



MUNICIPAL TRANSPORT MASTERPLAN

Changunarayan Municipality Office,
Kharipati, Bhaktapur

Picasso Consultant Pvt. Ltd.
Volume I: Main Report

FINAL REPORT

Project Information Sheet

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The study team

Acronyms and Abbreviations

CBS	Central Bureau of Statistics
DTMP	District Transport Master Plan
DUDBC	Department of Urban Development and Building Construction
UDBO	Urban Development and Building Office
FGD	Focused Group Discussion
GIS	Geographic Information System
GPS	Global Positioning System
IDPM	Indicative Development Potential Map
Kmph	Kilometer per hour
MIM	Municipal Road Inventory Map
MoFALD	Ministry of Federal Affairs and Local Development
MRCC	Municipal Road Coordination Committee
MTMP	Municipal Transport Master Plan
MTPP	Municipal Transport Perspective Plan
MUTM	Modified Universal Transverse Mercator
OD	Origin and Destination
sq. km.	Square Kilometer
SRN	Strategic Road Network
VDC	Village Development Committee
KV	Kathmandu Valley

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Executive Summary

Changunarayan municipality is located in Bhaktapur district of province 3, and it is also a part of the urban agglomeration of the Kathmandu valley. The present day Changunarayan municipality was formed in 2073 B.S. by merging previous area of Changunarayan Municipality and Nagarkot Municipality. The previous area of Changunarayan Municipality was formed by integration of Changunarayan, Jhaukhel, Chhaling and Duwakot VDCs and similarly, Nagarkot Municipality was formed by integration of Nagarkot, Bageshwori, Sudal and Tathali VDCs. The present day Changunarayan municipality now consists of 9 wards and occupies 62.98 sq.km, with the center of the municipality situated at Kharipati.

Preparation of Municipal Transport Master Plan of Changunarayan Municipality is a milestone step towards planned development of the municipality. Being a part of the urban agglomeration of Kathmandu valley and surrounded by other growing municipalities, the municipality poses huge potential to serve for the growth in the adjacent and surrounding urbanizing areas. The municipality has huge potential to accommodate the growing population in terms of various services and infrastructures such as health and education. The municipality gets its name from the famous temple of Changunarayan, which is listed in the UNESCO World Heritage Site. So the place has immense potential to attract domestic and foreign tourists.

To support the envisioned growth, a well-connected road network providing safe, efficient and comfortable movement of goods and people is vital. Road network supporting the desired movement is a basic infrastructure for the development of other infrastructures and services in the municipality. As such, preparation of MTMP presents huge opportunity to grasp the potential growth by developing necessary road network of different hierarchy of roads in its early phase. At the same time, its implementation will present various challenges. A participatory bottom-up approach has been used to prepare the MTMP. The approach was adopted through formation of a member committee (municipal road coordination committee (MRCC)) of techno-political interface that included representatives and technicians from the municipality, other stakeholders and active political parties in the municipality. To increase the participation of the local people, ward level discussion program was facilitated by the study team and the suggestions were collected. The team has also tried to adopt data driven decision making by collecting necessary secondary and primary data. The preliminary study identified collection of socio-economic data, origin and destination, and characteristics of daily trips, status of existing road and transport infrastructure, demand/vision of the locals, status of existing services, road safety risks and use of the roads by traffic as the required primary data. The collected data provides strong base for planning the development at present and in the future as well.

According to the census of 2011 A.D. the municipality has a total population of 55,430 people residing in 12,170 household with an average family size of 4.55 people. The composition of population in the municipality consists of more female than male in the ratio of 1.05:1. However, the municipality profile of 2018 shows that the total population has reduced to 54,550 with a negative growth rate of 0.16% per annum. Despite this fact, the growth rate between 2001 and 2011 was 1.44 % per annum. Considering the past trend and the urbanization pattern in the neighboring locations can be used to predict that the municipality will be able to experience a growth of population in the coming years. With the urban growth rate of World Bank 2016 A.D. for Nepal of 3.15%, the municipality population is expected to reach 92,421 by 2035 A.D.

The landcover composition of the municipal area shows that more than half of the area is being utilized for the purpose of agriculture. About 1/4th of the total area is occupied by forest and about 17% of the total area is in use for builtup. Being a part of Kathmandu valley, Changunarayan municipality is adequate in terms of connectivity, both internal and to neighboring location as well. The municipality does not consist of any national highway but Araniko highway passes less than a kilometer away from the southern boundary of the municipality. In contrast to the current trend of urbanization in adjacent and surrounding municipalities, Changunarayan municipality still consists of large cultivable area which can be preserved to serve the growing agricultural needs of the population in the nearby locations.

The inventory survey of roads and roadside infrastructures in the municipality shows that the proportion of blacktop, gravel and earthen roads are more or less equal in length, with ward 2 consisting the highest road density of about 8 km per sq.km. area. The household survey was conducted to gather sample data of people residing in the municipality. It shows that the majority of trips of people is to Bhaktapur, as it is the major market center in the vicinity. Majority of trips occur within a time duration of 30 minutes. According to the municipal profile of 2018, more than half of the household do not own any type of vehicle. From among those who do own vehicle, majority of them own motorcycle and only a few proportion of families own a car or other four wheelers.

The road hierarchy and its network developed supports existing settlement, other infrastructures and potential development dictated by the envisioned land use zoning. The perspective plan dictates the necessity of development of 62.02 km of Class A roads, 37.87 km of Class B roads and 71.34 km of Class C roads. The planned network of road of Class A, B and C along with the SRN provides access to public transport for all the people. The proposed network covers 100% of the total land area within a walking distance of 20 minutes. The coverage includes 99% of the existing built-up area within a walking distance of 5 minutes and about 96% of the total buildable area. The municipality is further facilitated by the presence of about 49 km of Strategic Road Network (SRN) providing both inter and intra linkage to different locations within and outside the municipality. The proposed land use and the network of roads of different hierarchy allows the people living in any part of the municipality to access any service within 30 minute time period through public or private mode, thus improving accessibility through enhanced mobility. The interconnected footpath and cycle tracks provided in the Class B and C roads allows a majority of the pedestrians and cyclist to access the facilities within the same time period.

Based on the perspective plan, the total budget to be invested within 5 years is NRs. 2,109,225,503. Of this amount, 30% is to be utilized for maintenance which adds up to NRs. 632,767,650 and the remaining amount for upgrading and construction of roads. The segregation of budget in each road shall be based on the rank provided to each road. The current trend of budget increment in the municipality shows that the forecasted budget required for the development of all the roads will not be a problem for the municipality. The current investment by the municipality is projected to increase by 15% for the first fiscal year and a steady growth of 20% each year thereafter, which estimates the total municipal budget for roads to be NRs. 20.31 Arba for a period of 15 years. Similarly, a minimum of 5% can be contributed by the local users to upgrade the Class D roads. The short term plan do not incorporate expansion of the existing roads. Expansion of roads require formulation of policies and strategies first which should be done within the medium term period. It should also include identification and clearing of existing RoW and land owned by the government. Other plans along with

new MTMP at the end of another five years should be integrated. Preparation of MTMP is the first step for the planned development of the municipal area. This should follow preparation of other plans and their integration with other plans. This will ensure efficient use of limited available resources and proper development of Changunarayan Municipality.

CHAPTER 1. INTRODUCTION

1.1 Background

Transportation of goods and people is the basis for any economic activity. Therefore, access to such transport service is prime in generating economic activity in any area. Further, the value of the economic activity depends on the speed, safety and comfort of the transport service. As seen in many municipalities of Nepal, haphazard population growth is visible paving a way for unplanned and unmanaged development of urban infrastructures and facilities; resulting in the inadequacy of the provided service and infrastructure. Such increase in population and the consequent increase in demand for different service and infrastructures affects the road and transport sector most extensively. This is because of the fact that transport is the backbone for the development of all other infrastructures. Safe, efficient and comfortable use of existing transport services and infrastructure supporting the surrounding environment and all the users is necessary for a healthy and liveable city. High economic value/trip demands higher mobility and better transport service. Land transport is the backbone of transportation and other facilities in Changunarayan municipality. Movement on land is done through a network of interconnected roads.

The land transportation network is a complex system that exhibits the properties of self-organization and emergence. But with the increasing population and demand, the unplanned road network often turn to be insufficient in providing the required access and mobility. The increase in number of vehicles demands wider roads which is restricted by the developed built-up area along the roads. Therefore, it is necessary to plan and maintain a road hierarchy for long term sustainability and serviceability. Transport network are complex and large scale system in different hierarchies according to the demand of hierarchy of settlement development and geographical alternation. Although the exact nomenclature of the roads of different hierarchy varies, they basically comprise of freeways, arterials, collectors and local roads. Strategic transport network are top hierarchy and local transport network is the bottom hierarchy transport network. It is necessary to plan a proper hierarchy of roads to maintain smooth operation and avoid bottlenecks.

Transport sector is also known for high energy use and greenhouse emission. Large number of premature deaths due to respiratory disease are attributed to vehicular emissions. Rapid urbanization and motorization with diminishing urban greenery adds to the misery of the people residing in the urban area. The reduction in the level of service and rapid motorization is a sign of vicious cycle where the quality of road infrastructure and public transport service is reduced resulting in reliance of people on private mode which further degrades the road performance through increased congestion. Congestion further reduces the reliability of the public transport service and undermines the supplied capacity of the infrastructure. It is thus necessary to break the vicious cycle to turn it to a virtuous cycle.

The main purpose of MTMP is to prepare the inventory of existing infrastructures and prepare plans of management tools and investments in transport sector for the overall sustainable development of the urban economy and environment. Based on other plans already prepared, existing and potential development areas – the road network will be planned and prioritized for investment. After a comprehensive study of the study area both in settlement level, municipal level and regional context,

necessary interventions from construction of new road linkages to upgrading and maintenance of the existing road linkages will be planned. Therefore, municipal transport master plan (MTMP) incorporates identification, mapping and classification of existing road network in the municipality along with formulation of vision for the development of the transport sector; followed by identification of required intervention (new construction/ upgrading/ rehabilitation/ maintenance), prioritization and, preparation of physical and financial implementation plan.

1.2 Objectives

The overall objective of the consulting service is to prepare the Transport Master Plan of Changunarayan Municipality. As a part of the TMP preparation, accessibility planning could be an effective tool to assess the existing situation of the services and facilities. The interventions derived from the accessibility and mobility planning will represent the real needs and priorities of the local people. The planning approach is participatory and bottom-up from the settlement level. The implementations of such projects will certainly be more participatory and owned by the local communities.

The TMP is designed to take account of the rest of the people for infrastructure as per the integrated development plan (IUDP). The preparation of IUDP is underway and TMP shall harmonize with it.

The MTMP is designed to take account of real needs of the people for infrastructure as per the comprehensive town development plan. The specific objectives of the assignment, but not necessarily limited to the following are:

- i. Prepare inventory and map of municipal roads.
- ii. Analyze existing road network accessibility and mobility situation.
- iii. Identify and prioritize the interventions based on the accessibility and mobility situation
- iv. Prepare Indicative Development Potential Map (IDPM).
- v. Collect demands of new/rehabilitation transportation linkages from municipality/settlements based on the integrated urban development plan.
- vi. Prepare perspective plan of transportation services and facilities.
- vii. Synchronize the TMP with the IDP.
- viii. Prepare road network and hierarchy plan for the development of the municipal roads.
- ix. Study the existing public transport service and propose plans for future extension of the network.
- x. Develop scoring criteria and its approval from the municipality.
- xi. Prepare five-year Transport Master Plan (TMP).
- xii. Prepare a realistic physical and financial implementation plan of prioritized roads for the TMP period.

1.3 Scope of Work

The consultant shall provide high quality professional services for the preparation of TMP/MTMP, with the reference to the attached annexes and integrated urban development plan (IUDP). The

scope of services to be carried out by the consultant shall broadly include, but not be limited to the following:

a. Assist in the formulation of municipal road coordination committee (MRCC) The main task of MRCC is to provide support to the municipality in formulating, managing and monitoring municipal road transport infrastructure policies, rules and regulations. Generally, the MRCC shall be composed of:

- | | |
|--|------------------|
| • Infrastructure Development Committee Chair | Chairperson MRCC |
| • Executive officer of municipality | Member |
| • Two-elected or nominated municipality member | Member |
| • One representative from different political parties | Member |
| • Chiefs of line agencies (max. 3 nos.) | Member |
| • Representative from women and ethnic minority groups | Member |
| • DTO representative | Member |
| • Planning section chief of municipality | Member |
| • Technical section chief of municipality | Member |

b. Review of existing plans and secondary data

The consultant shall study the existing and past plan and programmes prepared for the municipality. It should include the plans and progress of various line agencies working in the municipality.

c. Accessibility and mobility data collection and analysis

Various data shall be collected to assess the accessibility and mobility conditions in the municipality. The consultant shall assess the status of public transportation service and also propose its development as a part of integral sustainable transport system. The collected information shall be used to assess the existing status and gaps in the provision of infrastructure and services.

d. Prepare indicative development potential map (IDPM)

The consultant shall prepare the Municipality's Indicative Development Potential Map (IDPM) according to the integrated urban development plan. The consultant shall add on the plans and programs on indicative development potential to update the maps and should be approved by the municipality.

e. Prepare inventory and map of municipal roads including trails and bridges

The consultant shall collect primary data on the existing condition of road including width, surface type, land use, etc. and prepare relevant maps of the inventory accordingly. The road network map shall be discussed with the wider audience through municipal level workshop. Socioeconomic data of all the requested linkages shall also be collected.

f. Collection of demand for new/upgrading/rehabilitation of transport linkages from wards

The consultant shall collect demand from each ward/settlement for new construction, rehabilitation or upgrading of various road linkages. The demand shall be collected in order of priority. The collected demand shall be screened, synthesized, synchronized and harmonized at municipal level through workshop.

g. Develop scoring criteria and its approval from municipality

The consultant shall mandatorily develop weight system for the scoring and prioritization criteria for screening and prioritization of roads in the network for all interventions. The scoring and prioritization criteria shall be approved by the municipality.

h. Road classification and nomenclature

The local road names should also be collected. The consultant shall prepare road classification criteria, propose metric system of road nomenclature and accordingly apply the same during data collection and inventory survey from field. The geographical code for Changunarayan Municipality is 30701 where first digit “3” represents province, next two digits “07” represents Bhaktapur District and last two digits “01” represents Changunarayan Municipality. The local road code should follow this code with Class name and road number.

i. Prepare perspective plan and map of interventions of services and facilities

The consultant shall prepare perspective plan of interventions of services and facilities, which are identified from the accessibility analysis and municipal level workshop. All the identified interventions shall be screened and rated on the basis of approved criteria. The consultant shall discuss with the municipality technical team and MRCC related to interventions of services and facilities for the improvement for the access situation. It should include (but not limited to) road maintenance and upgradation, construction of new tracks, public transport, road safety, etc. The final perspective plan of municipality roads will be developed. The perspective plan shall be shown in GIS maps.

j. Analyze fund availability for roads

The internal and external financial resources available in the municipality shall be reviewed by the consultant discussing with the municipality authority so that the financial resources available for the transport interventions during the five year TMP period can be estimated. Sources of funding include annual budget allocated in the municipality, the budget allocated through GoN central and provincial agencies, etc. Other possible sources of funds could be from road tolls, royalties, land taxes, etc. Prospects of funding from other external sources, including possible and committed funding from donors, are reviewed and shall be taken into account.

k. Preparation of Transport Master Plan (TMP)

The consultant shall prioritize intervention and road linkages for those interventions based on the perspective plan. The interventions shall be planned for the five-year period to be implemented annually. This shall be based on the cost estimates of maintenance, upgrading, rehabilitation and new construction of main trails, bridges, and roads.

l. Prepare a realistic physical and financial implementation plan of prioritized roads for the TMP period.

The consultant shall collect information on existing resources spent on transport infrastructure and possible available resources, and make a projection for the next five years' period. From the total projected resources, the consultant shall discuss with the municipality to find out the appropriate proportion to be spent on on-going roads and new interventions proposed. Based on the five year projected funds availability the financial implementation plan shall be prepared. This step involves matching the estimated resources that are expected to be available to the municipality over the plan period, with the TMP period shall match with the projected available resources and should avoid proposing a long list for the TMP period.

m. Medium and long term planning

A medium and long term plan should be prepared in reference to the long term vision of twenty years. The medium term plan should address 10-year period and the long term plan for 20 years. The short term plan should be guided by the medium term and long term plans.

1.4 Study Area

The area under study, Changunarayan Municipality, lies in the Bhaktapur district of province 3, and is a part of the urban agglomeration of the Kathmandu valley. It occupies the northern area of the district and is located at 27°43'00"N and 85°25'47"E. It shares its boundary with Shankarapur municipality in the north, Kageshwori Manohara and Madhyapur Thimi municipalities in the west. Similarly, Bhaktapur and Suryabinayak municipalities lie in the southern part of the municipality. Banepa and Mandandepur municipalities share their boundary with the municipality in the east.

The municipal area of Changunarayan Municipality is formed by merging Changunarayan Municipality and Nagarkot Municipality in 2073 B.S. Before that Changunarayan Municipality was formed by integration of Changunarayan, Jhaukhel, Chhaling and Duwakot VDCs and similarly, Nagarkot Municipality was formed by integration of Nagarkot, Bageshwori, Sudal and Tathali VDCs. After the merger, Changunarayan municipality now consists of 9 wards with the center of the municipality situated at Kharipati. The new boundary of Changunarayan municipality occupies about 62.98 sq.km.

1.5 Report outline

Volume I is the main report. The content of the report is elaborated into eight chapters. The first chapter gives overview of the project with details of background, objective and scope of work. Second chapter elaborates the method of study administered to conduct the study. Chapter three pictures the existing status of Changunarayan municipality based on the specific primary and secondary data collected during the study. Chapter four provides insight on the potential scenario of development with forecasts on demography and trips, and presents the basis for preparation of the plan including

prioritization criteria and road code. Chapter five is the transport master plan. It provides details on the investment and roads to be invested on. Chapter six concludes the report with conclusive remarks and recommendations. **Volume II** is the appendix and is collection of the primary data and questionnaires collected during the study.

CHAPTER 2. STUDY METHOD

2.1 General Approach

It is said that high quality development plans lie at the heart of a high quality planning system. Therefore, it is important to develop and upgrade a planning system with time to capture the change in the site condition and finding and advancement in the planning methodology and interpretation elsewhere. The planning approach has been changing over time with change in political status in Nepal over past 50 years. Such approaches have been studied. The approach as suggested by the ToR along with other approaches has been adopted to prepare the Municipal Transport Master Plan of Changunarayan Municipality as discussed below.

The approach as suggested by ToR is participatory bottom-up approach and differs from conventional practices of trickle down approach. Techno-political interface is incorporated in the planning process; active participation from representatives of political parties, line agencies, municipality officials and other stakeholders including the local people is crucial in the process and is ensured at different level through different methods such as data collection, key informant survey, case study, focused group discussions, public rapid appraisal, presentation, workshops and seminars.

Data based plan is prioritized through collection of available secondary data, and use of different methods and instruments to collect necessary primary data. The collected data will be used to reflect existing scenario and back the plans prepared, and its management will support any further planning effort in the future. The data collected reflects the overall scenario of the municipality and special/specific context of some local roads and settlements as well. For example the data on investment on road sector, socio-economy, travel pattern, vehicle ownership etc. will reflect the scenario of both specific settlements and the municipality as a whole.

Coordination among different stakeholders in the field of transport is also crucial. Coordination among stakeholders of different infrastructure and services will be done to ensure quality of the plans prepared. Coordination among/with institutions working in the field of transport; such as District Coordination Committee (DCC), Kathmandu Valley Development Authority (KVDA), Department of Roads (DoR), Asian Development Bank (ADB), The World Bank (IBRD), etc. is also facilitated to gain insight on what has already been done and also to validate the quality of the plans prepared. This will help to internalize their plans and research into the master plan ensuring better implementation and effective participation of different stakeholders. The broad scope of work of these institutions will help to study the municipality in regional context. Their involvement is also ensured through Key Informant Survey and discussion during different workshops.

Other approaches to provide complete streets, create liveable communities, smart city, identify and facilitate transit oriented development, and sustainable development will be incorporated in the planning process through discussion with different stakeholders at different level. The discussions will be focused on the adaptability of such approaches in our local contexts. These approaches generally supports the users and facilitate safe, comfortable and efficient movement of goods and movement with minimum impact of the environment and other users. It includes public transport routes, their connectivity, transfer stations and integration with other means of transport.

As a part of training and knowledge transfer, the municipality officials will be involved in data collection, planning and discussion on every level. This will help the municipality to understand the method of preparation of the plans and their interpretation. Better understanding of the plans prepared will help to implement the plans effectively and efficiently. Further, students and researchers in the field of transportation will be supported to conduct case studies, research and focused group discussion on local level. Participation of local youths and local stakeholders will be ensured. This will be facilitated through coordination with technical institutions and, local clubs and committees. The municipal office will be directly involved in each stage of plan preparation including local, municipality and national level meeting, seminar and workshops. Such participation will ensure knowledge transfer of the planning process and its outcome to the concerned authorities. Broad discussion between the techno-political stakeholders on the plans and case studies from national and international practices and their local applicability will be organized to generate better plans and innovation in the local context.

The strategies and policies set out in the Transport Master Plan will provide the municipality the means to plan and manage a transportation system that supports the key development policies and objectives. It includes preparation of strategic transport network with regional and sub-regional divisions with the concept of regionalization. These regions are having nodes which are linked through the network to deliver services using regional strategies that can enhance the effectiveness and efficiency of service provision at regional level.

2.2 Flow Chart

The detail method of study is presented in the flow chart below:

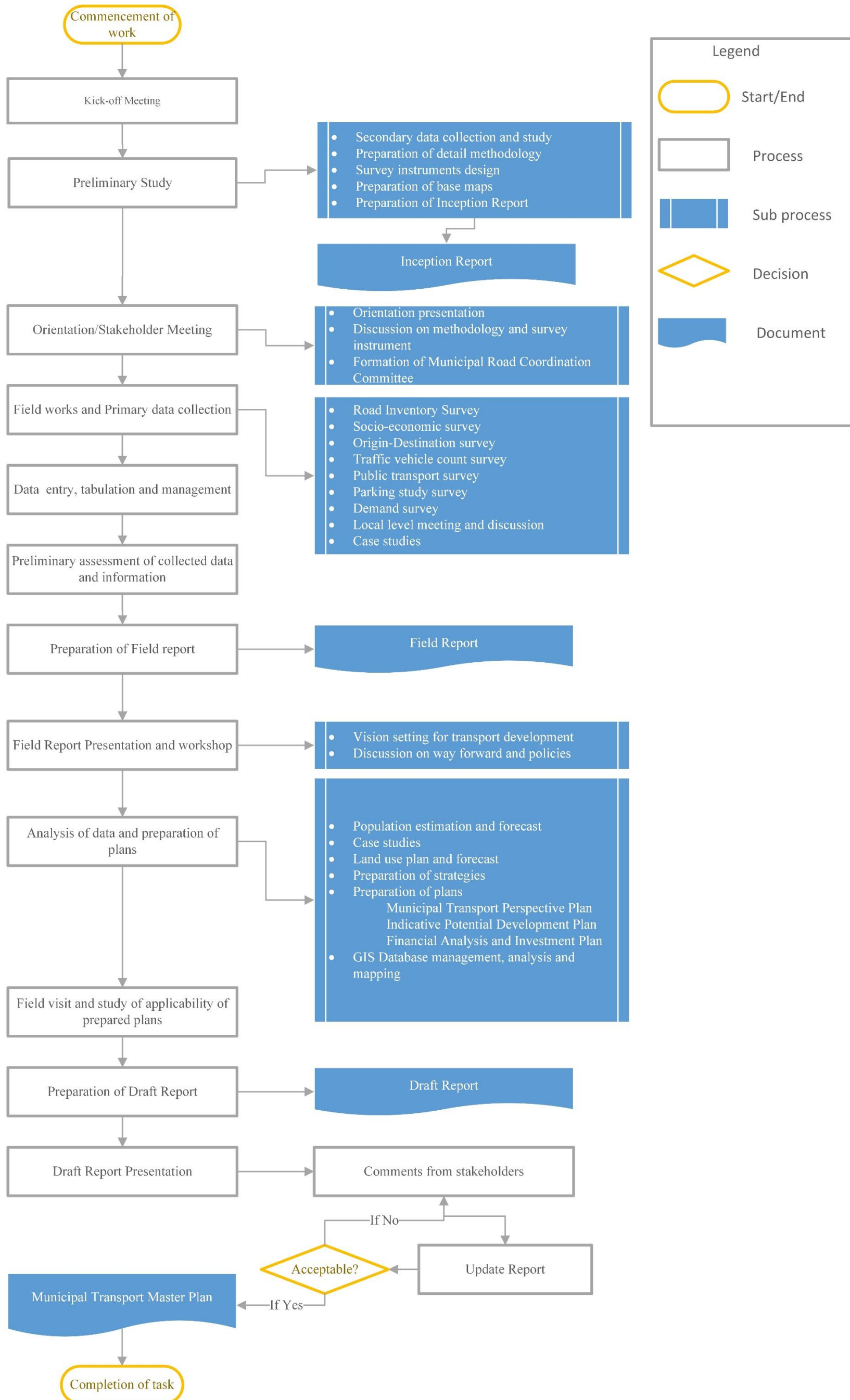


Figure 1 Methodology flow chart

CHAPTER 3. EXISTING SCENARIO (PROJECT AREA BRIEF)

3.1 Demographic and socio-economic status

Socio-economic and demographic status refers to the population and their distribution based on age, gender, caste, educational attainment, occupation, income level and so on. Population, household structure and their characteristics are some of the major pillar for better understanding of the locality.

3.1.1 Demography and growth trend

Changunarayan municipality, named after the famous Hindu temple of Changunarayan, lies in the Bhaktapur district of Province 3 of Nepal. The municipality was formed by merging Changunarayan Municipality and Mahamanjushree Nagarkot Municipality in 2073 B.S. Before formation of the current day Changunarayan municipality, the former Changunarayan Municipality boundary was formed by integration of Changunarayan, Jhaukhel, Chhaling and Duwakot VDCs and the Mahamanjushree Nagarkot municipality was formed by integration of Nagarkot, Bageshwori, Sudal and Tathali VDCs. After the merger, Changunarayan municipality now consists of 9 wards with the center of the municipality situated at Kharipati, Bhaktapur.

The population density in the municipality varies from as low as 482.38 person per sq.km. in ward 6 to 1901.18 person per sq.km. in ward 2, as shown in the adjoining chart. The variation in the total population residing in the wards is not significant. However, as seen in the chart, the variation in the total area of ward has caused the population density to fluctuate drastically.

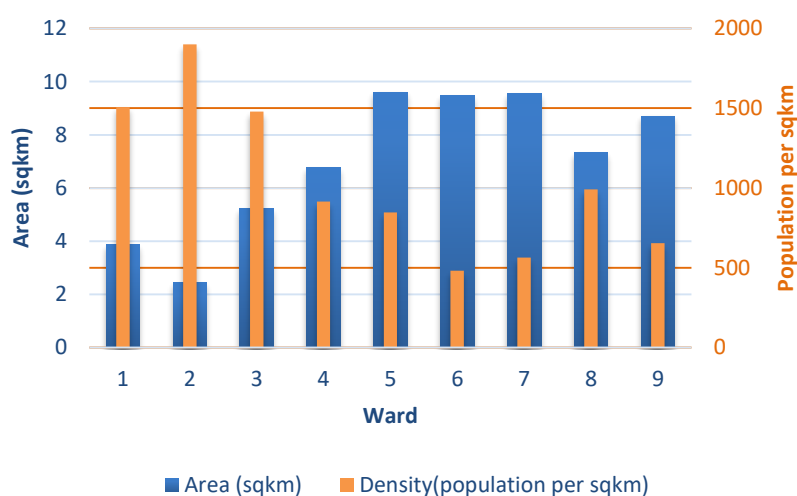


Figure 2 Ward-wise Population Distribution

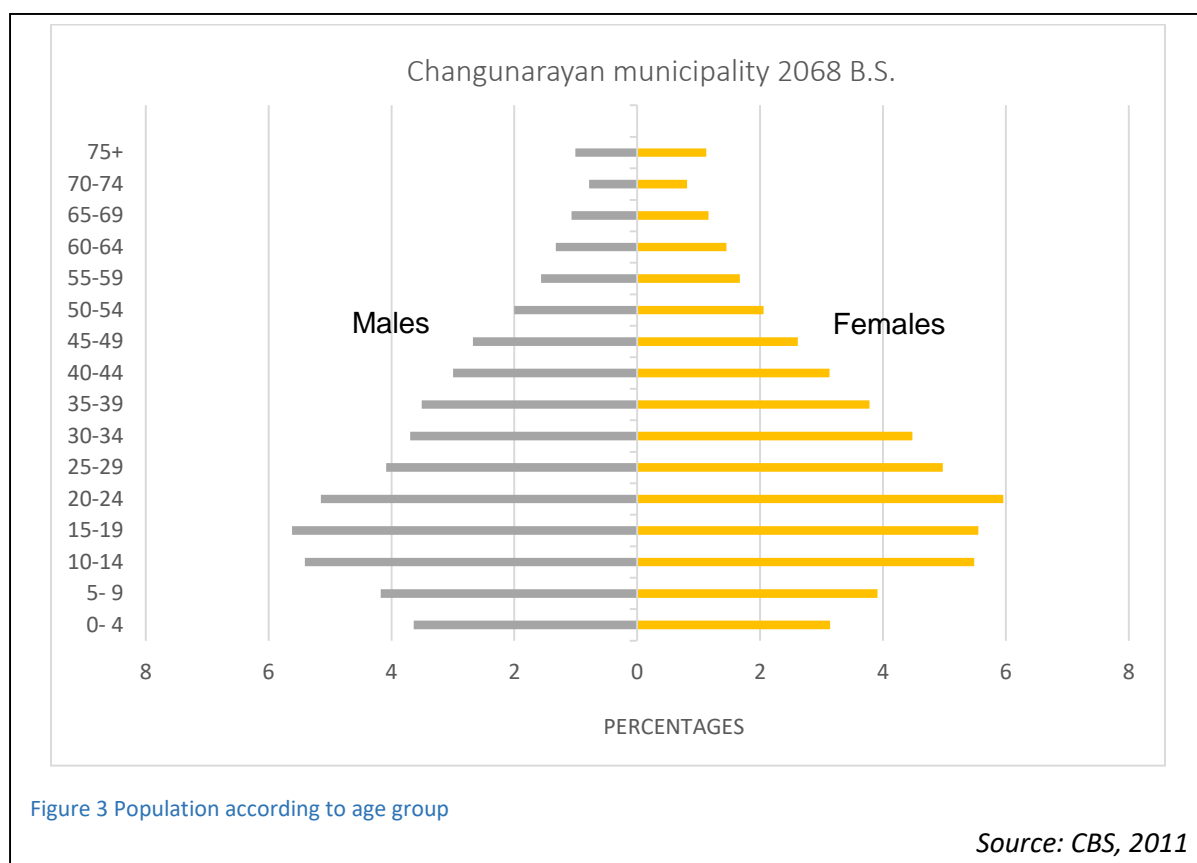
Table 1 Political division of Changunarayan Municipality

Name of Municipality	Changunarayan Municipality
Established year	2017 A.D
District	Bhaktapur
Province	3
Area	62.98 sq.km
No. of wards	9
Total household no.	12,170
Total population	55,430
Female population	28,438
Male population	26,992
Sex ratio (F:M)	1.05:1
Population growth rate	1.44%
Ward having highest and lowest population respectively	Ward no. 5 & 6
Ward having highest and lowest population density	Ward no. 2 & 6
Ward having highest and lowest area	Ward no. 5 & 2
Temperature	2.5°C in winter to 30°C in summer
Longitude	85°23'45" to 85°31'30"
Latitude	27°39'22" to 27°43'43"
East boundary	Banepa municipality and Mandandeupur municipality
West boundary	Kageshori Manohara municipality and Madhyapur Thimi municipality
North boundary	Shankharapur municipality
South boundary	Bhaktapur municipality and Suryabinayak municipality
Rivers at the boundaries	Manohara khola and Khasyan Khusun khola

According to the population census 2011, total population of Changunarayan municipality is 55,430 and is comprising of 26,992 males and 28,438 females living in a total of 12,170 households. The municipality consists of a total of 9 wards, where wards 5 and 6 consists of the maximum (8,129) and minimum (4,571) population respectively.

3.1.1.1 Age-Sex Composition

The population distribution of different age group shows that the maximum number of population is in the age group 15-19. This is the age group consisting of maximum number of students in their high schools. The number of people is the second highest in the age group of 20-24 as this age group consists of people who travel in search of quality education and may migrate from one place to the other. The minimum number of population is in the age group 70 -74, the old age group. As shown in the figure 2, the maximum number of population is of the age group 15-19 and minimum is of the age group 70-74.



3.1.1.2 Family size

According to census 2011, the total family number is 12,170 for a population of 55,430 resulting in a family size of 4.55. The average household size in 1991, 2001 and 2011 were 5.78, 5.35 and 4.55 respectively which shows a decline in the number of family members per family. This indicates that most of the families in the municipality are experiencing a shift towards modernization and adopting nuclear family structure rather than a joint one. With the increase in number of families, the vehicle ownership per family is also expected to increase as the family members will have a need and desire to own a vehicle. This will reflect the registration of vehicles as presented in chapter 4.

Table 2 Pattern of Population Change

Year (A.D.)	Total Population	Male	Female	Family Number	Average Family Size	Average annual population growth rate %
2001	48,465	24,109	24,356	9,099	5.35	
2011	55,430	26,992	28,438	12,170	4.55	1.44

[Source: C.B.S 2001 AD, 2011 AD]

3.1.1.3 Ethnic Composition

Among the total population of the municipality, the largest ethnic group is Newar, followed by Chhetri, Brahmins, Tamang and others. The Newars being native to Kathmandu Valley, can be considered to be a factor for the existence of large number of Newars in the municipality. The Newars-through their architecture, art, trading practices and compact settlements - have had a unique impact upon their natural environment and people with whom they have come into close contact (*The physical development plan for the Kathmandu Valley, 1969*).

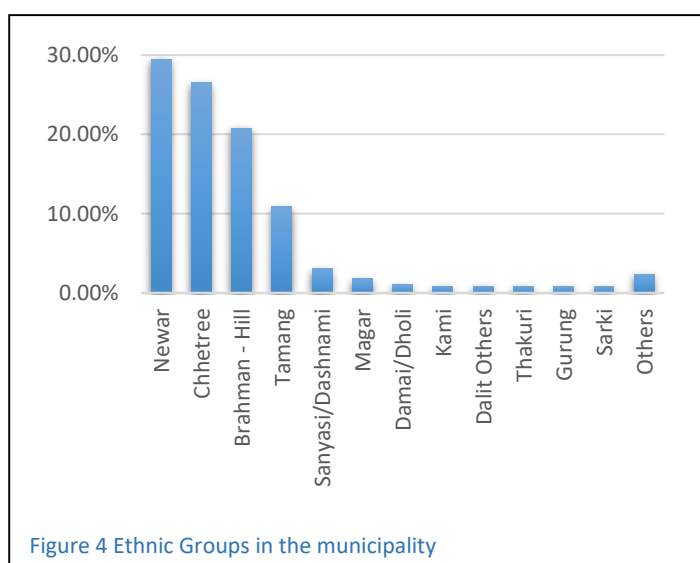


Figure 4 Ethnic Groups in the municipality

3.1.1.4 Literacy

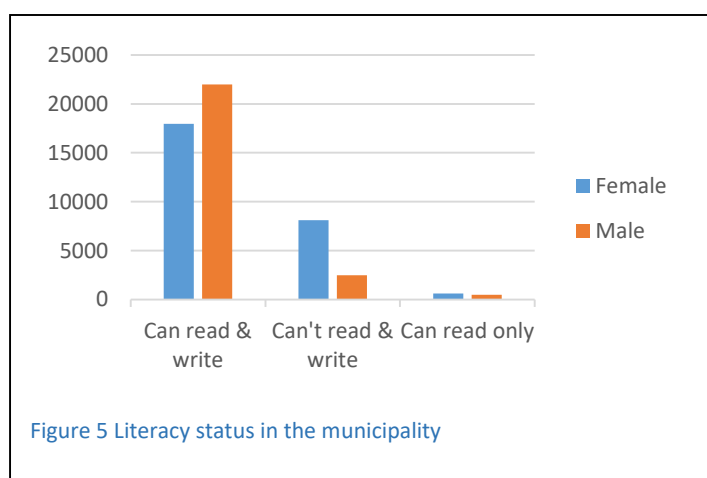


Figure 5 Literacy status in the municipality

Based on the Census data 2011, the literacy rate for male is about 90% that for female is about 70% female. On an average, about 80% of the total population are literate and the remaining proportion are unable to read or write. This also shows that despite of greater female population in the municipality, the community is majorly paternal and a greater proportion of males are receiving education.

3.1.2 Socio-economy

3.1.2.1 Occupation Pattern

The table below shows the occupation of people in the municipality. Almost half the total population are involved in agriculture. The profile further shows that only 3.3% of people are involved in foreign employment.

Table 3 Occupation pattern of people in the municipality

Occupation/Ward	1	2	3	4	5	6	7	8	9	Total	%
Agriculture	458	296	477	685	806	369	599	832	678	5200	44.6
Agriculture labour	10	26	8	34	23	99	15	39	87	341	2.9
Business	118	172	87	66	70	57	85	48	94	797	6.8
Daily wage	40	61	90	33	76	73	41	88	71	573	4.9
Foreign employment	38	40	15	24	72	52	41	43	60	385	3.3
Govt job	232	211	205	147	204	70	189	242	120	1620	13.9
Others	185	229	141	156	79	111	126	206	135	1368	11.7
Private	89	165	119	90	116	23	64	101	89	856	7.3
Self employed	66	57	27	50	33	50	65	92	92	532	4.6
Total	1236	1257	1169	1285	1479	904	1225	1691	1426	11677	100.0

Source: Changunarayan Municipality Profile of 2074 BS

3.1.2.2 Vehicle Ownership

The Census data of 2011 shows that majority of the vehicles in the area is motorcycle. There are 2669 number of motorcycle ownership in the municipality, followed by cycle with 892. The number of motor owned is 194, whereas, other vehicles count to 49. With the change in the living pattern and social development, the maximum ownership of motorcycle may be due to its affordability and easiness to carry. The ownership of private vehicles is increasing rapidly which can be assured by the maximum crowded traffic in each and every area. The increasing number of vehicles day by day within the same road length is the major problem along with on street parking in different places. In the present context, walking, cycling and facilitated public transport should be encouraged and traffic should be managed with the help of new and modern technologies.

Table 4 Different types of vehicles owned

Total	Types of Vehicles owned			
	Motor	Motorcycle	Cycle	Other Vehicles
3804	194	2669	892	49

Source: CBS-2011

3.1.3 Social Infrastructures

3.1.3.1 Education

There are a total of 53 schools in Changunarayan municipality with 16 private and 37 public ownership schools. The municipality is famous for good education facilities. The municipality houses Nepal Engineering College, the first privately led institution for providing engineering education in Nepal. Similarly, Janakpur Engineering College and Kathmandu Medical College Teaching Hospital is also located within the municipality.

As per municipality profile, 4.4 % schools lies at a distance more than one hour (walking distance) from the settlement and almost 16.6% houses are very near to the academic institutions. More than 68% of household are at 15-30 min walking distance from one or other education institution. Very few houses are at more than one-hour walking distance. Being rural in nature ward no 4 and ward 8 have maximum number of (112+384) which need to travel more than one hour to reach education institute.

Table 5 Distance to reach school

Distance to reach school/ Ward	1	2	3	4	5	6	7	8	9	Total	%
At home	110	250	334	61	85	709	202	118	60	1929	16.6
15 to 30 mins	991	864	752	865	1134	176	879	1037	1228	7926	68.0
30 mins to 1 hour	135	139	69	247	256	17	137	151	133	1284	11.0
More than 1 hour	0	4	4	112	4	1	2	384	5	516	4.4
Total	1236	1257	1159	1285	1479	903	1220	1690	1426	11677	100.0

Source: Changunarayan Municipality Profile (2074 BS)

3.1.3.2 Health infrastructure

The major health infrastructure located in the municipality is Kathmandu Medical College Teaching Hospital. Similarly, Kathmandu Cancer Center is also located in the municipality. The new facility of Bir Hospital has also been proposed in the municipality.

The municipality profile shows that more than half the population require 15-30 minutes time to reach the nearest health center and about 28% people require 30 minutes. About 1 in 10 people need more than one-hour walking time to reach the health center.

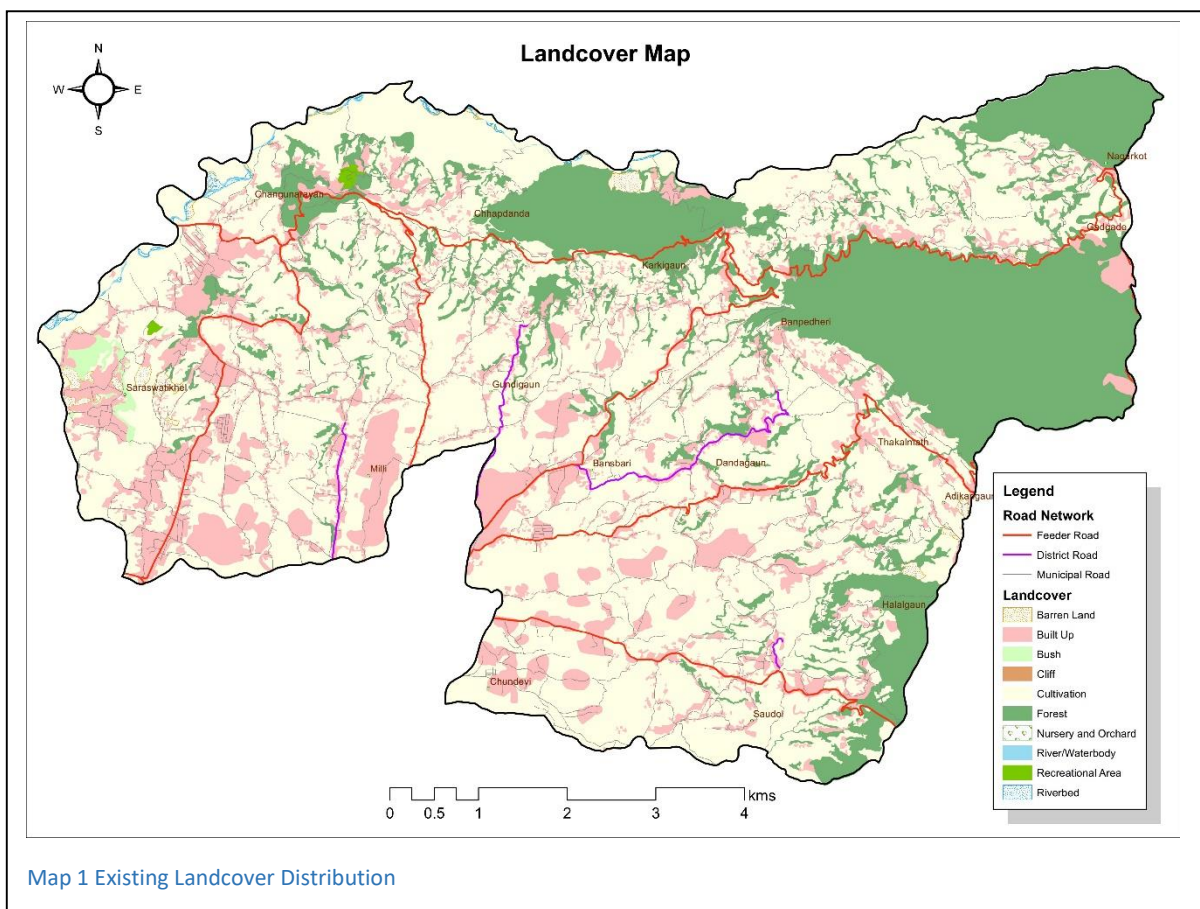
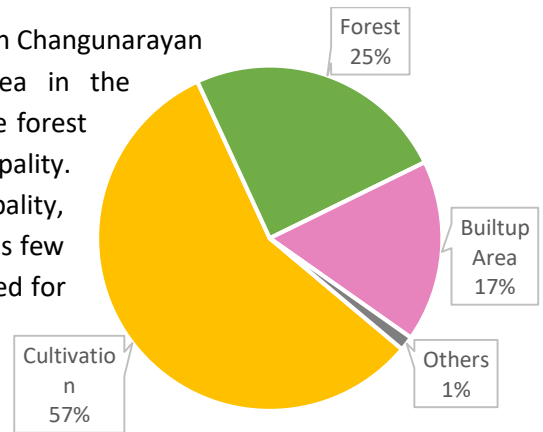
Table 6 Distance to reach health center

Distance to reach health center/Ward	1	2	3	4	5	6	7	8	9	Total	%
Closer to house	57	467	77	30	29	48	119	14	26	867	7.4
15 to 30 minutes walking distance	690	699	742	569	1069	590	576	465	1058	6458	55.4
30 minutes to 1 hour walking distance	480	86	332	492	356	260	447	495	297	3245	27.8
More than 1 hour walking distance	9	5	8	194	25	5	78	716	45	1085	9.3
Total	1236	1257	1159	1285	1479	903	1220	1690	1426	11677	100.0

Source: Changunarayan Municipality Profile (2074 BS)

3.2 Land cover

The existing land use shows that more than half of the area in Changunarayan Municipality is covered by cultivation. The builtup area in the municipality is 17%. About 1/4th of the total area constitute forest towards the northern and north-eastern part of the municipality. Because of development of ribbon settlement in the municipality, the builtup is visible mostly along the roads and in the places few hundred metres away from the road can be found to be used for cultivation. All other aspects of landcover such as waterbody, industries, etc. contribute to a combined proportion of only about 1% of the total municipal area.

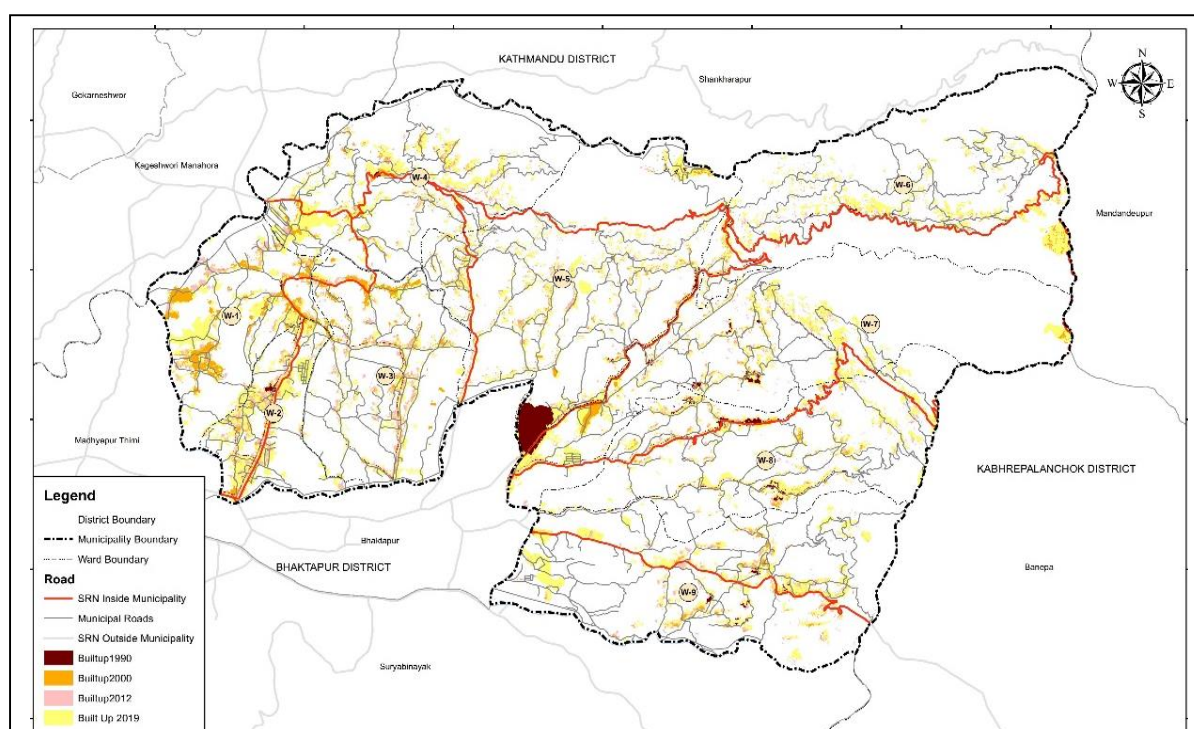


3.2.1 Change in land use

Table 7 Change in builtup area between 2005 AD and 2019 AD

Change	Area (sq.km.)		Total Change (%)	Annual Change (%)
	2005	2019		
Built Up	3.283	10.72	227%	16.18%

The change in the builtup area between 2005 AD and 2019 AD has been shown in Map 1. No significant change has been observed in landcover of other categories such as bush, forest, etc. The major change is the increment of builtup area and the reduction in the cultivation area. As shown in the table, the builtup area has experienced a massive growth of 227% in a period of 14 years with an annual increment of 16.18%. This illustrates an alarming rate of urbanization, with cultivation land being transformed into built up area.

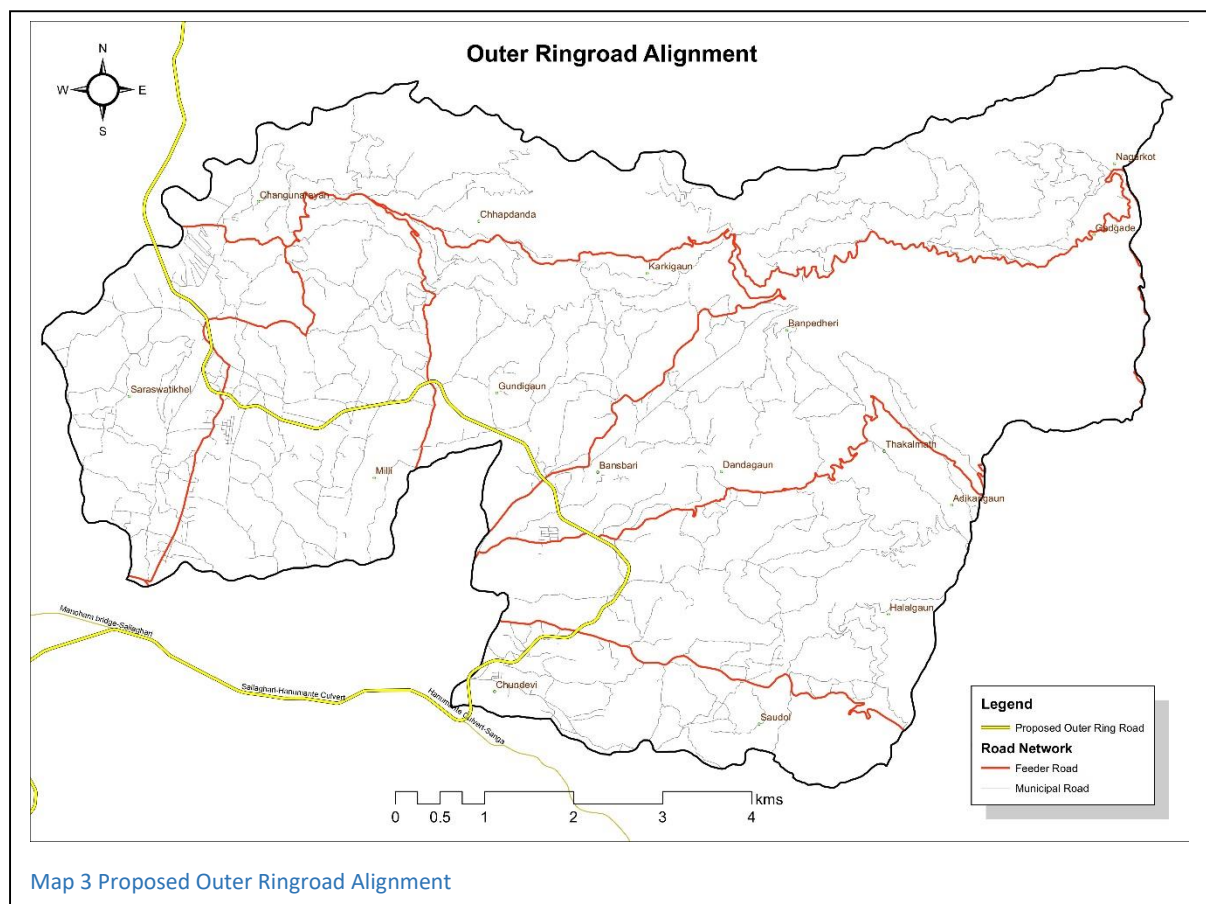


Map 2 Builtup area change in the municipality

3.3 Road and traffic

3.3.1 Outer Ringroad

The alignment of outer ringroad passes through the municipality covering most of the southern and western region of the municipality, as shown in Map 3. The proposed alignment of the outer ringroad has its entry/exit locations at Jagati in the south and in Duwakot, near to Nepal Engineering College in the west. The alignment of the outer ringroad is not the final one and is subject to change based on the DPR and other study reports prepared by the concerned authority. The development of outer ringroad will attract more traffic to the area along with increment in the infrastructure and other development activities. So it is essential for the preparation of MTMP to achieve planned development and eliminate haphazard expansion of infrastructures and settlement.



3.3.2 Existing road network

According to the District Transport Master Plan of 2013, the total length of roads in the district is 313.39 km with 115.09 km of strategic roads, 6.10 km of urban roads and 192.20 km of rural roads. This shows that the district consists majorly of rural areas with only a small portion of urban area with urban road and infrastructures. The total length of blacktopped road is 123.46 km which accounts to about 40% of the total roads in the district.

Table 8 Total Road Length Category-wise of Bhaktapur district

Class	Total	Blacktopped	Gravelled	Earthen
Strategic Roads	115.09	81.50	23.59	10.00
Urban Roads	6.10	6.10	-	-
Rural Roads	192.20	35.86	45.79	110.55
Total	313.39	123.46	69.38	120.55

Source: DTMP of Bhaktapur District, 2013

According to the strategic road network of 2011, the municipality consists of a total of about 24 km of major feeder road, 19 km of minor feeder roads and about 10 km of National Highway.

Table 9 Total Road length category-wise of Changunarayan municipality

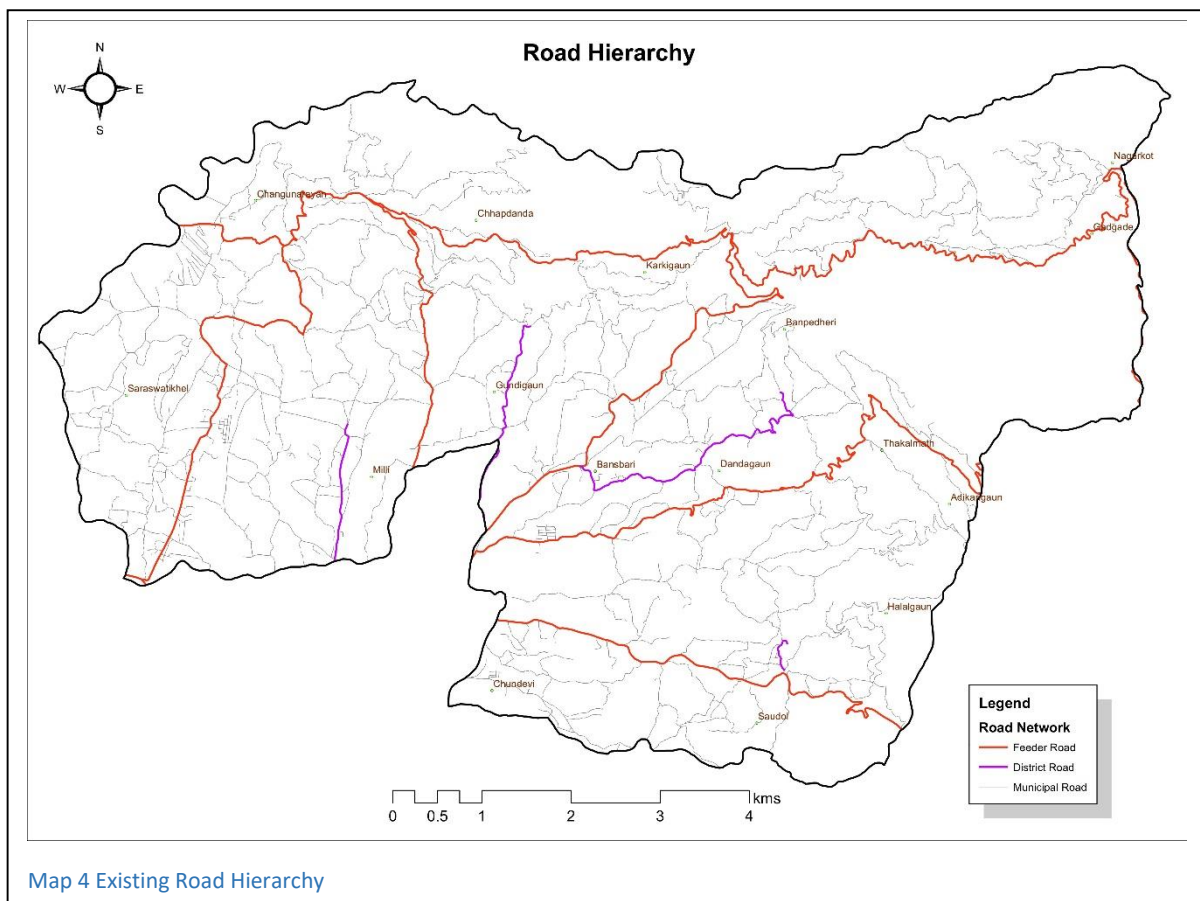
Class	Blacktopped	Earthen	Gravelled	Planned*	Total
FRN	21.14		3.13	-	24.26
FRO	7.75	5.70	5.57	0.01	19.02
NH	-	-	-	10.18	10.18
Key NH=National Highway; FRN=Feeder Road National (Major); FRO=Feeder Road Other (Minor)					
*The planned roads include the proposed outer ringroad alignment					

Source: Department of Roads (Strategic Road Network), 2011

The municipality has a total of 296.9 km of road excluding the trail roads. The road network in the municipality has almost equal proportion of blacktopped, gravelled and earthen roads, each constituting of about one third of the total length of all the roads in the municipality. The remaining roads in the municipality has a total of 4.52 %, 0.31 % and 0.21 % of RCC roads, Stone paved and Brick paved roads respectively.

3.3.3 Existing road hierarchy

The road network in Kathmandu Valley is composed of national highway, feeder roads, and local/municipal roads. The roads are categorised as strategic road network consisting of the highway and feeder roads. The Strategic Roads Network (SRN) are constructed and maintained centrally by the department of roads (DoR).



Map 4 Existing Road Hierarchy

The SRN covers nearly 49.5 Km of roads (excluding the proposed Outer Ringroad) in Changunarayan Municipality with six major feeder roads and seven minor feeder roads. The Outer Ring Road has been proposed, that passes through the municipality but its exact length has not been determined yet.

3.3.4 Public transport

Public vehicle provides mobility to the general people. The accessibility of the roads do not necessarily guarantee mobility as many people do not have access to private vehicle. Comprehensive reach of public transport is thus important. Further, for sustainability in transport sector, the negative externalities associated with transport sector needs to be addressed. Most of the negative externalities include congestion, pollution, impact on health, etc. Public transport plays a vital role in reducing these externalities as public transport allows transport of higher number of people with low level of emission and space use.

The public vehicles that ply on the roads of the municipality are operated by both private as well as public owned. Among a total of 21 vehicles available on the route of Nagarkot-Kamalbinayak-Ratnapark, only 11 vehicles are operated per day, with an interval of 45 minutes between two vehicles.

This shows that the number of passengers per trip is also limited. The following table presents the public vehicle routes available in the municipality.

Table 10 Description of Public Vehicle route

Route	Name of Committee	Type of Vehicle	Stops	Total No. of vehicles	Interval between two vehicles
Nagarkot – Kamalbinayak – Kathmandu (Ratnapark)	Uttar Purbi Yatayat Byawasai Sangh	Bus	No dedicated Bus stops	21	45 minutes
Chyamasing – Nala	Madhya Yatayat Byawasai Sangh	Micro Bus / Bus	Brahmayani	15	10-20 minutes
Chyamasing – Kalamasi	Madhya Yatayat Byawasai Sangh	Micro Bus / Bus	Brahmayani	10	15-30 minutes

According to the household survey, the average time to reach the nearest bus stop to get a public vehicle is 11.38 minutes. It is an indirect way of measuring the accessibility of public transport. The value ranges from 5 minutes to 20 minutes. Wards 1 and 8 have minimum time to reach the bus stop as these wards have easy access to public transportation with good road networks. On the contrary, people of ward 6 require the maximum time of about 20 minutes to reach their nearest bus stop. The scenario shows that almost all parts of the municipality is within the reach of public transport. The timing of public vehicles, however, is the major challenge for the public vehicle users in the municipality. The gap between arrivals of two consecutive vehicles is longer than the time to reach the bus stop, making the use of public vehicle less reliable.

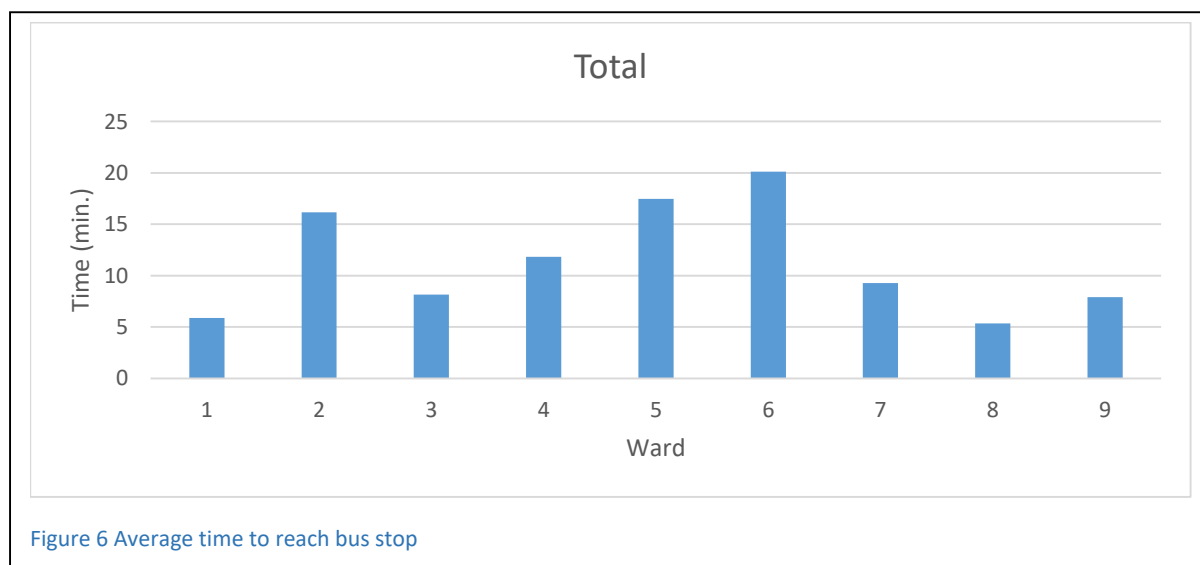
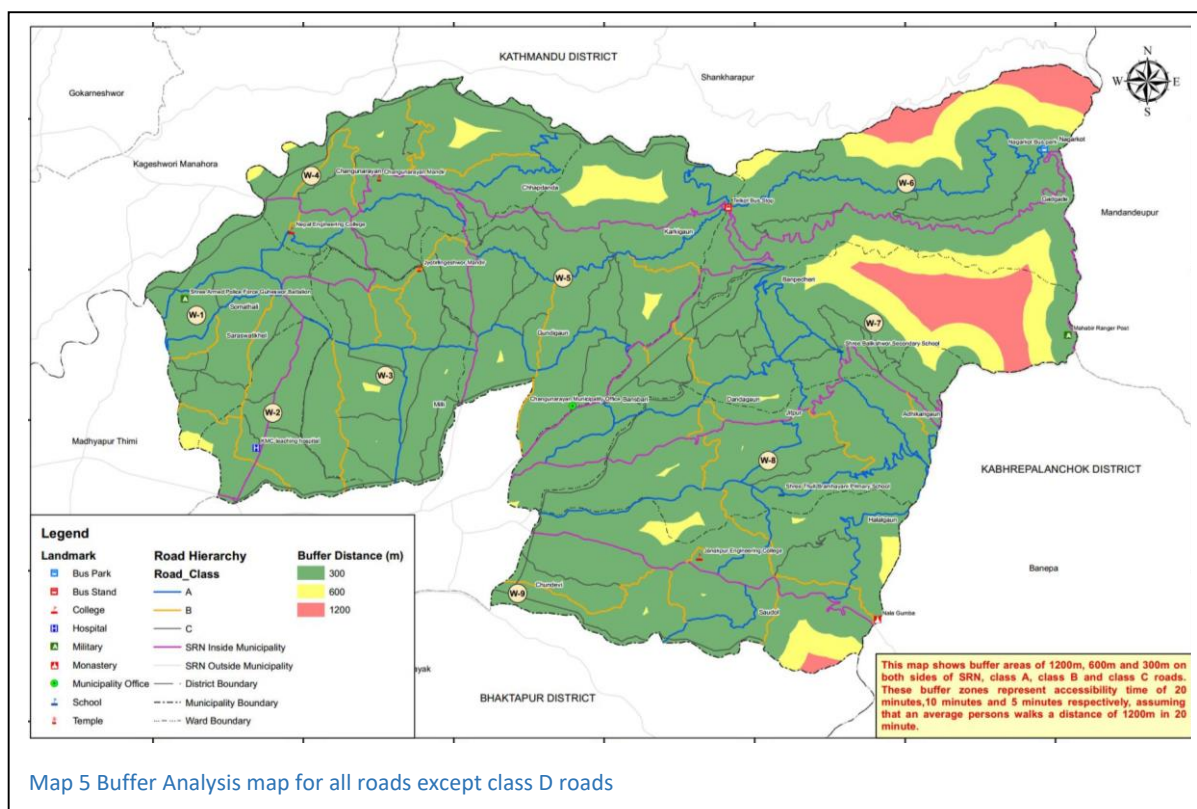


Figure 6 Average time to reach bus stop

3.3.5 Buffer analysis

An analysis to assess the reach of the proposed road class in the municipality was conducted for Changunarayan Municipality using the distribution of bus stops. As shown in the adjacent map, it can be seen that the proposed road classes cover full municipality area within a walking distance of 1200m. The results of the analysis can help inform government authorities and private sector service providers in planning and managing public vehicle services for better management of routes and allocation of bus stops/stations.



The buffer analysis was conducted using ArcGIS; the data for the analysis was the proposed road network of class A, B, C and the SRN. A walking distance of 300m, 600m and 1200m was considered assuming that an average person walks at a speed of 3.6 km/hr in the flat to moderately hilly terrain in the municipality.

The output of the analysis shows that all of the settlements will have access to the roads of at least Class C that will enable easily accessibility from the households to the road network. As shown in the table below, about 99% of the total households will have access to the road within a walking distance of 5 minutes. The remaining households will be able to utilize the roads within a walking time of less than 20 minutes. This shows that the proposed road class will cover the entire municipality within a convenient amount of walk time.

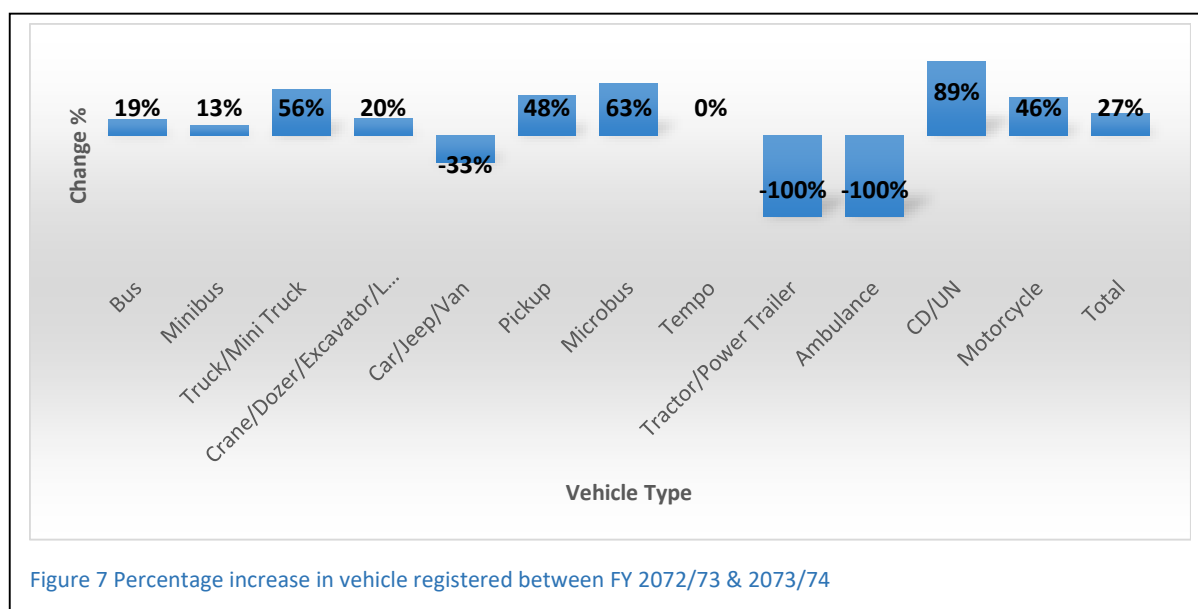
Table 11 Buffer Analysis

Buffer distance of A, B, C and SRN intersection with landcover						
S.N.	Time estimated (min)	Distance assumed(m)	Total Landcover (sq.km.)	Buildable area (sq.km.)	Builtup area (sq.km.)	Builtup Percentage
1	0-5	300	55.42	45.5	8.38	99.38%
2	5-10	600	5.07	1.27	0.05	0.60%
3	10-20	1200	2.45	0.28	0.002	0.02%
Total			62.93	47.05	8.43	100.0%

3.3.6 Traffic

3.3.6.1 Registered vehicles

Due to the restructuring of local level and the shift of the country towards provincial government, exact number is not available for the registration of vehicles categorized into provinces. However, the trend can be studied with the available data of upto the fiscal year of 2073/74. The fiscal year of 2073/74 has seen an abrupt increase in the number of vehicles registration in Bagmati Zone. There was a surge in the vehicles registered in the fiscal year 2066/67 which subsidized to previous rates in the following years. The increase in motorization gained pace again in 2069/70 and has been increasing ever since. The registration of private vehicles, especially car/jeep/ van decreased by nearly one third as compared to the fiscal year 2072/73. The number of motorcycles registered, on the contrary, almost doubled than the previous fiscal year. Although the figure seems small compared to other vehicles, it has the highest share of vehicles registered with about 69% during FY 2072/73 and 79% during FY 2073/74. This clearly shows rapid motorization of Kathmandu Valley (Bagmati zone). The pace of provision of road and other infrastructure to meet the demand by the additional vehicles has been slow resulting in pollution, congestion, crashes and other problems.



As shown in the chart, the number of vehicles registered in Bagmati zone is experiencing a rapid rise, with majority of those vehicles being motorcycle. The pattern of vehicle registration in Bagmati zone matches with that of the whole country but the proportion of vehicles in Bagmati zone compared to

the country seems to be declining. This is possibly because of the development and easy accessibility of vehicles in zones other than Bagmati. Also, the Bagmati zone is approaching a state of saturation as the growth of vehicles is maximum that the area can handle with majority of them being concentrated in the Kathmandu valley.

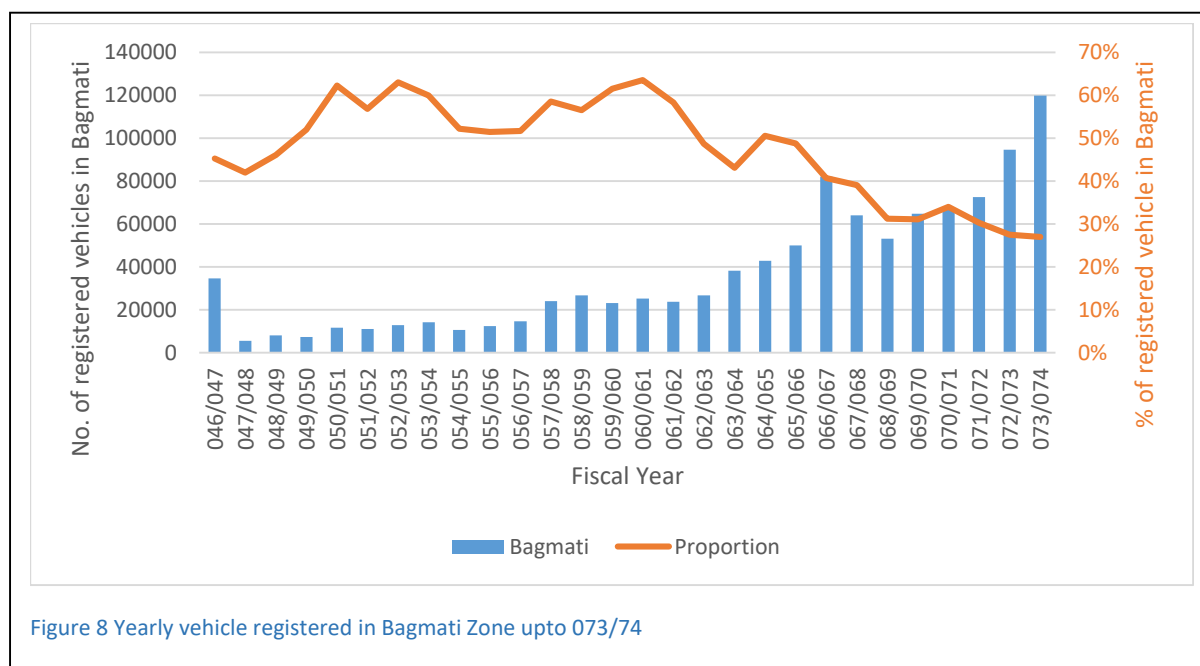


Figure 8 Yearly vehicle registered in Bagmati Zone upto 073/74

3.3.6.2 Vehicle ownership

According to the municipality profile, more than half of the households in the municipality do not own any vehicle. About 41% of the families have ownership of motorcycle and very few own a car on the family.

Table 12 Vehicle Ownership

Transportation service /Ward	1	2	3	4	5	6	7	8	9	Total	%
Bike	715	732	630	510	536	204	498	632	519	4976	41.4
Car private	40	43	31	26	18	14	17	14	21	224	1.9
Car business	10	6	9	5	8	3	9	3	18	71	0.6
Minibus/truck	20	12	3	6	7	0	4	7	3	62	0.5
Bus/tripper	5	11	3	4	4	3	5	13	5	53	0.4
Heavy equipment	1	1	0	0	1	2	1	5	5	16	0.1
No any vehicle	507	520	524	766	929	693	722	1049	899	6609	55.0
Total	1298	1325	1200	1317	1503	919	1256	1723	1470	12011	100.0

Source: Changunarayan Municipality Profile of 2074 BS

3.3.6.3 Traffic on road

The traffic vehicle count was conducted at eight different locations in Changunarayan municipality. Traffic vehicle count at various stations shows that more than three-fourth of the vehicles counted accounted for private vehicles (motorcycle 70%, car 8%). The passenger car unit (PCU) share, however, is only 52% (motorcycle 42%, car 10%). This further confirms the high rate of motorization, private vehicle ownership and use. The traffic trend in most of the stations shows that there is no peak period for travel. However, the traffic in Duwakot is slightly different from other stations as the morning peak period is 08:00 AM to 10:00 AM. The traffic then subsides till 12:45 PM and then it slightly rises to about 80% of morning peak and remains more or less constant throughout the rest of the day.

The highest number of traffic was observed at Duwakot Mod, the road to Duwakot. The second highest traffic is seen at Bhatkekopati (road to Nagarkot), where the peak traffic flow is observed to be during the evening time. As shown in the graph below, the traffic flow at all the stations experiences a state of fluctuation throughout the day.

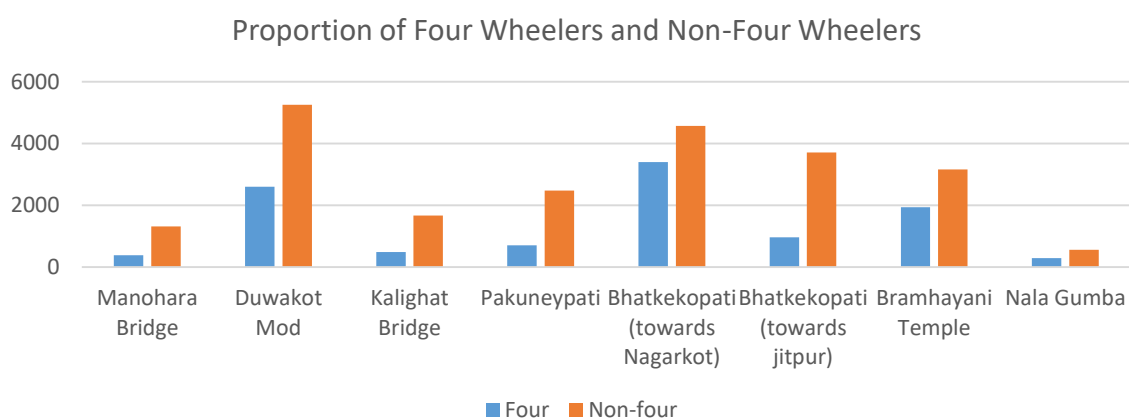


Figure 9 Proportion of different vehicles at TVC stations

The proportion of vehicles, as seen in the graph, shows that majority of vehicles at all the stations are two wheelers (non-four wheelers), with almost all of those being motorcycle. This indicates that the intervention on roads need to be focused majorly on two wheelers for the safety purpose as well.

The traffic vehicle count at different locations in the municipality shows that the flow of vehicle in majority of the surveyed roads, for an interval of 15 minutes, is highly fluctuating as shown in the graph below. This indicates that the vehicular movement is in its initial stages and has not reached to the level where traffic congestion is a terrifying problem. However, many bottlenecks have been identified that is causing for the congestion to occur at various places and this pattern of traffic flow may cause for a serious congestion at some places if left untreated.

The traffic vehicle survey carried out in this project shall be used as a baseline for utilizing further detailed study regarding traffic flow and management in the municipality, and many other researches to come.

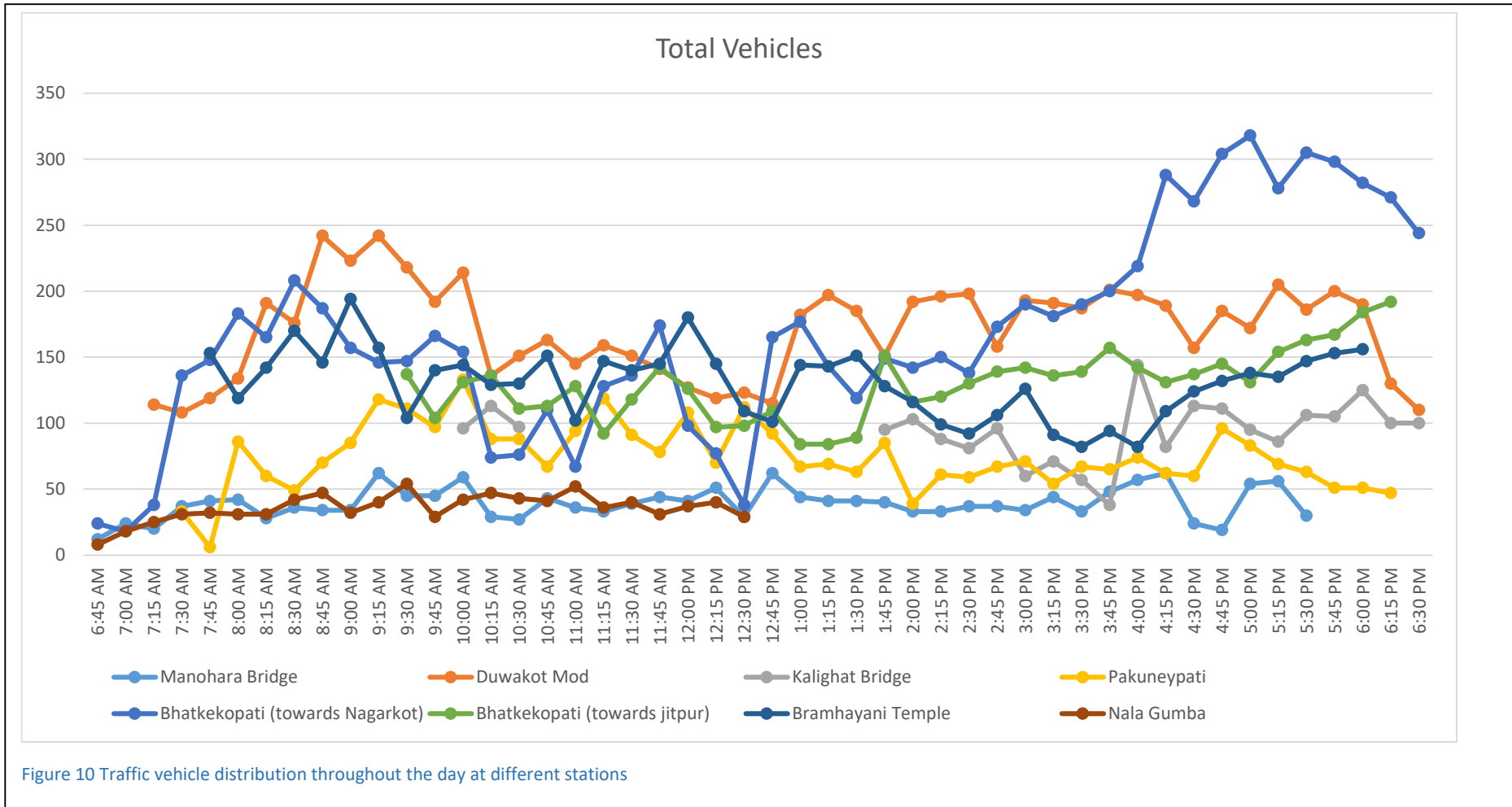


Figure 10 Traffic vehicle distribution throughout the day at different stations

The traffic volume at stations such as Nala Gumba and Kalighat bridge were counted for only half a day because of less number of traffic.

3.3.6.4 Speed of traffic

Speed is a basic parameter for accessing the level of service and capacity of road network. With increase in traffic volume, speed reduces, and so does the capacity of the road network. Even at the same day, speed has minimum value during peak hour and comparatively greater value during other time of the day. Speed differs for various road segment and also depend upon vehicle composition. Speed analysis helps to post speed limit and to improve geometric design parameters. The road infrastructure need to be planned and designed based on the design speed, and speed study helps to obtain the value. At any existing road section, the 85th percentile speed is taken as the upper speed limit for regulation. Similarly 15th percentile speed is lower speed limit, 98th percentile speed guides the design speed and other geometric parameter accordingly, and modal average speed represents the speed at which highest proportion of the vehicles ply at the particular section.

3.3.7 Road and road side infrastructures

The operation characteristic and level of service by the developed infrastructure depends on the road side amenities and infrastructure as well. These infrastructure includes shoulder, bus stop/ bus bay, footpath, traffic lights, signs and signal, etc.

3.3.7.1 Road way

Roadway is the total width of the road for the traffic. The total width of the roads vary from 1.5 m to 14 m based on the field observation. As shown in the figure aside, about half (155km) of the total road length have a total road width less than 6 m, as shown in the figure below.

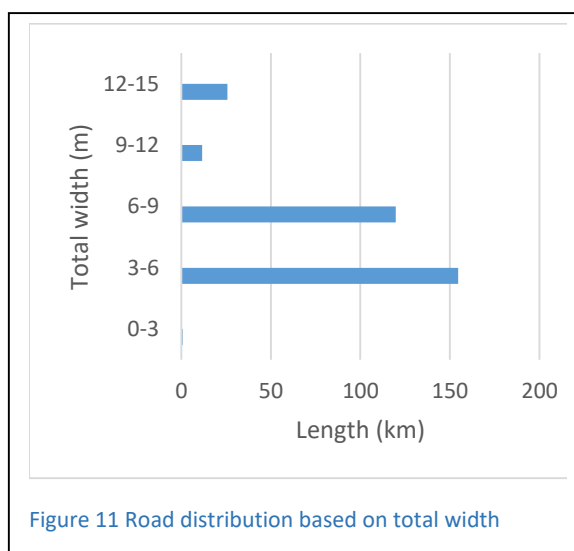


Figure 11 Road distribution based on total width

The carriageway width of the roads vary significantly from about a meter to 12 m. A major proportion of roads (>200 km) in the municipality have a carriageway width between 3 m and 6 m, which makes up the intermediate lane. Less than one-fourth of the total road length has two or more lanes with a carriageway width of >6m. About 7% of roads have a carriageway width of less than 3 m, i.e., single lane or less.

Only about one-third of the total road length is black topped (25%). About 37% of the road length is graveled while nearly 33% is earthen. Remaining length of the road surface is composed of stone, bricks, and cement concrete road surface.

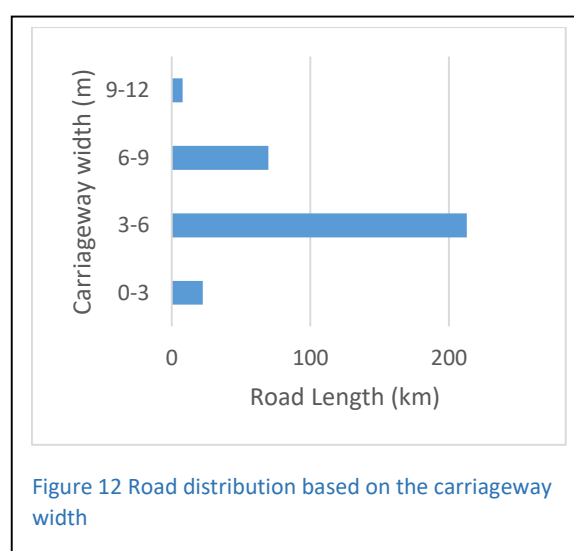


Figure 12 Road distribution based on the carriageway width

3.3.7.2 Traffic lights, signs and markings

There are no functional traffic lights in any road junction or stretch. Traffic lights along with signs and markings provide necessary information and directions to the road users for safe, efficient and comfortable travel. Therefore, they play a vital role in managing the traffic in the road network. Central line, lane delineation and road edge marking, stop line and zebra crossings, etc. are most abundantly used markings.

Further, traffic signs are also widely used. Most of the traffic signs used are either regulatory or warning. Owing to the haphazard parking, "No parking" sign is the most abundantly used traffic sign at and along the major road and alleys. But, major concern in the use of traffic signs and markings is their regular maintenance and comprehensive use. Traffic sign posts are often knocked down by wind or vehicle crashing into them or are worn-off with time, but are not repaired as there is no mechanism in place to report the damage to the concerned authority. Further, the unclear jurisdiction on the maintenance between the municipality, traffic police and department of roads has left many signs and markings unrepaired for long period of time.

3.3.7.3 Parking

The municipality does not consist of designated location for parking. Majority of vehicles plying in the municipality are parked at the roadside. No on-street or off-street parking facility is available except for some institutions. Some of the on-street parking causes congestion, pollution and sometimes resulting in accidents as well. The rapid motorization has been adding to the demand for parking, and with lack of sufficient off-street parking the roads have become easy excuse to park.

3.4 Trip characteristics

Any trips made can be directly or indirectly linked to economic activity. Trips are generally made to go to educational institutions, work place, markets and shopping centers and other places. They directly or indirectly contribute to barter of information, knowledge, goods and money. Transport is demanded to fulfil other needs and services. *Transport is a service rarely in demand for its own characteristics* (Cole, 2005). Most individuals travel because they wish to benefit from the social, recreational, educational, employment and other opportunities which become accessible with movement. Similarly, *freight transport opens up opportunities for greater efficiency in production and permits extensive geographical specialization with the accompanying benefits of increased division of labour* (Elgar, 2002). The demand depends on the spatial distribution and location of various infrastructures such as educational institutions, market and business centres, customer service outlets, industries etc. The trips are characterized by the reason for which it is made, trip distance, the choice of available mode options, etc.

3.4.1 Trip composition

From the data collected, about one-third people do not contribute in any trips. On average, a person makes less than 1 trip per day. There are two possible reasons for this – either all the facilities are available in the neighborhood, or the economic condition and occupation of the person does not require for trips to be made.

3.4.2 Purpose, Vehicle & destination

The daily trips made can be visualized based on their purpose, use of vehicle, destination, travel duration and time of travel. Such segregation allows better understand the demand for travel.

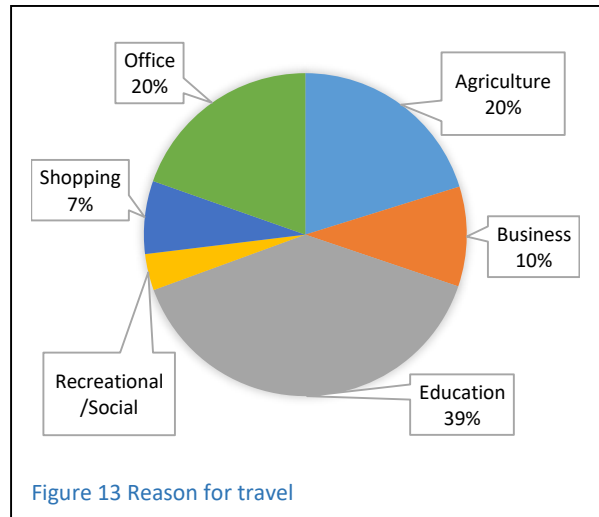


Figure 13 Reason for travel

3.4.2.1 Reason for travel

Among the total trips made by individuals, about 39% of the trips were for education purpose, followed by office and agriculture trips. The least proportion of trips were made for recreational/ social purpose at about 4%. The proportion of business trips is half the office trips.

3.4.2.2 Use of vehicle

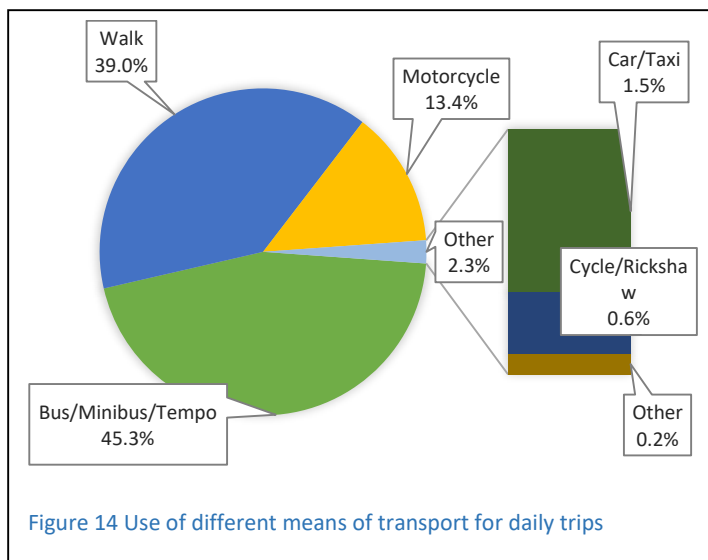


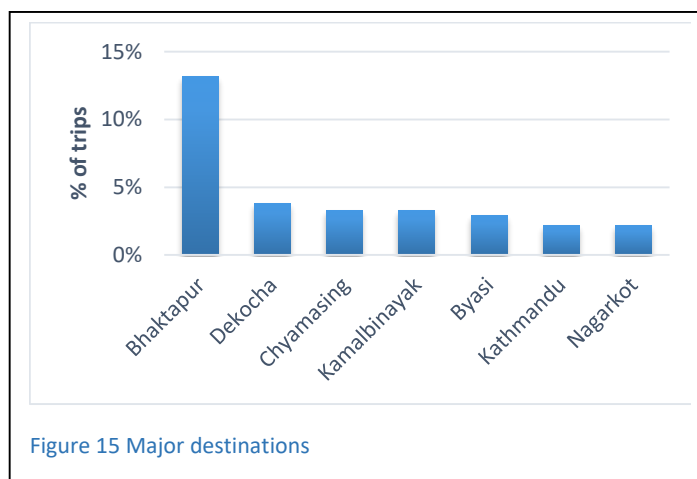
Figure 14 Use of different means of transport for daily trips

Travel choice is vastly affected by the vehicle (means of travel) available. As all the people cannot afford private mode of transport, access to public transport is necessary to all the areas of the city. The household survey conducted shows that most of the daily trips (45%) are made with the use of public transport. About 39% of the trips are made on foot. The share is followed by motorcycle occupying 13% of the trips and car or taxi with 1.5% of the trips. The proportion of population walking to reach the destination seems

to be in a large quantity, and the municipality roads do not contain proper footpaths for the pedestrian. So the roads need to be developed with footpaths on at least one side of the road.

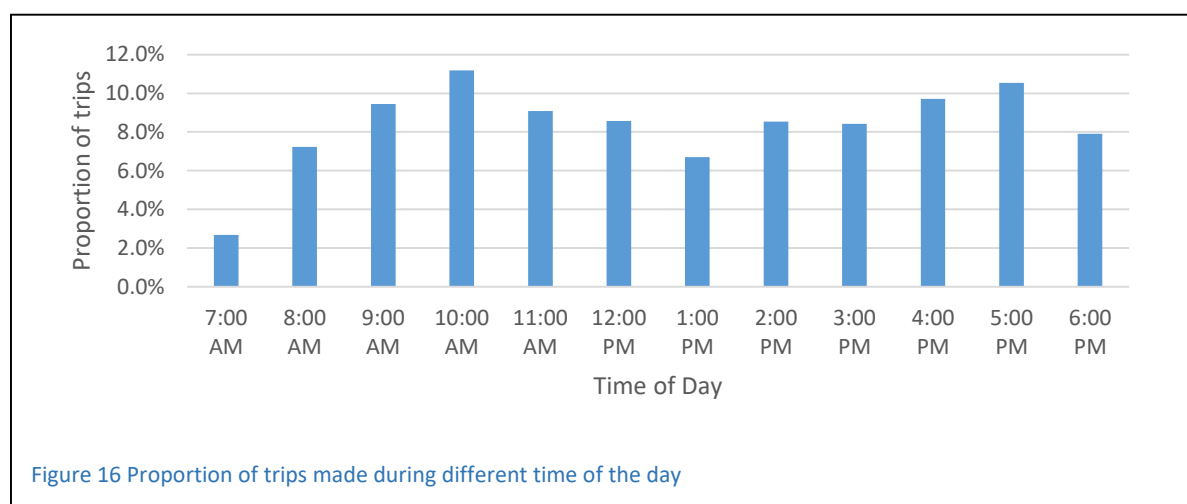
3.4.2.3 Major destination

Bhaktapur is the major destination (>12% of trips) among all the surveyed individuals, followed by Dekocha, Chyamasingh, Kamalbinayak and Byasi, each receiving more than 2% of the daily trips made.



3.4.2.4 Time of travel

The traffic vehicle count at different station shows that the peak period is around 10 am in the morning as shown in the figure below. The second peak, or evening peak begins from about 3 pm and max out at around 5 pm. The peaking of traffic at these two times need to be managed properly by applying necessary interventions depending on the location and type of traffic. The junctions such as Duwakot mod and Bhatkekopati needs to be studied in detail and necessary intersection improvement steps needs to be carried out for making the traffic flow easy and convenient for all.



3.5 Land use, transport & infrastructure

Most of the current land use distribution is supported by extensive road network and public transport routes but the provided infrastructure and services is quiet inadequate to carter the demand generated. Land use and transport are inextricably linked to each other. But, unplanned land use change has rendered transport sector inadequate to support the change.

The current trend in development follows the sequence of land use change induced transport intervention. While the proper plan should take these both factors concurrently. Internationally transit oriented development (TOD) has been another tool to plan the land use and infrastructure in the locality. TOD envisions the development along a road / transport corridor and plans for the transport network. Thus, both land use and transport are planned adjacently and developed accordingly. The transport system developed then attracts the planned land uses such as commercial, institutional or residential.

CHAPTER 4. FORECAST AND PLANNING

4.1 Population forecast

One of the major consideration in preparing plans is the time for which it is prepared. Since the development works will be implemented in the future and the expected results of the plan will be yield in some time in the future, it is necessary to predict the population for the time that the plan will generate desired results. So for the same purpose, the following formula is used to forecast the population in 2035 A.D.

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

Where, I = annual geometric growth rate = 3.15%

P = Present population=54,550 (From Municipality Profile 2018)

n = no. of year= 17 years

P_n = population at the end of 17th year

The total population of the municipality according to the CBS 2011 is 55,430. The municipality profile shows that the population has decreased in 2018 to 54,550. So in order to forecast the future population in the municipality, the population growth rate of World Bank 2016 AD for the urban area of Nepal has been used, which is 3.15 % per annum. By using this geometric method,

$$\begin{aligned} \text{Population at the end of 17 years } (P_{17}) &= 54,550 (1+3.15/100)^{17} \\ &= 92,421 \end{aligned}$$

The projected population of the municipality for the year 2035 A.D will be 92,421. By considering the growth rate of 3.15% per annum, the municipality population is expected to double to 1,09,100 in about 22 years, i.e., in 2040 A.D.

Table 13 Population projection of Changunarayan municipality

Population				Growth Rate (%)	Population Projection			
1991	2001	2011	2018		2020	2025	2030	2035
40,823	48,465	55,430	54,550	3.15	58,041	67,777	79,145	92,421

4.2 Indicative development potential

4.2.1 Gap Analysis

The planning norms and standards prepared by DUDBC published in 2013 has set the planning guideline for the urban area of different population size. As per the planning norms and standard, the urban areas with a population between 40,000 and 1,00,000 is considered as a city. Thus the Changunarayan municipality is considered to be a city on the basis of population also. There are several criteria mentioned in the standards varying from the size of road, water supply and sanitary

measures, electric supply, waste management, educational institutions, health institutions, stadiums, university, public library and so on.

4.2.1.1 Educational Sector

As per Planning norms and standards, it is stated that there should be 1 primary school for 3000 population within the distance of 0.4 to 0.8 km and 1 higher secondary school per 7500 population within a distance of 30 minutes by public vehicles. Similarly, there should be at least 1 Campus per 25000 population within a distance of 45 minutes by public vehicles and 1 University per 40,000 population should be within distance of 1 hour by Public Vehicles.

4.2.1.2 Health Institutions

As per Planning Norms, there should be 1 primary health care center per 20,000 population with 5-15 beds capacity, and 1 district hospital with 25-50 bed capacity per 50,000 population.

4.2.1.3 Open Space

There should be 5% of open space of the total city area. Accordingly, there should be 1 neighborhood park with play equipment of 0.4 hectare area for 800 population, 1 neighborhood park with play equipment of 1 hectare area for 10000 population, 1 local park of 2 hectare area for 20,000 population and 1 community park for each city.

4.2.1.4 Community Services

According to the standards for a city, one community level Library per 10,000 population of 0.5 hectare area and one Central Level Library is required. So, there will be need of at least 5 community level libraries and 1 central level library in the municipality.

Accordingly, there should be one fire station for 5 to 7 km radius of 0.5 hectare area. So, there will be a need of 3 to 4 fire stations. In case of religious institution, incineration / Crematorium area / Burial ground should be of 0.5 hectare per site. The national museum and Art Gallery should be of National level with a total area of 0.5 hectare/site.

Regarding Old age people, Orphanage, Centre for differently able people, Sanatorium, there should be 1 for 20,000 people of National or Regional Level of 0.3 hectare per site. For the security, there should be 1 police post per 10,000 population and 1 police station per 40,000 population of 0.1 ha/site and 0.5 ha/site respectively. And there should be one Exhibition Centre of National Level for 50,000 population of 4 ha/site.

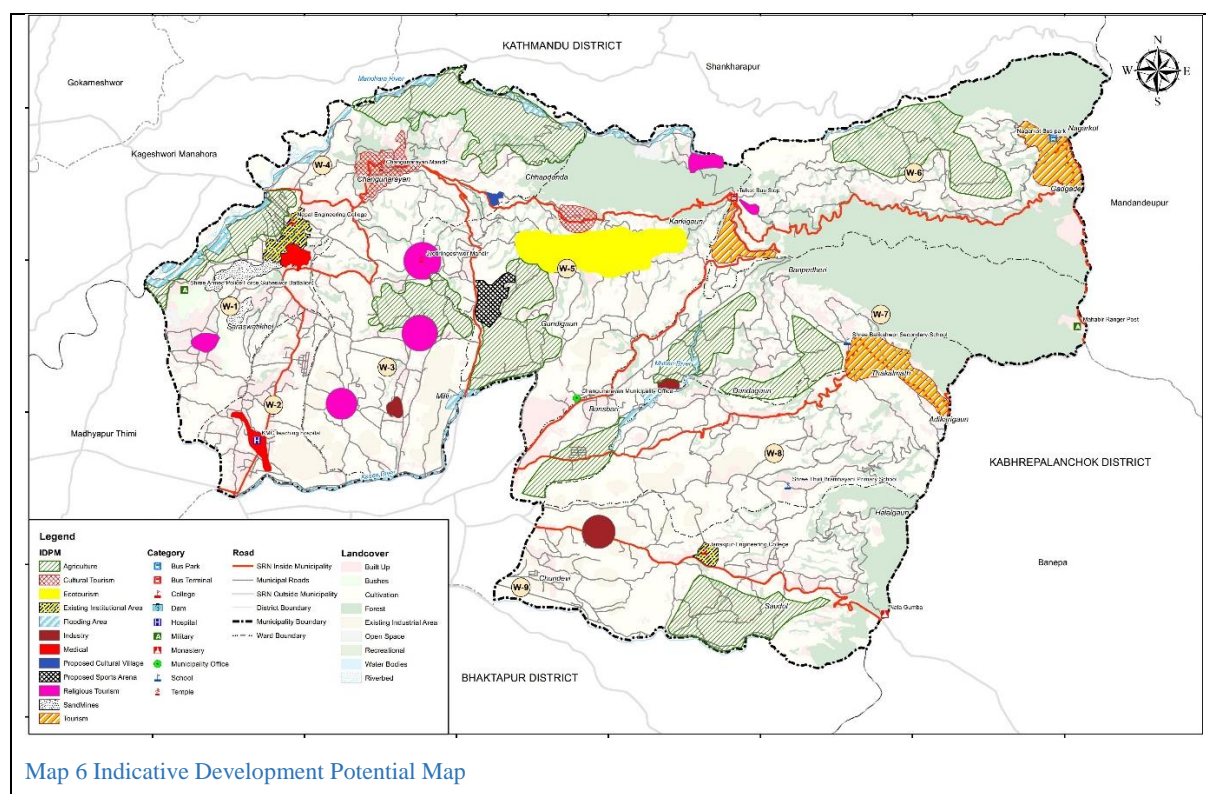
4.2.2 Indicative Development Plan

Changunarayan municipality has immense potential for development in various aspects. The major economic sectors of the municipality are education, tourism and health services. The presence of colleges for higher studies such as Nepal Engineering College (NEC), Janakpur Engineering College, (JEC) and Kathmandu Medical College (KMC) presents the high potential of the municipality to grow as an education hub for students in and around Kathmandu valley. Similarly, the municipality also has its strength in terms of tourism. The presence of UNESCO World Heritage Site, Changunarayan temple, attracts the tourists in a large number every year. In addition, Nagarkot, one of the major destinations of both domestic and foreign tourists is also located within the municipality. Changunarayan municipality can, therefore, be developed in terms of both religious as well as recreational tourism. The KMC hospital in the area also serves most of the locations in and outside the municipality. The

largest government hospital of the country, Bir Hospital, has plans to open its branch inside the municipality, which will further enable to serve the local people in that area as well as people residing in the peripheral region.

Furthermore, the municipality currently consists of large number of brick factories towards the eastern and southern region. However, there are plans to shift these industries from the present locations to a more convenient area. This will allow for an environmental friendly locality and development of other infrastructures.

Numerous studies have already been conducted in various development related activities and few more of such studies are being undertaken as this report is being prepared. Some of those projects are Integrated Urban Development Plan (IUDP), New Town Development, etc. The potential for the development has also been identified and proposed by these projects in the municipality area. The potential for development as identified by this project, Municipal Transport Master Plan, focuses more on the development of those infrastructures from transportation point of view and the interlinkage of transportation infrastructures with those other infrastructures.



4.3 Formulation of road hierarchy

A road hierarchy is a means of defining each roadway in terms of its function such that appropriate objectives for that roadway can be set and appropriate design criteria can be implemented. It is an important tool of road network and land use planning for asset management. A well-formed road hierarchy will reduce overall impact of traffic by concentrating longer distance flow onto routes in less sensitive locations, ensuring land uses and activities that are incompatible with traffic flow. Road hierarchy principles will assist planning agencies via orderly planning and provision of public transport routes, pedestrian and bicycle routes. It also identifies the effects of development decisions in and on

surrounding areas and roadways within the hierarchy and also facilitates urban design principles such as accessibility, connectivity, efficiency, amenity and safety. Further, it also identifies treatments such as barriers, buffers and landscaping to preserve amenity for adjacent land use.

To satisfy economy of movement, minimize air and noise pollution, achieve door-to-door delivery of drivers and passengers, and guarantee independence in route choice, networks of surface roads have been developed. Usually these are differentiated into freeways, highways, arterials (major and minor), local streets, and lanes or alleys (Golledge & Garling, 2003). There always is a conflict between accessibility and mobility. Therefore, to cater both, a network of roads serving the function of accessibility and mobility has to be planned. The roads of class D and C provides access while the roads of Class B and A are for mobility. The hierarchy from A to D shows reduction in mobility at the same time increased accessibility to land use.

The Terms of Reference issued by the Ministry of Federal Affairs and Local Development (MoFALD) has given set of road hierarchy that classifies the municipal roads into four classes as follows:

Table 14 Road hierarchy as per ToR

Class of road	Category	RoW
Class A	Main Collector Road	14 m
Class B	Other Collector Road	10 m
Class C	Main Tole Road	6 m
Class D	Other Road	4 m

This hierarchy is out dated as the national code for local roads dictated that the roads should be at least 6 m wide. Further, other documents suggest necessity of higher hierarchy of roads in an urban context. The planning norms and standards published by DUDBC in 2013, describes the necessity of following road hierarchy based on the population of the city.

Table 15 Road hierarchy for various urban areas based on planning norms and standards, 2013

Type of city	Population criteria	RoW of road (m)				
		Expressway	Arterial	Sub-arterial	Collector	Local
Sub-city	10,000-40,000	-	-	30	20	10
City	40,000-100,000	-	50	30	20	10
Sub-metro city	100,000-300,000	50	30	20	10	10

Source: Planning Norms and Standards 2013, GoN, DUDBC

A more detailed criteria for roads set by Planning Norms and Standards is provided in the table below:

Table 16 Detailed Road Hierarchy for City based on Planning Norms and Standards, 2013

	ROW	Setback	Footpath	Cycle Track
Arterial	30	1	2	2
Sub-Arterial	22	1	2	1.5
Collector	14	1	2	1.5
Local	10	1	2	-

Source: Planning Norms and Standards 2013, GoN, DUDBC

Similarly, according to the urban road standard 2068 (draft), the road of hierarchy of greatest width is Arterial road with RoW of 50-60 m for any urban area as tabulated below:

Table 17 Road hierarchy based on Nepal Urban Road Standard 2068 (Draft)

RoW of Road (m)				
Expressway	Arterial	Sub-arterial	Collector	Local
-	50-60	30-40	20-30	10-20

The road hierarchy defined by these standards and guidelines is based on the RoW of the road. Such explicit segregation of roads of different class might be a challenge in various locations in Changunarayan municipality because of the topography and because the road networks that have already been developed in most places. However, there is still a possibility of assigning these ROWs in some locations. This study therefore identifies different road hierarchy based on their function i.e. mobility and accessibility. The designated roads of each hierarchy may have a RoW between 6 m and 16 m varying at different sections within the same road.

As such, the road classification provided is functional classification. The specific characteristics is given below:

Class A Roads:

These roads provide connectivity to major administrative and commercial centers. They receive larger volume of traffic throughout the day and connects different strategic road networks. Their main function is to provide mobility to longer distance and to wider share of users. They provide frequent and interconnected public transport services. Recommended RoW for Class A roads is minimum 14m.

Class B Roads:

These roads also functions to provide mobility connecting Class A roads and SRN roads with each other. These along with Class A provides alternative routes to major trip attraction centers. Recommended RoW for class B roads is minimum 10 m.

Class C Roads:

These roads functions to link the local roads to higher hierarchy roads for greater mobility to travel longer distance. These roads functions as both accessibility road and mobility road. It provides mobility

to shorter trips and accessibility to longer trips. Recommended RoW for class C roads is minimum 8 m.

Class D roads:

These roads functions primarily as accessibility roads providing accessibility to individual households and property. Recommended RoW for class D roads is minimum 6m.

The list of roads of Class A, B and C are as follows:

Table 18 List of roads of Class A, B and C

Road Code	Class	Road Name	Wards Passed	ROW (in m)	Length (in km)
30701A001	A	Changunarayan Fast Track	1, 2, 3, 5, 6, 7, 8, 9	14.00	16.36
30701A002	A	Telkot - Bhattidada - hariguru marga sadak	6	14.00	7.72
30701A003	A	Mahankal Chowk - Yapi Bhairab School - Ganesh School - United Preparatory School - Ward no. 3 office - Thulo Byasi	3	14.00	1.84
30701A004	A	Chaap - Manohara	4	14.00	3.17
30701A005	A	Telkot - Chhyabasti - Panchamahalaxmi	5	14.00	1.83
30701A006	A	Bhaktapur Ringroad	7, 8, 9	14.00	7.09
30701A007	A	Pepsicola - Manohara - Nilbarahi - NEC Changu - Indrakholra - Telkot Road Bhaktapur	1, 4, 5	14.00	10.29
30701A008	A	Brahmayini-Sudal--Adhikarigaun	8, 9	14.00	7.99
30701A009	A	Ram Mandir - Manohara Lower Secondary School	1	14.00	0.39
30701A010	A	Yatu Mahadev Temple - Balmiki School - Shree Balikshwor Secondary School - Bagheti School	7, 8	14.00	4.75
30701A011	A	NEA Training Centre Road	7	14.00	0.58
30701B001	B	Nyacho Pauwa - Mane dada - Manohara	4	14.00	2.21
30701B002	B	Phaidhoka - Masandol - Chyaamasing	9	10.00	2.68
30701B003	B	Sakhu - Mangaltar - pauwa sadak	4	10.00	1.95
30701B004	B	Kharipati - Manakamana Temple	5	10.00	1.29
30701B005	B	Ganesh School (Duwakot) - Kasan khola - Haaku falcha	2, 3	10.00	2.26
30701B006	B	Kasan Khola - Golden Sungava School - KMC - Bode Planning	1, 2	10.00	2.60

Road Code	Class	Road Name	Wards Passed	ROW (in m)	Length (in km)
30701B007	B	Sangam Marga	9	14.00	0.88
30701B008	B	Duwakot Health post - Ward no. 1 office - phaidhoka ganesh - KMC Hostel	1, 2	10.00	1.86
30701B009	B	Suiti Khola Bridge - Pujaripati - Nala Gumba	9	10.00	1.92
30701B010	B	Sudal - Tathali Road	8, 9	10.00	1.26
30701B011	B	NEC Road	4	14.00	0.35
30701B012	B	Sangdaha - Nilo Pul - NEC	4	14.00	2.74
30701B013	B	Mandev Amrit Smriti School - Jagriti Chowk	3	12.00	0.77
30701B014	B	Pikhel Height - Jyoti Lingeswor - Mandev Amrit Smirti School	3, 4, 5	10.00	1.90
30701B015	B	Sainik School(Kharipati) - Ganesh Secondary School - Ward no. 5 office	5	14.00	2.32
30701B016	B	Adhikari Gaun Road	8	10.00	0.75
30701B017	B	Sudal - Bageshwori Road	8	10.00	0.44
30701B018	B	Bageshwori - Bhadrakali	7	10.00	1.41
30701B019	B	Dada gaun - Ratopati	8	10.00	0.59
30701B020	B	Ngyabu - Hanuman Chowk (Ratopati)	8	10.00	1.26
30701B021	B	JEC Road	9	10.00	0.66
30701B022	B	Phaidhoka - Saudol	9	14.00	0.90
30701B023	B	Tathali pul - Ward no. 9 office	9	10.00	0.56
30701B024	B	Jitpur - Sudal	8	10.00	1.92
30701B025	B	Saraswotikhel Buspark - Saraswoti Temple	1	14.00	1.12
30701B026	B	Jagriti Chowk - Gelal gaun Chowk	3	10.00	0.99
30701B027	B	Radakrishna School - Trishul Dada	7	10.00	0.28
30701C001	C	KMC Hospital - KMC Hostel	2	10.00	0.58
30701C002	C	Eco Brick Road	7	8.00	0.87
30701C003	C	Radhakrishna School - Trishul Dada	5	8.00	0.24
30701C004	C	Balikhswor Secondary School - Bojini - Kalamasi	7, 8	8.00	3.14
30701C005	C	Jharna Road	7, 8	8.00	0.71
30701C006	C	Mohan pokhari - Bageshwori Road	7	8.00	0.58
30701C007	C	Ganesh Primary School - Ward no 7 office	7	8.00	0.49
30701C008	C	Bageshwori Health Post - Pipeline Road	7	8.00	1.48

Road Code	Class	Road Name	Wards Passed	ROW (in m)	Length (in km)
30701C009	C	Pipeline Road	6, 7	9.00	2.95
30701C010	C	Saraswotikhel besi shiva mandir - Somthali ganesh	1	10.00	0.32
30701C011	C	Duhkharaneshwor - Phaidhoka Ganesh	2	8.00	0.45
30701C012	C	Masandol - Chyaamasing	9	8.00	1.55
30701C013	C	Nagarkot Road - Bangerukh - Gadgade	6	8.00	2.60
30701C014	C	Ward no. 6 - Jalpadevi - Nagarkot Road	6	8.00	1.84
30701C015	C	Chaturbahu Narayan Temple - Phaidhoka Ganesh	1, 2	8.00	1.08
30701C016	C	Chhetrapal Ganesh - Fullbright School	3	10.00	1.01
30701C017	C	Bhattidada - Manohara	6	8.00	0.77
30701C018	C	Rokagaun - Jagriti Vidhya Sadan School	1	14.00	0.51
30701C019	C	Ghumaune - Radhakrishna School	5	10.00	1.39
30701C020	C	Bhaju Bhairav temple - Radhakrishna School	5	10.00	1.34
30701C021	C	Municipality Office - Bhaju Bhairav Temple	5, 7	8.00	1.33
30701C022	C	Chhaling - Ganesh Temple	5	8.00	0.55
30701C023	C	Pakunepati - Begbinayak Temple	5	8.00	0.95
30701C024	C	Gyan jyoti School - Pikhel Height	5	8.00	0.69
30701C025	C	Trishul Dada - Mandev Club	4, 5	10.00	2.55
30701C026	C	Changunarayan Healthpost Road	5	8.00	0.40
30701C027	C	Manedada Road Agriculture Road	4	10.00	0.78
30701C028	C	Sanchukcha - NEC	4	8.00	1.05
30701C029	C	Tauthali Primary School - Nagarkot Road	6	8.00	0.58
30701C030	C	Kalodhara pati pul - dobu - kasula tol - sundar thali	2, 3	10.00	2.32
30701C031	C	Phaidhoka - Dobu	2, 3	8.00	0.52
30701C032	C	Kalighat Bridge - Dobu	3	10.00	0.81
30701C033	C	Khwopa College - Suwal Tole	3, 5	10.00	1.55
30701C034	C	Kamalpokhari Chowk - Lakila Chowk	3	10.00	1.38
30701C035	C	Lakila Chowk - Bhutte Khola	3	10.00	0.16
30701C036	C	Bhutte Khola Corridor	3, 4, 5	10.00	5.06
30701C037	C	Manohara Corridor	5	8.00	0.91

Road Code	Class	Road Name	Wards Passed	ROW (in m)	Length (in km)
30701C038	C	Kulpakot - Sangadaha	4	10.00	1.21
30701C039	C	Khasangkhusung Corridor	1, 4	14.00	0.49
30701C040	C	Manohara Corridor	1, 4, 5	8.00	3.63
30701C041	C	Pauwa - Sanchukcha	4	8.00	1.07
30701C042	C	Kasan Khola Corridor	2, 3, 5	8.00	3.78
30701C043	C	TabyaKhusi Corridor	9	8.00	1.63
30701C044	C	Azad School - Chhinnamasta Durga Temple	3	10.00	1.91
30701C045	C	Gwal Daha - Jyotilingeshwor	4	10.00	0.89
30701C046	C	Sudal Chowk - Panchakanya School	8	8.00	1.69
30701C047	C	Ward no 3 office - Chhetrapal Ganesh	3	8.00	0.90
30701C048	C	Mahadev Khola Corridor	6, 7, 8, 9	8.00	4.17
30701C049	C	KMC Hospital - Phaidhoka Ganesh - Saraswati School - Saraswotikhel bus stop	1	14.00	1.19
30701C050	C	Saraswotikhel Buddha Stupa Road	1	10.00	0.63
30701C051	C	Bamikeshwor - Chareli	7	8.00	0.70
30701C052	C	Tathali pul - Rautetol - Halalgaun	9	8.00	2.03

The distribution of the proposed road hierarchy and network is composed of 62.02 Km of Class A roads, about 37.87 Km of Class B roads, 71.34 Km of Class C roads and about 111 Km of Class D roads.

4.4 Prioritization of investment

Prioritization is a method of scoring the relative importance and urgency of intervention so that the investment may result in maximum output or maximum service. Alternatively, it minimizes per capita cost of provision of infrastructure and services. Prioritization scores each road based on its characteristics and service it provides, sum of which reflects the relative importance of each road with respect to other roads. It helps to reduce individual's influence in the investment plan.

The proposed scoring criteria and weightage is given below:

Population served: Population served reflects the service provided by the roads. Higher the number of population served, greater is the importance of the road in the road network system. Therefore, it has been taken as an important criteria.

Road width: The existing width of the road in relation to its designated class reflects the ease of construction and reduction in cost of construction.

Local Demand: It is one of the major factor that determines the importance of a road in the network. The people use the road in daily basis and thus have good idea of necessity of intervention and urgency of the intervention. Therefore, their judgement in prioritizing the interventions in road is crucial but not the only factor.

4.5 Perspective plan of transportation

Perspective plan of transport is a long term strategic plan which sets the long term objective, target and milestone for a focused direction of better coordination, guidance and harmonization of the investment for the prosperity of the municipality and development in the regional context. The MTPP gives a basic framework for the period of 20 years; a broad outline on how the transport sector should evolve and look like so that local and regional harmony on accessibility and mobility is achieved. The long term perspective plan of Changunarayan Municipality involves widening of the narrow roads whose RoW have already been fixed by the municipality building byelaws and implementation of traffic management strategies for safe, efficient and reliable transport infrastructure and services.

The long term perspective plan is segregated into short term plan, medium term plan and long term plan. The MTMP and MTPP should be revised every five years to update the plans based on changing scenario.

4.5.1 Short term plan

Short term plan refers to maintenance and upgrading of the existing road network to a specific standard that can support the present and recent future (5 years) demand. It will pave the way for well managed and better transport to be developed in the medium to long term. The short term plan also includes construction of new roads to provide basic accessibility to settlements. The short term plan gives a physical and financial implementation plan to implement the planned road network and services. The interventions are prioritized according to developed prioritization criteria and budget required/available.

The applied interventions in the short term maintains and generates demand for higher hierarchy roads with proposed infrastructures. The short term plan in case of an urbanized area should pave the way to implement proper management plans in the future. This means, construction / upgradation of the existing roads to their full extent in the short term plan.

4.5.2 Medium term plan

The medium term plan is for the time period of ten years from year one to year ten. This period should formulate necessary policies, rules and guidelines, and plans to implement and enforce urban road discipline, pedestrian friendly infrastructure, environment friendly roads, differently-abled and age friendly roads, and sustainable infrastructures in the long term. The medium term plan may also include piloting of such management plans which may include one-way roads, restricted vehicle use at specific area, etc.

The best way to implement traffic management is to conduct comprehensive dialogue with the local residents and other stakeholders at local level to identify the actual users, their need and infrastructure gap. Based on local conditions and use, plans to divert thorough traffic, reduce the average speed around residential area, educational institutions and hospitals should be formulated and administered.

4.5.3 Long term plan

The long term vision of the municipality is to develop the road network to their proposed width with roads providing equitable opportunity of use for all sorts of users. The vision is to create a safe, equitable, sustainable transport network infrastructure and services to support people's mobility and make the economy vibrant for social and economic prosperity. The policies prepared during the medium time period will pave the way towards implementing traffic and transport management plan at local level.

CHAPTER 5. MUNICIPAL TRANSPORT MASTER PLAN (MTMP)

5.1 Financial institutions

Road is a basic infrastructure that drives the economy of any area or region. It is public space and is shared by different road users. Therefore, it is the responsibility of the government to provide the necessary road infrastructure for the uninterrupted and smooth movement of goods and people for higher economic activities. But the government alone cannot fund the investments as road investments are huge. Therefore it is necessary to explore other possible financial institutions and funding agencies who can invest in the road infrastructure.

Capital investment plan is essential to support local government in developing good and best practice in construction, upgrading, overall asset management and especially operation and maintenance of the road projects. The most common sources of funding which are investing in the road sectors in Changunarayan Municipality and other cities in Nepal are listed and summarized below:

- Users' participation
- Municipality office's internal revenue
- State/central government
- Regional line agencies
- Donor agencies, NGO, INGO, etc.
- Town Development Fund (TDF)
- Department of Urban Development and Building Construction (DUDBC)

In recent days, the involvement of the **local users** (end beneficiaries) of the road projects and interventions have been the driving factor for the construction and maintenance of the road infrastructure. Their involvement helps to create informed, responsible and accountable citizens in the community. It also generates a sense of ownership and thus promote preservation and proper use of the infrastructure and the facilities. Such involvement is essential to construct and maintain the local roads if not higher hierarchy roads. People's participation can be ensured through different methods – direct investment, free labour, maintenance, tree plantation, cleanliness, etc.

Municipality Office has the major role in developing the overall infrastructure within the municipal boundary. It is the local government responsible of preparing the necessary framework and implementing policies and strategies for the planned and sustainable development of the necessary infrastructures and facilities. As road infrastructure supports other infrastructure and facilities, the role of municipality in the development and maintenance of the road infrastructure is further pronounced. A major share of the municipal budget is generated from the revenue collected from taxes and service charge, and should be allocated to provide infrastructure and service such as maintenance of the roads and construction of wider roads to meet the planned class and ROW. The annual program should address the local need and the need of emergency and specific maintenance. Specific roads should be constructed as a whole and not in parts for longer period of time.

Under the new federal structure of the nation, the **federal or state government** may also contribute to the development of the major urban roads. The involvement and contribution of the local level government is certainly required and will support the development of transport sector throughout the nation.

Other **institutions and line agencies** working in the field of development of local and regional roads also play important role in the development of the municipal roads. Normally, these institutions invest in the roads that are important in a regional context, rather than local small area context.

Town Development Fund (TDF) and **Urban Development and Building Office (UDBO)** are governmental funding agencies which contributes to the development of emerging town and cities. They can be a major source of fund for major urban road projects in Changunarayan Municipality.

Like the line agencies, there are many donor funded projects run by NGOs and INGOs in the sector of road and other infrastructure development. The development of wider roads of higher hierarchy required greater amount of investment and, technical and administrative capacity which may be lacking with the local body and institutions. Such projects are implemented through donor funded projects. KVDA (KVRIP) are examples of such projects. They can be important sources of investment for major roads of the municipality.

5.2 Municipal budget: trend and projection

The municipal budget for road and road side infrastructures has been rapidly increasing in the past years. After the local level restructuring, the budget has more than doubled from 7.31 crore in the fiscal year 2074/75 to 15 Crore in the fiscal year 2075/76. After that, the budget has increased by 65.9% in the fiscal year 2076/77. The total budget required in the MTMP for a period of 15 years is 20.31 Arba. With this requirement and assuming a growth rate of 15% for the first fiscal year and then a steady growth rate of 20% per annum thereafter, the total budget required in the fiscal year of 2077/78 for road and road side infrastructures is 29.40 crore, and for the first five years is Rs. 2.109 Arba. The trend for the budget dissemination is shown in the figure below.

Year	Amount	Increment
2073/74	53,142,030	
2074/75	73,150,000	37.65%
2075/76	150,000,000	105.06%
2076/77	248,850,000	65.90%
2077/78	294,042,478	18.16%
2078/79	338,148,850	15.00%
2079/80	405,778,620	20.00%
2080/81	486,934,343	20.00%
2081/82	584,321,212	20.00%

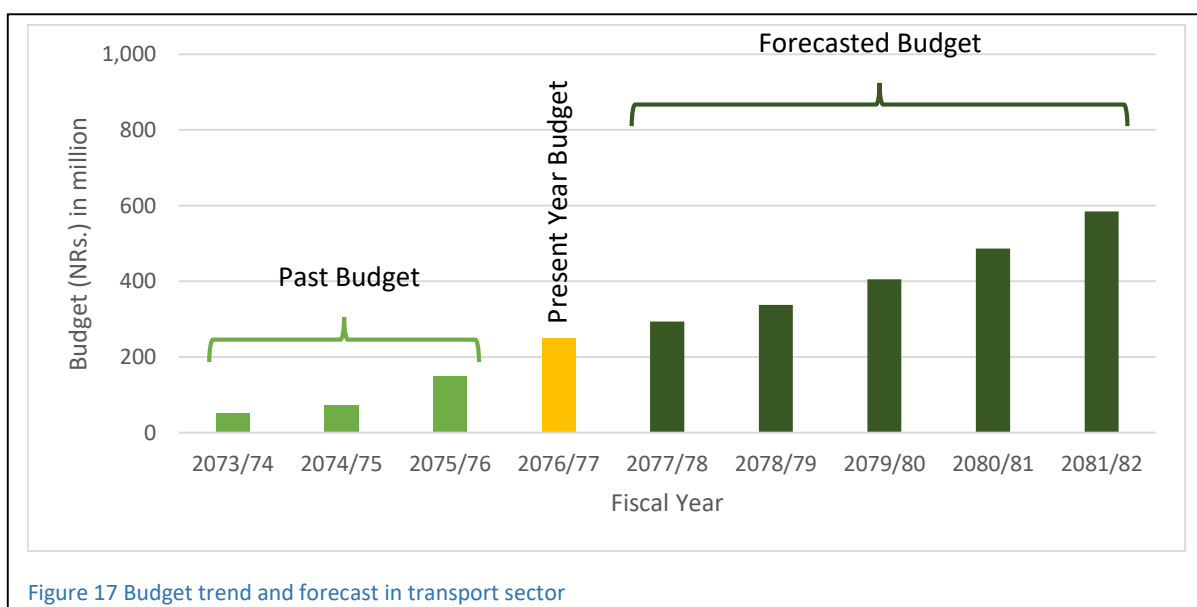


Figure 17 Budget trend and forecast in transport sector

5.3 Financial investment plan

Based on the prioritization criteria, the roads have been prioritized. The investment should follow the prioritization list as given below.

Table 19 Rank of each of the proposed road class A, B and C

Municipal Code	Road Name	Overall Rank	Rank in Class
30701A001	Changunarayan Fast Track	3	3
30701A002	Telkot - Bhattidada - hariguru marga sadak	2	2
30701A003	Mahankal Chowk - Yapi Bhairab School - Ganesh School - United Preparatory School - Ward no. 3 office - Thulo Byasi	6	6
30701A004	Chaap - Manohara	9	9
30701A005	Telkot - Chhyabasti - Panchamahahalaxmi	14	10
30701A006	Bhaktapur Ringroad	5	5
30701A007	Pepsicola - Manohara - Nilbarahi - NEC Changu - Indrakholsa - Telkot Road Bhaktapur	7	7
30701A008	Brahmayini-Sudal--Adhikarigaun	4	4
30701A009	Ram Mandir - Manohara Lower Secondary School	18	11
30701A010	Yatu Mahadev Temple - Balmiki School - Shree Balikshwor Secondary School - Bagheti School	1	1
30701A011	NEA Training Centre Road	8	8
30701B001	Nyacho Pauwa - Mane dada - Manohara	88	21
30701B002	Phaidhoka - Masandol - Chyaamasing	24	5
30701B003	Sakhu - Mangaltar - pauwa sadak	25	6
30701B004	Kharipati - Manakamana Temple	26	7
30701B005	Ganesh School (Duwakot) - Kasan khola - Haaku falcha	46	14
30701B006	Kasan Khola - Golden Sungava School - KMC - Bode Planning	36	11
30701B007	Sangam Marga	90	22
30701B008	Duwakot Health post - Ward no. 1 office - phaidhoka ganesh - KMC Hostel	12	2
30701B009	Suiti Khola Bridge - Pujaripati - Nala Gumba	39	12
30701B010	Sudal - Tathali Road	79	20
30701B011	NEC Road	169	26
30701B012	Sangdaha - Nilo Pul - NEC	44	13
30701B013	Mandev Amrit Smriti School - Jagriti Chowk	264	27
30701B014	Pikhel Height - Jyoti Lingeshwor - Mandev Amrit Smirti School	95	24
30701B015	Sainik School(Kharipati) - Ganesh Secondary School - Ward no. 5 office	15	3
30701B016	Adhikari Gaun Road	62	17
30701B017	Sudal - Bageshwori Road	73	19
30701B018	Bageshwori - Bhadrakali	29	9
30701B019	Dada gaun - Ratopati	70	18
30701B020	Ngyabu - Hanuman Chowk (Ratopati)	61	16
30701B021	JEC Road	94	23
30701B022	Phaidhoka - Saudol	23	4
30701B023	Tathali pul - Ward no. 9 office	158	25
30701B024	Jitpur - Sudal	51	15
30701B025	Saraswotikhel Buspark - Saraswoti Temple	11	1

Municipal Code	Road Name	Overall Rank	Rank in Class
30701B026	Jagriti Chowk - Gelal gaun Chowk	27	8
30701B027	Radakrishna School - Trishul Dada	32	10
30701C001	KMC Hospital - KMC Hostel	42	11
30701C002	Eco Brick Road	55	17
30701C003	Radhakrishna School - Trishul Dada	35	9
30701C004	Balikshwor Secondary School - Bojini - Kalamasi	56	18
30701C005	Jharna Road	80	23
30701C006	Mohan pokhari - Bageshwori Road	60	21
30701C007	Ganesh Primary School - Ward no 7 office	218	44
30701C008	Bageshwori Health Post - Pipeline Road	21	7
30701C009	Pipeline Road	16	3
30701C010	Saraswotikhel besi shiva mandir - Somthali ganesh	17	4
30701C011	Duhkharaneshwor - Phaidhoka Ganesh	64	22
30701C012	Masandol - Chyaamasing	54	16
30701C013	Nagarkot Road - Bangerukh - Gadgade	52	14
30701C014	Ward no. 6 - Jalpadevi - Nagarkot Road	53	15
30701C015	Chaturbahu Narayan Temple - Phaidhoka Ganesh	122	31
30701C016	Chhetrapal Ganesh - Fullbright School	282	49
30701C017	Bhattidada - Manohara	20	6
30701C018	Rokagaun - Jagriti Vidhya Sadan School	151	37
30701C019	Ghumaune - Radhakrishna School	50	13
30701C020	Bhaju Bhairav temple - Radhakrishna School	48	12
30701C021	Municipality Office - Bhaju Bhairav Temple	57	19
30701C022	Chhaling - Ganesh Temple	199	43
30701C023	Pakunepati - Begbinayak Temple	123	32
30701C024	Gyan jyoti School - Pikhel Height	101	26
30701C025	Trishul Dada - Mandev Club	93	25
30701C026	Changunarayan Healthpost Road	147	35
30701C027	Manedada Road Agriculture Road	183	40
30701C028	Sanchukcha - NEC	138	34
30701C029	Tauthali Primary School - Nagarkot Road	120	30
30701C030	Kalodhara pati pul - dobu - kasula tol - sundar thali	13	2
30701C031	Phaidhoka - Dobu	179	39
30701C032	Kalighat Bridge - Dobu	366	52
30701C033	Khwopa College - Suwal Tole	132	33
30701C034	Kamalpokhari Chowk - Lakila Chowk	19	5
30701C035	Lakila Chowk - Bhutte Khola	189	42
30701C036	Bhutte Khola Corridor	278	48
30701C037	Manohara Corridor	112	27
30701C038	Kulpakot - Sangadaha	114	28
30701C039	Khasangkhusung Corridor	262	46
30701C040	Manohara Corridor	331	50
30701C041	Pauwa - Sanchukcha	148	36
30701C042	Kasan Khola Corridor	357	51

Municipal Code	Road Name	Overall Rank	Rank in Class
30701C043	TabyaKhusi Corridor	30	8
30701C044	Azad School - Chhinnamasta Durga Temple	228	45
30701C045	Gwal Daha - Jyotilingeshwor	162	38
30701C046	Sudal Chowk - Panchakanya School	86	24
30701C047	Ward no 3 office - Chhetrapal Ganesh	277	47
30701C048	Mahadev Khola Corridor	187	41
30701C049	KMC Hospital - Phaidhoka Ganesh - Saraswati School - Saraswotikhel bus stop	10	1
30701C050	Saraswotikhel Buddha Stupa Road	41	10
30701C051	Bamikeshwor - Chareli	59	20
30701C052	Tathali pul - Rautetol - Halalgaun	119	29

The detailed distribution of budget for all the planned roads of class A, B and C for a total of 15 years is given in the table below:

Table 20 Budget and ROW for each of the proposed road class A, B and C

S. N.	Rank	Code	Total Cost ('000)	Cost per km per 2 lanes ('000)	Class	Length (in km)	ROW (in m)	Road Area (sq.m)	Length of 2 Lanes
1	1	30701A010	357,603.35	37,632.49	A	4.8	14	66.5	9.5
2	2	30701A002	679,866.10	44,040.97	A	7.7	14	108.1	15.4
3	3	30701A001	1,718,363.03	52,529.09	A	16.4	14	229.0	32.7
4	4	30701A008	595,093.89	37,217.78	A	8.0	14	111.9	16.0
5	5	30701A006	571,830.09	40,321.86	A	7.1	14	99.3	14.2
6	6	30701A003	147,337.68	39,968.06	A	1.8	14	25.8	3.7
7	7	30701A007	1,076,663.45	52,305.63	A	10.3	14	144.1	20.6
8	8	30701A011	43,156.86	37,111.60	A	0.6	14	8.1	1.2
9	9	30701A004	239,438.00	37,740.44	A	3.2	14	44.4	6.3
10	10	30701C049	30,323.78	12,772.16	C	1.2	14	16.6	2.4
11	11	30701B025	47,704.66	21,225.47	B	1.1	14	15.7	2.2
12	12	30701B008	80,072.79	30,087.24	B	1.9	10	18.6	2.7
13	13	30701C030	46,854.72	14,142.83	C	2.3	10	23.2	3.3
14	14	30701A005	144,447.37	39,401.47	A	1.8	14	25.7	3.7
15	15	30701B015	109,175.16	23,516.95	B	2.3	14	32.5	4.6

S. N.	Rank	Code	Total Cost ('000)	Cost per km per 2 lanes ('000)	Class	Length (in km)	ROW (in m)	Road Area (sq.m)	Length of 2 Lanes
16	16	30701C009	66,527.28	17,563.92	C	2.9	9	26.5	3.8
17	17	30701C010	6,433.71	14,190.86	C	0.3	10	3.2	0.5
18	18	30701A009	29,940.37	38,646.90	A	0.4	14	5.4	0.8
19	19	30701C034	28,172.37	14,338.21	C	1.4	10	13.8	2.0
20	20	30701C017	15,695.41	17,738.57	C	0.8	8	6.2	0.9
21	21	30701C008	30,082.08	17,738.57	C	1.5	8	11.9	1.7
22	23	30701B022	40,569.03	22,484.79	B	0.9	14	12.6	1.8
23	24	30701B002	109,424.85	28,633.51	B	2.7	10	26.8	3.8
24	25	30701B003	79,589.20	28,531.46	B	2.0	10	19.5	2.8
25	26	30701B004	54,852.07	29,848.80	B	1.3	10	12.9	1.8
26	27	30701B026	44,241.47	31,278.37	B	1.0	10	9.9	1.4
27	29	30701B018	125,080.40	61,962.40	B	1.4	10	14.1	2.0
28	30	30701C043	40,781.76	21,958.69	C	1.6	8	13.0	1.9
29	32	30701B027	11,401.84	28,738.91	B	0.3	10	2.8	0.4
30	35	30701C003	4,812.26	17,649.43	C	0.2	8	1.9	0.3
31	36	30701B006	106,812.24	28,754.22	B	2.6	10	26.0	3.7
32	39	30701B009	78,605.13	28,679.54	B	1.9	10	19.2	2.7
33	41	30701C050	12,697.88	14,190.86	C	0.6	10	6.3	0.9
34	42	30701C001	13,900.80	16,810.71	C	0.6	10	5.8	0.8
35	44	30701B012	115,965.13	21,148.75	B	2.7	14	38.4	5.5
36	46	30701B005	97,561.13	30,214.05	B	2.3	10	22.6	3.2
37	48	30701C020	30,029.91	15,713.77	C	1.3	10	13.4	1.9
38	50	30701C019	81,706.27	41,252.85	C	1.4	10	13.9	2.0
39	51	30701B024	145,863.09	53,180.50	B	1.9	10	19.2	2.7
40	52	30701C013	55,319.54	18,652.58	C	2.6	8	20.8	3.0
41	53	30701C014	38,780.07	18,473.33	C	1.8	8	14.7	2.1

S. N.	Rank	Code	Total Cost ('000)	Cost per km per 2 lanes ('000)	Class	Length (in km)	ROW (in m)	Road Area (sq.m)	Length of 2 Lanes
42	54	30701C012	31,341.36	17,702.19	C	1.5	8	12.4	1.8
43	55	30701C002	71,274.68	72,071.33	C	0.9	8	6.9	1.0
44	56	30701C004	71,677.36	19,982.73	C	3.1	8	25.1	3.6
45	57	30701C021	26,819.08	17,649.43	C	1.3	8	10.6	1.5
46	59	30701C051	14,173.14	17,738.57	C	0.7	8	5.6	0.8
47	60	30701C006	11,724.22	17,738.57	C	0.6	8	4.6	0.7
48	61	30701B020	55,245.97	30,752.47	B	1.3	10	12.6	1.8
49	62	30701B016	30,731.74	28,695.89	B	0.7	10	7.5	1.1
50	64	30701C011	9,107.67	17,738.57	C	0.4	8	3.6	0.5
51	70	30701B019	24,023.27	28,738.91	B	0.6	10	5.9	0.8
52	73	30701B017	18,026.20	28,738.91	B	0.4	10	4.4	0.6
53	79	30701B010	51,910.53	28,738.91	B	1.3	10	12.6	1.8
54	80	30701C005	14,321.70	17,738.57	C	0.7	8	5.7	0.8
55	86	30701C046	34,344.92	17,734.95	C	1.7	8	13.6	1.9
56	88	30701B001	93,811.76	21,200.53	B	2.2	14	31.0	4.4
57	90	30701B007	35,908.34	20,488.52	B	0.9	14	12.3	1.8
58	93	30701C025	51,607.65	14,165.30	C	2.6	10	25.5	3.6
59	94	30701B021	27,131.14	28,675.74	B	0.7	10	6.6	0.9
60	95	30701B014	80,822.42	29,833.92	B	1.9	10	19.0	2.7
61	101	30701C024	13,939.68	17,649.43	C	0.7	8	5.5	0.8
62	112	30701C037	18,659.10	17,922.91	C	0.9	8	7.3	1.0
63	114	30701C038	24,350.91	14,119.54	C	1.2	10	12.1	1.7
64	119	30701C052	94,792.88	40,906.19	C	2.0	8	16.2	2.3
65	120	30701C029	11,692.27	17,738.57	C	0.6	8	4.6	0.7
66	122	30701C015	21,796.83	17,675.39	C	1.1	8	8.6	1.2
67	123	30701C023	19,268.14	17,738.57	C	1.0	8	7.6	1.1

S. N.	Rank	Code	Total Cost ('000)	Cost per km per 2 lanes ('000)	Class	Length (in km)	ROW (in m)	Road Area (sq.m)	Length of 2 Lanes
68	132	30701C033	31,462.42	14,200.21	C	1.6	10	15.5	2.2
69	138	30701C028	21,145.72	17,690.70	C	1.0	8	8.4	1.2
70	147	30701C026	7,926.52	17,348.81	C	0.4	8	3.2	0.5
71	148	30701C041	21,724.32	17,708.04	C	1.1	8	8.6	1.2
72	151	30701C018	10,214.34	10,085.39	C	0.5	14	7.1	1.0
73	158	30701B023	24,086.91	30,195.17	B	0.6	10	5.6	0.8
74	162	30701C045	17,753.01	13,954.72	C	0.9	10	8.9	1.3
75	169	30701B011	16,011.60	23,060.77	B	0.3	14	4.9	0.7
76	179	30701C031	10,445.54	17,649.43	C	0.5	8	4.1	0.6
77	183	30701C027	15,751.08	14,190.86	C	0.8	10	7.8	1.1
78	187	30701C048	195,592.25	40,993.43	C	4.2	8	33.4	4.8
79	189	30701C035	3,148.33	14,184.85	C	0.2	10	1.6	0.2
80	199	30701C022	10,820.53	17,366.97	C	0.5	8	4.4	0.6
81	218	30701C007	9,092.09	16,317.43	C	0.5	8	3.9	0.6
82	228	30701C044	38,623.79	14,132.63	C	1.9	10	19.1	2.7
83	262	30701C039	10,282.29	10,438.62	C	0.5	14	6.9	1.0
84	264	30701B013	32,387.24	24,378.34	B	0.8	12	9.3	1.3
85	277	30701C047	18,100.51	17,649.43	C	0.9	8	7.2	1.0
86	278	30701C036	277,624.43	38,398.03	C	5.1	10	50.6	7.2
87	282	30701C016	21,327.95	14,826.88	C	1.0	10	10.1	1.4
88	331	30701C040	170,033.11	40,993.43	C	3.6	8	29.0	4.1
89	357	30701C042	177,072.45	40,993.43	C	3.8	8	30.2	4.3
90	366	30701C032	18,133.02	15,751.45	C	0.8	10	8.1	1.2

Among the above mentioned roads, the intervention for first 6 roads from the above table shall be implemented for the first five years, as shown in the table below:

Table 21 Distribution of budget for the first five years

Rank	Code	Total Cost (Rs. In lakhs)	Year 1		Year 2		Year 3		Year 4		Year 5		Total length	Total amount
			Length	Amount	Length	Amount	Length	Amount	Length	Amount	Length	Amount		
1	30701A010	6,223.91	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	0.75	492.06	4.75	3,111.96
2	30701A002	10,110.93	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	5.00	3,274.87
3	30701A001	21,425.93	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	5.00	3,274.87
4	30701A008	10,472.73	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	1.00	654.97	5.00	3,274.87
5	30701A006	9,288.62					1.00	654.97	1.00	654.97	1.00	654.97	3.00	1,964.92
6	30701A003	2,414.49							1.00	654.97	0.84	552.27	1.84	1,207.25
7	30701A007	13,482.06									1.00	654.97	1.00	654.97
9	30701A004	4,155.38									1.00	654.97	1.00	654.97
10	30701C049	675.94									0.19	53.27	0.19	53.27
11	30701B025	1,808.16									0.12	99.57	0.12	99.57

CHAPTER 6. CONCLUDING REMARK (WAY FORWARD)

The country has recently undergone restructuring and the way of planning and implementing development activities has changed as compared to the past practices, giving more power and budget to the local levels. The new formed local levels are required to provide maximum input for implementation of the prepared plans and support the development of the municipality and its infrastructures.

The institutional capacity of the Municipality needs to be strengthened with technical experts such as urban planner, GIS experts and others to effectively understand and implement the plans prepared. To make the transport sector sustainable, a more rigorous study that prepares plans at local level for the management of traffic at local level should be done. Further, the coordination among the stakeholders for different kind of development activities need to be strengthened to ensure effective implementation of such plans prepared.

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass								
										Earthen	Gravelled	Blacktopped	RCC	Brick/ Stone	Maximum	Minimum	Average		1	2	3	4	5	6	7	8	9
1	30701A001	A001	A	Changunarayan Fast Track	Saudol, Tathali, Sudal, Bageshwori, Ghumaune, Chhaling, Jhaukhel, Duwakot, Saraswotikhel	2, 3, 5, 6, 7, 8,	14	14	16.36	4.47	6.74	4.69	0.46	-	10.0	4	5.99	4.63	2.23	0.29	1.96	-	3.27	0.32	2.34	2.38	3.56
2	30701A002	A002	A	Telkot - Bhattidada - hariguru marga sadak	Telkot, Bhattidada, Lamagaun, Gairigaun, Bakhriagaun	6	14	14	7.72	-	5.73	1.93	0.06	-	7.0	5.5	6.83	5.84	-	-	-	-	-	7.72	-	-	-
3	30701A003	A003	A	Mahankal Chowk - Yapi Bhairab School - Ganesh School - United Preparatory School - Ward no. 3 office - Thulo Byasi	Mahankal Chowk, Jhaukhel	3	14	14	1.84	-	0.30	1.55	-	-	12.0	8	11.14	7.73	-	-	1.84	-	-	-	-	-	-
4	30701A004	A004	A	Chaap - Manohara	Pauwa, Chhap, Mangaltar	4	14	14	3.17	3.09	-	-	0.09	-	7.0	5.5	6.56	4.94	-	-	-	3.17	-	-	-	-	-
5	30701A005	A005	A	Telkot - Chhyabasti - Panchamahalahaxmi	Telkot, Chhyabasti	5	14	14	1.83	-	0.22	0.90	0.71	-	8.0	7	7.77	5.79	-	-	-	-	1.83	-	-	-	-
6	30701A006	A006	A	Bhaktapur Ringroad	Tathali, Pujaripati, Adhikarigaun, Chareli, Bageshwori	7, 8, 9	14	14	7.09	1.77	0.07	5.25	-	-	8.0	4.5	6.95	5.53	-	-	-	-	-	-	2.24	1.84	3.01
7	30701A007	A007	A	Pepsicola - Manohara - Nilbarahi - NEC Changu - Indrakholra - Telkot Road Bhaktapur	Telkot, Gokulgaun, Indrakholra, Sangdaha, NEC, Rupathali, Nilbarahi, Saraswotikhel	1, 4, 5	14	14	10.29	3.10	3.48	3.01	0.43	-	14.0	4	6.78	5.35	2.54	-	-	3.04	4.71	-	-	-	-
8	30701A008	A008	A	Brahmayini-Sudal-Adhikarigaun	Sudal, Adhikarigaun, Kalamasi	8, 9	14	14	7.99	-	7.75	0.25	-	-	14.0	8	12.90	10.41	-	-	-	-	-	-	-	6.42	1.57
9	30701A009	A009	A	Ram Mandir - Manohara Lower Secondary School	Rupathali	1	14	14	0.39	-	-	0.25	0.13	-	7.0	7	7.00	6.17	0.39	-	-	-	-	-	-	-	-
10	30701A010	A010	A	Yatu Mahadev Temple - Balmiki School - Shree Balikshwor Secondary School - Bagheti School	Yatu Mahadev, Bansbari, Bageshwori	7, 8	14	14	4.75	0.60	4.15	-	-	-	8.0	4	6.19	4.29	-	-	-	-	-	-	3.66	1.09	-
11	30701A011	A011	A	NEA Training Centre Road	Bansbari	7	14	14	0.58	-	0.58	-	-	-	8.0	8	8.00	5.00	-	-	-	-	-	-	0.58	-	-
12	30701B001	B001	B	Nyacho Pauwa - Mane dada - Manohara	Nyacho Pauwa, Mane dada, Kapahiti	4	14	14	2.21	0.43	1.52	-	0.26	-	7.0	4	5.45	4.41	-	-	-	2.21	-	-	-	-	-
13	30701B002	B002	B	Phaidhoka - Masandol - Chyaamasing	Phaidhoka, Masandol	9	10	10	2.68	0.47	2.06	-	0.15	-	7.0	4	5.73	4.73	-	-	-	-	-	-	-	-	2.68
14	30701B003	B003	B	Sakhu - Mangaltar - pauwa sadak	Pauwa, Chhap, Mangaltar	4	10	10	1.95	1.10	0.67	-	0.18	-	9.0	7	7.34	5.22	-	-	-	1.95	-	-	-	-	-
15	30701B004	B004	B	Khariapati - Manakamana Temple	Khariapati	5	10	10	1.29	-	0.88	0.40	-	-	10.0	4	6.29	5.02	-	-	-	-	1.29	-	-	-	-
16	30701B005	B005	B	Ganesh School (Duwakot) - Kasan khola - Haaku falcha	Duwakot, Kasan Khola	2, 3	10	10	2.26	1.13	0.79	0.28	0.06	-	8.0	6	6.65	4.97	-	0.14	2.12	-	-	-	-	-	-
17	30701B006	B006	B	Kasan Khola - Golden Sungava School - KMC - Bode Planning	Duwakot, Gankhu	1, 2	10	10	2.6	1.31	1.24	0.05	-	-	7.5	4.5	5.93	5.00	0.68	1.92	-	-	-	-	-	-	-
18	30701B007	B007	B	Sangam Marga	Tathali	9	14	14	0.88	0.48	0.40	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	0.88
19	30701B008	B008	B	Duwakot Health post - Ward no. 1 office - phaidhoka ganesh - KMC Hostel	Duwakot Health post, Phaidhoka Ganesh, Duwakot	1, 2	10	10	1.86	-	1.15	0.71	-	-	9.0	5	5.93	4.93	1.48	0.38	-	-	-	-	-	-	-
20	30701B009	B009	B	Suiti Khola Bridge - Pujaripati - Nala Gumba	Tathali, Pujaripati, Amaldole	9	10	10	1.92	1.13	0.79	-	-	-	5.5	5	5.42	4.42	-	-	-	-	-	-	-	-	1.92
21	30701B010	B010	B	Sudal - Tathali Road	Tathali, Sudal	8, 9	10	10	1.26	-	1.26	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	0.55	0.71
22	30701B011	B011	B	NEC Road	NEC	4	14	14	0.35	-	-	0.35	-	-	5.0	5	5.00	4.00	-	-	-	0.35	-	-	-	-	-
23	30701B012	B012	B	Sangdaha - Nilo Pul - NEC	Pauwa, Sanchukcha, NEC	4	14	14	2.74	1.17	1.54	-	0.03	-	10.0	5	5.97	4.83	-	-	-	2.74	-	-	-	-	-
24	30701B013	B013	B	Mandev Amrit Smriti School - Jagriti Chowk	Duwakot Chowk, Neupaneagaun	3	12	12	0.77	-	0.64	0.12	0.02	-	6.0	6	6.00	5.00	-	-	0.77	-	-	-	-	-	-
25	30701B014	B014	B	Pikkel Height - Jyoti Lingeshwor - Mandev Amrit Smirti School	Pikkel Height, Jyoti Lingeshwor, Gelal Gaun Chowk	3, 4, 5	10	10	1.9	0.95	0.34	0.61	-	-	8.0	5	6.96	5.59	-	-	0.94	0.00	0.96	-	-	-	-
26	30701B015	B015	B	Sainik School(Khariapati) - Ganesh Secondary School - Ward no. 5 office	Khariapati, Chhaling	5	14	14	2.32	-	-	2.11	0.21	-	13.0	5.5	7.76	4.38	-	-	-	-	2.32	-	-	-	-
27	30701B016	B016	B	Adhikari Gaun Road	Adhikari Gaun	8	10	10	0.75	0.32	0.43	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	0.75	-
28	30701B017	B017	B	Sudal - Bageshwori Road	Adhikari Gaun	8	10	10	0.44	-	0.44	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	0.44	-
29	30701B018	B018	B	Bageshwori - Bhadrakali	Bageshwori, Kuslantar, Bhadrakali	7	10	10	1.41	0.76	0.66	-	-	-	6.0	4	4.83	3.83	-	-	-	-	-	-	-	1.41	-
30	30701B019	B019	B	Dada gaun - Ratopati	Dada gaun	8	10	10	0.59	-	0.59	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	0.59
31	30701B020	B020	B	Ngyabu - Hanuman Chowk (Ratopati)	Ngyabu, Ratopati	8	10	10	1.26	0.18	1.08	-	-	-	5.5	4	4.96	3.96	-	-	-	-	-	-	-	-	1.26
32	30701B021	B021	B	JEC Road	Tathali	9	10	10	0.66	0.41	0.25	-	-	-	6.0	5	5.37	4.37	-	-	-	-	-	-	-	-	0.66
33	30701B022	B022	B	Phaidhoka - Saudol	Phaidhoka, Saudol	9	14	14	0.9	-	0.07	0.74	0.09	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	0.90
34	30701B023	B023	B	Tathali pul - Ward no. 9 office	Tathali	9	10	10	0.56	-	0.22	0.26	0.07	-	6.0	5.5	5.64	4.64	-	-	-	-	-	-	-	-	0.56
35	30701B024	B024	B	Jitpur - Sudal	Jitpur, Ghorsahi, Sudal	8	10	10	1.92	0.95	0.97	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	1.92	-
36	30701B025	B025	B	Saraswotikhel Buspark - Saraswoti Temple	Saraswotikhel	1	14	14	1.12	-	0.81	0.31	-	-	8.0	6	6.25	4.67	1.12	-	-	-	-	-	-	-	-
37	30701B026	B026	B	Jagriti Chowk - Gelal gaun Chowk	Jagriti Chowk, Hanumantar, Kotali, Gelal gaun Chowk	3	10	10	0.99	-	0.97	-	0.02	-	8.0	6	6.94	4.88	-	-	0.99	-	-	-	-	-	-
38	30701B027	B027	B	Radakrishna School - Trishul Dada	Gumaune	7	10	10	0.28	-	0.28	-	-	-	9.0	9	9.00	6.00	-	-	-	-	-	-	-	0.28	-
39	30701C001	C001	C	KMC Hospital - KMC Hostel	KMC Chowk, Saraswotikhel	2	10	10	0.58	-	0.05	0.52	-	-	6.0	6	6.00	5.00	-	0.58	-	-	-	-	-	-	-
40	30701C002	C002	C	Eco Brick Road	Khariapati, Bageshwori	7	8	8	0.87	0.08	0.78	-	-	-	6.0	4	5.80	4.80	-	-	-	-	-	-	-	0.87	-
41	30701C003	C003	C	Radakrishna School - Trishul Dada	Trishul Dada, Chhaling	5	8	8	0.24	0.24	-	-	-	-	3.0	3	3.00	2.00	-	-	-	-	-	-	-	-	-
42	30701C004	C004	C	Balikshwor Secondary School - Bojini - Kalamasi	Chareli, Bojini, Kalamasi	7, 8	8	8	3.14	-	2.63	0.24	-	-	8.0	4	5.30	4.20	-	-	-	-	-	-	-	2.19	0.95
43	30701C005	C005	C	Jharna Road	Bojini	7, 8	8	8	0.71	-	0.71	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	0.68	0.03	
44	30701C006	C006	C	Mohan pokhari - Bageshwori Road	Bageshwori	7	8	8	0.58	-	0.58	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	0.58	-
45	30701C007	C007	C	Ganesh Primary School - Ward no 7 office	Bageshwori	7	8	8	0.49	-	-	-	0.49	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	0.49	-
46	30701C008	C008	C	Bageshwori Health Post - Pipeline Road	Bageshwori	7	8	8	1.48	-	1.48	-	-	-	7.0	5	5.92	4.92	-	-	-	-	-	-	-	1.48	-
47	30701C009	C009	C	Pipeline Road	Muhan Pokhari, Bageshwori, Bhadrakali, Bansbari	6, 7	9	9	2.95	1.15	1.35	0.20	0.12	-	9.0	5	5.51	4.40	-	-	-	-	-	-	0.00	2.94	-
48	30701C010	C010	C	Saraswotikhel besi shiva mandir - Somthali ganesh	Saraswotikhel	1	10	10	0.32	-	0.32	-	-	-	8.0	4	6.59	5.59	0.32	-	-	-	-	-	-	-	-
49	30701C011	C011	C	Duhkharaneshwor - Phaidhoka Ganesh	Phaidhoka	2	8	8	0.45	-	0.45	-	-	-	4.5	3.5	4.26	3.07									

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass																
										Earthen	Gravelled	Blacktopped	RCC	Brick/Stone	Maximum	Minimum	Average		1	2	3	4	5	6	7	8	9								
64	30701C026	C026	C	Changunarayan Healthpost Road	Pikhel Height	5	8	8	0.4	0.31	-	-	0.09	-	6.0	5.5	5.89	5.00	-	-	-	-	0.40	-	-	-	-	-	-	-	-	-	-		
65	30701C027	C027	C	Manedada Road Agriculture Road	Nyacho Pauwa, Kapahiti	4	10	10	0.78	-	0.78	-	-	-	5.0	5	5.00	4.00	-	-	-	0.78	-	-	-	-	-	-	-	-	-	-	-		
66	30701C028	C028	C	Sanchukcha - NEC	Changunarayan, Ghamphedi	4	8	8	1.05	0.56	0.48	-	-	-	6.0	5	5.46	4.46	-	-	-	1.05	-	-	-	-	-	-	-	-	-	-	-		
67	30701C029	C029	C	Tauthali Primary School - Nagarkot Road	Lama gaun	6	8	8	0.58	-	0.58	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	0.58	-	-	-	-	-	-	-	-	-		
68	30701C030	C030	C	Kalodhara pati pul - dobu - kasula tol - sundar thali	Kalodhara pati pul, dobu, kasula tol, sundar thali	2, 3	10	10	2.32	1.56	0.76	-	-	-	6.0	4	5.13	4.24	-	0.74	1.58	-	-	-	-	-	-	-	-	-	-	-	-		
69	30701C031	C031	C	Phaidhoka - Dobu	Phaidhoka, Dobu	2, 3	8	8	0.52	0.52	-	-	-	-	4.0	4	4.00	3.22	-	0.51	0.01	-	-	-	-	-	-	-	-	-	-	-	-		
70	30701C032	C032	C	Kalighat Bridge - Dobu	Kalighat Bridge, Dobu	3	10	10	0.81	0.36	-	0.44	-	-	7.0	5	5.90	4.72	-	-	0.81	-	-	-	-	-	-	-	-	-	-	-	-	-	
71	30701C033	C033	C	Khwopa College - Suwal Tole	Suwal Tole	3, 5	10	10	1.55	1.51	-	0.04	-	-	6.0	6	6.00	5.00	-	-	1.51	-	0.04	-	-	-	-	-	-	-	-	-	-	-	
72	30701C034	C034	C	Kamalpokhari Chowk - Lakila Chowk	Kamalpokhari, Jhaukhel	3	10	10	1.38	0.15	1.15	0.07	-	-	10.0	5	6.37	4.97	-	-	1.38	-	-	-	-	-	-	-	-	-	-	-	-	-	
73	30701C035	C035	C	Lakila Chowk - Bhutte Khola	Jhaukhel	3	10	10	0.16	0.01	0.14	-	-	-	5.0	3	4.83	3.37	-	-	0.16	-	-	-	-	-	-	-	-	-	-	-	-	-	
74	30701C036	C036	C	Bhutte Khola Corridor	NEC, Kulpakot, Lakila, Pakunepati	3, 4, 5	10	10	5.06	0.02	-	0.56	-	-	6.0	3	.68	.56	-	-	1.04	1.88	2.14	-	-	-	-	-	-	-	-	-	-	-	
75	30701C037	C037	C	Manohara Corridor	Pikhel, Lakila	5	8	8	0.91	0.70	0.07	0.09	0.06	-	4.0	3.5	3.88	3.38	-	-	-	-	0.91	-	-	-	-	-	-	-	-	-	-	-	
76	30701C038	C038	C	Kulpakot - Sangadaha	Kulpakot, Sangadaha	4	10	10	1.21	1.21	-	-	-	-	5.0	5	5.00	4.00	-	-	-	1.21	-	-	-	-	-	-	-	-	-	-	-	-	
77	30701C039	C039	C	Khasanghusung Corridor	Neupanegaun, NEC	1, 4	14	14	0.49	-	0.29	0.11	0.10	-	8.0	5	5.75	4.55	0.33	-	-	0.17	-	-	-	-	-	-	-	-	-	-	-	-	
78	30701C040	C040	C	Manohara Corridor	Chhyabasti, Nilo pul, Sanchukcha, Ghamphedi, Saraswotikhel	1, 4, 5	8	8	3.63	-	-	-	-	-	.0	0	.00	.00	1.95	-	-	0.17	1.51	-	-	-	-	-	-	-	-	-	-	-	
79	30701C041	C041	C	Pauwa - Sanchukcha	Pauwa, Sanchukcha	4	8	8	1.07	0.37	0.71	-	-	-	5.5	5	5.33	4.33	-	-	-	1.07	-	-	-	-	-	-	-	-	-	-	-	-	
80	30701C042	C042	C	Kasan Khola Corridor	Duwakot mod, Kalighat, Chhaling	2, 3, 5	8	8	3.78	-	-	-	-	-	.0	0	.00	.00	-	1.10	1.15	-	1.53	-	-	-	-	-	-	-	-	-	-	-	
81	30701C043	C043	C	TabyaKhusi Corridor	Saudol, Chundevis	9	8	8	1.63	0.60	0.55	-	0.17	-	5.5	4.5	4.05	3.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.63	
82	30701C044	C044	C	Azad School - Chhinnamasta Durga Temple	Lkundol	3	10	10	1.91	1.56	0.35	-	-	-	5.0	3	4.05	3.05	-	-	1.91	-	-	-	-	-	-	-	-	-	-	-	-	-	
83	30701C045	C045	C	Gwal Daha - Jyotilingeshwor	Kulpakot, Gwal Daha	4	10	10	0.89	0.75	-	-	0.14	-	5.0	4	4.85	3.85	-	-	-	0.89	-	-	-	-	-	-	-	-	-	-	-	-	
84	30701C046	C046	C	Sudal Chowk - Panchakanya School	Sudal	8	8	8	1.69	0.07	1.63	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.69	
85	30701C047	C047	C	Ward no 3 office - Chhetrapal Ganesh	Jhaukhel	3	8	8	0.9	0.90	-	-	-	-	5.0	5	5.00	4.00	-	-	0.90	-	-	-	-	-	-	-	-	-	-	-	-	-	
86	30701C048	C048	C	Mahadev Khola Corridor	Chundevis, Brahmayini, Kharipati, Bageshwori, Bhadrakhali, Muhan Pokari	6, 7, 8, 9	8	8	4.17	-	-	-	-	-	.0	0	.00	.00	-	-	-	-	-	-	2.97	1.20	0.00	0.00	-	-	-	-	-	-	-
87	30701C049	C049	C	KMC Hospital - Phaidhoka Ganesh - Saraswati School - Saraswotikhel bus stop	KMC Chowk, Saraswotikhel	1	14	14	1.19	-	0.29	0.83	0.07	-	9.0	5	7.20	5.74	1.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
88	30701C050	C050	C	Saraswotikhel Buddha Stupa Road	Gankhu	1	10	10	0.63	-	0.63	-	-	-	5.5	5.5	5.50	4.50	0.63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
89	30701C051	C051	C	Bamikeswor - Chareli	Yatu Mahadev, Bansbari, Bageshwori	7	8	8	0.7	-	0.70	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.70	
90	30701C052	C052	C	Tathali pul - Rautetol - Halalgaun	Tathali, Rautetol, Halalgaun	9	8	8	2.03	0.53	1.50	-	-	-	5.5	5	5.37	4.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.03	
91	30701D001	D001	D			9	6	6	0.23	-	-	0.08	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	
92	30701D002	D002	D			9	6	6	0.32	-	-	0.08	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	
93	30701D003	D003	D			9	7	7	0.08	-	-	0.08	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	
94	30701D004	D004	D			9	7	7	0.08	-	-	0.16	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16	
95	30701D005	D005	D			9	7	7	0.08	-	-	0.13	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	
96	30701D006	D006	D			9	7	7	0.16	-	-	0.04	-	-	7.0	7	7.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04	
97	30701D007	D007	D			9	7	7	0.13	-	0.14	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	
98	30701D008	D008	D			9	7	7	0.04	0.28	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.28	
99	30701D009	D009	D			9	6	6	0.14	0.27	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	
100	30701D010	D010	D			9	6	6	0.28	-	0.23	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.23	
101	30701D011	D011	D			9	6	6	0.27	-	0.16	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16	
102	30701D012	D012	D			9	6	6	0.23	-	0.05	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	
103	30701D013	D013	D			9	6	6	0.16	0.41	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41	
104	30701D014	D014	D			9	6	6	0.05	-	0.05	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	
105	30701D015	D015	D			9	6	6	0.41	-	0.03	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	
106	30701D016	D016	D			9	6	6	0.05	0.10	0.51	-	-	-	5.0	4	4.84	3.84	-	0.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
107	30701D017	D017	D			9	6	6	0.03	-	-	-	0.09	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09	
108	30701D018	D018	D			2	6	6	0.61	0.46	-	-	-	-	5.0	4	4.29	3.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.46	
109	30701D019	D019	D			9	6	6	0.09	0.77	-	-	-	-	4.5	4	4.04	3.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.77	
110	30701D020	D020	D			9	8	8	0.46	-	0.20	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	
111	30701D021	D021	D			9	6	6	0.77	0.65	-	-	-	-	6.0	5	5.27	4.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.65	
112	30701D022	D022	D			9	6	6	0.2	0.59	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	
113	30701D023	D023	D			9	6	6	0.65	0.71	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71	
114	30701D024	D024	D			9	6	6	0.59	0.40	-	-	-	-	5.0	3	3.52	2.52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.40	
115	30701D025	D025	D			9	6	6	0.71	0.28	-	-	-	-																					

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass																	
										Earthen	Gravelled	Blacktopped	RCC	Brick/ Stone	Maximum m	Minimum	Average		1	2	3	4	5	6	7	8	9									
137	30701D047	D047	D			9	6	6	0.42	-	0.09	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09		
138	30701D048	D048	D			9	6	6	0.09	-	0.18	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18		
139	30701D049	D049	D			9	6	6	0.09	-	0.77	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	0.50		
140	30701D050	D050	D			9	6	6	0.18	0.55	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.55	-		
141	30701D051	D051	D			8,9	6	6	0.77	0.27	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.27	-		
142	30701D052	D052	D			8	6	6	0.55	0.58	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.44		
143	30701D053	D053	D			8	6	6	0.27	0.42	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42		
144	30701D054	D054	D			8,9	6	6	0.58	0.47	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.47		
145	30701D055	D055	D			9	6	6	0.42	0.23	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.23	-	
146	30701D056	D056	D			9	6	6	0.47	-	-	-	0.05	-	14.0	14	14.00	6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	-	
147	30701D057	D057	D			8	6	6	0.23	0.18	-	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.18	-	
148	30701D058	D058	D			8	14	14	0.05	0.51	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.51	-	
149	30701D059	D059	D			8	6	6	0.18	-	0.54	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	-	
150	30701D060	D060	D			8	6	6	0.51	-	0.24	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.24	-	
151	30701D061	D061	D			8	6	6	0.54	0.92	-	-	-	-	6.0	4	5.32	4.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.92	-	
152	30701D062	D062	D			8	6	6	0.24	-	0.50	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.09	0.41	-	
153	30701D063	D063	D			9	8	8	0.92	-	0.12	-	-	-	12.0	12	12.00	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	
154	30701D064	D064	D			7,8	6	6	0.5	-	0.42	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42	-	
155	30701D065	D065	D			8	12	12	0.12	-	0.21	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21	-	
156	30701D066	D066	D			8	6	6	0.42	-	0.10	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	-	
157	30701D067	D067	D			8	6	6	0.21	0.20	-	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	-	
158	30701D068	D068	D			8	6	6	0.1	-	-	0.44	-	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.44	-	
159	30701D069	D069	D			7	6	6	0.2	-	0.67	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.67	-	
160	30701D070	D070	D			8	6	6	0.44	-	1.04	-	-	-	6.0	5	5.56	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.04	-	
161	30701D071	D071	D			8	6	6	0.67	-	0.71	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.71	-	
162	30701D072	D072	D			8	6	6	1.04	0.47	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.47	-	
163	30701D073	D073	D			8	6	6	0.71	0.43	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	-	
164	30701D074	D074	D			7	6	6	0.47	-	0.17	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	-	
165	30701D075	D075	D			7	6	6	0.43	-	0.19	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.19	-	
166	30701D076	D076	D			7	6	6	0.17	-	0.30	-	-	-	5.0	5	5.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	-	
167	30701D077	D077	D			7	6	6	0.19	-	0.17	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.02	-
168	30701D078	D078	D			7	6	6	0.3	-	0.22	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-	
169	30701D079	D079	D			7,8	6	6	0.17	0.57	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.55	0.02	
170	30701D080	D080	D			8	6	6	0.22	0.14	-	-	-	-	4.0	4	4.00	2.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	-	
171	30701D081	D081	D			8,9	6	6	0.57	0.22	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-	
172	30701D082	D082	D			7	8	8	0.14	0.12	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	
173	30701D083	D083	D			7	6	6	0.22	1.57	-	-	-	-	5.0	4	4.41	3.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.57	-	
174	30701D084	D084	D			7	6	6	0.12	0.52	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.52	-	
175	30701D085	D085	D			6	6	6	1.57	0.61	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.61	-	
176	30701D086	D086	D			6	6	6	0.52	1.43	-	-	0.07	-	6.0	3	4.17	3.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
177	30701D087	D087	D			8	6	6	0.61	-	0.12	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	
178	30701D088	D088	D			5	8	8	1.5	0.26	0.18	-	-	-	5.5	4	4.62	3.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.44	-	
179	30701D089	D089	D			8	6	6	0.12	-	-	-	0.11	-	6.0	6	6.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	
180	30701D090	D090	D			8	6	6	0.44	0.43	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	-	
181	30701D091	D091	D			8	6	6	0.11	-	0.12	-	-	-	5.5	5.5	5.50	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	
182	30701D092	D092	D			8	6	6	0.43	-	0.08	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	-	
183	30701D093	D093	D			7	6	6	0.12	-	0.14	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	-	
184	30701D094	D094	D			7	6	6	0.08	-	0.28	-	-	-	6.0	6	6.00	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.28	-	
185	30701D095	D095	D			7	6	6	0.14	0.12	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	
186	30701D096	D096	D			7	6	6	0.28	-	0.33	-	-	-	5.0	5	5.00	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.33	-	
187	30701D097	D097	D			7	6	6	0.12	-	0.14	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	-	
188	30701D098	D098	D			7	8	8	0.33	-	0.34	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.34	-	
189	30701D099	D099	D			7	6	6	0.14	-	-	-	0.11	-	4.5	4.5	4.50	3.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.11	-	
190	30701D100	D100																																		

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass								
										Earthen	Gravelled	Blacktopped	RCC	Brick/Stone	Maximum	Minimum	Average		1	2	3	4	5	6	7	8	9
214	30701D124	D124	D			6	6	6	0.26	-	-	-	0.14	-	6.5	6.5	6.50	5.50	-	-	-	-	-	0.14	-	-	-
215	30701D125	D125	D			6	6	6	0.55	-	0.16	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	0.16	-	-	-
216	30701D126	D126	D			6	6.5	6.5	0.14	0.18	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.18	-	-	-
217	30701D127	D127	D			6	6	6	0.16	0.13	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	0.13	-	-	-
218	30701D128	D128	D			6	8	8	0.18	0.15	-	-	0.08	-	5.0	4	4.65	3.65	-	-	-	-	-	0.23	-	-	-
219	30701D129	D129	D			6	6	6	0.13	0.61	0.33	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.94	-	-	-
220	30701D130	D130	D			6	6	6	0.23	0.41	0.87	-	-	-	6.5	3	5.38	4.38	-	-	-	-	-	1.28	-	-	-
221	30701D131	D131	D			6	6	6	0.94	0.84	-	-	-	-	3.0	3	3.00	2.00	-	-	-	-	-	0.84	-	-	-
222	30701D132	D132	D			6	6.5	6.5	1.28	0.47	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.47	-	-	-
223	30701D133	D133	D			6	6	6	0.84	-	-	-	0.05	-	4.0	4	4.00	3.00	-	-	-	-	-	0.05	-	-	-
224	30701D134	D134	D			6	6	6	0.47	0.41	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	0.41	-	-	-
225	30701D135	D135	D			6	6	6	0.05	0.23	-	-	-	-	3.0	3	3.00	2.00	-	-	-	-	-	0.23	-	-	-
226	30701D136	D136	D			6	6	6	0.41	0.51	-	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	0.51	-	-	-
227	30701D137	D137	D			5	6	6	0.23	0.13	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	0.13	-	-	-
228	30701D138	D138	D			5	6	6	0.51	0.61	-	-	-	-	3.0	3	3.00	2.00	-	-	-	-	-	0.61	-	-	-
229	30701D139	D139	D			5	6	6	0.13	0.06	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.06	-	-	-
230	30701D140	D140	D			5	6	6	0.61	-	-	0.21	-	-	7.0	7	7.00	6.00	-	-	-	-	-	0.21	-	-	-
231	30701D141	D141	D			5	6	6	0.06	-	-	0.48	-	-	7.0	7	7.00	6.00	-	-	-	-	-	0.48	-	-	-
232	30701D142	D142	D			7	7	7	0.21	-	-	0.56	-	-	7.0	7	7.00	6.00	-	-	-	-	-	0.56	-	-	-
233	30701D143	D143	D			7	7	7	0.48	-	-	0.16	-	-	7.0	7	7.00	6.00	-	-	-	-	-	0.16	-	-	-
234	30701D144	D144	D			7	7	7	0.56	0.59	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.58	-	0.00	-
235	30701D145	D145	D			7	7	7	0.16	0.39	-	-	-	-	3.0	3	3.00	2.50	-	-	-	-	-	0.39	-	-	-
236	30701D146	D146	D			5,7	6	6	0.59	-	0.35	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.34	-	0.01	-
237	30701D147	D147	D			5	6	6	0.39	-	0.10	-	-	-	5.0	5	5.00	3.50	-	-	-	-	-	0.09	-	0.01	-
238	30701D148	D148	D			5,7	6	6	0.35	0.07	-	-	-	-	4.0	4	4.00	2.50	-	-	-	-	-	0.07	-	-	-
239	30701D149	D149	D			5,7	6	6	0.1	-	-	0.12	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.12	-	-	-
240	30701D150	D150	D			5	6	6	0.07	-	1.17	-	-	-	6.0	6	6.00	4.00	-	-	-	-	-	1.17	-	-	-
241	30701D151	D151	D			5	6	6	0.12	0.35	-	-	-	-	4.0	4	4.00	2.00	-	-	-	-	-	0.35	-	-	-
242	30701D152	D152	D			5	10	10	1.17	-	0.28	-	-	-	5.5	5.5	5.50	4.50	-	-	-	-	-	0.28	-	-	-
243	30701D153	D153	D			5	10	10	0.35	-	0.02	-	-	-	4.5	4.5	4.50	3.50	-	-	-	-	-	0.02	-	-	-
244	30701D154	D154	D			5	10	10	0.28	0.32	0.20	-	-	-	6.0	3	4.15	2.77	-	-	-	-	-	0.51	-	-	-
245	30701D155	D155	D			7	6	6	0.02	0.21	0.08	-	-	-	7.0	5	5.55	4.55	-	-	-	-	-	0.28	-	0.01	-
246	30701D156	D156	D			5	6	6	0.51	0.61	0.10	0.22	-	-	6.0	4	4.68	3.67	-	-	-	-	-	0.93	-	-	-
247	30701D157	D157	D			5,7	7	7	0.29	-	0.13	-	-	-	3.0	3	3.00	2.50	-	-	-	-	-	0.13	-	-	-
248	30701D158	D158	D			5	6	6	0.93	0.12	-	-	-	-	4.0	4	4.00	3.50	-	-	-	-	-	0.12	-	-	-
249	30701D159	D159	D			5	6	6	0.13	-	-	0.12	-	-	7.5	7.5	7.50	4.00	-	-	-	-	-	0.12	-	-	-
250	30701D160	D160	D			5	6	6	0.12	-	-	0.20	-	-	7.5	7.5	7.50	4.00	-	-	-	-	-	0.20	-	-	-
251	30701D161	D161	D			5	8	8	0.12	0.06	-	-	-	-	3.5	3.5	3.50	3.00	-	-	-	-	-	0.06	-	-	-
252	30701D162	D162	D			5	7.5	7.5	0.2	0.05	-	-	-	-	3.5	3.5	3.50	3.00	-	-	-	-	-	0.05	-	-	-
253	30701D163	D163	D			5	6	6	0.06	-	0.23	-	0.14	-	5.0	4	4.20	3.20	-	-	-	-	-	0.37	-	-	-
254	30701D164	D164	D			5	6	6	0.05	0.45	0.42	-	0.34	-	6.0	5	5.42	3.93	-	-	-	-	-	1.21	-	-	-
255	30701D165	D165	D			5	6	6	0.37	-	0.68	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	0.68	-	-	-
256	30701D166	D166	D			5	10	10	1.21	-	0.11	-	-	-	6.0	6	6.00	5.00	-	-	-	-	-	0.11	-	-	-
257	30701D167	D167	D			5	6	6	0.68	0.35	-	-	-	-	7.0	7	7.00	5.00	-	-	-	-	-	0.35	-	-	-
258	30701D168	D168	D			5	6	6	0.11	0.42	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	-	0.42	-	-	-
259	30701D169	D169	D			5	10	10	0.35	0.08	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	0.08	-	-	-
260	30701D170	D170	D			5	6	6	0.42	0.57	0.27	-	-	-	5.0	4	4.68	3.68	-	-	-	-	0.59	0.25	-	-	-
261	30701D171	D171	D			5	6	6	0.08	0.22	-	-	-	-	3.5	3.5	3.50	2.50	-	-	-	-	-	0.22	-	-	-
262	30701D172	D172	D			4,5	6	6	0.85	0.35	0.53	-	-	-	8.0	4	5.60	4.20	-	-	-	-	0.67	0.22	-	-	-
263	30701D173	D173	D			5	6	6	0.22	-	-	-	0.08	-	5.5	5.5	5.50	5.00	-	-	-	-	0.08	-	-	-	-
264	30701D174	D174	D			4,5	10	10	0.88	0.23	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	0.23	-	-	-	-
265	30701D175	D175	D			4	6	6	0.08	-	0.39	-	0.18	-	7.0	4	5.39	4.07	-	-	-	-	0.57	-	-	-	-
266	30701D176	D176	D			4	6	6	0.23	0.29	0.11	-	-	-	6.0	5	5.73	4.73	-	-	-	-	0.40	-	-	-	-
267	30701D177	D177	D			4	7	7	0.57	0.14	-	-	-	-	6.0	6	6.00	5.00	-	-	-	-	0.14	-	-	-	-
268	30701D178	D178	D			4	6	6	0.4	0.71	-	-	0.12	-	4.5	4	4.07	3.14	-	-	-	-	0.83	-	-	-	-
269	30701D179	D179	D			4	6	6	0.14	-	-	-	-	0.33	5.0	5	5.00	4.00	-	-	-	-	0.33	-	-	-	-
270	30701D180	D180	D			4	10	10	0.83	-	-	-	-	0.19	4.5	4.5	4.50	3.50	-	-	-	-	0.19	-	-	-	-
271	30701D181	D181	D			4	6	6	0.33	0.10	-	-	-	-	4.0	4	4.00	3.00	-	-	-	-	0.10	-	-	-	-
272	30701D182	D182	D			4	6	6	0.19	0.47	-	-	-	-	5.0	5	5.00	4.00	-	-	-	-	0.47	-	-	-	-
273	30701D183	D183	D			4	6	6	0.1	-	0.46	-	-	-	6.5	6.5	6.50	5.00	-	-	-	-	0.46	-	-	-	-
274	30701D184	D184	D			4	6	6	0.47	0.20	-	-	-	-	1.5	1.5	1.50	1.00	-	-	-	-	0.20	-	-	-	-
275	30701D185	D185	D			4	10	10	0.46	0.03	-	-	-	-	3.5	3.5	3.50	3.00	-	-	-	-	0.03	-	-	-	-
276	30701D186	D186	D			5	6	6	0.2	0.06	-	-	0.10	-	8.0	5	6.13	3.62	-	-	-	-	0.16	-	-	-	-
277	30701D187	D187	D			5	6	6	0.03	0.32	0.17	-	-	-	4.5	4	4.17	3.50	-	-	-	-	0.49	-			

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass											
										Earthen	Gravelled	Blacktopped	RCC	Brick/ Stone	Maximum m	Minimum	Average		1	2	3	4	5	6	7	8	9			
291	30701D201	D201	D			4	6	6	0.58	-	-	0.46	-	-	6.0	6	6.00	4.86	0.10	-	0.36	-	-	-	-	-	-	-	-	-
292	30701D202	D202	D			1, 3	6	6	0.3	0.65	-	-	-	-	6.0	3	4.26	2.97	0.64	0.01	-	-	-	-	-	-	-	-	-	-
293	30701D203	D203	D			1, 3	6	6	0.46	0.08	0.11	0.05	-	-	5.0	4	4.67	3.67	-	-	0.24	-	-	-	-	-	-	-	-	-
294	30701D204	D204	D			1, 2	8	8	0.65	0.09	-	-	-	-	5.0	5	5.00	4.00	0.09	-	-	-	-	-	-	-	-	-	-	-
295	30701D205	D205	D			3	8	8	0.24	0.22	-	-	-	-	4.0	4	4.00	3.00	0.22	-	-	-	-	-	-	-	-	-	-	-
296	30701D206	D206	D			1	6	6	0.09	-	0.06	-	-	-	6.0	6	6.00	5.00	-	-	-	0.06	-	-	-	-	-	-	-	-
297	30701D207	D207	D			1	6	6	0.22	-	0.23	-	-	-	5.5	5.5	5.50	4.50	-	-	-	0.23	-	-	-	-	-	-	-	-
298	30701D208	D208	D			4	6	6	0.06	-	0.17	-	-	-	6.0	5	5.47	4.47	-	-	-	0.17	-	-	-	-	-	-	-	-
299	30701D209	D209	D			4	6	6	0.23	-	0.26	-	-	-	5.5	5.5	5.50	4.50	-	-	-	0.26	-	-	-	-	-	-	-	-
300	30701D210	D210	D			4	6	6	0.17	-	1.97	-	-	-	6.0	6	6.00	5.00	-	-	-	1.97	-	-	-	-	-	-	-	-
301	30701D211	D211	D			4	6	6	0.26	0.06	-	-	-	-	5.0	5	5.00	4.00	-	-	-	0.06	-	-	-	-	-	-	-	-
302	30701D212	D212	D			4	6	6	1.97	0.16	-	-	-	-	4.5	4.5	4.50	3.50	-	-	-	0.16	-	-	-	-	-	-	-	-
303	30701D213	D213	D			4	6	6	0.06	-	0.10	-	-	-	4.5	4.5	4.50	3.50	-	-	-	0.10	-	-	-	-	-	-	-	-
304	30701D214	D214	D			4	6	6	0.16	-	0.42	-	-	-	5.0	5	5.00	4.00	-	-	-	0.42	-	-	-	-	-	-	-	-
305	30701D215	D215	D			4	6	6	0.1	-	0.37	-	-	-	6.0	6	6.00	5.00	-	-	-	0.37	-	-	-	-	-	-	-	-
306	30701D216	D216	D			4	6	6	0.42	-	0.52	-	-	-	6.0	4.5	4.60	3.60	-	-	-	0.52	-	-	-	-	-	-	-	-
307	30701D217	D217	D			4	6	6	0.37	-	0.27	-	-	-	5.0	5	5.00	4.00	-	-	-	0.27	-	-	-	-	-	-	-	-
308	30701D218	D218	D			4	6	6	0.52	-	0.21	-	-	-	4.5	4.5	4.50	3.50	-	-	-	0.21	-	-	-	-	-	-	-	-
309	30701D219	D219	D			4	6	6	0.27	-	0.29	-	-	-	4.5	4.5	4.50	3.50	0.16	-	-	0.13	-	-	-	-	-	-	-	-
310	30701D220	D220	D			4	6	6	0.21	-	0.22	-	-	-	6.0	6	6.00	5.00	0.22	-	-	-	-	-	-	-	-	-	-	-
311	30701D221	D221	D			1, 4	6	6	0.29	0.26	0.12	-	-	-	5.5	4.5	4.82	3.82	0.38	-	-	-	-	-	-	-	-	-	-	-
312	30701D222	D222	D			1	6	6	0.22	0.14	-	-	-	-	4.0	4	4.00	3.00	0.14	-	-	-	-	-	-	-	-	-	-	-
313	30701D223	D223	D			1	6	6	0.38	0.19	-	-	-	-	6.0	6	6.00	3.00	0.19	-	-	-	-	-	-	-	-	-	-	-
314	30701D224	D224	D			1	6	6	0.14	-	0.23	-	-	-	5.0	5	5.00	4.00	0.23	-	-	-	-	-	-	-	-	-	-	-
315	30701D225	D225	D			1	6	6	0.19	-	0.46	-	-	-	5.0	5	5.00	4.00	0.46	-	-	-	-	-	-	-	-	-	-	-
316	30701D226	D226	D			1	6	6	0.23	0.13	-	-	-	-	4.0	4	4.00	3.00	0.13	-	-	-	-	-	-	-	-	-	-	-
317	30701D227	D227	D			1	6	6	0.46	-	0.85	-	-	-	4.0	4	4.00	3.00	-	-	-	-	-	-	0.85	-	-	-	-	-
318	30701D228	D228	D			1	6	6	0.13	-	0.05	0.16	0.32	-	8.0	6	7.82	5.91	0.35	-	-	0.19	-	-	-	-	-	-	-	-
319	30701D229	D229	D			6	6	6	0.85	0.50	-	-	-	-	6.0	3	4.60	3.71	-	-	0.50	-	-	-	-	-	-	-	-	-
320	30701D230	D230	D			1, 4	14	14	0.53	0.02	-	-	-	-	5.0	5	5.00	3.00	-	-	0.02	-	-	-	-	-	-	-	-	-
321	30701D231	D231	D			2	6	6	0.5	0.08	0.21	-	-	-	5.0	4	4.21	3.21	-	-	0.29	-	-	-	-	-	-	-	-	-
322	30701D232	D232	D			2	6	6	0.02	0.06	-	-	-	-	10.0	10	10.00	9.00	-	-	0.06	-	-	-	-	-	-	-	-	-
323	30701D233	D233	D			2	6	6	0.29	0.25	-	0.05	-	-	6.0	4	4.31	3.31	-	-	0.29	-	-	-	-	-	-	-	-	-
324	30701D234	D234	D			2	10	10	0.06	0.07	-	0.11	-	-	5.0	5	5.00	3.62	-	-	0.17	-	-	-	-	-	-	-	-	-
325	30701D235	D235	D			2	6	6	0.29	-	-	0.24	-	-	4.5	4.5	4.50	4.00	-	-	0.24	-	-	-	-	-	-	-	-	-
326	30701D236	D236	D			2	6	6	0.17	-	0.19	-	-	-	4.0	4	4.00	3.50	-	-	0.19	-	-	-	-	-	-	-	-	-
327	30701D237	D237	D			2	6	6	0.24	0.16	-	-	-	-	5.0	4	4.43	3.43	-	-	0.16	-	-	-	-	-	-	-	-	-
328	30701D238	D238	D			2	6	6	0.19	-	0.15	-	-	-	5.5	5.5	5.50	4.50	-	-	-	0.15	-	-	-	-	-	-	-	-
329	30701D239	D239	D			2	6	6	0.16	1.08	-	-	-	-	3.0	3	3.00	2.00	-	-	1.08	-	-	-	-	-	-	-	-	-
330	30701D240	D240	D			3	6	6	0.15	0.14	0.10	-	-	-	5.0	3	3.83	2.83	-	-	0.24	-	-	-	-	-	-	-	-	-
331	30701D241	D241	D			3	6	6	1.08	-	0.30	-	-	-	6.0	6	6.00	5.00	-	-	0.30	-	-	-	-	-	-	-	-	-
332	30701D242	D242	D			3	6	6	0.24	0.10	-	-	-	-	5.0	5	5.00	4.00	-	-	0.10	-	-	-	-	-	-	-	-	-
333	30701D243	D243	D			3	6	6	0.3	0.52	-	-	-	-	7.0	3	5.19	4.19	-	-	0.52	-	-	-	-	-	-	-	-	-
334	30701D244	D244	D			3	6	6	0.1	0.16	-	-	-	-	3.0	3	3.00	2.00	-	-	0.16	-	-	-	-	-	-	-	-	-
335	30701D245	D245	D			3	7	7	0.52	0.45	-	-	-	0.24	4.0	4	4.00	3.17	-	-	0.69	-	-	-	-	-	-	-	-	-
336	30701D246	D246	D			3	6	6	0.16	-	0.14	-	-	-	4.5	4.5	4.50	3.00	-	-	0.14	-	-	-	-	-	-	-	-	-
337	30701D247	D247	D			3	6	6	0.69	-	-	-	0.09	-	4.0	4	4.00	3.00	-	-	0.09	-	-	-	-	-	-	-	-	-
338	30701D248	D248	D			3	6	6	0.14	0.12	-	-	0.06	-	4.0	4	4.00	3.00	-	-	0.19	-	-	-	-	-	-	-	-	-
339	30701D249	D249	D			3	6	6	0.09	-	-	-	0.10	-	3.0	3	3.00	3.00	-	-	0.10	-	-	-	-	-	-	-	-	-
340	30701D250	D250	D			3	6	6	0.19	-	0.27	-	-	-	8.0	8	8.00	7.00	-	-	0.27	-	-	-	-	-	-	-	-	-
341	30701D251	D251	D			3	6	6	0.1	0.10	-	-	-	-	3.0	3	3.00	2.00	-	-	0.10	-	-	-	-	-	-	-	-	-
342	30701D252	D252	D			3	8	8	0.27	0.34	0.37	-	-	-	7.0	3	4.78	3.56	-	-	0.71	-	-	-	-	-	-	-	-	-
343	30701D253	D253	D			3	6	6	0.1	1.27	0.14	-	-	-	6.0	4	4.16	3.16	-	-	1.40	-	-	-	-	-	-	-	-	-
344	30701D254	D254	D			3	10	10	0.71	0.10	-	-	-	-	5.0	5	5.00	4.00	-	-	0.10	-	-	-	-	-	-	-	-	-
345	30701D255	D255	D			3	10	10	1.4	0.09	-	-	-	-	5.0	5	5.00	4.50	-	-	0.09	-	-	-	-	-	-	-	-	-
346	30701D256	D256	D			3	6	6	0.1	0.35	-	-	-	-	3.0	3	3.00	2.00	-	-	0.35	-	-	-	-	-	-	-	-	-
347	30701D257	D257	D			3	6	6	0.09	0.54	-	-	-	-	9.0	6	6.52	3.69	-	-	0.54	-	-	-	-	-	-	-	-	-
348	30701D258	D258	D			3	6	6	0.35	0.44	-	-	-	-	6.0	6	6.00	5.00	-	-	0.44	-	-	-	-	-	-	-	-	-
349	30701D259	D259	D			3	10	10	0.54	0.20	-	-	-	-	6.0	6	6.00	4.00	-	-	0.20	-	-	-	-	-	-	-	-	-
350	30701D260	D260	D			3	6	6	0.44																					

SUMMARY OF MTPP ROADS

SN	Municipal Code	Road Code	Class	Road Name	Settlement Passed	Wards Passed	Proposed ROW	ROW (in m)	Length (in km)	Surface Type					Total Width (m)			Carriageway Width (in m)	Ward Pass										
										Earthen	Gravelled	Blacktopped	RCC	Brick/Stone	Maximum	Minimum	Average		1	2	3	4	5	6	7	8	9		
368	30701D278	D278	D			2	7	7	0.29	-	0.07	-	-	-	7.0	7	7.00	6.00	-	0.07	-	-	-	-	-	-	-	-	-
369	30701D279	D279	D			2	7	7	0.07	0.24	0.28	-	-	-	5.5	4	4.61	3.68	-	0.51	0.01	-	-	-	-	-	-	-	-
370	30701D280	D280	D			2	7	7	0.07	0.29	-	0.16	-	-	6.0	5	5.35	4.35	-	0.45	-	-	-	-	-	-	-	-	-
371	30701D281	D281	D			2, 3	6	6	0.52	-	0.09	-	-	-	5.0	5	5.00	4.00	-	0.09	-	-	-	-	-	-	-	-	-
372	30701D282	D282	D			2	6	6	0.45	-	0.13	-	-	-	5.0	5	5.00	4.00	-	0.13	-	-	-	-	-	-	-	-	-
373	30701D283	D283	D			2	6	6	0.09	0.15	-	-	-	-	12.0	12	12.00	3.00	-	-	0.15	-	-	-	-	-	-	-	-
374	30701D284	D284	D			2	6	6	0.13	-	-	-	-	0.12	4.0	4	4.00	3.50	-	-	0.12	-	-	-	-	-	-	-	-
375	30701D285	D285	D			3	12	12	0.15	0.25	-	-	-	-	5.0	5	5.00	4.00	-	-	0.25	-	-	-	-	-	-	-	-
376	30701D286	D286	D			3	6	6	0.12	0.33	0.11	-	-	-	6.0	3	3.74	2.74	-	-	0.43	-	-	-	-	-	-	-	-
377	30701D287	D287	D			3	6	6	0.25	0.21	0.27	-	-	-	6.0	3	4.70	3.70	0.48	-	-	-	-	-	-	-	-	-	-
378	30701D288	D288	D			3	6	6	0.43	0.26	-	-	-	-	4.0	4	4.00	3.50	0.16	0.10	-	-	-	-	-	-	-	-	-
379	30701D289	D289	D			1	6	6	0.48	0.07	0.22	-	-	-	4.0	3.5	3.88	3.26	-	0.29	-	-	-	-	-	-	-	-	-
380	30701D290	D290	D			1, 2	6	6	0.26	-	0.06	-	-	-	4.0	4	4.00	3.50	-	0.06	-	-	-	-	-	-	-	-	-
381	30701D291	D291	D			2	6	6	0.29	-	0.22	-	-	-	4.0	4	4.00	3.50	0.18	0.04	-	-	-	-	-	-	-	-	-
382	30701D292	D292	D			2	6	6	0.06	-	0.17	-	-	-	5.0	5	5.00	4.50	0.17	-	-	-	-	-	-	-	-	-	-
383	30701D293	D293	D			1, 2	6	6	0.22	-	0.14	-	-	-	4.0	4	4.00	3.00	0.14	-	-	-	-	-	-	-	-	-	-
384	30701D294	D294	D			1	6	6	0.17	0.84	-	-	-	-	8.0	4.5	5.37	4.37	0.84	-	-	-	-	-	-	-	-	-	-
385	30701D295	D295	D			1	6	6	0.14	-	0.21	0.09	0.22	-	9.0	6	7.77	6.77	0.00	0.52	-	-	-	-	-	-	-	-	-
386	30701D296	D296	D			1	8	8	0.84	-	0.12	-	0.04	-	4.0	4	4.00	3.50	-	0.16	-	-	-	-	-	-	-	-	-
387	30701D297	D297	D			1, 2	9	9	0.52	-	0.04	-	-	-	4.0	4	4.00	3.00	-	0.04	-	-	-	-	-	-	-	-	-
388	30701D298	D298	D			2	6	6	0.16	-	0.17	-	-	-	3.5	3.5	3.50	3.00	-	0.17	-	-	-	-	-	-	-	-	-
389	30701D299	D299	D			2	6	6	0.04	-	0.11	-	-	-	5.0	5	5.00	4.00	0.10	0.01	-	-	-	-	-	-	-	-	-
390	30701D300	D300	D			2	6	6	0.17	0.31	-	-	-	-	3.0	3	3.00	2.00	-	-	0.31	-	-	-	-	-	-	-	-
391	30701D301	D301	D			1, 2	6	6	0.11	0.36	-	-	-	-	5.0	5	5.00	4.00	-	0.36	-	-	-	-	-	-	-	-	-
392	30701D302	D302	D			3	6	6	0.31	0.38	0.18	-	-	-	7.0	5	5.84	4.84	-	0.56	-	-	-	-	-	-	-	-	-
393	30701D303	D303	D			2	6	6	0.36	0.29	-	-	-	-	5.0	5	5.00	4.00	-	0.29	-	-	-	-	-	-	-	-	-
394	30701D304	D304	D			2	7	7	0.56	0.19	-	-	-	-	5.0	5	5.00	4.00	-	0.19	-	-	-	-	-	-	-	-	-
395	30701D305	D305	D			2	6	6	0.29	0.43	-	0.24	0.04	-	5.5	3	3.98	2.98	-	-	0.71	-	-	-	-	-	-	-	-
396	30701D306	D306	D			2	6	6	0.19	0.09	0.17	-	-	-	4.5	3	3.53	2.36	0.26	-	-	-	-	-	-	-	-	-	-
397	30701D307	D307	D			3	10	10	0.71	-	0.15	-	-	-	4.5	4.5	4.50	4.00	-	0.15	-	-	-	-	-	-	-	-	-
398	30701D308	D308	D			1	6	6	0.26	-	0.14	-	-	-	4.0	4	4.00	3.50	-	0.14	-	-	-	-	-	-	-	-	-
399	30701D309	D309	D			2	6	6	0.15	-	-	-	0.06	-	4.5	4.5	4.50	4.00	-	0.06	-	-	-	-	-	-	-	-	-
400	30701D310	D310	D			2	6	6	0.14	-	0.31	0.14	0.04	-	5.0	4.5	4.69	3.83	-	0.49	-	-	-	-	-	-	-	-	-
401	30701D311	D311	D			2	6	6	0.06	-	0.15	-	-	-	4.0	4	4.00	3.00	-	0.15	-	-	-	-	-	-	-	-	-
402	30701D312	D312	D			2	6	6	0.49	0.04	-	-	-	-	3.0	3	3.00	2.00	-	0.04	-	-	-	-	-	-	-	-	-
403	30701D313	D313	D			2	6	6	0.15	-	0.11	-	-	-	6.0	6	6.00	5.00	0.01	0.10	-	-	-	-	-	-	-	-	-
404	30701D314	D314	D			2	6	6	0.04	-	0.07	-	-	-	5.0	5	5.00	4.00	-	0.07	-	-	-	-	-	-	-	-	-
405	30701D315	D315	D			1, 2	10	10	0.11	-	-	-	-	0.26	4.0	4	4.00	3.00	0.26	-	-	-	-	-	-	-	-	-	-
406	30701D316	D316	D			2	6	6	0.07	0.18	-	-	-	-	5.0	5	5.00	4.00	0.18	-	-	-	-	-	-	-	-	-	-
407	30701D317	D317	D			1	6	6	0.26	-	-	-	-	0.34	4.5	4	4.21	3.21	0.34	-	-	-	-	-	-	-	-	-	-
408	30701D318	D318	D			1	6	6	0.18	-	0.07	-	-	-	4.0	4	4.00	3.00	0.07	-	-	-	-	-	-	-	-	-	-
409	30701D319	D319	D			1	6	6	0.34	0.19	-	-	-	-	3.0	3	3.00	2.00	0.19	-	-	-	-	-	-	-	-	-	-
410	30701D320	D320	D			1	6	6	0.07	0.16	-	-	-	-	5.0	5	5.00	4.00	0.16	-	-	-	-	-	-	-	-	-	-
411	30701D321	D321	D			1	6	6	0.19	0.11	0.34	-	-	-	10.0	4	7.22	4.70	0.45	-	-	-	-	-	-	-	-	-	-
412	30701D322	D322	D			1	6	6	0.16	0.34	-	-	-	-	6.0	5	5.32	4.32	0.34	-	-	-	-	-	-	-	-	-	-
413	30701D323	D323	D			1	10	10	0.45	0.18	-	-	-	-	5.0	5	5.00	4.00	0.18	-	-	-	-	-	-	-	-	-	-
414	30701D324	D324	D			1	14	14	0.34	0.19	-	-	-	-	5.0	5	5.00	3.00	0.19	-	-	-	-	-	-	-	-	-	-
415	30701D325	D325	D			1	6	6	0.18	0.24	-	-	-	-	3.0	3	3.00	2.00	-	0.24	-	-	-	-	-	-	-	-	-
416	30701D326	D326	D			1	6	6	0.19	0.29	0.30	-	-	-	5.0	4	4.50	3.50	-	-	-	-	-	-	0.59	-	-	-	-