatiya Rural Municipality*.

According to the "Planning Standard and Norms 2015", road density should be 5 km/sq.km (NUDS 2015) for newly formed municipality. At present, the road density of the municipality is 7.38 km/sq.km which means that the road density is more than the standard value. Therefore, the rural municipality need not to open the new track but rural municipality should plan for the upgrading/expansion of the roads which should be of standard quality and suitable for all types

of weathers. The existing road networks need major intervention in maintenance and upgrading tasks.

The Major R-Municipal Policies and Guidelines (2076/77 BS)

- भू-उपयोग नीति बनाई कृषि, खानी, जडिबुटी, व्यापारिक, बस्ती आदी क्षेत्रको बर्गिकरण गरी भूमिको बैज्ञानिक व्यवस्थापन गरिनेछ । कृषि भूमिको खण्डिकरण, प्लाटिङलाई निरुत्साहित गरिनेछ । गाउँपालिकाको विस्तृत सर्भे र नापी गर्ने कार्य आरम्भ गरिनेछ ।
- पर्यटन प्रवर्द्धन तथा विकासको लागि पर्यटन गुरुयोजना निर्माण गरिनेछ । गाउँपालिका भित्र रहेका पर्यटकीय क्षेत्रहरूको पहिचान गरी विकासमा जोड दिईनेछ ।
- **Eco-Tourism** को अवधारणालाई आत्मसात् गर्दै पर्यावरण हराभरा बनाउँदै भू-क्षय तथा जथाभावी माटो खन्ने तथा ओसारपसार माथि नियमन गरिनेछ । वातावरण मैत्री गाउँपालिकाको अवधारणा बमोजिमका क्रियाकलापहरू संचालन गरिनेछ ।
- सार्वजनिक उद्यान तथा पार्क, मनोरञ्जन केन्द्र निर्माण तथा स्थापना गरिनेछ । पर्यटन प्रवर्द्धनको लागि एकिकृत सूचना केन्द्रको स्थापना गरिनेछ ।
- आ.व. २०७८।७९ सम्ममा प्रत्येक वडामा १/१ वटा खेलकुद मैदान र गाउँपालिकास्तरमा रंगशाला निर्माणको लागि पहल गरिनेछ ।
- “महिनाको एक दिन श्रम”को अवधारणा अनुसार प्रत्येक महिनाको तोकिएको निश्चित दिनमा सबै शिक्षक, कर्मचारी तथा जनप्रतिनिधीले सार्वजनिक हित जस्तै : सरसफाई, बृक्षारोपण, निर्माण आदि जस्ता सार्वजनिक कार्यक्रमहरूमा अनिवार्यरूपमा श्रम गर्नुपर्ने नीति अवलम्बन गरिनेछ ।
- स्थानीय स्तरमा रोजगारीका अवसरहरू सिर्जना गरिनेछन । यसका लागि निजी क्षेत्रसंग सहकार्य गरिनेछ । उद्योगमैत्री नीतिको अवलम्बन गरी गाउँपालिका भित्र उद्योग धन्दा, कलकारखानाको स्थापना र संचालन गर्न निजी क्षेत्रलाई प्रोत्साहित गरिनेछ ।
- ओमसतिया गाउँपालिकालाई पूर्ण सरसफाई युक्त गाउँपालिका बनाईनेछ । यसका लागि ढल व्यवस्थापन, फोहरमैला व्यवस्थापन कार्यलाई प्रभावकारी बनाईनेछ ।
- गाउँपालिकालाई कृषि क्षेत्रको हब का रूपमा रूपान्तरण गरिनेछ । गाउँपालिकामा रहेका कृषि योग्य भूमिलाई विभिन्न ब्लक र पकेटमा विभाजन गरी माटो सुहाउदो आधुनिक र व्यवसायिक खेतीलाई जोड दिईनेछ । कृषि अन्तर्गत मल र बिउमा अनुदान दिने व्यवस्था गरिनेछ ।
- गाउँपालिका भित्रका प्रत्येक घरधुरीको सर्वेक्षण गरी डिजिटलाईज गरिनेछ । प्रत्येक घर र व्यक्तिलाई **Unique Identification Number** उपलब्ध गराउदै गाउँपालिकाको बृहत प्रोफाइल तयार गरिनेछ । गाउँपालिकाको रणनीतिक योजना, गुरु योजना, आवधिक योजना र ई-प्रोफाइल तयार गरी सोही बमोजिम नै अन्य योजना तथा कार्यक्रमहरू सञ्चालन गरिनेछ ।
- भवन निर्माण आचार संहितालाई अनिवार्य रूपमा लागु गर्दै बस्ती विकासलाई व्यवस्थित बस्ती विकासको अवधारणा बमोजिम गर्दै गाउँपालिका मार्फत भवन निर्माण कार्यविधि निर्माण गरी नक्सा पास गरेर मात्र भवन निर्माण कार्य अधि बढाइनेछ ।
- टोल विकास समिति गठन गरी साना तथा मझौलास्तरका विकास आयोजनाहरूमा सहकार्य गरिनेछ । विकास कार्यमा सहकार्य गर्न, विकासलाई स्थायित्व दिन र संरचनाहरूलाई संरक्षण गर्न प्रत्येक टोलमा टोल विकास समिति बनाई गाउँपालिकामा दर्ता गरिनेछ । विकासका कार्यक्रमहरू टोल विकास समिति मार्फत गर्न प्रयास गरिनेछ ।

- समन्वय, सहकार्य र सहअस्तित्वमा आधारित रही छिमेकी स्थानीय तहहरु, प्रदेश सरकार र केन्द्र सरकारसंग सहकार्य र समन्वय गरी गा.पा.को समग्र विकासका लागि आवश्यक क्रियाकलापहरु संचालन गर्न आवश्यक पर्ने प्राविधिक एवं आर्थिक सहयोगका लागि पहल गरिनेछ ।
- स्थानीय सडक तथा भौतिक पूर्वाधारहरुको निर्माण तथा उपयोग गर्दा वातावरणीय सन्तुलनको पक्षलाई ध्यान दिदै पानीको मुहान, वनजंगल, वस्ती, खोलानाला, पर्यटकिय तथा धार्मिक क्षेत्रको संरक्षणलाई उच्च प्राथमिकतामा राखिनेछ । वातावरण मैत्री सडक निर्माणको अवधारणालाई आत्मसाथ गरिनेछ । पूर्वाधार विकास तथा निर्माण सम्बन्धि सबै कार्यहरु उत्पादनमुखी, वातावरणमैत्री, अपांगतामैत्री, बालमैत्री, जेष्ठ नागरिकमैत्री र प्रकोप प्रतिरोधी बनाउने कार्यविधि निर्माण गरी कडाईकासाथ लागु गरिनेछ ।
- ठूला पूर्वाधार निर्माण तथा विकासका लागि संघीय र प्रदेश सरकारसंग समन्वय गरी अधि बढिनेछ । सो को लागि योजना पहिचान गरी डि.पि.आर. तयार गरी पेश गरिनेछ ।
- विभिन्न ठाउँमा रहेको स्थानीय बजारलाई व्यवस्थित बजार (Smart City) को अवधारणा अनुसार अगाडि बढाइनेछ ।

Source: ओमसतिया गाँउपालिकाको आ.व. २०७६/०७७ को नीति तथा मार्गदर्शन

3.3 Visionary Rural Municipal Transport Master Plan

Current Life is Living in New Town/ SMART CITY-i.e., organized and planned human settlements, which are mostly referred to as communities is only possible if people have good mobility in daily basis. Settlements are separated from workplaces, major shopping is concentrated in identifiable centers, and larger entertainment and relaxation facilities are found at specific locations. They have to have good accessibility.

The Siddhartha Highway (H10) on western part and FR (Bhumahi - Parasi - Bhairahawa) in southern part are major national highways passing through the rural municipality. These highways play important role in transport mobility and enhance the economy of the rural municipality. The Omsatiya Temple and numerous number of fish farming ponds are major tourism sites. The market along the highway like Padasari, Thutepipel, Balapur, Basantapur, Darkhaswaa are major existing market centers. Besides these Tarkula, Pathkhauli Gaun, Chotki Ramnagar, Narainapur, Farsatikhar, Karuwani, Gaurigaun areas can be developed as potential local market areas. The settlements are seemed as linear pattern which is mostly along the highway corridor and in typical village area, settlements are in compact type settlements. The people from local level are migrating towards the market areas in search of better lives and opportunities. All wards are suitable for the residential purposes. The major economic development sector is agriculture, business/trade and eco-tourism. Majorly, Fish farming and livestock farming have great opportunity within the rural municipality. The agriculture products can be easily exported via. major two highways to the major cities like Bhairawa, Siddharthangar, Butwal. The chemical factory, fiber factory, food industries, rice mill, furniture, brick industries are major industries within the rural municipality. In general, most of the sectors are connected by urban roads.

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

The minimum road density in existing municipal level has planned to make at least 5 km/sq.km area. Again, the clause number-40 has described the overall strategy of municipal roads. It has focused on:

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

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

Source: Nepal Urban Development Strategy, 2015

- स्थानीय सडक तथा भौतिक पूर्वाधारहरूको निर्माण तथा उपयोग गर्दा वातावरणीय सन्तुलनको पक्षलाई ध्यान दिदै पानीको मुहान, वनजंगल, वस्ती, खोलानाला, पर्यटकिय तथा धार्मिक क्षेत्रको संरक्षणलाई उच्च प्राथमिकतामा राखिनेछ । वातावरण मैत्री सडक निर्माणको अवधारणालाई आत्मसाथ गरिनेछ । पूर्वाधार विकास तथा निर्माण सम्बन्धि सबै कार्यहरू उत्पादनमुखी, वातावरणमैत्री, अपांगतामैत्री, बालमैत्री, जेष्ठ नागरिकमैत्री र प्रकोप प्रतिरोधी बनाउने कार्यविधि निर्माण गरी कडाईकासाथ लागु गरिनेछ ।
- ठूला पूर्वाधार निर्माण तथा विकासका लागि संघीय र प्रदेश सरकारसँग समन्वय गरी अधि बढिनेछ । सो को लागि योजना पहिचान गरी डि.पि.आर. तयार गरी पेश गरिनेछ ।
- विभिन्न ठाउँमा रहेको स्थानीय बजारलाई व्यवस्थित बजार (Smart City) को अवधारणा अनुसार अगाडि बढाइनेछ ।

Source ओमसतिया गाँउपालिकाको आ.व. २०७६/०७७ को नीति तथा मार्गदर्शन

3.4 Constraints in the Implementation of R-MTMP

Road network is believed to be the lifeline of infrastructure. The doors of other physical, social, economic, institutions, environmental infrastructures development possibilities are unlocked through the proper development of roads and transportation. Since the existing condition of roads in the rural municipality is medium stage and large in length which requires huge portion of budget is to address the problem of road upgradation and maintenance. This budgetary problem is purely a major obstacle for the timely implementation of the R-MTMP. Besides this other possible constraint are:

- Scatter settlements

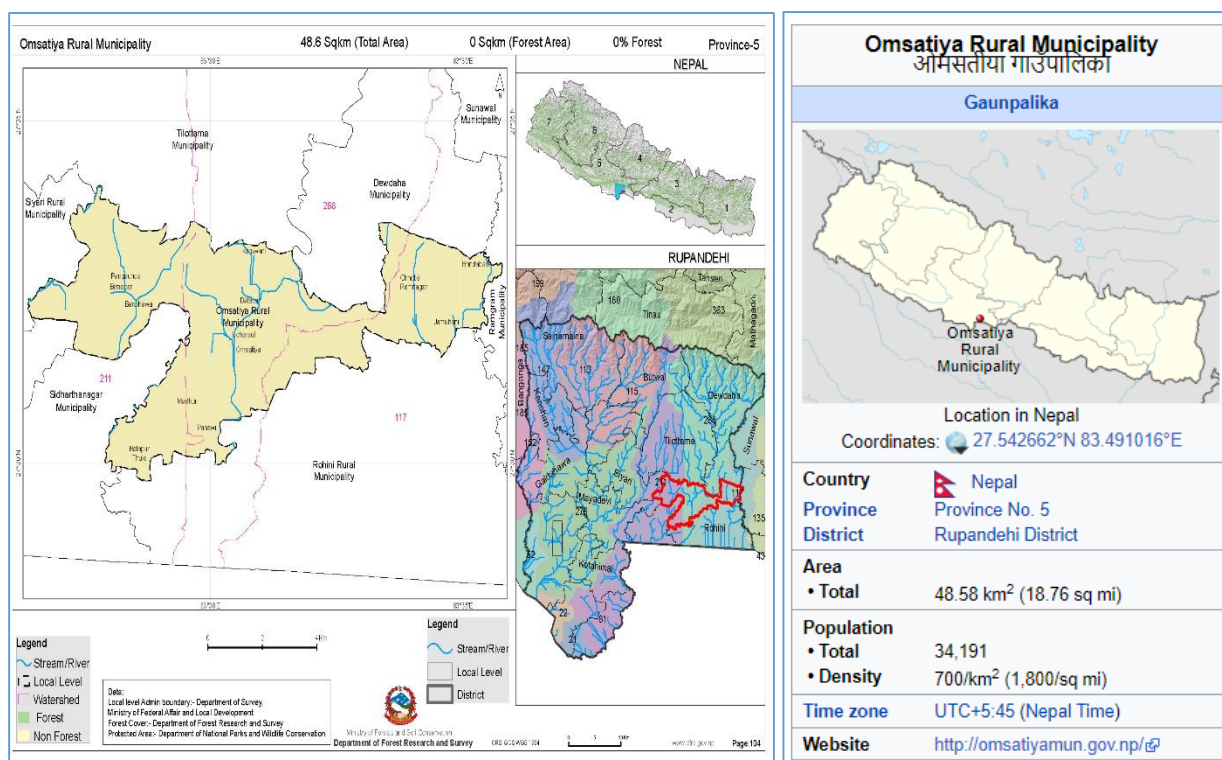
- Lack of natural drainage due to minimal land slopes
- Problem of inundation due to waterlogging
- Finalization of standard RoW from the base level is problematic
- Lack of technology and information
- Lengthy procurement process for construction work
- Lack of qualified manpower and labor force
- Lack of smooth and reliable availability of construction materials
- Lack of stable and favorable working environment.
- Social issues and believes
- Lack of financial supports

Chapter: 4 Indicative Development Potential Map

4.1 Introduction of Study Area

Omsatiya Rural Municipality is located in Rupandehi District of Lumbini Province. Hatiphasatiker is the Center of Omsatiya Rural Municipality. Omsatiya was declared Rural Municipality on 12 March 2017 by annexing former Padsari, Hatiphasatiker, Basantapur, Patkholi, Chotiramnagar VDCs. The total administrative boundary area of the rural municipality is 48.53 Sq.km having total 6 numbers of Wards.

Topographically, Omsatiya Rural Municipality entails 27°32'16"N and 83°26'22" E to 27°32'55"N and 83°35'47" E. Rohini Khola is major river flowing through mid of the Rural Municipality.



Map No 4.1: Location Map, Omsatiya Rural Municipality

Source: Local Resource map

Table No 4.1: Political Boundary, Omsatiya Rural Municipality

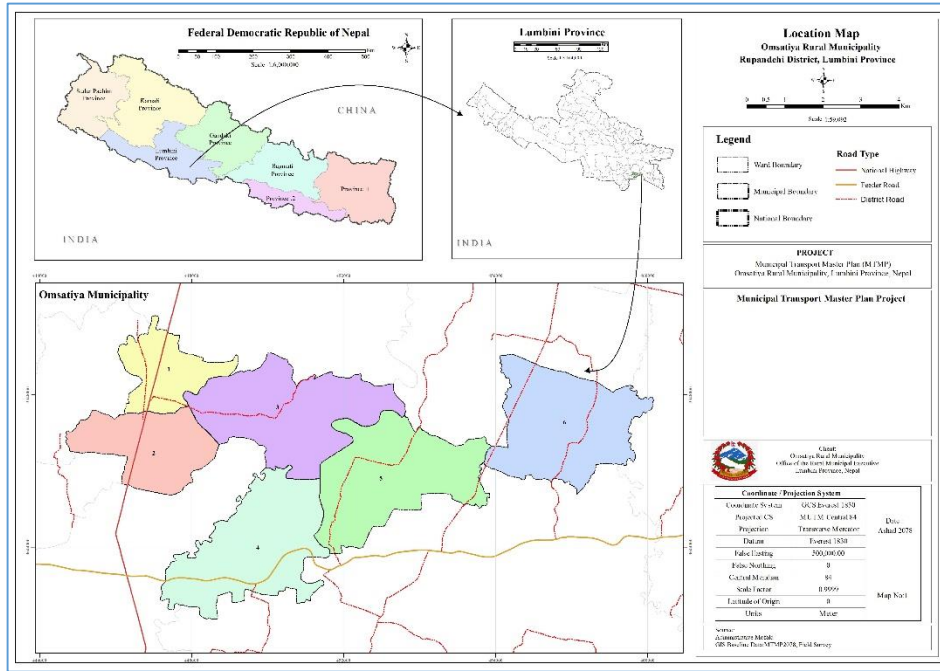
East :	Nawalparasi
West :	Siyari and Mayadevi Rural Municipality and Siddharthanagar Municipality
North :	Devdaha and Tilottamma Municipality
South :	Rohini Rural Municipality

Source: MoFALD, 2073

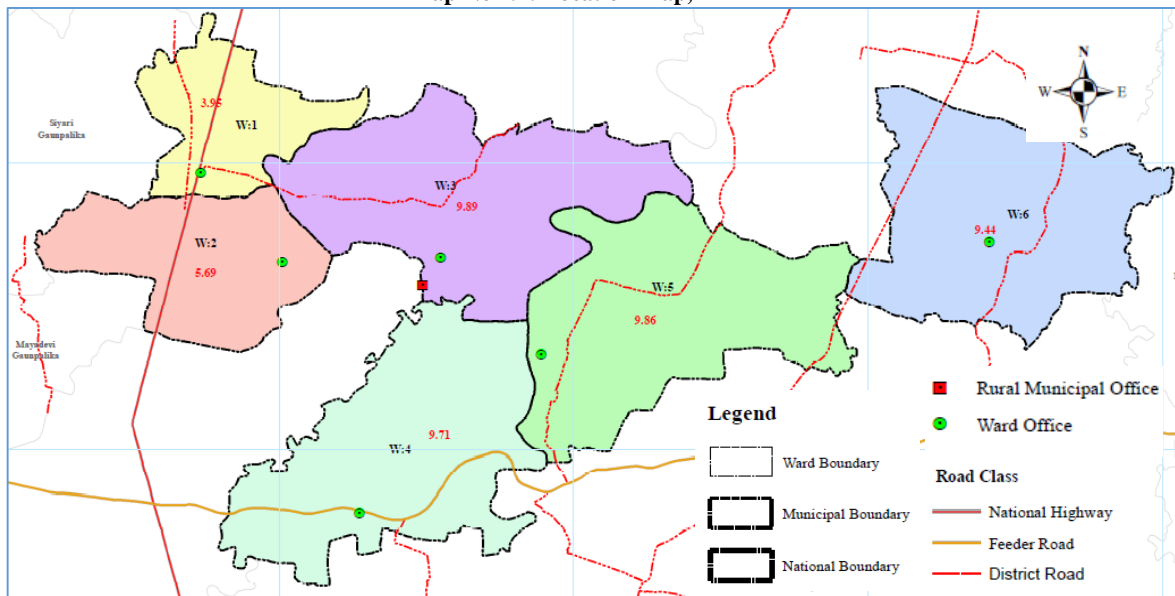
Table No 4.2: Annexing Wards Forming Rural Municipality

New Ward No	Old Ga. Bi. Sha	Old Ward No	Ward Area, Sq.Km
1	Padsari	5-8,9	3.94
2	Padsari	1-4, 6	5.69

New Ward No	Old Ga. Bi. Sha	Old Ward No	Ward Area, Sq.Km
3	Hatiphasatiker	1-9	9.89
4	Basantapur	1-9	9.71
5	Patkholi	1-9	9.86
6	Chhotaramnagar	1-9	9.44
Total Area			48.53



Map No 4.2: Location Map, RMTMP



Map No 4.3: Administrative Boundary Map

4.2 Landuse, 2077

The total land cover of the municipality is 48.53 sq.km. 84.38 % of the land is covered by cultivation area while 8.87 % area of municipality is covered by builtup area where as 2.66 % accounted for forest and bushes area. Municipality has several numbers of small ponds, and

Rohini river as water bodies that covers an area of 1.46 %. The rural municipality has highly dense settlement along the Siddhartha Highway corridor 1, 2, which has been seen in Table No 4.3. below.

Table No 4.3: Existing Landuse, 2077

S.N.	Landuse	Area, Sq.Km	%
1	Barren Land	0.39	0.80
2	Builtup	4.30	8.87
3	Bush	1.26	2.61
4	Cultivation Area	40.93	84.38
5	Embankment Area	0.13	0.27
6	Forest	0.03	0.05
7	Orchards	0.25	0.52
8	Pond	0.26	0.54
9	Sand	0.48	0.99
10	Swamp	0.04	0.08
11	Water Bodies	0.43	0.88
Grand Total		48.53	100.00

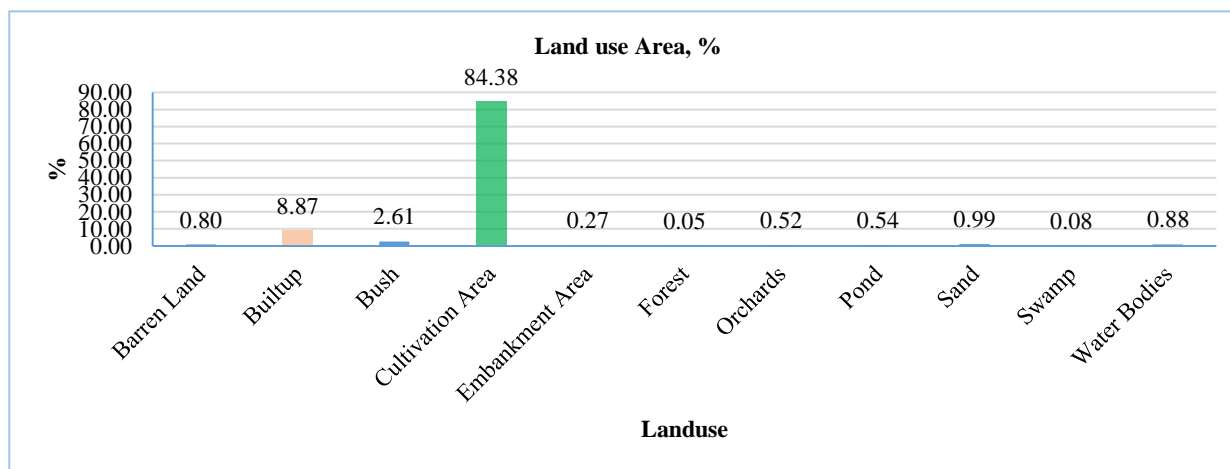
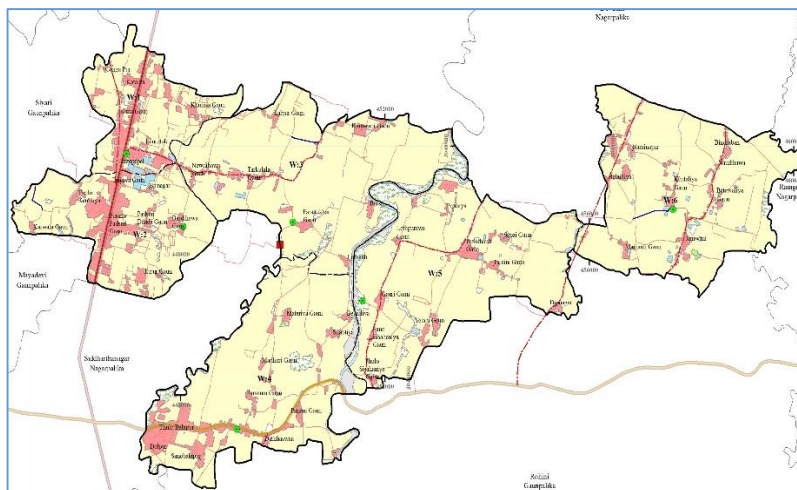


Chart No 4.1: Existing Landuse, 2077

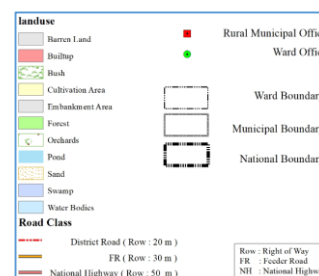
Table No 4.4: Ward wise Landuse

Landuse	Wards						Grand Total Area, Sq.km
	1	2	3	4	5	6	
Barren Land	0.06	0.08	0.05	0.07	0.06	0.07	0.39
Builtup	0.82	1.00	0.44	1.11	0.47	0.46	4.30
Bush	0.01	0.08	0.36	0.29	0.44	0.09	1.26
Cultivation Area	2.93	4.40	8.77	7.78	8.34	8.70	40.93
Embankment Area	-	0.02	0.02	0.06	0.03	0.01	0.13
Forest	0.00	-	-	0.01	0.00	0.02	0.03

Landuse	Wards						Grand Total Area, Sq.km
	1	2	3	4	5	6	
Orchards	0.04	0.01	0.03	0.03	0.12	0.03	0.25
Pond	0.07	0.07	0.02	0.00	0.03	0.07	0.26
Sand	-	-	0.08	0.20	0.20	-	0.48
Swamp	0.02	0.01	0.01	-	-	-	0.04
Water Bodies	-	-	0.12	0.16	0.15	-	0.43
Grand Total	3.95	5.69	9.89	9.70	9.86	9.44	48.51



Land Use Map
Omsatiya Rural Municipality
Rupandehi District, Lumbini Province



Map No 4.4: Landuse Map

4.3 Summary of Municipal Profile

4.3.1 Socio-Economic and Demographic Status

Local people involve in economic activities, participation, open markets etc. It provides more choices and more options as well. Local government is expecting to change the socio economic development by ensuring economic right, decentralization, shifting resources to poorer geographic. Rural Municipality has been trying to explore skills, knowledge and expertise of the local people in the process of socio-economic development. Local government has provided trainings, skills, knowledge and expertise to backwards groups, women and youth as well for poverty reduction, employment generation, gender equality with technical assistance, monitoring and evaluation.

Demography of the city helps to forecast the population changes pattern and its proper management. Total population, population density, household structure, literacy rate status, health, education., economic status, existing infrastructures, topography, climates changes, environment conditions, natural resources, and their characteristics are summarized here. These are some of the major pillar for better understanding of the locality.

Population and Density

According to the municipal profile of 2076, the total population of Omsatiya Rural Municipality is 35, 451 with 6,539 households. The population that are 18,214 male and 17,237) are female.

The average population density of the Rural Municipality is 769 people per square kilometres, the average family size of the Rural Municipality is around 5.42.

Table No 4.5: Description of Demography and Household

S.N	Ward No	Ward Area, Sq.Km	HH	Female	Male	Total Population, 2076	Total Population, 2068	Population Increase rate %, ANNUAL	Population Density, People/Sq. km
1	1	3.94	1047	2350	2377	4727	4840	-0.29	1228
2	2	5.69	1107	2845	2995	5840	5111	1.68	898
3	3	9.89	1058	2832	3014	5846	4929	2.16	498
4	4	9.71	1283	3894	4164	8058	8163	-0.16	841
5	5	9.86	973	2356	2553	4909	5708	-1.87	579
6	6	9.44	1071	2960	3111	6071	5352	1.59	567
Total	6	48.53	6539	17237	18214	35451	34103	0.52	769

The table 4.5 shows that the population increased rate of the Omsatiya is on average 0.52 % per annum. Also the highest populated ward is 1 having population density 1228. The largest ward of the rural municipality is 3 having area 9.89 sq.km whereas smallest ward is 3.94 sq.km. The total number of the wards is 6 and total administrative boundary area of the rural municipality is 48.53 sq.km.

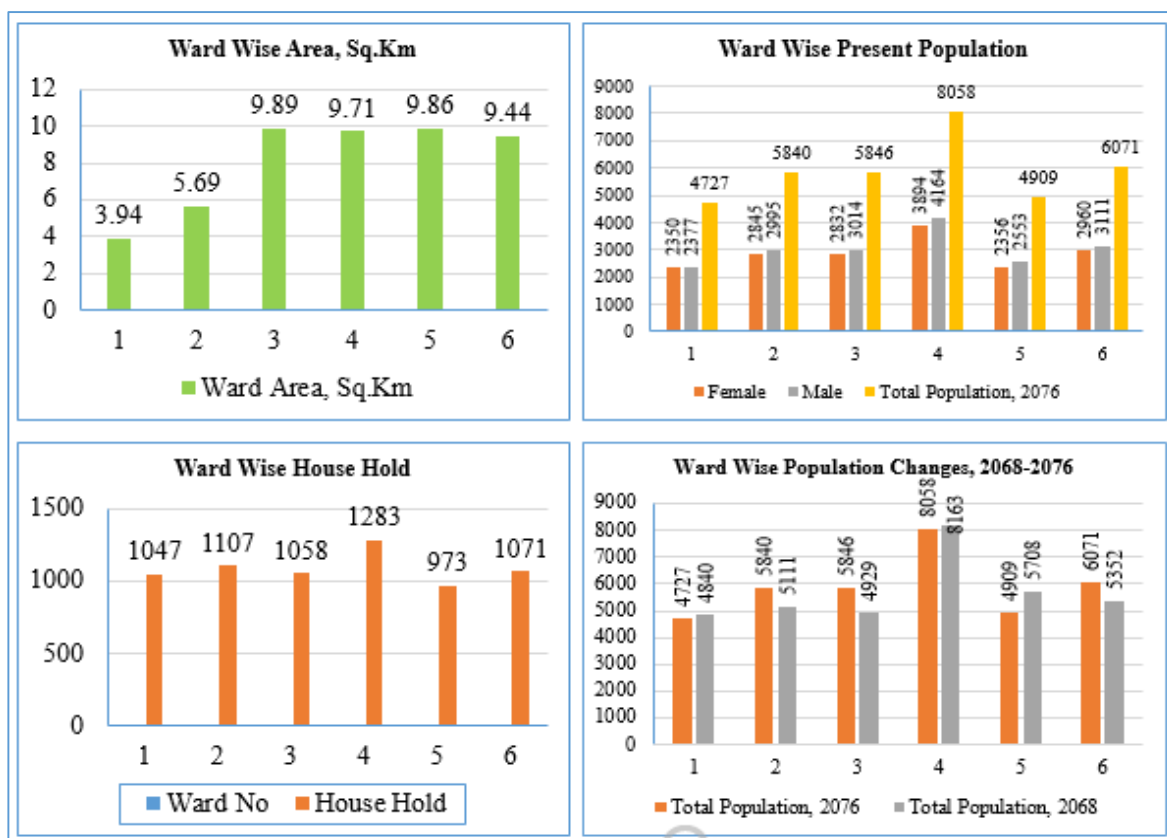
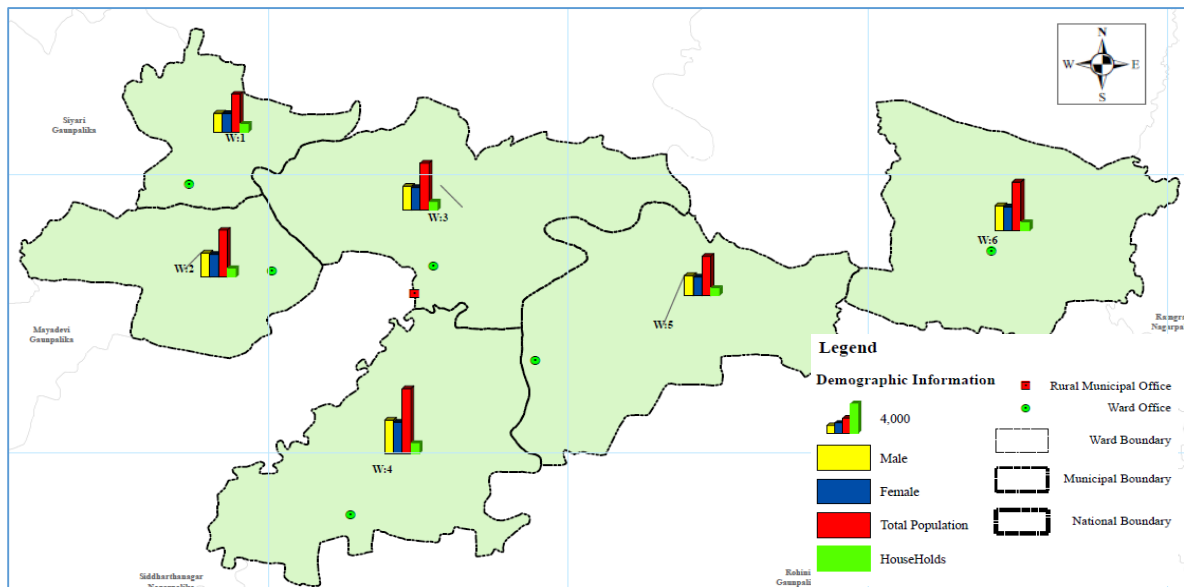


Chart No 4.2: Description of Demography

Source: Municipal Profile 2076



Map No 4.5: Demographic Map

Population by Ethnicity and Caste

The ethnicity and caste pattern of the Rural Municipality shows diversity with major ethnic groups like Janajati including Terai community (53%), Dalit (6%), Chhetri (15%), Bramin (9%) in majority.

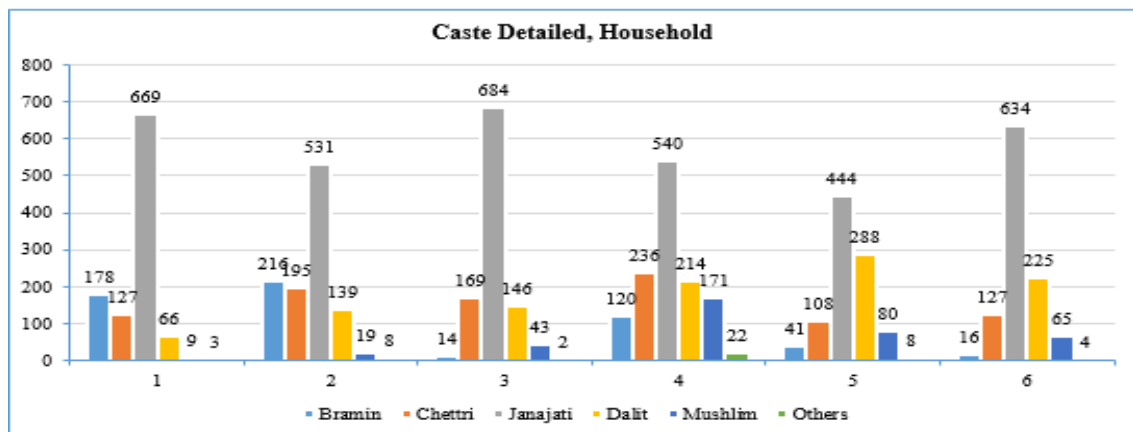


Chart No 4.3: Caste Detail

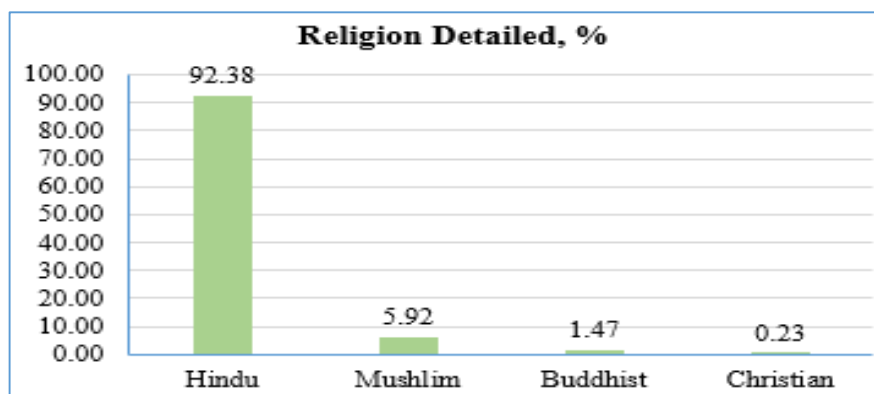


Chart No 4.4: Religion Detail

Source: Municipal Profile 2076

Literacy Status

The literacy rate of the population in the Rural Municipality is 82%, where number of literate females are higher than the number of literate males.

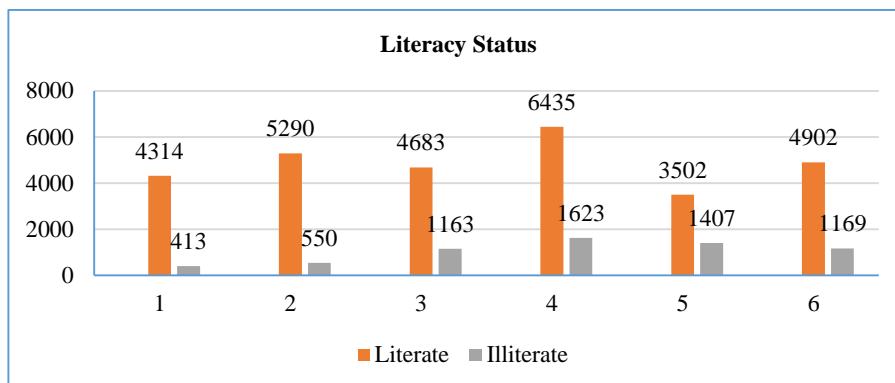


Chart No 4.5: Education Status of the Rural Municipality

Source: Municipal Profile 2076

Population Migration

With the on-going trend of land transaction in Omsatiyat, the urban growth is likely to gain momentum in all the major settlements. One of the reason for this might be the introduction of federal system and people in search of better facility. Omsatiya Rural Municipality has a direct approach from Butwal, Parasi, Rupandehi through different roads. So, rural municipality is predicted to receive few number of inward migrants from these places.

The study shows that, the total increase in population due to migration though it doesn't reflect the real status of migration. Similarly, birth and death rate records shows that there is increase in population.

From Municipal profile, the total inward migration record is 929 households while 5466 households which are old residential household in the rural municipality. The detailed of migration status of ward wise has been presented below chart 4.6.

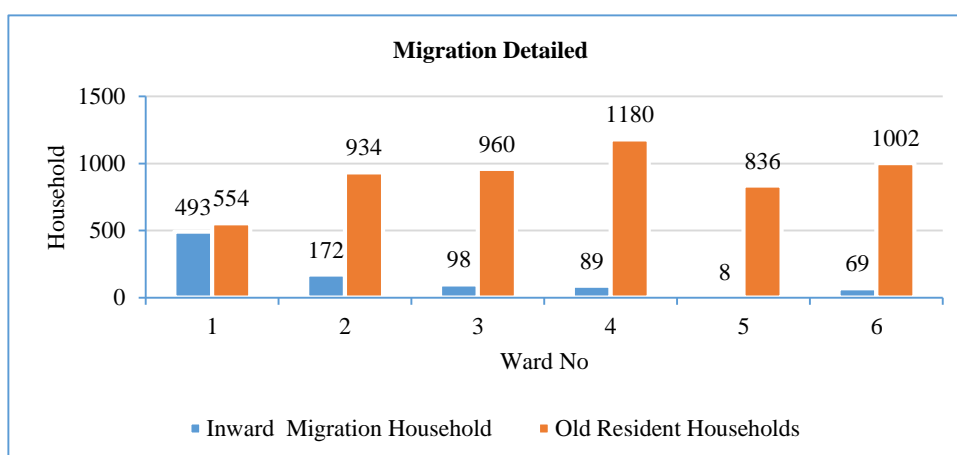


Chart No 4.6: Migration Detail

Source: Municipal Profile 2076

4.3.2 Physical Infrastructure

Road Network

The Siddhartha Highway (H10) passes the rural municipality crossing ward no 1 and 2 while Postal (Hulaki)-Highway-FR (Bhumahi - Parasi - Bhairahawa) passes through the southern part crossing ward 4. thus the traditional ribbon (Linear) settlement can be noticed along the highway corridor. The rural municipality has altogether 201.908 km of road which consist of all kinds of road including Siddhartha Highway 4.179 km, Postal (Hulaki)-Highway-FR (Bhumahi - Parasi - Bhairahawa) (4.431 km), while 18.682 km is district road and R-Municipal Road Core Network 172.732 km while 123.069 km road are found gravel. The study further identified that Postal Highway and Siddhartha Highway are is blacktopped The ward wise road inventory network detailed has been given in Chapter 5 Below.

Water Source and Network

According to Municipal Profile 2076 Bs, ground water through hand pump has been used as the primary source of water for household in Omsatiya Rural Municipality which constitutes 72 while only about 27 % of the households have access to tap or piped water services. Others sources of waters are covered and uncovered wells, rivers etc. The 2 elevated water tank is located at ward no 4.

The population increase rate (0.52 % per annual) is high and the sources are limited which is very challenging for the rural municipality. The water source and its consumption pattern has been shown in Chart No.4.7, below.

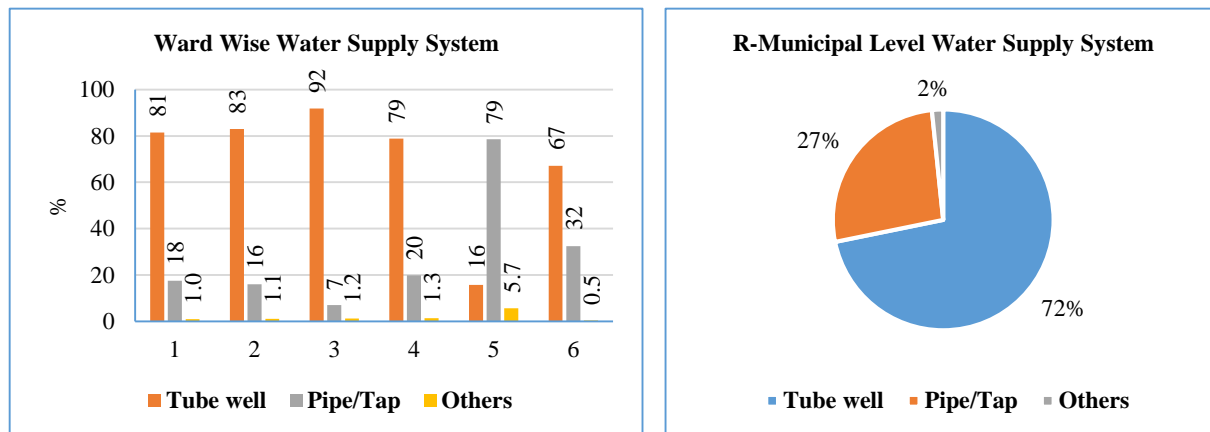


Chart No 4.7: Water Supply System

Source: Municipal Profile 2076

Table No 4.6: Elevated Tank Detail

S.N	Features	Ward No	Location	Road Access
1	Water Elevated Tank	2	Bardihawa Gaun	YES
2	Water Elevated Tank	4	Darkhasawaa	YES

Source: Field Survey, RMTMP 2077

Irrigation Network

Irrigation is process of artificial supply of water to soil for raising crops yields. The irrigation system directly helps to crops productions and ultimately in economic development in the locality. The main source of irrigation is underground water whereas the detailed of irrigation land is shown in below chart 4.8.

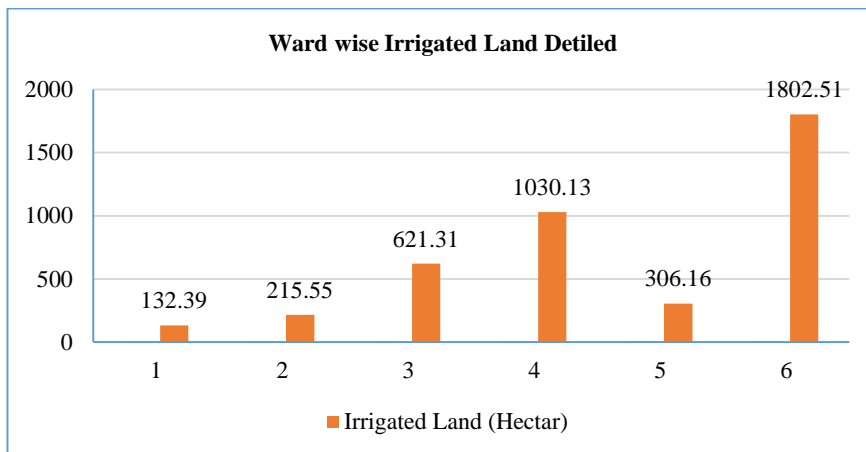


Chart No 4.8: Irrigation System

Source: Municipal Profile 2076

Electricity Network

Omsatiya Rural Municipality receives electricity from the National Grid System, though few wards do not have enough power supply. Most of the areas of municipality are electrified.

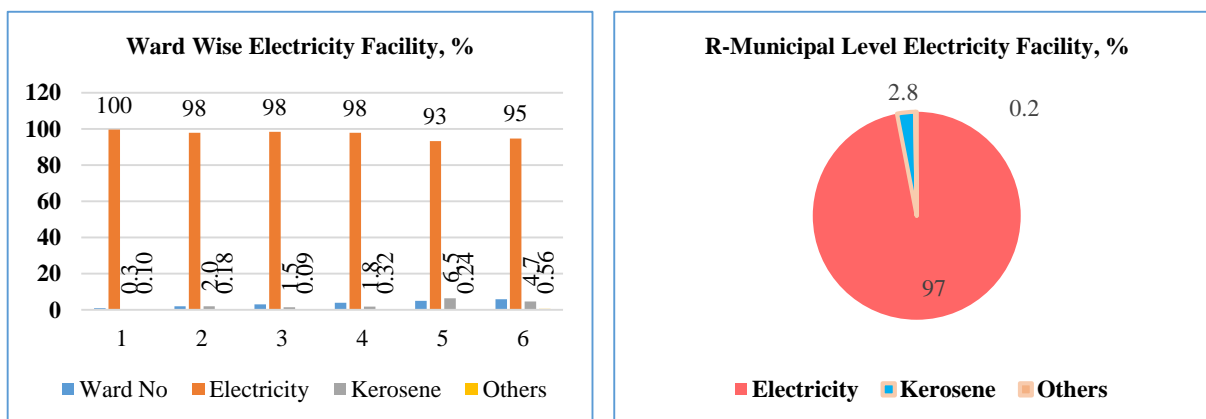


Chart No 4.9: Electricity Facility

Source: Municipal Profile 2076

Sanitation and Drainage System

There is no sewerage system in rural municipality and without sewerage system personnel hygiene, environmental pollution control cannot be achieved. The system creates potential high risk of bacteriological exposure and contamination to the shallow groundwater, which is widely used in the municipality.

In summary, 89 % of the households have toilet facility without flush while only 7% of the households have flush toilet facility and rest of household about 4 % have open toilets. For more information in terms of number of households, it can be seen in Chart No 4.10 below.

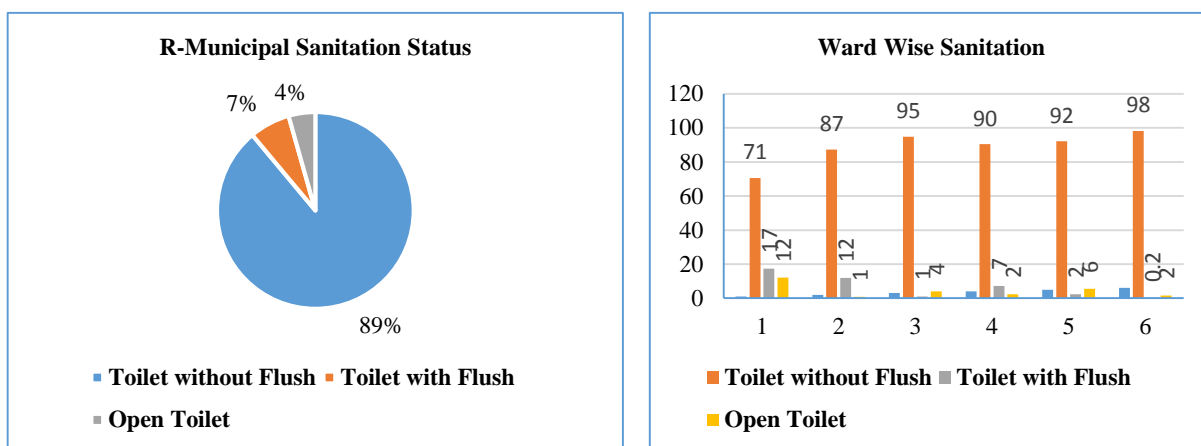


Chart No 4.10: Sanitation Status

Source: Municipal Profile 2076

Existing practice in rural municipality is that discharge effluent from settlements are openly. Only on sections of highways and few urban roads have drainage facilities.

As a consequences of lack of integrated system for storm water drainage, every year rural municipality area faces inundation.

The main problems in the urban drainage in the city are:

- Tendency of people throwing solid waste into drains with the perception that it will be washed away during high discharge.
- Multiple agencies/authorities have built drains, however its constructed with lack of co-ordination, planning and improper design on piecemeal basis.
- Many natural drains are encroached leaving no space for cleaning.
- Flat topography of Terai which makes it difficult to construct effective drainage systems.

Solid Waste Management

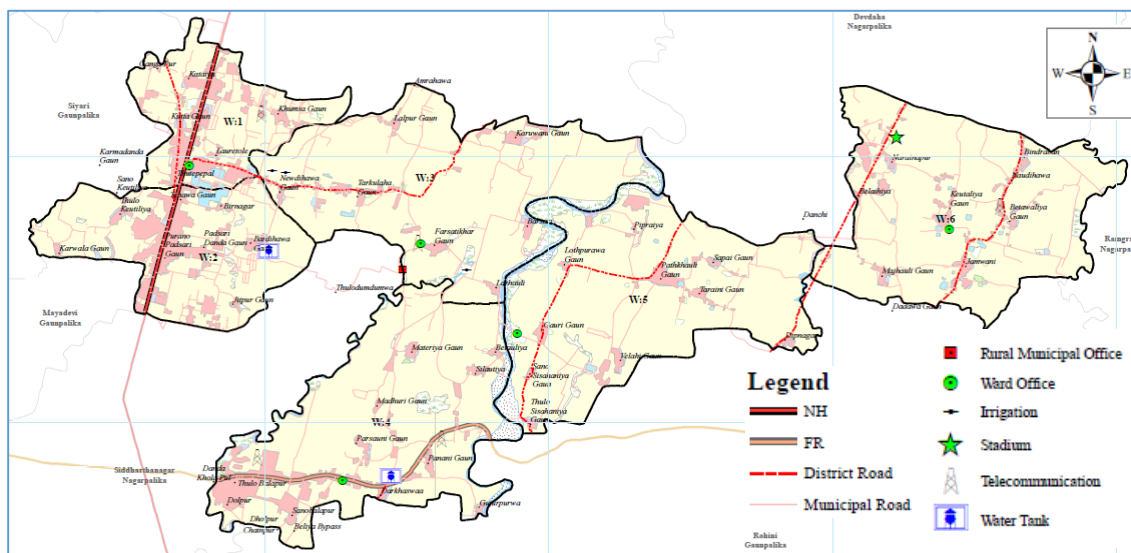
The main problem in solid waste management sector is that people throw the entire domestic waste either on the road or into the road side drains. The situation further exaggerates with hospital and industrial wastes. The other identified problems in solid waste sector are summarized as,

- No segregation practice at source.
- The present disposal practice of solid waste disposal is just crude dumping.
- There is poorly segregation practice, i.e. hospital/medical wastes, industrials.

Tele-Communication

The use of communication has made huge change in life style of people and city. The use of these modes is increasing day by day. Newspaper, Radio, Television are being used in extensive amount as primary mode of communication for information while Nepal Telecom and Ncell are providing tele-communication services in the rural municipality.

Landline phone is available in the Major Market areas and some part of Hulaki Highway and National Highway section while rest of area lacks PSTN Telephone Service. Mobile phones are of common use in Omsatiya for telecommunication and mobile internet service. Some leading telecommunication service providers like NTC, N-CELL, UTL Network and Smart Cell facilitate their services in the area. No PCO services are available inside the market. There is no VSAT facilities in the rural municipality but some broadband Internet Service Provider (ISP) like Subisu, NTC’s ADSL and Wi-Fi facilities are available in the rural municipality.



Map No 4.6: Physical Infrastructures Map

4.3.3 Social Infrastructure

Educational Institutions

There are 23 educational institutions including Private/Government institutions in the rural municipality. Among these only 4 institutions provide education from 5 secondary educations level 1 is bachelor level. There are 6 primary level Madarsa/Religious schools. Almost all the wards are facilitated with school level education while higher level education is only located at Ward-1. The literacy rate of the rural municipality is 82 %. Due to the lack of campus and faculties, student rely on to go Butwal, Siddharthanagar and vicinity municipalities for higher educations. The detailing of educational institutions within the R-municipality has been given below table 4.7.

Table No 4.7: Educational Intuitions Detailing

School Ownership							
Ward No	Government School			Religious	Private	Total Number	Road Access
	Basic Level (<8 Class)	Secondary Level (9-12)	Campus Level				
1	2	1	1	0	4	4	YES
2	2	0	0	0	0	2	YES
3	3	1	0	1	2	5	YES
4	0	1	0	3	0	4	YES

School Ownership							
Government School				Religious	Private	Total Number	Road Access
Ward No	Basic Level (<8 Class)	Secondary Level (9-12)	Campus Level				
5	1	1	0	1	0	3	YES
6	3	1	0	1	0	5	YES
Total	11	5	1	6	6	23	YES

Source: Municipal Profile 2076

Healthcare Centres

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

Local health services are providing health facilities through 4 health institutions, which includes Government and Community based health centres. During field study, team has found that all the health institution has availability of medicines but lacking proper health infrastructures. There is no facility of operation theatre in case of emergency. People have to rely on hospitals of Butwal or Bhairawa, in case of serious health conditions. Even in case of C-Section delivery of a women, she needs to be rushed to hospitals of Butwal, Siddharthanagar or Bhairawa even Kathmandu.

Table No 4.8: Healthcare Centers Detail

Healthcare Centers			
Ward No	Location	Name of Institutions	Road Access
1	-	-	-
2	Padasari	Padasari Health Post	Highway (H10)
3	Lalpur Jane Bato	Heath post	Urban Road
4	-	-	-
5	Omsatiya Temple	Heath post	Urban Road
6	Chotki Ramnagar	Heath post	Urban Road

Source: Field Survey R-MTMP 2077

Crime and Citizen Security Service

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

Public safety organizations include law enforcement, fire, natural disasters and emergency medical services. The public safety issues that a R-municipality, state, or federal jurisdiction might grapple with narcotic use, trespassing, burglary, harassment, juvenile delinquency, unauthorized living, noise, littering, inappropriate social behaviour, inebriation, and other quality of life issues. Generally organizations are involved in the prevention of and protection from events that could endanger the safety of the general public from significant danger, injury, or property damage, such as crimes or disasters (natural or human-made). The description of public security offices has been listed in Table 4.9 below.

Table No 4.9: Citizen Security Services

S.N	Name of Centers	Ward No	Location	Road Access
1	Police Bit	1	Thutepile	Highway (H10)
2	Omsatiya Ilaka Police Station	3	Tarkulaha	49DR019

Source: Field Survey R-MTMP 2077

Heritage, Culture and Religion Tourism Potential Areas

The Omsatiya area comprises of people living of different caste and creed. The society is heterogeneous with mix of people from different communities, cultures and beliefs. There is no such typical language, culture, tradition or festival which can be considered as uniqueness of that area. There are 14 Number of major Religious sites in the rural municipality among them Omsatiya temple, Durga temple and Ramjanaki temples are well renowned within the municipality and vicinity areas which may have great opportunities for the religious tourism development Some major religious and tourism sites have been listed as below.

Table No 4.10: Major Religious Sites

S.N.	Name of Sites	Ward No	Locations	Road Access
1	Durga Temple	2	Padasari	Highway (H10)
2	Kali Temple	3	Newdihawa	49DR019
3	Shiva/Durga Temple	3	Tarkulaha	49DR019
4	Masjid	3	Lalpur	49DR019
5	Durga Temple	3	Farsatikhar	Urban Road
6	Cemetery	3	Farsatikhar	Urban Road
7	Durga Temple	3	Larhauri	Urban Road
8	Hanuman Temple	4	Larhauri (South)	Urban Road
9	Masjid	4	Panani	Urban Road
10	Ramjanaki Temple	4	Darkhasawaa	Hulaki Highway
11	Shiva Temple	4	Maduri	Urban Road
12	Omsatiya Temple	5	Gauri Gaun	Urban Road
13	Ramjanaki Temple	6	Jamwani	49DR022
14	Ramjanki Temple	6	Narainapur	49DR021

Source: Field Survey R-MTMP 2077

Public Service Centers

The local level Omsatiya is one of the rural municipality of the Rupandehi district, from Lumbini Province. The rural municipality lies in Terai territory and connected by two highways which is divided in to 6 wards. The rural municipality is linked with urban roads and highways that makes to setup divisions offices, post offices, forest offices etc. The detailing of public services centers have been listed below table 4.11.

Table No 4.11: Public Service Centers

S.N	Name of Public Service Centers	Ward No	Locations	Road Access
1	Omsatiya Rural Municipality Office	3	Farsatikhar	Urban Road
2	Ward Office-1	1	Thutepiple	Highway (H10)
3	Ward Office-2	2	Bardihawa	Urban Road
4	Ward Office-3	3	Farsatikhar	Urban Road
5	Ward Office-4	4	Darkhasawaa	Hulaki Highway
6	Ward Office-5	5	Omsatiya Temple	Urban Road
7	Ward Office-6	6	Chotki Ramnagar	Urban Road
8	Post Office	3	Farsatikhar	Urban Road
9	Post Office	6	Chotki Ramnagar	Urban Road
10	Community Hall	3	Newdihawa	Urban Road
11	Community Hall	3	Lalpur	Urban Road
12	Community Hall	3	Farsatikhar	Urban Road
13	Community Hall	6	Narainapur	49DR021
14	Forest Office	4	Balapur	Urban Road/Highway

Source: Field Survey R-MTMP 2077

Open Space and Parks

The well facilitated parks/gardens and open spaces has not been developed yet in rural municipality. In order to strengthen the ecosystem, open areas are necessary to protect and develop. These areas support creating a clean environment with addition of beauty to the rural municipality.

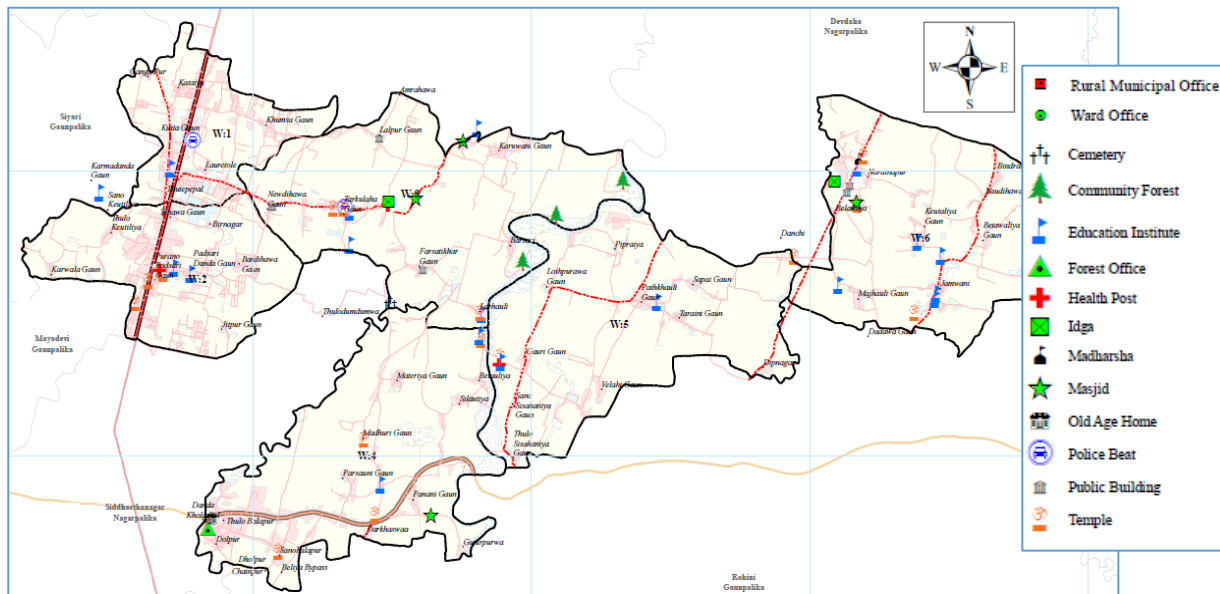
People require daily exercise for recreation, entertainment and mental refreshment. Different ways of recreation include the fun and relaxation through clean and natural environment. No any parks and garden are available in the local level whereas open spaces have been setup as a playing ground in the R-municipality. The list of existing and recreational infrastructures has been given in Table 4.12 below.

Table No 4.12: Public Spaces and Open Spaces

S.N.	Name of Public Spaces	Ward No	Location	Road Access
1	Omsatiya Temple Area	5	Gaurigaun	Urban Road
2	Karma Danda Khel Maidan	2	Sano Keutiliya	Urban Road
3	Ramjanaki Khel Maidan	6	Narainapur	49DR021

S.N.	Name of Public Spaces	Ward No	Location	Road Access
4	Shiva Mandir Community Forest	-	Farsatikhar	Urban Road
5	Community Forest along the Rohini Khola Corridor	3,4,5	Rohini Khola	Urban Road

Source: Field Survey R-MTMP 2077



Map No 4.7: Social Infrastructures Map

4.3.4 Economic Status

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

Agriculture

Agriculture is the main occupation of the rural municipality and about 51% of the total population is engaged agriculture or agro- based industries. The main income source of the municipal people is agriculture production, i.e., paddy, wheat, vegetable, sugarcane, pulses, mustard, sunflowers, herbals, livestock, fishery, poultry farm etc. All agriculture filed is connected by agriculture roads with in the rural municipality which helps farmers to export agriculture products to big cities easily.

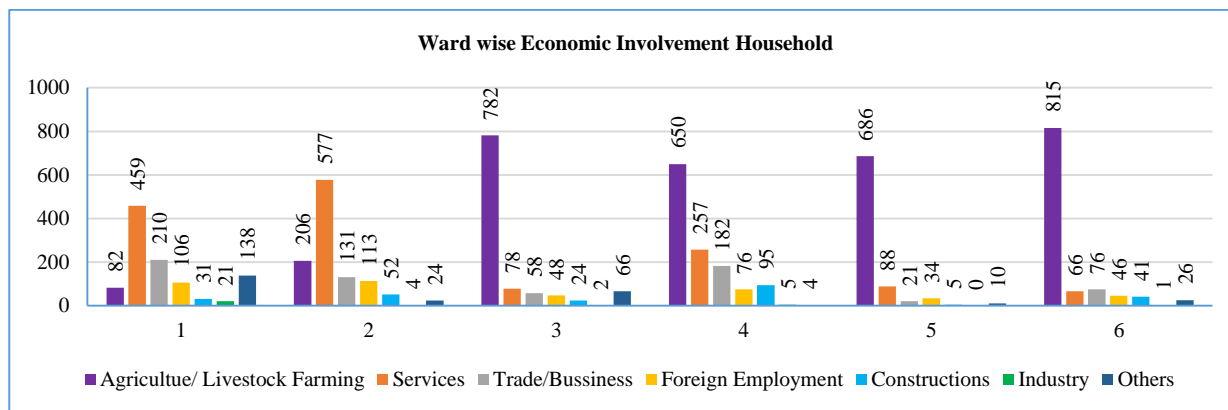


Chart No 4.11: Ward Wise Involvement in Economic Activity, Households

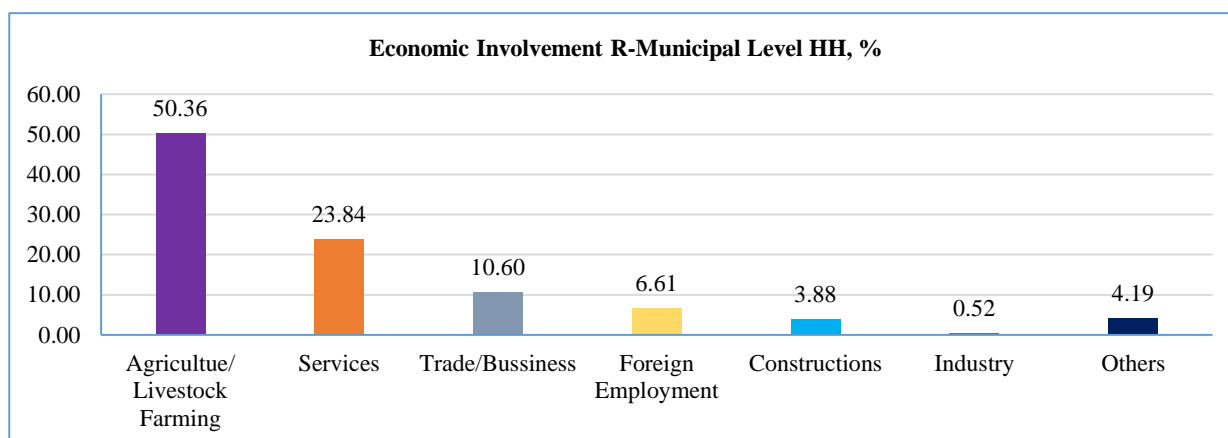


Chart No 4.12: Involvement of People in Economic Sector, %

Source: R-Municipal Profile 2076

Major Production of Agriculture Crops

The agriculture land is fertile that helps to increase economy of the local people. The rural municipality is also suitable for the fish farming, livestock farming. The major agriculture products in the rural municipality are Paddy, Maize, Wheat, Cash crops, Vegetables, Fruits, Cereal crops etc.

Omsatiya R-Municipality exports the paddy, wheat, vegetables, meats, fish etc.

Industry

Currently, there are 6 brick industries in the rural municipality. These industries are spread around various wards of the rural municipality. Similarly, there are other industries like Rice Mill, Furniture Industries, Grill Industries etc. along with other types of industries which operate within the rural municipality.

As most of the areas of the rural municipality is covered with cultivable and fertile lands. Therefore, major source of income of the residents of the rural municipality is from agriculture based industries. There are more than 30 existing industries are in operation based on agriculture and animal husbandry like Poultry Farm, Cow Farm, Bee Farm, Buffalo Farm, Goat Farm, fish farming in the rural municipality. The major industries and farms have been listed below in the Table 4.13.

Table No 4.13: Major Agro farms, Industries and Factories

S.N.	Industries/Factories	Ward No	Locations	Road Access
1	Asian Pharmacy/Medicine	1	Khmsa Gaun	Urban Road
2	Constructions/Blocks/Pre cast	1	Sarshwoti tole	Urban Road
3	Mache Biksah Kendra	1 and 2	Thutepipe	Highway (H10)
4	Agro Farm	2	Srijana Tole	Highway (H10)
5	Chemical Factory	3	Tarkulaha	49DR019
6	Fish Farming	3	Tarkulaha, Karuwani	49DR019/Urban Road
7	Plastic Factory	3	Tarkulaha	49DR019
8	Fibre Factory	3	Tarkulaha	Urban Road
9	Brick Industry	3	Larhauhi, Karuwani	Urban Road
10	Fish Farming	4	Materiya ,	Urban Road
11	Laxmi/ Manakamana Brick Industry	4	-	Urban Road
12	Form Factory	4	Balapur	Hulaki Highway
13	Brick Industry	4	Balapur	Hulaki Highway
14	Crusher Industry	4	Dolpur	Urban Road/Highway
15	Fish Farming	5	Velahani, Gaurigaun, Pathkhau	Urban Road
16	Soap Factory	5	West Danchi	Urban Road
17	Brick Industry	6	Narainapur	49DR021
18	Fish Farming	6	ChoktiRamnagar, Jamwani	Urban Road
19	Petrol Pump	6	Bindraban	49DR022

Source: Field Survey R-MTMP 2077

Banks/Finance

Banks and Financial Institutions are also the indicators of development especially economy. There is great role of cooperative organization in the economic and social development of the rural municipality. Co-operative organizations are investing in various income-related sectors by preventing local level savings from going out of rural municipality.

There are 18 Co-operative, Finances and Money Transfers which are operational at the moment. Similarly, there are 1 Banijya bank, 6 development banks like NMB Bank, Jyoti, Gandaki, Mahalaxmi Bank Bank etc. which are mostly located at ward no 1.

The commercial banks operate their own remittance services, which includes the considerable amount of transactions. The commercial banks have not yet started investing in the infrastructures and other development activities. They provide loans under different headings such as home loans, agriculture loans, business loans etc. Also, all the A – Class banks provide ATM services.

Table No 4.14: Bank and Finances

S.N.	Bank and Finances	Ward no	Numbers	Road Access
1	Banijya Bank	1	1	YES
2	Development Banks	1	6	YES
3	Finances	1	6	YES
4	Co-Operatives	1 and 3	4 and 1	YES

Source: R-Municipal Profile 2076

4.3.5 Environment Status

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

Air Pollution: There is still practice of burning organic fuels such as firewood, charcoal, dried dung, agricultural wastes etc. as a source of energy for cooking and various other purposes. As most of the households are not modern concept houses and lack proper ventilation. Similarly, these sorts of energy usage cause smoky environment along with indoor pollution. Women and Small Children spend long hours each day around open fires or unventilated stoves in enclosed spaces, thus it's also hampers their health in long run.

Land Pollution: Almost half percentage of the total land available in the rural municipality is an agricultural land. Agriculture and Livestock farming is one of the major occupation of R-municipality's residents. These are vulnerable to soil pollution due to excess use of chemical pesticides and fertilizers leading to loss of fertility of land in a long run. Excess use of chemicals and pesticides degrades the quality of the soil and land.

Lack of Solid Waste Management: Current waste generation in Omsatiya is 0.20 kg/capita/day with average design waste generation of 0.22 kg/capita/day including 1% increment with development of standard of life. Total average waste generation is 7.90 ton/day and total waste collection is about 4.35 tons/day with 55% collection efficiency. The R-municipal waste contains biodegradable waste, paper, plastics, metal, glass, textile, inert etc.

Waste Water Pollution: The problem emerging from waste water, especially the degradation of water quality of rivers and other water bodies due to haphazard disposal of waste water and the associated health and livelihood consequence indicates lack of planning and infrastructures for management of waste water. The production of waste water is through domestic, commercial and industrial routes. Waste water produced from the domestic routes include grey water and black water generated during washing, cleaning, bathing and sanitary uses.

Disaster Management: Although there is a disaster management committee currently working with specific disaster management fund in the R-municipality, there is lack of technical approaches.

Drinking Water Quality Degradation: As in other parts of the Terai, drinking water source is groundwater in Omsatiya, which is higher in concentration of Arsenic and Iron.

Noise Pollution: The main source of noise pollution in the municipality is due to vehicles and industries. Especially in ward. 1,2 4, which lies near National Highway, noise generation is higher due to movement of heavily loaded vehicles.

Industrial Pollution: There are around 50 various types of small-medium industries in Omsatiya R-municipality. Rice mill, Chemical, polythene industries, fibre could be source of effluent polluting the land and water bodies nearby while brick factories cause harmful air emission polluting the air. There are above 20 livestock farms in the municipality which also pollutes the environment directly or indirectly.

Core Problems Associated with Disaster

Regional in nature due to lowlands, flood is most common, damaging and frequent. The municipality is committed to build a disaster resilient community in order to protect environmentally vulnerable areas. While the plans and process for disaster management is ongoing, there are some common problems associated with disaster in the municipality as listed below-

Fire: Fire is another hazard prevalent in Omsatiya municipality. Many of the areas of this new rural municipality has rural style traditional homes which are generally made of stone clay and thatched roofs, which makes it more vulnerable to impacts of fire hazard.

Drought: Although there are few perennial rivers in the R-municipality, the water flow has been negatively impacted due to source degradation, making the areas around susceptible to drought in near future.

Heat wave and Cold wave: Omsatiya experience high temperature conditions during the month of May and June. Strong heat wave condition prevail and temperature soar up. People get dehydration, restlessness and situation gets worst when there is power shortage/cut during this time. The harsh weather condition hampers mostly the day shit students.

During mid-winter season, cold wave occurs under thick freezing fog and chilly wind causing cooling of the air miserably. Cold waves bring freezes and frosts that can kill plant during early and most vulnerable stage of growth, resulting in crop failure. It also brings several cold ailments such as cold, flu, pneumonia etc.

Epidemic: Outbreak of the air and waterborne diseases is common in the R-municipality especially during summer.

Earthquake: Although there have been no recent phenomena of earthquake in the municipality, there is always a risk as whole of Nepal lies in a seismically active zone. Thus, preparedness of earthquake is important as well, to keep the casualties and loss of properties low as possible, even when they occur in large magnitude.

4.4 Development Potential Area

There are major highways such as Siddhartha Highway and Hulaki Highway passes through the rural municipality. These two national highways offer many development opportunities in the rural municipality such as:

4.4.1 Settlement and Market Centers

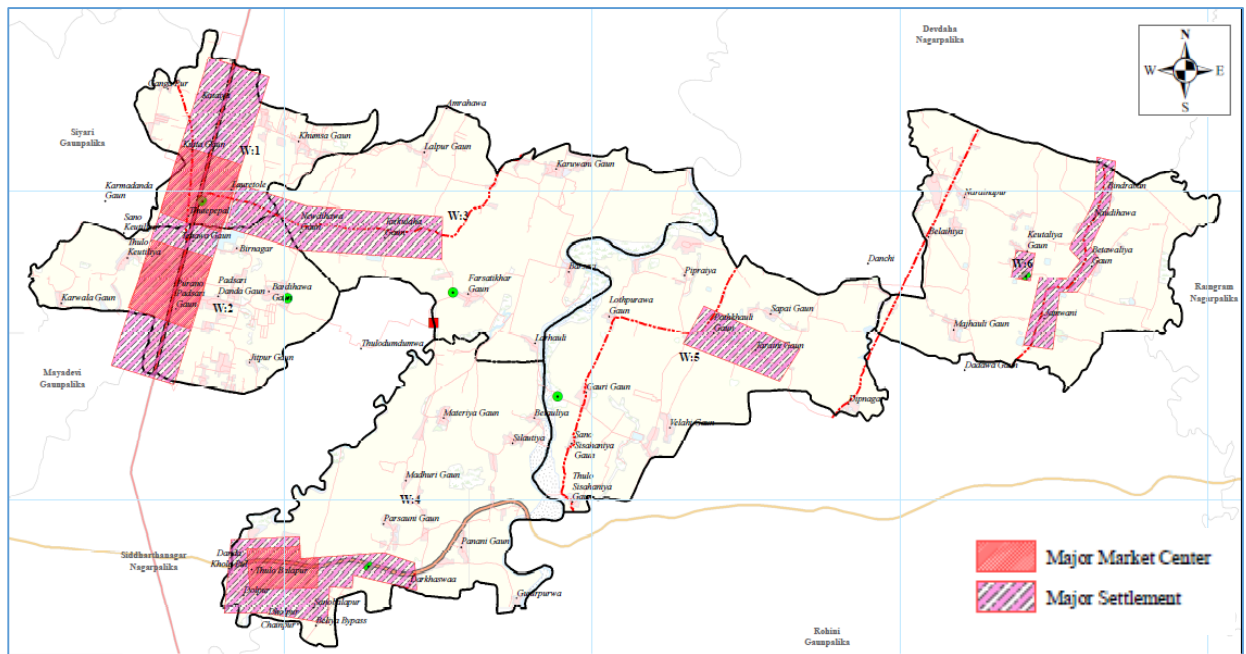
The land topography is plain which is suitable for the development of settlement in the rural municipality. The existing road network is almost developed in the settlement and need to be upgraded.

The core market center of the municipality is Thutipipla Bazar along the Siddhartha Highway. Omsatiya R-Municipality lies within Strategic Postal Highway, which indicates the potential of transit point of export/import business. This rural municipality is near to the Siddharthanagar, Butwal, Bhairawa and India Boarder. It has created a great possibility to be a transit Area.

The local existing markets and settlement and their potential development has been listed below Table 4.15 below.

Table No 4.15: Major Settlements and Markets

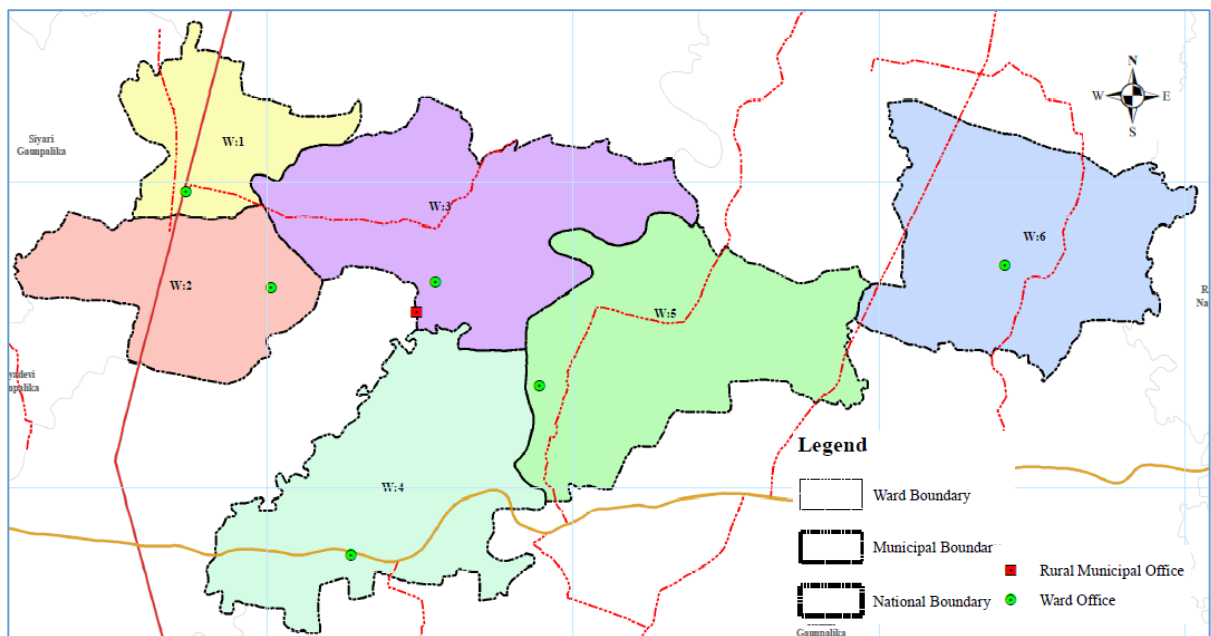
S.N.	Name of Settlements and Markets	Ward No	Types	Potential Areas	Road Access
1	Thutepiple	1	Major Settlement/ Major Markets	Expansion Settlement / Market/Business/Trade	Highway (H10)
2	Padasari	2	Major Settlement/ Major Markets	Expansion Settlement	Highway (H10)
3	Tarkulaha	3	Major Settlement	Expansion Settlement	49DR019
4	Farsatikhar	3	Major Settlement	Expansion Settlement/Local Markets	Urban Road
5	Balapur to Darkhasawaa	4	Major Settlement/Makets	Expansion Settlement/ Market/Business/Trade	Hulaki Highway Corridor
6	Gaurigaun	5	Main Market	Religious tourism	49DR020
7	Pathkhauli	5	Major Settlement	Expansion Settlement	49DR020
8	Chotki Ramnagar	6	Major Settlement	Expansion Settlement /Local Market	Urban Road
9	Narainapur	6	Major Settlement	Local Market	49DR021
10	Bindrapur	6	Major Settlement	Expansion Settlement/ Local Market	49DR022
11	Jamwani	6	Major Settlement	Expansion Settlement/ Local Market	49DR022



Map No 4.8: Major Market and Settlements

4.4.2 Administration Center and Service

The municipal executive office of Omsatiya R-municipality is located at Farsatikhar ward no 3. The R-Municipal office is situated almost mid part of the rural municipality which has been connected via good urban road network. This may offer high possibility to develop as an institutional zone in the rural municipality.



Map No 4.9: Administrative Centers and Service Map

4.4.3 Industry

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

4.4.4 Agriculture/Forestry and Its Processing

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

4.4.5 Tourism

As this rural municipality is easily accessible with roadway, Siddhartha Highway and Postal Highway (National Highway). The Eco-tourism and religious tourism is great opportunity in the rural municipality. The large land is covered by fish farming which makes agriculture fields with ponds in the rural municipality. This may offer building eco-home stay along the r-municipal area. The Omsatiya temple is one of the renowned temple in the vicinity which may attract numerous religious tourists in the rural municipality. The mela, sports programs, festivals, cultures, terai community are specific features that are the baseline in the tourism development which helps in trade and business.

Chapter: 5 Municipal Inventory Map of Road Network

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

5.1 Overview of Road Network

The Siddhartha Highway (H10) passes the rural municipality crossing ward no 1 and 2 while Postal (Hulaki)-Highway-FR (Bhumahi - Parasi - Bhairahawa) passes through the southern part crossing ward 4. thus the traditional ribbon (Linear) settlement can be noticed along the highway corridor. The rural municipality has altogether 201.908 km of road which consist of all kinds of road including Siddhartha Highway 4.179 km, Postal (Hulaki)-Highway-FR (Bhumahi - Parasi - Bhairahawa) (4.431 km), District road (18.682) and R-Municipal Road Core Network 172.732 km. Total of 123.069 km road are found gravel and 24.858 is earthen. The study further identified that Postal Highway and Siddhaartha Highway, Feeder road and district roads are blacktopped

Table No 5.1: Existing Road Inventory

S. N	Administrative Classification	Blacktop (Km)	Gravel (Km)	RCC (Km)	Earthen (Km)	Total Length, Km
1	Siddhartha Highway	4.179	-		-	4.179
2	FR (Bhumahi - Parasi - Bhairahawa) Postal Highway	4.431	1.249		-	5.680
3	District Road	14.413	3.945	0.324	-	18.682
4	R-Municipal Roads	30.587	117.874	2.530	22.377	172.732
Grand Total		53.610	123.068	2.854	24.858	201.908

Table No 5.2: List of District Road

S.N	Road_Code_Name	Road Code	Ward Pass	Grand Total
1	49DR017_District Road	49DR017	1,2	2.17362
2	49DR019_District Road	49DR019	1,3	5.084084
3	49DR020_District Road	49DR020	5	5.013622
4	49DR021_District Road	49DR021	5,6	3.057662
5	49DR022_District Road	49DR022	6	3.114046
6	49DR024_District Road	49DR024	4	0.239076

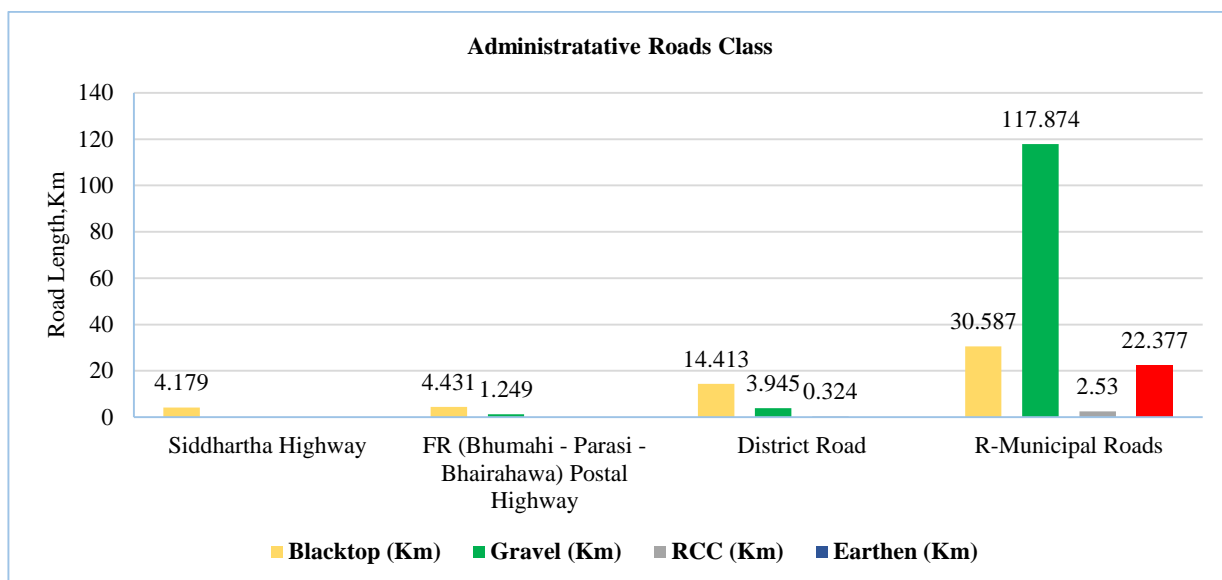


Chart No 5.1: Existing Road Inventory

Table No 5.3: Distribution of Ward Wise Road Length and Density

Ward	Blacktop	Gravel	RCC	Earthen	Grand Total	Ward Area Sq. Km	Road Density (Km/sq.km)	Population 2077 BS	Population Density (km/100 person)
1	10.731	13.246	1.008	7.658	32.643	3.940	8.29	4727	1.45
2	3.329	25.334		7.050	35.713	5.690	6.28	5840	1.64
3	8.620	21.828	0.660	3.004	34.112	9.890	3.45	5846	1.71
4	9.449	25.531			34.979	9.710	3.60	8058	2.30
5	11.056	12.335	1.185	4.665	29.241	9.860	2.97	4909	1.68
6	10.424	24.795			35.220	9.440	3.73	6071	1.72
Grand Total	53.610	123.069	2.854	22.377	201.908	48.530	4.72 (Avg.)	35451	1.75

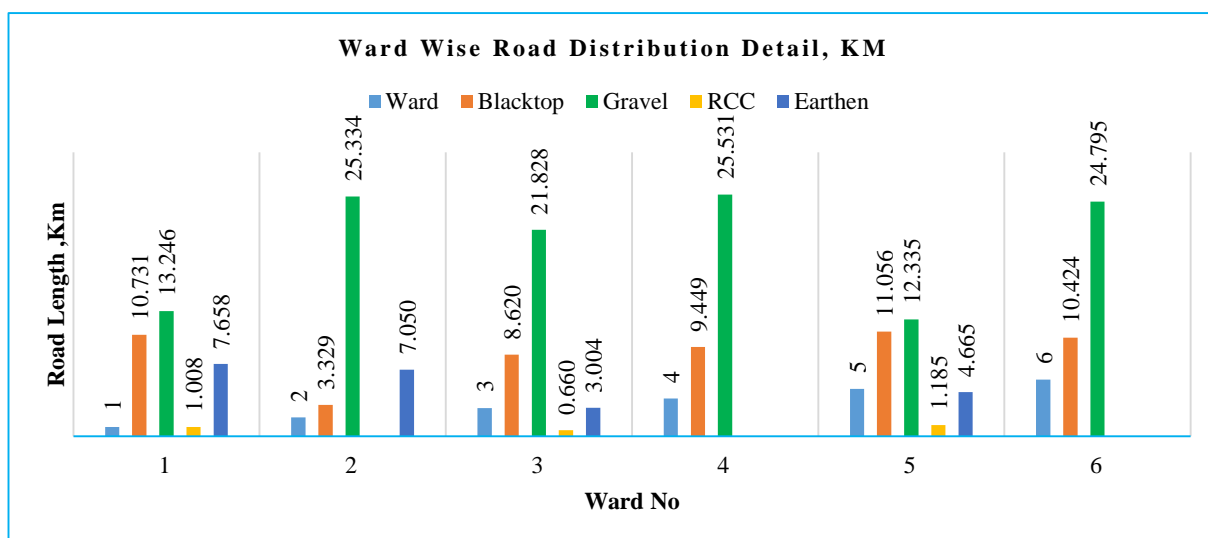


Chart No 5.2: Ward Wise Road Network

Table 5.3 above shows that ward no. 2 has the highest road coverage of 35.713 km and ward no. 5 has the lowest road coverage of 29.241 km only. According to the NUDS 2015, the desirable road density of road should be 5 km/sq.km but while comparing the road density of whole rural municipality, we found out that the rural municipality has not met yet the standard requirement. The municipality has 4.72 km/sq.km of road. But, if we observe the individual wards (1 and 2), they individually have met the standards set by NUDS.

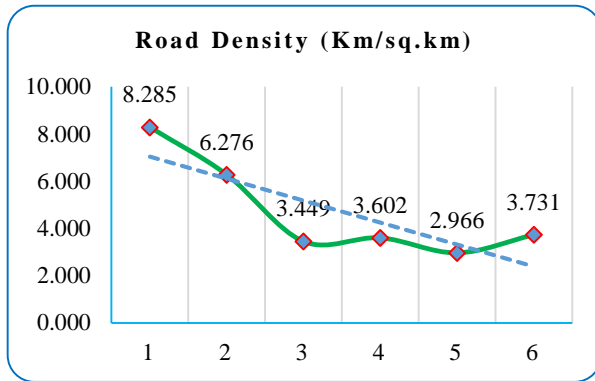


Chart No 5.3: Ward Level Road Density

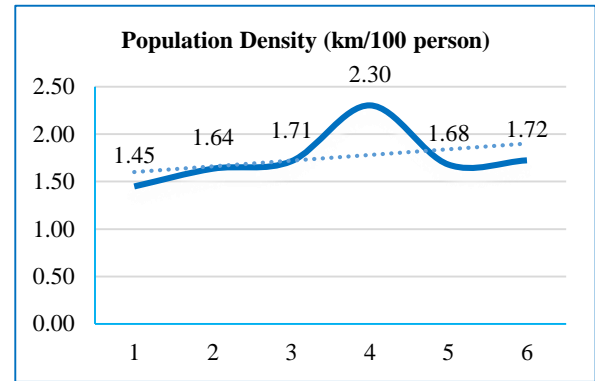


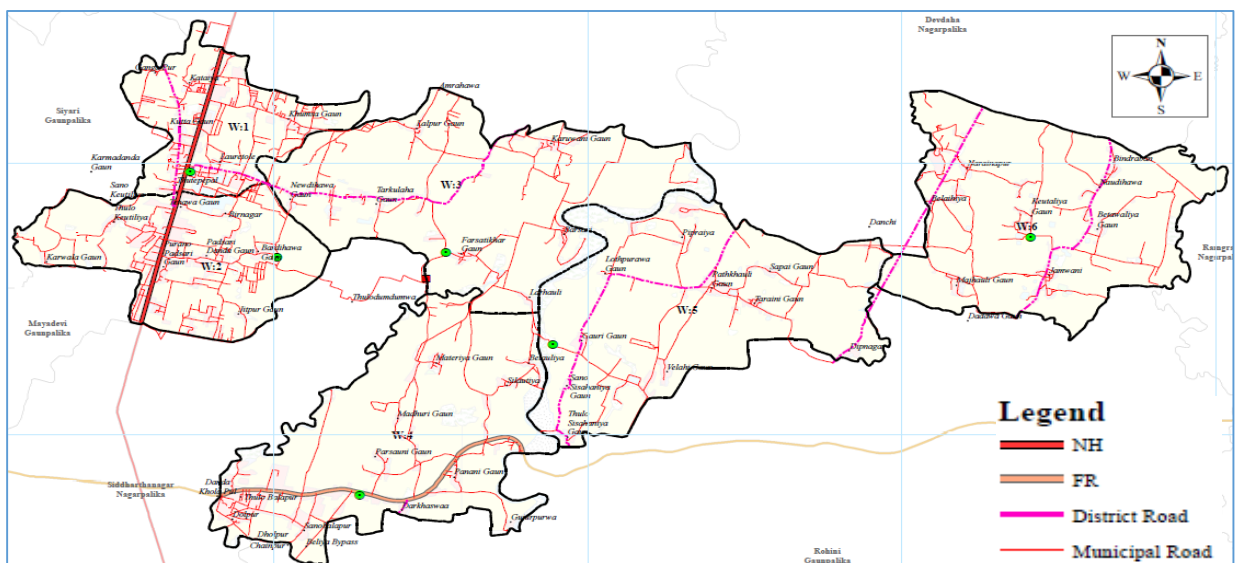
Chart No 5.4: Ward Level Population Road Density



Figure No 5.1: Urban Road Condition at Ward 5



Figure No 5.2: Urban Road Condition at Ward 6



Map No 5.1: Urban Road Network

Table No 5.4: Road Length by Road Width

Existing Road Width, M					
Ward	0 - 4	4 to 6	6 to 8	8 to 12	Grand Total
1	30.290	-	0.190	2.163	32.643
2	32.792	0.905	-	2.016	35.713
3	34.112	-	-	-	34.112
4	29.300	-	-	5.680	34.979
5	28.458	0.783	-	-	29.241
6	33.408	1.811	-	-	35.220
Grand Total	188.361	3.499	0.190	9.859	201.908

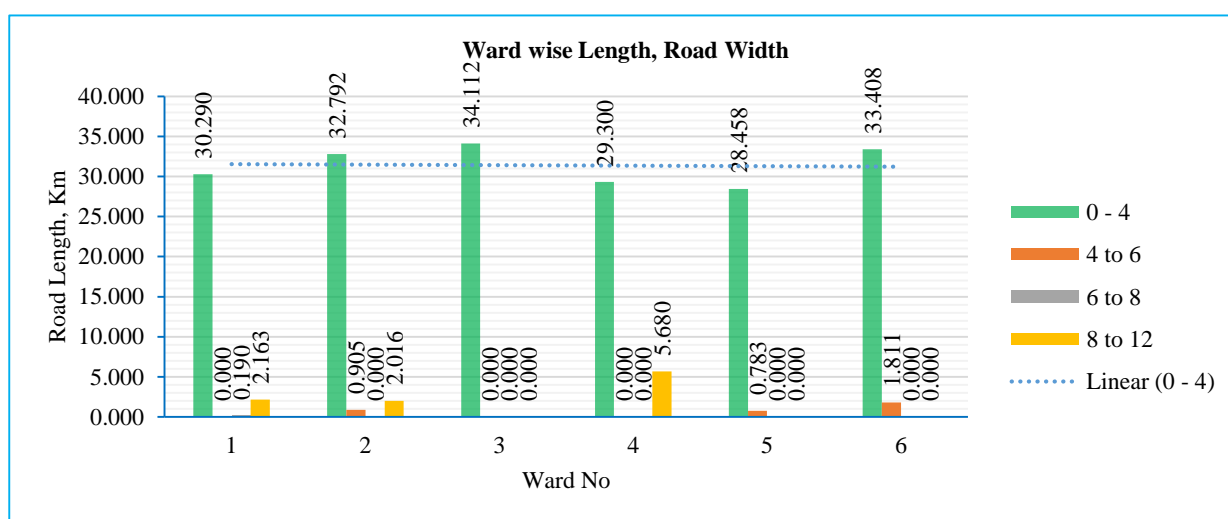


Chart No 5.5: Road Length by Road Width

The table shows that the rural municipality has 188.361 km of road width below 4m.

Table No 5.5: Road Condition

Ward	Fair	Good	Poor	Grand Total
1	13.246	11.740	7.658	32.643
2	26.239	2.424	7.050	35.713
3	21.838	9.270	3.004	34.112
4	25.532	9.447	0.000	34.979
5	19.320	5.256	4.665	29.241
6	24.795	10.424	0.000	35.220
Grand Total	130.970	48.562	22.377	201.908

The shows that 130.970 km road is fair in condition and 22.377 km is poor.

5.2 Accessibility and Mobility

Rural Municipality has basic accessibility, i.e. All the people of rural municipality have access with all-weather road in 5-10-minute walking distance. In modern concept, accessibility is

defined as an access to the services and facilities, not the derived travel. Access to urban roads is not a problem in rural municipality, but the access to the services and facilities such as bus stops, city buses, road side infrastructures etc. is questionable in urban areas. The average travel time to access urban transport is an about 10-30 minutes by means bicycles, cycles, auto rickshaw etc. This hinders their mobility and thus renders the services and facilities inaccessible. The average time required to reach the nearest bus stop is about 15 minutes. Unreliability of public vehicles has hindered urban mobility, which has increased dependence on privately owned bicycles and motorcycles.

Public transportation facilities especially by magic bus (Micro-bus), E-Rickshaw, Tempo, Safari etc. services are available on the road. The Tempo and E-rickshaw services have a wide coverage network so they are available almost in all parts of the rural municipality. Major roads of the rural municipality are gravel and in poor condition. Although, almost in all wards have good connectivity from the core market. The rural municipality has linked via. road connectivity with major cities like Siddharthanagar, Butwal, Narayangadh, Bhairawa etc.

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

Table No 5.6: Transport Facility

S.N.	Transport Facility	Numbers	Ward	Location	Road Access	Remarks
1	Bus Terminal	1	2	Thutepipe	Highway	Proposed
2	City Bus Station	1	3	Farsatikhar	Urban Road	Proposed
3	Public Route/ Regular Vehicle Access	Siddhartha Highway, and Hulaki Highway				

Table No 5.7: Connectivity of Major Cities

Connectivity from Omsatiya To	Major Cities	Distance(Km)
	Butwal (Province Capital)	19.26
	Narayangadh	111.35
	Kathmandu	262.36
	Bhairahawa	5.50
	Belahiya	10.42
	Hetauda	188.02
	Pokhara	176.507
	Treveni Dham	49.02
	Lumbini	24.42

5.3 Traffic Volume Study

Generally, traffic volume study has been done for establishment of relative importance of road. It helps to decide the priority of improvement and expansion of road and to allocate fund

accordingly. It will also help in analysis of traffic pattern. Inventory of road traffic, physical features has been done by use of GPS, GIS Maps and manual vehicle counting method. This method has identified traffic volume as well as vehicle classification

Mostly, People from the area has made trip by walking. Besides this people are using motorbikes and cycles as a trip option due to less availability of public vehicle in urban areas.

5.3.1 Traffic Vehicle Count

The traffic vehicle count per hour has been done at the following stations which are listed in Table 5.8 below.

Table No 5.8: Location and Route for Vehicular Count

SN	Count Station	Location	Name of Road Linkage
1	Kataiya Chowk	Kataiya	508RM09A010: Kataiya Chowk-Khumsa Gaun- Lalpur Gaun- Lalpur Laxmi Chowk path
2	Padasari Chowk	Padasari	508RM09A002: Purano Padsari Gaun - Padsari Danda Gaun - Bardihawa Gaun - Thulo Dhumdumwa - Gaupalika Office - Ward Office 3 -Fastikhar Gaun - Larhauri - Ward Office 5 - Gauri Gaun - Velahi Path
3	Ward Karyalaya 4	Darkhaswaa	508RM09A006_Ward 4 Office (Hulaki Rajmarg) - Parsauni Gaun -Shree Dashrat Janta Ma vi -Madhuri Gaun- Materiya Gaun - Gaupalika Office - Lalpur Jane Chowk - Amrahawa-Janajagriti School - Karwani Gaun Path
4	Pathkauli Gaun	Pathkhauli	508RM09A001_Hulaki Rajmarga - Velahi Gaun - Pahkhauli Gaun - Taraini Gaun - Dipnagar Path
5	Chotki Ramnagar	Chotki Ramnagar	508RM09A003_Pathkhauli Gaun - Danchi- Belaihiya - Keutaliya Gaun

Table No 5.9: Vehicle count per Hour

S.N	Station	Bicycle	%	Motorbike	%	Jeep/Car	%	Tractor	%	Tripper/Truck	%	Auto-Rickshaw	%	Total
1	Kataiya	20	18.35	12	18.18	1	12.50	2	22.22	-	0.00	4	15.38	39
2	Padasari	24	22.02	18	27.27	3	37.50	3	33.33	1	50.00	8	30.77	57
3	Darkhaswaa	35	32.11	23	34.85	2	25.00	2	22.22	1	50.00	9	34.62	72
4	Pathkhauli	17	15.60	7	10.61	1	12.50	1	11.11	-	0.00	3	11.54	29
5	Chotki Ramnagar	13	11.93	6	9.09	1	12.50	1	11.11	-	0.00	2	7.69	23
Total		109	100	66	100	8	100	9	100	2	100	26	100	220
Total %		49.55		30.00		3.64		4.09		0.91		11.82		-

The composition of vehicle shows that the major vehicle that plies on the major urban roads. Among the station, transport facility is bicycle (49.55%), motorbike (30.00 %). Other than these, 11.82 % of traffic is occupied by Auto Rickshaw, 4.09 % tractor, 3.64% is private jeep and cars.

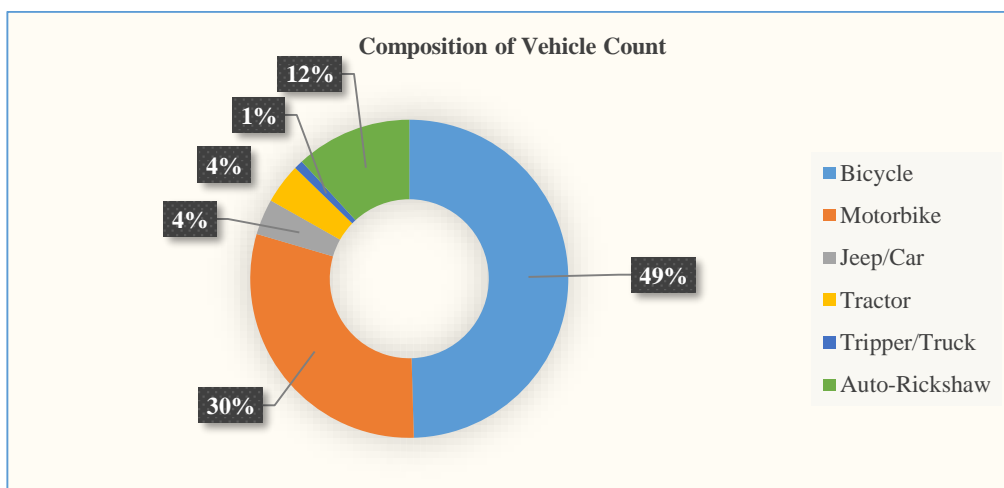


Chart No 5.6: Composition of Vehicle Count

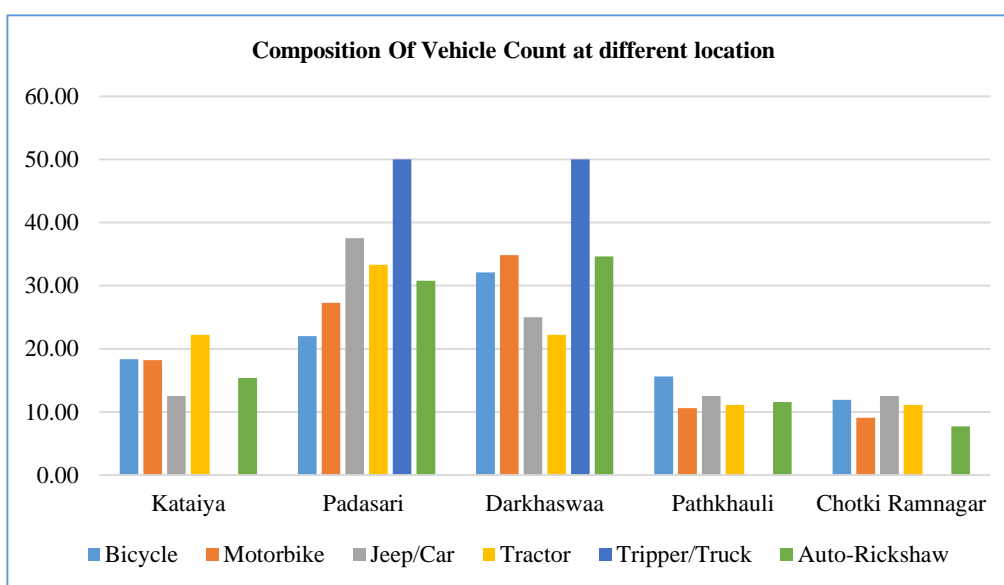


Chart No 5.7: Vehicle Composition at Different Places

5.3.2 Traffic

Table No 5.10: Traffic Condition

Ward No	Cycle	Motorcycle	Tractor	Auto Rickshaw	Gada	Others	None
1	766	526	13	11	10	38	133
2	743	541	38	14	17	36	127
3	1009	519	60	6	5	22	28
4	1148	293	27	7	4	4	66
5	773	393	27	7	3	1	60
6	1000	428	62	12	7	15	32
Total	5439	2700	227	57	46	116	446

The table 5.10 shows that the most of the house has cycle for a trip and no public vehicle trip except highways within the rural municipality.

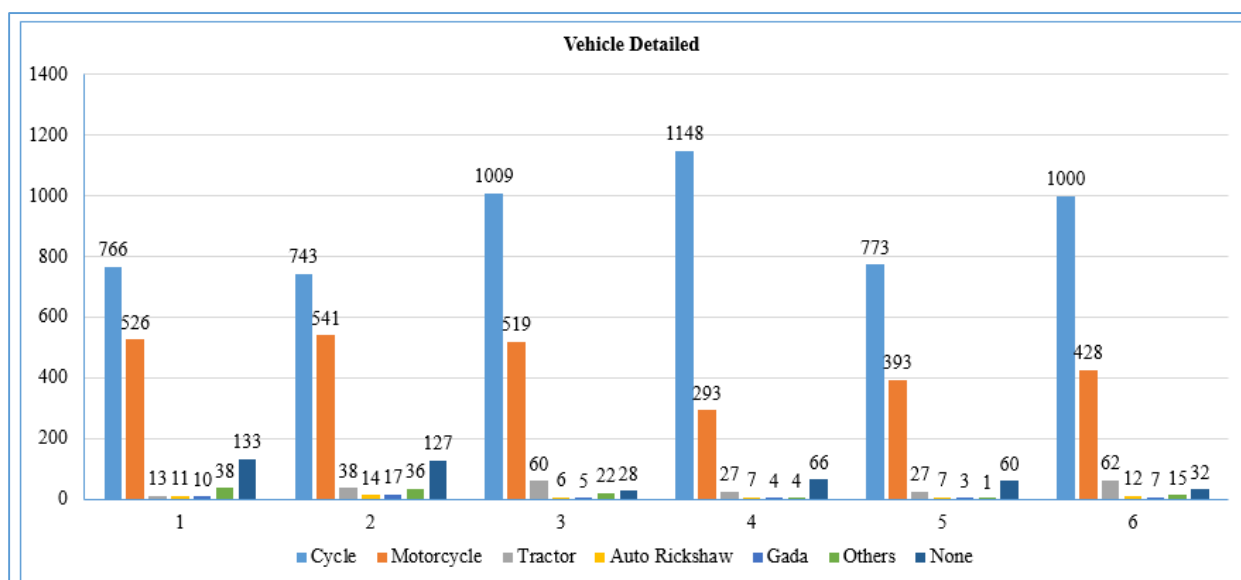


Chart No 5.8: Traffic Detailed

Source: Municipal Profile 2076

5.3.3 Active and Passive Transport User

Active transport is also called Non-Motorized Transport, NMT and human powered transport. It refers to walking, cycling, and variants such as wheelchair, scooter and handcart use. It includes both utilitarian and recreational travel activity, plus stationary uses of pedestrian environments such as standing on sidewalks and sitting at bus stops (Litman, 2015). The passive transport users refer to travel by buses, cars etc. The sample survey shows that nearly 60% or above of the daily trips are done via active mode of transport. Active mode of transport is beneficial in many aspects: this mode can be used by people of any age group irrespective of gender and economic status, it consumes human energy and does not depend on fossil fuel, and it is environment friendly and provides many health benefits to the user.

5.3.4 Public Transportation

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

5.3.5 Safety Status and Issues

The data provided by the traffic police shows that majority of vehicles involved in the accidents is motorbike due to negligence and over speeding are the major causes.

The R-municipal roads are mainly used by bicycle, motorbike users and pedestrians. Use of motorized vehicles is very limited as the ownership of motor vehicles is low. Thus, with majority of slow vehicles plying in the r-municipal roads, the roads are safer. This situation has facilitated the use of bicycles in the r-municipal roads by children to go to school, women to go to shopping and others for all sorts of purposes.

But the situation is not very friendly along the highway and feeder roads which supports all sorts of high speed motor vehicles. The Siddartha Highway, Hulaki highway pass through the urban centre (core market area) of ward 1,2 and 4. Market development along these highways is highly risk because of the carriage way section in bridge and highway which is share by all sorts of vehicles including pedestrian. Cyclists and pedestrians are at highest risk along these section. Therefore, proper urban road infrastructure should be provided along the highway as it is a part of an urban road network. Pedestrian walking to be prohibited in highway and overhead bridge to be provided on such road to cross the road. Because, neither pedestrian followed the traffic rules nor followed by the vehicle drivers. Therefore, either proper road infrastructure has to be provided with overhead bridge or prohibited to walk on the highway road.

5.4 Forecast and Planning

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

5.4.1 Population and Traffic Forecasting

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

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

According to record from CBS 2068, CBS 2076, the population of rural municipal area seems to be increased. The population will also be increasing in coming years. To forecast the population of the rural municipality, the geometric method has been used considering the urbanization of the area. For this the following formula is used:

$$P_n = P (1 + I_G/100)^n$$

Where, I_G = geometric mean (%)

P = Present population

n = no. of year.

P_n = population at the end of n th year

By using this method, we found that the average increase rate of population in this municipality is on average 0.52 % per year. Based on this trend, the minimum projected population of this municipality on the year 2082/83 BS will be 36,572.

The population prediction for the rural Municipality has been made for the following years: 2078, 2079, 2080, 2081, 2082/83 BS which has been given in Table 5.11 and Chart 5.9 below.

Table No 5.11: Population Forecast

Projected Years, BS	Projected Population	Remarks
2068	34103	Census Population
2076	35451	Municipal Profile
2077	35635	Forecast
2078	35821	
2079	36007	
2080	36194	
2081	36382	
2082/83	36572	

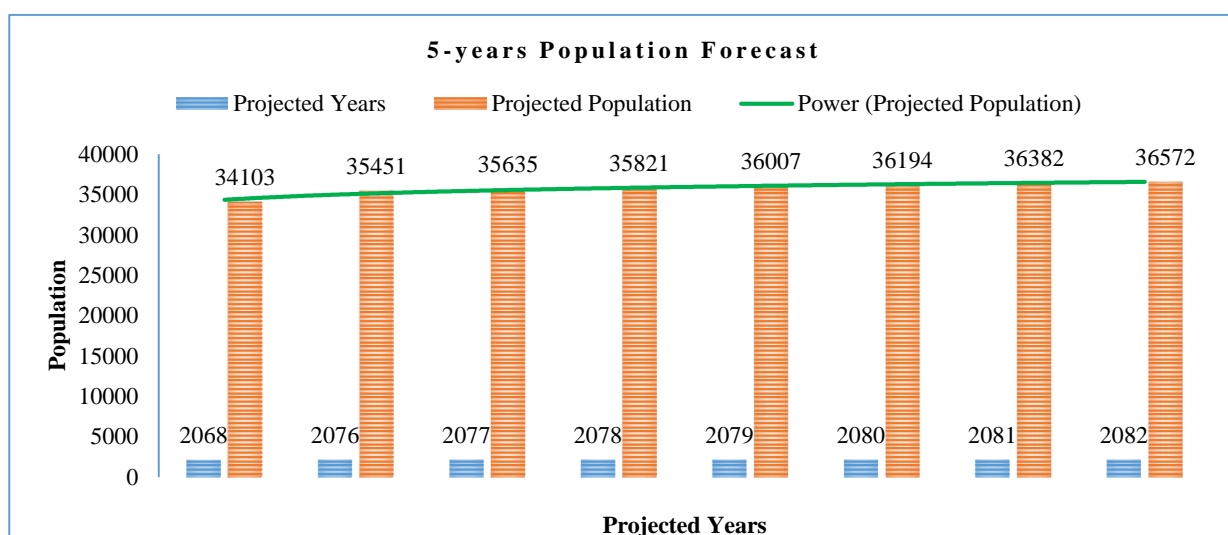


Chart No 5.9: Population Forecast

5.4.2 Traffic Forecast

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

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

Thus, the data collected during study is used for forecasting the traffic in the rural municipality. Present day traffic can be interpreted based on OD survey. To forecast the traffic flow, it is assumed that about 50 to 60% of the population make the daily trips. The projected traffic is based on extreme case of population.

Table No 5.12: Traffic Forecast

Projection			Daily Trip, Mode Share					
Year (B.S.)	Projected Population	Trip Maker	Auto Rickshaw	Bicycle	Motorcycle	Car/Jeep	Public Vehicle	Walking
Assume	%	50	11	20	25	6	8	30
2077	35635	17,818	1960	3564	4454	1069	1425	5345
Assume	%	54	9	21	26	7	9	28
2078	35,821	19,343	1741	4062	13308	1354	1741	5416
Assume	%	56	8	22	27	8	10	25
2079	36,007	20,164	1613	4436	14290	1613	2016	5041
Assume	%	58	7	24	28	9	12	20
2080	36,194	20,993	1469	5038	15789	1889	2519	4199
Assume	%	59	6	25	30	10	14	15
2081	36,382	21,466	1288	5366	17381	2147	3005	3220
Assume	%	60	6	28	31	11	15	9
2082	36,572	21,943	1317	6144	19068	2414	3291	1975

The above table 5.12 shows that the motorcycle contributes about 25% trips and assuming 6% increases in bike ownership in next five years, we can use the growth factor of about 2% in trips making. The increase in trips of motorcycle reduces the trips of Auto Rickshaw and walking. Assuming the same trips get increase from cycle use, we can come up with the above table. Without any intervention in public transport routes, public transportation usage level will more or less remains the same. But interventions during first five years should demand for public vehicles during the plan. Assuming increasing in the trips by 2%, we will come up with the above fact. There will increase in private car ownership and public vehicles in the rural municipality. At the same time, there will decrease in walking trips, which are taken up by bicycles, motorbike, car trips, and public vehicles. Though, its usage changes to initial one as people has to walk to the nearest bus stops and so on. And, provision of pedestrian facilities will help to maintain the mass mobility in proportion.

5.5 Formulation of Road Network Hierarchy

Urban roads facilitate a variety of functions, including as a direct access to pedestrian and bicycle paths, bus routes and catering for through traffic. Many roads serve more than one function and to varying degrees, but it is clear that the mixing of incompatible functions can lead to problems. Thus it is important to distinguish road in different class or type based on various criteria.

An urban road hierarchy is a means of defining that each roadway in terms of its function along with appropriate objectives. Roadway can be setup and appropriate design criteria can be implemented. It is an important tool for road network and land use planning to asset management. Road hierarchy restricts or reduces direct connections between certain types of links, for example residential streets and arterial roads, and allows connections between similar order streets (e.g. arterial to arterial) or between street types that are separated by one level in the hierarchy (e.g. arterial to highway and collector to arterial.). These hierarchical distinctions of road types become

clearer when considering the recommended design specifications for the number of through lanes, design speed, intersection spacing and driveway access. A well-planned road hierarchy will reduce overall impact of traffic by concentrating longer distance flow onto routes in less sensitive locations, ensuring land uses and activities. These networks are incompatible with traffic flow and restricted from routes where traffic movement should predominate and preserving areas where through traffic is discouraged.

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

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

he road hierarchy principles will support orderly planning and provision of public transport routes, pedestrian and bicycle routes. It also identifies the effects of development decisions on surrounding areas. It also facilitates urban design principles such as accessibility, connectivity, efficiency, amenity, safety, road furniture and preserves landscaping. This study also formulates the road hierarchy for the various roads. After going through large number of literature, the study has proposed four level hierarchy roads namely Class A, B, C and D.

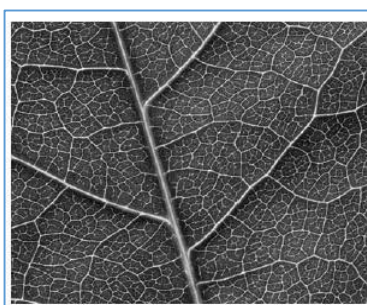


Figure No 5.3: Conceptual Hierarchy



Figure No 5.4: Road Network Hierarchy

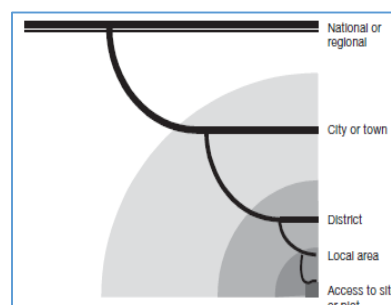


Figure No 5.5: Urban Road Hierarchy

5.5.1 Right of Way (RoW)

The RoW is width of land to be acquired for the road along its alignment. The Nepal Road Standard 2070 has proposed roads under category of National Highway (NH), Feeder Roads (FR), District Roads (DRCN) and Urban Road within the municipality area. The RoW of these roads are considered as per respective Guidelines. i.e the RoW of National Highways, Feeder Roads and District Roads are 50.0 m, 30.0 m and 20.0 m respectively. The guideline has clearly stated about the setback distance for these roads (having RoW ≥ 20.0) as 6.0 m on either side. All of these standards shall be applied to the rural municipality accordingly.

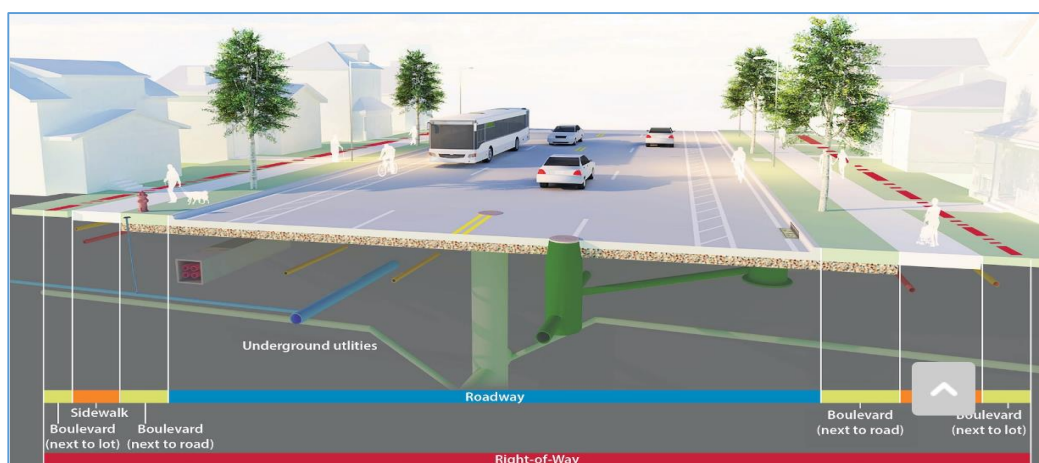


Figure No 5.6: Definition of RoW

Table No 5.13: Urban Road Class and Features

Road Class	Descriptions	Minimum RoW (m)	Minimum Set-back Distance (m)	Remarks
NH	National Highway	50	As Prescribed	NRS 2070
FR	Feeder Road	30		
DRCN	District Road	20		
R-Municipal Ring Road	R-Municipal Road (if any)	20	5 & 5	R-MTMP
A	Arterial Road	16	3 & 3	
B	Sub-Arterial Road	13	2 & 2	
C	Collector Road	8	2 & 2	
D	Local Road	6	2 & 2	

Based on MTMP guideline, the building line or setback shall be maintained 6.0 m for roads having RoW equal to or more than 20.0 m and 2.0 to 5.0 m for other roads. However, Nepal Road Standards-2070 has considered the setback distance at curved section only and that should be sufficient to provide the adequate sight distance. It is silent about the building line.

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

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

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

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

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

5.5.2 Road Classification

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

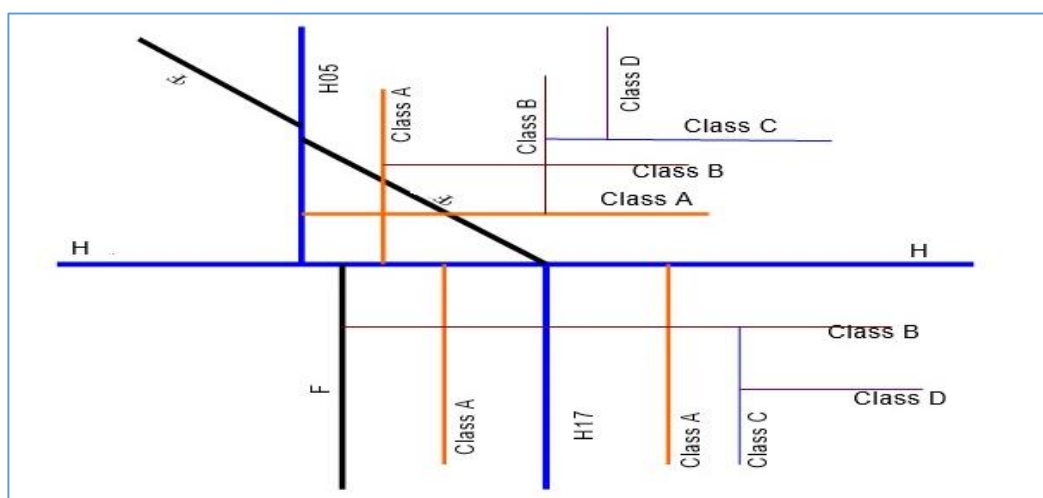


Figure No 5.7: Detail Description of Road Class

The fundamental parameters of the urban road are shown in Figure No 5.6. R-Municipality has a complete road network hierarchy consisting of National Highways, Feeder Roads and Urban Roads of all four classes. The conceptual layout based on the functional hierarchy of the entire road network is shown in Figure No 5.3,5.4,5.5.

5.5.3 National Highways

National Highways are main roads connecting East to West and North to South of the Nation. These serve directly the greater portion of the longer distance travel, provide consistently higher level of service in terms of travel speeds, and bear the inter-community mobility. These roads shall be the main arterial routes passing through the length and breadth of the country as a whole. They are designated by letter „H“ followed by a two-digit number. For Example: Siddhartha Highway (H10), Ratuwa river-Rangeli Highway (Postal Highway-H19) with RoW 50 m.

5.5.4 Feeder Roads

Feeder roads are important roads of localized nature. These serve the community's wide interest and connect District Headquarters, Major economic centres, Tourism centres to National Highways or other feeder roads. They are designated by letter „F“ followed by 3-digit number. For example, FR (Bhumahi - Parasi - Bhairahawa).

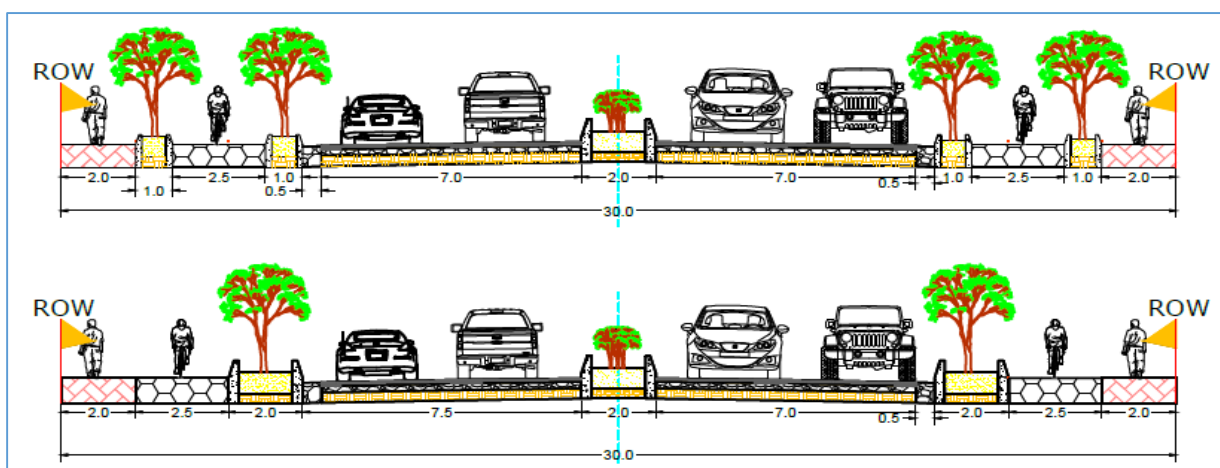


Figure No 5.8: Typical Cross Section of Feeder Road

5.5.5 District Roads

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

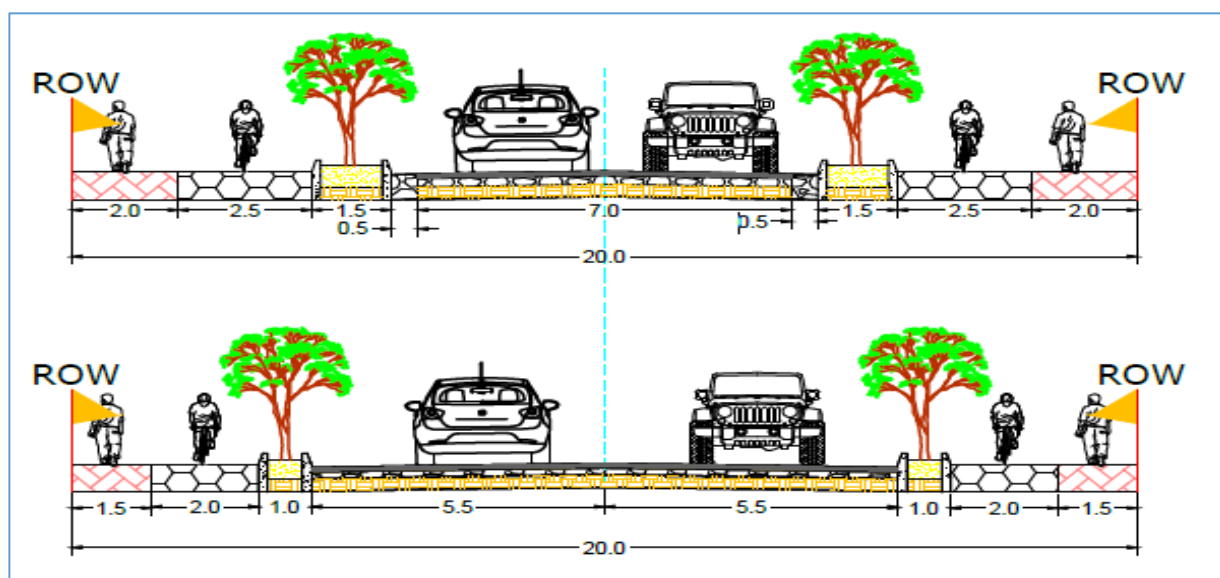


Figure No 5.9: Typical Cross Section of District Road

5.5.6 Municipal Urban Roads

Arterial Roads (Path)- Class "A": These roads are generally meant for thorough traffic usually on a continuous route. These roads are wider roads, basically with total right of way of 20m and principally serve the purpose of mobility. However, in case of Omsatiya R-Municipality these roads have been designed with Right of Way of 16 m. These roads are high standard roads with longer length and serving large number of population and are considered as highways of the R-Municipality. They connect one or more major growth centers or has direct linkage to SRN or LRN and thus it has high network coverage. The Design Speed of 40-50 Kmph has been set for Class A roads. These roads are equipped with proper facilities for vehicles, pedestrians, cyclists and greenbelt. Pedestrians are allowed to cross only at intersections or at the designated crossings.

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

- High network coverage
- The right of way is at least 16 m.
- Directly or through the National Strategic Road Network, district road.
- Complete access to public transport with segregated NMT facilities.
- Underground facilities, i.e. cable, electric lines, sewer line, water supply, gas lines etc.

Typical sections of Arterial are shown in the figures of two types. The type II, urban road has been prescribed for the Omsatiya rural municipality.

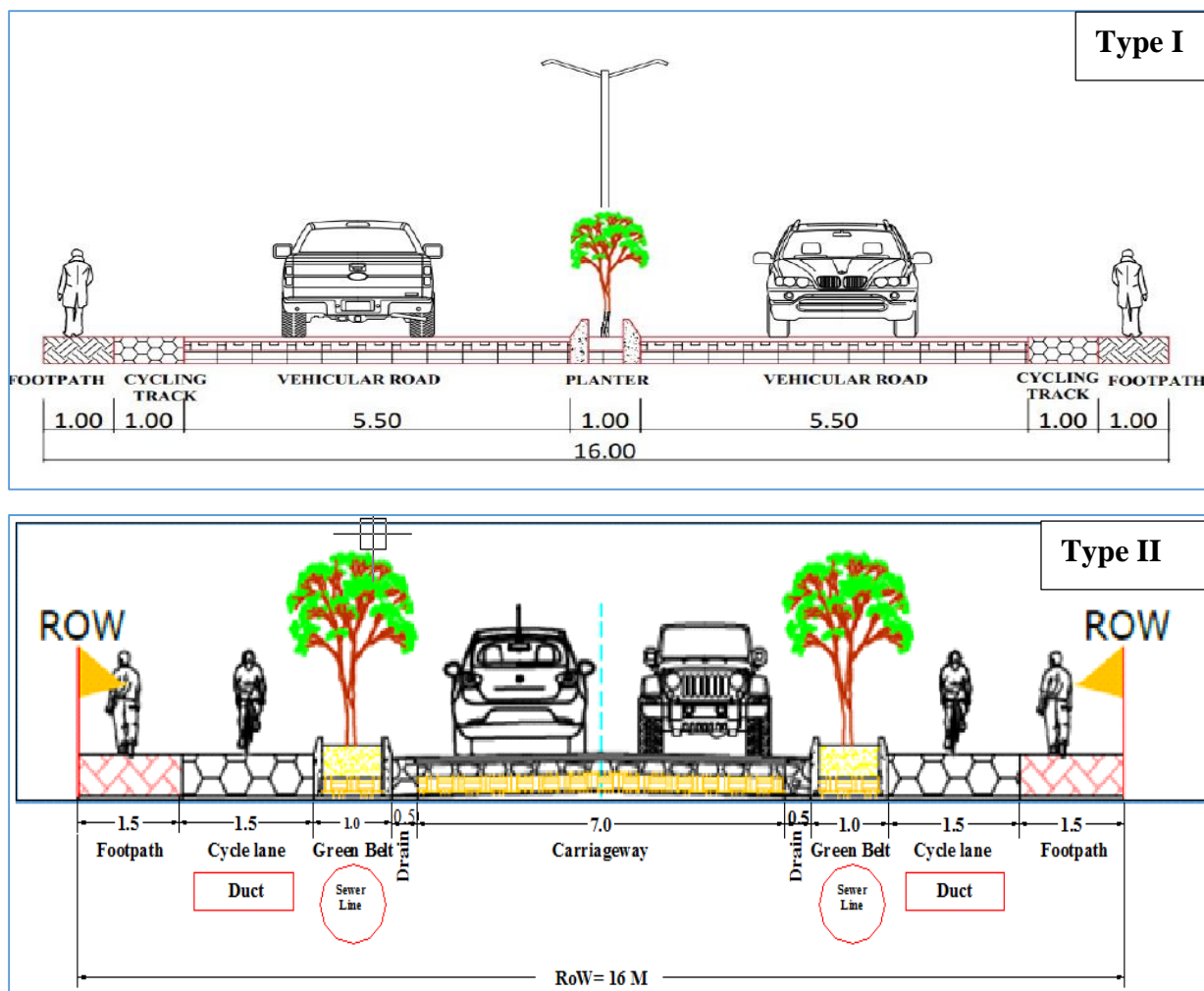


Figure No 5.10: Typical Cross Section of Arterial Road (Class A)

Sub-Arterial Roads (Sadak)-Class "B": These are roads of somewhat lower level of travel mobility than the arterial roads. The emphasis on access to adjoining area is more in case of these roads than in case of arterial roads. These roads have been designed with total right of way of **13 m** which can be considered as Feeder roads of R-Municipality. These roads connect major road network and other roads of similar hierarchy with either major growth center or provide access between Class A and Class C road. Mobility is also the main function and purpose for these roads too and are designed with similar facilities for all road users including drivers, pedestrians and cyclists. The Design Speed of 30-40 Kmph has been set for Class B roads. Pedestrians are allowed to cross only at intersections or at the designated crossings.

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

- A road connecting major Growth Centre of the same or neighboring wards which provide access between Class A and class C road.
- The right of way is at least 13 m.
- Access to public transport with segregated NMT facilities.
- Underground facilities, i.e. cable, electric lines, sewer line, water supply, gas lines etc.

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

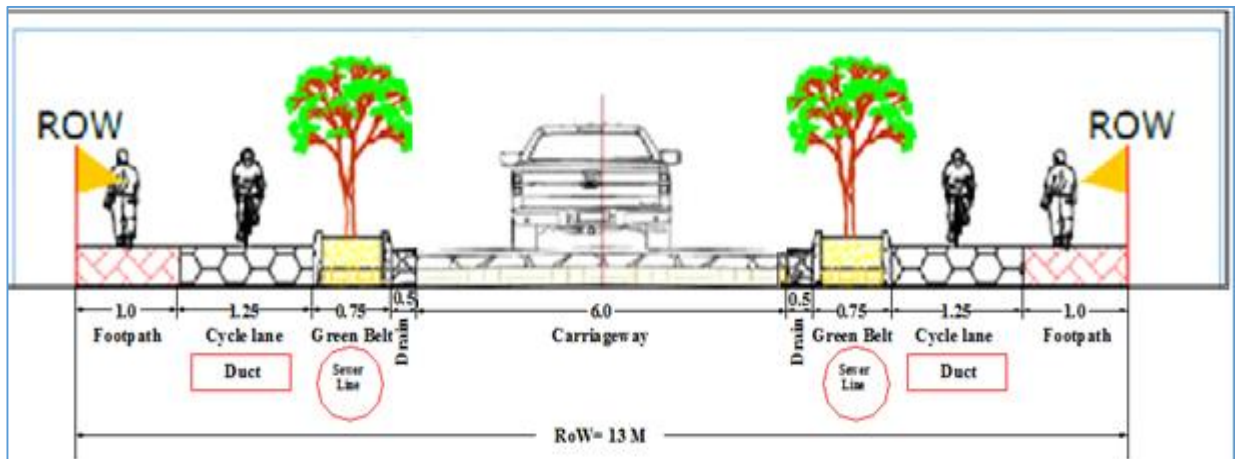


Figure No 5.11: Typical Cross Section of Arterial Road (Class B)

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

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

- All agricultural roads which connect a farm with a mini-market Centre or a agro-based production Centre
- The right of way is **8 m**, Roads for mobility of local trips.
- Underground facilities, i.e. cable, electric lines, sewer line, water supply, gas lines etc.

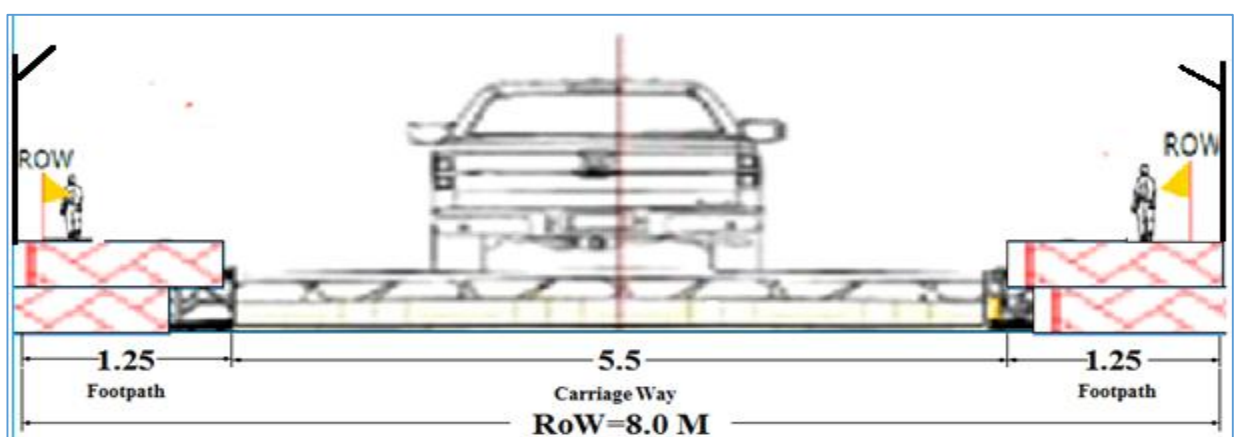


Figure No 5.12: Typical Cross Section of Collector Road (Class C)

Local Road (Upamarg)-Class "D": A local road is one primarily intended for access to residence, business or other abutting property. Such a road normally does not carry large volume

of traffic. The traffic carried either originates or terminates along its length. A local road may be residential, commercial or industrial, depending upon the prominent use of the adjoining land. Typical section of Local Road is shown in the given figure:

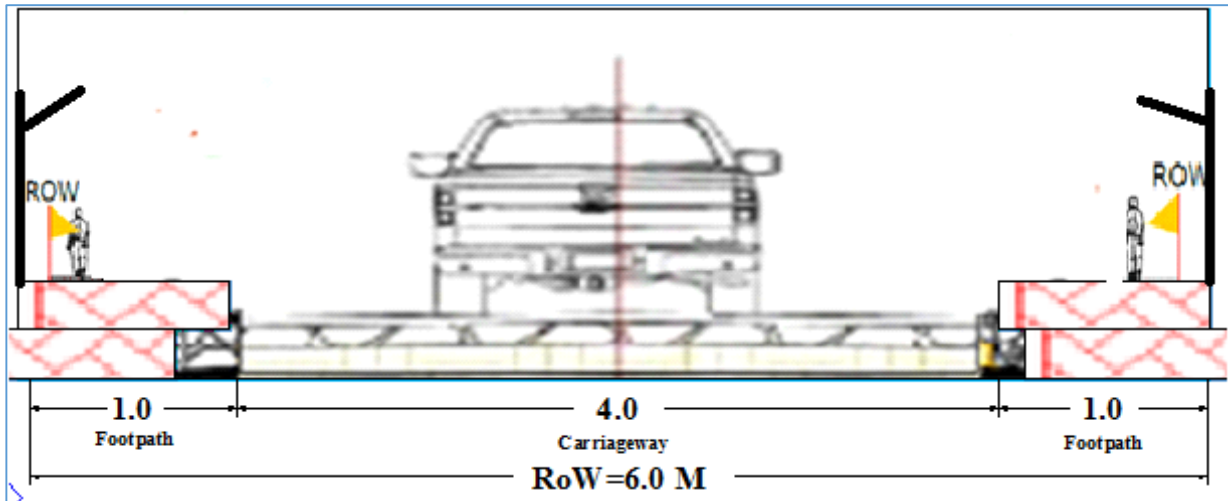


Figure No 5.13: Typical Cross Section of Local Road (Class D)

Criteria	Arterial Road (Path): - Class A	Sub-Arterial Road (Sadak): - Class B	Collector Road (Marg): - Class C	Local Road (Upa-Marg) Class D	R-Municipal Ring Road (if any)
Purpose	Mobility	Mobility and control Access	Access and mobility	Access	Mobility, control access and access
Function	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	Through and overall distance movement
	High network coverage	Support through movement of traffic	Access to property	direct access to property	High network coverage
	Segregated NMT facilities and Bus laybys	Segregated NMT facilities and Bus laybys	Segregated NMT facilities	Local NMT movement	Segregated NMT facilities and Bus laybys
	Complete access to public transport	High access to Public transport	Limited access to public transport	-	Complete access to public transport
Maintenance/Responsibility	Rural Municipality	Rural Municipality	R-Municipality & Community	Community	R-Municipality/Province
Public transport services	Mass Transit facilities	Mass Transit, Local Public transport	No public transportation	No public transportation	Mass Transit facilities
Minimum Right of Way (ROW) m	16	13	8	6	20
Design Speed (Kmph)	40-50	30-40	20-30	10-20	50-60
Radius (m)	60-70 and 90-105	30-40 and 60-70	15-20 and 30-40	9-20	>105
Stopping Sight Distance ,m	45-65	30-45	20-30	10-20	>65
Decision Sight Distance (m)	160-195	120-160	80-120	40-80	>195
Setback ,m	3	2	2	2	5
Street Light pole height, m	10-12	10-12	9-10	9-10	>12
Street Light Pole Spacing, m	30-35	30-35	25-30	25-30	30-35
Footpath, m	1.5	1.0	1.25	1.0	2
Cycle Track, m	1.5	1.25	-	-	2
Vertical Clearance, m	5	5	5	5	6

Discussion on Road Hierarchy and Proposed RoW

During R-MTMP preparation, a series of discussions was held with Omsatiya RMunicipal Board members, stakeholders on related to R-MTMP. One of the major issue was road hierarchy and RoW. The matter was discussed during field report presentation. It is an obvious fact that people welcome any possibility of investment in their locality. But when the people's contribution demanded especially with their own land and house for the road, they tend not to support such plans. With existing road width of about 12 m or less, the proposed road network with 16 m and 20 m RoW roads were not welcomed whole heartedly.

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

After the consensus on the road network was met, the proposed minimum RoW of the roads was explained to accommodate the proposed infrastructures. The proposed RoW of 16 m for class A and 13 m for class B roads was not easily accepted. The necessity of such wider roads were clarified with the examples of developed cities of Nepal such as Kathmandu, Biratnagar, Butwal, etc. where with urbanization, wider roads were enforced at the loss of huge built-up infrastructures including houses. With time, number of people with small plot of land and house along the major roads will increase making expansion socially more unacceptable. The necessity of minimum RoW of 6 m was also emphasized by giving an examples of fire in Asan Indrachowk area, Kathmandu. There was slight change in road network during the initial discussion and final discussion at the municipality.

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

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

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

5.6 Nomenclature and Coding of Urban Roads

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

- First digit (1 to 7) represents the number of Province. Code 1 stands for Province 1, 2, 3, 4 5,6 and 7 indicate Province 2, Province 3, Province 4, **Province 5**, Province 6 Province 7 respectively.
- Second and third digits represent particular district (1 to 77). Rupandehi district is coded by **08**.
- Fourth code RM represents for the Rural Municipality.
- Fifth and sixth digits represent particular name (1 to 753 for particular municipality) of the municipality in the district. i.e. **Omsatiya** Rural Municipality is coded by **09**.
- Seventh code indicates letter A to D for particular Class of road.
- Next three digits (001 to 999) represent the particular transport linkage.

The following guideline shall be followed for Road Coding.

i.e.,

Table No 5.14: Coding Guideline of R-Municipal Roads

5	Lumbini Province				
5	08	Rupandehi District			
5	08	RM	Rural Municipality		
5	08	RM	09	Omsatiya Rural Municipality	
5	08	RM	09	A	Class Of Road
5	08	RM	09	A	001 Number of Roads

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

5	0	8	RM	0	9	A	0	0	1
----------	----------	----------	-----------	----------	----------	----------	----------	----------	----------

(508RM09A001: Hulaki Rajmarga-Velahi Gaun-Pahkhauri Gaun-Taraini Gaun–Dipnagar Path)

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

Chapter: 6 Perspective Plan of Municipal Transport Network

6.1 Accessibility and Trip Pattern

The ultimate goal of most transportation is “access,” people’s ability to reach their destination, and get services and activities in time. Transportation decisions often involve trade-offs between different forms of access. How transport is measured can have a major impact on these trade-offs [(Litman Todd, 2003).

Land use patterns affect mobility and accessibility in various ways. Thus Land use and transportation are interdependent. Mobility, especially in the form of motorized transport requires an increasing share of land. For, Long term sustainability it should be considered by altering the urban structure itself. As we fell, transportation demands are concentrated in town areas which can be dispersed to sub centres by developing markets and economic activities. The disperse of the settlement and economic activities will help in relieving congestion and promoting development of a more balanced society.

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

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

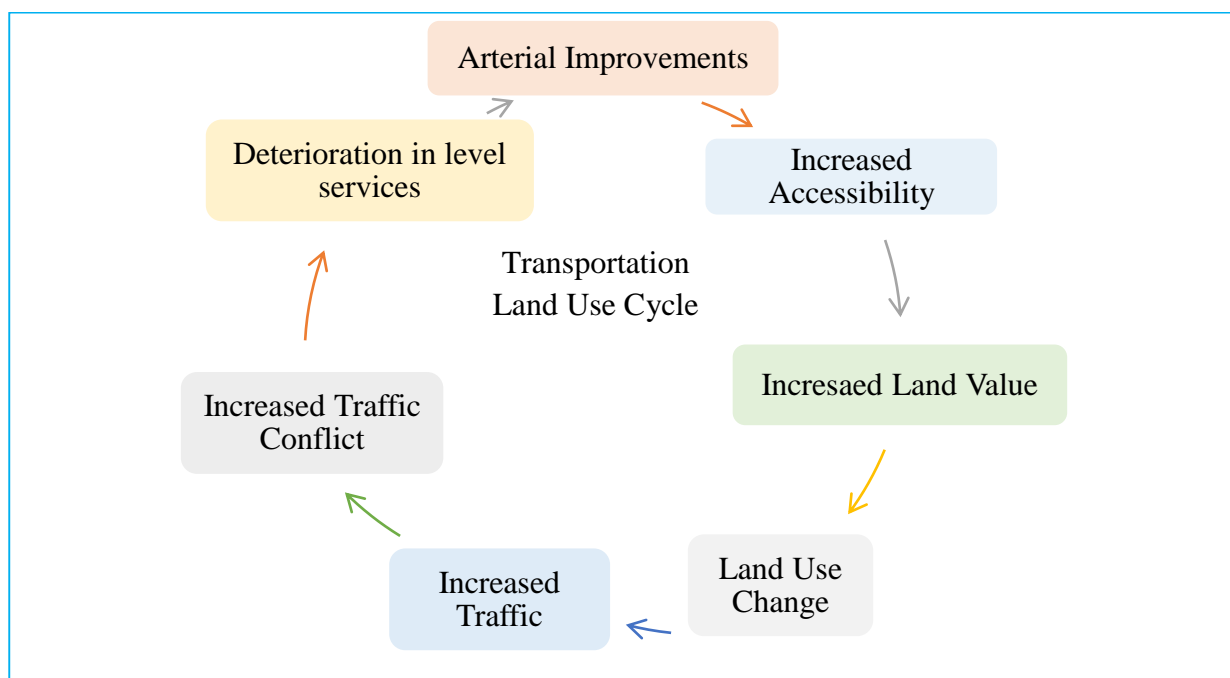


Chart No 6.1: Transportation Land Use Cycle

Land use patterns affect mobility and accessibility in various ways:

Density: (number of people or jobs per unit of land area) increases the proximity of common destinations, and the number of people who use each mode, increasing demand for walking, cycling and transit.

Land use mix: (locating different types of activities close together, such as shops and schools within or adjacent to residential neighbourhoods) reduces the amount of travel required to reach common activities.

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

Network connectivity: (more roads or paths that connect one geographic area with another) allows more direct travel.

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

6.2 Process and Procedure for Collection of Demand

Ward level meeting in every ward or ward cluster has been done. From, where information on R-MTMP are collected. Demand form for each wards are provided. Later on, these forms have been collected after the form are duly filled in given time. As road demand from the settlement level has also collected bottom up approach of planning applied.

Data Analysis and Field Verification of the Roads from Demand Form: Analysis of data regarding the accessibility situation in each settlement, population forecasting for each sector, major road linkages have been done. Similarly, all the roads demanded in demand form are verified in field, GIS Base Maps by the survey team.

6.3 Scoring System for Screening, Grading and Prioritization

Transport linkage in an urban area has greater importance for its overall development. A transport network consists of several links. It is not possible to construct all roads at a time due to resource and time constraint. Therefore, each link in a network needs to be scoring for screening, grading and ranking them. The basic criteria that has been used for prioritization includes existing population within the urban of influence, present road demand, future potential route,

accessibility situation, land use pattern, environmental and social safeguard, proximity to the market/service centers, religious and tourism places. The finalized scoring criteria based on rigorous study is set in front of municipality and MRCC for its approval. Each road link is allocated the number of points corresponding to the fulfillment of the particular criteria. The weighted average of score that each intervention receives leads to a ranking/prioritization of the intervention options. Consultant has worked out the following weights for the criteria for the prioritization of road links. The following criteria were used as prioritization indicator.

Table No 6.1: Criteria for Prioritization

S.N.	Criteria	Scoring Unit	Method of Measurement	Score (ToR)	Score
1.	Link providing service to large settlement areas/ population.	Population served/km (continuously Scored)	Measurement of served HH from map and multiplying with HH occupancy of respective wards	15-20	15
2.	Link providing service to areas with high potential for agriculture, horticulture, livestock production.	Annual production equivalent to NRs...../km (continuously Scored)	Measurement of Agriculture land area from map, livestock from inventory and multiplying with unit rate of production.	5 - 10	10
3.	Link providing service to existing market centers: commerce and business centers or market sites (local haatbazar) tourism attraction centers Areas having agro-based and cottage industries Other obligatory centers as decided by the rural municipality.	Estimated annual transaction in these centres equivalent to NRs...../km (continuously Scored)	Inventory survey along with consultation with people (MRCC) and land cover map are used to identify their location and transactions.	20 - 25	20
4.	Link Providing Service to the Existing Service Centers: Health Centers, Education Centers (School/Campus, Office (Municipality/ Government) Communication Centre (Post Office, Communication)	Population served by these service centers expressed as persons per km per year. (continuously Scored)	Inventory survey, Map along with consultation with people (MRCC) identifies their location and served population.	15-20	15
5.	Link providing service to the potential growth or service centers identified by municipality (IDPM) such as Waste management site.	Anticipated number of people to be directly benefited expressed as persons per km per. (scored continuously)	Consultation with MRCC and IDPM shall also be used	5-15	5
6.	Link providing service to the potential future development sites such as: Potential town growth	It is technically sound to score these service discretely based on existence. For each service centers, a	Consultation with MRCC and IDPM shall also be used	10-20	10

S.N.	Criteria	Scoring Unit	Method of Measurement	Score (ToR)	Score
	Land pooling Potential industrial area Forming ring road to municipality	score of 2.5 is allocated.			
7.	Link providing service to the areas recognized by the municipality as areas for special consideration, such as areas inhabited by backward and poor ethnic groups/communities, isolated remote areas, historic sites, religious sites etc.	Very important = 5 Important = 2.5 less important = 0 (Scored discretely)	Inventory survey along with consultation with local people identifies their location and Importance.	10 -15	15
8.	Direct link with another linkage	National Highway=10 Feeder Roads=8 District Roads=6 Neighboring Municipality/ district= 4 Otherwise= 0	Road Network Map and attribute table.	5 - 10	10

The prioritize/rank of the roads has been developed based on criteria as above described which is proposed by MoFALD and approved by MRCC meetings. The MRCC and ToR has decided to prioritize the class D Class Roads based on available budget during the implementation of R-MTMP.

6.4 Feasible New Linkage

The concept of R-MTMP is integrated development of municipal road core network with economic, social, physical, environment, institutional including future land use plan and future settlement expansion plan, religious cultural and tourism plan etc. and other development infrastructures which will influence the vehicular trip nature and pattern. These development areas have to be connected with high-class roads to achieve the objective of Omsatiya as a Smart Town. The Rohini Khola Corridor which is feasible new linkages that have been identified through MRCC meetings in consultation with ward representatives.

The list of new feasible road link has been given in Table 6.2 below.

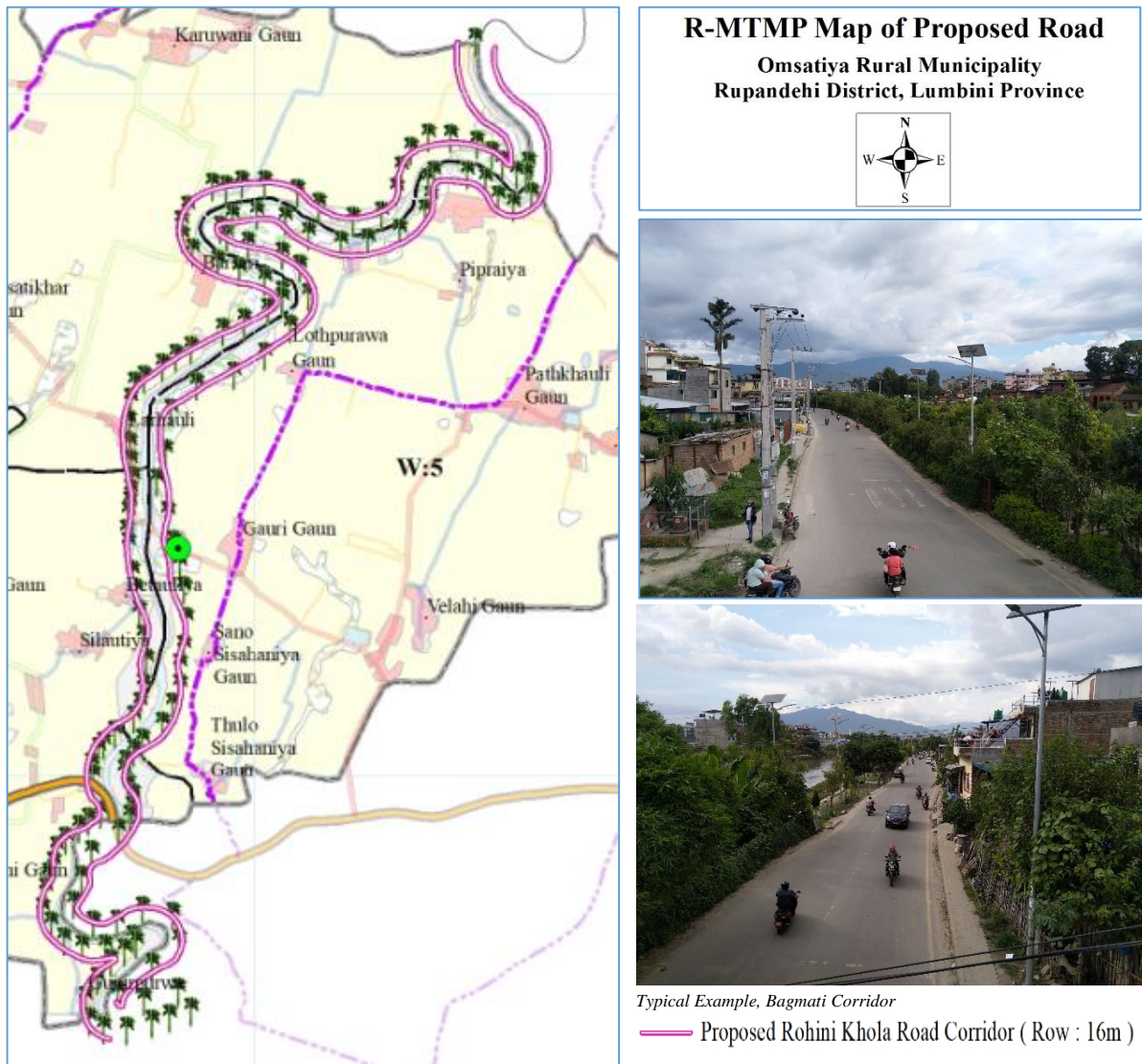
Table No 6.2: Proposed Route for Corridor Development

S. N.	Feasible Corridor	Origin	Destination	Ward Pass	Class	RoW (m)	Length (km)
1.	508RM09A012: Rohini Khola Corridor Both Side	Gujurpurwa	Pipraiya		A	16	

508RM09A012: Rohini Khola Corridor

- Path acts as river corridor at Rohini Khola
- Pass mid-way which is North to South way

- Path serves as the recreation and relaxation regions
- Prevent inundation problem from Rohini Khola
- Develop greenery region along the corridor
- River training works in Rohini Khola



Map No 6.1: Major Feasible New Linkage



Figure No 6.1: Typical View of Bagmati Corridor



Figure No 6.2: Typical Views of Dhobikhola Corridor

Table No 6.3: List of Connectivity , Ward Centre

Ward	Ward Name		Population (2076)	CRN	MRCN Connectivity		
	English	Nepali			1 st Connecting Road	2 nd Connecting Road	3 rd Connecting Road
1	Thutepiple	ठुटेपिपले	4,727	H10	49DR019	-	-
2	Bardihawa	बर्दिहवा	5,840	H10	508RM09A002	-	-
3	Farsatikhar	फर्साटिकर	5,846	49DR019	508RM09A006	-	-
4	Balapur	बालापुर	8,058	F13003	-	-	-
5	Omsatiyaa	ओमसतिया	4,909	49DR019	508RM09A006	508RM09A002	-
6	Chotki Ramnagar	छोटी रामनगर	6,071	49DR022	508RM09B004	-	-

6.5 Public Transportation

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

The travel pattern of people in rural municipality from settlements to market, institutional area i.e R-Municipal centre while from settlements to Thutepiple, Balapur, Farsatikhar in morning and reverse at evening peak time. This travel pattern is fundamental for the planning of public transport routes. In this regard, the proposed route of public transportation must follow the main road and the link roads that helps to access the public with R-Municipal Head office and wards Centre. Strategic development of such roads will not only create demand for public transport (greater mobility) but also develop proper road network where public transport vehicles can access. For the better mobility and transportation system, local government should introduce city buses.

Thus, these road networks link the Postal Road and Siddhartha National highway. The link roads are important for inter-linkages with other routes within rural municipality as well.

Table No 6.4: Proposed Public Transportation Route

S. N.	Proposed Public Transport Route	Origin	Destination	Ward Pass	Length (km)
1	H10-49DR019- 508RM09A006- 49DR020- 508RM09A001- 508RM09A003- 508RM09B004- 49DR022	Thutepiple	Brindaban	1,3,5,6	34+600

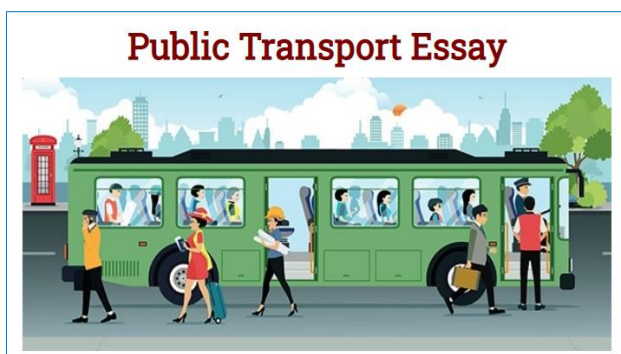


Figure No 6.3: Typical Public Transport Mode



Figure No 6.4: Typical Public Road

6.6 Basic Road Infrastructure

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

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

In the context of Omsatiya Rural Municipality, cycle lane will have constructed along highways, feeder roads, district roads, the Municipal Ring Road, Class A, Class B roads networks.

6.6.1 Street Lighting

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

Table No 6.5: Street Light Pole Height and Spacing

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



Figure No 6.5: Provision of Street Light

6.6.2 Parking Lanes

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

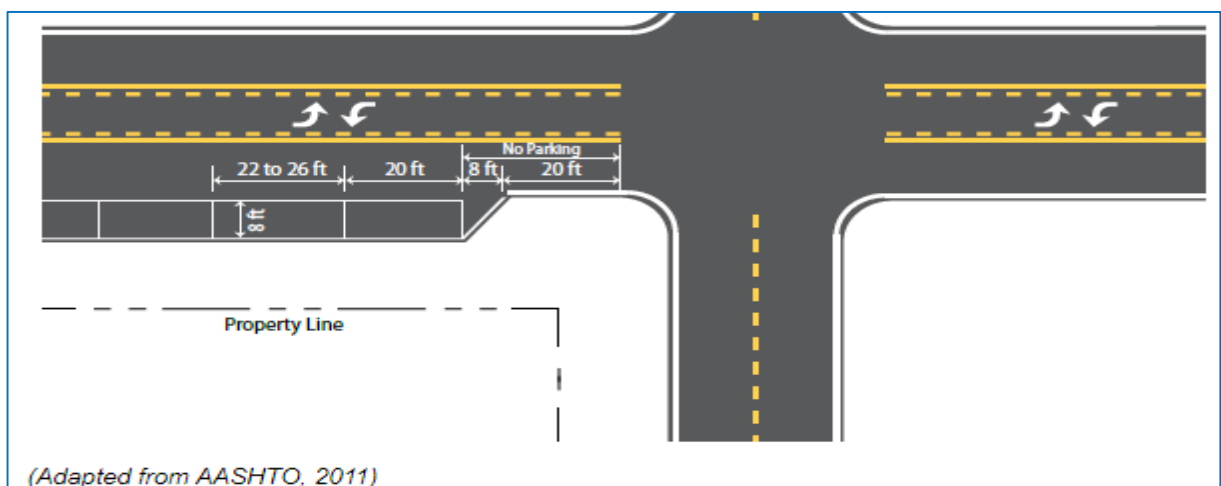


Figure No 6.6: Typical Layout of street parking

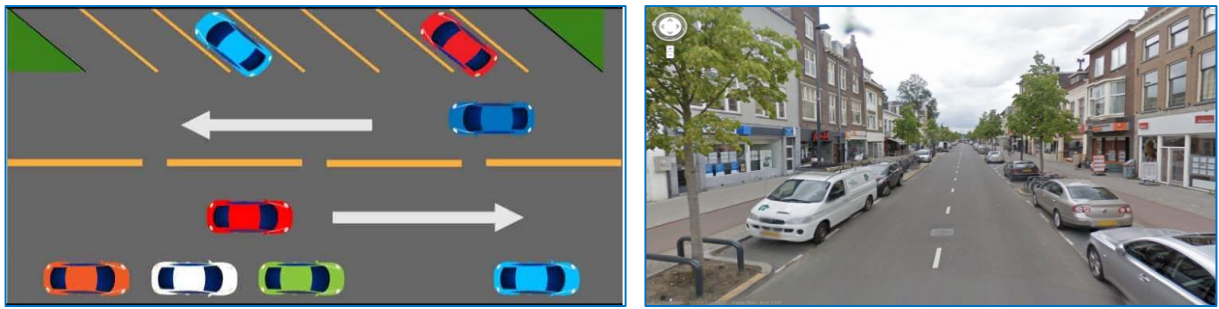


Figure No 6.7: Provision of Street Parking Lane

6.6.3 Taxi Stand

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

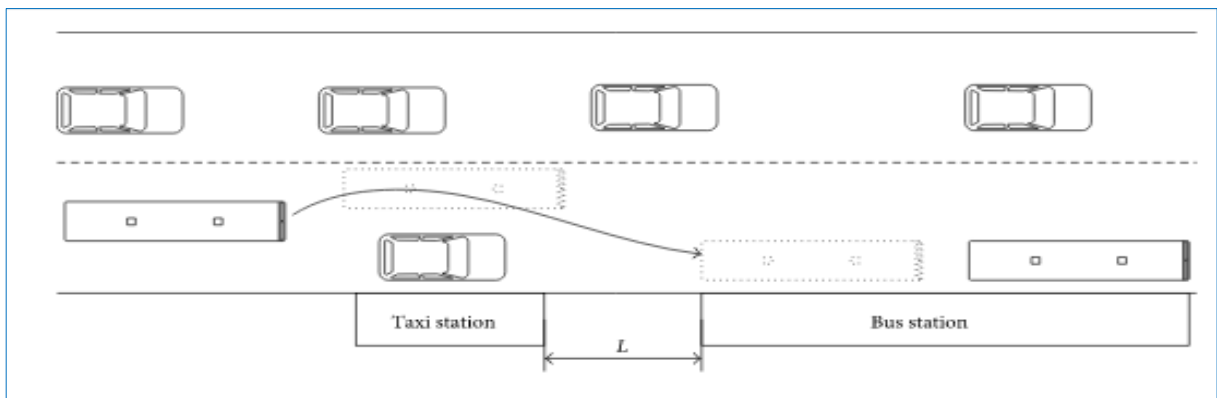


Figure No 6.8: Typical Layout of Taxi Stand

6.6.4 Bus Stops and Bus-Bays

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

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



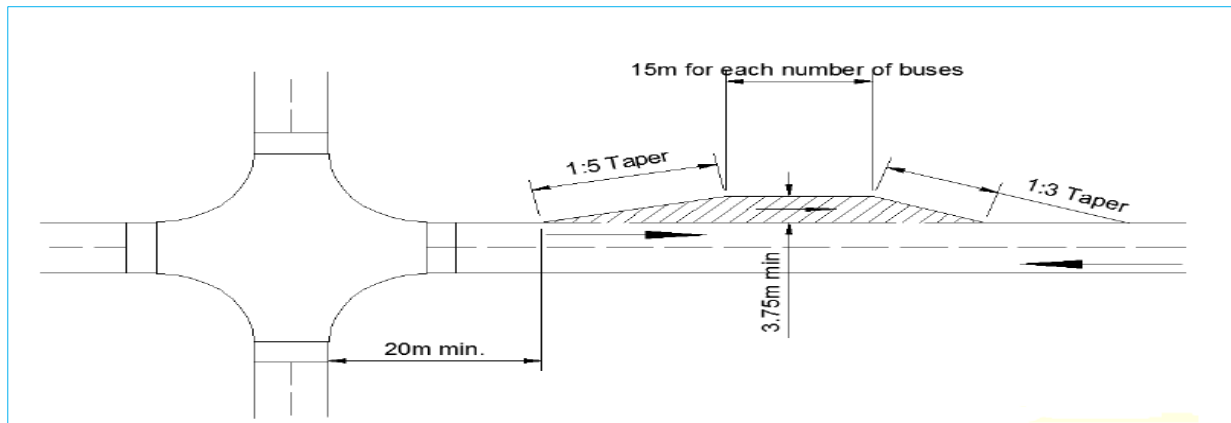


Figure No 6.9: Typical Plan of Bus Stop & Bus Bys

6.6.5 Cross Pedestrians

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

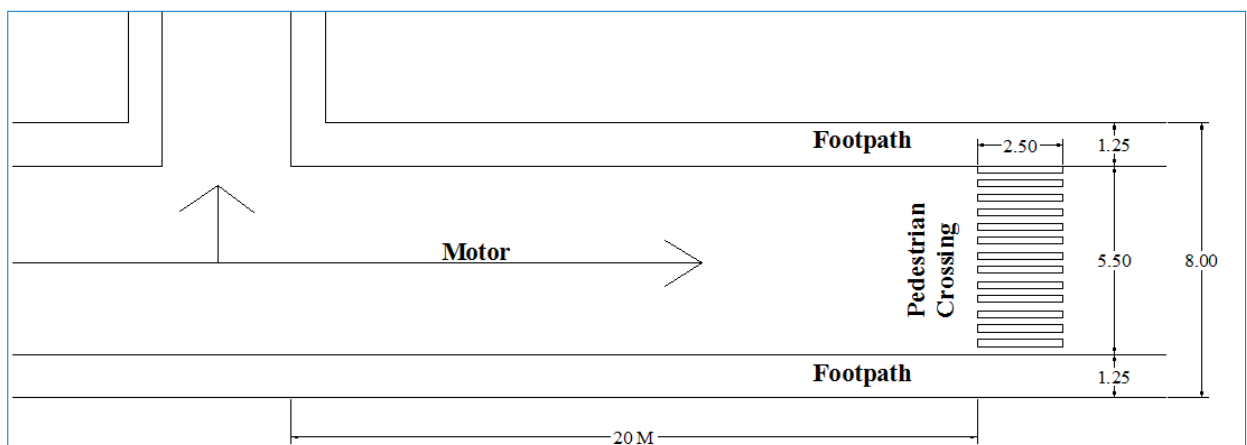


Figure No 6.10: Typical Plan of Pedestrian Crossing, C. Class Road

6.6.6 Electricity lines, Cable Poles

The overhead electrical lines shall be at least 5.5 m above the road pavement when along the road and 6.0m above at road crossing with poles at the inner edge of the walkways on the median strip.

Also, the underground electric cable should be at least 2.0 m from the building line and at 1.5 m depth under the walkways or median strip.

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

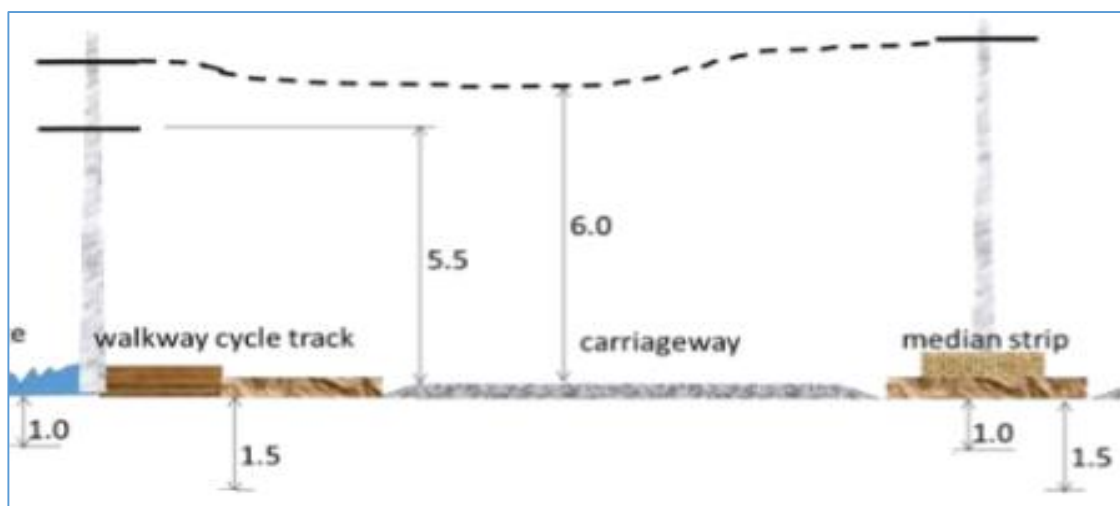


Figure No 6.11: Electricity lines and Cable Poles

6.6.7 Underground Utilities

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

Table No 6.6: Recommendation of Depth of Laying Underground utilities

S.N.	Types of Utilities	Depth (Denoting the bottom of trench, m)	Remarks
1	Trunk Sewer line	2.0-6.0	
2	Water supply line		
2.1	Service line	0.6-1.0	
2.2	Trunk Line	1.0-1.5	
3	Electric Cable		
3.1	Low Tension Cable	0.6-1.0	
3.2	High Tension Cable	1.5-2.0	
4	Telecommunication Cable		
4.1	Directly laid	0.6-1.0	
4.2	Laid in Duct	2.0-3.0	
5	Gas Mains and Lines caring combustible materials	2.0-3.0	

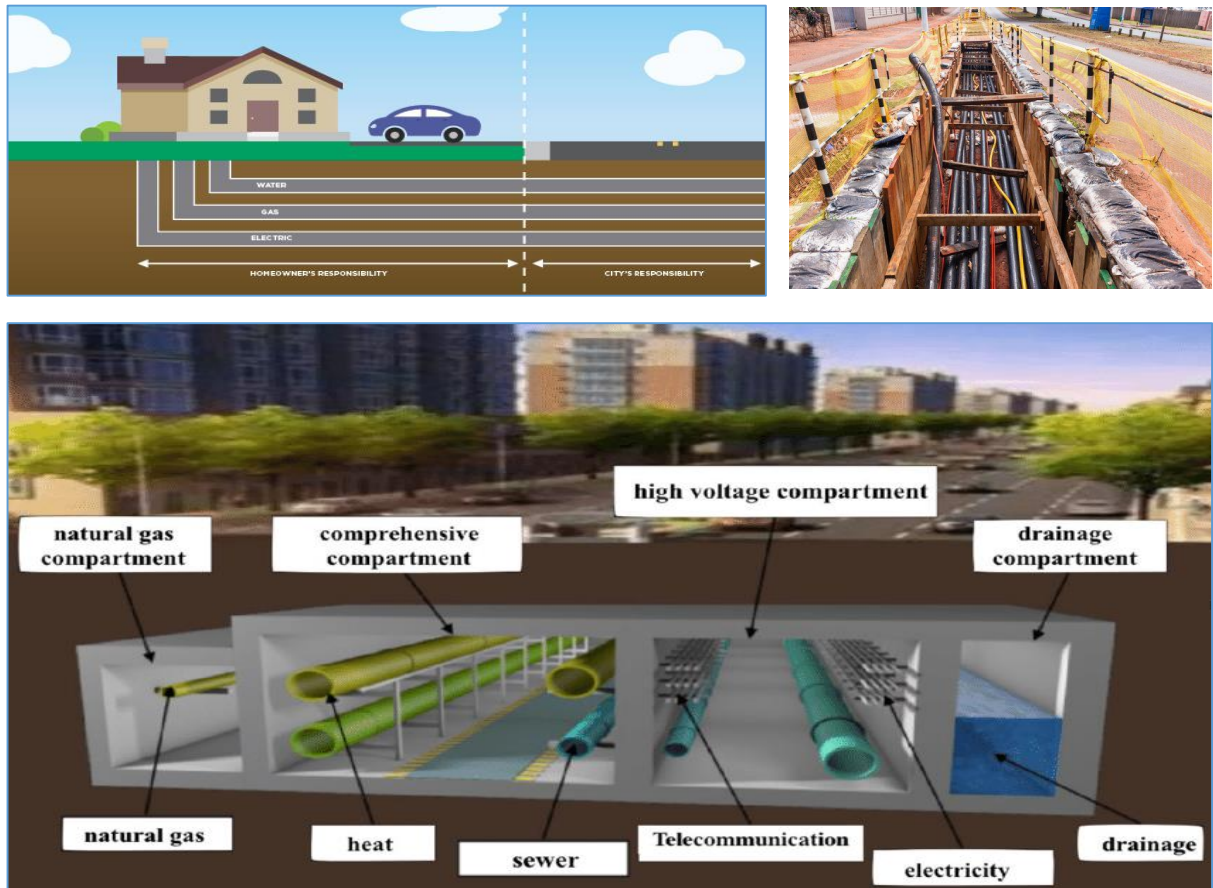


Figure No 6.12: Provision of Underground Utilities

6.6.8 Road Side Drainage

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

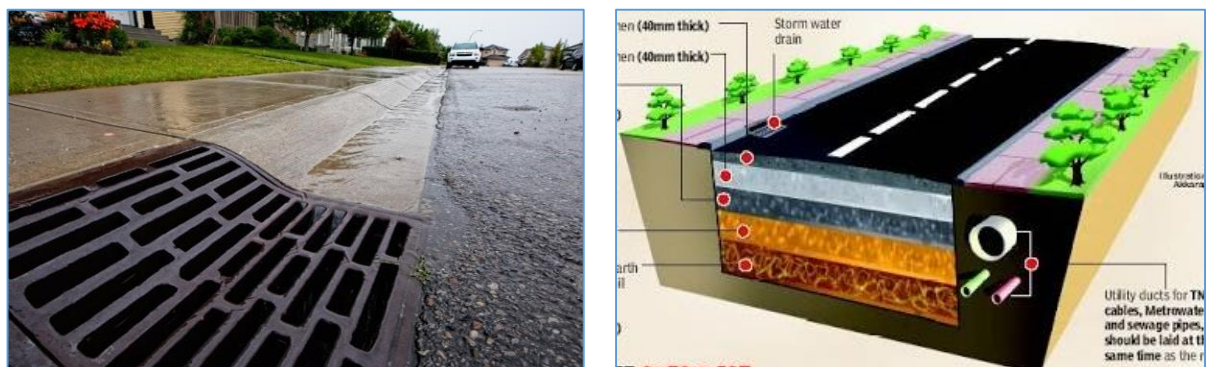


Figure No 6.13: Typical Conceptual Plan of Road Side Drainage

6.6.9 Traffic Calming Elements (Road Hump)

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

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

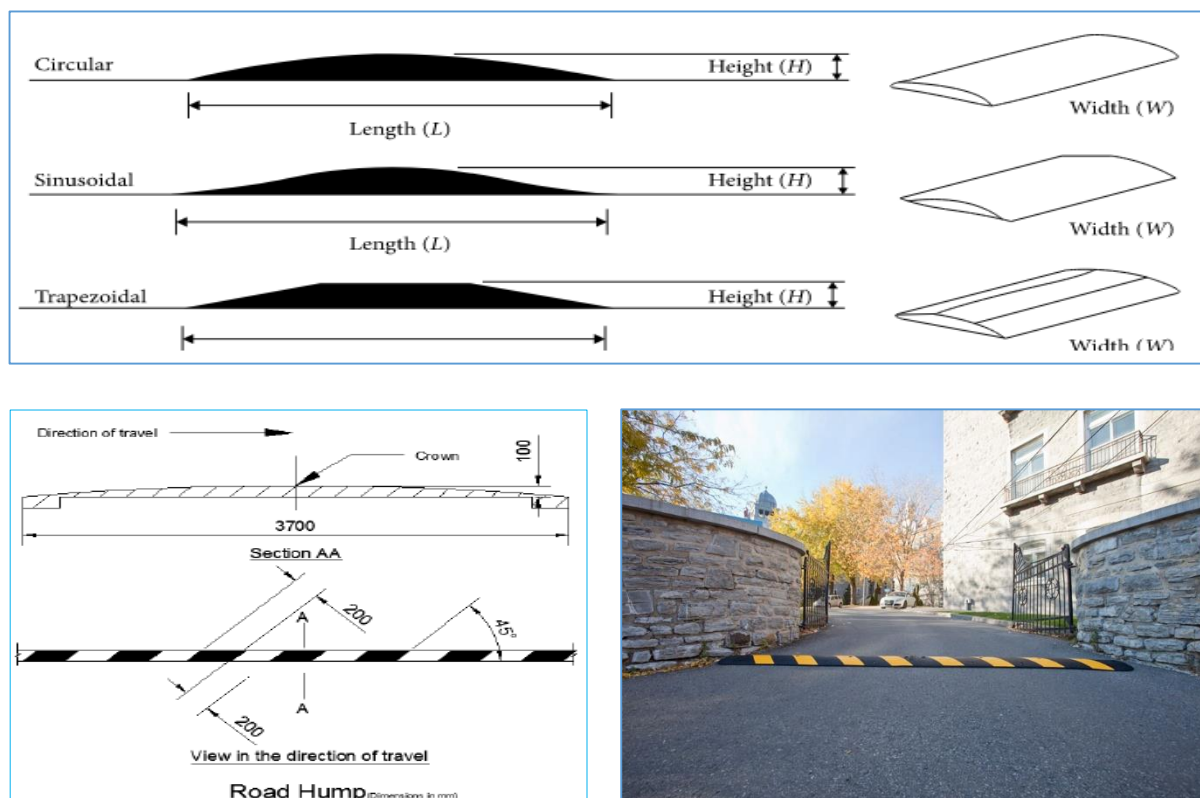


Figure No 6.14: Typical Plan & Section of Road Hump

6.6.10 Green Belt

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

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



Figure No 6.15: Green Belt

6.6.11 Traffic Regulations and Control

In order to have safe traffic operation on roads, it is desirable to impose adequate traffic regulations and traffic control with the help of standard traffic control devices. It is essential that the traffic regulations and controls should have the legal backing by enacting appropriate acts, suitable laws and rules which is given at Traffic signs manuals Vol-I and Vol-II published by DOR.

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

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



Figure No 6.16: Traffic Regulations and Signs

6.6.12 Road Side Furniture

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

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



Figure No 6.17: Road Side Seating Furniture

6.6.13 Bus Terminal and City Bus Station

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

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

Currently, Omsatiya Rural Municipality has not been bus station yet. Due to the space limitation and facilities, the other vehicles such Auto Rikshaw, Motor Cycle, Cars, Trucks can be seen on parking along the roads sides. The existing bus park and station is insufficient for accommodating existing public vehicles. Therefore, a city bus park is essential for managing the public vehicles. Since, a large bus terminal to accommodate all the existing vehicles requires large space, that can be very difficult to acquire. However, its practical to construct one bus terminal and one bus station based on the necessity and proximity within the city. This will minimize congestion, delay in mobility, and more accidents. This situation in the rural municipality has also increased the

aesthetic of overall urban road networks. For better mobility and transportation system, 1 bus terminal and 1 city bus station has been proposed in following locations within the rural municipality. i.e.,

Table No 6.7: Bus Terminal and City Station

S.N.	Bus Station	Location	Ward No	Capacity	Area	Situation	Intervention
1	Bus Terminal	Thutepile.	2	100 Buses	-	Proposed	Planned
2	City Bus Station	Farsatikhar	4	50 Buses	-	Proposed	Planned
4	Helipad						



Figure No 6.18: Typical Conceptual Plan of Bus Terminal-I

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

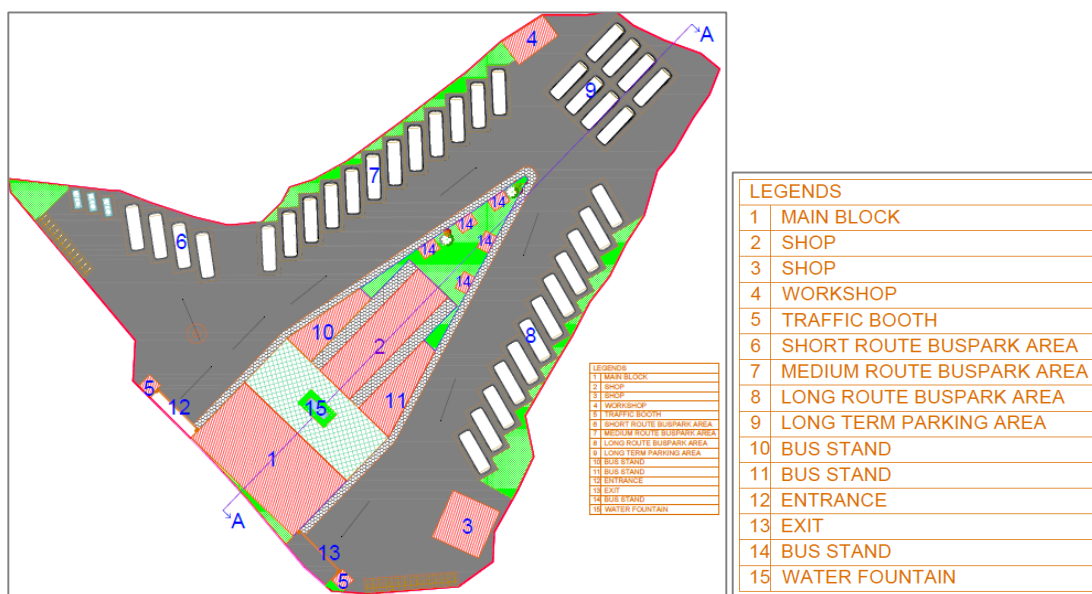


Figure No 6.19: Typical Conceptual Plan of Bus Terminal-II

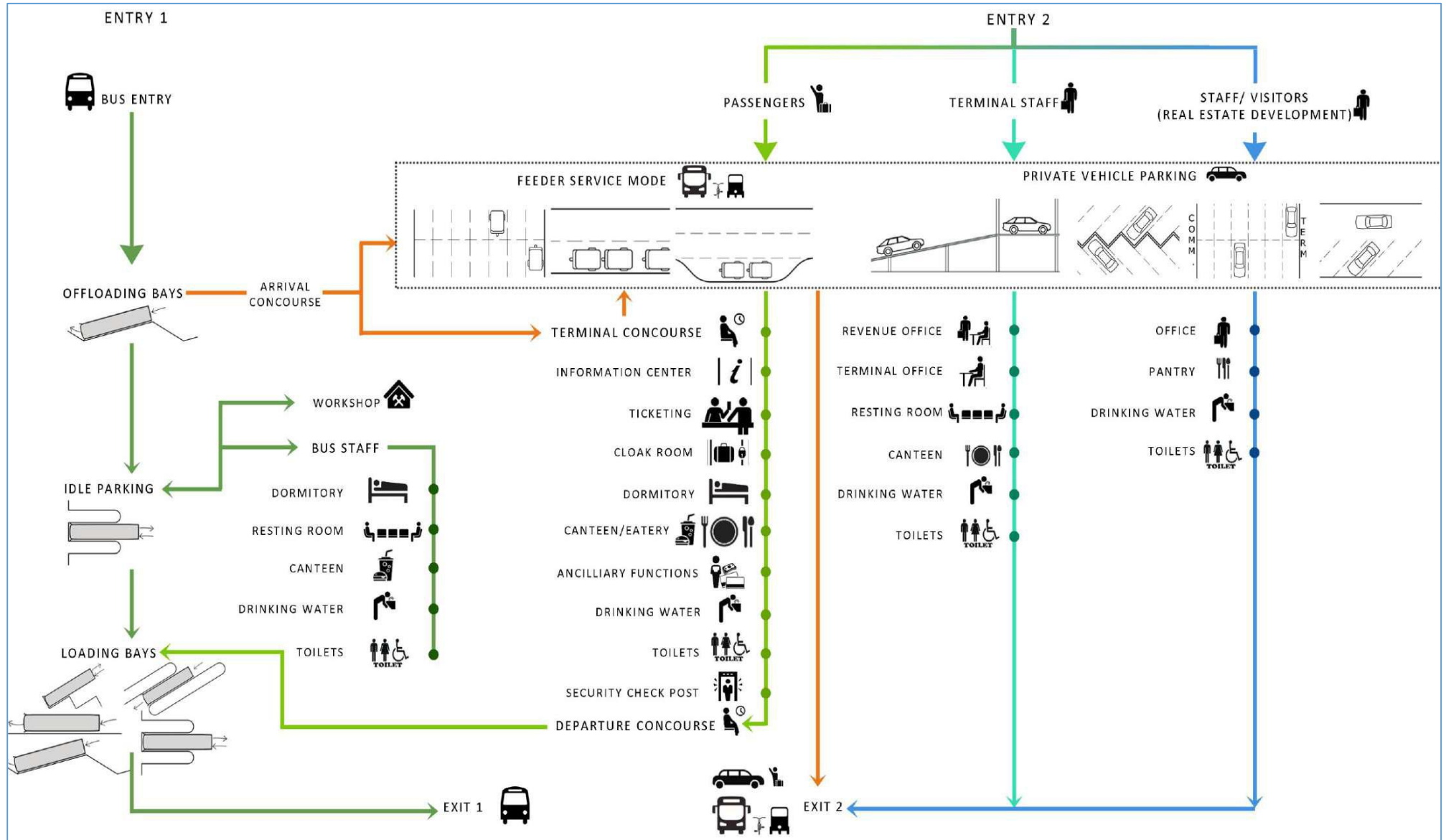


Figure No 6.20: Typical Functional Arrangement of Bus Terminal

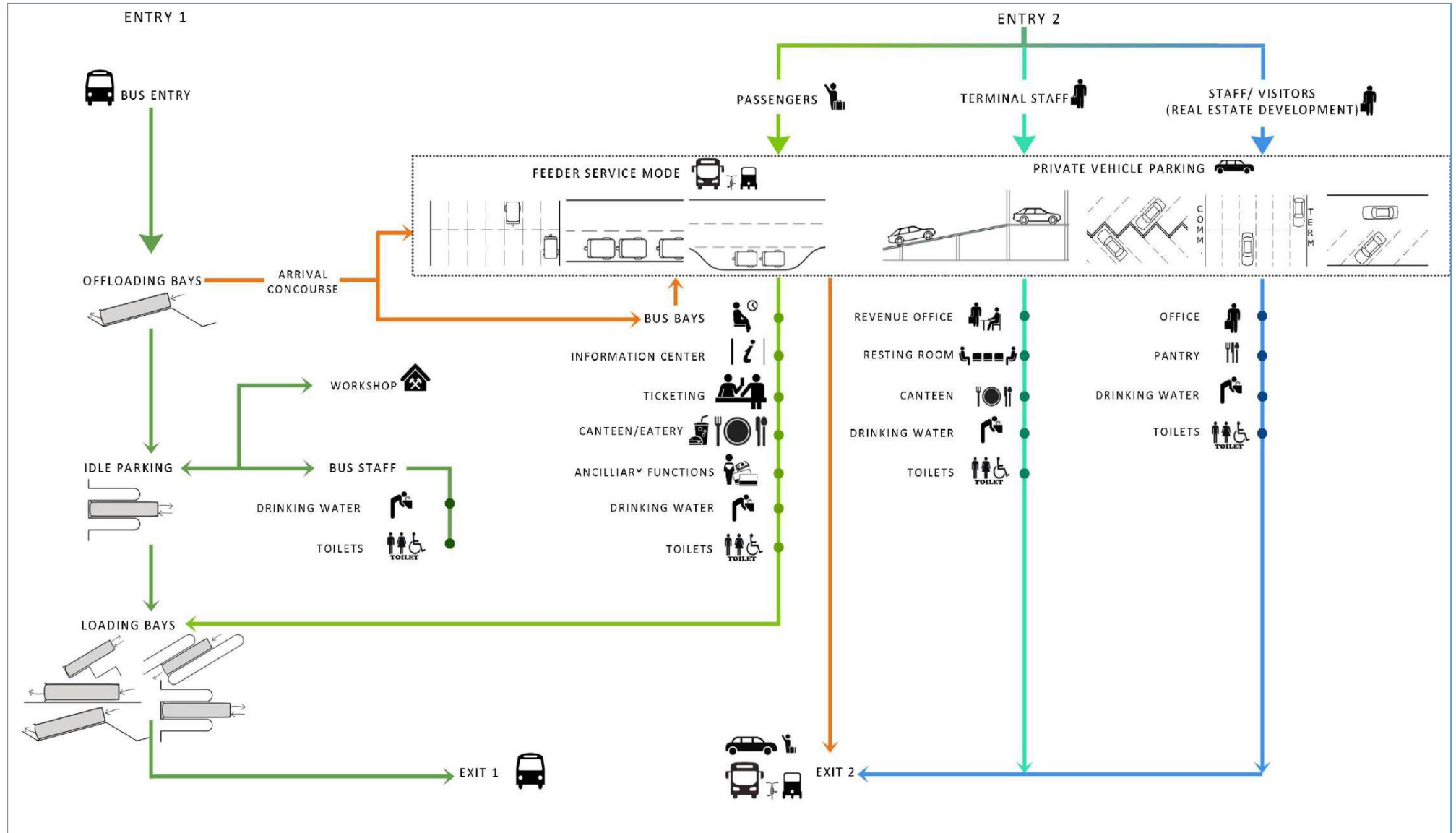


Figure No 6.21: Typical Functional Arrangement of City Bus Station

6.7 Transportation Management and Safety

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

Drainage system

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

Parking Area

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

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

Road Furniture

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

Traffic Management

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

6.8 Road Pavement

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

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

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

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

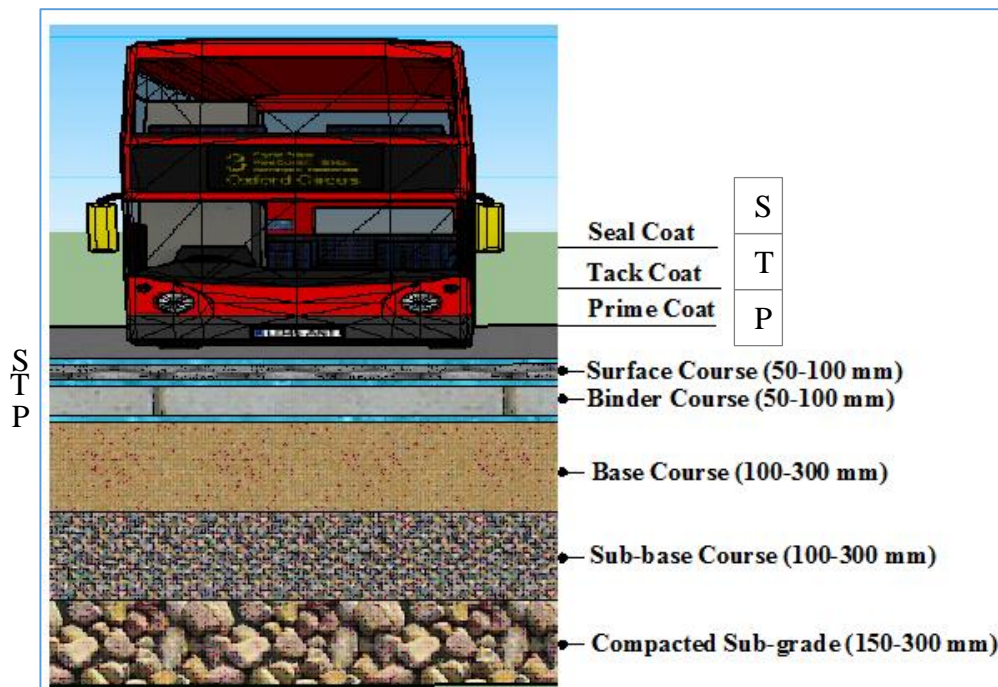


Figure No 6.22: Typical Pavement Thickness

Note2: Pavement thickness and material selection should be as Final DPR of urban roads.

6.9 Urban Road Maintenance and Rehabilitation

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

Routine Maintenance

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

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

Recurrent Maintenance

Maintenance operations of localized nature of limited extent carried out at more or less regular interval of six months to years with a frequency that depends on traffic volume. The works are generally carried out by contract by use of minor equipment. It covers the activities like pot hole patching, edge repairs, holes and ruts, repair of depression, local reconstruction, crack sealing, maintenance of drains, repairs of road furniture etc.

Periodic Maintenance

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

Emergency Maintenance

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

Rehabilitation

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

Chapter: 7 Five Year Rural Municipal Transport Master Plan

The five Year Rural Municipal Transport Master plan has been developed to guide the municipal investments on road infrastructure through 2077-2082/83 B.S. The plan will help the rural municipality towards the medium and long term plan as outlined. The R-MTMP refers to maintenance and upgrading of the existing road networks to the proposed standards to support the present and future (5 years) transport demand. It also includes construction of new road linkages which are necessary to support the current road network and the envisaged road network for the future. The interventions are applied to the road sections based on their priorities and the annual budget. The plan has also addressed the immediate need of NMT facilities within the municipal area along the MRCN.

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

7.1 Five Year Projected Financial Plan

The plan has made provision of annual budget expenditure to new construction, upgrading, maintenance, rehabilitation and landscaping of MRCN. The financial sources and expenditures in urban roads has been thoroughly studied of the rural municipality. The financial budget plan is developed on the basic of available municipal budgets and forecasted for future requirement on the basic of preceding years budgets.

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

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

S.N	Fiscal Years	Total Municipal Budget(NRS)	Total Budget Increment %	Development Budget (DB)	Development Budget %	Total Expenditure in Road Sectors	Road Sector(%), DB	Remark
1	2076/077	503304000	-	-	-	-	-	Existing
2	2077/078	434164470	-13.74	148268000	34.15	42800000	28.87	
3	2078/079	493860913	13.75	211615000	42.85	88450000	41.80	Forecast
Average Budget Increment (Assuming)			>13.75	-	>44	-	>44	
Assuming		Increment 15 % Per Year			-	-	-	Projection
1	2079/080	567940050	15	249893622	44	109953194	44	
2	2080/081	653131057	15	300440286	46	138202532	46	
3	2081/082	751100716	15	360528344	48	169448322	47	
4	2082/083	863765823	15	423245253	49	211622627	50	

The Table No 7.1 above shows that the total municipal budget has been increased by 13.75 % per year in present situation. Here, it is assumed that the 15 % of total budget will be increased from 2078 to 2083 BS. Also, the development budget is on average 44 % of total municipal budget. By, Municipal Annual Book (2076-2078 BS), the expenditure in road sector is 41.80 % of development budget. The expenditure in road sector should be increased to achieve the R-MTMP goals. Therefore, it has been taken that the investment in road sector will be increased by 44 to 49 % per year up to 2083 BS. The expenditure in road sector will be 44 to 50% of the development budget.

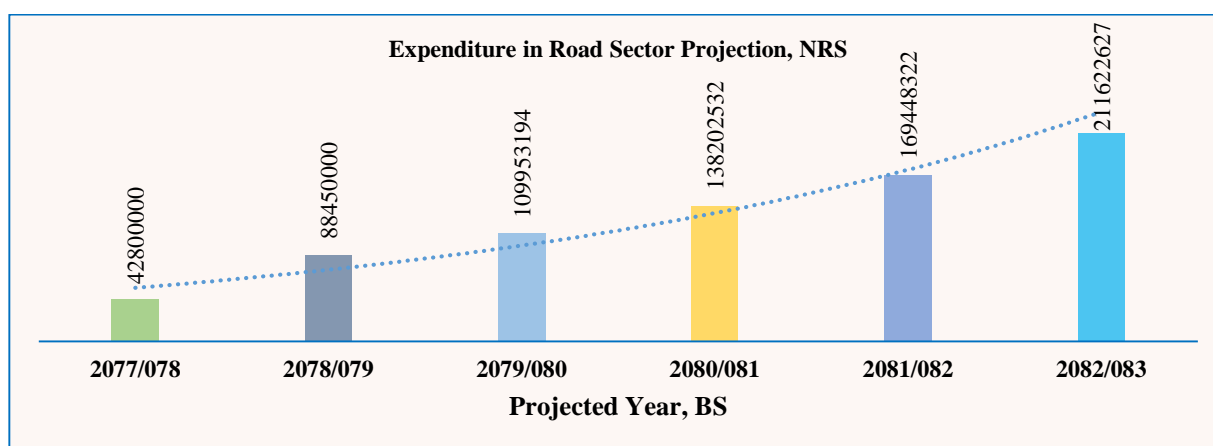


Chart No 7.1: Municipal Expenditure in Road Sector

7.2 Sharing of Municipal Fund

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

- Class A road, $\geq 40\%$
- Class B road, $\leq 30\%$
- Class C road, $\leq 20\%$
- Class D road, $\leq 10\%$

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

The estimate of budget required for the five years is prepared based on that the Class A road is to be made two lanes, Class B road is to be made intermediate lane and Class C and Class D road is to be made single lane and Rural Municipal Ring road (if any) will be four lanes. Due to limitation of budget, the roads are assumed to have simple cross drainage structures within this period whereas cross drainage structures such as bridges are not included in this budget and expected to

be completed within this time period by external sources. For approximate costing, the construction rate of road appurtenances is assumed to be equal to that of gravelling cost and for short term the minimum width of 3 m is assumed if existing road width doesn't exist. Similarly, longitudinal drainage on both side of roadway is considered in this plan.

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

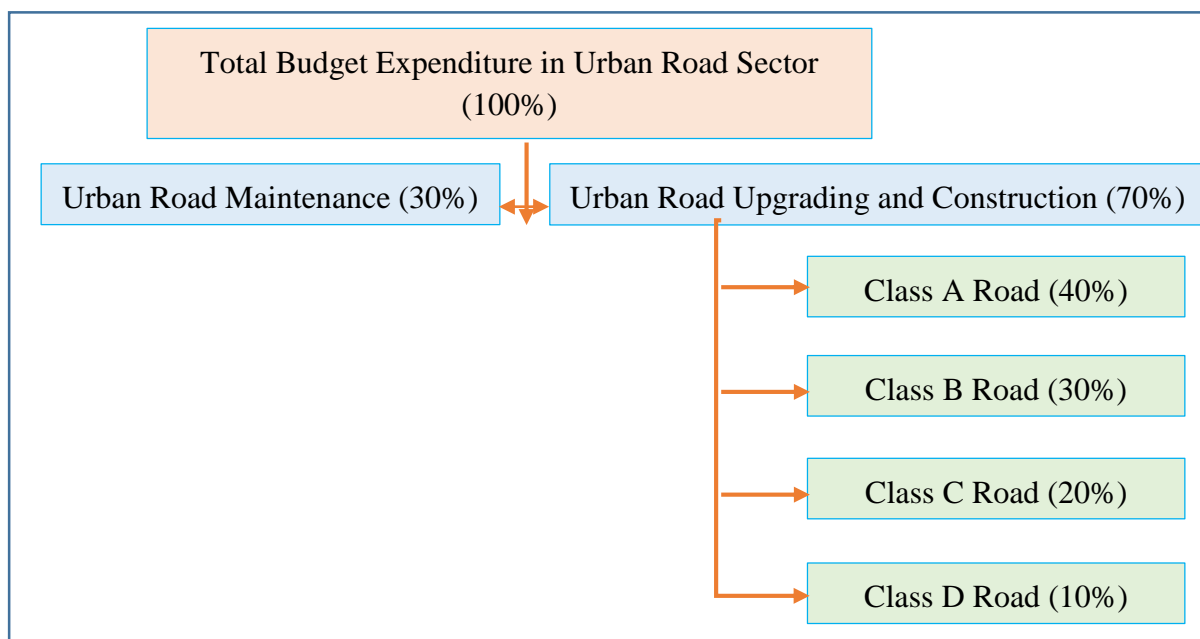


Chart No 7.2: Budget Share for Different Intervention and Class of Road

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

Table No 7.2: Sharing of Municipal Budget on MRCN Class

S.N.	Fiscal Years	@Total R-Municipal Probable Budget in Road_Sector(NRS)	#Construction Budget(NRS)	Maintenance Budget (NRS)	Class A(NRS)	Class B(NRS)	Class C(NRS)	Class D(NRS)
			70% of @	30% of @	40% of #	30% of #	20% of #	10% of #
1	2078/079	88450000	61915000	26535000	24766000	18574500	12383000	6191500
2	2079/080	109953194	76967236	32985958	30786894	23090171	15393447	7696723
3	2080/081	138202532	96741772	41460760	38696709	29022532	19348354	9674177

S.N.	Fiscal Years	@ Total R-Municipal Probable Budget in Road Sector(NRS)	#Construction Budget(NRS)	Maintenance Budget (NRS)	Class A(NRS)	Class B(NRS)	Class C(NRS)	Class D(NRS)
4	2081/082	169448322	118613825	50834496	47445530	35584148	23722765	11861383
5	2082/083	211622627	148135839	63486788	59254335	44440752	29627168	14813584
		717676675			200949468	150712103		

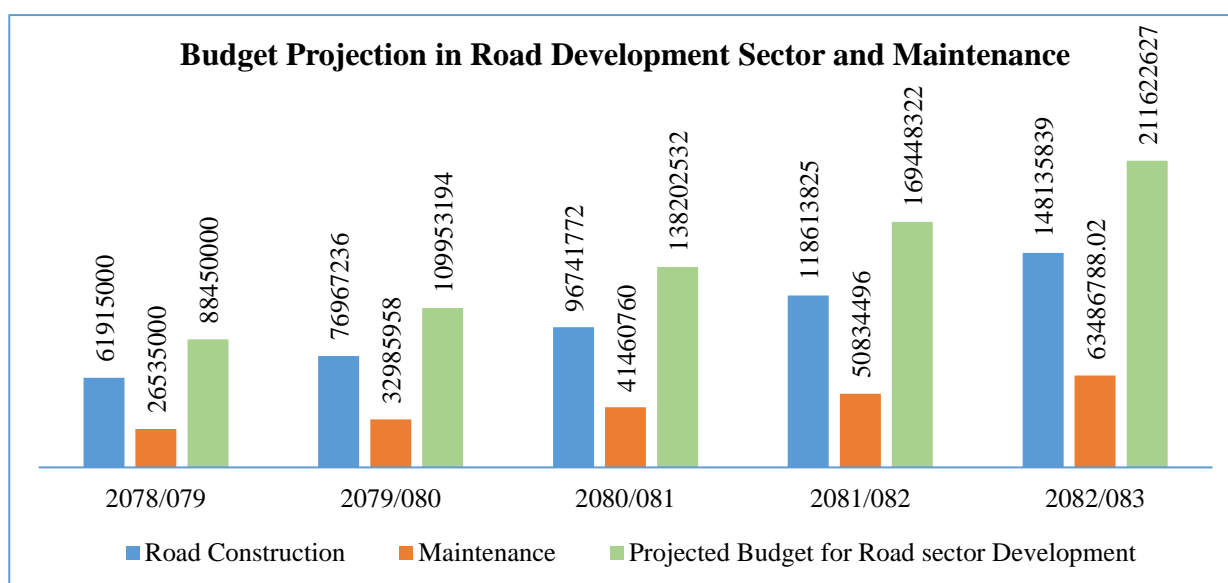


Chart No 7.3: Budget Projection in Road Development Sector and Maintenance

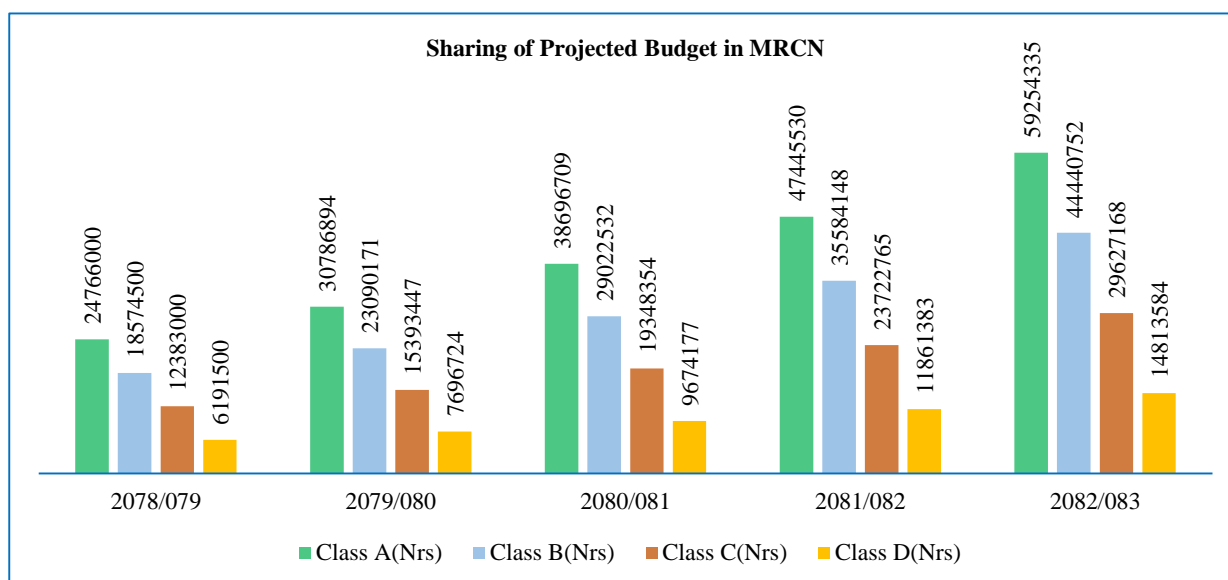


Chart No 7.4: Projection of Sharing of Municipal Budget in MRCN

7.3 Intervention on MRCN and Cost Estimation

The financial plan of R-MTMP has been developed as per following intervention in R-Municipal Road Core Network. The intervention includes construction (bridge, culverts, new track opening,

gravelling, blacktopping, longitudinal drains, footpaths, cycle lanes, street lights etc.), upgradation and maintenance of the urban roads. The summary of total length of roads has been listed in Table No 7.3 below and intervention by road classification has been listed below Table No.7.4.

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

Table No 7.3: Total Length By MRCN Class

S.N	Proposed MRCN Class	RoW, M	Track Opening, Km	Road Length	Total Road Length by Class
1	Class A	16	-	34.105	34.105
2	Class B	13	-	22.939	22.939
3	Class C	8	-	39.483	39.483
4	Class D	6	-	74.31	74.31
5	Rohini Khola Corridor	16	12.6 (both side)	12.60	12.600
Grand Total			12.60	183.438	183.438

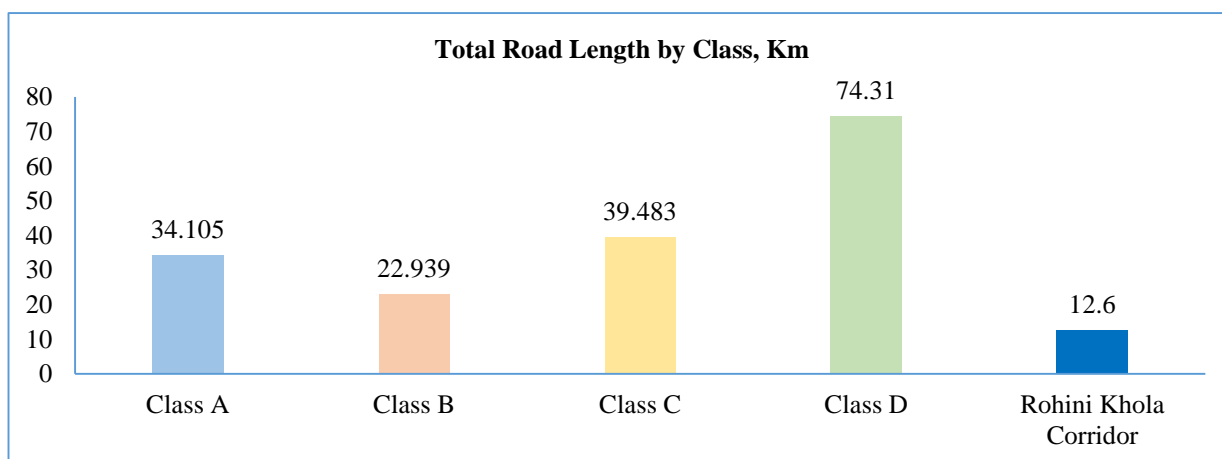
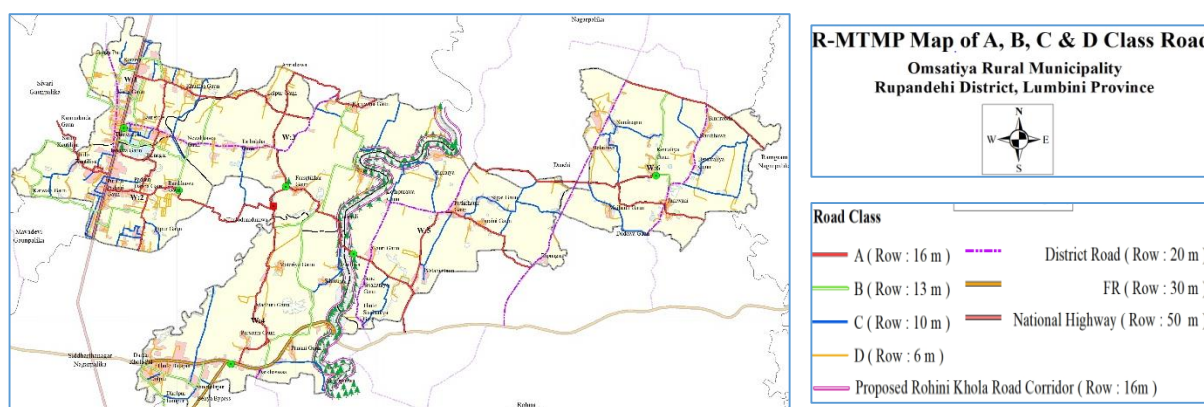
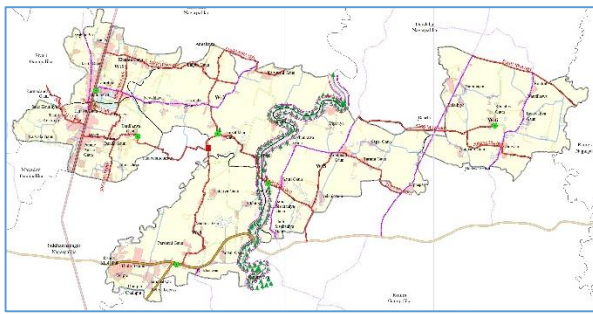


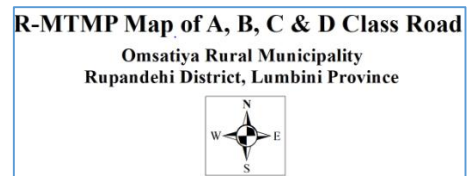
Chart No 7.5: Proposed Road Class



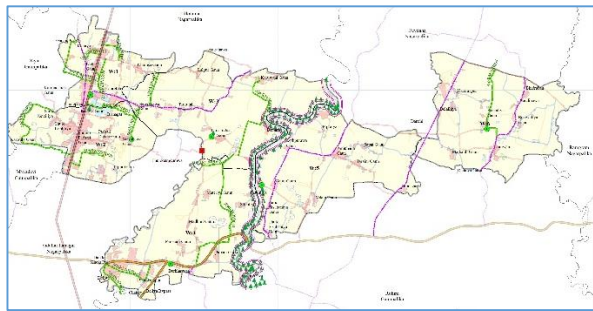
Map No 7.1: Proposed Road Class Map



Road Class A Map



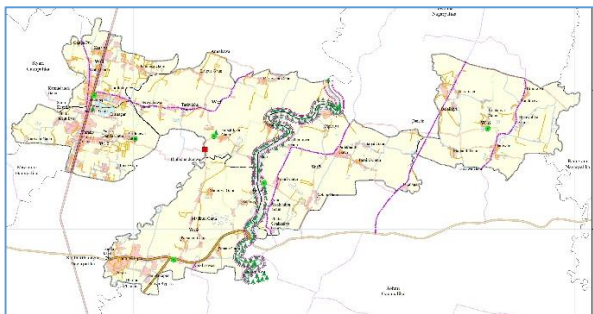
Road Class	
— A (Row : 16 m)	— District Road (Row : 20 m)
— B (Row : 13 m)	— FR (Row : 30 m)
— C (Row : 10 m)	— National Highway (Row : 50 m)
— D (Row : 6 m)	— Proposed Rohini Khola Road Corridor (Row : 16m)



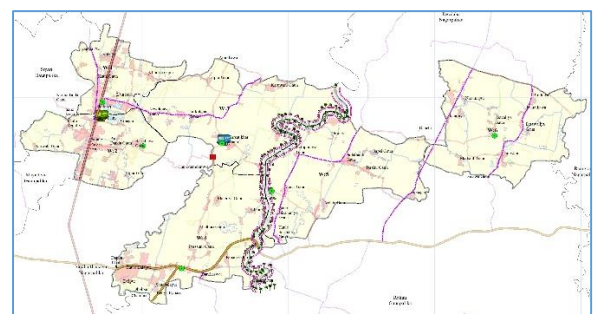
Road Class B Map



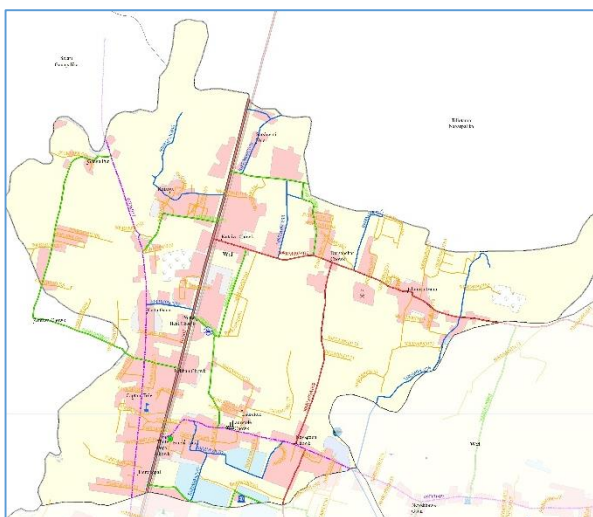
Road Class C Map



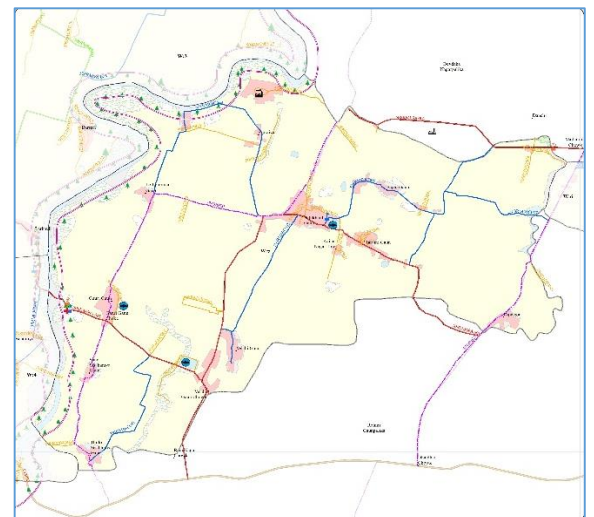
Road Class D Map



Proposed Road Map



Ward Wise Maps, Sample

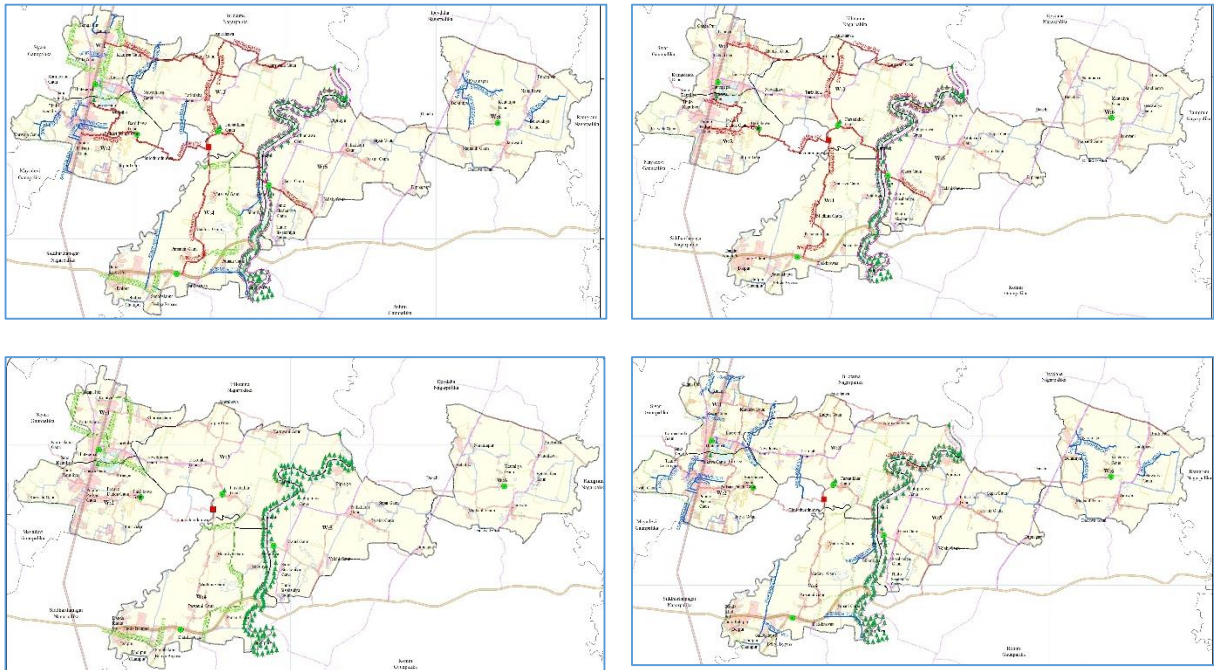


Map No 7.2: Sample Maps of Proposed Road Class

7.4 Five –Year Implementation Plan

The detailed of five years and abstract of twenty-year implementation plan has been prepared. The implementation plan has prepared based on the priority/rank obtained from the prioritization criteria and as per suggestion from the municipal authority. Total expected length of road for blacktopping within R-MTMP period is 50.305 km as prescribed standards and 12.60 km track opening of Rohini Khola corridor. The summary of implementation plan is given in Table No. 7.6 below, and the year wise implementation plan has been tabulated in Table No. 7.7 below.

Note: The MRCC has decided to Plan Class D roads making discussion with local stake holder during Budget Preparation.



Map No 7.3: Five Year Plan Map

Table No 7.4: Intervention on MRCN Class for Twenty Years

S.N	MRCN Class	Proposed			Existing Road Length, Km			Proposed Road Length Km	Upgrade Length Km	Total Road length Km	Proposed				Road No.
		Bridge (15-30m)	Slab Culvert (10-16m)	Hume Pipe	Earthen	Gravel	Blacktop				Longitudinal Road Side Drain, km	Footpath, km	Cycle Lane, km	Green Belt, km	
1	Class A	1	1	100	3.298	18.153	12.654	12.60	34.105	46.705	46.705	46.705	46.705	46.705	13
2	Class B	-	-	31	1.092	16.871	4.977	-	22.939	22.939	22.939	22.939	22.939	22.939	16
3	Class C	-	1	50	7.124	25.221	7.138	-	39.483	39.483	39.483	39.483	0.000	0.000	40
4	Class D	-	-	50	10.862	57.628	5.819	-	74.310	74.310	74.310	74.310	0.000	0.000	279
Grand Total		1	2	231	22.377	117.874	30.587	12.60	183.438	183.438	183.438	183.438	69.644	69.644	348

Table No 7.1: Total Estimate of MRCN Class Road for Twenty Years

Cost Estimate of Construction																	
S.N	MRCN Class	Bridge	Slab Culvert	Pipe Culvert/Hume Pipe	Upgrading Gravelling	New Track Opening	Blacktopping	Longitudinal Road Side Drain	Footpath,	Cycle Lane	Green Belt	Landscaping	Street Lighting	# Total Maintenance	@ Total Construction	Grand Total= #+@	Construction Cost per Km
1	Class A	30000000	2400000	22414000	780568393	50400000	419449846	257306066	91765821	91765821	138454354	255334921	88282449	77063143	2218319201	2295382344	49146463
2	Class B	0.000	0.000	5642000	169367891	2096536	194423518	173434534	41235878	51544848	92371762	167193184	57807306	37850022	955117455	992967477	43286536
3	Class C	0.000	2250000	5600000	156405271	0.000	314200702	293992757	90872437	0.000	0.000	156844626	87354012	66728759	1107519804	1174248563	29035609
4	Class D	0.000	0.000	4200000	266787077	0.000	428756327	573704930	136404360	0.000	0.000	219205964	163903770	125204269	1792962428	1918166697	25278492
Grand Total		30000000	4650000	37856000	1373128632	52496536	1356830393	1298438286	360278496	143310668	230826116	798578696	397347537	306846192	6073918888	6380765080	36686775

Table No 7.2: Estimated Budget Summary for Five Years:

S.N	Plan Period/Year	Road Class			Total Cost, NRs.	Total Municipal Budget Available	Deficit Budget
		Class A RoW 16 m	Class B RoW 13 m	Class C RoW 8 m		Nrs.	Nrs.
1	2078/079	66755862	24343646	28130606	119230115	88450000	30780115
2	2079/080	66755862	58424751	84391817	209572431	109953194	99619237
3	2080/081	133511725	87637127	140653029	361801880	138202532	223599348
4	2081/082	200267587	121718231	140653029	462638848	169448322	293190526
5	2082/083	200267587	194749170	168783635	563800392	211622627	352177765
Grand Total		696490183	667558624	486872926	1717043666	717676675	999366991
Total Length		19.697	11.216	19.391	50.305	ORM	Deficit budget will be managed by taking aid from Province Govt., Federal, O RM., TDF, Donor etc.
No. of Bridge		0	0	0	0		
No. of Slab Culvert		1	0	0	1		
No. of Pipe Culvert/Hume Pipe		26	16	27	69		
Intervention		BT, Cycle lane, Footpath, Drain , Green zone, Street Light etc.	BT, Cycle lane, Footpath, Drain , Green zone, Street Light etc.	BT, Footpath, Drain, Street Light etc.	-		
Additional: Rohinikhola Corridor will be track opened within upcoming 5 years having length 12.20km including both side length., Proposed RoW 16 m							

Table No 7.3: Year Wise Investment Plan- 5 Year Plan

MRCN Features and Estimates											Year Wise Investment Plan, Budget Allocated in NRs.					After 5-Years (2078-2083)										
S.N.	Road Class	Road Code	Total Length, Km	Unit	Cost Per Km, Nrs.	Rank in Class	Total Amount Nrs.	Plan Period	Responsible Agency	Funding Agency	2078/079	2079/080	2080/081	2081/082	2082/083	BT Road Length, km	Bridge	No. of Slab Culvert	Pipe Culvert	Both Side Cycle Lane, km	Both Side Foot Path, km	Both Side Drain, km	Both Side Green Belt, km	Street Lighting	Landscaping	
Class A																										
1	A	508RM09A006	7.868	Km	30641405	1	199769870	5	ORM	Province Govt.,Federal,ORM,, TDF, Donor	19976987	19976987	39953974	59930961	59930961	7.868	--	1	10	7.868	7.868	7.868	7.868	7.868	7.868	
2	A	508RM09A002	6.206	Km	32191196	2	241085193	5	ORM	Province Govt.,Federal,ORM,, TDF, Donor	24108519	24108519	48217039	72325558	72325558	6.206	--	-	8	6.206	6.206	6.206	6.206	6.206	6.206	
3	A	508RM09A010	3.927	Km	30727886	3	55645109	5	ORM	Province Govt.,Federal,ORM,, TDF, Donor	5564511	5564511	11129022	16693533	16693533	3.927	-	-	2	3.927	3.927	3.927	3.927	3.927	3.927	
4	A	508RM09A008	1.697	Km	32790263	4	120658452	5	ORM	Province Govt.,Federal,ORM,, TDF, Donor	12065845	12065845	24131690	36197536	36197536	1.697	--	-	6	1.697	1.697	1.697	1.697	1.697	1.697	
5	A	508RM09A012	12.600	Km	86712061	5	50400000	5	ORM	Province Govt.,Federal,ORM,, TDF, Donor	5040000	5040000	10080000	15120000	15120000	Only Track Opening										
Grand Total, A			32.297	-	52937159	-	667558624	-	-	-	66755862	66755862	133511725	200267588	200267588	19.697	-	1	26	19.697	19.697	19.697	19.697	19.697	19.697	
Class B																										
1	B	508RM09B007	1.659	km	43156538	1	71594927	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	3579746	8591391	12887087	17898732	28637971	1.659	-	-	3	1.659	1.659	1.659	1.659	1.659	1.659	
2	B	508RM09B003	0.598	km	43721817	2	26133317	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	1306666	3135998	4703997	6533329	10453327	0.598	-	-	1	0.598	0.598	0.598	0.598	0.598	0.598	
3	B	508RM09B015	1.717	km	43467104	3	74631801	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	3731590	8955816	13433724	18657950	29852720	1.717	-	-	3	1.717	1.717	1.717	1.717	1.717	1.717	
4	B	508RM09B010	1.021	km	43005136	4	43892074	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	2194604	5267049	7900573	10973018	17556830	1.021	-	-	1	1.021	1.021	1.021	1.021	1.021	1.021	
5	B	508RM09B012	1.212	km	45091086	5	54647240	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	2732362	6557669	9836503	13661810	21858896	1.212	-	-	2	1.212	1.212	1.212	1.212	1.212	1.212	
6	B	508RM09B001	4.159	km	43017719	6	178907638	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	8945382	21468917	32203375	44726909	71563055	4.159	-	-	5	4.159	4.159	4.159	4.159	4.159	4.159	
7	B	508RM09B014	0.851	km	43561518	7	37065929	5	ORM	Province Govt.,Federal,ORM, TDF, Donor, INGOs,	1853296	4447912	6671867	9266482	14826372	0.851	-	-	1	0.851	0.851	0.851	0.851	0.851	0.851	
Grand Total B			11.216	-	43574417	-	486872926	-	-	-	24343646	58424752	87637126	121718230	194749171	11.216	-	-	16	11.216	11.216	11.216	11.216	11.216	11.216	
Class C																										
1	C	508RM09C027	0.662	km	29209068	1	19347386	5	ORM	Province Govt.,ORM	967369	2902108	4836846	4836846	5804216	0.662	-	-	1	-	0.662	0.662	-	0.662	0.662	
2	C	508RM09C026	0.764	km	28829952	2	22019250	5	ORM	Province Govt.,ORM	1100963	3302888	5504813	5504813	6605775	0.764	-	-	1	-	0.764	0.764	-	0.764	0.764	
3	C	508RM09C015	1.526	km	29069272	3	44373227	5	ORM	Province Govt.,ORM	2218661	6655984	11093307	11093307	13311968	1.526	-	-	2	-	1.526	1.526	-	1.526	1.526	
4	C	508RM09C031	0.900	km	28969223	4	26059119	5	ORM	Province Govt.,ORM	1302956	3908868	6514780	6514780	7817736	0.900	-	-	2	-	0.900	0.900	-	0.900	0.900	
5	C	508RM09C025	0.311	km	30063724	5	9338093	5	ORM	Province Govt.,ORM	466905	1400714	2334523	2334523	2801428	0.311	-	-	1	-	0.311	0.311	-	0.311	0.311	
6	C	508RM09C029	0.572	km	29263340	6	16746239	5	ORM	Province Govt.,ORM	837312	2511936	4186560	4186560	5023872	0.572	-	-	1	-	0.572	0.572	-	0.572	0.572	
7	C	508RM09C023	0.697	km	28999696	7	20226041	5	ORM	Province Govt.,ORM	1011302	3033906	5056510	5056510	6067812	0.697	-	-	1	-	0.697	0.697	-	0.697	0.697	
8	C	508RM09C039	0.542	km	29048592	8	15751686	5	ORM	Province Govt.,ORM	787584	2362753	3937922	3937922	4725506	0.542	-	-	1	-	0.542	0.542	-	0.542	0.542	

MRCN Features and Estimates											Year Wise Investment Plan, Budget Allocated in NRs.					After 5-Years (2078-2083)									
S.N.	Road Class	Road Code	Total Length, Km	Unit	Cost Per Km, Nrs.	Rank in Class	Total Amount Nrs.	Plan Period	Responsible Agency	Funding Agency	2078/079	2079/080	2080/081	2081/082	2082/083	BT Road Length, km	Bridge	No. of Slab Culvert	Pipe Culvert	Both Side Cycle Lane, km	Both Side Foot Path, km	Both Side Drain, km	Both Side Green Belt, km	Street Lighting	Landscaping
9	C	508RM09C016	2.052	km	28943634	9	59381021	5	ORM	Province Govt.,ORM	2969051	8907153	14845255	14845255	17814306	2.052	-	-	2		2.052	2.052	-	2.052	2.052
10	C	508RM09C001	1.362	km	28913430	10	39393016	5	ORM	Province Govt.,ORM	1969651	5908952	9848254	9848254	11817905	1.362	-	-	2	-	1.362	1.362	-	1.362	1.362
11	C	508RM09C009	1.384	km	29013015	11	40150619	5	ORM	Province Govt.,ORM	2007531	6022593	10037655	10037655	12045186	1.384	-	-	2	-	1.384	1.384	-	1.384	1.384
12	C	508RM09C011	1.359	km	29006646	12	39430561	5	ORM	Province Govt.,ORM	1971528	5914584	9857640	9857640	11829168	1.359	-	-	2	-	1.359	1.359	-	1.359	1.359
13	C	508RM09C013	1.541	km	28986841	13	44675157	5	ORM	Province Govt.,ORM	2233758	6701274	11168789	11168789	13402547	1.541	-	-	2	-	1.541	1.541	-	1.541	1.541
14	C	508RM09C040	0.884	km	28981741	14	25625336	5	ORM	Province Govt.,ORM	1281267	3843800	6406334	6406334	7687601	0.884	-	-	1	-	0.884	0.884	-	0.884	0.884
15	C	508RM09C034	2.111	km	28881512	15	60958388	5	ORM	Province Govt.,ORM	3047919	9143758	15239597	15239597	18287516	2.111	-	-	3	-	2.111	2.111	-	2.111	2.111
16	C	508RM09C030	1.328	km	29111543	16	38671803	5	ORM	Province Govt.,ORM	1933590	5800770	9667951	9667951	11601541	1.328	-	-	2	-	1.328	1.328	-	1.328	1.328
17	C	508RM09C033	0.254	km	28842978	17	7337019	5	ORM	Province Govt.,ORM	366851	1100553	1834255	1834255	2201106	0.254	-	-	0	-	0.254	0.254	-	0.254	0.254
18	C	508RM09C010	0.262	km	29780233	18	7804327	5	ORM	Province Govt.,ORM	390216	1170649	1951082	1951082	2341298	0.262	-	-	0	-	0.262	0.262	-	0.262	0.262
19	C	508RM09C035	0.627	km	28830695	19	18077884	5	ORM	Province Govt.,ORM	903894	2711683	4519471	4519471	5423365	0.627	-	-	1	-	0.627	0.627	--	0.627	0.627
20	C	508RM09C017	0.251	km	28841753	20	7245942	5	ORM	Province Govt.,ORM	362297	1086891	1811486	1811486	2173783	0.251	-	-	0	-	0.251	0.251	-	0.251	0.251
Total C			19.391	-	29079344	-	562612116	-	-	-	28130605	84391817	140653030	140653030	168783635	19.391	0.000	0.000	27	-	19.391	19.391	-	19.391	19.391
Grand Total			50.305	-	-		1717043666	-	-	-	119230115	209572431	361801880	462638848	563800392	50	0	1	69	31	50	50	31	50.305	50.305

7.1 Policy and Strategy

- Policy for Integrated Development Approach (co-ordination of line agencies) shall be developed.
- Policy for the road class C and D shall be constructed by mobilization of User's Committee.
- Policy for the construction of Ring Road (if any) and Class A roads by taking aid from donor agencies.
- Policy for the construction of Class B roads by co-ordinating Municipal own source and line agencies and donor agencies.
- All line agencies, NGOs and INGOs who works in the urban roads have to manage their program as per approved R-MTMP.
- Policy for operating City Bus, and Electric Vehicle shall be prepared.
- Policy of promoting pedestrian friendly paths, pedestrian crossings is to be kept at top priority followed by cycling and other motor vehicles.
- Facility, security and guarantee to be provided for investment of private sector in urban roads.
- Policy of urban road landscaping, green belt and beautification shall be prepared.
- Effective regulatory mechanism for public transportation is to be prepared.
- Policy for road accident management and rescue mechanism shall be developed.

7.2 Suggestion

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

Chapter: 8 Conclusion

In Omsatiya Rural Municipality, population increase rate is 0.52 % per years. The rural municipality is developing as an emerging Smart City. The sustainable MRCN is required for better urbanization and market centers development in the rural municipality. The development of transport infrastructures and traffic mobility should be smooth. By considering the better future in transport facilities of rural municipality, 5-year R-MTMP has been prepared.

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

The data are then coded in GIS software for developing the maps. Finally, the inventory map was prepared and the land used map has also been prepared. The potential development map and visionary plan has used for the preliminary classification of the roads. The classification of the road is validated through MRCC meetings. The classes validated are A, B, C, D by defining Right of Way (RoW) 20m, 16m, 13m, 8m, and 6m respectively. The proposed prioritization criteria have been validated through MRCC and municipal office. Again, the financial as well as implementation plan has been prepared in the report.

The total length of MRCN in municipality will be 183.438 km including new track opening 12.60 km. Among this, the proposed length of MRCN validated class A, B, C, D, are 46.705 km, 22.939 km, 39.483 km and 74.31 km respectively.

The cost for the construction of each roads has estimated based on the rate provided in the District rate and guidelines. The total cost of interventions excluding SRN and DRCN was found as NRs. 6,38,07,65,080 for the length of 183.438 km. The detailed of five years and abstract of 20- year implementation plan has been developed. The implementation plan has prepared based on the priority/rank obtained from the prioritization criteria.

Within 5-year plan period, 19.697 km of Class A roads, 11.216 km of Class B and 19.391km of Class C roads will be blacktopped as per prescribed standards. The total budget required for first 5-years is Nrs. 1,71,70,43,666 including bridges, slab culverts, pipe culvert, footpath, green belt, drain, cycle lanes etc. The budget available is less than the required. Therefore, rural municipality should take aid from Province Government, Federal, Road Departments, INGOs, Donor and line agencies.

References

- Central Bureau of Statistics. (2013). National Census 2011. Kathmandu: Government of Nepal, National Planning Commission Secretariat.*
- Omsatiya Rural Municipal Profile 2076*
- DoR: Nepal Roads Standards (2027): First Revision 2045, BS*
- DoR: Nepal Roads Standard 2070, Kathmandu,*
- GoN. (2014). Government of Nepal Ministry of Federal Affairs and Local Development (MoFALD) Rural Municipality Transport Master Plan Preparation Guidelines and Terms of Reference for Hiring Consultant Infrastructure Development Division, (IDD)/MoFALD RURAL MUNICIPALITY TRANSPORT MASTER PLAN PREPARATION GUIDELINES AND TERMS OF REFERENCE FOR HIRING CONSULTANTS RURAL MUNICIPALITY TRANSPORT MASTER PLAN (R-MTMP).*
- DoR: Traffic Signs Manuals Vol-I and Vol -II, Kathmandu, 1997*
- Nepal Rural Road Standards- 2012,*
- Nepal Urban Road Standards 2071, Concept Paper*
- Nepal Urban Road Standard- 2076, Jestha, Government of Nepal Ministry of Urban Development Singhadurbar, Kathmandu.*
- Planning Norm and Standard 2015 A.D, DUDBC, Babarmahal Kathmandu*
- Ministry of Federal Affairs and Local Development. (2017). गाउँपालिका र नगरपालिका कायमगर्ने गरि उक्त एकाईहरूको नाम, संख्या, सीमाना, केन्द्र र वडाको सीमाना सहितको विवरण .Kathmandu, RAJPATRA.pdf.*
- Government of Nepal. (2015). National Urban Development Strategy (NUDS). kathmandu,Nepal.*
- Litman Todd. (2003). Measuring Transportation Traffic, Mobility and Accessibility.*
- District Transport Master Plan, guideline 2012 A.D.*
- National Transport Policy, His Majesty's Government Ministry of Physical Planning and Works 2058 (2001/2002)*
- Statistics of Local Road Network (SLRN) 2016, Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR), Babarmahal Kathmandu.*

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

S.N.	MRCN: Road Code- Name	Origin	Destination	Ward Pass	Existing Surface Type (Km)				Existing Road width Length (Km)			Drainage System	Total Length, Km
					Blacktop	Earthen	Gravel	RCC	0-4(m)	4-6(m)	6-8(m)		
Arterial Road Class (A-Class Road), RoW=16 m													
1	508RM09A001_Hulaki Rajmarga - Velahi Gaun - Pahkhauri Gaun - Taraini Gaun - Dipnagar Path	Hulaki Rajmarg	Dipnagar	5	3.389	-	0.527	-	3.916	-	-	-	3.916
2	508RM09A002_Purano Padsari Gaun - Padsari Danda Gaun - Bardihawa Gaun - Thulo Dhumdumwa - Gaupalika Office - Ward Office 3 -Fastikhar Gaun - Larhauri - Ward Office 5 - Gauri Gaun - Velahi Chowk Path	Farsatikhar	Velahi	2,3,5	2.782	1.476	1.947	-	5.301	0.905	-	-	6.206
3	508RM09A003_Pathkhauri Gaun - Danchi- Belaihiya -Keutaliya Gaun Path	Pathkhauri	Keutaliya	5,6	0.506	-	1.728	-	1.451	0.783	-	-	2.234
4	508RM09A004_Majauri Gaun - Jamwani - Ward Simana (Ramgram Nagarpalika) Path	Majauri	Ward Simana	6	-	-	2.395	-	2.395	-	-	-	2.395
5	508RM09A005_Narainapur Chowk - Sadauniya Bazaar - Bindra ban - Ward Simana (Ramgram Nagarpalika) Path	Narainapur Chowk	Ward Simana	6	-	-	1.811	-	-	1.811	-	-	1.811
6	508RM09A006_Ward 4 Office (Hulaki Rajmarg) - Parsauni Gaun -Shree Dashrat Janta Ma vi -Madhuri Gaun - Materiya Gaun - Gaupalika Office - Lalpur Jane Chowk - Amrahawa- Janajagriti School - Karwani Gaun Path	Hulaki Rajmarg	Karwani	3,4	3.882	0.652	3.333	-	7.868	-	-	-	7.868
7	508RM09A007_Padsari Panwoda Pul - Unnati Tole Chowk - Ward Simana Path	Panwoda Pul	Ward Simana	2	-	-	1.189	-	1.189	-	-	-	1.189
8	508RM09A008_Tenawa Gaun - Birnagar - Padsari Danda Gaun Path	Tenawa	Padsari Danda	2	-	-	1.697	-	1.697	-	-	-	1.697
9	508RM09A009_Dursanchar Chowk - Nayagaun Chowk - Birnagar Path	Dursanchar	Birnagar	1,2	0.461	1.169	-	-	1.630	-	-	-	1.630
10	508RM09A010_Kataiya Chowk - Dursansar Chowk - Khumsa Gaun - Lalpur Gaun - Lalpur laxmi Chowk Path	Kataiya	Lalpur	1,3	1.633	-	2.293	-	3.927	-	-	-	3.927
11	508RM09A011_Punam Path Chowk - Thulo Keutaliya - Sano Keutaliya - Karmadanda Gaun Path	Punam Path Chowk	Karmadanda	2	-	-	1.233	-	1.233	-	-	-	1.233
12	508RM09A012_Rohini Khola Corridor	Rohini Khola Corridor Proposed Route		3,5	-	-	-	-	-	-	-	-	12.600
Sub-Arterial Road Class (B-Class Road), RoW=13 m													
1	508RM09B001_Hulaki Rajmarga - Ramjanaki Mandir - Shree Dasharat Mavi -Hulaki Rajmarga - Pul Tax-Farsatikhar Gaun Sadak	Hulaki Rajmarg	Farsatikhar	3,4	1.022	-	3.137	-	4.159	-	-	-	4.159
2	508RM09B002_School Chowk - Karuwani Gaun -Barsari - Larhauri Sadak	Karwani School	Larhauri	3	0.591	-	2.499	-	3.090	-	-	-	3.090
3	508RM09B003_Laxmi itta Bhatta-Larhauri Sadak	Laxmi Itta	Larhauri	4	-	-	0.598	-	0.598	-	-	-	0.598
4	508RM09B004_Jamwani Chowk 2 - Ward Office - Keutaliya Gaun - Sadauniya Bazaar Sadak	Jamwani	Sadauniya Bazar	6	2.207	-	-	-	2.207	-	-	-	2.207
5	508RM09B005_Khumsa Gaun -Newdihawa Gaun Sadak	Khusma	Newdihawa	3	-	-	0.953	-	0.953	-	-	-	0.953
6	508RM09B006_Newdihawa Gaun - Ward Office 2 Sadak	Newdihawa	Ward Office 2	2,3	-	0.156	0.788	-	0.943	-	-	-	0.943
7	508RM09B007_Siddhartha Rajmarga - Mache Bikes Kendra - Newdihawa Gaun Sadak	Siddhartha Highway	Newdihawa	1,2	0.275	0.136	1.248	-	1.659	-	-	-	1.659
8	508RM09B008_Siddhartha Rajmarga - Unnati Tole Sadak	Siddhartha Highway	Unnati Tole	2	-	-	1.289	-	1.289	-	-	-	1.289
9	508RM09B009_Siddhartha Rajmarga - Karwala Gaun - Sano Keutaliya Sadak	Siddhartha Highway	Sano Keutaliya	2	-	-	1.753	-	1.753	-	-	-	1.753
10	508RM09B010_Kataiya - Police Beat - Hume Pipe Factory Sadak	Kataiya	HP Factory	1	-	0.369	0.651	-	1.021	-	-	-	1.021
11	508RM09B011_Police Beat Chowk - Police Bit Sadak	Police Bit Chowk	Police Chauki	1	-	-	0.158	-	0.158	-	-	-	0.158
12	508RM09B012_Lakhan Chowk - Amuwa Chowk - Gangapur Sadak	Lakhan Chowk	Gangapur	1	0.300	-	0.912	-	1.022	-	0.190	-	1.212
13	508RM09B013_Katiya Gaun - Kutta Gaun Sadak	Katiya	Kutta	1	0.521	-	-	-	0.521	-	-	-	0.521

S.N.	MRCN: Road Code- Name	Origin	Destination	Ward Pass	Existing Surface Type (Km)				Existing Road width Length (Km)			Drainage System	Total Length, Km
					Blacktop	Earthen	Gravel	RCC	0-4(m)	4-6(m)	6-8(m)		
14	508RM09B014_Siddhartha Rajmarga - Sarshwoti Tole - Dursanchar Chowk Sadak	Siddhartha Highway	Dursanchar	1	0.062	0.431	0.358	-	0.851	-	-	-	0.851
15	508RM09B015_Danda Khola Bridge - Sanobalapur - Hulaki Rajmarga Sadak	Danda Khola Pul	Hulaki Rajmarg	4	-	-	1.717	-	1.717	-	-	-	1.717
16	508RM09B016_Danda Khola Bridge - Forest Office -Dolpur Sadak	Danda Khola Pul	Dolpur	4	-	-	0.809	-	0.809	-	-	-	0.809
Collector Road Class (C-Class Road), RoW=8 m													
1	508RM09C001_Silautiya - Betauliya - Rohini Khola Marg	Silautiya	Rohini Khola	4	-	-	1.362	-	1.362	-	-	-	1.362
2	508RM09C002_Thulo Sisahaniya Gaun Marg	Thulo Sisahaniya	Thulo Sisahaniya	5	-	-	1.442	-	1.442	-	-	-	1.442
3	508RM09C003_Pathkhauri Gaun - Velahi Gaun Marg	Pathkhauri	Velahi Gaun	5	-	-	1.115	0.521	1.636	-	-	-	1.636
4	508RM09C004_Pathkhauri Gaun - Pipraiya - Lothpurawa Gaun Marg	Pathkhauri	Lothpurawa	5	-	2.465	-	-	2.465	-	-	-	2.465
5	508RM09C005_Barsari - Uttar Ward Simana Marg	Barsari	Ward Simana	3	-	-	-	-	1.484	-	-	-	1.484
6	508RM09C006_Om Satiya Pathkhauri Ma Vi - Sapai Gaun -Taraini Gaun Marg	Omsatiya	Taraini	5	1.859	-	-	-	1.859	-	-	-	1.859
7	508RM09C007_Sapai Gaun Marg	Sapai	Sapai	5	0.742	-	0.885	-	1.628	-	-	-	1.628
8	508RM09C008_Jamwani Chowk1 - Majhauri Gaun - Sagarmatha Pra vi Marg	Jamwani	Sagarmatha School	6	0.383	-	1.093	-	1.476	-	-	-	1.476
9	508RM09C009_Belaihiya - Durga mandir - Majhauri Gaun Marg	Belaihiya	Majhauri	6	-	-	1.384	-	1.384	-	-	-	1.384
10	508RM09C010_Naraina pur Vitri Marg	Naraina Pur	Naraina Pur	6	-	-	0.262	-	0.262	-	-	-	0.262
11	508RM09C011_Samsher Smriti Namuna Adharbhat - Narinapur - Kusmahawa Tole Marg	Samser Smriti	Kusmahawa	6	1.359	-	-	-	1.359	-	-	-	1.359
12	508RM09C012_Naudihawa - Sadauriya Bazaar Marg	Naudihawa	Sadauriya Bazar	6	-	-	1.044	-	1.044	-	-	-	1.044
13	508RM09C013_Betawaliya Gaun - Bindraban Jodne Marg	Betawaliya	Bindraban	6	-	-	1.541	-	1.541	-	-	-	1.541
14	508RM09C014_Jamwani Chowk 2 -Bindraban Jodne Marg	Jamwani	Bindraban Pul	6	1.084	-	1.409	-	2.492	-	-	-	2.492
15	508RM09C015_Basantapur Chowk - Gujurpurwa Marg	Basantapur	Gujurpurwa	4	-	-	1.526	-	1.526	-	-	-	1.526
16	508RM09C016_Irrigation Dam - Sanobalapur Marg	Dam site	Sano Balapur	4	-	-	2.052	-	2.052	-	-	-	2.052
17	508RM09C017_Sanobalapur - Beliya Bypass Marg	Sanobalapur	Beliya Bypass	4	-	-	0.251	-	0.251	-	-	-	0.251
18	508RM09C018_Dholpur - Sanobalapur Marg	Dholpur	Sano Balapur	4	-	-	0.614	-	0.614	-	-	-	0.614
19	508RM09C019_Dolpur - Thulo Balapur Marg	Dolpur	Thulo Balapur	4	-	-	0.323	-	0.323	-	-	-	0.323
20	508RM09C020_Jitpur Gaun Road Marg	Jitpur	Jitpur	2	-	0.733	-	-	0.733	-	-	-	0.733
21	508RM09C021_Unnati Tole - Unnati Tole Chowk Marg	Unnati Tole	Unnati Tole	2	-	0.681	-	-	0.681	-	-	-	0.681
22	508RM09C022_Unnati Tole - Unnati Tole Chowk (B) Marg	Unnati Tole	Unnati Tole	2	-	0.861	-	-	0.861	-	-	-	0.861
23	508RM09C023_Laxmi Narayan Mandir - Sirjan Tole - Milan Tole - Siddhartha Marg	Laxmi Narayan Mandir	Siddhartha Rajmarg	2	-	-	0.697	-	0.697	-	-	-	0.697
24	508RM09C024_Durga Mandir Tole - Laxmi Narayan Mandir Marg	Durga Mandir	Laxmi Narayan Mandir	2	-	-	0.306	-	0.306	-	-	-	0.306
25	508RM09C025_Durga Mandir - Durga Mandir Tole Marg	Durga Mandir	Durga Mandir Tole	2	-	-	0.311	-	0.311	-	-	-	0.311
26	508RM09C026_Putali Tole Chowk - Purano Padsari Gaun Marg	Putali Tole	Purano Padsari	2	-	-	0.764	-	0.764	-	-	-	0.764
27	508RM09C027_Putali Tole Chowk - Putali Tole Marg	Putali Tole	Putali Tole	2	-	-	0.662	-	0.662	-	-	-	0.662
28	508RM09C028_Punam path Chowk Marg	Thulo Keutiliya	Thulo Keutiliya	2	-	-	0.288	-	0.288	-	-	-	0.288

S.N.	MRCN: Road Code- Name	Origin	Destination	Ward Pass	Existing Surface Type (Km)				Existing Road width Length (Km)			Drainage System	Total Length, Km
					Blacktop	Earthen	Gravel	RCC	0-4(m)	4-6(m)	6-8(m)		
29	508RM09C029_Tenawa Gaun Vitri Marg	Tenawa	Tenawa	2	-		0.572	-	0.572	-	-	-	0.572
30	508RM09C030_Thulo Keutiliya - Karwala Gaun Marg	Thulo Keutiliya	Karwala	2	-	-	1.328	-	1.328		-	-	1.328
31	508RM09C031_Nayagaun Tole - Farena Tole Marg	Nayagaun	Farena Tole	1	-	0.549	0.098	0.252	0.900	-	-	-	0.900
32	508RM09C032_Farena Tole - Tenawa Tole Marg	Farena Tole	Tenawa	1	-	0.273	-	-	0.273	-	-	-	0.273
33	508RM09C033_Kutta Gaun - Police Beat Chowk Marg	Kutta Gaun	Police Bit	1	-	0.070	-	0.185	0.254	-	-	-	0.254
34	508RM09C034_Newdihawa Gaun - Naya Gaun - Khusma Gaun - Uttar Ward Simana Marg	Newdihawa	Ward Simana	2	-	0.553	1.558	-	2.111	-	-	-	2.111
35	508RM09C035_Tara Path Chowk - Janta Adhar Bhut School - Dakxin Ward Simana Marg	Tarkula	Ward Simana	3	0.627	-	-	-	0.627	-	-	-	0.627
36	508RM09C036_Lalpur Laxmi Chowk - Karuwani Gaun Marg	Lalpur	Karuwani	3	0.263	-	0.294	-	0.557	-	-	-	0.557
37	508RM09C037_Khusma Gaun - Uttar Ward Simana Marg	Khusma Gaun	Ward Simana	1	-	0.380	-	-	0.380	-	-	-	0.380
38	508RM09C038_Kataiya - Saraswati Tole Marg	Kataiya	Sarswoti Tole	1	-	0.163	0.347	-	0.510	-	-	-	0.510
39	508RM09C039_Saraswati Tole Marg	Sarswoti Tole	Sarswoti Tole	1	0.335	-	0.207	-	0.542	-	-	-	0.542
40	508RM09C040_Kataiya Tole Marg	Kataiya Tole	Kataiya Tole	1	0.485	0.399	-	-	0.884	-	-	-	0.884

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
1	508RM09D001_Betawaliya Gaun Krishi Sadak	6	-	-	1.018	-	1.018	-	-	1.018
2	508RM09D002_Betawaliya Krishi Sadak 2	6	-	-	0.368	-	0.368	-	-	0.368
3	508RM09D003_Betawaliya Krishi Sadak 3	6	-	-	0.127	-	0.127	-	-	0.127
4	508RM09D004_Betawaliya Krishi Sadak 3	6	-	-	0.425	-	0.425	-	-	0.425
5	508RM09D005_Betawaliya Upamarga1	6	-	-	0.279	-	0.279	-	-	0.279
6	508RM09D006_Bindraban Upamarga	6	-	-	0.541	-	0.541	-	-	0.541
7	508RM09D007_Bindraban Upamarga 2	6	-	-	0.104	-	0.104	-	-	0.104
8	508RM09D008_Bindraban Upamarga 3	6	-	-	0.063	-	0.063	-	-	0.063
9	508RM09D009_Naudihawa Upamarga 1	6	-	-	0.222	-	0.222	-	-	0.222
10	508RM09D010_Naudihawa Upamarga 3	6	-	-	0.490	-	0.490	-	-	0.490
11	508RM09D011_Naudihawa Upamarga 2	6	-	-	0.272	-	0.272	-	-	0.272
12	508RM09D012_Naudihawa Upamarga 3	6	-	-	0.098	-	0.098	-	-	0.098
13	508RM09D013_Jamwani Upamarga 6	6	-	-	0.193	-	0.193	-	-	0.193
14	508RM09D014_Jamwani Upamarga 7	6	-	-	0.093	-	0.093	-	-	0.093
15	508RM09D015_Jamwani Upamarga 8	6	-	-	0.165	-	0.165	-	-	0.165
16	508RM09D016_Jamwani Upamarga 5	6	-	-	0.110	-	0.110	-	-	0.110
17	508RM09D017_Jamwani Upamarga 2	6	-	-	0.154	-	0.154	-	-	0.154
18	508RM09D018_Jamwani Upamarga1	6	-	-	0.283	-	0.283	-	-	0.283
19	508RM09D019_Jamwani Upamarga 3	6	-	-	0.093	-	0.093	-	-	0.093
20	508RM09D020_Jamwani Upamarga 4	6	-	-	0.142	-	0.142	-	-	0.142
21	508RM09D021_Majhauri Gaun Upamarga 1	6	-	-	0.143	-	0.143	-	-	0.143

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
22	508RM09D022_Majhauri Gaun Upamarga 2	6	-	-	0.509	-	0.509	-	-	0.509
23	508RM09D023_Majhauri Gaun Upamarga 4	6	-	-	0.169	-	0.169	-	-	0.169
24	508RM09D024_Majhauri Gaun Upamarga 3	6	-	-	0.188	-	0.188	-	-	0.188
25	508RM09D025_Chotki Ramnagar Ma vi Upamarga 3	6	-	-	0.164	-	0.164	-	-	0.164
26	508RM09D026_Chotki Ramnagar Ma vi Upamarga 2	6	-	-	0.563	-	0.563	-	-	0.563
27	508RM09D027_Chotki Ramnagar Ma vi Upamarga	6	-	-	0.209	-	0.209	-	-	0.209
28	508RM09D028_Keutaliya Upamarga	6	0.090	-	0.177	-	0.268	-	-	0.268
29	508RM09D029_Kushmahawa Tole Upamarga	6	-	-	0.193	-	0.193	-	-	0.193
30	508RM09D030_Ramjanaki Upamarga 4	6	-	-	0.121	-	0.121	-	-	0.121
31	508RM09D031_Ramjanaki Upamarga 1	6	-	-	0.893	-	0.893	-	-	0.893
32	508RM09D032_Ramjanaki Upamarga 3	6	-	-	0.120	-	0.120	-	-	0.120
33	508RM09D033_Jagadamba Itta Bhatta Upamarga	6	-	-	1.016	-	1.016	-	-	1.016
34	508RM09D034_Ramjanaki Upamarga 2	6	-	-	0.108	-	0.108	-	-	0.108
35	508RM09D035_Narainapur Upamarga 1	6	-	-	0.099	-	0.099	-	-	0.099
36	508RM09D036_Narainapur Upamarga 2	6	-	-	0.091	-	0.091	-	-	0.091
37	508RM09D037_Narainapur Upamarga 3	6	-	-	0.020	-	0.020	-	-	0.020
38	508RM09D038_Narainapur Upamarga 4	6	-	-	0.044	-	0.044	-	-	0.044
39	508RM09D039_Belaihiya Upamarga 4	6	-	-	0.530	-	0.530	-	-	0.530
40	508RM09D040_Belaihiya Upamarga 2	6	-	-	0.460	-	0.460	-	-	0.460
41	508RM09D041_Belaihiya Upamarga 3	6	-	-	0.617	-	0.617	-	-	0.617

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
42	508RM09D042_Belaihiya Upamarga 1	6	-	-	0.732	-	0.732	-	-	0.732
43	508RM09D043_Majhauri Gaun Upamarga 6	5	0.346	-	-	-	0.346	-	-	0.346
44	508RM09D044_Majhauri gaun Upamarga 5	5	0.338	-	-	-	0.338	-	-	0.338
45	508RM09D045_Dipnagar Upamarga	5	-	0.184	-	-	0.184	-	-	0.184
46	508RM09D046_Sapai Gaun Upamarga	5	-	-	0.121	-	0.121	-	-	0.121
47	508RM09D047_Pathkhauri Upamarga	5	0.056	-	0.315	-	0.371	-	-	0.371
48	508RM09D048_Taraini Gaun Upamarga 2	5	-	-	0.102	-	0.102	-	-	0.102
49	508RM09D049_Taraini Gaun Upamarga 1	5	-	-	0.260	-	0.260	-	-	0.260
50	508RM09D050_Taraini Gaun Upamarga 3	5	-	-	0.101	-	0.101	-	-	0.101
51	508RM09D051_Kailas Nagar Tole Upamarga	5	0.116	-	0.501	-	0.617	-	-	0.617
52	508RM09D052_Omsatiya Patkauli Ma vi Upamarga	5	-	-	0.132	0.087	0.219	-	-	0.219
53	508RM09D053_Pathkauli Gaun Upamarga 1	5	-	-	0.204	0.112	0.316	-	-	0.316
54	508RM09D054_Pathkauli Gaun Upamarga 3	5	-	--	-	0.141	0.141	-	-	0.141
55	508RM09D055_Pathkauli Gaun Upamarga 2	5	-	-	0.078	-	0.078	-	-	0.078
56	508RM09D056_Pipraiya Upamarga	5	-	0.516	-	-	0.516	-	-	0.516
57	508RM09D057_Pipraiya Upamarga 2	5	-	0.676	-	-	0.676	-	-	0.676
58	508RM09D058_Praksah Itta Bhatta Upamarga	5	-	0.824	-	-	0.824	-	--	0.824
59	508RM09D059_Lothpurawa Upamarga	5	-	-	0.204	-	0.204	-	-	0.204
60	508RM09D060_Gaurigaun Krishi Sadak	5	-	-	0.881	-	0.881	-	-	0.881
61	508RM09D061_Velahi Gaun Upamarga	5	-	-	0.829	-	0.829	-	-	0.829
62	508RM09D062_Velahi Gaun Krishi Sadak	5	-	-	0.292	-	0.292	-	-	0.292

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
63	508RM09D063_Gauri Gaun Upamarga	5	-	-	0.370	-	0.370	-	-	0.370
64	508RM09D064_Thulo Sisahaniya Upamarga	5	-	-	0.206	-	0.206	-	-	0.206
65	508RM09D065_Silautiya Upamarga 3	4	-	-	0.340	-	0.340	-	-	0.340
66	508RM09D066_Silautiya Upamarga 2	4	-	-	0.105	-	0.105	-	-	0.105
67	508RM09D067_Silautia Upamarga	4	-	-	0.210	-	0.210	-	-	0.210
68	508RM09D068_Betauliya Upamarga	4	-	-	0.346	-	0.346	-	-	0.346
69	508RM09D069_Pul tax Upamarga 1	4	-	-	0.388	-	0.388	-	-	0.388
70	508RM09D070_Pul tax Upamarga 2	4	-	-	0.126	-	0.126	-	-	0.126
71	508RM09D071_Pul tax Upamarga 3	4	-	-	0.173	-	0.173	-	-	0.173
72	508RM09D072_Pul tax Upamarga 4	4	-	-	0.162	-	0.162	-	-	0.162
73	508RM09D073_Panani Gaun Upamarga 1	4	-	-	0.532	-	0.532	-	-	0.532
74	508RM09D074_Panani Gaun Upamarga 2	4	-	-	0.033	-	0.033	-	-	0.033
75	508RM09D075_Panani Gaun Upamarga 3	4	-	-	0.036	-	0.036	-	-	0.036
76	508RM09D076_Panani Gaun Upamarga 4	4	-	-	0.078	-	0.078	-	-	0.078
77	508RM09D077_Panani Gaun Upamarga 5	4	-	-	0.132	-	0.132	-	-	0.132
78	508RM09D078_Sanobalapur Upamarga 1	4	-	-	0.104	-	0.104	-	-	0.104
79	508RM09D079_Thulo Balapur Upamarga 10	4	-	-	0.218	-	0.218	-	-	0.218
80	508RM09D080_Thulo Balapur Upamarga 9	4	0.468	-	-	-	0.468	-	-	0.468
81	508RM09D081_Thulo Balapur Upamarga 6	4	-	-	0.202	-	0.202	-	-	0.202
82	508RM09D082_Thulo Balapur Upamarga 7	4	-	-	0.216	-	0.216	-	-	0.216
83	508RM09D083_Thulo Balapur Upamarga 8	4	-	-	0.065	-	0.065	-	-	0.065

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
84	508RM09D084_Thulo Balapur Upamarga 2	4	-	-	0.125	-	0.125	-	-	0.125
85	508RM09D085_Thulo Balapur Upamarga 3	4	-	-	0.186	-	0.186	-	-	0.186
86	508RM09D086_Thulo Balapur Upamarga 4	4	-	-	0.131	-	0.131	-	-	0.131
87	508RM09D087_Thulo Balapur Upamarga 5	4	-	-	0.095	-	0.095	-	-	0.095
88	508RM09D088_Thulo Balapur Upamarga 1	4	-	-	0.166	-	0.166	-	-	0.166
89	508RM09D089_Ganesh Itta Udhyog Upamarga	4	-	-	0.701	-	0.701	-	-	0.701
90	508RM09D090_Dolpur Upamarga 1	4	-	-	0.287	-	0.287	-	-	0.287
91	508RM09D091_Dolpur Upamarga 2	4	-	-	0.302	-	0.302	-	-	0.302
92	508RM09D092_Dolpur Upamarga 3	4	-	-	0.224	-	0.224	-	-	0.224
93	508RM09D093_Dolpur Upamarga 4	4	-	-	0.332	-	0.332	-	-	0.332
94	508RM09D094_Dolpur Upamarga 5	4	-	-	0.340	-	0.340	-	-	0.340
95	508RM09D095_Dolpur Upamarga 6	4	-	-	0.184	-	0.184	-	-	0.184
96	508RM09D096_Parsauni Gaun Upamarga	4	0.292	-	-	-	0.292	-	-	0.292
97	508RM09D097_Parsauni Gaun Upamarga 2	4	0.377	-	-	-	0.377	-	-	0.377
98	508RM09D098_Parsauni Gaun Upamarga 3	4	0.082	-	-	-	0.082	-	-	0.082
99	508RM09D099_Madhuri Gaun Krishi Sadak	4	-	-	0.739	-	0.739	-	-	0.739
100	508RM09D100_Madhuri Gaun Upamarga 1	4	-	-	0.928	-	0.928	-	-	0.928
101	508RM09D101_Madhuri Gaun Upamarga 2	4	-	-	0.141	-	0.141	-	-	0.141
102	508RM09D102_Materiya Gaun Upamarga 1	4	-	-	0.361	-	0.361	-	-	0.361
103	508RM09D103_Materiya Gaun Upamarga 2	4	-	-	0.159	-	0.159	-	-	0.159
104	508RM09D104_Materiya Gaun Upamarga 3	4	-	-	0.069	-	0.069	-	-	0.069

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
105	508RM09D105_Materiya Gaun Upamarga 4	4	-	-	0.187	-	0.187	-	-	0.187
106	508RM09D106_Materiya Gaun Upamarga 5	4	-	-	0.061	-	0.061	-	-	0.061
107	508RM09D107_Materiya Gaun Upamarga 6	4	-	-	0.098	-	0.098	-	-	0.098
108	508RM09D108_Materiya Gaun Upamarga 1	3,4	-	-	1.109	-	1.109	-	-	1.109
109	508RM09D109_Manakamana Itta Bhatta Upamarga 2	3	-	-	0.088	-	0.088	-	-	0.088
110	508RM09D110_Manakamana Itta Bhatta Upamarga	3	-	-	0.315	-	0.315	-	-	0.315
111	508RM09D111_Irrigation Dam Krishi Sadak	3	-	-	0.164	-	0.164	-	-	0.164
112	508RM09D112_Farsatkar Upamarga 10	3	-	-	0.226	-	0.226	-	-	0.226
113	508RM09D113_Farsatkar Upamarga 1	3	-	-	0.681	-	0.681	-	-	0.681
114	508RM09D114_Farsatkar Upamarga 2	3	-	-	0.055	-	0.055	-	-	0.055
115	508RM09D115_Farsatkar Upamarga 3	3	0.108	-	-	-	0.108	-	-	0.108
116	508RM09D116_Farsatkar Upamarga 4	3	-	-	-	0.056	0.056	-	-	0.056
117	508RM09D117_Farsatkar Upamarga 5	3	-	-	-	0.031	0.031	-	-	0.031
118	508RM09D118_Farsatkar Upamarga 6	3	-	-	0.087	-	0.087	-	-	0.087
119	508RM09D119_Farsatkar Upamarga 7	3	-	-	-	0.107	0.107	-	-	0.107
120	508RM09D120_Farsatkar Upamarga 8	3	-	-	-	0.046	0.046	-	-	0.046
121	508RM09D121_Farsatkar Upamarga 9	3	-	-	-	0.043	0.043	-	-	0.043
122	508RM09D122_Barsari Upamarga	3	1.292	-	-	-	1.292	-	-	1.292
123	508RM09D123_Barsari Upamarga 2	3	-	-	0.379	-	0.379	-	-	0.379
124	508RM09D124_Barsari Upamarga 3	3	-	0.053	-	-	0.053	-	-	0.053
125	508RM09D125_Barsari Upamarga 4	3	-	-	-	0.175	0.175	-	-	0.175

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
126	508RM09D126_Barsari Upamarga 5	3	-	0.277	-	-	0.277	-	-	0.277
127	508RM09D127_Pipraiya Krishi Sadak	3	-	-	1.210	-	1.210	-	-	1.210
128	508RM09D128_Karawani Gau Upamarga	3	-	-	0.060	-	0.060	-	-	0.060
129	508RM09D129_Karuwani Gaun Krishi Sadak 2	3	-	-	1.199	-	1.199	-	-	1.199
130	508RM09D130_Karuwani Gaun Upamarga 2	3	-	-	0.098	-	0.098	-	-	0.098
131	508RM09D131_Karwani Gau upamarga 3	3	-	-	0.104	-	0.104	-	-	0.104
132	508RM09D132_Karwani Gaun Upamarga 4	3	-	-	0.445	-	0.445	-	-	0.445
133	508RM09D133_Karwani Krishi Sadak	3	-	-	0.543	-	0.543	-	-	0.543
134	508RM09D134_Amrahawa Upamarga	3	-	0.066	0.459	-	0.525	-	-	0.525
135	508RM09D135_Lalpur Gaun - Amrahawa Gaun Upamarga	3	-	-	0.749	-	0.749	-	-	0.749
136	508RM09D136_Lalpur Gaun Upamarga 1	3	-	-	0.111	-	0.111	-	-	0.111
137	508RM09D137_Lalpur Gaun Upamarga 10	3	-	-	0.135	-	0.135	-	-	0.135
138	508RM09D138_Lalpur Gaun Upamarga 2	3	-	-	0.400	-	0.400	-	-	0.400
139	508RM09D139_Lalpur Gaun Upamarga 3	3	-	-	0.059	-	0.059	-	-	0.059
140	508RM09D140_Lalpur Gaun Upamarga 4	3	-	-	0.049	-	0.049	-	-	0.049
141	508RM09D141_Lalpur Gaun Upamarga 5	3	-	0.326	-	-	0.326	-	-	0.326
142	508RM09D142_Lalpur Gaun Upamarga 6	3	-	0.178	-	-	0.178	-	-	0.178
143	508RM09D143_Lalpur Gaun Upamarga 8	3	-	-	0.232	-	0.232	-	-	0.232
144	508RM09D144_Lalpur Gaun Upamarga 9	3	-	-	0.150	-	0.150	-	-	0.150
145	508RM09D145_Fiber Company Upamarga	3	-	-	-	0.203	0.203	-	-	0.203
146	508RM09D146_Newdihawa Gaun Upamarga 7	3	-	0.111	-	-	0.111	-	-	0.111

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
147	508RM09D147_Tarkulaha Gaun Upamarga 1	3	-	0.426	-	-	0.426	-	-	0.426
148	508RM09D148_Tarkulaha Gaun Upamarga 2	3	-	0.186	-	-	0.186	-	-	0.186
149	508RM09D149_Newdihawa Gaun Upamarga 8	3	-	0.065	-	-	0.065	-	-	0.065
150	508RM09D150_Newdihawa Gaun Upamarga 9	3	-	-	0.135	-	0.135	-	-	0.135
151	508RM09D151_Tarkulaha Gaun Upamarga 3	3	-	0.255	-	-	0.255	-	-	0.255
152	508RM09D152_Newdihawa Gaun Upamarga 1	3	-	-	0.217	-	0.217	-	-	0.217
153	508RM09D153_Newdihawa Gaun Upamarga 2	3	-	0.072	-	-	0.072	-	-	0.072
154	508RM09D154_Newdihawa Gaun Upamarga 4	3	-	-	0.164	-	0.164	-	-	0.164
155	508RM09D155_Newdihawa Gaun Upamarga 5	3	-	0.119	-	-	0.119	-	-	0.119
156	508RM09D156_Newdihawa Gaun Upamarga 6	3	-	0.069	-	-	0.069	-	-	0.069
157	508RM09D157_Newdihawa Gaun Upamarga 7	3	0.463	0.148	-	-	0.611	-	-	0.611
158	508RM09D158_Lalpur Gaun Upamarga 7	3	-	-	1.095	-	1.095	-	-	1.095
159	508RM09D159_LaureTole Upamarga 10	1	-	0.140	-	-	0.140	-	-	0.140
160	508RM09D160_LaureTole Upamarga 11	2	0.152	-	0.170	-	0.322	-	-	0.322
161	508RM09D161_LaureTole Upamarga 12	2	0.161	-	0.186	-	0.347	-	-	0.347
162	508RM09D162_LaureTole Upamarga 13	2	-	0.416	0.228	-	0.643	-	-	0.643
163	508RM09D163_Mache Bikes Kendra	1	-	0.208	0.303	-	0.511	-	-	0.511
164	508RM09D164_LaureTole Upamarga 5	1	-	0.202	-	-	0.202	-	-	0.202
165	508RM09D165_LaureTole Upamarga 8	1	-	0.100	-	-	0.100	-	-	0.100
166	508RM09D166_LaureTole Upamarga 9	1	-	0.090	-	-	0.090	-	-	0.090
167	508RM09D167_LaureTole Upamarga 6	1	-	-	0.274	-	0.274	-	-	0.274

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
168	508RM09D168_LaureTole Upamarga 6	1	-	-	-	0.372	0.372	-	-	0.372
169	508RM09D169_LaureTole Upamarga 7	1	-	-	0.139		0.139	-	-	0.139
170	508RM09D170_LaureTole Upamarga 1	1	-	0.517	-	-	0.517	-	-	0.517
171	508RM09D171_LaureTole Upamarga 3	1	-	0.126	-	-	0.126	-	-	0.126
172	508RM09D172_LaureTole Upamarga 4	1	-	0.135	-	-	0.135	-	-	0.135
173	508RM09D173_LaureTole Upamarga 2	1	-	0.621	-	-	0.621	-	-	0.621
174	508RM09D174_Khumsa Gaun Upamarga 10	1	-	0.146	-	-	0.146	-	-	0.146
175	508RM09D175_Khumsa Gaun Upamarga 9	1	-	0.226	-	-	0.226	-	-	0.226
176	508RM09D176_Khumsa Gaun Upamarga 5	1	-	-	0.722	-	0.722	-	-	0.722
177	508RM09D177_Khumsa Gaun Upamarga 6	1	-	-	0.265	-	0.265	-	-	0.265
178	508RM09D178_Khumsa Gaun Upamarga 7	1	-	-	0.107	-	0.107	-	-	0.107
179	508RM09D179_Khumsa Gaun Upamarga 8	1	-	-	0.245	-	0.245	-	-	0.245
180	508RM09D180_Police Beat Chowk Upamarga 1	1	-	-	0.474	-	0.474	-	-	0.474
181	508RM09D181_Police Beat Chowk Upamarga 2	1	-	-	0.398	-	0.398	-	-	0.398
182	508RM09D182_Khumsa Gaun Upamarga 4	1	-	-	0.202	-	0.202	-	-	0.202
183	508RM09D183_Khumsa Gaun Upamarga 1	1	-	-	0.739	-	0.739	-	-	0.739
184	508RM09D184_Khumsa Gaun Upamarga 2	1	-	-	0.212	-	0.212	-	-	0.212
185	508RM09D185_Khumsa Gaun Upamarga 3	1	-	-	0.643	-	0.643	-	-	0.643
186	508RM09D186_Khumsa Gaun Upamarga 11	1	0.344	-	-	-	0.344	-	-	0.344
187	508RM09D187_Khumsa Gaun Upamarga 12	1	0.095	-	-	-	0.095	-	-	0.095
188	508RM09D188_Khumsa Gaun Upamarga 13	1	0.080	-	-	-	0.080	-	-	0.080

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
189	508RM09D189_Khumsa Gaun Upamarga 14	1	-	0.235	-	-	0.235	-	-	0.235
190	508RM09D190_Khumsa Gaun Upamarga 15	1	-	-	0.203	-	0.203	-	-	0.203
191	508RM09D191_Khumsa Gaun Upamarga 16	1	-	-	0.075	-	0.075	-	-	0.075
192	508RM09D192_Khumsa Gaun Upamarga 17	1	-	-	0.151	-	0.151	-	-	0.151
193	508RM09D193_Kataiya Upamarga 6	1	-	0.120	-	-	0.120	-	-	0.120
194	508RM09D194_Kataiya Upamarga 7	1	-	0.168	-	-	0.168	-	-	0.168
195	508RM09D195_Kataiya Upamarga 4	1	0.569	-	-	-	0.569	-	-	0.569
196	508RM09D196_Kataiya Upamarga 1	1	0.111	-	-	0.155	0.266	-	-	0.266
197	508RM09D197_Kataiya Upamarga 2	1	0.128	-	-	-	0.128	-	-	0.128
198	508RM09D198_Kataiya Upamarga 3	1	-	-	-	0.044	0.044	-	-	0.044
199	508RM09D199_Kutta Gaun Upamarga 2	1	-	-	0.464	-	0.464	-	-	0.464
200	508RM09D200_Captain Tole Upamarga 1	1	-	0.182	-	-	0.182	-	-	0.182
201	508RM09D201_Kataiya Upamarga 5	1	-	0.156	-	-	0.156	-	-	0.156
202	508RM09D202_Ganga Pur Upamarga 1	1	-	-	0.106	-	0.106	-	-	0.106
203	508RM09D203_Gangapur Upamarga 2	1	-	-	0.174	-	0.174	-	-	0.174
204	508RM09D204_Amuwa Tole Upamarga 2	1	-	-	0.099	-	0.099	-	-	0.099
205	508RM09D205_Amuwa Tole Upamarga 3	1	-	-	0.177	-	0.177	-	-	0.177
206	508RM09D206_Amuwa Tole Upamarga 4	1	-	0.058	0.139	-	0.197	-	-	0.197
207	508RM09D207_Amuwa Tole Upamarga 5	1	-	-	0.366	-	0.366	-	-	0.366
208	508RM09D208_Amuwa Tole Upamarga 6	1	-	-	0.316	-	0.316	-	-	0.316
209	508RM09D209_Amuwa Tole Upamarga 1	1	0.151	0.052	-	-	0.202	-	-	0.202

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
210	508RM09D210_Kutta Gaun Upamarga	1	-	-	0.215	-	0.215	-	-	0.215
211	508RM09D211_Captain Tole Upamarga 4	1	-	0.134	-	-	0.134	-	-	0.134
212	508RM09D212_Captain Tole Upamarga 3	1	-	0.104	-	-	0.104	-	-	0.104
213	508RM09D213_Captain Tole Upamarga 2	1	-	0.192	-	-	0.192	-	-	0.192
214	508RM09D214_Captain Tole Upamarga 5	1	-	0.125	-	-	0.125	-	-	0.125
215	508RM09D215_Captain Tole Upamarga 1	1	-	0.092	-	-	0.092	-	-	0.092
216	508RM09D216_Thulo Keutiliya Upamarga 5	1	-	-	0.124	-	0.124	-	-	0.124
217	508RM09D217_Thulo Keutiliya Upamarga 6	1	-	-	0.126	-	0.126	-	-	0.126
218	508RM09D218_Thulo Keutiliya Upamarga 7	1	-	-	0.333	-	0.333	-	-	0.333
219	508RM09D219_Thulo Keutiliya Upamarga 8	1	-	-	0.487	-	0.487	-	-	0.487
220	508RM09D220_Thulo Keutiliya Upamarga 3	1	-	-	0.374	-	0.374	-	-	0.374
221	508RM09D221_Thulo Keutiliya Upamarga 2	1	-	-	0.030	-	0.030	-	-	0.030
222	508RM09D222_Thute Pepal Upamarga 1	1	-	-	0.268	-	0.268	-	-	0.268
223	508RM09D223_Tanawa Gaun Upamarga	2	-	-	0.051	-	0.051	-	-	0.051
224	508RM09D224_Bardihawa Gaun Upamarga 3	2	-	-	0.109	-	0.109	-	-	0.109
225	508RM09D225_Sano Keutiliya Upamarga	2	-	-	0.396	-	0.396	-	-	0.396
226	508RM09D226_Putali Tole Chowk Upamarga 1	2	-	-	0.153	-	0.153	-	-	0.153
227	508RM09D227_Bardihawa Gaun Upamarga 2	2	-	-	0.101	-	0.101	-	-	0.101
228	508RM09D228_Punam Path Chowk Upamarga 3	2	-	-	0.065	-	0.065	-	-	0.065
229	508RM09D229_Punam Path Chowk Upamarga 1	2	-	-	0.051	-	0.051	-	-	0.051

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
230	508RM09D230_Punam Path Chowk Upamarga 2	2	-	-	0.681	-	0.681	-	-	0.681
231	508RM09D231_Padsari Chowk Upamarga 1	2	-	-	0.122	-	0.122	-	-	0.122
232	508RM09D232_Punam Path Chowk Upamarga 4	2	-	-	0.090	-	0.090	-	-	0.090
233	508RM09D233_Thulo Keutiliya Upamarga 1	2	-	-	0.074	-	0.074	-	-	0.074
234	508RM09D234_Thulo Keutiliya Upamarga 2	2	-	-	0.020	-	0.020	-	-	0.020
235	508RM09D235_Thulo Keutiliya Upamarga 3	2	-	-	0.021	-	0.021	-	-	0.021
236	508RM09D236_Thulo Keutiliya Upamarga 4	2	-	-	0.506	-	0.506	-	-	0.506
237	508RM09D237_Thulo Keutiliya Upamarga 5	2	-	-	0.115	-	0.115	-	-	0.115
238	508RM09D238_Karwala Gaun Upamarga	2	-	-	0.631	-	0.631	-	-	0.631
239	508RM09D239_Bardihawa Gaun Upamarga 2	2	-	-	0.038	-	0.038	-	-	0.038
240	508RM09D240_Bardihawa Gaun Upamarga 3	2	-	-	0.392	-	0.392	-	-	0.392
241	508RM09D241_Bardihawa Gaun Upamarga 5	2	-	-	0.097	-	0.097	-	-	0.097
242	508RM09D242_Durga Mandir Tole Upamarga 1	2	-	-	0.156	-	0.156	-	-	0.156
243	508RM09D243_Padsari Health post Upamarga	2	-	-	0.181	-	0.181	-	-	0.181
244	508RM09D244_NewMoon Academy Upamarga	2	-	-	0.226	-	0.226	-	-	0.226
245	508RM09D245_New Moon Academy Upamarga 2	2	-	-	0.069	-	0.069	-	-	0.069
246	508RM09D246_Padsari Danda Gaun Upamarga 1	2	-	-	0.160	-	0.160	-	-	0.160
247	508RM09D247_Padsari Danda Gaun Upamarga 2	2	-	-	0.118	-	0.118	-	-	0.118

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
248	508RM09D248_Padsari Danda Gaun Upamarga 4	2	-	-	0.238	-	0.238	-	-	0.238
249	508RM09D249_Padsari Danda Gaun Upamarga 3	2	-	-	0.137	-	0.137	-	-	0.137
250	508RM09D250_Bardihawa Gaun Upamarga 1	2	-	0.272		-	0.272	-	-	0.272
251	508RM09D251_Bardihawa Gaun Upamarga 2	2	-	-	0.282	-	0.282	-	-	0.282
252	508RM09D252_Padsari Danda Gaun Upamarga 6	2	-	-	0.241	-	0.241	-	-	0.241
253	508RM09D253_Padsari Danda Gaun Upamarga 7	2	-	-	0.481	-	0.481	-	-	0.481
254	508RM09D254_Padsari Danda Gaun Upamarga 5	2	-	-	0.142	-	0.142	-	-	0.142
255	508RM09D255_Bardihawa Gaun Upamarga 10	2	-	-	0.337	-	0.337	-	-	0.337
256	508RM09D256_Bardihawa Gaun Upamarga 5	2	-	-	0.362	-	0.362	-	-	0.362
257	508RM09D257_Bardihawa Gaun Upamarga 7	2	-	-	0.898	-	0.898	-	-	0.898
258	508RM09D258_Bardihawa Gaun Upamarga 3	2	-	-	0.850	-	0.850	-	-	0.850
259	508RM09D259_Bardihawa Gaun Upamarga 4	2	-	-	0.192	-	0.192	-	-	0.192
260	508RM09D260_Bardihawa Gaun Upamarga 6	2	-	-	0.062	-	0.062	-	-	0.062
261	508RM09D261_Bardihawa Gaun Upamarga 8	2	-	-	0.367	-	0.367	-	-	0.367
262	508RM09D262_Bardihawa Gaun Upamarga 9	2	-	-	0.127	-	0.127	-	-	0.127
263	508RM09D263_Purano Padsari Upamarga 1	2	-	-	0.508	-	0.508	-	-	0.508
264	508RM09D264_Purano Padsari Upamarga 2	2	-	-	0.041	-	0.041	-	-	0.041
265	508RM09D265_Purano Padsari Upamarga 3	2	-	-	0.033	-	0.033	-	-	0.033
266	508RM09D266_Purano Padsari Upamarga 4	2	-	-	0.105	-	0.105	-	-	0.105

Local Road (D-Class) RoW = 6m										
S.N.	MRCN: Road Code- Name	Ward Pass	Existing Surface Type (Km)				Existing Road Width (Km)		Drainage System	Total Length, Km
			Blacktop	Earthen	Gravel	RCC	0 to 4	4 to 6		
267	508RM09D267_Sirjan Tole Upamarga 2	2	-	-	0.625	-	0.625	-	-	0.625
268	508RM09D268_Krishi Farm Upamarga 1	2	-	-	0.154	-	0.154	-	-	0.154
269	508RM09D269_Krishi Farm Upamarga 2	2	-	-	0.188	-	0.188	-	-	0.188
270	508RM09D270_Krishi Farm Upamarga 3	2	-	-	0.102	-	0.102	-	-	0.102
271	508RM09D271_Unnati Tole Upamarga 3	2	-	0.078	-	-	0.078	-	-	0.078
272	508RM09D272_Unnati Tole Upamarga 4	2	-	0.069	-	-	0.069	-	-	0.069
273	508RM09D273_Unnati Tole Upamarga 5	2	-	0.166	-	-	0.166	-	-	0.166
274	508RM09D274_Unnati Tole Upamarga 2	2	-	0.098	-	-	0.098	-	-	0.098
275	508RM09D275_Unnati Tole Upamarga 8	2	-	0.058	-	-	0.058	-	-	0.058
276	508RM09D276_Unnati Tole Upamarga 9	2	-	0.056	-	-	0.056	-	-	0.056
277	508RM09D277_Unnati Tole Upamarga 1	2	-	0.310	-	-	0.310	-	-	0.310
278	508RM09D278_Unnati Tole Upamarga 6	2	-	0.332	-	-	0.332	-	-	0.332
279	508RM09D279_Unnati Tole Upamarga 7	2	-	0.327	-	-	0.327	-	-	0.327

Annex II: List of Scoring of (MRCN)

MRCN Scoring and Prioritization											
Class A											
Road Code	Population Served Per Km	Potential Growth Center	Existing Market Center	Service Center	Future Service Center	Potential Site	Special Consideration	Road Connection	Total Score	Overall Rank	Rank in Class
	15.0	10.0	20.0	15.0	5.0	10.0	15.0	10.0	100.0		
508RM09A006	12.0	6.5	7.0	12.0	4.0	8.0	12.0	8.0	69.5	1	1
508RM09A002	8.0	6.0	7.0	11.0	4.0	7.0	12.0	6.0	61.0	2	2
508RM09A010	5.5	7.9	11.0	5.0	3.0	5.7	12.0	10.0	60.1	4	3
508RM09A008	5.0	6.5	7.0	7.0	3.0	7.0	8.0	10.0	53.5	5	4
508RM09A011	4.3	6.0	12.0	6.0	3.0	6.0	6.0	10.0	53.3	6	5
508RM09A009	4.0	7.0	6.7	8.0	3.0	5.0	7.9	6.0	47.6	11	6
508RM09A007	4.0	5.5	6.0	7.0	2.0	7.0	9.0	5.0	45.5	13	7
508RM09A003	4.0	3.5	4.0	9.0	3.0	6.0	9.0	6.0	44.5	14	8
508RM09A001	5.0	4.0	5.0	5.0	3.0	6.0	10.0	6.0	44.0	18	9
508RM09A004	3.0	3.0	4.0	4.0	2.0	4.0	8.0	6.0	34.0	36	10
508RM09A005	3.0	3.0	3.0	4.0	2.0	3.0	7.0	6.0	31.0	45	11

MRCN Scoring and Prioritization											
Class B											
Road Code	Population Served Per Km	Potential Growth Center	Existing Market Center	Service Center	Future Service Center	Potential Site	Special Consideration	Road Connection	Total Score	Overall Rank	Rank in Class
	15.0	10.0	20.0	15.0	5.0	10.0	15.0	10.0	100.0		
508RM09B007	6.3	5.0	12.0	6.5	3.0	5.0	13.0	10.0	60.8	3	1
508RM09B003	6.0	5.0	4.0	9.0	4.0	6.0	10.0	5.0	49.0	7	2
508RM09B015	4.8	4.0	11.0	4.0	3.0	6.0	8.0	8.0	48.8	8	3
508RM09B010	4.5	7.0	6.0	6.0	4.0	5.6	9.0	6.0	48.1	9	4
508RM09B012	3.0	5.5	7.5	5.4	6.0	4.0	6.0	10.0	47.4	12	5
508RM09B001	4.0	4.5	9.0	4.0	2.0	6.0	7.0	8.0	44.5	15	6
508RM09B014	5.0	4.2	9.0	2.0	3.0	4.0	7.0	10.0	44.2	17	7
508RM09B011	4.0	6.8	7.0	3.0	3.0	3.0	7.0	10.0	43.8	19	8
508RM09B006	5.0	5.0	4.4	6.0	3.0	6.0	7.0	6.0	42.4	22	9
508RM09B013	3.4	5.8	8.0	2.0	3.0	4.0	6.0	10.0	42.2	23	10
508RM09B008	4.0	6.0	6.4	4.0	2.0	3.0	6.0	10.0	41.4	24	11
508RM09B009	5.0	5.5	7.0	2.0	2.0	3.2	4.0	10.0	38.7	28	12
508RM09B016	3.0	3.5	6.0	3.0	3.0	5.0	7.0	8.0	38.5	29	13
508RM09B004	5.0	4.0	4.0	4.0	3.0	5.0	6.0	6.0	37.0	30	14
508RM09B002	3.0	4.0	6.4	3.0	2.0	4.0	5.0	5.0	32.4	40	15
508RM09B005	3.0	3.0	4.0	5.0	4.0	3.0	4.0	6.0	32.0	41	16

MRCN Scoring and Prioritization											
Class C											
Road Code	Population Served Per Km	Potential Growth Center	Existing Market Center	Service Center	Future Service Center	Potential Site	Special Consideration	Road Connection	Total Score	Overall Rank	Rank in Class
	15.0	10.0	20.0	15.0	5.0	10.0	15.0	10.0	100.0		
508RM09C027	3.0	5.5	12.0	4.6	3.0	4.0	6.0	10.0	48.1	10	1
508RM09C026	3.5	5.0	11.0	4.0	2.0	3.5	5.5	10.0	44.5	16	2
508RM09C015	3.6	4.2	12.0	3.0	2.0	3.0	8.0	8.0	43.8	20	3
508RM09C031	3.4	5.0	13.0	2.0	3.0	4.0	7.0	6.0	43.4	21	4
508RM09C025	3.0	4.5	6.0	2.0	3.0	4.0	8.0	10.0	40.5	25	5
508RM09C029	3.8	4.5	11.0	2.0	2.0	2.0	5.0	10.0	40.3	26	6
508RM09C023	4.5	4.0	6.2	3.0	3.0	3.0	6.5	10.0	40.2	27	7
508RM09C039	3.0	4.0	4.0	4.0	2.0	4.6	5.0	10.0	36.6	31	8
508RM09C016	2.3	3.0	6.0	5.2	2.0	3.4	5.5	8.0	35.4	32	9
508RM09C001	3.0	4.0	6.0	5.0	3.0	4.0	6.0	4.0	35.0	33	10
508RM09C009	2.6	2.4	5.0	5.0	3.0	4.0	7.0	6.0	35.0	34	11
508RM09C011	4.0	3.4	5.0	3.0	2.0	3.0	8.0	6.0	34.4	35	12
508RM09C013	3.3	4.0	6.0	3.0	2.0	3.0	6.0	6.0	33.3	37	13
508RM09C040	3.2	3.0	2.0	3.0	4.0	3.8	4.0	10.0	33.0	38	14
508RM09C034	4.0	6.0	3.0	3.0	3.0	3.3	4.3	6.0	32.6	39	15
508RM09C030	3.0	4.0	7.0	3.0	3.0	3.0	4.0	5.0	32.0	42	16
508RM09C033	1.8	4.0	5.0	2.0	2.0	3.0	4.0	10.0	31.8	43	17
508RM09C010	2.5	2.4	4.0	4.8	3.0	3.8	6.0	5.0	31.5	44	18
508RM09C035	1.7	4.0	2.0	4.0	3.0	4.0	6.2	6.0	30.9	46	19
508RM09C017	2.0	4.2	3.0	4.0	2.5	3.0	4.0	8.0	30.7	47	20

MRCN Scoring and Prioritization											
Class C											
Road Code	Population Served Per Km	Potential Growth Center	Existing Market Center	Service Center	Future Service Center	Potential Site	Special Consideration	Road Connection	Total Score	Overall Rank	Rank in Class
	15.0	10.0	20.0	15.0	5.0	10.0	15.0	10.0	100.0		
508RM09C024	3.3	4.0	6.0	2.0	2.0	2.0	6.0	5.0	30.3	48	21
508RM09C008	3.0	2.5	4.0	3.0	2.0	2.6	5.3	6.0	28.4	49	22
508RM09C018	1.3	3.0	5.0	2.0	1.0	4.0	6.0	5.0	27.3	50	23
508RM09C006	3.0	2.0	4.0	2.0	2.0	4.0	5.0	5.0	27.0	51	24
508RM09C014	3.2	3.0	4.0	2.0	1.0	2.0	5.6	6.0	26.8	52	25
508RM09C019	1.7	3.0	7.0	1.0	1.0	5.0	3.0	5.0	26.7	53	26
508RM09C003	3.0	3.0	3.0	3.0	2.4	3.0	4.0	5.0	26.4	54	27
508RM09C022	4.2	3.0	1.0	2.0	1.0	3.0	7.0	5.0	26.2	55	28
508RM09C002	2.0	2.0	4.0	2.0	2.0	3.0	5.0	6.0	26.0	56	29
508RM09C004	2.0	2.0	3.0	2.0	2.0	4.0	5.0	6.0	26.0	57	30
508RM09C012	1.0	2.0	7.4	2.0	1.0	2.0	4.0	6.0	25.4	58	31
508RM09C021	3.1	2.3	1.0	2.0	1.0	2.0	7.0	5.0	23.4	59	32
508RM09C032	2.0	3.0	3.0	2.0	2.0	4.0	3.0	4.0	23.0	60	33
508RM09C020	2.2	2.0	2.0	2.0	1.0	3.5	4.2	5.0	21.9	61	34
508RM09C028	2.0	2.3	1.0	2.0	2.0	3.0	3.3	5.0	20.6	62	35
508RM09C038	2.3	3.0	2.0	1.0	2.0	1.0	4.0	5.0	20.3	63	36
508RM09C037	2.0	2.0	1.0	1.0	2.0	3.0	4.0	5.0	20.0	64	37
508RM09C007	2.0	2.0	1.0	1.0	1.5	2.0	4.0	4.0	17.5	65	38
508RM09C036	1.0	2.0	1.0	1.0	1.0	2.0	3.0	6.0	17.0	66	39
508RM09C005	1.0	1.0	1.0	2.0	1.0	2.0	3.0	5.0	16.0	67	40

Annex III: Consider Unit Cost for Different Interventions

Activities	Unit	Class A		Class B		Class C		Class D		Source	Remarks
		Actual Required Cost	Adopted Cost	Actual Required Cost	Adopted Cost	Actual Required Cost	Adopted Cost	Actual Required Cost	Adopted Cost		
Gravelling and upgrading	Km	41018180	12305454	24610908	7383272	19337142	3867428	11719480	3515844	Rupandehi Rate Analysis [2077/78 B.S]	
Blacktopping	Km	12324900	12324900	8475525	8475525	7769231	7769231	5650350	5650350	Rupandehi Rate Analysis [2077/78 B.S]	
Bridge Construction	M	600000	600000	600000	600000	600000	600000	600000	600000	Mo FALD [2014 A.D]	
Cycle Lane Construction	Km	2696400	2696400	2247000	2247000	0	0	0	0	Rupandehi Rate Analysis [2077/78 B.S]	Both Sides
Emergency Maintenance	Km	30000	30000	30000	30000	30000	30000	30000	30000	Mo FALD [2014 A.D]	
Footpath Construction (Both Side)	Km	2696400	2696400	1797600	1797600	2247000	2247000	1797600	1797600	Rupandehi Rate Analysis [2077/78 B.S]	
Green Belt Construction, Median	Km	4068272	4068272	4026772	4026772	0	0	0	0	Rupandehi Rate Analysis [2077/78 B.S]	Both Sides
Longitudinal lined drain	Km	7560550	7560550	7560550	7560550	7269550	7269550	7560550	7560550	Rupandehi Rate Analysis [2077/78 B.S]	Both Sides
Periodic Maintenance BT	Km	200000	200000	200000	200000	200000	200000	200000	200000	Mo FALD [2014 A.D]	
Periodic Maintenance Gravel	Km	250000	250000	250000	250000	250000	250000	250000	250000	Mo FALD [2014 A.D]	
Pipe Culvert	No.	10000	10000	10000	10000	10000	10000	10000	10000	Mo FALD [2014 A.D]	
Humepipe @ 1m Dia	No.	14000	14000	14000	14000	14000	14000	14000	14000		
Recurrent Maintenance BT	Km	500000	500000	500000	500000	500000	500000	500000	500000	Mo FALD [2014 A.D]	
Recurrent Maintenance Earthen	Km	250000	250000	250000	250000	250000	250000	250000	250000	Mo FALD [2014 A.D]	
Recurrent Maintenance Gravel	Km	400000	400000	400000	400000	400000	400000	400000	400000	Mo FALD [2014 A.D]	
Routine Maintenance	Km	20000	20000	20000	20000	20000	20000	20000	20000	Mo FALD [2014 A.D]	
Slab Culvert Construction	M	150000	150000	150000	150000	150000	150000	150000	150000	Mo FALD [2014 A.D]	
Track Opening	Km	4000000	4000000	4000000	4000000	4000000	4000000	4000000	4000000	Mo FALD [2014 A.D]	
widening	M	25000	25000	25000	25000	25000	25000	25000	25000	Mo FALD [2014 A.D]	
Street Light	LS	2520000	2520000	2520000	2520000	2160000	2160000	2160000	2160000		
Landscaping	LS	7288470	7288470	5123836	5123836	3878292	3878292	2888798	2888798		
Total Per Km		86622172	57909446	62811191	45583555	49110216	33640502	38225778	30022142		

Annex IV: Field Photographs

Table No 0.1: Field Photographs



Annex V: Minutes

आज मेली २०६८ साल असार माहिनाको १५ गते मंगलवारको दिन ओम सातिया गाउँपालिका अर्न्तगत सडक उपयोजनाको विषयमा घस वडा नं. ६ को गाउँपालिका अध्यक्ष श्री हिरा डेब्रे ज्युको अध्यक्षतामा इलफल गाँउ सडक उपयोजना सम्बन्धी इलफल विषयमा तपशिलमा अवलोकन गरे अनुसार माहानुकाव-सडको उपस्थितिमा कूल इलफल गाँउ सम्पन गर्यो ।

उपस्थित

- | | |
|-----------------------|-------------------------------|
| १. गाउँपालिका अध्यक्ष | : श्री हिरा डेब्रे (राजुल) |
| २. स्थानिय | : श्री अजि मुल्ल खान |
| ३. " " | : श्री सङ्कर पाठान |
| ४. " " | : श्री सङ्कर पाठान |
| ४. " " | : श्री जितवापुर निसाङ |
| ५. वडा सचिव | : श्री संजय यादव |
| ६. प्राविधिक | : श्री एमकेकुल क. ड. ड. ड. |
| ७. प्राविधिक | : श्री एमकेकुल उ. ड. ड. |

प्रस्तावना :-

१. दिप नगर - मकौडली चौड - केलथे ६ - नरेन्द्रपुर वडा सिमाना (३ वर्ग) १.
२. जम्बानी चौड - जम्बानी गाउँ - केलवलीयागाड - लोडोकाया - विन्द्रावन इड वडा सिमाना । (३ वर्ग) २
३. मकौडली चौड - मकौडली गाउँ - जम्बानी चौड (३ वर्ग)
४. नारायणपुर - सदीनिय वजार - विन्द्रावन वड (३ वर्ग)
५. सदीनिय वजार - इकथे टिलीय गाउँ - वडा कार्यालय - जम्बानी चौड २ (०९ वर्ग)

आज मिति २०७८ साल असार महिनाको १४ गते सोमवार-
 को ओम सतिया गाउँपालिका अन्तर्गत सञ्चु गुरुयोजनाको
 विषयमा यस वडा नं. ५ को वडा सदस्य श्री जितेन
 प्रसाद कुर्मी ज्यूको अध्यक्षतामा दलफल गरी सञ्चु गुरुयोजना
 सम्बन्धी विषयमा तयबिलमा अवलोकन गरी नए अनुसार
 माहागुकावफको उपस्थितिमा दलफल गरी सम्पन्न गरीयो ।

उपस्थित

१. वडा सदस्य : श्री जितेन प्रसाद कुर्मी
२. अध्यक्ष : श्री. रामवरण यादव
३. वडा सचिव : श्री राज अलि अन्सरी
४. समाजीय परिचालक : श्री. निर्मला चौधरी
५. स्थानिय : श्री सुरेन्द्र चौधरी
६. " : श्री बाबेश कुमाल यादव
७. " : श्री एच गोबिल यादव
८. " : प्रहारा इपरी

प्रस्तावना

१. कोलाइ गाउँ इस्की चौड देखी - गोरिगाउँ - चौड - वडा कार्यालय -
 नरडली - फर्साटिरेट गाउँ इवै गाउँ पालिका सम्म (५ वटा) १.
२. राम नगर चौड - कोलाइ चौड - पदरवौली गाउँ - देवदह सिमाना
 सम्म (५ वटा)
३. चौधौ चौड देखी विपतगल - मधुडली चौड सम्म (५ वटा)
४. डलाडी राजमार्ग - कुलो सिसनिया - सातो सिसनिया गाउँ -
 गौरि गाउँ - लौतपूर्वा गाउँ - पदरवौली गाउँ - तराइनी
 गाउँ - विपतगल सम्म (५ वटा)
५. कोलाइ गाउँ देखी पदरवौली गाउँ सम्म (१० वटा)

आज मिति २०६८ साल असार महिनाको १४ गते सोमवाले
 गते ओम्स रमिया गाउँपालिका अन्तर्गत सडक गुरुयोजनाको
 विषयमा घस वडा नं. ४ को वडा अध्यक्ष श्री - -
 मसाङ्क - मुसलमान ज्यूको अध्यक्षतामा केहु वसि
 सडक गुरुयोजना सम्बन्धी विभिन्न विषयमा उपस्थित
 मा अवलोकन श्री वर अनुसार माहानुलावको
 उपस्थितिमा वृहत् इलफल गरी सम्पन्न भयो ।

उपस्थित

१. वडा अध्यक्ष :- श्री मसाङ्क मुसलमान
२. वडा सदस्य :- श्री वासीव इति मुसलमान
३. प्राविधिक :- श्री गोबुल काठाली
४. प्रवेष्ट :- महेश उज्वेली

प्रस्तावना :

- १) सानो बालापुर (देवी) सडा (बोला पुल दायाँ) जाने बलापुर (देवी)
 हुँदै डोल्डा - चौनपुर, वैलायाँ जोडने (२० को) ४ नं.
- २) कम चौनपुर सानो बालापुर - कम प्याङ्ग हुँदै इलाङ (२० को) (५ नं.)
- ३) इलाङ्गी राजमार्ग - पलङ्गी - मधुली गाउँ - लक्ष्मी इश कटी
 - गाउँपालिका जोडने सडक (३ को) १ नं.
- ४) बसनापुर चाडे - पलानी इश - गुगुलुपुर्वा जाने (३ को) ३ नं.
- ५) पुल छे. थपकष देवी - कुरवानी जोडने सडक (२० को) २ नं.

अज मिली २०६८ साल असार महिना १४ गते सम्बन्धित दिने ओम सारिया गाउँपालिका अन्तर्गत सडक गुरुयोजना विषयमा यस वडा नं. २ को वडा अध्यक्ष श्री. जगन्नेश - - - -
 - - - - अध्यक्ष ज्यूको अध्यक्षतामा हुलफलमा कसी सडक गुरुयोजना सम्बन्धी विषयमा तपस्विलमा उल्लेखित अवलोकन गरे अनुसार सडक नमोहानुकावस्तुको उपस्थितिमा वृहत हुलफल सम्पन्न गरि सम्पन्न गरियो ।

उपस्थिति

- १. अध्यक्ष : श्री. जगन्नेश
- २. सदस्य : श्री. शिला पासो
- ३. प्राविधिक : श्री. गोबुल कच्छारी
- ४. प्राविधिक : महेका ड्योरी

प्रस्तावना:

- १. ~~सडक~~ पडसरी चौक देखी पाहा वडा हुदै कपिलको गाउँ वडा कार्यालय हुला दुम्मा दुमा हुदै गाउँपालिका कार्यालय (५ वर्ग)
- २. पुनप पथ चौक देखी हुला वेडाटिनीपा - दुम्माडा गाउँ हुदै सियारी गाउँपालिका सम्म (५ वर्ग)
- ३. लक्ष्मी नारायण मल्ले हुदै ~~कसी~~ ^{कसी} सम्म (५ वर्ग)
- ४. हुला टोल चौक देखी. सिरेगा वडापास जाने वारा नयाँ गाउँ सम्म (५ वर्ग)

आज मिति २०७८ साल असार माहिनाको १६ गते सोमवारको दिन ओम सतिया गाउँपालिका अन्तर्गत सडक गुरुयोजना विषयमा यस वडा नं. १ को वडा अध्यक्ष श्री बेल बहादुर बराल मगर ज्यूको अध्यक्षतामा बैठक बसि सडक गुरुयोजना सम्बन्धी विषयमा तपासिलमा अवलोकन गरि अनुसार माहाबुभावहको उपस्थितिमा कूल ६ लफुल गरि सम्पन्न भयो ।

उपस्थिति

१.	वडा अध्यक्ष	: श्री बेलबहादुर बराल मगर
२.	प्राविधीक	: जोकुल भण्डारी
३.	सदस्य	: सुमकुला कथाल
४.	"	: भारती वि.उ.
५.	"	: प्रकाश थापा
६.	"	: जम बहादुर बराल
	प्रविधीक	: महेश उग्र

प्रस्तावना

१. कुँडे हुँदै पिपल देखी लडौँ चौड हुँदै कुकुमाका सम्म (३ कर्जा)
२. नया गाउँ चौड देखी खिरा नगर हुँदै लिम्बा गाउँ (१२ कर्जा)
३. कुँडेमा चौड देखी २१५५ सा ६ गाउँ हुँदै लालपुर गाउँ (२० कर्जा)
४. फु संस्था चौड देखी नया गाउँ सम्म (१५ कर्जा)
५. चुलीस विट चौड देखी हिम पाइप ज्यादी (फरेमा) थोला (४ कर्जा)