SHIMLA MUNICIPAL CORPORATION

July 2012

Comprehensive Mobility Plan Shimla

Final Report

Urban Mass Transit Company Limited

Table of Contents

List of Figures

List of Tables

List of Abbreviations

CDP	City Development Plan
CMP	Comprehensive Mobility Plan
ECS	Equivalent Car Space
SPA	Shimla Planning Area
IPT	Intermediate Public Transport
ISBT	Inter State Bus Terminal
LCV	Light Commercial Vehicle
MAV	Multi Axle Vehicle
NMT	Non-Motorised Transport
PCU	Passenger Car Unit
JnNURM	Jawaharlal Nehru National Urban Renewal Mission
SMC	Shimla Municipal Corporation
TOD	Transit Oriented Development
TSM	Transport System Management
V/C Ratio	Volume/Capacity Ratio
TAZ	Traffic Analysis Zone
MCRTS	Medium Capacity Rapid Transit System
MoUD	Ministry of Urban Development, Government of India
NUTP	National Urban Transport Policy
UDPFI	Urban Development Plans Formulation and Implementation Guidelines

Chapter 1-Introduction

1 Introduction

1.1 Background

Formerly known as Simla, a popular tourist destination and often referred to as the "Queen of Hills", was declared the summer capital of the British Raj in India in 1864.

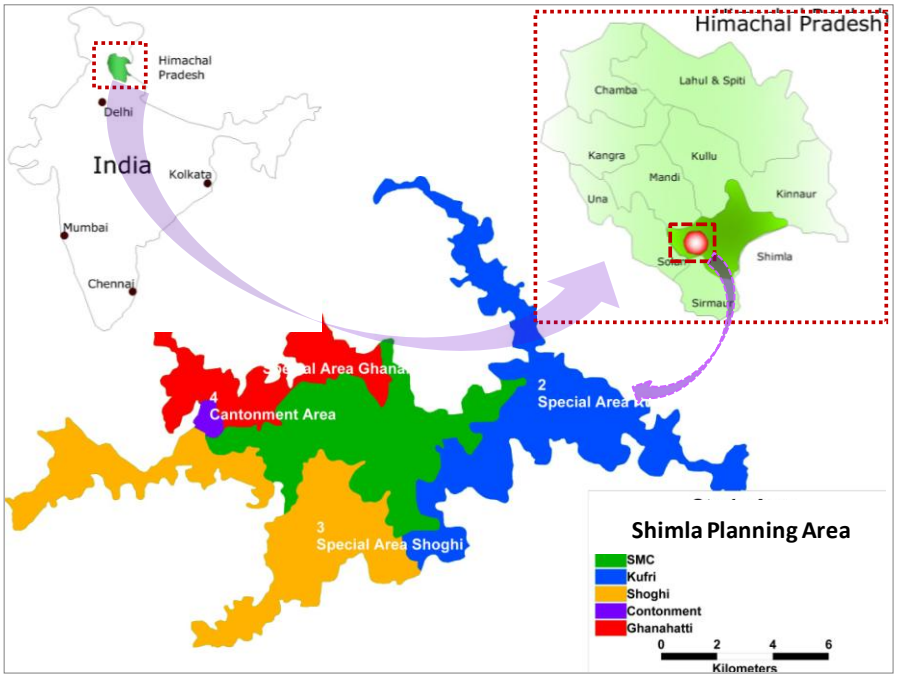


Figure 1-1: Location of Shimla

The capital city of Himachal Pradesh, the city is named after the goddess Shyamala Devi, an incarnation of the Hindu Goddess Kali. Located in the north-western ranges of the Himalayas, at an average altitude of 2397 meters (7866 ft) above mean sea level, the city is spread on a ridge and its seven spurs.

Shimla city has undergone vast transformations over a period of time. Till 1815, Shimla was merely a small-sized village. Shimla Municipal Committee was first constituted in 1851. In 1874, Shimla was brought under 'Punjab Municipal Act, 1873'. In 1966, with reorganization of territory of Punjab, Haryana and Himachal Pradesh, Shimla became the capital of Himachal Pradesh. In 1969, Shimla Municipal Committee was converted into a Corporation.

With everincreasing importance of Shimla particularly after declartion of Shimla as capital of the state of Himachal Pradesh has grown manifold over periods of time.

Today Shimla with population of 2.01 Lakhs (Census Provisional Records, 2011) is considered as one of the large hill town (as per UDPFI guidelines) of the country.

The city of Shimla is connected to the city of Kalka by one of the longest and World Heritage listed narrow gauge railway routes still operating in India, the Kalka-Shimla Railway. Shimla is approximately 115 km from Chandigarh, the nearest major city, and 365 km from New Delhi, the national capital.

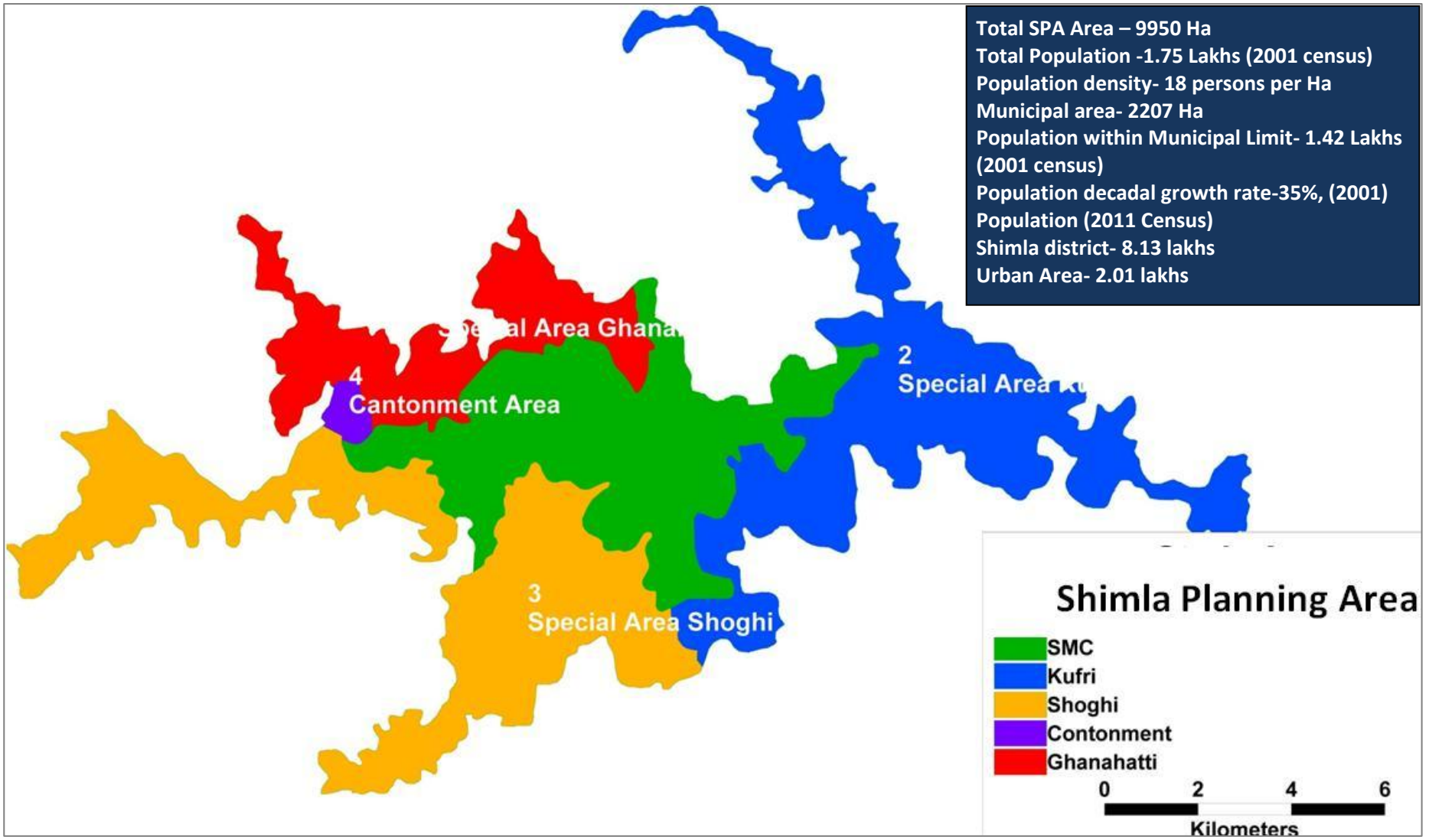


Figure 1-2: Profile of Shimla Planning Area

1.2 Need for CMP

1.2.1 Improving mobility of people

Once termed as queen of hills, during the post - independence period, Shimla has witnessed unprecedented urbanization. The urban sprawl has extended far beyond the existing territorial jurisdiction of the city administration and is continuing to spill over into the fringe areas. Although, number of measures have been adopted by the city authority to improve basic infrastructure services, yet chaotic traffic scenario remains the major issue of concern. Due to limited road width and limited scope to widen the same, together with increase in number of private vehicles, traffic congestion, delays have become common phenomenon. The situation becomes more acute during peak hours. Besides the fuel getting wasted, air is also being polluted due to congestion. Growth and development of commercial activities along both sides of the road and on-street parking of private vehicles by resident users, has further aggravated the situation. On the other hand, the pedestrians have become more vulnerable due to lack of dedicated pedestrian lanes. In areas like Gurudwara bus stand, Old ISBT, Sanjauli Chowk without adequate pedestrian refuge area has become the major bottleneck point of Shimla city. Thus, in order to sustain its old glory and to promote it as one of the most vibrant heritage rich city of the country, Shimla requires a comprehensive vision document for urban mobility. This vision document should spell out the transport infrastructural needs and requirements of Shimla for both base year and horizon year in conjunction with the other plans and schemes (such as Master Plan or Development Plan etc.) as conceived by the authorities. The Comprehensive Mobility Plan (CMP) for Shimla aims at developing an integrated land-use transport vision document for creating an organized transport system to achieve sustainable mobility for Shimla city. The CMP for Shimla emphasizes movement of people and goods by both motorized and non-motorized mode of transport giving priority to public transport.

The need for this CMP arises from the fact that, transport infrastructure improvement projects being underway or proposed in Shimla are viewed in isolation and not visualized as a part of an overall transport plan for Shimla.

1.3 Integrated approach

As per the National Urban Transport Policy (NUTP), it is important to focus on personal mobility to achieve cost-effective and equitable urban transport measures within an appropriate and consistent methodology. Accordingly, the Ministry of Urban Development, Government of India (MoUD) encourages each city to prepare a Comprehensive Mobility Plan (CMP) as part of long-term urban transport strategy for sustainable improvement in the mobility of people and goods in regions, integrated with respective land use plan. CMP should also highlight the projected mobility needs of the city as also the manner in which these are proposed to be met.

City civic agencies like Shimla Municipal Corporation have undertaken various programes/studies on improving the transportation system. Several road widening and network improvement proposals (including planning and construction of tunnels, ISBT etc.) are undertaken by HPPWD, NHAI, HIMUDA etc. These programmes are sometimes isolated from each other, with each of them being planned to meet an objective set by the respective program. There is a strong need for coordinated implementation strategy for these projects in the entire study area. It is wiser to first set goals for the study area and establish strategies to meet these goals rather than implement isolated projects.

CMP needs to be prepared which focuses on mobility of people and vehicles, give priority to pedestrians, Non-Motorized Transport (NMT) as well as all modes of public transport.

A Comprehensive Mobility Plan is a strategy document that defines Mobility Vision of the city, which is in synchronization with the City Development Plan and details out strategies and actions for achieving the objectives for enhancing mobility of the people. CMP will address traffic issues and problems of all modes of transportation and suggests a direction for a sustainable integrated multi-modal transport system for the city.

It is in this context, that Government of Himachal Pradesh through Municipal Corporation of Shimla is preparing Comprehensive Mobility Plan for Shimla. The

Municipal Corporation of Shimla has signed an Agreement with Urban Mass Transit Company (UMTC) for preparation of CMP.

1.4 Organisation of the Report

The process of preparing Comprehensive Mobility Plan for Shimla Planning Area has been completed in four stages, and accordingly four deliverables has been submitted to the respective authority. These four deliverables and their broad coverage are as follows:

1. Inception Report: Inception Report covers various aspects of this study such as understanding of Scope of work, Study Area demarcation, list of primary surveys to be conducted, list of secondary data collected and to be collected, list of stakeholders consulted and to be consulted.
2. Interim Report: Interim Report covers the Analysis of secondary and primary survey data, evaluation of existing transport scenario of the study area and project concepts based on preliminary analysis and site observations.
3. Draft Final Report: The Draft Final covers the development of Travel Demand Model using transport planning software to project the transport scenario for the both base year and horizon year, establishment of traffic and transportation issues, and formulation of draft proposals in respect of mobility corridors, network improvement plan, public transport plan, non motorized transport plan and pedestrian facility, parking management plan, freight mobility plan and traffic management plan etc. Block cost estimates of each individual proposals along with financing options have been elaborated upon.

   Each report submitted, has been discussed with stakeholders, details of which is given in chapter nine (Stakeholder Consultations) of this report.
4. Final Report: Based on the feedback obtained from stakeholders, the proposals discussed in the Draft Final Report has been reformulated or modified as required with detailed block cost estimates, sources of funding and possible revenue generation.

This Final Report consists of ten chapters - Introduction, Approach and Methodology, Existing Transportation Scenario of Study Area, Travel Demand Assessment, Mobility

Plan Strategies, Implementation Programme and Costing, Institutional Framework, Environmental and Social Impact Assessment, Outcomes and Stakeholder Consultaions.

The first chapter "Introduction" describes the need for CMP for Shimla and different aspects of the study area such as physical connectivity, demographic characteristic, landuse pattern, economic base and major traffic attraction centers of the study area.

The second chapter "Approach and Methodology" describes the scope of work and methodolgy adopted to prepare Comprehensive Mobility Plan for Shimla

Chapter three describes the existing transportation scenario of study area in terms of network, traffic and travel, parking, pedestrian and public transport characteristics based on both primary and secondary data.

Chapter four "Travel Demand Assessment" descibes the process of developing tranportation model to forcast the future or horizon year travel demand. This chapter also describes the process of scenario building to arrive at feasible and sustainable mobility goal for Shimla.

Chapter five on "Mobility Plan Strategies" describes the various approaches for achiveing mobility vision of the study area. This chapter incude identification of number of intervention measures ranging from landuse-transport integartion to junction improvemnt for improving mobility of the study area based on data analysis and transportation model.

Chapter six "Implementation Programme and Costing" defines phases for implementing the projects identified in chapter five in terms of priority. This chapter also descibes the cost estmates associated with implementation of each projects. The financing options to implement each of the projects is also described in this chapter. Revenue generation potential of selected projects is also assessed in this chapter.

Chapter seven "Institutional Framework" descibes the existing city and state level institutional structures responsible for managing and monitoring urban transport. This chapter recommends number of reform measures for improvement of existing city and state level institutional structures.

Chapter eight "Environmental and Social Impact Assessment" describes the environmental and social impacts of projects identified.

Chapter nine on "Stakeholder Consultations" describes the details of stakeholder consulted during the whole process of prepartion of Comprehenshive Mobility Plan for Shimla.

Chapter ten on "Outcomes" assessed the outcomes and accordingly justifies the projects suggested in terms of overall improvement in mobility situation.

1.5 Study area

As per guidelines of Ministry of Urban Development, Government of India, the study area for the Comprehensive Mobility Plan (CMP) should cover a larger planning area including the municipal corporation area limits. Thus, for the purpose of this study, the spatial limits considered for developing the CMP is the Shimla Planning Area. The geographical spread of Shimla Planning Area (SPA) is about 100 sq. km, which comprises of areas under jurisdiction of following local bodies:

(1) Shimla Municipal Corporation (SMC) including area under recently merged Special Areas of Dhalli, New Shimla, and Tutu
(2) Special Area Development Authority, Kufri
(3) Special Area Development Authority, Shoghi
(4) Special Area Development Authority, Ghanahatti

The area distribution of Shimla Planning Area is given in Table 1-1.

Table 1-1 Area distribution of Shimla Planning Area

S.No	Settlements	Area (in Hectare)	% of Total
I.	Shimla Municipal Corporation	1367	13.74
(a)	New Shimla[1]	388	3.90
(b)	Dhalli[1]	253	2.54
(c)	Tutu[1]	199	2.00
II.	SADA Ghanahatti[2]	1647	16.55
III.	SADA Kufri[3]	3173	31.89
IV.	SADA Shoghi[3]	2923	29.38
	Total SPA Area	**9950**	**100.00**

Source: City Development Plan, 2007

[1] Notified as Special Area Development Authority in 2003 and merged in SMC in August 2006

[2] Notified as Special Area Development Authority in 2004

[3] Notified as Special Area Development Authority in 2000

1.6 Land use pattern

The land use pattern for the Shimla Planning Area (SPA) is given in Figure 1.3. Referring to Figure 1.3, 61% of total land of SPA is forestland, approximately 4% of land is under traffic and transportation and 9% is under residential use. However within Shimla Municipal Corporation area, 61% area is under residential use reflecting municipal area has the highest pressure on land in terms of residential activity (Refer to figure 1-4). 25% of land within Shimla Municipal Corporation area is under traffic & transportation, which seems to be one of the best, however, this 25% land under traffic & transport includes both motorable roads and old pathways, and most of the pathways are in poor conditions.

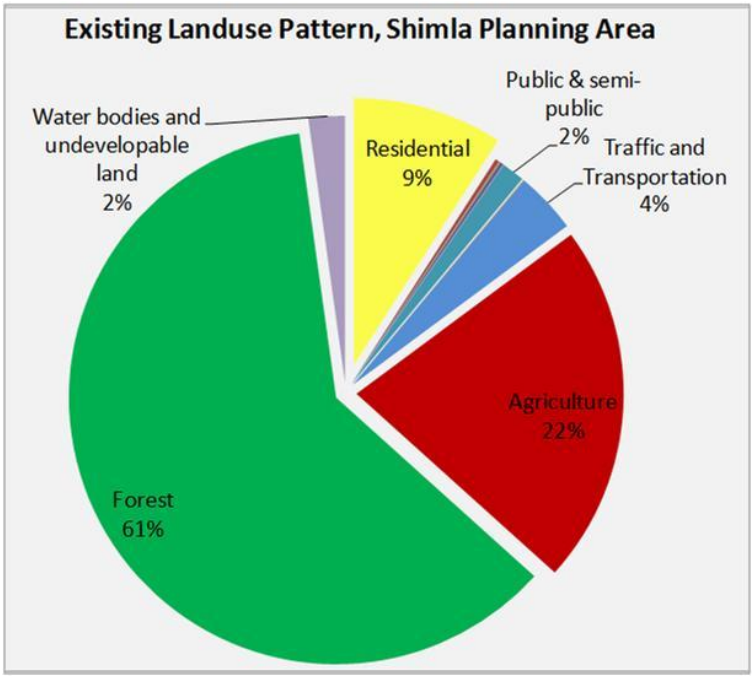


Figure 1-4: Exiting land use pattern, Shimla Planning Area

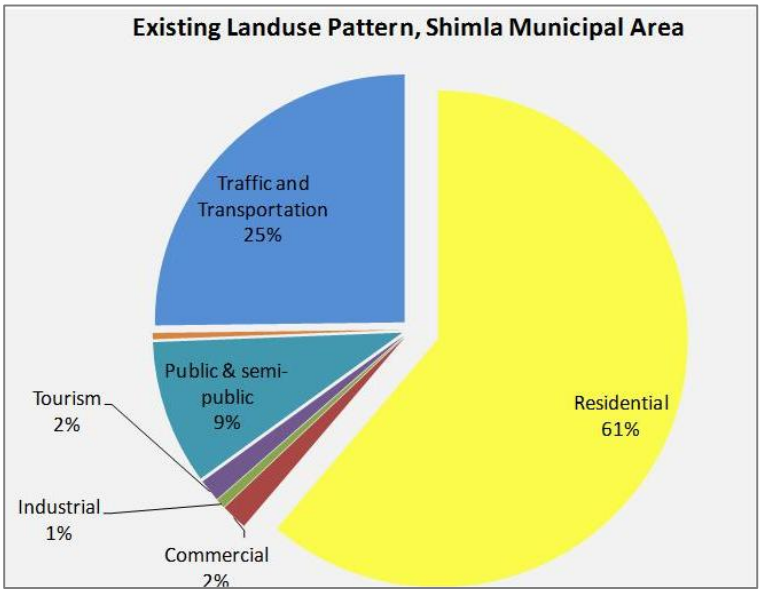


Figure 1-3: Exiting land use pattern, Shimla Municipal Area

The existing land use plan of SPA is presented in Figure 1-5.

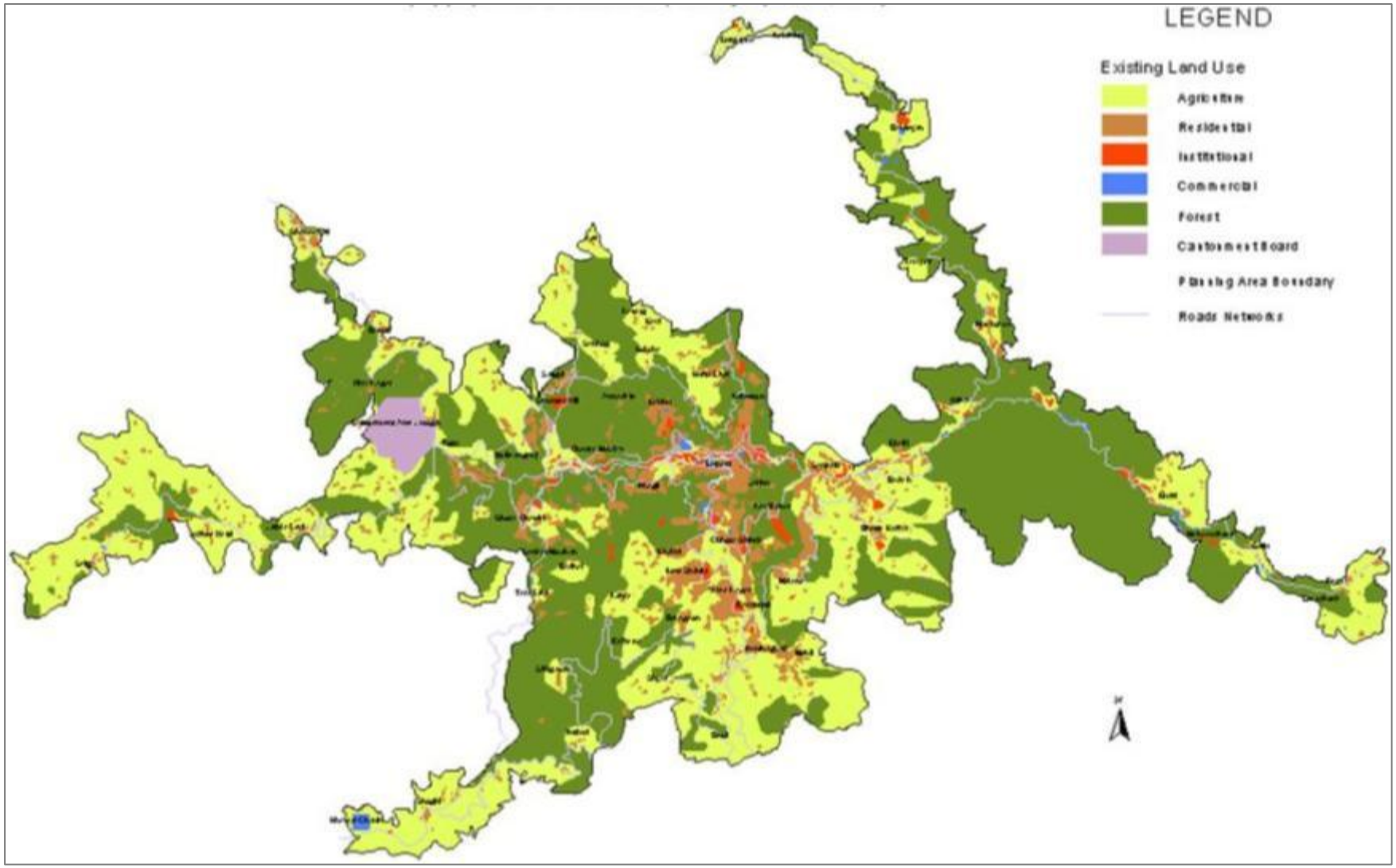


Figure 1-5: Land use plan for Shimla

1.7 Connectivity

Shimla is connected by road, rail and air. Shimla is connected by road with Delhi (365 km), Chandigarh (117 km) and Kalka (90 km) through NH-22. National Highway 88 provides connectivity to the Kangra Valley and contributes significantly to the tourist circuit of Himachal Pradesh. Shimla is connected by narrow gauge railway line from Kalka (90 km). Shimla Airport at Jubbarhatti, 23 km from city is connected to Delhi.

1.8 Demography

Shimla Planning Area (SPA), has a population of 1,74,789 persons (2001 census), accounting for about 24% population of the Shimla district. As per the UDPFI (Urban Development Plans Formulation and Implementation Guidelines, Ministry of Urban Affairs and Employment, Govt. of India, 1996), a hill town with population of 80,000 or more is considered as large city.

The population of SPA has increased from 1,29,827 persons in 1991 to 1,74,789 in 2001, recording a decadal growth rate of 34.63%. During the past few decades, the city's population has grown at a faster pace than the corresponding state average of 25%. Figure 1-6 shows the growth of population in study area. As per Census Provisional Records 2011, the urban population of Shimla is 2.01 Lakhs (Shimla district population-8.13 lakhs, 2011 census)

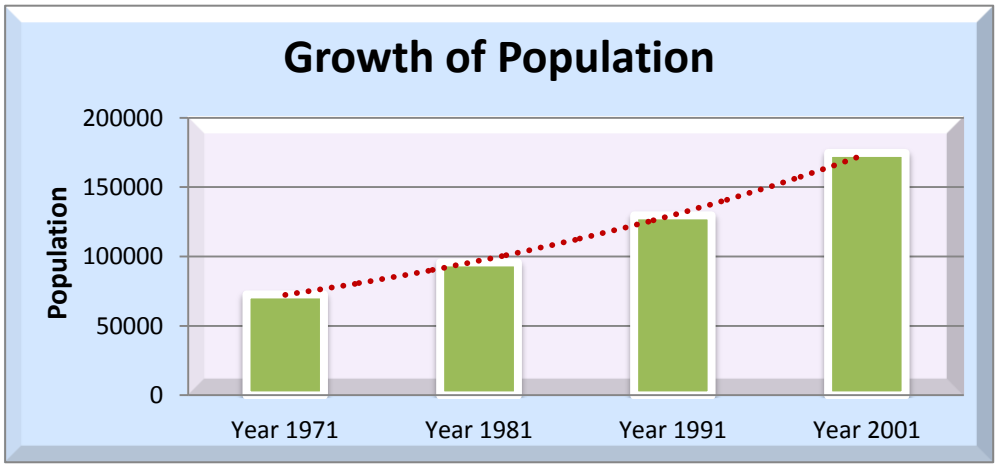


Figure 1-6: Population growth in Shimla

Source: Census of India

The distribution of population within SPA is described in the Table 1-2.

Table 1-2 Settlement pattern- of Shimla City

Settlements	Population (2001)	% of Total
Shimla Municipal Corporation including Tutu, New Shimla & Dhalli	1,42,555	82%
Special Area Development Authority (Ghanahatti)	10,185	6%
Special Area Development Authority (Kufri)	10,720	6%
Special Area Development Authority (Shoghi)	11,329	6%
Total SPA Area	**1,74,789**	**100%**

Source: City Development Plan for Shimla, 2007 and Integrated Development Plan for Shimla

About 82% of entire population of SPA lives in Shimla Municipal Corporation area, including Dhalli, Tutu, and New Shimla.

1.9 Population Projection

As per the City Development Plan and Development Plan prepared by Town and Country Planning Department, the population of SPA is anticipated to increase at the rate of 35% during the decades of 2011 and 2021, which is likely to be 2,35,970 and 3,18,560 respectively.

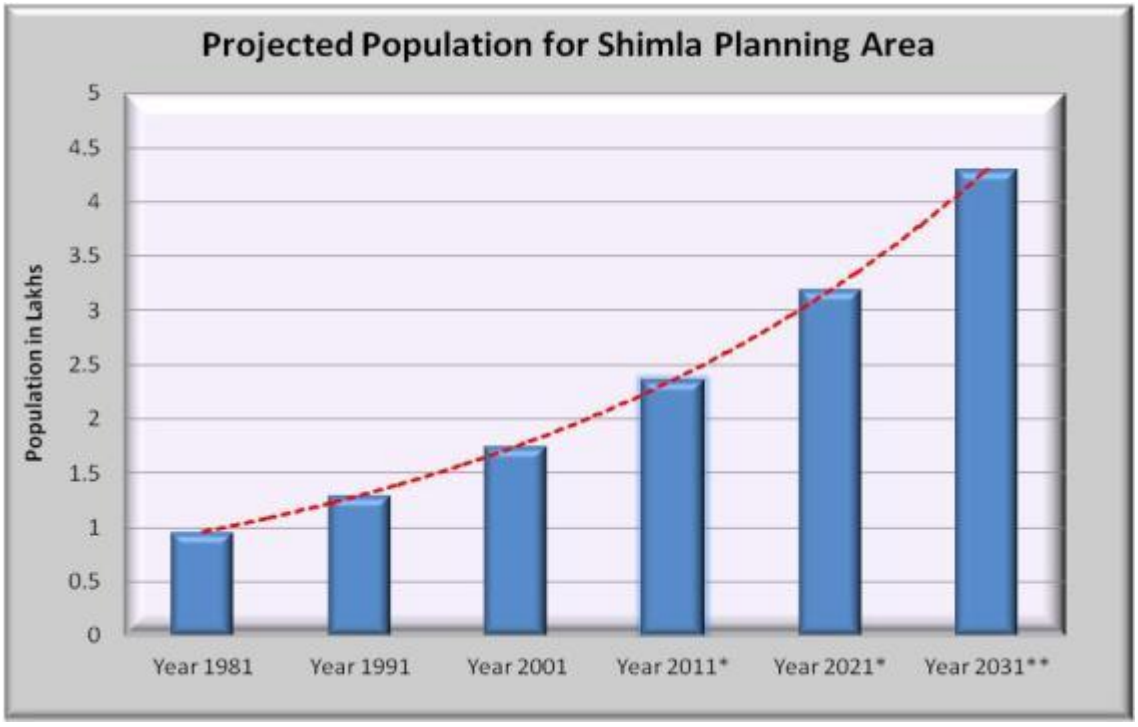


Figure 1-7: Projected population for Shimla

* Population projected by City Development Plan and Development Plan
** Population projected by CMP

Based on the assumptions of the CDP and the Development Plan, the CMP for Shimla has also projected the population of Shimla for the horizon year i.e for 2031 as 4.30 Lakhs. The projected population is shown in Figure 1-7.

1.10 Tourism

Tourism industry is one of the main growth driver for the state of Himachal Pradesh. Tourism provides direct employment opportunities in hotels and guesthouses, bars and restaurants, guides, travel agents, photographers etc. and generates large indirect employment. Year wise annual tourist arrivals in Shimla district is given in Table 1-3.

Table 1-3 Year wise tourist arrivals in Shimla district

Year	Domestic Tourists	Foreign Tourists	Total no. of Tourists
2006	19,71,417	90,407	20,61,824
2007	20,95,946	98,839	21,94,785
2008	20,61,539	11,2,917	21,74,456
2009	21,75,314	10,8,981	22,84,295
2010	24,85,564	12,7,737	26,13,301

Source: Department of Tourism, Himachal Pradesh

Amongst other tourist destinations within the state, Shimla attracted the maximum (approximately 20% of total tourist arrivals in the state) number of tourists during the year 2010. As the number of tourists has increased, tourism is playing an important role in the economy of Shimla. As per Development Plan (2007) for Shimla, 4,049 people are employed in tourism industry.

Table 1-4: Employment in tourism industry

Sub-Sector	Number of Workers	Percentage
Hotels and Guesthouses	3130	77.00
Restaurants and Bars	276	7.00
Tourist guides	235	6.00
Travel agents	188	5.00
Photographers	220	5.00
Total	**4049**	**100**

Source: H.P. Tourism Department

1.11 Major traffic attraction centers

Shimla city has the following distinct categories of major traffic attraction centers:

1. **Heritage centers or tourist centers** – The main tourist attraction centers of Shimla city are:
   - The Ridge: A large open space in the heart of town presents excellent views of the mountain ranges acting as lifeline of the city.
   - The Mall: A unique road length starting from Boileauganj to Chota Shimla along the Ridge with heritage buildings and showcase of colonial architecture, all along, the Mall road is highly fascinating and most commonly visited place by both the local residents as well as the tourists.

- Kufri: Located at an altitude of 2,510 metres above sea level amongst the foothills of the Himalayas, Kufri is famous for its beautiful environs and cool refreshing atmosphere.
- Jakhu Temple: The hanuman temple at the top of Jakhu hill is the highest point in the city.
- Naldehra: Situated at a height of 2044 metres above sea level and about 22 kms from Shimla city, it is famous for its beautiful and serene Golf Course.
- Tibet Monastery: Built it in unique Tibetan architectural style at Sanjauli, is famous for Buddhist Lamas and nuns for their spiritual rituals, who worship over here and equally valued by other pilgrims also.
- Sri Sankat Mochan: Sri Sankat Mochan Hanuman temple made of stone is located in natural surroundings and is one of the major tourist attraction points in Shimla
- Prospect Hill: Kamna Devi temple is situated on the summit of Prospect hill.
- Birds Sanctuary: Himalayan Birds sanctuary is situated near Petter Hoff Hotel.
- Tara Devi: Is a halting point and picnic spot and home of an ancient temple of Tara Devi.
- Dhingu Temple: Located on the top of Dhingu peak, near Sanjauli, there is a temple of deity.

Other important places worth visit around Shimla are Chadwick fall, Annadale Golf Course, State Museum, Jubbarhatti and Jatogh.

2. **Commercial centers –** Due to geographical constraints, Shimla city does not have a large wholesale trading centre. Few regional level wholesale trading market centres, which cater the needs of its residents, are located in Dhalli- Bhatakufar area and automobile centres at Shoghi area.

   The existing main commercial centre is concentrated in and around the Mall in localities namely, Middle Bazaar, Lower bazaar, Lakkar Bazaar and Chhota Shimla. Other newly developed commercial areas are in Kusumpti, New Shimla, Dhalli and Boileauganj.

3. **Industrial centers –** Shimla is being primarily an administrative city, and due to its geographical constraint, has a relatively poor industrial base. An industrial area is located at Shoghi, which houses approximately 40 small-scale industries.
4. **Educational centers –** A large number of schools and colleges are located along Cart road, the main arterial road of Shimla, such as Edwards School, Auckland House School, Bishop Cotton School (BCS), Govt. G.S.S.S. Lakkar Bazaar, Convent of Jesus and Merry etc. The other main educational centers of Shimla are Indian Institute of Advance Studies, the Himachal Pradesh University and IGMC.
5. **Transport terminals** (Railway Stations, Airport and Bus Terminal) – Shimla is well connected by roadways, railways and airways. A large number of passengers or commuters across the state and the country use these modes for commuting daily to and from Shimla, and thereby create an impact on city's transport infrastructure. The newly developed ISBT is located at Tutikandi which has altogether 35 bays for entry and exit. At present, the old ISBT at Cart road is used as terminal for local bus service. The main railway station is Shimla Railway Station along Cart road, which on an average handles approximately 7,000 passengers daily. Shimla airport is located on the western side of the city at Jubarhatti. Some of the selected major traffic attraction centers are shown in Figure 1-8.

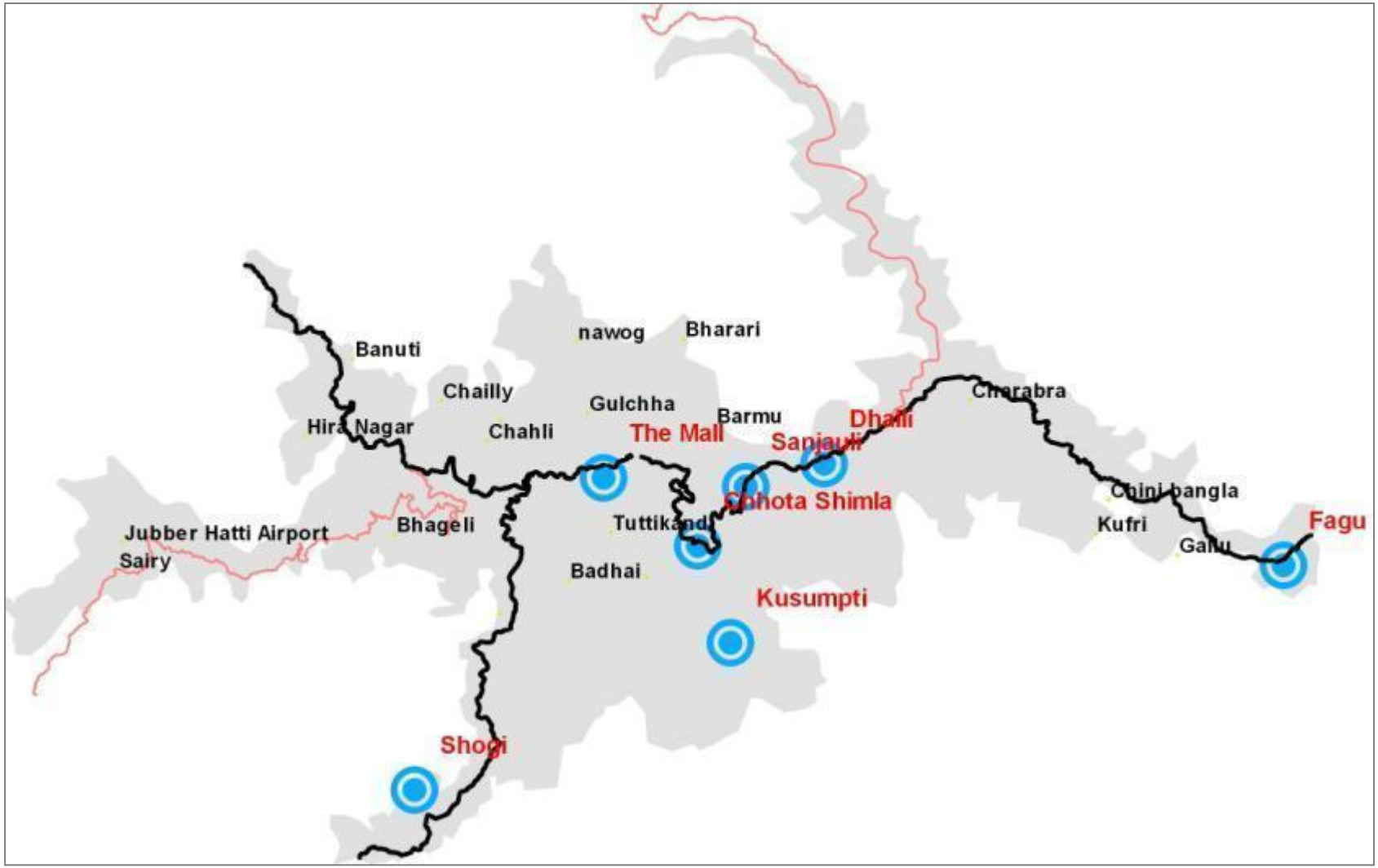


Figure 1-8: Major traffic attraction centres

Chapter 2 - Approach and Methodology

2 Approach and Methodology

2.1 Approach and Methodology

The Methodology for preparing this CMP has been formulated after studying the need for preparing the CMP for Shimla and is based on following aspects:

1. Demographic characteristics of Shimla Planning Area
2. Land use characteristics of Shimla Planning Area
3. Traffic & travel characteristics of Shimla Planning Area
4. Challenges and issues relating to mobility of residents of Shimla Planning Area
5. Suggestions and inputs of project stakeholders
6. Guidelines of National Urban Transport Policy

An in-depth analysis based on the information/data collected on transport and traffic situation has been carried out identifying urban transport characteristics and issues of the study area. The Approach and Methodology followed in preparing of Comprehensive Mobility Plan for Shimla is given in Figure 2-1.

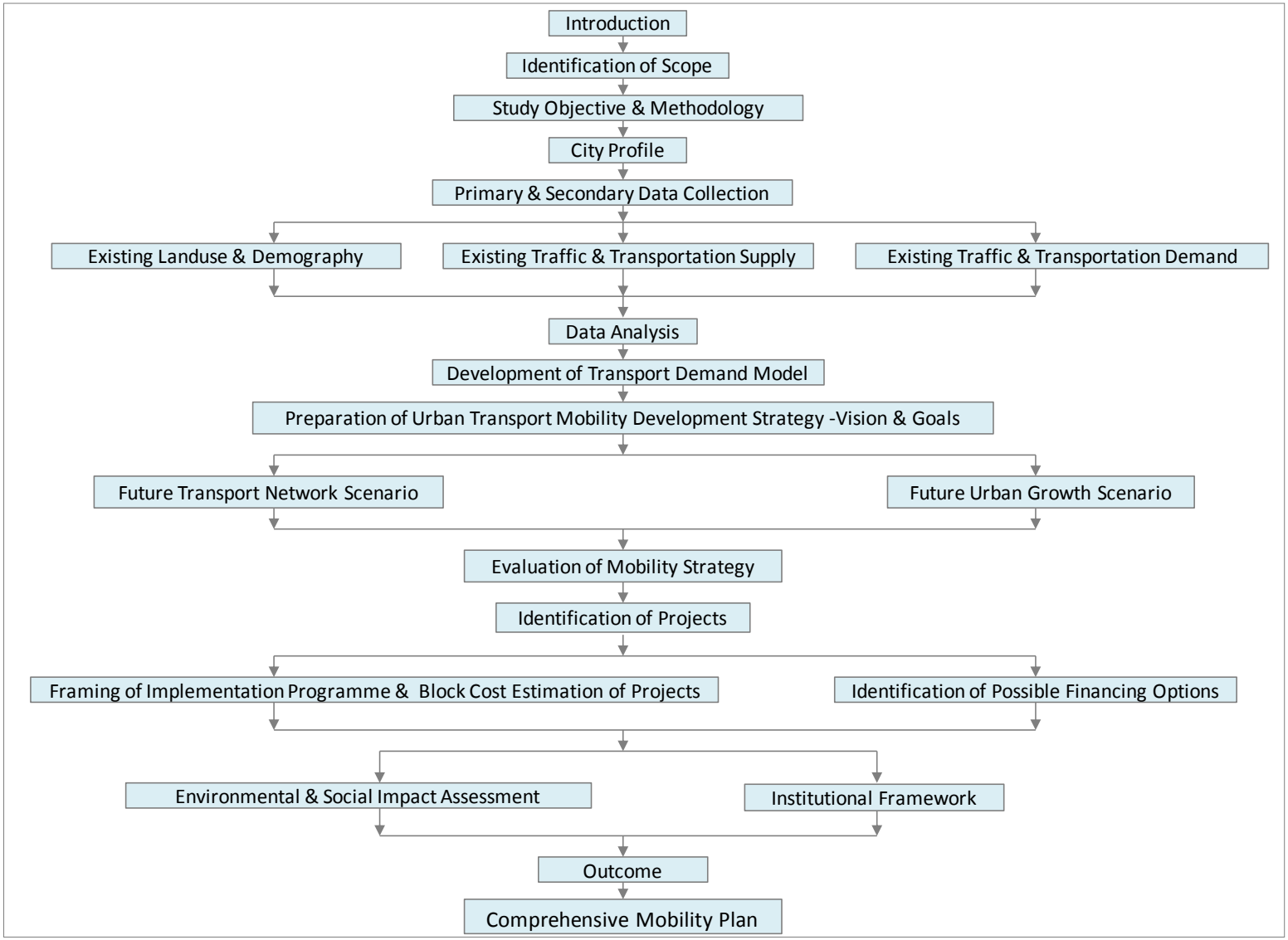


Figure 2-1: Approach and methodology

2.2 Collection and review of existing secondary information

UMTC, with assistance from all stakeholders has collected, compiled and updated all the available relevant information from various past studies carried out in the study area. The secondary data as required for the development of study has been collected from various sources primarily from the government/planning organizations of the study area. Data on existing land use and land use plans have been collected and presented, through a detailed review of existing development plans, including the Master Plan and the City Development Plan (CDP).

During the process, UMTC has identified the data gaps and additional data requirements and accordingly, UMTC has carried out number of primary surveys.

2.3 Collection of data through primary surveys

A number of primary surveys such as traffic survey, household surveys etc. have been carried out by UMTC. An illustrative list of surveys conducted by UMTC, is enlisted below:

1. Road network inventory survey
2. Speed & Delay survey
3. Household survey
4. Outer cordon classified traffic volume count
5. Outer cordon origin-destination survey
6. Turning traffic volume count at intersection
7. Classified traffic volume count at mid block
8. Pedestrian count at intersection
9. Pedestrian count at mid blocks
10. Pedestrian opinion survey
11. Transport infrastructure user opinion survey
12. Bus terminal OD interview survey
13. Boarding alighting survey
14. Railway terminal survey
15. On-street parking survey
16. Off-street parking survey
17. Truck operator survey
18. Taxi & IPT operator survey

Figure 2-2 & figure 2-3 are showing the photographs of various surveys conducted during this study. Details of primary surveys conducted are furnished in Chapter 2 of

Annexure. The information collected from secondary source and primary survey are used for assessment of existing travel pattern and for development of transportation modal, modal validation and forecasting of future travel demand.

2.4 Analysis existing traffic/transport situation

Based on the information/data collected, a basic analysis of the transport and traffic situation was done, identifying characteristics and issues for the city, which includes analysis of existing urban transport situation and traffic characteristics.

2.5 Travel demand modeling

The purpose of travel demand modeling has been to project future travel demand in order to estimate the likely consequences of several alternatives taking into consideration the "Do Nothing or Business as Usual Alternative".

The travel demand forecasting has been done for different horizon years for different modes, in different alternative scenarios.

2.6 Development of urban mobility plan

The Urban Mobility Plan includes development of vision and goals, planning of short-term improvement measures such as pedestrian and other non-motorized transport, public transportation, road network etc., planning of medium and long-range measures, along with cost estimates and prioritization of project. To make the mobility plan a collaborative effort, detailed meetings, consultation were held to solicit the comments and concerns from the stakeholders and disseminate the findings of the draft mobility plan. Input from the stakeholder meetings provided input to the development of this final mobility plan on various aspects and issues of the transportation system.

Figure 2-2: Photographs showing various surveys conducted during this study-1

Figure 2-3: Photographs showing various surveys conducted during this study-2

Urban Mass Transit Company Limited

Chapter 3 -Existing Transportation Scenario of the Study Area

3 Existing Transportation Scenario of the Study Area

3.1 Introduction

Assessment of traffic characteristics within an urban area is an essential pre-requisite to understand the problems with respect to traffic movement and to understand the need for organizing the same in an efficient and economical manner. Traffic characteristics help in appreciating the spatial and temporal features of travel within the area, relationship of traffic intensity with network capacity and the prevailing level of service obtained on various corridors of the network in the study area. This appreciation and understanding is essential for identifying the present conditions and constraints for formulating suitable policies and strategies, selecting relevant systems, and designing individual components of the system.

In order to appreciate an in-depth and comprehensive traffic and transport system and to understand mobility pattern of Shimla Planning Area, a number of primary surveys were conducted within the study area such as classified traffic volume count at outer cordons and junctions, origin destination survey, household survey, parking survey, pedestrian survey, speed & delay survey etc. Based on secondary data and primary data, the analysis and inferences of existing transportation scenario of Shimla Planning Area is highlighted herein.

3.2 Road network characteristics

25.20% of land of Shimla Urban Agglomeration Area (which covers the area within municipal limit) is under Traffic & Transportation. However the Shimla Planning Area as a whole (the study area) has allocated only 3.75% of its land under Traffic & Transportation (as per the Draft Master Plan 2021) which is less than the required for a large hill town (6-8%, as per UDPFI guidelines). The roads in Shimla can be broadly categorized as (refer to table 3-1):

Table 3-1: Characteristics of road network

S.No.	Category	Description	Characteristics
1	Main Arterial Road	Cart Road or Circular Road or Motor Round Road , NH 22 and NH-88	• The length of Cart road is 18 km. • Intersection to minor roads along Cart road at about 66 locations • On-street parking of vehicle on all sections of Cart road
2	Municipal roads	All the roads connecting to Cart Road are municipal roads and are maintained by Shimla Municipal Corporation	• The total length of roads for vehicle movement under the Municipal Corporation as per data available with the SMC is 74.6 kms
3	Mall road	The road from Boileauganj to Scandal point and from Scandal point to Secretariat and from Scandal Point to Sanjauli Chowk	• The road along the Mall is for pedestrian movement and entry is restricted for vehicles except for vehicles with permits and emergency vehicles
4	Municipal pathways or staircases	Municipal paths are in form of blacktop streets along with stairs for pedestrian movement	• These paths or stairs are used for manual transportation of goods/payloads by porters • The total length of walk paths under SMC is 73 kms.
5	Lift	Connectivity between the Mall road and the Ridge with circular road	• The lift is the only mechanized transport system available for vertical mobility between Circular road and the Mall road.

The primary survey for road network covered approximately 200 kms of the road network in the study area (detailed road network characteristics are given in Chapter 2 of Annexure). About 6% of the road network has less than 5m Right of Way (RoW), 73% has RoW between 5 to 10m while 21% has RoW between 10 to 15 m, as indicated in Figure 3-1. Road network plan in Shimla Planning Area is shown in Figure 3-2 and in figure 3-3 road network distribution by right of way is shown.

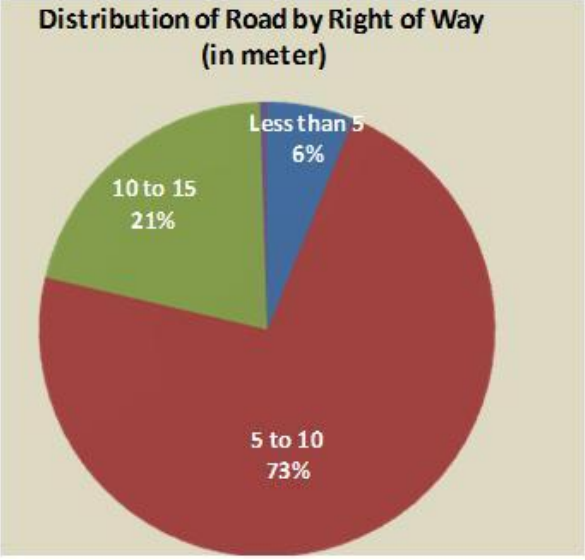


Figure 3-1: Distribution of road by Right of Way

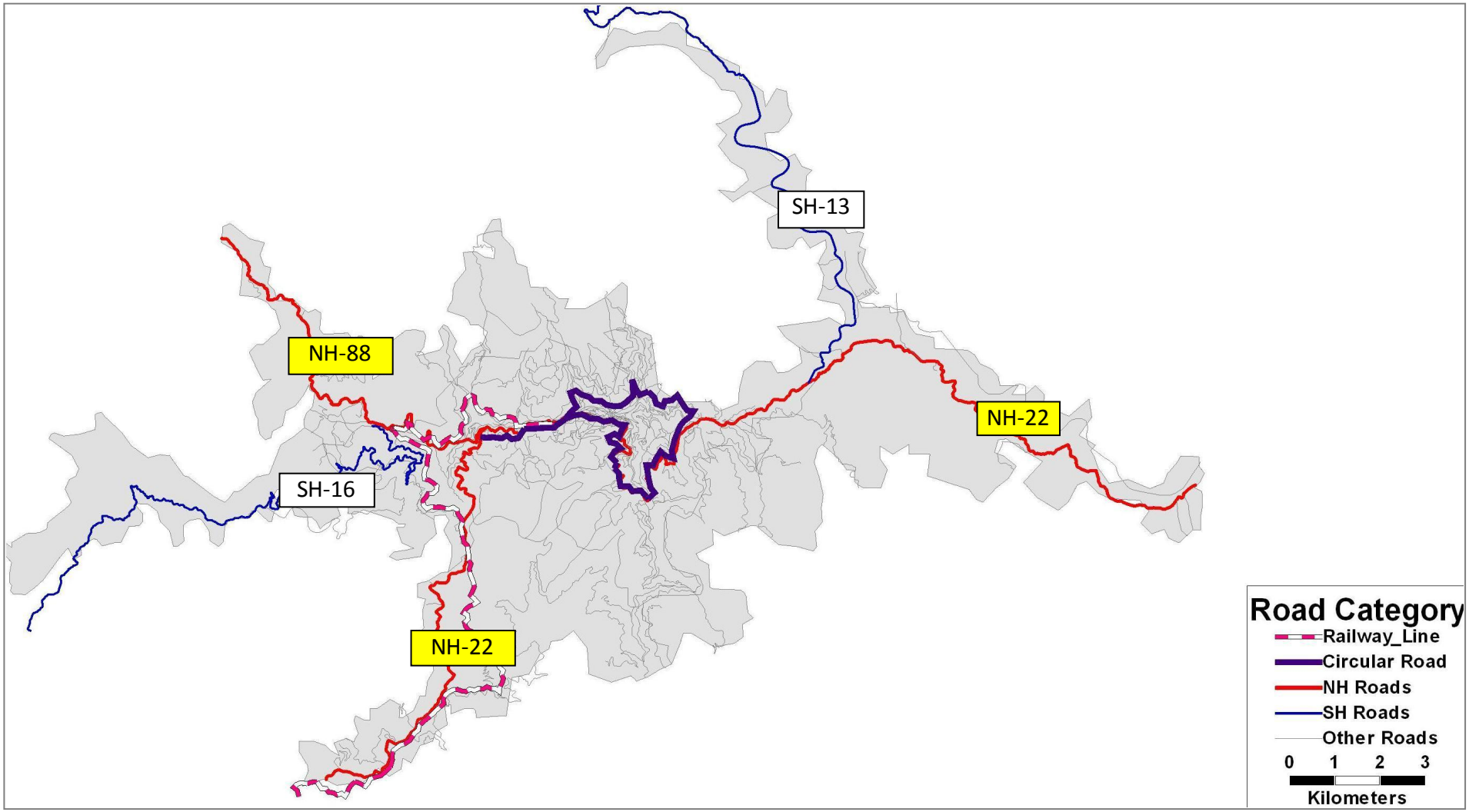


Figure 3-2: Road Network Plan for Shimla

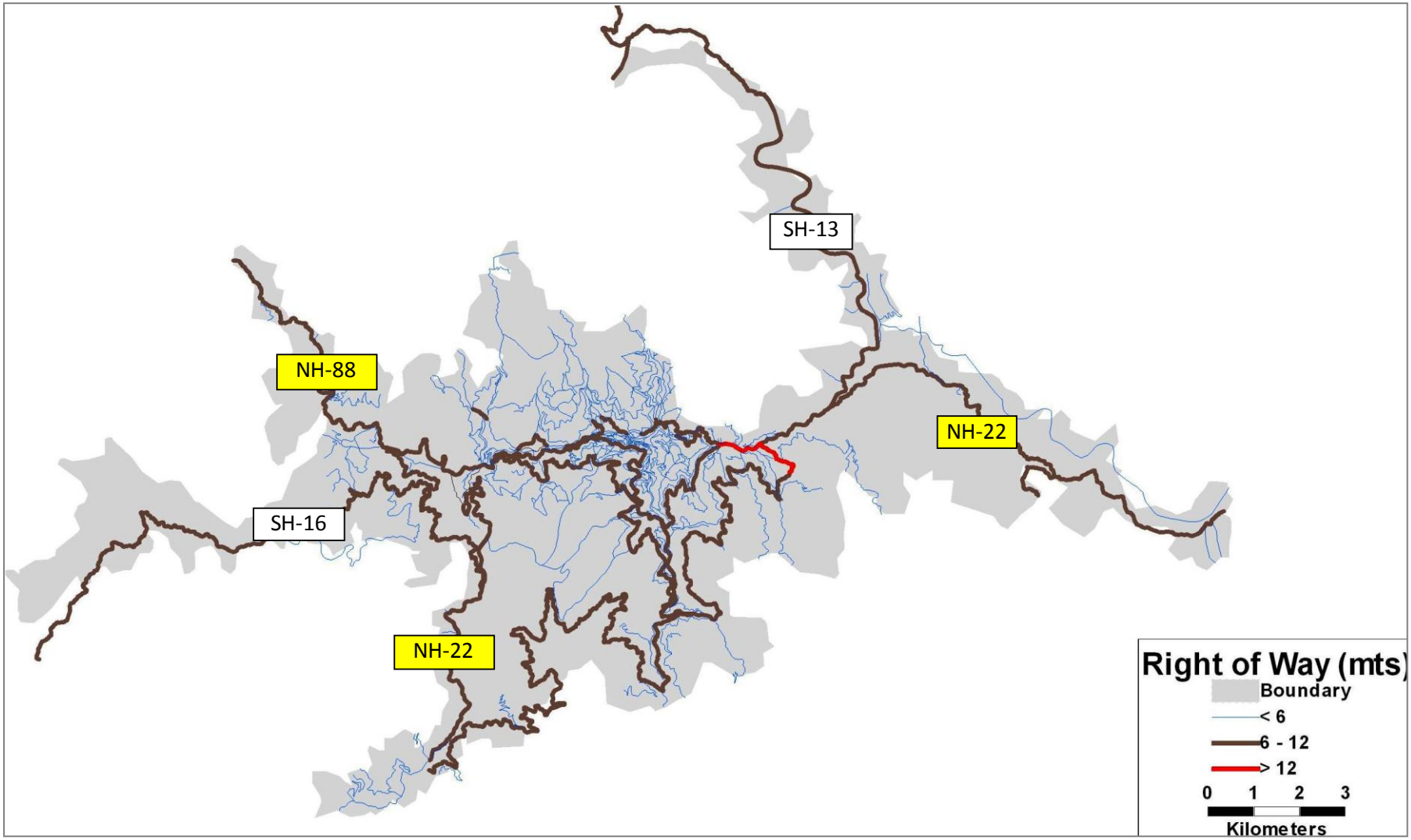


Figure 3-3: Road network in Shimla Planning Area by RoW

Within SPA, only 16% of the road network has footpath while 84% of the road network does not have footpaths. In case of areas under Shimla Municipal Corporation, 32.6% of the road network has footpaths.

74.5% of motorable roads under Shimla Municipal Corporation (SMC) or 36% of total roads under SMC have street lighting facility. However, the street lighting facility for the Shimla Planning Area (SPA) as a whole is grossly inadequate with only 16% of the road network within SPA having street light facility.

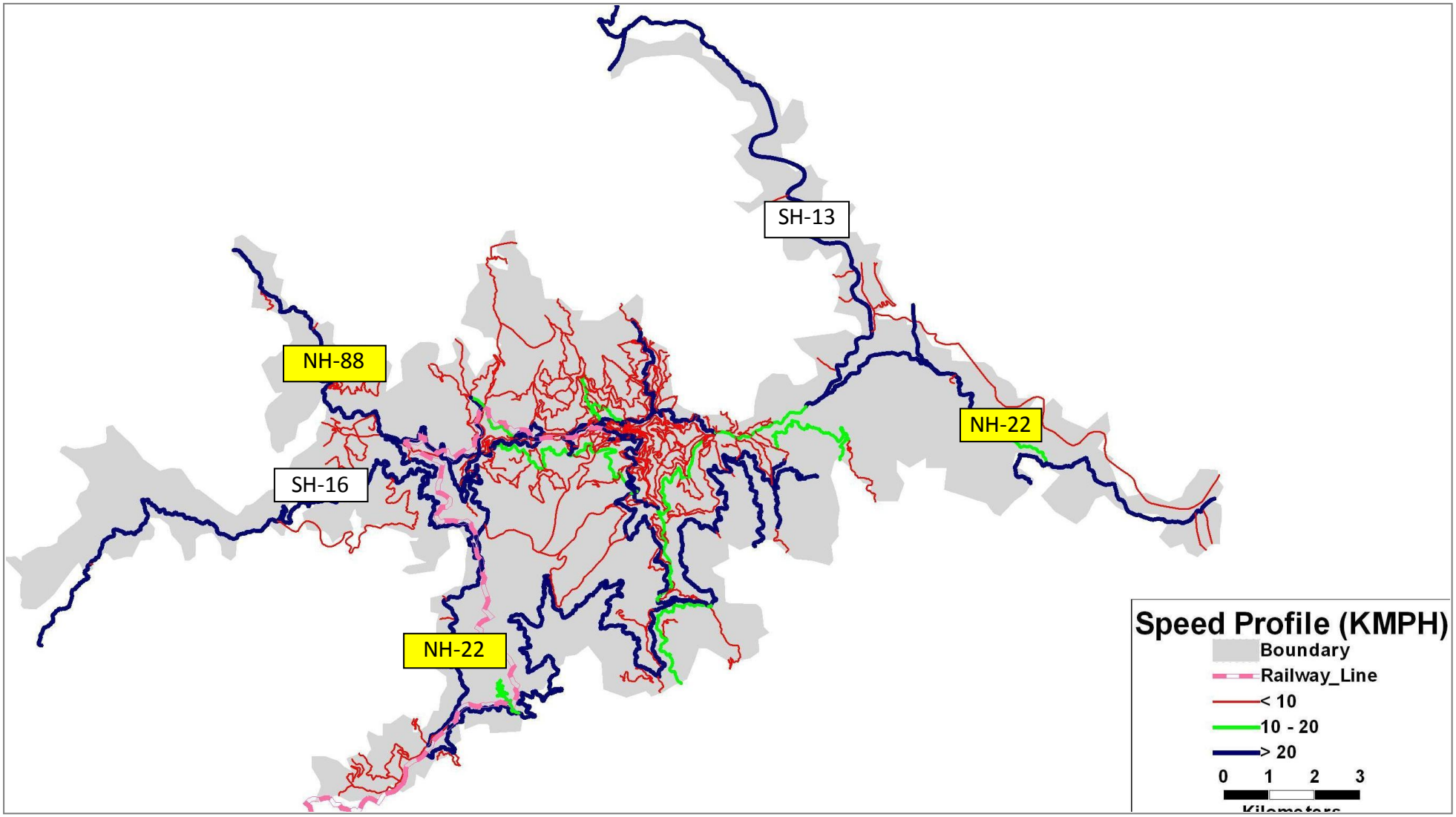


Figure 3-4: Speed profile map of Shimla Planning Area

3.3 Traffic Characteristics

3.4 Travel speed

Travel speed is an important characteristic of traffic. Its measurement is important in transport planning particularly to evaluate the road network system, provide vital inputs to transport demand-modeling process and assist in economic analysis of improvement plans.

- **Journey Speed:** The average journey speed was found to be 27 Kmph with the bottleneck areas such as Lakkar bazaar area near bus stand having the lowest journey speed of approximately 2 kmph during peak hours. Apparently, 16% of the road network has journey speed of less than 20 kmph, 25% of the road network is between 21 to 30 kmph, 48% of road network has the journey speed between 31-40 kmph, while about 11% of the road network has journey speed more than 40 kmph during peak hour. For details, refer to Chapter 2 in Annexure.
- **Delay Profile:** About 75% of the delays occurred due to congestion on the roads. 25% of the delays lasted upto 60 seconds, 42% of the delays lasted between 61–120 seconds while about 33% lasted more than 120 seconds during peak hours. Figure 3-4 shows the speed profile map of Shimla Planning Area.

3.5 Turning traffic volume counts at intersections locations

Turning traffic volume count survey was carried out at 13 major intersections for 16-hour period (0600 Hrs to 2200 Hrs) on a typical fair weather normal working day.

3.5.1 Traffic Volume (Average Daily Traffic – 16 hrs)

It was observed that the traffic at different locations varies from minimum of 4,420 PCUs at Boileaugunj chowk to maximum of 39,914 PCUs at Victory Tunnel chowk, followed by

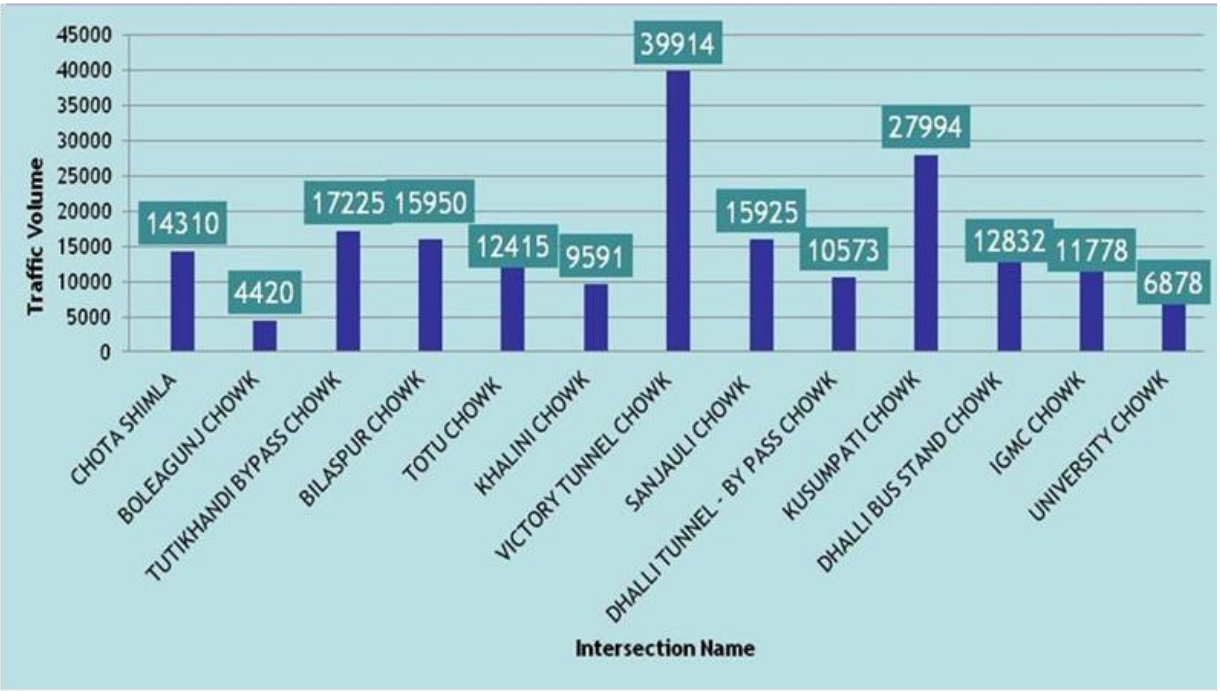


Figure 3-5: Turning volume count at junctions

27,994 PCUs at Kusumpti chowk. Figure 3-5 shows the traffic volume at surveyed intersections, the details of each intersection are given in Chapter 2 of Annexure.

3.5.2 Peak Hour Traffic

The peak hour traffic at the various intersection locations is presented in Chapter 2 of Annexure. The morning peak hour volume varies from minimum of 283 PCUs at Bolieauganj chowk to maximum of 3,577 PCUs at Victory Tunnel chowk. Similarly, the evening peak hour traffic volume varies from minimum of 569 PCUs at University chowk to maximum of 2,818 PCU's at Victory Tunnel chowk.

3.6 Classified traffic volume counts at outer cordon locations

The survey had been conducted at 7 outer cordon locations, which are primarily the major entry and exit points of the study area. The traffic volume counts both in terms of numbers of vehicles and passenger car units (PCUs) have been computed for the total daily (24 hour) traffic conducted at various outer cordon locations and are presented in

Chapter 2 of Annexure. It was observed that the traffic at different locations varies from minimum of 1,894 PCUs at Mehli to maximum of 11,634 PCUs along NH-22 before Shoghi Market. It was observed that on the average about 23,457 vehicles enter and exit Shimla on a typical normal working day.

3.6.1 Details of Traffic Characteristics at the outer cordon

The details of traffic characteristics at the outer cordon locations are presented in Table 3-2. The morning peak hour volume varies from 118 PCUs at Naldehra (Golf Course) along SH-13 to 890 PCUs at NH-22 before Shoghi Market. Evening peak hour volume varies from 118 PCUs near Naldehra (Golf Course) along SH -13 to 1,380 PCUs along NH-22 before Shoghi Market. Figure 3-7, shows the traffic characteristics at outer cordons.

Table 3-2: Traffic characteristics at outer cordon location

Loc. No	Name of Location	Total Traffic		Morning Peak		Evening Peak	
	Outer Cordon	(Veh.)	(PCUs)	(PCUs)	% of Total Traffic	(PCUs)	% of Total Traffic
1	Ghanahatti Market along NH-88	3633	4767	506	10.6	321	6.7
2	Nr. Naldehra (Golf Course) along SH-13	200	214	118	55.1	118	55.1
3	Fagu on NH-22	3959	5748	198	3.4	298	5.2
4	Kufri on MDR-88	1865	1934	231	11.9	265	13.7
5	Mehli on MDR -13	1825	1894	206	10.9	126	6.7
6	NH-22 before Shoghi Market	8231	11634	890	7.6	1380	11.9
7	Along SH-16 before Airport near Kunihar Bus Depot	3744	4121	1456	35.3	333	8.1

Source: Primary Survey 2011

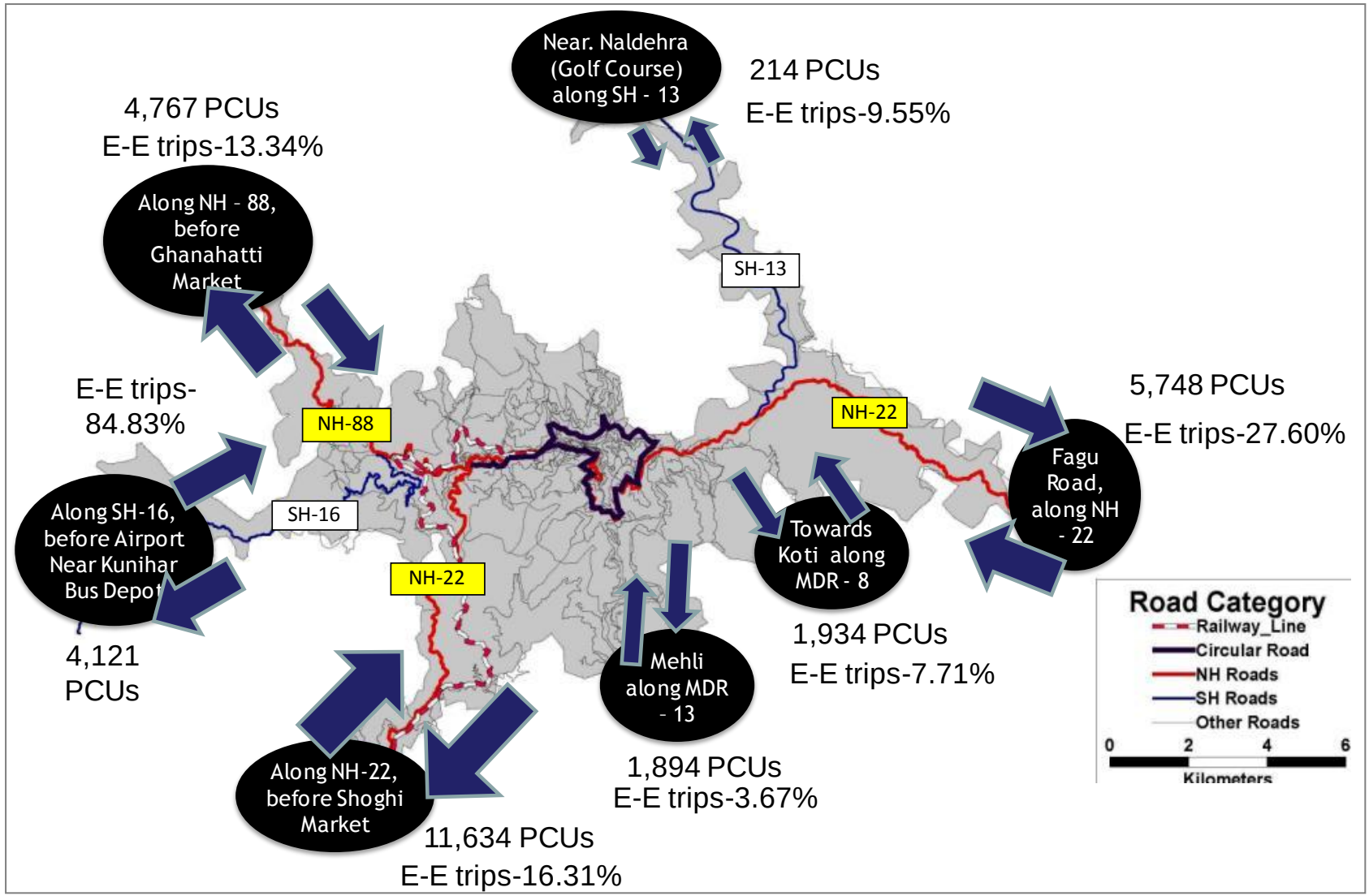


Figure 3-7: Traffic characteristics at outer cordon

3.7 Composition of traffic

The daily traffic composition at outer cordon locations exhibits predominance of fast moving passenger traffic consisting two wheelers, cars, jeep/van etc. The share of bus traffic is as low as 3% at Kufri on MDR–8 and as high as 10% at Ghanahatti Market along NH-88 with an average of about 6.5%. Share of cars in total traffic is maximum at Mehli (52%). The share of goods traffic varies from 6% to 30% and the average is about 17%. Composition of traffic at outer cordon locations is presented in Table 3-2.

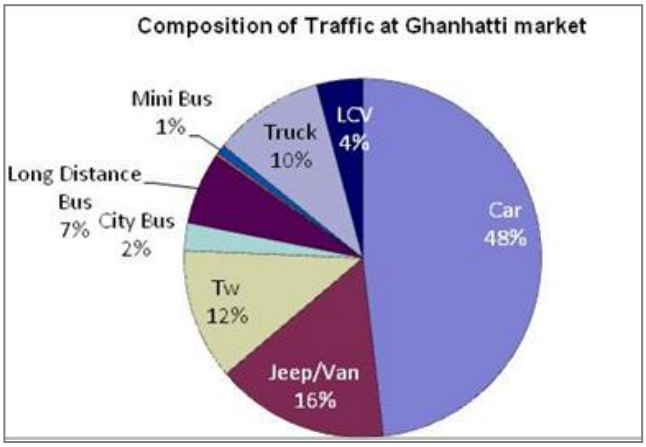


Figure 3-8: Traffic composition at Ghanahatti market

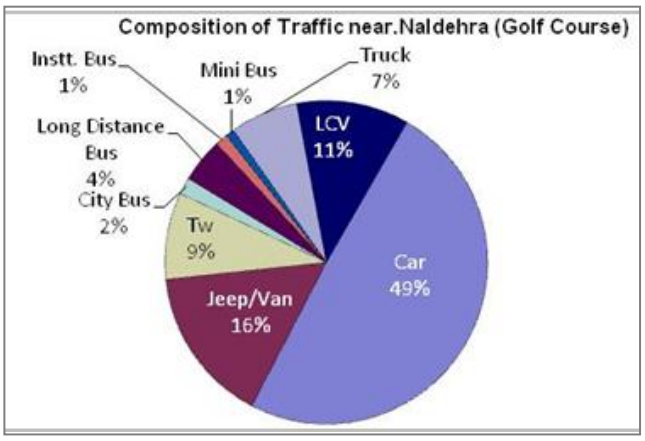


Figure 3-9: Traffic composition near Naldehra

3.8 Travel Characteristics

Referring to Figure 3-10, 87% of the regional passengers use bus as a preferred mode of transport for travelling to and from Shimla, only 13% use rail as alternative mode of transport. Again 44% of regional passengers use bus for work purpose (combined both service and self-business, refer to Figure 3-11), 32% uses for education purpose, only 5% uses for recreation (tourism) purpose. While 81% of regional passenger use rail is primarily for recreation (tourism purpose), only 15% uses rail for work purpose (refer to Figure 3-12).

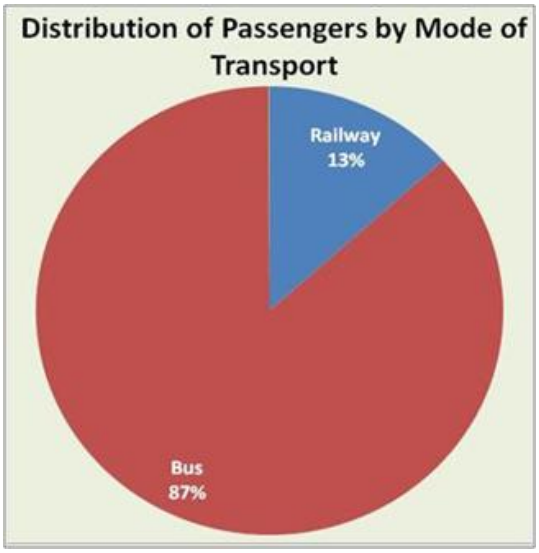


Figure 3-10: Distribution of regional passengers by mode of transport

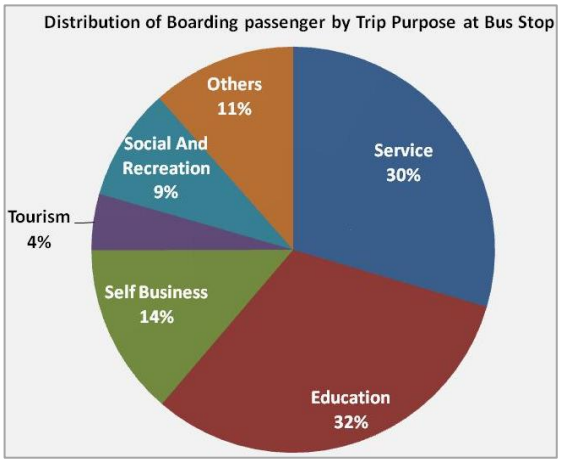


Figure 3-11: Distribution of bus user regional passengers by trip purpose

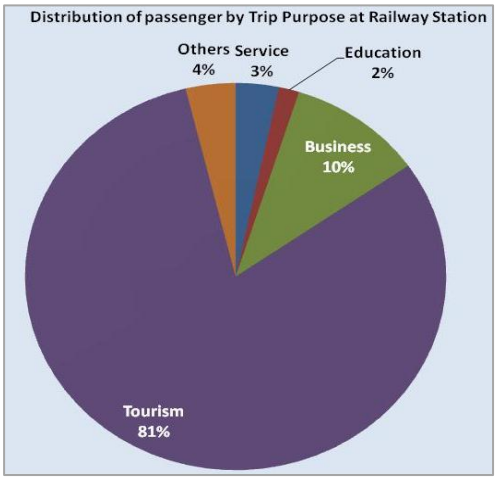


Figure 3-12: Distribution of rail user regional passengers by trip purpose

3.9 Trip distribution by mode of transport by resident of SPA

Referring to Figure 3-13, 42% of total trips made by local residents of SPA are by walk, and 49% trips by bus, while only 9% of total trips by private vehicles (combined cars and two wheelers).

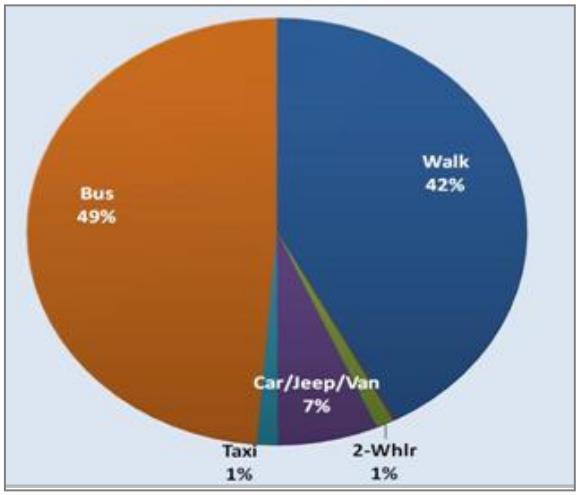


Figure 3-13: Distribution of trips by mode of transport made by residents of SPA

3.9.1 Distribution of trips by trip length

The average trip length is 3.6 Kms. Distribution of Trips according to trip trip length is presented in the figure 3-14. It was observed 90% of trips has trip length of 1 to 5 kms and 8% of trips has trip length of 6 to 10 kms.

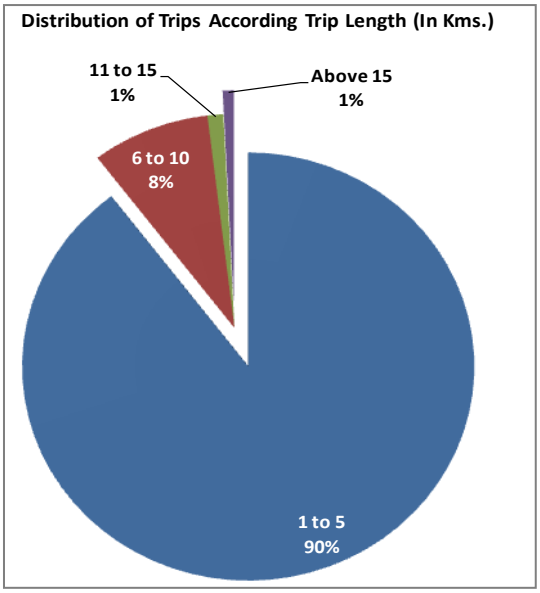


Figure 3-14: Distribution of trips according to trip length

3.10 Public transport charcteristics

Existing city bus service provided by Himachal Road Transport Corporation (HRTC) and by private operators under HRTC permit is the only mode of public transport in Shimla Planning Area. At present HRTC itself runs 45 buses in Shimla. Shimla Urban Transport Management Society, a society registered under Himachal Pradesh Societies Registration Act, 2006 runs 75 JnNURM buses on 98 routes. Private operators run 120 buses under HRTC permit within study area.

3.11 Shimla Urban Transport Management Society city bus service

Shimla has received 75 buses from Ministry of Urban Development Govt. of India for improvement of city bus service in Shimla under JnNURM Scheme. Shimla Urban Transport Management Society, a society registered under Himachal Pradesh Societies Registration Act, 2006 runs these 75 buses on 98 routes.

3.12 HRTC Service

HRTC runs 45 buses in Shimla as local bus service to cater public transport demand in Shimla.

3.13 Private operators service

Private operators under HRTC and RTO permit run 120 buses covering the whole study area.

3.14 Regional bus services

Previously regional bus transports were operated from Old ISBT on Cart Road. However, after completion of new ISBT at Tutikandi, the service of regional buses has been shifted to this newly developed ISBT at Tutikandi.

3.15 Bus terminal facilities

Bus terminal facilities in Shimla Planning Area are located at New ISBT at Tutikandi, Old ISBT on Cart Road and ISBT at Lakkar Bazaar.

3.16 Bus depot facilities

Department of Transport has established three bus depots for Shimla City one at Taradevi handling 82 buses and two other depots at Dhalli collectively handling 182 buses.

3.17 Characteristics of passengers at bus terminal

The survey was carried out in three major Bus Terminus i.e old ISBT at Cart road, ISBT at Lakkar Bazaar and Dhalli Bus Terminal and 35 other bus stops in the study area. On a normal working day, about 44,925 boarding and alighting were observed at these terminals. For details, please refer to Chapter 2 in Annexure.

Referring to Figure 3-15, it was observed that about 44% of passengers use buses for their work purpose (Service & Self Business) purpose and about

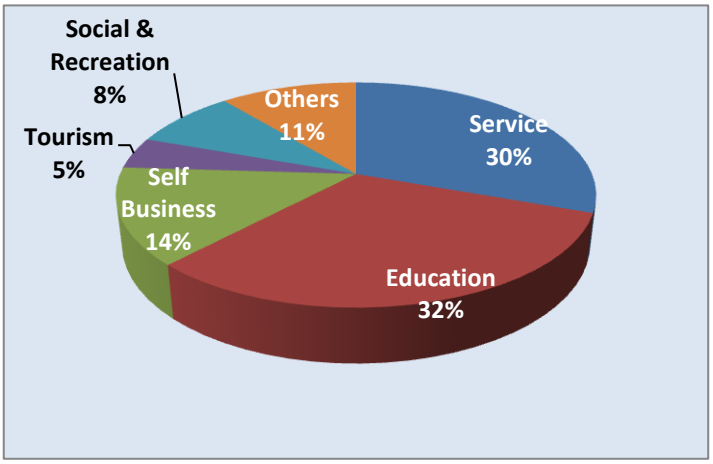


Figure 3-15: Distribution of passenger by trip purpose at Bus Stop

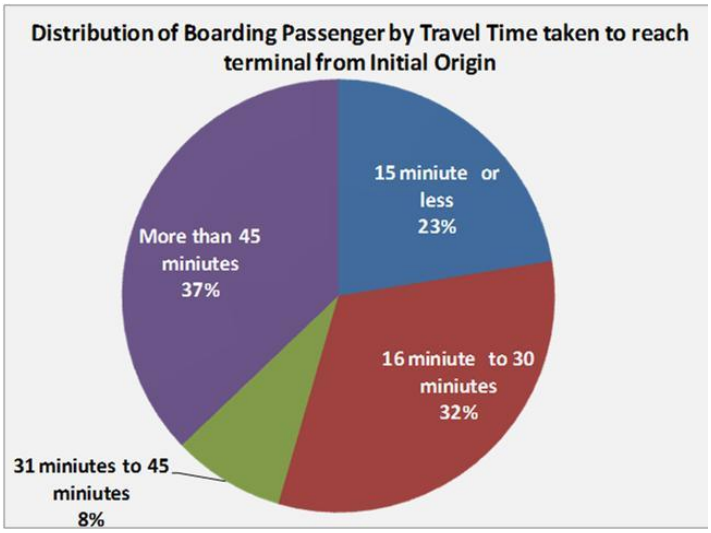


Figure 3-16: Distribution passengers by travel time to reach terminal

32% of passengers use it for education purpose. On the average, commuters spend approximately 25 minutes to reach terminal from its initial origin. 37% of the commuters spend more than 45 minutes to reach terminal (Refer to figure 3-16).

Refer to Chapter 2 in Annexure, which highlights that about 41% of total boarding passengers and 28% of total alighting passengers at terminals perform their trips on daily basis.

3.18 Bus stop passenger characteristics

The bus stop origin and destination data was collected at 35 major bus stops in both the direction in the study area. The details of boarding and alighting survey are given in Chapter 2 in Annexure. The same are depicted in Figure 3-17.

It is observed that about 81% of total passengers spend upto Rs 10/- to reach bus stop from their initial origins. Refer Table 3-3.

Table 3-3: Distribution of boarding passengers by travel cost to reach bus stop from initial origin

S. no.	Travel Cost (Rs)	Percentage (%)
1	0 (Walk trips)	36.49
2	Less than 5	22.42
3	>5-<=10	21.73
4	>10-<=20	9.23
5	>20-<=50	4.45
6	>50.-<=100	2.33
7	>100-<=150	1.70
8	>150	1.65
Total		100.00

Source: Primary Survey 2011

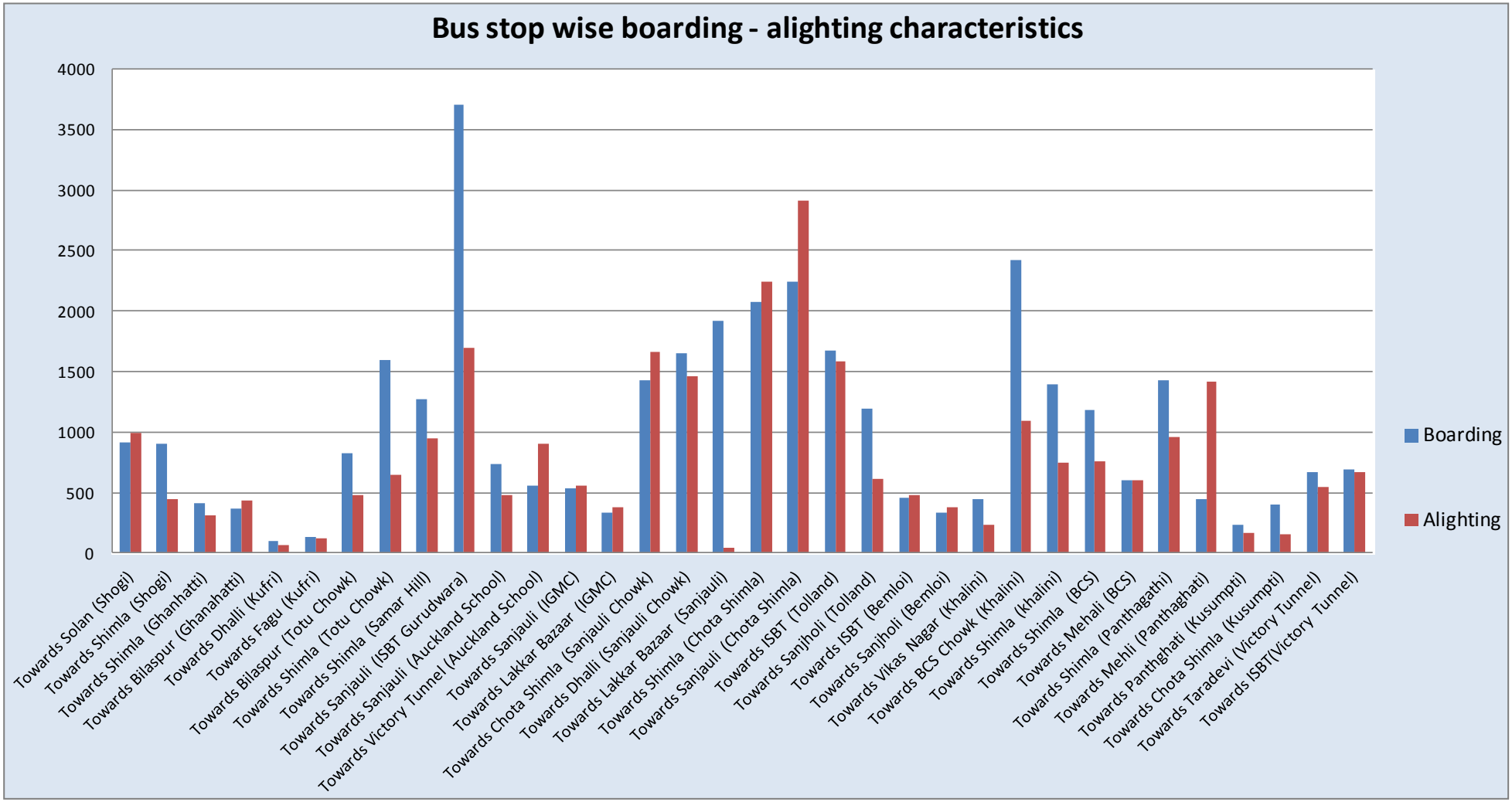


Figure 3-17: Boarding alighting characteristics

3.19 Pedestrian volume count

Pedestrian volume surveys were conducted at all major intersections and mid-block locations to assess the pedestrian volume and flow across and along the intersections/mid-block for designing of pedestrian facilities. It was observed that the total pedestrian traffic at the major intersections varies from minimum of 3,504 Tutikandi bypass chowk to maximum of 98,753 at Sanjauli chowk. As part of analysis, the CMP for Shimla has calculated the value of PV^2, which is the product of peak hour pedestrian flow and square of vehicular flow corresponding to the same time at any particular location[4]. Referring to Table 3-4, the PV^2 values of the intersections such as Chota Shimla chowk, Chakkar bypass chowk (Bilaspur road chowk), Totu chowk, Victory Tunnel chowk, Sanjauli chowk, Dhalli tunnel bypass chowk, Kusumpti chowk, University chowk are higher than 1 (one) which necessitates improvement in pedestrian crossing facility.

Table 3-4: PV^2 values at some of the important intersections

Name of Location	$PV^2/10^8$
Chota Shimla	**4.1**
Bolieauganj	0.1
Tutikandi bypass Chowk	0.8
Chakkar bypass (Bilaspur road) Chowk	**1.6**
Totu Chowk	**1.8**
Khallini Chowk	0.5
Victory Tunnel Chowk	**11.6**
Sanjauli Chowk	**35.5**
Dhalli Tunnel bypass Chowk	**3.3**
Kusumpti Chowk	**11.1**
Dhalli Bus Stand Chowk	0.5
IGMC Chowk	0.1
University Chowk	**1.7**

[4] The degree of conflict between pedestrians and vehicles is determined by PV^2 where V is the two-way total hourly flow of vehicles and P is the two-way total hourly flow of pedestrians crossing the road within 50 m on either side of the site during peak hours. If the value of PV^2 exceeds 10^8 (or 1 = $PV^2/10^8$) for an undivided road or 2 x 10^8 (or 2 = $PV^2/10^8$) for a divided road, then there is requirement of pedestrian crossing facility.

3.20 Parking Characteristics

Shimla city is experiencing increased use of private vehicles. Being a hill town, with natural constraint, together with shortage of off-street parking facilities, Shimla is facing acute parking problem. On-street parking is observed along the most of the major roads of Shimla. Although SMC has authorized on-street parking in many areas by marking yellow line on the road surface, at the same time, in many places un-authorized on-street parking was also observed in many parts of the city.

Maximum Parking demand was observed at the areas such as High Court, SDA complex, Metro Pole, IGMC, Lift, Rahn Basera, Kelston Housing Board Colony, Chakkar area, Sanjauli, BCS, Near Khalini bypass, Shoghi Market, Near RTO office etc.

(a) **Off Street Parking:** SMC has designated 9 off-street parking lots having a total capacity of 505 cars. The details of each of the parking lots are tabulated in Table 3-5. Most of the off-street parking lots are working at full capacity.

Table 3-5 : Details of off-street parking locations under Shimla Municipal Corporation

S.No	Location	Capacity (no.)
1	Lift car parking, Cart road	45
2	High Court car parking	25
3	Metro pole car parking terrace floor	70
4	Metro pole car parking 5th floor	60
5	Metro pole car parking 4th floor	60
6	Car parking Jodha Niwas ground floor	20
7	Car parking Jodha Niwas 1st floor	20
8	Car parking Rehan Basera terrace floor	10
9	Car parking Rehan Basera 4th floor	8
10	Car parking Amar Bhawan 1st floor	12
11	Car parking Amar Bhawan 2nd floor	15
12	Car parking 1st level near Aggarwal Dharamsala	7
13	Car parking 2nd level near Aggarwal Dharamsala	8
14	Car parking near Cecil Hotel	40
15	Car parking community center, Kaithu-4	15
16	Car parking Auckland, Lakkar Bazaar	20
17	Road side parking near Lift Mall road to the US club	30
18	Road side parking near Rivoili road (only two wheeler)	40
Total		**505**

Source: Municipal Corporation, Shimla

(b) **On-street parking:** On-street parking is witnessed all along the roads in Shimla and particularly along Cart Road. The authorized on-street parking areas, are delineated by yellow color paint on the road. Parking of vehicles on roads is one of the major reasons for under performance of the already over loaded Cart Road and other road network. Based on the trend, the estimated demand for on-street parking in Shimla is about 14,500 ECS, while authorized on-street parking supply is only 1769 ECS, with demand-supply gap of 12,731 ECS.

Recently, Shimla Municipal Corporation has taken steps to augment the supply of off-street parking space through creating more off-street parking lots under PPP mode at various places of Shimla city. The details of off-street parking proposed by Shimla Municipal Corporation are as:

1. Lift Parking
   Total Space for Parking-24,338.05 Sq meters
   Capacity- 700 ECS

2. Sanjauli Chowk
   Total Space for Parking-12, 606 Sq meters
   Capacity – 388 ECS

3. Near Ashiana Regency (Chota Shimla Chowk)
   Total Space for Parking- 7,638.48 Sq meters
   Capacity – 250 ECS

After completion of these proposed parking lots the existing demand of the off-street parking demand can be met, however, the overall demand supply gap for parking will remain. Refer to figure 3-18 and 3-19.

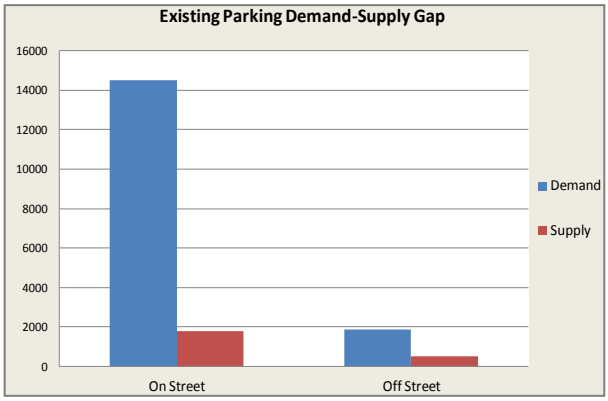


Figure 3-18: Existing parking demand and supply

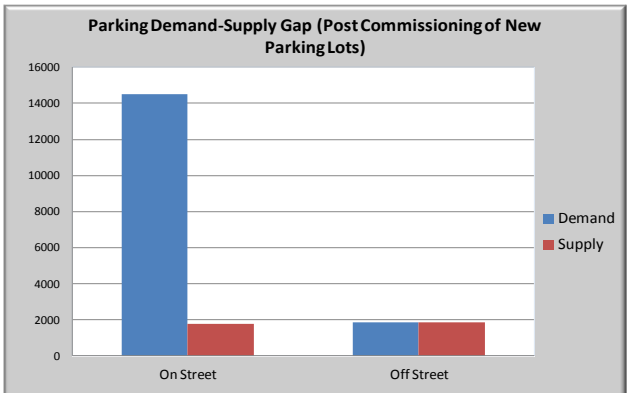


Figure 3-19: Parking demand and supply in post commissioning of new parking lots

3.21 Road safety

Road safety is another major issue of concern for Shimla. The roads in Shimla are functioning more than its capacity reflected by high value of V/C ratio. Existence of on-street parking along the main arterials is causing congestion and bottleneck points.

Although 42% trips are made by walk, but Shimla city completely devoid adequate infrastructure to sustain walk trips. There is discontinuity of footpaths, lack of adequate pedestrian crossing facility, lack of sinages etc.

All these have resulted in road safety hazards for both the resident population as well as for tourist also. The number of accidents on the main locations in Shimla are given in Table 3-6.

Table 3-6 Number of road accidents within Shimla Planning Area in year 2003

S.No.	Name of the Road	Number of Accidents
1	Circular road / Cart Road	34
2	Bypass road	22
3	Sanjauli to Lakkar Bazaar	16
4	Shimla Kalka Highway	22
5	Shimla Mandi Road	10
6	Dhalli to Mashobra	16
7	Dhalli to Kufri	14
8	Lakkar bazaar to Bharari	3
9	Chota Shimla to Kusumpti	3
10	Mall road, US Club, Kaithu, Chaura Maidan and Boileauganj	9
	Total	**149**

3.22 Origin/Destination characterstics

Origin – Destination survey of vehicles entering Shimla was conducted at 7 outer cordon locations. On the average 23.29% of traffic is bypassble traffic, i.e external-to-external (EE) traffic. Highest external-to-external (EE) traffic (84.83% of total traffic) was observed at outer cordon location 7 along SH-13 near Kunihar bus depot and that of minimum was observed at outer cordon location 5, along MDR-13 near Mehli. Location wise of external to external (E-E) trips in percentage of total trips at each outer cordon is shown at Figure 3-20.

On the average, 34.4% of freight, traffic, is found to be external-to-external (EE) traffic. Highest external-to-external (EE) freight traffic (80.1% of total freight traffic) was observed at outer cordon location 7 along SH-13 near Kunihar. Details are given in Chapter 2 of Annexure.

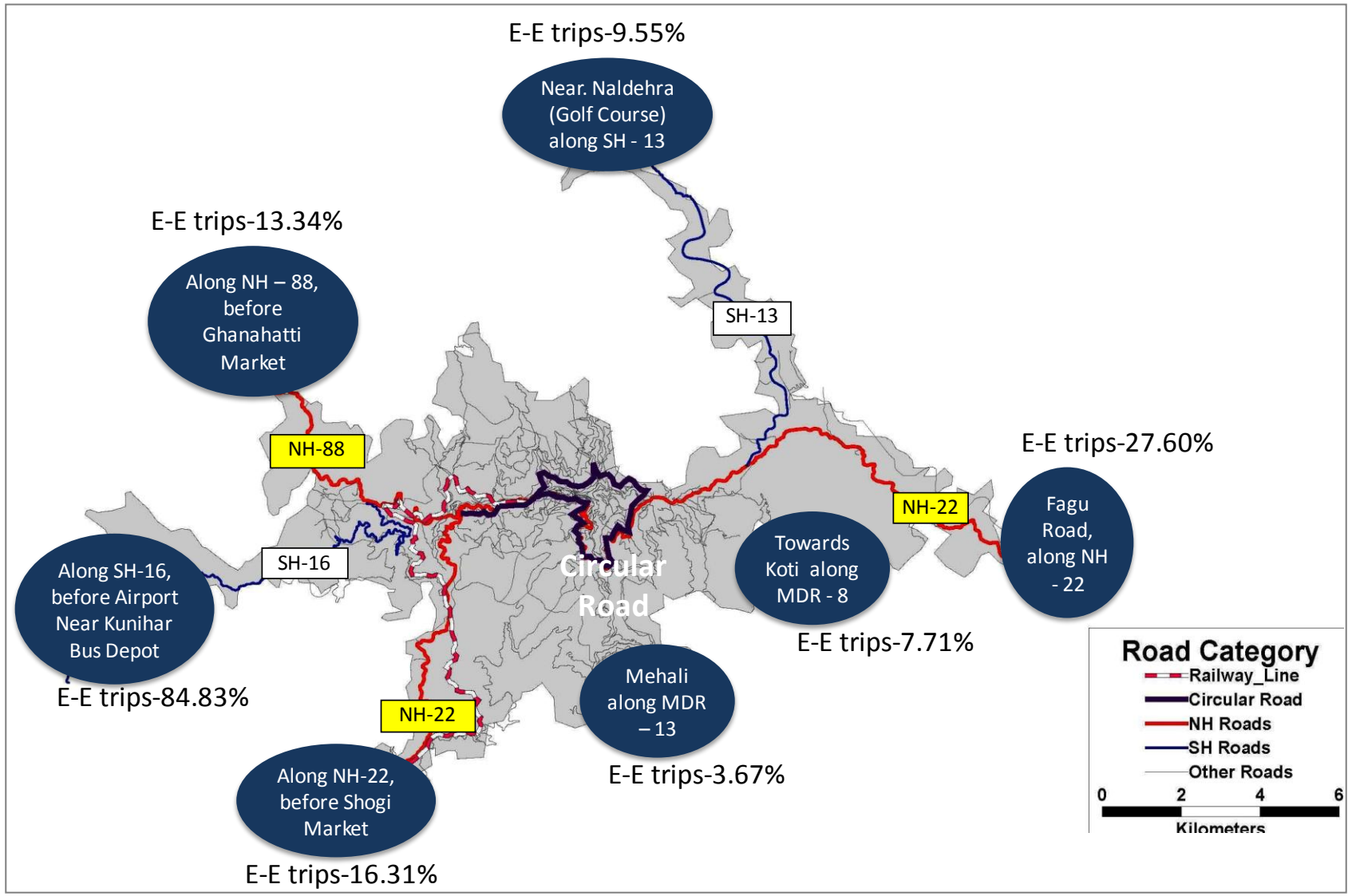


Figure 3-20: Location wise of E-E trips in percentage of total trips at each outer cordon

3.23 Household Characteristics

3.24 Distribution of household by size

The average household size is 4.5. The pie chart from Figure 3-21 indicates that 51% of the households have 4 to 6 members, while 37% of household have 2 to 3 members.

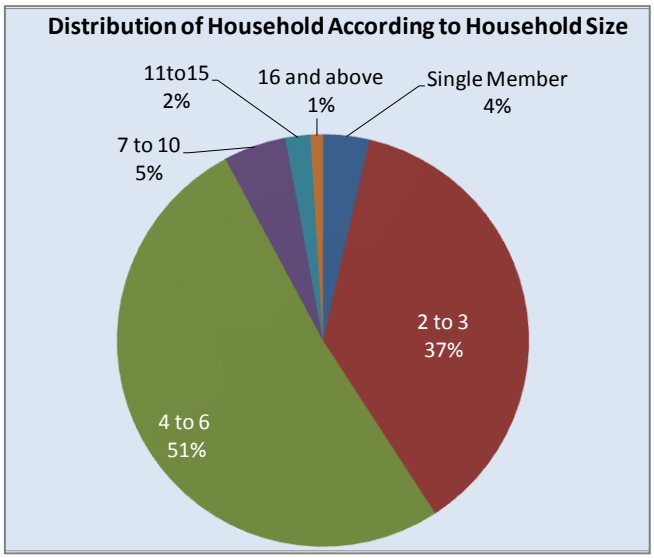


Figure 3-21: Distribution household by household size

3.25 Distribution of household by number of workers

The average size of workers in a family is 1.44. Distribution of workers in a household according to no. of working members is depicted in Figure 3-22. It shows that in majority of households, there is only one working member.

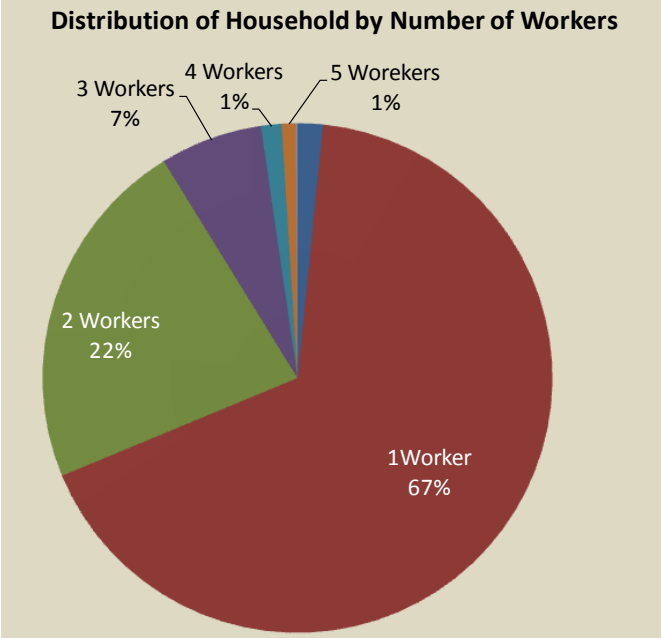


Figure 3-22: Distribution Household by number of workers

3.26 Distribution of household according to their household income

The average household income is Rs. 19,017 per month. Distribution of household according to monthly income ranges is shown in Figure 3-23. It was observed that nearly 33% of household have monthly income upto Rs. 10,000 and about 41% have income between Rs. 10,001 – 20,000 per month. The percentage of household having monthly income above Rs. 50,000 is about 3%.

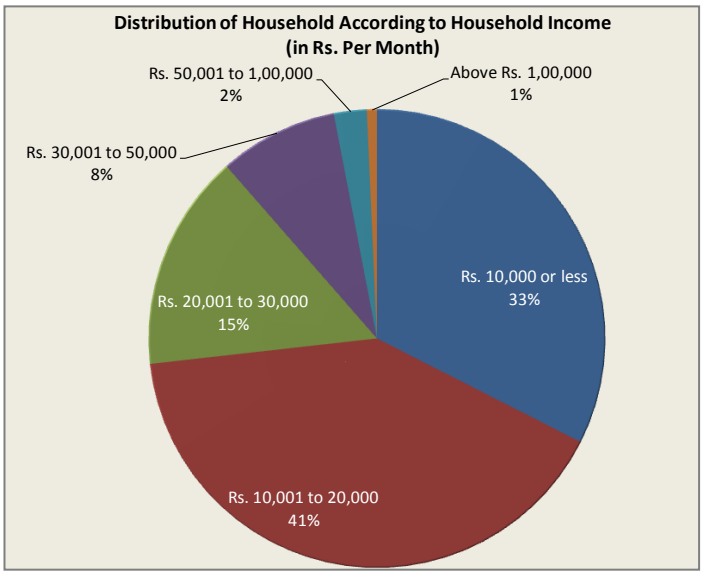


Figure 3-23: Distribution of Individuals by their household income

3.27 Expenditure on transport

The average monthly expenditure on transport by household is Rs. 926/-which is approximately 5% of total household income.

Distribution of households by expenditure on transport is shown in Figure 3-24.

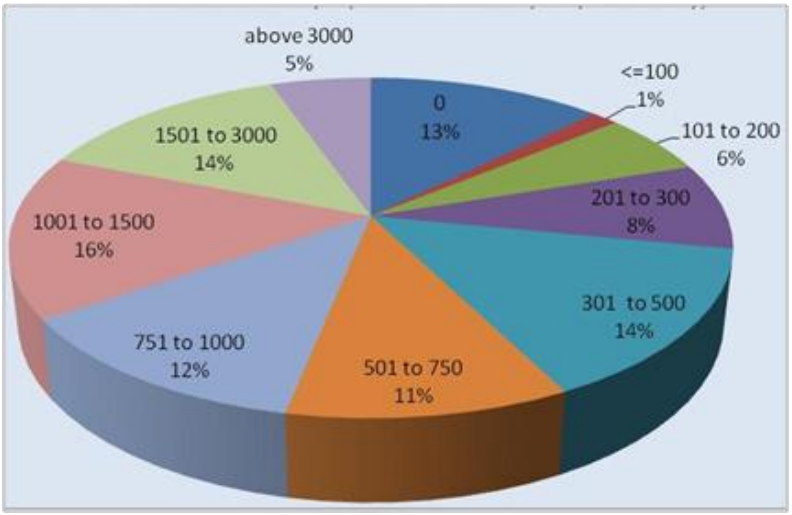


Figure 3-24: Distribution of housolds by expenditure on transport

3.28 Summary of data analysis

Shimla being the capital of the state and being one of the major tourist destination of the country it attracts large number of traffic both from different parts of the country and also from different parts of the state. Within Shimla Planning Area, the area under Shimla Municipal Corporation experiences the maximum traffic. The Cart road, NH-22 and NH-88 form the main arterial roads of Shimla, which are experiencing heavy traffic. Traffic data shows that in many stretches of these arterial roads the journey speed during peak hour is below 10 km per hour. Following inferences have been drawn from the analysis of both primary and secondary data:

(a) **Road Network-** The Cart road, NH-22 and NH-88 form the main arterial roads of the study area. These roads in many stretches are serving well below the designed capacity. Speed & delay survey data shows that the journey speed during peak hour is as low as 2 km per hour in the areas like Lakkar Bazaar, Lift, Sanjauli Chowk etc. Due to existence of large number of schools along the main arterial road, during peak hours the stretches near the schools faces heavy congestion. This is primarily because of haphazard parking of private vehicles carrying students.

(b) **Public transport-** Although the shares of trips by public transport (bus) is as high as 49%, however the share of trips by public transport has declined in last five years (65% during 2005-06). The challenges faced by public transport in Shimla are as:

- Lake of dedicated bus shelter leading to haphazard/ unregulated stoppage of buses on road for boarding and alighting of passengers causing traffic congestion
- Non reliability of bus service due to absence of real time passenger information system at terminals and bus stops
- Lack of integration of public transport system with other feeding modes such as HRTC run Taxi service
- Lack of proper connectivity from new ISBT to the city center

(c) **Parking:** Like many other Indian cities, parking is one of the major issue of concern for Shimla city. There are about 505 parking spaces in Shimla, which are inadequate due to ever increasing private vehicles. The parking demand is estimated to be approximately 14,500 ECS out of which 4,311 ECS are provided in the form of supply of both off-street and on-street parking.

(d) **Traffic and Travel:** Traffic Congestion is the most significant issue that Shimla is facing today. The coverage of road network for vehicular movement is low and existing roads are operating more than its desired capacity. The effective carriageway capacity of roads is reducing with increasing traffic volume and increase in activity centers along the roads impairing traffic movement and creating bottlenecks. Origin-destination survey conducted at outer cordon locations shows that the share of through traffic is as high as 23.29%, which necessitates creation of additional bypass road.

(e) **Major bottleneck Points:** Following are the major bottleneck points of Shimla city:

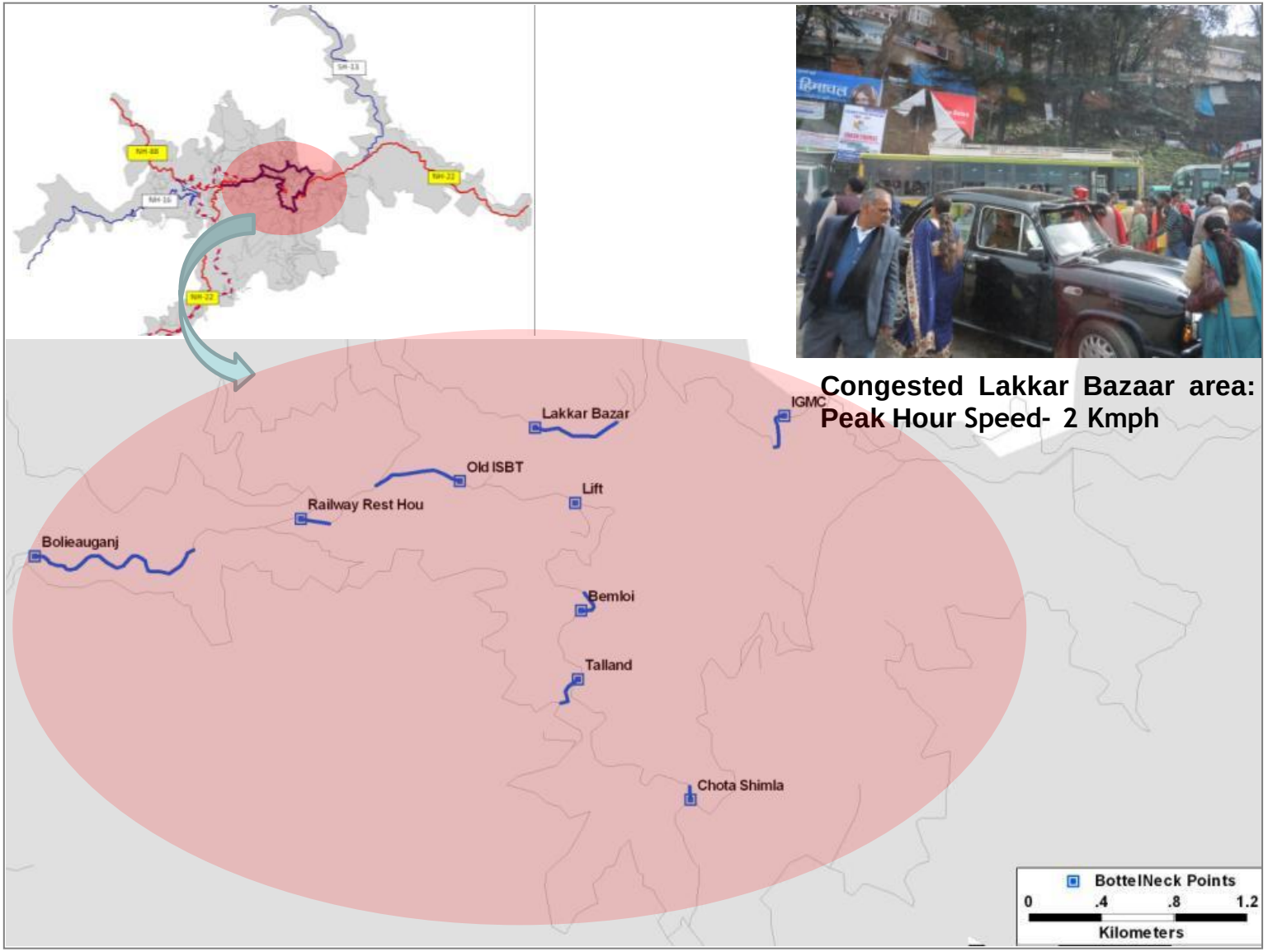
1. Between Kaithu bifurcation & petrol pump
2. Between Tara hall bus stop & Snow view
3. Near roop hardware, Lakkar bazaar
4. Near Auckland school
5. Near IGMC
6. Road leading to Walker hospital
7. Sanjauli Chowk to Mehta petrol pump
8. Dhalli tunnel
9. Dhalli bazaar
10. From Tolland to Khalini Chowk
11. From Khalini Chowk to NH-22
12. Near Bamloi bus stop
13. Near St. Edward school
14. Near HHH
15. Road leading to Ganj bazaar
16. Local bus stand to old ISBT
17. Near Railway guest house
18. Boileauganj bazaar
19. Between power house and Totu bazaar via Railway bridge
20. SDA complex
21. Kusumpti Bazaar
22. Ashiana Regency to Ayurvedic hospital, Chota Shimla

(f) **Pedestrians Facilities:** Although walk is the predominant mode of transport (42% trips are made by walk) in Shimla, but the city lacks proper pedestrian facilities. Only 16% of the total road network has footpaths. The pedestrian crossing facility

is also inadequate. Lack of proper footpaths and absence of pedestrian crossing facility is creating safety concern in Shimla.

(g) **Congestion:** The areas like Lakkar bazaar, IGMC, Bemloi bus stop, Cart road at Old ISBT, Cart road near Railway Rest House, Bolieauganj, Talland, Chota Shimla remain congested throughout the day (refer to figure 3-25). Referring to table 3-7, the values of volume by capacity (V/C) ratio of some of the highly congested roads of Shimla city shows, majority of the roads have V/C ratio greater than one (1), even in the base year. Ideally, for urban roads (ranging from C to D level of service) the desired value of V/C ratio should remain 0.6 to 0.8. The value of V/C ratio more than 0.8 indicates that there is need for improvement/management measures. Table 3-7 is clearly indicating the deteriorated quality of service in Shimla.

Figure 3-26 & figure 3-27 are showing various mobility issues in Shimla.



Congested Lakkar Bazaar area: Peak Hour Speed- 2 Kmph

Figure 3-25: Congested (bottleneck) areas in Shimla

Urban Mass Transit Company Limited

Traffic congestion inside the Victory tunnel

Chaotic traffic and vulnerable pedestrians

Narrow roads (Limited Right of Way)

Need for public participation & awareness

Figure 3-26: Photographs showing mobility issues in Shimla-1

On-street parking and its consequence on effective carriageway of road

Poor conditions of pathways

High demand for mechanized vertical mobility solution at Lift

Traffic congestion and vulnerable pedestrians

Figure 3-27: Photographs showing mobility issues in Shimla-2

Urban Mass Transit Company Limited

Table 3-7 V/C ratios of some of the congested roads

S.No	Location	Base year (2011)
1	Lakkar Bazaar	**1.00**
2	IGMC	0.91
3	Bemloi Bus Stop	**1.10**
4	Old ISBT to Gurudwara	**1.22**
5	Railway Rest House	**1.14**
6	Bolieauganj	**1.17**
7	Talland	**1.05**
8	Chota Shimla	**1.25**

3.29 Service Level Benchmark

The CMP for Shimla has also computed the existing level of service of overall traffic and transportation scenario based on a number of parameters. The Table 3-8 shows the existing Level of Service (LOS). LOS is a measure of quality of service in terms of ranking – the higher the value of LOS, the lower is the quality and vice versa. From the Table it appears that other than pollution level in which Shimla has scored 1 and in Travel Speed & Availability of Parking Spaces in which Shimla has scored 2, in overall LOS ranking, in all other parameters, the city's overall ranking is either 3 or 4, meaning poor quality of service.

Table 3-8 Service Level Benchmark

Overall Level of Service (LOS)		
	Indicators	**LOS - Existing**
A	Overall Public Transport facilities City wide	3
B	Overall Pedestrian Infrastructure Facilities	3
C	Level of usage of ITS facilities	4
D	Travel Speed along major corridors	2
E	Availability of Parking Spaces	2
F	Road Safety	3
G	Pollution Levels	1
H	Integrated Land-use Transport Integration	3
I	Financial Sustainability of Public transport	3

3.30 Conclusion on existing tranportation scenario of the study area

The present situation in Shimla will only continue to worsen unless the Government responds appropriately in this regard. In the absence of Government interference, by 2031, the share of public transport will go down leading to more congested road space attributed by higher use of private vehicles. Traffic forecast data shows that by 2031, the network speed of the study area will be less than 12 kmph, depicting a really serious and unsustainable situation. A set of indicators has been developed to arrive at goals to be achieved for the city. These goals have been defined with vision and objectives. The mobility strategies developed for Shimla aim at attaining these goals.

Chapter 4- Travel Demand Assessment

4 Travel Demand Assessment

4.1 Background

To appreciate and understand the base year travel demand of the study area and to estimate the travel demand for the horizon years, an urban transport model was developed. Based on the travel demand model, various travel demand scenarios along with proposed interventions and recommendations have been developed. The process of developing the transport model is discussed in the subsequent sections.

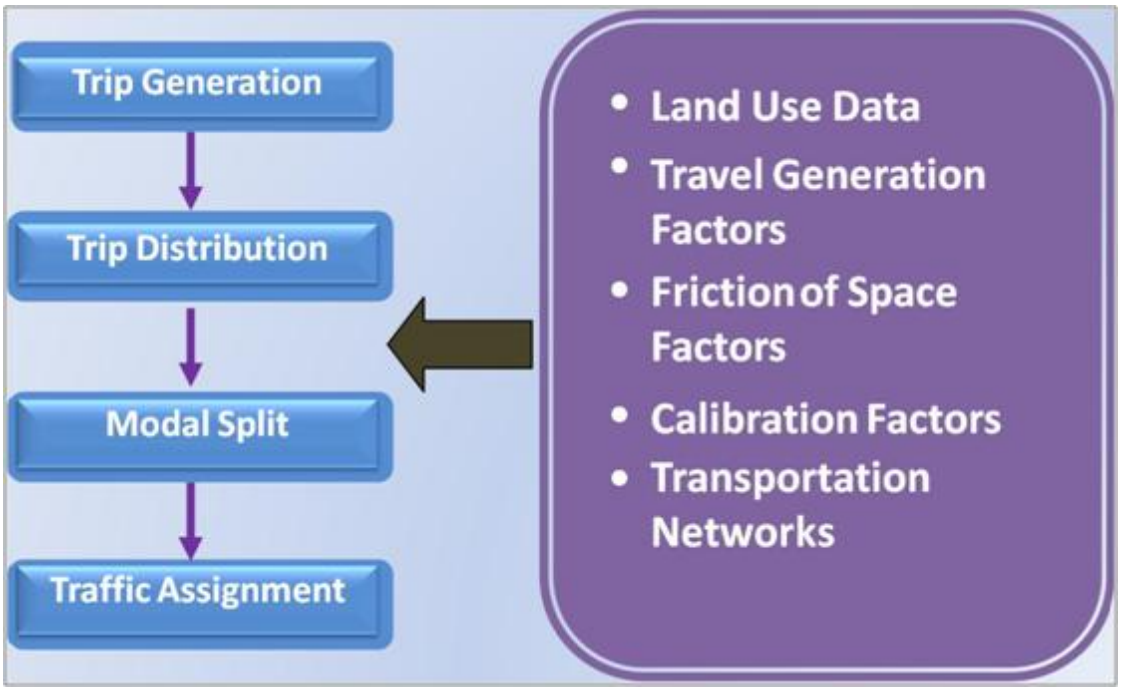


Figure 4-1 Four Stage Transport Model Structure

4.2 Model Structure

The model is based on a conventional Four-Stage Transport Model approach (refer to **Figure 4.1**). It includes:

- Trip Generation – calculating the number of origins and destinations for each zone
- Trip Distribution – attaching the origins and destinations for complete trips
- Mode Choice – determining the mode for each trip (Two wheeler, Car, Taxi,

Public Transport)

- Assignment – assigning passengers to their respective highway and transit networks

4.3 Study Area Zoning

The study area has been divided into smaller areas called as Traffic Analysis Zone (TAZ) for analysis. The study area has been divided into 39 internal zones and the outside area is grouped into 8 external zones. Figure 4.2 shows the details of TAZ with zone number. The broad breakup of TAZ is given below:

Table 4-1 Description of Traffic Analysis Zones

Serial No	Description of TAZ	No of TAZ
1	Shimla Municipal Corporation Area (Municipal Wards)	25
2	Grouped Internal Zones (Clubbing 3 Special Planning Areas)	13
3	Cantonment	1
Total Internal Zones		**39**
External Zones		**8**
Total Zones		**47**

The zonal parameters such as socio-economic, demographic etc. are attached to the Zonal map and are given in Chapter 3 Annexure.

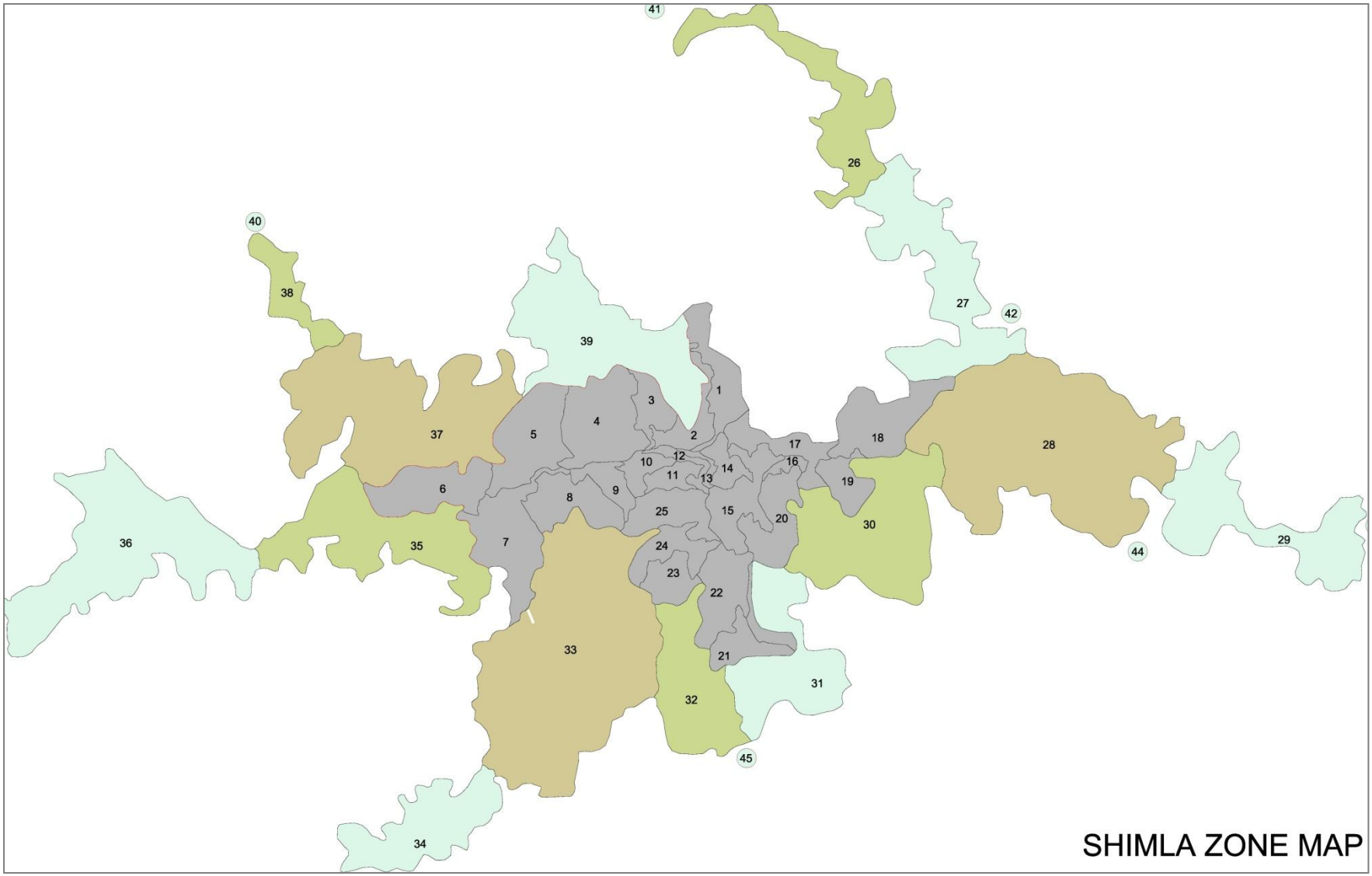


Figure 4-2 Traffic Analysis Zones (Internal)

4.4 Network Development

Transport network developed for the model comprises of two components:

1. **Road Network:** The coded road network for the study area represents the nodes (intersections) and links connecting nodes. Connectivity between the network and zones is provided through centroid connectors. Based on the network inventory, each link has been assigned attributes such as: number of lanes; divided or undivided carriageway; one way/two way; encroachments; availability of footpaths, etc. Figure 4-3 shows the base year road network of study area. The network attributes linked with geographic files are used for development of models. GIS stores the data from which a desired view can be drawn to suit a particular application. There are two types of data in GIS, spatial data and non-spatial data (attribute data). Non-spatial data includes information about the features.
2. **Public Transport Network:** The public transport (or transit) network shows the route section, stops, and route system. The transit network is attached with transit route information such as route number, route length, headways, capacity etc. Figure 4-4 shows the base year Transit Network.

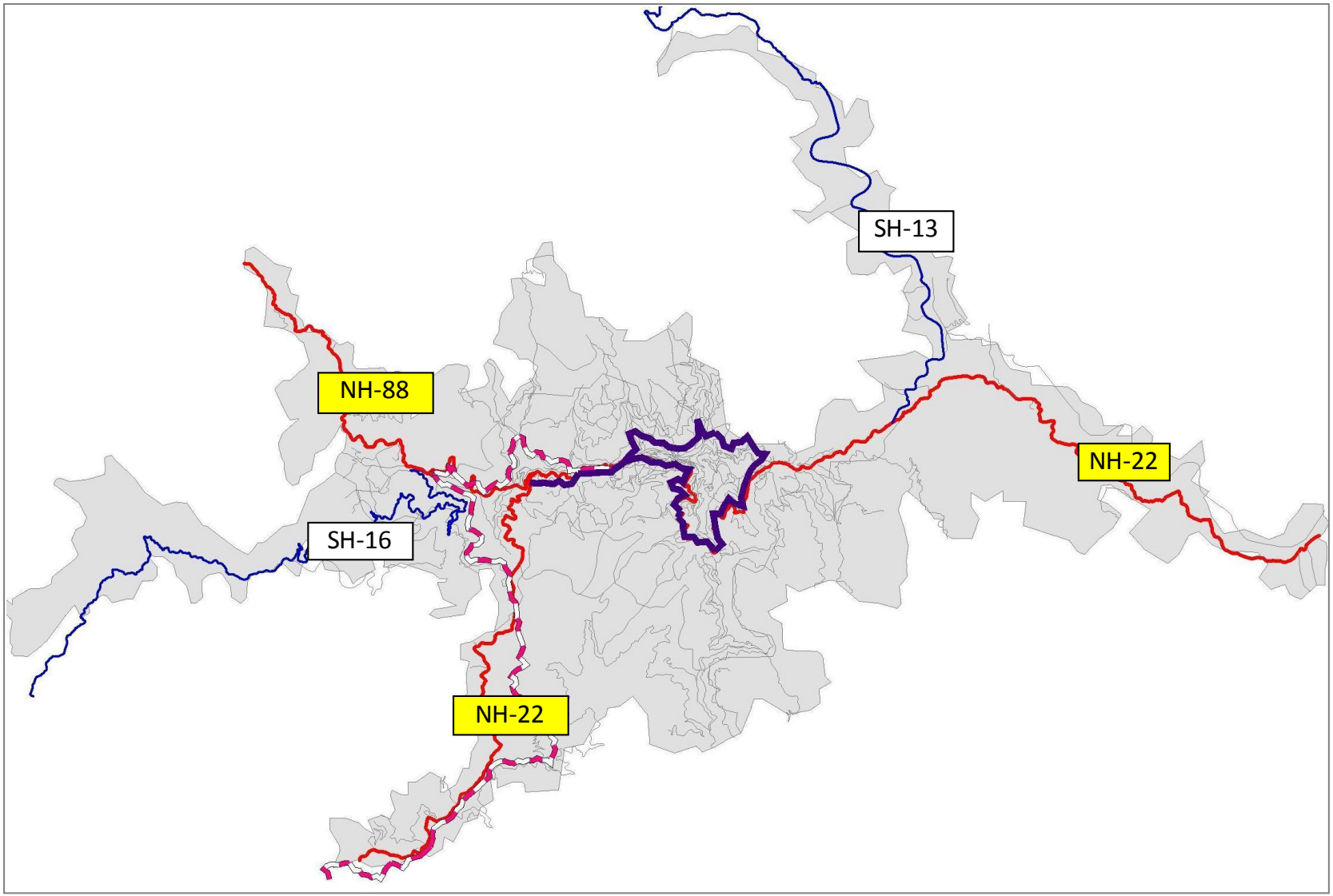


Figure 4-3 Base Year (2011) Road Network for Shimla

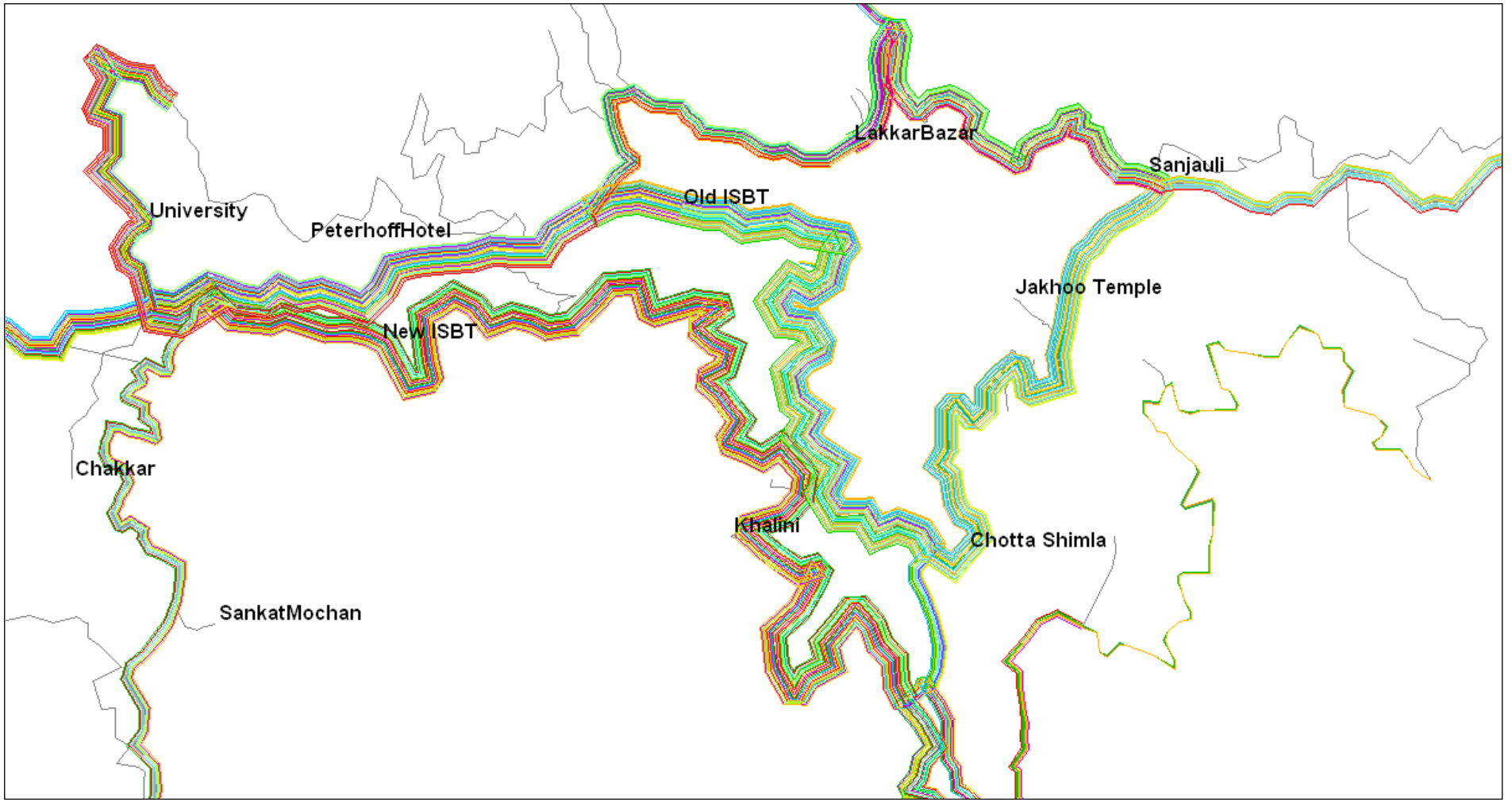


Figure 4-4 Base year (2011) Transit Network

4.5 Trip Distribution & Modal Split

Trip details regarding calibration of doubly constrained gravity model and the base year mode splits are given in Chapter 3 of Annexure.

4.6 Trip Assignment

Traffic assignment is the stage in the transport planning process wherein the trip interchanges are allocated to different parts of the network forming the transport system.

- **Highway Assignment**: User-equilibrium procedure based on travel time was used for assignment of highway traffic.
- **Public Transport/Transit Assignment**: Stochastic user equilibrium method based on generalized cost has been performed for Transit Assignment.

4.7 Base Year (2011) Travel Pattern

The base year trip matrix have been developed using the data extracted from household surveys and roadside interview survey. The traffic characteristics of the study area are identified in terms of average network speed, average trip length volume to capacity ratio, vehicle distance travelled, total passenger hours, etc. The results of the travel-demand-estimation for base year and trip-rate-analysis is summarized in the Table 4-2.

Table 4-2 Base Year Travel Characteristics

Description	Value
Network Traffic (PCU/day)	65,347
Public transport/Transit Trips	75,397
Daily Vehicle Kms Traveled	5,59,309
Per Capita Trip Rate	0.67

Referring to figure 4-5 the base year desire line diagram shows that maximum trips occur within municipal area only. This is apparent from the land use pattern also (refer to figure 1-3 & 1-4), as the municipal area experiences maximum activities in terms of both residential and commercial activity. Figure 4-6 shows the percentage wise attraction of trips by various important activity centers of the study area.

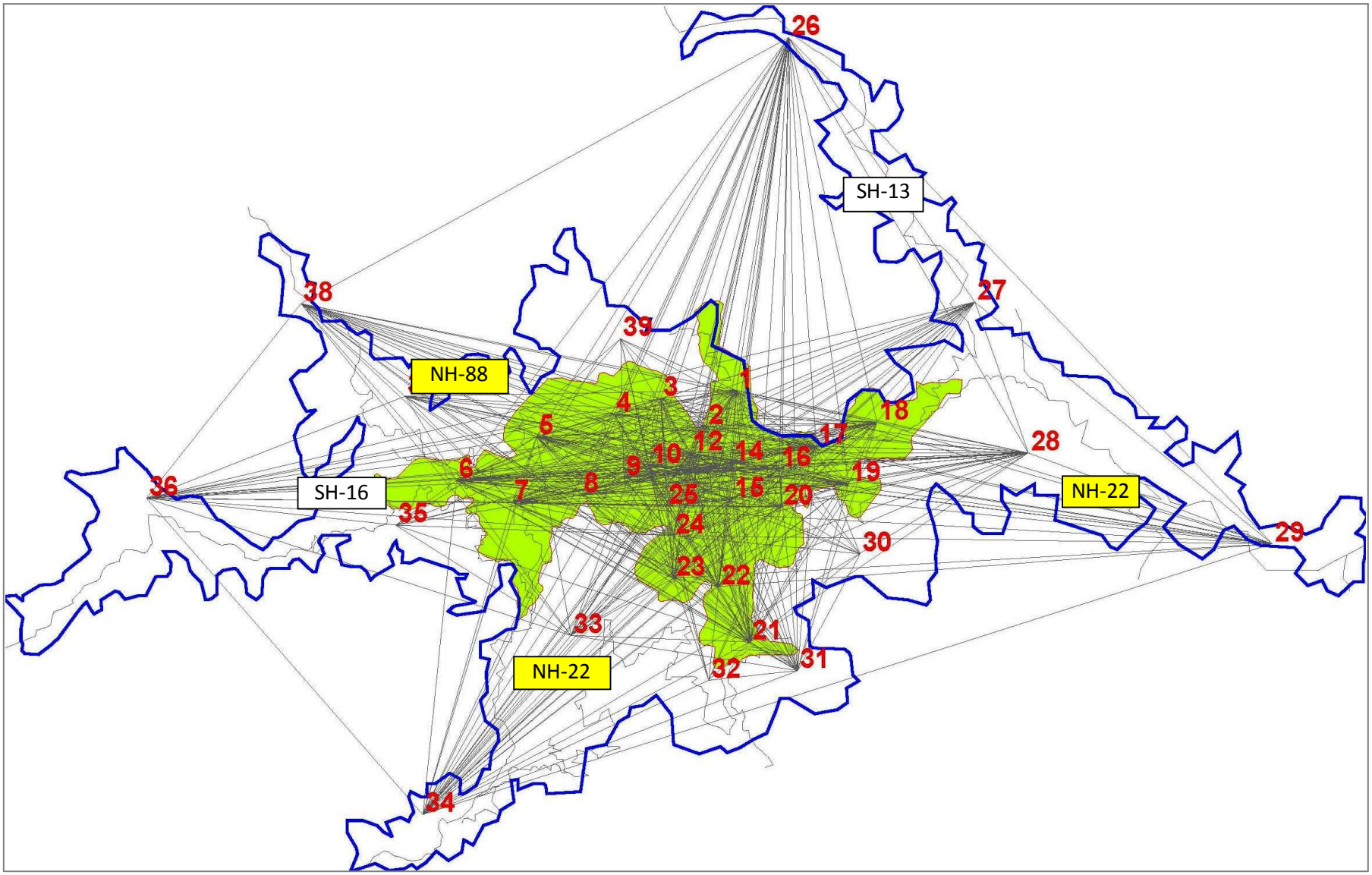


Figure 4-5: Base year desire line diagram

Urban Mass Transit Company Limited

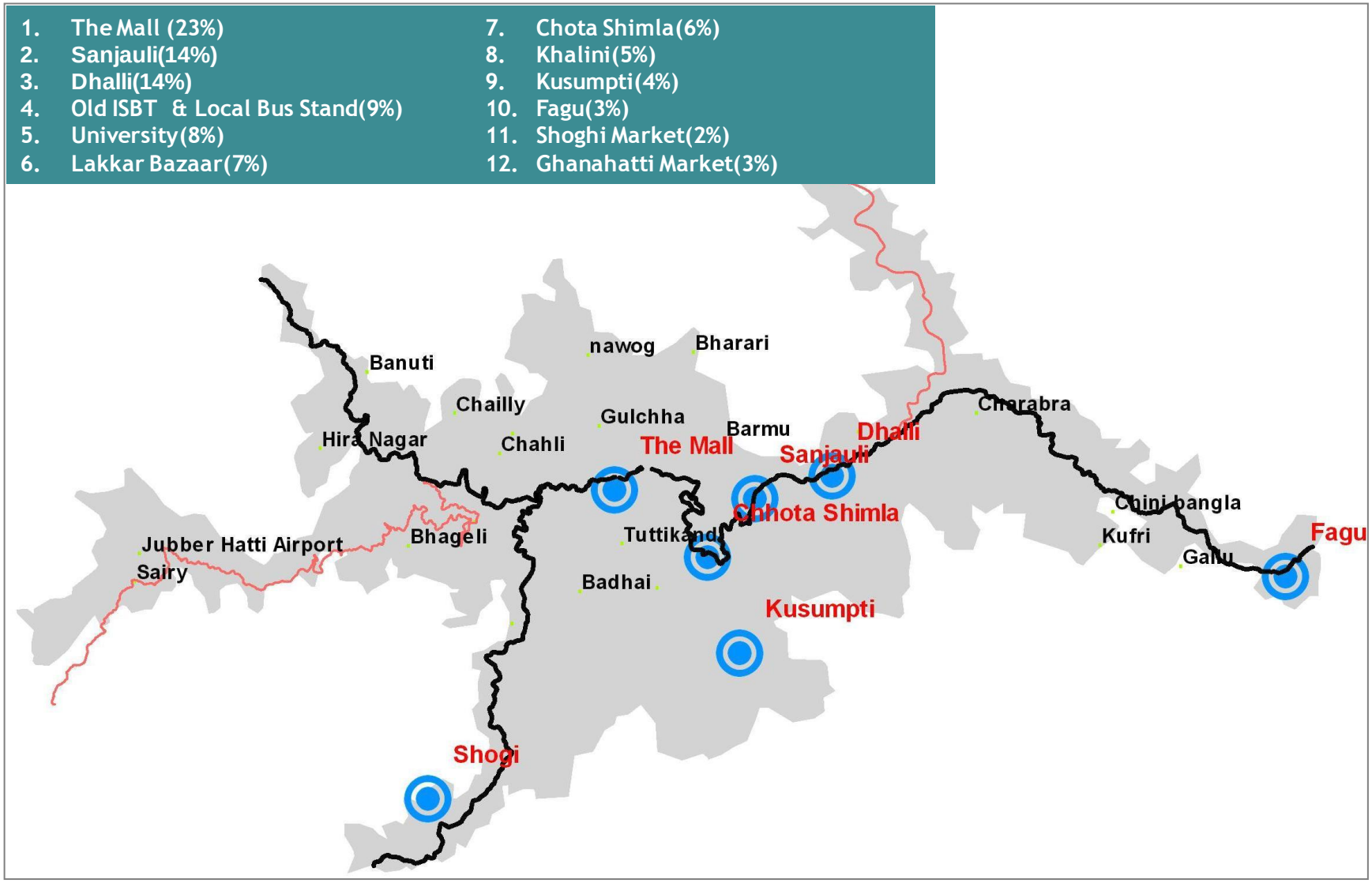


Figure 4-6: Percentage wise distribution of trips in major activity centers of study area

4.8 Assigned & Observed OD Validation

Base year mode-wise matrices developed were then assigned to the network. The assigned volume on the network was compared with the observed volume on few selected Roads. Since the variation was within the range of ± 10% in many road stretches, the model parameters are found acceptable for further application.

4.9 Travel Demand Forecasting

Since the urban land use and transport has closer interaction, the policy makers need broad idea about the availability of land, the possible orientation of development and the transportation system required to be contemplated while formulating the policies. There are several combinations of development scenarios available. Hence, it is necessary to test various alternatives of development and select the best one from travel demand point of view. After validating, the Travel Demand Model developed was used to estimate or project the travel demand for the horizon years 2021 and 2031 under respective transport system and network scenarios. The projected population for study area is given in Table 4-3.

Table 4-3 Population Projection

Year	Population
2011	2,35,965
2021	3,18,555
2031	4,30,058

TAZ wise future estimate of population is given in Chapter 3 of Annexure. The projected population were further used to estimate the trips in the corresponding horizon years. Based on the estimated trips, three different scenarios of travel demand pattern have been assessed for the study area.

4.10 Scenario building

Based on forecasted traffic and trips three different scenarios were built and assessed according with number of performance parameters to arrive at the best sustainable solution for Shimla. The various scenarios are described as follows:

1. **Scenario 1, Business as Usual (BAU):** Business as Usual scenario means projecting or visualizing the horizon year traffic & travel or the mobility situation assuming if no mobility improvement measure is going to be undertaken. The outcome or the results drawn from this scenario show the overall deterioration of mobility in the study area. Decrease in share of trips by public transport and increase in trips by private vehicles, which is not desirable. As the share of public transport goes down the overall mobility situation in Shimla worsens which is clear from the table 4-4. The table 4-4 shows that if nothing is done to improve the traffic and transportation scenario in Shimla, the average value of V/C ratio will increase resulting more congested road network by 2031 and the same is also reflected in estimated congestion index of 0.31[5]. Vehicle kilometers will also increase; increase in vehicle kilometers implies the increase in emission level and increase in likelihood of occurring more traffic accidents. Thus in order to arrive at sustainable and improved mobility for Shimla, the CMP for Shimla has assessed and examined various alternative targets of mode share in favor of public transport comparing the performance parameters of corresponding targets. In order to improve the mobility scenario in Shimla, after in-depth examination, the CMP for Shimla has fixed the target of achieving 60% trips through public transport by 2031. **Scenario 2** and **Scenario 3** have been

[5] Congestion index is the ratio of observed speed to posted speed, if the value of congestion index is less than 0.75 it means traffic flow speed along the stretch is guided by number of vehicles, in other words congested network.

developed and tested adopting two different approaches to achieve the target of 60% trips in favor of public transport by 2031.

2. **Scenario 2**, **Public Transport Improvement by augmenting City Bus Service only:** Under this scenario, the CMP for Shimla has assessed and examined to achieve the target of 60% mode share in favor of public transport by augmenting city bus service only, by 2031. From the analysis, it was found that through augmenting city bus service it is possible to achieve the target of 60% mode share in favor of public transport, however this scenario is unsustainable. For achieving the target of 60% mode share in favor of public transport, more and more number of buses has to be added every year, which will further lead to addition of more vehicles on the same road space. Constrained by scope for widening due to its terrain constraints, the same road space will be used by increased number of buses, resulting in congestion and reduced travel speed i.e. augmenting bus service alone will not decongest the city roads or will improve the mobility.
3. **Scenario 3, Overall Mobility Improvement of the study area through adoption of number of intervention measures:** Under this scenario, the CMP has assessed and examined to achieve the target of 60% mode share in favor of public transport (by 2031) through undertaking number of improvement strategies, which includes:
   - Augmentation of city bus service
   - Improvement of road network by developing new links, tunnels and bypasses
   - Introducing and developing alternative public transport modes such as Metro Cable or Ropeway and Medium Capacity Rapid Transit System (MCRTS)

   This scenario shows an overall improvement of mobility scenario in Shimla reflected by improvement in number of performance indicators. Referring to table 4-4 which shows improvement V/C ratio, congestion index; reduction in

vehicle kilometers (meaning less emission) and decrease in private vehicle mode share. Considering all the scenarios, scenario 3 is found to be sustainable and optimum mobility solution for Shimla.

Table 4-4 Performance of different scenarios

Scenario	Private vehicle share (%)	V/C ratio	PT Share (%)	Vehicle Kilometers	Congestion Index
Base Year (2011)	9%	1.1	49%	5,59,309	0.54
Scenario 1: Business as Usual –(2031)	38%	1.9	35%	13,62,319	0.31
Scenario 2: Bus Service augmentation -(2031)	5%	1.2	60%*	6,68,283	0.45
Scenario 3: With all Proposed Improvement Measures –(2031) such as: • *Network Improvement through development of:* – New Links – Tunnels – Bypass road • *Public Tranport Improvement through:* – Augmentation of bus service with new bus routes, increased frequency etc. – Introduction of Ropeway – Introduction of Medium Capacity Rapid Transit System	5%	0.8	60%*	6,38,600	0.82

From the above it is clear that the scenario 3 is most desirable scenario for overall improvement of mobility in Shimla (refer to table 4-4 and 4-5). Thus in

the subsequent sections, the CMP for Shimla has suggested number of improvements measures to achieve the sustainable mobility solution for Shimla in consistent with scenario 3.

Table 4-5 V/C Ratios in different scenarios

S.No	Location	2011	Scenario 1: Business as Usual (2031)	Scenario 2: Bus Augmentation only (2031)	Scenario 3: With all improvement Measures (2031)
1	Lakkar Bazaar	**1.00**	**3.93**	**1.18**	0.80
2	IGMC	0.91	**3.76**	**1.29**	0.82
3	Bemloi Bus Stop	**1.10**	**2.92**	**1.47**	0.85
4	Road to Old ISBT	**1.22**	**3.20**	**1.05**	0.75
5	Railway Rest House	**1.14**	**3.77**	**1.23**	0.76
6	Bolieauganj	**1.17**	**4.06**	**1.27**	0.81
7	Talland	**1.05**	**2.75**	**1.22**	0.76
8	Chota Shimla	**1.25**	**2.58**	**1.14**	0.67

Chapter 5-Mobility Plan Strategies

5 Mobility Plan Strategies

5.1 Vision Statement

The Mobility Vision for Shimla city is to "Provide safe, efficient, and environmentally sustainable means of transportation system for improving mobility of people and goods".

5.2 Mobility Pillars

The three most important pillars for ensuring Sustainable Mobility in urban areas are:

(a) Integrated Land use-Transport Planning

(b) Bringing a control on movement of personal vehicles

(c) Encourage Public Transport System and other Sustainable modes of transport

Sustainable Mobility however can only be ensured if the solutions are environmentally, socially, and economically sustainable as presented in figure 5-1.

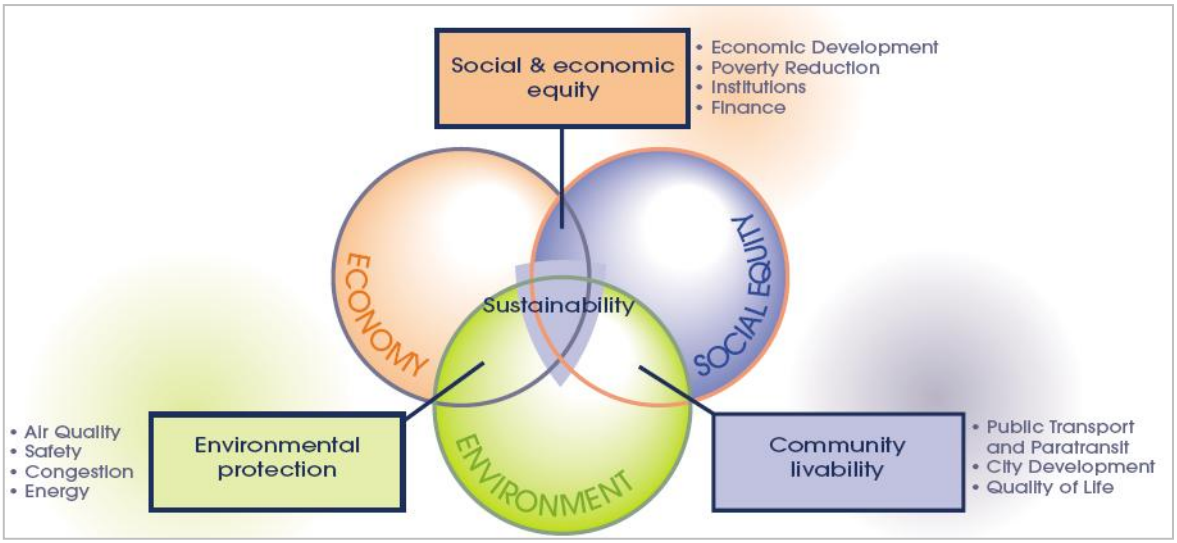


Figure 5-1 Sustainable Mobility Solutions

5.2.1 Goals

To ensure that Mobility solutions for Shimla that are sustainable and in conformity with the pillars of sustainable mobility, following Goals have been formulated:

1. **Goal 1**: Develop public transport system in conformity with the land use that is accessible, efficient, and effective.
2. **Goal 2:** Ensure safety and mobility of Pedestrians and Non Motorized Transport (NMT) users by designing streets and areas that make a more desirable, livable city for residents and visitors and support the public transport system.
3. **Goal 3**: Develop satellite towns to act as counter magnet for the main city.
4. **Goal 4:** Develop traffic and transport solutions that are economically and financially viable and environmentally sustainable for efficient and effective movement of people and goods
5. **Goal 5:** Develop a parking system that reduces the demand for parking and need for usage of private mode of transport and also facilitate organized parking for various types of vehicles

5.2.2 Objectives

The Objectives for each of the Goals are given below:

1. **Goal 1**: Develop public transport system in conformity with the land use that is accessible, efficient and effective

   Objectives

   (a) Provide good quality of public transport system that is accessible, efficient and effective within Shimla Planning Area

   (b) Develop strategies to encourage people to use public transport system and discourage use of private vehicles

(c) Develop policies that encourage concentrated mixed land use development along the public transport corridors

2. **Goal 2:** Ensure safety and mobility of Pedestrian and Non Motorized Transport (NMT) users by designing streets and areas that make a more desirable, livable city for residents and visitors and support the public transport system.

   Objectives

   (a) To improve pedestrian facilities in areas of pedestrian concentration and encourage pedestrian movement in heavy pedestrian movement areas and restrict use of private vehicles

   (b) To provide facilities for pedestrians and NMT users to ensure safety by segregating their movement from vehicles along major corridors

   (c) To provide safe pedestrian facilities along major public transport nodes and transfer points

   (d) Introduction of bike sharing scheme

3. **Goal 3:** Develop satellite towns to act as counter magnet for the main city.

   Objectives

   (a) Develop strategies to encourage people to reduce dependence on the main city area

   (b) To shift major activity centers out of the main city area

4. **Goal 4:** Develop traffic and transport solutions that are economically and financial viable and environmentally sustainable for efficient and effective movement of people and goods.

Objectives

(a) Develop short term strategies such as traffic management and engineering solutions to ease flow of traffic at major congestion points within the city

(b) Develop medium and long-term measures such as construction of bypass, new link roads, tunnels, road network development etc. to ease traffic flow along major roads within the city

5. **Goal 5:** Develop a parking policy that reduces the demand for parking and need for private mode of transport and also facilitate organized parking for various types of vehicles.

Objectives

(a) Restrict on street parking at critical locations in the city

(b) Create off street parking (wherever possible Multilevel Parking) near major activity centers, transit stations/terminals to meet the growing parking demand.

(c) To suggest various measures through a combination of demand management and fiscal measures to restrain the demand for parking of private vehicles at critical locations.

5.3 Mobility plan approach

Urban mobility solutions for Shimla cannot be evolved by a single source strategy, the mobility goals for Shimla will need to be addressed through a multipronged approach. The following strategies need to be adopted in tandem to meet the various goals set for Shimla:

- ✓ Integrated land use and transport strategy
- ✓ Mobility corridor strategy
- ✓ Public transport strategy
- ✓ Pedestrian and non-motorized transport strategy
- ✓ Freight management strategy
- ✓ Traffic engineering measures
- ✓ Parking demand management

All the listed strategies are equally important and the order of listing does not imply priority. Each of the broad strategies includes sub- strategies of immense importance. The strategies when implemented through specific projects shall fulfill the goals and objectives of the CMP. The sections below discusses adoption all these strategies in order to improve mobility of Shimla Pallning Area.

5.4 Integrated Land use and Transport Strategy

Increasing sprawl of urban areas due to development activities adversely affects the environment as human footprint spreads over a large area resulting in

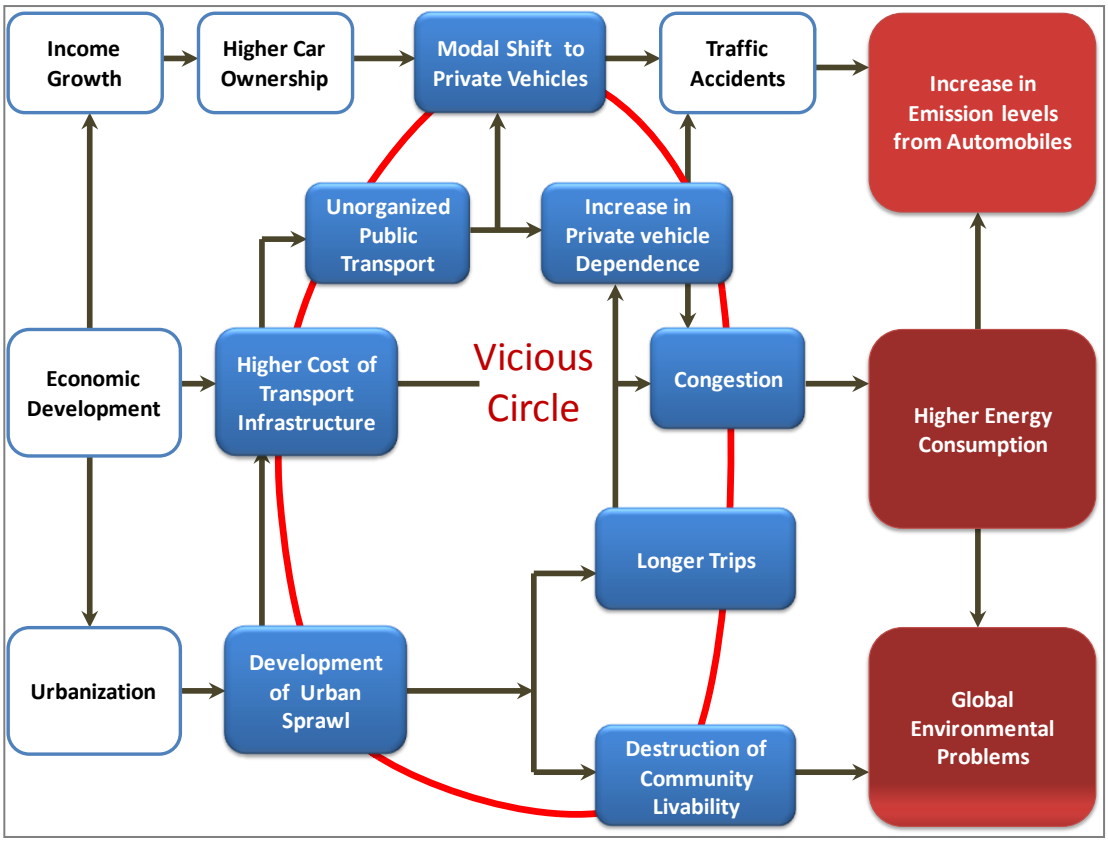


Figure 5-2: Relationship between Urbanization and Transport

increased movement from one point to another.

As the urbanization takes place with rising income level, in the absence of proper planning, leads to unsustainable automobile dominated and dependent society. Figure 5-2 describes the unplanned urban transport and its consequences.

In the wake of emerging importance to control urban sprawl and providing environmentally sustainable development, it is necessary to adopt all urban issues in an integrated manner. Land use has crucial impact on travel demand and can guide the future travel demand. Figure 5-3 clearly depicts the attainment of sustainable transport through integrated landuse transport planning.

In order to provide mobility solutions for Shimla, it is vital that there is effective integration between landuse and transport in the entire region, without which, it will be difficult to coordinate growth in sustained manner.

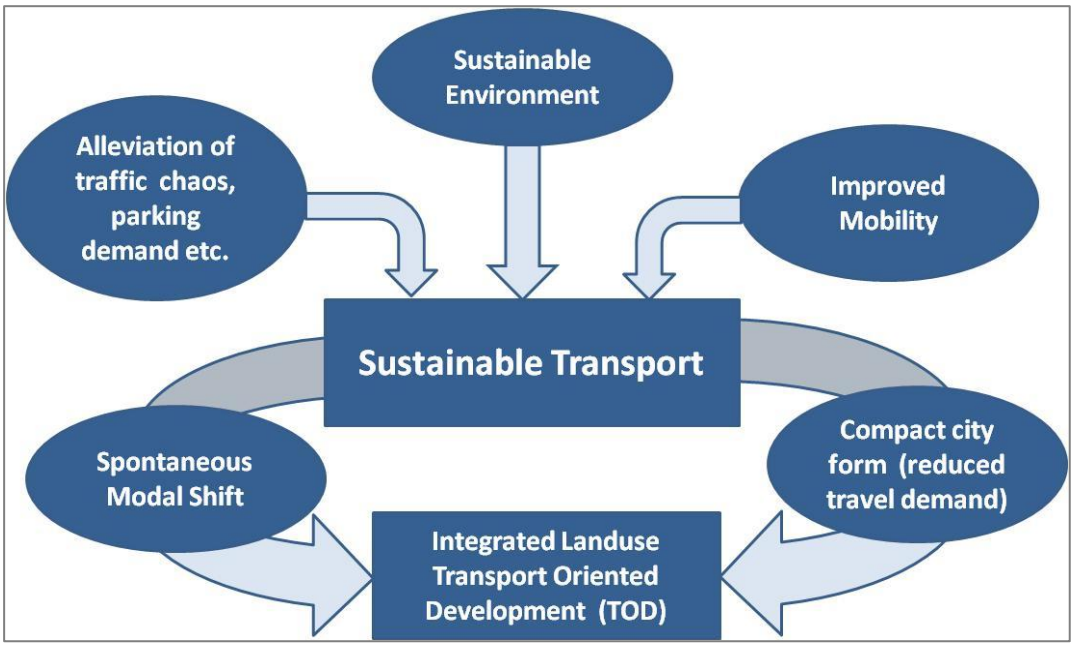


Figure 5-3: Sustainable transport through integrated landuse transport planning

5.4.1 Land use and transport strategy

Development pattern of Shimla has been guided by geographical constraint imposed by rugged topography & slope. The east-west axis has emerged as the main axis of development because of milder slopes along its southern face and favorable climatic factors. From this main axis several spurs have projected towards north and south providing the base for development (shown in figure 5-4). Most of the activities are concentrated near the central area. Large numbers of government offices are also located within the central area only. This has resulted in chaotic traffic situation within central part of the city encircled by Cart road.

Due to natural constraint such as existence of forestland and limited scope for road widening, the chaotic traffic situation of Shimla cannot be improved by adopting single approach. Figure 5-5 shows the natural constraint for development potential in terms of notified green fields (forestland). Further, in

order to regulate the construction activities in view of carrying capacity, physical thresholds, environmental, ecological and heritage imperatives, the Town and Country Planning Department of Himachal Pradesh has divided and notified the whole Shimla planning area into six different zones, which are as (shown in figure 5-6):

1. No Construction Zone
2. Eco-Sensitive Zone
3. Restricted Area
4. Activity Zone
5. Heritage Zone
6. Cantonment Area

The CMP for Shimla has considered all these spatial characteristics of the study area and thrived to achieve landuse transport integration in formulating intervention measures.

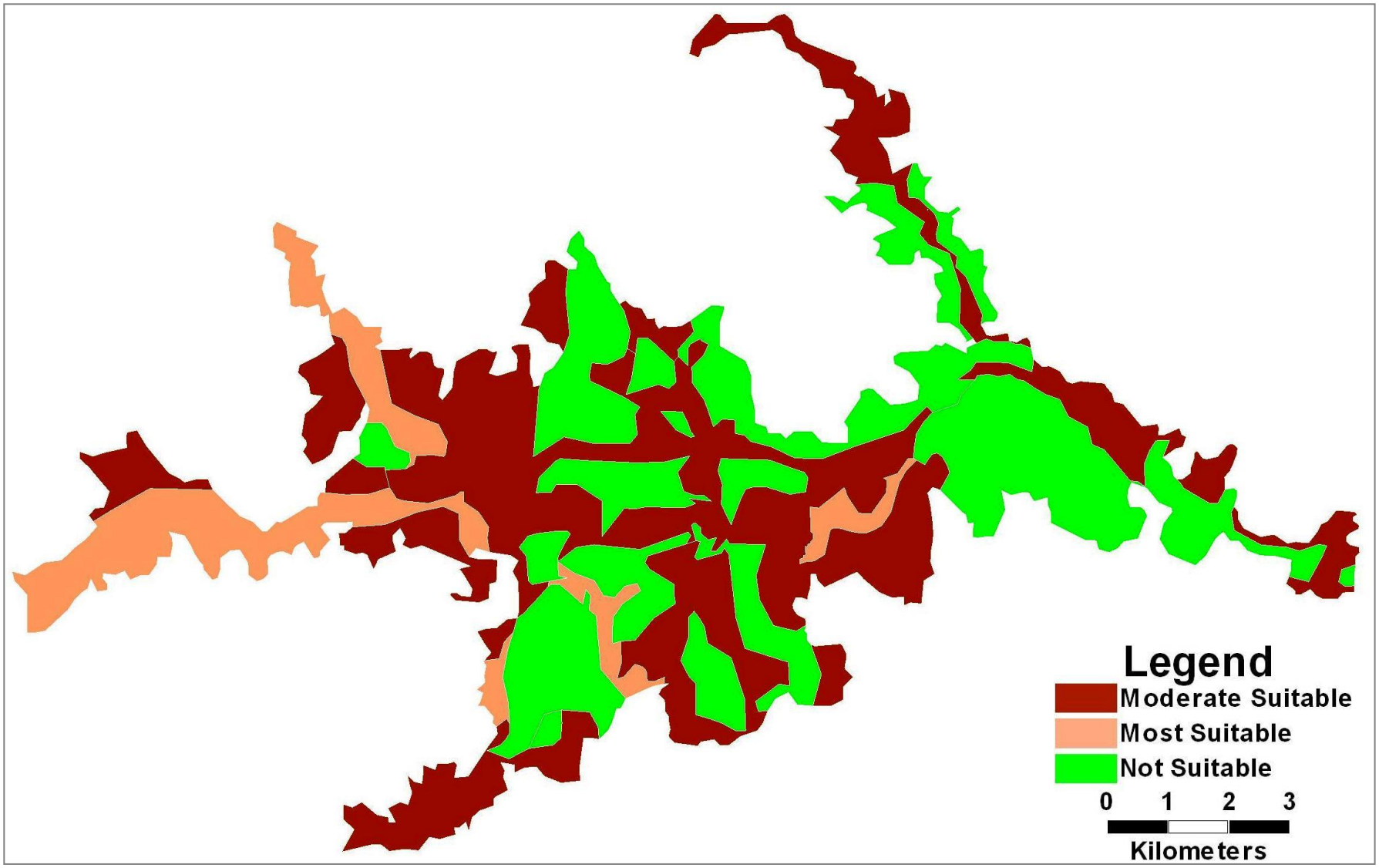


Figure 5-4: Potential areas for future development

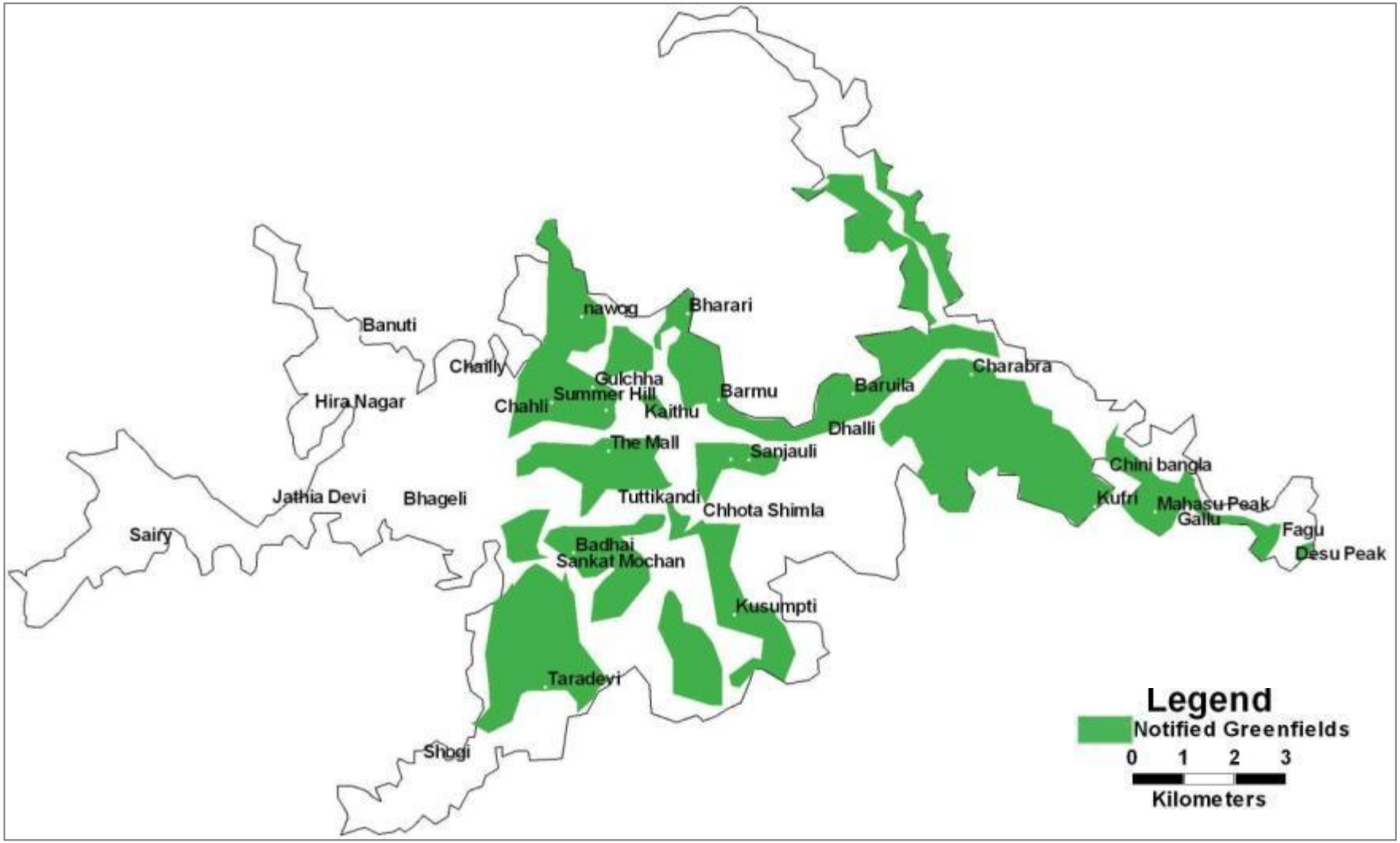


Figure 5-5: Natural constraints in terms of notified green fields

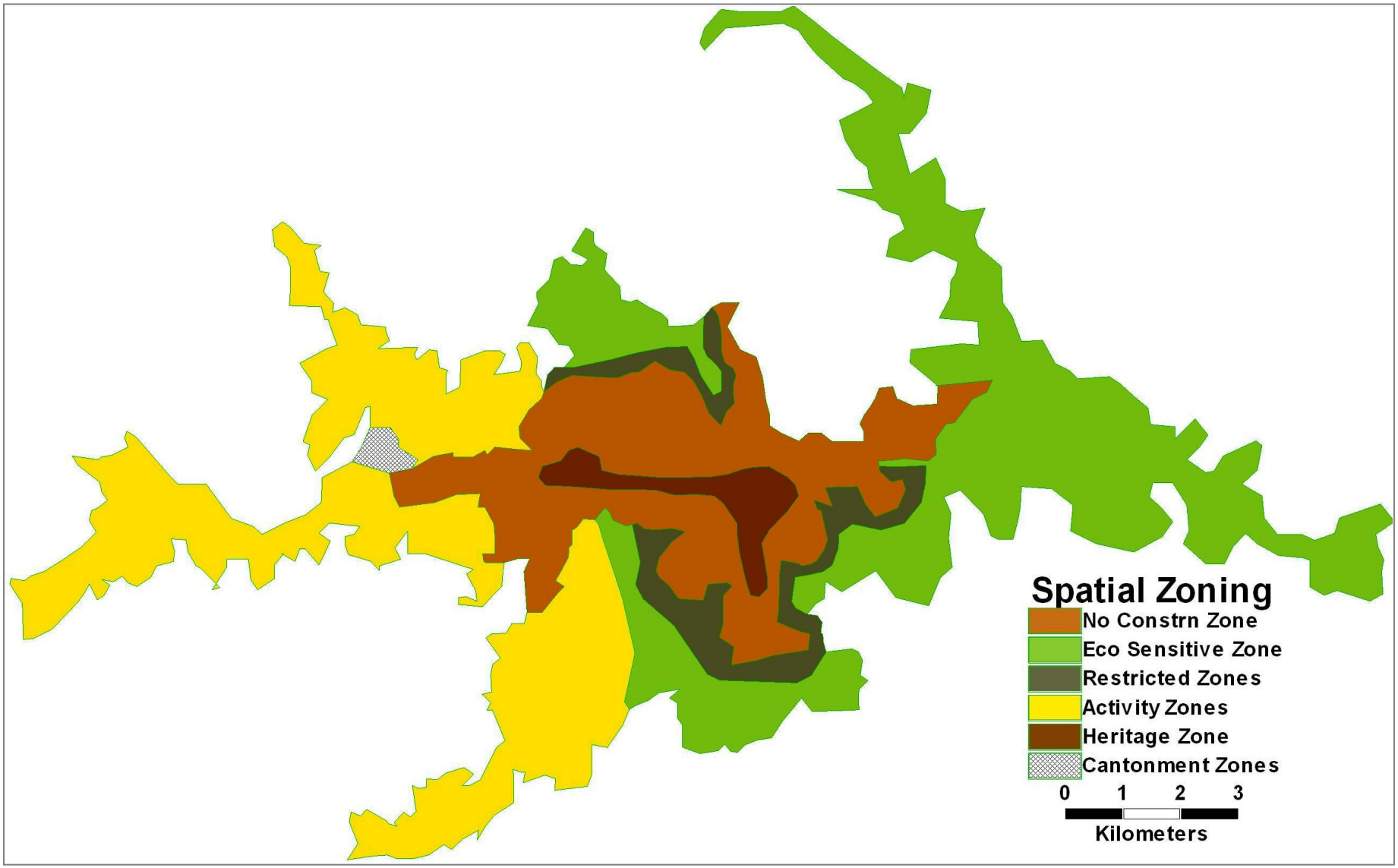


Figure 5-6: Spatial zoning for Shimla Planning Area by Town & Country Planning Department

5.4.1.1 Development of satellite towns

As per 2001 census, the population of Shimla Planning Area is 1.75 Lakhs with average decadal growth of 35%. The size of floating population for the year 2001 was 56,000 and the decadal growth rate was 40% (1991-2001).

The decadal growth rate of urban area of Himachal Pradesh is 25%. Thus, it is apparent that the Shimla Planning Area has the higher decadal growth rate as compared to the state. This high growth rate of population in Shimla is attributed to natural growth rate and migration from neighboring areas. Natural growth rate component found to be 74% while 26% growth is contributed by migration to total growth rate.

Shimla being the state capital and the main hub for commercial, educational, and administrative activity in the state is going to experience more migration in the horizon year. If the same situation prevails, the ever-increasing pressure of population rise on land coupled with high growth of vehicles will lead to collapse of fragile eco-diversity of Shimla and the traffic situation in Shimla will become unmanageable.

In order to have a sustainable solution and keeping in view long run potentials, the Town & Country Planning Department, Government of Himachal Pradesh has proposed to develop three satellites towns in three different directions of Shimla Planning Area to act as a counter magnet. These three proposed satellite towns are Vaknaghat towards Shoghi, Fagu and Ghandal towards Ghanahatti as shown in figure 5-7. Developing these three satellite towns with provision of adequate employment opportunity and infrastructure will improve urban ambience and mobility within SPA. The Comprehensive mobility plan for Shimla has further suggested to develop effective and efficient transport network to connect each of these proposed satellite towns with Shimla city.

Based on existing characteristics, the Shimla CMP has broadly worked out the proposed landuse and employment pattern of these three satellite towns, however a detailed study is required to clearly earmark the land use and to prepare complete layout for these satellite towns.

(a) Vaknaghat Cyber City:

The proposed Vaknaghat satellite town can be developed as cyber city considering the presence of Information Technology related academic infrastructure such as J.P University of Information Technology. Developing Vaknaghat as cyber city, will reduce the work trips to Shimla from the surrounding areas.

The CMP for Shimla has proposed Vaknaghat cyber city should be developed for an area of 200 Ha with density of 50 persons per Ha to accommodate 10, 000 population. The table 5-1 shows the area and population details of Vaknaghat cyber city.

Table 5-1 Area, population details of proposed Vaknaghat Cyber city

Vaknaghat Cyber City	
Area (Ha)	200
Population	10,000
Density	50

The board landuse and employment pattern of proposed Vaknaghat cyber city is shown in table 5-2 and table 5-3.

Table 5-2 Board land use pattern of proposed Vaknaghat Cyber city

Land use	In%	Area (in Ha.)
Residential	30	60
Commercial	5	10
P & S.P	10	20
Industrial	25	50
Transport	12	24

Open Space	18	36
Total	100	200

Table 5-3 Employment pattern for proposed Vaknaghat Cyber city

Sector	Employment %
Primary	20
Secondary	30
Tertiary	50

(b) Fagu Tourism City:

A large number of trips from upper Shimla to Shimla city occur with purpose of getting medical treatment. Thus, providing better medical facilities in some strategic location near to Fagu side can reduce the trips from upper Shimla to Shimla with purpose of medical treatment. On the other hand, the Fagu- Kufri belt has potential to develop as tourist attraction points along with development of horticulture and agriculture. Considering this aspect, the CMP for Shimla has suggested Fagu to develop as tourism city along with adequate infrastructure for medical facilities.

The CMP for Shimla has suggested Fagu Tourism city should be developed for an area of 60 Ha with density of 33 persons per Ha to accommodate 2,000 population. The table 5-4 shows the area and population details of Fagu Tourism city.

Table 5-4 Area, population details of proposed Fagu Tourism city

Fagu Tourism City	
Area (Ha)	60
Population	2,000
Density	33

The board landuse and employment pattern of proposed Fagu Tourism city is shown in table 5-5 and table 5-6.

Table 5-5 Board land use pattern of proposed Fagu Tourism city

Land use	In %	Area (in Ha.)
Residential	25	15
Commercial	8	4.8
P & S.P	10	6
Transport	12	7.2
Horticulture/ Agri	35	21
Open Space	10	6
Total	100	60

Table 5-6 Employment pattern for proposed Fagu Tourism city

Sector	Employment %
Primary	40
Secondary	20
Tertiary	40

(c) Ghandal Township:

Ghandal, which is situated near to the Shimla airport has the potential to develop as activity based satellite town with provision of all and adequate urban amenities. Developing Ghandal as activity based satellite town will reduce the dependency of the residents from Bilaspur, Kandaghat side on Shimla for basic urban amenities such as education, health, trade & commerce etc. The CMP for Shimla has suggested Ghandal Township should be developed for an area of 100 Ha with density of 100 persons per Ha to accommodate 10,000 populations. Table 5-7 shows the area and population details of Ghandal Township.

Table 5-7 Area, population details of proposed Ghandal Township

Ghandal Township	
Area (Ha)	100
Population	10,000
Density	100

The board landuse and employment pattern of proposed Ghandal Township is shown in table 5-8 and table 5-9.

Table 5-8 Board land use pattern of proposed Ghandal Township

Land use	In %	Area (in Ha.)
Residential	30	30
Commercial	5	5
P & S.P	45	45
Transport	10	10
Open Space	10	10
Total	100	100

Table 5-9 Employment pattern for proposed Ghandal Township

Sector	Employment %
Primary	35
Secondary	25
Tertiary	40

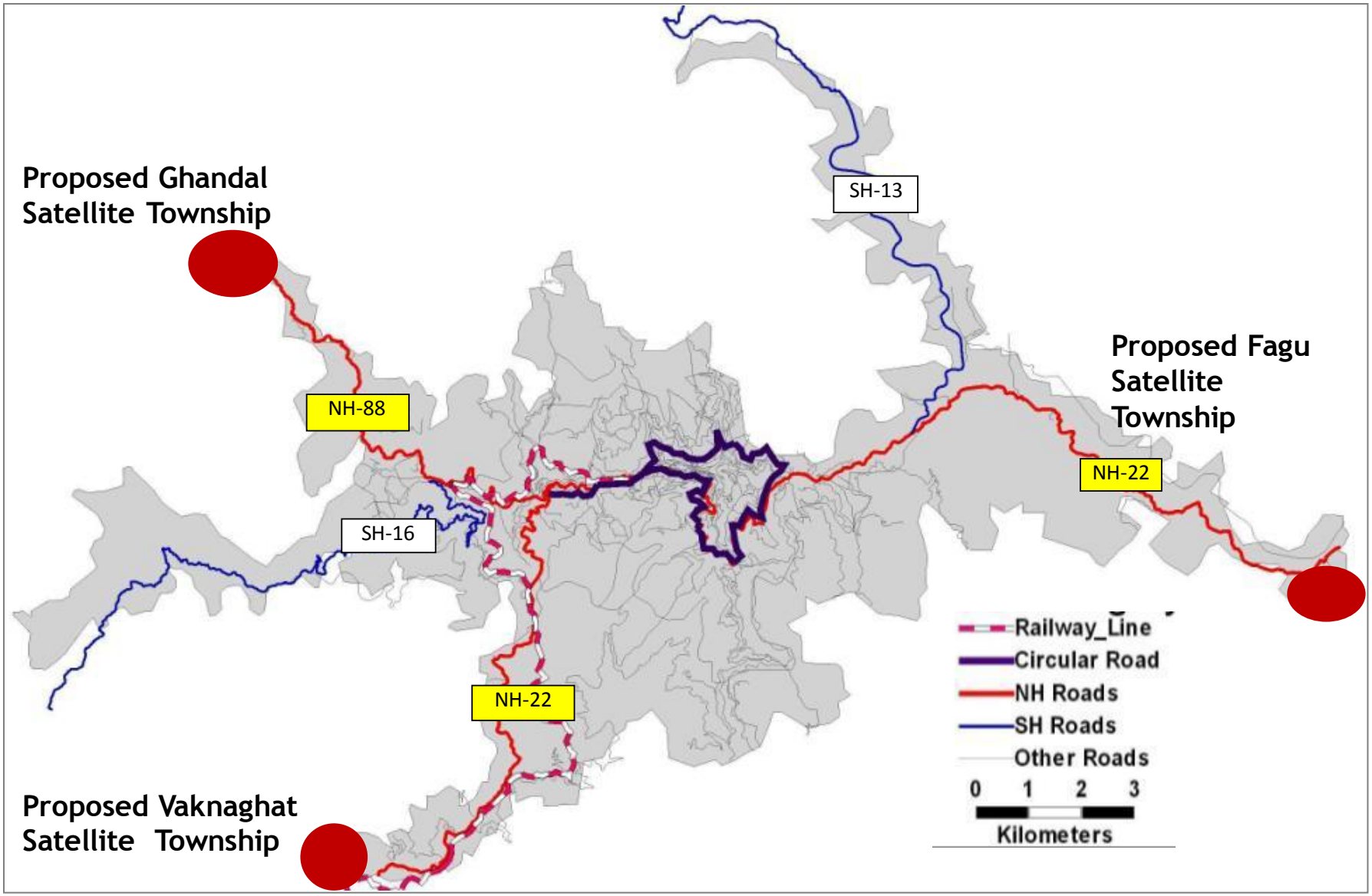


Figure 5-7: Proposed Satellite towns

5.4.1.2 Regional connectivity and land use and transport integration strategy for Shimla

The Comprehensive mobility plan for Shimla has further suggested to develop effective and efficient transport network to connect each of these proposed satellite towns with Shimla city. In order to develop effective and efficient transport network, the CMP for Shimla has adopted two-way approach:

1. Development of bypass roads for network connectivity (Detailed proposal for bypasses is given in Network Improvement Plan section)
2. Development of reliable public transport system (Detailed proposal for city bus service along the bypasses is given in Public Transport Plan section) along these proposed bypasses for functional connectivity.

Figure 5-8 shows the city bus routes along the bypass to connect proposed satellite towns.

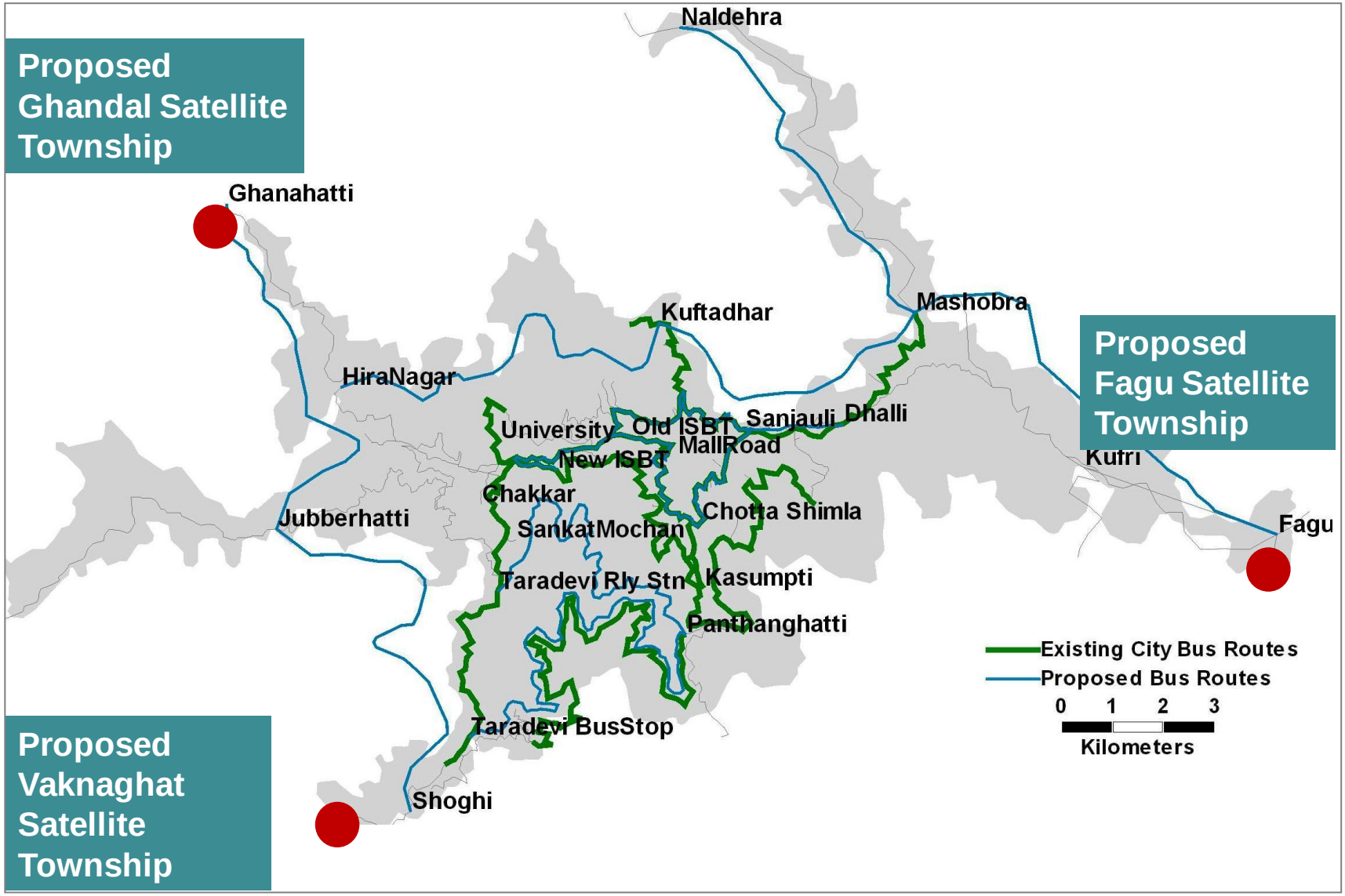


Figure 5-8: City Bus service to connect proposed sattelite towns

5.4.2 Mobility corridor strategy

By designating certain roads as mobility corridors, the transport corridors get prioritized for increasing the throughput. As speed of public transport vehicle reduces, travel times increases to such an extent that commuters look for option of using personalized modes of travel. In addition to the user travel preferences the road design and operations also have a bearing on traffic congestion. Development of hierarchy in road network of a city helps in addressing the specific problems of a particular kind of road in the entire network with specific solutions.

Development of mobility corridor based on functional characteristics of a corridor is an important step towards efficient utilization of road space. In a hill town like Shimla, the scope for widening of road space is limited by terrain constraint. On the other hand, heterogeneous traffic and increasing use of private vehicles leads to inefficient utilization of road space.

The mobility corridor for Shimla Planning Area has been identified based on the existing maximum vehicular flow and passenger flow during peak hours along the main arterials (Refer figures 5-9 and 5-10). Referring to table 5-10, the corridors namely Circular Road, NH-22, from Shoghi Market to Victory Tunnel, NH-22 from Sanjauli Chowk to Fagu and NH-88 from Chakkar Chowk to Ghanahatti should be develop as mobility corridor.

Table 5-10: Vehicular and passenger flow along major corridors in both base year and planning year

Sl No.	Corridor	Veh flow (PCU/hr) 2011	Pax Flow (Pax/hr) 2011	Veh flow (PCU/hr) 2031	Pax Flow (Pax/hr) 2031
1	Circular Road	1,144	13,178	5,294	60,981
2	NH- 88	571	6,577	2,723	31,366
3	NH-22 Shoghi side	1,105	12,728	4,774	54,992
4	NH-22 Fagu side	1,134	13,063	4,527	52,146

The CMP for Shimla has suggested that following corridors should be developed as mobility corridor (Refer to figure 5-11).

1. Corridor 1: Circular Road
2. Corridor 2: NH-22, from Shoghi Market to Victory Tunnel
3. Corridor 3: NH-22 from Sanjauli Chowk to Fagu
4. Corridor 4: NH-88 from Chakkar Chowk to Ghanahatti

These mobility corridors will augment the connectivity within both Shimla Municipal Corporation area and within Shimla planning area by connecting municipal corporation area with rest of the Special Planning Area.

Referring to figure 5-12, the mobility corridors should have following features:

Physical Features:

- Minimum two-lane (7 meters carriageway) road with varying Right of Way (RoW)
- Provision of footpath (minimum 1 meter width) wherever necessary and feasible to construct
- Provision of streetlight, road markings and signages

Functional Features:

- Provision of public transport along mobility corridor
- Provision of public transport promoting infrastructures along the corridor
- Permission of higher FAR along mobility corridor
- Partially or fully banned on on-street parking along mobility corridor

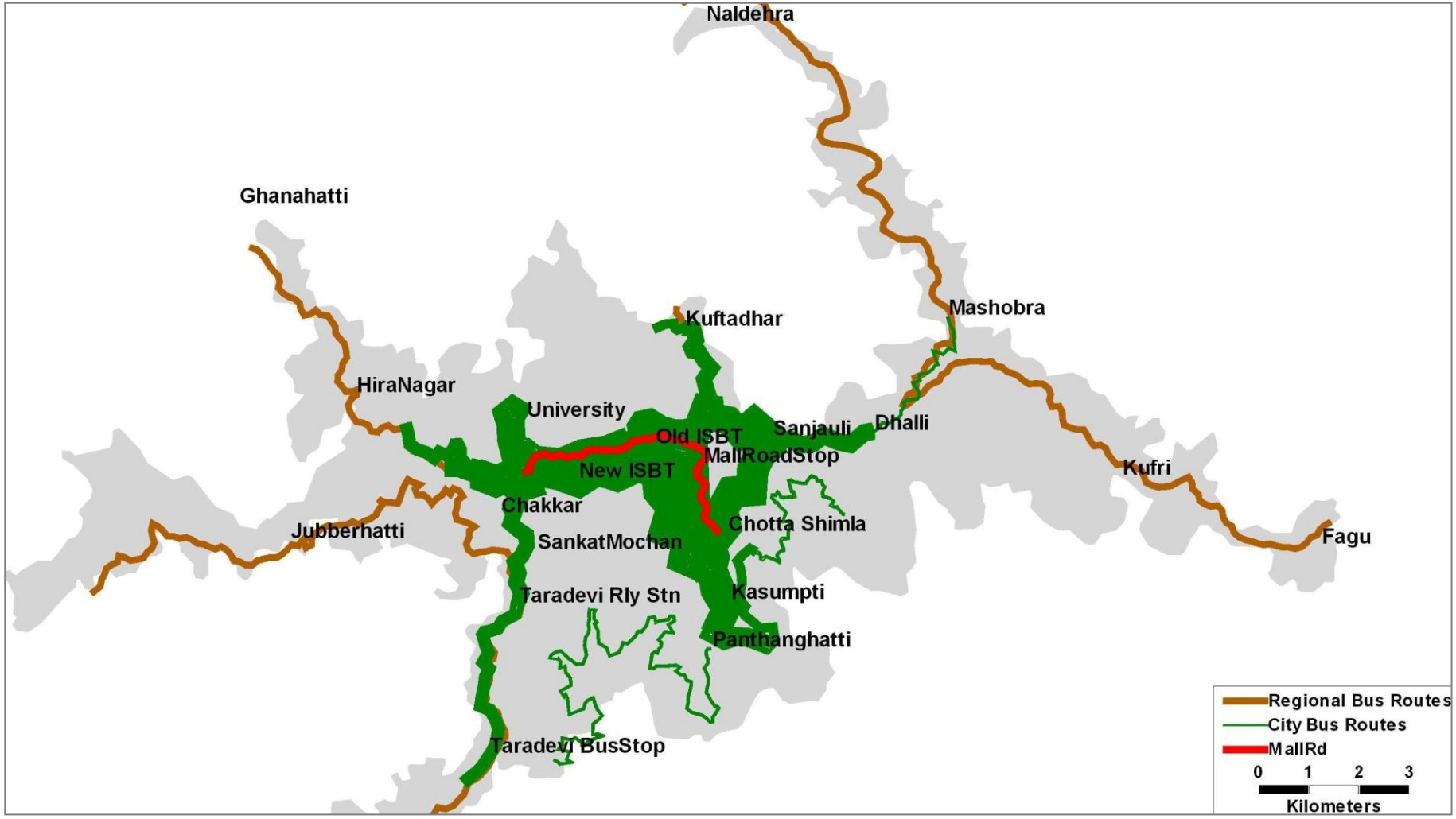


Figure 5-9: Public transport demand routes

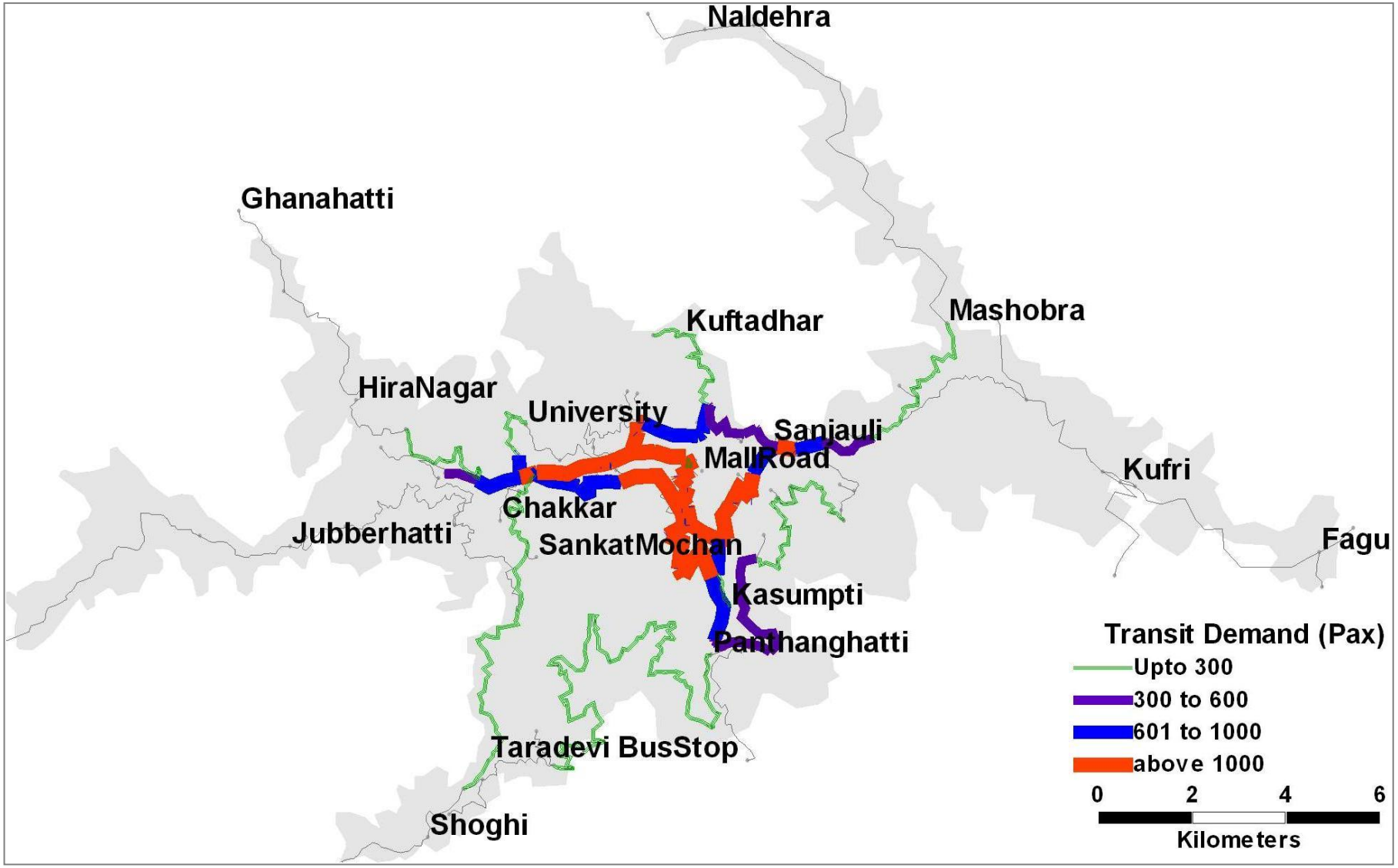


Figure 5-10: Public transport demand routes along with demand (passenger per hour)

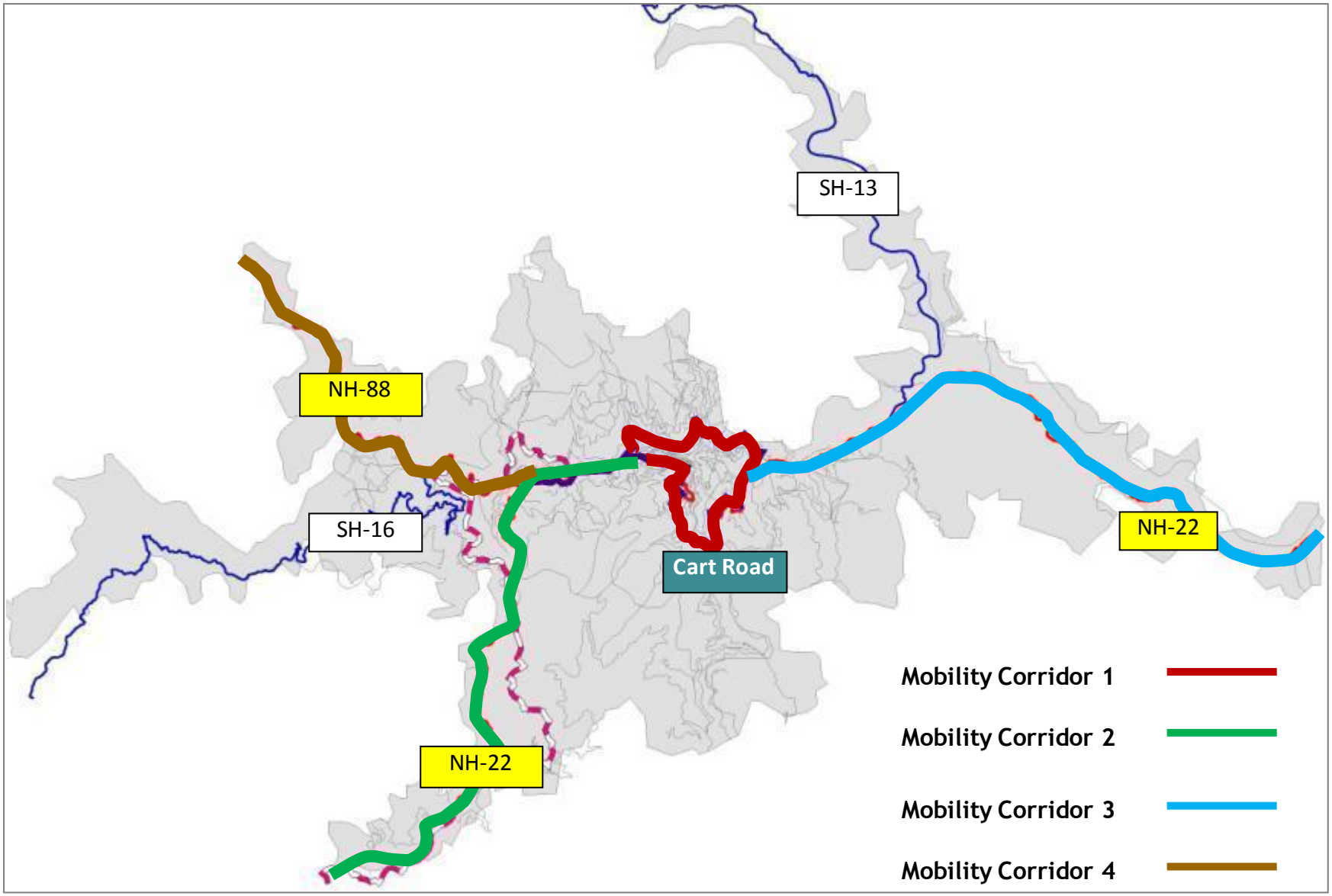


Figure 5-11: Proposed mobility corridor for Shimla Planning Area

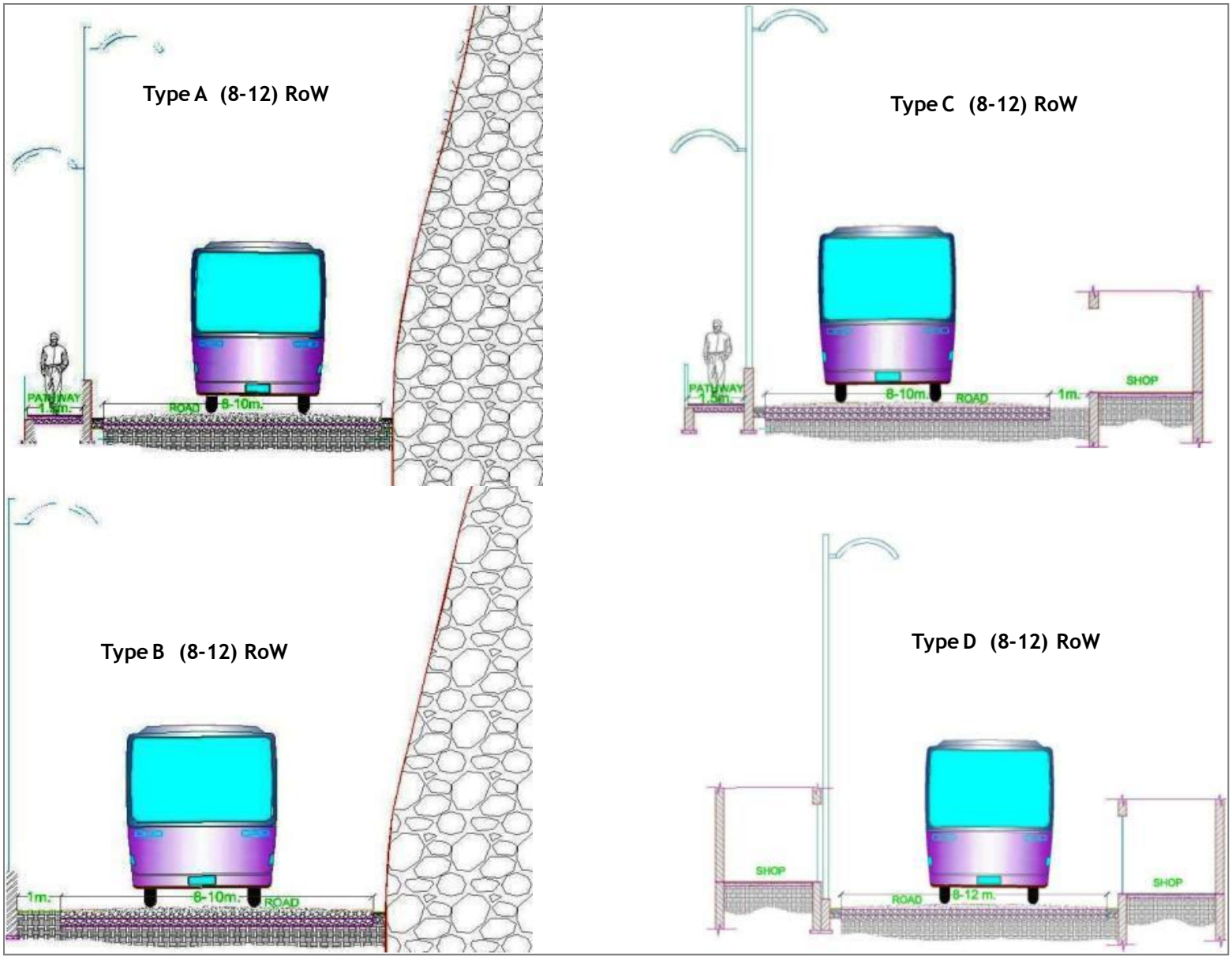


Figure 5-12: Cross sections of proposed mobility corridor for Shimla Planning Area

However, public transport without land use-integration is unsustainable due to poor ridership. Developing major transit interchange nodes as activity center and developing space for private parking will act as a stimulus for increase in ridership and generator for induced demand for public transport. The CMP for Shimla has suggested development of activity center and parking space at proposed transit interchanges. Figure 5-15 shows the major transit locations suitable for activity centers, parking space etc. (Details are given in Infrastructure for multimodal integration section)

5.4.3 Transit Oriented Development (TOD) measures

Considering the terrain pattern in Shimla, the CMP for Shimla has proposed following measures Transit Oriented development measures:

(I) **Re-densification along the public transport corridor:** High-density development along the proposed mobility corridors and public transport corridors should be permitted. Public transport infrastructure such as stations etc. should be developed to make the public transport more convenient, easily accessible and to encourage ridership. This form of development utilizes existing infrastructure, optimizes use of the proposed mobility corridor, and creates mobility options for public transport riders and the residents. It is recommended that the mobility corridors should be permitted a density one-step higher than the surrounding area and the Transit Nodes be permitted density two steps higher.

Densification can be promoted primarily by permitting higher Floor Area Ratio (FAR) or Floor Space Index (FSI). It is important that the redevelopment with higher FAR or FSI is permitted after assessing the infrastructure capacity of the area such as water, sewage, drainage etc. Figure 5-13 and figure 5-14 show the concept of densification along the mobility corridors.

(II) **Improving accessibility to public transport:** Along the proposed mobility corridors, particularly in the Green Field Development areas, the

development of any residential pockets or colonies should meet the following criteria:

1. **Improved Vertical Mobility:** At certain bus stations located in a higher density neighborhood, the CMP has proposed to provide lift or escalators for easy accessibility to the people residing in the valley to public transport system. This will result in increase in ridership for public transport and will reduce usage of private vehicles. Figure 5-16 shows the concept of improved vertical mobility for higher public transport ridership.
2. **Restricted Private Car Parking Strategy:** Adoption of parking strategy, which can discourage use of private vehicles. As per the current norms a minimum car space of 1 is permitted per dwelling units. Thus, it is proposed to levy incremental charges for every additional space so as to restrict the growth in parking demand for private vehicles. Any developer or individual, applying for over and above the minimum required parking space (or ECS) should be levied additionally on an incremental basis.
3. **Multimodal Integration:** Details are given in Infrastructure for multimodal integration section.

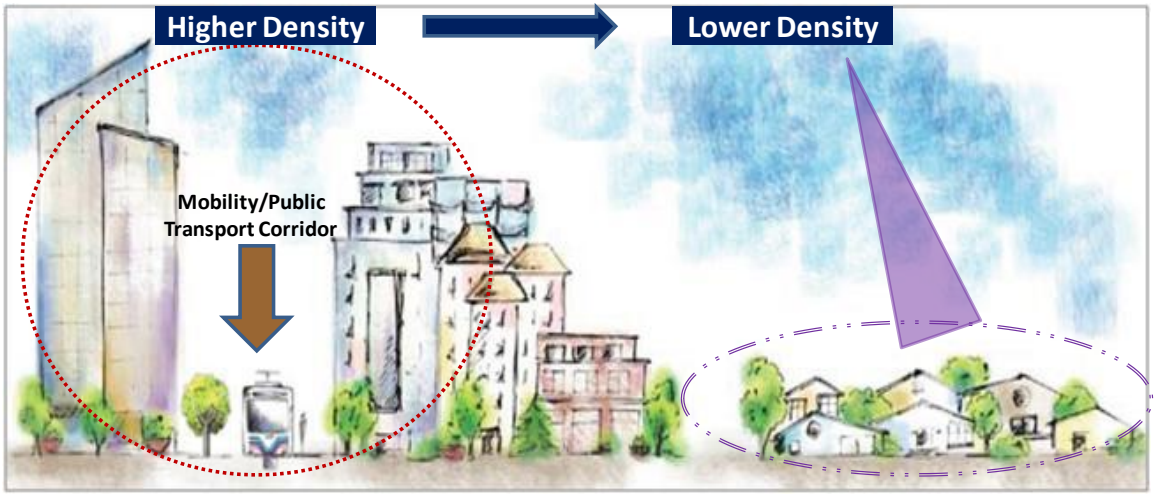


Figure 5-14: TOD concepts –Higher density proximity to mobility corridor

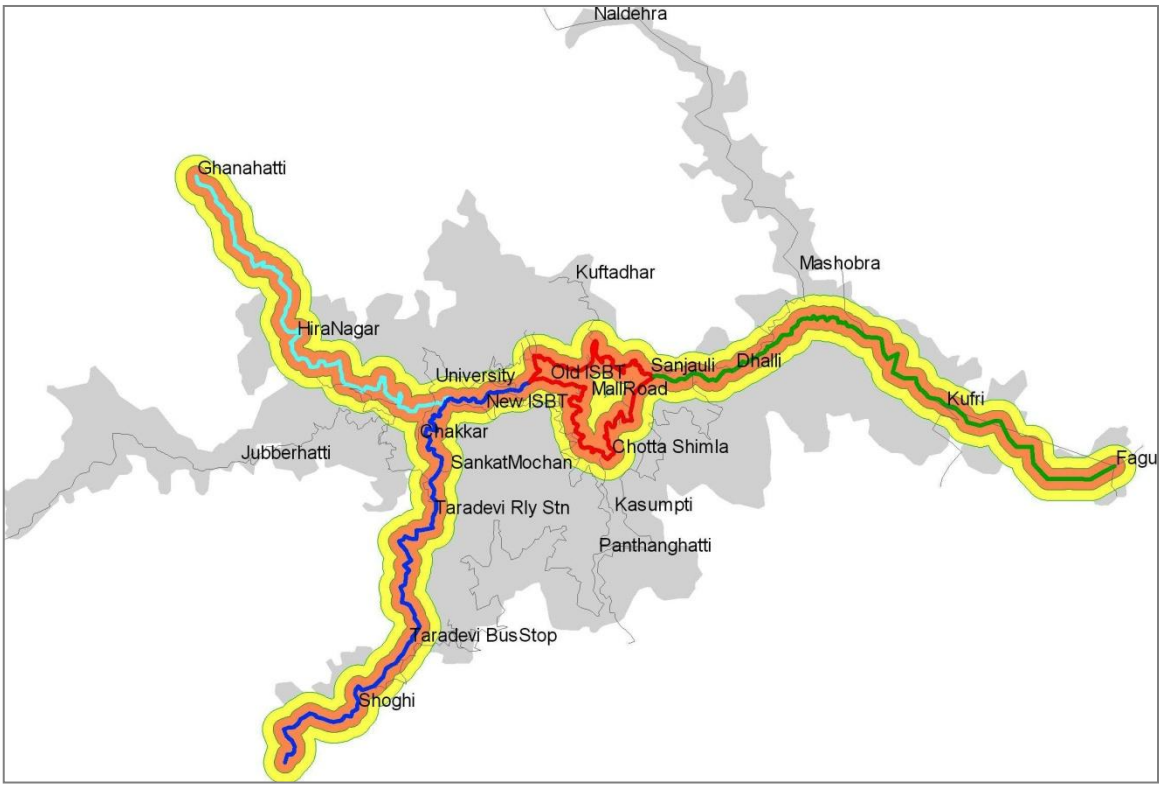


Figure 5-13: Higher density proximity to mobility corridor

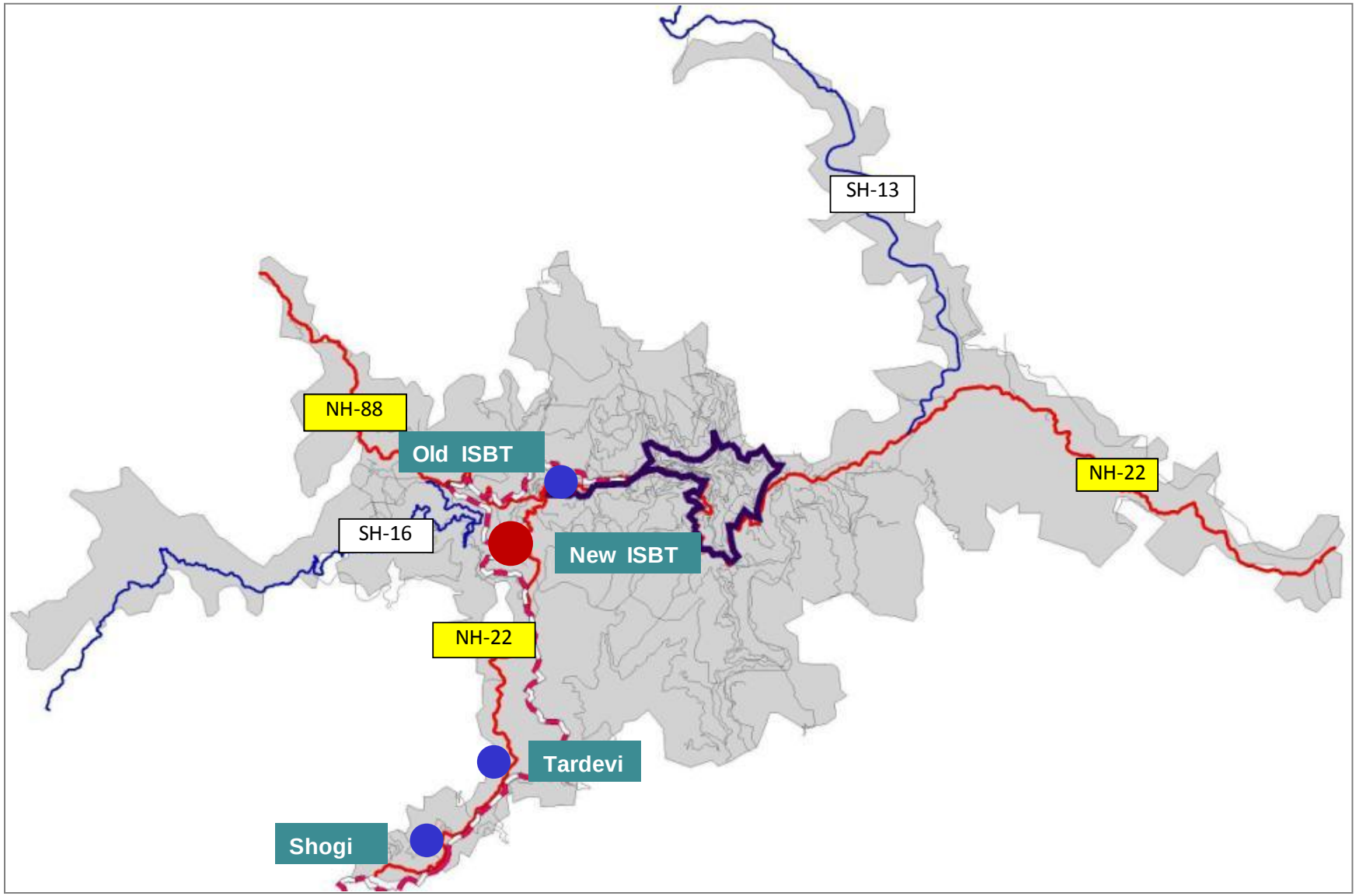


Figure 5-15: Proposed major transit locations for development of activity center

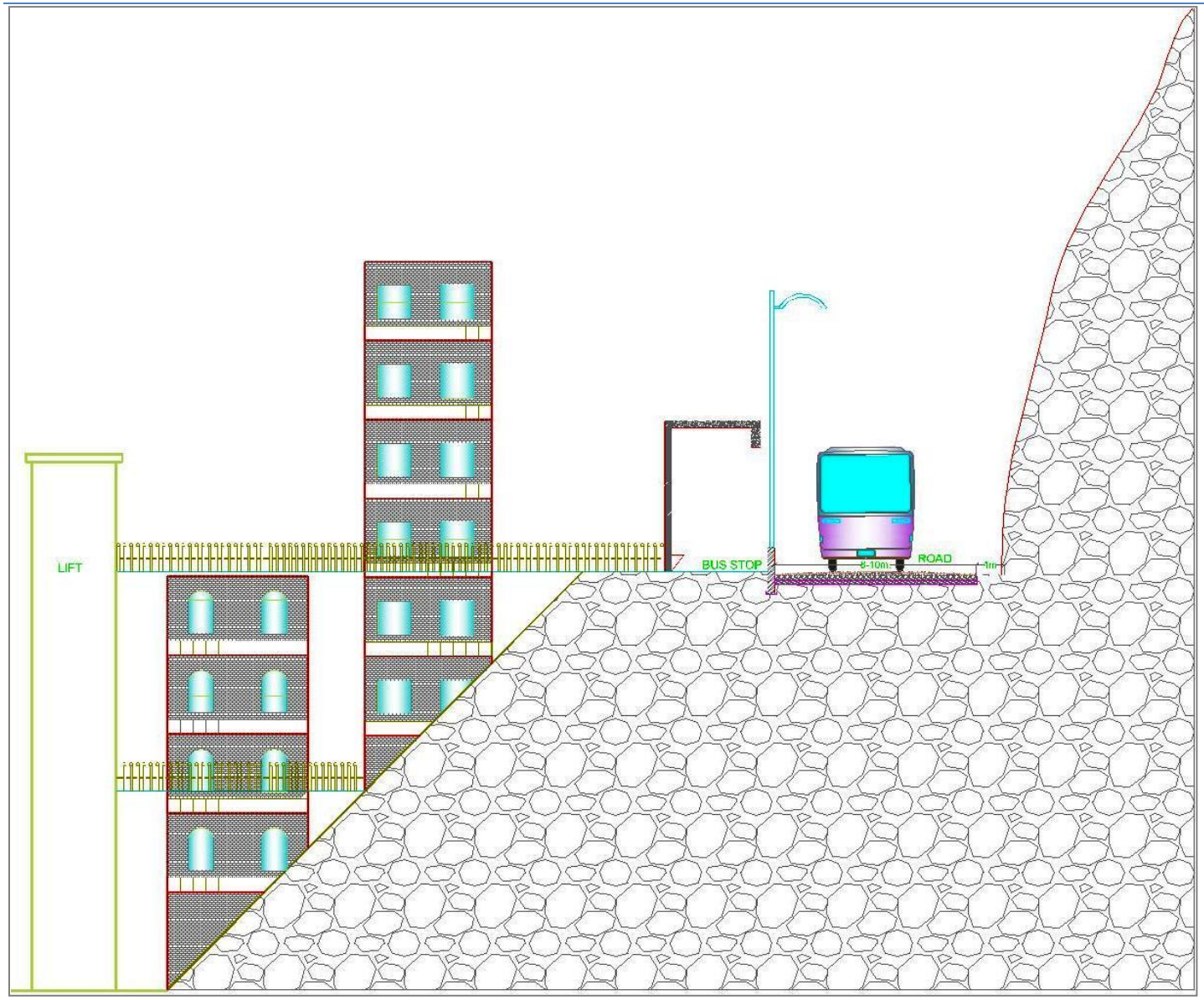


Figure 5-16: Concepts of improved vertical mobility for higher public transport ridership

5.4.4 Network Improvement Plan

The Comprehensive Mobility Plan for Shimla has suggested for improvement of network for overall improvement of connectivity (refer to figure 5-17). As a part of its network improvement plan, the following aspects have been covered:

(a) Development of new links

(b) Development of tunnels

(c) Development of bypasses

(d) Improvement of existing roads

Each of these aforementioned aspects has been described as a part of network improvement plan in details in the subsequent sections.

(a) Developement of New Links:

The CMP for Shimla has proposed development three new links (refer to figure 5-18), which are as:

1. **Tara Devi- Tutikandi- Panthaghatti Link:** (Starting from Tara Devi to Panthaghatti via Tutikandi measuring 8 kms)

Based on projected traffic for the year 2031, the Cart road will be at its below level of service apperent from estimated value of the V/C ratio of 3.4 in 2031 without proposed new link connecting Panthaghati with Taradevi. Once the new link is developed the level of service of Cart road will improve as there will be shift of traffic to the tune of 28% from the Cart road to this new proposed link destined to Panthaghatti (Refer to table 5-11).

2. **Sanjauli–Dhalli Link:** (An alternate link road starting from Sanjauli to Dhalli measuring 1.86 kms)

The proposed Sanjauli-Dhalli link will improve the existing road Sanjauli to Dhalli link of NH-22 in terms of level of service with 33% shift of traffic to the new link.

Referring to table 5-11, the value of V/C ratio with and without proposed new links, i.e Tara Devi- Tutikandi- Panthaghatti Link and Sanjauli–Dhalli Link shows that V/C ratio will improve considerably with development of these new links.

3. **Development of a new link for connecting phase II and phase IV of New Shimla:** (Approximately 1.5 Kms)

At present, the existing inter-phase, inter-sector conncetivity of different phases of New Shimla is found to be grossly inadequate. In the absence of proper connectivity, the residents of New Shimla area use the NH-22 bypass road to travel from one phase to the other.

The CMP for Shimla has suggsted two different alternatives to improve the connectivity between phase II and phase IV of New Shimla, which are as:

- Devlopment of jeepable road connecting phase II and phase IV of New Shimla across the nallah (refer to figure 5-19) as immideate maesure
- Development of a bridge over the nallah to connect Phase II and Phase IV of New Shimla (refer to figure 5-20) as medium term measure

The development of a new bridge will shorten the distance between Phase II and Phase IV of New Shimla by about 2 kms while the development of a new jeepable road will shorten the distance by 500 meters. Further in the absence of a bridge/ road, on the average 926 vehicular trips between Phase II and Phase IV of New Shimla passes daily through the NH-22 bypass road. With a direct link in the form of a bridge or a new road between Phase II and Phase IV of New Shimla, will reduce the traffic on NH-22 bypass road.

The development of a direct link in the form of a bridge or a new road between Phase II and Phase IV of New Shimla, will reduce the traffic on NH-22 bypass road which will in turn improve the vehicle carrying capacity of the road reflected by improved V/C ratio of 0.5 in 2031 with the new bridge (value of V/C ratio will be 1.6 in 2031 without the bridge/road refer to table 5-12).

Table 5-11: V/C ratio with and without New Link

New Links	Location	V/C without New Link 2031	V/C with New Link 2031	% Shift
Taradevi-Panthaghatti-Tutikandi	Cart Road	3.4	0.88	28%
Sanjauli-Dhalli Link	NH-22 Sanjauli Road	1.06	0.71	33%

Table 5-12: V/C ratio with and without new link/bridge to connect phase II & phase IV of New Shimla

New Links	Location	V/C without New Link 2031	V/C with New Link 2031
Jeepable road/bridge to connect phase II & phase IV of New Shimla	NH-22 bypass	1.6	0.5

(b) Development of Tunnels

Aprat from the Auckland tunnel, construction of which has been completed and was inaugurated for use on 9th April 2012, the CMP for Shimla has suggested development of two more tunnels which are as:

1. Tunnel No. I: From Tawi to Barrier measuring 700 m
2. Tunnel No. 2: Parallel to Dhalli Tunnel measuring 190 m

Further as per stakeholder consultation, UMTC was informed that HPPWD has already prepared Detailed Project Report (DPR) for three more tunnels in Shimla and UMTC was asked to study the DPRs. The tunnels proposed by HPPWD and are as:

1. Himfed Petrol Pump to IGMC measuring 890 m
2. Himfed Petrol Pump to Lift measuring 1135 m
3. Lift to Lakkar Bazaar measuring 681.25 m

As, per the DPRs, tunnels proposed by HPPWD were found to be feasible for implementation (refer to table 5-13).

In its final proposal, UMTC has suggsted development of five more tunnles apart from Auckland tunnel which are as (refer to figure 5-21):

1. **Tunnel No. I:** From Tawi to Barrier measuring 700 m

The traffic destined towards Bilaspur takes the NH-88 which passes through Boileauganj Chowk having narrow Right of Way, the Boileauganj chowk is considered one of the most congested part of Shimla city. The existing Chakkar bypass is also unable to bypass the traffic from NH-22 to NH-88 due to right of way constraint. Thus, in order to smoothen the traffic from NH-22 to NH-88 and vice versa and also to decongest the Boileauganj chowk, a tunnel from Tawi to Barrier measuring 700 meters have been proposed.

2. **Tunnel No. 2:** Parallel to Dhalli Tunnel measuring 190 m

At present staggered oneway traffic movement is allowed through Dhalli tunnel with one directional traffic at a time. With the rise in vehicular traffic, the existing Dhalli tunnel is experiencing heavy congestion which is apparent from the existing level of service of 1.05 and estimated level of service in 2031.

3. **Tunnel No. 3:** Himfed Petrol Pump to IGMC measuring 890 m

Development of the tunnel connecting Himfed petrol pump with IGMC will improve the level of service of Cart road particularly from Himfed to Sanjauli chowk. This tunnel will lead to shift of 36% of traffic from Cart road to this new tunnel.

4. **Tunnel No. 4:** Himfed Petrol Pump to Lift measuring 1135 m

Projected traffic figure shows, development of this tunnel connecting Himfed petrol pump to Lift will improve the level of service of Cart road with shift of 24% of traffic form Cart road to this new tunnel.

5. **Tunnel No. 5:** Lift to Lakkar Bazaar measuring 681.25 m

Lakkar bazaar area is one of the most congested area of Shimla, with the development of this tunnel connecting Lakkar bazaar with Lift will improve the chaotic traffic scenario along circular road particularly from Victory tunnel to Lakkar bazaar stretch.

Table 5-13: V/C ratio with and without proposed tunnels

Tunnel No	Proposed Tunnels	Location	Base year V/C ratio	V/C without Tunnel (2031)	V/C with Tunnel	% Shift
Tunnel 1	Tawi to Barrier Tunnel	Boileauganj Chowk	1.17	4.06	0.86	48%
Tunnel 2	Dhalli Parallel Tunnel	Existing Dhalli Tunnel	1.05	2.05	0.70	33%
Tunnel 3	Himfed Petrol Pump to IGMC	Circular Road near Sanjauli Chowk	1.02	1.8	0.57	36%
Tunnel 4	Himfed Petrol Pump to Lift	Circular Road at Bemloi	0.9	1.5	0.7	24%
Tunnel 5	Lift to Lakkar Bazaar	Circular Road at Lakkar Bazaar	1.71	2	0.62	35%

From the table 5-13, it is clear that the value of V/C ratio on the existing road without these proposed tunnels will be more than 1 requiring adoption of improvement measures.

(c) Construction of bypasses

Origin – Destination survey conducted at 7 outer cordon locations shows that on the average 23.29% of traffic is bypassble traffic, i.e external-to-external (EE) traffic. By developing proper road network link this traffic can be bypassed. Considering this aspect, the CMP for Shimla has assessed the need for bypasses and proposed development of the following two bypasses (refer to figure 5-22).

1. **Northern Bye Pass** (Starting form Hira Nagar to Fagu via Kuftadhar, Mashobra measuring 20.5 kms and nothern bypass Naldehra link from Mashobra to Naldehra measuring 9 kms)

   In the absence of bypass, the traffic, from Bilaspur side to Fagu and vice versa takes the existing Cart road which is already experiencing congestion at many stretches. Based on projected traffic the value of V/C ratio for Cart road will be 3.4 which means unsustainable level of service. Similarly the traffic from Kalka side to Bilaspur side and vice versa takes the NH-22 and NH-88 which can be by passed.

   With Northern Bypass (Hira Nagar-Kuftadhar-Naldehra- Mashobra-Fagu), 49% of traffic using Cart road originated at Bilaspur side to Fagu and vice versa will shift to this new proposed bypass.

2. **Ghanahatti-Jubberhatti-Shoghi measuring 20 kms**

   With development of Ghanahatti to Shoghi bypass, 31% of traffic using NH-22 and NH-88 will shift to this new bypass.

   Referring to the table 5-14 the value V/C ratio in the year 2031, with two proposed bypasses will improve considerably.

Table 5-14: V/C ratio with and without proposed bypasses

Bypasses	Location	V/C without bypass (2031)	V/C with bypass (2031)	% Shift
Hira Nagar-Kuftadhar-Mashobra-Naldhera-Fagu	Cart Road	3.4	0.88	49%
Ghanaghatti to Jubberhatti to Shoghi Bypass	NH-88 near Ghanahatti	1.12	0.77	31%

(d) Improvement of existing roads:

Apart from the development of new roads, tunnels and the CMP for Shimla has also suggsted improvement of existing roads which includes:

1. Widening of Mall Road to from 7 to 12 meters width
2. Widening of motorable roads within municipal limit from 5 to 7 meters
3. Widening of existing jeepable roads from 2.75 to 5 mtrs

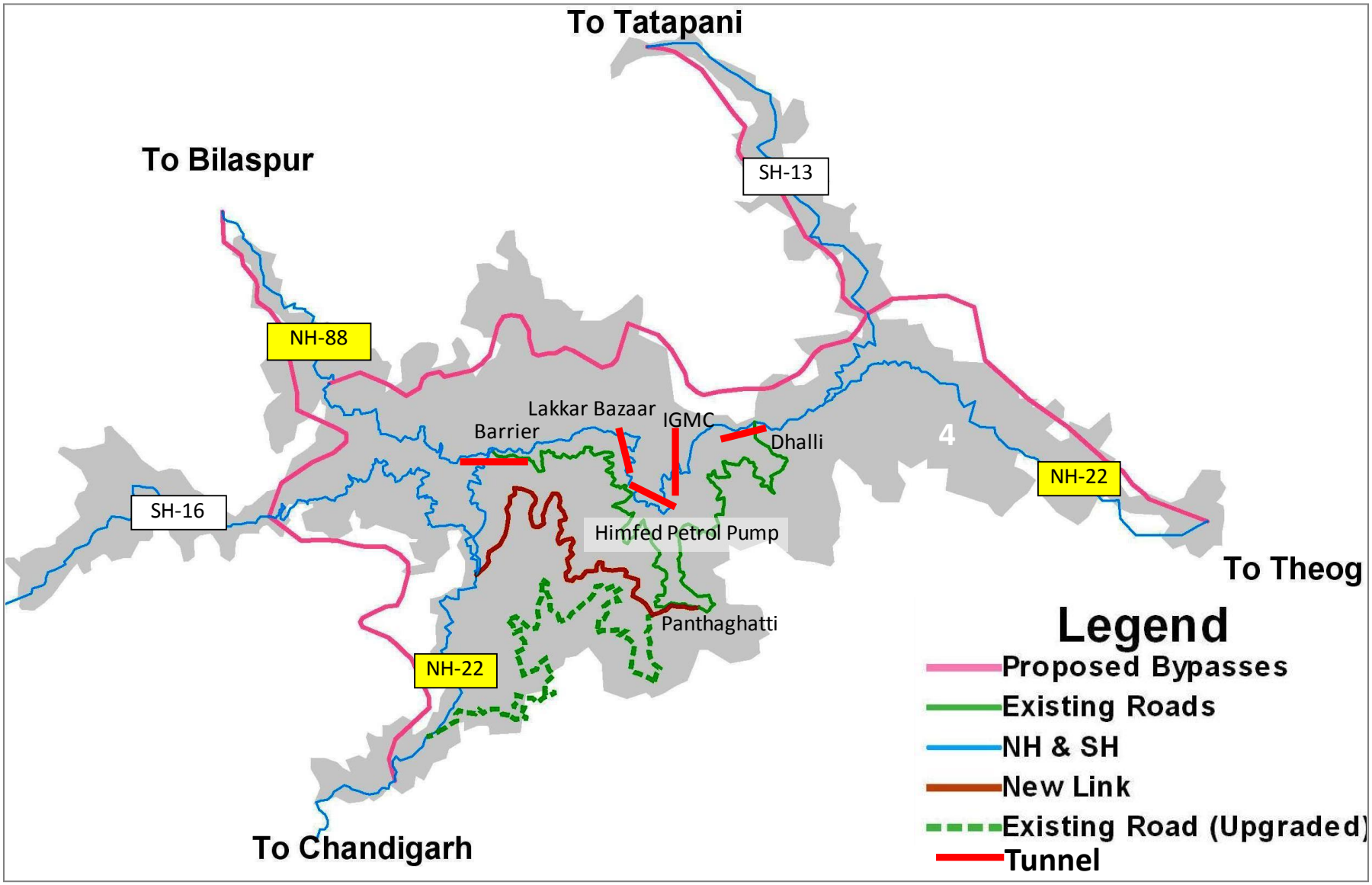


Figure 5-17: Proposed Network Improvement Plan

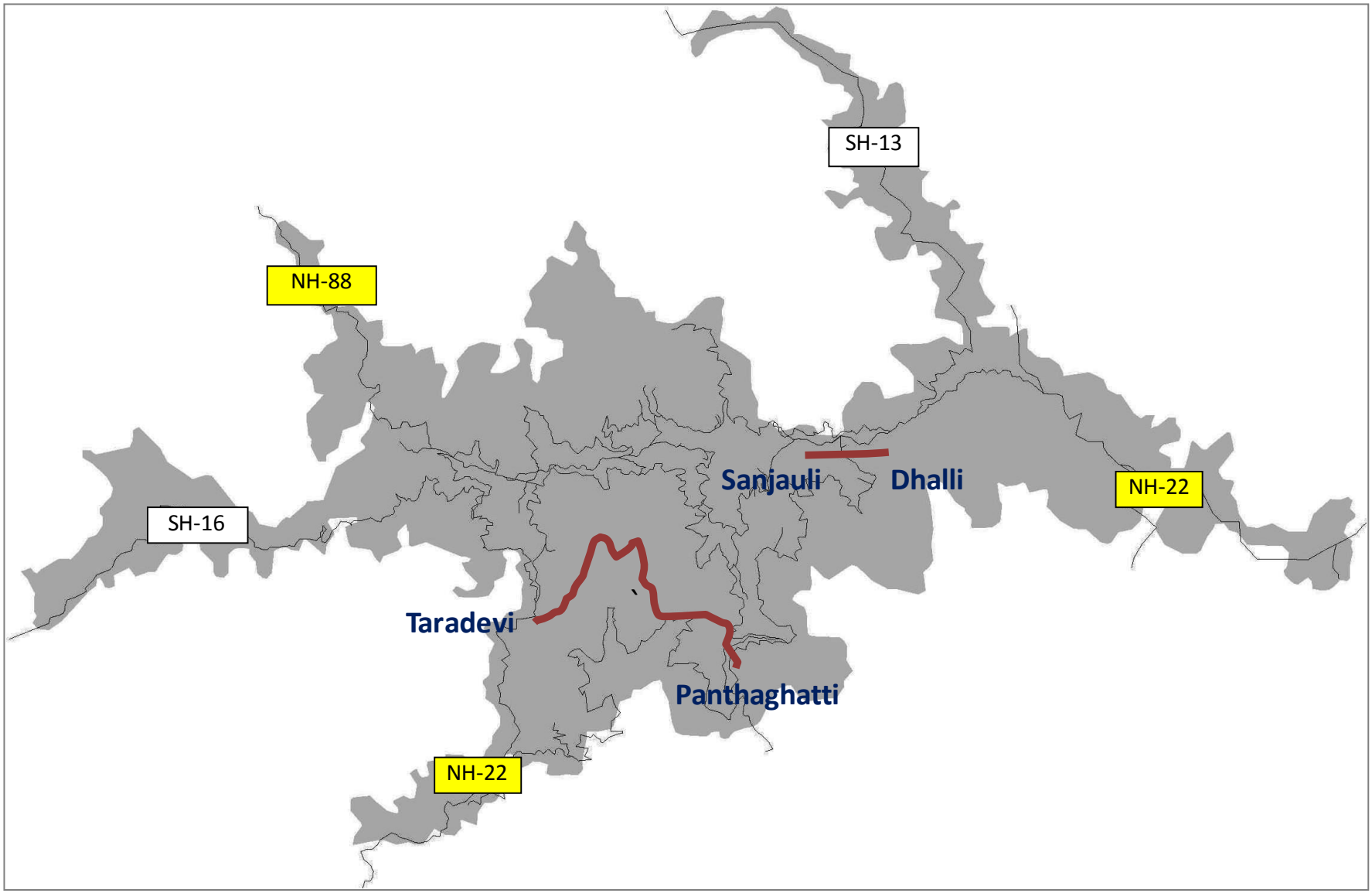


Figure 5-18: Proposed New Links

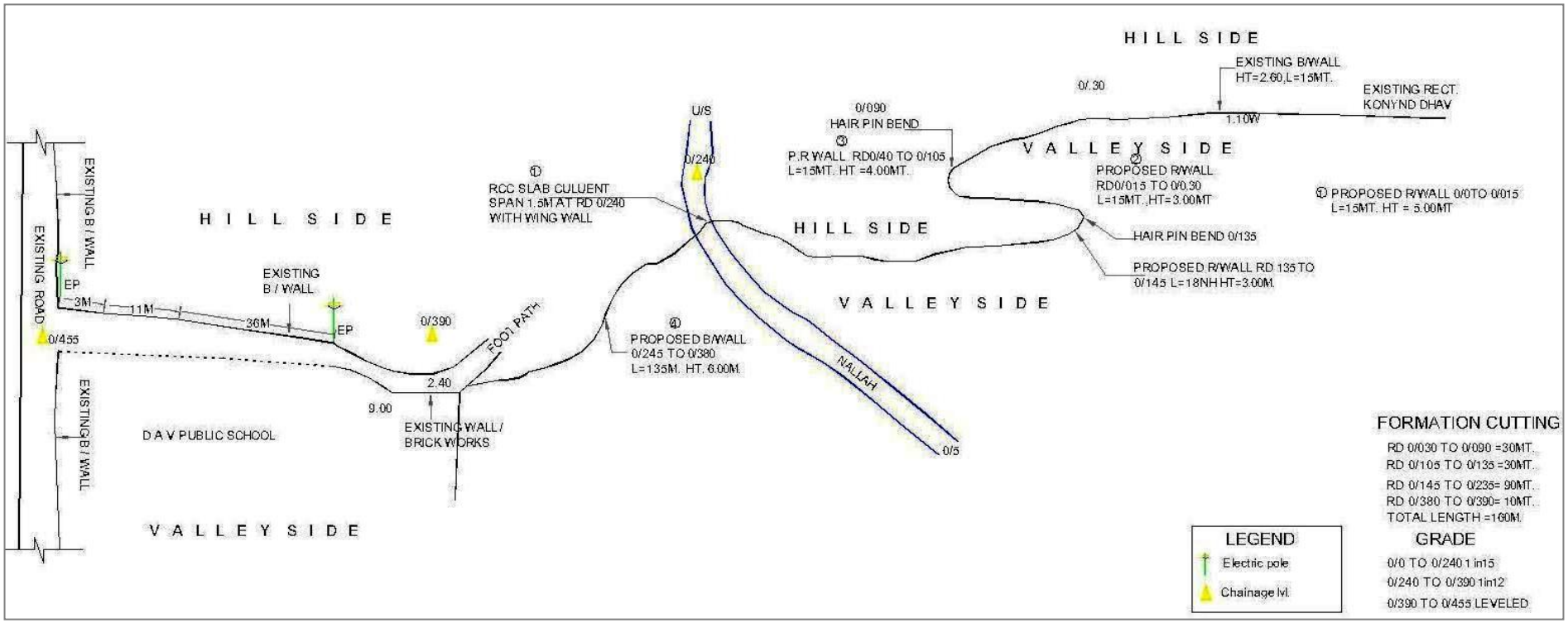


Figure 5-19: Option 1:- Development Jeepable road to connect Phase II and Phase IV of New Shimla

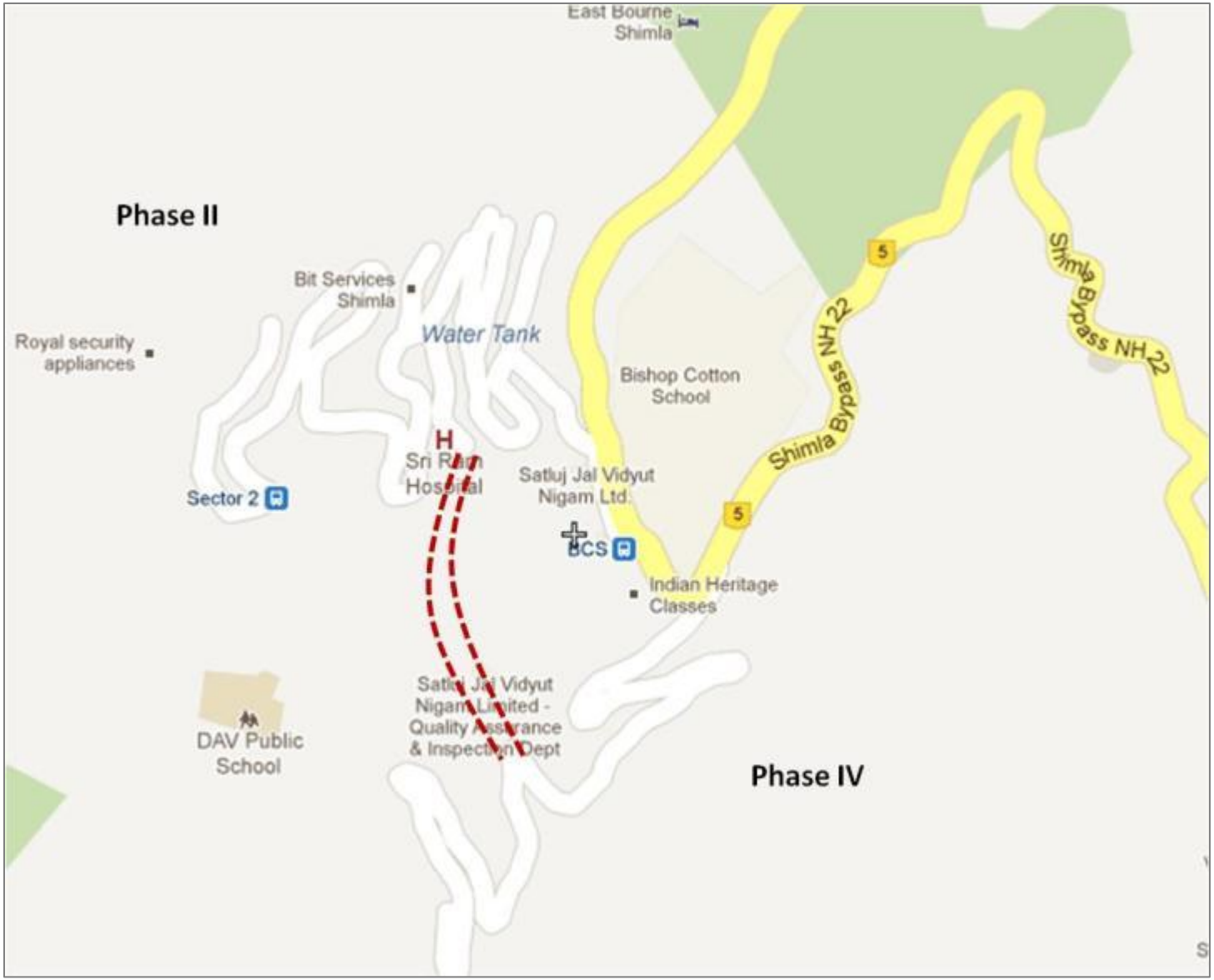


Figure 5-20: Option 2:- Development of a bridge connecting Phase II and Phase IV of New Shimla

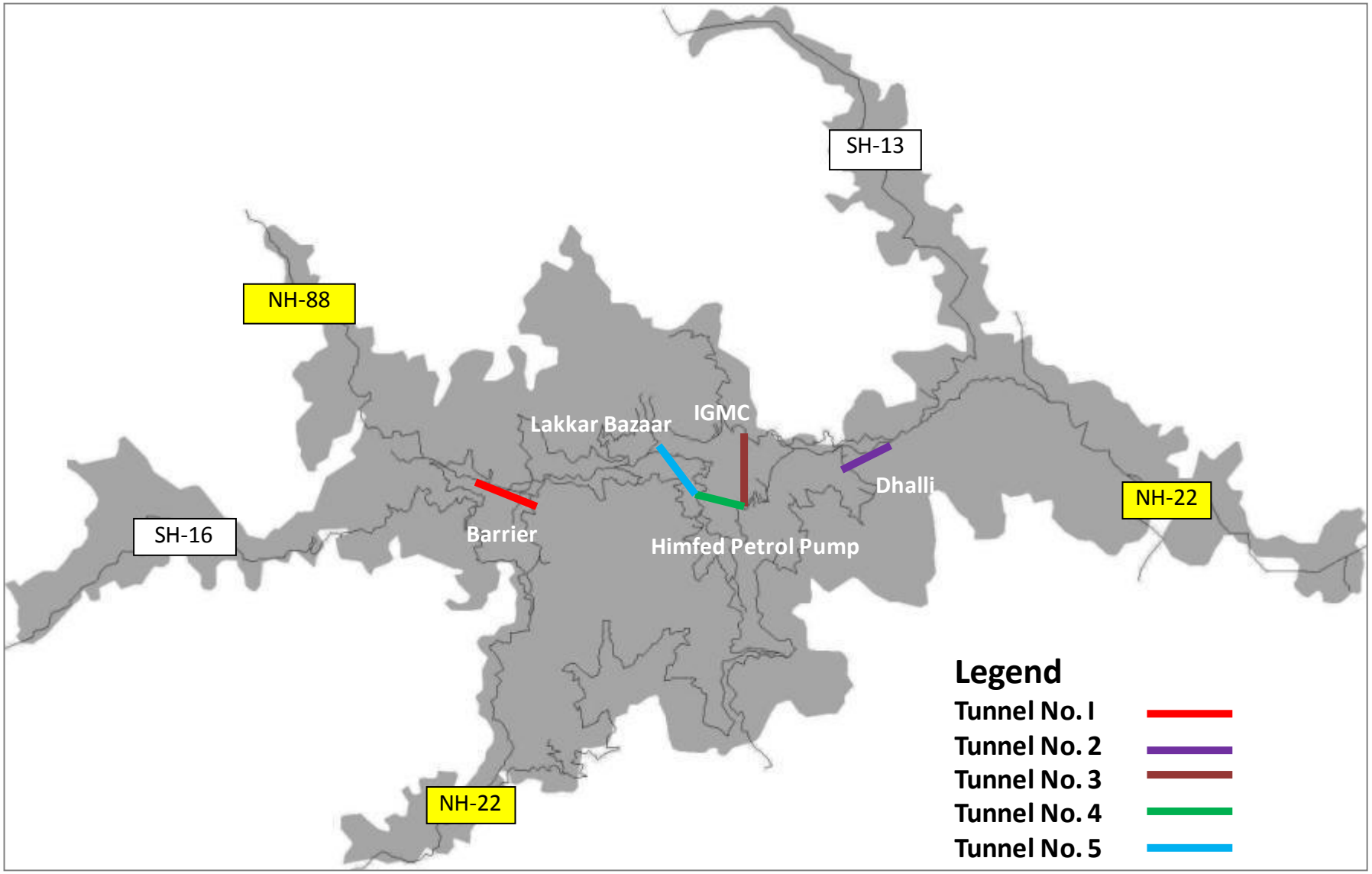


Figure 5-21: Proposed Tunnels

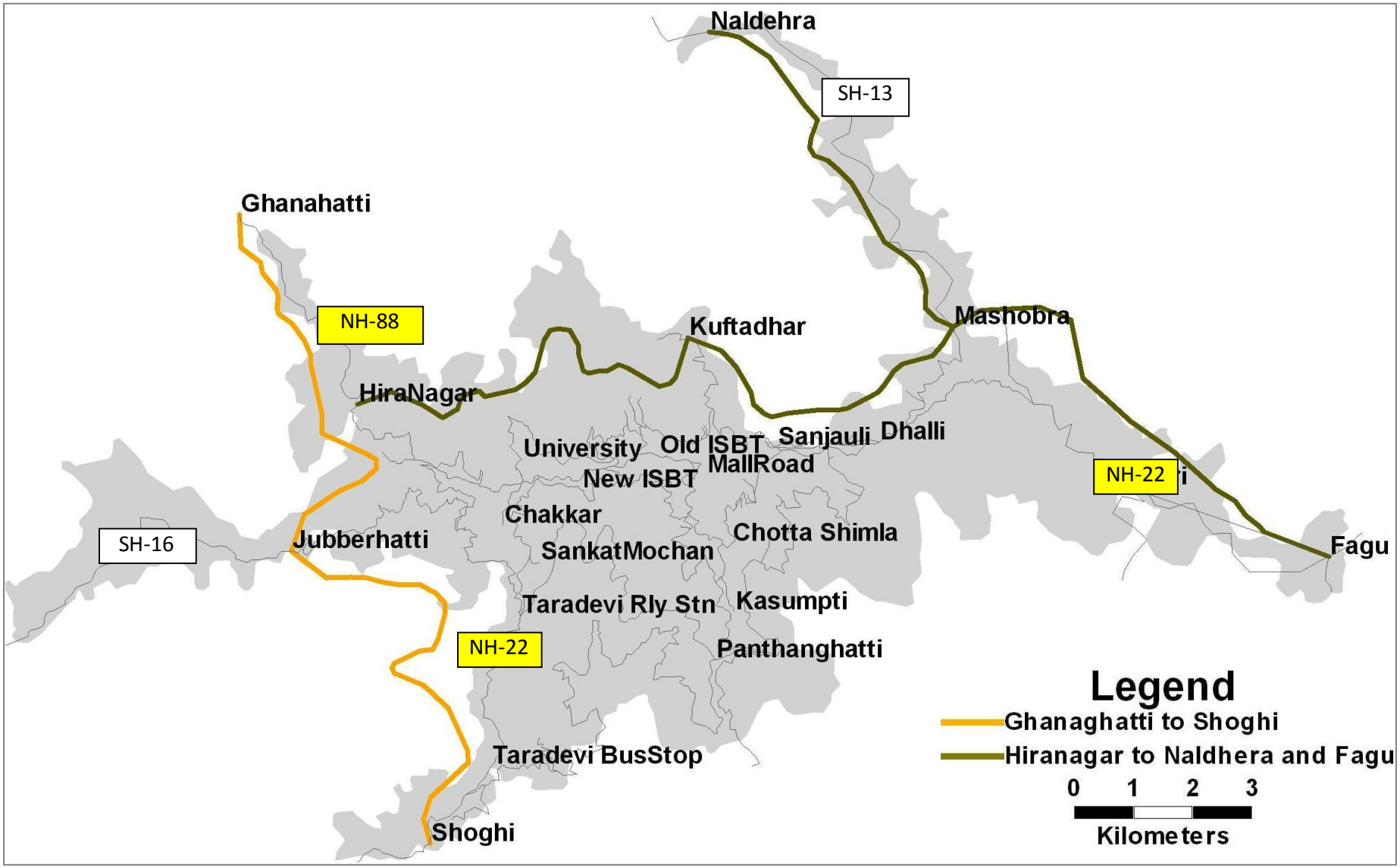


Figure 5-22: Proposed Bypasses

5.5 Public Transport Strategy

At present 49% of trips in Shimla are by public transport which is catered by existing city bus service. However, the vehicle registration data shows that there is upward trend of purchase of private vehicles particularly four wheelers.

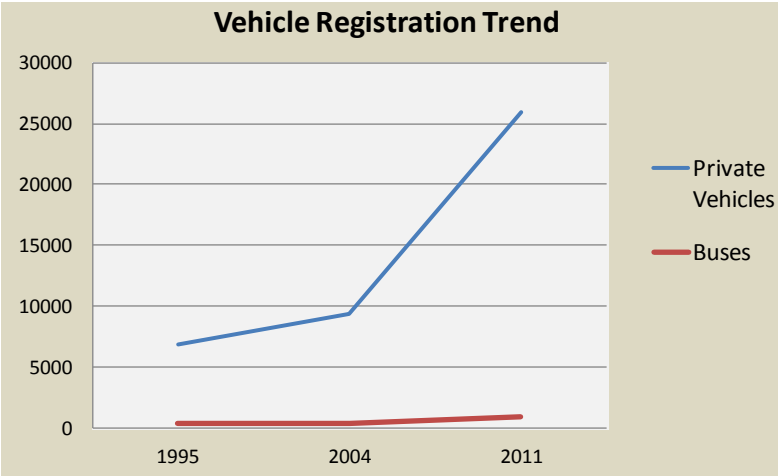


Figure 5-23: Vehicle registration trend in Shimla

The vehicle registration data shows that over the years, registration of private vehicles has outnumbered (registration private vehicles is more than 20 times higher than that of buses) the registration of buses. In 2010-11, the total number of registered vehicles in Shimla is 48,000; out of which four wheeler constitute 48% and two wheelers constitute 18%. Public transport (Bus) accounts only 2% of total registered vehicles and contribute 49% of total trips. Further, the share of public transport has also declined from 65% during 2005-06 to 49% in 2011. Thus, if the same trend continues, by 2031 the the traffic and transportation situation of Shimla will be completely unsustainable.

The objective of CMP is to move peoples and goods not the vehicles by promoting public transport. By following the NUTP guidelines and to fulfill the objective of a CMP, the CMP for Shimla has carried out various alternative scenarios to arrive at the best feasible and sustainable public transport scenario for Shimla. The details of scenarios are described in Travel Demand Assessment Chapter.

After in-depth, analysis and assessment, the CMP for Shimla has suggsted the target of achieving 55% and 60% share of public transport by 2021 and 2031 respectively.

To achieve the goals set for the study area, of achieving the modal share of 55% and 60% by 2021 and 2031 respectively in favour of public transport, the comprehensive mobility plan for Shimla has proposed adoption of a number of strategies for promotion and development of public transport system. These strategies include:

1. Development of three tiers of Public Transport system which shall include:
    - Improvement of City Bus service
    - Introduction and development of Metro Cable or Ropeway
    - Introduction and development of Medium Capacity Rapid Transit System (MCRTS)
2. Improvement and development of adequate infrastructure for promotion of public transport and multi-modal integration
3. Implementation of ITS for improving reliability of public transport
4. Initiating reform measures in Urban Transport
5. Promoting public participation and campaigning mass awareness programme
6. Encouraging private sector in promotion of public transport
7. Adoption of private vehicle usage reducing strategies and policies
8. Adoption of Transit Oriented Development (TOD) measures

Each of these strategies has been explained in details in the subsequent sections.

5.5.1 Development of three tiers of Public Transport system

The CMP for Shimla has proposed development of three tiers of public transport system.

(a) **Improvement of city bus service**

At present city bus service in Shimla is operated by Himachal Pradesh Road Transportation corporation (HRTC) and by private operator under HRTC permit. Existing city bus service routes shown is in figure 5-24. However, the existing city bus service is not able to meet the demand for public transport

system of the city. The city bus service in Shimla can be improved by adopting the following strategies:

Strategy for improvement of city bus service:

1. ***Development of old ISBT as main hub for the city bus service within the Municipal Limit:*** Although, at present the old ISBT works as main terminal point for city bus service, however the Gurudwara local bus stand acts as a focal point for city bus service. The Gurudwara local bus stand is located at the congested part of the circular road which creates bottleneck during peak hours. In order to make city bus service in Shimla more efficient and to decongest the circular road the Old ISBT needs to be developed as hub for city bus service.
2. ***Development of feeder Service to connect New ISBT with the Old ISBT:*** In order to promote public transport in Shimla, the regional bus service originated/terminated at New ISBT should be integrated with city bus service, which has been proposed to originate/terminate at Old ISBT. Thus, for integration of regional bus service and city bus service, the CMP has suggested to ply feeder service between old and New ISBT.
3. ***Lakkar bazaar ISBT to work as local bus stand:*** Lakkar bazaar ISBT is located in one of most congested part of the Shimla city. Due to lack of adequate parking space, the buses originate/terminate at this ISBT creates major bottleneck on the circular road. The CMP, keeping in view all these aspects has suggested that Lakkar bazaar ISBT to act as normal local bus stand rather than an ISBT.
4. ***Augmentation of city bus service with improvement in frequency within municipal limit:*** The existing frequency of city bus service varies from 2 minutes to 30 minutes. Thus, in order to rationalize the frequency and to improve the reliability of city bus service, the CMP

for Shimla has suggested improvement of city bus service by augmenting the frequency of service. City bus service along the mobility corridor 1 should have frequency of 2 minutes during peak hours and along mobility corridor 2, 3 and 4, the frequency should be 5 minutes. However, a detailed study is required for city bus service augmentation.

5. ***Installation of ITS at bus stops and on buses for better reliability of the system:*** Intelligent Transport System (ITS) plays a crucial role in promoting public transport in recent times. The detailed ITS application for improving city bus service is described in ITS for Public Transport section
6. ***Introduction of new city bus routes along the proposed bypasses and along mobility corridors:*** The CMP for Shimla has suggested following new routes for better coverage of city bus service (refer to figure 5-26):
    - Ghanghatti to Shoghi through bypass
    - Hira Nagar to Mashobra through new proposed bypass
    - Fagu to Naldhera through new bypass
    - New ISBT to Dhalli via new Sanjauli-Dhalli bypass
    - Old ISBT to Dhalli via new Sanjauli-Dhalli bypass
    - Taradevi Bus Stop to Taradevi Railway Station via Panthaghatti through new proposed bypass
    - Old ISBT to New ISBT
    - Ghanahatti to Shoghi Market via Taradevi, New ISBT
    - Shoghi to Fagu via Lakkar Bazaar
    - Shoghi to Fagu via Chota Shimla

7. ***Integration of city bus service with HRTC run taxi service for increased coverage of public transport:***

   At present the city bus service and HRTC permitted is not inter-linked with each other (refer to figure 5-24 and figure 5-25). For better reliability of both city bus service and HRTC run taxi service, the CMP has suggested integrated development of both the system and to promote HRTC run taxi service as a feeder service to the city bus service (refer to figure 5-27). For integration of city bus service and taxi service, the CMP has suggested adoption of following strategies:

   a. Curtailment of certain taxi routes which overlap with city bus service route such as taxi route from Tutikandi to CTO Fagali
   b. Extension of certain taxi routes to connect nearest city bus service interchange point
   c. Introduction of taxi service at Totu, Shoghi and Ghanahatti area under PPP framework
   d. Introduction of common ticket or common mobility card applicable for both taxi, city bus service and with other alternative public transport service

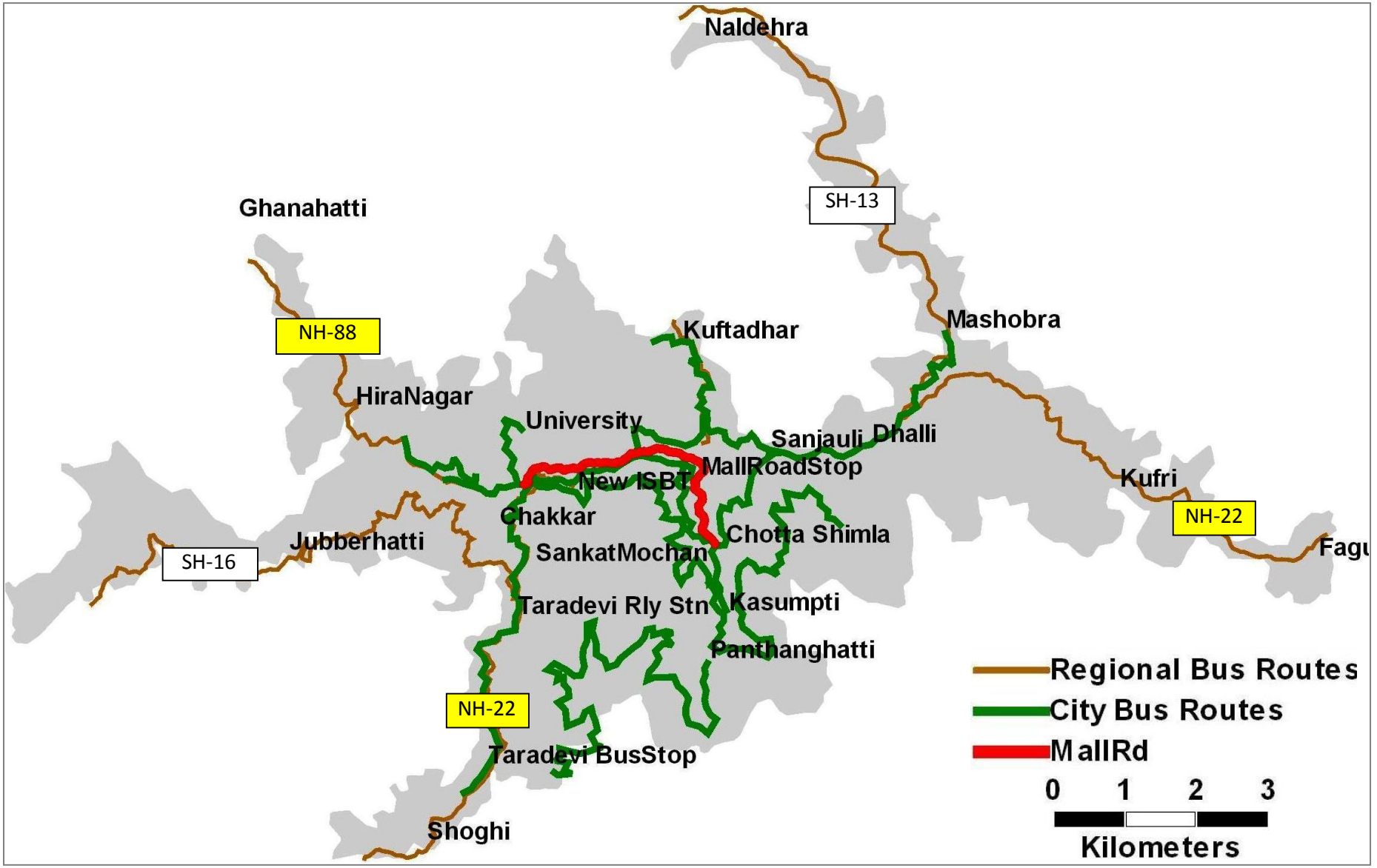


Figure 5-24: Existing city bus service routes

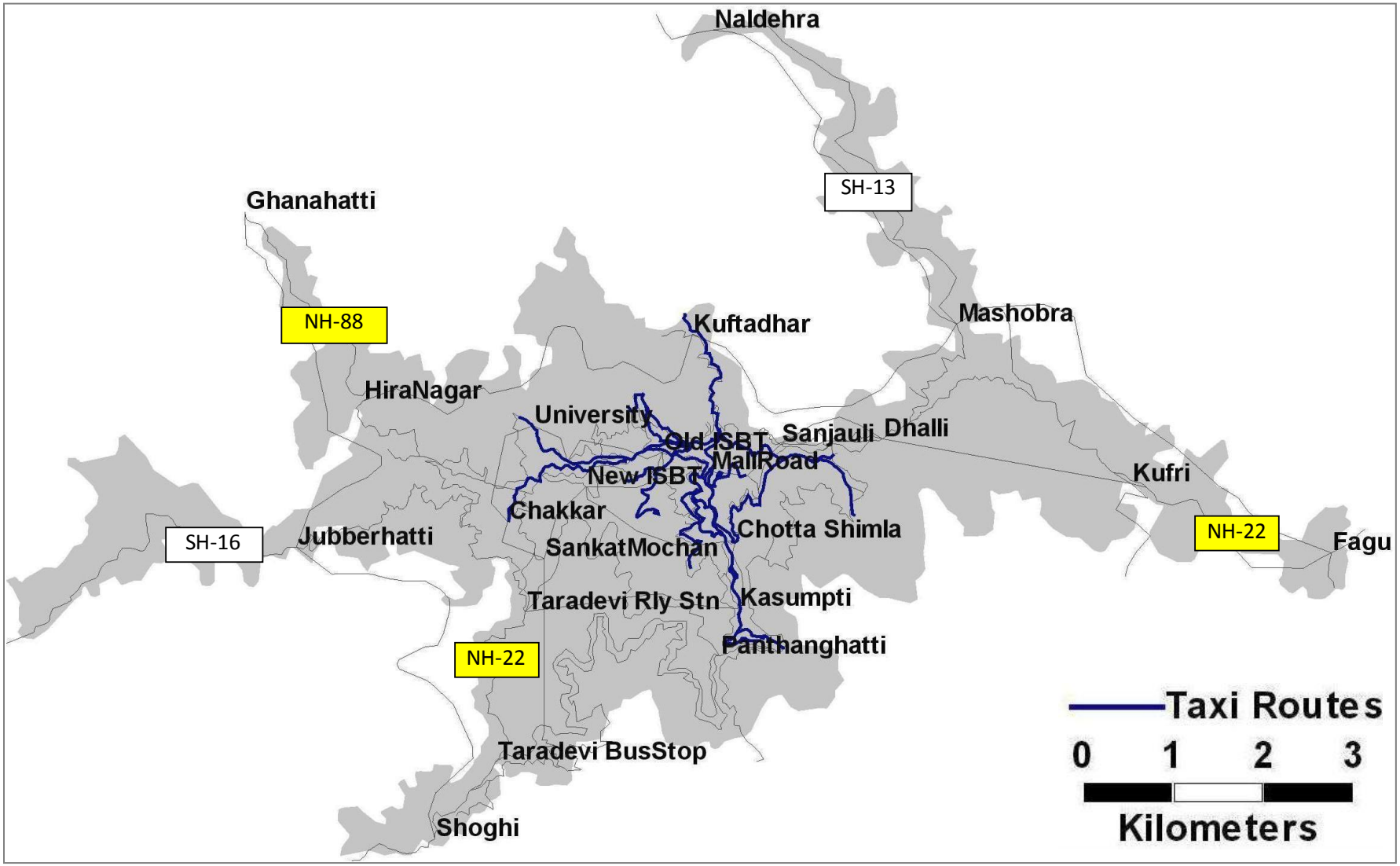


Figure 5-25: HRTC taxi service routes

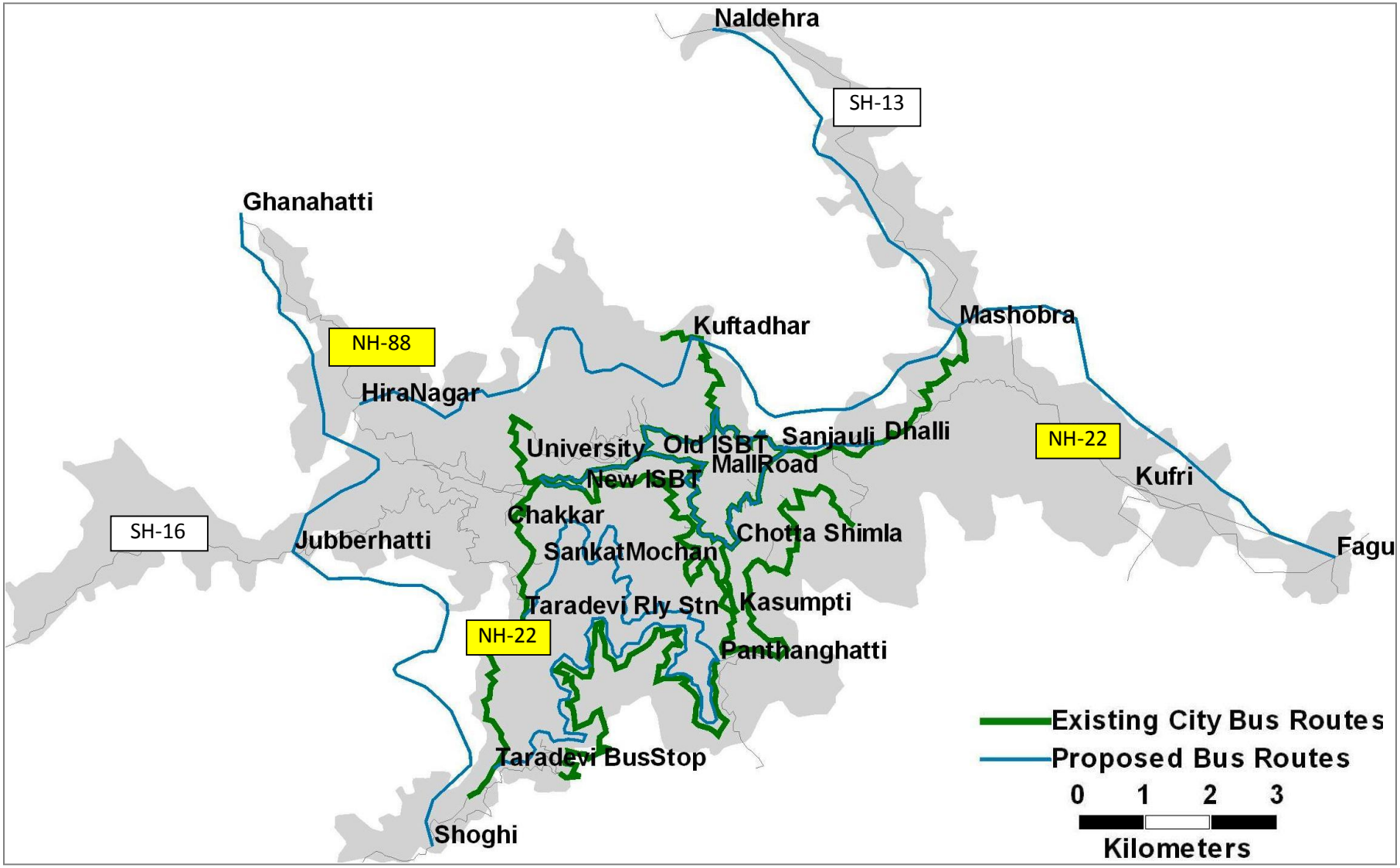


Figure 5-26: Proposed city bus service routes

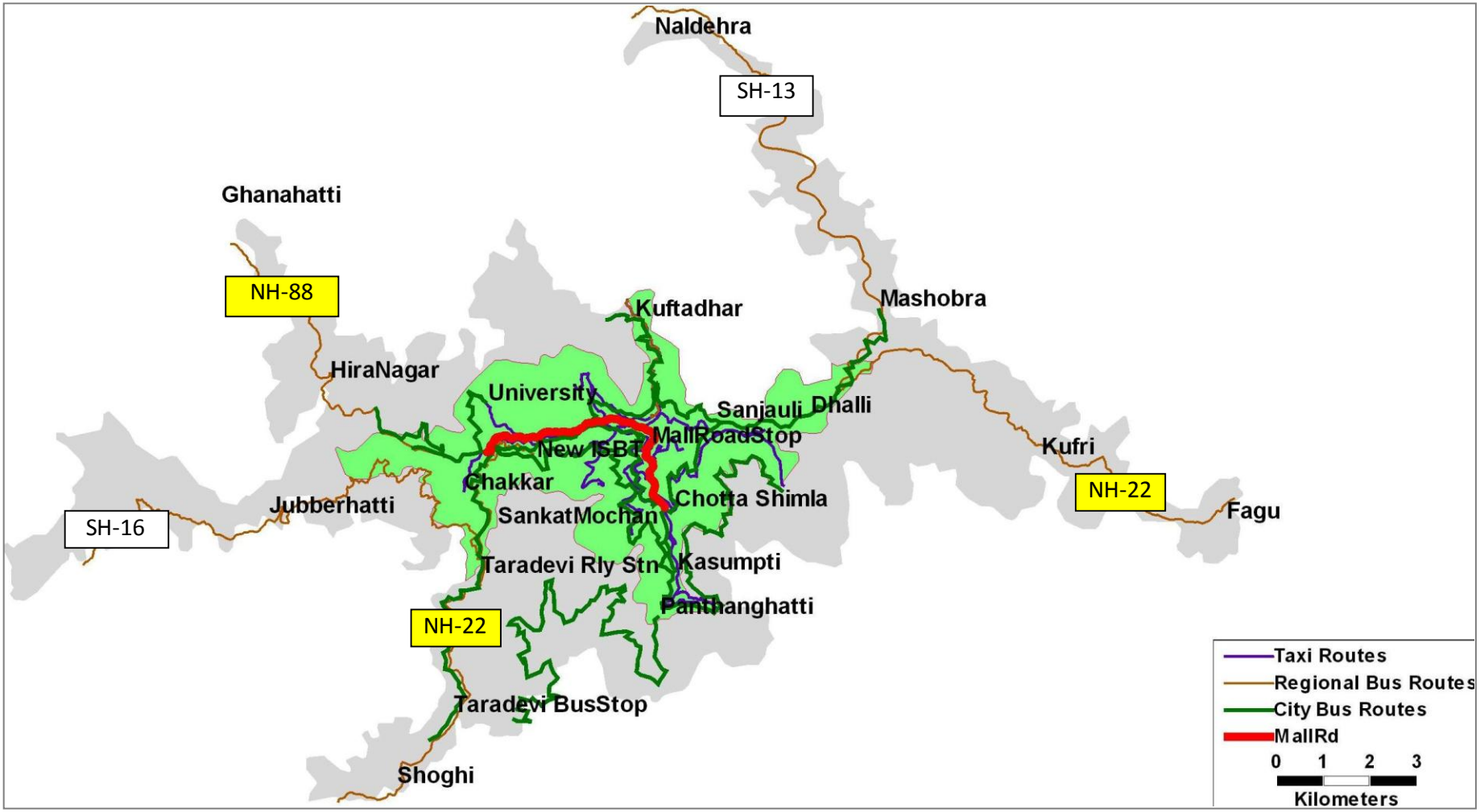


Figure 5-27: Integeration of city bus service and taxi service

(b) **Introduction and development of Metro cable or ropeway**

The metro cable or the ropeway has been proposed as an alternative public transport mode. The proposed metro cable will provide better connectivity to the major tourist attraction locations in and within Shimla, such Jakhu temple, Tara Devi temple, Sankat Mochan temple, kufri etc. The proposed metro cable will also promote tourism industry in the region in general and in Shimla in particular.

Although metro cables or ropeway is a popular mode of tourist transportation in number of hill towns across the country, Shimla is completely devoid of the system. The main aspects of the poposal of ropeway system in Shimla is based on the following criteria:

i. **Connection to all the Seven Hills:** Shimla is surrounded by Seven hills namely Prospect hill, Summer hill, Observatory hill, Inverarm hill, Bantony hill, Jakhoo hill and Elysium hill which offer a wide variety of trails to the visitors. Each of the hill carries its own and distinct importance. A large number of major trip attraction points are located on these hills such as Himachal Pradesh Univeristy on Summer hill, famous tourist spot Jakhu temple is located on Jakhu hill etc. Till date, there is no proper and direct network which connects all the seven hills.

ii. **Promotion of Tourism:** Tourism is an important source of revenue generation for both the state and Shimla. Each year on the average 20 to 22 lakhs of tourists visit Shimla. However, till date Shimla city completely devoids ropeways system which has been considered as one of the important means of tourism promotion across the globe. Even in India, a large number of hill towns have ropeway system. Ropeway or metro cable provides both fun ride to the tourist and environmentally clean mode of trsnportation.

iii. **Alternative public transport mode:** Ropeway is considered as an alternative mode of urban transport. Ropeway or metro cable is a unique and ingenuous mechanical system, which facilitates transportation of

passenger and goods over difficult and peculiar terrain bringing about comparative ease and economy vis-à-vis other means of transport. Application of passenger ropeways as an urban transportation mode is a cost effective, pollution free and environment friendly solution especially for hilly terrain. The main advantages of application of ropeway or metro cable in urban transportation are;

- It can traverse through difficult terrain
- Low land requirement
- Time saving
- Cost effective
- Low power requirements
- Environmental friendly
- High value as a tourist attraction

5.5.2 Planning concept of ropeway or metro cable in Shimla:

The concept of Metro cable in Shimla will serve dual purpose of tourism promotion and also as alternative public transport mode. In order to serve both the objectives, the CMP for Shimla has suggested to develop the metro cable with staggered service features.

The proposed route, which connects both major urban nodes and the tourist attraction points, will operate with different service specification such as with differential cabin/box capacity, frequency, service span etc. across the route.

Referring to figure 5-28, the proposed route A to D connects both tourist locations (A & D) and urban nodes (B & C). The frequency from one urban node to the tourist location (either from A to B or from C to D) will be lower, while the frequency between urban nodes (B to C) will be higher.

With exiting available technology, the ropeway system in Shimla can be designed to cater 1500 PHPD to 6,000 PHPD with varying cabin capacity of 8 to 25 persons. The maximum average speed can go upto 30 kmph.

Based on existing and projected demand, the CMP for Shimla has suggested to develop metro cable or ropeway along three following routes (refer to figure 5-29):

- Route 1:- Taradevi (one from Shoghi Market) to Kufri via Sankat Mochan Temple, University, Old ISBT, Jakhu Temple, Kufri, (extendable upto Fagu) – 20.5 Kms
- Route 2:- Taradevi Railway Station to Himachal Pradesh University via Kusumpti, Chota Shimla, Tutikandi ISBT, Old ISBT- 14.5 Kms
- Route 3:- Taradevi bus stand to Ridge, via Tutikandi ISBT, Old ISBT, Ridge, - 9 Kms

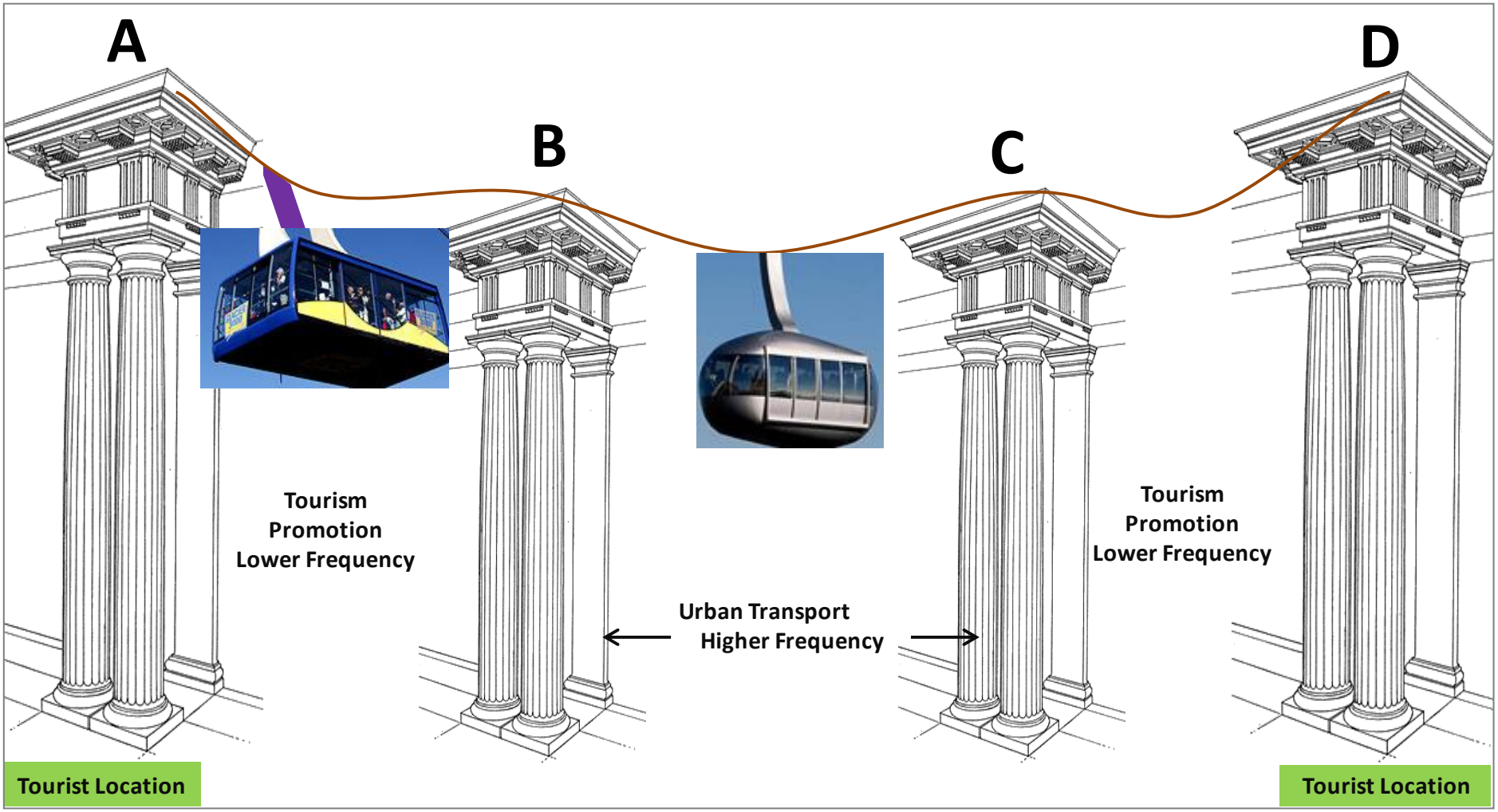


Figure 5-28: Concept of Metro cable in Shimla

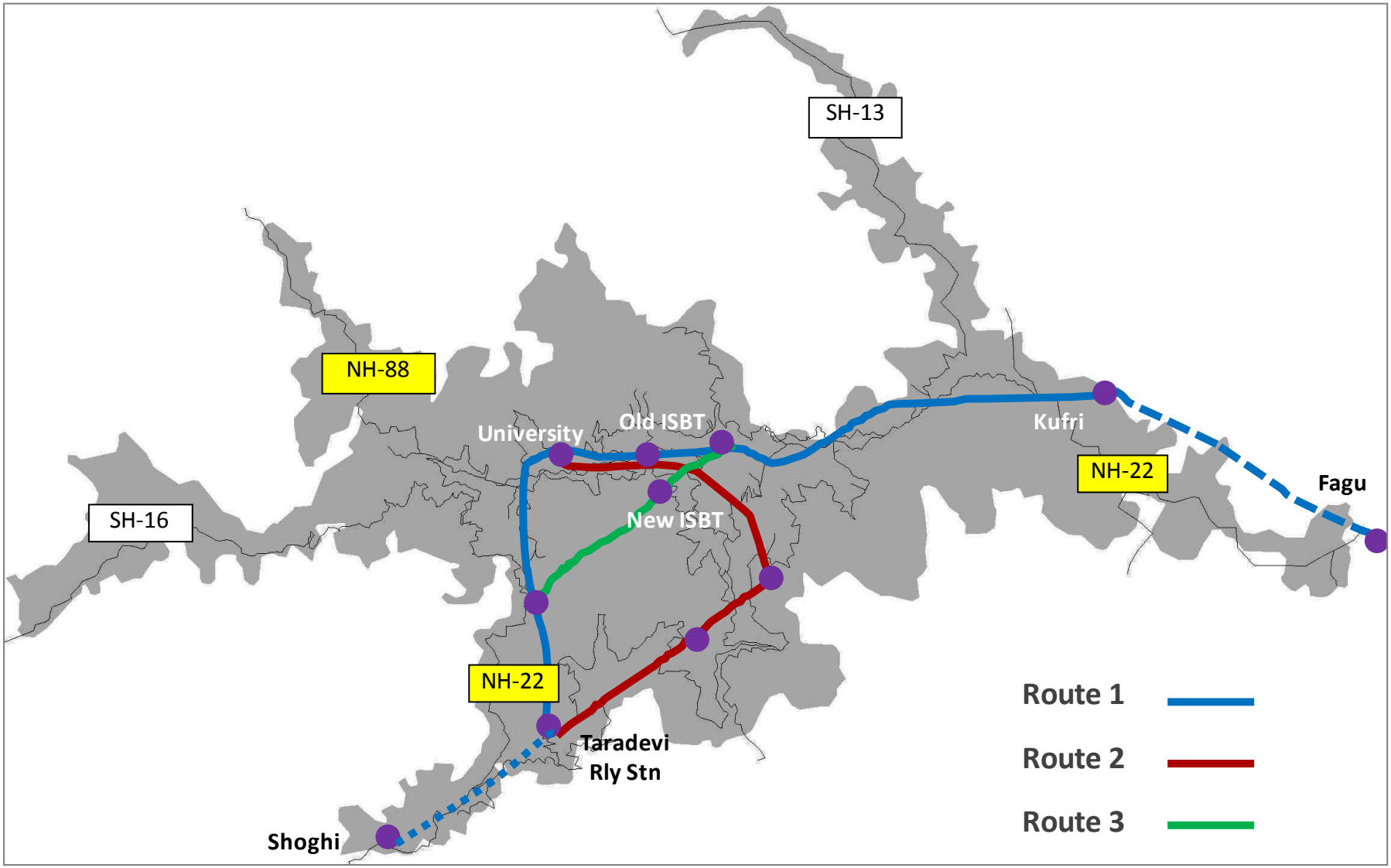


Figure 5-29: Proposed ropeway routes for Shimla

(c) **Introduction and development of Medium Capacity Rapid Transit System (MCRTS)**

Medium capacity rapid transit system is a low-cost and environment friendly rapid transit system and can cater upto 6,000 PHPD. The Cart road is considered as the spine of Shimla city, which experiences the maximum traffic (Vehicular flow: 1,144 PCUs/Hr, Passenger flow 13,178 Pax/Hr during base year, 2011) thus, the CMP for Shimla has suggested introduction of MCRTS along the following two routes in order to decongest the Cart road.

- Route 1: MCRTS along Chota Shimla to Victory Tunnel via ISBT and connected to Mall Road -5.5 kms
- Route 2: MCRTS along Chota Shimla to Victory Tunnel via IGMC and connected to Mall Road-9.5 kms

Figure 5-30 shows the suggested MCRTS routes.

For feasibility of implementing both Metro Cable and MCRTS, a detailed study needs to be carried out based on following broad indicative parameters:

- Existing and projected demand
- Terrain and soil suitability for construction
- Availability of adequate space for proposed system
- Rehabilitation and Resettlement for proposed system (Government ownership of land needed for acquisition preferred, minimum and easy acquisition of private land). Rehabilitation and Resettlement issues needs to be examined
- Depending upon the places to be connected there should be minimum possible infringement
- Easy connectivity to the boarding and alighting place
- Avoidance of high transmission power lines etc.
- Minimum cutting & rehabilitation of trees

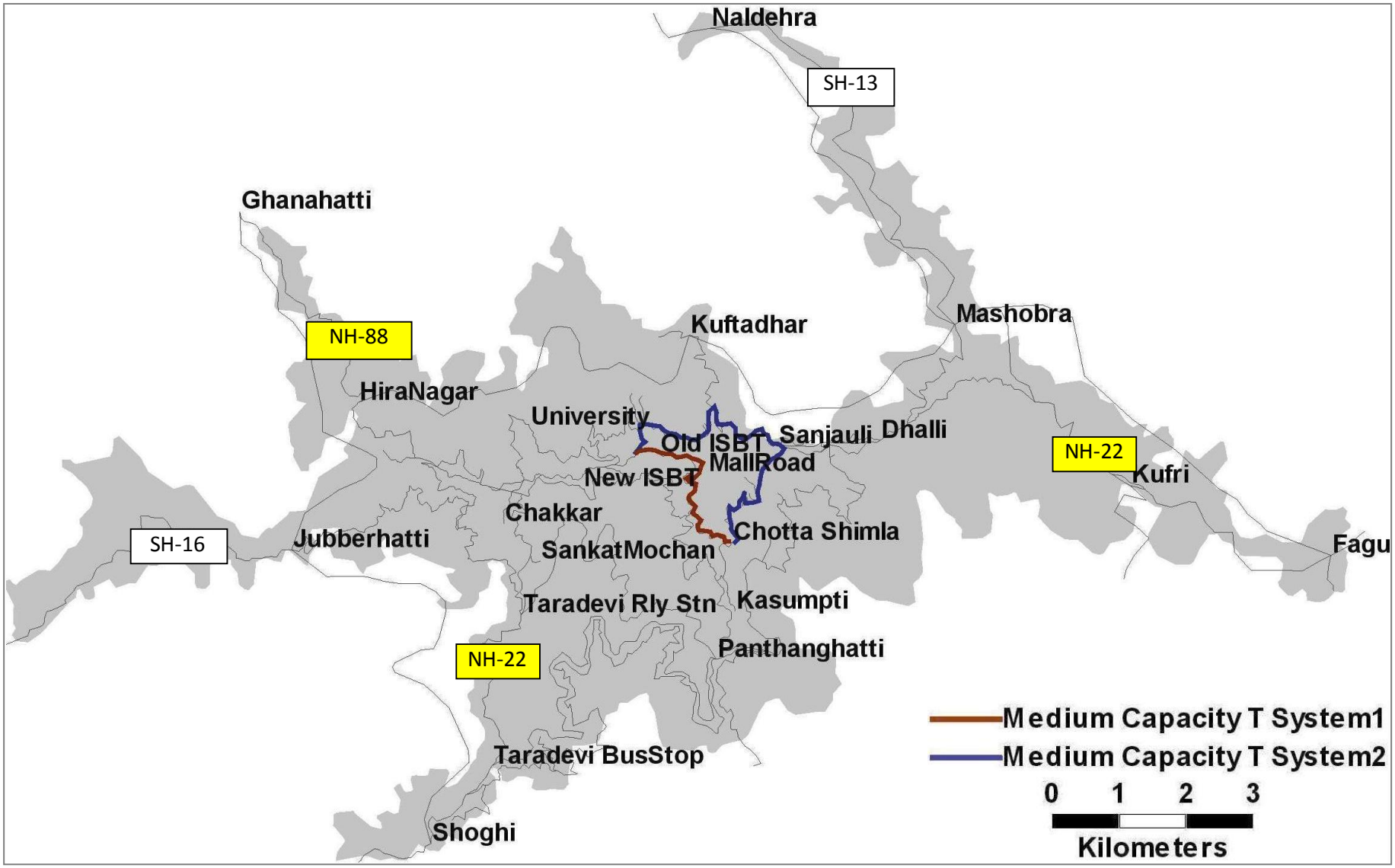


Figure 5-30: Proposed MCRTS routes for Shimla

Urban Mass Transit Company Limited

(d) **Integration of HRTC taxi service with public transport system**

HRTC has introduced taxi service under PPP framework in the year 2011 to connect various locations of Shimla city to the Mall road through sealed and restricted roads, which provides an opportunity to transport disadvantaged group such as old and physically challenged commuters in particular and to other commuters in general. However, to make this taxi service more attractive, reliable, and efficient, the taxi service should be integrated with both the existing and proposed public transport system and should be designed to act as a feeder service.

The CMP for Shimla has proposed to re-design HRTC taxi service as a feeder service for the existing and proposed public transport system through rerouting and re-scheduling. CMP has suggested adoption of following strategies as mention in the previous section:

1. Curtailment of certain taxi routes which overlap with city bus service route such as taxi route from Tutikandi to CTO via Fagali
2. Extension of certain taxi routes to connect nearest city bus service interchange point
3. Introduction of taxi service at Totu, Shoghi and Ghanahatti areas under PPP framework
4. Introduction of common ticket or common mobility card applicable for both taxi, city bus service and with other alternative public transport service

(e) **Chartered bus service for educational institution**

A large number of educational institutions in Shimla city are located along the circular road such as Edwards School, Auckland House School, Bishop Cotton School (BCS), Sacred Heart Convent School (Tara Hall), Govt.G.S.S.S. Lakkar Bazaar, Govt. S.S.S. Summer Hill, Govt. School Kusumpti, Convent of Jesus and Marry, Tibetan School, Saraswati Vidya Mandir School etc. (refer to figure 5-31).

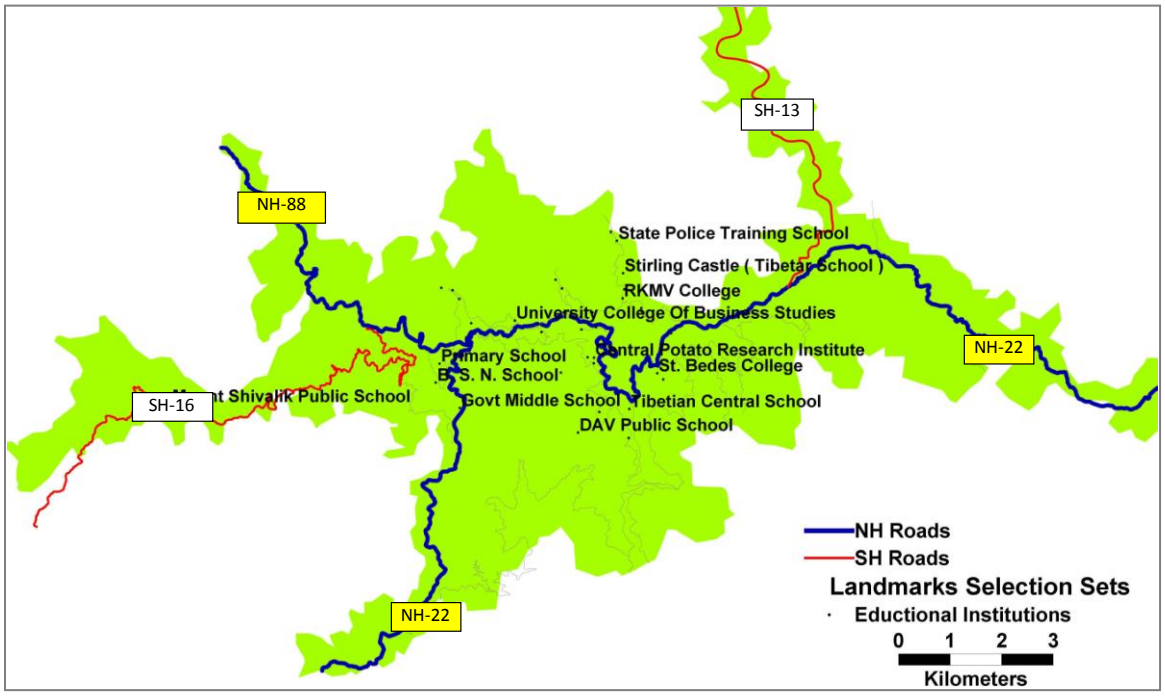


Figure 5-31: Location of educational institutes

Due to non-availability of dedicated and reliable public transport system, private vehicles are used for commuting to these institutions. In addition, due to lack of parking space together with narrow carriageway width, haphazard on-street parking of private vehicles carrying students during peak hour creates major bottlenecks points in front of all these educational institutes resulting congestion along the entire stretch of the road. The CMP for Shimla has recognized this aspect and proposed to develop dedicated chartered bus service under HRTC for all these educational institution.

5.5.3 Infrastructure for public transport and multi-modal integration

For development of three tiers of public transport, it is imperative to develop adequate infrastructure. Considering the multimodal integration of different types of public transport, there should be a complete and supportive public transport infrastructure. The existing bus service in Shimla, is being operated through Old ISBT, Lakkar Bazaar ISBT, Dhalli and New ISBT at Tutikandi (refer to figure 5-32).

The Lakkar Bazaar ISBT being loacted at the one of the most congested part of the city, the CMP for Shimla has suggested to use it as local bus stand. Considering the proposed increase in span of service in terms both coverage and quality, the CMP for Shimla has suggseted development of followiing infrastructures:

(A) **Infrastruture for City Bus Service**

In order to improve city bus service in Shimla, following infrastructure has been proposed (refer to figiure 5-33):

1. Origin –Destination Terminal at:
   - Ghanahatti - 0.5 to 1 Acre
   - Shoghi - 0.5 to 1 Acre
   - Fagu - 0.5 to 1 Acre
2. Upgradtaion of Terminal cum Depot at Dhalli to modern ISBT located at Tutikandi
3. Development of local bus stands at:
   - Panthaghatti
   - Vikasnagar
4. Improvement of exiting 65 bus stops cum rain shelters
5. Development of 45 new bus stops along proposed new city bus service routes on bypasses with 1.5 to 2 kms spacing between the bus stops

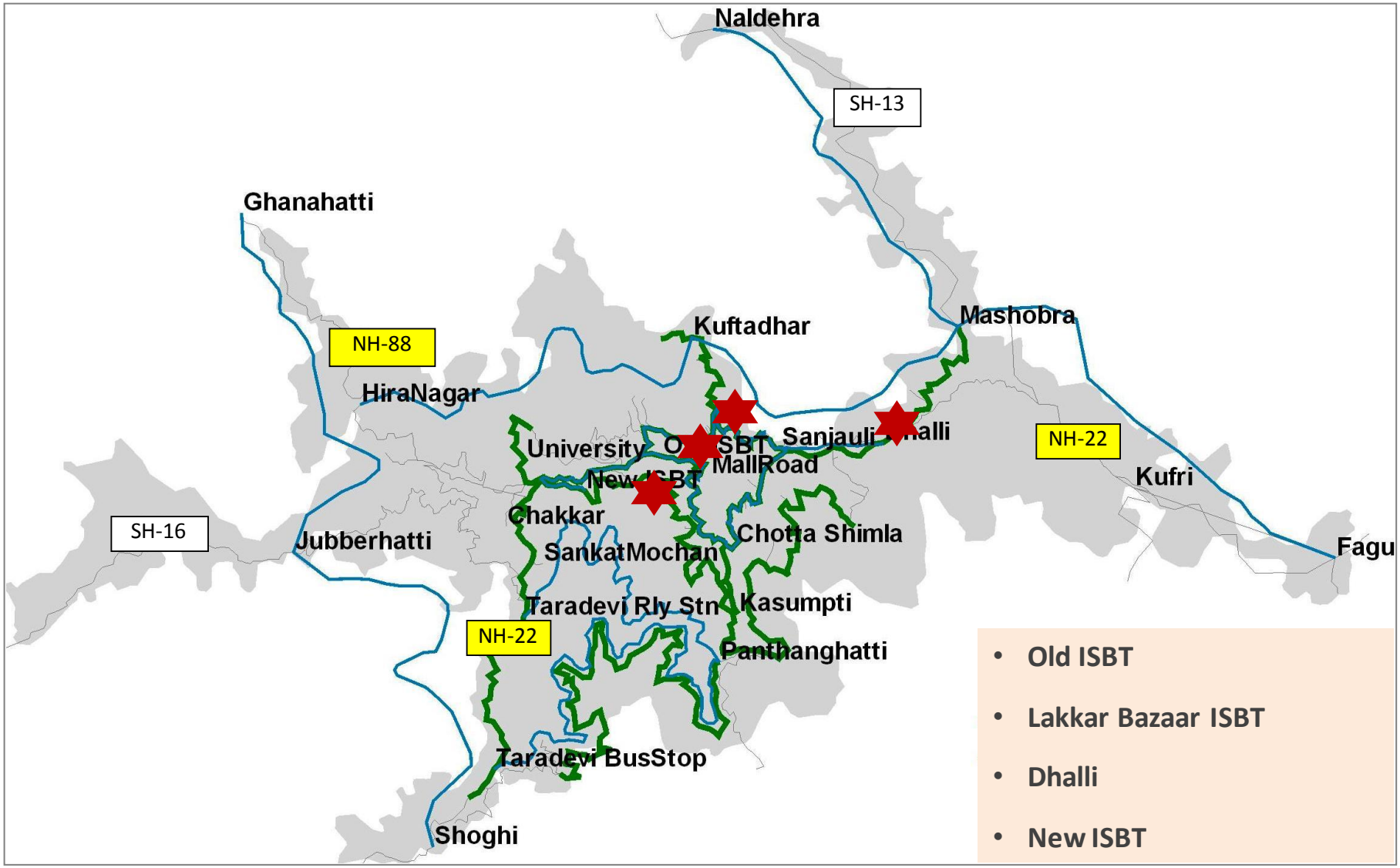


Figure 5-32: Existing terminals

Urban Mass Transit Company Limited

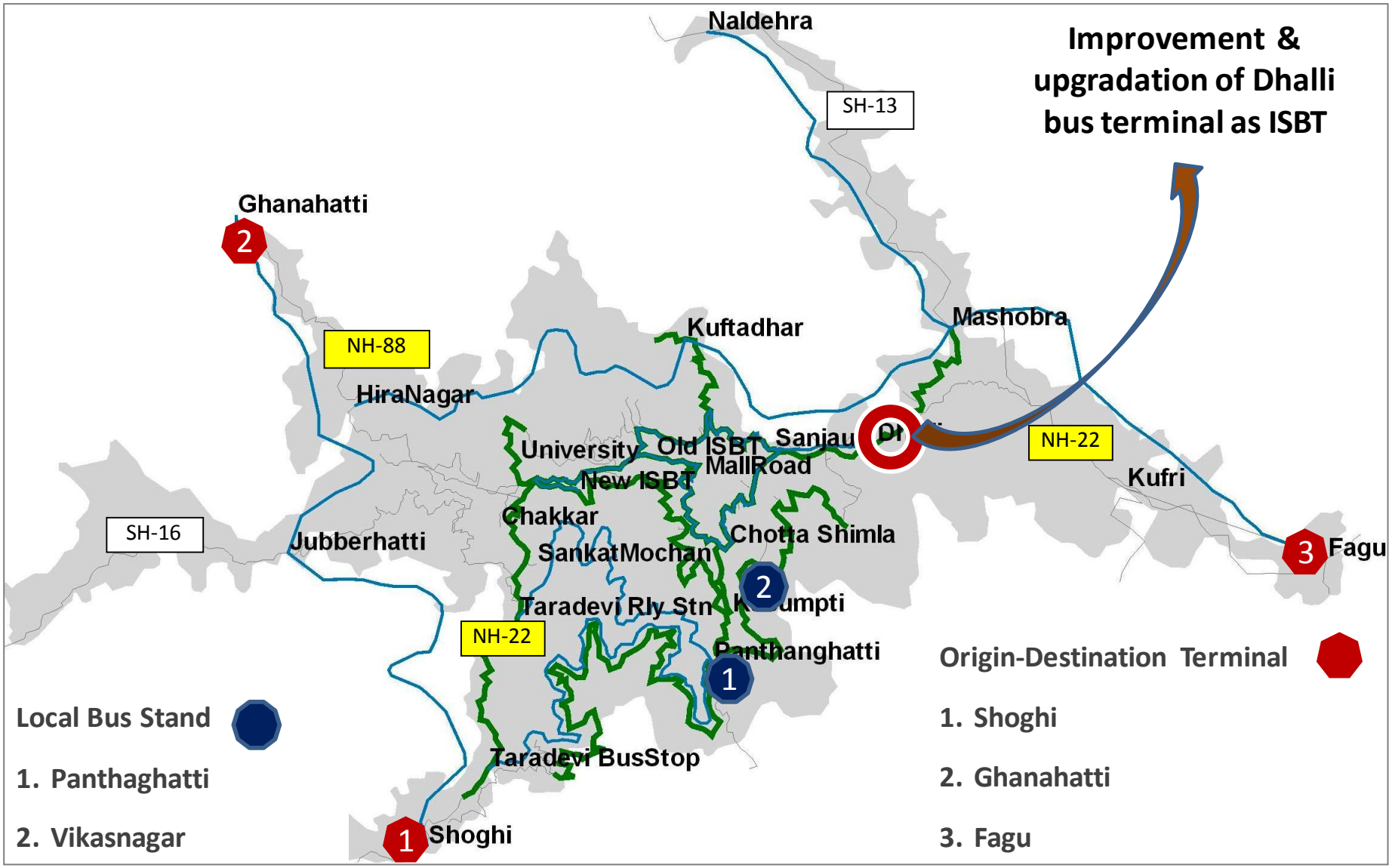


Figure 5-33: Propsed infrastructure for city bus service

Urban Mass Transit Company Limited

(B) **Infrastruture for Metro cable**

For the proposed Metro Cable or Ropeway system, following Infrastructure have been proposed (refer to figure 5-35):

1. Terminal cum maintenance depot at Soghi – 0.3 to 0.60 Acre
2. Terminal cum maintenance depot at Kufri -0.30 to 0.60 Acre
3. Development of 28 boarding and alighting station with 1.2 to 1.5 km spacing between the stations

Figure 5-34: Photgraphs for typical terminal cum deopt for Metro cable

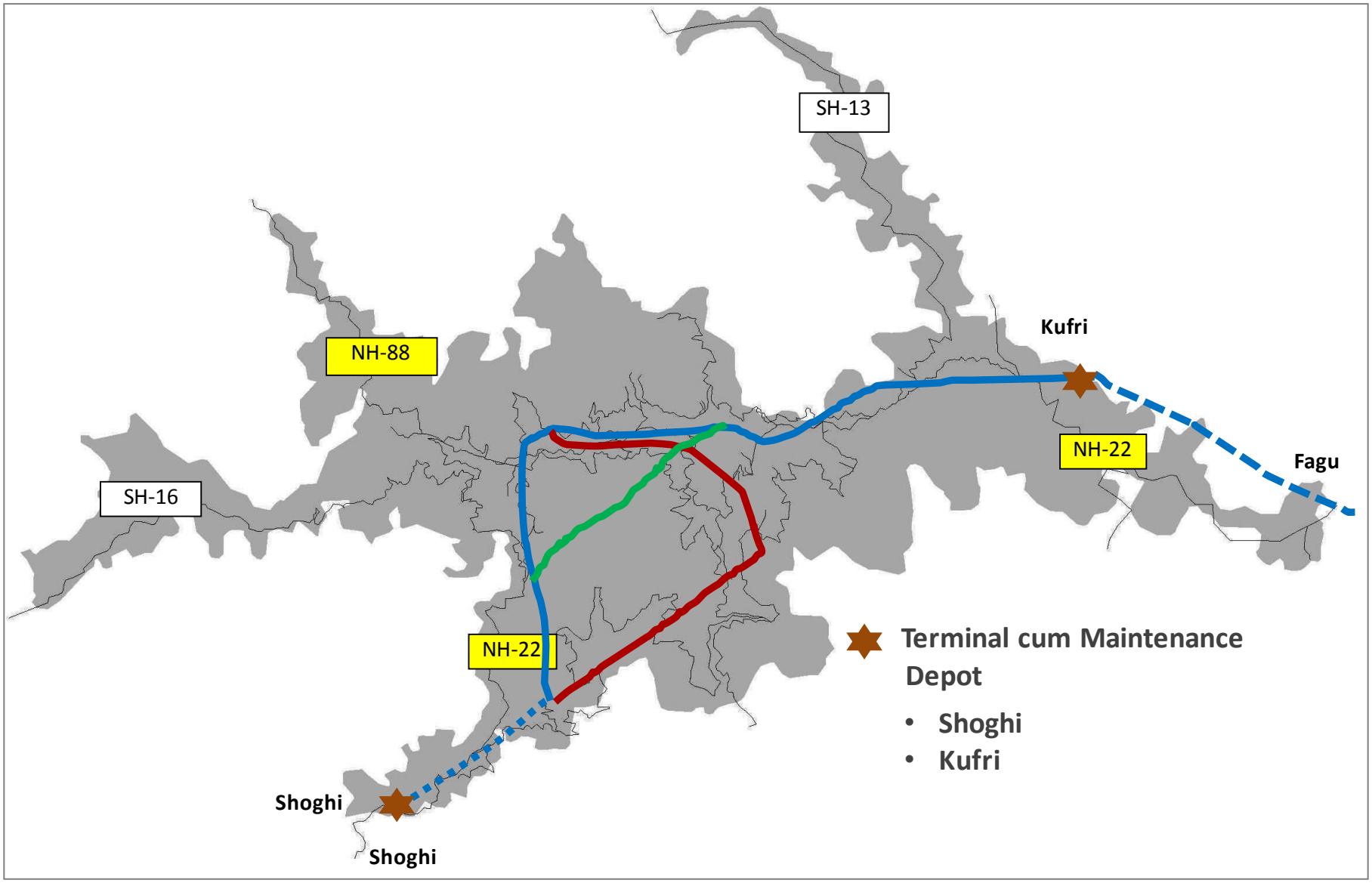


Figure 5-35: Propsed infrastructure for metro cable

Urban Mass Transit Company Limited

(C) **Infrastruture for Metro cable Medium Capacity Rapid Transit System (MCRTS)**

For the proposed MCRT system, following Infrastructure have been proposed:

1. Terminal cum maintenance depot near Chota Shima towards Engineghar – 0.20 to 0.5 Acres (refer to figure 5-36)
2. Devlopment of 20 boarding and alighting station with 0.5 km to 1 km spacing between the stations.

(D) **Infrastructure for Multi-modal Integration:**

A multimodal transport hub (MMTH) is a place where passengers transfer between different services or modes of public transport as a part of their journey. An MMTH zone is often a gateway to the public transport network, in that it represents the interface between the public transport services and the surrounding area (or the 'urban context'). This includes connections by the most common mode of access, walking, but can also include provision for access by taxi or even the private car.

Importance of a Multimodal Transport Hub: A world-class multimodal transport hub, incorporating best practice, will help to meet the social, economic and environmental needs of a thriving and growing world city like Shimla including:

- Supporting the continued economic development of the city
- Minimizing the need to travel, by concentrating new jobs and homes around accessible locations
- Ease congestion and tackling climate change by promoting more sustainable modes
- To meet the increasing demand for travel by public transport
- Improving access to facilities and services in urban centers
- Providing links between neighborhoods and employment, education and other opportunities

- Improving quality of life by saving time and improving the quality of travel
- Acting as a catalyst for socio-economic and physical regeneration in local communities
- Creating more attractive buildings and public spaces
- Removing barriers which prevent disabled people and others with reduced mobility from travelling freely
- Providing safer and more secure journeys

To develop multi modal transit hub, following location have been identified (refer to figure 5-37):

(I) **Multi- Modal Transit Hub**

- Old ISBT
- New ISBT

Multi-modal transit hub at New ISBT and Old ISBT will integrate the existing city bus service with proposed Metro cable and Medium Capacity Rapid Transit System (MCRTS).

(II) **Major Transit Interchange Points**

Major transit interchange points such as Shoghi, Taradevi bus stand, University point, Kusumpti, Chota Shimla will integrate more than one transport system. For example, at university point, Shoghi, Taradevi bus stand city bus service and Ropeway should be integrated.

At locations such as Kusumpti, Chota Shimla, the public transport system such as proposed Ropeway and MCRTS should be integrated.

These Multi Modal Transit Hub and major transit Interchange Points will have park and ride facility i.e development of private vehicle parking lots at these locations to support public transport. Developing parking lots at the transit locations will generate additional ridership.

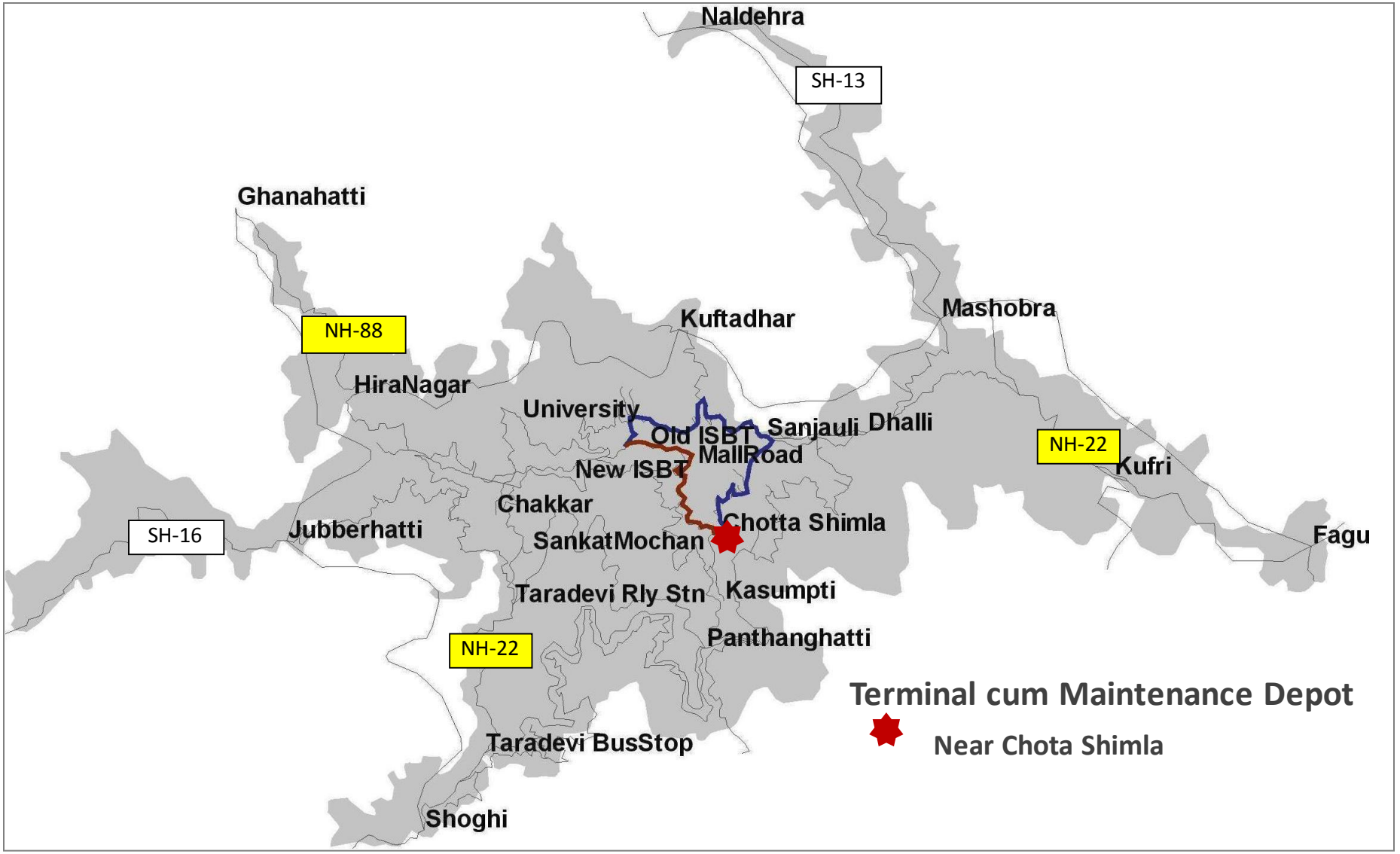


Figure 5-36: Propsed infrastructure for Medium Capacity Rapid Transit System

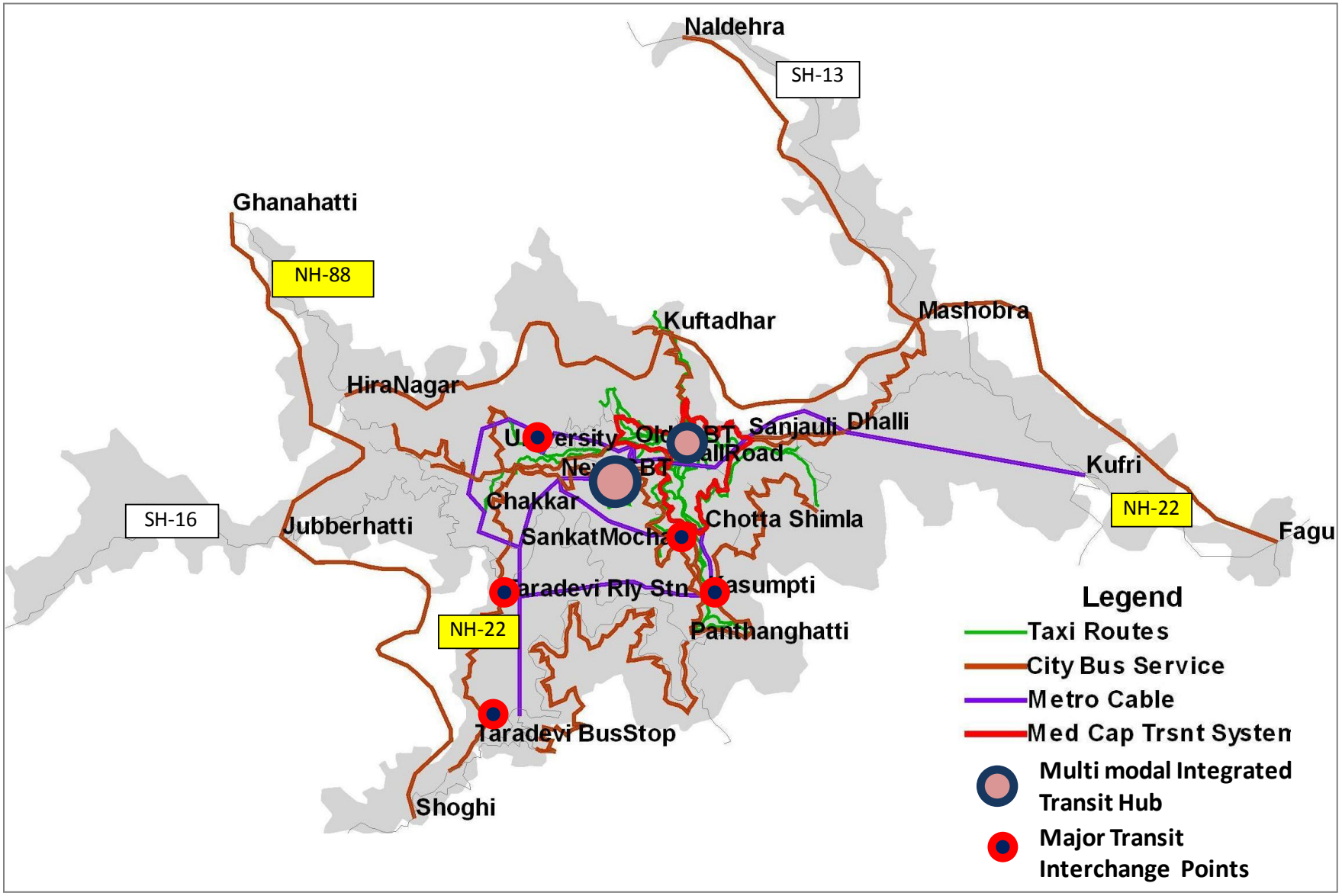


Figure 5-37: Propsed infrastructure for Multi Modal Integration

5.5.4 ITS for Public Transport

In order to promote public transport in general and city bus service in particular improvement in the quality of service, efficiency, reliability and safety is utmost important which can lead to wider acceptance of the service. With newly started city bus service under JnNURM, there is an urgent need of installation of ITS and control system facilities. Installation of ITS will improve the efficiency, reliability, and safety of the city bus service which will create value addition to the service and thereby will contribute to increase in ridership.

Intelligent Transport Systems (ITS) comprise of wide range of tools for managing transport networks, as well as services for travelers. ITS applications are specific to improving the efficiency and user friendliness of public transport system. These include improved information systems to disseminate time tables, fares and ride sharing information more conveniently to users through internet and media; automated fare collection system which eliminates the need for exact change and Automatic Vehicle Location (AVL) system for fleet management, security and communicating exact arrival and departure times of different buses. The CMP for Shimla has proposed phase wise installation of ITS system for improvement in the quality of city bus service and to promote public transport, which includes:

- **Installation of ITS on vehicles**

  - GPS and Data Logger Facilities: The system would record latitude, longitude, fuel consumption data (optional), with time stamp so as to be able to facilitate computation of stoppage data, speed data, distance covered, route deviation, stoppage deviation, skipping of scheduled stoppages, and provide passenger information like next bus queue shelter, expected time to arrive at next bus queue shelter, etc.

  - LED display in vehicles capable of providing information of current location of bus and the next stop.

- Automated announcement facilities on the bus to inform the current position of the bus, next stoppage and the time left to reach next stoppage.
- A modem/GSM-based transceiver for maintaining contact between the bus driver and the control centre.
- Fuel sensor to provide correct information on fuel consumption per kilometer, fuel theft, etc.

Installation of ITS at the bus stops

- LED display at bus shelter to provide a wide range of message display attributes including the information on departure sequence number, route number, destination, scheduled departure time, predicted time of arrival, etc.
- Communication interlink system for maintaining communication between the bus stop and the control centre

Installation of ITS at the control station

- Communication centre (GSM/CDMA/GPRS based)
- GIS Application Software
- Other hardware and software requirements at the control centre

The central control system shall have suitable facilities for detecting and reporting malfunctions and failures of system elements without continuous supervision. The system shall include a comprehensive, efficient and user-friendly Database Configuration Management Tool for managing the process of entering/changing data, verifying the data, testing the data, activating the data in the live data set, distributing the live data set around the whole system (including the vehicle fleet) and withdrawing the data. The tool shall

enable the number of routes covered by the system to be increased with minimal disruption to the settings of previously configured routes. In addition to the above mentioned ITS Facilities, it is proposed that the following will be included at a later stage in the second phase for a more comprehensive ITS environment for public transport system management and control in the city.

It also proposes for the introduction of Management Information System (MIS) covering the aspects related to vehicle details, fare collection details, etc. Figure 5-38 shows the ITS architecture for promoting public transport.

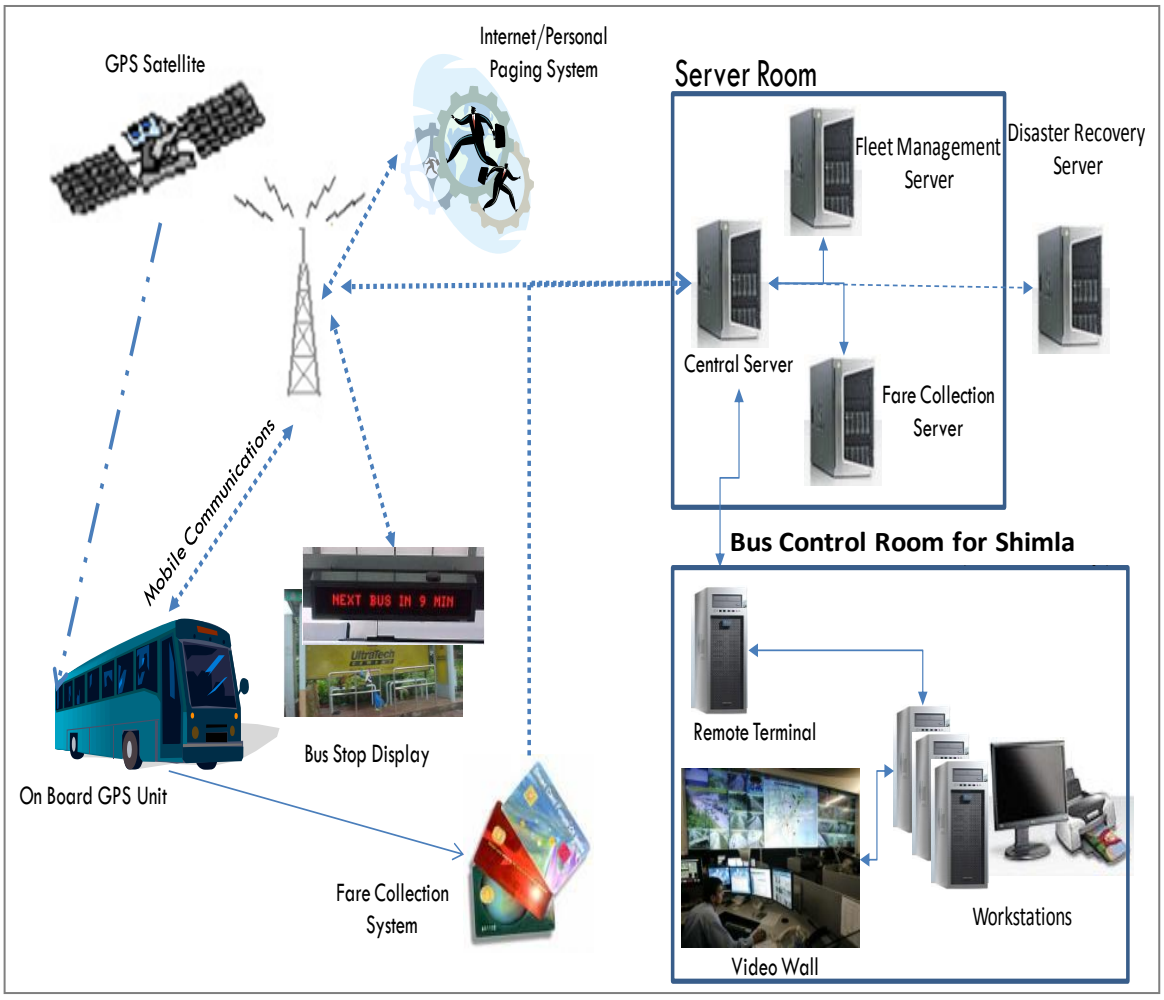


Figure 5-38: ITS architecture for promoting public transport

5.5.5 Initiating reform measures in Urban Transport

To effectively promote and implement public transport, a robust institutional arrangement is essential. In the line of Government of India guidelines, it is proposed to set up a single agency that would coordinate public transport services in the city so that there is an integrated service. Refer to Chapter7, Institutional Framework where the details of institutional setup has been discussed.

5.5.6 Public participation and Awareness Programme

For successful implementation of any transport project in general and public transport project in particular, it is necessary to promote public awareness and create a sense of public ownership of the project. It is necessary to evolve an outreach and education strategy for public transport. The outreach and education goals need to be defined at the planning stage of the public transport itself to focus the efforts of the project implementation team. To secure support of the public for public transport facilities and obtain acceptance thereof the outreach and education goals are defined as follows:

- Introduce the concept of public transport, its purpose and benefits to various stakeholders
- Create profile of public transport as a big impact, incremental step for achieving the long-term vision for mobility in the city
- Enhance understanding that public transport projects positively impact economic health and environmental sustainability of the city
- Introduce the concept of public transport as an important strategy in making best use of public resources
- Establish communication channels for the public to receive information and interact with the project implementation team

Education and Outreach goals can be addressed by utilizing the following strategies:

- Create a network of allies and provide platforms for them to actively participate as disseminators of project benefits
- Use proactive and creative media relations to promote key public transport messages, particularly travel time-saving and trip reliability messages etc.

Following three basic pillars of public outreach programme needs to be effectively and efficiently used for successful implementation of any public education & awareness sachems.

(A) Communication Media

The selection of the communication media is critical in ensuring that the message is delivered effectively to the target audience. Available media includes:

1. Print – newsletters, newspapers, magazines
2. Broadcast – radio, TV
3. New Media – internet, web sites
4. Out of Home – hoardings, posters, short films, display models
5. Direct mail – flyers, inserts, brochures, letters, fact sheets
6. Event marketing – special events, workshops/conferences at various levels such holding awareness campaign at school & colleges etc.
7. Public Relations – media management, general awareness programe
8. Mobile phone – Through SMS, toll free enquiry system etc.

The choice of media should be based on ability to reach target audience, the desired impact and the message to be communicated. The messages have to be reiterated at a regular frequency for them to impact the target audience effectively. The development of the message is also critical to the success of the marketing plan and the message has to be well crafted with both written copy

and visual component. The messages should be focused on the benefits of public transport, should be supported by facts, positive and consistent.

(B) Outline Marketing Plan for public transport

A marketing plan for public transport needs to be prepared with following communication objectives for promoting public transport.

- Create awareness of the project
- Improve image of public transport
- Build brand identity
- Maximize rider ship
- Disseminate information on user benefits
- Provide information on service (routes, schedules, fares)

(C) Target Audience

Selection of target audience and addressing each segment of target audience is utmost important. Marketing strategies are to be designed to cater the specific needs of each of the following segments separately.

- Segment 1- Existing public transport users (such as bus users)
- Segment 2- Potential Users – two wheeler users, taxi users, car users etc.
- Segment 3- Local Community/Special Interest Groups/NGOs

5.5.7 Encouraging private sector in promotion of public transport

Traditionally, the responsibility of providing public transport lies with the Government financed and operated using resources from taxes and various levies. Over the years, experience have shown that important urban utility services like urban transport is controlled by multiple institutions resulting in fragmentation of functional responsibilities and large scale inefficiencies in service delivery. In order to improve the quality of service delivery of public transport and to effectively infuse and utilise private fund for supply of public transport, participation of private players should be encouraged through adopting various Public Private Partnership (PPP) models. Details of various PPP model have been discussed in Chapter 6, Implementation Programme and Costing.

5.5.8 Adoption of private vehicle usage reducing strategies and policies

The CMP for Shimla has proposed a number of measures to reduce the usage of private vehicles, which includes:

- Introduction of different alternative mode of public transport system such as ropeway, MCRTS etc.
- Adoption of parking policy conducive for promotion of public transport (Refer to section 5.9)

5.5.9 Adoption of Transit Oriented Development (TOD) measures

The CMP for Shimla has proposed adoption of Transit Oriented Development (TOD) measures as described earlier. (Refer to section 5.4.3).

5.6 Pedestrian Mobility Improvement Strategy

A study (Study of Traffic and Transportation Policies and Strategies in Urban Areas in India, 2008) conducted by Ministry of Urban Development Government of India in 30 seleceted Indian cities including Shimla (Shimla Planning Area) shows that the walkablity index for Shimla is 0.22, whereas average walkablity index computed for urban areas in India (based on selected 30 cities including Shimla) was 0.52. Higher

the value of walkability index means avilability of better pedestrian infrastructure. Thus, it was apparent from secondary data source, that the Shimla city does not have adequate pedestrain infrastructure.

Primary data collected also shows that like in any normal hilly area, the predominant mode of transport in Shimla is walk (42% of the total trips in Shimla are walk trips). However, only 16% of the total road network has footpaths. The existing footpath is also not continuous in nature.

The pedestrian crossing facility is also inadequate. Referring to chapter three, Existing Transportation Scenario of Study Area (section 3.7) and table 5-15 the value of PV^2 of eight intersections namely Chakkar Chowk (Bilaspur road chowk), Chota Shimla, Totu Chowk, Victory Tunnel Chowk, Sanjauli Chowk, Dhalli Tunnel bypass Chowk, Kusumpti Chowk, University Chowk are greater than 1, implying need for grade separated pedestrain crossing facility.

Table 5-15 Pedestrian-vehicular conflict represented by PV^2

Serial No	Name of Location	PV^2
1	Chota Shimla	**4.1**
2	Bolieauganj	0.1
3	Tutikandi bypass Chowk	0.8
4	Chakkar Chowk (Bilaspur road chowk)	**1.6**
5	Totu Chowk	**1.8**
6	Khallini Chowk	0.5
7	Victory Tunnel Chowk	**11.6**
8	Sanjauli Chowk	**35.5**
9	Dhalli Tunnel bypass Chowk	**3.3**
10	Kusumpti Chowk	**11.1**
11	Dhalli Bus Stand Chowk	0.5
12	IGMC Chowk	0.1
13	University Chowk	**1.7**

Further, within Shimla Municipal area a network of 73 kms of pathways or walk paths exits, out of which 16% pathways are non-metalised or kutcha road. Even metalised pathways do not have adequte safety railing and proper street lighting facility. These municipal paths are in the form of blacktop streets along with stairs for pedestrian movement. These paths/stairs are used for manual transportation of goods by porters and for pedestraian movement.

Considering all these aspects and after in-depth analysis, the CMP for Shimla has suggested adoption pedestrian mobility improvement strategy, which includes:

(a) **Pedestrian phasing signalization/grade separated pedestrian crossing facility:**

Based on the PV^2 value, the CMP for Shimla has suggested development of grade separated pedestrian crossing or pedestrian signal phasing facility at following critical locations (refer to figure 5-39).

1. Chota Shimla
2. Chakkar Chowk (Bilaspur road Chowk)
3. Totu Chowk
4. Victory Tunnel Chowk
5. Sanjauli Chowk
6. Dhalli Tunnel bypass Chowk
7. Kusumpti Chowk
8. University Chowk

However, considering the terrain constraints and availability of land, construction of grade separated pedestrian crossing facility may not be feasible at all locations, in such case, other pedestrain safety measures like dedicated pedestrain signal phase syncronised with traffic signal can be opted for implemation.

(b) **At grade pedestrian crossing facility:** Apart from the above critical intersections, the CMP has also suggested development of at grade

pedestrian croosing facility based on higher pedstrain flow at following locations (refer to figure 5-39):

1. Circular road at old ISBT
2. Circular road at Lakkar bazaar
3. Tutikandi Chowk
4. IGMC Chowk
5. Shoghi market

(c) **Development of escalators, lift for vertical mobility:**

The Mall road being the main center for commercial activities in Shimla located at the top and is not accessible by motorised mode of tranport. A large number of trips (vertical movement from circular road to Mall road) from circular road to the Mall road takes place at various locations using stairs, pathways. However there is only one mechanised lift for vertical mobility.

Vertical movement of pedestrians from circular road to Mall road during peak hours at following selected locations are as:

1. Lakkar Bazaar (400 persons/ hour)
2. Near Victory Tunnel towards 103 tunnel (2456 persons/ hour)
3. Bemloe (480 persons/ hour)
4. From Lower Bazaar to Mall road, the peak hour movement of pedestrian is (1650 persons/ hour)
5. The existing bus user and pedestrians to SDA complex at Vikasnagar (SDA complex) is- 350 persons/ hour.

Provision of lifts/escalator will improve vertical mobility and save travel time and it will also promote public transport by providing better linkages.

Considering this aspect and as one of the main objective of CMP is to provide better connectivity for pedestrians, the CMP for Shimla has suggsted

development of lift/escalator for vertical mobility at following locations (refer to 5-40):

1. Lakkar Bazaar (Circular road to Mall road)
2. Near Victory Tunnel towards 103 tunnel (Circular road to Mall road)
3. Bemloe (Circular road to Mall road)
4. Vikasnagar (SDA Complex connectivity, Relocation of Kusumpti SDA complex bus stop on NH-22 and a lift from the relocated bus stop to SDA complex). Provision of a lift and relocation of bus stop will also decongest the SDA complex area as the buses plying to connect SDA complex (through narrow Chota Shimla to Kusumpti road) with rest of the city area will now be re-routed along NH-22.
5. Proposed parking lot at IGMC
6. Development of escalator at Auckland Tunnel (Direct connectivity to Lakkar bazaar)
7. Development of escalators connecting Mall road with Lower Bazaar (refer to figure 5-41)

(d) **Improvement of old pathways**

As the condition of exiting path ways are poor, thus the CMP for Shimla has suggested to revive the old pathways and adequate improvements. The improvement measures include (refer to figure 5-43 and 5-44):

- Provision of proper safety railing
- Improvement of road surface
- Provision of ornamental streetlights
- Provision of benches

The Shimla Municipal Corporation has prepared a Detailed Project Report (DPR) on Shimla Beautification Plan in order to promote tourism in Shimla. The Shimla Beautification Plan has identified 36 parks and 4 water bodies for renovation (refer to figure 5-42).

The CMP for Shimla has thrived to integrate the CMP with Shimla Beautification Plan. The improvement of pathways will benefit Shimla in variety of ways: It will promote more eco-friendly pedestrian trips, it will provide better connectivity to the neighborhood and children parks as proposed in the Shimla Beatification Plan, provision of ornamental street-lights and furniture will add to improvement of tourism promoting infrastructure in Shimla.

(e) **Improvement of footpaths**

Only 16% of road network in Shimla Planning Area has footpaths and discontinuous in manner. The CMP thus suggested development of continuous footpath network in Shimla. The improvement of footpath strategies includes:

- Development footpaths with minimum width of 1.5 m
  - Foot paths along Circular road (Victory Tunnel to Sanjauli junction)-5 kms
  - Foot paths along Circular road (NH bypass junction to Bemloe) - 5.2 kms
- Improvement of exiting footpaths

(f) **Provision of street lighting, signages and road markings at junctions**

The street lighting facilities, road markings etc. are not adequate at the junctions in Shimla.

Road markings, signages and High Mass Light (HML) have been proposed at following locations:

1. Chota Shimla
2. Chakkar Chowk (Bilaspur road Chowk)
3. Totu Chowk
4. Victory Tunnel Chowk
5. Sanjauli Chowk

6. Dhalli Tunnel bypass Chowk
7. Kusumpti Chowk
8. University Chowk
9. Tutikandi Chowk
10. IGMC Chowk
11. Shoghi market

In addition to the above-mentioned locations, provision of HML has also been proposed at the following locations:

1. Ridge
2. Boileauganj Chowk
3. BCS Chowk
4. Secretariat (Chota Shimla)
5. Takka Bank
6. Scandal Point
7. Old ISBT
8. Ramchandra Chowk
9. Khalini Chowk
10. Dhalli Chowk
11. Summer Hill Chowk

5.6.1 Introduction of bike sharing scheme

Bicycle sharing scheme is a concept in which bicycles are made available for shared use to the individuals who do not own them. The provision of bicycles for use is a mobility service, mainly useful in urban environment for proximity travels.

In a hilly terrain like Shimla, introducing bicycle-sharing scheme is although difficult to implement, however it has its own potential to promote eco- tourism as well as environment friendly mobility solutions for shorter trips in certain areas where terrain considerably permits development of such schemes. After detailed stakeholder consultation and reconnaissance survey, the CMP for Shimla has suggested introduction of bicycle sharing schemes at following routes:

(A) **Route 1:** Sanjauli Chowk to the Mall, via Lakkar Bazaar- 3 Kms (refer to figure 5-45)

This route has the potential to introduce bike sharing/bicycle share scheme, due to following reasons:

- High demand of non-motorized trips (pedestrian trips as high as 9,400 on a normal working day) along this route as there is ban on movement of motorized vehicles (HRTC run taxi is permitted).
- Relatively flat terrain
- Presence of intermediate demand nodes such as IGMC, Govt. College etc along this route

Based on above-mentioned characteristics, the CMP for Shimla has suggested to develop bike-sharing scheme along this route as pilot project in phase 1.

Bikes/bicycles should be attractive and there should be provision of adequate protective headgears and other accessories available at each bike parking shelter. The main features of bike sharing scheme along this route would be:

(I) **Surface marking indicating cycle priority:** Considering narrow carriageway width, the CMP has suggested only separate lane marking instead of creating dedicated physical cycling lane.

(II) **Covered bike parking shelter:** Four covered bike parking shelter has been proposed along this route, which are at:

- Near Sanjauli Chowk- Minimum parking space for 10 bikes
- Govt. College- Minimum parking for 5 bikes
- IGMC- Parking- Minimum parking for 5 bikes
- Lakkar Bazaar- Minimum parking space for 10 bikes

(III) **Self-sustaining:** The scheme will initially be free of charge at least for one to three months, however a nominal charges can be levied depending upon the elasticity of demand.

To make the scheme sustainable, there is need for aggressive advertisement at both bike parking lots and also on bicycles.

(B) **Route 2:** Indian Institute of Advanced Studies to HP University- 1.5 kms (refer to figure 5-46)

This route also has the potential to introduce bike sharing/bicycle share scheme, due to following reasons:

- Relatively flat terrain
- Presence of student population

Bike sharing scheme along this route has been proposed in phase II.

The main features of bike sharing scheme along this route would be same as route 1:

(I) **Surface marking indicating cycle priority**

(II) **Covered bike parking shelter:** Two covered bike parking shelter has been proposed along this route, which are at:

- HP University- Minimum parking space for 10 bikes
- IIAS- Minimum parking space for 10 bikes

(III) **Self-sustaining:** The scheme will initially be free of charge at least for three months, however a nominal charges can be levied depending upon the elasticity of demand.

Thus in order to make the scheme sustainable, there is need for aggressive advertisement at both bike parking lots and also on bicycles.

Cycle track marking

Covered bike parking lot

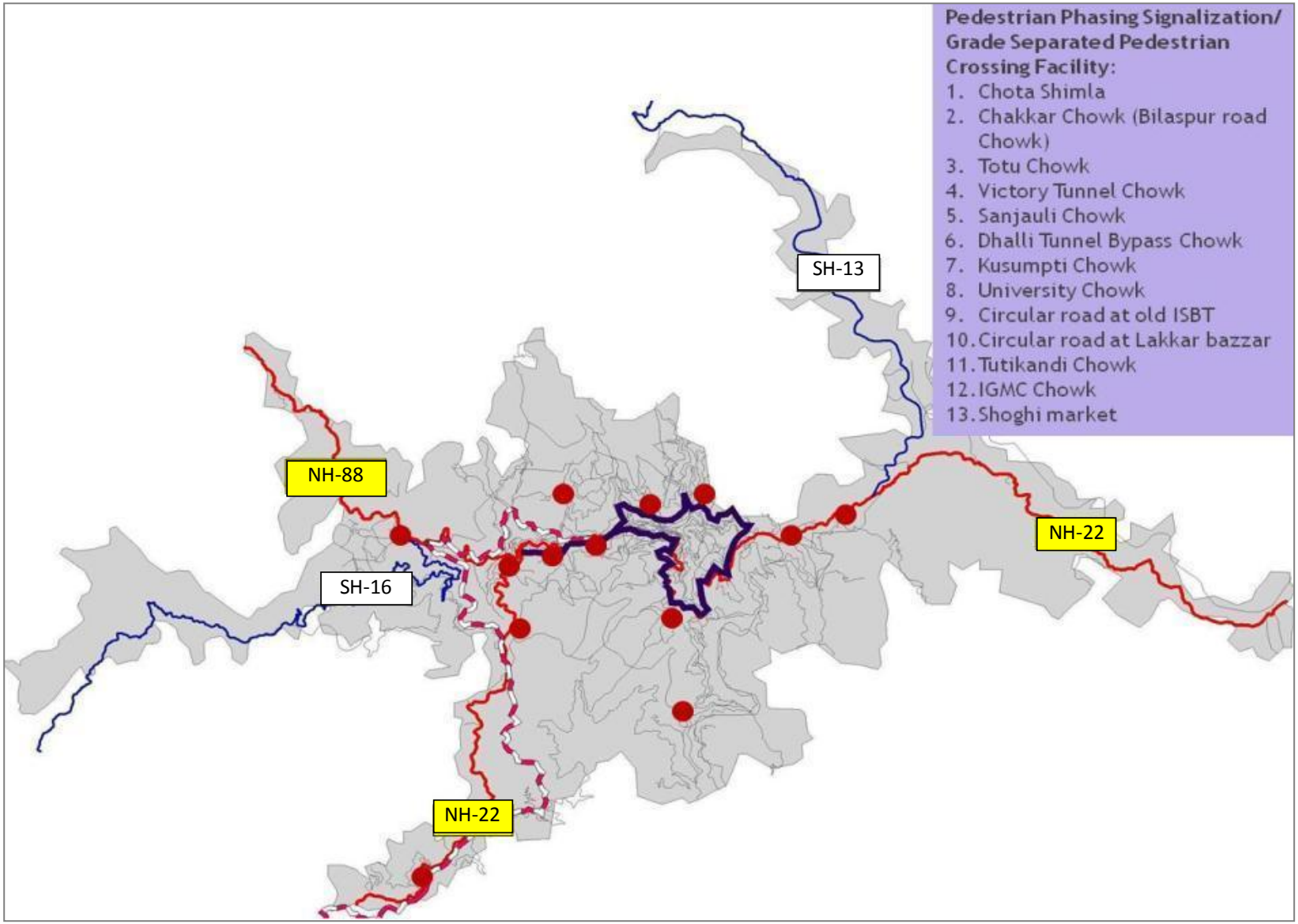


Figure 5-39: Proposed locations of pedestrian phasing signlization /grade separated pedestrian crossing facility

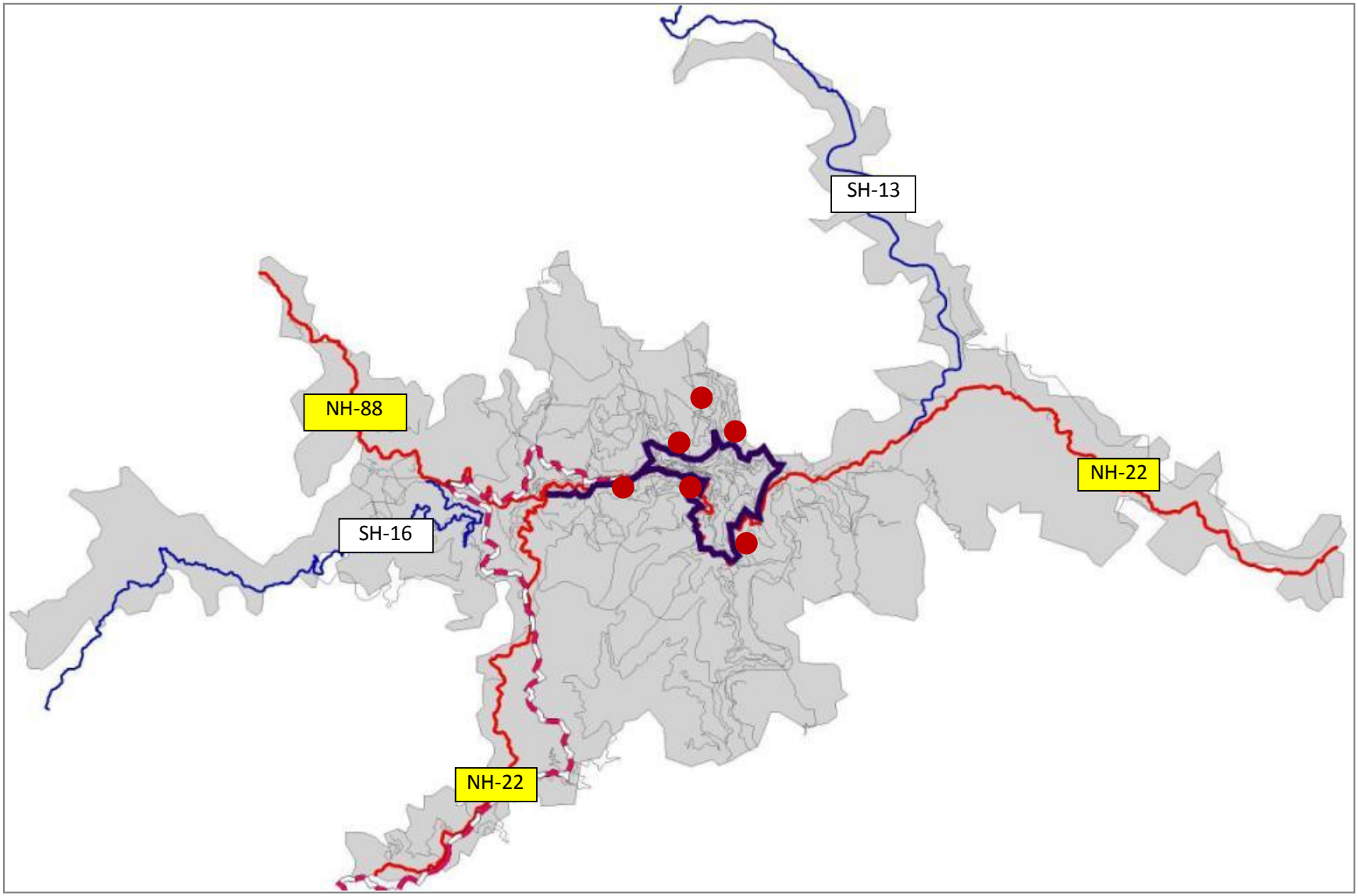


Figure 5-40: Proposed locations of lifts/escalators

Photographs showing location of proposed escalator at Auckland Tunnel

Urban Mass Transit Company Limited

Figure 5-41: Proposed of escalators for connecting Mall road with Lower Bazaar

Urban Mass Transit Company Limited

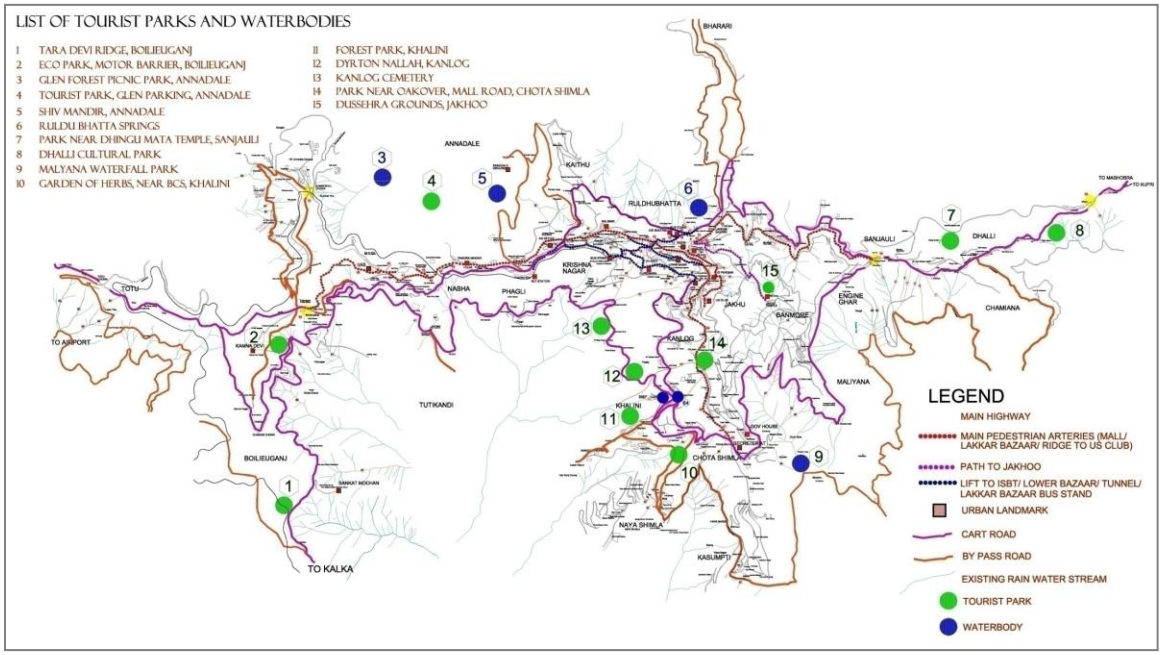


Figure 5-42: Shimla Beautification Plan

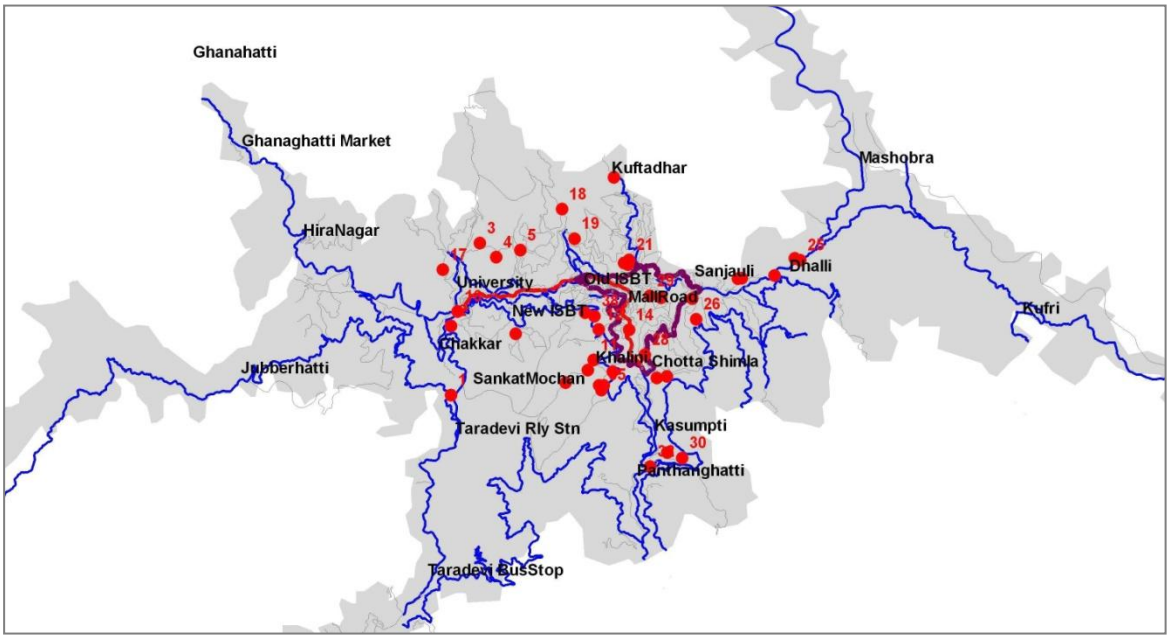


Figure 5-43: Integartion with Shimla Beautification Plan

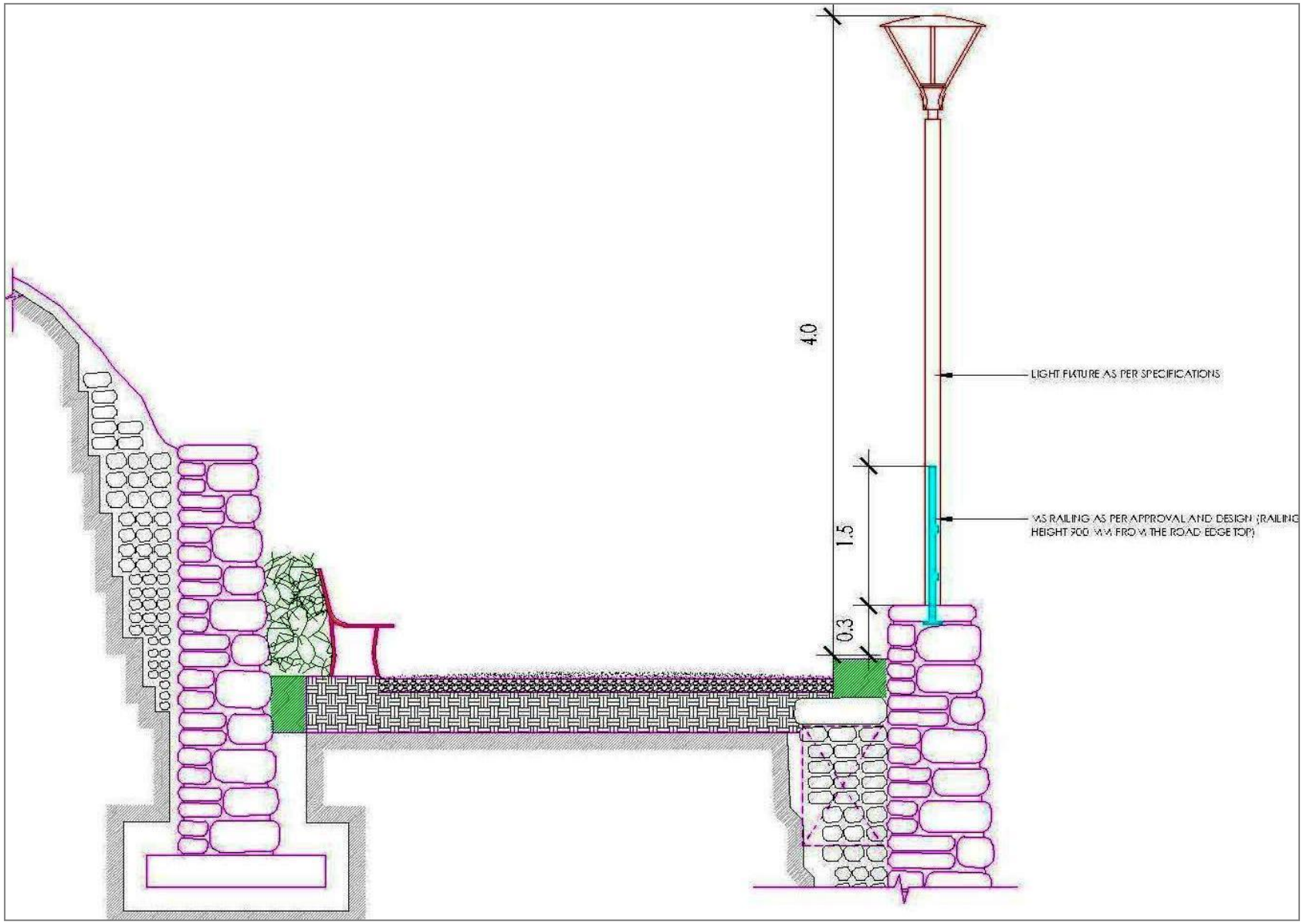


Figure 5-44: Conceptual cross-section of proposed pathway improvement

Urban Mass Transit Company Limited

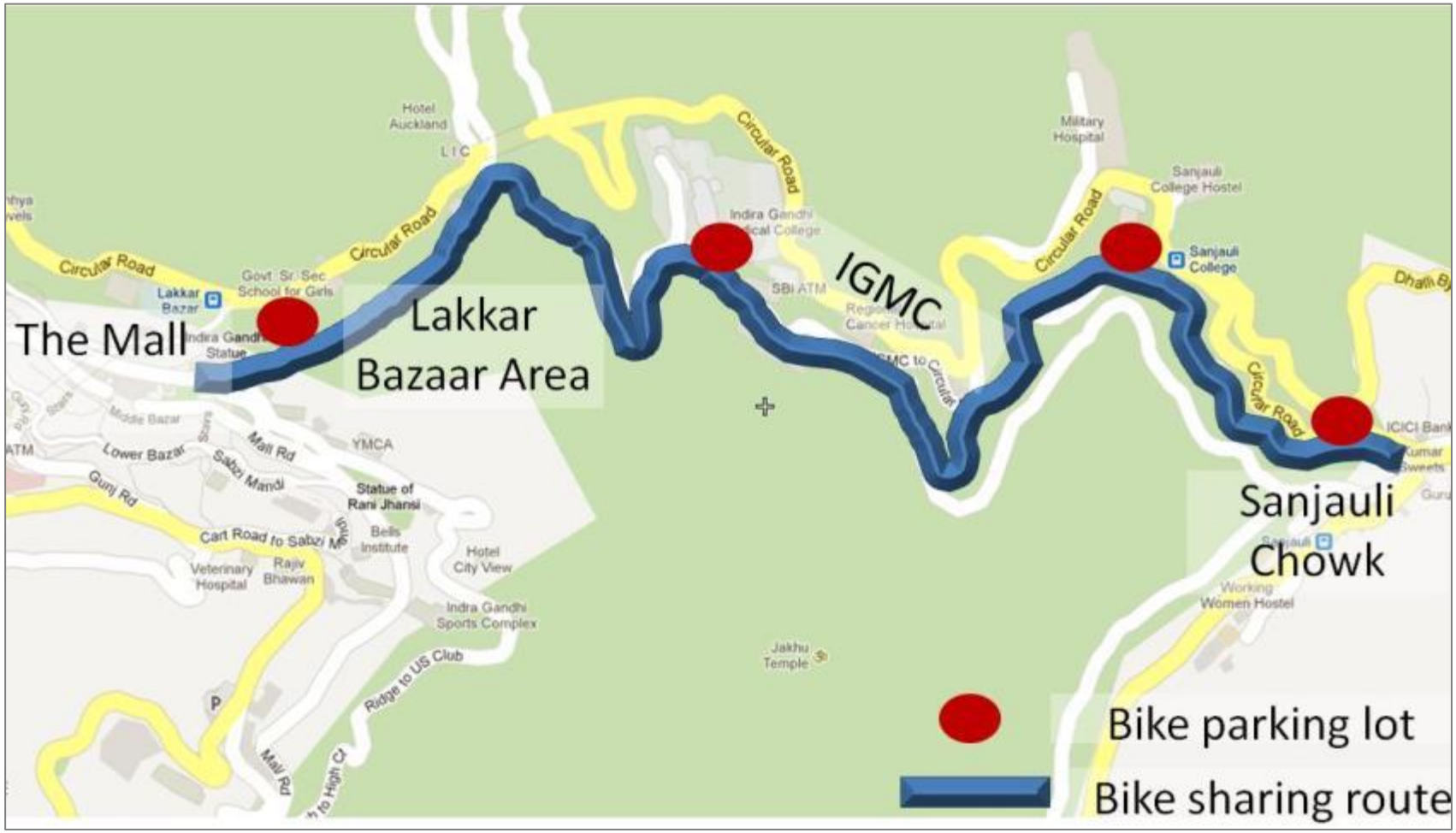


Figure 5-45: Bike sharing route 1

Figure 5-46: Bike sharing route 2

5.7 Freight Management Strategy

Freight movement in a city is an inevitable process of trade and economy. Traditionally, movement of goods for local consumption and sale generally takes place from a certain location within a city which is closest to the wholesale markets. In other cases, where there have been successful planning interventions, the goods terminal is preferred to be located on the outskirts of the city, in order to prevent the entry of heavy vehicles into the congested parts of the city. In Shimla, the wholesale market for grain, timber are located in the heart of the city areas of Lower bazaar and Lakkar bazaar etc. Existence of timber market at Lakkar bazaar creats traffic congestion during peak hours.

The City Development Plan (CDP) have suggested relocation of non conforming activities like timber market, transport hub, wholesale grain market, wholesale vegetable market in the peripheral areas to decongest the core areas.

The Town and Country Planning Organization (TCPO), Government of Himachal Pradesh has already identifed an area at Shoghi as “Activity Zone” wherein TCPO has proposed development of a truck terminal and have earmarked space for wholesale market for grain, timber and vegetable.

As part of freight mobility improvement strategy, the CMP for Shimla has made an in-depth assessment of the proposals suggested by TCPO and in the CDP apart from analysis of primary data on freight traffic movement pattern. From the analysis it was found that the shifting of non-conforming activities like timber market, wholesale grain market, wholesale vegetable market in the proposed activity will reduce 25% of freight related traffic form the congested core city areas like Lakkar bazaar. This reduction in traffic will have significant impact on the level of service of Lakkar bazaar road.

In order to efficiently and efficiently manage freight traffic, the CMP for Shimla has proposed development of truck terminals at the proposed activity zone as suggsted by the TCPO. The CMP has also suggested the shifting of wholesale market, grain market, timber market at the proposed activity zone. Bypasses have

been proposed for through movement of freight traffic. Further the CMP has also proposed development of another freight terminal towards Dhalli side.

The freight traffic mobility improvement strategies are summarised as:

Phase I

- Ban on movement of goods carrying vehicles during 6.30 AM to 10 PM
- Ban on old goods carrying vehicles

Phase III

- Development of truck terminal at proposed activity center at Shoghi
- Shifting of wholesale market for grain, timber

Phase IV

- Development of truck terminal at proposed activity center towards Dhalli
- Development of Ghanghatti to Shoghi bypass
- Development of Hiranagar - Naldhera - Fagu Ghanghatti to Shoghi bypass

Figure 5-47 shows the proposed interventions for freight improvement mobility in Shimla

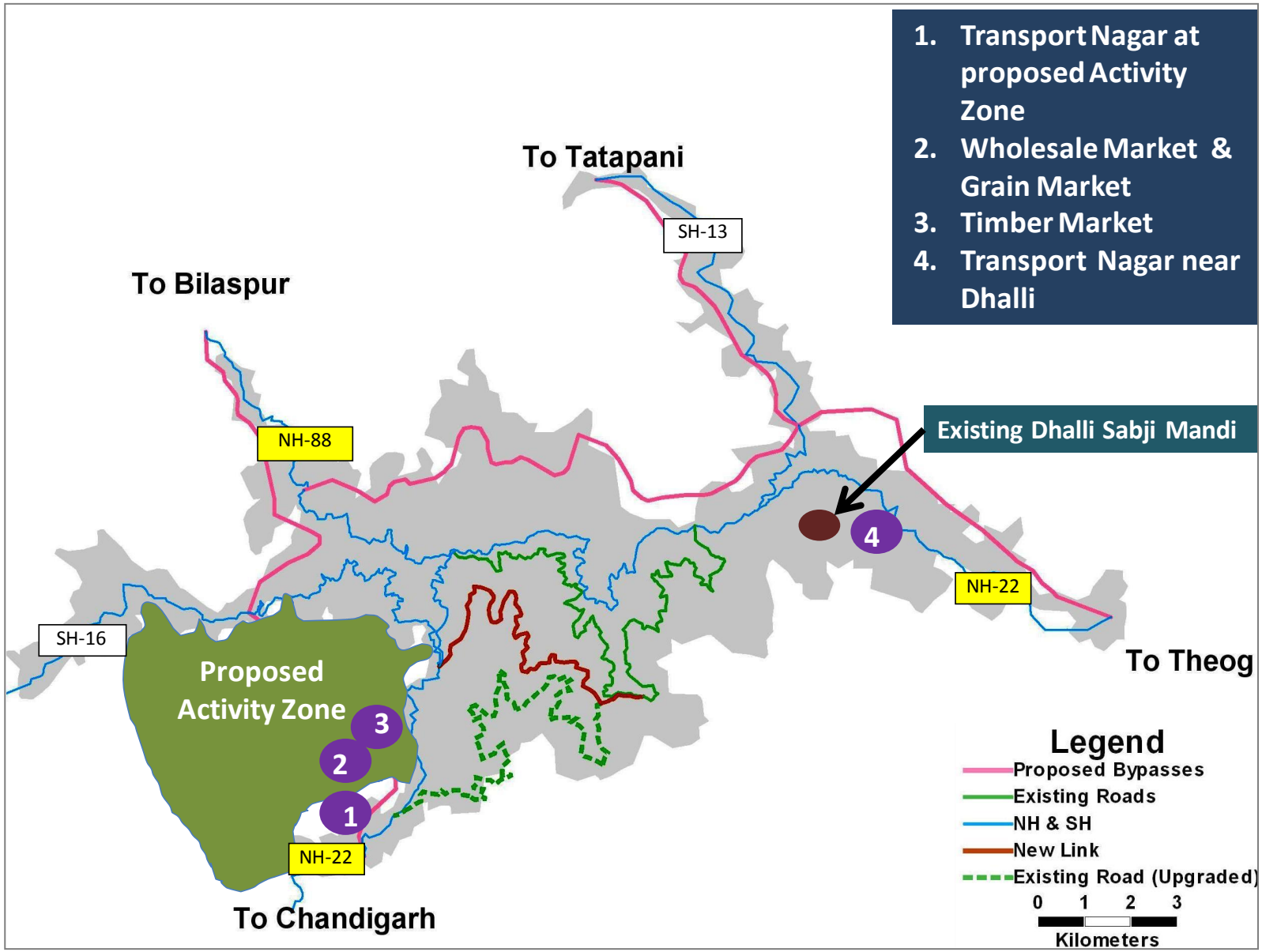


Figure 5-47: Proposed interventions for freight improvement mobility in Shimla

5.8 Traffic Management Plan

Under traffic management plan, the CMP for Shimla has suggested following improvement measures.

5.8.1 Junction Improvement

Junctions are the major sources for bottlenecks in the transportation network. As traffic increases on major roads, to improve safety and to provide orderly movement of vehicles, improvements of junction such as installation of traffic signals, geometric improvements etc. are necessary. The basic problems of junctions and suggested intervention measures are given in the table 5-16:

Table 5-16: Problems and suggested interventions

Problems at Junction	Suggested Interventions
• Poor road geometrics • Lack of proper sight distance • Lack of pedestrian facility • Bus stand near side to the junction • Parking of private vehicles • Poor enforcement	• Provision of footpath • Improvement of turning radius • Pedestrian crossing demarcation • Road Marking and signages • Provision of channalizers

Based on traffic volume and site observations and stakeholder consultation following are the list of junctions for which requires junction improvement measures (refer to figure 5-48).

1. Chota Shimla Chowk
2. Boileauganj Junction
3. Tutikandi Junction
4. Chakkar Road Junction
5. Totu Chowk
6. Khalini Chowk
7. Victory Tunnel Chowk
8. Sanjauli Chowk
9. Dhalli Bypass - Tunnel chowk
10. Kusumpti Junction
11. Dhalli Bus Stand Chowk
12. IGMC bypass Chowk
13. University Junction
14. Talland
15. 103 Junction

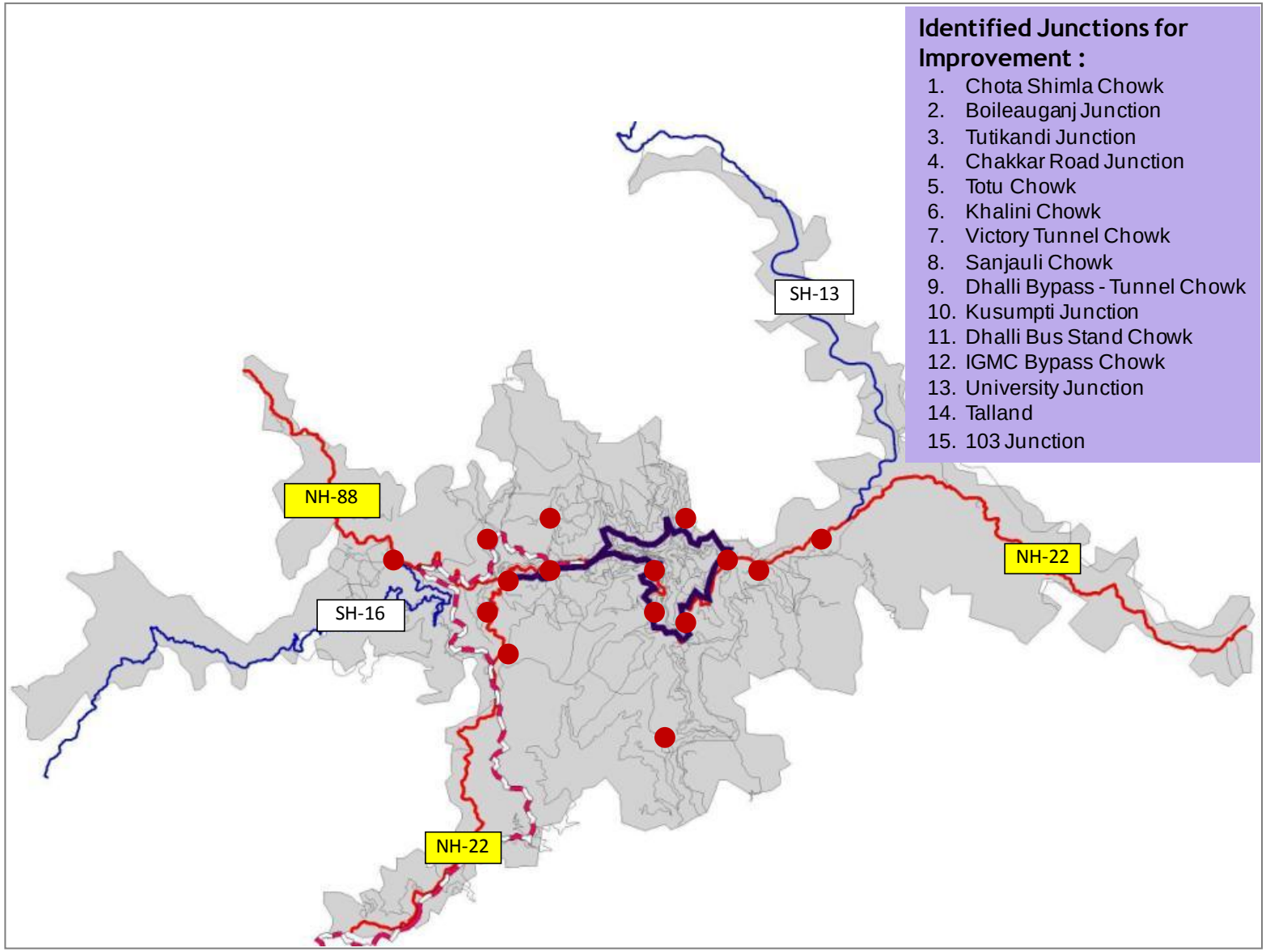


Figure 5-48: Identifed locations for junction improvemnt

Figure 5-48 shows the location of junctions for proposed improvement. As part of the study, the CMP for Shimla, had mentioned number of possible intervention measures for junction improvement. However, the junctions identified in this report needs to be further studied and analyzed with detailed drawings and costing for implementation. Figure 5-49, figure 5-50 and figure 51 show the proposed intervention measures for Victory Tunnel, Tutikandi junction and at Talland respectively as a concept of junction improvement measures.

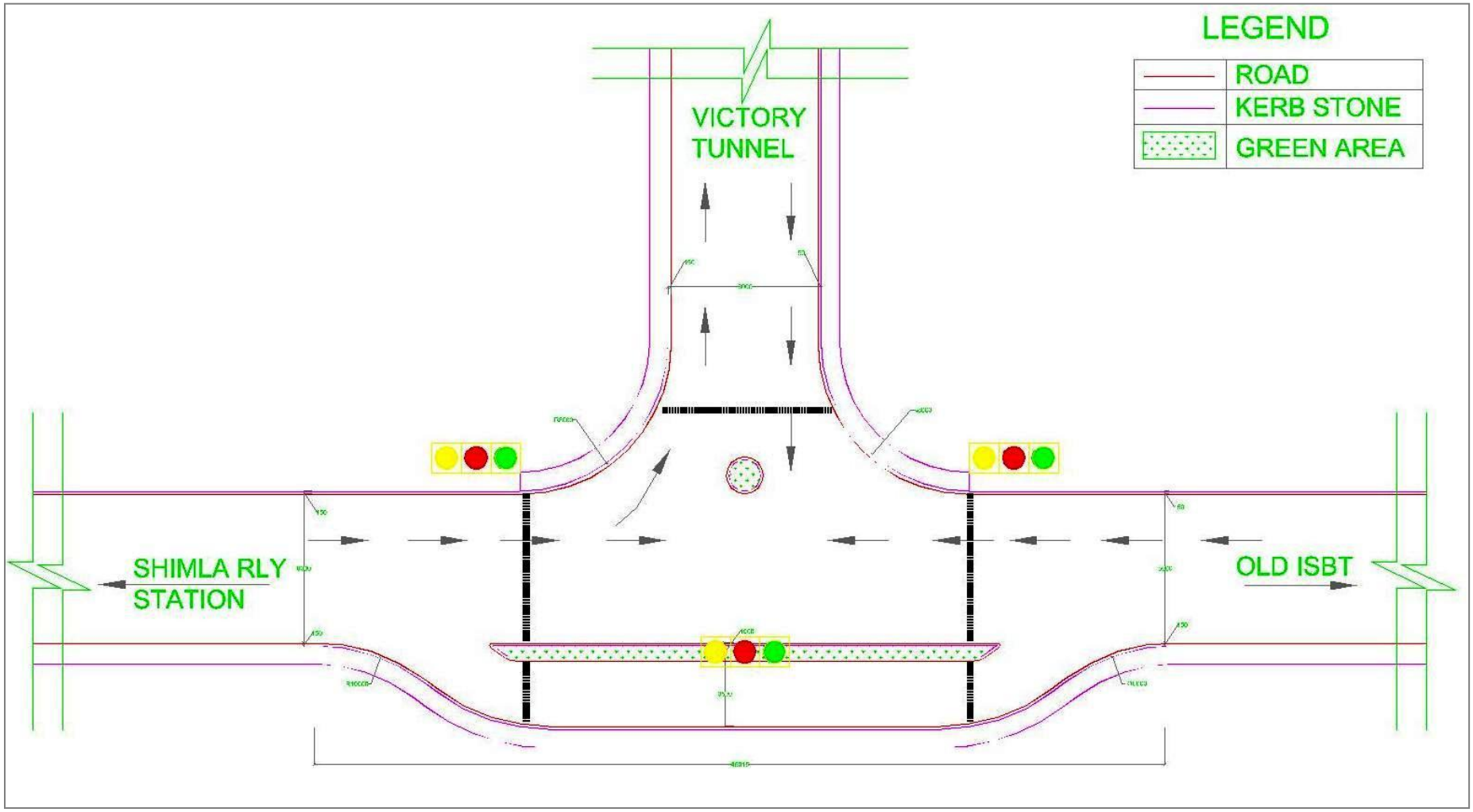


Figure 5-49: Proposed junction improvement at Victory tunnel

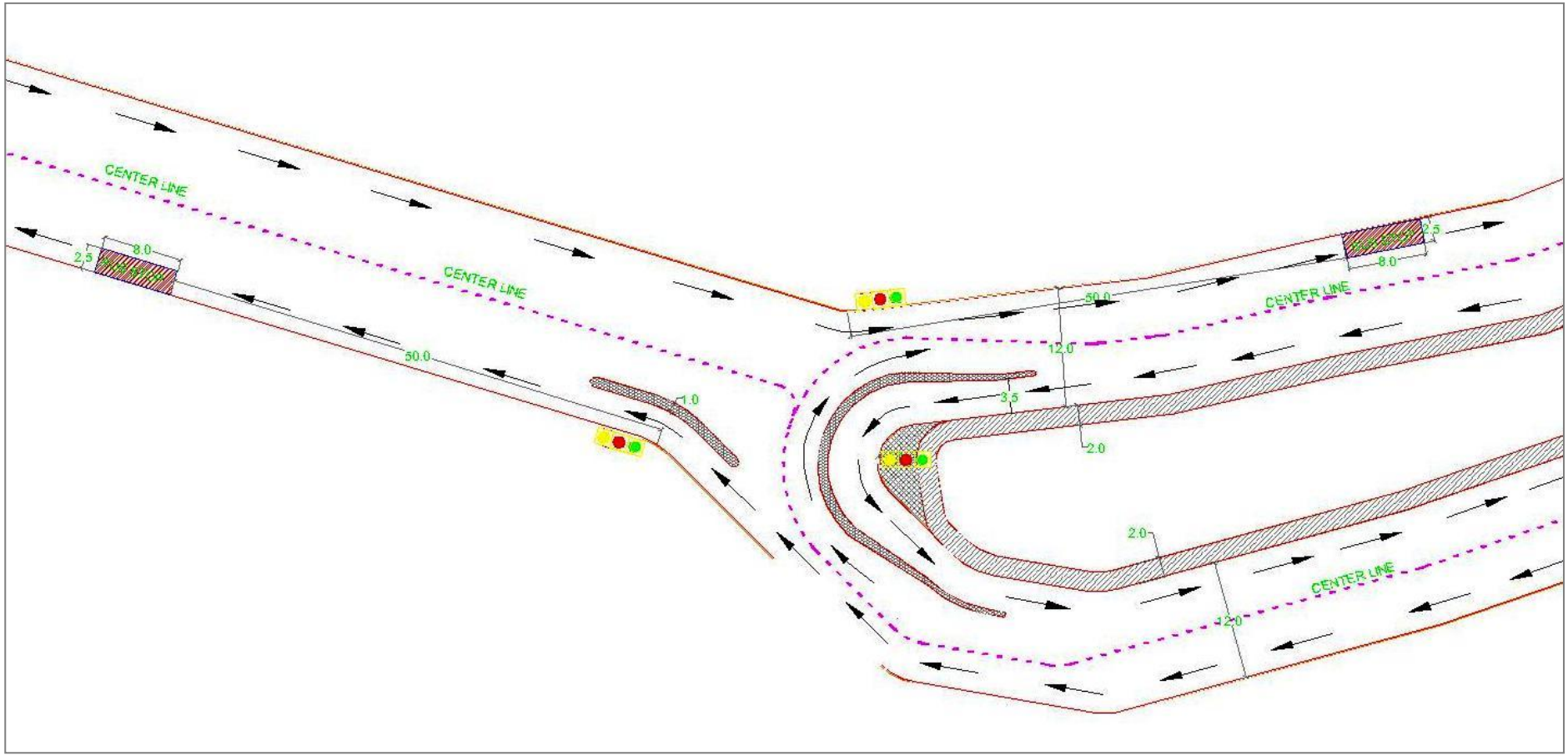


Figure 5-50: Proposed junction improvement at Tutikandi junction

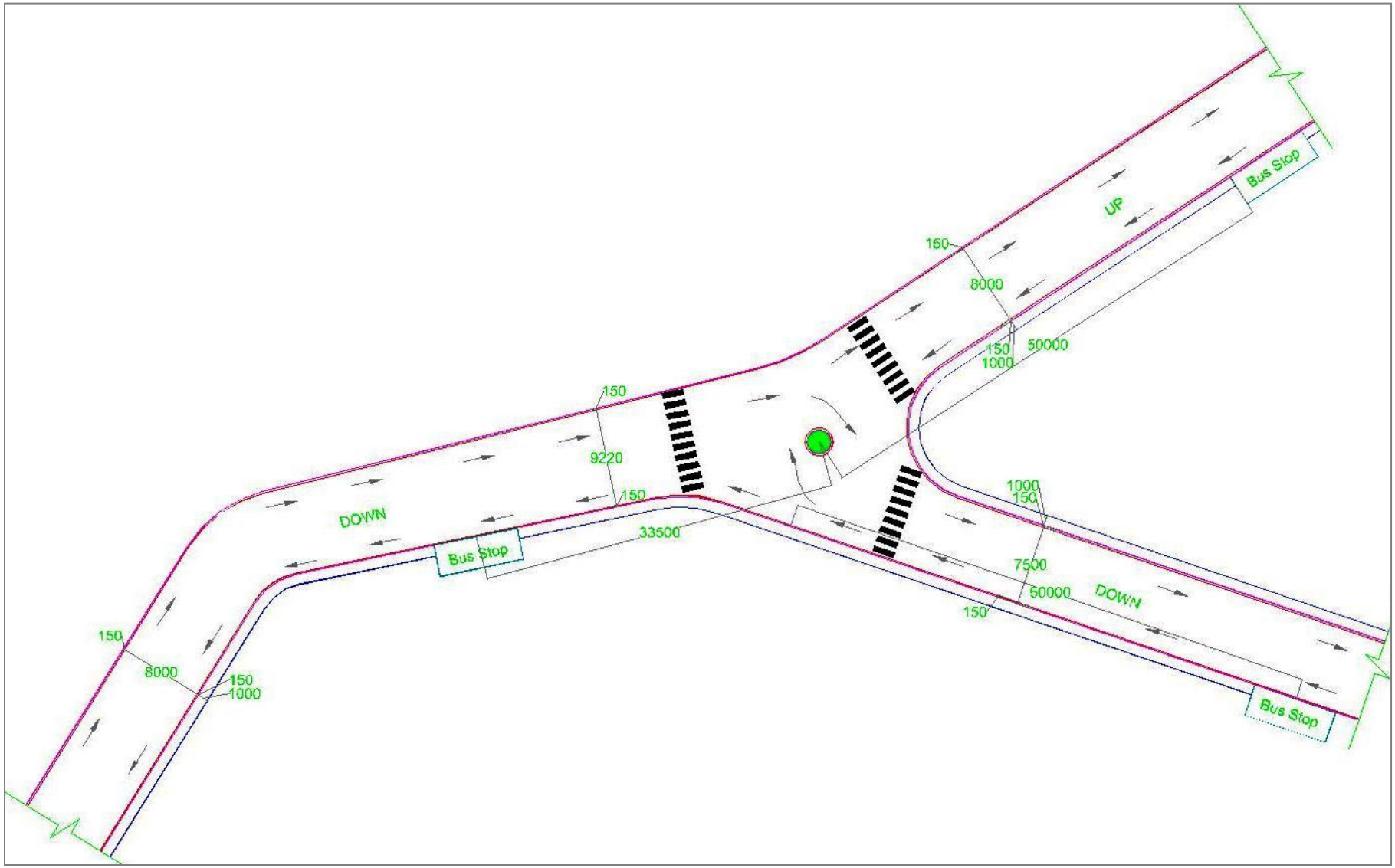


Figure 5-51: Proposed junction improvement at Talland junction

5.8.2 Pavement Markings and Signage

It is recommended that proper signs should be marked at appropriate locations. Signs near schools should be installed on priority basis. Traffic control facilities such as Center line, Traffic lane lines, Stop lines, Pedestrian crossings, Parking space limits, Kerb marking for visibility, Obstruction marking etc. must be provided keeping in view all users of the road and especially for night time driving. All the traffic signs should be facilitated as per the guidelines provided in IRC publication 67-2001. Figure 5-52 which shows different traffic signages.

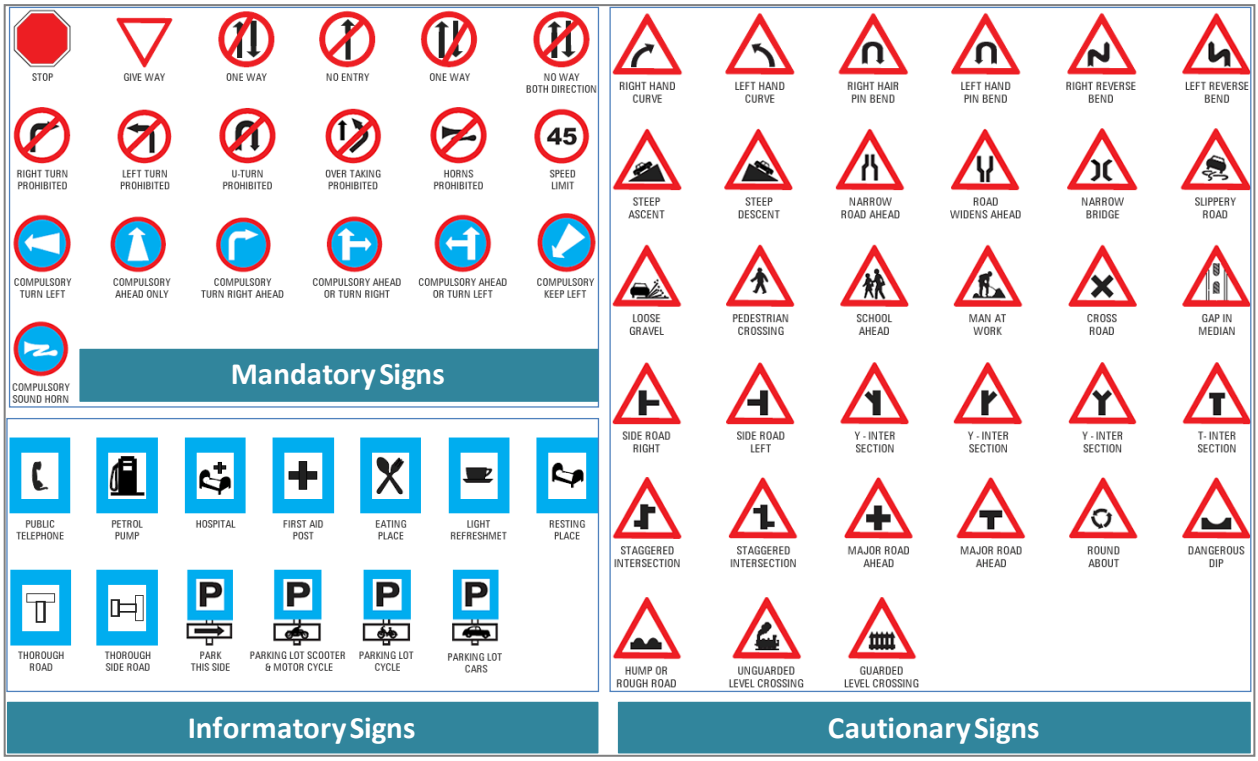


Figure 5-52: Traffic signages

5.8.3 Traffic Information and Management Control Centre (TIMC)

Intelligent Transportation Systems such as vehicle-actuated traffic signals, surveillance cameras, and enforcement cameras etc., which enables decision makers to identify and react to an incident in a timely manner based on real-time data, will help to reduce incident response times, lower incident rates (mainly secondary incidents), disseminate traveler information and hence reduce congestion and enhance safety. As a first step, simple real time traffic monitoring equipments are proposed to be installed that will result in traffic assessment on various corridors within the city and can be accessed by the users and enforcement agencies on the web.

5.8.4 Safety Measures

Poor road geometry and lack of traffic sense of both drivers and pedestrians increases the incidence of accidents. Many of the accidents occur due to the casual approach of the road users towards driving rules, safety precautions, and regulations. The following action programmes are proposed for implementation to enhance the safety of the road users:

- Black spots need be identified along the major roads and specific improvements must be proposed at those locations. A Road Accident Analysis System based on the accident database must be implemented for accurate reporting and use in geometric improvements
- Provision of anti-crash barrier railing
- All speed breakers and humps be marked and signed adequately for night time visibility
- All traffic signage should be made retro reflective
- Create traffic safety patrol programmes for student volunteers at all schools
- Install pavement markings at all radial arterials and other major sub-arterials
- Provision of adequate street lighting on all arterials, sub-arterials, collectors, and local roads
- Setting up of a Road Accident Analysis System (RAAS)

5.8.5 Traffic Management- Area Improvement Plans

As part of the study, the CMP has identified the following areas for traffic improvement schemes such as creation of one-ways, provision of signages, relocation or removal of on-street parking etc. However, the areas identified in this report needs to be further studied and analyzed with detailed schemes and costing for implementation.

1. Circular road from Old ISBT to Gurudwara
2. Circular road at Lakkar bazaar
3. From Tolland to NH-22 via Khalini Chowk
4. Boileauganj bazaar
5. Between power house and Totu bazaar via Railway bridge
6. SDA complex
7. Ashiana Regency to Ayurvedic Hospital, Chota Shimla
8. At Kaithu bifurcation area

5.8.6 Education & Enforcement

Overall awareness of the traffic discipline and compliance with the traffic rules by road users in Shimla is far below the desired level. Traffic Police in Shimla will have to offer positive leadership in this direction to make people responsible and rule-abiding road users. Special traffic drives have to be planned by them for making the public aware of the traffic rules. In addition, imposing fines at the spot procedure for defaulters may be reviewed in view of the large backlog of pending traffic offence cases. The Road Safety programmes is aimed at users and should serve three main purposes:

1. To inform the public about the new regulations or changes to the traffic regulation system
2. To influence the attitudes towards road safety
3. To persuade road users to change their behavior in relation to identified causal factors in road accidents

5.9 Parking Demand Management Plan

Referring to section 3.8, Shimla city is experiencing acute parking problem. Due to shortage of adequate off-street parking space, on-street parking is observed along most of the major roads of Shimla. Although, SMC has authorized on-street parking in many areas by marking yellow line on the road surface, at the same time, in many places un-authorized on-street parking were also observed in many parts of the city. Considering this aspect, Shimla CMP has suggested development of off-street parking space at various locations. However, the CMP for Shimla on the one hand proposes the creation of off-street parking facilities in order to augment the parking supply, and, on the other hand, seeks to discourage the use of private vehicles by promoting public transport, and thereby tries to reduce the demand for parking. The demand for additional parking space is about 14,500 ECS. However in order to promote public transport and discourage the usage of private vehicles, the CMP for Shimla has suggested development of off-street parking space at various locations for additional 7,250 ECS meeting 50% of the total demand.

Further, the CMP has suggested development of parking lots for private vehicles at major transit interchange nodes such as terminals, major interchange points as park and ride facility. Provision of park & ride facility at following locations will not only improve the ridership for public transport but also will help in reducing the private vehicles usage. The estimated number of passenger boarding-alighting at some of the major locations are as:

1. Shoghi Market (Estimated boarding alighting of 8,005 passengers per day)
2. Taradevi Bus stand (Estimated boarding alighting of 3,941 passengers per day)
3. Multilevel Parking at New ISBT (Estimated boarding alighting of 10,640 passengers per day)
4. Near Dhalli Bus Stand (Estimated boarding alighting of 14,603 passengers per day)

Considering all these aspect, the CMP for Shimla has suggested adoption of following strategies:

(A) **Development of additional off street parking space:** In order to meet the ever-increasing parking demand, the CMP for Shimla has suggested development of off-street parking space[6] at various locations. The locations of proposed off-street parking are as furnished below and are shown in figure 5-54.

Table 5-17: Proposed off-street parking locations

Serial No	Proposed Location	Minimum Design Capacity
1	Near Sanjauli Chowk	388
2	Near Ashiana Regency (Chota Shimla Chowk)	250
3	Multilevel parking at Lift	700
4	Taradevi	700
5	Ghanahatti Market	100
6	Multi level parking at SDA complex	300
7	IGMC	400

(B) **Support public transport- Park & Ride facility**

The CMP for Shimla has suggested development of parking lots for private vehicles at major transit interchange nodes such as terminals, major interchange points as park and ride facility (refer to figure 5-55). Provision of park & ride facility will not only improve the ridership for public transport but also will help in reducing the private vehicles usage.

1. **Shoghi Market**

   Referring to Public Transport Plan, there is a proposal for developing one major transit interchange point (Integration of metro cable and city bus service) at Shoghi. Thus, providing park and ride facility at Shoghi will increase the ridership for both metro

[6] *All the proposed off-street parking space should have minimum basic community convenience facilities such as but not limited to availability of free drinking water, toilets etc.*

cable and city bus service. The proposed parking space as park & ride facility at Shoghi market should be developed for minimum of 900 ECS.

2. **Taradevi Bus stand**

   At Taradevi Bus Stand, there is a proposal of developing transit interchange point (Integration of metro cable and city bus service). Thus, providing park and ride facility at Taradevi will increase the ridership for both metro cable and city bus service. The proposed parking space as park & ride facility at Taradevi should be developed for minimum of 800 ECS.

3. **Multilevel Parking at New ISBT**

   The New ISBT is a major transit interchange point for metro cable and city bus service, provision of park and ride facility will increase the ridership for both metro cable and city bus service. The proposed parking space as park & ride facility at New ISBT should be developed for minimum of 1500 ECS.

4. **Near Dhalli Bus Stand**

   Dhalli bus stand is located along NH-22 at the periphery of Shimla municipal limit, as such providing park and ride facility at Dhalli bus stand will encourage use of public transport parking private vehicles there. The proposed parking space as park & ride facility near Dhalli bus stand should be developed for minimum of 1200 ECS.

(C) **Differential parking rates location wise**

Referring to section 3.8, the existing parking rate is uniform irrespective of the locations all the there is differential rates by type of vehicles and duration. In order to reduce the usage of private vehicles and to promote public transport, the CMP for Shimla has suggested differential rate for parking depending upon the location of parking. The parking rates at the locations other than the locations integrated with public transport nodes such as terminals or interchange points should be 1.5 to 2 times higher.

(D) **Regulation of on-street parking**

As in many places of Shimla, un-authorized on-street parking exists along with SMC authorized on-street parking (yellow lined on the road surface), due to lack of enforcement mechanism. Further, Shimla CMP has suggested development of parking lots in various parts of Shimla Planning Area, which will reduce the on-street parking demand. Considering these aspects, the CMP for Shimla has suggested ban on all unauthorized on-street parking. Further, it has also suggested removal of on street parking at:

- Shoghi Market (Since of-street parking lot have been proposed at Shoghi market)
- Sanjauli Chowk (Since of-street parking lot have been proposed at Sanjauli Chowk)

(E) **Adoption of parking regulation policy**

Adoption of appropriate parking regulations and building bylaws such as:

- Areas up to 100 m from intersections on all arms and other critical locations would be kept free from parking and other encroachments
- Suitable kerbside lengths would be kept clear of parked vehicles near bus bays
- All mobility corridors/bus routes would be declared as no-parking zones, to ensure better operational conditions for buses.
- In all “no parking” areas, only –embarkment / disembarkment will be permitted for one minute only.
- Any large-scale new development would be mandated to submit an Impact Statement, clearly spelling out the impact it will have on all urban infrastructure, especially the transport infrastructure.
- Parking should be conforming to parking standards of each premise. Differential Parking fees for additional parking space
- Where no standards are prescribed, the standards (equivalent car space) given in the Development Code section of the Master Plan, UDPFI Guidelines should be followed.

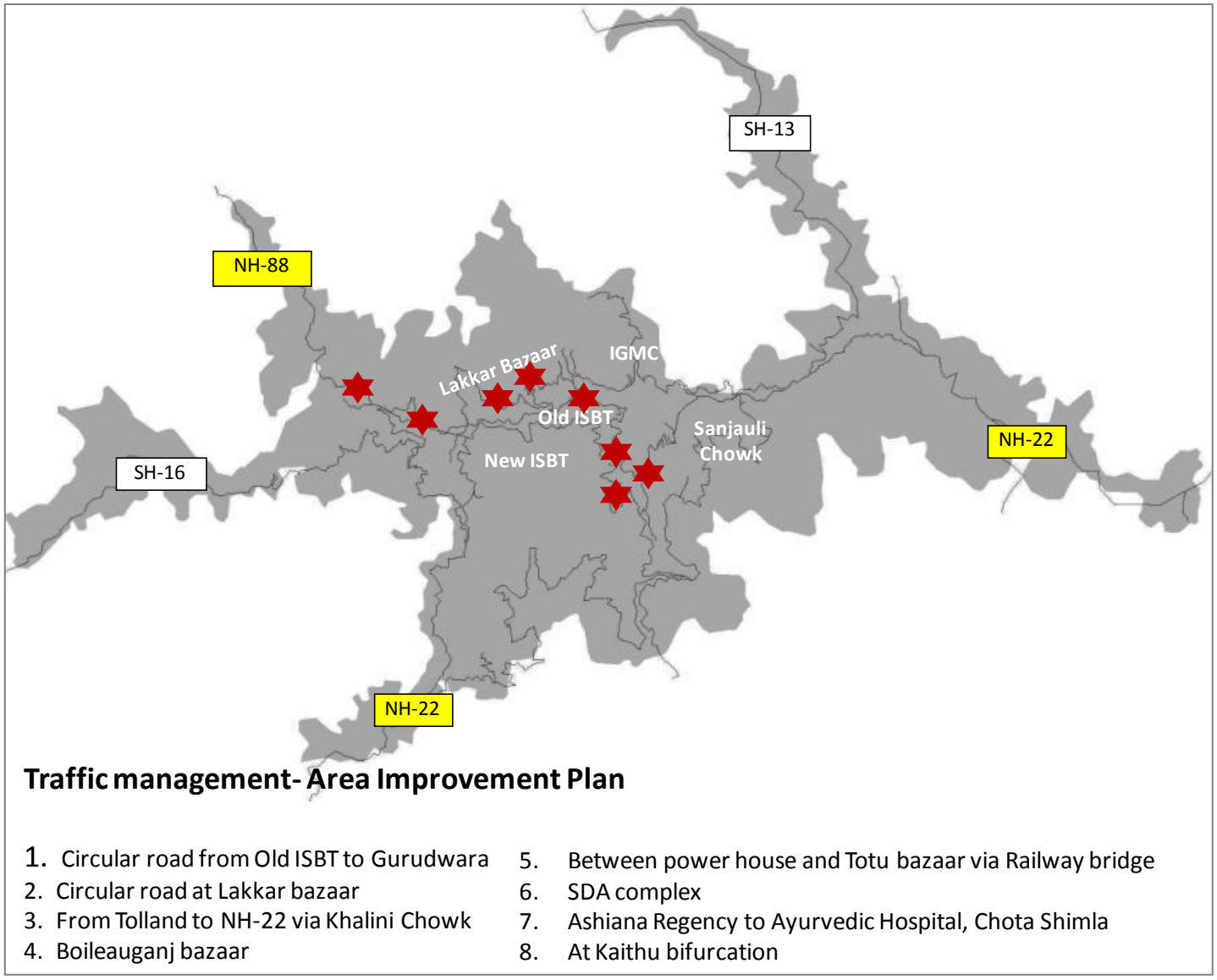


Figure 5-53: Proposed locations for implementation of traffic management plans

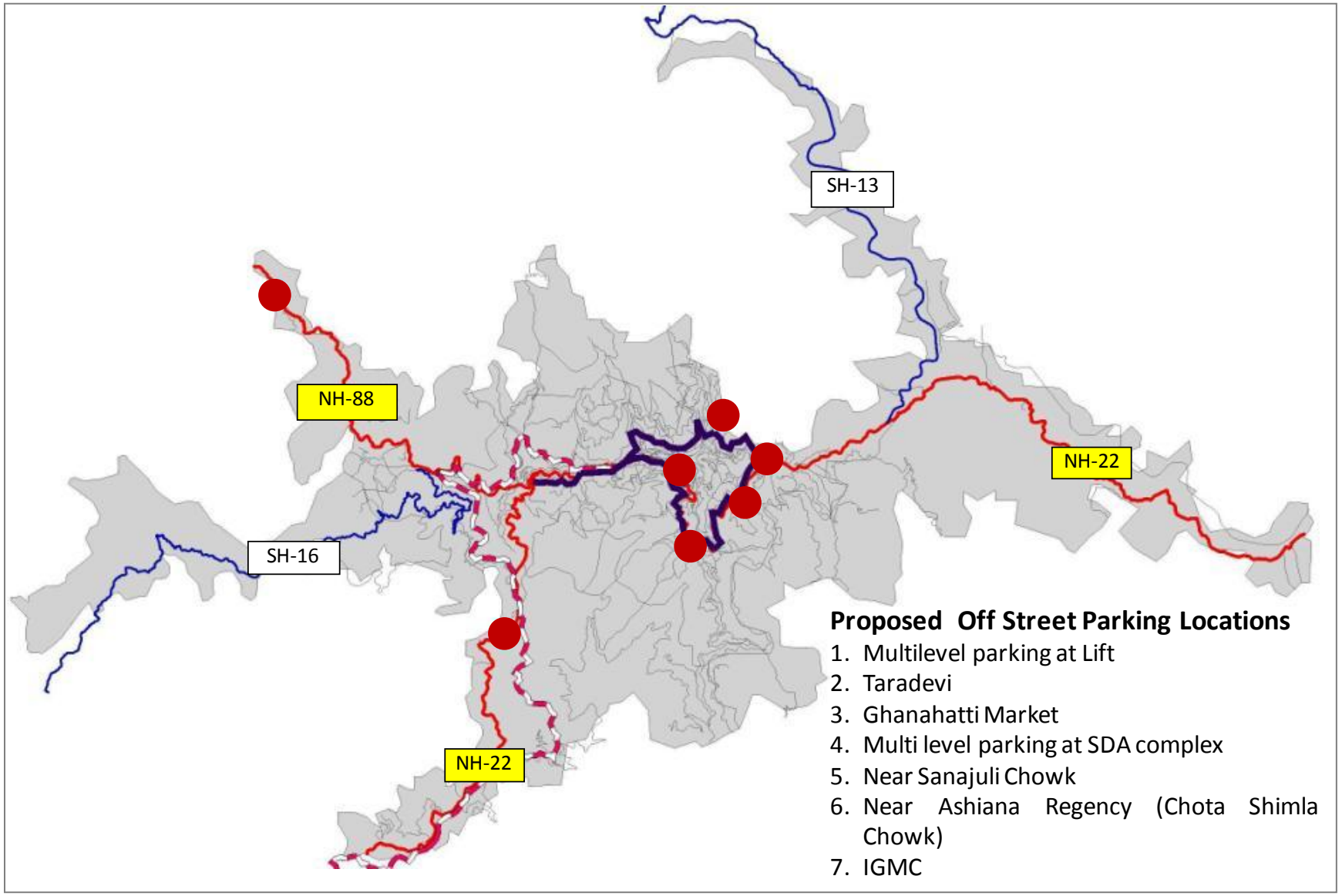


Figure 5-54: Proposed off-street parking locations

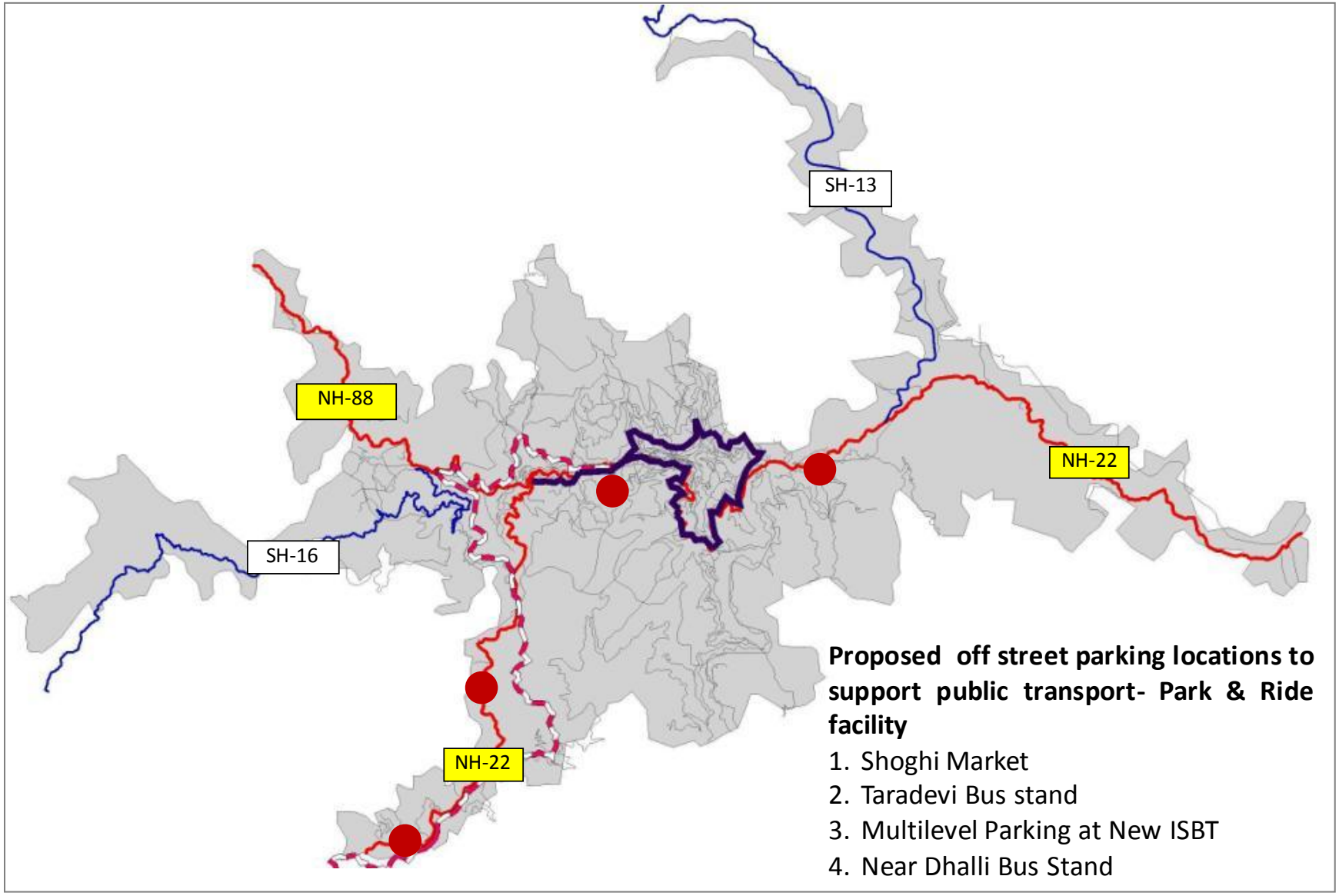


Figure 5-55: Proposed park & ride facility locations

5.10 Tourism promoting projects

The city of Shimla once known as Queen of Hills for its scenic beauty and weather, attracts tourist from various parts of the country. However, over the years, due to rapid pace of urbanization, Shimla has lost its glory. Congestion or chaotic traffic conditions is one of the main reason, for which tourists have started bypassing Shimla to other locations such Manali, Kullu etc. Further poor condition of the existing tourism-supporting infrastructure, natural parks etc has aggravated the situation.

In order to boost tourism, Shimla Municipal Corporation has prepared a Detailed Project Report (DPR) on beatification of Shimla, which has suggested improvement of 36 parks and 4 water bodies. It has also suggested improvement of facade and street-railings for etc.

In order to promote tourism, the CMP for Shimla has thrived to integrate and aligned its recommendations in conjunction with both City Development Plan and DPR on Shimla Beautification Plan.

Thus, the CMP for Shimla has suggested number of measures to reduce congestion and bottleneck points, which includes promotion of public transport by introducing Metro Cable System, Medium Capacity Rapid Transit System etc. In order to blend with Shimla Beautification Plan, the CMP for Shimla has suggested development of old pathways, which leads to parks and water bodies.

Apart from afore-mentioned, the CMP for Shimla also has suggested following measures to boost tourism:

1. Promotion of cycling as tourist attraction activity at sites such as:
    a. Bicycle sharing schemes along the route starting from St. Beds College Chowck to the Mall Road
    b. Bicycle sharing schemes at Naldehra
2. Introduction of Tourist Train connecting Summer Hill with Jutogh

Chapter 6-Implementation Programme and Costing

6 Implementation Programme and Costing

6.1 Phasing Plan

The projects identified would be phased depending upon several criteria like urgency of implementation, capital investment, ease of implementation, resource availability and environmental considerations. The phasing is generally done according to Long Term, Medium Term , Short Term and Immediate requirements.

Projects, which do not require high capital investment and resource allocation and would prove useful in providing instant relief to the traffic problems of the city are given high priority and fall under Immediate and Short Term Projects. Similarly, projects requiring high amounts of capital inflow and which have other issues like land availability problems and do not cater to immediate demand, are identified for medium and long term.

6.2 Project Prioritisation

As given in the above section, based on the detailed analysis, all the projects identified have been has been prioritized. Based on this prioritization and time taken for implementation, all the projects have been divided into immediate, short, medium and long-term projects.

6.3 Cost Estimation

The mobility plan components discussed in the previous sections were considered in the estimation of block cost for implementing the projects in the future. The approximate capital cost, excluding land acquisition, for implementing the mobility plan is about Rs 4701.42 Crores. The Phase wise costing is given in table below:

Table 6-1: Phase wise cost details

Phases	Project Cost (Rs crores)
Phase I : Immediate Projects : 2014-2015	125.40
Phase II : Short Term Projects : 2016-2019	549.01
Phase III : Medium Term Projects : 2020-2025	1500.03
Phase IV : Long Term Projects : 2026-2031	2526.99
Total	**4701.42**

The breakup of the project cost is given in the Table below:

Table 6-2: Project costing of Phase I: Immediate Projects: 2014-2015

Sl.No	Project	Quantity	Unit	Unit Rate (Rs Crores)	Total Cost (Rs.Crores)
1	Construction of Footpath	10	Km	0.47	4.73
2	Grade Separated Pedestrian Facilities	5	Nos	2.10	10.50
3	Road Marking	3.5	Ls	3.68	12.86
4	Pathways	5	Nos	5.25	26.25
5	Intersection improvement	15	Nos	0.53	7.88
6	Street Lights	168	Km	0.28	47.63
7	Traffic Management Schemes		Ls	5.25	5.25
8	Lifts /Escalator	2	Nos	0.53	1.05
9	Connectivity between Phase 3 and Phase 4	1.5	Km	4.20	6.30
10	Bike Sharing Scheme				
	Sanjauli to Mall Road				3.00
Phase I					**125.40**

Table 6-3: Project costing of Phase II: Short Term Projects: 2016-2019

Sl.No	Project	Quantity	Unit	Unit Rate (Rs Crores)	Total Cost (Rs.Crores)
1	City bus service(Bus Augmentation)	81	Buses	0.264	21.38
2	Bus Stops	65	Nos	0.110	7.15
3	Khalini Chowk Improvement	1	Nos	105.00	105.00
4	ITS on Buses	81	Ls	0.055	4.46
5	ITS on Bus Stops	65	Ls	0.066	4.29
6	Creation of Off-street parking facilities	3	Nos	11.000	33.00
7	Public Education and Awareness Program		Ls	5.500	5.50
8	Tunnels				
a	*Himfed Petrol pump to IGMC*	890	Meters	0.110	97.90
b	*Lift to Himfed Petrol Pump*	1134.92	Meters	0.088	99.87
c	*Lift to Lakkar Bazaar*	681.25	Meters	0.097	65.95
d	*Dhalli Tunnel*	147.6	Meters	0.154	22.73
9	Standardization of MC Road		Ls	74.151	74.15
10	Bike Sharing Scheme				
	IAS to University and St Beds to Mall Road				7.64
Phase II					**549.01**

Table 6-4: Project costing of Phase III: Medium Term Projects: 2020-2025

Sl.No	Project	Quantity	Unit	Unit Rate (Rs Crores)	Total Cost (Rs.Crores)
1	City bus service(Bus Augmentation)	130	Buses	0.30	39
2	Bus Stops	10	Nos	0.13	1.25
3	Construction of Footpath	14	Km	0.56	7.875
4	Grade Separated Pedestrian Facilities	5	Nos	2.50	12.5
5	Road Marking	2	Ls	2.50	5
6	ITS on Buses	130	Ls	0.06	8.125
7	ITS on Bus Stops	10	Ls	0.08	0.75
8	Pedestrianized Zones	5	Nos	6.25	31.25
9	Creation of Off-street parking facilities	2400	Ecs	0.05	120
10	Development of Freight Terminal	1	Nos	62.50	62.5
11	Network Improvement			0.00	0
a	*New Link (Taradevi to Panthaghatti)*	8	Km	8.75	70
b	*Tawi to Barrier Tunnel*	0.7	Km	43.75	30.625
c	*Connectivity between Phase 3 and Phase 4 (bridge)*	1.5	Km	125.00	187.5
12	Ropeway			0.00	
a	*Taradevi Rly Stn to University*	15		12.50	187.5
b	*Taradevi Bus Stand to Ridge*	4		12.50	50
C	*Terminal cum Depot*	2	Nos	6.25	12.5
d	*Supporting Infrastructure*	14	Nos	0.63	8.75
13	Medium Capacity Rapid Transit System			0.00	
a	*Victory Tunnel to Chota Shimla via ISBT*	8		75.00	600
b	*Terminal cum Depot*	1		10.00	10
c	*Supporting Infrastructure*	5		0.63	3.125
14	Lifts /Escalator	6	Nos	0.63	3.75
15	Street Lights		Ls	2.50	2.50
16	Traffic Management Schemes		Ls	6.25	6.25
17	Public Education and Awareness Program		Ls	6.88	6.88
18	Tourism Promoting Transport Infrastructures				
a	*Bike Sharing Scheme*	2	No	3.70	7.40
b	*Street Furniture*		Ls	6.25	6.25
19	Relocation of Mandis & Markets		Ls	18.75	18.75
Phase III					**1500.03**

Table 6-5: Project costing of Phase IV: Long Term Projects: 2026-2031

Sl.No	Project	Quantity	Unit	Unit Rate (Rs crores)	Total Cost (Rs.Crores)
1	City bus service(Bus Augmentation)	170	Buses	0.36	61.2
2	Bus Stops	35	Nos	0.15	5.25
3	Construction of Footpath	6	Km	0.68	4.05
4	Road Marking	3.5	Ls	5.25	18.375
5	ITS on Buses	170	Ls	0.08	12.75
6	ITS on Bus Stops	35	Ls	0.09	3.15
7	Pedestrianized Zones	5	Nos	7.50	37.5
8	Creation of Off-street parking facilities	3500	Ecs	0.06	218.75
9	New Bus Terminals	1	Nos	30.00	30
10	Development of New OD Bus Terminal	6	Nos	12.00	72
11	Development of Freight Terminal	6	Nos	75.00	450
12	Network Improvement			0.00	0
a	*Bypass road-Ghanghatti to Shoghi*	15	Km	10.50	157.50
b	*Bypass road-Hiranagar to Naldhera and Fagu*	25	Km	10.50	262.50
c	*Bypass road-Sanjauli to Dhalli Additional Bypas*	1.8	Km	10.50	18.9
13	Ropeway		Km	0.00	0
a	*Taradevi to Kufri*	17		15.00	255
b	*Kufri to Fagu*	4		15.00	60
c	*Supporting Infrastructure*	14	Nos	0.75	10.5
14	Medium Capacity Rapid Transit System		Km	0.00	0
a	*Victory Tunnel to Chota Shimla via Lakkar Bazaar & Sanjauli*	9		90.00	810
b	*Supporting Infrastructure*	7	Nos	0.75	5.25
15	Street Lights		Ls	6.00	6.00
16	Traffic Management Schemes		Ls	3.00	3.00
17	Public Education and Awareness Program		Ls	10.31	10.31
18	Relocation of Mandis & Markets		Ls	15.00	15.00
Phase IV					**2526.99**

6.4 Financing Options for Urban Transport Projects

As per the Recommendations of Working Group on Urban Transport for 12th Five Year Plan, the financing of urban transport projects in the country has largely been confined to gross budgetary support from the government and the user charges. Due to heavy investment needs of urban transport and conflicting demands on the general exchequer, the investment in urban transport in past has not kept pace with the rapidly increasing requirement of the sector. The current level of user charges of limited urban transport facilities, do not make the system self sustainable. At the same time, providing safe, comfortable, speedy and affordable public urban transport to all has to be a necessary goal of the governance. The key funding sources besides GBS and fare box can be dedicated levies, land monetization, recovery from non-user beneficiaries, debt and private investments. The paradigm of financing has to clearly move towards non-users pay principle and the polluters pay principle. There is a need for long-term sustainable dedicating financing mechanism to address fast worsening scenario in the field of urban transport. All the various components in which the investment would be required in the 12th Five Year Plan would need to be funded through a combination of funding from Govt. of India, State Govt./urban local body, development agencies, property development, loan from domestic and financial institutions as well as PPP. Thus, it is imperative to identify projects that are amenable to Government funding or PPP.

6.4.1 Public Private Partnership (PPP)

Public-Private Partnerships is cooperation between a public authority and private companies, created to carry out a specific project. They can take on a number of forms, and can be a useful method of capturing property value gains generated by transport infrastructure In a PPP for a new transport infrastructure development project, the public authority creates a secure environment for the private sector to carry out the project, and the private partner offers its industry know-how, provides funding and shares in the project's risk.

The objectives of the public and private sector partners appear to be quite different. The public sector aims to best serve the interests of taxpayers. The aim is not to use public money to obtain a return on capital investments. The private sector, on the other hand, aims to ensure a return on investment for its shareholders and to be as profitable as possible and yet these two contrasting goals can function perfectly well together in the framework of a PPP.

The decision to undertake a public-private partnership and the choice of the most suitable form of partnership greatly depends on the context and the type of project to be developed are given below:

- The project context may influence the type of PPP to be implemented. The public partner must evaluate the total cost of the project, its importance in terms of public need, the time frame, the number of actors involved and the geographic area in question. Does providing this public service require a major infrastructure? Will it require high levels of human and financial resources to provide this service? Before a decision can be made, it is necessary to fully understand the context of the proposed project.
- The cost of the project is of course a critical factor, which will weigh on the choice. Many PPP concern projects for underground systems, LRT and BRT requiring significant levels of financing which the local authorities would have difficulty assuming alone.
- A well-structured institutional framework and the local authority's experience in developing transport projects are also decisive factors. Urban transport is an industrial and commercial activity, which involves financial risk. Bringing in experienced partners is one way of compensating for a lack of certain skills in this field, though a good PPP should call upon other forms of expertise on the part of the public authority. This can sometimes facilitate obtaining a loan, in particular from international funding agencies.

- The tasks entrusted to the private sector (design, construction, development, operation, maintenance) will influence the type of contract.
- The sharing of responsibilities and risks will determine the degree of involvement of each partner and the type and clauses of the contract. There are many types of contracts but it is primarily the sharing of financial risk, which will determine the key characteristics. There are two categories of risk: commercial risk, related to trends in revenue, and industrial risk, related to the cost of construction and trends in operating and maintenance expenses. if both types of risk are covered by the public partner, then it would be a management contract in which the private partner is merely performing the work. The private partner must meet the specifications but will not be motivated to improve the service nor propose innovative techniques or management;
- If the project is not self-financing, i.e. if, at the end of the contract, the total revenues and gains do not balance out the total costs, the transit authority may be required to provide compensation, depending on the clauses of the contract.

6.4.2 Government sources of funding

One of the particularities of the urban transport sector is that it depends on funding from several sources and involves various partners, public and private, individual and collective.

(a) **Viability Gap Funding**

In a recent initiative, the Government of India has established a special financing facility called "Viability Gap Funding" under the Department of Economic Affairs, Ministry of Finance, to provide support to PPP infrastructure projects that have at least 40% private equity committed to each such project. The Government of India has set certain criteria to avail this facility under formal legal guidelines, issued in August 2004, to support infrastructure under PPP framework. Viability Gap Funding can take various forms such as capital grants, subordinated loans, O&M support grants and interest subsidies. It will be provided in installments, preferably in the form of annuities. However, the Ministry of Finance guidelines require that the total

government support to such a project, including Viability Gap Funding and the financial support of other Ministries and agencies of the Government of India, must not exceed 20% of the total project cost as estimated in the preliminary project appraisal, or the actual project cost, whichever is lower.

Projects in the following sectors implemented by the Private Sector are eligible for funding:

- Roads and bridges, railways, seaports, airports, inland waterways
- Power
- Urban transport, water supply, sewerage, solid waste management and other physical infrastructure in urban areas
- Infrastructure projects in Special Economic Zones
- International convention centers and other tourism infrastructure projects

(b) **JnNURM funding**

Since cities and towns in India constitute the second largest urban system in the world and contribute over 50 % of the country's GDP, they are central to economic growth. For the cities to realise their full potential and become effective engines of growth, it is necessary that focused attention be given to the improvement of infrastructure in an organised manner. As such, the JnNURM was launched in December 2005 with the aim to encourage reforms and fast track planned development of identified cities. Focus is to be on efficiency in urban infrastructure and service delivery mechanisms, community participation, and accountability of ULBs/Parastatal agencies towards citizens. The period of the Mission is seven years, up to 2012. During this period, funds shall be provided for proposals that would meet the Mission's requirements. Assistance under JnNURM is additional central assistance, which would be provided as Grant (100 % Central grant) to the implementing agencies.

The funding from JnNURM is supported by counterpart funding in the form of grants from the State and the ULBs, for which the ratio has been fixed by the Mission for different categories of cities. In the case of Shimla, the funding pattern is as follows:

- Government of India grant under JnNURM: 90%
- State Government grant under JnNURM: 10%

(c) **Dedicated Urban Transport Fund at city level**

For the projects, which are not admissible under JnNURM, or viability gap funding, the alternative sources of funding that a city could avail by setting up a dedicated urban transport fund at city level are given below:

A dedicated urban transport fund would need to be created at the city level through other sources, especially land monetization, betterment levy, land value tax, enhanced property tax or grant of development rights, advertisement, employment tax, congestion, a cess on the sales tax, parking charges reflecting a true value of the land, traffic challans etc.

Pimpri-Chinchwad Municipal Corporation has already set up a dedicated urban transport fund through land monetization and advertisement rights. Similarly, Karnataka has set up a dedicated urban transport fund through MRTS cess on petrol and diesel sold in Bangalore, which is being used to fund the metro rail projects. The various sources of funding that can be used to set up the urban transport fund is given below:

(i) **Anticipated purchase of land**

This method involves public authorities buying land before announcing that an infrastructure will be built or where the route will run. In this way, the purchase can be made at market price without the infrastructure. The strategy then consists in:

- Directly selling the land to private developers including the estimated added value in the sale price, such as was done in Aguas Claras on the periphery of Brasilia, or in Copenhagen;

- Developing the area as part of an urban renewal project and then selling it at market price, as was done in Copenhagen or in Japan, where rail companies were the first to use this method to finance their operations

A city can also levy additional stamp duty (5%) on registration of property.

(ii) **Betterment Tax**

A betterment tax is not the same as a property tax, because the increase in value of property is not due to the action of the owner (such as would be the case with renovations and improvements) but from a community action, thus justifying the public authorities to impose such a tax. However, it is not easy to implement, which no doubt explains why this financing mechanism is still underused.

This tax must be levied on all areas that benefit from the new transport infrastructure. The land is valued each year based on an optimal use of each site, without taking into account the existing facilities. A tax based on the value of the land is then levied in order to generate funds for the public sector. Thus, if the value of the land increases, the tax collected also increases. This means that a vacant plot of land in the city centre which has been earmarked for building a residential and commercial complex will pay the same tax as an identical site which has already been developed in a similar manner. Unlike construction taxes, no tax reduction is available to landowners who leave the site empty. Likewise, taxes are not increased if the site is built upon. Landowners will therefore to seek to capitalise on the use of their land.

(iii) **Land Value Tax**

Once an area is well connected by public transport and is accessible to the commercial area and also the liveability of the area increases it is possible that the price of the land will increase. Such increase in price can be source revenue for the municipality. Similar to parking, the obtained revenue needs to be

utilized for improvement of the area and other areas in the vicinity. A substantial amount of revenue could be generated through cess on turnover, particularly in cities, based on industry, trade and commerce activities. Such cess has already been levied for Bangalore MRTS project. Bangalore has also levied luxury tax and professional tax towards the metro fund.

(iv) **Advertising**

This is another important source of revenue for the city. When properly utilised this source can be of immense value in supporting sustainable urban transport measures in a city. The revenues from advertising in the city can be used to improve the existing transport system and/or create new schemes in sustainable transport.

Paris, France has used the advertising money in developing a public bike scheme, which is now a well renowned model. Similarly, Transport for London (TfL) has made a deal with the advertising specialist, Clear Channel, for the regular maintenance and design of the street furniture in return for the advertising space on bus shelters.

One important aspect that needs to be considered is that the advertising money needs to be utilised for improving the transport system rather than spending it on building more roads. In the similar way, the advertising should not be overdone to avoid visual pollution. Further, ideally advertising revenue should not be a reason for building of pedestrian overpasses as the greater good for the society from these overpasses is minimal.

(v) **Green Fee**

The Municipal Corporation of Shimla has decided to levy and charge a fees on vehicles entering in Shimla bearing registration numbers other that State of Himachal Pradesh at following four locations:

1. NH- 22 at Tara Devi on entry point of M.C. Limit
2. Totu near Tawi
3. Mehali near police post
4. Dhalli, Shimla

The rates/fees for various class of vehicles entering Shimla town bearing registration plates other than the State of Himachal Pradesh as follows w.e.f from 1st April 2012.

(i) Two Wheelers: ₹ 100/-
(ii) Car & Jeep: ₹ 200/-
(iii) MUV's (Tata Sumo, Safari, Scorpio, Qualis, Bolero, Maxi Cab & Utility Vehicles): ₹ 300/-
(iv) Buses, Trucks and other heavy vehicles: ₹ 500/-

The rate of fees would be valid for a period of only 7 days and would be called as Composite Environment Fees (CEF). Although, it is proposed by the Municipal Corporation Shimla to utilize the fees collected for tourism related activities, however a certain percentage of proceeds should be transferred to the Urban Transport fund.

6.4.3 Sources of Finance

Based on the above possible sources of funding, and based on broad guidelines as per the Working Group Report for 12th 5 year Plan, the sources of financing for all the projects are given in figure 6-1 to figure 6-4 below:

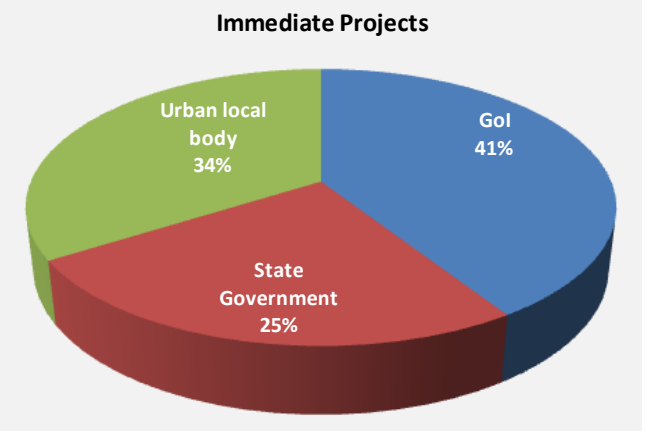


Figure 6-1: Sources of finance for immediate projects

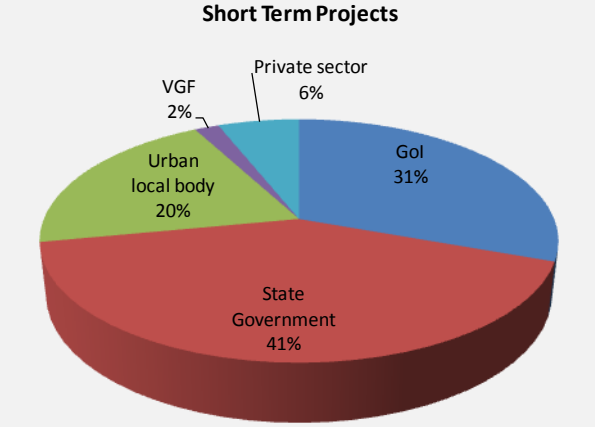


Figure 6-2: Sources of finance for short term projects

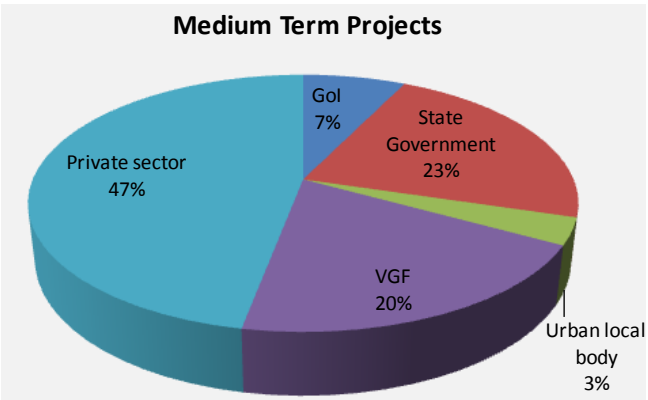


Figure 6-3: Sources of finance for medium term projects

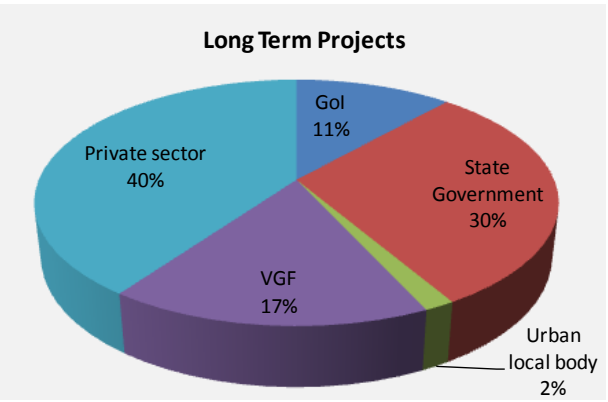


Figure 6-4: Sources of finance for long term projects

Referring to table 6-6, it is evident that private sector (37.3%) is one of the major sources of finance for financing urban transport projects in shimla.

Table 6-6: Sharing of funding

GoI	State Government	ULB	VGF	Private sector	Total
619.3	1353.0	244.3	732.5	1751.8	4700.8
13.2%	28.8%	5.2%	15.6%	37.3%	100.0%

6.5 Revenue Estimates

Based on traffic volumes, emerging from the primary surveys, an estimation of the revenue potential during implementation period from Fare box revenue, Parking Fees, Advertisement revenue and Green fees is given in Table 6-7.

Table 6-7: Revenue Estimates

S.no	Revenue Sources	Phase I : 2014-2015	Phase II : 2016-2019	Phase III : 2020-2025	Phase IV: 2026-2031
1	**Fare Box Revenue**				
	Bus		51.57	110	304
	Metro Cable		0	29.3	44.4
	MCRTS		0	3.1	10.9
	Subtotal (Rs crores)		52	143	359
2	**Advertisement Revenue**				
	Bus		5	11	30
	Metro Cable		0	3	4
	MCRTS		0	0	1
	Subtotal (Rs crores)		5.2	14.3	35.9
3	**Parking Fees**				
	Existing sites	5.0	5.0	5.0	5.0
	Additional 3 Sites		12.0	12.0	12.0
	Proposed sites			20	28
	Subtotal (Rs crores)	5.00	17.00	37.00	45.00
4	**Parking Advertisement Revenue**				
	Existing sites	0.5	0.5	0.5	0.5
	Additional 3 Sites		1.2	1.2	1.2
	Proposed sites		0.0	2.0	2.8
	Subtotal (Rs crores)	0.5	1.7	3.7	4.5
5	Green Fees				
	Subtotal (Rs crores)	34.5	34.5	34.5	34.5
	Total (Rs crores)	40.0	109.9	232.3	478.8

Although initially, the fare box revenue potential is low, but once the proposed new public transport system (Metro cable or Ropeway, MCRTS etc.) establishes itself as an acceptable alternative public transport mode over a period of two to three years the revenue generated from this system will go up.

Chapter 7-Institutional Framework

7 Institutional Framework

7.1 Introduction

City transport system generally involves several organisations that look after various forms and aspects of the transport system and network and have overlapping functions and areas of work. The existing institutional setup in Shimla includes a variety of institutions sharing their responsibilities in different aspects of governance of Shimla Planning Area. Municipal Corporation of Shimla, which is primarily responsible for the governance of the city and for providing urban infrastructure and services to its citizens, is one of them for instance. Aside from the local level institutions, various departments and agencies from the State Government play important roles. Therefore, to delineate areas of operation and to remove ambiguity of functions, the institutional framework has been proposed.

Departments and Organisations involved in Urban Affairs and Urban Transport

- Directorate of Urban Development
- Municipal Corporation Shimla (MCS)
- Public Works Department
- National Highway Authority of India (NHAI)
- Superintendent of Police (Traffic), Shimla
- Himachal Pradesh Housing and Urban Development Authority (HIMUDA)
- Directorate of Town and Country Planning
- Special Area Development Authority (SADA)-Ghanahatti, Kufri, and Shoghi
- Himachal Road Transport Corporation (HRTC)
- Indian Railways (Northern Railways)
- State Pollution Control Board, Shimla
- Regional Transport Office (RTO)
- Office of the District Collector, Shimla

7.2 Existing City Level Institutions

(a) **Municipal Corporation Shimla (SMC)**

Shimla was first constituted as Municipal Committee in 1851 and became class I Municipality in 1871. In 1874, it was brought under Punjab Municipal Act, 1873. After Shimla becoming part of Himachal Pradesh on reorganization of Punjab, pursuant to

Himachal Pradesh (Development and Regulation) Act 1968, Shimla Municipal Committee was converted into Corporation in 1969.

The functional domain of SMC is derived from HP Municipal Corporation Act 1994 which lists obligatory and discretionary functions for SMC and functions entrusted by GoHP to SMC as per the 12th Schedule of the 74th Constitution Amendment Act. Local level governance; Primary Collection of Solid Waste; Maintenance of Storm Water Drains; Maintenance of municipal roads; Allotment of Trade Licenses under the Prevention of Food Adulteration Act; O&M of internal sewers and community toilets; Street lighting.

(b) **Special Area Development Authority (SADA)**

GoHP has notified Ghanahatti, Kufri, and Shoghi as Special Areas under Town and Country Planning Act 1977. The Special Area Development Authority (SADA) for respective special area is responsible for planning, implementation of development plan and provision of municipal services in notified special areas. Deputy Commissioner, Shimla is the chairperson and Town and Country Planner is Member Secretary of three notified SADAs in Shimla Planning Area. The other members include SDM, Executive Engineers and village panchayat heads. TCP staff provides operational support to the SADA. Provision of services is actually done by SMC and parastatal agencies.

(c) **Cantonment Board**

In 1924, the Government in Council declared Jutogh as a Cantonment Board under Section 2, clause XV of the Cantonment Act, 1924. The cantonment board is spread over an area of 1.41 Sq. Km. The Cantonment was originally built for and occupied by Gurkha Troops but after 1857 revolt a mountain battery was quartered and thereafter a detachment of British Infantry was stationed. The Board served a population of 1396 in 1981 in civil area. Number of houses in the Board area is 109. Present population according to 1991 census is 1636. Board obtains its water supply in bulk

from military station and re-distributes it in the Board area. Cantonment Board provides basic amenities in cantonment area.

(d) **Shimla Urban Transport Management Society**

The Directorate of Urban Development, Government of Himachal Pradesh in December 2009 has set up an autonomous society for operation and management of urban buses in the cities as the guidelines of JnNURM for operating city bus service in Shimla.

7.3 Existing State Level Institutions

7.3.1 Directorate of Urban Development

The Directorate of Urban Development was established in 1985 to direct, control and monitor activities of 53 Municipalities, 1 Municipal Corporation, 20 Municipal Councils, and 32 Nagar Panchayats in the state of Himachal Pradesh. Till 1994, the Directorate was performing nominal regulatory functions of coordination of development works, release of grants and passing of municipal budgets. Pursuant to 74th CAA and enactment of H.P. Municipal Corporation Act, 1994, Directorate is directing, supervising and controlling authority, which acts as a bridge between government and urban local bodies.

Main functions performed by the Directorate are:

- Recommendation for amendments in Acts Rules/Regulations and Bye-Laws of the Urban Local Bodies;
- Implementation of centrally sponsored schemes; and Inspection and monitoring
- Periodical Inspections of Urban Local Bodies
- Scrutiny of development work estimates
- Improving service condition of the Employees of the Urban Local Bodies
- Election matters of Municipalities
- Regulating finances of the Urban Local Bodies
- Streamline the tax structure of the municipalities to increase their finances

7.3.2 Himachal Pradesh Housing and Urban Development Authority (HIMUDA)

Erstwhile, H.P Housing Board established in 1972 was re-christened as H.P Housing And Urban Development Authority (HIMUDA) in 2004. HIMUDA was formed in 2004 under Himachal Pradesh Housing and Urban Development Authority Act 2004, with objective of establishing a Development Authority to be entrusted with tasks such as planning, land-development, and creation of necessary infrastructures to meet the housing demand of different income groups. HIMUDA is also entrusted for promotion and development of various schemes for mobilizing public and private resources for development of housing colonies and related infrastructures.

The main aim of the Authority is the development of housing colonies at various places of the State under different housing schemes like Social Housing Schemes, Self Financing Schemes, Rental Housing Schemes for HP Govt. employees, Police Personnel etc. by taking loan from financial institutions like HUDCO, National housing Bank etc. or by inviting public finances. Authority has also executed prestigious deposit work projects of different Departments like Tourism, Urban Development, Education, HIPA, Social Justice and Empowerment, Department of sports and Youth Services, Police, Prison, Health, Animal Husbandry and Fisheries, Horticulture etc. HIMUDA is designated as SLNA for implementation of JnNURM and UIDSSMT in Himachal Pradesh.

7.3.3 Department of Town and Country Planning, Himachal Pradesh

For planning, development and use of land and execution of town and country development plan, Government of Himachal Pradesh established Directorate of Town and Country Planning (TCP) under the Himachal Pradesh Town and Country Planning Act 1977. The functions of Town and Country Planning include:

- Constitution of planning/special areas;
- Preparation of existing landuse, development plan for planning area;
- Implementation of approved/notified development plan or interim development plan; and
- Preparation of sectoral plans and town planning schemes

TCP is regulatory authority for implementation of Interim Development Plan 1979. It has prepared Development plan of Shimla Planning Area, which is awaiting approval and notification from GoHP.

7.3.4 Himachal Pradesh Publics Works Department

Himachal Pradesh Publics Works Department (HPPWD) is engaged in planning, construction and maintenance of roads, bridges, ropeways and buildings (both residential and non-residential of various Govt. departments) in the State. The department further executes engineering work on behalf of Local Bodies, Public Undertakings, Boards & other Institutions under Himachal Pradesh Government as "Deposit works".

7.3.5 HP State Environment Protection and Pollution Control Board

HP State Environment Protection and Pollution Control Board is a regulatory body constituted in 1974 under provision of Water (Prevention & Control of Pollution) Act 1974. The main function of HP State Environment Protection and Pollution Control Board is to plan a comprehensive program for prevention, control and abatement of pollution.

7.3.6 Himachal Road Transport Corporation

Transport in Himachal Pradesh came into existence as a Himachal Government Transport in July 1949 and continued to function as such till 1974. In 1958, the Govt. of Punjab, Government of Himachal Pradesh and Railways under Road Transport Corporation Act, 1950 floated a Corporation jointly in a name and style as “Mandi Kullu Road Transport Corporation” to operate the joint routes in the States of Punjab and Himachal. With the re-organization of Punjab State in 1966 certain hilly areas of Punjab were merged in Himachal and operational areas of Mandi Kullu Road Transport Corporation came entirely under GoHP. In 1974, Himachal Government Transport was merged with Mandi Kullu Road Transport Corporation and was renamed as Himachal Road Transport Corporation under Road Transport Corporation Act, 1950. HRTC is responsible for provision of regional and local transport services including city bus services in Shimla.

7.3.7 HP Bus Stand Management and Development Authority

Himachal Pradesh Government has constituted HP Bus Stand Management and Development Authority (HPBMDA) under HP Bus Stand Management and Development Authority Act 1999. HPBMDA is responsible for planning, development, construction, operation, and maintenance of Bus Stands in Himachal Pradesh. The Act provides for revenue streams comprising of Adda Fees, parking charges and other user charges for passenger amenities for HPBMDA for its sustainability.

7.3.8 HP Tourism Development Corporation

HP Tourism Development Corporation (HPTDC) was established in 1972 to facilitate development of tourism in the State. Besides operating hotels in Shimla, HPTDC manages Tourist Information Centre and passenger lift between Cart road and Mall Road.

7.3.9 HP Infrastructure Development Board (HPIDB)

HP Infrastructure Development Board has been constituted in January 2002 under HP Infrastructure Development Act 2001, which provides framework for private sector participation in financing, construction, operation and maintenance of infrastructure projects and to raise resources on behalf of State Government for infrastructure projects development.

The Chief Secretary heads the HPIDB and Finance Secretary is Chief Executive Officer (CEO) of the Board. The Board does not have any independent funding source and is dependent on GoHP budgetary allocation and borrowing through issue of bonds, debentures, loans or such other instruments. The investments raised is used for financing the expenditure under State Plan against the unconditional and irrevocable State Government Guarantee. The role of HPPIDB is limited to raising finances for GoHP and its role as a nodal agency for private sector involvement in infrastructure projects so far is negligible.

7.4 Issues with the Present Institutional Set up

As observed, there are multiple organizations that are involved in urban and rural planning for the City and Region. The municipal corporation's role in urban transport is miniscule and

so is their area of control. The HPPWD and NHAI are in charge of constructing roads and maintaining them; however, their functioning is independent of the urban/rural planning body of the state. Bus operations, land ownership issues, collection of parking fees and traffic violation fines, NMT planning, pedestrian safety, etc are several issues that are interconnected, but they fall under the ambit of completely disconnected organisations. Some of these issues are listed below:

- There is no clear segregation between the planning and implementing bodies.
- There is lack of coordination amongst all the departments in the urban transport sector.
- All departments related to urban transport do not function in coherence.
- Road projects are implemented in isolation with other projects, which should otherwise be an integral part of road development like footpath, cycle tracks, pedestrian facilities, etc.
- Operation issues in public transport due to poor route and service planning.
- There is no dedicated organisation that is in charge of long-term urban transport planning for the city.

Thus, the need is felt for setting-up an umbrella level organisation for the overall planning and monitoring of the Urban Transport in the city.

7.5 Proposed Institutional Framework

7.5.1 Unified Metropolitan Transport Authority

With a view to coordinate all urban transport activities in the city, it is recommended that a UMTA be set up for the Shimla Planning Area that acts as a planning and decision-making body for all matters related to urban transport in the city.

It is recommended that the city level UMTA be set up on an executive order for the ease of formation; however, it must be given a legal backing so that its functioning falls under an act and commands greater authority.

7.5.2 Broad Functions

The following functions are proposed to fall under the purview of the city level UMTA:

- Undertake overall planning for public transport in the city, covering all modes - road, rail, water and air transport systems
- Allocate routes amongst different operators
- Procure public bus services for different routes through contracting, concessioning, etc.
- Ensure compliance of terms and conditions of license
- Recommend revocation of license for non-compliance of terms and conditions of the license
- Carry out surveys and manage a database for scientific planning of public transport requirements
- Co-ordinate fare integration among different operators of public transport and determine the basis for sharing of revenues earned from common tickets or passes
- Operate a scheme of passes for the users of public transport and channelise subsidies to operators for any concessions that are offered in accordance with government policy
- Regulate the arrangement amongst operators for the sharing of their revenue derived from the use of passes
- Promote efficiency in public transport operation
- Protect the interest of the consumers
- Settle disputes between different public transport operators and between operators and infrastructure providers
- Levy fees and other charges at such rates and in respect of such services as may be determined by regulations

7.6 Proposed Structure of UMTA

The National Urban Transport Policy, 2006 and GoI recommends setting up of UMTA in all million-plus cities, the extract of which is re-produced herein below:

"The current structure of governance for the transport sector is not equipped to deal with the problems of urban transport. Those structures were put in place well before the problems of urban transport began to surface in India and hence do not provide for the right co-ordination mechanisms to deal with urban transport."

The Central Government will therefore recommend the setting up of Unified Metropolitan Transport Authorities (UMTAs) in all million-plus cities to facilitate more co-ordinated planning and implementation of urban transport programmes and projects and an integrated management of urban transport systems. Such Metropolitan Transport Authorities would need statutory backing in order to be meaningful.

The Central Government would also encourage the setting up of professional bodies that have the capacity to make scientific assessment of the demand on various routes and contract services that can be properly monitored. Towards this end, it would encourage the setting up of umbrella bodies that regulate the overall performance of the Public Transport System and ensure that the city has a Comprehensive Public Transport System".

The overall aim of the UMTA will be to promote public transport in the urban areas through formulation of policies, programmes, rules and regulations related to urban transit. Its function is to facilitate/ co-ordinate planning and implementation of urban transport programmes and projects in an integrated management framework. To be effective, such Urban Metropolitan Transport Authority would need statutory backing.

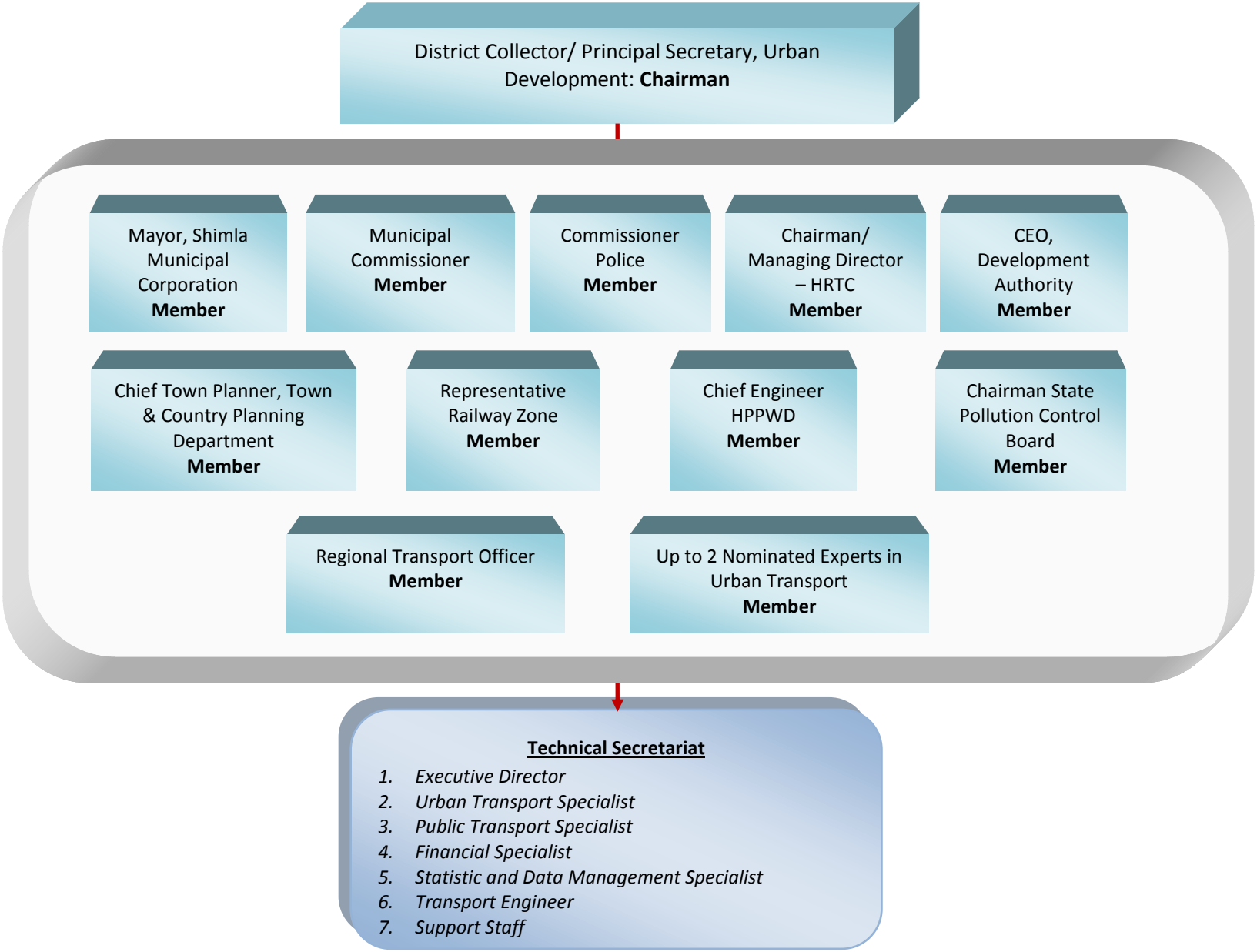
The National Urban Transport Policy clearly identifies land use and transport as two intricately linked elements of urban system that has bearing on each other. Hence, the distinctive role of UMTA regarding formation of progressive land use and transportation policy for metropolitan area becomes critical.

Although Shimla is not a million plus city, but considering its importance as state capital and prime hub for trade & commerce of the state, the CMP for Shimla has suggested to form UMTA under the Directorate of Urban Development Department, Government of Himachal Pradesh. Formation of UMTA will not only ensure reduction of overlapping of

responsibilities towards delivery of urban transport but will also make the whole system of delivery mechanism more efficient and effective.

7.7 Composition of UMTA

As per the National Urban Transport Policy (NUTP-2006), representation of agencies involved in the preparation of land use and transportation plan is required in UMTA. In the light of the above guidelines/recommendations, the following structure is proposed for UMTA:


District Collector/ Principal Secretary, Urban Development: **Chairman**
Mayor, Shimla Municipal Corporation **Member**
Municipal Commissioner **Member**
Commissioner Police **Member**
Chairman/ Managing Director – HRTC **Member**
CEO, Development Authority **Member**
Chief Town Planner, Town & Country Planning Department **Member**
Representative Railway Zone **Member**
Chief Engineer HPPWD **Member**
Chairman State Pollution Control Board **Member**
Regional Transport Officer **Member**
Up to 2 Nominated Experts in Urban Transport **Member**
Technical Secretariat
1. *Executive Director*
2. *Urban Transport Specialist*
3. *Public Transport Specialist*
4. *Financial Specialist*
5. *Statistic and Data Management Specialist*
6. *Transport Engineer*
7. *Support Staff*

Besides the above members, Government of HP could invite representatives from other government departments, Vice Chairman (VC) of the concerned city development authority, bus operation unions, and other unions directly and/or indirectly related to provision of public transport, etc. as considered necessary from time to time.

7.8 Legal backing of UMTA

In order to give UMTA objectives, functions and operations a legal status, a draft Act has to be prepared by UMTA to be taken up for approval by the State Cabinet after finalisation. The draft Act shall cover the following:

1. Objectives and functions of UMTA
2. Operational area of UMTA
3. Powers and delegation of powers of UMTA
4. Authority to have power to acquire land by agreement
5. Power of Government to transfer to the Authority lands belonging to it or to other ULBs, etc.
6. Power of Authority to borrow
7. Laying of annual estimate of income and expenditure
8. Authority to approve or amend such estimate
9. Estimates to be submitted to Government for sanction
10. Supplementary estimates may be prepared and submitted when necessary
11. Provisions regarding expenditure
12. Accounts and audit
13. Schedule of officers and employees to be submitted for sanction of Government
14. Appointments, etc., by whom to be made
15. Powers of entry
16. Directions by the Authority
17. Members and officers to be public servants
18. Power to make rules
19. Power to make regulations

7.9 Manpower Requirement and Staffing Plan

UMTA shall have to avail the services of an expert team of traffic and transportation planners, engineers, urban planners and other technical advisers. In order to strengthen its human resource, UMTA shall have to form a schedule of officers and employees whom it shall deem it necessary and proper to maintain for the purposes of UMTA Act. In addition to this, various powers related to appointment, promotion, suspension, etc shall also have to be worked out as per the Government's schedule.

7.10 Urban Transport Fund (UTF)

As cities and towns are the generators of national wealth, there is a growing recognition that the resources needed for urban development be generated from within the urban economies by use of principles like "beneficiaries pay", "users pay" and "polluters pay". Provision of public transport/transit facilities act as 'facilitators' and go a long way in triggering the multiplier effect in the city economy. As per the guidelines of National Urban Transport Policy, an Urban Transport Fund is desired to be set up to sustain and expand the transit operations (city buses) and to develop the transit infrastructure (bus stands, terminals, inter-changes, depots, workshops, etc).

A reasonable quality of service has to be maintained in order to encourage residents to use public transport instead of private vehicles. From domestic and worldwide experience, we know that as the fares are regulated, city bus operations would be a loss-making proposition from operations' point-of-view. There would be a viability gap and hence, non-operational revenues and state support would be required to bridge the gap.

Public transport sector in most cities have been running in losses leaving little or no scope for enhanced services to the users. On the physical infrastructure side, vehicle sales generate large revenues, through taxation. Most of the proceeds, however, are treated as general taxes and do not trickle down to the urban area level as a ready pool of resources for urban transport projects.

It is thus suggested that a separate collection of funds be generated locally so that the same may be spent locally on development and maintenance of urban transport

infrastructure. This fund can be managed by a professional fund manager appointed by the city level Unified Metropolitan Transport Authority so that the balances in this fund can earn appropriate returns, in accordance with prevailing market potential.

Any local investment proposal that would require funding/part-funding from the Local Govt. /State Govt. could be posed to the UTF for financial support. Approval could be given by the UMTA, after due appraisal by the Local Administrator/Secretariat.

7.11 Implementing Agencies

Based on roles and responsibilities of various institutions, the agency responsible for implementation of the proposed projects in the CMP are given in Table 7-1.

Table 7-1: Details of Implementing Agencies

S.No	Projects	Agencies responsible for Implementation	Implementation Options	
			Construction	Operation/Maintain.
1	Construction of Footpaths	Municipal Corporation Shimla/HPPWD	HPPWD/ULB	ULB/ HPPWD
2	Grade Separated Pedestrian Facilities	HPPWD	HPPWD/ ULB	ULB/ HPPWD/ Private
3	Road Marking	Municipal Corporation Shimla	HPPWD/ ULB	ULB/ HPPWD/NHAI
4	Restoration of Pathways	Municipal Corporation Shimla	GoI/State Govt/ ULB	ULB/ HPPWD
5	Intersection improvement	HPPWD/ MC Shimla/NHAI	State Govt/ ULB	HPPWD/NHAI
6	Traffic Management Schemes	Municipal Corporation Shimla/ Traffic Police	State Govt/ ULB	HPPWD
7	City bus service(Bus Augmentation)	HRTC	GoI/ State Govt/ Private	Private
8	Bus Stops	Municipal Corporation Shimla/ HRTC	State Govt./Private	Private
9	ITS on Buses	HRTC	GoI/ State	Private

S.No	Projects	Agencies responsible for Implementation	Implementation Options	
			Construction	Operation/Maintain.
10	ITS on Bus Stops	HRTC	Govt./ ULB	
11	Off street parking facilities	Municipal Corporation Shimla/SADA	Private	Private
12	Public Education and Awareness Program	Directorate of Urban Development/ Traffic Police	GoI/ State Govt	Public Education and Awareness Program
13	Bike Sharing Scheme	Municipal Corporation Shimla/ Directorate of Urban Development	State Govt./ Private	Private
14	Development of Freight Terminal	HPIDB/ HP State Agricultural Marketing Board	State Govt/Private	Private
15	Network Improvement	HPPWD/ NHAI/HPIDB	HPPWD/ NHAI/Private	HPPWD/ NHAI/Private
16	Ropeways	HPIDB/ Directorate of Urban Development	GoI/State Govt/ ULB/Private	HPPWD/ Private
17	Medium Capacity Rapid Transit System	HPIDB/ Directorate of Urban Development	State Govt/ ULB/Private	HPPWD/Private
18	Lifts /Escalator	Municipal Corporation Shimla/ Directorate of Urban Development/HPPWD	GoI/State Govt/ ULB/ Private	Private
19	Street Lights	Municipal Corporation Shimla/SADA	State Govt/ ULB	HPPWD/Private
20	Relocation of Mandis & Markets	HPIDB/ HP State Agricultural Marketing Board	State Govt./Private	Private
21	New Bus Terminals	HPIDB/ HRTC	Private	Private
22	Development of New OD Bus Terminal	HPIDB/ HRTC	Private	Private
23	Development of Freight Terminal	HPIDB/ HP State Agricultural Marketing Board	State Govt./Private	Private

Chapter 8-Environmental and Social Impact Assessment

8 Environmental and Social Impact Assessment

8.1 National Level Policy and Legal Framework

As per Section 3 of EIA Notification S.O. 1533 dated 14th September 2006, the Central government formed a State-level Environment Impact Assessment Authority. All projects and activities are broadly categorised into two categories as Category A and B. The projects which have been classified as Category A projects are those having potential impacts on human health and natural and man-made resources. Those projects require prior environmental clearance from the Central government in the Ministry of Environment and Forests (MoEF). The projects categorised as Category B projects require prior environmental clearance from the State/Union Territory Environment Impact Assessment Authority (SEIAA). The SEIAA's decisions are based on the recommendations of a State or Union Territory-level Expert Appraisal Committee (SEAC) as to be constituted for in this notification.

8.2 Screening and Identification of Impacts

Environmental and social screening is intended to provide inputs into identification of potential impacts with the implementation of the CMP. Screening is conducted by identifying the interaction of environmental components on the project activities for various projects. Screening conducted for the identified projects and respective impacts identified are presented in the Table 8-1 given below.

Table 8-1: Environmental Impacts of Important Projects

Broad Project Category	Activities / Sub Components	Impacts
Regional Hubs based on Transit Oriented Development principles	• Development of serviced land for high density development • Public transport interchange hubs	• Land acquisition from farmers • Construction activity around the highway

Broad Project Category	Activities / Sub Components	Impacts
Pedestrian / NMT Infrastructure Improvement	• Land acquisition for road widening and creation of service lane wherever necessary	• Relocation of existing vending activity • Removal of squatters and encroachers from the footpaths • Causing livelihood losses even though they are illegal • Loss of shelter for temporary shops / residences for squatters and encroachers
	• Construction of new footpaths	• Improvement in safety of pedestrians due to measuresproposed
	• Pedestrian Infrastructure development like subways/foot over bridges/ signals etc	• Improvement in pedestrian safety • Slowing of traffic at the time of constructing and erecting structures across major intersections
Public Transport Planning	• Dedicated public transport network	• Land acquisition for dedicated lanes will cause R&R issues • Use of existing pavement width for dedicated bus lanes will cause removal of squatters and encroachments from road sides causing loss of livelihood and loss of shelter • Construction / reconstruction / improvement of bus lanes will be causing construction issues such as: ▪ Generation of noxious gases during construction, increasing air pollution ▪ Temporary increase in noise pollution during construction ▪ Contamination of road runoff with construction material stacked on road side ▪ Traffic safety during construction ▪ Traffic diversions causing lengthening of routes increasing air emissions and exposing previously unexposed neighbourhoods to noise • Reduction of additional lane width for other traffics if existing road width is used for demarcating the dedicated bus lanes • Reduction in private vehicles causing reduction in air/noise pollution
	• Terminals/Depots/Commuter Amenity	• Acquisition of land for the facilities causes R&R issues as loss of livelihood, loss of shelter,

Broad Project Category	Activities / Sub Components	Impacts
	Centers	severance of community & social ties • Increase of noise and air pollution in the areas of terminals and depots • Improvement in approaches to the terminals and depots causing impacts on adjacent landuses and land acquisition • Additional land acquisition, if any, for the approach road improvement will lead to R&R issues along the roads and cause impacts on livelihood and shelter • Construction of stage impacts include the increase in air and noise pollution • Contamination of road runoff with stacked construction materials • Improvement of traffic conditions during operation stage causing reduction in air and noise pollution
	• Bus-Stops and FOBs/Sub-ways	• Temporary interruption to traffic and increase of emissions from vehicles due to higher idling times • Temporary increase of noise levels due to idling and traffic snarls • Alternate traffic diversion routes increasing route length and consequently emissions • Alternate traffic diversion routes exposing previously low traffic routes to higher urban traffic and increasing air/noise pollution • Removal of squatters and encroachers from the footpaths causing livelihood losses at approaches to the sub-ways / FOBs • Loss of shelter for temporary shops / residences for squatters and encroachers at approaches to the sub-ways / FOBs • Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth
Others-Road Infrastructure	• Junction/Rotary Improvements	• Additional land requirement for junction improvements will cause R&R impacts as loss of livelihood and loss of shelter • May cause removal / displacement of squatters & Encroachers • Air and noise pollution from construction impacts • Contamination of runoff from road with

Broad Project Category	Activities / Sub Components	Impacts
		construction material as sand / cement / silt from stacked excavated earth
Freight Management	• Banning and restrictions	• Rediction in urban congestion due to banned movement of freight in the day hours • Banning of use of animals for movement of goods in the city may result in ▪ Animal welfare and safety ▪ Improved speeds in CBD area due to reduction in congestion
	• Relocation of Activity inside existing freight terminal	• Resistance by operators for relocation • Improved air quality in the surrounding residential areas due to shifting of transport nagar
	• Creation of new freight terminal	• Acquisition of land in the peripheries • Contamination of runoff from road with construction material as sand / cement / silt from stacked excavated earth

8.3 Location Impacts

The location impacts being analysed are associated with site selection and project location on environment and resettlement or livelihood related impacts on communities. Some of the generic impacts associated with location of project facilities that involves construction activities either by acquiring additional land and / or public land encroached by residents are as below:

- Major environmental features as lake fronts, parks etc., in the urban areas would generally be avoided and hence environmental impacts on these areas would be minimal to absent
- Projects do not have any major environmental features that are sensitive to acquisition of land as it is nominal in case of the conceived projects
- Removal of encroachments and squatters leading to loss of livelihood and / or shelter
- Vulnerable PAP within the encroachers would be further impacted by the pressure of relocation as well as loss of income and their removal

- Break-up of established social fabric that can cause severance of established relationships amongst the community
- Temporary loss of services provided by the encroaching PAPs due to their removal

Some of the specific impacts associated with construction of bridges and flyovers involves disruption to existing traffic flow, especially, if located in the congested urban stretches. These would also involve land acquisition (either temporary or permanent) and would also impact the squatters and encroachers affecting residences and/or livelihood.

They would cause traffic congestion and delays and may also involve changes in the project design and alternatives. Project interventions as ITS application and improvement in public transport infrastructure would only improve the environment rather than causing pollution though resettlement impacts would be present to a limited extent.

8.4 Construction Impacts

Impacts resulting from pre-construction and construction activities including site clearance, earthworks, civil works, etc are identified in this section. Pre-construction and construction impacts arise due to dismantling of existing facilities, use of heavy construction machinery, spillage/disposal of construction debris, runoff from construction site, inadequate or inappropriate drainage of the construction site, inadequate safety measures, etc. These are some of the direct impacts of construction in the project area.

In addition to the above, there are few indirect impacts or impacts that resulted from construction activities though not causing the impacts, support to cause the impacts. Some of these impacts include generation of vectors and vector borne diseases, spread of STD / HIV amongst the construction workers and within the community in the vicinity of construction activities, etc. The above environmental impacts are generic in nature occurring along all the project activities where civil works are involved. Impacts that are specific to the construction activities in a project intervention are presented below:

- Construction activities in case of reconstruction of footpaths or construction of new foot paths would cause temporary interruption to traffic and increase of emissions

from vehicles due to higher idling times apart from temporary increase of noise levels due to idling and traffic snarls.

- Loss of adequate frontage in few cases of foot path construction or provision of additional cycle lanes and bus lanes
- Relocation of utilities in the pre-construction stage causing temporary disruption to services. These impacts would be more severe in case of construction of exclusive bus lanes and foot paths.
- Safety of pedestrians and traffic in the area is likely to be affected due to the progress of construction activities.
- Contamination of runoff from road with construction material as sand/cement/silt from stacked excavated earth.
- Construction activities elevate the air pollution and noise pollution in the project area temporarily. Air pollution is due to generation of noxious gases emanating from asphalt plants, construction equipment, crushers, etc., while noise pollution is due to operation of various types of construction equipments.
- Stacking of construction waste causing interruption to traffic and pedestrian movements.
- Runoff from stacked construction waste entering the water bodies and existing drainage systems causing clogging of drain outlets as well as the drains themselves.

Project interventions as procurement of low emission vehicle fleets, traffic signal prioritisation, ITS, provision of signages, etc., involve minimal construction activities and hence, environmental and social benefits from these activities will outweigh any minimal impacts that may occur.

8.5 Operation Impacts

These are the Impacts associated with the operation and maintenance of the infrastructure built in the project. The project interventions are conceived to provide maximum benefits to the community with the implementation of the project. The project interventions, as could be judged from the discussion so far, involve environmental and

resettlement impacts during pre-construction and construction stages of the project and appropriate mitigation and management measures would be undertaken to avoid the same.

Negative environmental/social impacts in the operation stage would mostly be limited to air and noise pollution along the improved road infrastructure as well as the parking areas. While there would be loss of usual transport routes for provision of pedestrian routes or NMT, overall improvement in environmental quality is anticipated in the operation stage.

While in previously polluted and congested core city areas/heritage areas would be experiencing better environmental quality than before the project implementation, due to pedestrianisation and encouraging NMT, pedestrian safety would also be improved with the implementation of the project.

Implementation of ITS and traffic signal prioritisation interventions would also aid in better management of traffic leading to improvements in air and noise quality.

8.6 Social Impacts

The impact of the proposed projects from the social angle is analysed at a broader perspective. It is found that most of the projects have significantly less impact with respect to Rehabilitation and Resettlement. Land acquisition for some of the projects is inevitable.

Chapter 9-Stakeholder Consultations

9 Stakeholder Consultations

9.1 Inroduction

Comprehenshive Mobility Plan, being the long term vision document, without active participation and feedbacks from different stakeholders, the process of prepareing CMP can not be completed. Taking into cognizance of this fact, the process of preparing CMP for Shimla has been completed in consultation with all and concerned stakeholders in each stage of the process. The details of stakeholder consultation is follows:

(a) **Finalization of Study Area, Horizon Year & Scope of Work Stage:** Each and every aspect of the scope of services has been discussued with Shimla Municipal Corportation, Town and Country Planning Department, HIMUDA etc.

(b) **Secondary Data Collection Stage:** Secondary data has been collected from various following agencies and departments along with their inputs:

1. Directorate, Town and Country Planning Department, Government of Himachal Pradesh
2. Director, Urban Affairs Department, Himachal Pradesh
3. Himachal Road Transport Corporation
4. Traffic police
5. Himachal Pradesh Public Works Department
6. State Transport Department
7. Officer in Charge, Special Area Development Authority
8. Tourism Department
9. Himachal Pradesh Pollution Control Board
10. Railway Authority
11. Airport Authority
12. Himachal Pradesh State Infrastructure and Industrial Development Corporation (HSIIDC)
13. Economics and Statistics Department
14. HP Infrastructure Development Board
15. HP Bus Stands Management & Development Authority
16. HP State Agriculture Marketing Board

(c) **Primary Data Collection Stage:** During the process of secondary data collection, UMTC has identified the data gaps and additional data requirements and accordingly, UMTC has carried out number of primary surveys (details of primary survey carried out has been discussed in Chapter 2 of this report and in Annexure) in consulation

with Traffic police, Town and Country Planning Departmen and Shimla Municipal Corporation. The locations of primary survey such as traffic and travel survey has been identified jointly by UMTC and Traffic police.

(d) **Data Analysis Stage:** The data collected from both seconadary and primary sources has been compiled and analyzed. Based on the analysis of the data, inferences has been drawn and broad recommendations were dovetailed and the same has been submitted to the Shimla Municipal Corporation in the form of second deliverable, Interim Report. The Interim Report was presented to the Commssioner, Shimla Municipal Corporation on 23rd December, 2011 and to the Monitoring & Appraisal Committee, GoHP on 23rd Feb, 2012. During the presentation of the Interim Report UMTC has received feed back and suggestions from various officials of Monitoring & Appraisal Committee and Shimla Municipal Corporation.

(e) **Planning & Proposal Formulation Stage:** After incorporating the comments and suggestions, UTMC has prepared a detailed Transport Demand Model using transportation software to forecast future transport demand. Based on forecasted traffic and population, in consulation with stakeholders UMTC has formulated various intervention measures for improving the mobility scenario of Shimla and same has been submitted in the form of Draft Final Report. UMTC had made presentation on Draft Final Report to various stakeholders such as:

1. To Municipal Commissioner, Shimla on 22nd Feb, 2012
2. To Monitoring & Appraisal Committee, GoHP on 23rd Feb, 2012
3. To the Mayor and MC House on 28th & 29th March 2012
4. To Monitoring & Appraisal Committee GoHP on 3rd April 2012

All the suggestions and comments received on Draft Final Report has been examined and studied and the feasible suggestions and comments has been incorporated in this Final Report of Comprehenshive Mobility Plan. The Minutes of Meetings has been enclosed in this Report.

Figure 9-1: Photographs showing traffic police assisting UMTC from identification of survey locations to conduct of surveys

Figure 9-2: Photographs of stakeholder consultations

Chapter 10-Outcomes

10 Outcomes

10.1 Level of Service

The CMP for Shimla has proposed various phase-wise mobility improvement meaures in terms of projects and policy interventions in consistent with the goals and objectives set for Shimla. The CMP for Shimla estimated the outcomes in terms of certain mobility improvement parameters of each scenario as described in detail in Chapter 4 Travel Demand Assessment. Refering to table 10-1, the outcomes of scenario 3, with all the improvement measures for achiveing the target of 60% share of trips in favor of public transport shows the overall improvement in mobility scenario in the study area.

Table 10-1: Scenario wise outcomes

Scenario	Private vehicle share (%)	V/C ratio	PT Share (%)	Vehicle Kilometers	Congestion Index
Base Year (2011)	9%	1.1	49%	5,59,309	0.54
Scenario 1: Business as Usual or Do Nothining –(2031)	38%	1.9	35%	13,62,319	0.31
Scenario 2: Public tranport improvement through augmentation of bus service only -(2031)	5%	1.2	60%*	6,68,283	0.45
Scenario 3: With all Proposed Improvement Measures –(2031) such as: • *Network Improvement through development of:* – New Links – Tunnels – Bypass road • *Public Tranport Improvement through:* – Augmentation of bus service with new bus routes, increased frequency etc. – Introduction of Ropeway – Introduction of Medium Capacity Rapid Transit System	5%	0.8	60%*	6,38,600	0.82

With scenario 3, the city of Shimla will be able to achieve 60% modal share in favor of public tranport, which will lead to reduction in private vehicle usage (from 38% trips by private vehicles in Business as Usual scenario to 5% in scenario 3), improvement in quality of service of road networks (improved V/C ratio form 1.9 in Business as Usual scenario to 0.8 in scenario 3), reduction in congestion level (improved congestion index form 0.31 in Business as Usual scenario to 0.82 in scenario 3). Scenario 3 will also lead to reduction in Vehicle Killometers Traveled (VKT) by 53%, form approximately 14 lakhs VKT in Business as Usual scenario to approximately 6.4 lakhs VKT in scenario 3. Ceteris paribus, reduction in VKT will result in reduction in accident levels and emmission levels as both are direct function of Vehicle Killometers Traveled (VKT).

The outcomes of the intervention measures proposed have also been assessed in terms of improvements in the Level of Service (LOS) for the 10 Benchmarks defined by the Ministry of Urban Development, Government of India. The overall LOS achieved for all the Benchmarks are given in Table 10-2. A significant improvement can be observed from the existing LOS.

Table 10-2: Overall LOS

Overall Level of Service (LOS)			
SL. No	Indicators	LOS - Existing	LOS - Improved
1	Overall Public Transport facilities City wide	3	1
2	Overall Pedestrian Infrastructure Facilities	3	1
3	Level of usage of ITS facilities	4	2
4	Travel Speed along major corridors	2	1
5	Availability of Parking Spaces	2	1
6	Road Safety	3	2
7	Pollution Levels	1	1
8	Integrated Land-use Transport Integration	3	2
9	Financial Sustainability of Public transport	3	2

10.2 Conclusion

Over a periods of time, the city of Shimla has grown manifold with high urbanization rate which is higher than the state average urbanization rate. The urban sprawl has extended

and is continuing to spill over into fringe areas. The high growth of population in Shimla, can be attributed to high natural growth and migration from the adjacent rural areas and towns with expectation of better employment & livelihood opportunity.

With rapidly growing population and high usage of private modes, the city of Shimla is experiencing chaotic unsustainable traffic situation. On the other hand the share of public transport is also declining leading to more and more usage of private vehicles for mobility needs and inreased demand for parking of private vehicles. Due to this chaotic situation, tourists have also started bypassing Shimla, which once termed as queen of hills and one of the favorite tourist destination of the country.

Taking into cognizance of this fact, the Govt. of Himachal Pradesh, following the National Urban Transport Policy (NUTP), 2006, guidelines has prepared this Comprehenshive Mobility Plan which has laid out a set of intervention measures that are designed to improve the mobility scenario of the city in a sustainable manner to meet the needs of the growing population.

The CMP for Shimla has suggested a number of intervention mesures in terms of projects for implementation with justicfication based on expected outcomes. The projects identified in the CMP ranging from promotion of public transport to promotion of NMT usage, improvement of freight mobility to management of growing parking demands etc. The CMP has estimated the detailed block cost of each the project and has also broadly identified and listed the projects amenable to PPP along with potential alternative sources of financing of such projects for implementation. Different agencies based on existing institutional set up have been identified for implementing these projects. The CMP for Shimla has also recommended reform in the existing instutional setup and has suggested to form a single agency UMTA to act as umbrella agency for implementation, co-ordination, managment, monitoring & regulation of urban transport projects and services in the city.

Bibliography

1. Regional Plan
2. Draft Master Plan
3. Development Plan for Shimla Planning Area
4. City Development Plan
5. Interim Development Plan for Shimla Planning Area, 1979
6. Detailed Project Reports of Pedestrian Facility
7. Transportation 2040 towards a sustainable transportation system, Puget Sound Regional Council, May 20, 2010
8. Green Paper, Towards a new culture for urban mobility, Commission of the European Communities, Brussels, September 25, 2007
9. Action Plan on Urban Mobility, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, September 30, 2009
10. The opportunities for sustainable urban transportation in medium-sized cities in Latin American and the Caribbean, Inter-American Development Bank- Sustainable Development Department-Environment Division, November 2004
11. The Implementation of Brazil Sustainable Urban Mobility Policy, National Secretary of Transportation and Urban Mobility, Ministry of Cities
12. Sustainable Urban Transport in Asia, Making the Vision a Reality- a Cai-Asia Programme
13. Motorising the Developing World, Daniel Sperling and Eileencla Ussen
14. Sustainable urban mobility measures that may be applicable in Hanoi, Peter Midgley, global transport knowledge partnership -the international seminar on sustainable development of Hanoi urban transport, June 25, 2010
15. Changing course, a new paradigm for sustainable urban transport, urban development series, Asian Development Bank, 2009

16. Urban Transport Thematic Research Summary, European Commission Dg Energy and Transport: Transport Research Knowledge Centre, September 15, 2009
17. Mobility Plans: The Way Forward for a Sustainable Urban Mobility- European Metropolitan Transport Authorities, 2009
18. Land-use / Transport interaction models, Department for Transport Analysis Guidance (TAG), June 2005
19. Bicycle and Pedestrian Mobility Plan, Thornbury Township Chester County, PA, November 20, 2007
20. Pennsylvania Mobility Plan, Gannett Fleming/Parsons Brinckerhoff team, September 2006
21. SUTP development in Europe, State of the Art Review , European Commission, DG Environment, November 2005
22. Texas Urban Mobility Plan: Breaking the Gridlock, Victoria County Urban Transportation Study in cooperation with the Texas Department of Transportation
23. Managing travel demand applying European perspectives to U.S. Practice, U.S. Department of transportation federal highway administration in cooperation with American Association of state highway and transportation officials national cooperative highway research programme, May 2006
24. Mitigating Traffic Congestion, the role of demand-side strategies, Association for commuter transportation, October 2004
25. Travel Demand Management Some Insights, Thomas Guéret , International Energy Agency
26. Greater Dublin area Travel Demand Management Study, Dublin, October 2004
27. Is Curitiba, Brazil the model city for Parking Management, Christopher Ziemann district of Columbia, Department of Transportation, November 15, 2008
28. Victoria Transport Policy Institute, Parking Management Strategies, Evaluation and Planning, Todd Litman Victoria Transport Policy Institute, November 5, 2008
29. Congestion pricing and parking policy in the Netherlands, Karel Martens, Institute for Management Research Radboud Universiteit Nijmegen

30. Parking pricing implementation guidelines, how more efficient parking pricing can help solve parking and traffic problems, increase revenue and achieve other planning objectives, Todd Litman, Victoria Transport Policy Institute, February 25, 2010
31. Parking Management Strategies, Evaluation and Planning, Todd Litman, Victoria Transport Policy Institute, February 04, 2011
32. The Integrated Sustainable Urban Transport Plan Dresden 2025, Polis Conference, Brussels, Gerd-Axel Ahrens Dresden, December 10th, 2009,
33. Road user pricing could help ease and manage international traffic congestion, Deloitte research highlights effective examples of road user pricing
34. Intelligent transport systems, results from the transport research programme by European Commission
35. Study on Traffic and Transportation Policies and Strategies in Urban Areas in India, Ministry of Urban Development, Government of India, 1998
36. Study on Traffic and Transportation Policies and Strategies in Urban Areas in India, Ministry of Urban Development, Government of India, 2008
37. Land Transport Master Plan, Land Transport Authority, Singapore
38. Sustainable Urban transport, European project Trendsetter, Civitas, 2006
39. Streetscaping of Delhi Road for Commonwealth Games, Pradeep Sachdeva Design Associates, May 2009
40. NUTP guidelines

Websites

1. http://www.gtkp.com
2. http://psrc.org/transportation/t2040
3. http://www.dft.gov.uk/
4. http://transportblog.co.nz
5. http://sustainablecities.dk/
6. http://ops.fhwa.dot.gov
7. http://ec.europa.eu
8. Online TDM encyclopedia

Minutes of Meetings

MUNICIPAL CORPORATION SHIMLA

No. MCS/PD/CMP/2012- 381-82 Dated: 18 .06.2012

From

Executive Engineer-cum-Project Director,
Municipal Corporation, Shimla.

To

Sh. Ankush Malhotra,
Assistant Vice President, UMTC,
5th Floor, 'A" Wing, IFCI tower, 61 Nehru Place,
New Delhi-110019.

Subject: - Proceedings of meeting regarding Comprehensive Mobility Plan (CMP) for Shimla City.

Sir,

This is with reference to the letter No. UD-H (F) (10)-6/2009- CMP-II-3424-25 dated 26.05.2012 received from the Director, UD and the copy of the same was sent to your office on the subject cited above. Enclosed please find herewith the approved copies of the proceedings of the meetings held on 23.02.2012, 28.03.2012 and 03.04.2012 for further necessary action please.

Encl: As above.

Yours Faithfully,

Executive Engineer-cum-Project Director,
Municipal Corporation Shimla.

Copy to:

The Commissioner, Municipal Corporation Shimla, for information please.

Executive Engineer-cum-Project Director,
Municipal Corporation Shimla.

Municipal Corporation Shimla

Minutes of Meeting- Monitoring cum Appraisal Committee

...ation on the Draft Final Report for Comprehensive Mobility Plan for Shimla Planning Area

...23rd February 2012

...ue: Conference Hall, Palika Bhawan, Talland, Shimla, Himachal Pradesh

1. The meeting commenced by a brief welcome note by Commissioner, Municipal Corporation of Shimla who welcomed Principal Secretary (UD), Government of Himachal Pradesh and Director, Urban Development, Government of Himachal Pradesh all the other participants in the Monitoring cum Appraisal Committee meeting. He briefed all the participants about the objectives of the project and purpose of the meeting. He invited the Consultants, M/s Urban Mass Transit Company (UMTC) to make a detailed presentation and update all the committee members about the status of the project. A list of persons who attended the meeting is enclosed as **Annexure 1**.

2. UMTC representatives made a detailed presentation to the Committee Members highlighting the following aspects:

(a) Introduction to the Concept of Comprehensive Mobility Plan (CMP)
(b) Objectives of CMP
(c) Terms of Reference of the study and Approach and Methodology
(d) Progress Report
(e) Primary and Secondary Data Analysis
(f) Stakeholders Consulted
(g) Transport Demand Assessment
(h) Identification of Projects
(i) Reform measures
(j) Implementation Framework and Costing
(k) Outcomes

Page | 1

ant (UMTC) apprised the committee member that the Inception Report has itted and approved by Municipal Commissioner of Shimla on March 2011. In , UMTC has completed the process of Primary and Secondary data collection ad made a presentation on the Interim Report to the Commissioner, Municipal oration of Shimla on 23rd November 2011. Thereafter, comments received from the mmissioner were incorporated and the Interim Report was submitted to the Municipal Corporation on 29th December 2011.

4. UMTC informed that the Draft Final Report was being presented to the Committee members and based on the comments received from the Committee members, the Draft Final Report would be submitted to the Municipal Corporation Shimla in March 2012.

5. UMTC has suggested following strategies for improving mobility in Shimla

(a) **Land Use Transport Integration Plan**

(i) Development of satellite towns in Fagu, Ghandal and Vaknaghat

(ii) Development of four Mobility Corridors in Shimla

(iii) Promote Transit Oriented Development (ToD) along the main Mobility Corridors

(b) **Integrated Public Transport Plan**

An Integrated Public Transport Plan has been proposed by integrating regional bus service, city bus service, HSRTC taxi service. In addition, routes for introducing a Ropeway/ cable car system and a medium capacity rapid transit system have also been proposed.

(c) **Pedestrian Mobility Strategy**

A Pedestrian mobility strategy has been proposed with following measures:

(i) Pedestrian phasing signalization/ Grade separated pedestrian crossing facility

(ii) Creation of Escalators, Lift, pathways for vertical mobility

(iii) Pedestrian friendly street furniture

(iv) Pedestrian friendly Transit facility

(v) Improvement of Old Pathways

(vi) Improvement of footpaths

(vii) Provision of Street lighting, signage's and road markings

(d) **Freight Mobility Improvement strategy for Shimla**

A Freight mobility improvement strategy has been proposed with following measures:

(i) Freight Mobility Plan

(ii) Goods Terminals – Improvement, rearrangement and relocation

(e) **Junction Improvement measures**

(i) Signalization- Timing and Phasing

(ii) Signage & Marking

(iii) Geometric Design

(iv) Installation of ITS

(v) Pedestrian facility

(f) **Parking strategy**

Parking strategy has been proposed with following measures:

(i) Creation of additional off street parking space

(ii) Ban on on-street parking in some areas

(iii) Differential parking rates-parking duration and location wise

(iv) Support public transport- Park & Ride facility

(v) Enforcement & organization of on-street parking

Page | 3

(v) Adoption of appropriate building bylaws and parking policy

After detailed discussion on the presentation, the Committee approved the Interim Report submitted by UMTC and made following comments/suggestions to be incorporated in the Draft Report to be submitted by UMTC.

(a) Principal Secretary (UD) advised UMTC to examine the additional tunnels proposed by PWD, and if feasible incorporate the same in the CMP.

(b) Principal Secretary (UD) advised to explore feasibility of implementing escalators for pedestrian movement on lines of travellators proposed in other countries namely Equador/Peru/Brazil/Columbia and examine their replicability in Shimla.

(c) As UMTC had conducted primary surveys before commissioning of the new ISBT Terminal, the Principal Secretary (UD) advised UMTC to examine the traffic and pedestrian movement in the area post commissioning of new ISBT.

(d) Director (UD), Government of Himachal Pradesh advised UMTC to examine feasibility of connecting Phase 3 & Phase 4 of New Shimla by opening the existing shorter route from DAV school to Sec-5 of phase III, across the valley.

(e) Director (UD) also advised UMTC to examine feasibility of developing cycling tracks and introducing Bicycle Sharing Scheme at following corridors:

1. Indian Institute of Advanced Study Chowk to University Chowk
2. Cecil to Vidhan Sabha
3. Sanjauli Chowk to Mall road via Lakkar Bazaar

(f) Principal Secretary (UD) advised UMTC to discuss with the Himachal Pradesh Agricultural Marketing Board regarding the locations of the major grain market/terminal at Dhalli.

(g) Municipal Commissioner advised UMTC to consider and integrate the proposals as recommended in the Shimla Beautification Project. He also appraised that Shimla Municipal Corporation (SMC), Shimla would be imposing

a Green Fees to vehicles entering Shimla from 1st April 2012 and suggested that UMTC may like to include the recommendation in the CMP.

(h) Principal Secretary (UD) advised UMTC to make following modifications in the project costing and Implementation framework.

(i) Revise the costing considering Year 2014 as base year

(ii) Identify projects amenable for government funding or PPP for easy implementation

While concluding the meeting, Principal Secretary (UD) as the Chairperson of the Monitoring cum Appraisal Committee thanked all the participants for attending the meeting and UMTC for presenting the Draft Final Report. The Committee approved the Draft Final Report presentation and advised UMTC to submit the Draft Final Report after incorporating all the comments and suggestions by March 15th 2012.

Page | 5

4/16/2012

Annexure 1: List of Persons present in the Meeting

S. No	Name	Designation
1	Dr Bharathi Sihag	Principal Secretary, UD & TCP
2	Dr. Purnima Chauhan	Director UD & TCP
3	Dr. M.P.Sood	Commissioner, MC, Shimla
4	H.K. Gupta	DM (Traffic), HRTC
5	A.M. Gupta	CE, HIMUDA
6	Naresh Sharma	SE, HP PWD
7	Rajesh Kashyap	AE, MC, Shimla
8	Deep Pathak	Project Coordinator, PIU, MC, Shimla
9	Priyanka Khanghata	Research & Training Officer, PIU, MC, Shimla
10	Rajesh Kumar Sharma	Executive Director, SAMIKSHA, Shimla
11	Rajesh Chauhan	Jr. Asst (UD)
12	Pradeep Manu	JSA
13	R.K. Katoch	JE
14	Naresh Kumar	JE
15	Krishna Sood	Special Officer I
16	R.S.Chauhan	TCP (S)
17	B.S.Thakur	Project Officer (UD)
18	S.K. Justo	District Tourism Officer, Shimla
19	Punit Raghu	DSP, Traffic, Shimla
20	Ankush Malhotra	UMTC
21	Durga Prasad Sunku	UMTC
22	Ranjan Jyoti Dutta	UMTC

Page | 6

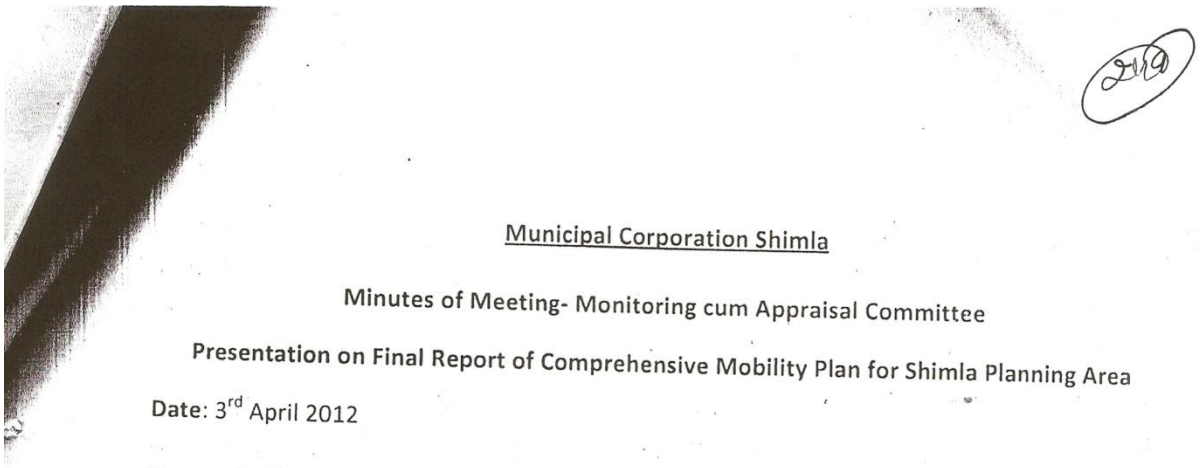
Discussion on the Draft Final Report for Comprehensive Mobility Plan for Shimla Planning Area

Date: 28th March 2012

Venue: Directorate of Urban Development, Talland, Government of Himachal Pradesh

In continuation of the Minutes of the Meeting held on 23rd February 2012 on the presentation of the Draft Final Report, the Director, Urban Development gave following additional points to be included while submitting the Final Report for Comprehensive Mobility Plan for Shimla Planning Area.

1. The CMP must blend in the City Development Plan of Shimla city.
2. Linkage between areas near DAV School and Sector-VI (Phase-III), New Shimla.
3. Provision of Toilet facilities in the proposed parking lots.
4. Exploration of Possibilities for Escalator e.g. near IGMC, Lift, Jakhoo to Lakkar Bazaar, etc.
5. Explore possibility of improving vertical mobility from the main road to Kanlog Cemetery from the point of view of promoting tourism
6. Over bridge are required to be constructed especially near schools and hospitals.
7. Bicycle points are required to be explored for tourist attraction.
8. Train could be a tourist attraction in local Shimla e.g. Summer Hill, Jatog. Special Package to promote it as means of Public Transport
9. Sources of Urban Transport fund to be elaborate upon.



Municipal Corporation Shimla

Minutes of Meeting- Monitoring cum Appraisal Committee

Presentation on Final Report of Comprehensive Mobility Plan for Shimla Planning Area

Date: 3rd April 2012

Venue: Conference Hall, Palika Bhawan, Talland, Shimla, Himachal Pradesh

1. At the outset, UMTC team has appraised the Monitoring cum Appraisal Committee, GoHP that it has assessed and analysed all the suggestions and comments received on the presentation of Interim Report and Draft Final Report to the Monitoring cum Appraisal Committee held on 23rd February 2012.

2. UMTC briefed the committee members that following action points have been completed since the last meeting held on 23rd February 2012:

   (i) All the recommendations have been analysed based on the existing and projected traffic movement pattern. After in-depth analysis, the feasible suggestions have been incorporated in the Draft Final Report.

   (ii) As advised by the committee the Draft Final Report incorporating all the comments and suggestions has been submitted to Shimla Municipal Corporation as per the timeline fixed by committee members on 15th March 2012.

   (iii) The Draft Final Report was also presented to the Mayor and the House, Shimla Municipal Corporation on 29th March 2012.

   (iv) UMTC team further briefed the committee members that, UMTC is also assessing the suggestions received from the Directorate of Urban Development, GoHP as per the meeting held on 28th March 2012 and the suggestion received

from the House, Shimla Municipal Corporation and the same will be incorporated in the Final Report.

3. Referring to the previous meeting cum presentation to the Monitoring cum Appraisal Committee, GoHP, held on 23rd February 2012, UMTC made a detailed presentation on the Final Report to the Committee Members highlighting the following aspects:

   (a) Objectives of CMP
   (b) Terms of Reference of the study and Approach and Methodology
   (c) Progress Report
   (d) Primary and Secondary Data Analysis
   (e) Stakeholders Consulted
   (f) Transport Demand Assessment
   (g) Identification of Projects
   (h) Reform measures
   (i) Phase wise project cost
   (j) Implementation Framework
   (k) Outcomes

4. UMTC has suggested following strategies for improving mobility in Shimla Planning Area

   (a) **Land Use Transport Integration Plan**
      (i) Development of satellite towns in Fagu, Ghandal and Vaknaghat
      (ii) Development of four Mobility Corridors in Shimla
      (iii) Promote Transit Oriented Development (ToD) along the main Mobility Corridors Network

   (b) **Network Improvement Plan**
      (i) Development of New Links
      (ii) Development of Bypass Road
      (iii) Development of Tunnels

Page | 2

257

(iv) Development of Links connecting Phase III and Phase IV of New Shimla

(c) **Integrated Public Transport Plan**

An Integrated Public Transport Plan has been proposed by integrating regional bus service, city bus service, HRTC taxi service. In addition, routes for introducing a Ropeway/ cable car system and a medium capacity rapid transit system have also been proposed.

(d) **Non motorized Transport Plan**

A Pedestrian mobility strategy has been proposed with following measures:

(i) Pedestrian phasing signalization/ Grade separated pedestrian crossing facility
(ii) Creation of Escalators, Lift, pathways for vertical mobility
(iii) Introduction of Bike Sharing Scheme for promotion of Tourism and to encourage the usage of Non Motorized Transport
(iv) Improvement of Old Pathways in accordance with Shimla Beautification Plan
(v) Improvement of footpaths
(vi) Provision of Street lighting, signage's and road markings

(e) **Freight Mobility Improvement Plan**

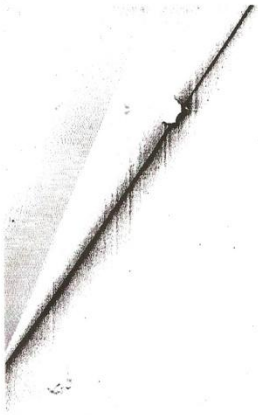
A Freight mobility improvement strategy has been proposed with measures such as development of Truck Terminals, rearrangement and relocation of mandis, whole sale market etc.

(f) **Junction Improvement measures**

(i) Signalization- Timing and Phasing
(ii) Signage & Marking
(iii) Geometric Design
(iv) Installation of ITS
(v) Pedestrian facility

(g) **Parking strategy**

Page | 3



252

Parking strategy has been proposed with following measures:

(i) Creation of additional off street parking space
(ii) Ban on on-street parking in some areas
(iii) Differential parking rates-parking duration and location wise
(iv) Support public transport- Park & Ride facility
(v) Enforcement & organization of on-street parking
(vi) Adoption of appropriate building bylaws and parking policy

5. Further UMTC has also presented the detailed costing, potential source of revenue and implementation option along with the listing of agencies responsible for implementation of each of the project.

6. After detailed discussion on the presentation, the Committee members made following comments/suggestions:

(a) Principal Secretary (UD) requested UMTC to prepare a brief presentation on the CMP to be made to the Chief Secretary and the Committee of Secretaries, Government of Himachal Pradesh highlighting the following:

(i) Rational for preparation of CMP
(ii) Brief approach and methodology for assignment
(iii) Summary of problems and issues in Shimla
(iv) Phase wise projects and costing, potential source of revenue
(v) Implementation option
(vi) Listing of agencies responsible for implementation in order to present the same

(b) Director (UD), Government of Himachal Pradesh advised UMTC to examine the feasibility of additional tunnels proposed by HIMUDA and HPPWD, and if feasible incorporate the same in the CMP. Director (UD) requested HIMUDA officials to share

the information on additional tunnels proposed by HIMUDA and HPPWD with UMTC.

7. While concluding the meeting, Principal Secretary (UD) as the Chairperson of the Monitoring cum Appraisal Committee thanked all the participants for attending the meeting and UMTC for presenting the Final Report. The Committee approved the Final Report presentation.

Page | 5

Annexure 1: List of Persons present in the Meeting

S. No	Name	Designation
1	Dr Bharathi Sihag	Principal Secretary, UD & TCP
2	Dr. Purnima Chauhan	Director UD & TCP
3	Dr. M.P.Sood	Commissioner, MC, Shimla
4	H.K. Gupta	DM (Traffic), HRTC
5	B.B Gupta	CEO, HIMUDA
6	B.S.Thakur	Project Officer (UD)
7	Ankush Malhotra	UMTC
8	Ranjan Jyoti Dutta	UMTC

Page | 6