

# Kashipur Master Plan- 2041 (Draft)



**TOWN & COUNTRY PLANNING DEPARTMENT**

**UTTARAKHAND**

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## **Abbreviations**

**AMRUT:** Atal Mission for Rejuvenation and Urban Transformation

**AOI:** Area of Interest

**ASI:** Archaeological Survey of India

**BC:** Before Christ

**BHK:** Bedroom, Hall, and Kitchen

**BOD:** Biological Oxygen demand

**BPL:** Below Poverty Line

**CBD:** Central Business District

**CCTV:** Closed-Circuit Television

**CERC:** Consultance Evaluation Revue Commette

**CGWB:** Central Ground Water Board

**COD:** Chemical Oxygen Demand

**CPCB:** Central pollution Control board

**CPHEEO:** Central Public Health & Environmental Engineering Organization

**CPWD:** Central Public Works Department

**CVC:** Classified volume count

**DIC:** District Industry Centre

**US Nagar:** Udham Singh Nagar

**DO:** Dissolve Oxygen

**DPR:** Detail Project Report

**DR&DRC:** Deviated Residential and Deviate Residential Colonies

**DU:** Dulling Unit

**DUPH:** Dulling Units per hectare

**ECS:** Equivalent Car Space

**EPPCB:** Environment Protection and Pollution Control Board

**EWS:** Economically Weaker Section

**FY:** Financial Year

**FCI:** Food Corporation of India

**FDI:** Foreign Direct Investment

**FGD:** Focus group discussion

**GO:** Government Order

**GDDP:** Gross District Domestic Product

**GEC 1997:** Ground water resources estimation methodology, 1997

**GIS:** Geographic Information System

**GSDP:** Gross State Domestic Product

**Ha:** Hectare

**HH:** Household

**HLPCA -** Housing Level Primary Census Abstract

**IIM:** Indian Institutes of Management

**IRC:** Indian Road Congress

**ISRO** Indian Space Research Organisation

**KGCCI:** Kumaun Garhwal Chamber Of Commerce & Industry

**Km:** Kilometre

**KPA:** Kashipur Planning Area

**LIG:** Low Income Group

**LOR:** Letter of recommendation

**LOS:** Level of Service

**LPCD:** Liters Per Capita per Day

**LPG:** Liquefied petroleum gas

**LULC:** Land use and land Cover

**MT:** Metric Ton

**MC:** Municipal Corporation

**MDR:** Major District Road

**MLA:** Member of Legislative assemble

**MLD:** Million liters per day

**MoHUA:** Ministry of Housing and Urban Affairs

**MSME:** Micro, Small & Medium Enterprises.

**MUZ:** Multi Utility Zone

**NHAI:** National Highway Authority of India

**NBC:** National Building Code

**NBSS:** National Bureau of Soil Survey

**NDDP:** Net District Domestic Product

**NDP:** Net Domestic Product

**NH:** National Highway

**NHAI:** National Highways Authority of India

**NIDM:** National Institute of Disaster Management

**NOC:** No Objection certificate

**NPP:** Nagar Palika Parishad

**NRSC:** National Remote Sensing Centre

**NSDP:** Net State Domestic Product

**NUIS:** National Urban Information System

**NULM:** National Urban Livelihood Mission

**ODR:** Other District Road

**OHR:** Over Head Reservoir

**PCI:** Per Capita Income

**PCU:** Passenger Car Units

**pH:** Potential of hydrogen

**PM:** Particulate Matter

**PPH:** Persons Per Hectare

**PPP:** Public Private Participation

**PWD:** Public Works Department

**QA:** Quality Assurance

**QC:** Quality Check

**QC:** Quality Control

**RBM:** Riverbed minerals

**RFP:** Request for proposal

**ROB:** Rail Over Bridge

**ROW:** Right Of Way

**RUB:** Rail Under Bridge

**SAAP:** State Annual Action Plan

**SBM:** Swachh Bharat Mission

**SC:** Scheduled Caste

**SDG:** Sustainable Development Goals

**Shp:** Shapefile

**SIIDCUL:** State Infrastructure and Industrial Development Corporation of Uttarakhand Limited

**SLRM:** Solid and Liquid Resource Management

**Sqm:** Square Meter

**STP:** Sewage Treatment Plant

**SWM:** Solid Waste Management

**TAZ:** Traffic Analysis Zones

**TCPD:** Town and Country Planning Department, Govt of Uttarakhand

**TCPO:** Town and Country Planning Organization, Govt of India

**TDS:** Total Dissolved Solids

**TPD:** Tons per day

**TVC:** Traffic Volume Count

**U.S. Nagar:** Udham Singh Nagar

**UDD -** Urban Development Directorate

**UK:** Uttarakhand

**UKHUDA:** Uttarakhand Housing and Urban Development Authority

**UKRERA:** Uttarakhand Real Estate Regulatory Authority

**ULB:** Urban Local Bodies

**UNDP:** United Nations Development Programme

**URDPFI Guidelines:** Urban and Regional Development Plan Formulation and Implementation Guidelines

**UTTIPEC:** Unified Traffic and Transportation Infrastructure (Planning and Engineering) Centre

**V/C:** Volume/Count

**VHRS Imagery:** Very High-Resolution Satellite Imagery

**WTP:** Water Treatment Plant

**WPR:** Work Participation Rate

## **Definitions**

The document is comprised of certain set of terms. Description of these terms has been provided in the following points:

- **Act:** It hereby means relevant act including:
  - The Uttarakhand Urban and Country Planning and Development Act” 1973 (Amendment) Act, 2013
  - Uttarakhand (The Uttar Pradesh Municipal Corporation Act, 1959) (Amendment) Act, 2017
  - The Uttarakhand Panchayati Raj Act, 2016
  - The Uttarakhand (The Uttar Pradesh Special Area Development Authority Act, 1986) Adaptation And Modification Order, 2006 (Amendment) Act, 2008
  - The Uttarakhand Building Construction and Development Byelaws / Regulations, 2011 (Amendment 2017)
  - Uttarakhand Special Area (Planned Development and Promotion of Tourism) Act, 2013
- **Abadi:** ‘abadi’ or ‘village abadi’ means such area in a village which, on the date of commencement of this Code, is being used for the purposes of residence of its inhabitants or for purposes ancillary thereto such as sahan and green trees, wells etc. or which may have been or be hereafter reserved for such use. [21]
- **Access:** A clear approach to a plot or a building. [4]
- **Accident:** Any event that happens by chance or unintentionally like collision of vehicles and injury, damage to property or death to passengers. [43]
- **Addition and/or Alteration:** A change from one occupancy to another, or a structural change including an addition to the area or change in height or the removal of part of building, or any change to the structure, such as the construction or removal or cutting into of any wall or part of a wall, partition, column, beam, joist, floor including a mezzanine floor or other support, or a change to or closing of any required means of access ingress or egress or a change to fixtures or equipment" as provided in the Bye-Laws. [4]
- **Affordable Housing Project:** An affordable housing project can be a mix of houses for different categories with at least 35% of the houses in the project are for EWS category and a single project has at least 250 houses. [77]



- **Age-sex Pyramid:** The graphical presentation of age-sex structure in the form a pyramid comprising two sets of horizontal bars placed side by side, one showing males and the other females in different age group at 5-years interval. [20]
- **Agriculture:** It Includes horticulture, farming, raising of crops, fruits, vegetables, flowers, grass, fodder, trees or any other kind of cultivation, dairy, animal husbandry, breeding and keeping of live-stock, including cattle, horses, donkeys, mules, pigs, fish, poultry and bees; and use of land which is ancillary to the farming of land or any other agriculture purposes, but shall not include the use of land attached to a building for the purposes of a garden to be used alongside such building. [2]
- **Agro based & food processing Industry:** An industry defined as a set of techno-economic activities, applied to all the products, originating from agricultural farm, aqua cultural sources, livestock and forests for their conservation, handling and value-addition to make them usable as food, feed, fibre, fuel or industrial raw materials. [46]
- **Air Pollutant:** Any solid, liquid, or gaseous substance, including noise, present in the atmosphere, due to any process of substances, in such a concentration as may be, or tend to be, injurious to human beings or other living creatures, or plants, or property, or environment. [11]
- **Alignment:** The ground plan of a road, railway, or waterway. [39]
- **Allocation of land:** Distribution of land for a specified purpose according to an approved layout plan. [2]
- **Amenities:** Natural and man-made features in a city or region and include natural landscaped areas, rivers, lakes, open spaces, road, and utilities, facilities, and services [11]. Amenity includes road, water supply, street lighting, drainage, sewerage. public works and such other convenience as the State Government may, by notification in the Gazette specify to be an amenity for the purposes of Uttarakhand Urban and Country Planning and Development Act, 1973. [4]
- **Amusement Park:** Amusement park means a permanent indoor or outdoor facility or park where amusement rides are available for use by the public that is located in a city with a population of more than 5 lakhs, encompasses at least 25 acres in surface area, is enclosed with access only through controlled entries, is open for operation more than 120 days in each calendar year, and has security guards on the premises at all times. The term does not include any public or private driveway, street, sidewalk or walkway, parking lot, parking garage, or other parking area. [13].

- **Anganwari / Anganwari Centre:** Anganwari as space provision at residential housing/ neighbourhood level is a centre to provide service for children of 0-6yrs age, pregnant women, feeding mothers, etc. under the Integrated Child Development Scheme (ICDS). [2]
- **Apartment:** These shall include any building or structure in which living quarters are provided for three or more families, living independently of each other and with independent cooking facilities, for example, apartment houses, mansions and Chawls. [14]
- **Approved Plan:** A plan approved by a competent authority having jurisdiction. [4]
- **Approved:** Approved by a competent authority having jurisdiction. [2]
- **Area of Influence:** The special extent of a central function identified by the interaction between places where such function is located and the places from where people derive its benefits. [2]
- **Area Plan:** A plan for development of an area consisting of data, text, maps, and other illustrations, pertaining to land use, transportation, utilities, facilities, and services as per provisions of the master plan and zoning and sub-division regulations. [2]
- **Arterial Roads in Development Area:** They are the primary roads for ensuring mobility function. They carry the largest volumes of traffic and longest trips in a city. These roads are characterized by mobility and cater to through traffic with restricted access from carriageway to the side. [2]
- **Auditorium:** A building especially designed with all related services and facilities, to serve as an enclosed space to seat audience and a stage for live performances. [4]
- **Authority or Development Authority:** ‘Authority’ in relation to the State Area shall be as per the relevant act. [1]
- **Auto / Taxi Stand:** A premise used for parking of intermediate public transport vehicles run on commercial basis. [39]
- **Automobile Service Station:** A premise for sale, repair and servicing of automobiles. [11]
- **Average Daily Traffic:** The total volume of traffic passing a point or segment of a roadway during a given time period (more than a day and less than a year) divided by the number of days in that time period. [39]
- **Bank:** (a) a banking company as defined in the Banking Regulation Act, 1949 ; (b) the State Bank of India constituted under the State Bank of India Act, 1955; (c) a subsidiary

bank as defined in the State Bank of India (Subsidiary Bank) Act, 1959 ; (d) a “corresponding new bank” constituted under the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1970 ; (e) a Regional Rural Bank established under sub-section (1) of section 3 of the Regional Rural Banks Act, 1976 ; (f) any banking institution notified by the Central Government under section 51 of the Banking Regulation Act, 1949 ; or (g) any other banking or financial institution notified by the State. [27]

- **Banquet Hall / Barat Ghar / Marriage Palace:** A building exclusively used for holding social functions such as marriage and other such related get-togethers/activities. Its premises built up or open or both or any part thereof, where accommodation or space is used for marriage, receptions, social gatherings, meetings on regular or periodical or occasional basis and where at least fifty persons can congregate or gather. [3]
- **Base Map:** A map serving as the foundation for subsequent planning and design operations, showing all features and characteristics of the area, as per requirements of the plan/project. [2]
- **Basement / Cellar:** The lower storey of a building below or partly below the ground level. [14]
- **Basin:** A geographical area determined by the watershed limit of the system of waters, flowing into the ocean/sea either directly or through another sovereign nation or into a natural lake/depression having no outlet. [16]
- **Bazaar:** A commercial area in old city core, generally located along a main road in mixed land use pattern, where ground floor, especially the front portion, is shaping and the upper floors are occupied by residential use. [76]
- **Bio-diversity:** means the variability among living organisms from all sources and the ecological complexes of which they are part and includes diversity within species or between species and of eco-systems. [17]
- **Biogas Plant:** A biogas plant is the name often given to an anaerobic digester that treats farm wastes or energy crops. It can be produced using anaerobic digesters (air-tight tanks with different configurations). [53]
- **Birth Rate:** Ratio of the number of live births per 1,000 populations in a given year. [20]
- **Botanical Garden:** A park landscaped with a variety of plant species for exhibition, nature studies, and botanical research purposes. [2]

- **Bottleneck:** A portion of road with lowest capacity along the route due to an obstruction to free-movement of vehicles. [39]
- **Brick Kiln:** A kiln in which blocks of clay are baked into bricks, bricks are baked or burned. [46]
- **Buffer Zone:** Buffer zones are areas created to enhance the protection of a conservation area, often peripheral to it, inside or outside. Within Buffer zones, certain legal and/or customary restrictions are placed upon resource use and/or is managed to reduce the negative impacts of restrictions on the neighbouring communities. [2]
- **Buffer:** A landscaped area between two zones provided for the purpose of separating two incompatible land uses and curtailing unwanted view, noise, odour, or dust using plants, walls, berms, or other such elements. [2]
- **Building Bye-laws / Building Regulations:** Building bye-laws here means, the bye-laws mentioned in the Building Construction and Development Regulation, 2011 (Amended in 2015), Uttarakhand. Municipal rules, regulations, and procedures that in the interest of public health, safety, and welfare, ensure minimum acceptable, (i) quality of the design of all types of buildings, (ii) quality of building materials, (iii) structural safety, (iv) provision of sanitation, and (v) other safety and local requirements. [18]
- **Building:** 'Building' includes any structure or erection or part of a structure or erection which is intended to be used for residential, industrial, commercial, or other purposes, whether in actual use or not. "Building" shall mean any structure for whatsoever purpose and of whatsoever materials constructed and every part thereof, whether used as human habitation or not including foundation, plinth, walls, floors, roofs, chimneys, plumbing and building services, fixed platforms, veranda, balcony, cornice or projection, part of a building or anything affixed thereto. [3]
- **Built-up Area:** It means such densely populated areas wherein commercial, industrial or residential area has been developed as mixed use horizontally and vertically and contains all essential facilities and has been defined as built-up area in the master plan or has been demarcated as such by Authority Board / Competent Authority. In towns not having a master plan or not having a well-defined built up area, the built-up area or whether any land parcel in question falls under the said area or not shall be determined by the competent authority. In such areas, relative to the congested right-of-way, unavailable / negligible setbacks and absence of organized / unorganized open spaces; on the basis of

relatively highly dense built-up mass / urban form of buildings, following parameter may be taken as basis. [3]

- **Burial Ground:** A premise with facilities for burying of dead bodies. [2]
- **Bus Bay:** An additional area designed and designated at a bus stand for buses to pull into to pick up and drop off passengers with a view to minimise disturbance to the flow of traffic. [39]
- **Bus Depot:** A premises where the public transport buses are parked during the night period after completing all the trips for the day and includes servicing facility and other related infrastructure. [39]
- **Bus Lane:** A lane of roadway intended primarily for use by buses, either all day or during specified periods (Sacramento Regional Transit District). A vehicular right-of-way or portion thereof—often an exclusive lane—reserved exclusively for buses (California Planning Roundtable). [41]
- **Bus Stand:** A Bus Stand is a designated location on a road away from carriage-way to park buses for short time periods for embarkation and disembarkation of passengers. [41]
- **Bus Stop / Bus Shelter / Transit Stop Shelter:** A small, roofed structure, usually having three walls, located near a street and designed primarily for the protection and convenience of bus passengers. (Maryland Heights, Mo.) [41]
- **Bus Terminal:** A premise used by a public or private transport agency to park the buses for short duration to serve the population. It may include the related facilities for passengers. [2]
- **Bye-law:** It means a byelaw made under the relevant act by Uttarakhand Housing and Urban Development Authority (hereinafter referred to as the State Authority) or the Local Development Authority with the previous approval of the State Government. [1]
- **Cadastral Map/Khasra Map:** A map of an area on a scale 1:4000 or below. Showing the property boundaries, dimensions, ownership, and value of all subdivisions of land. [21]
- **Camping Site:** A premises located in a recreational or tourist zone and provided with all necessary facilities and services for the purpose of short-duration stay in tents or other temporary structures. [48]
- **Canteen:** A premise used for serving food items to workers in an institution including cooking facilities. It may have covered or open space or both for sitting arrangement. [4]

- **Cantonment/ Battalion:** An area notified by central government under The Cantonments Act, 1924. [19]
- **Capital Expenditure:** The money spent on fixed assets e.g., land, buildings, machinery, and equipment as well as on major public works like roads, bridges, airport, hospitals, schools, and other buildings. [49]
- **Carpet Area:** The covered area of the usable rooms of a dwelling unit / at any floor (excluding the area of the walls). [4]
- **Carriageway:** The part of road right-of-way designed for movement of vehicular traffic. [41]
- **Catchment Area:** The area from where the rain water drains into a river or lake. [50]
- **Cell Tower:** It tower houses the electronic communications equipment along with an antenna to support cellular communication in a network. A cell tower is usually an elevated structure with the antenna, transmitters and receivers located at the top. [51]
- **Census Town:** Administrative units satisfying the following three criteria simultaneously are treated as Census Towns:
  - i. A minimum population of 5,000 persons
  - ii. 75 per cent and above of the male main working population being engaged in non-agricultural pursuits
  - iii. A density of population of at least 400 persons per sq. km. (1,000 per sq. mile)[20]
- **Census:** The periodic, generally every 10 years, official enumeration of population and its demographic, social, and economic characteristics including area of settlements and housing conditions. [20]
- **Central Business District (CBD):** A major commercial area of a large city with high concentration of business activity, having very high land value and where major transportation and communication networks converge. [2]
- **Central/State Government Office:** A premise used for the offices of Central/State Government. [2]
- **Chemical Industry:** A complex of processes, operations, and organizations engaged in the manufacture of chemicals and their derivatives. [46]
- **Chief Town and Country Planner:** means the Head of the Town and Country Planning Department of the State Government. [1]
- **Church:** A premises serving the Christian community as a place of worship. [52]

- **Cinema/ Multiplex:** A premise with facilities for projection of movies and stills with a covered space to seat audience. [4]
- **City Centre / Town Centre / Downtown:** The central area of a city characterised by convergence of transportation and communication networks, concentration of socio-economic, cultural, and administrative activities and very high land value. [2]
- **City:** Towns with population of 1,00,000 and above are categorized as cities.. [20]
- **Cluster:** A group of generally up to maximum 20 plots or dwelling units arranged around a group open space. [4]
- **Collector Road / Collector Street:** As the name suggests, these are connector roads, which distribute the traffic from access streets to arterial and sub arterial roads. They are characterized by mobility and access equally. It carries moderate traffic volumes compared to the arterial roads. Due to its overlapping nature, distributor roads can act as sub arterial and as access streets, depending upon the function and the land use of the surroundings. [2]
- **College:** “College” means an educational institution meant for imparting education above Higher Secondary ( 10+2 level) and up to Bachelor’s/ Master’s degree affiliated to an University, and includes the land, buildings, playgrounds, hostels and movable properties such as furniture, books, apparatus, map and equipment, owned by and used for the activities of the educational institution. [40]
- **Commercial Building:** means any building or part of building, which is used as shop and / or market for display and sale of merchandise either wholesale or retail, or a building used for transaction of business or the keeping of accounts, records for similar purpose, professional service facilities, corporate offices, software services, offices of commercial undertakings and companies. Habitat centers, petrol pump, restaurant, lodge, Stand Alone Private Hostel, guest houses, hotel, motel, resort, cinema, theatre, multiplex, mall, wedding point, banquet hall, bank, gymnasium, multi-level car parking, storage and service facilities incidental to the sale of merchandise and located in the same building shall be included under this group, except where exempted and any other use which is in the opinion of sanctioning authority is of similar nature as mentioned in the above activities. [3]
- **Commercial Land Use:** A parcel of land, shown on a development or layout plan, where retail or wholesale commercial and related activities are being carried out (existing land use) or will be permitted in future (proposed land use). [2]

- **Commercial Office:** A built space in a commercial building used for office of an individual, group or organisation. [5]
- **Commercial:** Commercial areas in a city are areas, districts, or neighbourhoods primarily composed of commercial buildings, such as strip malls, office parks, downtown, central business district, financial district, "Main Street", or shopping centres. Commercial activity within cities includes the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and a wide variety of uses that are broadly classified as "business." While commercial activities typically take up a relatively small amount of land, they are extremely important to a community's economy. They provide employment, facilitate the circulation of money, and often serve many other roles important to the community, such as public gathering and cultural events. [2]
- **Community Development / Community Planning:** A participatory process where the people living in a locality, identify problems and initiate action for improvement of the area or quality of life of a section of the community such as women, children, or the elderly, through mobilising physical, social, human, and financial resources. [2]
- **Community Hall / Centre:** At city level, a commercial centre serving a population of 10000 and comprising shops (Retail, service and informal), offices, cinema, hotel, nursing home, service industries, post office, electric sub-station, and conveniences. At residential area level, an enclosed space, used for various social and cultural activities of a neighbourhood of 15,000 population. [4]
- **Community:** (a) A self-conscious social unit having common identity and interests, (b) An identifiable group of people living, studying, or working in proximity, (c) A planning unit, in a large city or metropolis, serving a population of 100,000 with a community centre as its core. [37]
- **Commute:** To travel daily between places of residence to place of work located in another settlement. [2]
- **Commuter:** The person who commutes. [2]
- **Concept Plan:** A generalized plan indicating the boundaries of a tract or tracts under common ownership, and identifying proposed land use, land-use intensity, and thoroughfare alignment. [2]
- **Conceptual Plan / Inception Plan / Conceptual Design / Inception Plan / Planning Concept / Preliminary Plan / Schematic Design / Schematic Plan:** A preliminary



plan/design giving the schedule of requirements, general approach, and alternative concepts/ solutions for the consideration of the client and his comments, suggestions, and choice of a preferred alternative for further detailing. [2]

- **Conservation:** Judicious and sustainable use and management of natural or manmade resources in such a manner that their natural, ecological, architectural, historical, socio-cultural significance, as applicable, is maintained. [48]
- **Convenience Shops:** means a shop where the necessary goods for daily needs of the public are available. [3]
- **Coordinate:** In GIS, a set of numbers that define location in a given reference system, such as x, y in a planar coordinate system or an x, y, z in a three-dimensional coordinate system. [5]
- **Corridor:** A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways, and transit route alignments. [2]
- **Country Planning:** A spatio-economic planning process that addresses to the issues of rural areas. [54]
- **Courts:** “Court” means a principal civil court of original jurisdiction, and includes any other civil court empowered by the State Government to perform the functions of the court under this Act within the pecuniary and local limits of its jurisdiction. [54]
- **Coverage:** In GIS, (a) A digital version of a map, which forms the basic unit of vector data storage in Arc Info: (b) A set of thematically (such as soils, streams, roads, or land use) associated data considered as a unit. [5]
- **Crèche / Day Care Centre / Day Nursery:** An educational or custodial facility, managed by an individual or an institution on commercial or non-commercial basis, for infants and pre-school children during day time when both parents are out to work. A premise having nursing facilities for young children during day time. The center may be managed by an individual or an institution on commercial or non-commercial basis. [2]
- **Cremation Ground/ Crematorium:** A premise with facilities of performing last rites of dead bodies by burning. [2]
- **Cottage and Household industry:** an industry whose labor force consists of family units or individuals working at home with their own equipment.
- **Cul-de-sac:** A dead end street with appropriately designed area at the end for turn around. [41]

- **Cultivation:** The processes of ploughing, sowing, and production of cereals and millet crops (such as Wheat, Paddy, Jowar, Bajra, Ragi, etc.), pulses, raw jute and kindred fibre crops, cotton, etc. and includes supervision or direction of cultivation but does not include growing of fruits and vegetables, keeping orchard or groves, or working in plantations like tea, coffee, rubber, cinchona, and medicinal plants. [20]
- **Cultivator:** For purpose of the Census, a person is classified as cultivator if he or she is engaged in cultivation of land owned or held from Government or held from private persons or institutions for payment in money, kind or share. Cultivation includes effective supervision or direction in cultivation. A person who has given out her/his land to another person or persons or institution(s) for cultivation for money, kind or share of crop and who does not even supervise or direct cultivate on land, is not treated as cultivator. [20]
- **Cycle Lane / Bike Lane / Bicycle Lane:** A portion of a road right-of-way reserved for use by bicycles exclusively. [41]
- **Cycle Rickshaw:** A three-wheeled vehicle driven manually the help of a cycle and serving a city as a para-transit. [41]
- **Cycle Track / Bike Path / Bike Way / Bicycle Path / Bicycle Track:** A path, physically separated from automobile and pedestrian traffic by an open strip or barrier, reserved for exclusive use by cycles and may or may not be part of the road right-of way. [41]
- **Dairy Booth:** A kiosk operated by private entity/local authority for the distribution of milk and dairy products. [5]
- **Dairy Farm:** A premise with facilities for rearing and processing of dairy products. It may have temporary structures for sheds of cows. [55]
- **Dam:** “Dam” means any artificial barrier and its appurtenant structure constructed across rivers or tributaries thereof with a view to impound or divert water which also include barrage, weir and similar water impounding structures but does not include— (a) canal, aquaduct, navigation channel and similar water conveyance structures; (b) flood embankment, dike, guide bund and similar flow regulation structures;. [56]
- **Database:** Information stored on a computer system that can be updated, modified, and retrieved by authorised persons for further analysis and presentation. [5]
- **Deforestation:** The direct human-induced conversion of forested land to non-forested land. [2]
- **Demand:** The quantity of goods or services required as per accepted norms and standards or need of the people. [57]

- **Demarcation:** Transferring the layout plan on the site by marking the boundaries of land subdivisions. [5]
- **Demography:** The scientific study of characteristics of human population. [20]
- **Density:** (a) In case of spatial distribution, number of persons or things per unit area (i.e., hectare, acre, sq. mile, or sq. km.), (b) In case of population served, number of things or facilities per unit of population (i.e., 100, 1000, 10,000 etc. persons) where depending upon need, the things may include telephone, phone, doctors, schools etc. The residential density expressed in terms of the number of dwelling units per hectare [4].
- **Department:** means office of the Chief Town and Country Planning Department of Uttarakhand. [1]
- **Design:** Conceptualisation of a thought and its planning. Architectural and / or engineering details, through plans, elevations, sections, and other graphic presentation, as required for its implementation. [4]
- **Detached Housing:** A plotted housing development where each dwelling unit is located on a plot with setbacks on all its four sides. [14]
- **Developed Land / Developed Area:** A land area in an urban centre that has been equipped with basic network of infrastructure such as roads, water supply, sewerage, drainage, electricity, and roadside plantation. [3]
- **Development Area:** means any area declared, development area under relevant act. [1]
- **Development Vision / Goals / Vision:** A perception of the future pattern of development based upon anticipated changes, dreams and aspirations that inspires further planning interventions. [2]
- **Development:** ‘Development’ with grammatical variations means the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in any building or land, and includes re-development and layout and subdivision of any land and ‘to develop’ shall be construed accordingly. [4]  
[3]
- **Dharamshala / Ashram:** In Hindi, a building, normally located near religious places or hospitals where rooms are let out for short duration on non-profit basis. It means building used for holding religious meetings and as resting place for religious followers, a place where arrangements are made for stay of a particular community at minimal charge in the form of donation or free of cost. The ownership of such buildings / plots essentially be of a registered charitable institution and the operation of permissible activities within it shall

also be done by it. In the design of such buildings, a maximum of 25 percent of proposed F.A.R. may be proposed for single rooms and the rest of the F.A.R. shall be in the form of dormitory (along with common room and toilet). [3]

- **Digitise:** In GIS, (a) To encode geographic features in digital form as x, y coordinates, (b) The process of using a digitiser to encode the locations of geographic features by converting their map positions to a series of x, y coordinates stored in computer files. [5]
- **Disaster:** Disaster means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or damage to, or degradation of environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area. [22]
- **Dispensary for Pet Animal and Birds / Veterinary Dispensary:** A premise having facilities for medical advice and provision of medicines to pet animals and birds, managed by public/ private or charitable institutions. [2]
- **Dispensary:** A premise having facilities for medical advice and provision of medicine, managed by public or charitable institutions. [2]
- **District Court/ Family Courts:** Premises used for the offices of Judiciary. [9]
- **District Police Office & Battalion:** A premise having facilities for the offices and paramilitary forces. [2]
- **District:** (a) An administrative division of a state managed by a District Collector. [58]
- **Drainage System:** A system or a line of pipes, with their fittings and accessories, such as manholes, inspection chambers, traps, gullies, floor traps used for drainage of building or yards appurtenant to the buildings within the same cartilage; and includes an open channel for conveying surface water or a system for the removal of any waste water. [4]
- **Dwelling Unit:** A single self-contained house with independent access designed and constructed as an independent unit of a residential area. “Dwelling Unit” shall mean an independent housing unit with separate facilities for living, cooking and sanitary requirements. [3]
- **Earthquake:** A natural phenomenon caused by a sudden rupture inside the earth's crust resulting in shaking or movement of its surface which results in damage to life and property depending upon its intensity measured on a 10-point Richter scale. [59]
- **Eco-industrial Estate / Industrial Park:** A designated industrial area, developed and managed in an eco-friendly manner where the industries share resources, effluent is

treated in a common treatment plant, wastes are recycled and common facilities are jointly looked after. [60]

- **Ecosystem:** An arrangement of living (plants and animals) and non-living (mountains and minerals) things and the forces (climate and wildfire) that influence them. [61]
- **Educational Building:** A building exclusively used for a school or college, recognized by the appropriate Board or University, or any other Competent Authority involving assembly for instruction, education or recreation incidental to educational use, and including a building for such other uses as research institution. It shall also include quarters for essential staff required to reside in the premises, and building used as a hostel captive to an educational institution whether situated in its campus or outside. [4] [3]
- **Effluent Treatment Plant (ETP):** ETP is a Waste Water Treatment Process (WWTP) that is used to treat wastewater. It is mostly used in industries like pharmaceuticals, textiles, and chemicals where extreme water contamination is a possibility. ETP plays a significant role in treatment of industrial wastewater & domestic sewage. [62]
- **Electric Sub-station:** means a station for transforming or converting electricity for the transmission or distribution thereof and includes transformers converters, switch-gears, capacitors, synchronous condensers, structures, cable and other appurtenant equipment and any buildings used for that purpose and the site thereof. [23]
- **Electricity Grid:** Means the high voltage backbone system of inter-connected transmission lines, sub-stations and generating plants. [23]
- **Encroachment:** It means an act to enter into the possession or rights either of permanent or temporary nature on a land or built up property of local body or state/ central Government. [4]
- **Environment:** "Environment" includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property. [24]
- **Equivalent Car Space (ECS):** A unit used to specify parking norms/ requirements where one equivalent car space (ECS) is equivalent to one standard car and the other modes are converted into this unit depending upon their size and parking space requirements, accordingly the ECS of a two-wheeler, bicycle, and a truck is 0.25, 0.10, and 3.00 respectively. [2]
- **EWS:** EWS households are defined as households having an annual income up to Rs. 3,00,000 (Rupees Three Lakh). [77]

- **EWS House:** An all-weather single unit or a unit in a multi-storied super structure having carpet area of upto 30 sq.m. with adequate basic civic services and infrastructure services like toilet, water, electricity etc. [77]
- **Existing Land Use Plan:** The Plan showing the different land use existing at the time of preparation of the Existing Land Use Plan of Planning Area. [7]
- **Facility:** A premises where health care, educational, socio-cultural, and recreational activities take place. [2]
- **Fair Grounds:** A multipurpose, centrally located, facility for a variety of short-duration socio-cultural, economic, and political functions. [2]
- **Farm House:** A farm, located in the green belt around a city, used generally for agriculture and allied activities, where a dwelling unit of a specified size (e.g. 100 to 150 sq. m.) is also permitted [11]. Farm House means a building allowed on a minimum holding of 2.5 acre of agricultural land for residential activity of the land holder [7].
- **Feature Class:** In GIS, a classification describing the format of geographic features, such as point, arc, node, route-system, route, section, polygon and region, and the supporting data in a coverage. [11]
- **Fencing:** Plant or construction materials used for provision of fences around an area. [4]
- **Fire Station:** A premise having facility for firefighting for a catchment area assigned to it. It may include residence of essential staff. [2]
- **Flat / Apartment / Residential Flat:** A complete dwelling unit, with independent entrance, for one household within a group housing complex containing similar such units. [4]
- **Flood Control:** Measures taken to prevent the damage to human life and property due to floods and include dredging, maintaining vegetation as groundcover, and construction of dams. [63]
- **Flood Zone / Flood Area:** Area inundated during floods. [63]
- **Floor Area Ratio (FAR):** The ratio of the gross floor area on all floors of a building to the area of the plot on which it is located and multiplied by 100, e.g., an FAR of 250 means that the gross floor area on all floors of a building can be 250 per cent of the area of the plot on which it is located [11]. The quotient obtained by dividing the combined covered area (plinth area) of all floors, excepting areas specifically exempted under these regulations, by the total area of the plot [4].
- **Flora:** The plant life of an area. [48]

- **Footpath / Footway / Path / Pathway/ Pedestrian Path / Sidewalk / Walkway:** Footpaths are defined as any area primarily used by ‘all’ pedestrians. They can be adjacent to roadways or away from the road. A footpath should consist of a dead or frontage zone, pedestrian zone and a multi-functional zone (IRC:103). [41]
- **Forecasting:** The technique of estimating the future conditions related to demographic and socio-economic characteristics, demand and supply of infrastructure, traffic volume etc. [41]
- **Forest Cover:** The Ministry of Environment, Forest and Climate Change defines ‘forest cover’ in India as “all lands, more than one hectare in area with a tree canopy density of more than 10%”.
- **Forest:** The 1996 Supreme Court judgement expanded the definition of forest to include lands that were already notified by the Centre as forests, that appear in government records as forests as well as those that fell in the “dictionary definition” of forest. This description covers all statutorily recognised forests, whether designated as reserved, protected or otherwise.
- **Freight Complex:** A complex having premises for booking and storage of goods that a train, truck, ship or aircraft carries. [2]
- **Freight Transport:** Movement of goods by means of common, carriers. [2]
- **Gap Analysis:** A process of evaluation of the difference between the demand and supply of an activity at a given point of time, or between the current and future state of an activity, with a view to identify the action needed and resources required to bridge the gap, if any. [2]
- **Garden:** An open space landscaped with trees, plants, flowers, water bodies, and other manmade elements of landscape for outdoor relaxation and pleasure. [64]
- **Gau Shala/ Dairy Farm:** A premise with facilities for rearing and processing of dairy products. It may have temporary structure for sheds of animals and birds. [2]
- **Geographic Information System (GIS):** A system which provides computerized mechanisms for integrating various geo information data sets and analysing them in order to generate information relevant to planning needs in a context. [5]
- **Goals:** Broad and general statements, that highlight the vision and development approach which direct further planning and implementation efforts. [2]
- **Golf Course:** A tract of land laid out with at least nine holes for playing a game of golf and improved with tees, greens, fairways, and hazards. A golf course includes a

clubhouse and shelters as accessory uses. (Maryland Heights, Mo.) An area or course for playing golf, consisting of at least nine holes, except miniature golf, within which the playing area is not artificially illuminated. (Pine Bluff, Ark.). At least nine separate holes consisting of a separate tee, fairway, and green for each of the nine holes, and requiring the use of standard golf clubs in addition to a putter. The minimum length of a golf course shall be 2,000 yards total, measuring from the front of each tee to the middle of each green. (Sioux City, Iowa.) [4]

- **Government Housing Scheme:** A project, often funded by a local or state or central government or jointly or another organization, that provides homes for people to buy or rent at a low price. For e.g., Pradhan Mantri Awas Yojana.
- **Government Quarter:** housing provided to an employer by the government. [5]
- **Government:** The system that has authority to govern a country and comprises three arms: the legislature to make laws, the administration-responsible for implementation of the laws, and the judiciary to protect the laws and ensure justice. [31]
- **Govt. / Semi Govt. / Public Undertaking/ Local Body Office:** A premise used for offices of the Union and State Governments, semi-Government organizations, Public Sector Undertakings and Local Body Offices. [6]
- **Gradient:** The degree of slope of land, pipe invert or road as compared with horizontal. [62]
- **Green Belt / Green Girdle / Park Belt:** An area of land predominantly agriculture in use, located around the proposed urbanisable limit of an urban area with a view to controlling its growth, preserving towns from merging into one another or to preserve special neighbouring character of a town. [64]
- **Grave Yard:** a place where dead people are buried. [2]
- **Grid:** In GIS, a geographic data model representing information as an array of equally sized square cells, referenced by their respective geographic x, y locations, and arranged in rows and columns. [5]
- **Ground Control Points:** Reference points on ground, obtained, through ground survey, to control and correct distortion of remote sensing images. [5]
- **Ground Cover:** Planting material that forms a carpet of low height. [4]
- **Ground Level Reservoir:** Ground reservoir includes four parts: storage zone consisting with natural storage structure, dam to enclose storage zone, infiltration works



of surface water and water-intake works from groundwater. In many countries, ground reservoirs always are referred to ASR (Aquifer Storage & Recovery). [62]

- **Ground Water:** The water under the earth's surface in an aquifer or in the soil, water of a spring or a shallow well. [62]
- **Group Housing:** means a building unit constructed or to be constructed with one or more floors having more than two dwelling units having common service facilities where land is owned jointly (as in the case of co-operative societies or the public agencies, such as local authorities or housing boards, etc) and the construction is undertaken by one Agency. [4]
- **Growth Rate:** Statistical estimate of the percentage increase or decrease in size of an entity or population of area(s) in a given year. [20]
- **Growth:** A process of positive change, (b) Quantitative increase or expansion in size. [20]
- **Guard House:** A building built in compliance with all building codes of the [jurisdiction] and all the terms granted in a special use permit and located on a private road or on private property adjacent to a private road as shown on the site plan approved with the special use permit, for the purpose of manually or electronically regulating and monitoring pedestrian and/or vehicular traffic into a subdivision or neighbourhood and promoting security within the subdivision or neighbourhood; provided, however, a guardhouse shall not be designed or used for sleeping or living purposes. [76]
- **Guest House / Lodging / Inn:** It means tourist houses having 5 to 20 rooms along with dormitory, dining hall, and capacity to provide kitchen. In the guest house any kind of banquet hall, seminal hall, wedding point or other multi-purpose hall for any community activities shall not be permitted. [3]
- **Gymnasium / Health Club:** A facility where members or non-members use equipment or space for the purpose of physical exercise. [4]
- **Hamlet:** A physically identifiable part of a dispersed village comprising a few households. [6]
- **Hazardous Building:** Any building or part thereof, which is used for the storage, handling, manufacture or processing of highly combustible or explosive materials or products which are liable to burn with extreme rapidity and / or which may produce poisonous fumes or explosions for storage, handling, manufacturing or processing which involve highly corrosive, toxic or noxious alkalis, acid or other liquids or chemicals

producing flame, fumes, and explosive, mixtures of dust or which result in the division of matter into fine particles subject to spontaneous ignition. [4] [3]

- **Health Care Facilities:** The premises where health care services are located e.g., hospitals, clinics, nursing homes, pharmacies, and training centres for health workers. [2]
- **Health Centre/ Family Welfare Centre:** A premise having facilities for treatment of indoor and outdoor patients having up to 30 beds. The health centre may be managed by a public or a charitable institution on non-commercial basis. [2]
- **Heritage Zone:** Means those areas of archaeological or historical or architectural or aesthetic or scientific or environmental or cultural significance including man made and natural features and sites of scenic beauty which are included in a list(s) published by notification in the Government Gazette, by the Government, from time to time. [26]
- **Historic Site:** An area having historical, architectural, archaeological, or cultural value that is protected by Survey of India or needs to be protected by the local community or state government. [65]
- **Horticulture:** Horticulture is the art of cultivating plants in gardens to produce food and medicinal ingredients, or for comfort and ornamental purposes. Horticulturists are agriculturists who grow flowers, fruits and nuts, vegetables and herbs, as well as ornamental trees and lawns. [66]
- **Hospital:** A building complex, having more than 30 beds with all necessary facilities, and services, providing general or specialised health-care facilities including observations, care, treatment to indoor patients and medical advice to outdoor patients suffering from illness, disease or injury and managed by public body or private institution. [4]
- **Hostel:** A building having several rooms with independent access and attached or common toilet/bath as well as other facilities like dining and indoor recreational spaces for letting out on long term basis to students or other persons belonging to an institution or otherwise. [4]
- **Hotel:** A building having a capacity of more than 20 rooms along with independent access and attached or common toilet/bath with or without dining and other facilities, with fooding facilities and multi-purpose hall for conference, exhibition for public programs. [3]
- **House / Dwelling:** A single self-contained house with independent access designed and constructed as an independent unit of a residential area. “Dwelling Unit” shall mean an

independent housing unit with separate facilities for living, cooking and sanitary requirements. [3]

- **Household Industry:** A small-scale industry, operated from a house by one or more members of the household for production or for servicing and repairs of goods [11]. Household Industry means household occupation/industry conducted only by family members/persons residing in the dwelling with or without power and not contrary to the provisions of the Water Pollution (Prevention and Control) Act 1974, Air Pollution (Prevention and Control) Act, 1981, and Environment (Protection) Act, 1986. [7]
- **Household:** A group of persons, related or otherwise, living in the same dwelling and sharing meals and expenses related to housekeeping. [20]
- **Housing Conditions:** General state of housing stock as measured by its age, quality, state of repairs and value. [20]
- **Housing Policy:** A series of financial, land-related, and administrative measures undertaken by the government to bridge the gap between the supply and demand of housing stock, ensure access to shelter to all sections of the society especially the economically weaker sections. [57]
- **Housing Shortage:** The gap between the demand and supply of dwelling units of various types for different sections of the society. [57]
- **Housing Stock:** The total quantity of housing units, irrespective of condition, legal status, or compliance to norms and standards, existing in a housing market area at a given point of time. [57]
- **Housing:** The total physical environment within and outside the house where families and households live and includes houses, and all necessary utilities, community facilities, park, playground, and roads. In Low-Income Group (LIG) housing accommodating households engaged in same or similar occupation, a common place of work is also included as an integral part of housing. [57]
- **Human Settlement:** A place, rural or urban, where people live, work, raise family and fulfil their physical, spiritual and intellectual needs and where, depending upon its hierarchy in the national or regional system of settlements, a variety of activities, facilities and services are located. [2]
- **Image:** The recorded representation of an object produced by optical, electro-optical, optical mechanical, or electronic means. [5]

- **Implementation:** The process of execution or carrying out of the provisions of a policy, plan, programme, project or scheme. [2]
- **Individual House:** A premise for one dwelling unit which may or may not have on it one main building block and one accessory block for garage/ garages and servant quarters. [4]
- **Indoor stadium:** A premise for indoor stadium with play area and spectator seating including related facilities. [4]
- **Industrial Land Use:** The use of a parcel of land, where process of manufacturing and related activities are being carried out (existing industrial land use) or will be permitted in future (proposed industrial land use). [2]
- **Industrial Sector:** The sector of economy contributing to development and employment generation comprising manufacturing of products, machines and consumer goods. [2]
- **Industrial Waste:** Residue or by-products of an industrial process that may contain inorganic, non-biodegradable and polluting substances such as metals, plastics, liquids, gases, and chemicals. [62]
- **Industry:** A group of productive enterprises or organizations that produce or supply goods, services, or sources of income. In economics, industries are generally classified as primary, secondary, tertiary, and quaternary; secondary industries are further classified as heavy and light. Industry” means a specific branch of manufacture and trade, which includes green, orange and red category industries as categorized by Uttarakhand Pollution Control Board / Department of Industries or as amended from time to time. It excludes mining and quarrying [7].
- **Informal Sector / Parallel Economy:** The sector of economy where the labour force is self-employed with family support, in economic activities such as trading and street vending that do not have any formal structure and designated areas, and is characterised by small-scale, labour-intensive operation. [67]
- **Infrastructure:** The basic components of a human settlement that make it functional, improve its quality of life, and include – network of water supply, sewerage, drainage, electricity, communication, transportation, and facilities and services. [62]
- **Institution:** A society or organisation established, through law, or otherwise, for a specific purpose. [4]
- **Integrated Freight Complex:** A strategically located premises, with access from both railway and a highway, comprising wholesale market, warehousing, truck terminal,

railway station and other related uses and infrastructure with a view to facilitate integrated movement of goods by rail as well as road. [41]

- **Jail:** “Prison” means any jail or place used permanently or temporarily under the general or special orders of a State Government for the detention of prisoners, and includes all lands and buildings appurtenant thereto, but does not include— (a) any place for the confinement of prisoners who are exclusively in the custody of the police; (b) any place specially appointed by the State Government under section 541 of the 1Code of Criminal Procedure, 1882 (10 of 1882); or (c) any place which has been declared by the State Government, by general or special order, to be a subsidiary jail;. [68]
- **Junction:** A place, serving as an interchange point, where two or more roads or railway lines meet. [69]
- **Jurisdiction:** The area, defined by a clear boundary (such as the municipal area, district, or state) within which the authority and powers of a legally constituted body extends and ceases beyond it. [2]
- **Khasra Number:** Official map of a village record indicating boundaries of all properties, dimensions, property number, ownership and other details. The property number, as recorded on the official khasra map, normally used in land acquisition notification to identify the property and its other details. [21]
- **Kitchen:** A place used for cooking of food. [20]
- **Lake:** A large body of water within land and can be natural or man-made. [38]
- **Land Development:** ‘development’ with its grammatical variations, means the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in any building or land, and includes re-development[1].
- **Land Disposal:** The procedure of sale or lease of land, acquired by a planning and development authority or local body for public purposes, according to the rules made in this respect. [29]
- **Land Use / Use of Land / Specific Land Use:** (a) The manner in which land is used at a given point of time to accommodate various human needs, (b) The activity that can be legally performed on a parcel of land and includes, in the context of urban settlements, residential, commercial, manufacturing, public and semi-public, recreation including open spaces, transport and communication, agriculture and other special areas, which are further subdivided into sub-categories. [2]

- **Land Use Plan (Existing):** A plan that gives the existing (in a given year) land use of all parcels of land in the planning area of a settlement and is supported by quantitative and qualitative analysis of each land use. [2]
- **Land Use Plan (Proposed):** A plan that gives the proposed land use of the area of a settlement that is likely to be developed during the plan period (5 years, or 20-25 years as the case may be) for various purposes and activities having regard to socio economic development needs as well as physical, environmental and accessibility considerations. Such plans serve as a guide to planned development of the settlement, land acquisition for public purposes, and future capital budgeting. [2]
- **Land Value:** (a) The value of parcel of land apart from structure or crops standing on it, (b) The value at which a person is ready to buy or sell a plot of land, (c) The value at which sale or purchase of a plot of land has been recently registered. [29]
- **Land:** the expression “land” includes benefits to arise out of land, and things attached to the earth or permanently fastened to anything attached to the earth. [29]
- **Landfill:** A designated disposal facility or part thereof, generally located on the out skirts of a city or away from residential zone, where municipal wastes are placed in or on land. [62]
- **Landmark:** A distinctive building or feature which can be entered or passed through and which stands out as being easily identifiable and easily retained image, forming part of the mental picture of a city and just a mention of its name reminds the city e.g. Qutab Minar - Delhi, Eiffel Tower-Paris, or Big Ben London,. [71]
- **Lane:** A portion of a road surface, usually indicated by road markings, that is intended for movement of one row of vehicles. [41]
- **Large Industries:** Industries that have fixed assets without depreciation, or project cost of more than Rs. 5 crore. [46]
- **Law:** (a) The rules of a community or state the statute, (b) in research, the theoretical principles deduced from practice or observations. [31]
- **Layout Plan / Site Plan / Site Layout:** A plan of an area showing its sub-divisions, land use, infrastructure services, prepared within the framework of the Master Plan, and/or zoning and sub-division regulations. Layout Plan means a Plan indicating configuration and sizes of all Use Premises. Each Use Zone may have one or more than one Layout Plan depending upon the extensiveness of the area under the specific Use Zones and vice

versa. A layout plan shall have at least two use premises (apart from Recreational, utilities and transportation) and a minimum area of 1 hectare. [4]

- **Lease:** A contractual agreement between a tenant and a landlord whereby the landlord permits a tenant to use his property for a specified period and use on payment of a specified rent and compliance of other mutually agreed conditions. [29]
- **Level of Service (LOS):** A quantitative stratification of a performance measure or measure that represents quality of service, measured on an A to F scale, with LOS-A representing the best operating conditions from the traveler's perspective and LOS-F the worst. [39]
- **Level of Urbanisation / Degree of Urbanisation:** The percentage of urban population to the total population in a country, state or region. [20]
- **Library (Public):** A premise having large selection of books for reading and reference for general public or specific class. [36]
- **Library/ Reading Room:** A premise having a large collection of books for reading and reference for general public or specific class. [2]
- **Literacy Rate:** The percentage of literates in the age group of seven years and above. [20]
- **Literate:** A person aged 7 years and above who can both read and write with understanding in any language was taken as literate. [20]
- **Local Bus Service:** An intra-city bus service that usually links residential areas and major activity centres using the local street system. [72]
- **Local Road / Local Street:** A street primarily for access to residence, business or other abutting property. Its primary function shall be for local activities and access to properties and not through movement of traffic. Local streets may not have a dedicated footpath and can be designed as shared space that gives priority to NMT modes. Various traffic calming elements will be employed to ensure that vehicle speeds are below 20 kmph, safe for intermingling of pedestrians, cyclists, and motor vehicles. [41]
- **Location Map:** A map showing the location of the project site in relation to neighbouring areas, settlements, transportation routes and other prominent features with a view to provide a clear comprehension of the locational characteristics of the site. [71]
- **LPG Godown:** A premise where cylinders of LPG are stored. [73]
- **Main Worker:** Workers who worked for more than 6 months (180 days) in the reference period are termed as Main Workers. [20]

- **Mall:** A large retail commercial complex with one large establishment acting as the anchor and several other small shops, owned and managed by different persons, selling a variety of goods and services. [4]
- **Mandi Town:** A town where trading of agricultural produce is the main economic activity and forms its economic base. [2]
- **Manufacturing Industries:** Industries that produce goods by using or processing a variety of raw, semi-processed and / or recycled materials. [46]
- **Map:** A representation on paper, of physical features, size, location, use, political and administrative boundaries, and other characteristics on land drawn to scale using cartographic techniques as per requirements. [71]
- **Marginal Worker:** Workers who worked for less than six months (180 days) in the reference period are termed as Marginal Workers. [20]
- **Market:** “Market” includes any place where persons assemble for the sale of, or for the purpose of exposing for sale, live-stock or food for live-stock or meat, fish fruit, vegetables, animals intended for human food or any other articles of human food whatsoever with or without the consent of the owner of such place, notwithstanding that there may be no common regulation of the concourse of buyers and sellers and whether or not any control is exercised over the business of or the persons frequenting the market by the owner of the place or any other person. [42]
- **Master Plan/Development Plan:** Development plan is a statutory plan prepared (under relevant Act) within the framework of an approved perspective plan. The objective of a development plan is to provide further necessary details and intended actions in the form of strategies and physical proposals for various policies given in the perspective plan and regional plan depending upon the economic and social needs and aspiration of the people, available resources and priorities. [2]
- **Median / Divider:** An area in the approximate center of a city street or state highway that is used to separate the directional flow of traffic, may contain left-turn lanes, and is demarcated by curb and guttering, having painted or thermally applied stripes or other means of distinguishing it from the portion of the roadway used for through traffic. (Thornton, Colo.) [41].
- **Medium Industries:** Where the investment in plant and machinery is more than five crore rupees but does not exceed ten crore rupees.[30]



- **Metropolis:** (a) Demographically, a city having a population of one million and above, (b) Administratively, a city having a population of one million and above and governed by one or more municipal body(ies), (c) Functionally, a city having a population of one million and above serving its influence region as the dominating centre of trade, commerce, art, culture, health care, recreation, education, research, administration and political activity. [20]
- **Microclimate:** The climate of a localised area which may differ from the overall climate of the wider area due to local factors such as tree cover (or the absence of tree cover), or exposure to winds. [74]
- **Migrant:** A person who moves from one place to another. [20]
- **Migration / Population Drift:** Movement of people from one place to another generally for employment, or other social purposes like education or marriage. [20]
- **Mining / Quarry:** All or any part of the process involved in the mining of minerals by removing overburden and mining directly from the mineral deposits, open pit mining or minerals naturally exposed, mining by auger method, dredging and quarrying, underground mining, and surface work incidental to an underground mine. [28]
- **Mining Site:** The entire area, including land and water, encompassed in the mining site plan. (Polk County, Fla.) [28]
- **Mixed Land Use:** The phenomenon of existence of two or more uses on a site, or plot or in a building, which may or may not be compatible. [2]
- **Mixed:** Mixed-use is a kind of urban development, urban design, urban planning and/or a zoning type that blends multiple uses, such as residential, commercial, cultural, institutional, or entertainment, into one space, where those functions are to some degree physically and functionally integrated, and that provides pedestrian connections. Mixed-use development may be applied to a single building, a block or neighbourhood, or in zoning policy across an entire city or other administrative unit. [2]
- **Mosaic:** An assemblage of overlapping aerial or satellite photographs or images whose edges have been matched to form a continuous pictorial representation of a portion of the earth's surface. [5]
- **Mosque:** A building or a complex of building with related infrastructure including parking and serving as an Islamic place of worship. [52]
- **Multiplex:** It shall mean an integrated entertainment and shopping complex/center. It shall necessarily have minimum two cinema halls and may have Theatres, Auditorium,

Retail Shops, Commercial show rooms, Restaurants and Food plazas, Health club and Fitness center, Clubs, Call centers, Corporate Offices, Convention Hall, Bank, Cyber café, Video Games, Parlours, Pubs, Bowling Allies and Recreational activities and all the areas/building except cinema halls shall fall in the commercial category. [3]

- **Multipurpose ground:** Support Facilities- Vending Booth/ Kiosk. [2]
- **Multipurpose Open Spaces / Maidan:** A space or an area, which is essentially, open and can be used for multiple temporal functions. [2]
- **Multi-storey parking:** A building designed for car and motorcycle parking and where there are a number of floors or levels on which parking takes place. [4]
- **Municipal Area:** The territorial area under the jurisdiction of municipality as notified by the Governor. [11]
- **Municipal Corporation / Nagar Nigam:** “Corporation” or “Municipal Corporation” means the Municipal Corporation constituted for a city under sub-clause (c) of clause (1) of Article 243-Q of the constitution. [42]
- **Municipal Council / Nagar Palika / Nagar Parishad:** An elected urban local body of self-governance for smaller urban areas constituted under the Municipal act. [6]
- **Municipal Government:** A municipal council, or corporation or Nagar Panchayat, constituted by election as per relevant municipal act to make policies, collect taxes, and discharge the specified administrative and developmental functions within their respective area of jurisdiction. [6]
- **Municipal Solid Waste:** All types of solid waste, except hospital waste, generated by different residential and commercial areas located in a municipality. [62]
- **Municipality:** The urban local institution of self-governance constituted under Municipal act. [6]
- **Museum:** A building having public significance by reason of its architecture or former use or occupancy or a building serving as a repository for a collection of natural, scientific, or literary curiosities or objects of interest, or works of art, and arranged, intended, and designed to be used by members of the public for viewing, with or without an admission charge, and which may include as an accessory use the sale of goods to the public as gifts or for their own use. [4]
- **Nala / Nallah:** In Hindi, an open main drain carrying storm water and / or sewage in a settlement. [21]

- **Natural Growth:** The surplus of population due to excess of births over deaths and does not include increase due to migration. [20]
- **Natural Reserve Area:** (a) A designated area of ecological significance with diversified flora and fauna kept reserved in their natural state for conservation, study, research and human enjoyment, (b) Designated areas, generally kept reserved in their natural state, that are unsuitable for urban development due to natural constraints and include rivers and their 100-year floodplains, wetlands, steep hill slopes, and the like. [61]
- **Nazul Land:** In Persian, the land vested with the government. [21]
- **Neighbourhood:** A residential planning unit in a city comprising housing-clusters that can support all necessary facilities and services to serve a population of 3,000 to 6,000 persons. [2]
- **Net Residential Density:** The number of persons per unit area (hectare or acre) of a residential site and it excludes area devoted to sector level facilities, services, commercial activity, parks, open spaces, and major roads (net residential density is generally double of the gross residential density as about 50 per cent area is occupied by sector level uses). [2]
- **Network:** (a) In transportation, a system that comprises transportation by rail, road, air, waterways, wires and pipe lines, (b) In planning, a system of transport and utility lines including water supply, electricity, gas, communication, roads connecting different areas of a city, (c) In administration, a system of relationship between different institutions, organisations and agencies having similar interests of organisational goals. [2]
- **New Town:** A self-contained town having its own economic base, administration and governance, comprehensively planned on a virgin site for accommodating industrial, commercial, and residential activities that are served by necessary utilities, facilities and services. [2]
- **Night Shelter / Ran Basera:** A premises generally owned and managed by the urban local body or a voluntary agency, for providing accommodation, in the night only, to homeless urban poor on daily payment of a token amount as rent, or without any charge [2].
- **Noise Pollution:** An undesirable sound produced by any source that has adverse impact on human beings such as annoyance, irritation, and deafness. [75]

- **Notified Area:** If in the opinion of the State Government any-area within the State requires to be developed according to plan it may, by notification in the Gazette declare the area to be a development area. [1]
- **Nursery:** Any land used to raise trees, shrubs, flowers, and other plants for sale or for transplanting. [66]
- **Nursing Home / Maternity Home / Polyclinic:** A premise having medical facilities for indoor and outdoor patients having up to 50 beds, where persons suffering from illness, injury or infirmity are usually received or accommodated or both the purposes of observation, Nursing and treatment. In case of polyclinic, it shall be managed by a group of doctors. [2]
- **Obnoxious Industry:** means an industry which creates nuisance to the surrounding in the form of smell, smoke, gas, dust, air pollution and other unhygienic conditions. [46]
- **Occupancy / Use:** Number of persons per habitable room in a house. The principal occupancy/ use for which a building or a part of a building is intended to be used. For the purposes of classification of a building according to occupancy, an occupancy shall be deemed to include the subsidiary occupancies which are contingent upon it [4]. “Mixed occupancy” buildings being those in which more than one occupancy is present in different portions of the buildings [4].
- **Office/ Corporate Office:** A premise used for office of commercial establishment, profit making organization and other Institutions. [54]
- **Office:** A building used for performing the functions and activities related to a government ministry or department, corporate body, private company or an individual. [4]
- **Off-Street Parking Area:** A site or a portion of a site, devoted to the off-street parking of vehicles, including parking spaces, aisles, access drives, and landscaped areas, and providing vehicular access to a public street. (Santa Rosa, Calif.). A land surface or facility providing vehicular parking spaces off of a street together with drives and manoeuvring lanes so as to provide access for entrance and exit for the parking of motor vehicles (Traverse City, Mich.). [2]
- **Old Age Home / Care Centre for Physically/Mentally Challenged:** A premise with commercial or non-commercial arrangement for long or short term stays of old people/ senior citizens. It may include arrangement for recreation, general health, catering etc

[11]. A premise having the facility of caring and training boarding and lodging of the elderly/ physically/ mentally challenged. [2]

- **On-Street Parking:** The storage space for an automobile that is located within the street right-of-way. (Hilton Head, S.C.) [2]
- **Open Spaces / Green Areas:** “Open space” means any land (whether enclosed or not), belonging to the State Government or any local authority, on which there are no buildings or of which not more than one-twentieth part is covered with buildings, and whole or the remainder of which is used for purposes or recreation, air or light. [79]
- **Orchard:** An enclosure for growing fruit trees for commercial purposes. [55]
- **Origin:** The starting point or zone of a trip. [41]
- **Orphanage:** A building with facilities for boarding and lodging of children, who are bereaved of parents. It may or may not have educational facilities. [2]
- **Overall Density / City Level Density / Town Density:** The density of population of a settlement calculated by dividing its total population by the total area covered by all uses. [11]
- **Overcrowding:** Excessive concentration of activities and people in an area that cannot be supported the existing infrastructure. [11]
- **Over-head tank (OHT):** A premise having overhead tank for storage and supply of water to its neighbouring areas. It may or may not include a pump house. [62]
- **Panchayat:** “Panchayat” means an institution of self-government constituted under article 243B of Constitution of India for the rural areas. [6]
- **Park:** An appropriately landscaped place used for outdoor leisure activity and may have fencing, parking space and public toilet. A premise used for recreational leisure activities. It may have on it related landscaping, parking facilities, public toilet, fencing etc. It will include synonyms like lawn, open space, green etc. [79]
- **Parking Space / Area:** Any public or private land area designed and used for parking motor vehicles including parking lots, garages, private driveways, and legally designated areas of public streets (*Bondurant, Iowa*). Parking space is an enclosed or unenclosed covered or open area sufficient in size to park vehicles. Parking spaces shall be served by a driveway connecting them with a street or alley and permitting ingress and egress of vehicles [4].
- **Passenger Car Unit (PCU):** An adjustment factor to convert a heterogeneous traffic into a homogeneous traffic where each vehicle type is assigned a factor equivalent to a

passenger car to convert it to the passenger car unit (PCU) (e.g. for car – 1-PCU, for Truck – 3-PCU). [41]

- **Path:** (a) In transport, *see footpath*, (b) In urban design, channel of movement in a city along which people walk, observe the various buildings and features and form part of the perceived image of the city. [41]
- **Peak Hour:** The hour, generally, in the morning and evening, when there is a maximum flow of traffic on a given transportation facility or corridor. [41]
- **Permission or Permit:** A valid permission or authorization in writing by the competent authority to carryout development or a work regulated by the regulations / bye-laws of the competent authority. [4]
- **‘Permitted Activities / Buildings’:** Use as specified in the zoning regulations / master plan, that are unconditionally allowed within specific land use. [2]
- **‘Permitted Activities / Buildings’ with Condition:** Use as specified in the zoning regulations / master plan, that require certain conditions within specific land use. Conditions are specified in the concerned zoning regulation / master plan document.
- **Petrol Pump/Service Station:** Means any premises specially prepared for the fuelling of motor vehicles and includes such places within the premises which have been specially approved by the licensing authority for the servicing of motor vehicles and for other purposes. [32]
- **Pharmaceutical Industry:** An industry discovers, develops, produces, and markets drugs or pharmaceutical drugs for use as medications to be administered to patients, with the aim to cure them, vaccinate them, or alleviate symptoms. [46]
- **Physical Infrastructure:** Essential utilities and services like water supply, sewerage, drainage, power supply, and solid waste management. [2]
- **Physical Planning / City Planning / Land Use Planning / Spatial Planning / Town Planning:** A process of formulation of the plan of a settlement or region, as the case may be, which serves as a tool in guiding the manner in which land will be used for various socio economic and physical activities and infrastructure provision and development therein shall be carried out by the public or private agencies. [2]
- **Plan:** (a) In spatial planning, a two dimensional representation of (i) existing or proposed characteristics of land and arrangement of various land uses and transportation network in an area, or (ii) spatial variations of an attribute, or (iii) distribution of various policy zones in a city or region, (b) In economic planning, a document highlighting the characteristics

of different sectors of economy, and proposed policies, programmes along with fiscal allocations for economic development and social justice in an area, (c) In administration, a scheme for accomplishing organisational goals, (d) In design, an arrangement of different components of a building at plinth level, seen from above. [2]

- **Planning Area:** An area, declared under the relevant act, having well defined boundaries identified by natural or manmade elements, for which the master plan or development plan shall be prepared. [1]
- **Planning Authority:** Hereby means Department of Town and Country Planning, Government of Uttarakhand. [1]
- **Planning:** A continuous, time-oriented and cyclic process of identification and achievement of goals. [2]
- **Play Ground:** “Playground” means a piece of land adapted for the purpose of play, game or sport and used by any educational institution or club or other association. [79]
- **Plot / Lot / Site:** A single unit of subdivision of land, that can be identified and defined in a layout plan, intended for the indicated specific use. A piece of land enclosed by definite boundaries. The maximum average between the frontage and depth of a plot meant for whatsoever purpose should be 1: 3.5 after leaving required right of way. In case of the average being higher than stated above, the map shall be approved only on notional 1:3.5 average of the plot and the remaining space shall remain open [11] [3]. Plot/ Site is a parcel or piece of land enclosed by definite boundaries [4].
- **Plotted Housing (Residential Plot):** A Premise for one or more than one dwelling unit and may have on it one main building block and one accessory block for garages and service personnel. [9]
- **Police Post:** A Building accommodating office and residential accommodation of some essential staff of police serving a designated local area having a population of about 50,000 (this figure may change). [47]
- **Police Station:** A building accommodating office and residential accommodation of some essential staff of police serving a designated area and having a population of 75,000 to 100,000 (this figure may change). [47]
- **Pollution Control:** Precautionary legal, administrative, planning, and monitoring procedures to control various sources of environmental contamination that are capable of causing harm to man or any other living organism supported by environment. [75]

- **Pollution:** Release into any environmental medium-air, water or land from any process or substances which are capable of causing harm to man or any other living organism supported by the environment. [75]
- **Population Density:** Number of persons per unit area (i.e. acre, hectare, square mile, square kilometre etc.). [2]
- **Population Projection / Population Forecast:** The statistical methods of calculation of population size of an area or settlement at a given point of time in future. [20]
- **Post Office:** A building used for collection, sorting, and distribution of articles sent by post to people as well as providing services related to deposit of money as a bank, and money-transfer from one place to another. A premise with facility for postal communication for public use. [2]
- **Potable Water:** Water that is satisfactory for drinking, culinary, and domestic purposes, meeting current drinking water standards (Troy, Ohio). Water which is satisfactory for drinking and culinary purposes (Temple Terrace, Fla.). The use of water for direct human consumption, human contact, or in the preparation of foods for human consumption (San Juan Capistrano, Calif.) [62]
- **Poultry Farm:** A premise with facilities for poultry products. It may have temporary structures for sheds of birds. [2]
- **Poverty:** (a) Poverty can be defined as a condition in which an individual or household lacks the financial resources to afford a basic minimum standard of living. (b) A condition where the people live on earnings less than US \$2 per capita per day (World Bank). [32]
- **Power Plant:** A power plant is an industrial facility that generates electricity from primary energy. Most power plants use one or more generators that convert mechanical energy into electrical energy in order to supply power to the electrical grid for society's electrical needs. [44]
- **Primary Health Centre / Family Welfare Centre / Diagnostic Centre:** A premise having facilities for treating indoor and outdoor patients having up to 10-15 beds. It may be managed by a public or charitable institution on non-commercial basis. It includes family welfare centre and maternity home. [2]
- **Primary School:** An institution located in a building or a campus of several buildings, managed by public or private institution, for offering education and play facilities for children between 6 to 10 years' age studying in I to V class / standard. [2]



- **Printing Press / Printing Plant (Service Industry):** A commercial printing operation involving a process that is considered printing, imprinting, reproducing, or duplicating images and using printing methods including but not limited to offset printing, lithography, web offset, flexographic, and screen process printing (Sioux Falls, S.Dak.). [46]
- **Private Garage:** A building or outhouse designed or used for the storage of private owned motor vehicles.
- **Private Office:** A building used for performing the functions and activities related to private company or an individual. [54]
- **Project:** A document related to a building, site, or equipment with all necessary supporting legal, administrative and technical details, estimated cost, sources of finance and cost recovery for submission to a funding agency or an approving body. [62]
- **Proposed Land Use Plan:** It means the plan showing the proposed admissible uses of different areas and land use zones covered in the Planning Area. [7]
- **Protected Area:** An area, building or structure designated as such, by law or otherwise in an approved plan, for protection from its misuse or abuse because of its special characteristics or historical or architectural significance or natural beauty. [61]
- **Public and Semi-Public Activities / Building:** A building used or intended to be used either ordinarily or occasionally by the public such as offices of State or Central Government, Public sector undertakings or Local authorities, a church, temple, chapel, mosque or any place of public worship, dharmashala/ashram, college, school, library, theatre for cultural activities, public concert room, public hall, hospital run by public institutions, public exhibition hall, lecture room or any other place of public assembly. Such buildings shall ordinarily include Assembly building, Educational building, Health building, Institutional building. [7] [3]
- **Public / Public Convenience / Community Toilets / Community Latrines:** a building providing WCs, urinals and wash basins for public use with or without payment of charges. [62]
- **Public Land:** A parcel of land owned by the government (central, state, or municipal) that holds its title and control. [11]
- **Public Parking:** A parking facility for use of any member of public free of charge or on payment of parking fee. [41]

- Public Purpose:** The expression “public purpose” includes- (i) the provision of village-sites, or the extension, planned development or improvement of existing village-sites; (ii) the provision of land for town or rural planning; (iii) the provision of land for planned development of land from public funds in pursuance of any scheme or policy of Government and subsequent disposal thereof in whole or in part by lease, assignment or outright sale with the object of securing further development as planned; (iv) the provision of land for a corporation owned or controlled by the State; (v) the provision of land for residential purposes to the poor or landless or to persons residing in areas affected by natural calamities, or to persons displaced or affected by reason of the implementation of any scheme undertaken by Government, any local authority or a corporation owned or controlled by the State; (vi) the provision of land for carrying out any educational, housing, health or slum clearance scheme sponsored by Government or by any authority established by Government for carrying out any such scheme, or with the prior approval of the appropriate Government, by a local authority, or a society registered under the Societies Registration Act, 1860 (21 of 1860), or under any corresponding law for the time being in force in a state, or a co-operative society within the meaning of any law relating to co-operative societies for the time being in force in any State; (vii) the provision of land for any other scheme of development sponsored by Government or with the prior approval of the appropriate Government, by a local authority; (viii) the provision of any premises or building for locating a public office, but does not include acquisition of land for companies;]. [29]
- Public Service:** (a) The civil service, (b) Services provided for the benefit of the people by the national, state or local government and include supply of water, gas, electricity, education and health care. [62]
- Public-private Partnership:** Public Private Partnership means an arrangement between a government / statutory entity / government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or public services, through investments being made and/or management being undertaken by the private sector entity, for a specified period of time, where there is well defined allocation of risk between the private sector and the public entity and the private entity receives performance linked payments that conform (or are benchmarked) to specified and pre-determined performance standards, measurable by the public entity or its representative. [33]

- **Quarry:** A place where mineral resources are being dug out and given primary treatment (like crushing), if needed, before its transportation to other users. [28]
- **R & D Centre:** A premise having facilities for research and development for any specialized field. [4]
- **Race course:** Area earmarked for racing with minimal built space for supporting the race. [4]
- **Rail Transport:** The mode of transport of people and goods that runs on fixed rail-tracks and includes sub-urban railways, tramways, and metro-rail. [69]
- **Railway Station:** A facility, either light or heavy rail, for the boarding of passengers and related ticketing sales and offices. (Prince William County, Va.) [69]
- **Railway:** “Railway” means a railway, or any portion of a railway, for the public carriage of passengers or goods, and includes— (a) all lands within the fences or other boundary marks indicating the limits of the land appurtenant to a railway; (b) all lines of rails, sidings, or yards, or branches used for the purposes of, or in connection with, a railway; (c) all electric traction equipments, power supply and distribution installations used for the purposes of, or in connection with, a railway; (d) all rolling stock, stations, offices, warehouses, wharves, workshops, manufactories, fixed plant and machinery, roads and streets, running rooms, rest houses, institutes, hospitals, water works and water supply installations, staff dwellings and any other works constructed for the purpose of, or in connection with, railway; (e) all vehicles which are used on any road for the purposes of traffic of a railway and owned, hired or worked by a railway; and (f) all ferries, ships, boats and rafts which are used on any canal, river, lake or other navigable inland waters for the purposes of the traffic of a railway and owned, hired or worked by a railway administration, but does not include— (i) a tramway wholly within a municipal area; and (ii) lines of rails built in any exhibition ground, fair, park, or any other place solely for the purpose of recreation. [34]
- **Rain Water Harvesting:** It means the process of harvesting of rainwater, which involves the collection of water from the surface(s) on which rain falls and subsequently storing this water for direct use or can be recharged into the underground aquifers; [62]
- **Rate of Growth:** The percentage increase or decrease of population/ number of vehicles/ industrial production/economy/etc. per year. [20]
- **Rates:** Charges levied by a municipal body or any other authorised agency for provision of utilities, facilities or services. [4]

- **Real Estate / Real Property / Landed Property / Immovable Property:** Includes land, buildings, rights of ways, lights or any other benefit arising out of land and things attached to the earth or permanently fastened to anything which is attached to the earth, but not standing timber, standing crops or grass. [35]
- **Recreational Area / Recreational Zone:** An area designated for activities related to active and / or passive recreation owned by a public agency or private body / individual. [54]
- **Recreational Club:** A premise having the facility for recreation with indoor sports, swimming pool, outdoor sports, socializing and gathering space for small functions with restaurant. [2]
- **Recreational:** An Area designated for activities related to active and passive recreation owned by a public agency or private body. [54]
- **Redevelopment :** In an Urban renewal programme of a dilapidated area declared unfit for human habitation, a process of (i) temporary or permanent relocation of affected people on the same or to another site, (ii) demolition of buildings, (iii) re-planning the area so cleared having regard to its full potential, (iv) construction of dwellings/other buildings and provision of infrastructure, (v) on completion, allotment of the dwellings to affected people, if located on a temporary site, and (vi) sale of remaining built spaces. [57]
- **Refuse / Wastes:** Anything that is discarded as worthless or useless and includes municipal, industrial, and other wastes. [62]
- **Region:** An area defined by a set of attributes. In practice, a prefix is added to highlight the attributes on which the region has been defined for example, agriculture region, resource region, city region, planning region, administrative region. [2]
- **Regulated Area:** It means any area specified or declared as per Master Plan / Development Control Regulations in force under relevant act by the State Authority or the Local Development Authority with the prior approval of the State Government. [1]
- **Regulation:** means a regulation made under relevant act by the State Authority or the Local Development Authority with the prior approval of the State Government. [1]
- **Rehabilitation:** (a) In housing and urban development, a process of improving the quality of a blighted area by one or more of the following actions: partial rebuilding, repair, remodelling, renovating, conserving, providing educational, health care and recreational facilities, or augmenting utilities and services, (b) In case of large projects requiring displacement of people, a processes of providing, the project-affected-people,

housing, job opportunities, training to enable them to take up new jobs and financial and technical assistance. [57]

- **Religious Building:** A general term for the building dedicated to the service of the god and may be a Temple, Mosque, Church, Gurudwara, Ashram and synagogue. [52]
- **Remote Sensing:** Science of acquiring information about the Earth's surface without actually being in contact with it. [2]
- **Remote Sensing:** The measurement or acquisition of information Remote of some property or an object or phenomenon by a remote recording device. [5]
- **Repair Shop:** A premise equivalent of a retail shop for carrying out repair of household goods, electronic gadgets, automobiles, cycles etc. Other shops include sweets shop, tailor shop, kirana store, meat shop, mobile repair shop, clock shop, cloth-iron shop, fish products shop, stationary shop, plumbing shop, carpenter shop, utensil shop etc. [9]
- **Residential Area:** An area in a settlement where people live and is characterised by residential buildings and related facilities, services and infrastructure. [54]
- **Residential Buildings:** It includes a building in which sleeping and living accommodation is provided for normal residential purposes, with cooking facilities and includes one or more family dwellings, apartment houses, flats, and private garages of such buildings. [4]
- **Residential Land Use:** The land use category in a development or layout plan devoted to residential activity, which may be further subdivided into zones/ clusters by nature. [54]
- **Residential Zone:** A designated area for residential activity where prohibited land uses shall not be allowed to maintain its safety, and environmental quality. [54]
- **Resolution:** (a) In GIS and remote sensing, resolution is the accuracy at which a given map scale can depict the location and shape of geographic features where, the larger the map scale, the higher is the possible resolution. [5]
- **Resort:** A group or groups of buildings containing more than five dwelling units and/or guest rooms and providing outdoor recreational activities that may include golf, horseback riding, swimming, shuffleboard, tennis and similar activities. A resort may furnish services customarily furnished by a hotel, including a restaurant, cocktail lounge, and convention facilities. [4]
- **Restaurant:** A premises used for cooking and serving, on commercial basis, food items to people seated in the covered or open space or both. [4]

- **Retail Shop:** A premises where sale of commodities, directly to the consumer, takes place and includes space for necessary storage of goods. [2]
- **Revenue Forest:** The forest revenue system is closely linked to the issuance of harvesting permits, which are based on inventories and farm inspections. This permit system is meant to ensure that harvesting is only allowed at a sustainable level. Thus, it is a mechanism to control and limit the exploitation of forest resources. [21]
- **Revenue Village:** ‘village’ means any local area whether compact or otherwise, recorded as a village in the revenue records of the district concerned, and includes an area which the State Government may, by general or special notification, declare to be a village. [21]
- **Right of Way:** (a) The total width of the strip of land designated as a road, railway, waterway, or a public utility, (b) The legal right to pass through the grounds of another under certain circumstances. [41]
- **Risk:** A possibility of loss or damage arising from a specific action, processes or situation that could be economic, socio cultural, environmental or political. [59]
- **River:** A natural water body that carries water collected from its catchment area to another river or sea and on the way, serves the irrigation, drinking water and other needs of the people. [16]
- **Road / Street:** Any highway, street, lane, pathway, alley, stairway, passageway, carriageway, footway, square, place or bridge whether a thorough-fare or over which the public have a right of passage or access or have passed and have access uninterruptedly for specified period, whether existing or proposed in any scheme and includes all bends, channels, ditches, storm water drains, culverts sidewalks, traffic islands, roadside trees and hedges, retaining walls fences, barriers and railing within the street lines. [4]
- **Room:** A space defined by walls, roof and floor. [4]
- **Row Housing:** A row of houses with only front, rear and interior open spaces. [4]
- **Rules:** means a rule made under the relevant act by the State Government or the State Authority. [1]
- **Run-off:** The portion of precipitation that flows over the land surface or in open channels. [62]
- **Sanctuary / National Park / Safari Park / Wildlife Sanctuary:** An area of adequate ecological, faunal, floral, geomorphologic, natural, or zoological significance reserved under a Wild Life Protection act, for the purpose of protecting, propagating or developing wild life and the environment. [61]

- **Sanitary Landfill Site:** A premise where solid waste is disposed of for short or specific period. [62]
- **Sanitation:** Measures taken to protect public health and include control of insects, rodents, environmental pollution, and management of solid and liquid wastes. [62]
- **Saw mill / Timber Mill:** A sawmill (saw mill, saw-mill) or lumber mill is a facility where logs are cut into lumber. Modern sawmills use a motorized saw to cut logs lengthwise to make long pieces, and crosswise to length depending on standard or custom sizes (dimensional lumber).
- **Scale of Maps:** Depending upon the size of the planning area and the coverage and extent of information required, the scale of maps vary and it generally is – 1:100,000 to 1:250,000 for regional plans, 1:50,000 to 1:100,000 for perspective plan, 1:10,000 to 1:25,000 for development plan (master plan) and 1: 500 to 1:5,000 plans of projects and schemes. [71]
- **Scale:** (A) A system or scheme of relative values or correspondence, (b) In a drawing or model, proportional relationship between an actual object and its representation on paper or as a model. [71]
- **School:** An institution located in a building or a campus of several buildings with or without hostel accommodation, managed by public or private institution, for offering education and play. facilities at different levels comprising children of different age groups. [2]
- **Scrap yard:** A place where old vehicles and machines are collected and either sold or prepared for being used again.
- **Secondary School:** An institution located in a building or a campus of several buildings, with playing facility, with or without hostel accommodation, managed by public or private institution, for offering education and play facilities for children between 11 to 17 years' age studying in VI to X class / standard. [2]
- **Secondary Sector:** One of the three sectors of economy comprising manufacturing, and household industries. [2]
- **Sector:** (a) In physical planning, a particular and distinguishable planning unit forming part of division or sub-division of a city for the purpose of equitable spatial distribution of utilities, facilities and services as per population residing or expected to reside there, (b) In economic planning, it refers to the various components of economy, where each is called a sector, and include agriculture, industry, trade and commerce, transport, urban

development, rural development, social development, science and technology, and infrastructure. [11]

- **Semi-detached Housing:** An arrangement of houses using pairs of dwelling units in such a way that two houses are attached by a common wall between them leaving the remaining three sides of each house detached. [4]
- **Senior Secondary School:** An institution located in a building or a campus of several buildings, with playing facility, with or without hostel accommodation, managed by public or private institution, for offering education and play facilities for children studying in X to XII class / standard. [2]
- **Service Centre:** In the context of a region, a town or large village having linkages with its rural hinterland and providing commercial, education, health, communication and recreational facilities and agriculture-related services to the group of villages in the service area. [46]
- **Service Industry:** A labour intensive economic activity that provides services rather than production of goods and includes printing, photography, health care, film and TV serial making, cold storage, laundry, dry cleaning, repair, servicing and maintenance of equipment and machineries. [46]
- **Service Lane / Road:** (a) A road, 7 to 10 m right of way, running at the rear side of residential or commercial buildings dedicated for providing services, scavenging in residential areas, or loading and unloading of goods in commercial areas (b) A 2-lane road forming a part of highway, arterial or sub-arterial road on its either side and dedicated to providing direct access to properties. [41]
- **Services:** Include transportation by rail, road, air, waterways, telecommunication, police protection, firefighting, postal, and such other services, not covered under utilities or facilities. [2]
- **Settlement:** A human settlement, whether urban or rural in character. It includes habited villages, towns, townships, cities and the areas notified under the control of the competent authority. [4]
- **Sewage / Waste Water:** Waste water from all sources - residential, commercial, and industrial or other areas. [11]
- **Sewage Disposal:** A system of collection, treatment, and safe disposal of sewage. [62]
- **Sewer:** A conduit pipe or channel, open or closed, carrying sewage or trade effluent. [62]



- **Sewerage pumping station:** A premise with a pumping station used for pumping sewage on to a higher gradient. It may include, treatment facilities used for treatment of sewage. [62]
- **Sex Ratio:** Number of females per 1000 males. [20]
- **Shelter:** A structure that provides bare minimum space for living Shelter and a cover for protection from sun and rain, which may not always be adequate. [20]
- **Shopping Mall:** One or more buildings forming a complex of shops representing merchandisers, with interconnecting walkways enabling visitors to easily walk from unit to unit, along with a parking area; a modern, indoor version of the traditional marketplace with controlled environment. [4]
- **Signage:** A well designed display mechanism, located strategically along the channel of movement of vehicle and people, indicating (i) direction to important places, facilities and services, (ii) name of roads, buildings, and sites, (iii) information of tourist interests, or (iv) traffic regulations. [41]
- **Site:** A well-defined parcel of land or area intended or suitable for development and building construction purposes, the various types of sites by accessibility are Corner Site, Double-Frontage Site, and Interior Site. [2]
- **Slaughterhouse:** A facility for the slaughtering and processing of animals and the refining of their by-products (Sioux Falls, S.Dak.). A building used for the for-profit slaughtering of animals that are either raised or transported to the building and the processing and storage of animal products and waste that results from a slaughtering process. (Washoe County, Nev.) [70]
- **Slope / Grade:** A raise in elevation within a specific distance generally expressed in percentage, e.g. one per cent slope means a rise of one metre in elevation over a horizontal distance of 100 metre. [62]
- **Slum:** ‘Slum’ shall mean those areas located within the local body which due to overcrowding, unplanned construction, lack of basic infrastructure and lack of tenurial rights are unfit for human habitation for reasons of health and security and for the above any one or a combination of factors have been notified by the State Government. [36].
- **Small/ Light Industry:** Small/ light industries as per classification of the State Government. [11]
- **Small Scale Spices Industry:** A household industry, in which one or more families are engaged in the processing of spices and substances which are used as adjuncts to food.

Spice processing include Cleaning, Grinding, Blending, Sieving, Material Handling and Bulk Storage, Batch making up to Packing. [46]

- **Social Infrastructure:** Social facilities needed for a community and include health care, education, recreation, communication. security, safety, religious and cultural activities, old-age homes, night shelters, cremation and burial grounds and cemeteries. [2]
- **Social Service:** activities of individuals, groups, NGOs, or Social government agencies that aim at well-being of society especially the poor, deprived, disadvantaged, and may include education, health care, recreation, mother and childcare, and provision of employment opportunities. [2]
- **Social Welfare Centre:** A premise with facilities for welfare and promotion of community development. It includes healthcare, empowerment, housing and other programs geared towards assisting the poor, unemployed and marginalized in society. It shall be run by a public or charitable institution. [5]
- **Solid Waste Disposal:** The process of collecting, transporting, processing, recycling, and disposing solid wastes safely in landfills or incinerators. [62]
- **Solid Waste Management:** A holistic approach to the issue of solid wastes and includes reduction of waste generation at source, segregation, collection, transportation, recycling, and safe disposal. [62]
- **Solid Waste Treatment Plant:** A premise where solid waste is collected treated mechanically / electrically and processed for reuse. [62]
- **Solid Waste:** Solid materials discarded from houses, business establishments, industries, gardens and forests, construction sites and other places and it does not include excreta. [62]
- **Special Areas:** (a) In city planning, areas designated as such that need unique and specific development norms, rules and regulations and include city core requiring redevelopment, or a heritage area needing conservation, (b) In regional planning, areas designated in the regional plan that require unique and specific policies and programmes and approaches for their planning and development and include hill areas, coastal areas and tribal areas, and environmentally sensitive areas. [2]
- **Sports Centre:** A premise having facilities for training and coaching for different indoor and outdoor games including swimming. It shall also include centre for physical education. [2]

- **Sprawl:** The haphazard outward physical growth around a large city in a disorderly fashion. [2]
- **Stadium:** A large building with tiers of seats for spectators at sporting or other recreational events. [4]
- **Stakeholder:** An individual or group of individuals who has an interest in and can influence the decisions pertaining to the government activities, programs and objectives. [2]
- **Standards:** Technical specifications based on accepted practice and approved by a recognised agency for repeated and continued use. [2]
- **Statutory Town:** All administrative units that have been defined by statute as urban like Municipal Corporation, Municipality, Cantonment Board, Notified Town Area Committee, Town Panchayat, Nagar Palika etc., are known as Statutory Towns. [20]
- **Storage or Warehouse Building:** It means a building used or constructed or adapted to be used either ordinarily or occasionally for the storage or sheltering of goods, wares, merchandise or any other similar activity, including servicing, processing or repairs incidental to such storage, warehouses, cold storages, freight depot, transit sheds, store houses / garages, hangars, truck terminals, grain elevators, barns and stables. [4] [3]
- **Storey:** The portion of a building included between the surface of any floor and the surface of the floor next above it, or if there be no floor above it, then the space between any floor and the ceiling next above it. [4] [3]
- **Stream:** “stream” includes— (i) river; (ii) water course (whether flowing or for the time being dry); (iii) inland water (whether natural or artificial); (iv) sub-terranean waters; (v) sea or tidal waters to such extent or, as the case may be, to such point as the State Government may, by notification in the Official Gazette, specify in this behalf. [38]
- **Street:** (a) A means of access to abutting properties, (b) A transport link connecting various areas of a city. [41]
- **Surface Water Drain:** A drain carrying surface water including storm water. [62]
- **Swimming Pool:** A pool or tub constructed either above or below grade and having a capacity of 5,000 or more gallons. [4]
- **SWOT Analysis:** An analysis that highlights the strengths, weaknesses, opportunities and threats pertaining to an area, project, or policy initiative. [2]
- **Taxi / Taxi Cab / Cab:** (a) A car available for hire, (b) A para-transit hired mode of transportation run by a private operator, available on demand for hire. [41]

- **Telecommunication:** Communication of voice, data and images through telephone and other methods. [51]
- **Telephone Exchange:** A building with all necessary equipment and office space to provide telephone service to an area. [51]
- **Temple:** A building or a complex of building with related infrastructure including parking and serving the public as a place of worship. [52]
- **Thematic Map:** A map representing information pertaining to an area on a specific theme like soil characteristics, or land use and the like. [5]
- **Tent House:** A retail facility on higher order road which is used for providing tents are made of a thin fabric, which is attached to supporting ropes or to poles. It is used in various functions to protects people from rain, wind, and the cold climate. It may also include the dining sets, foldable tables, dustbins, portable water and sanitation materials, decoration material, etc. It must have adequate space for loading / unloading in shop.
- **Textile industry:** An industry primarily concerned with the design, production and distribution of yarn, cloth and clothing. [46]
- **Topography:** The shape of the surface of the earth in a given area. [71]
- **Topology:** In GIS, the spatial relationships between connecting or adjacent coverage features, e.g., arcs, nodes, polygons, and points. [5]
- **Tourism:** A socio-economic activity initiated by desire to travel and enjoy the places of natural beauty and / or architectural, historical, religious, and socio-cultural significance. [8]
- **Town:** A small urban settlement in the hierarchy - mega-city, metropolis, city, and town, functioning as a service centre to the surrounding rural areas and housing people engaged in non-agricultural activities. [20]
- **Township:** An urban extension to a large city that may be within or outside its administrative boundary and may have both urban and rural characteristics. [2]
- **Traffic Congestion:** Overcrowding of vehicles and other activities that obstruct free flow of traffic along a route at a given point of time. [41]
- **Traffic Volume:** The number of vehicles, in passenger car units, passing a road in both directions. [41]
- **Traffic:** To and for movement of people or vehicles in an area, or along a route that could be a road, rail, waterway, or airway. [41]

- **Training Centre / Training Institute:** A public or private establishment equipped with all necessary physical facilities and technical, administrative and financial resources, for imparting training. [36]
- **Transport Network:** The pattern of transport routes, links and facilities in an area. [41]
- **Transport System:** The total transport network in an area including all modes of transportation to cater to the movement of goods and people. [41]
- **Travel Time:** The length of time taken to travel between two points. [41]
- **Tree:** A woody plant, generally taller than 2 metre, with well-distinguished trunk. [48]
- **Trip:** One-way travel from one point (origin) to another (destination) for a specific purpose, the destination of one trip becomes the origin of the next. [41]
- **Truck terminal / Transport Nagar:** A premise for parking of trucks on short term or long-term basis. It may include agency offices, workshops, dhabas, spare part shops, godowns, petrol/ diesel filling stations, restaurants, guest houses, hotels and such other operational facilities as decided by the Authority. [2]
- **Tube well:** A system to extract water from underground sources using mechanical means. It may consist of a room for operation and maintenance. [62]
- **Tuition Centre:** Means an educational institution which specifically provides educational guidance or assists a pupil of a school or educational institution or any person to prepare for an examination. Private educational institutions which offer tutoring in various subjects and preparation for specific tests and examinations.
- **Unauthorised Development:** ‘Unauthorised Development’ means such use of land or use of building and construction of building which are not relevant to the sanctioned plans or without obtaining the sanction from Competent Authority or in contravention of the Master Plan or Zonal Plan or lay out plan, or as the case may be, and it also includes encroachment [78].
- **University:** “University” means a University established or incorporated by or under a Central Act, a Provincial Act or a State Act, and includes any such institution as may, in consultation with the University concerned, be recognised by the Commission in accordance with the regulations made in this behalf under The University Grants Commission Act, 1956. [36].
- **Urban Area:** Urban areas are comprised of two types of administrative units – Statutory Towns and Census Towns. a) Statutory Towns: All administrative units that have been defined by statute as urban like Municipal Corporation, Municipality, Cantonment Board,

Notified Town Area Committee, Town Panchayat, Nagar Palika etc., are known as Statutory Towns. b) Census Towns: Administrative units satisfying the following three criteria simultaneously are treated as Census Towns: i) A minimum population of 5,000 persons, ii) 75 per cent and above of the male main working population being engaged in non-agricultural pursuits; and iii) A density of population of at least 400 persons per sq. km. (1,000 per sq. mile). [20]

- **Urban Form:** The three-dimensional shape of an urban area evolved out of the urban design characteristics and the spatial arrangement of land uses and activities. [2]
- **Urban Growth:** Physical expansion, generally unplanned, of a city as a result of increase in its population and socio-economic activities. [2]
- **Urban System:** A set of interconnected urban settlements extending over a designated area - regional, national or international serving a role in the development process depending upon their functional hierarchy. [2]
- **Urban:** (a) Belonging to a town or city, as defined in census of India. [20]
- **Use Zones:** Areas designated in a development plan or layout plan for a specific land use that could be residential, commercial, industrial, recreational, and related to transport, and facilities and services. [54]
- **Utility:** Services such as roads including approach roads, bridges, bypasses and underpasses, street lights, water supply system, sewerage system, storm water drainage system, electrical network, communication network, sewage treatment plants, percolation wells, solid waste disposal system, collection, treatment, discharge and disposal of industrial, institutional and township waste, gas pipeline, common effluent treatment plants (CETP), spaces for informal services, and any other as may be delineated by the Government. [2]
- **Vacant Land:** A public or private parcel of land that is not used for any purpose or has not been designated in an approved development plan for a specific use at a given point of time. [2]
- **Vector:** In GIS, a coordinate-based data structure commonly used to represent linear geographic features where each linear feature is represented as an ordered list of vertices. [5]
- **Vegetable/ Fruit Market:** A premise for retail sale of fruits and vegetables in shops or platforms. [54]
- **Vehicle Occupancy:** The number of people travelling in a car, bus, or other vehicle. [41]

- **Vehicle:** Any means of transportation of people and goods that may be driven by any source of power-human, animal, petrol, diesel, gas, electricity and others. [41]
- **Veterinary Hospital / Dispensary / Clinic:** A premise offering medical and similar facilities for animals. In other words, veterinary is used to describe the work of a person whose job is to treat sick or injured animals, or to describe the medical treatment of animals. A premise having medical facilities for indoor and outdoor treatment of pet animal and birds. It may be managed by a public or charitable institution or on community basis [2].
- **Vocational Institute:** A premise with training facilities for short term courses for discipline, predatory to the employment in certain profession and trade. It includes training-cum-work centre. [36]
- **Volume to Capacity Ratio / VC Ratio:** The ratio between the actual volume of traffic in PCUs to the designed capacity of a road. [11]
- **Ward:** Subdivision of a city into physically identifiable boundaries based upon population for the purpose of municipal elections, collection of property taxes, and grassroots participation in local development process as envisaged under Constitution (Seventy fourth Amendment) Act 1992. [37]
- **Warehouse/ Godown:** A premise for storage of goods and commodities in a manner as per requirement of respective goods/ commodities. The premise includes loading and unloading facilities. [46]
- **Wasteland:** Barren land not fit for agriculture purposes and not occupied by any other use. [45]
- **Water Bodies:** Water body means surface waters including rivers, streams, lakes, marine waters, estuaries and wetlands. Water body means a lake, reservoir, wetland, or a geographically defined portion of a river or stream. [21]
- **Water Conservation:** Protection, development, sustainable use and efficient management of water resources. [38]
- **Water Management:** The technical, administrative and fiscal arrangement for procurement, processing and distribution of water in an area. [38]
- **Water Pollution:** Means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or

injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. [38]

- **Water Pumping Station:** Water pumping stations are machines that can be used to transport water from one site to another, without needing direct human or animal input. These devices can supply water to canals, circulate water in treatment systems and can even drain water from low-lying land. [62]
- **Water Supply System:** The entire arrangement for supply of water from a source at one end to an outlet at the other and includes water reservoir, treatment facility, pumping facility, storage, and network of pipes for distribution, control valves, fittings and fixtures. [62]
- **Water Supply:** (a) The quantity of water available from all sources to meet the water demand of a community for all purposes. (b) The processes of provision, treatment, storage and distribution of water to a settlement for domestic, industrial, commercial and other purposes. [62]
- **Water Table:** The upper surface of groundwater in an area at a given point of time. [62]
- **Water Treatment Plant:** The facility for treatment of water to ensure that it is potable. In other words, a waste water treatment plant cleans sewage and water so that they can be returned to the environment. These plants remove solids and pollutants, breakdown organic matter and restore the oxygen content of treated water. [62]
- **Water Treatment:** The processes of cleansing water for human consumption. [62]
- **Way:** A passage to a building or site, which may or may not be motor able, (b) A manner, system or method of doing something. [41]
- **Weekly Market:** An area used once a week by a group of informal shop establishments in the form of a market. These markets may shift from one area to another on different days of the week and may be planned at designated places in all land uses. [67]
- **Weigh Bridge/ Dharam Kanta:** A premise with weighing facilities for empty or loaded trucks. [41]
- **Wholesale Market/ Mandi:** A premise from where goods and commodities are sold/ delivered to retailers. The premise includes storage, godown, loading and unloading facilities. [70]



- **Zonal Development Plan:** Zonal Plan is a plan detailing out the proposals of Master Plan and acting as a link between Master Plan and the Layout Plan. A zonal development plan may-
  - (a) contain a site-plan and use-plan for the development of the zone and show the approximate locations and extents of land uses proposed in the zone for such things as public buildings and other public works and utilities, roads, housing, recreation, industry, business, markets, schools, hospitals and public and private open spaces and other categories of public and private uses;
  - (b) specify the standards of population density and building density;
  - (c) show every area in the zone which may, in the opinion of the 2[Town and Country Planning Department or any other agency appointed/ nominated by the State Authority], be required or declared for development or re-development; and
  - (d) in particular, contain provisions regarding all or any of the following matters, namely,
    - (i) the division of any site into plots for the erection of buildings; (ii) the allotment or reservation of land for roads, open spaces, gardens, recreation-grounds, schools, markets and other public purposes; (iii) the development of any area into a township or colony and the restrictions and conditions subject to which such development may be undertaken or carried out; (iv) the erection of buildings on any site and the restrictions and conditions in regard to the open spaces to be maintained in or around buildings and height and character of buildings; (v) the alignment of buildings of any site; (vi) the architectural features of the elevation or frontage of any building to be erected on any site; (vii) the number of residential buildings which may be erected on plot or site; (viii) the amenities to be provided in relation to any site or buildings on such site whether before or after the erection of buildings and the person or Authority by whom or at whose expense such amenities are to be provided. [1]
- **Zone:** means any one of the divisions in which a development area may be divided for the purposes of development under the relevant act. [1]

Definition of any term related to development and construction which is not mentioned here, will be followed as defined in National Building Code (NBC)/ Urban and Regional Plan Formulation and Implementation Guidelines (URDPFI)/ Model Building Byelaws as well as in IS/BIS.

**References:**

1. The Uttarakhand (Uttar Pradesh) Urban Planning and Development Act, 1973
2. Urban and Regional Plan Formulation and Implementation Guidelines, Vol 1, Ministry of Urban Development, Government of India, 2014.
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## 1. Project Background

The urban settlements of the country have witnessed relatively rapid population growth and the percentage of India's population living in urban areas has increased more than twice in the year 2011 as compared to the percentage of people living in urban areas at the time of independence. This is expected to increase even further to nearly 40% by 2026 and is expected to be more than 50% by 2051. Most of the urban settlements, smaller ones, in particular, are being identified by haphazard and unplanned growth, non-conforming land uses, mushrooming unauthorized colonies, and land conversion from agriculture to urban resulting in environmental degradation and poor quality of life. The proper management of urban areas calls for accurate and vital information to be available regularly.

Master Plan/ Development Plan has been identified as a major tool for the management of urban land and for the provision of detailed land use allocation, which would help to ensure the sustainable development of the town/city. Formulation of master plans starts with base map preparation, existing land use surveys, and collection of socio-economic data necessary for reviewing the existing situation and proposing the future land use plan.

The Government of India launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015 as Centrally Sponsored Scheme with the objectives to (i) ensure that every household has access to a tap with an assured supply of water and a sewerage connection; (ii) increase the amenity value of cities by developing greenery and well maintained open spaces (e.g. parks); and (iii) reduce pollution by switching to public transport or constructing facilities for non-motorized transport (e.g. walking and cycling). One purpose of the Mission is to improve governance through a set of Reforms. During the Mission period, 11 reforms are being implemented. Formulation of GIS-based Master/Development Plans for 500 AMRUT Cities is one of the important reforms under AMRUT, which has been approved as a 100% centrally funded sub-scheme with a budget outlay of Rs. 515.00 crores. The major objectives of the sub-scheme include developing common digital geo-referenced base maps and land use maps using Geographical Information System (GIS) and Master Plan Formulation for 500 cities that are selected as AMRUT Cities. The major deliverables under this scheme include:

**a) Base Map & Thematic Maps:** Final base maps in the form of user-friendly spatial products at the functional scale of 1:4000 having defined layers as per Design & Standards. City /town base map and thematic maps including existing land use map which is a prerequisite for the formulation of the master plan and other plans.

**b) Urban Database Creation:** Sector-wise data collection and data analysis report of 25 aspects as per Design & Standards.

**c) Formulation of Master Plan:** Formulation of Master Plan of the city as per State Town & Country Planning Act, which includes demand assessment, identification of issues, projected requirements, development strategy, and draft proposals on the GIS base map and sector-wise data analysis.

**d) Capacity Building:** Build capacity among town planning, line departments, and other concerned personnel at State and local levels including ULBs and development authorities to create a cadre of professionals proficient in the use of GIS technology for using and updating databases in urban planning and management.

Urban Development Department (UDD) is the administrative department for local self-governments in the state, the Uttarakhand Housing Department plays a similar role to the Urban Development Authorities, and the Town and Country Planning Department, is responsible for urban planning and development control. The authority has taken up the task of preparing the GIS-Based Master Plan for Rudrapur to address the current issues and promote sustainable development for the future. The plan would include the determination of the carrying capacity of the development areas taking into account their location and should be based on assumptions of a decent and adequate quality of life, based on the acceptable/appropriate infrastructure, amenities, and available natural resources. It will also assess the potential industrial and tourism-led development along with the projections of population and future employment.

## **1.1. Present Status of Master Plans**

In the present scenario, about 52% of the statutory towns and 76% of the census towns in India do not have any Master Plans to guide their spatial growth and infrastructural investments. This implies that three-fourths of the urban centers in the country do not have any spatial strategy for the next 20 years. Such a severe lack of preparedness to manage the level of urbanization that the Indian cities are bound to witness in the coming decades is a huge risk.

Aspiring Uttarakhand, a newly formed state, had a master plan for many towns namely Dehradun, Ramnagar, Rudrapur, Kichha, Rishikesh, Kashipur, Nainital, Bhimtal, Srinagar, Chamauli-Gopeshawar and so on, since its formation in the year 2000. Post formation, Master Plans for Dehradun, Badrinath, Paudi, Doon Ghati, and Rudrapur towns were made. Thus, the state has controlled a lot of organic development state, especially in the large towns and tourist

cities. Besides these, a lot of organic development has taken place in the state, especially in the neglected small towns and Haldwani city.

The sub-scheme ‘Formulation of GIS-based Master Plans’ for 500 AMRUT Cities, launched by MoHUA, is one of the important reforms under AMRUT Mission, 2015. Out of 500 cities, 07 cities viz Dehradun, Haridwar, Roorkee, Rudrapur, Kashipur, Haldwani, and Nainital have been selected under the AMRUT mission in Uttarakhand. Except for the Nainital town, the remaining six cities are class-one cities, which have major urban populations and major urban population growth rates.

## **1.2. Need for GIS-based Master Plan**

A city is a ‘system of systems, wherein the spatial components include land use, transport, logistics, heritage, environment, housing, etc., and the non-spatial ones include the administrative structures, legislative frameworks, economic policies, labor market, budget allocations, and so on.

Master plans are critical for managing urbanization. They are statutory instruments to guide and regulate the present and future utilization of land, expansion, and zoning of cities for 20–25 years. It is an essential tool for socio-economic development, better liveability, inclusion, citizen engagement, environmental sustainability, and prevention of climate change-related risks. The covid-19 pandemic has revealed the dire need for planning and management of our cities, with a thrust on health aspects.

The need for the Master plan is to promote the balanced, orderly, & planned development of the town as well as the planning area of a town, as it acts as a basic guiding principle, for wiping out the deficits in urban infrastructure, minimizing the problems and helps to explore the potentials of a town. To make the urban transition efficient, equitable, and cost-effective there is a master plan is a prerequisite as it helps to bring out new projects/schemes. Due to urbanization, our towns and cities are growing very fast but in an organic way. The planned development is lacking in most of our towns and cities because of which these towns and cities are facing various kinds of problems, like congestion, environmental degradation, etc.

**Master Plan as a Structure to Guide and Accomplish Urban Growth:** Development plan is one of the important tools to guide and manage the future growth of the cities in a planned manner. Since its introduction in the UK under the Town and Country Planning Act of 1947, the master plan has been widely prepared for many cities in both developing and developed countries. It is a long-term plan and is usually prepared to guide the future growth of a city for

the next 20 years mainly consisting of a report, land use maps, and a program of action. Conceptually, the master plan is based on a study of the existing situation of every component of a city comprising land use, socioeconomic and other facilities.

**Master Plans as forwarding Planning Tools:** Master plans are planning tools that anticipate urban development and make provisions for city space in terms of:

- (a) The allocation of land for various uses,
- (b) The regulation of its development, and
- (c) The provision of civic infrastructure.

Thus, Master Plan is important to give a perspective picture of a fully developed town.

- Urbanisable/developable land is costly as well as limited in supply. Government guides and regulates development through planning regulations and building bye-laws. Thus, to decide on current & future development-related issues, Master Plan helps to rationalize the pattern of Land use and their interrelationship.
- To segregate major functions - residential, commercial, industrial, and recreational for minimizing the public nuisance and maximizing the efficiency of the urban system in effect constitute the policing powers in the guise of land use planning, zoning, and developmental controls.
- It helps to identify the existing gaps in physical and social infrastructure & to bridge those gaps. Thus, Master Plan makes proposals/schemes for the provision of various facilities and ensures that the basic amenities/services are in place; in that process, the Master Plan guides the urban development.
- To discourage the growth of the city in an unplanned and unscientific way. It offset evils, which have come up due to overcrowding of population such as shortage of houses, traffic congestion, inadequate open spaces, insufficient public amenities, etc.
- To control the development of various industries in a systematic manner.
- To rationalize the orderly movement of traffic and transportation within the town and defines the area for laying down a network of various services.
- To limit to a certain extent, the unprecedented flow of rural population.

So, Master Plan is considered one of the most effective mechanisms to promote the planned growth of the urban centers. As city regeneration initiatives are generally long-term propositions, it is important to consider the master plan as a dynamic document that can be altered based on changing project conditions over time.



Master planning aims at improving the urban environment as the efficiency of urban settlements largely depends upon how well they are planned, how economically they are developed, and how efficiently they are managed. In one sense, master planning is an exercise of resource planning, generation, development, and management. In short, Master Plan is a design for the physical, social, and economic development of the city, and to improve the quality of life as well. The functions of the Master Plan / Development plan are as follows:

- To guide the development of a city in an orderly manner to improve the quality of life of the people;
- Organize and coordinate the complex relationships between urban land uses;
- Chart a course for growth and change, be responsive to change and maintain its validity over time and space, and be subject to continual review;
- Direct the physical development of the city about its social and economic characteristics based on comprehensive surveys and studies on the present status and the future growth prospects; and
- Provide a resource mobilization plan for the proposed development works.
- Further, good Master planning can assume some or all these functions:
- Develop a phasing and implementation schedule and identify priorities for action.
- Act as a framework for regeneration and attract private sector investment.
- Conceptualize and shape the three-dimensional urban environment.
- Define public, semi-private, and private spaces and public amenities.
- Determine the mix of uses and their physical relationship.
- Engage the local community and act as the builder of consensus.

The absence of a planned development strategy leads to multiple issues, for example, lack of land for affordable housing, flooding, traffic jams, and wastage of water resources. Moreover, once the city has grown haphazardly, corrective measures and the provision of infrastructure are difficult and costlier to undertake. Master planning of a city is essentially an exercise involving land allocation for various uses, amongst other purposes. As a planner, one has to arrive at solutions for competing land uses, economic versus environmental considerations, and many other paradoxical situations. For example, a decrease in the density of land development may reduce air pollution in certain pockets, but in turn, may increase dependence on automobiles as well as travel time.

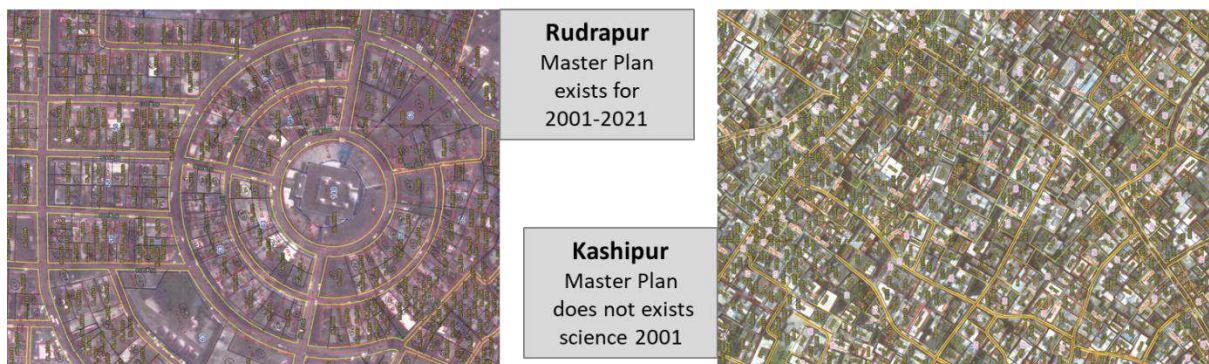
**Figure Error! No text of specified style in document.-1: Dharavi Slum: Staggering Inequality in Rich and Poors in Mumbai**



**Figure Error! No text of specified style in document.-2: India's 'Mount Everest of Trash' in the National Capital, Delhi (left) and Lack of Landuse-Transport Integration Leading to Traffic & Congestion (right)**



**Figure Error! No text of specified style in document.-3: Comparison among Planned (Rudrapur) and Unplanned (Kasipur) Growth**



The spatial and land use plans use environmental legislations and development control regulations to affect/control the land use. These instruments can restrict the usage of land in a certain way, but may not necessarily offer the most efficient, community, and market-driven land use patterns to emerge. The non-spatial systems may create incentives to use land in a certain but may not correspond to the objectives of land use planning systems.

Most urban settlements, especially smaller urban settlements, are characterized by haphazard and unplanned growth, non-conforming land uses, mushrooming unauthorized colonies, and land conversion from agriculture to urban resulting in environmental degradation and poor

quality of life. Master Plan/Development Plan is the major tool for urban land management, providing detailed land use allocation for the sustainable development of a city/town. The most crucial information for the formulation of the Master Plan is an accurate and updated Base Map of the planning area, showing roads and building layouts, the spatial extent of development, information on the use of each parcel of land, etc. Preparation of base maps from Very High-Resolution Satellite (VHRS) Images and Geographic Information System (GIS) technology is a time and cost-effective solution.

The GIS-based Master Plans help in different types of urban planning exercises, e.g., preparation of the master plan, development plan, zonal plan, utility plan, infrastructure plan, etc. to be simplified by using IT tools. The National Remote Sensing Centre (NRSC) provides geodatabase along with satellite data. This has been made available for all AMRUT cities. The MoHUA coordinates the satellite data acquisition and final base map preparation at 1:4000 scale will be undertaken by NRSC, Department of Space. The NRSC is an implementation agency for the activities like data acquisition, geo-referencing, GPS survey, data processing, and digitization and preparation of geodatabase in vector format. The geodatabase along with satellite image is provided to the respective consultants through the respective State Town & Country Planning Department for ground truthing. The vetted data has been given to NRSC for preparing the final Geo-database through State Town & Country Planning Department.

Formulation of GIS-based Master/Development Plans for 500 AMRUT Cities is one of the important reforms under AMRUT, which has been approved as a 100% centrally funded sub-scheme. The major two objectives of the sub-scheme are – i) To develop common digital geo-referenced base maps and land use maps using Geographical Information System (GIS), and ii) Master Plan Formulation for 500 cities that are selected as AMRUT Cities. Further, the need for GIS-based Master Plans using VHRS Images is –

- GIS data can be edited/modified and updated with the latest Satellite images/ground information.
- Local attribute data can be updated or new attributes can be added
- GIS analysis (both Spatial and attribute) tools are required for Master Plan formulation.
- With the advancements in GIS, the utilization of hard copy maps is limited to the fieldwork and field verification of data. The digital GIS environment can be used for spatial and attribute data analysis and GIS-based Master plan formulation.



- To capture the features in 3-dimension high relief hilly areas. According to the feature dimensionality (2D or 3D), the GIS data structure of polygon, line, or point features can be 2-dimension or 3-dimension.
- To attain thematic accuracy of land use classification. Urban Landuse classification is based on attribute data and therefore it has to be done based on the latest attribute data.
- Quality Assurance and Quality Check (QA/QC) shall be carried out at all levels of project execution. The main products covered under QA/QC are (i) Input high-resolution satellite data (ii) Geo-referenced/Ortho-rectified satellite data (iii) GIS Feature extraction from high-resolution data (iv) Final GIS database (v) Supply of the GIS database to the respective ULBs for Master Plan formulation.
- Apart from the above, the parameters like Completeness, Correctness, Conformity, Consistency, and Compatibility assuring the final GIS database product quality in various plans can be achieved through the GIS only.
- To take the GIS database generation using remote sensing & GIS technology is adopted for the preparation of Master Plans in a standard form under a single platform. It was also observed that various Town & Country Planning organizations/Departments are following different methods and procedures for base map preparation.
- Online approval and governance for creation, and updating database.
- Authorized personnel at the ULB level, at the State Town Planning Directorate level, and TCPO/ MoHUA level can access the specific city data, and view and read the status of cities.
- To support the generation of comprehensive GIS databases to meet the requirements of mapping under National flagship schemes like Smart Cities, AMRUT, HRIDAY, and also other State level urban development projects.
- To enable the compatibility of cadastral map scales for better implementation of tasks.

### **1.3. Background of previous Master Plans**

Kashipur City is the Tehsil headquarters of Kashipur Tehsil of Udham Singh Nagar District. With a population of 1, 21,623 according to the census 2011, Kashipur is the second-most populous city in the district of Udham Singh Nagar after Rudrapur, third-most in the Kumaon region and sixth most in the state, as per the Census of India, 2011. Kashipur is well connected by road & rail and is considered the transport hub of Uttarakhand. Kashipur is the gateway to

Jim Corbett National Park as well as the Kumaon region as it is located at the Uttarakhand-Uttar Pradesh border making it an important urban center.

The city has witnessed high population growth most of the time. The decadal growth rate for the city varies from 31% to 55% in science 1961. This massive population growth is the cumulative result of rural to urban migration towards Kashipur, the influx of refugees from then East Pakistan at the time of the Indo-Pakistan war..

Before the formulation of the long-term master plan of Kashipur city, it is important to get an insight into its continuous development process, its origin, importance, and its strategic and administrative importance and to review the impact of the proposals of the previous master plan of 2011.

Although the municipality was established in Kashipur in the year 1872, even after the formation of the municipality, in the absence of effective control over its physical development, the city continued to grow in an unplanned, uncontrolled, and erratic way. To cater to the everyday needs of people of the city, as well as nearby cities Kashipur has developed as a commercial center.

To plan and control the uncontrolled expansion and unplanned material development, and to give a guided direction to future development, the Government issued G.O number 3830/9-A-91-6-RA-91, Lucknow on 19 June 1992, Kashipur comprising the municipality and its adjacent 35 villages declaring it a 'Regulated Area' having a total area of 9823.32 Ha. Uttar Pradesh Government handed over the responsibility of preparing the Kashipur Master Plan in order number - 3426 / -A-3-93-12 Maha / 93 Awas Anubhag-3 Lucknow on 1 September 1980 to the Town and Country Planning Department. In this context the Kashipur Master Plan 2011 has been prepared and is still in force to date.

#### **1.4. Need of Master Plan in Kashipur**

Having large concentration of industries Kashipur experienced a huge growth in past few decades. Master plan, though exists for the period of 1991-2001, no master Plan has been prepared and enforced after the end of previous Master Plan, i.e., Master plan of Kashipur 2001. Science a decade there is no Master plan existing in Kashipur which has resulted in uncontrolled haphazard growth in Kashipur Municipal Corporation area as well as areas adjoining to it. The industrial development of the city has mainly taken place in an unplanned manner along the roads. There is no effective control even in the parking of vehicles, loading-unloading of goods, industrial waste disposal, and related pollution problems of the city of

Kashipur. Due to recent industrial establishment in Mahua Kheraganj, the unplanned haphazard growth is triggered in nearby rural areas. The reckless growth along the river and other water body has threatened the environment which needs to be taken care in an urgent basis. Lack of open space in core city area, narrow roads poor road connectivity has resulted in degrading the quality of life in the city core area. The unplanned growth in the periphery areas will also face the same situation if it is not taken care in the form of enforcement of new Master Plan. Thus it is the need of time to prepare and enforce a new Master Plan for Kashipur to bring a balanced development with environmentally sound manner which will enhance the quality of life of people. The objectives of the master plan have been to effectively control the unplanned development in Kashipur Municipal area as well as adjacent rural areas and to cater to the needs of the present urban population as well as of the future. It emphasizes on physical and economic development of the city and also strengthens the policy.

### **1.5. Objectives of Master Plan Preparation**

The major objective of the master plan is to ensure sustainable development and evolving development vision road map to ensure balanced growth of the region by regulating the future spatial development to be envisioned for the horizon year of 2041. The Master Plan is a statutory instrument as it conforms to the provisions stated in The Uttarakhand Urban and Country Planning and Development ACT 1973 and Rules. The objectives of the Master Plan are as follows:

- To minimize haphazard and uncontrolled growth of the city and to achieve planned growth and development to provide a healthy living environment.
- To propose such a sustainable distribution pattern of activities in the city that satisfies the present requirements as well as the future needs of the coming generations.
- To remove the defects of uncoordinated physical growth of the various components of the city since it considers the entire city as a planning and development entity.
- To rationalize the movement of traffic and transportation within the city and define the area for laying down a network of various services.
- To serve as a guide to the planning body to make any recommendations for public improvement.
- It helps in restricting haphazard and unplanned growth and helps to preserve natural resources.

- To place the various functions, that a city has to perform in the physical relationship of each other to avoid the chances of mutual conflict.
- To serve as a guide to the planning body for making any recommendations for public facilities improvement.
- To removes the defects of uncoordinated physical growth of the various components of the city because it considers the entire city as a planning and development entity.
- It aims at intelligent and economic spending of the public funds for achieving the welfare of the inhabitants in respect of amenities, convenience, and health.

Thus, the objective of the preparation of a Master Plan is to achieve comprehensive development of the city, in terms of its socio-economic and spatial aspects by way of utilizing its potential in the best possible manner and by exploring new avenues.

## **1.6. Project Approach**

The approach to the preparation of the Master Plan would cover conducting a demand-supply gap analysis, highlighting the critical issues of the city, and formulating a management framework including outlining strategies and guidelines for future growth and development of Rudrapur city and planning area. It will also include options for promoting sustainable development through the introduction of a regulatory mechanism including realistic planning and effective land use management interventions within the overall regulatory and institutional framework. The preparation of the Master Plan will be based on existing trends of development taking into account the Development Plans/Schemes of public and private agencies operating in the city and contributing towards its growth and development. It will also include reviewing previously prepared Master Plans for the Planning Area with special emphasis on the deviations from proposed land uses and suggestions for the same.

The detailed methodology for the preparation of the Master Plan of Rudrapur includes base map updation, data collection, city assessment, identifying gaps in service delivery and infrastructure network, identifying strengths, weaknesses, opportunities, and threats, stakeholder consultations, preparing Existing Land Use Plan, thematic maps, Proposed Land Use Plan, etc. as given in the next point.

## **1.7. Methodology for Preparation of Master Plan**

The methodology is a step-wise procedure to complete any task. It is important for the systematic approach in any planning exercise. It is essential to discuss before focusing on the

project as there can be different ways of doing one task and the most suitable way must be decided for good output. For this master plan, the reference has been made in **Error! Reference source not found.**

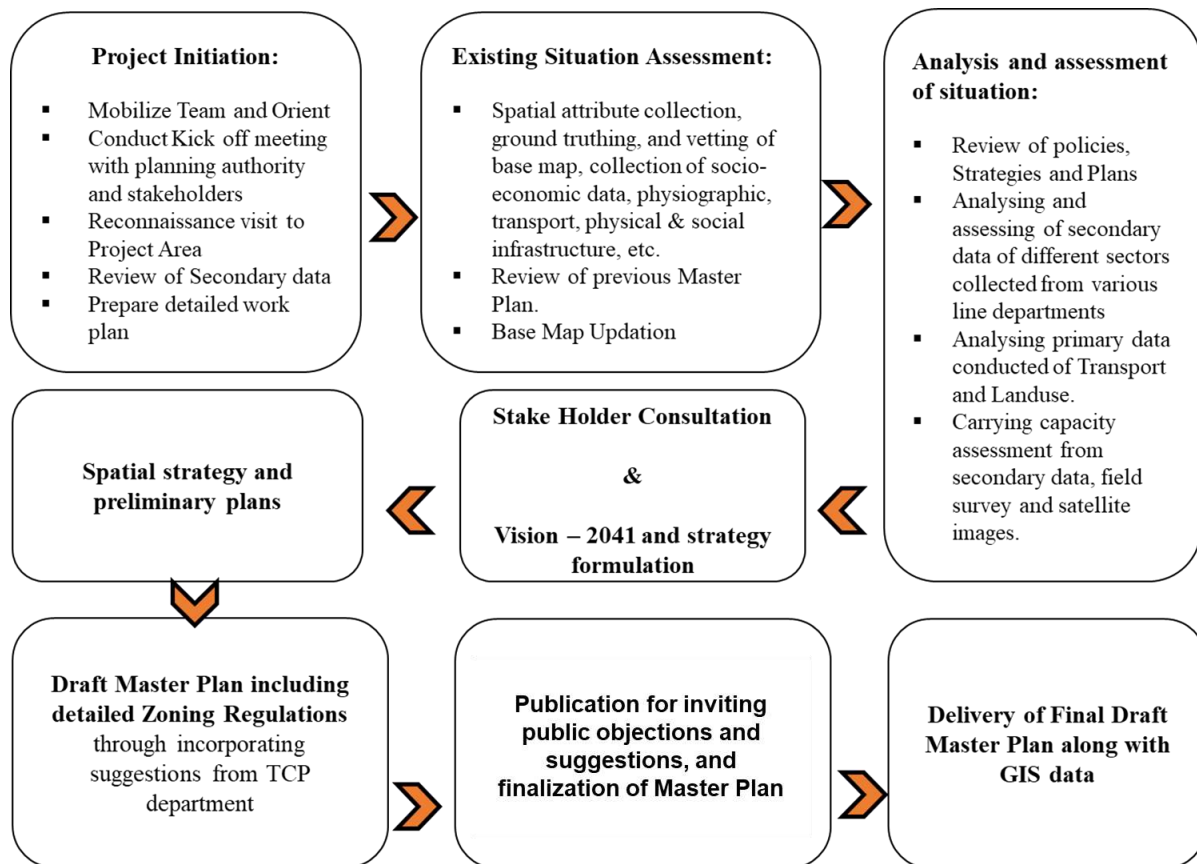
The Preparation of the master plan has been formulated into various stages along with the assigned tasks. The project was initiated with the mobilization of the team with proper orientation of the project and the task to be assigned. Conducted meetings with the planning authority and various line departments to orient them about the various aspects of the master plan and the data requirement. Further, a reconnaissance visit to the project area was conducted to understand the existing situation. Secondary data has been reviewed which has been collected through various online sources. Finally, a detailed work plan has been made for the preparation of the master plan.

The existing situation has been accessed with spatial attribute collection, ground truthing, vetting of the base map, collection of socio-economic data, and comprehensive assessment of the existing situation along with identification of the general trends of socio-economic development at the regional level. Compiled all available data of Socio-economic, Environment and Natural Resources, Physiographic and geology, Human settlement hierarchy, Built-up environment, Transportation infrastructure, and Physical and social infrastructure. Base map updation will be done through a field survey of the data provided by the NRSC. Moreover, data collected for review and documentation of Policies, Strategies, and Plans have been done in parallel. Review of all sectoral policies, strategies, and plans on regional economic development, industrial policy, tourism and heritage conservation, PPP framework, protection of environmental resources, directions given by Hon'ble Supreme court/ High Court/ National Green Tribunal, etc. have also been done.

Further, analysis and assessment of the existing situation have been carried out to identify issues, opportunities, and challenges. SWOT analysis must be done through various aspects like demographic characteristics, real estate market assessment, regional economic base, economic and investment scenario, transport sector, infrastructure and utilities, heritage and conservation, water resources, environment mapping, etc. to formulate the vision for the plan with stakeholder consultation.



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Based on the detailed analysis and assessment of the development status and current trends in the development area, strategies need to be carried out to achieve the goals and objective of sustainable development in the development area in the light of State level policies and a development vision for 2041 will be formulated. Further, upon approval of the preferred strategy, the final spatial strategy and the resultant preliminary land use plan have to be prepared. The preliminary land use plan will be prepared by incorporating all comments and feedback from the Authority.

Preparation of Draft Master Plans for the development area as per the provisions of the Uttarakhand Urban and Country Planning and Development Act - 1973 with the incorporation of the suggestions received from the Town and Country Planning Department, Uttarakhand. Assistance to the Town and Country Planning Department., Uttarakhand in notification and finalization of master plans will be done with the incorporation of public objections and suggestions of the Draft Master Plan as per provisions of the Uttarakhand Urban and Country Planning and Development Act – 1973. In consultation with the Town and Country Planning Department, Uttarakhand, strategies to incorporate objections and suggestions will be finalized and thereafter, they will be incorporated in the Final Draft Master Plan. Finally, along with the

Final Draft Master Plan all the maps, plans, and drawings in ArcGIS platform and also in AutoCAD platform in an agreeable format will be submitted to the Town and Country Planning Department, Uttarakhand.

**i) Base Map Updation**

The first stage of master plan preparation is to update the base map of the city as per the requirement of the plan. This would be done by carrying out a field survey in which each feature would be verified on the ground. Any kind of updation, if required, will be done in the field and the same will be transferred to the soft copy. It will also include spatial attribute data collection from fields and records for the generation of a comprehensive urban land use/land cover GIS database. The variation in the attributes will be corrected on the field and in the prescribed excel format.

**ii) Data Collection and Review of Existing Policies, Strategies, and Plans**

The second stage is data collection related to various aspects covered in the master plan through primary and secondary surveys. It includes a compilation of spatial and attributes data regarding existing conditions of the following aspects:

- Socio-economic data
- Environment and Natural Resources
- Physiography and Geology
- Human settlement hierarchy, function, and distribution
- Built up the environment & existing land use
- Transportation Infrastructure
- Physical Infrastructure
- Social Infrastructure
- Projects under implementation

**iii) Assessment and Analysis of Situation**

The third stage is to analyze the existing situation of the city based on the data collected in the second stage. This will help to identify the issues of the city along with the opportunities and challenges. The demand-supply gap analysis method will be adopted to determine the backlog of infrastructure. This will be done through comparison with available norms and standards and identification of critical problems and infrastructure gaps. It will also include the development of a carrying capacity assessment framework using environmental information, derived from field surveys and satellite images using the carrying capacity assessment process Methods or Tools Considering Development conditions.

**iv) SWOT Analysis**

This stage includes SWOT Analysis based upon the studies made and analysis carried on, city-level Assessment, identified problems and gaps, and identifying major socio-economic drivers.

It will cover the following:

- Review of all sectoral policies, strategies, and plans and G.O.s
- Status of the present situation of the development area in terms of implementation strategies;
- Demographic characteristics;
- Real Estate Market Survey and Assessment
- Regional Economic base assessment
- Economic sectors' assessment
- Study of Economic and Investments Scenario in the development area
- Catchment Area Analysis
- Transportation sector assessment
- Infrastructure and utilities;
- Slums and urban poverty
- Heritage and conservation;
- Water resources and their future capacities for the horizon year and water management
- Geomorphologic studies;
- Water bodies and conservation
- Environmental Mapping and Strategic Environment Assessment; and
- Spatial planning efforts and land use preferably land use modeling

**v) Stakeholder Consultation**

Interactive consultation sessions will be carried out with all the stakeholders involved which include the civil society of both urban and rural areas, the agriculture community, industrialists, traders, elected representatives, academicians, government, and non-governmental organizations. Consultations will be conducted in the form of meetings and workshops at different levels.

**vi) Vision and Policy Formulation**

In this stage, a development vision for the year 2041 will be formulated stating the vision statement, targets, and strategies to achieve goals. It will include suggestions or alternate solutions for the violations in the previous master plan. The provisions of the previous master plan need to be amended as per the present need. This stage will also include making projections for future development including the type of activities and employment opportunities from those activities.

**vii) Preparation of Preliminary Plans**

It includes the preparation of a preliminary land use plan based on the approved final spatial strategy along with the general zoning. It will also include plans related to the following sectors:

- Transportation plan
- Water supply system, sewerage, and stormwater drainage system
- Social Infrastructure
- Commercial centers at various levels.
- Solid waste and wastewater treatment and disposal facilities
- Heritage conservation system
- Conservation of ecosystem and water bodies and action plans for water harvesting

It also includes the preparation of a strategy report which includes the following:

- Regional Setting
- Current socio-economic conditions and trends
- Projections based on current trends
- Opportunities and challenges
- Proposed development strategy
- Projections based on the proposed strategy
- Spatial implications of the proposed strategy
- Action plans for a short and medium term

**viii) Preparation of Draft Master Plan**

Based on the previous stages and inputs from the authority, a draft master plan will be prepared for the development area as per the provisions of the Uttarakhand Urban and Country Planning and Development Act, 1973, and as per AMRUT / URDPFI guidelines. The same will be

submitted to the town and country planning department for their suggestions and modifications if required.

**ix) Finalization of Master Plan**

This is the final stage of master plan preparation. In this stage, public objections and suggestions shall be compiled and strategies will be prepared to incorporate those will be finalized in consultation with the town and country planning department. The same shall be incorporated in the final Draft Master Plan and submitted for approval.

**1.8. Summary**

The whole process of Master Plan preparation is in different approaches. The intended aim of the Master Plan can be achieved by land management, conserving the environment, integrated approach for infrastructure and services duly supported by financial and legislative framework. The emphasis is on sustainable and liberal plans to accommodate the existing development which has taken place.

The methodology is focused on building a strong base of the existing scenario by reviewing the past planning process and proposals. For the updated database analysis GIS techniques are used for collecting and analyzing spatial & non-spatial multi-level, multi-scalar and temporal data. This approach when integrated with the formulation of the overall vision through public consultation will lead to appropriate land use and transport integration, infrastructure needs, and controlled and conserved natural & built environment with detailing at the local level through zoning plans.

It is suggested that for regulating future development along with existing variations and growth the process of plan preparation shall incorporate the concept of zoning which can be further detailed in Local Area Plans.

## **2. Planning Area Profile**

The chapter includes the physical and locational details of the Kashipur Planning Area which mainly highlights its regional importance, distance from major nodes, and details about the regional linkages of the area. It would help to identify the locational advantages and disadvantages and also understand the connectivity of the area to other parts of the state and country. The chapter also highlights the historical evolution of the city from the time of its inception to the present scenario. It also includes physiographic and geomorphological details of the area which play a crucial role in the formulation of the master plan of the planning area, which includes temperature, rainfall, wind, soil, geology, topography, etc. Moreover, this chapter provides details of the regional resources of minerals, forests, flora, and fauna along with water resources.

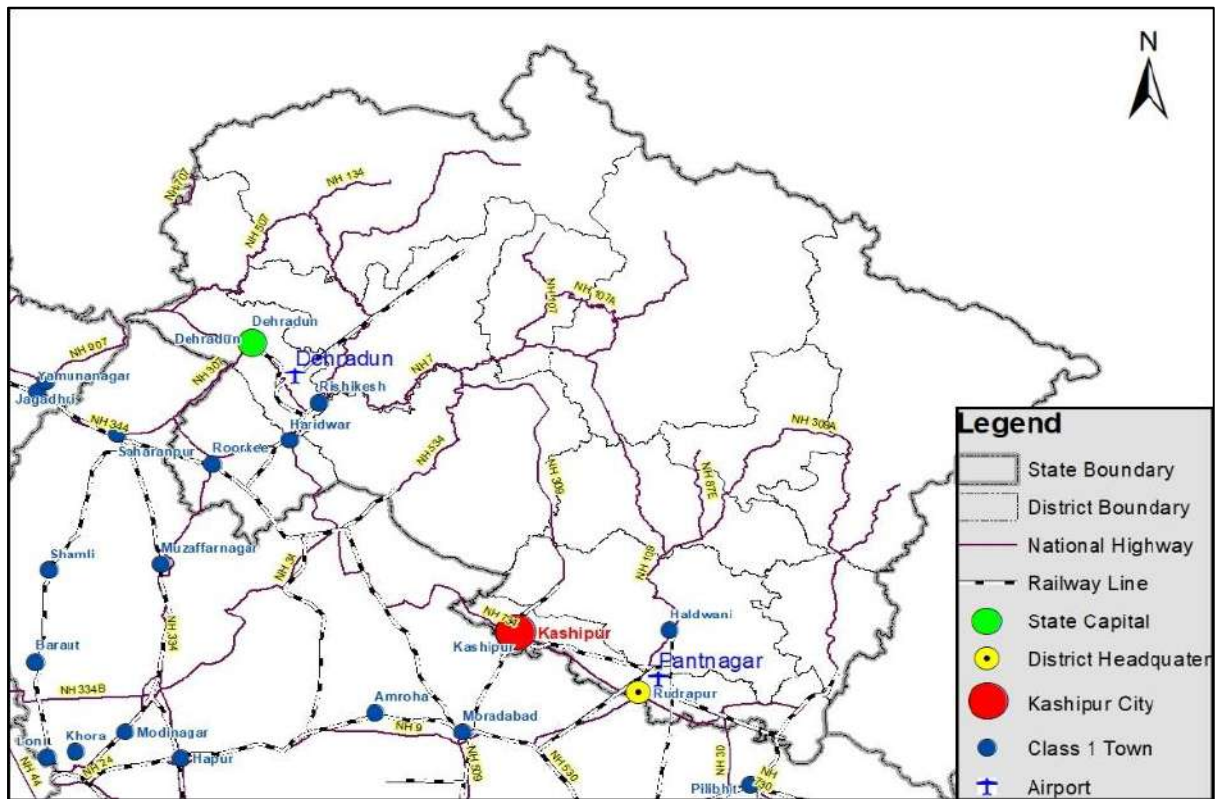
### **2.1.Regional Setting**

#### ***2.1.1. Location of Kashipur***

The city of Kashipur falls in the Udham Singh Nagar district of Uttarakhand state. Its geographical location is 29.2104°N latitude & 78.9619 ° E longitudes. It is located in the southwest part of the Kumaon region, which is generally found to be low lying area. Within the district, Kashipur is located on the north-western side, where it is bordered by Uttar Pradesh on the western and southern sides (refer to Error! Reference source not found.). Towards the north of the city is the Bhabar tract of Ramnagar at a distance of 30 km which is the lower region of Shivalik hills. Towards the southeast direction we have Rudrapur, the headquarters of the district and towards the eastern side exists Haldwani at 65 km.

Kashipur is well connected by both road & rail which serves not only the city of Kashipur but also has a major role in regional transport. The city can be accessed by two National Highways, NH 309 which connects Kashipur to Rudrapur in the southeast and Ramnagar in the north and NH 734 connects Jaspur and Najibabad towards the northwest. There is one railway station in the Kashipur Planning area namely, Kashipur Junction railway station and one is in Mahua Kheraganj NPP Railway Station adjacent to the NPA. They are very well connected from Kashipur to other towns viz. Lalkuan, Bareilly, Lucknow, Ramnagar, Moradabad, and Dehradun, and also well connected with the National Capital. However, the nearest airport servicing Kashipur is in Pantnagar which is 62 km away.

**Map 2-1: Location of Kashipur Planning Area**



The distance from major nodes is provided in **Table 2.1**. Dehradun i.e., State Head Quarters is situated at a distance of 201kms from Kashipur Planning Area. The nearest city having 1 lakh and above population is Rudrapur within the state and Moradabad outside the state.

**Table 2.1: Distance of Kashipur from major node**

| Sr. No: | Description                                                       | Name      | Distance (Km.) |
|---------|-------------------------------------------------------------------|-----------|----------------|
| i       | State Head Quarters                                               | Dehradun  | 201            |
| ii      | District Headquarters                                             | Rudrapur  | 57             |
| iii     | Tahsil/Taluk/Mandal Headquarters                                  | Rudrapur  | 57             |
| iv      | Nearest city (having 1 lakh & above population in-state)          | Rudrapur  | 57             |
| v       | Nearest city (having 1 lakh & above population outside the state) | Moradabad | 52             |
| vi      | Nearest Railway Station/s                                         | Kashipur  | 0              |
| vii     | Nearest Airport/Airstrip                                          | Pantnagar | 63.4           |
| viii    | Nearest Port                                                      | -         | -              |
| ix      | Nearest Bus Stand (govt/private)                                  | Kashipur  | 0              |

Source: Consultant's Analysis



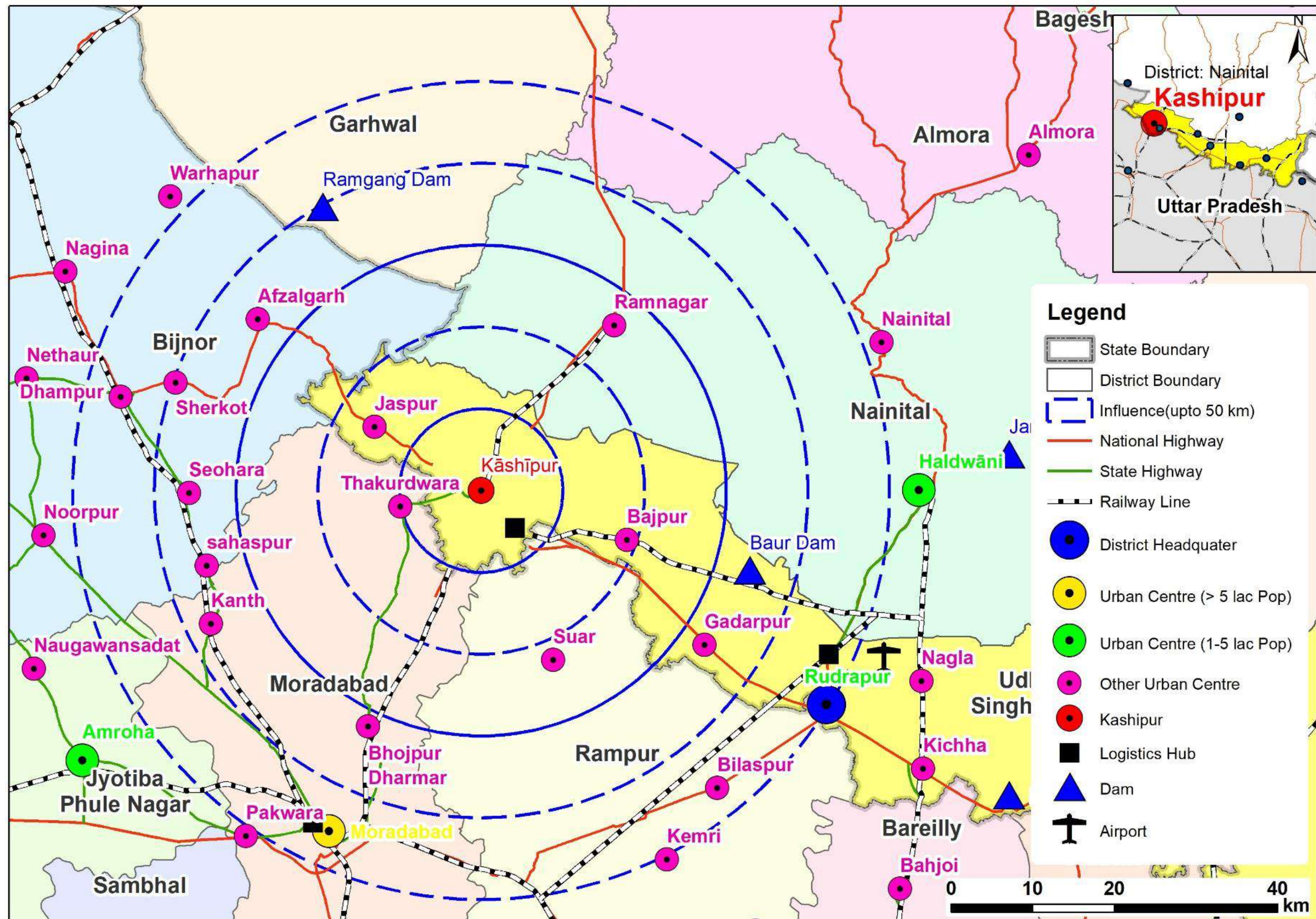
### ***2.1.2. Regional Setting and major settlements in close proximity to Kashipur***

With a population of 1,21,623 according to the census 2011, Kashipur is the second-most populous city in the district after Rudrapur, third in the Kumaon region, and sixth in the state. The district is bordered by Uttar Pradesh state on the western and southern side, Nainital district on the north, and Champawat district on the Northeast side. To understand the various other urban settlements in the proximity of Kashipur, **Map 2-2** depicts the urban settlements present within a 50 km radius of Kashipur. For easier understanding, the urban settlements have been divided into three categories i.e., urban centers having more than 5 lakh population, urban centers having 1-5 lakh population, and urban centers having less than 1 lakh population. Within a 50 km radius, only one urban settlement with more than 5 lakh population is found, i.e., Moradabad with a population of 8.9 lakh. Apart from Kashipur, three other settlements are having a population between 1-5 lakhs which include Haldwani, Amroha, and Rudrapur. Also, 18 other urban centers are having less than 1 lakh population.

While considering the impact of these towns and cities on Kashipur we found that Kashipur has both advantages and disadvantages. For example, Kashipur with its good social infrastructure and growing industrial sector acts as a regional center for the nearby towns. The regional importance of Kashipur is also impacted due to the presence of Jim Corbett



Map 2-2: Regional Setting of Kashipur



Source: Location Data from Google Earth

National Park within its vicinity and Industrial Estate in Rudrapur in a positive way. However, the presence of Moradabad in proximity has proven to impact negatively, due to better opportunities in the city than in Kashipur, which lead to the migration of many people.

Regarding this, the diversified economy of Kashipur should be strengthened to cater to the employment opportunities of the nearby towns. The diverse economy will also give rise to a stable economy and people would not migrate to other cities. The growing sector of the industry should be more supported as it shall provide long-term employment opportunities to people. The tourist inflow in Jim Corbett National Park can be directed and attracted towards Kashipur.

## 2.2.Kashipur Planning Area

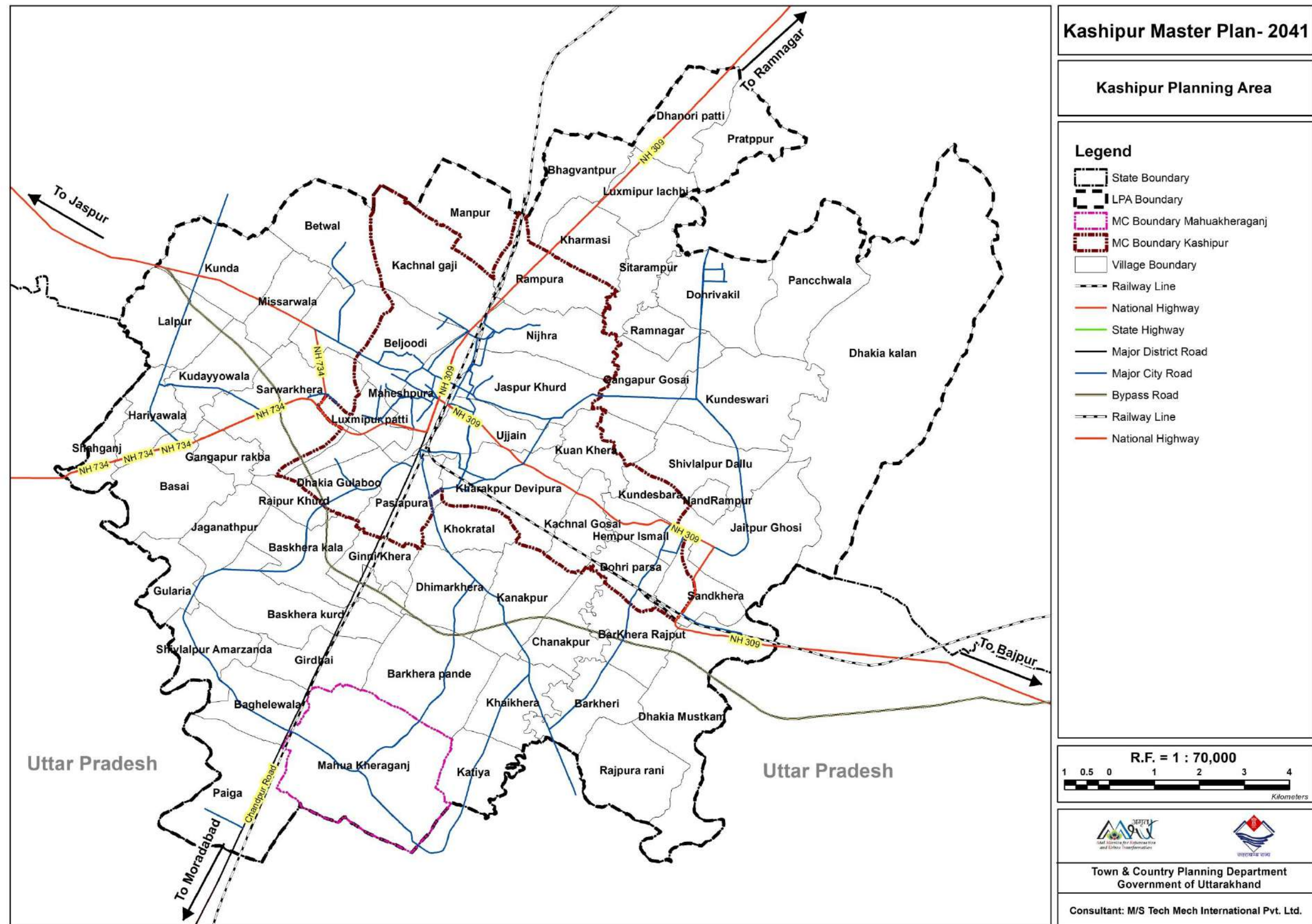
The delineation of the regulated area of the town is the initiation of the process of preparation of the master plan. Based on the influences, geography, and administrative control of the region the planning area is delineated. Kashipur Local Planning Area covers an area of 193.15 km<sup>2</sup>. It consists of one Kashipur Municipal Corporation with 40 wards , along with 50 rural settlements (refer to **Map 2-3**). However, according to 2011 census, there were one Municipal Corporation, Kashipur, and one Census Town Kachnal Gosain along with 61 rural settlements. But in 2018, out of 61 rural settlements 10 have become completely part of the Municipal area and 5 villages have been divided into two halves. The Dhela river cuts these villages into two halves. The eastern part of it comes under the M.C. limit whereas the western part is a rural settlement. So, in total there are 51 villages. The census town has also become the part of Municipal council. Hence the Kashipur Planning Area consists of 1 Municipal Corporation, and 51 villages. The list of the 51 villages has been shown in **Table 2.2**.

**Table 2.2: Villages Forming Kashipur Planning Area**

|                     |                   |                  |
|---------------------|-------------------|------------------|
| 1. Baintwala        | 18. Ginni Khera   | 35. Missarwala   |
| 2. Bans Khera Kalan | 19. Gir Dhyai     | 36. Nandrampur   |
| 3. Banskhera Khurd  | 20. Gularia       | 37. Paiga        |
| 4. Barkhera Rajpoot | 21. Hariawala     | 38. Pratappur    |
| 5. Barkheri         | 22. Jagannathpur  | 39. Raipur Khurd |
| 6. Basai            | 23. Jaitpur Ghosi | 40. Rajpura Rani |



|                            |                                                     |                                                           |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------------|
| 7. Beghelewala             | 24. Kanakpur                                        | 41. Ramnagar Kashipur                                     |
| 8. Berkhera Pandey         | 25. Kataiya                                         | 42. Shahganj                                              |
| 9. Bhagwantpur<br>Kashipur | 26. Khai Khera                                      | 43. Shivilalpur<br>Amarjhanda                             |
| 10. Chanakpur              | 27. Kharmasi                                        | 44. Shivilalpur Dallu                                     |
| 11. Dabhauramustahkam      | 28. Khokhratal                                      | 45. Sitarampur                                            |
| 12. Dhakia Kalan           | 29. Kudiyonwala                                     | 46. Sand Khera                                            |
| 13. Dhanauri Patti         | 30. Kunda                                           | 47. Manpur                                                |
| 14. Dheemar Khera          | 31. Kundeswari                                      | 48. Kuakhera                                              |
| 15. Dohari Vakil           | 32. Lalpur                                          | 49. Sarwar Khera (eartern part of dhela river is in M.C.) |
| 16. Gangapur Gosain        | 33. Laxmipur Lachhi                                 | 50. Pancchwala                                            |
| 17. Gangapur Raqba         | 34. Bejuri (eartern part of Dhela river is in M.C.) | 51. Pasiapura                                             |



Source: Town and Country Planning Department

## 2.3.Regional Connectivity and Advantages

### 2.3.1. By Road

Kashipur is well connected by road as it is located on a national highway. The city is served by the National Highways NH 309 and NH 734. NH 734 (formerly NH 74) connects to Najibabad via Jaspur and Nagina, while NH 309 connects Kashipur to Rudrapur in the east and the cities of Ramnagar and Srinagar to the north. Kashipur is indirectly connected with the state capital Dehradun via NH 734, NH 34, and NH 7 connecting Haridwar, Rishikesh, and then Dehradun respectively. The closest big hilly region town is on the north side of Kashipur city in Haldwani. Kashipur has indirect connectivity with Haldwani via Rudrapur city through NH 309 and NH 109.

### 2.3.2. By Rail

Kashipur has good direct rail connectivity with the surrounding major towns and cities like Moradabad, Rudrapur, and Ramnagar. But due to the presence of difficult terrain, Kashipur doesn't have direct connectivity to Haridwar or Rishikesh which are well connected with the state capital. Some of the important trains that run from Kashipur Junction are given in **Table 2.3.**

**Table 2.3: Train Timings**

| Train Name                                              | Timing  |         |
|---------------------------------------------------------|---------|---------|
|                                                         | UP      | DOWN    |
| Amritsar - Lalkuan Express                              | Evening | Morning |
| Moradabad Ramnagar Passenger                            | Morning | Morning |
| Moradabad Kathgodam Passenger                           | Morning | Evening |
| Ramnagar - Delhi - Jaisalmer Corbett Park Link Express. | Evening | Morning |
| Ramnagar - Haridwar Intercity Express.                  | Morning | Evening |
| Chandigarh - Ramnagar Weekly Inter City Express.        | Evening | Morning |
| Bandra Terminus Ramnagar Express.                       | Morning | Evening |
| Ramnagar - Agra Fort Express                            | Evening | Evening |
| Ramnagar - Delhi Uttarakhand Sampark Kranti Express     | Morning | Evening |
| Lalkuan - Anand Vihar Terminal (Delhi) Express.         | Morning | Evening |

Source: Office of the Railway Station Manager, Kashipur

### **2.3.3. By Air**

Pantnagar Airport located 72 kilometers east of the city in the University town of Pantnagar, is the only major airport in the Kumaon region of Uttarakhand. It has a single runway, which is 4,500 feet (1,400 m) in length, and is capable of handling a turboprop aircraft. Airline services exist in Delhi and Dehradun.

## **2.4. Locational Advantages and Disadvantages**

### **2.4.1. Locational Advantages**

- 1) A rich heritage and ASI-recognised monument increase the scope of tourism.
- 2) The presence of IIM Kashipur makes the location important at a central level.
- 3) Kashipur is the gateway to Jim Corbett National Park as well as the Kumaon region as it is located at the Uttarakhand-Uttar Pradesh border making it an important urban center.
- 4) There is a wide scope of industrial expansion in the planning area due to its plain terrain and presence of major terminals.<sup>78</sup>

### **2.4.2. Locational Disadvantages**

- 1) Due to the presence of a large city like Moradabad within a 50 km radius, the city is facing migration issues.
- 2) The growth of the city is restricted as the growth will be blocked on the north side due to Jim Corbett National Park and towards the west and south, it is bordered by Uttar Pradesh. The only growth direction for the city is towards the east and southeast.
- 3) There are three medium towns within a 50 km radius. As the towns are nearby with restricted growth of the city in a particular direction it might lead to a conurbation effect in the future if not controlled properly.

## **2.5. Climate**

### **2.5.1. Temperature**

Kashipur has a humid subtropical climate, like much of the Indo-Gangetic Plains to its south, with average maximum temperatures in summer (May) being around 39 °C (102 °F); and average minimum temperature in winter (January) around 8.2 °C (46.8 °F). During the year, the average temperatures vary by 17.1 °C. The main seasons are summer from March to June, the monsoon season from June to October, and winter from December to February (Table 2.4). The daily mean of Kashipur city falls between 14 – 32 °C, which is a good range compared to



other cities in India. Tourists like to visit places with good weather and Kashipur with its comfortable weather for more than half of the year can be used to attract tourists. Kashipur falls under the warm sub-humid to humid agro-eco-region as per the classification provided by NBSS and LUP (National Bureau of Soil Survey and Land Use Planning). Mild summers and cold winters characterize the region (refer to **Table 2.4**).

**Table 2.4: Climate Data of Kashipur**

| Climate data for Kashipur    |                |                |                |                |                |                |                |                |                |                |                |                | [hide]          |
|------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Month                        | Jan            | Feb            | Mar            | Apr            | May            | Jun            | Jul            | Aug            | Sep            | Oct            | Nov            | Dec            | Year            |
| Average high °C (°F)         | 20.8<br>(69.4) | 23.9<br>(75.0) | 29.5<br>(85.1) | 35.7<br>(96.3) | 39<br>(102)    | 37.6<br>(99.7) | 32.7<br>(90.9) | 31.8<br>(89.2) | 32.1<br>(89.8) | 31<br>(88)     | 26.8<br>(80.2) | 22.3<br>(72.1) | 30.3<br>(86.5)  |
| Daily mean °C (°F)           | 14.5<br>(58.1) | 16.9<br>(62.4) | 22<br>(72)     | 27.5<br>(81.5) | 31.4<br>(88.5) | 31.6<br>(88.9) | 28.8<br>(83.8) | 28.2<br>(82.8) | 27.9<br>(82.2) | 24.7<br>(76.5) | 19.4<br>(66.9) | 15.4<br>(59.7) | 24.0<br>(75.3)  |
| Average low °C (°F)          | 8.2<br>(46.8)  | 9.9<br>(49.8)  | 14.6<br>(58.3) | 19.4<br>(66.9) | 23.8<br>(74.8) | 25.7<br>(78.3) | 25<br>(77)     | 24.6<br>(76.3) | 23.7<br>(74.7) | 18.4<br>(65.1) | 12<br>(54)     | 8.6<br>(47.5)  | 17.8<br>(64.1)  |
| Average rainfall mm (inches) | 43<br>(1.7)    | 28<br>(1.1)    | 23<br>(0.9)    | 6<br>(0.2)     | 16<br>(0.6)    | 108<br>(4.3)   | 374<br>(14.7)  | 368<br>(14.5)  | 212<br>(8.3)   | 89<br>(3.5)    | 5<br>(0.2)     | 9<br>(0.4)     | 1,281<br>(50.4) |

Source: <https://en.climate-data.org/asia/india/uttarakhand/kashipur/>

## 2.5.2. Rainfall

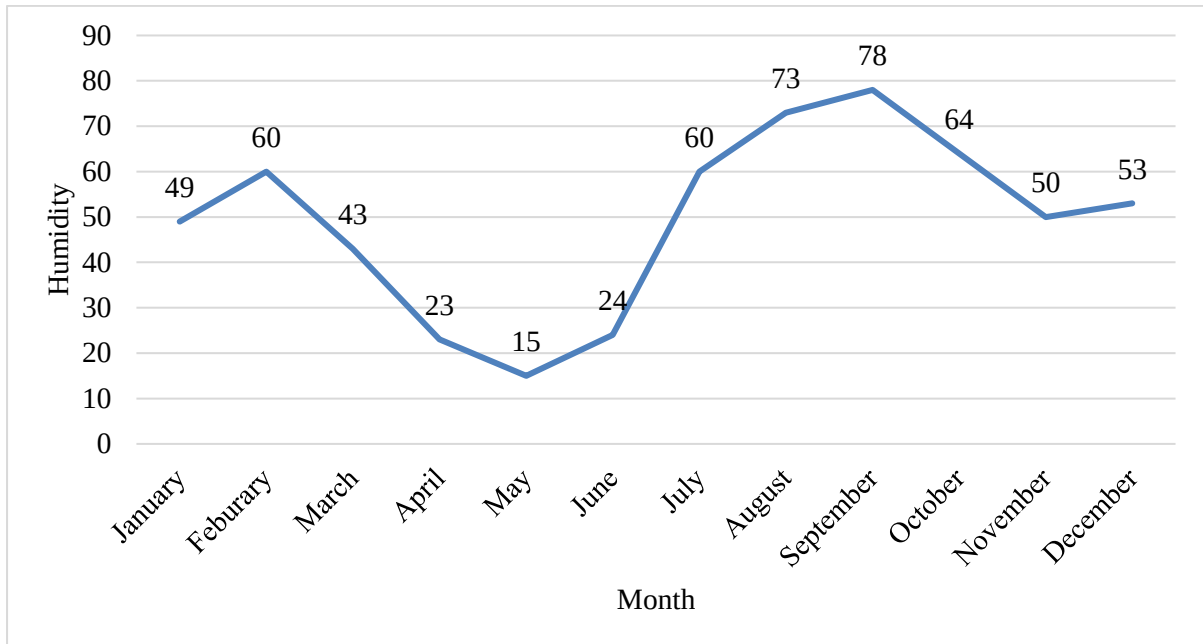
The monsoon season lasts from June to October with an average rainfall of 230.2 mm during the monsoon season. The average annual rainfall is 106.75 mm. The month of July experiences maximum rainfall of 374 mm while the driest month is November, with 5 mm of rain. There is an average rainfall difference of 369 mm of precipitation between the driest and wettest months. This water is not enough for the entire crop growing period. So alternative sources like Dhela and Kosi rivers are used for irrigation in the planning region. But this needs to be properly utilized so that both the present and future needs are met.

## 2.5.3. Humidity

Humidity is defined as the quantity representing the amount of water vapor in the atmosphere or gas and is depicted in percentage. The humidity level of Kashipur has been depicted in Figure 2-1. The level of humidity is highest in August and September. The level of rainfall is highest during this time due to which there is a larger concentration of water vapors in the atmosphere. As a result, the climate is hot and humid from July to September. The level of humidity is also higher in February i.e., 60% due to rainfall and the climate is cold and humid during this time as the temperature level is quite low. The comfortable humidity levels are 49-59%. The month of July, August, September, October, and February have humidity of more than 50. But the uncomfortable humidity levels are more than 70% which is found only in two

months. Below 49%, the weather feels a little dry. But most of the month over the year has comfortable weather (refer to **Figure 2-1**).

**Figure 2-1: Month-Wise Humidity of Kashipur**

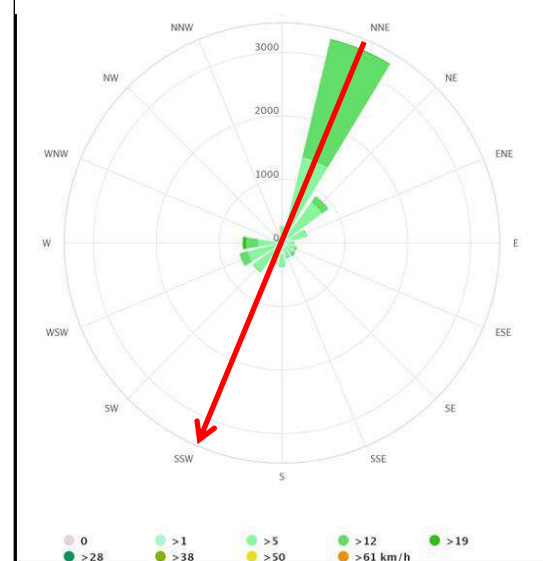


Source: [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kashipur\\_india\\_1267579](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kashipur_india_1267579)

#### 2.5.4. Wind

The wind rose diagram (Refer to **Figure 2-2**) for Kashipur shows how many hours per year the wind blows from the indicated direction. The maximum flow of wind is from NNE to SSW direction with 3299 hrs./year. The average wind speed in Kashipur lies between 12 km/hr to 19 km/hr in case of flow of wind in the above-mentioned direction. The wind affects the microclimate of the region to a great extent. With an increase in the population and built-up area in the core city, the temperature around the city

**Figure 2-2: Wind rose diagram of Kashipur**



Source: [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kashipur\\_india\\_1267579](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kashipur_india_1267579)



increases causing the island effect. Utilizing the prevalent wind direction this effect can be reduced to some extent.

### **2.5.5. Atmospheric Pressure**

Atmospheric pressure also called barometric pressure is the force per unit area exerted by an atmospheric column. The standard pressure at the mean sea level is 1013.25 mb. Kashipur lies in the plain Tarai region, the foothills of Kumaon hills of Uttarakhand. The mean sea level of Kashipur is 218m. Although, being on the plains, Kashipur has an atmospheric pressure of approximately 1016 mb.

## **2.6. Natural Resources**

### **2.6.1. Mineral Resources**

There are not many mineral resources in Udham Singh Nagar District. The only major mineral produced in the district is River Bed Minerals (RBM). As per the details provided by Mining and Geology Department, Udham Singh Nagar, there are 37 sanctioned mining sites in the district out of which 32 are being mined along River Kosi while the rest are being carried out on other rivers. There is no mining site present within the Planning Area of Kashipur, but R.B.M mining sites are present on Kosi river just outside the planning area in village Dabhaura Aihatmali. These mining sites have been sanctioned for 5 years from the date of allotment.

### **2.6.2. Forest Resources**

The total forest cover in the district is 568.33 km<sup>2</sup> and constitutes nearly 22% of the total land area of the district. Deciduous forests are predominant in the district while evergreen forests occupy very less area in the district. Details of the land cover are provided in **Table 2.5** and Error! Reference source not found..

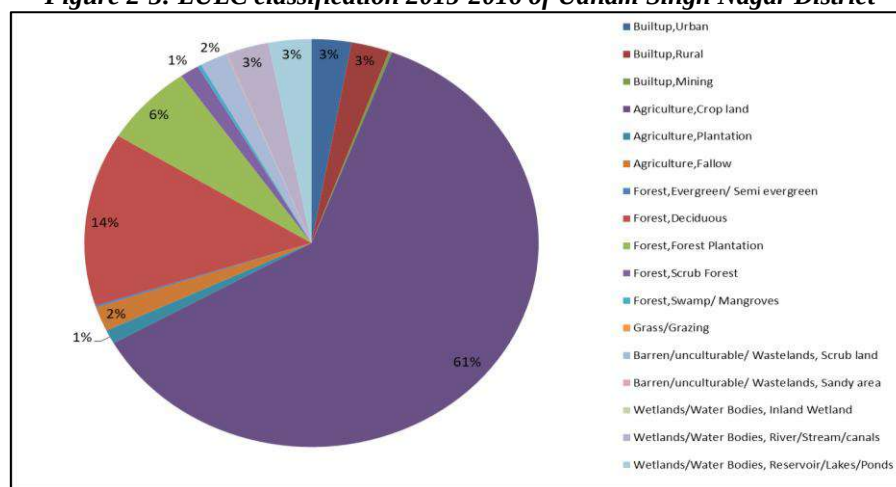
*Table 2.5: LULC classification of Udham Singh Nagar District (2015-2016)*

| <b>LULC Class</b>                 | <b>Area ( km<sup>2</sup>)</b> |
|-----------------------------------|-------------------------------|
| Built up, Urban                   | 72.89                         |
| Built up, Rural                   | 70.37                         |
| Built up, Mining                  | 5.61                          |
| Agriculture, Cropland             | 1574.71                       |
| Agriculture, Plantation           | 28.53                         |
| Agriculture, Fallow               | 50.49                         |
| Forest, Evergreen/ Semi-evergreen | 3.79                          |
| Forest, Deciduous                 | 355.09                        |

|                                              |         |
|----------------------------------------------|---------|
| Forest, Forest Plantation                    | 167.26  |
| Forest, Scrub Forest                         | 35.14   |
| Forest, Swamp/ Mangroves                     | 7.05    |
| Grass/Grazing                                | 0.03    |
| Barren/ unculturable/ Wastelands, Scrub land | 49.79   |
| Barren/ unculturable/ Wastelands, Sandy area | 2.3     |
| Wetlands/Water Bodies, Inland Wetland        | 0.05    |
| Wetlands/Water Bodies, River/Stream/canals   | 77.58   |
| Wetlands/Water Bodies, Reservoir/Lakes/Ponds | 78.32   |
| Total                                        | 2579.00 |

Source: <https://bhuvan.nrsc.gov.in>

**Figure 2-3: LULC classification 2015-2016 of Udham Singh Nagar District**



Source: <https://bhuvan.nrsc.gov.in>

### 2.6.3. Flora and Fauna

Uttarakhand is known for its horticultural crops, which include fruits, vegetables, offseason vegetables, floricultural crops, and medicinal and aromatic plants. Horticulture is one of the critical sectors in the economy of the hilly state of Uttarakhand. It provides a much-needed opportunity for diversification and increased employment in the state where the scope of a high rate of growth in conventional agriculture is rather limited due to peculiar topography and a majority of scattered and marginal holdings. Uttarakhand shared 2.81 percent of all India's area under fruits.

### 2.6.4. Water Resources

Udham Singh Nagar district lies on the plain regions of the state of Uttarakhand. The district has a dense network of drainage pattern. The rivers of the district belong to the Ganges drainage system. Of these, Sarada, Kosi, Gola, and Phikka Rivers and their tributaries are Sawalkeh,

Bour, Nandhour, Bhak, Kailash, etc. drain the district. The unique feature of the area is debouching of major rivers into the plains of Lower Himalayas. The overall flow direction of these rivers is generally north-south trend or northeast-southwest and flows south till its confluence with the Ganga River. The major rivers are perennial, whereas their tributaries originating from the sub-Himalayan zone are ephemeral and remain dry during the non-monsoon seasons. The average water availability in the district is at a 10m level. Information on the hydrogeology of the district is obtained from the district brochure of Udham Singh Nagar. Generally, the groundwater flows from north to south in the study area. Based on the behavior and occurrence of groundwater, the district can be broadly categorized into two broad hydro-geomorphic units namely (1) Bhabar and (2) Tarai.

The nearest River is Dhela which crosses from the western part of Kashipur city. There are more than 40 canals according to the Irrigation Department, which flow within the region having its origin at Tumaria Dam at a distance of 32 km Major Dam/Reservoir is Tumaria Dam located 32 km from the planning area. However, numerous drains can be seen in the planning area (refer to **Table 2.6**).

*Table 2.6 Nearness/Distance of Major River/Canal/coastline from Town*

| River name & distance (km.) | Canal name & Distance (km.)          | Distance of Big Drains       | Distance of Major Dams & Reservoirs |
|-----------------------------|--------------------------------------|------------------------------|-------------------------------------|
| Dhela River<br>(Within KPA) | Laxmipur Patti canal<br>(Within KPA) | Arjun nallah<br>(Within KPA) | Sumeria Dam (32 km)                 |

Source: Basemap from NRSC, verified through primary data

## 2.7. Physical Features

### 2.7.1. Physiography

#### 2.7.1.1. Topography and Water Bodies

At 29.22°N 78.95°E and 180 kilometers northwest of New Delhi, Kashipur is located in the south-west of the Kumaon region of Uttarakhand in the Terai – an area of relatively low-lying land, ranging between 500 and 1,000 feet (150 and 300 meters) above sea level and crossed by Kumaun's main north-south watershed between the basins of the Rivers Ramganga and Kosi. Kosi is the master stream flowing in the eastern part with its broad course from north to south. To the north of the city lies the Bhabar tract of Ramnagar, which separates the area from Shivalik Hills. Kashipur is drained only by minor rivers and lakes, primarily by two tributaries

of Ramganga, the Kosi and Dhela river. Several rivers and streams cross the region transversely and leave their deposit making the land fertile. The area in and around the city is relatively flat i.e., ranging up to 20 m per kilometer. The general elevation is over 250 m above sea level (refer to **Map 2-4**).

The slope of Kashipur Planning Area is 1:3870 i.e., there is a rise of 1 m after every 3870 meters i.e., 3.87 km. indicating a gentle slope. The aspect of Kashipur has been worked out in two ways i.e., based on the direction of the water body and the aspect map. Two water bodies are flowing from the North to the south direction which implies that the southern area is low lying as compared to the northern part. In the aspect map, the frequency of each direction has been worked out. Based on this, the maximum frequency is in the South direction followed by South East and South West. It indicates that the aspect is towards the South. Hence, the Southern area is the low-lying area of Kashipur. This would help lay the infrastructure projects.

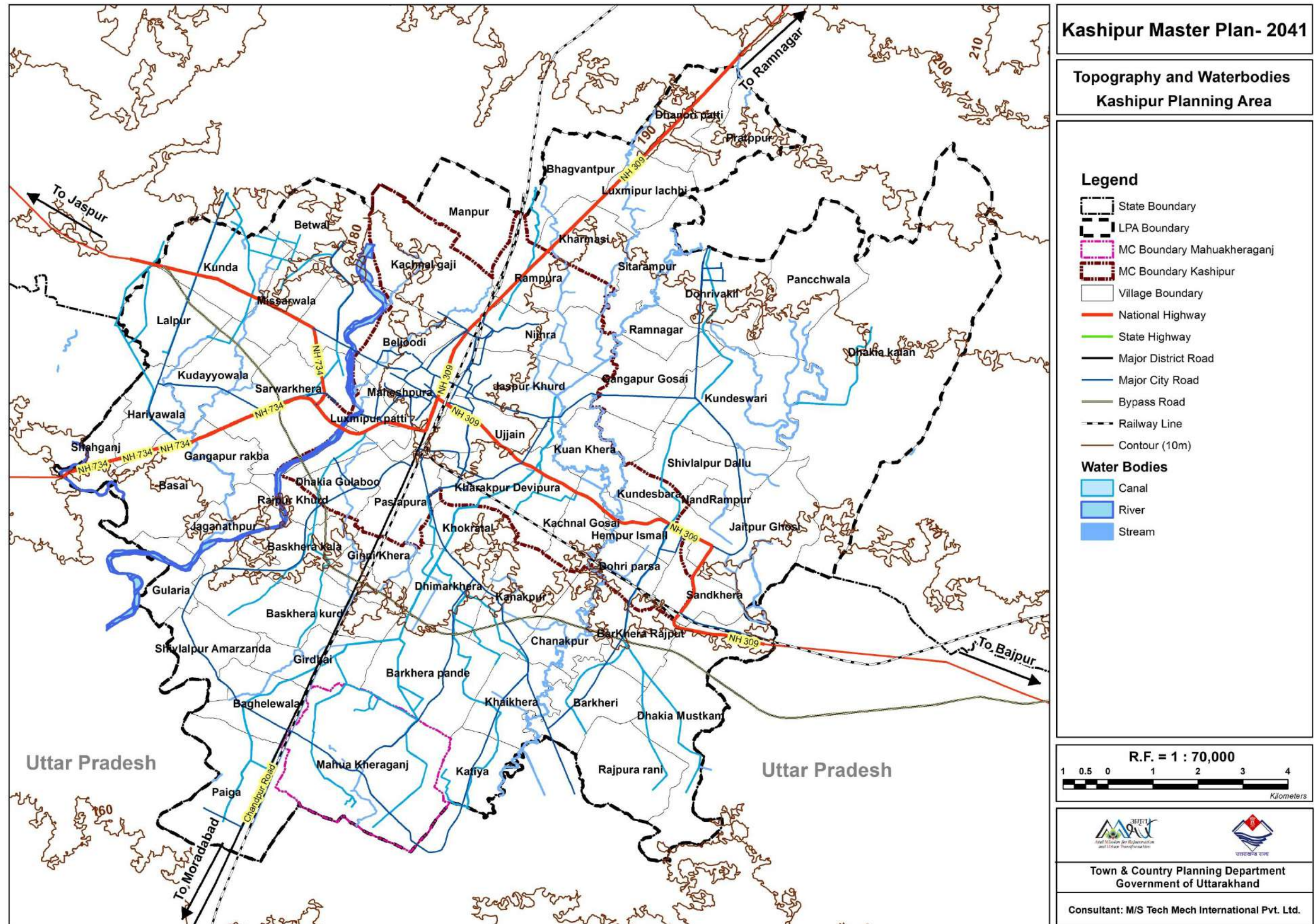
Kashipur planning area falls in the Ramganga Sub-basin which lies between 29.22°N and 78.95°E of the country. The Ramganga is the first major tributary to join the Ganga. It rises at an altitude of about 3,110 m in the lower Himalayas near the Lohba village in the Garhwal district of Uttarakhand. The length of the Ramganga river from the source to the confluence with the Ganga is 596 km. During its course, the river flows through mountainous terrain and has several falls and rapids. The river enters the plains at Kalagarh near the border of the Garhwal district, where the famous Ramganga dam has been constructed. Beyond Kalagarh, the river flows in a south-easterly direction and finally joins the Ganga on its left bank near Kanauj in the Fatehgarh district. The river flows entirely in the states of Uttarakhand and Uttar Pradesh. The catchment area of the sub-basin is about 30,839 km<sup>2</sup>. The important tributaries that join the Ramganga river are the Ban, the Khoh, the Gangan, the Gagas, the Aril, the Kosi, the Haldgadi Rao, and the Doha.

The natural slope of Kashipur which falls under the Ramganga sub-basin is an advantage to the planning area. The natural slope could be used for gravity-based sewerage and drainage channels. The presence of the Kosi and Dhela river is a gift for the agricultural lands in the Kashipur Planning area. It can also be used as a source of drinking water in the future if needed. But in recent years due to climate change and human intervention, there are cases of floods in the flood pane zone. The diversion of the Dhela river for agricultural purposes has been taken place in 2019. Though the river has been providing water to the region for a long time still the industrial waste of Kashipur is being dumped into the river causing water pollution. The

rejuvenation of the Dhela project is also taking place in 2019. If the human intervention of the river is not monitored properly it would result in various issues in the future like floods, waterborne diseases, and effective the quality of agricultural products.

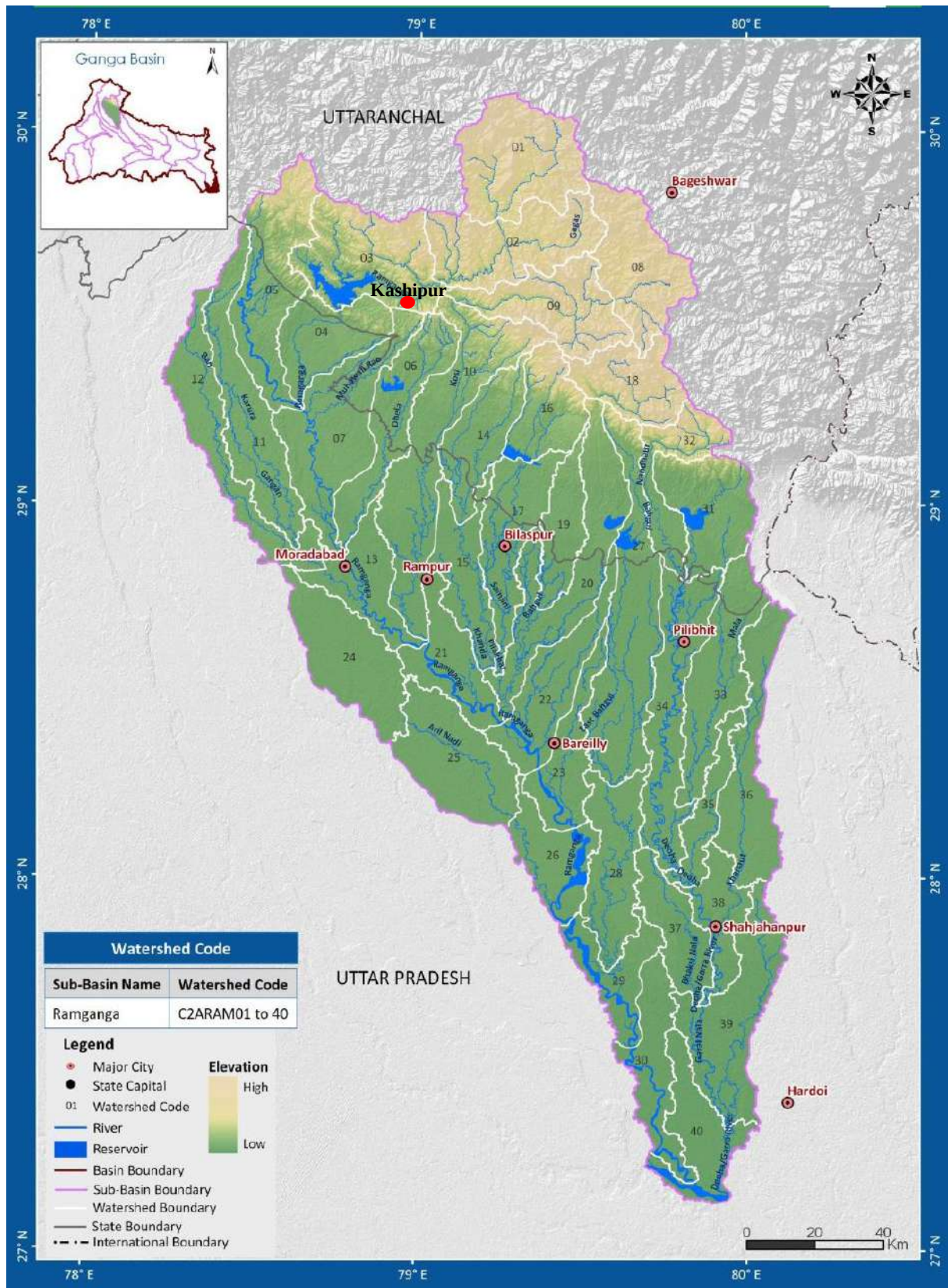
Kashipur is located near watershed boundaries 6 and 10 which implies that it is located near the ridge (refer **to Map 2-5**). The chances of flash floods are very less in this area as there will be a surface run-off in this area. Dhela river flows in the Kashipur Planning Area. Moreover, there are two water bodies in the city i.e., Drona Sagar & Girl. Kashipur Planning Area falls under flood zone according to 'Hazard Profiles of Indian Districts'.







**Map 2-5 Ramganga Sub-Basin**



Source: Ganga Basin Report by Ministry of Water Resources, Govt. of India

### **2.7.2. Geology**

Udham Singh Nagar may be broadly divided into two physiographic units from north to south viz., Bhabar and Terai respectively. Since the area is located in the Himalayan foothills, a very thick column of alluvial is deposited, which further is classified into two distinct divisions: (A) The piedmont fan deposits known as Bhabar & (B) The Tarai. In the case of Kashipur, Tarai formation is present in the entire study area as depicted in **Map 2-6**. The terai soils are rich in nitrogen and organic matter but are deficient in phosphate. These soils are generally covered by tall grasses and forests which are suitable for several crops such as wheat, rice, sugarcane, jute, etc. This thickly forested region provides shelter to a variety of wildlife. The soil type of the city is Mollisols. This type of soil has deep, high organic matter, nutrients enriched surface soil, mainly of about 60 – 80 cm thickness. The fertile surface horizon results from the long-term addition of organic materials derived from plant roots. They have a soft, granular, soil structure. This soil is highly fertile and best suited for agricultural activity.

### **2.7.3. Hydrogeology**

Tarai formation lies south of the Bhabar, which comprises predominantly of clays and silts with horizons of well-sorted granular material such as sand, gravel occasionally boulders and cobbles, and pebble beds. The boundary between the Bhabar and the Tarai is defined by a spring line, which is characterized by auto-flow (free-flowing) conditions. There are plenty of moist and waterlogged areas around the spring line, particularly during the monsoon season. The sand and gravel associated with the finer fractions are the major aquifers in this zone.

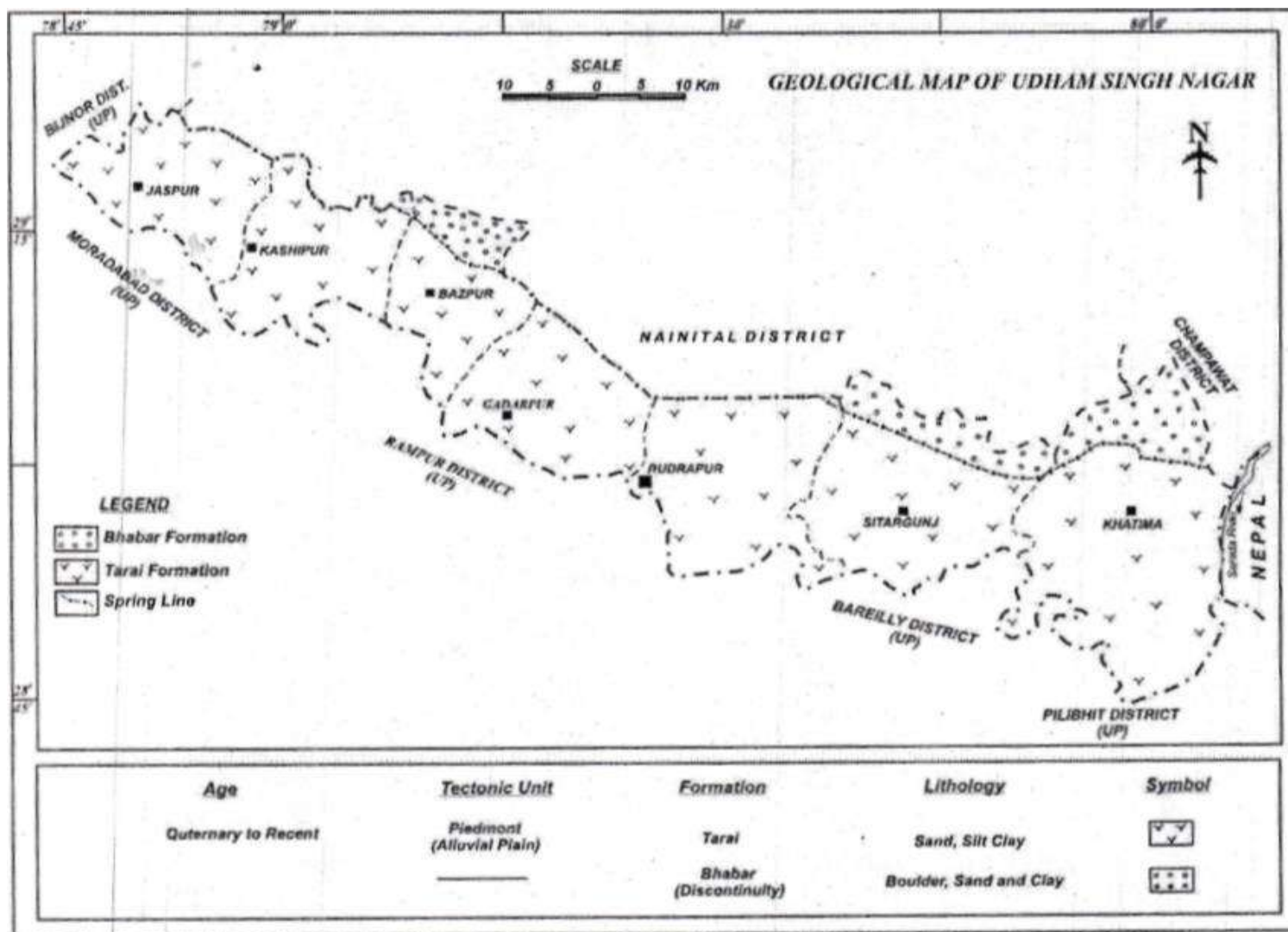
Groundwater in shallow aquifers is tapped through dug-wells; the groundwater occurs under unconfined and phreatic conditions. The groundwater in deep aquifers is under confined and artesian conditions. The deeper aquifers (> 50 m), generally being in confined conditions with higher artesian heads, and the tightly cased tube wells constructed in them result in flowing wells. The unconfined shallow groundwater of the Tarai may be recharged by (1) the direct infiltration from rainfall on the land surface, (2) the infiltration from the streams when flooded, (3) return seepage from irrigation (4) lateral percolation from adjacent Bhabar zone.

On the contrary, the confined groundwater is probably recharged by downward percolation and lateral flow from the Bhabar belt. Bhabar is, therefore, the intake area for Tarai as well. The groundwater in the Tarai zone occurs both in unconfined and confined conditions. In the



## Kashipur Master Plan - 2041

Map 2-6: Geological Map of Udham Singh Nagar

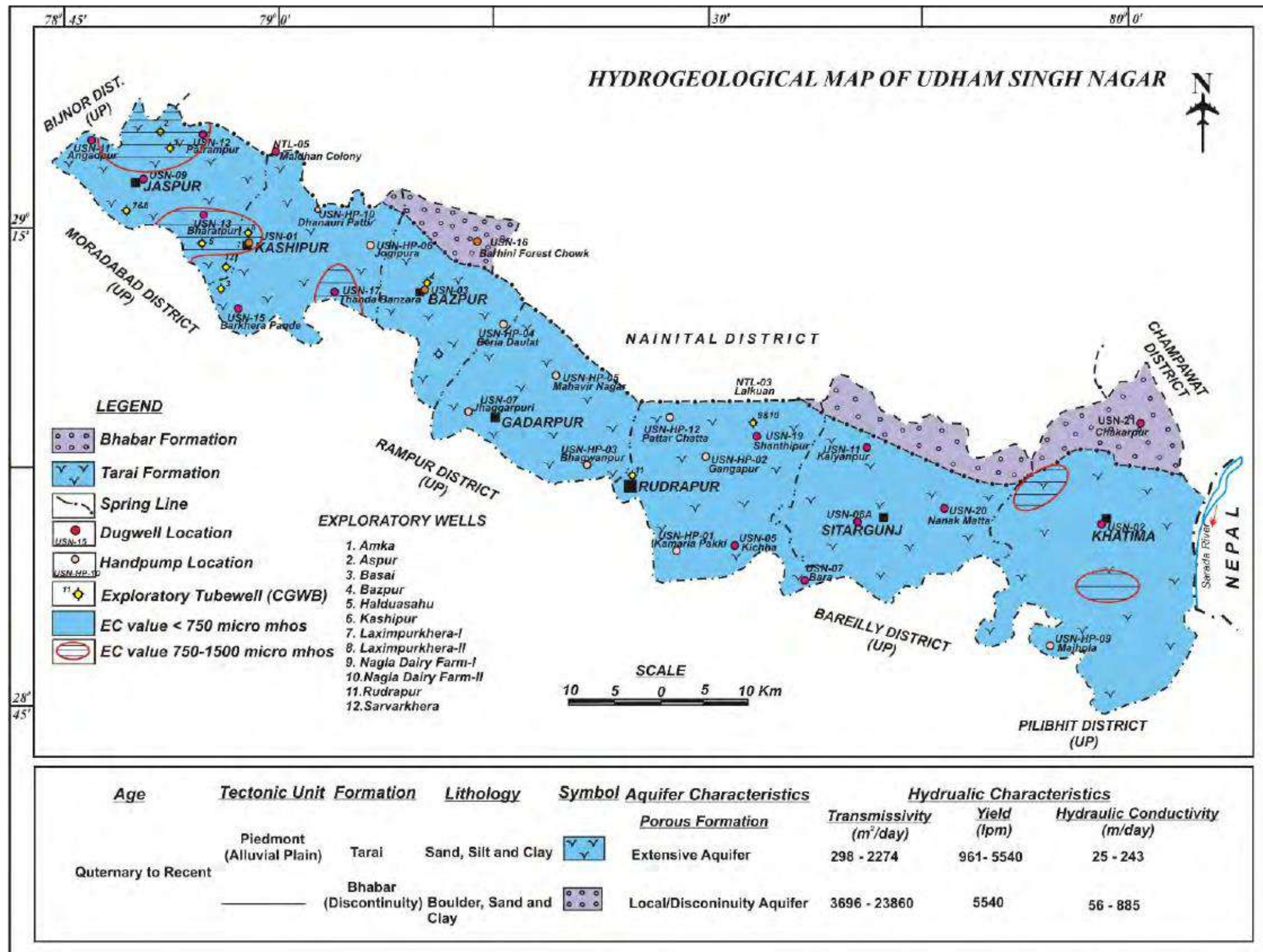


Source: Geology and Mining Department, US Nagar

unconfined aquifer, the depth of the water level in pre-monsoon and post-monsoon varies from 2.09 to 7.08 m bgl and from 1.99 to 6.89 m bgl, respectively. The seasonal fluctuation varies from 0.09 to 3.56 m. The general slope of the water table is from north to south. The detailed hydrogeological map along with locations of exploratory tube wells are shown in Map 2-7. The tube wells tapping deeper confined aquifers with auto-flow conditions yield 25.0 to 55.0 lps of freshwater for a drawdown of 2.0 to 8.0 m. In the case of tube wells tapping confined aquifers with non-flowing conditions, the yield varies between 10 and 40 lps for a drawdown of 4.0 to 9.0 m. The exploratory wells of CGWB tapping confined aquifer, drilled depth ranges from 74.98 to 88.39 m, yield ranges from 2683 to 3100 lpm, transmissivity values range from 1180 to 2500 m<sup>2</sup>/day, and the hydraulic conductivity ranges from 25 to 243 m/day. The hydraulic gradient ranges from 1.35 to 4.0 m/km the coefficient of permeability ranges between 17 and 108 m/day.

Artesian conditions are restricted to the Tarai zone. In a well, penetrating through an aquifer, the water level will rise above the bottom of the confining bed. If the water level rises above the top of the upper confining layer, above the ground surface, it will result in free-flowing /auto-flow conditions. In this zone confining conditions result due to the intercalation of permeable materials like sand and gravel with impervious clay horizons. The difference in elevation of Bhabar and Tarai, together with the regional slope of the strata, appears to build the artesian head in the aquifers. The permeability of the Tarai aquifers is less than that of Bhabar, thereby playing a vital role in developing the pressure, as it impedes groundwater flow. The discharge of the tube wells is dependent on aquifer properties, and local ground conditions. More than 2000 artesian wells are present in Kashipur, Bazpur, Gadarpur, Rudrapur, and Sitargunj blocks. Central Ground Water Board has constructed artesian wells at Basai, Kashipur, Bazpur, Nagla, and Rudrapur (refer to Map 2-7). The drilled depth ranges from 84.4 to 433.0 m bgl, with a free-flowing head up to 8.69 m above ground level.

The yield of these wells is up to 3400 lpm, with the drawdown 5.39 to 10.69 m. The Transmissivity values range from 825 to 12274 m<sup>2</sup>/day, and the hydraulic conductivity ranges from 16.17 to 106.6 m/day. It is observed that the pressure head of the artesian aquifers drastically reduced over the two decades and some of the shallower depth wells lost their artesian conditions. The causes of reduction in discharge of artesian wells may be attributed to i. Overexploitation of groundwater due to industrialization ii. Reduction in recharge area due to developmental activities in Bhabar zone iii. Overexploitation of confined



Source: Central Groundwater Board, Report, US Nagar



artesian aquifer iv. Interlinking of confined and unconfined aquifers due to an increased number of tube wells, v. choking of wells, and vi. Continuous free flow of artesian water as there are no efforts to arrest the auto-flow (*refer to Map 2-7*).

#### **2.7.4. Ground Water Availability**

In the Kashipur block, the total groundwater availability as per the CPWG report of 2004 was 7331.68 Ha m while the Groundwater draft was 6179.41 Ha m. Kashipur block (84.28%) has shown the highest groundwater development, and the lowest groundwater development is shown by the Sitargunj block (69.60%). As per the norms of GEC-1997, all the blocks are under semi-critical situation except the Sitargunj block with safe distinction.

#### **2.7.5. Ground Water Related Issues and Problems**

Hydrogeological investigations reveal that the depth to water level is shallow in Udham Singh Nagar district for the last two decades and there is no change in the long-term water level trend. The shallow aquifer gets contaminated and gives a foul smell as many industries discharge their untreated effluents directly to nearby water bodies, which affects the quality of drinking water. Groundwater pollution studies are to be taken up in project mode to bring out a clearer picture in a realistic manner. However, in hand pumps the quality problem is mainly because of the color (yellowish-brown) and bitter taste, indicating that the water has a very high iron content. Putting an iron filter unit with the outlet of the hand pump can solve this problem.

#### **2.7.6. Recommendations**

The groundwater is developed mainly through tube wells, hand pumps, and dug wells. The overall groundwater scenario in the district is safe to semi-critical. However, the situation is slowly deteriorating due to the over-exploitation of groundwater due to rapid urbanization, and industrialization besides rapid deforestation. There is an urgent need for intensive monitoring of the groundwater scenario in the district. In the district, paddy is grown intensively, leading to the over-exploitation of groundwater. The local farmers should be encouraged to adopt cultivating other less water-consuming crops along with paddy. Unmetered domestic water is being supplied in the district, which leads to the wastage of water. There should be metered domestic water supply to encourage water conservation. Detailed pollution studies are required in the vicinity of the industrial areas like Kashipur, Rudrapur and Sitargunj blocks to assess the quality of groundwater.

## **2.8. Historical Background**

Based on the evidence available in the book “History of Kumaon” written by Mr. Badidat Pandey concerning the origin of Kashipur city, it is written that Kashipur city is the oldest and most famous town in the Terai Bhavar region. Public Chinese traveler, Honsang came here in 629 BC, stayed for 16 years, and returned to China in the year 645 AD. Housing mentions this city as Govishna and Kashipur was known as Govishana, during the time of Harsha (606–647 AD). According to him, the city was 2.5 miles round and many monasteries existed in which Hindu priests and Buddhists lived. Bishop Dare wrote that God created Kashipur 5000 years ago which is a holy pilgrimage site for Hindus. The city of Kashipur was founded in 1839 by ‘Laat Adhikari’ Kashinath of Kumaon king Devi Chandra after his name.

A famous pond named Dronasagar is situated near the old fort called Ujjain, Kashipur. It is said that the Pandavas built it for their guru Dronacharya. This pond is 600 feet square in area and there is also a memorial for sati women near it. During that period, 17 localities in Kashipur and Braham-Pant, Pandey, Joshi, Bhat, Lohni, etc. of Kurmachal settled here. Apart from them, people of many castes like Rajput Vaishya also resided here. In the year 1872 after the suzerainty of the British, a municipality was established. Udayraj High School was established here in 1915. Thus, this city continued to develop according to the then circumstances of the country.

Kashipur is believed to have a good historic trade of clothes and metal vessels. The exact date of the foundation of the town is disputed, and several historians have expressed their views on the matter. From the ancient Kings to the rule of the British, Kashipur has shown its natural growth without any drastic or sudden growth of the city until when the state of Uttarakhand got newly formed and separated from Uttar Pradesh in 2000. After becoming a separate state, Kashipur like other several small towns has shown a rapid increase in urban settlement. The growth of the city was mainly directed towards the north part due to increasing tourism activities of Jim Corbett National Park, south due to industrial growth and towards the southeast, as it connects to Rudrapur, the district headquarters.

### ***2.8.1. Regulated Area Kashipur and Master plan Background:***

Although the municipality was established in Kashipur in the year 1872, even after the formation of the municipality, in the absence of effective control over its physical development, the city continued to grow in an unplanned, uncontrolled, and erratic way. There was abundant migration from the rural population in the city because of employment and business opportunities. Due to this many new residential colonies and mohallas have developed in an unplanned manner. To cater to the everyday needs of people of the city, as well as nearby cities Kashipur has developed as a commercial center. The pressure on good community facilities and services increased due to the high population load. To accommodate the population growth, the city is developing at a rapid pace causing urban sprawl.

Due to a lack of control over the area, the people started to cater to basic facilities like water, solid waste, and sewerage individually. That's why we find handpumps and septic tanks in the majority of households than in any centralized network. At present, the city is not able to keep up in providing basic utilities and services, organized open spaces and parks with the continuous growth of population, and uncontrolled physical expansion. As a result, such settlements have been converted into those which are organized for adequate community facilities and services at present. Open spaces have been lacking in the area, which is why the provision of these essential facilities has become a challenging task for all residential areas to be developed. Simultaneously, due to unplanned growth and lack of affordable housing few areas have transformed into slums. Hence, there is a need for centralized drinking water, stormwater and sewerage systems through this masterplan. Solid waste Management and building bylaws are already in place but still need to be strengthened.

Similarly, the current industrial development of the city has mainly taken place in an unplanned manner along the roads. There is no effective control even in the parking of vehicles, loading-unloading of goods, industrial waste disposal, and related pollution problems of the city of Kashipur. In terms of the environment, pollution has become very relevant and vivid. To plan and control such uncontrolled expansion and unplanned material development in the last decades and to give a guided direction to future development, the Government issued G.O number 3830/9-A-91-6-RA-91, Lucknow on 19 June 1992, Kashipur comprising the municipality and its adjacent 35 villages declaring it a Regulated Area having a total area of 9823.32 Ha, in which the area of Nagar Palika Parishad was 541 hectares.

Limit of Regulated Area:

The boundary of Kashipur Regulated Area in different directions is as follows.

- It includes the area of the village Bhanpur and Rampur Road to the northern limit of about 6 km on the Ramnagar road towards the north.
- It extends approximately towards the Bajpur Road in the east, Sodkheda up to the Jaitpur area of the boundary of Ghosi Wala, Kundeshwari, Gangapur Gosai Village.
- The area up to the boundary of village Bans Kheda Khurd on the route leading to Aliganj in the south.
- The area on the western border of village Lalpur and Kunda on the route going towards Jaspur and about 7 km on the route going to Thakurdwara on the same side, to the west of Shahganj and Basai village boundaries.

### **2.8.2. Master Plan Background:**

Objectives of the master plan have been to effectively control the unplanned development in Kashipur Municipality boundary and adjacent rural areas and to cater to the needs of the present urban population as well as of the future. It emphasizes on physical and economic development of the city and also strengthens the policy. Uttar Pradesh Government handed over the responsibility of preparing the Kashipur Master Plan in order number - 3426 / -A-3-93-12 Maha / 93 Awas Anubhag-3 Lucknow on 1 September 1980 to the Town and Country Planning Department.

It is in this context that the Kashipur Master Plan 2011, was initiated in which the following objectives have been kept in mind:

- To manage the uncontrolled and unplanned development in Kashipur and direct the future urban area and future development following the agreed physical boundaries and policies.
- Balancing the master plan area based on the current population and functional trend of the city and according to planning principles by forecasting the effective population.
- To make necessary provisions for the population of the future city for basic utilities and services like water supply, sewage disposal, education, medical, organized open spaces like parks and playgrounds, community facilities, and power supply.
- To make a land-use proposal to maintain a smooth inter-relationship between residential areas and various workplaces based on time and distance.
- Provision of traffic and transport techniques following planning rules for implementation in master plan which would be effective for various land uses.

*Kashipur Master Plan - 2041*

- To ensure possible cohesion through non-committing bylaws, land use proposals, and sectoral regulations in mutual anomalies of various existing urban actions.



### **3. Demographic Profile**

The chapter includes the statistical and analytical study of the population size, distribution, and composition of human settlements. It also covers various aspects related to demography which include caste composition, sex ratio, literacy, and occupational classification. The data collected for population studies are categorized into time series data and spatial data in which the former focuses on the changes and transformations of various demographic aspects while the latter deals with the analysis of the distribution pattern of settlements and population. The study of demographic and socio-economic characteristics is essential to assess and evaluate the existing character of people which in turn would help to identify the shortcomings and would also help us in predicting the future population for the Kashipur Planning Area.

#### **3.1. Existing Population Profile**

##### **3.1.1. District profile**

Udham Singh Nagar is a district in Uttarakhand with Rudrapur as its headquarters. The district was formed in 1995, before which it was part of the Nainital district. The total population of Udham Singh Nagar is 16, 48,902 out of which 10, 62,142 (64.4%) are residing in rural areas while the remaining 5, 86,760 (35.6%) are residing in urban areas. The sex ratio of the rural areas of the district is 930 which is more than the sex ratio of urban areas i.e., 903. The sex ratio of the district, as a whole, comes out to be 920 females per 1000 males. The literacy rate of Udham Singh Nagar district is 73.10%. The male literacy rate is 81.09% and the female literacy rate is 64.44%. The total number of workers in the district is 591458 out of which 76.21% are main workers and 23.79% are marginal workers.

##### **3.1.2. Kashipur Planning Area**

Kashipur Planning Area covers an area of 193.15 sq.km, consisting of one Municipal Corporation (MC)/Nagar Nigam Kashipur, and 51 villages. The Kashipur Planning Area, with a population of 279342 contributes 16.94% population of the district, which is about 1/6th of the district population. Furthermore, 67% of the population reside in urban areas and 33% of the population reside in a rural areas in Kashipur Planning Area reflecting that urban areas have better infrastructure and opportunities which is attracting people from nearby. Apart from this Kashipur has a good trade and commerce establishment due to the presence of Kumaun Garhwal Chamber

of Commerce & Industry (KGCCI) and due to this, it creates abundant business opportunities and people from nearby villages as well as from nearby towns like Jaspur, Sultanpur, Thakurdwara, Ramnagar shift to Kashipur to grab and utilize this opportunity (refer to **Table 3-1**).

**Table 3-1: Population and Growth rate of Kashipur planning area, Udham Singh Nagar, and Uttarakhand**

| Kashipur Planning Area |         |        |         |        |          |        |
|------------------------|---------|--------|---------|--------|----------|--------|
| Year                   | Urban   | Growth | Rural   | Growth | KPA      | Growth |
| 2001                   | 101825  | -      | 95724   | -      | 197549   | -      |
| 2011                   | 138839  | 36.35% | 140503  | 46.78% | 279342   | 41.40% |
| 2019                   | 188403  | 85.03% | 90939   | -5.00% | 279342   | 41.40% |
| Udham Singh Nagar      |         |        |         |        |          |        |
| Year                   | Urban   | Growth | Rural   | Growth | Total    | Growth |
| 2001                   | 403014  | -      | 832600  | -      | 1235614  | -      |
| 2011                   | 586760  | 45.59% | 1062142 | 27.57% | 1648902  | 33.45% |
| Uttarakhand            |         |        |         |        |          |        |
| Year                   | Urban   | Growth | Rural   | Growth | Total    | Growth |
| 2001                   | 2179074 | -      | 6310275 | -      | 8489349  | -      |
| 2011                   | 3049338 | 39.94% | 7036954 | 11.52% | 10086292 | 18.81% |

Source: Census 2001, 2011

From **Table 3-1** we can refer that the Kashipur Planning Area has experienced an overall growth rate of 41.40% from 2001-2011. This is due to many factors which have been influencing the planning area. SIIDCUL, the State Infrastructure and Industrial Development Corporation of Uttarakhand have come up in the district headquarters, Rudrapur which has also enhanced industrial growth in Kashipur. Trade and commerce in Kashipur have been blooming due to the influence of the Kumaun Garhwal Chamber of Commerce & Industry (KGCCI), which is located within the Kashipur Planning Area. Also, tourism activities have been increasing on the road connecting to Ramnagar which leads to Jim Corbett National Park.

### **3.2. Population Distribution**

The population distribution gives us a clear idea of the character of the city. It is the pattern of where people live. The population distribution of the Kashipur planning area and Kashipur MC, have been discussed in the sections below.

### **3.2.1. Population distribution of Kashipur MC**

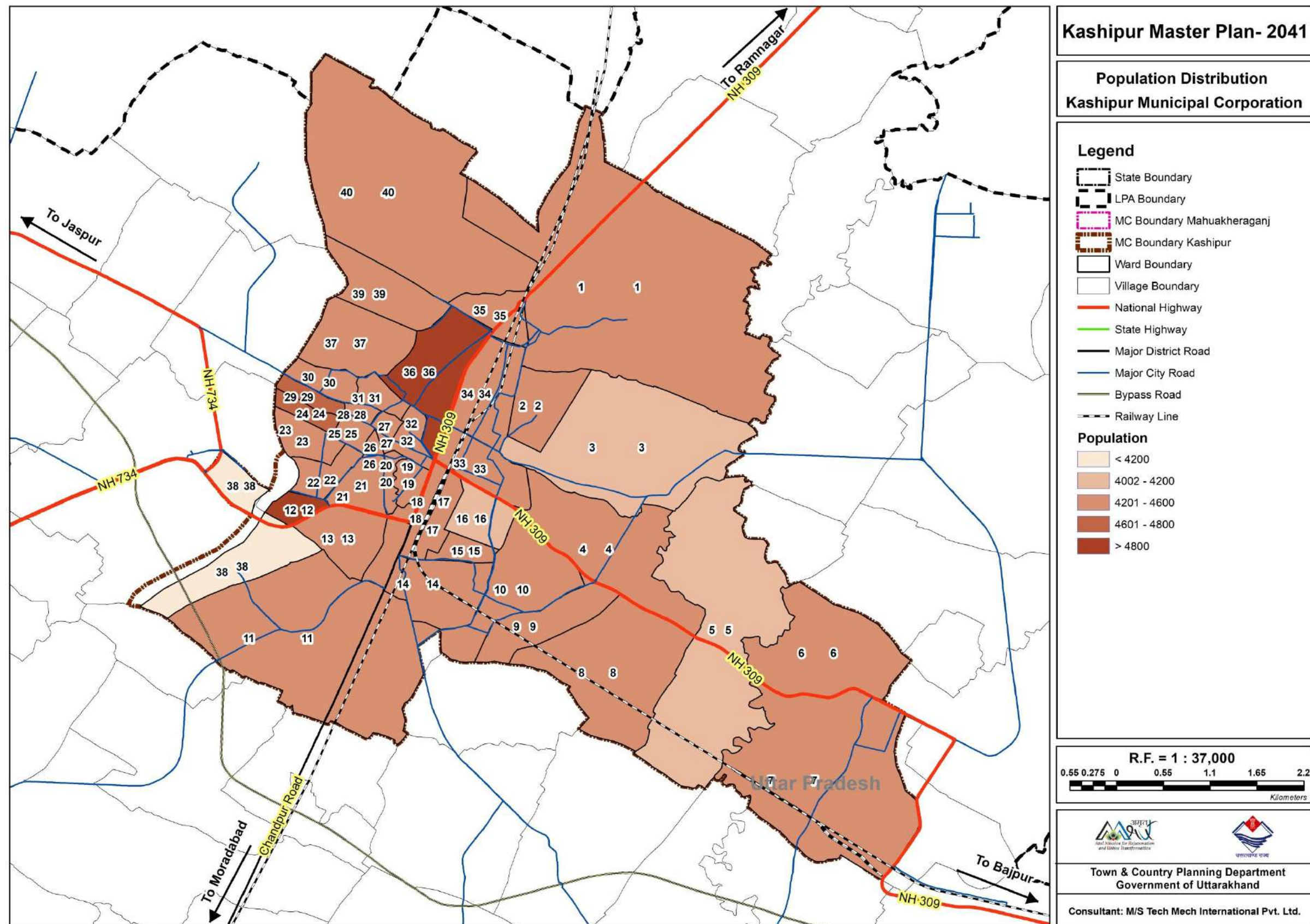
The Kashipur Municipal Corporation with a population of 175819 is spread over an area of 36.94 km<sup>2</sup>. The Municipal Corporation has been divided into 40 wards in 2019. Observing the Kashipur MC population distribution map i.e., **Map 3-1** we can see that the Municipal Corporation area has been categorized into 5 categories of population, i.e., <4000, 4001-4200, 4200-4600, 4601-4800, >4800. The majority, i.e., 31 wards out of 40 falls in the 3rd category where the population is between 4201-4600. Ward 12 has the highest population with a population of 4892 and then ward 36 with a population of 4820. Both wards fall in the city core areas. The area of ward 12 is very small and with the highest population, it is one of the most crowded areas of the planning area. In the 2011 census, a slum named Luxmipur Patti has been mentioned but according to Municipal Corporation Kashipur (2018), there are no slums in the planning area. Ward 36 falls on the junction of two national highways NH309 and NH734 attracting people for better accessibility and reach. The high population can lead to congestion and traffic delays in the area.

### **3.2.2. Population distribution of Kashipur planning area**

Kashipur planning area with a population of 279342 covers an area of 193.15 km<sup>2</sup>. The planning area has been divided into 6 categories (refer. to Error! Reference source not found.). The municipal area as a whole comprises the highest population as it is the core area due to the high trade and commerce and industries present in the area. Also, the two national highways meet at the center as well the railway station is present in the vicinity leading it to be the most populated area. The villages in the planning area show varying populations. The entire planning area is dissected into two parts, the eastern part and the western part by the railway lines. The villages in the western part i.e., Sawar Khera, Beljuri, Basai, Bans Khera, etc. have a greater population than the eastern part because the western part is mainly the old area where the city started. The villages on the eastern side just outside the MC areas (Khokratal, Chanakpur, Jaitpur Ghosi, Kua Khera, Ramnagar Kashipur, etc.) shows a very low population. This is because the majority of the areas in those wards are agricultural land. Whereas Dhakia Kalan and Kundeswari have a high

population even though they are mainly agricultural lands, is because of their large area, which carries a large population.

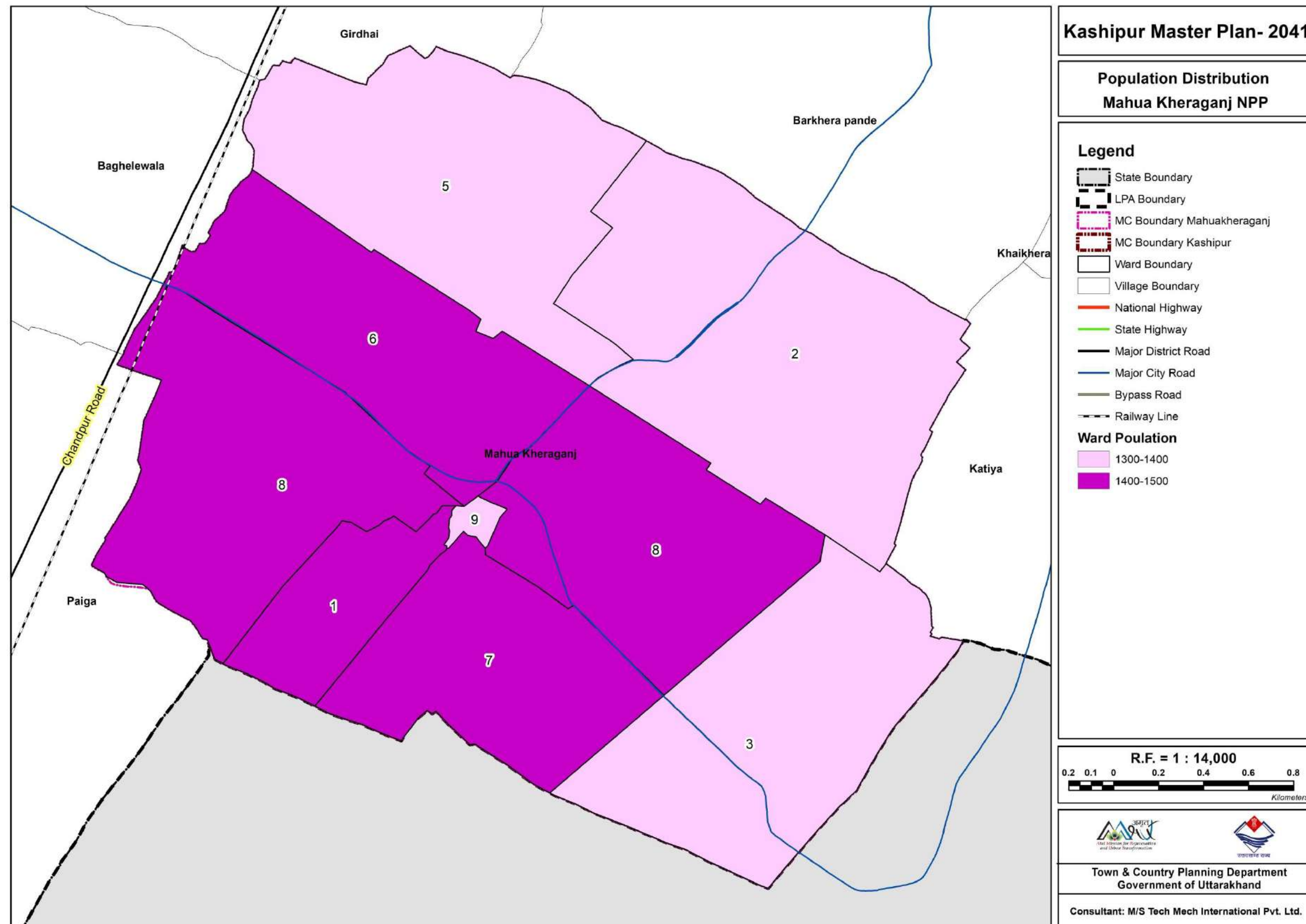
Map 3-1: Population Distribution of Kashipur MC



Source: Census of India, 2011



Map 3-2: Population Distribution of Mahua Kheraganj NPP



Source: Census of India, 2011

### 3.3. Population Density

Population density is a measure of population per unit area. Table 3-2 provides details of the change in population density over a decade for the Kashipur planning area. The population density for the Kashipur planning area is 53.75 PPH. The density in the rural area is 6.19 PPH and the urban area is 47.6 PPH. Within the urban areas, Kashipur MC has 47.60 PPH. Comparing it to 2001 values the density has increased overall by 65.4%. The densities in urban areas have increased but in rural areas, it has remained almost constant. According to URDPFI guidelines the minimum suggested average densities for developed areas is 75-125 PPH in plain areas and 45-75 in Hilly areas. In Kashipur planning area has a very low density in comparison to it. This also means that there is a lot of scope in the master plan to bring in a new development in the planning area and has a lot of potential for development in the future.

*Table 3-2: Population density in Kashipur Planning Area, 2001, 2011 & 2019*

| Area                       | Population |         | Area (Ha) | Population Density/PPH |       |
|----------------------------|------------|---------|-----------|------------------------|-------|
|                            | 2001       | 2011/19 |           | 2001                   | 2011  |
| <b>Urban (Kashipur MC)</b> | 97167      | 175819  | 3694      | 26.3                   | 47.6  |
| <b>Rural</b>               | 91524      | 90939   | 14789     | 6.19                   | 6.15  |
| <b>KPA</b>                 | 188691     | 266758  | 18483     | 32.49                  | 53.75 |

*Source: Census 2001, 2011*

#### 3.3.1. Population Density of Kashipur MC

Looking more into the details of urban area densities as given in **Table 3-2** we can see that the variation in population density is much high. It ranges from less than 100 PPH to more than 600 PPH in 5 categories. The western part of Kashipur MC where the city has originally established is highly populated and the other areas are densities below 100PPH. The high dense areas are generally found near the railway station and the junction of two national highways in the planning area. Out of 40 wards in Kashipur MC, only 18 wards have a density of more than 100 rest 22 wards have wards less than 100. Only 3 wards have densities of more than 400 with ward 27 having the highest density in Kashipur with 625 PPH. As per **Map 3-3** ward 27 is near the city center and other wards have high density i.e., wards 24, and 28, which also lie near the city center offering less travel distance to the workplace and marketplace. Some of the wards have densities as low as 8 as in the case of ward number 1. Mostly the wards falling in the old core area are having high

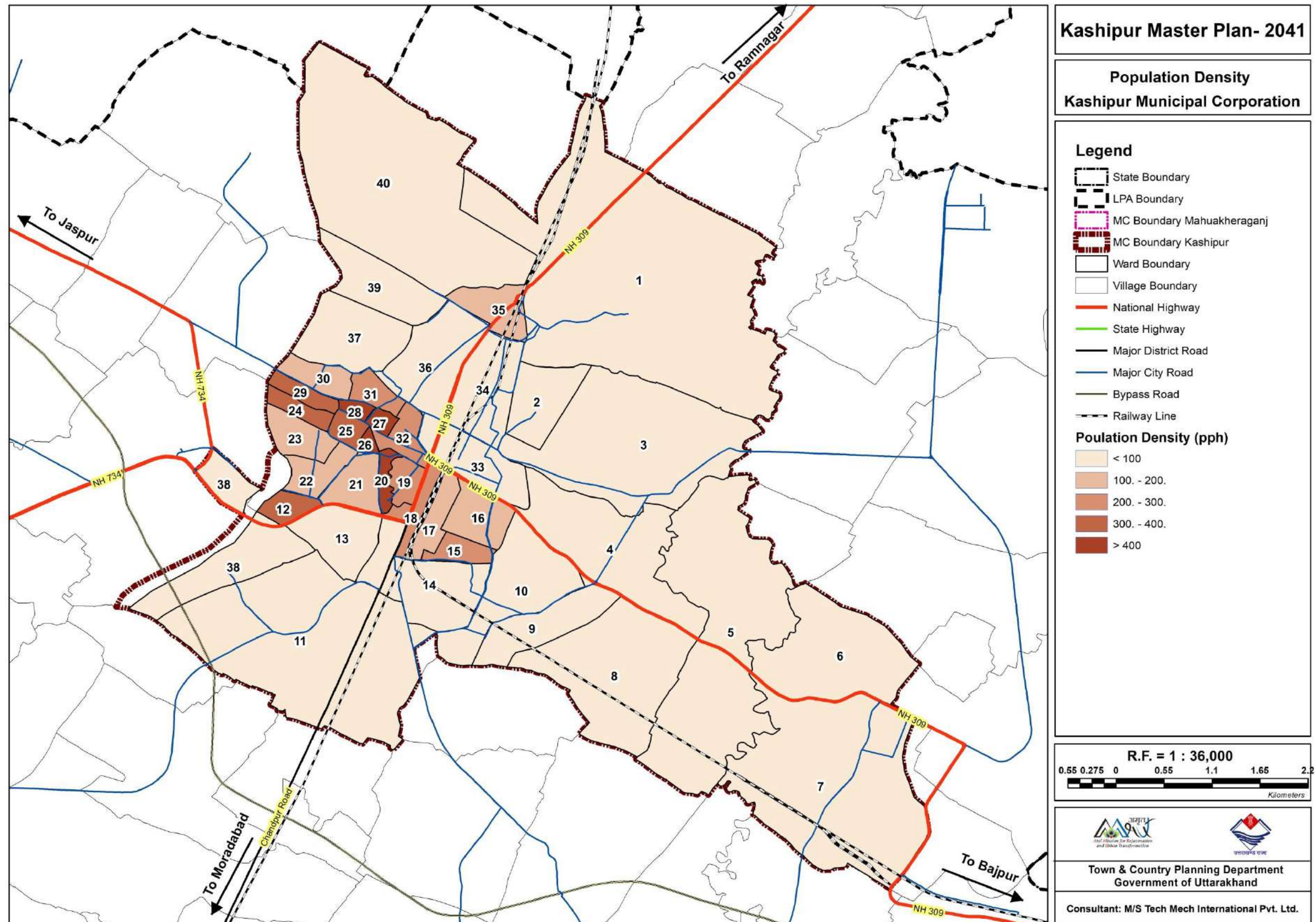
density. As against this, the peripheral wards have densities as low as 8-10. The MC generally has high densities on the left side of the railway station and towards the right, it is sparsely populated.

### **3.3.2. Population density map of Kashipur planning area**

Referring to **Map 3-4** the population density of Kashipur MC is the highest as the majority of the population resides there and it stands as a central place for the Kashipur planning area as well as the nearby towns. In the planning area, 66% of the urban population lives only on 20% of the land. That is the reason for higher densities in urban areas. The population density outside the MC is varying at different places but it is gradually decreasing as we move farther away from the MC. Few villages like Rajpur rani, Dhaka Kalan, Beghelewala, and Kudiyonwala have densities as low as 1-5 PPH, as it is in the outskirts and mostly agricultural land is found in those areas. Dhiman Khera has the next high density after the MC area. The planning area as a whole is divided into two parts by railway tracks, the western side of the planning area has more dense areas than the eastern side. As the western side villages have more population and less agricultural land than the eastern side of the planning area. The characteristics of the planning area on both the left and right sides are different. But still, the overall densities of the planning



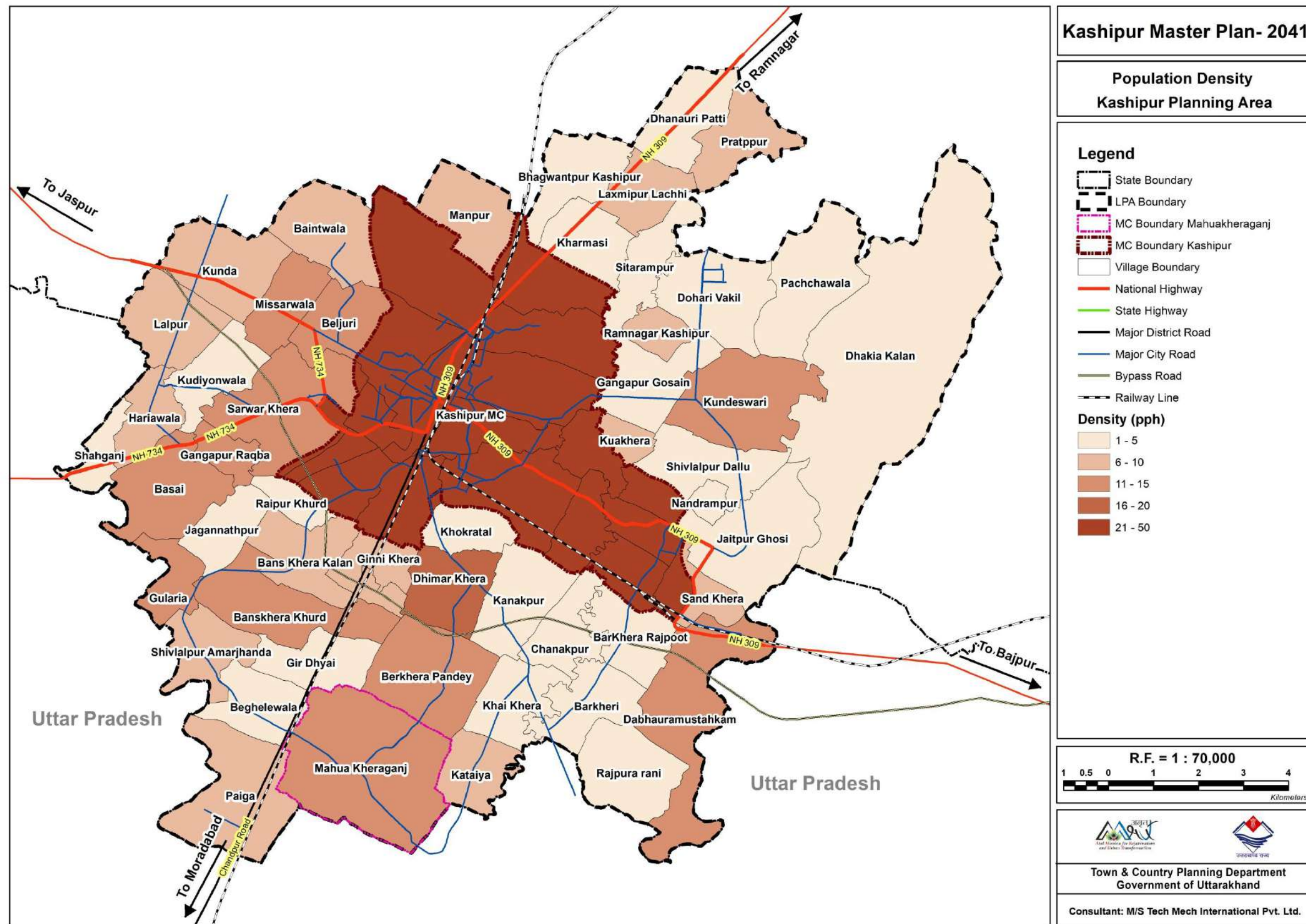
Map 3-3: Population Density of Kashipur MC



Source: Census of India, 2011



Map 3-4: Population Density map of Kashipur Planning Area



Source: Census of India, 2011

the area is low. The density of rural areas is low due to the presence of agricultural land but the density of the urban area in the planning area is also low as it is still developing and there is a lot of scope for future organized development which would lead to an increased quality of life for the planning area (refer to **Table 3-3**).

**Table 3-3: Ward-wise Population Density of Kashipur MC, 2019**

| Ward Number | Population | Area (Ha) | Population Density/Ha |
|-------------|------------|-----------|-----------------------|
| 1           | 4505       | 545       | 8.27                  |
| 2           | 4360       | 61        | 71.48                 |
| 3           | 4200       | 140       | 30.00                 |
| 4           | 4214       | 124       | 33.98                 |
| 5           | 4121       | 288       | 14.31                 |
| 6           | 4215       | 154       | 27.37                 |
| 7           | 4344       | 268       | 16.21                 |
| 8           | 4251       | 179       | 23.75                 |
| 9           | 4255       | 71        | 59.93                 |
| 10          | 4252       | 54        | 78.74                 |
| 11          | 4522       | 338       | 13.38                 |
| 12          | 4892       | 29        | 168.69                |
| 13          | 4456       | 73        | 61.04                 |
| 14          | 4342       | 73        | 59.48                 |
| 15          | 4233       | 48        | 88.19                 |
| 16          | 4156       | 53        | 78.42                 |
| 17          | 4311       | 26        | 165.81                |
| 18          | 4298       | 31        | 138.65                |
| 19          | 4387       | 16        | 274.19                |
| 20          | 4367       | 18        | 242.61                |
| 21          | 4441       | 22        | 201.86                |
| 22          | 4258       | 22        | 193.55                |
| 23          | 4568       | 21        | 217.52                |
| 24          | 4601       | 11        | 418.27                |

| Ward Number | Population | Area (Ha) | Population Density/Ha |
|-------------|------------|-----------|-----------------------|
| 25          | 4351       | 22        | 197.77                |
| 26          | 4510       | 10        | 451.00                |
| 27          | 4378       | 7         | 625.43                |
| 28          | 4592       | 11        | 417.45                |
| 29          | 4654       | 35        | 132.97                |
| 30          | 4365       | 45        | 97.00                 |
| 31          | 4354       | 11        | 395.82                |
| 32          | 4498       | 18        | 249.89                |
| 33          | 4542       | 42        | 108.14                |
| 34          | 4417       | 99        | 44.62                 |
| 35          | 4324       | 27        | 160.15                |
| 36          | 4820       | 89        | 54.16                 |
| 37          | 4568       | 91        | 50.20                 |
| 38          | 4001       | 174       | 22.99                 |
| 39          | 4545       | 62        | 73.31                 |
| 40          | 4351       | 286       | 15.21                 |

Source: Census of India, 2011

### 3.4. Population Growth Rate

Exploring the growth rate of the Kashipur Planning Area, the urban and rural growth rates are 36.35% and 46.78% in the year 2001-2011 respectively. The urban growth rates of district and state are 45.59% and 39.94%, and rural growth rates are 27.57% and 11.52% which indicates that the growth rate in urban areas is low as compared to state and district in the year 2001-2011 and that of rural areas is high. This is because there has been industrial as well as trade and commerce growth in nearby areas which was under rural areas in 2011. That's why the growth rate of the rural area is 46.78% and urban areas is 36.35%. The villages where the growth of rural areas of Kashipur planning area is found to be just outside the Municipal area. In 2019, these rural areas have become part of the Municipal Corporation. The rural population of 2011 comprises a population of 61 villages and in 2019 consists of 51 villages. After the inclusion of those rural

areas in the Kashipur Urban area the growth rate of urban areas comes to 80.94% and rural areas show a negative growth rate of -0.63%.

As discussed earlier, Kashipur urban area is an important urban settlement in the district. The population growth rate of Kashipur MC, rural areas, and the entire Kashipur planning area from 1961 to 2011 has been represented in Table 2 2. The growth rate has also been represented in Figure 2 1 for better understanding. The population growth rate has always been positive but we can see a lot of variations in growth rate over the decades. As per Figure 2 1, we can see that the growth rate of Kashipur MC, the total urban area is highest for the year 1971-81 but the rural area has been decreasing. This is because of the Indo- Pakistan war of 1971 which lead to an inflow of refugees from east Pakistan. These refugees settled in the Municipal area hence leading to the increase of population in the urban area whereas the population of the rural areas kept decreasing. Also, people traveled from rural areas to urban areas for employment opportunities and better education facilities. After 1971-81 the growth rate has been decreasing but the growth rate from 1981-91 to 1991-01 in rural areas saw a huge growth i.e., 56.03%, which is the highest in all year growth rates. The reason for this enormous growth is trade and commerce in the Kashipur planning area. In 1988 the Kumaun Garhwal Chamber of Commerce & Industry (KGCCI) came up in Kashipur. This acted as a catalyst and resulted in the growth of trade and commerce in the planning area. This growth was seen in the rural areas which were just in proximity of the Kashipur MC. For example, Kharakpur Devipura, Jaspur Khurd, Dhakia Kalan, Dhabauramushtakam, Kachnalgaji, Barkhera Pandey, Hempur Ismail, and Kundeswari these villages have received the highest growth. The majority of these villages are currently part of the MC area and are along the national highway connecting to Rudrapur. Since 1991 the growth rate of the rural area has remained on the higher side than urban areas. In 2019, 10 villages have been added in Kashipur MC which resulted in an increase in the growth rate in urban areas to 80.93% and rural areas show a negative growth rate of -0.63%. After 2001. (refre to **Table 3-4**).

**Table 3-4: Population and growth rate in Kashipur planning area**

| Year | Total Urban *(Kashipur Municipal Corporation) |             | Total Rural |             | Total KPA  |             |
|------|-----------------------------------------------|-------------|-------------|-------------|------------|-------------|
|      | Population                                    | Growth rate | Population  | Growth rate | Population | Growth rate |
| 1961 | 24258                                         | -           | 25095       | -           | 49353      | -           |



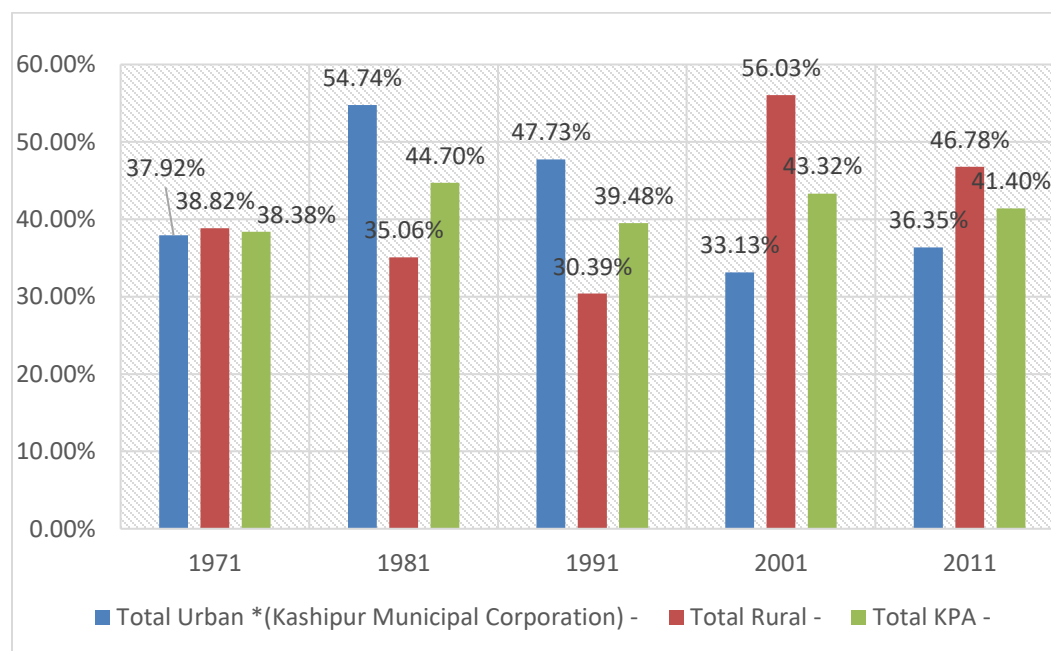
|             |        |        |        |        |        |        |
|-------------|--------|--------|--------|--------|--------|--------|
| <b>1971</b> | 33457  | 37.92% | 34837  | 38.82% | 68294  | 38.38% |
| <b>1981</b> | 51773  | 54.74% | 47050  | 35.06% | 98823  | 44.70% |
| <b>1991</b> | 76484  | 47.73% | 61350  | 30.39% | 137834 | 39.48% |
| <b>2001</b> | 101825 | 33.13% | 95724  | 56.03% | 197549 | 43.32% |
| <b>2011</b> | 138839 | 36.35% | 140503 | 46.78% | 279342 | 41.40% |

Source: Census 1961, 1971, 1981, 1991, 2001, 2011

*\*Note: In the column total urban the total population of only the Municipal Corporation, Municipal Council and Census town of that area year has been presented. For e.g., in 1961 only Kashipur was Municipal Corporation hence the total urban population is equal to Kashipur MC.*

Overall, the growth rate of the Kashipur planning area has remained within the range of 43.32 %-41.40% i.e., with a variation of only 2 %. With a growth rate of 41.4%, it is also important that the city has to provide basic utilities and services, infrastructure, housing facilities, and also employment opportunities to the growing population. This is already putting pressure on the urban areas and needs to be catered to in the master plan for the present, as well as the future. Meeting the basic needs of the people of the Kashipur planning area should be the priority of the master plan (refer to **Figure 3-1**).

**Figure 3-1: Population Growth Rate of Kashipur Planning Area**

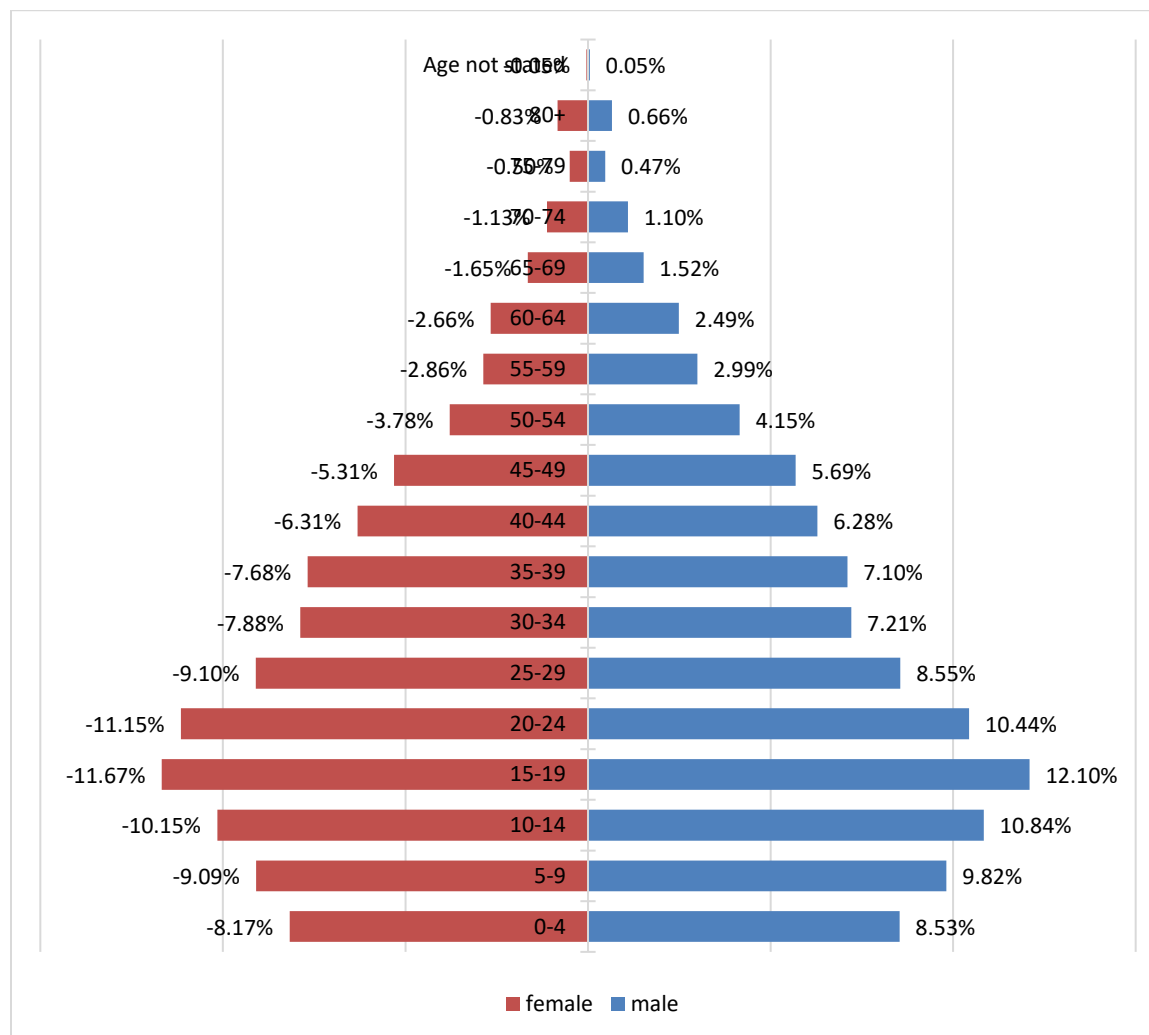


Source: Census 1961, 1971, 1981, 1991, 2001, 2011

### 3.5. Age- Sex Structure

The age-sex pyramid graphically represents the summation of the population, reflecting long-term trends in the birth and death rates. **Figure 3-2** represents the age-sex pyramid or the population pyramid of Kashipur MC based on the census of 2011. The age group of 15-19 and then 20-24 has the highest share in both males and females. This is due to good education infrastructure in the Kashipur Planning Area which can be referred to in the social infrastructure chapter where we can see that all the education facilities are in surplus. These age groups also create a demand for future jobs in the planning area which needs to be catered to in the master plan.

*Figure 3-2: Age sex pyramid of Kashipur*



Source: Census of India, 2011

### 3.6. Literacy rate

The literacy rate is defined by the percentage of the population of a given age group that can read and write. The literacy rate is calculated by taking the number of literates of that age group to the total population of that age group. **Table 3-5** depicts the analysis of the literacy rate of Kashipur in comparison to state and district literacy rate levels. Also, the information based on gender has been analyzed in both urban and rural areas. Ward-wise and village-wise literates can be referred to in Error! Reference source not found.. The literacy rate of the Kashipur planning area is 67 %, the district is 62.94% and the state is 68.22% in 2011. Kashipur planning area literacy rate is less than the state average by approximately 1% while it is more than the district average by 4% in the case of 2011. So, the overall literacy rate is better than the district but lower by 1% than the state. Considering the change over a decade the literacy rate has been increasing from 2001 to 2011 in both urban and rural areas which is a positive indication of growth in the planning area, reflecting that education has been receiving more importance in the last decade. The increase is 7% in KPA, 10% in the district, and 8% in the state.

*The literacy rate of Kashipur MC is 89% which is an excellent character for the planning area and it has increased from 79% in 2001 to 89% in 2011. . The literacy rate of rural areas is as low as 40% in 2011 which has increased only 4% from 2001. This might be due to a lack of accessible education facilities in the rural areas and also for educational purposes people might travel to urban areas leaving behind the uneducated population in the rural areas. Moreover, in rural areas, many students drop out of school to support their families or lose interest in education. Even though the literacy rate is high in urban areas it is very low in rural areas which results in a 67% of literacy rate in the planning area. And the overall increase from 2001 is only 7%. This issue highlights the need to provide better educational infrastructural facilities in rural areas*

**Table 3-5: Literacy Rate of Uttarakhand, Udham Singh Nagar, and Kashipur**

| Year |        | Urban Area<br>(Kashipur MC) | % of Male, Female,<br>Total Population | Rural | % of Male, Female,<br>Total Population | KPA    | % of Male, Female,<br>Total Population | Udham Singh Nagar | % of Male, Female,<br>Total Population | Uttarakhand | % of Male, Female,<br>Total Population |
|------|--------|-----------------------------|----------------------------------------|-------|----------------------------------------|--------|----------------------------------------|-------------------|----------------------------------------|-------------|----------------------------------------|
| 2001 | Male   | 44378                       | 58%                                    | 21005 | 64%                                    | 67912  | 60%                                    | 402308            | 61%                                    | 3008875     | 59%                                    |
|      | Female | 32511                       | 42%                                    | 12043 | 36%                                    | 45807  | 40%                                    | 256857            | 39%                                    | 2096907     | 41%                                    |
|      | Total  | 76889                       | 79%                                    | 33048 | 36%                                    | 113719 | 60%                                    | 659165            | 53.34%                                 | 5105782     | 60.14%                                 |
| 2011 | Male   | 68742                       | 56%                                    | 33163 | 59%                                    | 106475 | 57%                                    | 598525            | 58%                                    | 3863708     | 56%                                    |



|  |                    |                    |            |              |            |               |            |                     |            |                     |            |
|--|--------------------|--------------------|------------|--------------|------------|---------------|------------|---------------------|------------|---------------------|------------|
|  | <b>Femal<br/>e</b> | 54459              | 44%        | 23459        | 41%        | 80300         | 43%        | 439314              | 42%        | 301724<br>5         | 44%        |
|  | <b>Total</b>       | <b>12320<br/>1</b> | <b>89%</b> | <b>56622</b> | <b>40%</b> | <b>186775</b> | <b>67%</b> | <b>103783<br/>9</b> | <b>63%</b> | <b>688095<br/>3</b> | <b>68%</b> |

Source: Census, 2001 & 2011

Based on gender, the literacy rate among males is high in Kashipur in both urban as well as rural areas. There is a rough variation of 15-20% in the literacy rate of males and females in 2001 and 2011 as well. In comparison to State and district, the male, as well as female literacy rate of Kashipur, is almost similar. It implies that the awareness or opportunity or encouragement among females is quite less as compared to the males due to which the literacy rate is comparatively low among them (refer to **Table 3-5**). In the case of urban areas, the difference between male and female literacy rates is 12% in Kashipur MC. However, the overall literacy rate of Kashipur is quite well which would help to ensure that skilled workers are easily available within KPA. However, there is a need to take measures that would help to ensure that the female literacy rate is at par with the male literacy rate which could be done by ensuring better educational facilities for females. Education plays a very important role in the growth of an area. Whoever is it, in rural or urban areas, male or female, it should be received by all. So, the master plan should be prepared in a direction to provide educational facilities accessible in all regions and demography.

### 3.7. Families below Poverty Line

Below the poverty line is a benchmark used by the government of India to indicate families who are at an economic disadvantage. There are 4388 below-poverty line families in the entire Kashipur planning area which contributes about 8.3% of the total households. In the planning area, 1,413 families in Kashipur MC are below the poverty line which contributes 4.2% to the total households and in Mahua Kheraganj NPP, 271 families are below the poverty line and account for 12.15% of total households. In rural areas, 2,704 families are living below the poverty line which is 15.7% of the total households. The BPL families in rural areas and Mahua Kheraganj NPP is comparatively high in the planning area. This is because in rural areas agricultural laborers are more and in Mahua Kheraganj NPP the industrial labor is more and their income is not stable over the years. It is more

seasonal. Even though the number of BPL families is less still strategies should be implemented which would alleviate their economic status.

### 3.8. Vital Statistics

**Table 3-6** represents the birth and death rate of Kashipur city in the year 2018 as per Municipal Corporation/ Nagar Palika records. In the case of Kashipur, it has been analyzed that the birth rate of females is slightly higher than that of males having a variation of 2.45% among the two. The death rate, on the other hand, is higher among males i.e., 7.95% as compared to 4.75% among females. There is a variation of 3.2% between the two. In Mahuakhera Ganj, the birth rate among females is higher by 2.29% as compared to males and the death rate among females is less than males. There is a variation of 3.22% between the death rate of males and females. This could lead to a better sex ratio. The birth and death rate of Kashipur is higher than that of Mahua Kheraganj NPP as Mahua Kheraganj NPP has more worker population rather than families. The lower death rate is attributed to the provision of better medical facilities for the local people which helps to ensure that people are healthy and not vulnerable to any sort of disease. However, the birth rate of Kashipur is on the higher side and certain family planning measures need to be taken to ensure that the increase in the population remains in control.

*Table 3-6: Vital Statistics of Kashipur MC*

| Sr. No:            | Vital Statistics | Male  | Female | Total |
|--------------------|------------------|-------|--------|-------|
| <b>Kashipur MC</b> |                  |       |        |       |
| 1                  | Birth Rate (%)   | 31.42 | 33.87  | 32.59 |
| 2                  | Death Rate (%)   | 7.95  | 4.75   | 6.43  |

Source: Municipal Corporation, Kashipur; Nagar Palika, Mahuakhera Ganj NPP, 2018

### 3.9. Issues and potentials

#### 3.9.1. Issues

- There is a highly uneven distribution of population in the Planning Area. Most of the population is concentrated in the western part of the Planning Area.

- ii. There is an uneven distribution of population within the Kashipur Municipal limit also. Most of the population concentration is in the western part of Ramnagar Road.
- iii. The literacy rate is much lower than at the state as well as national level.
- iv. The Workforce Participation Rate is lower than the district as well as the state average.
- v. The share of marginal workers is higher in the rural part of the Planning Area.

### **3.9.2. Potentials**

- i. The eastern part of the Planning Area which has a very low population concentration can be used as a house for the upcoming population.
- ii. Increasing female participation in the workforce can be seen as a positive side in terms of the workforce participation rate.

### **3.10. Residential Population Projection**

Projections are a set of calculations, which attempt to describe what is likely to happen under certain explicit assumptions about the future as related to the immediate past. Planners are concerned with population projections, which form the basic framework for setting targets expected to be achieved within a specified time frame, be it for land use, services, or facilities. Population projection is a method used to estimate the future population of an area based on various factors like previous growth trends, birth and death rate, floating population, immigration, etc. Population projection gives us a picture of the future size and structure of the population. Population projection is an imperative part of the Master plan as the entire future proposal is of various sectors i.e., housing, social infrastructure, physical infrastructure, etc., and is dependent on the population projections.

There are multiple methods for estimation of population projection, but the most frequently used are Arithmetic population projection, Geometric population projection, and Incremental population projections. These three methods have been used for the population projection of the Kashipur Planning Area. The arithmetic population projection method is suitable for large and old cities with considerable development while the Geometric mean method gives higher values and hence should be applied for a new industrial town at the beginning of development for only a few decades. Incremental population projections are suitable for an average size town under a normal condition where the growth rate is found to be in increasing order.

### **3.10.1. Methods for Population Projection**

For estimation of population projection, 'Arithmetic Increase Method', 'Geometric Increase Method', and 'Incremental Increase Method' have been used for the Rudrapur Planning Area.

#### **3.10.1.1. Arithmetic Method**

In this method, the average increase in population per decade is calculated from the past decades. This increase is added to the present population to find out the population for the next decades. Thus, it is assumed that the population is increasing at a constant rate. This method is generally applicable to large and old cities where the growth has stabilized.

Hence,  $dP/dt = C$  i.e., rate of change of population with respect to time is constant.

Therefore, Population after  $n^{\text{th}}$  decade will be  $P_n = P + n.C$

Where,  $P_n$  is the population after 'n' decades and 'P' is present population

#### **3.10.1.2. Geometric Increase Method**

In this method, the percentage increase in population from decade to decade is assumed to remain constant. This method is used to find out the future increment in population. Since this method gives higher values and is hence mostly applicable for growing towns and cities having vast scope for expansion.

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

Where, IG = geometric mean (%)

P = Present population

#### **3.10.1.3. Incremental Increase Method**

This method is the modification of the arithmetical increase method and it is suitable for an average size town under the normal condition where the growth rate is found to be in increasing order. While adopting this method the increase in increment is considered for calculating future population. The incremental increase is determined for each decade from the past decade's population and the average value is added to the present population along with the average rate of increase.

Hence, population after  $n^{\text{th}}$  decade is  $P_n = P + n.X + \{n(n+1)/2\}.Y$

Where,  $P_n$  = Population after  $n^{\text{th}}$  decade

$X$  = Average increase

$Y$  = Incremental increase

### 3.10.2. Population projection for Kashipur Planning Area

Based on Census data from 1961 to 2011 the projected population is calculated. Population projections for urban areas i.e., Kashipur MC and rural areas have been carried out separately. The reason is that all the areas have a different character and the previous growth rates also vary for each area. So, all the areas, i.e., Kashipur MC, and rural areas needed to deal with separately. All three methods, Arithmetic projection, Geometric mean projection, and Incremental projection have been applied to all the areas and analyzed for the selection of projection methods. However, for the final selection, the data from 1961 to 1991 has been used to project the 2001 and 2011 populations and compared to the existing 2001 and 2011 populations. The method by which the projected population is close to the current population is adopted.

### 3.10.3. Urban area: Kashipur Municipal Corporation

The selection of the most suitable method for Kashipur MC backward projections has been done, which is presented in **Table 3-7**. The existing population of Kashipur MC for 2001 is 1,19,162 and 1,75,819 in 2011. From the projected calculations it is inferred that it is closer to the geometric mean method of projections. Hence, for Kashipur MC Area Geometric Mean method has been chosen for projections.

*Table 3-7 Backward Projection of Kashipur MC*

| Year        | Arithmetic Projection | Geometric Projection | Incremental Projection | Average       |
|-------------|-----------------------|----------------------|------------------------|---------------|
| 1961        | 28840                 | 28840                | 28840                  | 28840         |
| 1971        | 40012                 | 40012                | 40012                  | 40012         |
| 1981        | 58857                 | 58857                | 58857                  | 58857         |
| 1991        | 83068                 | 83068                | 83068                  | 83068         |
| <b>2001</b> | <b>101144</b>         | <b>118226</b>        | <b>107664</b>          | <b>109011</b> |
| <b>2011</b> | <b>119220</b>         | <b>168263</b>        | <b>138779</b>          | <b>142087</b> |

Source: Analysis by Town and Country Planning Department

The population projection of Kashipur MC is represented in **Table 3-8**. First, the Arithmetic Projection gives a result of 16.72% of the growth rate maximum. Whereas the Geometric mean method gives 43.59%, the Incremental method gives 23.19% and on Average of all the three methods, a 27.83% of growth rate is achieved at maximum. Looking at the previous growth trend we can infer that the growth rate of Kashipur MC lies between 38% to 48%. Comparing this with projected growth rates we can infer that, the growth rate achieved through the Geometric mean method is closer to the previous growth rates. Other growth rates give very little increase in population. Hence, a 43.59% growth rate achieved through the Geometric mean projection method has been adopted for Kashipur MC which gives a population of 520562 for 2041.

**Table 3-8 Population Projection for Kashipur MC**

| Year        | Arithmetic Projection | Growth rate   | Geometric Projection | Growth rate   | Incremental Projection | Growth rate   | Average         | Growth rate   |
|-------------|-----------------------|---------------|----------------------|---------------|------------------------|---------------|-----------------|---------------|
| 1961        | 28840                 | -             | 28840                | -             | 28840                  | -             | 28840           | -             |
| 1971        | 40012                 | 38.74%        | 40012                | 38.74%        | 40012                  | 38.74%        | 40012           | 38.74%        |
| 1981        | 58857                 | 47.10%        | 58857                | 47.10%        | 58857                  | 47.10%        | 58857           | 47.10%        |
| 1991        | 83068                 | 41.14%        | 83068                | 41.14%        | 83068                  | 41.14%        | 83068           | 41.14%        |
| 2001        | 119162                | 43.45%        | 119162               | 43.45%        | 119162                 | 43.45%        | 119162          | 43.45%        |
| 2011        | 175819                | 47.55%        | 175819               | 47.55%        | 175819                 | 47.55%        | 175819          | 47.55%        |
| <b>2021</b> | <b>2,05,215</b>       | <b>16.72%</b> | <b>2,52,465</b>      | <b>43.59%</b> | <b>2,16,586</b>        | <b>23.19%</b> | <b>2,24,755</b> | <b>27.83%</b> |
| <b>2031</b> | <b>2,34,611</b>       | <b>14.32%</b> | <b>3,62,524</b>      | <b>43.59%</b> | <b>2,68,724</b>        | <b>24.07%</b> | <b>2,88,620</b> | <b>28.42%</b> |
| <b>2041</b> | <b>2,64,006</b>       | <b>12.53%</b> | <b>5,20,562</b>      | <b>43.59%</b> | <b>3,32,234</b>        | <b>23.63%</b> | <b>3,72,267</b> | <b>28.98%</b> |

Source: Analysis by Town and Country Planning Department

#### **3.10.4. Rural areas**

The backward projections of rural areas are provided in **Table 3-9**. The existing population of rural areas in 2001 and 2011 is 69529 and 90939 respectively. In rural areas too it is found that the backward projection is closer to the geometric projections. Hence, for rural areas too geometric mean method of projection is finalized.

**Table 3-9 Backward Projection of Rural Area in Kashipur Planning Area**

| Year | Arithmetic Projection | Geometric Projection | Incremental Projection | Average |
|------|-----------------------|----------------------|------------------------|---------|
| 1961 | 18198                 | 18198                | 18198                  | 18198   |
| 1971 | 25180                 | 25180                | 25180                  | 25180   |

| Year        | Arithmetic Projection | Geometric Projection | Incremental Projection | Average      |
|-------------|-----------------------|----------------------|------------------------|--------------|
| 1981        | 35244                 | 35244                | 35244                  | 35244        |
| 1991        | 48151                 | 48151                | 48151                  | 48151        |
| <b>2001</b> | <b>58135</b>          | <b>66602</b>         | <b>61098</b>           | <b>61945</b> |
| <b>2011</b> | <b>68120</b>          | <b>92123</b>         | <b>77007</b>           | <b>79083</b> |

Source: Analysis by Town and Country Planning Department

The population projection of rural areas has been composed and presented in **Table 3-10**. The rural areas have the best fit of growth rate in the Geometric mean projection method. The growth of rural areas in previous years has also been high within a range of 30% to 44%. The growth rate in the Geometric mean method comes to be 38.03%. From all other methods, the maximum growth rate achieved is 24% and hence 38.03% growth is more suitable for rural areas as it is in line with the previous trend. Hence, the growth rate of 38.03% is adopted for rural areas, where the population comes to be 239148 by 2041.

**Table 3-10 Population projection of Rural areas**

| Year        | Arithmetic Projection | Growth rate   | Geometric Projection | Growth rate   | Incremental Projection | Growth rate   | Average         | Growth rate   |
|-------------|-----------------------|---------------|----------------------|---------------|------------------------|---------------|-----------------|---------------|
| 1961        | 18198                 | -             | 18198                | -             | 18198                  | -             | 18198           | -             |
| 1971        | 25180                 | 38.37%        | 25180                | 38.37%        | 25180                  | 38.37%        | 25180           | 38.37%        |
| 1981        | 35244                 | 39.97%        | 35244                | 39.97%        | 35244                  | 39.97%        | 35244           | 39.97%        |
| 1991        | 48151                 | 36.62%        | 48151                | 36.62%        | 48151                  | 36.62%        | 48151           | 36.62%        |
| 2001        | 69529                 | 44.40%        | 69529                | 44.40%        | 69529                  | 44.40%        | 69529           | 44.40%        |
| 2011        | 90939                 | 30.79%        | 90939                | 30.79%        | 90939                  | 30.79%        | 90939           | 30.79%        |
| <b>2021</b> | <b>1,05,487</b>       | <b>16.00%</b> | <b>1,25,523</b>      | <b>38.03%</b> | <b>1,09,094</b>        | <b>19.96%</b> | <b>1,13,368</b> | <b>24.66%</b> |
| <b>2031</b> | <b>1,20,035</b>       | <b>13.79%</b> | <b>1,73,258</b>      | <b>38.03%</b> | <b>1,30,856</b>        | <b>19.95%</b> | <b>1,41,383</b> | <b>24.71%</b> |
| <b>2041</b> | <b>1,34,584</b>       | <b>12.12%</b> | <b>2,39,148</b>      | <b>38.03%</b> | <b>1,56,226</b>        | <b>19.39%</b> | <b>1,76,653</b> | <b>24.95%</b> |

Source: Analysis by Town and Country Planning Department

### **3.10.5. Kashipur Planning Area**

The population projection of the entire planning area is represented in **Table 3-11**. The projected population of Kashipur MC, , and rural areas have been individually projected and added to arrive at the total population projection for the Kashipur Planning Area. In both areas, Geometric mean projection has been adopted with varying growth rates i.e., 43.59% for Kashipur MC, and 38.03% for rural areas. Altogether the growth rate of the Kashipur Planning Area comes to be 41.79% with

a population of 7,59,710 by 2041. However, there is a significant amount of floating population which needs to be considered.

**Table 3-11 Population projection of Kashipur Planning Area**

| Year        | Arithmetic<br>Projection | Growth<br>rate | Geometric<br>Projection | Growth<br>rate | Incremental<br>Projection | Growth<br>rate | Average         | Growth<br>rate |
|-------------|--------------------------|----------------|-------------------------|----------------|---------------------------|----------------|-----------------|----------------|
| 1961        | 49353                    | -              | 49353                   | -              | 49353                     | -              | 49353           | -              |
| 1971        | 68294                    | 38.38%         | 68294                   | 38.38%         | 68294                     | 38.38%         | 68294           | 38.38%         |
| 1981        | 98823                    | 44.70%         | 98823                   | 44.70%         | 98823                     | 44.70%         | 98823           | 44.70%         |
| 1991        | 137833                   | 39.47%         | 137833                  | 39.47%         | 137833                    | 39.47%         | 137833          | 39.47%         |
| 2001        | 197549                   | 43.32%         | 197549                  | 43.32%         | 197549                    | 43.32%         | 197549          | 43.32%         |
| 2011        | 279342                   | 41.40%         | 279342                  | 41.40%         | 279342                    | 41.40%         | 279342          | 41.40%         |
| <b>2021</b> | <b>3,10,702</b>          | <b>11.22%</b>  | <b>3,77,988</b>         | <b>35.31%</b>  | <b>3,25,680</b>           | <b>16.58%</b>  | <b>3,38,123</b> | <b>21.04%</b>  |
| <b>2031</b> | <b>3,54,646</b>          | <b>14.14%</b>  | <b>5,35,782</b>         | <b>41.74%</b>  | <b>3,99,580</b>           | <b>22.69%</b>  | <b>4,30,003</b> | <b>27.17%</b>  |
| <b>2041</b> | <b>3,98,590</b>          | <b>12.53%</b>  | <b>7,59,710</b>         | <b>41.79%</b>  | <b>4,88,460</b>           | <b>22.24%</b>  | <b>5,48,920</b> | <b>27.65%</b>  |

Source: Analysis by Town and Country Planning Department

### 3.11. Floating Population

The floating population of Kashipur Planning Area is mainly due to the tourist population and due to workers in nearby areas. To arrive at the floating population the tourist information of Udham Singh Nagar has been utilized and a portion of the tourist is assumed to be traveling to Kashipur based on the major tourist location. In total in Udham Singh Nagar there are 12 major tourist spots, they are Tumaria Reservoir, Dronasagar, Girl, Chaiti Temple, Haripura Lakes, Atariya Devi Temple, Panch Mandir, Lake Paradise, Gurudwara Nanakmatta Sahib, Nanak Sagar, Begul Reservoir, and Dhaura Reservoir. Out of these three major tourist spots are in Kashipur i.e., Dronasagar, Girl, Chaiti Temple which comes about to be 25% of the total number of tourists spots and hence it is assumed that 25% of tourists out of total tourists in Udham Singh Nagar travel to Kashipur which has been represented in **Table 3-12**. This population has been used to protect the floating population of 2041.

**Table 3-12 Tourist Population in Kashipur Planning Area**

| Year        | Tourists of US Nagar | Tourist in Kashipur Planning Area |
|-------------|----------------------|-----------------------------------|
| <b>2014</b> | 130624               | 32656                             |
| <b>2015</b> | 132474               | 33119                             |
| <b>2016</b> | 134243               | 33561                             |
| <b>2017</b> | 140794               | 35199                             |



|             |        |       |
|-------------|--------|-------|
| <b>2018</b> | 153875 | 38469 |
|-------------|--------|-------|

Source: Analysis by Town and Country Planning Department

For the projection of the floating population Geometric mean method has been used as of population projection, the same method has been used (refer to **Table 3-13**).

**Table 3-13 Tourist projection in Kashipur Planning Area**

| <b>Year</b> | <b>Geometric mean Projection</b> |
|-------------|----------------------------------|
| 2021        | 38950                            |
| 2031        | 40598                            |
| 2041        | 42315                            |

Source: Analysis by Town and Country Planning Department

The floating population projection for 2041 comes to be 42315 via the Geometric mean projection method and this comes to be about 5.35% of the total projected population of the Kashipur planning Area i.e., 794579.

### **3.12. Total Projected Population**

**Table 3-14 Total Population Projection for Kashipur Planning Area**

| <b>Year</b> | <b>Projected Population</b> | <b>Floating (6%)</b> | <b>Total</b> |
|-------------|-----------------------------|----------------------|--------------|
| 2041        | 794579                      | 47675                | 842254       |

Source: Analysis by Town and Country Planning Department

Considering the workers of the planning area a total of 6% floating population has been assumed for the Kashipur Planning Area from which the total projected population comes to be 842254 as represented in **Table 3-14**.

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## 4. Economic Profile

Development is described in terms of economic growth over some time in a given spatial unit. The Chapter deals with the assessment of the economic parameters like the Gross State Domestic Product (GDDP) and Net State Domestic Product (NDDP) growth over time in Udham Singh Nagar district, the per capita income distribution and growth in Udham Singh Nagar district, distribution of workers in different economic sectors and the output from each sector in terms of productivity. This would give us a clear set of pictures of the current economic scenario in the notified planning area.

### 4.1. Occupational Structure

#### 4.1.1. Work Participation Rate (WPR)

The workforce participation rate is a measure of an economy's active workforce. The workforce participation rate of the Kashipur planning area has been depicted in **Table 4-1**. The workforce participation rate increased in the year 2011 in comparison to 2001 by nearly 5%. Considering the increase in population, which is 41% for the year 2001-2011, the growth in workforce participation is low as it is increasing only in the industrial sector and other sectors are the employment situation was not favorable concerning the population growth. In 2011, the overall Work Force Participation Rate (Ratio of total workers vs. total population) for the Kashipur planning area stands at 32.06% which is lower than the state figure as well as the district figure of 38.39% and 35.87% respectively. It reflects that the dependent population is more in the Kashipur planning area. Among the total workers, 82.55 % of the workers are main workers while the remaining 17.44% of workers are marginal (refer to **Table 4-1**). In comparison to the state figure and district figure, the percentage of main workers to total workers is higher. Ward-wise and Village-wise workforce composition can be referred to in Error! Reference source not found.. Looking at the urban and rural areas figures the WPR is high in rural areas by approx. 4%. It can be inferred that the employment opportunities in the tertiary sector are limited in the planning area and primary and secondary sectors it is good. That's why the workforce in rural areas is more. For the development of the planning area, more jobs in the tertiary sector are required.

**Table 4-1: Workforce Participation**

| State/District/City/             | Total Population | Total Workers | Total Workers (% of Total Population) | Non-Workers | Non-Workers (% of Total Population) | Main Workers | Main Workers (% of Total Workers) | Marginal Workers | Marginal Workers (% of Total) |
|----------------------------------|------------------|---------------|---------------------------------------|-------------|-------------------------------------|--------------|-----------------------------------|------------------|-------------------------------|
| <b>2001</b>                      |                  |               |                                       |             |                                     |              |                                   |                  |                               |
| <b>Total Urban (Kashipur MC)</b> | 119162           | 31710         | 26.61%                                | 87452       | 73.39%                              | 28245        | 89.07%                            | 3465             | 10.93%                        |
| <b>Rural</b>                     | 69529            | 19351         | 27.83%                                | 50178       | 72.17%                              | 14877        | 76.88%                            | 4474             | 23.12%                        |
| <b>KPA</b>                       | 197549           | 53507         | 27.09%                                | 144042      | 72.91%                              | 44805        | 83.74%                            | 8702             | 16.26%                        |
| <b>2011</b>                      |                  |               |                                       |             |                                     |              |                                   |                  |                               |
| <b>Urban(Kashipur MC)</b>        | 175819           | 53146         | 30.23%                                | 120115      | 68.32%                              | 46840        | 88.13%                            | 6306             | 11.87%                        |
| <b>Rural</b>                     | 90939            | 32188         | 35.40%                                | 61309       | 67.42%                              | 23610        | 73.35%                            | 8578             | 26.65%                        |
| <b>KPA</b>                       | 266758           | 85334         | 31.9892937                            | 181424      | 68.0107063                          | 70450        | 82.5579488                        | 14884            | 17.4420512                    |
| <b>Udham Singh Nagar</b>         | 1648902          | 591458        | 35.87%                                | 1057444     | 64.13%                              | 450762       | 76.21%                            | 140696           | 23.79%                        |
| <b>Uttarakhand</b>               | 10086292         | 3872275       | 38.39%                                | 6214017     | 61.61%                              | 2870624      | 74.13%                            | 1001651          | 25.87%                        |

Source: Census 2001 & 2011

With industrial growth in Mahua Kheraganj NPP, the population has been increasing nearby areas and also generating more employment in the vicinity. The focus should be on generating more employment in Kashipur MC as well as in the entire planning area in various sectors. Diversification of the economy is required so that employment opportunities can come up in more than one sector and not just limited to industries as in the existing situation. This leads to a concentration of a particular category of people in the area and others would move out to other regions for better opportunities. So, it is extremely important to create employment in various fields.

#### **4.1.2. Main and Marginal Workers**

As per the Census of India, a person who has worked for a major part of the reference period (i.e., six months or more during the last year preceding the date of enumeration) in any economically productive activity is termed a 'Main worker'. As per, **Table 4-1** the percentage of main workers in Kashipur urban area is 88.90% and in the case of rural areas, the percentage of main workers is 85.30%. Kashipur planning area with the main workers participation rate, 87.72% stands higher in comparison to district and state in 2011. In 2001, the percentage of main workers in Kashipur urban area was 93.70% and in the case of rural areas, the percentage of main workers is 93.40%.

It shows that the percentage of main workers has decreased in all area. It also indicates that the majority of the working population falls under the main worker category and there are employment opportunities in the area, but with a growing population, the employment opportunity should have been also increasing which is not seen in the planning area.

As per Census of India, a person who worked for 3 months or less than six months of the reference period (i.e., in the last year preceding the date of enumeration) in any economic activity is termed a 'Marginal worker'. The percentage of marginal workers in Kashipur urban area is 11.87% and the percentage of marginal workers in rural areas is 26.65% in 2011. Overall, with a percentage of 17.44% of the marginal workers are less than district and state. When compared to 2001 we can see a very minute change, only 1 %. But still this 1% has been reduced in main workers and increased in marginal workers which is a worrying situation. But overall, there has been an increase of 5% of total workers which is less if we see for a decade. And considering a decade of change in which the population has increased by 41% (refer to **Table 4-1**) the employment opportunity will not be enough for the area. So, employment must be created for the present as well as the projected population.

#### **4.1.3. Gender-wise workforce Distribution**

As per the census 2011, the gender-wise workforce distribution in the Kashipur planning area fluctuates much with that of the state. In the case of main workers, males constitute 87.72% of the total main workers which is higher than that of the state while females constitute only 12.27%. While considering marginal workers, males constitute 60.86%, which is also higher than the district and state and females constitute only 39.13% of the total marginal working population.

The percentage of working women is very low in the planning area, district as well as state. The state percentage of female workers is still better at 27.9% and Similar is in the case of Kashipur MC. The work opportunities for women are very less than that of men. In marginal workers, the involvement of women is more than in main workers in rural areas It can be inferred from this that women are generally involved in rural areas in labor or agricultural work. Opportunities for main workers for females are very limited. And that's why the female workers in the case rural areas are also higher than that of state and district values. (Refer to **Table 4-2**).

In comparison to the 2001 census, the percentage of female main workers in the Kashipur planning area has increased by double, which is a good sign of growth in the area but still, there is a lot of

scope for improvement. Similarly, the percentage of female marginal workers increased from 23.2% to 39.1% in 2011. It implies that the involvement of women has been increasing in the planning area.

**Table 4-2: Gender-wise workforce distribution of Kashipur Planning Area**

| State/District/City/            | Main Workers |          |        |          | Marginal Workers |          |        |          |
|---------------------------------|--------------|----------|--------|----------|------------------|----------|--------|----------|
|                                 | Male         | %        | Female | %        | Male             | %        | Female | %        |
| <b>2001</b>                     |              |          |        |          |                  |          |        |          |
| <b>Total Urban(Kashipur MC)</b> | 26471        | 93.70%   | 1774   | 6.30%    | 2611             | 75.40%   | 854    | 24.60%   |
| <b>Rural</b>                    | 13889        | 93.40%   | 988    | 6.60%    | 3550             | 79.30%   | 924    | 20.70%   |
| <b>KPA</b>                      | 41955        | 93.60%   | 2850   | 6.40%    | 6685             | 76.80%   | 2017   | 23.20%   |
| <b>2011</b>                     |              |          |        |          |                  |          |        |          |
| <b>Urban(Kashipur MC)</b>       | 41656        | 88.90%   | 5184   | 11.10%   | 4644             | 73.60%   | 1662   | 26.40%   |
| <b>Rural</b>                    | 20149        | 85.30%   | 3461   | 14.70%   | 4415             | 51.50%   | 4163   | 48.50%   |
| <b>KPA</b>                      | 61805        | 87.72889 | 8645   | 12.27111 | 9059             | 60.86402 | 5825   | 39.13598 |
| <b>Udham Singh Nagar</b>        | 373061       | 82.80%   | 77701  | 17.20%   | 71517            | 50.80%   | 69179  | 49.20%   |
| <b>Uttarakhand</b>              | 2070760      | 72.10%   | 799864 | 27.90%   | 481161           | 48.00%   | 520490 | 52.00%   |

Source: Census 2001, 2011

#### **4.1.4. Sector Distribution**

The sector distribution has been noticed for the main and marginal workers of Kashipur planning area as per Census 2011 and 2001 which are represented in **Table 4-3** and **Table 4-4**. In total 82.55% of workers are main workers and 17.44% are marginal workers. In context to main workers, in Kashipur planning area majority i.e., 73% of people are engaged in secondary activities, 14% are agriculture labor, 10% are cultivators and 4% are in household industry. There has been a decrease in cultivators by 6% and an increase in household industries by 1% and agriculture labor has remained the same. In urban areas, 89% of the population is engaged in secondary activities. In rural areas too it is more but the agricultural labor is also high contributing 32% of the total population. From the data, it can be inferred that the economic base of Kashipur is both industries and trade and commerce as nearly 73% of the workforce is engaged in these two activities. But for marginal workers, only 49% of the total workers are engaged in secondary and tertiary activities.

**Table 4-3 Main workers' distribution**

| Area                            | Cultivator | % of total main workers | Agricultural labour | % of total main worker | Household Industry | % of total main worker | Others | % of total main worker |
|---------------------------------|------------|-------------------------|---------------------|------------------------|--------------------|------------------------|--------|------------------------|
| <b>2001</b>                     |            |                         |                     |                        |                    |                        |        |                        |
| <b>Total Urban(Kashipur MC)</b> | 1726       | 6%                      | 1467                | 5%                     | 561                | 2%                     | 24491  | 87%                    |
| <b>Rural</b>                    | 5242       | 35%                     | 4377                | 29%                    | 214                | 1%                     | 5044   | 34%                    |
| <b>KPA</b>                      | 6968       | 16%                     | 5844                | 14%                    | 775                | 2%                     | 29535  | 68%                    |
| <b>2011</b>                     |            |                         |                     |                        |                    |                        |        |                        |
| <b>Total Urban(Kashipur MC)</b> | 1476       | 3%                      | 2271                | 5%                     | 1242               | 3%                     | 41851  | 89%                    |
| <b>Rural</b>                    | 5438       | 23%                     | 7457                | 32%                    | 1047               | 4%                     | 9668   | 41%                    |
| <b>KPA</b>                      | 6914       | 10%                     | 9728                | 14%                    | 2289               | 3%                     | 51519  | 73%                    |

Source: Census 2001, 2011

As per **Table 4-4** in 2001 majority of the marginal workers were engaged in agriculture labour activities i.e., 52%, then in secondary and tertiary activities 39%. But the scenario changed in 2011 when 49% were engaged in secondary and tertiary activities and 38% in agriculture labour. Similar to main workers people are shifting from primary to secondary and tertiary activities. In comparison to the main workers the marginal workers also are engaged mostly in secondary and tertiary activities but a good percentage of people, about 38% are engaged in agriculture labour and very limited people are involved in cultivating and household industry. The decrease in workers in the primary sector is a concern for the planning areas. If people continue to shift from agriculture to other sectors, this would lead to a lack of primary products in the area in near future. The scarcity of food products will give rise to a food crisis and the prices of food products would increase making them inaccessible to common people. Also, for the growth of the area, we need to employ the majority of the population needed to be involved in the secondary and tertiary sectors which would lead to higher per capita income. So, a proper balance between primary, secondary, and tertiary activities should be achieved for sustainable growth of the planning area.

**Table 4-4 Marginal workers' distribution**

| Area                            | Cultivator | % of total marginal workers | Agricultural labour | % of total marginal workers | Household Industry | % of total marginal workers | Others | % of total marginal workers |
|---------------------------------|------------|-----------------------------|---------------------|-----------------------------|--------------------|-----------------------------|--------|-----------------------------|
| <b>2001</b>                     |            |                             |                     |                             |                    |                             |        |                             |
| <b>Total Urban(Kashipur MC)</b> | 161        | 5%                          | 921                 | 27%                         | 150                | 4%                          | 2233   | 64%                         |
| <b>Rural</b>                    | 330        | 7%                          | 3196                | 71%                         | 110                | 2%                          | 838    | 19%                         |
| <b>KPA</b>                      | 491        | 6%                          | 4117                | 52%                         | 260                | 3%                          | 3071   | 39%                         |
| <b>2011</b>                     |            |                             |                     |                             |                    |                             |        |                             |
| <b>Total Urban(Kashipur MC)</b> | 190        | 3%                          | 1270                | 20%                         | 327                | 5%                          | 4519   | 72%                         |
| <b>Rural</b>                    | 560        | 7%                          | 4437                | 52%                         | 809                | 9%                          | 2772   | 32%                         |
| <b>KPA</b>                      | 750        | 5%                          | 5707                | 38%                         | 1136               | 8%                          | 7291   | 49%                         |

Source: Census 2001, 2011

#### **4.1.5. Dependency Ratio**

The dependency ratio refers to the number of non-workers dependent on total workers. It is the number of non-workers per 100 workers. **Table 4-5** describes the total population, total workers, and non-workers. The dependency ratio of Kashipur is 416 and that of district and state are 179 and 160 respectively. The dependency ratio is much higher than in the state and district, which reflects the number of people dependent on the worker population is more in the Kashipur planning area. While considering the dependency ratio change from 2001 to 2011, we can see that it has reduced from 535 to 416 which is a good indication for the planning region, but still much higher than district and state. However, the improvement in dependency ratio is much better than in districts and states. As the state has seen a change of only 11 numbers, the district only has 36 numbers but the Kashipur planning area has seen a change of 119 numbers.

**Table 4-5: Dependency Ratio of Kashipur planning area**

| State/District/City | Total Population | Total Workers | Non-Workers | Dependency Ratio (per 100 workers) |
|---------------------|------------------|---------------|-------------|------------------------------------|
|---------------------|------------------|---------------|-------------|------------------------------------|

|                                 | 2001    | 2011     | 2001    | 2011    | 2001    | 2011    | 2001 | 2011 |
|---------------------------------|---------|----------|---------|---------|---------|---------|------|------|
| <b>Total Urban(Kashipur MC)</b> | 119162  | 175819   | 31710   | 53146   | 87452   | 120115  | 276  | 226  |
| <b>Rural</b>                    | 69529   | 90939    | 19351   | 32188   | 50178   | 61309   | 259  | 190  |
| <b>KPA</b>                      | 188691  | 266758   | 51061   | 85334   | 137630  | 181424  | 535  | 416  |
| <b>Udham Singh Nagar</b>        | 1235614 | 1648902  | 392156  | 591458  | 843458  | 1057444 | 215  | 179  |
| <b>Uttarakhand</b>              | 8489349 | 10086292 | 3134036 | 3872275 | 5355313 | 6214017 | 171  | 160  |

Source: Census 2001 & 2011

Among the urban areas, Kashipur MC has a dependency ratio of 226.. A high dependency ratio creates a high burden on the working class.. Overall the dependency ratio of Kashipur urban area is 226, which has reduced from 276 in 2001. It is a sign of improvement. But when we compare it to rural areas, contrastingly we see that the dependency ratio of rural areas is less. This is because people have been shifting from rural areas to urban areas for better employment and opportunity, leading to a high dependency ratio in urban areas and low in rural areas. The overall dependency ratio of the Kashipur planning area is 416 which has improved from 535 in 2001.

#### 4.2. Household Income

Household income is an important factor for assessing the economic condition of the people. It has been observed that the per capita income of Udham Singh Nagar was 1,19,936 rupees in the year 2011-2012. The total number of households in Udham Singh Nagar is 308581 and the total household income is 370099.71 lakhs rupees. Here the household income is directly proportional to the number of households as the per capita income is constant. The total household income of the Kashipur planning area is 604.42 crore rupees (refer to **Table 4-6**).

*Table 4-6: Household Income, 2011*

| Area                            | Total No: of Households | Per Capita Income (at constant price) | Household Income (Crore) |
|---------------------------------|-------------------------|---------------------------------------|--------------------------|
| <b>Total Urban(Kashipur MC)</b> | 33370                   | 1,19,936                              | 400.23                   |
| <b>Rural</b>                    | 17025                   |                                       | 204.19                   |



|                          |        |  |        |
|--------------------------|--------|--|--------|
| <b>KPA</b>               | 50395  |  | 604.42 |
| <b>Udham Singh Nagar</b> | 308581 |  | 3701   |

Source: Directorate of Economics & Statistics, Dept. of Planning, Uttarakhand

### 4.3. Sector Wise Analysis of Kashipur Planning Area

There are several economic drivers within the Kashipur planning area which have been identified, in which industrial development is the major driver because of its terrain and locational advantage. Although, agriculture was the main economic activity earlier now it has been linked with industrial development. Apart from this city has the potential for tourism because of its proximity to Jim Corbett national park as well as the heritage richness of the city. These activities have played a great role in both the physical and economic development of the city.

Besides this, several other activities such as retail & wholesale commercial shops tune the economy of Kashipur as well as caters to the requirement of its vicinity which is contributing towards economic development. The KPA has good rail, and road connectivity thus boosting the trade activities in the area. The tourism industry is also flourishing gradually in the area due to the presence of certain religious and recreational sites. The increasing tourism industry is bound to give employment to a large number of people in near future.

#### 4.3.1. Primary Sector (Agriculture and Allied Activities)

##### 4.3.1.1. Agriculture

As it has already been discussed that the primary sector takes the third share in Udham Singh Nagar district. Out of the total GDDP share, the primary sector shared 9.1% during the 2017-18 FY. The share of the primary sector in GDDP has decreased over a while. During 2011-12 the share of the primary sector was 11.4% which fell to 9.1%. in the 2017-18 FY. This is clear from this statistic that people are shifting from the primary sector to other sectors for better employment purposes. The secondary sector in Udham Singh Nagar is dominating because of the presence of the industrial estate of SIDCUL and DIC-U.S. Nagar.

*Table 4-7: Land Utilization Category*

| Land Category          | Description | Share (%) |
|------------------------|-------------|-----------|
| Area Under for Reserve | Forest Land | 33.6      |

|                                              |                                                                     |      |
|----------------------------------------------|---------------------------------------------------------------------|------|
|                                              | Permanent Pastures & other Grazing                                  |      |
|                                              | Land under Trees, and shrubs which is not included in Net Sown Area |      |
| <b>The area under Agriculture activities</b> | Fallow Land other than current fallow                               | 52.5 |
|                                              | Current Fallow Land                                                 |      |
|                                              | Net Area Sown                                                       |      |
| <b>Area for the Development</b>              | Barren and Uncultivable Wasteland                                   | 13.0 |
|                                              | Cultivable Waste Land Area                                          |      |
|                                              | Land other than agricultural uses                                   |      |

Source: District Census Handbook, Udham Singh Nagar, 2011

As per the land categorization, the major portion of the land is agricultural about 52.5% which may be used in the future depending on the productivity of the land. Also, the share of area under reserve which constitutes forest land, permanent pastures & other grazing & land under trees, and shrubs which are not included in Net Sown Area is 33.6%. Moreover, the area available for developmental activities is only 13% which has increased over the year because of industrialization in the district and linked development with it (refer to **Table 4-7**).

Crop cultivation is mainly undertaken in Kharif and Rabi seasons. The crops grown in the Kharif season in the district include paddy, wheat, Barley, maize, groundnut, soybean, and turmeric and those grown in the Rabi season include paddy, wheat, barley, maize, groundnut, soybean, and turmeric. Overall, paddy is cultivated in both seasons and the major factor for the success of paddy cultivation is the availability of water and suitable soils. The highest productivity is of wheat which constitutes 39.27 Qty. /Ha. in the cereal crops (refer to **Table 4-8**). Then the highest production is of paddy with 34.48 Qty. /Ha.

**Table 4-8: Productivity of Cereal Crops**

|        | Area (Hectare) | Production (M.T.) | Productivity (Qty. /Hectare) |
|--------|----------------|-------------------|------------------------------|
| Paddy  | 115618         | 398618            | 34.48                        |
| Wheat  | 99586          | 391100            | 39.27                        |
| Barley | 9              | 10                | 11.11                        |

|       |    |     |       |
|-------|----|-----|-------|
| Maize | 59 | 116 | 19.66 |
|-------|----|-----|-------|

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

Further, the production of pulses in the district has a substantial share. The major pulses grown in the district are Urad, Pea, Lentil, Gram, and Arhar with the highest share of Pea having productivity of 11.22 Qty/Ha. followed by Urad having 14.8 Qty/Ha. and gram & Arhar with 10 Qty/Ha. Each (refer to **Table 4-9**).

**Table 4-9: Productivity of Pulses**

|              | Area (Hectare) | Production (M.T.) | Productivity (Qty. /Hectare) |
|--------------|----------------|-------------------|------------------------------|
| Urad         | 329            | 487               | 14.8                         |
| Pea          | 2904           | 3258              | 11.22                        |
| Lentil       | 241            | 199               | 8.26                         |
| Gram         | 3              | 3                 | 10                           |
| Tur/Arhar    | 1              | 1                 | 10                           |
| Other Pulses | 16             | 9                 |                              |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

Oilseed crops are grown for the extraction of oil, which is contained in their seeds. The oil content of different oilseed crops varies from 20% for soybean to 40% for sunflowers. The highest productivity of oilseeds is from Rapeseed and Mustard in the district followed by Groundnut and Soybean. The production of Mustard in the district is almost 6639 metric tonnes on a land parcel of 4825 hectares as given in **Table 4-10**.

**Table 4-10: Productivity of Oilseeds**

|                      | Area (Hectare) | Production (M.T.) | Productivity (Qty. /Hectare) |
|----------------------|----------------|-------------------|------------------------------|
| Rapeseed and Mustard | 4825           | 6639              | 13.76                        |
| Groundnut            | 15             | 15                | 10                           |
| Soybean              | 619            | 655               | 10.58                        |
| Other Oilseeds       | 50             | 47                | 13.35                        |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

A cash crop is an agricultural crop that is grown to sell for profit. It is typically purchased by parties separate from a farm. In the case of Udham Singh Nagar district, the only cash crop grown is sugarcane. Sugarcane is a cash crop, but it is also used as livestock fodder. Sugarcane production

constitutes a huge share of the district because of its plain topography. Moreover, the district is surrounded by western Uttar Pradesh which has a huge production of sugarcane because of favorable land, climate, and infrastructure availability. The total production of sugarcane is 1140478 metric tonnes having productivity of 652 Qty/Hec. in the district (refer to **Table 4-11**).

**Table 4-11: Productivity of Cash Crops**

| Area (Hectare) | Production (M.T.) | Productivity (Qty. /Hectare) |
|----------------|-------------------|------------------------------|
| 17492          | 1140478           | 652                          |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

Horticulture is the agriculture of plants, mainly for food (fruits and vegetables), materials, comfort, and beauty for decoration. Major fruits grown in the district are Mango, Litchi, and Citrus with the highest share of mango creating 66.2% of the total crops. The production of vegetables is almost 89986 metric tonnes on 7437-hectare land. Potato production shows a decent share in the district with 61036 metric tonnes.

**Table 4-12: Production of Horticulture Crops**

| Mango            |                    | Apple         |                    | Litchi        |                    | Citrus        |                    | Walnut        |                    | Other Fruits  |                    |
|------------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|--------------------|
| Area (Hec t.)    | Produc tion (M.T.) | Area (Hec t.) | Produc tion (M.T.) | Area (Hec t.) | Produc tion (M.T.) | Area (Hec t.) | Produc tion (M.T.) | Area (Hec t.) | Produc tion (M.T.) | Area (Hec t.) | Produc tion (M.T.) |
| 4139             | 35177              | 0             | 0                  | 1471          | 2208               | 239           | 1916               | 0             | 0                  | 1707          | 13837              |
| Vegetables (All) |                    | Potato        |                    | Onion         |                    | Ginger        |                    | Turmeric      |                    | Other Spices  |                    |
| 7437             | 89986              | 2757          | 61036              | 343           | 4816               | 262           | 3787               | 169           | 1756               | 38            | 171                |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

Although **Table 4-12** provides district-level analysis it can safely be assumed that in the rural part of KPA, the major crops are rice, paddy, sugarcane, mango, guava, Jamun, jack fruit, and litchi during the Kharif season and Wheat during the Rabi season.

#### 4.3.1.2. Agriculture allied activities

Apart from main agriculture, the allied activities also play a major part in the economy of the region. Livestock production and agriculture are intrinsically linked; both are dependent on each other and crucial for overall food security. The livestock sector forms an important livelihood activity for most farmers, supporting agriculture in the form of critical inputs, contributing to the

health and nutrition of the household, supplementing incomes, and offering employment opportunities. It acts as a supplementary and complementary enterprise. These include livestock, milk production, goat and sheep rearing, and egg production. Below attached **(Table 4-13)** shows a detailed description of livestock activities in U.S. Nagar.

**Table 4-13: Detail of Livestock of Udham Singh District**

| Type                                      |                      | Numbers |
|-------------------------------------------|----------------------|---------|
| Cattle                                    | Indigenous           | 51657   |
|                                           | Exotic & Cross Breed | 87072   |
| Buffalo                                   |                      | 165053  |
| Yalk                                      |                      | 0       |
| Sheep (Indigenous & Exotic & Cross Breed) |                      | 1925    |
| Goats                                     |                      | 42958   |
| Horses & Ponies                           |                      | 1545    |
| Mules                                     |                      | 144     |
| Donkeys                                   |                      | 82      |
| Pigs (Indigenous & Exotic & Cross Breed)  |                      | 1721    |
| Total Poultry                             |                      | 116572  |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

The majority of people depend on buffalo as per Table 4-13 whose number is 165053 and then cattle with several 138129 totals. The goat is also kept as one of the major livestock with 42958 numbers.

The fisheries sector is one of the fast-growing sectors contributing to the GSDP of the State as well as generating income and employment. It has also been observed that fishing also plays a significant part as an economic activity in the district. **(Table 4-14)** reveals that there are 4 departmental fish farms in the district with a production of 2074.89 metric tonnes and values of 2386.12 lakhs.

**Table 4-14: Details of Fisheries Statistics**

| Departmental Fish Farms | Fish Production (M.T.) | Value of Fish Production (Lakhs) | Production of Fish Seeds |
|-------------------------|------------------------|----------------------------------|--------------------------|
| 4                       | 2074.89                | 2386.12                          | 623.11                   |

Source: Statistical abstract 2015-16 (Directorate of Economics and Statistics, Uttarakhand)

#### **4.3.2. Secondary Sector**

There are at present 257 industrial units which have been registered with District Industrial Corporation, Udham Singh Nagar which are located within the planning area. The industries have been classified into micro/household, small, medium, and largely based on the investment in plant machinery as per classification in the MSME policy of the Indian government. It can be analyzed that the large industries have not been registered since 2016 and only units functioning before 2015 are functioning. The least number of industries have been registered in the year 2016 which are 5 in number. Majority of the industries which have been registered fall in the category of micro/household as per the definition but it can be analyzed that the number of registered industries is done in the last three years before which no significant micro industries were functioning in the KPA. The number of medium industries is very less as only 1 unit has been registered to date. The increase in the number of industries can be attributed to the favorable government policies which have come up in the last few years thus encouraging entrepreneurs to set up industrial units in the KPA.

There are certain industries whose address is missing in the data provided by the District Industrial Corporation of Udham Singh Nagar. The number of industries may vary after receiving the complete list of industries or filling in the required data.

The major commodities that are manufactured in the industrial area include agriculture implements, textiles, machinery parts, paper, etc. Certain other types of goods are also manufactured in the KPA. In the case of exports, major goods that are being exported include polyester staple fiber, paper and paper board, etc. In the case of imports, raw material required for these industries is being imported to function in these industrial units which mainly include cotton, iron, steel, and rubber.

**Table 4-15: Industrial Classification and Number of Workers**

| <b>Sr. No:</b> | <b>Type of Industries</b> | <b>No: of Units</b> | <b>No: of Workers</b> | <b>Average Workers per unit</b> |
|----------------|---------------------------|---------------------|-----------------------|---------------------------------|
| 1              | Large                     | 26                  | 7064                  | 272                             |
| 2              | Medium                    | 1                   | 15                    | 15                              |
| 3              | Small                     | 42                  | 321                   | 8                               |
| 4              | Household                 | 188                 | 817                   | 4                               |

|              |     |      |   |
|--------------|-----|------|---|
| <b>TOTAL</b> | 257 | 8217 | - |
|--------------|-----|------|---|

Source: District Industrial Corporation, US Nagar

**Table 4-15** represents the total number of industries falling in each category of industries that have been registered till June 2019. The maximum number of industries falls in the households or micro industries category while small industries are 42 in number. The least number of industries are present in the medium category having only 1. The table also depicts the workforce employed by these units in which the maximum workforce is employed in the case of large industries i.e., 7064 which is 85.97% of the total employed followed by micro industries which employ 817 workers. Large industries are employing the maximum number of workers per unit followed by the medium, small, and household industries. Looking at the current scenario large and middle-scale industries should be encouraged in the planning area as it provides more stable employment and helps in building the economy of the planning area.

Apart from an industrial estate located in the Kashipur planning area, Mahua Kheraganj NPP occupies a high concentration of industries located near the Kashipur planning area. 163 industries lie in Mahua Kheraganj NPP.

#### 4.3.2.1. **Key Issues:**

- 1) Certain industries are not compatible with their surrounding uses e.g., Industrial; Estate, DIC. Also, there is the negligence of proper policies/strategies in the development of industrial units present along major roads.
- 2) There is a need for adequate loading and unloading facilities in the industries and parking space is also limited in some cases.
- 3) Dumping of industrial waste is being done in drains or open land thus causing inconvenience to local people.
- 4) There is a need to boost the small and medium industries in the KPA as the majority of the industries are either micro or large.
- 5) There is a need to encourage large-scale industries also as it provides better and more employment opportunities. Since 2015 there has been no increase in the number of large-scale industries.
- 6) The industries present outside the industrial estate are scattered and no consideration is given to accessibility or approach to these units.

### 4.3.3. Tertiary Sector

Trade and Commerce are important economic activities prevailing in KPA as well as Kashipur MC because of its location. As per data provided by the Municipal Corporation of Kashipur, there is the existence of a large number of shops in the city of Kashipur of varied sizes and nature. These are mainly located along the arterial and sub-arterial roads of the city. The informal sector is also present in the city at various locations. The details of each aspect of trade and commerce are as follows:

#### 4.3.3.1. Retail and Wholesale Shops:

As per the data provided by the Municipal Corporation Kashipur, there are 6672 shops including both wholesale and retail that exists in Kashipur city which are scattered all over the city. As per URDPFI guidelines for the existing population of KPA, 1 shop is required for every 200 persons, at each, Community center and Sector center, and 1 shop is required for 110 persons at the Cluster center. Since there is no hierarchy adopted, the average has been taken which is 1 shop is required for 170 persons.

*Figure 4-1: Main market, Kashipur*



*Figure 4-2: Main Market, Kashipur*





**Figure 4-3: Commercial area in a new city area**



**Figure 4-4: Commercial area in the new city area**



Data provided by MC gives one shop per 19 persons which is quite high as per the requirement. It implies that the commercial establishment is sufficient as per standards and the existing population of the city. The market area of the old area and new area of Kashipur can be referred to in **Figure 4-1, Figure 4-2, Figure 4-3 & Figure 4-4. Warehouses and Godowns**

In general, the warehouses and Godowns are present within Kashipur Mandi as per Municipal Corporation Kashipur. There is only one godown present outside mandi which is present at Killa Market in Kashipur city.

#### 4.3.3.2. **Mandis:**

There is one mandi in the KPA of Kashipur located at Moradabad road which is in the form of a rectangle spread over an area of 14 acres. This market is doing export and import fruits and vegetables to different parts of the state and country as well. The mandi is wholesale as the import and export are done in wholesale quantity. The facilities present in the Mandi include the following:

1. Administration Office
2. Check Post
3. Bank Bhavan
4. Toilet Blocks
5. Auctioning space
6. OHR
7. Canteen

8. Mechanical Handling Unit

9. Shops

10. Platforms

#### 4.3.3.3. **Grain Market:**

There are two vegetable markets present in KPA which are located on Maheshpura road while the other one is located at Killa market. The area under the vegetable market is not sufficient and is further choked by Rehris (Hawker) in the mandi area.

#### 4.3.3.4. **Informal Sector:**

There are 4 informal markets in Kashipur as per Municipal Corporation data which are located along the following road stretch/area:

- Ratan Cinema Road
- Maheshpura Road
- Tanda Tiraha on Tanda Ujjain road
- Main market

The informal sector does not have organized space due to which they are causing problems like encroachment, traffic congestion, littering of waste, etc. in the markets located in the new city area. The problem of traffic congestion is evident in the main market of the old area as there is not much room for vehicular movement. Hence, there is a need to provide certain organized spaces with basic amenities to this sector. The informal markets can be referred to in **Figure 4-5 & Figure 4-6**.

**Figure 4-5: Informal market, Main market, Kashipur**



**Figure 4-6: Informal market, Main market, Kashipur**



#### 4.3.3.5. Key Issues

- 1) There is no organized space for the operation of the informal sector in the city due to which they create problems rather than helping in the economic generation of the city.
- 2) There is a requirement for space for the vegetable market as the present market is choked by Chris.

### 4.4. Government Schemes and Policies

#### 4.4.1. Support to Urban Street Vendors under NULM Mission & PM SVANidhi

Street vendors constitute an important segment at the bottom of the pyramid of the informal economy in cities. Street vending provides a source of self-employment and acts as a measure of urban poverty alleviation. Street vending is therefore an integral part of the economic growth process in urban areas.

Under the street vendor component of the NULM mission, it has the following objectives which will address the vulnerabilities of the urban street vendors through a multi-pronged approach. This includes:

- Survey of street vendors and issuance of Identity Cards
- Development of city street vending plans
- Infrastructure development of vending zones in the city
- Training and Skill Development
- Financial Inclusion

- Access to credit
- Linkages to social security schemes

Due to the pandemic situation in 2020, the government of India has launched a different scheme i.e., PM SVANidhi for street vendors apart from the running NULM street vendors' scheme. Due to the decline in the economy and the poor condition of the EWS group, this scheme will come out to be a boon for the marginalized section of society. This scheme will work on the identified vendors in the previous street vending scheme and an allotment of subsidy will be offered. The total number of vendors identified under NULM in Kashipur municipal corporation were 1020. All the vendors have delivered the identity cards to both the ULBs.

Under PM SVANidhi in Kashipur M.C., 129 applications have been received out of which 42 are from the marketplace. Out of the total applications, 26 have been sanctioned and 6 of them have been issued LOR. Out of the total applications, 80 have been sanctioned and none of them has been issued LOR. This scheme has benefited the people since its initiation and it will be a boon in the coming future.

#### **4.5. Workforce projection**

Workforce analytics involves using models that integrate internal and external data to predict future workforce and help organizations in any industry examine factors that have a prognostic effect. The models are decomposed into three modes: supply-based, demand-based, and need-based, which in some cases provide substantially different estimates of future workforce needs. One of the principal reasons to use workforce-forecasting models is to identify the potential gap between the present workforce and future requirements to predict training and recruitment needs. Focusing on the most frequently used modeling approaches, the qualitative model and time series model have been adopted which are based upon historical data. Further, optimization models fix the workforce projection. Optimization, which is concerned with minimizing and maximizing an objective function, usually subject to various constraints, has been widely used in workforce modeling.

As discussed in the preceding points of this chapter, the probable occupational structure for the horizon years is used as a policy measure to alleviate the economic problems of the region. The estimate of prospective workforce structure has been based on certain assumptions and the

explanation of underlying assumptions is necessary to ensure the realization of the objectives of the Master Plan in totality.

The past trends of the workforce show that the participation rate was 27.09% and 31.98% in the years 2001 and 2011 respectively. The workforce Based upon the standards mentioned in the URDPFI Guidelines, it is assumed that the workforce participation rate will almost remain the same as it was in 2001 and 2011 with an average of 30% workforce participation rate in the case of Kashipur Planning Area as a whole.

#### **4.5.1. Projected Workforce**

The proposed workforce participation ratio (WFPR) for the horizon of 2041 is estimated at 30%. Workers for the horizon year have been projected based on some assumptions like, it is expected that few of the proposals in the master plan will be implemented by then, also, the share of workers engaged in the primary sector will get reduced in the coming years and for the service sectors, the numbers will increase (refer to **Table 4-16**).

**Table 4-16: Workforce Forecast for the year 2041**

|                                                                                  |          |
|----------------------------------------------------------------------------------|----------|
| <b>Projected Population for the year 2041</b> (including Floating Population)    | 8,42,254 |
| <b>Workforce Participation for Small Town</b> (at 30% of the total population) * | 2,52,676 |

Source: Computed Values      \*Standards given in URDPFI Guidelines

These population projections are based on the following assumptions:

- The strong economic base of SIDCUL outside the Planning Area has started attracting industries and other builders for investment in real estate, which is likely to invite more people.
- Economic corridors shall be extended from Delhi to Moradabad, which will enhance the present employment opportunities and hence make the stronger economic base of the city.

The workforce projections for industrial workers' classification have been made for Kashipur Planning Area based on the category-wise employment data available for it from the census 2011. To estimate category-wise employment for the year 2041, it has been assumed that the employment pattern of the Kashipur Planning Area will be almost the same as observed in 2011 with a slight downward trend in the primary sector. The category-wise employment data for 2011 and employment forecast for Kashipur Planning Area up to the year 2041 are given in the following sub-points.

#### 4.5.1.1. Primary Sector

As per the past trend, the share of the workforce engaged in the primary sector has declined drastically from 20.71% in 2001 to 9.76% in 2011. The basic assumption for the projection of WFPR in the planning area is that the primary workers will decrease in absolute number during the plan period (refer to **Table 4-17**).

**Table 4-17: Proposed Workforce Engaged in Primary Sector for the year 2041**

|                                                                           |                                                                                |                     |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------|
| 1.                                                                        | Total Planning Area                                                            | 19,315 Ha           |
| 2.                                                                        | Projected Population for the year 2041 (Excluding Floating Population)         | 8,42,254            |
| 3.                                                                        | <b>Adopted Town Density</b> (100-150 PPH)*                                     | 125                 |
| 4.                                                                        | <b>Required Developable Area</b> = ( 2 / 3 )                                   | <b>6,738.03 Ha</b>  |
| 5.                                                                        | Existing Developed Area                                                        | 2760 Ha             |
| 6.                                                                        | <b>Additional Land Required</b> = ( 4 – 5 )                                    | <b>3978.03 Ha</b>   |
| 7.                                                                        | Available Vacant Land (Calculated from Existing Land Use Analysis)             | 1651 Ha             |
| 8.                                                                        | <b>Available Agriculture Land</b> (Calculated from Existing Land Use Analysis) | <b>14302 Ha</b>     |
| 9.                                                                        | Loss of Agriculture Land = ( 6 – 7 )                                           | 2327.03 Ha          |
| 10.                                                                       | <b>Pending Agriculture Land</b> = ( 8 – 9 )                                    | <b>11,974.97 Ha</b> |
| 11.                                                                       | Existing Primary Sector Workers (Census 2011)                                  | 17,592              |
| 12.                                                                       | <b>Existing Dependency Ratio</b> (in workers / ha) = ( 8 / 11 )                | <b>0.62</b>         |
| 13.                                                                       | Assumed Dependency Ratio (in workers / ha)                                     | 0.62                |
| <b>Forecast of Primary Sector Workers for the year 2041</b> = ( 10 x 13 ) |                                                                                | <b>7,424</b>        |

Source: Computed Values      \*Standards given in URDPFI Guidelines

#### 4.5.1.2. Secondary Sector

Undoubtedly, the industrial sector must play a major role if employability is to be increased. For an industrial city like Kashipur, the URDPFI Guidelines suggests a share of fifty percent of industrial workers in the total workforce (refer to **Table 4-18**).

**Table 4-18: Proposed Workforce Engaged in Secondary Sector for the year 2041**

|                                         |          |
|-----------------------------------------|----------|
| <b>Computed Workforce Participation</b> | 2,52,676 |
|-----------------------------------------|----------|

|                                                              |          |
|--------------------------------------------------------------|----------|
| <b>Industrial Workforce</b> (at 50% of the total workforce)* | 1,26,338 |
|--------------------------------------------------------------|----------|

Source: Computed Values \*Standards given in URDPFI Guidelines

The secondary sector is proposed to provide the platform for the economic development of the region shifting the dependence from marginal jobs in the tertiary sector to substantial jobs in the secondary sector. The city is already the focus of industrial development.

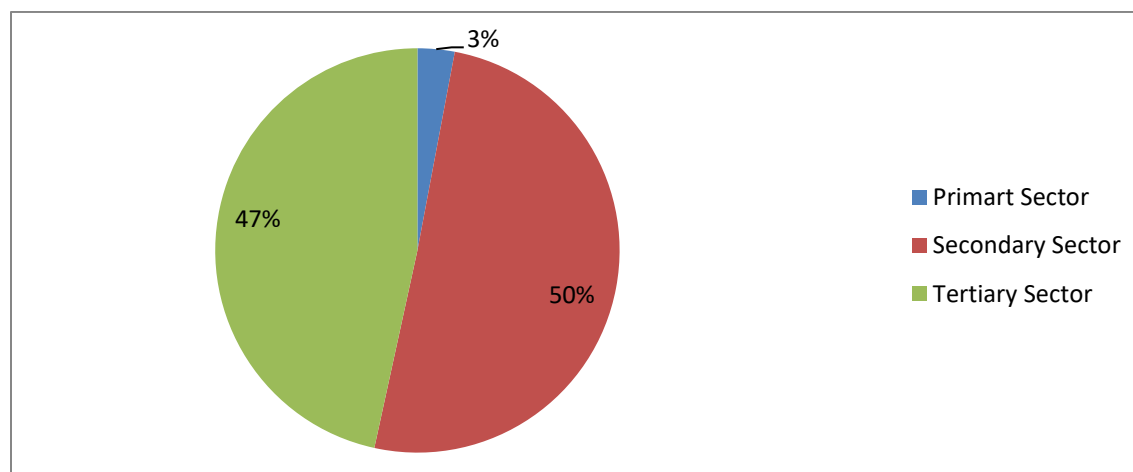
#### 4.5.1.3. Tertiary Sector

The tertiary sector, which is the predominant feature of all district headquarters, will continue to play an important role in the economy of Kashipur city. The tertiary sector will continue to play an important role in the local and regional economy of Kashipur primarily because of its insignificant industrial base and unemployment presently existing in the region. In terms of workforce projection, employment in the tertiary sector would be 1,16,638 by 2041.

#### 4.5.2. Comparison of Sector-wise Workforce Distribution

Correction to the basic economic structure has become inevitable and must be supplemented by proper infrastructure to streamline its economy during the plan period of twenty years. It is clear from the sectoral composition that the employment opportunities in the tertiary sector will play a major role after the secondary sector. Provided the land availability and better connectivity, the city can explore the development of industrial corridors. This would affect the future employer's composition. The agriculture practice would be limited in the city jurisdictions due to decrease in available agricultural land. Overall, in the long run, the secondary sector remains the major contributor followed by the service sector and primary sector (refer to **Figure 4-7**).

*Figure 4-7: Sectoral Composition of Projected Workforce*



Source: Calculated by Town and Country Planning Department

#### 4.6. Industrial Estates

There is one industrial estate setup in KPA by the Department of Industrial Corporation under State Govt. Policy to facilitate industrial development in the city with potential for industrialization. The industrial estate is located on the Rudrapur- Kashipur road having 69 industrial plots of different sizes. The total number of industrial plots of categories A, B, and C are 12, 29, and 28 respectively. The estate is very well-planned with the incorporation of all the basic facilities.

#### 4.7. Commercial Demand

Commercial demand for Kashipur Planning Area has been calculated under this section. The commercial area calculation based on URDPFI guidelines has been presented in **Table 4-19**. URDPFI suggests the area required per 1000 persons and the number of shops required for the population. Based on the calculation the total area under commercial comes to be 160.03 Ha with 11250 shops. In URDPFI it has been highlighted that small and medium towns should emphasize the weekly markets for promoting local economic activities. *Mandis* and wholesale markets are to be emphasized in regional planning. Integration of the rural and small and medium towns to be developed through the provision of *Mandis*.

**Table 4-19: Area calculation for commercial areas - URDPFI**

| Sl. No | Category                                | Area per 1000 persons (sqm) | Number of Shops (1 shop for the below-mentioned persons) | Area required for 2041 (sqm) | Area required for 2041 (Ha) | Number of shops |
|--------|-----------------------------------------|-----------------------------|----------------------------------------------------------|------------------------------|-----------------------------|-----------------|
|        | <b>Population</b>                       |                             |                                                          | <b>842254</b>                |                             |                 |
| 1      | Convenience Shopping                    | 220                         | 110                                                      | 185295.88                    | 18.53                       | 7657            |
| 2      | Local shopping including service center | 300                         | 200                                                      | 252676.2                     | 25.27                       | 926             |
| 3      | Community Centre with service center    | 500                         | 200                                                      | 421127                       | 42.11                       | 1263            |
| 4      | District Centre                         | 880                         | 300                                                      | 741183.52                    | 74.12                       | 1404            |
|        | <b>Total</b>                            |                             |                                                          |                              | <b>160.03</b>               | <b>11250</b>    |

Source: Analysis by Town and Country Planning Department

Apart from commercial centers and convenience shops space has also been considered for Urban Street Vendors. Street vendors form a very important segment of the unorganized sector in the



country and it is estimated that in several cities' street vendors account for about 2% of the population. Master/ Zonal/ Local/ Layout development plans to be 'inclusive' and address the requirements of space for street vending through the reservation of space. With the growth of cities/ towns in response to urbanization, the statutory plans of every new area should have adequate provision for Vending / Hawking zones and 'Vendor Markets'.

It is observed that informal eating places mushrooms at a faster rate. It is suggested to make provision for 1 informal eating-place per 1 lakh population with a space allocation of 2000 sqm (NBC, 2005 part 3) which gives about 1.7 Ha of land for Kashipur.

URDPFI also suggests an average area of land for commercial area based on population. The average land requirements for commercial activities work out to be 0.4 Ha per 1000 persons in a range of 0.2 to 0.6 Ha/ 1000 persons depending on the location of these large cities concerning metropolitan which comes to be about 336.90 Ha for Kashipur Planning Area.

The cities have a diversified economy focussing on various sectors like Trade & Commerce, Industry, and Tourism. Considering the vision of the Kashipur Planning Area commercial area plays a very important role in the city's growth. The area requirements of warehousing have been calculated based on the land use break-up of the Integrated Freight Complex as given in URDPFI guidelines. It states that 10% of land should be reserved for warehousing. Hence, 10% of the total industrial area has been proposed for warehousing for Kashipur Planning Area. The total area under the proposed industrial land is 1299.68 Ha and for warehousing is 10% which is 129.96 Ha.

## **5. Preparation of Base Map and Existing Land Use**

The Land use of an area deals with the various socio-economic activities occurring in a particular area/land. It is one of the most important aspects of a Master Plan as it helps study the spatial development pattern. The chapter will feature the pattern of development of the Kashipur Planning Area through the study of various land use categories such as residential, commercial, public semi-public, recreational, religious, etc., and the type of structure occupying the specific area/land.

### **5.1. Need for Preparation of Base Map/ Existing Land Use**

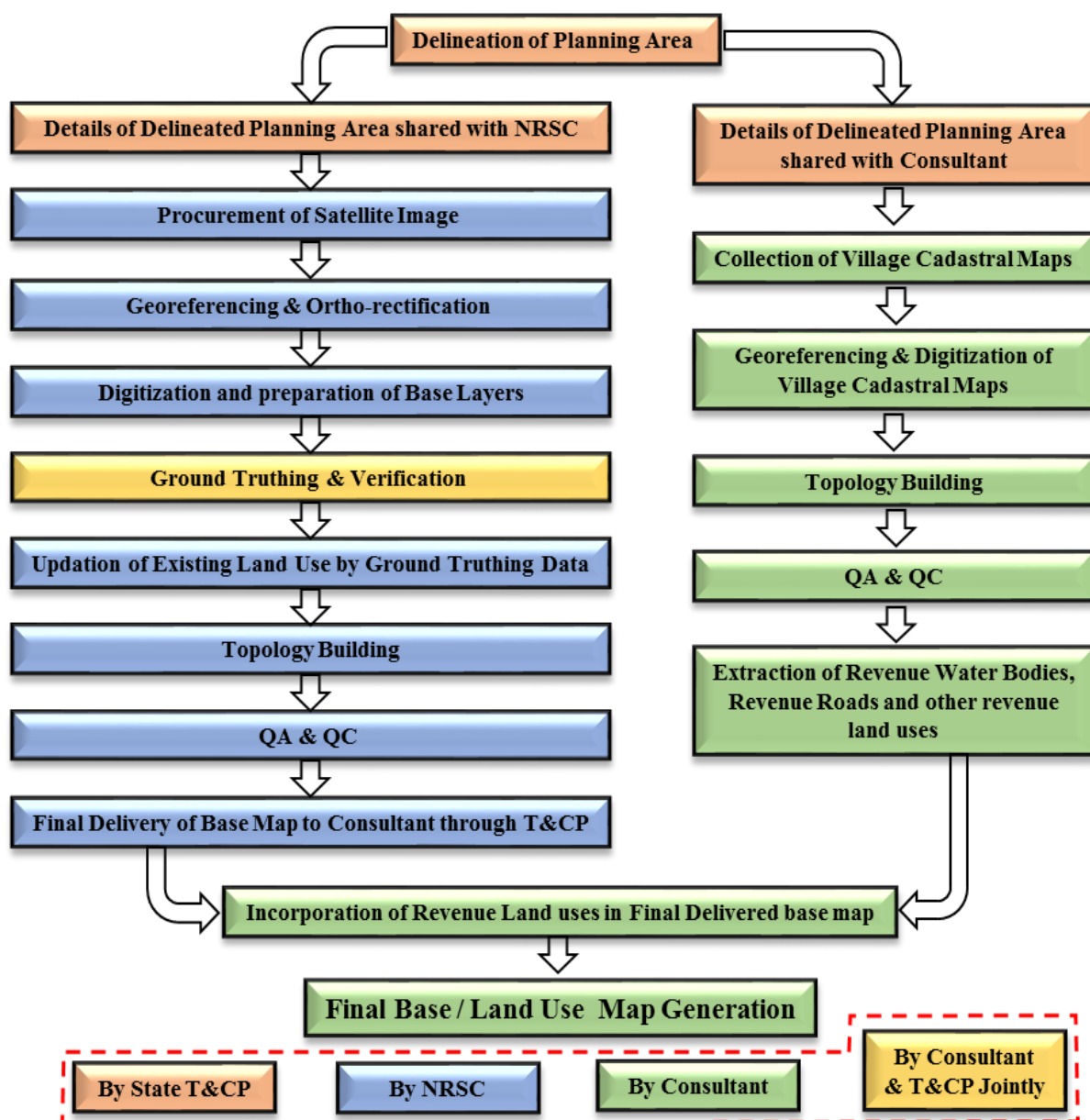
Land-use planning is important to mitigate the negative effects of land use and to enhance the efficient use of resources with minimal impact on future generations. The main objective of this planning process is to allocate land uses to meet the needs of people while safeguarding future resources. To prepare the land use map. It is of crucial importance to have an accurate and updated base map for the formulation of the Master Plan.

### **5.2. Approach & Methodology of Base Map Formulation**

The State Mission Directorate has provided the draft base map of the Kashipur Planning Area obtained from NRSC to the Consultant for value addition by collecting spatial attributes as per AMRUT Design and Standards. After updating the base maps, the same has been sent back to NRSC (National Remote Sensing Centre), Indian Space Research Organisation (ISRO), Hyderabad to incorporate the attributes collected by the consultant on the GIS database. NRSC, after incorporating spatial attributes, has sent the generated to the TCPD, Uttarakhand for vetting, after which the final base maps were generated which were used as an input for plan formulation (refer to **Figure 5-1**).

As the planning area comprises both urban and rural areas, the land use classification adopted is comprised of urban and regional level land uses as specified in the URDPFI guidelines. Consequently, a two-level classification of land use has been adopted i.e., for the Municipal Corporation Area as well as the Planning Area. Formulation of Master Plan of city region (which includes the urban local bodies and peripheral areas for which base map is prepared by NRSC) is as per “Uttarakhand Urban and Country Planning and Development Act, 1973”.

Figure 5-1: Approach & Methodology for Preparation of Existing Land Use



### 5.2.1. Delineation of Planning Area

Demarcation of the area of mapping is used to define the boundaries of the study area, and/or to divide the study area into sub-areas. For the AMRUT sub-scheme, the concerned State Mission Directorate is responsible for the demarcation of Area of Interest (AOI) for mapping by delineation of the planning area. After demarcation, the State Mission Directorate has shared the boundary with NRSC (National Remote Sensing Centre) through Town & Country Planning Organisation, MoHUA. In addition to this, the delineated planning area boundary is also shared with the consultants for the cadastral mapping and extraction of land uses. These are further discussed under the following headings.

### 5.2.2. Procurement of Satellite Image

The base map has been updated on the satellite image map provided by NRSC (National Remote Sensing Centre), Indian Space Research Organisation (ISRO), Hyderabad. The base map has been prepared on a high-resolution satellite image. The NRSC has provided the satellite imagery of the city into grids, which comprise 770 grids for the Kashipur Planning Area. The Grids have been provided on a 1:1000 scale as a “Field Map”. The NRSC has also provided a Base map in GIS shapefile format (.shp) at a 1:4000 scale. As mentioned in ‘Spatial Reference Standards’<sup>1</sup>, an additional 5 km buffer is selected to cater to accommodate the near future increase in Planning Area. The Base Map Vector Data has also been obtained from the NRSC, a Quality check of the image has been carried out and necessary adjustments have been made to the available satellite imagery and Vector Data.

### 5.2.3. Geo-referencing and Ortho-rectification

The DGPS survey was undertaken by NRSC using various ground control points recorded throughout the Rudrapur Planning Area and verified. Further, NRSC provided the geo-referenced satellite image to the consultant through the State Town & Country Planning Department (refer to **Figure 5-2**).



**Figure 5-2 GCPs for DGPS Survey marked on Satellite Imagery**

### 5.2.4. Digitization & Preparation of Base Layers from Satellite Data

The mentioned task entails the preparation of base layers, based on which spatial analysis has been done. Under this, the base layer preparation included digitization of existing features, geo database preparation and preparation of a preliminary base map which with further inputs will lead to final base map preparation. The whole task is done by the NRSC, Hyderabad.

<sup>1</sup> Formulation of GIS based Master Plan for AMRUT Cities – Design & Standard, Page-7.



### 5.2.5. Ground Truthing & Verification

The officials of local departments and consultants were provided with a grid sheet of maps, a copy of the correspondent attribute table and a simplified coding list provided by NRSC. They visited different locations in Kashipur Planning Area for sample vetting and attribute data collection (refer to **Figure 5-3**).

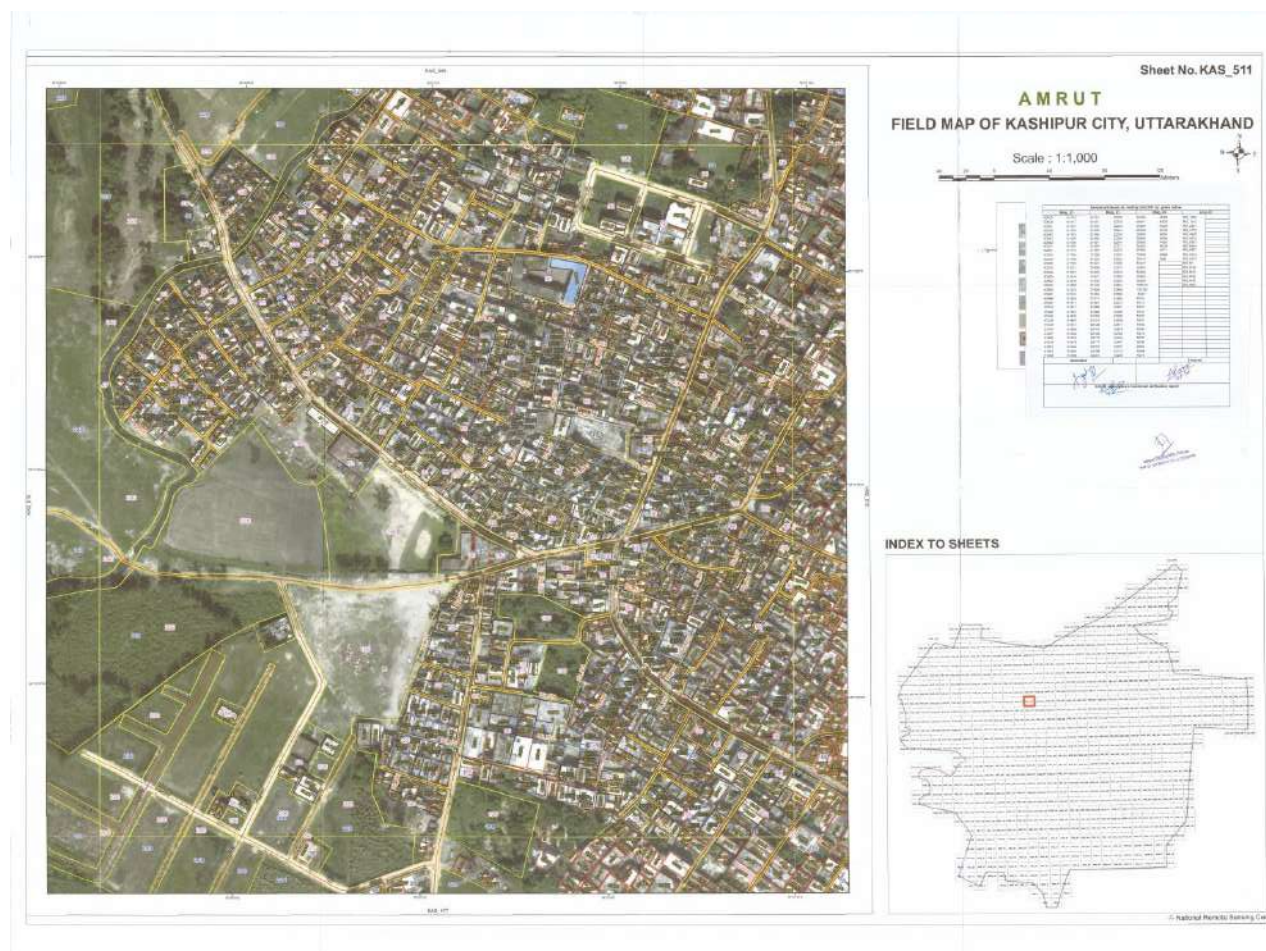


**Figure 5-3 Sample Base Map Vetting by Digitising the NRSC Pdf Sheets**

Required hard copy maps were printed for visualisation purposes at different scales for example at 1:2000 or 1:1000 for field verification. The concerned Divisional Town Planner along with the planning team and consultant has supervised the field visit and rectified the queries issued there on the field.



Figure 5-4 Sample Road Inventory by using Laser Distance Meter



Figure 5-5 Geo-tagged Photos used during Ground Truthing

Ground truth and verification of the land use details obtained above have been carried out and submitted to NRSC to prepare the updated land use map for the project area (refer to **Table 5-1 and Table 5-2**).

Table 5-1: Sample Attribute Table: Buildings (GRID 511)

| FI D | OBJECT ID | Cod e | Class       | Sub_Class       | Ward_ No | Rd_ID   | No_floo rs | Cons_type | SHAPE_Len g | SHAPE_Are a | Bldg_I D |
|------|-----------|-------|-------------|-----------------|----------|---------|------------|-----------|-------------|-------------|----------|
| 0    | 18837     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 48.28181914 | 132.4749115 | 18837    |
| 1    | 18838     | 58A   | Residential | House           |          | RD_5296 | 1          | RCC       | 35.02158196 | 74.72545423 | 18838    |
| 2    | 18839     | 58A   | Residential | House           |          | RD_N6   | 1          | RCC       | 45.54836228 | 106.5790593 | 18839    |
| 3    | 18840     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 56.82154873 | 199.5395016 | 18840    |
| 4    | 18841     | 58A   | Residential | House           |          | RD_N6   | 1          | RCC       | 49.11350661 | 135.4423725 | 18841    |
| 5    | 18842     | 58A   | Residential | House           |          | RD_538  | 1          | RCC       | 45.44313298 | 106.2323197 | 18842    |
| 6    | 18843     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 28.84949889 | 47.02818237 | 18843    |
| 7    | 18845     | 58A   | Residential | House           |          | RD_538  | 1          | RCC       | 49.00841317 | 135.0028304 | 18845    |
| 8    | 18846     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 40.83541077 | 83.49148093 | 18846    |
| 9    | 18847     | 58A   | Residential | House           |          | RD_538  | 1          | RCC       | 26.48714132 | 43.57159209 | 18847    |
| 10   | 18848     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 49.14020543 | 141.2660296 | 18848    |
| 11   | 18849     | 63    | Commercial  | General Busines |          | RD_688  | 1          | RCC       | 47.56406251 | 127.9721349 | 18849    |
| 12   | 18851     | 58A   | Residential | House           |          | RD_538  | 1          | RCC       | 29.57166004 | 54.59501025 | 18851    |
| 13   | 18852     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 46.82301561 | 122.2084846 | 18852    |
| 14   | 18853     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 41.15672877 | 91.94767513 | 18853    |
| 15   | 18854     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 41.54719512 | 94.68503919 | 18854    |
| 16   | 19124     | 58A   | Residential | House           |          | RD_688  | 1          | RCC       | 71.31009238 | 315.9175732 | 19124    |
| 17   | 19125     | 58A   | Residential | House           |          | RD_9136 | 1          | RCC       | 43.53061176 | 117.7779815 | N1       |
| 18   | 19126     | 58A   | Residential | House           |          | RD_9136 | 1          | RCC       | 41.85727404 | 107.9962161 | N2       |
| 19   | 19127     | 58A   | Residential | House           |          | RD_9136 | 1          | RCC       | 42.15911226 | 109.7606728 | N3       |
| 20   | 19238     | 58A   | Residential | House           |          | RD_561  | 1          | BCC & TIN | 13.55470731 | 11.45942296 | 19238    |
| 21   | 19239     | 58A   | Residential | House           |          | RD_561  | 1          | BCC & TIN | 47.24478037 | 80.69002631 | 19239    |

|    |       |     |             |       |  |        |   |           |             |             |       |
|----|-------|-----|-------------|-------|--|--------|---|-----------|-------------|-------------|-------|
| 22 | 19240 | 58A | Residential | House |  | RD_561 | 1 | RCC       | 34.62882293 | 71.26637695 | 19240 |
| 23 | 19241 | 58A | Residential | House |  | RD_561 | 1 | BCC & TIN | 36.63305903 | 63.84690297 | 19241 |
| 24 | 19268 | 58A | Residential | House |  | RD_688 | 2 | RCC       | 51.54065374 | 139.5629475 | 19268 |
| 25 | 19269 | 58A | Residential | House |  | RD_688 | 1 | RCC       | 42.75175886 | 107.5215305 | 19269 |
| 26 | 19270 | 58A | Residential | House |  | RD_688 | 1 | RCC       | 58.93128088 | 187.6456195 | 19270 |
| 27 | 19271 | 58A | Residential | House |  | RD_688 | 1 | RCC       | 55.88812477 | 179.0574594 | 19271 |

**Table 5-2 Sample Attribute Table: Roads (GRID 511)**

| SHAPE_Length | Line_Id | Rd_Leng_k m | Rd_Con_Mat | Rd_CW_Wid | Rd_ROW_Wid | FP_Width | Rail_Id | Rly_Name | Br_Fl_Wid | Br_Fl_Len | Class |
|--------------|---------|-------------|------------|-----------|------------|----------|---------|----------|-----------|-----------|-------|
| 54.84970342  | RD_139  | 0.054849703 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 19.42753279  | RD_143  | 0.018859814 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 49.55952706  | RD_147  | 0.045062885 | UNPAVED    | 10        | 10         | 0        |         |          | 0         | 0         | Road  |
| 186.6516096  | RD_235  | 0.18665161  | GRAVEL     | 3.5       | 6          | 0        |         |          | 0         | 0         | Road  |
| 25.72634604  | RD_525  | 0.025726346 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 36.12456598  | RD_538  | 0.036124566 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 205.2178043  | RD_561  | 0.142047595 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 296.5114686  | RD_688  | 0.236707947 | GRAVEL     | 3.5       | 5          | 0        |         |          | 0         | 0         | Road  |
| 38.03298964  | RD_1016 | 0.03803299  |            | 0         | 0          | 0        |         |          | 0         | 0         | Road  |
| 52.28189408  | RD_1035 | 0.052281894 | UNPAVED    | 3         | 3          | 0        |         |          | 0         | 0         | Road  |
| 28.57015249  | RD_1041 | 0.027292492 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 52.71200954  | RD_1444 | 0.05271201  | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 437.1474636  | RD_1931 | 0.131161918 | GRAVEL     | 3.5       | 5          | 0        |         |          | 0         | 0         | Road  |
| 54.11191001  | RD_2178 | 0.05411191  | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 691.1033665  | RD_2452 | 0.189425352 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 68.36413697  | RD_2455 | 0.068364137 | UNPAVED    | 10        | 10         | 0        |         |          | 0         | 0         | Road  |
| 27.96797135  | RD_2727 | 0.027967971 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 45.91386299  | RD_3042 | 0.045913863 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 76.86890387  | RD_3387 | 0.052117324 | UNPAVED    | 10        | 10         | 0        |         |          | 0         | 0         | Road  |
| 46.03637029  | RD_3962 | 0.04603637  | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 127.9613885  | RD_4097 | 0.003986752 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 127.450792   | RD_4306 | 0.073893217 | UNPAVED    | 10        | 10         | 0        |         |          | 0         | 0         | Road  |
| 358.7831663  | RD_4485 | 0.06238639  | UNPAVED    | 3.5       | 3.5        | 0        |         |          | 0         | 0         | Road  |
| 158.4322947  | RD_4734 | 0.056960188 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 186.6467403  | RD_5211 | 0.035076393 | UNPAVED    | 10        | 10         | 0        |         |          | 0         | 0         | Road  |
| 31.6414139   | RD_5225 | 0.026835209 | UNPAVED    | 3.5       | 3.5        | 0        |         |          | 0         | 0         | Road  |
| 81.24398221  | RD_5288 | 0.062745539 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 1280.048851  | RD_5296 | 0.189338625 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 45.19816835  | RD_5388 | 0.045198168 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 182.7754352  | RD_5520 | 0.071970481 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 56.1729004   | RD_5773 | 0.0561729   | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 35.83964418  | RD_5794 | 0.035839644 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 36.02095232  | RD_5835 | 0.036020952 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |
| 223.5957872  | RD_6283 | 0.195971831 | BRICKS     | 3.5       | 5          | 0        |         |          | 0         | 0         | Road  |
| 29.57303866  | RD_6329 | 0.029573039 | UNPAVED    | 5         | 5          | 0        |         |          | 0         | 0         | Road  |



#### **5.2.6. Validation of Existing Land Use**

The base map and existing land use is a pre-requisite input to assess the existing situation of the planning area. To infer the intensity of activities and their spatial distribution, an existing land use map is necessary. GARMIN Virb XE action camera with capabilities to capture wide-angle geo-tagged pictures mounted on a 2-wheeler is used to capture the exact situation of ground with buildings to map and update the existing land use. Two trips have been made to cover properties on either side of roads by orienting the camera towards properties. Whereas, the camera is oriented towards the driving direction to capture properties on either side in all minor/collector streets. Track logs of the geo-tagged images are imported to the GIS platform and land use is visually interpreted and validated.

#### **5.2.7. Updation of Existing Land Use by Ground Truthing Data**

The NRSC updated the geo-database of existing land use based on the information received from the State Town & Country Planning Department.

#### **5.2.8. Topology Building**

For cartographic representation/visualisation of the GIS database or to generate a copy of maps, appropriate symbols have been used. In urban applications, it is also important to choose appropriate symbols as a statutory requirement in the States Town Planning Act. To facilitate uniform symbology, symbols (mentioned in AMRUT Design & Standards) for the feature data content have been used. However, some of the symbols have been customised as per the requirement of the States Town Planning Act and have been adapted accordingly for the representation/visualisation of maps.

There are 69 major classes and 475 sub-classes for 1:4000 scale urban geospatial data for GIS-based Master Plan formulation under the AMRUT scheme. Each GIS feature is assigned with a unique four-character alphanumeric code. The code is unique concerning the feature, irrespective of its geometry and layer. The first two characters of the code represent the Class and the next two characters represent the Sub Class.

#### **5.2.9. Quality Assessment & Quality Control**

Quality Assessment (QA) and Quality Control (QC) procedures have been implemented at all stages of base map preparation. The routines and procedures used have been a combination of automated procedures and manual procedures. These have been finalized at the time of geo-database design. As a guideline, however, following data validation and QA/QC procedures



have been adopted. Quality reports against each data validation and QA/QC procedure have been generated for rectification and record.

**Quality Assurance and Quality Control for Base Map Preparation:** The data after technical scrutiny by QA/QC team has been integrated into the base map.

**Geo-Spatial Content from various Departments:** Spatial data received in either soft or hard copy from various line departments have been digitized/generated and integrated into the base map after QA/QC.

**Integration of Geo-spatial data:** Geo-Spatial data from various sources has been integrated onto a single platform to perform various spatial assessments and generation of thematic maps. Final QA & QC checks were performed to check the following parameters –

- **Completeness:** Entire Planning Area should be covered – (i) There should not be any gaps within the Planning Area, and (ii) Ensure that all features are mapped, as per the feature content, which is present in the Planning Area.
- **Correctness:** (i) Feature extraction should ensure correct interpretation, the shape of the feature as per the image and feature geometry definition (ii) The feature classification as per the ground truth and attribute data.
- **Conformity:** GIS database should conform to the specifications and standards of NUIS.
- **Consistency:** Interpretation, feature extraction/digitization, and geometry should be consistent in all parts of the local planning area.
- **GIS Compatibility:** The Geo-Spatial Data should conform to the co-ordinate system and conform to the GIS data structure as defined by QA/QC expert. It should be topological clean, free from errors such as sliver polygons, duplicates, overlaps and gaps.
- **Attribute Data Quality Check:** Attribute data is collected from field and line departments and has been confirmed with the source data.

#### **5.2.10. Final Delivery of Base Map / Existing Land Use Map**

After validation and QA/QC, the ArcGIS data of the Kashipur Planning Area was provided by the NRSC to State Town & Country Planning Department in the standard format in soft copy. As soon as receiving the NRSC's base map data, State Town & Country Planning Department handed over one copy of data to the consultant for inclusion of other databases and preparation of the Master Plan of Kashipur Planning Area.

### 5.2.11. Collection of Village Cadastral Maps

The process of base map preparation is done by the consultant, this involves the collection of required information such as cadastral maps and revenue data regarding the manuals for which mapping is to be done. It is followed by the linkage of cadastral and revenue information using the appropriate platform and finally, it involves the application of colour composition for different categories of land.

### 5.2.12. Geo-referencing and Digitisation of Village Cadastral Maps

Village maps procured from Rudrapur Tehsil Office have been geo-referenced by referencing geo-rectified satellite imagery. Available large-scale maps shall be initially geocoded concerning the satellite imagery and then proceeded to smaller-scale maps. Revenue maps will be co-registered with satellite imagery. The co-registration, in general, maintains the relative accuracy, shape and geometry of the buildings as well as the plot. Advanced geo-referencing techniques and geo-coding of revenue maps will be conducted to ensure the integrity of proportion, shape, and area. Mosaicking (GIS) and Geo-referencing of cadastral revenue village maps, revenue boundaries with survey number and bringing them to uniform scale for Master Plan (refer to *Figure 5-6*).



**Figure 5-6 Digitization of Agricultural Fields and River**

Internal quality assurance and quality checks are carried out during geo-referencing to meet the master plan requirements. Cadastral survey parcel boundary, village boundary, and water bodies including lakes, ponds, and streams have been vectorised from cadastral village maps and survey parcel numbers are stored as attribute information. Quality assurance and quality checks have been carried out at all levels to overcome digitization errors. Further, attribute errors where information about the feature capture is inaccurate or false have been rectified.

### 5.2.13. Topology Building

For cartographic representation/visualisation of the GIS database or to generate a copy of maps, appropriate symbols have been used. In urban applications, it is also important to choose appropriate symbols as a statutory requirement in the States Town Planning Act. To facilitate uniform symbology, symbols (mentioned in AMRUT Design & Standards) for the feature data content have been used. However, some of the symbols have been customised as per the requirement of the States Town Planning Act and have been adapted accordingly for the representation/visualisation of maps.

### 5.2.14. Quality Assessment & Quality Control

Quality Assessment (QA) and Quality Control (QC) procedures have been implemented at all stages of base map preparation. The routines and procedures used have been a combination of automated procedures and manual procedures. These have been finalized at the time of geo-database design. As a guideline, however, following data validation and QA/QC procedures have been adopted. Quality reports against each data validation and QA/QC procedure have been generated for rectification and record.

### 5.2.15. Extraction of Revenue Land Uses

After successful validation, QA and QC, features like revenue water channels water bodies, revenue rasta/roads and other revenue land uses have been extracted which are further added to the Base Map of Rudrapur Planning Area.

### 5.2.16. Incorporation of Revenue Land Uses in Final Delivered Base Map

The data obtained from the NRSC and data obtained from the cadastral maps are merged to improve the quality of the base map / existing land use map. From this, the revenue rasta, revenue water bodies and water channels are incorporated into this geo-database.

### 5.2.17. Final Base Map / Land Use Map Generation

With the inputs received from the site visits, overlaying with high-resolution imageries and

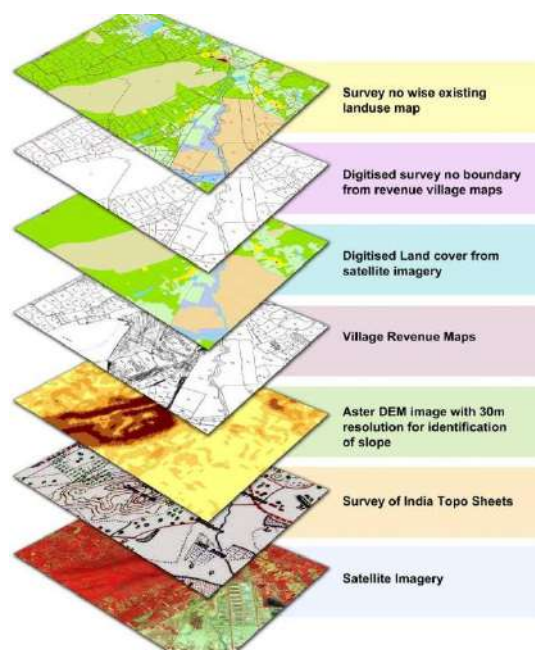


**Figure 5-7 Overlapping of various layers to arrive at Accurate Land Use Map**

consultations with officials as well as the client, the draft base map is modified and the final base map has been prepared. Key projects that are located in the Rudrapur Planning Area with relevant details are incorporated into the base plan as appropriate. The base plan so prepared enables the project to seamlessly conceptualize, formulate a strategy and prepare a master plan.

The mentioned task entails the preparation of a base map, based on which spatial analysis has been done. Preparation of a good base map is the key to the preparation of the Master Plan for the development area. Site visits are undertaken to add any existing site feature, access points, vegetation, and utility lines if any on the base map. The major components of the base map preparation include data collection from the concerned departments, procurement of satellite imagery, digitization of existing features, surveys, geodatabase design, geo database preparation and preparation of a preliminary base map which with further inputs will lead to the final base map preparation (refer to **Figure 5-7**).

#### **5.2.18. Land Use Classification**

The geo-database structure designed for the preparation of base map and existing land use is referred from the AMRUT Design & Standards, published by the Ministry of Housing & Urban Affairs, Government of India. The land use classification schemes typically address both land use and land cover. All the urban land uses are extracted as polygons, except a few, such as Community toilets, Fire stations, Garbage Collection points, Landfill sites & Dumping yard, Cell towers, Slums, Bus Stops, Trees etc, which are extracted as points. The road feature is captured as both Polygon and Line. Road area is represented as polygon and Road centreline as Line. Whereas, all the railway lines are captured as lines in the base layer and the railway track area is captured as polygon in Urban Land Use layer.

Buildings falling within each of the Class/Sub-class of urban land use/land cover is represented in the same Sub-class of the Building Footprint Layer. For example, buildings falling within ‘Commercial Retail’ urban land use/land cover area is represented as ‘Commercial Retail’ buildings. A single symbol is used for the representation of all buildings. The Sub-Class details for each building are provided as an attribute. The building footprints overlap with land use/land cover. A major land-use classification system developed under the AMRUT has multiple levels of classification.

### 5.3. Existing Land Use Distribution

Based on the finalization of the Planning Boundary by the Town and Country Planning Department, the total land area of Kashipur Planning Area is 19315 Ha. The existing land use structure of the Kashipur Planning Area and Kashipur MC are represented in **Table 5-3 and Figure 5-8**. Out of the total land in the Kashipur Planning Area, only 14.53% of the land is developed, 2.91% of land cannot be developed as these are water bodies, wetlands, and tree-clad area which needs to be preserved and 82.56% of the land is underdeveloped which includes agricultural related land use and vacant land. The percentage of vacant land is 8.55% in the Kashipur Planning Area which act as an excellent opportunity for the planning area. The entire land use has been classified broadly into 11 categories based on the URDPFI guidelines. These are Residential, Commercial, Manufacturing, Public/Semi-public, Mixed Use, Recreational, Transportation & Communication, Agriculture, Protective and Undevelopable Use Zone, Special areas, and Vacant Land. The Kashipur MC is about 19.12% and Mahua Kheraganj NPP is about 4.3% of the Kashipur Planning Area. The rest 76.58% of the planning area are rural areas.

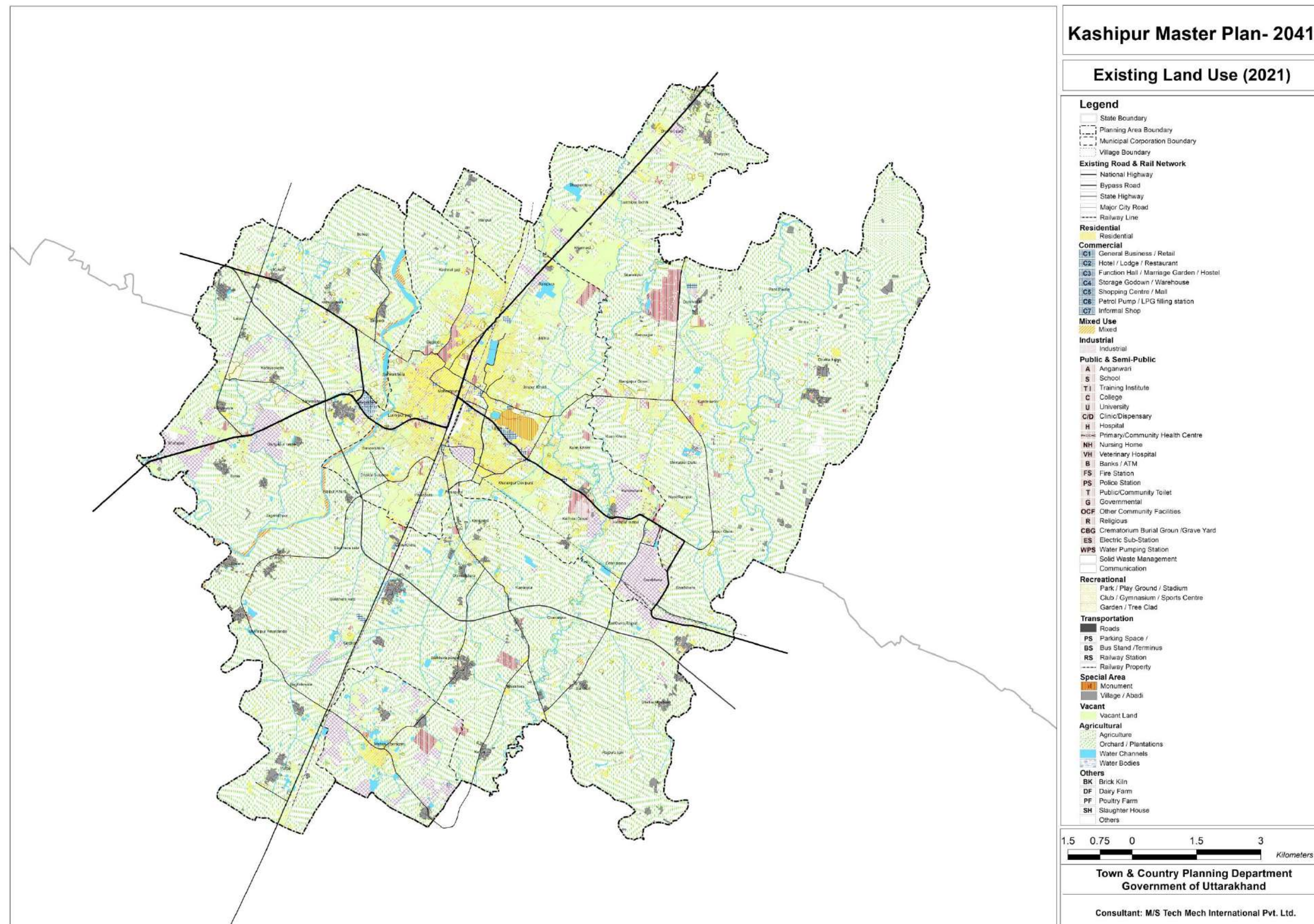
**Table 5-3: Existing Land Use of Kashipur Planning Area, Kashipur MC, and Mahua Kheraganj NPP**

| Land Use Category                            | Kashipur Planning Area |            | Kashipur MC  |            | Mahua Kheraganj NPP |            |
|----------------------------------------------|------------------------|------------|--------------|------------|---------------------|------------|
|                                              | Area                   | Percentage | Area         | Percentage | Area                | Percentage |
| <b>Residential</b>                           | 9.27                   | 4.80       | 5.86         | 15.87      | 0.36                | 4.32       |
| <b>Commercial</b>                            | 1.09                   | 0.56       | 0.70         | 1.90       | 0.03                | 0.32       |
| <b>Manufacturing</b>                         | 6.67                   | 3.45       | 2.07         | 5.60       | 1.36                | 16.34      |
| <b>Public &amp; Semi-Public</b>              | 2.78                   | 1.44       | 1.25         | 3.39       | 0.18                | 2.13       |
| <b>Mixed</b>                                 | 1.48                   | 0.77       | 0.78         | 2.10       | 0.06                | 0.70       |
| <b>Recreational</b>                          | 0.16                   | 0.08       | 0.10         | 0.26       | 0.00                | 0.00       |
| <b>Transportation &amp; Communication</b>    | 6.15                   | 3.18       | 2.95         | 7.98       | 0.39                | 4.71       |
| <b>Agriculture</b>                           | 143.02                 | 74.05      | 13.64        | 36.92      | 5.10                | 61.25      |
| <b>Protective and Undevelopable Use Zone</b> | 5.63                   | 2.91       | 1.65         | 4.47       | 0.30                | 3.63       |
| <b>Special Area</b>                          | 0.40                   | 0.21       | 0.40         | 1.08       | 0.00                | 0.00       |
| <b>Vacant Land</b>                           | 16.51                  | 8.55       | 7.54         | 20.42      | 0.55                | 6.60       |
| <b>Total</b>                                 | <b>193.15</b>          |            | <b>36.94</b> |            | <b>8.32</b>         |            |

Source: Ground Survey



Map 5-1: Existing Landuse of Kasipur Planning Area

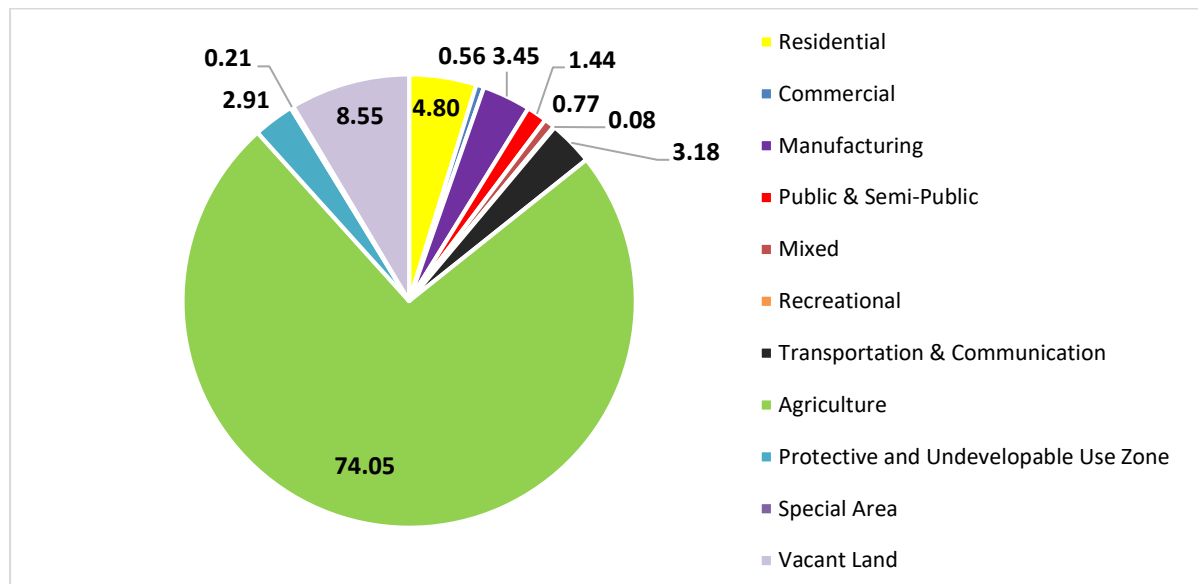


Source: Primary Syrvey

### 5.3.1. Existing Land Use of Kashipur Planning Area

The total area of Kashipur Planning Area is 193.15 Km<sup>2</sup>/19315 Ha with a population of 279342 and an average population density of 14.46 PPH.

*Figure 5-8 Land Use distribution of Kashipur Planning Area*



Source: Ground Survey

*Table 5-4: Detailed Land Use Classification of Kashipur Planning Area*

| Level- 1                      | Level- 2                                                              | Code     | Area_Ha       |
|-------------------------------|-----------------------------------------------------------------------|----------|---------------|
| <b>Residential</b>            | -                                                                     | -        | <b>913.96</b> |
| <b>Commercial</b>             | General Business / Retail / Private Office                            | C-1      | 52.14         |
|                               | Wholesale                                                             | C-2      | 2.07          |
|                               | Function Hall / Marriage Garden / Hostel / Hotel / Lodge / Restaurant | C-3      | 10.25         |
|                               | Storage Godown / Warehouse                                            | C-4      | 43.45         |
|                               | Shopping Centre / Mall                                                | C-5      | 3.11          |
|                               | Petrol Pump / LPG filling station                                     | C-6      | 5.43          |
|                               | Informal Shop                                                         | C-7      | 1.17          |
|                               | <b>Sub-Total</b>                                                      |          | <b>117.62</b> |
| <b>Industrial</b>             |                                                                       | <b>I</b> | <b>657.61</b> |
| <b>Mixed</b>                  |                                                                       | <b>M</b> | <b>148.71</b> |
| <b>Public and Semi-public</b> | Anganwari                                                             | A        | 0.03          |
|                               | School                                                                | S        | 53.37         |
|                               | Training Institute                                                    | TI       | 3.47          |
|                               | College                                                               | C        | 61.07         |
|                               | University                                                            | U        | 32.99         |
|                               | Clinic/Dispensary                                                     | C/D      |               |
|                               | Hospital                                                              | H        | 7.60          |
|                               | Primary/Community Health Centre                                       | PHC      | 0.41          |
|                               | Nursing Home                                                          | NH       | 0.13          |
|                               | Veterinary hospital                                                   | VH       | 0.62          |
|                               | Banks / ATMs                                                          | B        | 1.88          |
|                               | Police Station                                                        | PS       | 1.68          |



| Level- 1                                       | Level- 2                                    | Code    | Area Ha         |
|------------------------------------------------|---------------------------------------------|---------|-----------------|
|                                                | Public/Community Toilet                     | T       | 0.04            |
|                                                | Governmental                                | G       | 19.14           |
|                                                | Other Community Facilities                  | OCF     | 7.36            |
|                                                | Religious                                   | R       | 19.96           |
|                                                | Crematorium Burial Groun /Grave Yard        | CBG     | 7.18            |
|                                                | Electric Sub-Station                        | ES      | 49.69           |
|                                                | Water Treatment Plant/Water Pumping Station | WTS/WPS | 1.21            |
|                                                | Land Fill Site/Solid Waste Management       | SWM     | 0.58            |
|                                                | Communication                               | CM      | 0.48            |
|                                                | <b>Sub-Total</b>                            |         | <b>268.88</b>   |
| <b>Recreational</b>                            | Park / Play Ground / Stadium                | RE      | 15.81           |
|                                                | Club / Gymnasium / Sports Centre            | RC      | 5.07            |
|                                                | Garden / Tree Clad Area                     | G       | 300.63          |
|                                                | <b>Sub-Total</b>                            |         | <b>321.51</b>   |
| <b>Transportation</b>                          | Roads                                       | -       | 618.62          |
|                                                | Parking Space / Area                        | PS      | 2.99            |
|                                                | Bus stand /Terminus                         | BS      | 1.44            |
|                                                | Railway Station                             | RS      | 4.09            |
|                                                | Railway Property                            | -       | 75.58           |
|                                                | <b>Sub-Total</b>                            |         | <b>702.72</b>   |
| <b>Special Area</b>                            | Archaeological Site                         | H       | 39.82           |
|                                                | Village / Abadi Area                        | -       | 366.15          |
|                                                | <b>Sub-Total</b>                            |         | <b>405.97</b>   |
| <b>Vacant</b>                                  | <b>Vacant Land</b>                          | -       | <b>1842.53</b>  |
| <b>Agricultural</b>                            | Agricultural Land                           | -       | 12809.26        |
|                                                | Orchard/Plantation                          | -       | 729.94          |
|                                                | <b>Sub-Total</b>                            |         | <b>13539.21</b> |
| <b>Water Body</b>                              | Water Channel                               | -       | 266.92          |
|                                                | Water Body                                  | -       | 124.03          |
|                                                | <b>Sub-Total</b>                            |         | <b>390.95</b>   |
| <b>Others</b>                                  | Brick kiln                                  | BK      | 2.92            |
|                                                | Dairy farm                                  | DF      | 0.56            |
|                                                | Poultry farm                                | PF      | 8.49            |
|                                                | Other                                       |         | 24.97           |
|                                                | <b>Sub-Total</b>                            |         | <b>36.93</b>    |
| <b>Grand Total of Existing Land Use (2021)</b> |                                             |         | <b>19346.58</b> |

Source: Ground Survey

**Residential:** Residential covers about 4.80% of the land i.e., 9.27 Km<sup>2</sup> of land. It has the highest land use share after Agriculture. A variety of residential typologies could be found in the planning area like residential townships, plotted to house, and detached and semi-detached housing. Residential use is present mainly in the Municipal area nearby the core city or the old city. Outside the municipal area, two other major node residential could be found near Mahua Kheraganj NPP and Kundeswari. Mahua Kheragani is mainly an industrial town and to support these industries residential growth could be seen around it Kundeswari is being developed as a commercial center in the previous master plan and hence leading to the growth of residential around it. Beyond these major nodes, residential growth could be seen in a scattered manner

all around the planning area but majorly toward the north of the planning area toward Ramnagar.

**Commercial and Mixed:** The total area under commercial land use is 1.09 Km<sup>2</sup> which is 0.56% of the total land in the planning area. The major commercial area in the planning area is the Mandi, which is present along NH 734, outside the planning area on the western side and just beside the Dhela river, and is famous for various types of agricultural products. All other commercial areas are mainly found along the junction of National Highways 309 and 734. Near the bus stand, we have a wholesale market which is an important commercial area within the Municipal Area. Many commercial centers could be found in the core area.

The total land under mixed use is 1.48 Km<sup>2</sup> which is 0.77% of the total land. As the city has grown organically the character of the core city is found to be mixed. The mixed-use is mainly residential and commercial, where commercial is found on the ground floor and residential on the upper floor. In the core area all along the roads, mixed-use is found. Along the Dhela river, the entire stretch is found to be mixed-use. With both residential and commercial development i.e., mixed-use along the Dhela river the level of pollution in the Dhela river increases due to the discharge of all the waste in the river.

**Manufacturing:** The total area under manufacturing is 6.67 Km<sup>2</sup> which is 3.45%. Manufacturing has the largest share of land use after Agriculture and Residential in the Planning Area. Manufacturing is a growing sector in Kashipur Planning Area. We can see the growth of industries on all the major roads of Kashipur Planning Area except on the western side of NH 734. Mahua Kheraganj town was upgraded to Municipal Council because of its industrial growth along with residential. The road connecting Kashipur to Thakurdwara has plenty of industries. Also, NH 309 houses a lot of industries in the planning area. New smaller-scale industries are growing nearby Kundeswari and the road towards Ramnagar and these need to be regularized and promote their growth in a particular area.

**Public & Semi-Public:** The total land under Public/Semi-public facilities is 2.78 Km<sup>2</sup> which is 1.44%. the schools, colleges, health institutions, and offices are mainly found in the core city in a scattered manner which has developed according to need with time. Public utility facilities like electrical substations are present outside the Municipal area. Two major nodes for public/semi-public use could be identified, one is IIM Kashipur which is in the Dohari Vakil ward, and another in Kachnal Gosain where colleges and Offices could be found.

**Recreational:** The percentage of recreational land in the Planning Area is 0.08% which is 0.16 Km<sup>2</sup> of land. The percentage is too low for the planning area and highlights the lack of recreational space in the Planning Area. These recreational zones are found on the eastern side of NH 309 where new colonies have been made. Beyond this, there is a stadium and a few other parks have been demarcated towards the Ramnagar road to where new plotted development is seen.

**Transportation & Communication:** The total land under Transportation and Communication is 6.15 Km<sup>2</sup> which is 3.18% of the total land. It is the fourth highest land use in the area. Kashipur has good transportation facilities. Two national highways pass through the planning area which is NH 309 and NH 734. It has a railway station, a public bus stand, and a private bus stand that connects Kashipur to the surrounding region and the headquarters, and the capital. Kashipur growing in trade and commerce, industry and educational hubs needs a good transport network to facilitate all these facilities.

**Agriculture:** The percentage of agricultural land in the Planning Area is 74.05% which is 143.02 Km<sup>2</sup> of land. It is the highest land use in the planning area. As the contours do not vary much it is an ideal area for agricultural use. And many industries in the planning area are based on agricultural produce like rice mills. So, agricultural use plays a very important role in the planning area in economic terms which also helps us with environmental factors.

**Protective and Undevelopable Use Zone:** The total land under the Protective and Undevelopable Use Zone is 5.63 Km<sup>2</sup> which is 2.91% of the total land. Along with the Dhela river, there are a lot of streams flowing through the planning area which serve the agricultural land which needs to be protected. along with water bodies, there is three clad area that also needs to be protected.

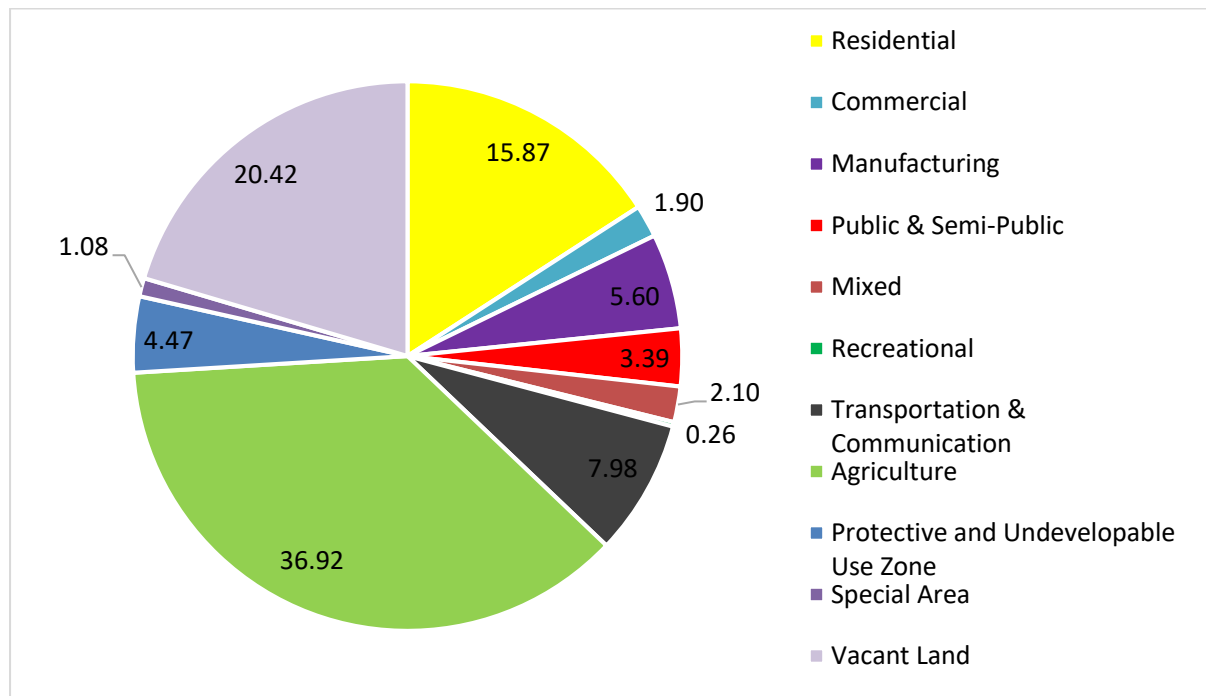
**Special Area:** The percentage of Special Area land in the Planning Area is 0.21% which is 0.40 Km<sup>2</sup> of land. The special area is the heritage area which is an ASI-identified site. The site is present along with a lake and hence the entire area is eco-sensitive and needs to be dealt with with proper precautions. Development along the area is predominant and needs to be controlled.

**Vacant Land:** The total vacant land is 16.51 Km<sup>2</sup> which is 8.55% of the total land. This gives us scope for more development in the planning area. However, out of the total vacant land, 54% of them are already plotted and the rest is just vacant. So, we can see residential development has been taking place in the planning area.

### 5.3.2. Existing Land Use at Kashipur Municipal Corporation level

The total area of Kashipur Municipal Corporation area is 36.94 Km<sup>2</sup>/3694 Ha with a population of 188403 and an average population density of 47.60 PPH.

*Figure 5-9 Land Use distribution of Kashipur MC*



Source: Ground Survey

**Residential:** Kashipur MC has a total of 5.86 Km<sup>2</sup> of land which is 15.87% of the total land. The residential area is concentrated in the core city of the MC which is at the junction of the two National Highways. The city is divided into parts by the railway line which is passing through the center of the city. On both, sides we can see residential growth but on the western side the character is old and on the eastern side the character of the city is new and plotted and apartments could be found. The new residential colonies are growing towards the north of the city along the Ramnagar road. New residential colonies along with recreational spaces have been coming up in these areas. So residential development is growing at a fast pace in the Municipal Area (refer to **Figure 5-9**).

**Commercial and Mixed:** Commercial is 1.90% (0.70 Km<sup>2</sup>) in the Municipal Area and mixed is 2.10% (0.78 Km<sup>2</sup>). Both combined form 4% of the Municipal Corporation land. As Kashipur is famous for its trade and commerce products and it acts as a regional center for trade and commerce in its immediate surrounding. The two major commercial centers i.e., the mandi and the wholesale market fall within the Municipal boundary and acts as an attraction point for the nearby regions. All along the roads of the core area on both sides, we can find commercial as

well as mixed-use activities. The mixed-use is mainly commercial and residential. The character of the city is mixed-use. The percentage of mixed-use is higher than the percentage of commercial in the MC area. Mixed-use is mainly found at a smaller scale at the household level but if regularized then it can be incorporated at a higher level which would help us meet the needs of the city as well as maintain its character.

**Manufacturing:** 5.6% (2.07 Km<sup>2</sup>) of land is under Manufacturing in the MC area which is the highest just after residential. Kashipur is growing in the industrial sector due to its plain lands and will be growing in the future as well. Three industrial estates from SIDCUL, one from DIC, and others from private players. Within the MC area, the major industrial growth is towards Bazpur and near the railway station.

**Public & Semi-Public:** The total land under public/semi-public is 3.39% (1.25 Km<sup>2</sup>). Schools, colleges, and health centers are present mainly within the core area. A college that contributes to the major area is along the road towards Bazpur.

**Recreational:** The percentage of recreational is very less that is, 0.26% (0.1 Km<sup>2</sup>) of the land. There is one stadium and a few parks in the planning area. The need for recreational space is high in the planning area.

**Transportation & Communication:** 7.98% (2.95 Km<sup>2</sup>) of land is under transport and communication in the MC area which is the third highest and is a very good character for the city. The facilities like railway station, and bus stand is present in the core city. Two national highways pass through the city connecting it to the other regions. The communication system is also in good working condition. Due to industrial growth, the city also needs a good transportation network.

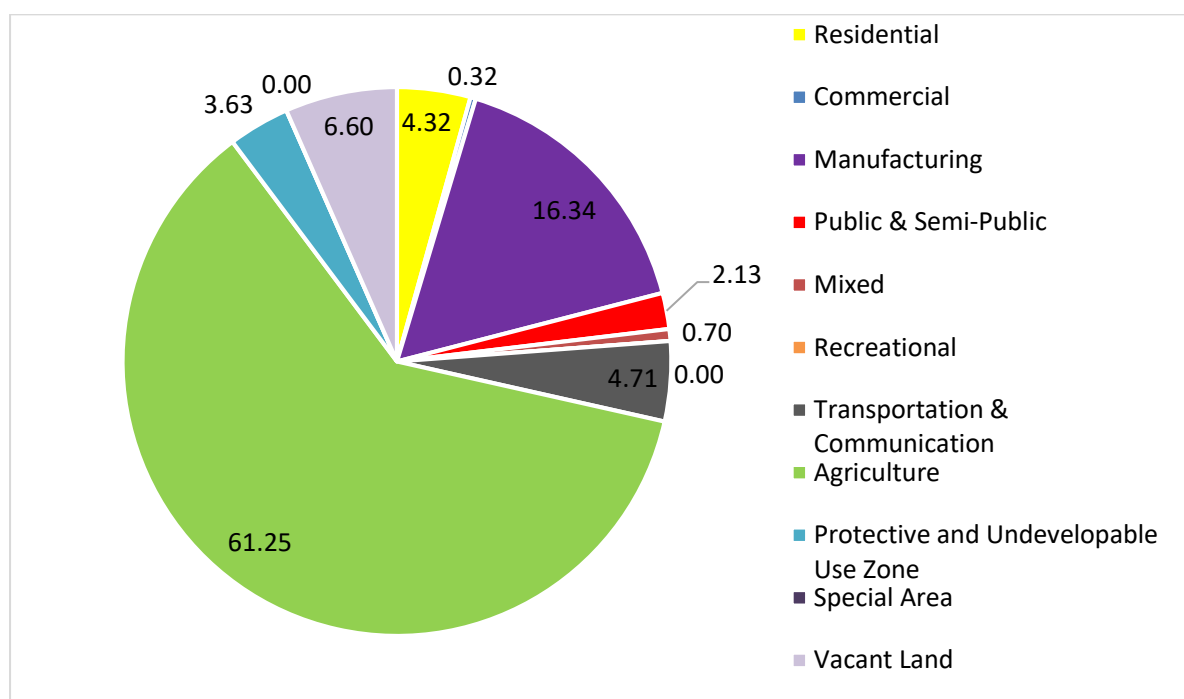
**Agriculture:** The highest land use in the planning area is Agriculture with 36.92% (13.64 Km<sup>2</sup>) of land under it. In 2019, 10 revenue villages were added to the Municipal boundary and most of these villages had agricultural land thus the percentage of agricultural land is high in the Municipal area too. Due to its plain land agriculture, Kashipur has an ideal topography for agriculture. The industries in Kashipur are also based on agricultural products like rice mills.

**Protective and Undevelopable Use Zone:** The total land under the Protective and Undevelopable Use zone is 4.47% (0.30 Km<sup>2</sup>). The total water bodies, streams, canals, and tree-clad areas which need to be protected and should not be altered for development purposes have been classified in this land use. The Municipal area has the Dhela river, and few water bodies and many streams pass through.

**Special Area:** Special area in Kashipur MC is 1.08% (0.40 Km<sup>2</sup>) of land. Within the MC there ASI is a recognized site that is a heritage site and an important tourist destination for the entire planning area.

**Vacant Land:** The percentage of vacant land in the planning area is high i.e., 7.54 Km<sup>2</sup>/20.42%, which is an opportunity for the preparation of the master plan. But among all the vacant lands 57% of the land is already plotted which means it is under residential and 43% is vacant.

**Figure 5-10**



Source: Ground Survey

#### **5.4. Land Availability for Future Development**

The land which is currently not underbuilt environment can be considered as potential land for future development. In this regard, vacant land and agricultural land have been considered potential land for future development. As per current land use, there is 14302 hectare of land under agricultural use which is 74.05% of the total land of Planning Area, and 1651 hectares of vacant land which stand for 8.55% area of Planning Area. In total 15953 hectares of land is available for potential future development which constitutes 82.6% of the total Planning Area.

#### **5.5. Land Required for Different Land Uses**

Based on the requirements of the planning area and future gross density to be achieved, the proposed land uses classification has been derived. The entire planning area is divided into

seven broad land uses, which are residential, commercial, manufacturing/industrial, public & semi-public, recreation, transport & communication, and special area and water bodies.

The total projected population for Kashipur Planning Area for 2041 is 279342. According to the URDPFI Guidelines, density should be 75-125 PPH and 100-150 PPH for small towns and medium towns respectively. The average existing population density of the Kashipur Planning Area is 101.21 PPH for the whole planning area. However, the existing density is low and considering the existing low density taking medium town density will be a drastic change in the planning area. It would be better to provide a smooth transition, and it is preferred to consider the small-town density for future development. Hence, by taking 125 PPH as the density base, the total developable area comes out to be 6,356.63 ha (refer to **Table 5-1**).

**Table 5-5: Total Developable Area for Kashipur Planning Area**

| Population | Density (PPH) | Developable Area (ha) |
|------------|---------------|-----------------------|
| 794579     | 125           | 6,356.63              |

Source: Analysis by Town and Country Planning Department

**Table 5-6** represents the classification of land uses for the industrial city, normal cities, the previous master plan and the adopted land use classification for Kashipur Planning Area. For residential land use, as per **Table 5-6**, industrial towns suggest 25% and normal town suggests 39% and the previous year's master plan has 52.32% of the land. Based on the requirement for residential land 40% of the land is allocated for residential purposes in the Rudrapur Planning Area which comes to be about 2542.65 Ha out of which 927 Ha is already existing and we need an additional 1615.65 Ha of land till 2041.

For commercial as industrial town classification suggests, 4% has been adopted for the planning area. Hence the additional land required in commercial areas is 145.27 Ha.

For manufacturing or industrial land use, the industrial town land use structure suggests 30-35% a normal town suggests 8% and in the previous master plan, 21.5% of the land was suggested. As Kashipur is an industrial city, it also has a lot of influence from trade and commerce and the vision is also to maintain Kashipur as Industrial City. Hence, the percentage is kept at 20% which calls for an additional 604.33 Ha of land for industries.

The public semi-public land use percentage is kept at average i.e., 7% from suggested in industrial towns, normal towns, and previous master plans. For this, additional land of 166.96 Ha is required.



The recreation land uses are kept at 12%, which is higher than the suggested percentage of the previous master plan. To achieve 12% of recreational facilities an additional 746.80 Ha of land is required.

Kashipur being an Industrial city needs good transportation and communication facility for easy movement of goods and vehicles. Also, as the vision states to become an trade centre, the transportation facilities need to be of high quality and hence, the percentage is kept at 12% for which an additional 147.80 Ha of land is required.

The rest of the land in the Kashipur Planning Area will be allocated as green or open areas for agricultural purposes and shall be reserved for the future growth of the city.

*Table 5-6: Proposed Land Use Classification*

| Land Use                                  | Industrial Town           | Normal Town | Previous Master Plan | Adopted for KPA | Existing Land          | Total Require Land | Additional Required Land |
|-------------------------------------------|---------------------------|-------------|----------------------|-----------------|------------------------|--------------------|--------------------------|
|                                           | All figures in Percentage |             |                      |                 | All figures in Hectare |                    |                          |
| <b>Residential</b>                        | 20-25                     | 43-48       | 52.32                | 40              | 927                    | 2542.65            | 1615.65                  |
| <b>Commercial</b>                         | 2-4                       | 4-6         | 2.96                 | 4               | 109                    | 254.27             | 145.27                   |
|                                           | --                        | --          | --                   | --              | 148                    |                    | -148.00                  |
| <b>Manufacturing</b>                      | 30-35                     | 7-9         | 21.5                 | 20              | 667                    | 1271.33            | 604.33                   |
| <b>Public &amp; Semi-Public</b>           | 6-8                       | 6-8         | 5.28                 | 7               | 278                    | 444.96             | 166.96                   |
| <b>Recreation</b>                         | 12-15                     | 12-14       | 3.84                 | 12              | 16                     | 762.80             | 746.80                   |
| <b>Transportation &amp; Communication</b> | 10-12                     | 10-12       | 14.09                | 12              | 615                    | 762.80             | 147.80                   |
| <b>Special areas and water bodies</b>     | Balance                   | Balance     |                      | Balance         | Balance                |                    |                          |

## 6. Housing and Slum

Housing is one of the most basic human needs as well as an indicator of the standard of living of the people. Economic development is also influenced by the housing sector developments as it provides jobs to various people during construction and maintenance times. It is an important component of the human development index as it provides shelter, safety, and warmth. Housing provides a sense of security, possession, and status.

### 6.1. Existing Housing Stock

The number of households overall has become more than doubled in the year 2011 as compared to 2001 as depicted in **Table 6-1** which shows the increase in population in the area. In the urban area, Kashipur MC has a growth of households by 65.3%. Overall the growth of the urban area is 65.30% and that of rural areas is 49.7%. The growth in urban areas is more because of better employment, and infrastructure facilities. The overall growth of the KPA area is 60.4%.

*Table 6-1: Growth of Households*

| State/District/City/            | Total Population | No: of Households | Percentage Growth of Households | Household Size |
|---------------------------------|------------------|-------------------|---------------------------------|----------------|
| <b>2001</b>                     |                  |                   |                                 |                |
| <b>Total Urban(Kashipur MC)</b> | 119162           | 20189             | 45.50%                          | 5.9            |
| <b>Rural</b>                    | 69529            | 11376             | 50.20%                          | 6.11           |
| <b>KPA</b>                      | 188691           | 31565             | 46.50%                          | 6.02           |
| <b>2011</b>                     |                  |                   |                                 |                |
| <b>Total Urban(Kashipur MC)</b> | 175819           | 33370             | 65.30%                          | 5.26           |
| <b>Rural</b>                    | 90939            | 17025             | 49.70%                          | 5.34           |
| <b>KPA</b>                      | 266758           | 50395             | 60.40%                          | 5.2            |

Source: Census of India, 2001 & 2011

The household size of Kashipur MC has reduced from 5.9 to 5.26. It can be observed that in 2001 the household size of rural areas i.e., 6.11, was higher than the household size of urban areas i.e., 5.97. But in 2011 it has become almost equal, the household in urban areas is 5.26 and in rural areas is 5.34. This is because people have been shifting from rural to urban areas. The overall household size of the planning area is 5.2.

*Figure 6-1: Housing in Old city area*



*Figure 6-2: Housing in the Old City area*



*Figure 6-3: Housing in the New city area*



*Figure 6-4: Housing in the New city area*



### **6.1.1. Qualitative Aspects of Housing**

#### **6.1.1.1. Housing Characteristics**

The city of Kashipur is divided into two parts by the railway line passing through the city. The two areas, namely the new area and the old area are present on both sides of the railway line. The character of the old city is entirely different from the new area. Similarly, there is a difference in the type of housing stock and other elements related to housing. The difference between both the areas can be seen in **Figure 6-21, Figure 6-2, Figure 6-3 & Figure 6-4.**

The old area has narrow streets and drains with low-rise buildings whereas the new areas have broad streets and medium-rise buildings. There is no parking space in the old area and vehicles have been parked on the street making the street even more narrow. In new areas also the parking space is limited but due to broader roads, the congestion is limited.

### 6.1.1.2. Type of Housing Structures

Types of housing structures have been classified into 4 categories according to construction material used and considering the durability of the structure, i.e., Permanent, Semi-permanent, Temporary (Serviceable and Non-Serviceable), and Unclassifiable. **Table 6-2** reveals that the majority of the structures are permanent in the case of both urban and rural areas. The permanent structures account for 94.27% and 86.10% in Kashipur MC.. The total permanent structure in urban areas is 93.80% whereas in rural areas is 80.76% and the semi-permanent structures are 3.60% in urban and 9.57% in rural. The affordability of people in urban areas is more than in rural which leads to this difference in the housing structure. In addition to this, the total temporary households are 1.80% in urban and 9.32% in rural areas. Out of which .67% and 3.62% are non-serviceable. The total permanent structure for the planning area is 89.58%, semi-permanent is 5.69%, temporary is 2.78%, out of which 2.78% are serviceable and 1.61% are non-serviceable and 0.33% are unclassifiable. Overall, the housing structures are in good condition in the majority of the area but our focus should be on converting all households to permanent structures.

*Table 6-2: Percentage distribution of Households by Type of Structure of Census Houses, 2011*

| Area                            | Permanent | Semi-Permanent | Temporary |             |                 | Unclassifiable |
|---------------------------------|-----------|----------------|-----------|-------------|-----------------|----------------|
|                                 |           |                | Total     | Serviceable | Non-Serviceable |                |
| <b>Total Urban(Kashipur MC)</b> | 94.27%    | 3.60%          | 1.80%     | 1.13%       | 0.67%           | 0.33%          |
| <b>Rural</b>                    | 80.76%    | 9.57%          | 9.32%     | 5.69%       | 3.62%           | 0.35%          |
| <b>KPA</b>                      | 89.58%    | 5.69%          | 4.40%     | 2.78%       | 1.61%           | 0.33%          |

Source: Census of India, 2011

### 6.1.1.3. Distribution of Persons by Living Room

The distribution of persons by living room of both urban and rural areas of Kashipur along with the total population residing in it has been shown in **Table 6-3**. There are 6 categories namely, no exclusive room, one room, two rooms, three rooms, four rooms, five and above. In Kashipur MC Urban area majority i.e., 34.75% of people have single rooms, 31.07% have two rooms, 17.235 have three rooms, 10.24% have four rooms, 5.81 % have five and above rooms and only 0.91% do not have any exclusive rooms. The percentage of two rooms household is slightly higher in Kashipur MC which indicates that people staying with their families as much opportunities available in urban area . similarly more single room ratio shows that the number

of bachelor workers are more in urban area due to job opportunity availability. middle class household is more in kashipur MC area and also the number of higher-class families is very less kashipur Urban area.

**Table 6-3: Distribution of Households by Number of Living Room**

| Area                            | No exclusive room | One room | Two rooms | Three rooms | Four rooms | Five rooms and above |
|---------------------------------|-------------------|----------|-----------|-------------|------------|----------------------|
| <b>Total Urban(Kashipur MC)</b> | 0.91%             | 34.75%   | 31.07%    | 17.23%      | 10.24%     | 5.81%                |
| <b>Rural</b>                    | 1.37%             | 42.04%   | 30.82%    | 13.74%      | 7.53%      | 4.51%                |
| <b>KPA</b>                      | 1.10%             | 37.29%   | 30.81%    | 15.98%      | 9.38%      | 5.44%                |

Source: Census of India, 2011

In rural areas the percentage of one room i.e., 42.04 is higher than in urban areas i.e., 35.02%, also the percentage of no exclusive room is higher. It indicates that the number of people in rural areas is more singular as many people travel to urban areas leaving behind their families and also the affordability of people in rural areas is less as compared to urban areas. Overall, the percentage of one room is higher in KPA with 37.29% than in two rooms i.e., 30.81%, and the percentage decreases with an increase in the number of rooms.

### **6.1.2. Ownership Status**

The tenure status of houses in both urban and rural areas of Kashipur along with the total population residing is highlighted in **Table 6-4**. The status has been divided into three categories which include owned, rented, and others. The percentage of owned houses forms the majority in Kashipur MC, which is 75.1% a. The rental houses are very limited rural area. But there are a lot of people who come to urban areas for work and depend on rental housing. The rental houses might not be registered under the rental scheme and there are chances of practicing unfair means of renting houses. 75.10% of houses are owned in the total urban area and 89.44% are owned in rural areas, which is higher than in urban areas. in general people who own land in rural areas stay in rural areas or move to urban areas for better opportunities. In the planning area, 80.03% are owned, 15.92% are rented and 4.05% are others. For details refer to Error! Reference source not found.. Overall, we can infer that there is a lack of rental housing in both urban and rural areas of the planning area, but the requirement for rental housing is much more in urban areas as people travel from nearby places for employment as well as education in the Kashipur MC. So, the provision of rental housing should be catered to through the master plan.

**Table 6-4: Percentage distribution of Households by Tenure Status of Houses, 2011**

| Area                            | Owned  | Rented | Any others |
|---------------------------------|--------|--------|------------|
| <b>Total Urban(Kashipur MC)</b> | 75.10% | 20.75% | 4.15%      |
| <b>Rural</b>                    | 89.44% | 6.58%  | 3.98%      |
| <b>KPA</b>                      | 80.03% | 15.92% | 4.05%      |

Source: Census of India, 2011

### 6.1.3. Housing Condition

The housing condition of housing stock has been assessed qualitatively as well as based on Census data. The qualitative housing condition has been considered the predominant use of building material. Burnt bricks are predominantly used for both walls and roofs. For the floor, cement is used mostly but mud is also preferred by people.

The housing condition as per Census 2011 has been represented in **Table 6-5**. It shows that 68.35% of houses are in good condition, 29.88% are liveable and 1.77% are dilapidated in Kashipur MC. We can infer that Kashipur MC has better housing conditions as compare to rural areas. In rural areas 41.08% are in good condition, 52.18% are liveable and 6.745 are dilapidated. This is a concern for the planning area. in the entire planning area, 59.24% are good, 37.31% are liveable and 3.45% are dilapidated. The kuccha and semi-pucca houses need to be converted to pucca houses. Good housing conditions should be established in the planning area

**Table 6-5: Percentage distribution of Households by Housing Condition, 2011**

| Area                            | Good   | Liveable | Dilapidated |
|---------------------------------|--------|----------|-------------|
| <b>Total Urban(Kashipur MC)</b> | 68.35% | 29.88%   | 1.77%       |
| <b>Rural</b>                    | 41.08% | 52.18%   | 6.74%       |
| <b>KPA</b>                      | 59.24% | 37.31%   | 3.45%       |

Source: Census of India (2011)

## 6.2. Availability of Utilities and Services

### 6.2.1. Water Supply

As per Housing Level Primary Census Abstract (HLPCA) 2011, the utilities and services discussed in this part includes water supply, sanitation, lighting, and fuel. The distribution of water supply as depicted in **Table 6-6** reveals that the main source of drinking water in Kashipur MC is hand pumps with 47.70% The next major source for Kashipur MC is tap water from a treated source 11.47% of water in Kashipur MC is from an untreated source i.e., The water table in Kashipur is high this is why people use hand pumps. But treated water should be

made accessible to all citizens of the planning area and the use of untreated water should be eradicated.

From **Table 6-6** we can see that both urban and rural areas' main source of drinking water is hand pumps and then it is tap water from a treated source and then from an untreated source. Tube well has about 11.92% in urban areas and 3.03% in rural areas. Water from untreated sources is more in urban areas. Pollution is high in urban areas which pollutes the water on the surface as well as underground water. There is a need to introduce an organized system to provide water to the people. Overall, in the entire planning area, 52.46% of people use a hand pump, 27.11% use tap water from a treated source, 10.52% from an untreated source, and 8.57% from tube wells. The rest sources like wells, rivers, canals, ponds, and other sources together form 1.00% of the total water sources.

**Table 6-6: Percentage distribution of Households by the main source of Water Supply, 2011**

| Area                            | Tap water from a treated source | Tap water from an untreated source | Covered well | Un-covered well | Hand pump | Tube well/ Borehole | Spring | River/ Canal | Tank/ Pond/ Lake | Other sources |
|---------------------------------|---------------------------------|------------------------------------|--------------|-----------------|-----------|---------------------|--------|--------------|------------------|---------------|
| <b>Total Urban(Kashipur MC)</b> | 27.58%                          | 11.47%                             | 0.10%        | 0.01%           | 47.70%    | 11.92%              | 0.01%  | 0.00%        | 0.24%            | 0.97%         |
| <b>Rural</b>                    | 29.39%                          | 8.76%                              | 0.17%        | 0.08%           | 57.37%    | 3.03%               | 0.01%  | 0.07%        | 0.04%            | 1.08%         |
| <b>KPA</b>                      | 27.11%                          | 10.52%                             | 0.12%        | 0.03%           | 52.46%    | 8.57%               | 0.01%  | 0.02%        | 0.16%            | 1.00%         |

Source: Census of India (2011)

The location of the water source details is represented in **Table 6-7**. In both the urban areas more than 90% of the water sources are within premises which is a very good indication for the planning area. In the total urban area, 92.06% are within the premises which are higher than the rural areas which have 83.18% sources within premises. The percentage of near premises sources are higher in rural areas by 12% in urban areas. In the entire planning area, the drinking water sources within premises are 89.35%, near premises are 8.66%, and away are 1.99%. Overall, the location of water resources is good in the planning area. but there are still 1.99% of people who have to travel far away for water.



**Table 6-7: Percentage distribution of Households by Location of Drinking Water, 2011**

| Area                            | Within premises | Near premises | Away  |
|---------------------------------|-----------------|---------------|-------|
| <b>Total Urban(Kashipur MC)</b> | 92.06%          | 6.86%         | 1.08% |
| <b>Rural</b>                    | 83.18%          | 12.96%        | 3.86% |
| <b>KPA</b>                      | 89.35%          | 8.66%         | 1.99% |

Source: Census of India (2011)

### 6.2.2. Lighting

The various sources of lighting in the planning areas have been depicted in **Table 6-8** as per the census 2011. The major source of lighting is electricity in both the urban areas with 96.48% in Kashipur MC. Few people also use kerosene which is 3.05% MC. The percentage of electricity is slightly higher in MC. The use of solar energy is negligible in kashipur urban area.. In the total urban area, the major source of light is electricity whereas in rural areas it is low i.e., 79.35%. The use of kerosene is higher in rural areas, which is 19.15%, than in urban areas, which is 3.05%. However, though negligible, the use of solar energy is higher in rural areas than in urban areas. Overall, in the planning area, 90.86% have electricity as a source, 8.36% have kerosene as a source and 0.02% of solar energy is used. 0.49% of houses still do not have any lighting in their homes. Lighting needs to be provided especially in rural areas and instead of kerosene or other oils, all the houses should be covered in electricity. Most importantly solar energy should be encouraged and it is an excellent source of light that can be used with natural power. It saves electricity, cost, and power.

**Table 6-8: Percentage distribution of Households by Main Source of Lighting, 2011**

| Area                            | Electricity | Kerosene | Solar energy | Other Oil | Any Other | No lighting |
|---------------------------------|-------------|----------|--------------|-----------|-----------|-------------|
| <b>Total Urban(Kashipur MC)</b> | 96.48%      | 3.05%    | 0.01%        | 0.05%     | 0.14%     | 0.27%       |
| <b>Rural</b>                    | 79.35%      | 19.15%   | 0.05%        | 0.15%     | 0.30%     | 1.00%       |
| <b>KPA</b>                      | 90.86%      | 8.36%    | 0.02%        | 0.08%     | 0.19%     | 0.49%       |

Source: Census of India (2011)

### 6.2.3. Sanitation

In Kashipur MC urban area , 93.47% of houses are having toilets within their premises out of which 68.36% are having septic tanks and 18.24% are having piped sewer systems. The percentage of pit latrine toilets is 6.02% while night soil disposal in an open drain is done by 0.43% of households. 6.53% of households do not have a toilet facility within the premises. In the case of rural areas, 67.81% of houses are having toilets within their premises which are very low compared to urban areas. Out of this 50.85% are having septic tanks and 7.81% are

having piped sewer systems. The percentage of pit latrine toilets is 5.36% while night soil disposal in the open drain is done by 0.99% of the households (refer to **Table 6-9**). And 32.19% of households do not have a toilet facility. A large number of people in rural areas do not have any sanitation and are carried out outdoors, which is an issue for the planning area as it can cause various diseases to the people and is not hygienic. In the entire planning area, 84.87% of houses have a toilet within the premises and 15.13% do not have one within the premises. 63.38% of houses have septic tanks, 14.10% have piped sewer systems, 5.87% have pit latrines and 0.37% have service latrines. The majority of people in the planning area have septic tanks and there is a lack of piped sewer system. Piped sewer system should be introduced as it is a solution to cater to the sanitation needs of the present as well as the future city of Kashipur (refer to **Table 6-9**).

**Table 6-9: Distribution of Households by Sanitation, 2011**

| Area                     | Number of households having latrine facility within the premises | Flush/pour-flush latrine connected to |             |               | Pit latrine                       |                       | Night soil disposed into an open drain | Service Latrine             |                               | Number of households not having a latrine facility within the premises |
|--------------------------|------------------------------------------------------------------|---------------------------------------|-------------|---------------|-----------------------------------|-----------------------|----------------------------------------|-----------------------------|-------------------------------|------------------------------------------------------------------------|
|                          |                                                                  | Piped sewer system                    | Septic tank | Other systems | With slab/ventilated improved pit | Without slab/open pit |                                        | Night soil removed by human | Night soil serviced by animal |                                                                        |
| Total Urban(Kashipur MC) | 93.47%                                                           | 18.24 %                               | 68.36 %     | 0.35%         | 5.51%                             | 0.52%                 | 0.43%                                  | 0.07%                       | 0.00%                         | 6.53%                                                                  |
| Rural                    | 67.81%                                                           | 7.81 %                                | 50.85 %     | 1.82%         | 4.55%                             | 0.81%                 | 0.99%                                  | 0.72%                       | 0.27%                         | 32.19%                                                                 |
| KPA                      | 84.87%                                                           | 14.10 %                               | 63.38 %     | 0.83%         | 4.98%                             | 0.59%                 | 0.62%                                  | 0.28%                       | 0.09%                         | 15.13%                                                                 |

Source: Census of India (2011)

Several households having bathing facilities within the premises are represented in **Table 6-10**. In the case of Kashipur MC, 85.80 % of households have a bathing facility within premises and 7.35% have outside premises. Out of the total bathing facility, only 6.85% of houses have enclosures without a roof in Kashipur MC 85.80% of houses are having a bathing facility within their premises in the case of urban areas while in the case of rural areas it is only 55.53%. Almost 19.65% of houses do not have proper bathing facility sources (Enclosure without roof) while 24.82% of houses have no facility at all, this is a huge concern for rural areas. In total 75.62% have bathroom facilities with a roof, 11.24% have a bathroom without a roof and 13.14% do not have a bathing facility.

**Table 6-10: Percentage distribution of Households by bathing facility provisions**

|  | Yes | No |
|--|-----|----|
|--|-----|----|

| Area                            | Bathroom | Enclosure without Roof |        |
|---------------------------------|----------|------------------------|--------|
| <b>Total Urban(Kashipur MC)</b> | 85.80%   | 6.85%                  | 7.35%  |
| <b>Rural</b>                    | 55.53%   | 19.65%                 | 24.82% |
| <b>KPA</b>                      | 75.62%   | 11.24%                 | 13.14% |

#### 6.2.4. Drainage

The wastewater outlet connected to closed drainage, open drainage, and no drainage system is shown in **Table 6-11**. As shown in the table, the percentage of open drainage is maximum in both the urban areas and rural areas.. The scenario of open drainage is similar in both urban and rural areas ranging from 72-75% while closed drainage is higher in urban areas i.e., 18.83% while in rural areas it is 10.14%. Houses having no drainage are higher in rural areas i.e., 17.40% than in urban areas. Overall, 74.29% of houses, 16.02% have closed drainage and 9.69% have no drainage. In the planning area, there is a need to provide a proper closed drainage system. Without drainage, it can cause waterlogging in areas and open drains are generally clogged by solid wastes so a closed drainage system is very much needed in the planning areas.

*Table 6-11: Percentage distribution of Households by Storm Water Facility*

| Area                            | Closed drainage | Open Drainage | No Drainage |
|---------------------------------|-----------------|---------------|-------------|
| <b>Total Urban(Kashipur MC)</b> | 19.32%          | 74.39%        | 6.29%       |
| <b>Rural</b>                    | 10.14%          | 72.46%        | 17.40%      |
| <b>KPA</b>                      | 16.02%          | 74.29%        | 9.69%       |

Source: Census of India (2011)

#### 6.2.5. Cooking Fuel

The details of cooking fuel used for cooking purposes are given in **Table 6-12**. In the total Kashipur urban area, 74.58% use LPG/PNG, and 21.56 % use firewood the scenario is the opposite in rural areas.. The percentage of firewood usage is highest in rural areas i.e., 66.20%, then LPG/PNG with 21.56%. Overall, in the entire planning area, 55.37% of people use LPG/PNG, 36.35% use firewoods, cow dung is used by 3.4% of people, 2.21% use kerosene, 1.94% crop residue, 0.22% use biogas. A considerable amount of people use firewood and kerosene which causes pollution. The use of biogas should be encouraged more in rural areas because the resources are easily available and it is a renewable source of energy.

Table 6-12: Percentage distribution of Households by Type of Fuel used for Cooking, 2011

| Area                     | Fire-wood | Crop residue | Cow dung cake | Coal, Lignite, Charcoal | Kerosene | LPG/PNG | Electricity | Biogas | Any Other | No Cooking |
|--------------------------|-----------|--------------|---------------|-------------------------|----------|---------|-------------|--------|-----------|------------|
| Total Urban(Kashipur MC) | 19.28 %   | 1.19%        | 1.22 %        | 0.33%                   | 3.10%    | 74.58%  | 0.01%       | 0.05 % | 0.00 %    | 0.24%      |
| Rural                    | 66.20 %   | 3.49%        | 7.15 %        | 0.17%                   | 0.70%    | 21.56%  | 0.02%       | 0.56 % | 0.01 %    | 0.14%      |
| KPA                      | 36.35 %   | 1.94%        | 3.40 %        | 0.27%                   | 2.21%    | 55.37%  | 0.01%       | 0.22 % | 0.01 %    | 0.22%      |

Source: Census of India (2011)

### 6.2.6. Kitchen Facilities

The percentage of households cooking within their house is 95.53% in Kashipur urban area , 4.22% have cooking outside the house and only 0.25% have no cooking facilities. Out of 95.53%, 78.38% of households have a kitchen and 17.08% have no kitchen. As compare to urban area, cooking facilities inside the house is much lower in rural areas i.e., 75.72%. Among these, the percentage of households not having a separate kitchen is higher in rural areas than in urban areas i.e., 33.73% Outside cooking facilities are much higher in rural areas i.e., 24.12% than in urban areas which are 4.22%. but no cooking facilities are slightly higher in urban areas than in rural areas. Overall 89.05% of households have inside cooking facilities, 10.72% have and only 0.23% have no cooking facilities (refer to **Table 6-13**).

Table 6-13: Percentage distribution of Households by Kitchen Facilities

| Area                     | Cooking inside house | Has Kitchen | Does not have a kitchen | Cooking outside the house | Has Kitchen | Does not have a kitchen | No Cooking |
|--------------------------|----------------------|-------------|-------------------------|---------------------------|-------------|-------------------------|------------|
| Total Urban(Kashipur MC) | 95.53%               | 78.38 %     | 17.08 %                 | 4.22%                     | 0.85%       | 3.37%                   | 0.25%      |
| Rural                    | 75.72%               | 42.00 %     | 33.73 %                 | 24.12%                    | 7.45%       | 16.69 %                 | 0.16%      |
| KPA                      | 89.05%               | 65.16 %     | 23.86 %                 | 10.72%                    | 3.09%       | 7.63%                   | 0.23%      |

Source: Census of India (2011)

## 6.3. Housing Policy and Status of housing scenario under PMAY:

### 6.3.1. National Urban Housing and Habitat Policy 2007

The shelter is a basic human need next only to food and clothing. At the end of the 10<sup>th</sup> Five Year Plan, the housing shortages were estimated to be 24.7 million. However, urban areas in our country are also characterized by a severe shortage of basic services like potable water, well-laid drainage system, sewerage network, sanitation facilities, electricity, roads, and

appropriate solid waste disposal. It is these shortages that constitute the rationale for a policy focus on housing and basic services in urban areas. This policy intends to promote sustainable development of habitat in the country to ensure an equitable supply of land, shelter, and services at affordable prices to all sections of society. Given the magnitude of the housing shortage and budgetary constraints of both the Central and State Governments, it is amply clear that Public Sector efforts will not suffice in fulfilling the housing demand. Given this scenario, the National Urban Housing, and Habitat Policy, 2007 focuses the spotlight on multiple stakeholders namely, the Private Sector, the Cooperative Sector, the Industrial Sector for labor housing, and the Services/Institutional Sector for employee housing. In this manner, the Policy will seek to promote various types of public-private partnerships for realizing the goal of Affordable Housing for All.

### **6.3.2. Pradhan Mantri Awas Yojana (PMAY)**

This Central Government housing scheme is started for the people who are from the Below Poverty Line (BPL), Low Income Group (LIG), and the people who are from the Economically Weaker Section (EWS). Under PM Awas Yojana the candidates who want to take the houses should be from a lower class and the annual income of the candidate should not be more than Rs. 6 Lakh. The central government will provide loans up to Rs. 6 Lakh to the beneficiaries at affordable interest rates of 6.5%.

The Mission will support the construction of EWS (Economically Weaker Section) houses of up to 30 square meters of carpet area. As per PMAY EWS households are defined as households having an annual income up to Rs. 3,00,000 (Rupees Three Lakhs). The PMAY mission will be implemented as a Centrally Sponsored Scheme (CSS) except for the component of credit-linked subsidy which will be implemented as a Central Sector Scheme.

Given that this is a path-breaking approach being taken up by the Central, State, and City governments, there is a felt need to embark on a set of pilot projects to evolve, demonstrate, and establish models that can thereafter be scaled. A key objective of the program would be to therefore incentivize innovation and encourage new approaches and solutions that can demonstrably improve the quality and quantity of shelter and services for the poor.

In the context of Kashipur, PMAY Schemes have been under process with 80 applications received under the credit link subsidy scheme vertical. After the verifications of the applications, none of them was found eligible. Under the vertical beneficiary-led construction total applications received were 203 out of which 174 were for new construction and the

remaining 29 were for enhancement. A total of 86 applications were found eligible (64 from new and 22 for enhancement) out of which only 45 houses are under construction and 19 are completed. Moreover, in the ISSR component, no application has been received. Further, for the AHP component, there were 2217 applications received and all of them were found eligible. So, keeping this into consideration the Uttarakhand Housing and Urban Development Authority along with Uttarakhand Awas Avam Vikas Parishad has decided to invite PMAY (AHP) projects in PPP modes to develop housing society for the EWS group under this vertical. A total of 11 projects were identified out of which two projects are in Kashipur. Uttarakhand Awas Avam Vikas Parishad will be the nodal agency to do a tripartite agreement with the landowner and developer. The share of the beneficiary will be collected by UAAMP.

The two projects are Manpur-Kashipur and Kanakpur-Kashipur which is in the corporation area. The total area of Manpur-Kashipur is 12140.34 m<sup>2</sup> having total proposed units of 512 with a total cost of Rs.3074.47 lakhs will be implemented. For the Kanakpur-Kashipur project, 1256 units with 28338.65 m<sup>2</sup> of area and 7542.85 lakhs project cost have been proposed. The project is expected to be completed in the coming FY. With the completion and disbursement of units to beneficiaries identified under the PMAY AHP component, it will surely become one of the significant projects for the migrants and houseless population of the city.

#### **6.4. Housing Scheme**

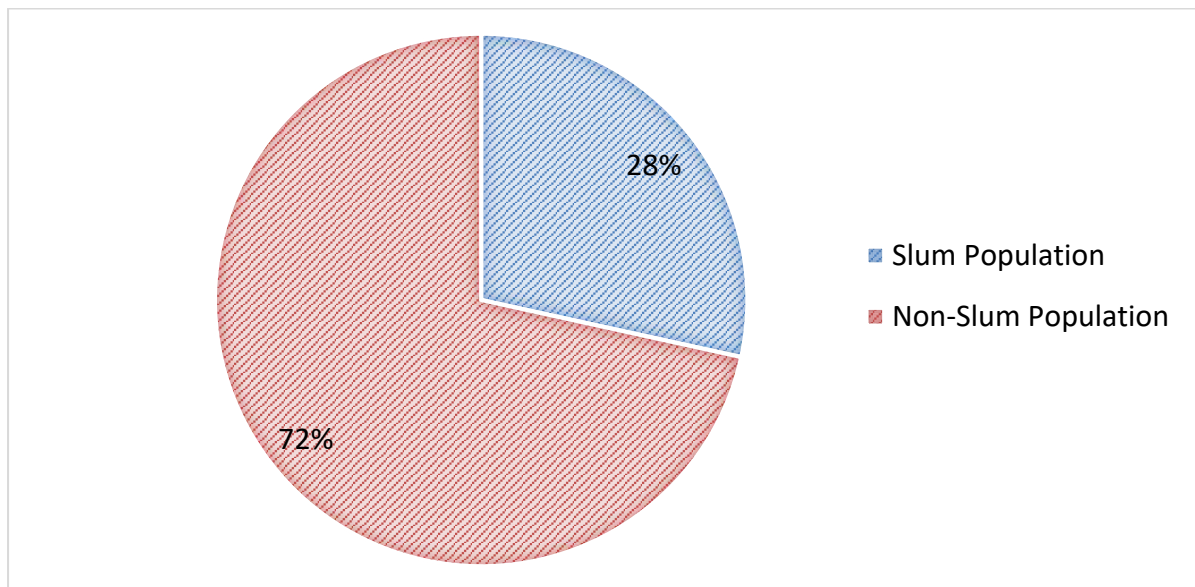
To provide housing to the houseless population, housing projects have been proposed for two different locations in the city under PMAY (Affordable Housing) scheme in 2019. The two projects are Manpur-Kashipur PMAY – (EWS) Awasiya Yojna (Uttarakhand Awas Avam Vikas Parishad) and Kanakpur-Kashipur PMAY (EWS) Awasiya Yojna (Uttarakhand Awas Avam Vikas Yojna).

#### **6.5. Slum Concentration**

A Slum, as per the Census of India, has been defined as residential areas where dwellings are unfit for human habitation for reasons of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light, or sanitation facilities or any combination of these factors which are detrimental to the safety and health. In Kashipur, there are 13 slums in total as per the 2011 census which is notified in nature. The total number of households residing in the slums is 4897 having a population of 34592 which implies that 28.44% of the total population of the city is residing in slums (refer to **Figure 6-5 & Error! Reference source not found.**). It implies that more than a quarter of the

population is staying in slums which needs to be considered. The family size of these households is 7.06 which is quite higher than the national average and also than the overall family size of Kashipur city which stands at 5.30.

**Figure 6-5: Slum Population of Kashipur City**



Source: Census of India (2011)

### 6.5.1. Availability of Basic Services in Slum

**Table 6-14** represents the basic services that are available to the households residing in the slums of Kashipur as per the census 2011. In the case of water supply, 175 tap points are present for 4897 households which means one tap for almost 30 households. In the case of electricity, only 3567 households are having electric connections which accounts for 72.84% of the total households which implies the remaining households do not have electricity or electricity theft is being done by these households. 2 community toilets are also available in the slums which are located at different locations.

**Table 6-14: Availability of Basic Services in Slums:**

| Type of Amenity   | No. of HHs Covered                       |
|-------------------|------------------------------------------|
| Water Supply      | 175 Tap points/Public Hydrants installed |
| Electricity       | 3567                                     |
| Community Toilets | 2 Toilets Present                        |
| Other (Specify)   | -                                        |

Source: Census of India, 2011

## 6.6. Property Market and Land Value



Real estate is the land along with any permanent improvements attached to the land, whether natural or man-made—including water, trees, minerals, buildings, homes, fences, and bridges. Real estate is a form of real property. It differs from personal property, which is things not permanently attached to the land, such as vehicles, boats, jewelry, furniture, and farm equipment.

The real estate sector has a crucial role in the economy. It also impacts various other allied sectors. The expenditure in the real estate sector impacts the expenditure and return in other sectors too. The pattern of urbanization in India has an effect on the real estate sector across all its segments of residential, commercial, and hospitality. The region with its bestowed natural beauty and existence of various topographical features along with excellent connectivity offers opportunities for economic development under various kinds of projects in sectors of tourism, real estate, industries, and others. The increase in work opportunities in many urban areas has attracted the migrant working population. The increase in population has demanded a rise in the available housing stock. The situation is the same in every other region in the country and Kashipur is no exception. The vast scope of this sector is waiting for exploration. The increased need has created a demand for housing as well as commercial activities. After the bifurcation of Uttarakhand from Uttar Pradesh, Kashipur has emerged as an attraction for investments.

Kashipur lies in Udham Singh Nagar district which is on the foothills of the Kumaon region. Kashipur area comes in the plain region of Uttarakhand. 50% of the areas of medium and large-scale industries are present in Kashipur like Surya Roshini Limited, Flexituff International Ltd, IGL, HCL Technologies, Videocon, etc. Due to the easy availability of raw materials various paper and pulp industries have been coming up in the region. The industrial sector in Kashipur is flourishing. Further, with the establishment of these industrial estates, the real estate sector has also flourished to cater to the needs of housing for the workers engaged in these industrial estates. The presence of IIM in Kashipur makes the region an important hub for education. We can find a lot of educational institutes which create a demand for housing for students. The area also has a lot of tourist attractions places and the Jim Corbett National park is just 16 km away which if developed properly can be a boon to the area.

#### **6.6.1. Characteristics of the Tracked Residential Market**

A growing base of Industrial and tourism establishments with rising disposable incomes and substantial global exposure-initiated market developments for a variety of uses from residential to commercial office space to retail has become increasingly common in Kashipur. Kashipur has emerged as one of the preferred residential locations in the district in terms of developments

in the residential tracked market. Various private developers have been investing in the area for building apartments. Also, due to the increase in tourism activities, a lot of hotels and homestays have come up in the area. The recent past real estate market saw a huge leap in the city with many developers who have come forward to invest in various sectors.

### **6.6.2. Key Players**

Public agencies such as UKHUDA & UKRERA along with private developers play an important role in real estate development in Udham Singh Nagar district and the Kashipur area. The key public players and their role in the development of real estate are as follows.

#### **6.6.2.1. UK housing and urban development authority**

The “Development Authority or the Authority” concerning the whole of the State Area shall be ‘The Uttarakhand Housing and Urban Development Authority (hereinafter referred to as the State Authority) and concerning any development, the area shall be the Local Development Authority (hereinafter referred to as the Local Authority) constituted and notified under section 4 of the Act.

Further, the Urban Local Bodies and Village Panchayats will also be construed as Local Development Authority/Local Authority under this Act if so, declared by the State Government but issuing Notification under sub-section (1-A) of section 4 of this Act defining the extent of their development area(s). Concerned Officer/ person of such Urban Local Bodies and Village panchayats shall exercise powers as determined by the State Government.

UKHUDA regulates the development according to the master plan and guides the private developers in developing layouts, housing schemes, integrated townships, apartments, commercial buildings/complexes and accords approval. UKHUDA has given approvals for various layouts spread across Kashipur LPA.

#### **6.6.2.2. UK real estate regulatory authority**

The real estate sector has grown in recent years but has largely been unregulated from the perspective of consumer protection. Though consumer protection laws are available, the recourse available therein is only curative, but not preventive. The Government of India has enacted the Real Estate (Regulation and Development) Act 2016 and all the sections of the Act have come into force with effect from May 1, 2017.

The key responsibilities of the Authority shall be Ensuring Disclosures of Real Estate Projects by Promoters, Real Estate Projects Registration, Real Estate Agents Registration & Complaints Redressal.

The Authority looks upon the real estate establishment in Kashipur and stands for transparency in the real estate industry. It was brought to action to eradicate the existing discrepancies and problems within the sector. It has been set up across India to promote uniformity and transparency, as well as to regulate the real estate sector.

#### **6.6.2.3. Private Developers**

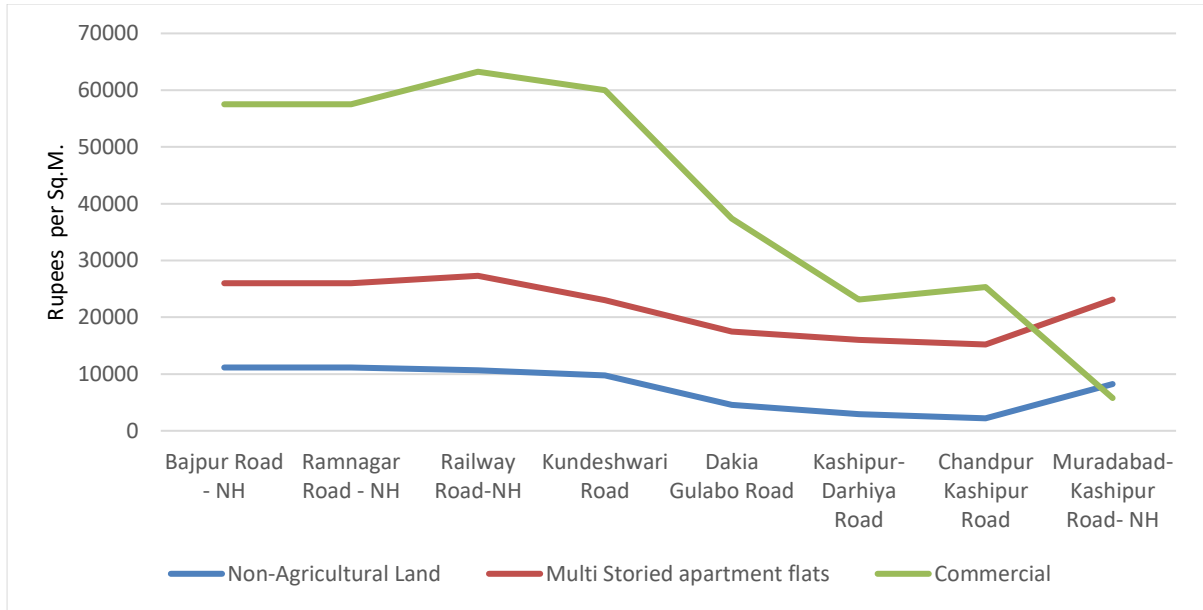
Apart from public-sector organizations, many private developers are operating in the field of construction and development in the area. A good number of industries have been thriving in the Kashipur region in the last few decades. This trend is likely to gain momentum over the coming years with the entry of several more reputed local and national developers, who have already acquired/ or are in the process of acquiring lands in the city.

There are many small and medium-sized developers in Kashipur LPA with a majority of them originating from within the district and nearby districts. The presence of KGCCI in Kashipur has helped in developing the industries. Jindal Solvent Extraction was already present in Kashipur but now large players like Flexituff International Ltd, IGL, HCL Technologies, Videocon, Pasupati Arcylon Limited, etc. have also established companies in Kashipur. This is a good sign for qualitative and quantitative housing and commercial developments soon.

#### **6.6.3. Land Value**

Land value is the value of a piece of property including both the value of the land itself as well as any improvements that have been made to it. Land value has been analyzed in the LPA area along the major and city roads to identify how land value changes as we move away from the roads and also how it changes with the change in land use. Land value is high in central areas of the city, especially the railway road. **Figure 6-6** shows the land value changes in three types of categories i.e., non-agricultural land, multi-storied apartment flats, and commercial areas along the national highways, major roads, and other roads. It is evident from the figure that the commercial areas have much higher land prices as compared to other uses in the core area but in the outskirts, non-agricultural land and apartment prices are higher than commercial. The highest land value can be seen on the national highway from Kashipur to Moradabad because it is at the core city, also railway station falls along the line, and real estate development is along the corridor. Move over, Ramnagar road and Bajpur road also have almost equal values.

**Figure 6-6: Variation in Land Value**



Source: Tehsil Headquarters, Kashipur, 2018

**Table 6-15** shows the land rates along national highways, bypass roads, and other roads both within the municipal limit and outside but within the LPA area. The roads comprise arterial, sub arterial, collector, and local roads within the corporation boundary. Moreover, agricultural land value has also been analyzed abutting the municipal corporation boundary to identify how the land prices are changing with the development occurring in the vicinity. It is evident from the data that how land prices are changing when we move away from the roads. For instance, the land value of the Non-agricultural land of Railway Road is Rs.13200 per square meter from the road to 100 meters which decreased to Rs.8100 beyond 100 meters. This show that road infrastructure plays a crucial part in changing land use and its prices with development. Similarly, if the data is analyzed for a commercial area that includes various shops, restaurants, and offices the land value is much higher in the core area as compared to the area in the vicinity. The commercial area evolves with the demand for it and it differs for different roads. In the case of the Kashipur LPA area the highest land prices are on Rampur- Railway Road-NH, Ramnagar-NH road, and Bajpur-NH road & Kundeshwari road.

**Table 6-15: Land Rates in LPA**

| S. No. | Road                        | Agricultural Land value (Rs./he.) | Non-Agricultural Land value (Rs./m <sup>2</sup> ) |                | Multi-Storied apartment flats (Rs./m <sup>2</sup> ) | Commercial (Rs./m <sup>2</sup> ) |        | Non-Commercial (Rs./m <sup>2</sup> ) |      |
|--------|-----------------------------|-----------------------------------|---------------------------------------------------|----------------|-----------------------------------------------------|----------------------------------|--------|--------------------------------------|------|
|        |                             |                                   | From 0 to 100mts.                                 | Beyond 101mts. |                                                     | Shops/Restaurant / Offices/      | Others | Linter                               | Tin  |
| 1      | Ramnagar Road NH            | 415                               | 14000                                             | 8300           | 26000                                               | 60000                            | 55000  | 12000                                | 7000 |
| 2      | Bajpur Road NH              | 415                               | 14000                                             | 8300           | 26000                                               | 60000                            | 55000  | 12000                                | 7000 |
| 3      | Railway Road                | 400                               | 13200                                             | 8100           | 27300                                               | 66000                            | 60500  | 12000                                | 7000 |
| 4      | Kundeshwari Road            | 425                               | 11000                                             | 8500           | 23000                                               | 65000                            | 55000  | 12000                                | 7000 |
| 5      | Dakia Gulabo Road           | 101                               | 4700                                              | 4400           | 17500                                               | 42900                            | 31900  | 12000                                | 7000 |
| 6      | Kashipur-Darhiya Road       | 71                                | 3100                                              | 2750           | 16000                                               | 24200                            | 22000  | 12000                                | 7000 |
| 7      | Chandpur Kashipur Road      | 55                                | 2300                                              | 2100           | 15200                                               | 26400                            | 24200  | 12000                                | 7000 |
| 8      | Muradabad-Kashipur Road- NH | 315                               | 9900                                              | 6600           | 23100                                               | 60500                            | 55000  | 12000                                | 7000 |

Source: Tehsil Headquarters, Kashipur, 2018

## 6.7. Key Issues

- 1) The household size is high i.e., 5.2 in the planning areas, and the percentage of one-room dwelling units are high i.e., 37%, indicating overcrowding of household in the planning area.
- 2) Lack of rental houses in the planning area. Kashipur planning area receives a lot of working-class people due to industries. To cater to this population rental houses at affordable rates are required.
- 3) The housing condition is average in the planning area. Only 59% of households have good condition, 37% are liveable and 4% are dilapidated.
- 4) Almost 20% of the population depends on unreliable sources of water resources i.e., tap water from an untreated source, lakes, ponds, canals, etc.
- 5) Lack of piped sewer system. Only 14% of households have access to a piped sewer system. The majority have septic tanks.

- 6) The percentage of households having open drainage is high i.e., 75%, the majority of the time it is clogged due to dumping of solid waste in the open drainage.
- 7) 36% of people still use firewood for cooking causing air pollution and a lack of use of biogas in the planning area.

### **6.8. Housing Demand**

For the housing demand in 2041, the existing situation was analyzed and the gap or shortage was considered. **Table 6-16** represents the calculation of the total houses required by 2041. The existing household size of Kashipur is above 5. The average household size taken for Kashipur Planning Area is 4.5. The projected population for 2041 without considering the floating population is 7,94,579 and this has been taken to arrive at the housing demand calculation. Taking the household size of 4.5 the total number of households comes to 1,76,573. Also, according to the census 2011, the number of dilapidated houses is 1809 and according to Kashipur MC, the total number of houseless households in the planning area is 0. These two factors need to be considered in the future projections and hence are added to the total requirement of houses which comes about to 1,78,382. The total number of existing households is 52625 and hence the total required houses for 2041 are subtracted from it and it comes to 1,25,757.

**Table 6-16 Housing Demand 2041**

| Housing Demand                                     | 2041   |
|----------------------------------------------------|--------|
| Total population                                   | 794579 |
| Household size                                     | 4.5    |
| Total housing stock required (1)                   | 176573 |
| Dilapidated household (2)                          | 1809   |
| Houseless Households (3)                           | 0      |
| Total housing demand (4) = (1) + (2) + (3)         | 178382 |
| Existing Residential Houses as per Census 2011 (5) | 52625  |
| Housing shortage (4)-(5)                           | 125757 |

Source: Analysis by Town and Country Planning Department



## 7. Physical Infrastructure

Availability and adequacy of infrastructure services have a larger role in well- the being of any habitation. Infrastructure services act as a catalyst for development, which fosters economic growth and enhances public well-being. Hence, the provision of adequate infrastructure is defined as Basic Services for any developed and developing region to sustain its growth and development.

This chapter outlines the details and analyses various types of physical infrastructure present in the planning area of Kashipur. It includes water supply, sewerage and sanitation, drainage, solid waste management, and telecommunication. Each of the above-mentioned infrastructures has been analyzed to highlight the issues regarding it.

### 7.1. Water Supply

Water supply is the provision of water by public utilities, commercial organizations, community endeavors, or individuals, usually via a system of pumps and pipes. Irrigation is covered separately.

#### 7.1.1. Sources of Water Supply

Kashipur city, located at an altitude of 218 meters from the mean sea level is dependent on groundwater pumping for the supply of water to the city residents. Jal Sansthan is responsible for the supply of water in the city. As per the data from Jal Sansthan, there are 3200 registered connections with Jal Sansthan to whom they are supplying water. It implies that around 9.7% of households in the city are receiving water from Jal Sansthan. Other households are dependent on illegal connections or other sources of water like hand pumps, river water, wells, etc. Hence, there is a need for an organized system of water supply that would ensure minimum or zero theft of water which can be ensured through an efficient metering system. The water supply system is intermittent as the household gets water supply for 6 hours in a day only. This is another reason for people depending on other sources than water supply from Jal Sansthan

In the case of rural areas, there are 42 villages out of 61 villages which are having treated tap water supply as per the census 2011. Other villages are dependent on other sources of water such as untreated tap water, hand pumps, wells, springs, rivers, etc. which include:

- |                       |                   |                       |
|-----------------------|-------------------|-----------------------|
| 1. Dhakia Kalan,      | 8. Kundsebara,    | 15. Dohari Vakil      |
| 2. Kundeswari,        | 9. Hempur Ismail  | 16. Dabhauramustahkam |
| 3. Ramnagar Kashipur, | 10. Jaitpur Ghosi | 17. Baintwala         |
| 4. Gangapur Gosain,   | 11. Sand Khera    | 18. Shahganj          |

- |                     |                     |                 |
|---------------------|---------------------|-----------------|
| 5. Kuakhera,        | 12. Berkhera Pandey | 19. Pachchawala |
| 6. Shivalpur Dallu, | 13. Pratappur       |                 |
| 7. Nandrampur,      | 14. Sitarampur      |                 |

There are multiple sources of water supply in these areas even in the villages having treated tap water. There is no organized system of water supply in these areas. Therefore, an organized system will be proposed in the area which will be part of the urbanisable area of Kashipur. For details refer to Error! Reference source not found.

#### **7.1.1.1. Domestic Demand**

The existing water supply of Kashipur city is 82 LPCD as per Jal Sansthan and the total number of registered connections is 3200, which implies that the total water supplied to the registered connections is 0.26 MLD. The total water supplied as per Jal Sansthan data in Kashipur city is 10 MLD. The total demand taking 70 LPCD as standard comes out to be 13 MLD. Hence, there is a shortage of 3 MLD which is a negative sign for the planning area.

#### **7.1.1.2. Non-Domestic Demand**

In the case of Kashipur, Bulk water supplied to the industrial establishment will be considered as per the specific requirement of each industry. However, the figure of 70 LPCD includes water requirements for commercial, institutional, and minor industries.

#### **7.1.2. Water Treatment**

There is no water treatment plant present in Kashipur city as per Jal Sansthan, Kashipur. Untreated water can lead to various diseases. So, there is a need for a water treatment plant in the city to ensure that people are getting safe and healthy water for drinking and other purposes.

#### **7.1.3. Area Coverage**

At present, there is very partial coverage of the water supply network in Kashipur city as per water supply data. However, there is a proposal for the provision of a water supply network in the city under the AMRUT scheme in which 20 wards as per the previous municipal limit have been covered. In this proposal, the city has been divided into 8 zones, and the water network will be laid down accordingly (Refer to Error! Reference source not found.). Overall, certain rural areas have become part of the municipal area as per the latest ward demarcation. These areas are not having a water supply network and they are also not covered in the proposed plan

of Payjal Nigam. Hence, there is a need to ensure the provision of water supply in these areas as well.

#### **7.1.4. Supply Infrastructure**

There are total 2 Overhead Reservoirs at present that are being used for the supply of water to households. The total capacity of OHRs is 800 KL. The location of these OHRs with the capacity of each is as follows:

1. Nagnath Campus-1 (350 KL)
2. Awas Vikas-1 (450 KL)

A few more OHRs have been proposed at various locations in the DPR prepared for water supply under the AMRUT scheme. These have been proposed to serve the existing and proposed locations.

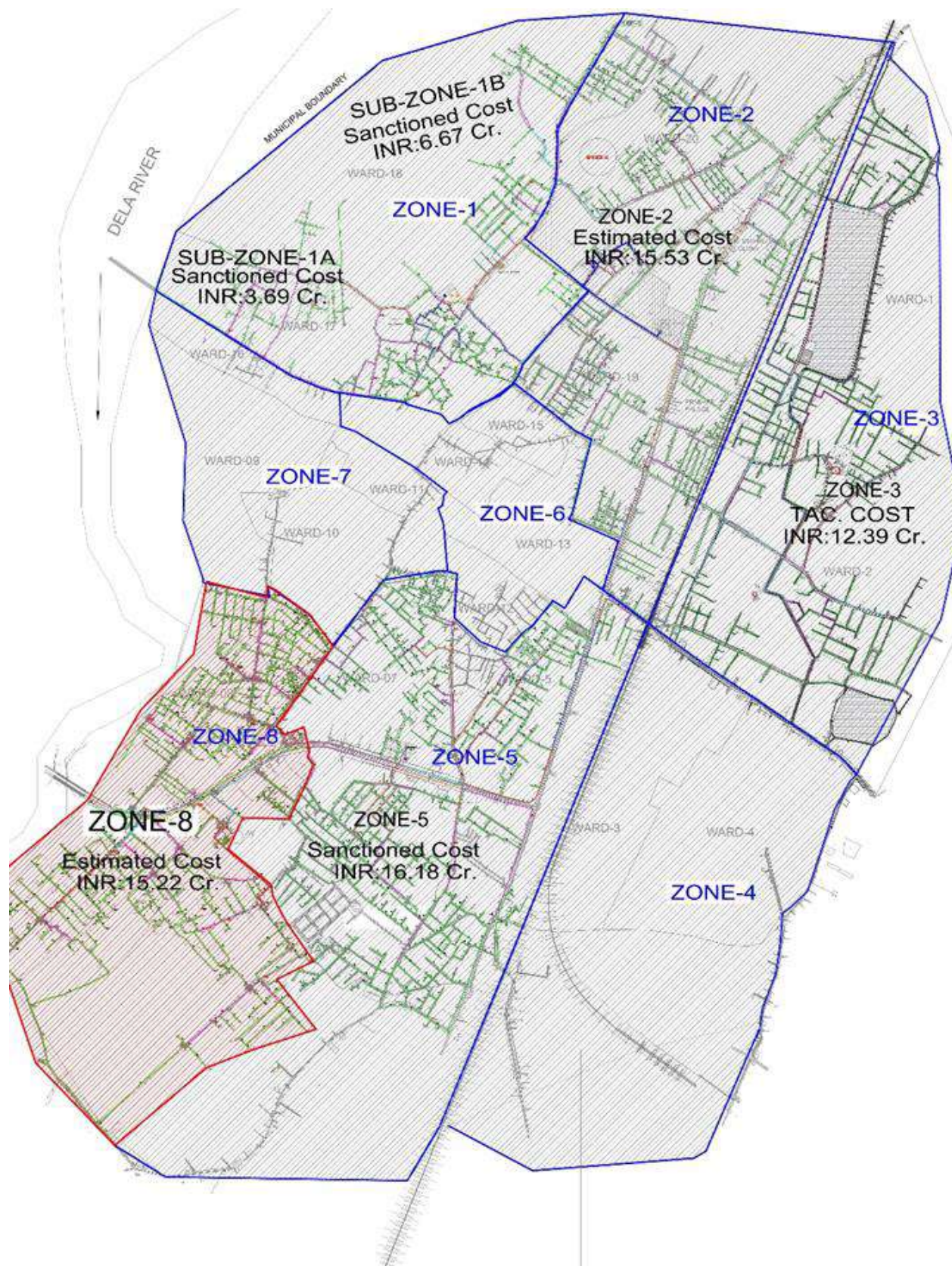
#### **7.1.5. Status of Water Supply under AMRUT Mission:**

AMRUT has been introduced with the vision of providing basic infrastructure and services like water supply, sewerage, stormwater, urban transport, and green spaces to households and building amenities in cities which will improve the quality of life for all, especially the poor and the disadvantaged, which is now a national priority which is being catered by this mission.

The projects proposed under AMRUT in the Kashipur region are in the sewerage and water supply sectors. Under the sector water supply, the area has been divided into 8 zones. The details of the zones are given below (refer to **Map 7-1**):



**Map 7-1: Proposed Zonal Map of water supply network by Payjal Nigam**



Source: Payjal Nigam, Kashipur

- Kashipur Payjal Yojana Zone 1A (Kanungoyan)
- Kashipur Payjal Yojana Zone 1B (Kanungoyan, Katoratal west, Katoratal centre)
- Kashipur Payjal Yojana Zone II (Giritaal, Dronasagar, Katoratal South, Katoratal east, Vijay Nagar new colony)
- Kashipur Payjal Yojana Zone III (Shakti nagar, Giritaal, Dronasagar)
- Kashipur Payjal Yojana Zone V Part 1 (Shakti nagar, Tada Ujjain, Mahespura west)
- Kashipur Payjal Yojana Zone V Part 2 (Shakti nagar, Tada Ujjain, Mahespura west)
- Kashipur Payjal Yojana Zone V Part 3 (Shakti nagar, Tada Ujjain, Mahespura west)
- Kashipur Payjal Yojana Zone VIII (Shakti nagar, Laxmipur Patti, Ullikha)

Kashipur Water Supply Scheme for Zone 1A caters to a population of 4412 with a storage tank capacity of 400KL and it is already providing service in the area. Kashipur Water Supply Scheme for Zone 1B is also in working condition catering to 9882 people. In this zone, a tube well of 1.152 MLD capacity and storage tanks of 700 KL has been constructed. Both Kashipur Water Supply Scheme for Zone III and V are under construction, they cater to 11801 and 20442 people respectively. In Zone III one tube well of capacity 1.152 MLD is being constructed whereas, in Zone V, two tube wells of the same capacity are being constructed. Storage tanks of capacity 850 KL and 1400 KL are being constructed in Zone III and Zone V respectively.

#### **7.1.6. Key Issues**

- 1) 90.3% of the population of Kashipur is not having provision registered water supply connections.
- 2) Unmetered water supply has resulted in wastage and theft of water.
- 3) Certain areas are not covered under water supply even in the case of proposals that are being implemented under AMRUT.
- 4) There is absence of a water treatment plant in the city.
- 5) There is an unorganized system of water supply in case of rural areas.

Considering the growth of Kashipur, appropriate strategies and mechanisms need to be explored, including recycling the wastewater generated by the industries. This would also help to reduce the water demand and in turn, save water.

#### **7.1.7. Water Demand for Horizon Period**



The residential water requirements for Kashipur Planning Area are represented in **Table 7-1**. The total population of the Kashipur Planning Area excluding floating is 794579 and taking 135 liters per capita per day as per URDPFI guidelines it comes to 107.3 MLD. The existing supply in the planning area is only 14.61 MLD so the master plan needs to be planned for an additional 92.7 MLD of water for residential areas.

**Table 7-1: Residential water requirements**

| Year        | Population | LPCD | Total requirement (MLD) | Existing supply (MLD) | Actual requirement (MLD) |
|-------------|------------|------|-------------------------|-----------------------|--------------------------|
| <b>2041</b> | 794579     | 135  | 107.3                   | 14.61                 | <b>92.7</b>              |

Source: Analysis by Town and Country Planning Department

The Industrial water requirements have been represented in **Table 7-2**. As per URDPFI guidelines, the major type of industries and their water requirements were identified and are reflected in **Table 7-2**. For large-scale industries 300 KL of water per day, for medium scale 146 KL of water per day, for small scale 11 Kl of water per day, and for micro/small scale industries 2 KL of water per day was identified and hence the total water requirements were calculated. The total water requirements for the Industrial area of Kashipur Planning area is 8.784 MLD.

**Table 7-2 Industrial water requirements**

| Industrial                          | No of industries | Water requirements (KL) | Total water requirements (MLD) |
|-------------------------------------|------------------|-------------------------|--------------------------------|
| <b>Large scale industries</b>       | 26               | 300                     | 7.8                            |
| <b>Medium scale industries</b>      | 1                | 146                     | 0.146                          |
| <b>Small Scale industries</b>       | 42               | 11                      | 0.462                          |
| <b>Micro/small scale industries</b> | 188              | 2                       | 0.376                          |
| <b>Total</b>                        | <b>257</b>       |                         | <b>8.784</b>                   |

Source: Analysis by Town and Country Planning Department

The water requirements for commercial areas for the Kashipur Planning Area 2041 have been provided in **Table 7-3**. The total commercial proposed area for Kashipur Planning Area is 589.58 Ha and the suggested water requirements for commercial areas are 45 KL of water per hectare. Hence, the total requirement of water for Kashipur Planning Area 2041 is 11.76 MLD.

**Table 7-3 Commercial area water requirements**

| Commercial Area (Ha) | Standard | Water Requirements (MLD) |
|----------------------|----------|--------------------------|
| 589.58               | 45 KL/Ha | 26.53                    |

Source: Analysis by Town and Country Planning Department

The water requirements for Fire safety for Kashipur Planning Area, 2041 are represented in **Table 7-4**. The total population considered is 842254; it includes the floating population as well. According to URDPFI, the water requirements for fire safety are as per the formula  $(100 \times \sqrt{\text{Population}})$  which comes to about 91.77 MLD.

**Table 7-4 Fire safety water requirements**

| FIRE   | Standard                              | Water (MLD) |
|--------|---------------------------------------|-------------|
| 842254 | $100 \times \sqrt{\text{Population}}$ | 91.77       |

Source: Analysis by Town and Country Planning Department

The water requirement for an educational facility has been represented in **Table 7-5**.

**Table 7-5 Water requirement for educational facilities**

| Kashipur Planning Area                          | 2041   | Pop served | Per head (LPCD) | Water (MLD)  |
|-------------------------------------------------|--------|------------|-----------------|--------------|
| Population                                      | 842254 |            |                 |              |
| Pre-Primary, Nursery School                     | 337    | 500        | 45              | 11.36        |
| Primary school                                  | 168    |            |                 |              |
| Senior Secondary School                         | 112    | 1500       |                 | 8.78         |
| Integrated School with/ without hostel facility | 18     |            |                 |              |
| School for Physically Challenged                | 19     | 400        |                 | 0.34         |
| College                                         | 7      | 1500       |                 | 0.47         |
| <b>Total</b>                                    |        |            |                 | <b>20.95</b> |

Source: Analysis by Town and Country Planning Department

The population served for each facility as per URDPFI is presented in the table below and water requirements for each student are 45 liters per capita per day hence, the total water is calculated. The total water required for an educational facility is 20.95 MLD.

The water requirement of healthcare facilities in the Kashipur Planning Area for 2041 is provided in **Table 7-6**. The number of beds and water requirements as suggested by URDPFI guidelines have been presented. For veterinary hospitals and dispensaries for animals and pets, 45 LPCD has been assumed as the minimum requirement for any facility is 45 LPCD. Hence, the total requirements of water for healthcare facilities are 3.93 MLD.

**Table 7-6 Water requirements for healthcare facilities**

| Kashipur Planning Area                           | 2041   | Beds | Per bed (L) | Total (MLD) |
|--------------------------------------------------|--------|------|-------------|-------------|
| Population                                       | 842254 |      |             |             |
| Dispensary                                       | 56.00  | 10   | 340         | 0.1904      |
| Nursing homes, child welfare & maternity centers | 19.00  | 30   | 340         | 0.1938      |



|                                                 |       |     |     |             |
|-------------------------------------------------|-------|-----|-----|-------------|
| <b>Polyclinic</b>                               | 8.00  | 10  | 340 | 0.0272      |
| <b>Intermediate Hospital (Category B)</b>       | 8.00  | 80  | 340 | 0.2176      |
| <b>Intermediate Hospital (Category A)</b>       | 8.00  | 200 | 450 | 0.72        |
| <b>Multi-Speciality Hospital</b>                | 8.00  | 200 |     | 0.72        |
| <b>Specialty Hospital</b>                       | 8.00  | 200 |     | 0.72        |
| <b>General Hospital</b>                         | 3.00  | 500 |     | 0.675       |
| <b>Family Welfare Centre</b>                    | 17.00 | 30  | 340 | 0.1734      |
| <b>Diagnostic center</b>                        | 17.00 | 30  | 340 | 0.1734      |
| <b>Veterinary Hospital for pets and animals</b> | 2.00  | 30  | 45  | 0.0027      |
| <b>Dispensary for pet animals and birds</b>     | 8.00  | 30  | 45  | 0.0108      |
| <b>Rehabilitation centres</b>                   | 8.00  | 30  | 450 | 0.108       |
| <b>Total</b>                                    |       |     |     | <b>3.93</b> |

Source: Analysis by Town and Country Planning Department

The total water requirement for Kashipur Planning Area for 2041 is provided in **Table 7-7**. The water requirement for residential areas is 92.66 MLD, for commercial it is 26.53 MLD, for Industrial it is 8.78 MLD, for educational it is 20.95 MLD, for health care 3.93 MLD and fire is 89.14 MLD.

*Table 7-7 Total water requirement for Kashipur Planning Area*

| <b>Category</b>    | <b>Water Requirement (MLD)</b> |
|--------------------|--------------------------------|
| <b>Residential</b> | 92.66                          |
| <b>Commercial</b>  | 26.53                          |
| <b>Industrial</b>  | 8.78                           |
| <b>Education</b>   | 20.95                          |
| <b>Healthcare</b>  | 3.93                           |
| <b>Fire</b>        | 89.14                          |
| <b>Total</b>       | <b>241.99</b>                  |

Source: Analysis by Town and Country Planning Department

The total water required for 2041 in Kashipur Planning Area is 241.99 MLD. For establishing a water treatment plant, the land required for a 200 MLD capacity plant is 3.73 Ha according to URDPFI. For 241.99 capacity, land of 4.5 Ha is required.

### **7.1.8. Water Supply proposals**

At present, there is very partial coverage of the water supply network in Kashipur city as per water supply data. However, there is a proposal for the provision of a water supply network in the city under the AMRUT scheme in which 20 wards as per the previous municipal limit have

been covered. In this proposal, the city has been divided into 8 zones, and the water network will be laid down accordingly (Refer to **Map 7-1**). The details of the zones are given below:

- Kashipur Payjal Yojana Zone 1A (Kanungoyan)
- Kashipur Payjal Yojana Zone 1B (Kanungoyan, Katoratal west, Katoratal centre)
- Kashipur Payjal Yojana Zone II (Giritaal, Dronasagar, Katoratal South, Katoratal east, Vijay Nagar new colony)
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- Kashipur Payjal Yojana Zone VIII (Shakti nagar, Laxmipur Patti, Ullikha)

Kashipur Water Supply Scheme for Zone 1A caters to a population of 4412 with a storage tank capacity of 400KL and it is already providing service in the area. Kashipur Water Supply Scheme for Zone 1B is also in working condition catering to 9882 people. In this zone, a tube well of 1.152 MLD capacity and storage tanks of 700 KL has been constructed. Both Kashipur Water Supply Scheme for Zone III and V are under construction, they cater to 11801 and 20442 people respectively. In Zone III one tube well of capacity 1.152 MLD is being constructed whereas, in Zone V, two tube wells of the same capacity are being constructed. Storage tanks of capacity 850 KL and 1400 KL are being constructed in Zone III and Zone V respectively.

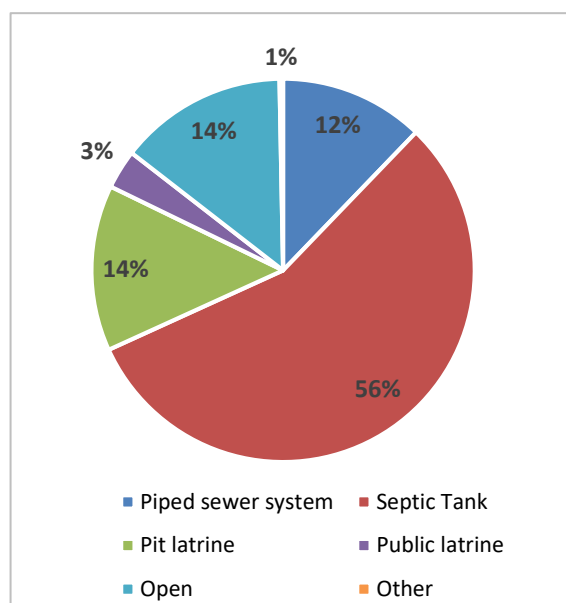
Overall, certain rural areas have become part of the municipal area as per the latest ward demarcation. These areas are not having a water supply network and they are also not covered in the proposed plan of Payjal Nigam. Hence, there is a need to ensure the provision of water supply in non-serving areas as well. For the same, a separate DPR must be prepared by Payjal Nigam and implemented separately.

## 7.2. Sewerage and Sanitation

The disposal of sewage generated by industrial, commercial, domestic, and institutions is also one of the basic functions of the local bodies/ concerned authorities. Providing a sewage disposal network is mandated due to its impact on the quality of life and quality of the environment. Accordingly, sewage disposal has also been considered one of the critical components of urban infrastructure determining the quality of life in the urban sector. The city, in general, is not having any sewage network and is dependent on a septic tanks system along with pit latrine and direct disposal of sewage into open land. The polluted water of the septic tank is being directed to the open drains flowing along the roads on both sides.

Figure 8-1 represents the sanitary systems that are being used by households of Kashipur city as per the census 2011. The maximum percentage of households are dependent on septic tanks i.e., 56% of the total households followed by pit latrine which accounts for 14% of the total households in the city. There are 3% of households which are using public toilets while the percentage of households defecating in open is 14%. There are 27 public toilets in the city of Kashipur which have been constructed by the Municipal Corporation of Kashipur and are being maintained by them only. Out of these, 5 toilets are pay and use while the rest are free of cost.

*Figure 7-1: Sanitary Systems used in Kashipur City*

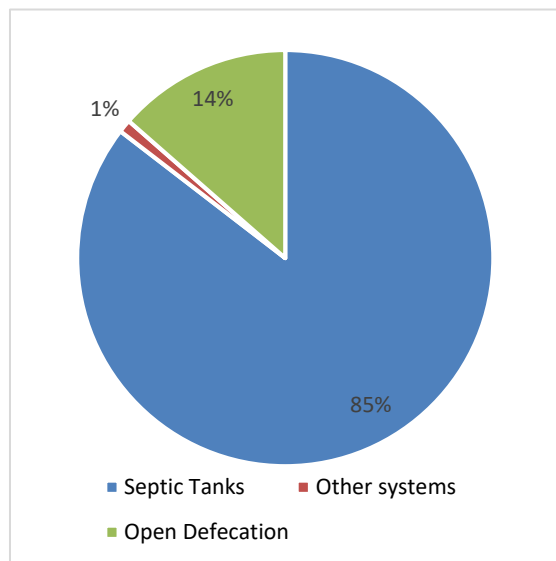


*Source: Census of India, 2011*

In the case of rural areas, people are mainly using septic tanks and pit latrines as sanitary systems as per the census 2011.

### **7.2.1. Status of Individual & Public toilets under AMRUT Mission:**

Under household toilets the components of SBM look for: no households engage in the practice of open defecation; no new insanitary toilets are constructed during the mission period and Single pit latrines are converted to sanitary latrines/sanitary cleaning. For Public toilets, all places within the city attracting a floating population should be covered. Care should be taken



*Source: Census of India, 2011*

to ensure that these facilities have adequate provision for men, and women and facilities for the disabled (e.g., ramp provision, Braille signage, etc.) wherever necessary. ULBs should ensure that all Public Toilets being constructed under SBM (Urban) are built in tandem with water supply arrangements in ULBs. The Projects will be prepared, sanctioned, and implemented by ULBs.

In the Kashipur planning area context, there have been 365 forms received for the construction of individual toilets out of which 185 have been verified and 185 have been fully constructed respectively till FY 2019-20. 40 applications from Kashipur have been received for public toilets, out of which all have been approved.

### **7.2.2. Status of Sewerage and Sanitation under AMRUT Mission:**

A sewerage treatment plant at Uttarakhand Jal Nigam Campus has been proposed and its under construction. The treatment plant is under the name of Kashipur Septage Scheme phase – 1 with the capacity of 18 MLD. Phase 1 has different parts, they are Kashipur Septage Scheme part 1, Kashipur Septage Scheme part 2, Kashipur Septage Scheme part 3, and Kashipur Septage Scheme part 4. Phase 2 is interception and diversion of the scheme.

### **7.2.3. Key Issues**

- 1) An organized sewerage system is absent in the city of Kashipur urban area .There is dumping of untreated wastewater on vacant land or drains.
- 2) 14% of households are defecating in the open which is quite high in the Kashipur MC as well as in Mahua Kheraganj NPP near to kashipur planning area.
- 3) There is an absence of a Faecal Sludge and Septage Treatment Plant in the city.

#### **7.2.4. Sewerage Generation for the Horizon Period**

As per the CPHEEO manual, 80% of the water supply may be expected to reach the sewers as given in URDPFI guidelines. The total water requirement for 2041 is 241.99 LMD and hence the total sewage produced taking 80% of water reaching sewers is 193.59 MLD. To the treatment plant, the land required for the conventional Activated Sludge Process is 1000 m<sup>2</sup> per MLD. So, the total land required is 193595 m<sup>2</sup> or 19.35 Ha.

#### **7.2.5. Sewerage Proposals**

The Kashipur Planning area is divided into three zones by railway lines. Hence, the proposal for sewerage is also divided into three zones for the feasibility of the project. The identified zones along with the proposed STP plants are presented in **Map 7-2**.

*Table 7-8 Proposed Sewerage Treatment Plant*

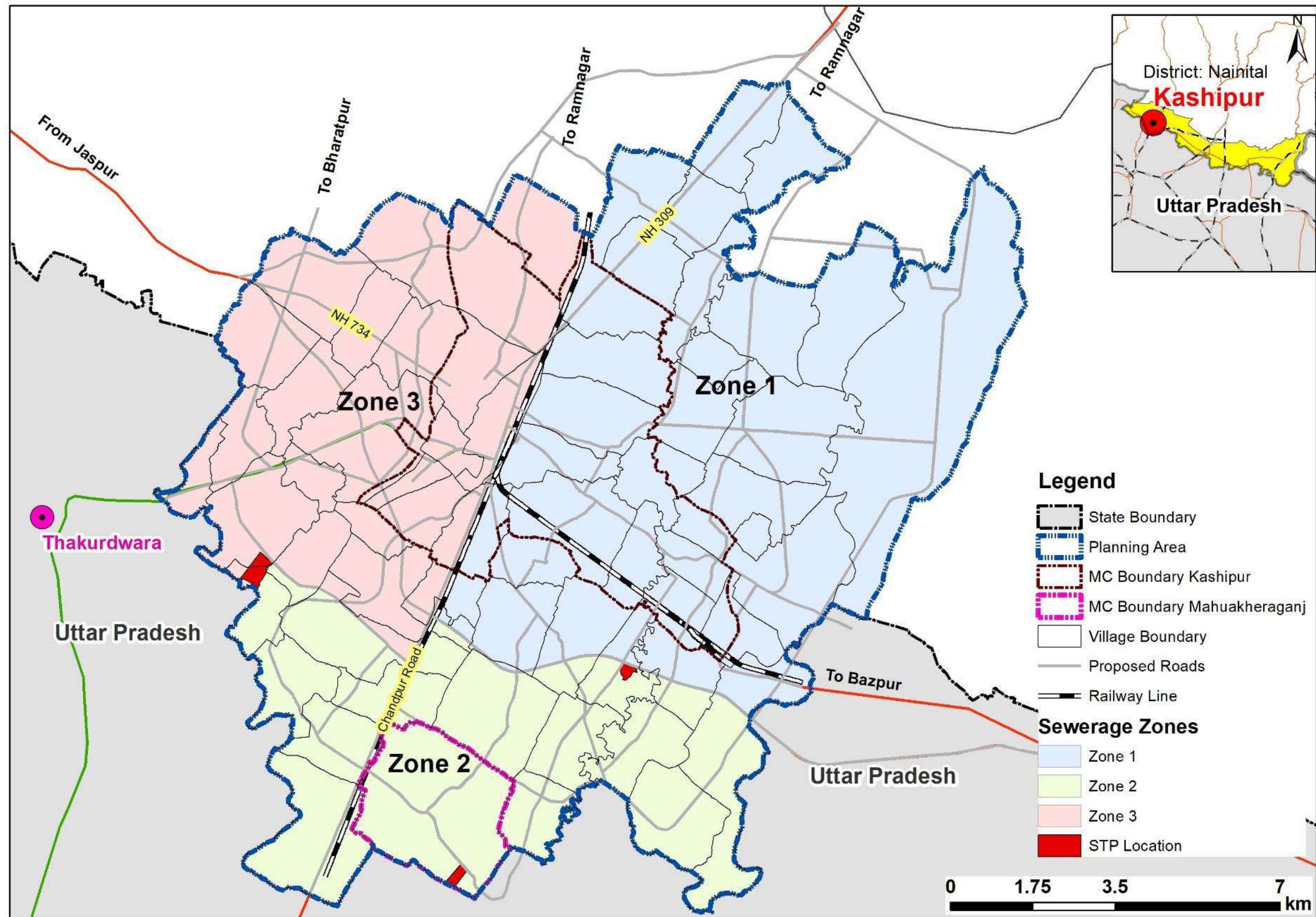
| <b>Zones</b> | <b>STP Area (ha)</b> |
|--------------|----------------------|
| 1            | 7.23                 |
| 2            | 9.63                 |
| 3            | 23.37                |
| <b>Total</b> | <b>40.23</b>         |

*Source: Proposed by Town and Country Planning Department*





Map 7-2: Proposed Sewerage Zones



Source: Proposed by Town and Country Planning Department



### 7.3. Drainage

With the creation of a large area of hard surface by bringing vacant and green land into urbanization, a large volume of stormwater drainage is generated in urban areas. Draining rainwater assumes importance because of the numerous problems created due to inefficient disposal of stormwater. Due to the inefficient or non-existence of the Storm Water Drainage network, most of the city face a problem of water logging, causing heavy loss of property and human lives.

#### 7.3.1. Area and Population Coverage

The city of Kashipur is having man-made drains constructed along both sides of the roads including both major and minor roads. The city is 100% covered with drains but the majority of those drains are open drains and only a certain percentage of drains are closed ones (refer

**Figure 7-2 & Figure 7-3).** This network is constructed and maintained by the Municipal Corporation of Kashipur. It plays an important role in the disposal of stormwater and sewage as well because the sewer network is not present within the city. The total length of minor drains is 212.4 km which include drains present on both sides of the roads within the municipal limit.

*Figure 7-2: Open drain, Gandhi Ashram Road*



*Figure 7-3: Open drain, Ramnagar Road*



#### 7.3.2. Key Issues

- 1) Disposal of domestic refuse and untreated sullage in the Drains water drains has led to a high degree of health hazard, emerging as a major threat to the environment and quality of life.
- 2) Storm water drains/nallahs are being used for the disposal of sewage.

- 3) Without a proper drainage system, it results in water logging in the planning area.
- 4) There is no mechanism for cleaning drains at regular intervals of time.

### 7.3.3. Storm Water Drainage Proposal

The existing drainage network is open and solid waste dumping is found for which the drainage system is not functioning properly. For the stormwater drainage, the drains are proposed to be provided below the roads. On each road, the drainage channels are being proposed along the MUZ or pedestrian zone or the edge of the bypass. These drainage channels would collect all the stormwater within the planning area to the natural drains which run through the planning area (Refer to Figure 7-4).

*Figure 7-4: Storm water drainage illustration*



## 7.4. Solid Waste Management

Solid waste management is the prime responsibility of the Municipal Corporation in Kashipur involving collection, storage, segregation, transportation, and disposal. In Kashipur city, door-to-door collection of solid waste is carried out through several sanitary workers deployed by the Municipal Corporation. In all, there are a total of 219 sanitary workers deployed by MC, and another 170 workers have been employed through outsourcing. In addition to this, there are one health inspector, two sanitary inspectors, and 12 environment supervisors who are working to ensure the safe and efficient management of solid waste.

### 7.4.1. Generation

The total generation of solid waste in the city of Kashipur is estimated to be 60 tons per day (TPD). This large amount of solid waste generated is disposed of in the sanitary landfill also known as trenching ground located at Manpur road. Out of 60 tons generated, 58.5 tons per

day are being collected by the Municipal Corporation which implies that 2.5% of the waste is not being collected by MC..

#### **7.4.1.1. Composition**

Solid waste comprises waste generated from different sources. Major sources of generation are individuals, households, industries, trade and commerce, hotels and restaurants, healthcare institutions including dispensaries and hospitals, animals, and floating populations in terms of tourists, hawkers, etc.

The solid waste generated can be broadly classified into four categories

1. **Organic Waste**, which includes kitchen waste (food items), leaves, remains of animals slaughtered, etc.,
2. **Recyclable Waste**, which includes paper, plastic, glass, metal, rags, packing materials, twigs, bark, etc.,
3. **Inert Waste** includes bricks, cement, building debris, furniture waste, etc.
4. **Industrial Waste**, which includes the byproducts.
5. In addition, a large amount of waste is also generated by several hospitals, dispensaries, and other health care institutions, which are operational in the city.
6. The recently added category is E-Waste generated from electronic products.

#### **7.4.2. Collection**

The collection of municipal solid waste at the household level is reported to be roughly 95% in Kashipur. Different methods are adopted for the collection of solid waste from different uses. At the household level, door-to-door collection of waste is practiced. Despite having a high content of organic waste in household waste, no system of segregation is used at the generation level. In the process, the quality of recyclable material also gets distorted due to the mixing of the dry and wet waste. There is a lack of dustbins in Kashipur city as roadside disposal of solid waste is being done (refer to **Figure 7-5 & Figure 7-6**).

**Figure 7-5: Roadside disposal of solid waste, Station Marg, Kashipur**



**Figure 7-6: Roadside disposal of solid waste, Station Marg, Kashipur**



### 7.4.3. Transportation

To transport solid waste from houses or from community bins to the disposal site, the Municipal corporation has deployed various kinds of vehicles which include the following:

**Table 7-9: Vehicles Deployed for collection of Solid waste**

| City/<br>Town | Type of<br>Vehicles<br>Deployed | Trucks/<br>Lorry | Tippers | Dumpers/<br>Placers | Rickshaw/<br>Hand Cart | Others |
|---------------|---------------------------------|------------------|---------|---------------------|------------------------|--------|
| Kashipur      | 47                              | 7                | 0       | 2                   | 10                     | 28     |

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

Source: Municipal Corporation, Kashipur

**Table 7-9** depicts the number and type of vehicles that have been deployed for waste collection. There are in total 47 vehicles deployed out of which 10 are either rickshaws or hand carts accounting for 21.27%. Other vehicles include 25 hydraulic tempos, 1 underground dustbin machine, and 2 JCBs. In addition to this 7 trucks/lorries are also used. Disposal

Kashipur Municipal Corporation is dumping their solid waste in the sanitary landfill, also known as, trenching ground located at Manpur road. The area of the dumping site is 2.24 km<sup>2</sup>. (refer to **Figure 7-7 & Figure 7-8**). In addition to this, informal dumping of waste has been

witnessed in nallahs, open spaces, vacant plots, etc. This informal dumping of garbage along nallah, etc. has led to the creation of an unhygienic environment in the areas of the city. Moreover, there is no formal system of solid waste management operating in the villages of KPA, which have been included within the planning area.

**Figure 7-7: Landfill site, Kashipur**



**Figure 7-8: Landfill site, Kashipur**



In order to effectively manage solid waste, it will be important to involve all the stakeholders and create awareness among the masses to manage the waste and keep the city clean. The best approach will be to ask people to generate as little waste as possible and to segregate the waste at the household level itself. There should be strategies to deal with the generation of E-waste in the city.

#### **7.4.4. Status of SWM under SBM Mission:**

According to the direction of the Swachh Bharat, Mission ULBs are to prepare bankable Detailed Project Reports (DPRs) for Solid waste management of their city in consultation with state governments. Smaller cities can form clusters to become viable entities to attract private investment. Central assistance is up to 35% of the project cost for all States/ UTs. Other funds will be arranged by the respective ULBs and private investors. In the case of Kashipur, the municipal corporation is responsible for implementing and monitoring the solid waste generated. In the KPA area, the Kashipur corporation has a dumping site of 0.91 hectares at a distance of 6 km. As of now, there are 7 bulk solid waste generating bodies within the municipal limit which generate more than 100 kg per day and have more than 200 families.

All 40 wards of the Kashipur corporation area are covered for SWM under the SBM mission with door-to-door collection in every ward. Further, only 6 wards in Kashipur are doing segregation and others are in progress. Total waste produced in the corporation is



approximately 60 tonnes per day and 58.5 tonnes are collected the same day and transported to dumping sites. Further, the ban on poly bags in the corporation is maintained very well and a total of 322 challans in Kashipur have been done in the current F.Y. A total amount of INR 226950 has been collected from these challans from the KPA which can be used in the upliftment of the infrastructure in the city. Moreover, under the Uttarakhand Anti Littering and Anti Spitting Act, 2016 which aims to keep the State clean and pollution-free, restriction on littering and spitting across ULBs and also in villages is under force in Kashipur. A total of 162 challans have been generated for offending the law with a revenue collection of Rs.41600 in the current F.Y.

#### **7.4.5. Key Issues**

- 1) 2.5% of the total waste generated is not being collected by Municipal Corporation Kashipur which is one of the reasons for informal dumping of waste in drains, open land, and even along roads.
- 2) There is no segregation of waste at the generation level or any other level.
- 3) There is an absence of scientific collection and disposal.
- 4) There is a high quantity of organic waste which is getting dumped in landfill when it can be converted into fertilizers.
- 5) Segregation of e-waste and its safe disposal and treatment is completely missing in the city.
- 6) There is no formal system of solid waste management operating in the villages of KPA, which have been included within the planning area.
- 7) Informal dumping of waste is creating an unhygienic environment and health-related risks for the local people.

There is a requirement for community bins which should be located at strategic locations

#### **7.4.6. Solid Waste Generation for the Horizon Period**

The total solid waste generation for Kashipur Planning Area for 2041 is represented in **Table 7-10**. According to URDPFI residential areas per person produces 0.6 kg of waste. Taking the total population as 794579 the total waste produced is 381.4 tonnes per day.

*Table 7-10 Solid Waste generation in Kashipur Planning Area*

| Year | Population | Residential (kg/cap/day) | Total (TPD) |
|------|------------|--------------------------|-------------|
| 2041 | 7,94,579   | 0.6                      | 381.4       |

Source: Analysis by Town and Country Planning Department

According to URDPFI the land required for the solid waste treatment plant is presented in **Table 7-11**. The land required presented is for a plant with a capacity of 500 TPD.

**Table 7-11 Land Required for Solid waste treatment plant**

| Land Required            | Area (ha) |
|--------------------------|-----------|
| Composting               | 6         |
| Refuse Derived Fuel      | 3         |
| Bio methanation          | 4         |
| Gasification / Pyrolysis | 10        |
| Incineration             | 4         |
| <b>Total</b>             | <b>27</b> |

Source: Analysis by Town and Country Planning Department

The total land required is 27 Ha which includes land for composting, Refuse derived fuel, Bio methanation, Gasification/ Pyrolysis, and Incineration facilities. So, for 635.66 TPD we require 34.3 Ha of land.

#### **7.4.7. Solid Waste Proposals**

##### **Option 1**

All the 40 wards of the Kashipur corporation area are covered for SWM under the SBM mission with door-to-door collection in every ward. Further, only 6 wards in Kashipur are doing segregation and others are in progress. Total waste produced in the corporation is approximately 60 tonnes per day and 58.5 tonnes are collected the same day and transported to dumping sites.

**Table 7-12 Landfill Site Requirements**

| Year         | Ha/Year | Total for 20 Years |
|--------------|---------|--------------------|
| 2021         | 4.81    | 4.81               |
| 2031         | 6.82    | 68.2               |
| 2041         | 9.66    | 96.6               |
| <b>Total</b> |         | <b>169.61</b>      |

Source: Analysis by Town and Country Planning Department

The land required till 2041 with current practice is 169.61 Ha (Refer to **Table 7-12**). The current Landfill site is 224 Ha, where more than 60% of the land is still available and the entire waste can be easily accommodated at the current landfill site.



## **Option 2 - Zero Waste Concept Based on SLRM Model (Solid and Liquid Resource Management)**

Solid and Liquid Resource Management (SLRM) is a decentralized waste management model. As per the SLRM model, almost every element of “waste” can be reused in some way. So, everything we call waste is a resource. The model is already being implemented in many cities across India. For example, Vellore in Tamil Nadu, Ambikapur in Chattisgarh, Silchar in Assam, CRPF campus in Delhi, and Mysore in Karnataka are early adapters.

The SLRM model ensures that residents segregate at source, in their homes, as per the municipal rules. With large volumes of “waste” generated in a township daily, there is potential to process/utilize these resources, within the township itself rather than carrying it miles away. So, the waste from every household is taken to an SLRM center that is situated within the township. There are different types of waste produced in residential areas – organic wet/kitchen waste, organic garden waste, inorganic dry waste, sanitary waste, and bio-medical waste. Each is handled at the SLRM center based on the local conditions. When treated on time, the waste remains useful.

### **7.4.8. Setting up an SLRM center in Kashipur**

- **Space** – The SLRM center would be designed based on the space allocated. For 1 SLRM center for 600 households 4000 sq.m of land is required. Total of 294 Centres of 4000 sq.m each is required till 2041 which can be easily designed within the current landfill site.
- **Infrastructure within the SLRM center** – The building will need electricity/solar power and water connections. It will also need furniture, segregation equipment, storage containers, etc. There will be one-time set-up costs and running costs.
- **Manpower** – Staff to work in the center to carry out waste segregation and processing will have to be identified, trained, and appointed. This will have to be done locally. For every 250-300 households, 4 staff would be required. The center would work 7 days a week and could have workers in shifts for 24 hours.
- **Transportation of waste from the societies to the SLRM center** – The waste is already been transferred to the site by Kashipur Nagar Nigam
- **Guidance and planning** – The entire design of the center’s activities would be done by Kashipur Nagar Nigam. They will define the processes, train staff, locate vendors,

assign tasks to volunteers, etc. Once the center is stable, which would take about 8-10 months, it will be handed over fully to local people to run.

**Administration** – The SLRM center will be handed over to a societies group (like a federation) and they will run it with the help of a self-help group or such. All societies will be a part of the federation and there will need to be a management team for administration and day-to-day operations

## 7.5. Tele-Communication

There are 5 telephone exchanges in the Kashipur planning area which are providing telecommunication facilities to the people. In these 5 telephone exchanges, there are 2058 landline telephone connections registered. A large number of Private companies have emerged in the telecommunication sector due to the privatization of this sector. To provide better connectivity services, 32 mobile towers are present within the KPA area which provides both 3G and 4G data services. These towers are scattered within the area and are located at strategic locations within the KPA. The majority of the services are being provided by private sector companies and the share of the public sector is very less in this sector as far as Kashipur is concerned.

*Table 7-13 Post and Telecommunication*

|                                                |      |
|------------------------------------------------|------|
| <b>No. of telephone Exchanges</b>              | 5    |
| <b>No. of telephone connections (landline)</b> | 2058 |
| <b>No. of Public Telephone booths</b>          | -    |
| <b>No. of Mobile Connections</b>               | -    |
| <b>No Mobile Towers</b>                        | 32   |
| <b>No. of Post/telegraph office</b>            | 6    |
| <b>No Internet Connections</b>                 |      |
| <b>No. of Wi-Fi hotspots</b>                   |      |

Source: Municipal Corporation, Kashipur

## 8. Social Infrastructure

Social Infrastructure refers to the facilities and the process involved, which ensures education, health facilities and community development in any town. Social Infrastructure includes the education system, health care, social and cultural facilities, parks and open spaces, etc. The different components of social infrastructure will help to know how well a city or town is equipped with facilities. The provision of education, health, etc. defines the quality of life. As the city expands and the population increases, the gap between the demand and supply of these essential services increases, which deteriorates the quality of life in urban areas.

### 8.1. Education Facilities

Educational facilities play an important role in the overall development of a city. These facilities enhance economic growth and employment by making people capable enough to work. Kashipur planning area is having a large number of educational institutes which makes it fortunate enough. There are in total 391 educational institutes both at lower level and higher levels which cater to the needs of the population of KPA.

*Table 8-1: Educational Facilities in Kashipur planning area*

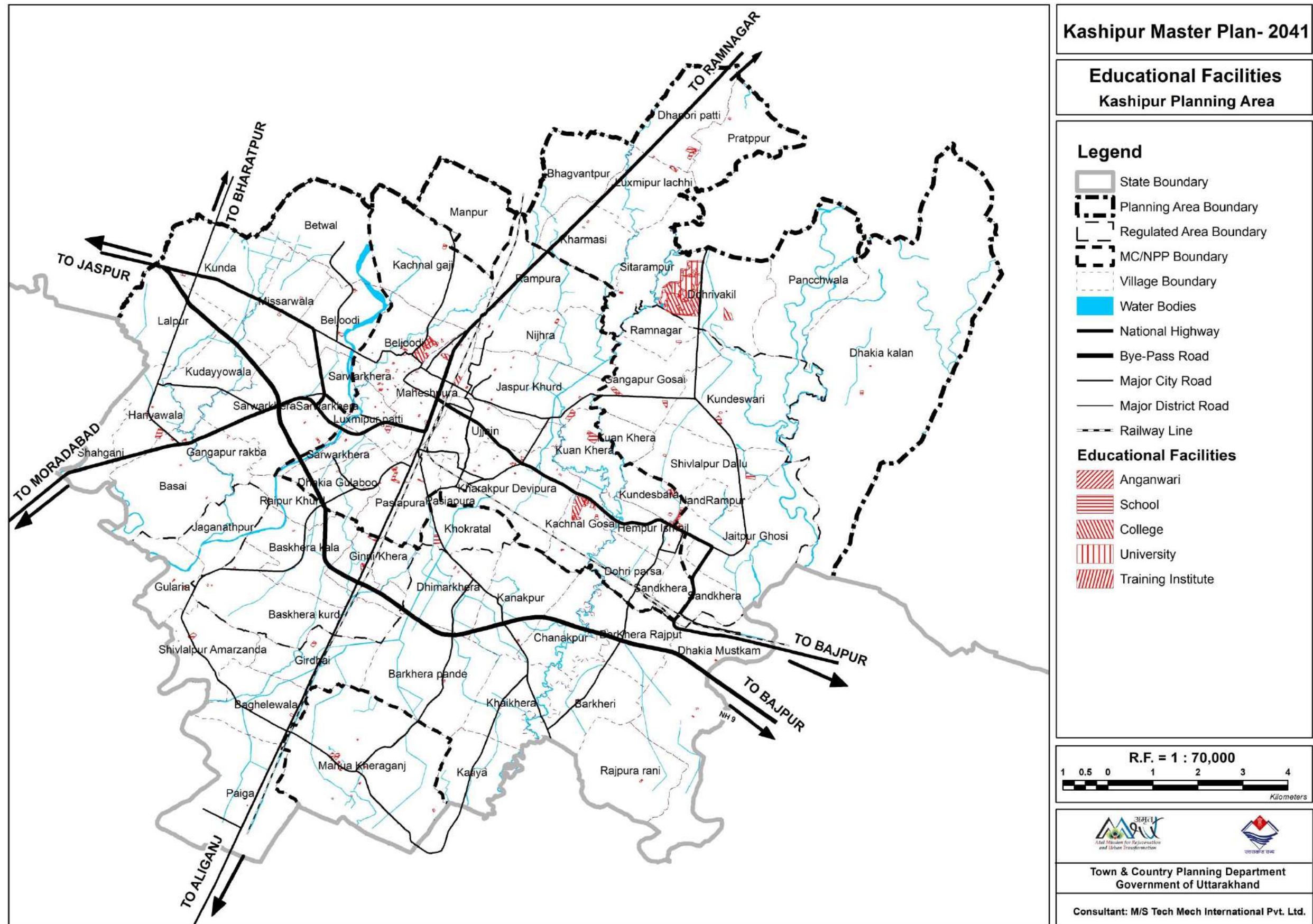
| Type of Institution               | Standard        | Urban |           | Rural |           | KPA |           |
|-----------------------------------|-----------------|-------|-----------|-------|-----------|-----|-----------|
|                                   |                 | No.   | Variation | No.   | Variation | No. | Variation |
| Anganwadi                         | 1 per 5000      | 130   | +93       | 72    | +52       | 202 | +145      |
| Primary School                    | 1 per 5000      | 43    | +6        | 50    | +30       | 93  | +36       |
| Middle to Senior Secondary School | 1 per 7500      | 55    | +30       | 30    | +17       | 85  | +47       |
| College                           | 1 per 1.25 lakh | 9     | +8        | 2     | +1        | 11  | +9        |

Source: District Education Office, US Nagar & Kumaon University, Nainital, Indian Institute of Management Kashipur, Uttarakhand Technical University, Dehradun.

Note: + depicts surplus and – depicts shortage

**Table 8-1** represents the number of educational institutions of each type which are present in both urban and rural areas. The existing number of facilities has been compared with the standards to calculate the shortage of each kind of facility. There are 130 Anganwadi in urban areas, where there is a requirement of 37 and in the case of KPA, there is a total of 202 Anganwadi which is much more than the requirement as per standard. At present, there are 43 primary schools, 55 middle to senior secondary schools and 9 colleges in the urban areas

Map 8-1: Educational Facility in Kashipur Planning Area



Source: Ground Survey



of Kashipur planning area.. At the urban level, all these facilities are more than the requirement as per standards. In the case of rural areas, there are 50 primary schools and 30 middle to senior secondary schools and 2 colleges which are present in Kundeswari and Shivalpur Dallu villages. In the case of rural areas as well, these facilities are present in surplus numbers. In total, there are 93 primary schools and 85 middle to senior secondary schools and 11 colleges in KPA. At the KPA level, there is a surplus of 36 primary schools, 47 Middle to Senior Secondary Schools and 9 colleges as per URDPFI guidelines (refer to **Map 8-1**).

## 8.2. Health Care Facilities

Health care facilities are provided by the department of health and family welfare in the case of Kashipur. The data provided by the concerned department given below is providing a clear image of the scenario of health infrastructure in KPA.

*Table 8-2: Health Care Facilities in Kashipur planning area*

| Type of Institution                     | Standard              | Urban  |           | Rural  | KPA    |           |
|-----------------------------------------|-----------------------|--------|-----------|--------|--------|-----------|
|                                         |                       | Number | Variation | Number | Number | Variation |
| Primary Health Centre                   | 1 per 1 lakh          | 1      | -1        | 1      | 2      | -1        |
| Primary Sub-Health Centre               | 1 per 45000 to 1 lakh | 0      | -4        | 0      | 0      | -6        |
| Dispensary                              | 1 per 15000           | 26     | +14       | 4      | 30     | +11       |
| Nursing Home                            | 1 per 45000 to 1 lakh | 8      | +4        | 1      | 9      | +3        |
| Hospital                                | 1 per 1-2.5 lakh      | 43     | +41       | 1      | 44     | +41       |
| Family Welfare Centre                   | 1 per 50000           | 0      | -4        | 0      | 0      | -6        |
| Diagnostic Centre                       | 1 per 50000           | 22     | +18       | 0      | 22     | +16       |
| Others                                  | -                     | 49     | -         | 1      | 50     | -         |
| Veterinary Hospital for pets and animal | 1 per 5 lakhs         | 2      | +1        | 1      | 3      | +2        |
| Dispensary for pet animals              | 1 per 1 lakh          | 0      | -2        | 6      | 6      | +3        |

Source: Health and Family Welfare Department, US Nagar

Note: + depicts surplus and – depicts shortage

The numbers of health facilities of each type which are present in both urban and rural areas have been depicted in **Table 8-2**. The existing number of facilities has been compared with the standards to calculate the shortage of each kind of facility. There are 26 dispensaries, 8 nursing

homes, 43 hospitals, 22 diagnostic centres and 49 other specialized health care centres in urban areas of KPA which are more than sufficient as per the existing requirement. However, there is an absence of primary sub-health centres and family welfare centres in urban areas while there is a requirement of 4 primary sub-health centres and 4 family welfare centres as per standards. At the KPA level, there is a shortage of 6 primary sub-health centres and 6 family welfare centres while other health facilities are more in number than required (refer to **Table 8-2**). There will also be a requirement of 1 primary health centre in the urban area as the population is reaching 2 lakhs soon. Facilities available for animal treatment include a veterinary hospital and dispensary. There is a shortage of 2 dispensaries for pets in urban areas of the planning area, but at the KPA level, the number is surplus by 3 numbers of dispensaries which is because all 6 dispensaries are located in rural areas. Veterinary hospitals are surplus in number in both cases as 3 hospitals are present within KPA of Kashipur while there is a requirement of only 1 hospital at the KPA level (refer to **Map 8-2**).

### **8.2.1. Epidemiological Details**

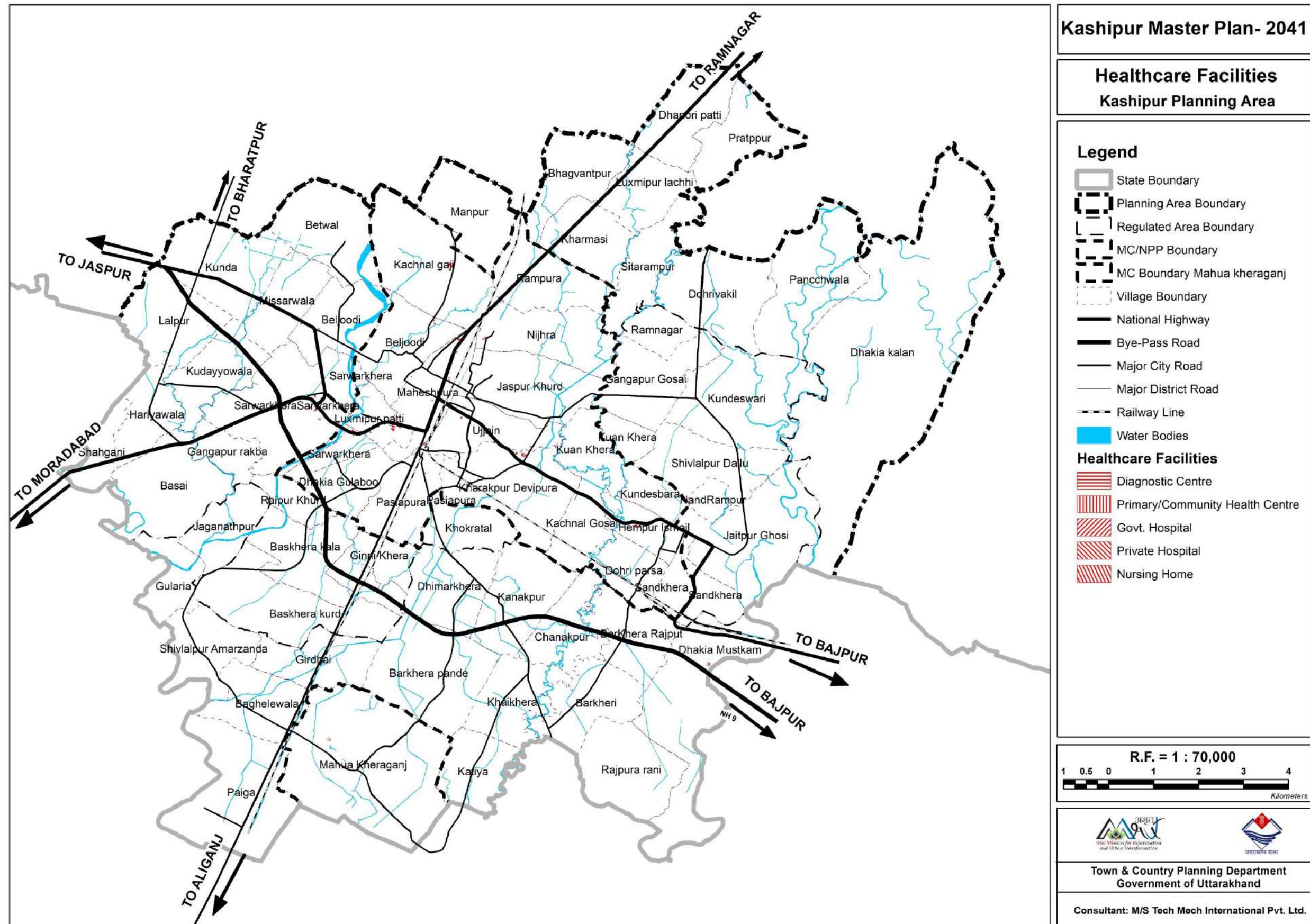
Tuberculosis is the most affecting disease in the area affecting 2,437 persons. Leprosy and Dengue also prevail in the Kashipur Tehsil. Other diseases also prevail in the area but the number is negligible. (Refer to **Table 8-3**)

*Table 8-3: Epidemiological Details of Kashipur Tehsil (Period from April 2016 to August 2019)*

| <b>Name of Predominant Diseases</b>           | <b>No: of persons Affected</b> |
|-----------------------------------------------|--------------------------------|
| <b>Leprosy</b>                                | <b>13</b>                      |
| <b>Phylaria</b>                               | <b>0</b>                       |
| <b>Tuberculosis</b>                           | <b>2437</b>                    |
| <b>Cholera</b>                                | <b>0</b>                       |
| <b>Dengue</b>                                 | <b>26</b>                      |
| <b>Chikungunya</b>                            | <b>0</b>                       |
| <b>Malaria</b>                                | <b>1</b>                       |
| <b>Others (Specify) Japanese encephalitis</b> | <b>1</b>                       |

*Source: Health and Family Welfare Department, US Nagar*

Map 8-2: Healthcare Facilities in Kashipur Planning Area



Source: Ground Survey



### 8.3. Socio-Cultural and Other Facilities

There are various socio-cultural facilities present in the Kashipur planning area which mainly include Anganwadi, community room/hall, recreational facilities, parks and open spaces, stadiums, etc. The details of each have been provided in **Table 8-4**.

**Table 8-4: Socio-Cultural Facilities in Kashipur planning area**

| Type of Institution                  | Standard                  | Urban  |           | Rural  | KPA    |           |
|--------------------------------------|---------------------------|--------|-----------|--------|--------|-----------|
|                                      |                           | Number | Variation | Number | Number | Variation |
| Community Room                       | 1 per 5000                | 0      | -37       | 0      | 0      | -56       |
| Community Hall                       | 1 per 15000               | 7      | -5        | 0      | 7      | -12       |
| Music, Dance and Drama Centre        | 1 per 1 lakh              | 0      | -2        | 0      | 0      | -3        |
| Meditation and Spiritual Centre      | 1 per 1 lakh              | 0      | -2        | 1      | 1      | -2        |
| Recreational Club                    | 1 per 1 lakh              | 0      | -2        | 0      | 0      | -3        |
| Housing Area Park and play area      | 1 per 5000                | 23     | -14       | 2      | 25     | -32       |
| Neighborhood Park and play area      | 1 per 15000               | 1      | -1        | 0      | 1      | -2        |
| Community Park                       | 1 per 1 lakh              | 0      | -         | 14     | 26     | -         |
| Community Level Multi-Purpose Ground | 1 per 1 lakh              | 4      | 0         | 1      | 5      | -1        |
| District Sport Centre                | 1 per 1 lakh              | 2      | 0         | 0      | 2      | -1        |
| Petrol Pump                          | -                         | 12     | -         | 14     | 26     | -         |
| Police Post                          | 1 per 40000-50000         | 4      | -         | 1      | -      | 0         |
| Police Station                       | 1 per 90000               | 2      | -         | 0      | 0      | 0         |
| Fire Station                         | 1 per 2 lakh              | 1      | -1        | 0      | 1      | -1        |
| District Management Centre           | 1 per administrative zone | 2      | +1        | 3      | 5      | +4        |
| Fire training institute              | 1 per city                | 0      | -1        | 0      | 1      | -1        |
| Cremation/Burial Ground              | 1 per 5 lakhs             | 30     | +18       | 2      | 32     | +13       |
| Telephone Exchange                   | 1 per 4 lakhs             | 2      | +1        | 3      | 5      | +4        |
| Post Office                          | 1 per 15000               | 4      | -8        | 2      | 6      | -18       |
| Bank                                 | 1 per 15000               | 0      | -2        | 0      | 0      | -3        |

| Type of Institution         | Standard | Urban  |           | Rural  | KPA    |           |
|-----------------------------|----------|--------|-----------|--------|--------|-----------|
|                             |          | Number | Variation | Number | Number | Variation |
| Poultry and Slaughter House | -        | 0      | -2        | 1      | 1      | -2        |

Source: Municipal Corporation, Kashipur; Concerned District Departments, US Nagar

Note: + depicts surplus and – depicts shortage

### 8.3.1. Socio-Cultural Facilities

There are 7 community halls in the urban areas of KPA, while the requirement of community halls is 12 which implies that there is a shortage of 5 community halls. At the KPA level, the shortage of community halls is 12. In addition to this, there is one spiritual centre located in Jaspur Khurd village but there is a requirement for two additional centres to serve the existing population. Other socio-cultural facilities such as a community room, music, dance and drama centre and the recreational club are missing in KPA. The number of units required for each can be referred to in **Table 8-4**.

### 8.3.2. Sports and Recreation

The physical and Social development of individual recreational facilities is foremost important. Therefore, the provision of these facilities at the local; sub-city and city levels in a balanced form are necessary. Recreational facilities exist in the shape of parks, stadiums, sports-related activities, etc. To cater to the essential needs of the individuals and communities these facilities need to be provided. Regarding the facility of parks, both the urban areas of KPA and KPA as a whole has a shortage of parks and playground. In urban areas, there are 23 parks available which is less than the requirement as 37 parks are required in total to serve the existing population indicating a shortage of 14 parks. There is a shortage of a total of 32 parks and playgrounds at the KPA level as there is a need for 57 parks in total to meet existing demands (refer to **Table 8-4**). There is one stadium in the city of Kashipur, located at Ram Nagar Road. There is a requirement for two more stadiums as per the population of KPA Kashipur.

### 8.3.3. Petrol Pump

**Table 8-4** depicts the number of petrol pumps present within the Kashipur planning area. There are 12 petrol pumps present in the urban area of KPA and 14 petrol pumps in rural areas of Kashipur. The petrol pumps are mostly located along Bazpur Road, Moradabad Road and Ramnagar Road.

### 8.3.4. Police Facilities

Maintaining the law and order situation in the region is one of the primary functions of the Police Administration. To fulfil this purpose, Kashipur has 2 Police stations and 4 Police Posts in Kashipur city and 1 police post in the rural area. At the KPA level, the facility is ample (refer to **Table 8-4**).

#### **8.3.4.1. Law and Order - Crimes Reported**

The total number of crime cases reported in 2018 was 424 which was the highest in the last 5 years (2014-2018) as depicted in **Table 8-5**. The two major crimes reported in the last 5 years were theft (549) and a crime against women (451). The crime rate has shown a variable trend in the last 5 years, decreasing in the years 2015 and 2016 in comparison to 2014 and then increasing in 2017 and 2018. The police department has installed 34 CCTV cameras along major roads and at major junctions to control crime.

*Table 8-5: Crimes Reported in Kashipur in the Last Five Years*

| Type                       | 2018 | 2017 | 2016 | 2015 | 2014 |
|----------------------------|------|------|------|------|------|
| <b>Theft</b>               | 97   | 108  | 118  | 104  | 122  |
| <b>Burglary</b>            | 25   | 14   | 8    | 17   | 15   |
| <b>Kidnapping</b>          | 25   | 18   | 20   | 6    | 12   |
| <b>Robbery</b>             | 4    | 17   | 4    | 9    | 5    |
| <b>Riots</b>               | 7    | 12   | 15   | 20   | 18   |
| <b>Murder</b>              | 5    | 11   | 7    | 9    | 11   |
| <b>Crime Against Women</b> | 132  | 110  | 76   | 56   | 77   |
| <b>Fatal Accidents</b>     | 11   | 31   | 34   | 34   | 34   |
| <b>Non-Fatal Accidents</b> | 13   | 14   | 25   | 12   | 25   |
| <b>Cyber Crimes</b>        | 3    | 4    | 3    | 2    | 1    |
| <b>Total</b>               | 322  | 339  | 310  | 269  | 320  |

*Source: Police Department, US Nagar*

#### **8.3.5. Fire Prevention and Protection**

Fire accidents have become a common day phenomenon, so to prevent & protect from fire it is necessary to provide essential services in the city. Due to the advancement in technology and high-rise construction, industrial accidents, and short-circuiting in commercial establishments are most vulnerable to fire incidents. It becomes the foremost obligation of the govt. to provide security from these accidents. There is 1 fire station present in the Kashipur planning area located at Bazpur Road in Kashipur city. The number of fire stations is sufficient to serve the existing population of an urban area but at the KPA level, 1 more fire station is required as per the given standards (refer to **Table 8-4**). However, there is an absence fire training college in the Kashipur planning area.

### 8.3.5.1. Existing Infrastructure in Fire Stations

As per the information supplied by the respective District Fire Officer, the infrastructure present in each of the fire stations can be referred to in **Table 8-6**:

*Table 8-6: Infrastructure Available in Fire Station present in Kashipur planning area*

| Sr. No: | Infrastructure                       | Number |
|---------|--------------------------------------|--------|
| 1       | Water Tender                         | 1      |
| 2       | Foam Tender                          | 1      |
| 3       | Mini-Water Tender                    | 1      |
| 4       | Water Mist High-Pressure Mini Tender | 1      |
| 5       | Fire Fighting Bike                   | 1      |
| 6       | Portable Pump Carrying Vehicle       | 1      |

*Source: Fire and Safety Department, US Nagar*

### 8.3.6. Telephone Exchange and Postal Facilities

There are 5 telephone exchanges present in KPA out of which 2 are present in urban areas while the other 3 are located in rural areas in Baghelwala, Kundeswari and Pratappur village. The number of telephone exchanges is more than sufficient in number (refer to **Table 8-4**) both at the urban as well as KPA levels. In the case of postal facilities, 4 post offices are present in urban areas and 2 in rural areas. There is a shortage of 8 post offices in urban areas while at the KPA level there is a shortage of 18 post offices as per the existing population of KPA (refer to **Table 8-4**).

### 8.3.7. Banking Facilities

**Table 8-4** highlights the existing banking facilities in urban areas of KPA and the total in KPA. The existing number of facilities has been compared with the standards to calculate the shortage of each kind of facility. There are 30 banks located in urban areas of KPA and 32 banks in total located in KPA. The number of banks present is sufficient in number as per the existing population for both urban as well as KPA. There is a shortage of 2 banks in urban areas and 3 banks at the KPA level.

### 8.3.8. Poultry and Slaughter Houses

As per data provided by Animal Husbandry and Dairy Farming Department, US Nagar there are no poultry and slaughterhouses present in KPA.

#### **8.4. Status of Socio-cultural facilities under AMRUT Mission**

The development of green spaces and parks with special provisions for child-friendly components is one of the essential components of the AMRUT mission. The mission mandate that for parks, ULBs will have to establish a system for maintenance with resident participation. One-half of the project cost will be given by the central government. Also, the total expenditure on these projects will not exceed 2.5% of the State Annual Action Plan (SAAP).

In the context of Kashipur, there are 8 parks which were proposed from the F.Y. 2015-16 to F.Y. 2017-18 in the corporation area under the AMRUT mission. The projects are as follows:

- Beautification of Park in Block C Transit Camp in Ward No. 1 in FY 2015-16
- Beautification of Subhash Park in Ward No. 2 (Part - 1) in FY 2016-17
- Beautification of Subhash Park in Ward No. 2 (Part - 2) in FY 2017-18
- Beautification of Choudhary Charan Singh and Awas Vikas Park in ward no. 3 in 2017-18
- Beautification of Awas Vikas Colony in Ward no. 3 in FY 2017-18
- Beautification of park near Raju Seth's house in Ward no. 3 in FY 2017-18
- Beautification of park near Ramesh Srivastav's house in Ward no. 3 in FY 2017-18
- Beautification of Indra Devi railway park in Ward no. 4 (Part – 1) in FY 2017-18
- Beautification of Indra Devi railway park in Ward no. 4 (Part – 2) in FY 2017-18
- Beautification of Ekram Aray Park in Ward No. 7 in FY 2016-17
- Beautification of Ansari Construction in Ward no. 8 in FY 2017-18
- Beautification of Park in front of girl's hostel in Ward No. 19 in FY 2017-18
- Beautification of Gayatri Park in Ward No. 20 in FY 2017-18
- Beautification of Ram Kumar Arya Park in Ward No. 17 in FY 2017-18
- Beautification of Patel Park in Ward No. 19 in FY 2017-18

A total amount of Rs.160 lakhs have been disbursed in all three FYs. Out of the eight projects seven projects are completed and one is under the implementation stage. The F.Y. 2017-18 data shows that almost 84% of funds have been utilized while 16% are remaining which is expected to be utilized in the coming F.Y. 2020-21.

#### **8.5. Key Issues**

- 1) There is a requirement for 2 primary sub-health centres and 3 family welfare centres at the KPA level.

- 2) There is a shortage of one dispensary for pets in urban areas but at the KPA level, the number of dispensaries is surplus in number.
- 3) Socio-cultural facilities such as a community room, music, dance and drama centre, meditation and spiritual centre, and a recreational club are missing.
- 4) 8 more post offices are required to serve the population of Kashipur as per the given standards.
- 5) There is a requirement for one more police station as per the analysis of existing police facilities.
- 6) Criminal activities have increased in the last few years which need to be given due consideration in the formulation of the master plan.
- 7) There is a shortage of one stadium, two community parks and 11 neighbourhood parks as per the given standards.

There is an absence of a fire training college/institute in KPA. However, it has been proposed within KPA itself.

## 8.6. Future Demand

This section represents the social infrastructure requirements demand for 2041. It includes educational facilities, health facilities, socio-cultural facilities, Open Spaces, Sports Facilities, Distribution Services, Police, and Civil Defense. For the calculation of the demand, URDPFI guidelines have been adopted.

### 8.6.1. Education Facilities

The demand assessment of educational facilities has been provided in **Table 8-7**. The existing number of facilities, the total required facility according to standard for 2041, and the additional requirement of facilities along with their land requirements are highlighted in **Table 8-7**.

*Table 8-7 Demand Assessment of Educational Facilities*

| Category                                       | Population served per unit | Existing | 2041   | Required Number | Area per facility (Ha) | Total area (Ha) |
|------------------------------------------------|----------------------------|----------|--------|-----------------|------------------------|-----------------|
|                                                |                            |          | 842254 |                 |                        |                 |
| Pre-Primary, Nursery School                    | 2500                       | 93       | 337    | -412            | 0.40                   | 164.80          |
| Primary school                                 | 5000                       |          | 168    |                 |                        |                 |
| Senior Secondary School                        | 7500                       | 85       | 112    | -27             | 1.8                    | 48.60           |
| Integrated School with/without hostel facility | 90000                      | 0        | 18     | -18             | 3.90                   | 70.20           |
| School for Physically Challenged               | 45000                      | 0        | 19     | -19             | 0.70                   | 13.30           |

|                |        |    |   |   |      |              |
|----------------|--------|----|---|---|------|--------------|
| <b>College</b> | 125000 | 11 | 7 | 4 | 5.00 | 0.00         |
| <b>Total</b>   |        |    |   |   |      | <b>296.9</b> |

Source: Analysis by Town and Country Planning Department

It can be inferred that colleges are surplus in the area till 2041 and any additional facility for colleges is not required. 412 pre-primary and primary are required together. 27 senior secondary schools are required. Integrated school with/without hostel facility is required in 18 numbers. There is no school for the physically challenged in the planning area so 19 such schools are required. The total land required for all the additional facilities is 296.9 Ha for an educational facility.

### 8.6.2. Healthcare Facilities

The demand assessment of healthcare facilities has been provided in **Table 8-8**. The existing number of facilities, the total required facility according to standard for 2041, and the additional requirement of facilities along with their land requirements. It is observed that Intermediate Hospitals of Category A and B are in surplus but there is a lack of multi-speciality Hospitals and Specialty hospitals by 8 numbers. The maximum need is for dispensaries which are 26 in number. There is a need for three general hospitals. Diagnostic Centre and Veterinary Hospital for pets and animals are also in surplus till 2041. The total land required for the healthcare facilities is 137.54 Ha for Kashipur Planning Area 2041.

*Table 8-8 Demand Assessment of Healthcare facilities*

| Category                                                    | Population served per unit | Existing | 2041   | Variation | Area per facility (Ha) | Total area |
|-------------------------------------------------------------|----------------------------|----------|--------|-----------|------------------------|------------|
|                                                             |                            |          | 842254 |           |                        |            |
| <b>Dispensary</b>                                           | 15,000                     | 30       | 56     | -26       | 0.12                   | 3.12       |
| <b>Nursing homes, child welfare &amp; maternity centres</b> | 45,000                     | 9        | 19     | -10       | 0.3                    | 3.00       |
| <b>Polyclinic</b>                                           | 1,00,000                   | 0        | 8      | -8        | 0.3                    | 2.40       |
| <b>Intermediate Hospital (Category B)</b>                   | 1,00,000                   | 44       | 8      | 28        | 3.7                    | 0          |
| <b>Intermediate Hospital (Category A)</b>                   | 1,00,000                   |          | 8      |           |                        |            |
| <b>Multi-Speciality Hospital</b>                            | 1,00,000                   | 0        | 8      | -8        | 9                      | 72.00      |
| <b>Speciality Hospital</b>                                  | 1,00,000                   | 0        | 8      | -8        | 3.7                    | 29.60      |
| <b>General Hospital</b>                                     | 2,50,000                   | 0        | 3      | -3        | 6                      | 18.00      |
| <b>Family Welfare Centre</b>                                | 50,000                     | 0        | 17     | -17       | 0.08                   | 1.36       |
| <b>Diagnostic centre</b>                                    | 50,000                     | 22       | 17     | 5         | 0.08                   | 0.00       |



| Category                                 | Population served per unit | Existing | 2041   | Variation | Area per facility (Ha) | Total area    |
|------------------------------------------|----------------------------|----------|--------|-----------|------------------------|---------------|
|                                          |                            |          | 842254 |           |                        |               |
| Veterinary Hospital for pets and animals | 5,00,000                   | 3        | 2      | 1         | 0.2                    | 0.00          |
| Dispensary for pet animals and birds     | 1,00,000                   | 6        | 8      | -2        | 0.03                   | 0.06          |
| Rehabilitation centres                   | 1,00,000                   | 0        | 8      | -8        | 1                      | 8             |
| <b>Total</b>                             |                            |          |        |           |                        | <b>137.54</b> |

Source: Analysis by Town and Country Planning Department

### 8.6.3. Socio-cultural Facilities and Other Facilities

The demand assessment of Socio-cultural and other facilities has been provided in **Table 8-9**. The existing number of facilities, the total required facility according to standard for 2041, and the additional requirement of facilities along with their land requirements are highlighted.

*Table 8-9 Demand Assessment of Socio-cultural and other facilities*

| Category                            | Population served per unit | Existing | 2041   | Variation | Area per facility (Ha) | Total area (Ha) |
|-------------------------------------|----------------------------|----------|--------|-----------|------------------------|-----------------|
|                                     |                            |          | 842254 |           |                        |                 |
| Anganwadi                           | 5000                       | 202      | 168    | 34        | 0.03                   | 0.00            |
| Community hall                      | 15000                      | 7        | 56     | -49       | 0.20                   | 9.80            |
| Music, dance and drama centre       | 100000                     | 0        | 8      | -8        | 0.10                   | 0.80            |
| Meditation and spiritual centre     | 100000                     | 1        | 8      | -7        | 0.50                   | 3.50            |
| Recreational Club                   | 100000                     | 0        | 8      | -8        | 1.00                   | 8.00            |
| Old age home                        | 500000                     | 0        | 2      | -2        | 0.10                   | 0.20            |
| Housing Area Park                   | 5000                       | 25       | 168    | -143      | 0.50                   | 71.50           |
| Neighbourhood Park                  | 15000                      | 1        | 56     | -55       | 1.00                   | 55.00           |
| Community Park                      | 100000                     | 0        | 8      | -8        | 5.00                   | 40.00           |
| District Park                       | 500000                     | 0        | 2      | -2        | 25.00                  | 50.00           |
| District-level multipurpose ground  | 500000                     | 0        | 2      | -2        | 4.00                   | 8.00            |
| Community level Multipurpose ground | 100000                     | 1        | 8      | -7        | 2.00                   | 14.00           |
| District Sports Centre              | 100000                     | 2        | 8      | -6        | 8.00                   | 48.00           |
| Police Post                         | 40000                      | 5        | 21     | -16       | 0.16                   | 2.56            |
| Police Station                      | 90000                      | 2        | 9      | -7        | 1.55                   | 10.85           |
| Fire Station                        | 200000                     | 1        | 4      | -3        | 1.00                   | 3.00            |
| District Management Centre          | 1                          | 0        | 1      | -1        | 2.00                   | 2.00            |
| Fire training institute             | 1                          | 0        | 1      | -1        | 3.00                   | 3.00            |
| Cremation/Burial Ground             | 500000                     | 32       | 2      | 30        | 4.00                   | 0.00            |

| Category                                   | Population served per unit | Existing | 2041   | Variation | Area per facility (Ha) | Total area (Ha) |
|--------------------------------------------|----------------------------|----------|--------|-----------|------------------------|-----------------|
|                                            |                            |          | 842254 |           |                        |                 |
| Telephone Exchange                         | 400000                     | 5        | 2      | 3         | 4.00                   | 0.00            |
| Radio/TV station                           | 500000                     | 0        | 2      | -2        | 0.17                   | 0.34            |
| Post office                                | 15000                      | 7        | 56     | -49       | 0.01                   | 0.42            |
| Head post office with delivery office      | 250000                     | 0        | 3      | -3        | 0.08                   | 0.23            |
| Head post office and administrative office | 500000                     | 0        | 2      | -2        | 0.25                   | 0.50            |
| Bank                                       | 15000                      | 32       | 56     | -24       | 0.01                   | 0.19            |
| Bank with locker, ATM and other facilities | 100000                     | 0        | 8      | -8        | 0.25                   | 2.00            |
| <b>Total</b>                               |                            |          |        |           |                        | <b>333.89</b>   |

Source: Analysis by Town and Country Planning Department

#### 8.6.3.1. Socio-cultural Facilities

The number of Anganwadi is surplus by 34 numbers till 2041 reflecting the provision of childcare is high in the planning. Only 7 community halls are present in the planning area additional 49 are required. There are no music, dance, and drama Centre so 8 numbers are required. 7 Meditation and spiritual Centres of 0.5 Ha each are required. 8 recreational clubs and 2 old age homes are required. The total land for socio-cultural facilities in Kashipur Planning Area for 2041 is 22.30 Ha.

#### 8.6.3.2. Open Spaces

The existing number of Housing Area Park and Neighborhood Park is quite good. But still, for 2041 there is a requirement of 143 more Housing Area Park of 0.5 Ha each and 56 more Neighborhood level parks of 1 Ha each required. There are no community and district parks in the planning area. Hence, 8 Community Park of 5 Ha each and 2 District Park of 25 Ha are required. The total area required for open spaces is 216.5 Ha.

#### 8.6.3.3. Multipurpose grounds

There is 1 multipurpose ground in the planning area and hence, 7 more community-level ground of 2 Ha each and 2 at the district level of 4 Ha is required for Kashipur Planning Area till 2041.

#### 8.6.3.4. Sports Facilities

There are 2 District Sports Centres and there is a need for 6 more each of 8 Ha and a total of 48 ha are required in total for 2041 in Kashipur Planning Area. The Play areas in Kashipur are combined with the parks.

#### **8.6.3.5. Police, Civil Defence, and Home Guards**

16 police posts and 7 more police stations are required in the Kashipur Planning area for 2041 which accounts for a total land of 13.41 Ha.

#### **8.6.3.6. Safety management**

There is no District Management Centre in the planning area. Hence, one is required of 2 Ha and there is a requirement of a Fire Training Institute of 3 Ha in the Planning Area.

#### **8.6.3.7. Telephone, Postal and Banking facilities**

The numbers of telephone exchanges are surplus and there is a requirement of 2 Radio/TV stations of 0.17 Ha. There is a lack of Post offices as well, 49 new post offices are required, and 3 head post office with the delivery facility and 2 head post office with the administrative office is required. 24 new banks and 8 new banks with ATMs and other facilities are required. A total of 3.68 Ha of land is required.

#### **8.6.3.8. Miscellaneous facility**

The numbers of Cremation/Burial grounds are surplus in the planning area and there is no need for any more facilities.

The total land requirement for socio-cultural and other facilities is 333.89 Ha for 2041 in Kashipur Planning Area.

### **8.6.4. Overall Social Infrastructure Demand**

The total land required for entire social infrastructure facilities is 755.33 Ha. ( **Table 8-10**)

*Table 8-10 Overall Demand for Social Infrastructure*

| Facility             | Area (Ha) |
|----------------------|-----------|
| Education            | 296.9     |
| Health Care          | 137.54    |
| Socio-Cultural       | 22.30     |
| Open Spaces          | 216.5     |
| Multipurpose grounds | 4         |
| Sports Facilities    | 48        |

|                                          |               |
|------------------------------------------|---------------|
| Police, Civil Defence and Home Guards    | 13.41         |
| Fire and Disaster                        | 3             |
| Telephone, Postal and Banking facilities | 3.68          |
| <b>Total</b>                             | <b>755.33</b> |

Source: Analysis by Town and Country Planning Department

## 9. Traffic and Transportation

Transport is the backbone of the economy and social structure of any region. If urban centers have been recognized as engines of Economic Growth, Traffic and Transportation have rightly been termed as wheels of such engines. A good road and rail network are the symbols of sound development of any city and the study of transportation helps in understanding the existing situation, potentials, weaknesses, etc., and helps to draft out strategies and projects for future development. The road and Rail sector occupies significant roles in the transport sector in the Kashipur planning area. The road network has been studied in terms of classification of roads, length of roads, cross-section of roads (divided and undivided carriageways), area under major existing roads, and major road intersections. Available data regarding the rail network has also been studied.

### 9.1. Road Network at KPA Level

Kashipur planning area is well served by roads connecting it to various cities of other districts and within the district. Two National Highways i.e., NH-734 and NH-309 are passing through KPA. NH-309 connects Rudrapur to Srinagar having a Right of Way varying from 24m to 34m and a carriageway width of 7-14.5 m. NH-734 connects Kashipur to Jaspur having a Right of Way varying from 24m to 30m and a carriageway width of 7-14.5 m. In addition to it, there is one state highway passing through KPA which includes SH-45 connecting Kashipur to Thakurdwara. 4 MDRs are passing through the city including Kashipur main road having ROW of 24-36 m, Kashipur Aliganj road having ROW of 14-30 m, Kashipur Dadiyal road having ROW of 21 m and Dhakia-Gulaboo-Paiga-Mukandpur Road having ROW of 18 m. There is another Road which is known as Kashipur-Dhakia-Kharmasha Road connecting Kashipur to Kharmasha having a right of way of 21 m within the KPA boundary. The length of roads within Municipal limits is 106.24 km which accounts for 23.46% of total roads within KPA. The total length of village roads is 223.27 km which is 49.30% of total roads. The existing road network in KPA Kashipur shows that it is well served by the regional roads which provide a high level of connectivity with other parts of the state and covers a total of 27.24% of road length. The road hierarchy is not being followed efficiently and there is a need for R2 roads to cater to the traffic demands. For details refer to **Table 9-1**. The cross-sectional details can be referred to in Error! Reference source not found., Error! Reference source not found., Error! Reference source not found., Error! Reference source not found., Error! Reference source not found. & Error! Reference source not found.. There is one bypass road and one bridge under construction which has influenced the movement pattern of traffic (refer to Error! Reference source not

found., Error! Reference source not found., Error! Reference source not found. & Error! Reference source not found.). There are 45 bridges and culverts located on these roads made up of different materials. The hierarchy of roads is presented in Error! Reference source not found..

**Table 9-1: Length and Width of Roads in Kashipur within KPA limit**

| S. No. | Hierarchy | Name of Road                              | Length of the road (Km) | Right of Way (m) | Carriageway (m) |
|--------|-----------|-------------------------------------------|-------------------------|------------------|-----------------|
| 1      | R1        | NH-734                                    | 11.2                    | 24-30            | 7-14.5          |
| 2      | R1        | NH-309                                    | 19.8                    | 24-30            | 7-14.5          |
| 3      | R1        | Kashipur-Thakurdwara Road SH-45           | 6                       | 45.5             | 11              |
| 4      | R1        | Kashipur Main Road (MDR)                  | 21.60                   | 24-36            | 5.50            |
| 5      | R1        | Kashipur-Aliganj Road (MDR)               | 8                       | 14-30            | 7               |
| 6      | R1        | Kashipur-Dadiyal Road (MDR)               | 6.10                    | 21               | 7               |
| 7      | R1        | Dhakia-Gulaboo-Paiga-Mukandpur Road (MDR) | 25.75                   | 18               | 5.50            |
| 8      | R1        | Kashipur-Dhakia-Kharmasha Road (ODR)      | 14.88                   | 21               | 5.50            |
| 9      | R3        | Municipal Roads                           | 106.24                  | 3-24             | 2.5-12          |
| 10     | R4        | Village Roads (92 in number)              | 223.27                  | 7-36             | 3.75-7          |

Source: PWD Department, Kashipur; Kashipur Municipal Corporation; NHAI, Najibabad

**Figure 9-1: Cross section, Moradabad Road**



**Figure 9-2: Cross section, Manpur road**



**Figure 9-3: Cross-section, Kashipur Road**



**Figure 9-4: Cross-section, Jaspur Road**



**Figure 9-5: Cross-section, Ramnagar Road**



**Figure 9-6: Cross-section, Moradabad Road**





**Figure 9-7: Bypass Road(Under construction)**



**Figure 9-8: Bypass Road(Under construction)**



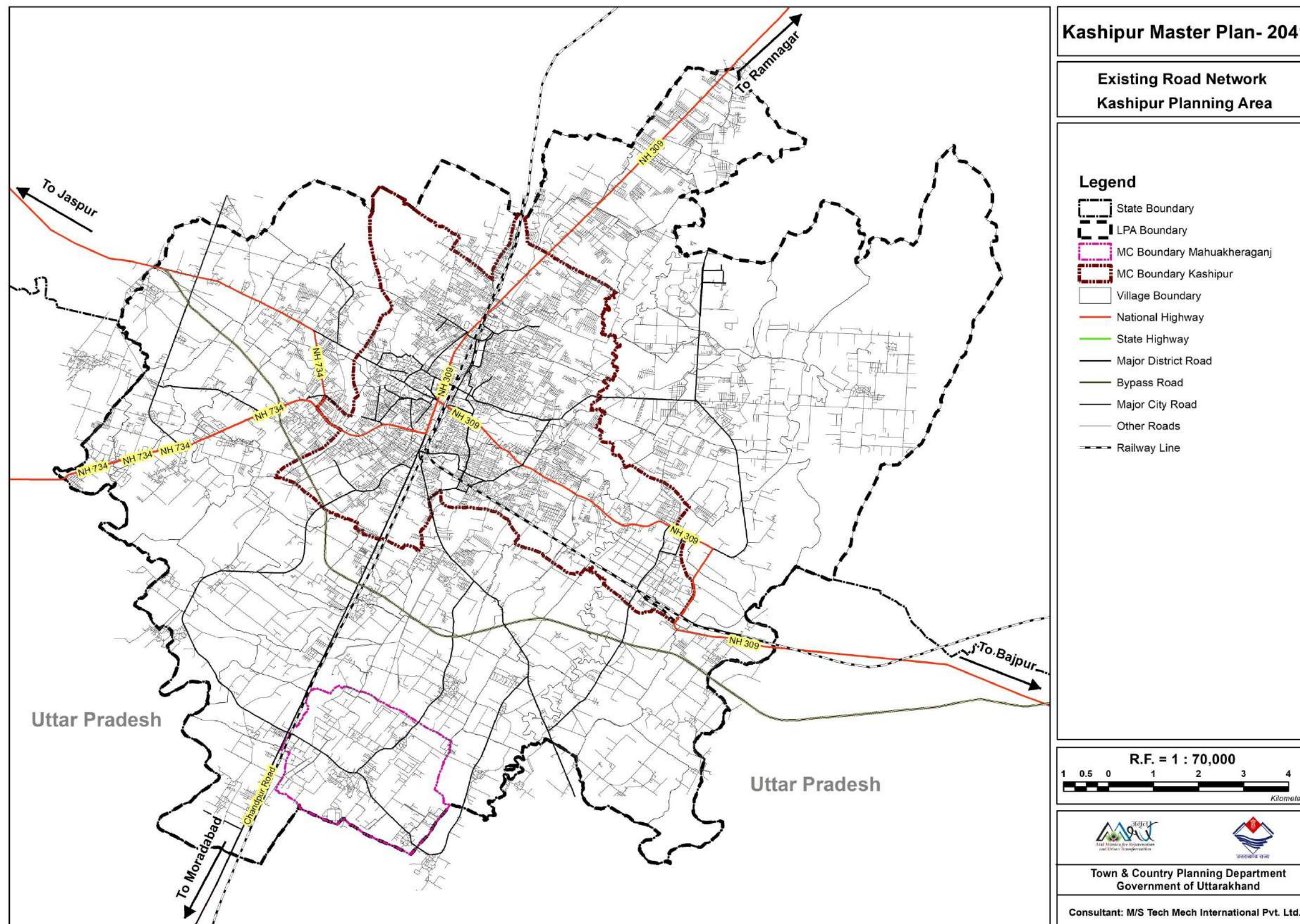
**Figure 9-9: Under construction Grade Separator, Maharana Pratap Chowk**



**Figure 9-10: Under construction Grade Separator, Maharana Pratap Chowk**



Map 9-1: Road Network of Kashipur Planning Area



Source: Base Map from NRSC



## 9.2. Growth of Vehicles

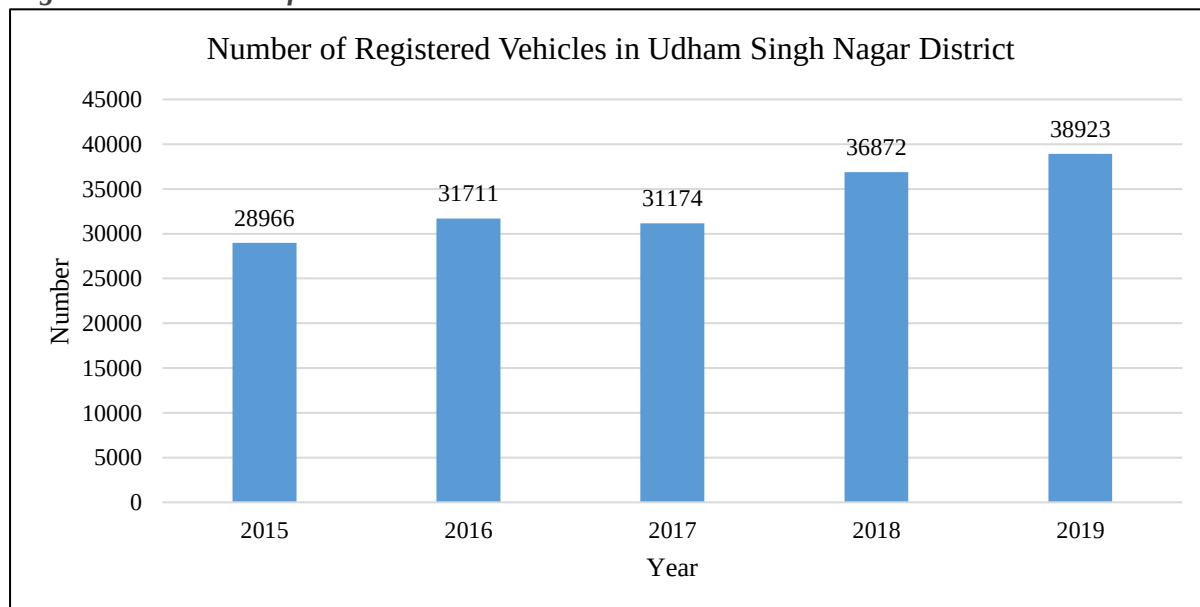
Error! Reference source not found. represents the vehicular growth in Udham Singh Nagar district from the period 2015 to 2019 (up to August). The number of vehicles has increased in each year except in 2017 where it has shown a marginal decline from 31711 in 2016 to 31174 in 2017. Private passenger vehicles have a greater share of the total number of registered vehicles and are observed to have increased every year although by a marginal rate from 10.1% in 2015-16 to 15.85% in the year 2018-2019 (refer to **Figure 9-11**).

*Table 9-2: Growth of Vehicles*

| Sr. No:      | Type of Vehicle | 2019 (up to 31.07.2019) | 2018         | 2017         | 2016         | 2015         |
|--------------|-----------------|-------------------------|--------------|--------------|--------------|--------------|
| 1            | Two Wheelers    | 30913                   | 28910        | 24879        | 25069        | 22547        |
| 2            | Car             | 4979                    | 5150         | 4521         | 4877         | 4653         |
| 3            | Truck           | 1143                    | 895          | 765          | 831          | 741          |
| 4            | Bus             | 116                     | 111          | 63           | 80           | 76           |
| 5            | Auto Rickshaw   | 349                     | 261          | 184          | 229          | 182          |
| 6            | E-Rickshaw      | 702                     | 770          | 210          | 0            | 0            |
| 7            | Tractor         | 721                     | 775          | 552          | 625          | 767          |
| <b>Total</b> |                 | <b>38923</b>            | <b>36872</b> | <b>31174</b> | <b>31711</b> | <b>28966</b> |

Source: Regional Transport Office, US Nagar

*Figure 9-11: Growth of Vehicles*



Source: Regional Transport Office, US Nagar

The personalized modes of the vehicle such as two-wheelers and cars together hold approximately 90-95 % of the total passenger vehicles. The growth rate of public transport

vehicles is lower as compared to private vehicles. So, there is a need for a cheap and convenient Public Transport System in the city which is lacking in the existing situation. Also, there is a need to provide adequate infrastructure to support the growing number of vehicles to avoid any sort of inconvenience.

### 9.3. Road Accidents

Kashipur planning area is facing the problem of traffic so much that the ill effect of this is relevant from the figures of Accidents. There is a total of 280 accidents that have occurred from 2014 to July 2019 in which 178 people have died and 197 have been injured. The number of accidents has shown a lot of variation in each year as compared to the preceding year. The number of accidents reduced to 46 in 2015 from 59 in 2014. Similarly, the number increased in the year 2018 i.e., 48 from 47 in 2017. There are 25 cases registered till July in the year 2019. The maximum number of people who have died in a year is 37 in the year 2015 while the maximum number of people injured in a year is 46 in the year 2018. The major cause of accidents as mentioned by the police department is the negligence of the driver and the speeding of the vehicle. Hence, there is a need to adopt certain speed control measures to minimize the number of accidents. For details refer to **Table 9-3**:

**Table 9-3: Accidents Record of Kashipur planning area**

| Sr. No:      | Year | Number of Accidents | No: of Dead Persons | No: of Injured Persons |
|--------------|------|---------------------|---------------------|------------------------|
| 1            | 2019 | 25                  | 12                  | 25                     |
| 2            | 2018 | 46                  | 23                  | 32                     |
| 3            | 2017 | 45                  | 35                  | 31                     |
| 4            | 2016 | 59                  | 36                  | 44                     |
| 5            | 2015 | 46                  | 37                  | 27                     |
| 6            | 2014 | 59                  | 35                  | 38                     |
| <b>Total</b> |      | 280                 | 178                 | 197                    |

Source: Police Department, US Nagar

### 9.4. Traffic and Travel Characteristics

A number of traffic and travel surveys were conducted to appreciate and quantify the traffic and transport characteristics of commuter travel within the study area. First of all, a detailed reconnaissance survey was conducted to identify the appropriate locations for carrying out the traffic volume count and origin-destination (O-D) surveys. The surveys were conducted in the best-suited locations. The details of various traffic surveys are presented in **Table 9-4**.

**Table 9-4: Details of traffic surveys at outer cordon locations.**

| Survey Type                     |                  | Location                                                                    | Duration<br>(in Hrs) | Survey<br>Date |
|---------------------------------|------------------|-----------------------------------------------------------------------------|----------------------|----------------|
| Traffic Volume<br>Counts        | Outer<br>Cordons | Pratappur (Ramnagar Road)                                                   | 24                   | 25-12-2020     |
|                                 |                  | Shahganj (Moradabad Road)                                                   | 24                   | 21-01-2020     |
|                                 |                  | Mahua Kheraganj NPP (Aliganj Road, Mahua Kheraganj NPP Road, Kashipur Road) | 24                   | 21-01-2020     |
|                                 |                  | Kunda (Jaspur Road)                                                         | 24                   | 21-01-2020     |
|                                 |                  | Paramanadpur (Rudrapur Road)                                                | 24                   | 12-02-2020     |
|                                 |                  |                                                                             |                      |                |
| Origin<br>Destination<br>Survey | Outer<br>Cordons | Pratappur (Ramnagar Road)                                                   | 16                   | 25-12-2020     |
|                                 |                  | Paramanadpur (Rudrapur Road)                                                | 16                   | 31-12-2020     |
|                                 |                  | Mahua Kheraganj NPP (Aliganj Road)                                          | 16                   | 21-01-2020     |
|                                 |                  | Jagatpur Patti (Jaspur Road)                                                | 16                   | 04-02-2020     |
|                                 |                  | Shahganj (Moradabad Road)                                                   | 16                   | 05-02-2020     |

Source: Primary Survey

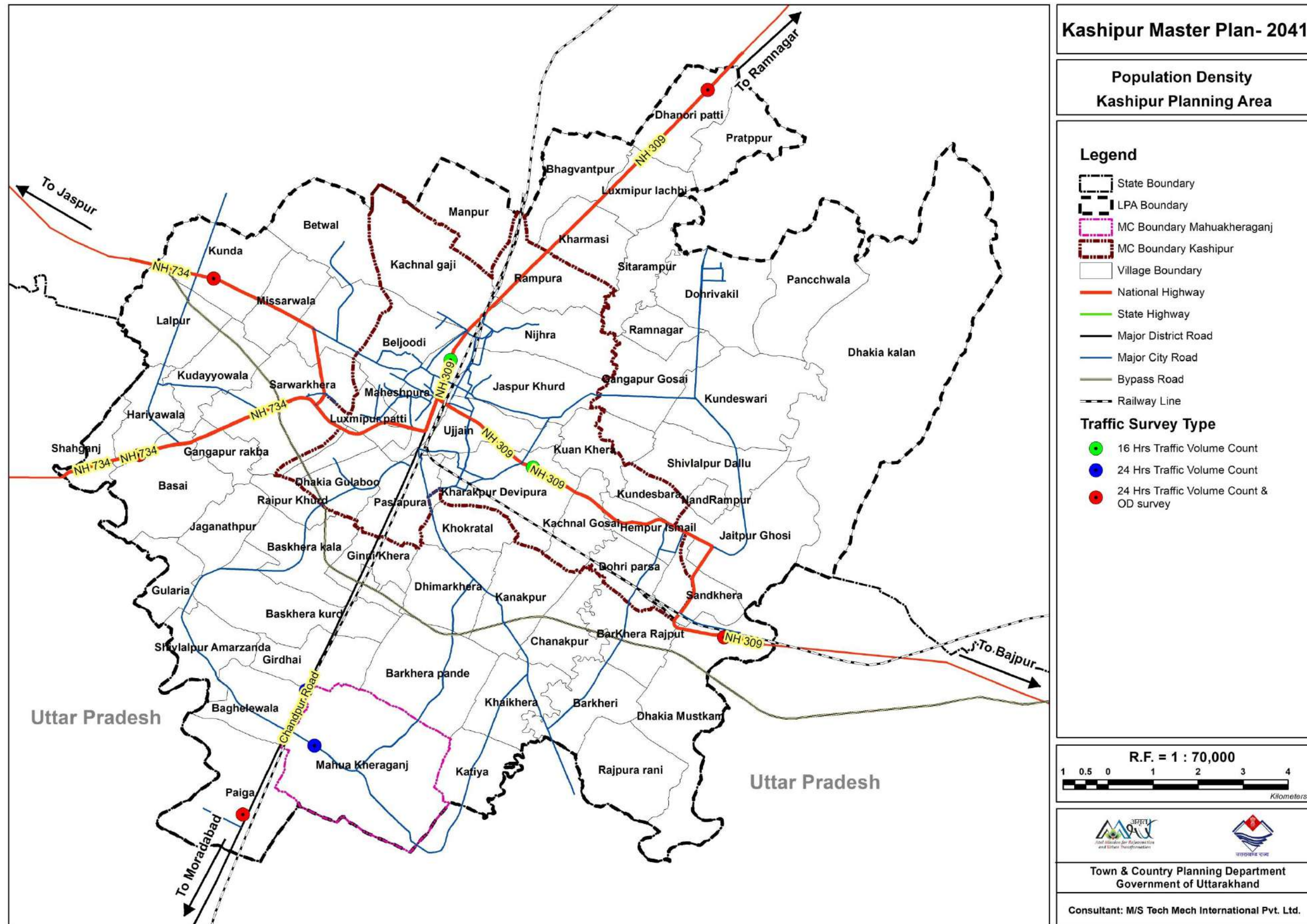
#### **9.4.1. Traffic Volume Characteristics at Outer Cordon**

The objective of classified volume count (CVC) is to determine the movement pattern of traffic coming into the city from various directions and vice versa. The survey was conducted at 7 outer cordon locations (refer to **Map 9-2**).

##### **9.4.1.1. Average Daily Traffic**

The traffic counts both in terms of numbers of vehicles and Passenger Car Units (PCUs) have been computed for the total daily (24 hours) traffic at 7 Outer Cordon locations as presented in **Table 9-5**. It is observed that the traffic at different locations varies from 7,740 Vehicles (7,728 PCUs) at Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) to 17,020 Vehicles (22,258 PCUs) at Rudrapur Road (Paramanadpur) on a normal working day.

Map 9-2 Traffic Survey Locations



Source: Proposed by Town and Country Planning Department



**Table 9-5: Daily traffic volume (24 hours) at outer cordon locations.**

| S.No. | Location of Outer Cordon                       | Grand Total (No.) | Grand Total (PCU's) | % of total traffic |
|-------|------------------------------------------------|-------------------|---------------------|--------------------|
| 1     | Moradabad Road (Shahganj)                      | 15920             | 16675               | 19%                |
| 2     | Jaspur Road (Kunda)                            | 11967             | 13222               | 14%                |
| 3     | Ramnagar Road (Pratappur)                      | 14512             | 15679               | 17%                |
| 4     | Rudrapur Road (Paramanadpur)                   | 17020             | 22258               | 20%                |
| 5     | Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) | 7740              | 7728                | 9%                 |
| 6     | Aliganj Road (Mahua Kheraganj NPP)             | 9729              | 10109               | 11%                |
| 7     | Kashipur Road (Mahua Kheraganj NPP)            | 7829              | 7353                | 9%                 |
|       | Total                                          | 84717             | 93022               | 100%               |

Source: Primary Survey

The above table shows the traffic characteristics of each cordon point. It can be observed that TVC count cordon point 4 on NH309 (at Paramanadpur, Rudrapur Road) shows the heaviest traffic while OC5 towards Mahua Kheraganj NPP as well as OC 7 leading towards Kashipur carries the least traffic movement towards and outward of the city.

#### **9.4.1.2. Peak Hour Traffic Characteristics**

The peak hour is the maximum percentage of the total traffic that uses the road in a single hour of the day. The peak hour traffic at the Outer cordon locations is presented in **Table 9-6**. The peak hour volume varies from 775 vehicles (559 PCUs) at Mahua Kheraganj NPP (Kashipur Road) to 1,371 vehicles (1,213 PCUs) at Shahganj (Moradabad Road).

**Table 9-6: Observed peak hour and peak hour traffic.**

| S.No. | Name of Outer Cordon Points  | Peak hour    | Peak Hour traffic |                    |         |                    |
|-------|------------------------------|--------------|-------------------|--------------------|---------|--------------------|
|       |                              |              | (Veh.)            | % of Total Traffic | (PCU's) | % of Total Traffic |
| 1     | Moradabad Road (Shahganj)    | 17:30 -18:30 | 1371              | 9%                 | 1213    | 7%                 |
| 2     | Jaspur Road (Kunda)          | 13:00 -14:00 | 1062              | 9%                 | 960     | 7%                 |
| 3     | Ramnagar Road (Pratappur)    | 16:30 -17:30 | 1202              | 8%                 | 1101    | 7%                 |
| 4     | Rudrapur Road (Paramanadpur) | 17:00 -18:00 | 1365              | 8%                 | 1529    | 7%                 |

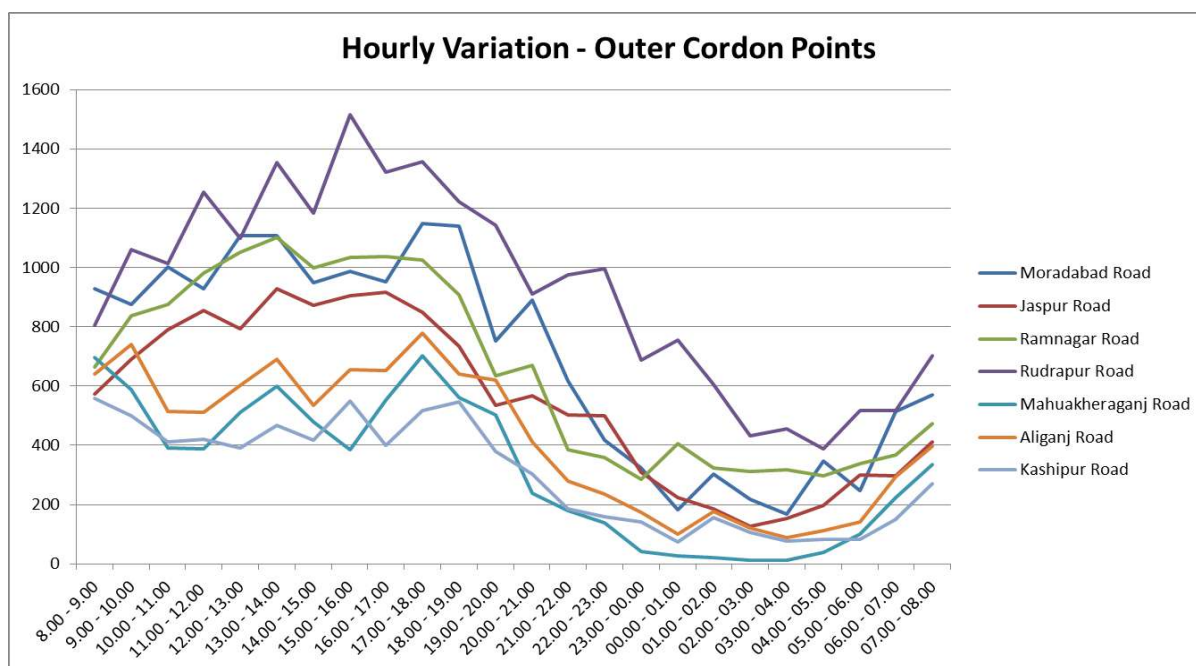


| S.No. | Name of Outer Cordon Points                    | Peak hour    | Peak Hour traffic |                    |         |                    |
|-------|------------------------------------------------|--------------|-------------------|--------------------|---------|--------------------|
|       |                                                |              | (Veh.)            | % of Total Traffic | (PCU's) | % of Total Traffic |
| 5     | Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) | 08:00 -09:00 | 839               | 11%                | 750     | 10%                |
| 6     | Aliganj Road (Mahua Kheraganj NPP)             | 08:45 -09:45 | 939               | 10%                | 830     | 8%                 |
| 7     | Kashipur Road (Mahua Kheraganj NPP)            | 08:45 -09:45 | 775               | 10%                | 559     | 8%                 |

Source: Primary Survey

It can be observed from the above table that the maximum peak hour traffic is at Location 1 with around 1,213 PCU between 17:30 -18:30 hours. The hourly variation of traffic illustrates the distribution of traffic over the day concerning time shown in **Figure 9-12**.

**Figure 9-12: Hourly variation of traffic at outer cordon points.**



Source: Primary Survey

#### 9.4.1.3. Directional Distribution of traffic

The directional distribution analysis, presented in **Table 9-7**, indicates that there is marginal variation in both directions of travel at most of the locations. It can be observed that inward directional traffic at Outer Cordon generally varies from 47% at Mahua Kheraganj NPP (Kashipur Road) to 52% at Paramanadpur (Rudrapur Road). While outward directional traffic

at Outer Cordon generally varies from 48% at Paramanadpur (Rudrapur Road) to 53% at Mahua Kheraganj NPP (Kashipur Road).

**Table 9-7: Directional distribution of outer cordon points.**

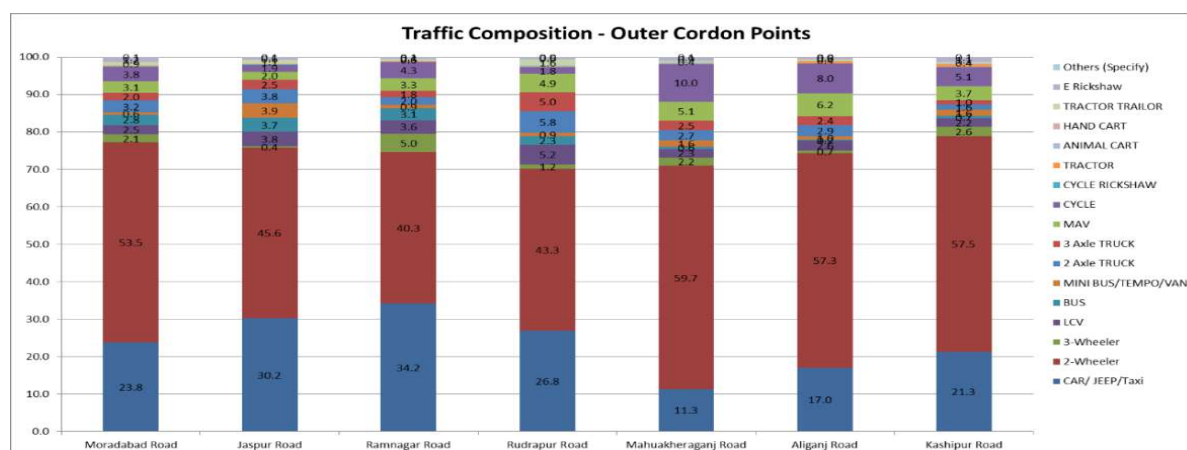
| S.No. | Name of Outer Cordon location                  | Directional Distribution |          |
|-------|------------------------------------------------|--------------------------|----------|
|       |                                                | Inflow%                  | Outflow% |
| 1     | Moradabad Road (Shahganj)                      | 49                       | 51       |
| 2     | Jaspur Road (Kunda)                            | 49                       | 51       |
| 3     | Ramnagar Road (Pratappur)                      | 48                       | 52       |
| 4     | Rudrapur Road (Paramanadpur)                   | 52                       | 48       |
| 5     | Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) | 49                       | 51       |
| 6     | Aliganj Road (Mahua Kheraganj NPP)             | 48                       | 52       |
| 7     | Kashipur Road (Mahua Kheraganj NPP)            | 47                       | 53       |

Source: Primary Survey

#### 9.4.1.4. Traffic Composition

An analysis was carried out to find the composition of traffic both for fast- and slow-moving traffic. The finding of the vehicular composition distribution for the Outer Cordon locations is shown in **Figure 9-13**.

**Figure 9-13: Traffic composition of Mid-block locations.**



Source: Primary Survey

The 2-wheeler composition is maximum on all Outer cordon locations as it represents around 59.7% of total movements at Mahua Kheraganj NPP Road (Mahua Kheraganj NPP), 57.5% at

Kashipur Road (Mahua Kheraganj NPP), 57.3% at Aliganj Road (Mahua Kheraganj NPP). On the other hand, Car/Jeep/taxi classification also comprises most of the traffic after 2-wheeler.

#### 9.4.1.5. Classification of Traffic (Passenger-Goods and Fast-Slow)

The traffic has been analyzed in terms of passenger and goods traffic as well as fast- and slow-moving vehicles. **Table 9-8** gives the detail of passenger - goods traffic and Fast - slow vehicles.

*Table 9-8: Classification of Outer Cordon traffic points.*

| Sr. No. | Location                                       | Total volume | Classification 1 |    |       |    | Classification 2 |    |      |    |
|---------|------------------------------------------------|--------------|------------------|----|-------|----|------------------|----|------|----|
|         |                                                |              | Passenger        | %  | Goods | %  | Fast             | %  | Slow | %  |
| 1       | Moradabad Road (Shahganj)                      | 15920        | 14007            | 88 | 1913  | 12 | 14884            | 93 | 1036 | 7  |
| 2       | Jaspur Road (Kunda)                            | 11967        | 10350            | 86 | 1617  | 14 | 11486            | 96 | 481  | 4  |
| 3       | Ramnagar Road (Pratappur)                      | 14512        | 12825            | 88 | 1687  | 12 | 13690            | 94 | 822  | 6  |
| 4       | Rudrapur Road (Paramanadpur)                   | 17020        | 13109            | 77 | 3911  | 23 | 16251            | 95 | 769  | 5  |
| 5       | Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) | 7740         | 6689             | 86 | 1051  | 14 | 6817             | 88 | 923  | 12 |
| 6       | Aliganj Road (Mahua Kheraganj NPP)             | 9729         | 8264             | 85 | 1465  | 15 | 8787             | 90 | 942  | 10 |
| 7       | Kashipur Road (Mahua Kheraganj NPP)            | 7829         | 7043             | 90 | 786   | 10 | 7220             | 92 | 609  | 8  |

Source: Primary Survey

The maximum passenger traffic percentage is flowing at Moradabad Road (Shahganj) around 14,007 vehicles while the goods traffic percentage is at Ramnagar Road (Pratappur) around 3,911 vehicles. On the other hand, the minimum passenger traffic percentage is observed at Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) of outer cordon point and goods traffic at Kashipur Road (Mahua Kheraganj NPP). In terms of fast and slow-moving classification, the maximum percentage of fast-moving at Jaspur Road (Kunda) and slow-moving at Mahua Kheraganj NPP Road (Mahua Kheraganj NPP).

#### 9.4.1.6.V/C Ratio and Level of Service (LOS)

The V/C ratio and level of service have been derived to check the adequacy of a particular type of road stretch. **Table 9-9** shows the V/C ratio and LOS of the outer cordon.

*Table 9-9: V/C Ratio and Level of service of Outer Cordon locations.*

| Sr. No. | Location                                       | Peak Hour PCU | Type of Carriageway | Design Service Volume (PCU) | Capacity (PCU) | V/C | LOS |
|---------|------------------------------------------------|---------------|---------------------|-----------------------------|----------------|-----|-----|
| 1       | Moradabad Road (Shahganj)                      | 1213          | 4 lane divided      | 2900                        | 4143           | 0.3 | A   |
| 2       | Jaspur Road (Kunda)                            | 960           | 2 lane undivided    | 1500                        | 2143           | 0.4 | B   |
| 3       | Ramnagar Road (Pratappur)                      | 1101          | 2 lane undivided    | 1500                        | 2143           | 0.5 | C   |
| 4       | Rudrapur Road (Paramanadpur)                   | 1529          | 2 lane undivided    | 1500                        | 2143           | 0.7 | D   |
| 5       | Mahua Kheraganj NPP Road (Mahua Kheraganj NPP) | 750           | 2 lane undivided    | 900                         | 1286           | 0.6 | C   |
| 5       | Aliganj Road (Mahua Kheraganj NPP)             | 830           | 2 lane undivided    | 1500                        | 2143           | 0.4 | B   |
| 5       | Kashipur Road (Mahua Kheraganj NPP)            | 559           | 2 lane undivided    | 1500                        | 2143           | 0.3 | A   |

Source: Primary Survey

The V/C ratio and level of service are worst at Rudrapur Road (Paramanadpur) of Outer Cordon location having the V/C ratio of 0.7, so needs improvements.

#### 9.4.2. Traffic Volume Characteristics at Mid-Block Points

The objective of classified volume count (CVC) is to determine the movement pattern of traffic plying on the major stretches of the city. The survey was conducted at 2 mid-block points.

##### 9.4.2.1.Average Daily Traffic

The traffic counts both in terms of numbers of vehicles and Passenger Car Units (PCUs) have been computed for the 16-hour traffic at 2 mid-block points and are presented in **Table 9-10**. It is observed that the traffic at these 2 locations varies from 31,874 Vehicles (28,554 PCUs) at Ramnagar Road to 20,463 Vehicles (17,188 PCUs) at Rudrapur Road on a normal working day.

**Table 9-10: Daily Traffic Volume (16 Hours) at Mid-Block Points**

| S.No. | Location of Mid-Block Points | Grand Total (No.) | Grand Total (PCU's) | % of total traffic |
|-------|------------------------------|-------------------|---------------------|--------------------|
| 1     | Ramnagar road                | 31874             | 29554               | 61%                |
| 2     | Rudrapur road                | 20463             | 17188               | 39%                |
|       | <b>Total</b>                 | <b>52337</b>      | <b>46742</b>        | <b>100%</b>        |

Source: Primary Survey

There are two Mid-Block locations at which total traffic is 52,337 vehicles. The maximum traffic is observed at Ramnagar Road carrying 61% of total mid-block traffic and 39% of the traffic is on Rudrapur Road.

#### 9.4.2.2. Peak Hour Traffic Characteristics

The peak hour is the maximum percentage of the total traffic that uses the road in a single hour of the day. The peak hour traffic at the Mid-Block locations is presented in **Table 9-11**. The peak hour volume varies from 3,286 vehicles (2,863 PCUs) at Ramnagar Road to 1905 vehicles (1566 PCUs) at Rudrapur Road.

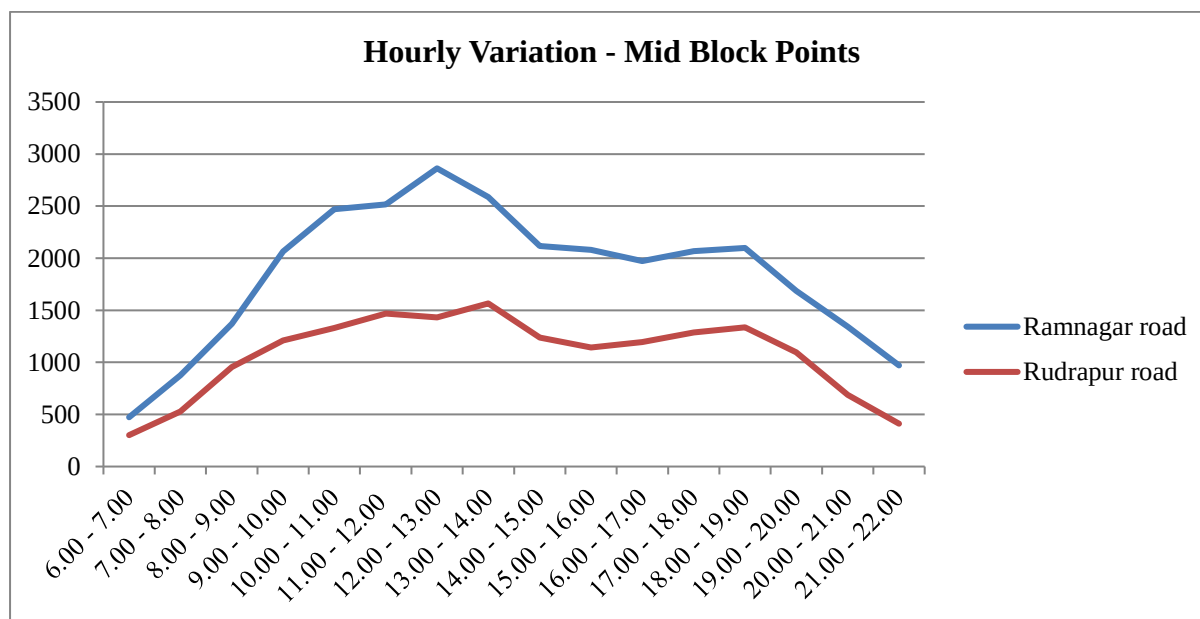
**Table 9-11: Observed Peak Hour and Peak Hour Traffic**

| S.no. | Name of Mid-Block Points | Peak hour    | Peak Hour traffic |                    |        |                    |
|-------|--------------------------|--------------|-------------------|--------------------|--------|--------------------|
|       |                          |              | (Veh.)            | % of Total Traffic | (PCUs) | % of Total Traffic |
| 1     | Ramnagar road            | 12:00 -13:00 | 3286              | 10%                | 2863   | 10%                |
| 2     | Rudrapur road            | 13:00 -14:00 | 1905              | 9%                 | 1566   | 9%                 |

Source: Primary Survey

It can be observed from the above table that the maximum peak hour traffic is at Ramnagar Road with around 2863 PCU between 12:00 -13:00 hours. The hourly variation of traffic illustrates the distribution of traffic over the day concerning time shown in **Figure 9-14**.

**Figure 9-14: Hourly Variation of Traffic at Mid-Block Points**



Source: Primary Survey

#### 9.4.2.3. Directional Distribution of traffic

The directional distribution analysis, presented in **Table 9-12**, indicates that, there is marginal variation in both directions of travel at the two mid-block locations. It can be observed that directional traffic at Mid-block points varies from 50% at Ramnagar Road to 53% at Rudrapur Road.

**Table 9-12: Directional Distribution of Mid-Block Points**

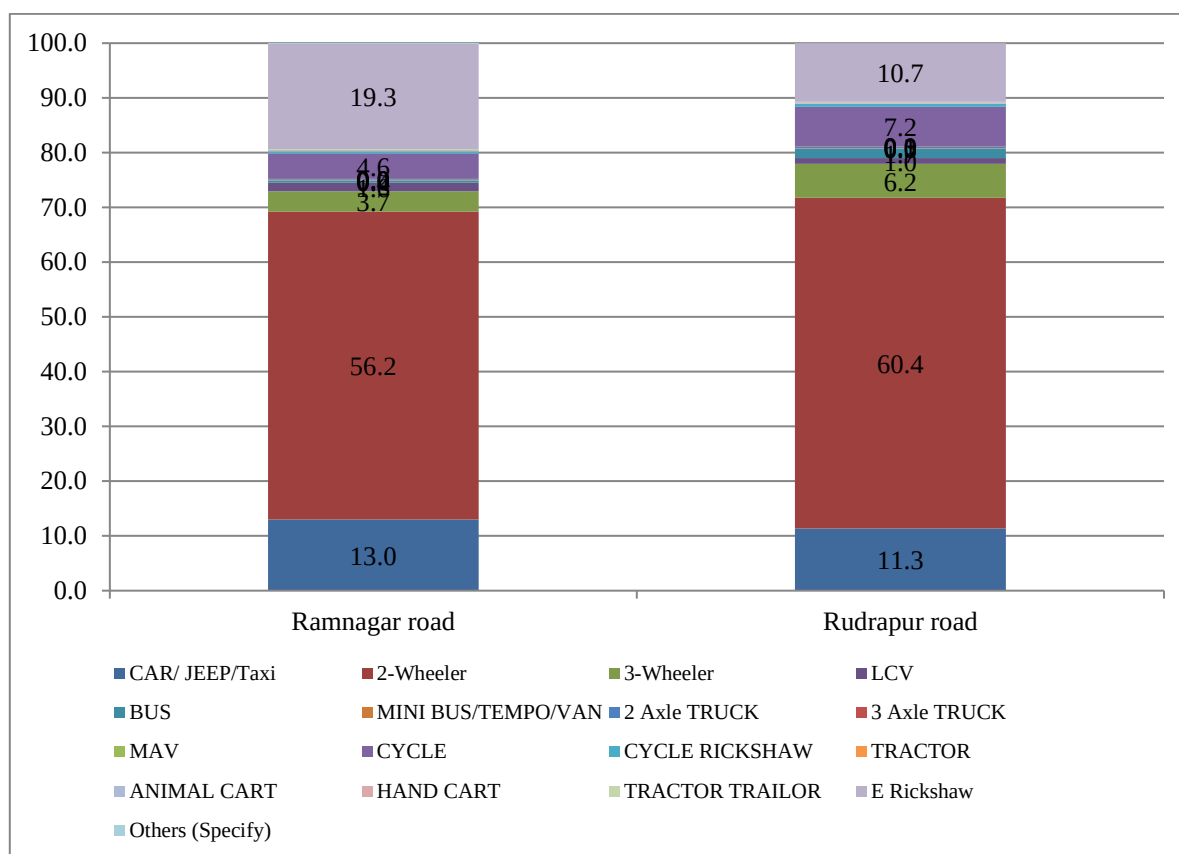
| S.no. | Name of Mid-Block Point | Directional Distribution |     |
|-------|-------------------------|--------------------------|-----|
|       |                         | D1%                      | D2% |
| 1     | Ramnagar road           | 50                       | 50  |
| 2     | Rudrapur road           | 53                       | 47  |

Source: Primary Survey

#### 9.4.2.4. Traffic Composition

An analysis was carried out to find the composition of traffic both for fast and slow-moving traffic. The finding of the vehicular composition distribution for the midblock locations is shown in **Figure 9-15**.

Figure 9-15: Traffic composition of Mid-block locations



Source: Primary Survey

The 2-wheeler composition is maximum on both the midblock location as it represents around 56.2% of total movements at Ramnagar Road and 60.4% at Rudrapur Road. On the other hand, Car/Jeep/taxi classification also comprises most of the traffic after 2-wheeler. E-Rickshaw movement is higher than car/jeep/taxi classification which accounts for 19.3% at Ramnagar Road.

#### 9.4.2.5. Classification of Traffic (Passenger-Goods and Fast-Slow)

The traffic has been analyzed in terms of passenger and goods traffic as well as fast and slow-moving vehicles. **Table 9-13** gives the detail of passenger - goods traffic and Fast - slow vehicles.

Table 9-13: Classification of Midblock Traffic Points

| S. No. | Location      | Total volume | Classification 1 |    |       |   | Classification 2 |    |      |    |
|--------|---------------|--------------|------------------|----|-------|---|------------------|----|------|----|
|        |               |              | Passenger        | %  | Goods | % | Fast             | %  | Slow | %  |
| 1      | Ramnagar road | 31874        | 31171            | 98 | 703   | 2 | 23964            | 75 | 7910 | 25 |



| S. No. | Location      | Total volume | Classification 1 |    |       |   | Classification 2 |    |      |    |
|--------|---------------|--------------|------------------|----|-------|---|------------------|----|------|----|
|        |               |              | Passenger        | %  | Goods | % | Fast             | %  | Slow | %  |
| 2      | Rudrapur road | 20463        | 20066            | 98 | 397   | 2 | 16615            | 81 | 3848 | 19 |

Source: Primary Survey

The maximum passenger traffic percentage is flowing at Ramnagar Road around 31,171 vehicles while goods traffic percentage is also on Ramnagar Road around 703 vehicles. Rudrapur Road witnessed around 20,066 passenger traffic and 397 goods traffic. In terms of fast and slow-moving classification, the maximum percentage of fast, as well as slow-moving traffic, can be observed at Ramnagar Road.

#### 9.4.2.6. V/C Ratio and Level of Service (LOS)

The V/C ratio and level of service have been derived to check the adequacy of a particular type of road stretch. **Table 9-14** shows the V/C ratio and LOS of Mid-Block points.

**Table 9-14: V/C Ratio and Level of Service of Mid-Block Points**

| S. No. | Location      | Peak Hour PCU | Type of Carriageway | Design Service Volume (PCU) | Capacity (PCU) | V/C | LOS |
|--------|---------------|---------------|---------------------|-----------------------------|----------------|-----|-----|
| 1      | Ramnagar road | 2863          | 2 lane (two-way)    | 1200                        | 1714           | 1.7 | F   |
| 2      | Rudrapur road | 1566          | 2 lane (two-way)    | 1200                        | 1714           | 0.9 | E   |

Source: Primary Survey

The V/C ratio at Ramnagar Road is the worst having Level of service 'F' while the V/C ratio at Rudrapur Road is 0.9 and has the Level of service 'E'. However, both roads have V/C ratio above 0.7, so it needs improvement.

### 9.4.3. Origin Destination Survey at Outer Cordon Locations

#### 9.4.3.1. Zoning

For traffic and travel analysis, a traffic zone system has been developed for the Study Area. The boundaries of wards and villages falling inside the local planning area have been taken as a boundary for traffic analysis zones. The Study Area has been divided into 46 TAZ which are referred to as internal TAZ. There are 16 external zones consisting of areas falling outside the local planning area and have been termed as external TAZ.

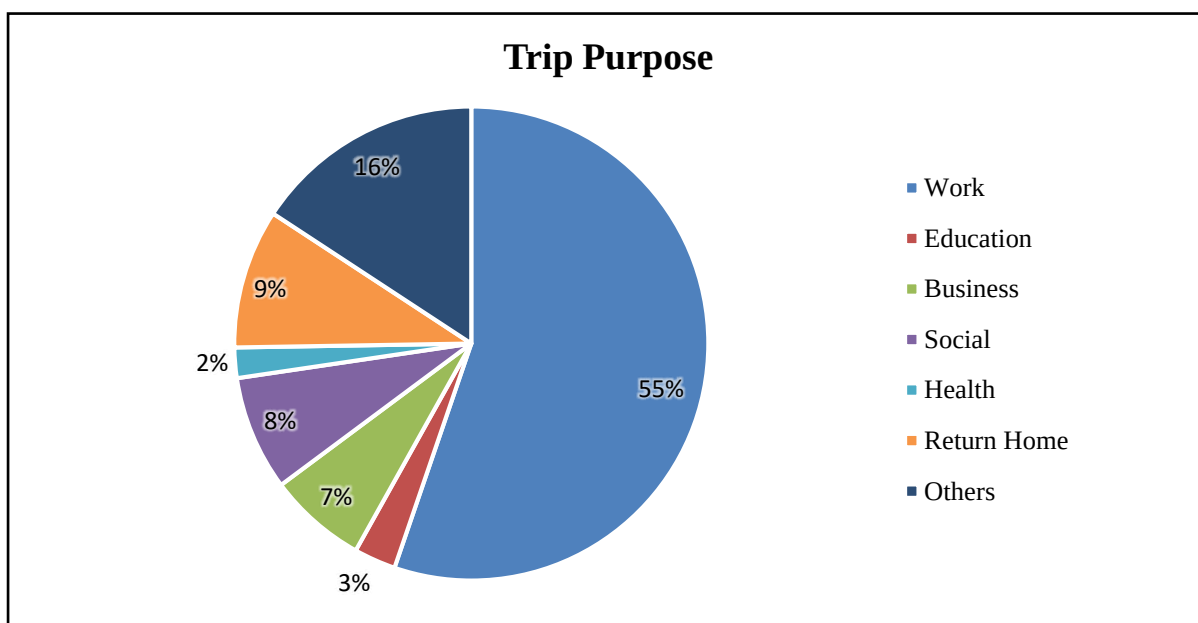
### 9.4.3.2. Passenger Traffic

**Table 9-15: Distribution of Outer Cordon Passengers by Trip Purpose**

| Mode                   | Work  | Business | Education | Social | Health | Return Home | Others | Total  |
|------------------------|-------|----------|-----------|--------|--------|-------------|--------|--------|
|                        | 1     | 2        | 3         | 4      | 5      | 6           | 7      |        |
| <b>Car</b>             | 24709 | 989      | 5094      | 3719   | 1412   | 6033        | 12697  | 54653  |
| <b>2-Wheeler</b>       | 31529 | 2065     | 2198      | 4113   | 839    | 4355        | 4289   | 49388  |
| <b>Auto</b>            | 4732  | 96       | 119       | 817    | 36     | 99          | 406    | 6305   |
| <b>Total</b>           | 60969 | 3150     | 7412      | 8648   | 2288   | 10486       | 17392  | 110346 |
| <b>Composition (%)</b> | 55.25 | 2.85     | 6.72      | 7.84   | 2.07   | 9.50        | 15.76  | 100.00 |

Source: Primary Survey

**Figure 9-16: Distribution of Outer Cordon Passengers by Trip Purpose**



Source: Primary Survey

The analysis of trip purpose suggests that about 55% of passengers travel for work, 3% for education, 7% for business, 8% for social gatherings, 2% for health, 9% for a return home, and

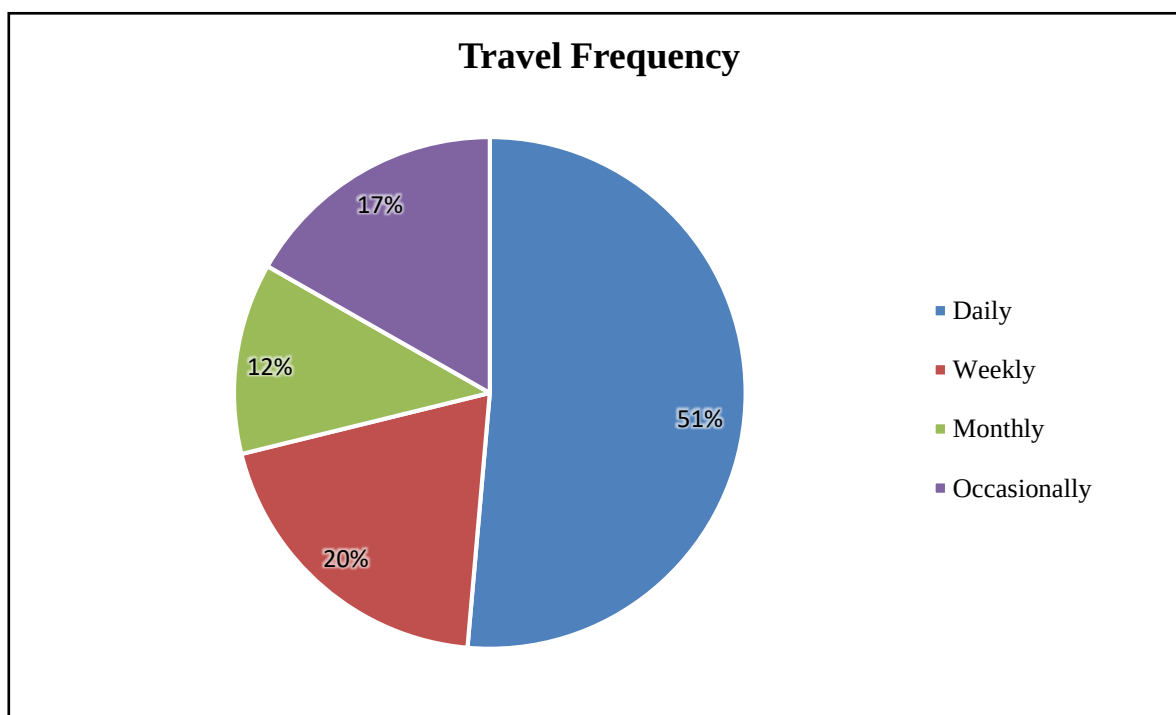
16% for other reasons than mentioned above (Refer **Table 9-15 & Figure 9-16**). The analysis of travel frequency suggests that about 51% of passengers travel on daily basis, 20% weekly, 12% monthly, and 17% occasionally (Refer to **Figure 9-17 & Table 9-16**).

**Table 9-16: Distribution of Outer Cordon Passengers by Travel Frequency**

| Mode         | Daily | Weekly | Monthly | Occasionally | Total  |
|--------------|-------|--------|---------|--------------|--------|
|              | 1     | 2      | 3       | 4            |        |
| Car          | 22715 | 10304  | 9842    | 11792        | 54653  |
| 2-Wheeler    | 28691 | 10750  | 3331    | 6616         | 49388  |
| Auto         | 5305  | 760    | 158     | 82           | 6305   |
| <b>Total</b> | 56711 | 21814  | 13332   | 18490        | 110346 |
| <b>(%)</b>   | 51.39 | 19.77  | 12.08   | 16.76        | 100.00 |

Source: Primary Survey

**Figure 9-17: Distribution of Outer Cordon Passengers by Travel Frequency**



Source: Primary Survey

The trip characteristics analysis of passenger trips at the outer cordon points reveals that external to external trips are insignificant with only 21% share in total trips. This shows that

the majority of the trips are either originating or destined in the study area. **Table 9-17** shows the passenger travel pattern at outer cordon locations.

The maximum number of passenger trips in Kashipur come from Rudrapur road (45%) followed by Aliganj road (40%). Maximum E-E movement has been recorded on Jaspur road (30%) followed by Moradabad road (27%).

**Table 9-17: Distribution of Outer Cordon Passenger Trips Based on OD**

| S. No:      | Name of Outer Cordon | Trips (I-E) | Trips (E-I) | Trips (E-E) | Total  |
|-------------|----------------------|-------------|-------------|-------------|--------|
| 1           | Moradabad Road       | 16500       | 11785       | 10351       | 38635  |
|             |                      | 43%         | 31%         | 27%         | 100%   |
| 2           | Jaspur Road          | 11898       | 10266       | 9469        | 31633  |
|             |                      | 38%         | 32%         | 30%         | 100%   |
| 3           | Ramnagar Road        | 19364       | 13204       | 9643        | 42210  |
|             |                      | 46%         | 31%         | 23%         | 100%   |
| 4           | Rudrapur Road        | 17839       | 17618       | 3360        | 38817  |
|             |                      | 46%         | 45%         | 9%          | 100%   |
| 5           | Aliganj Road         | 7072        | 6257        | 2400        | 15729  |
|             |                      | 45%         | 40%         | 15%         | 100%   |
| Grand Total |                      | 72672       | 59129       | 35223       | 167024 |
|             |                      | 44%         | 35%         | 21%         | 100%   |

Source: Primary Survey

#### 9.4.3.3. Goods Traffic

Modes carrying freight in to and out of Kashipur city are light commercial vehicles, heavy trucks, and multi-axle trucks. Data collected from the Origin-Destination survey has been analyzed to study the movement pattern of freight vehicles at the outer cordon.

The movement of goods from Kashipur to outer cordons is maximum on Moradabad road (49%) followed by Rudrapur road (38%) (Refer **Table 9-18**). The external to internal share of goods trips is high on Rudrapur road (44%) followed by Moradabad & Aliganj road (36%). Maximum about 33% through trips (E-E) use Aliganj road (51%) followed by Jaspur road (41%) (Refer **Table 9-18**).

**Table 9-18: Distribution of Outer Cordon Goods Trips Based on OD**

| S. No: | Name of Outer Cordon  | Trips (I-E) | Trips (E-I) | Trips (E-E) | Total |
|--------|-----------------------|-------------|-------------|-------------|-------|
| 1      | <b>Moradabad Road</b> | 938         | 687         | 287         | 1913  |

| S. No:      | Name of Outer Cordon | Trips (I-E) | Trips (E-I) | Trips (E-E) | Total |
|-------------|----------------------|-------------|-------------|-------------|-------|
|             |                      | 49%         | 36%         | 15%         | 100%  |
| 2           | Jaspur Road          | 470         | 489         | 658         | 1617  |
|             |                      | 29%         | 30%         | 41%         | 100%  |
| 3           | Ramnagar Road        | 500         | 589         | 598         | 1687  |
|             |                      | 30%         | 35%         | 35%         | 100%  |
| 4           | Rudrapur Road        | 1471        | 1729        | 711         | 3911  |
|             |                      | 38%         | 44%         | 18%         | 100%  |
| 5           | Aliganj Road         | 200         | 521         | 745         | 1465  |
|             |                      | 14%         | 36%         | 51%         | 100%  |
| Grand Total |                      | 3579        | 4014        | 3000        | 10593 |
|             |                      | 34%         | 38%         | 28%         | 100%  |

Source: Primary Survey

## 9.5. Terminal Facilities

### 9.5.1. Inter-State Bus Terminus

The existing bus terminal of Kashipur is located on Kashipur road near the central part of the city. The existing number of buses departing from Kashipur Bus stand is 44 per day which includes 39 buses and 5 mini-buses. However, there is a need for organized bus bays. This bus terminal is sufficient to cater to the existing requirement of the Kashipur planning area. There is no organized stop for buses due to which they are halting at different spaces. So, there is a need for organized stops for buses for smooth traffic circulation and bus parking. Also, there is a need to ensure that the bus traffic remains segregated from other traffic to ensure smooth traffic flow (refer to **Figure 9-18: Bus Terminal, Kashipur**



& Error! Reference source not found.).

**Figure 9-18: Bus Terminal, Kashipur**



**Figure 9-19: Bus Terminal for private bus**



#### 9.5.1.1. Bus Routes

**Table 9-19** highlights the daily bus traffic of Kashipur which depicts that 40 buses operate from Kashipur city. It includes buses owned by Private Transporters and public transport corporations. The maximum number of buses are plying on the Kashipur-Delhi-Ramnagar route i.e. 13 buses followed by the Kashipur-Haridwar route i.e. 5. Local routes include Kashipur-Rudrapur-Haldwani, Kashipur-Kichha, Kashipur-Tanakpur, Kashipur-Bareilly-Kashipur, etc. Buses are also available to travel to Chandigarh (2 buses), Dehradun (2 buses), Jaipur (2 buses), Lucknow (2 buses), and Agra (2 buses).

**Table 9-19: Details of Bus-Routes**

| Sr. No: | Name of Route                   | Number of buses per day |
|---------|---------------------------------|-------------------------|
| 1.      | Kashipur-Delhi-Ramnagar         | 13                      |
| 2.      | Kashipur-Chandigarh             | 2                       |
| 3.      | Kashipur-Agra-Ramnagar-Tanakpur | 2                       |
| 4.      | Kashipur-Bareilly-Kashipur      | 2                       |
| 5.      | Kashipur-Lucknow                | 2                       |
| 6.      | Kashipur-Haridwar               | 5                       |
| 7.      | Kashipur-Rudrapur-Haldwani      | 2                       |
| 8.      | Kashipur-Dehradun               | 2                       |
| 9.      | Kashipur-Kichha                 | 4                       |
| 10.     | Kashipur-Tanakpur               | 2                       |
| 11.     | Kashipur-Khatima                | 2                       |

| Sr. No:      | Name of Route   | Number of buses per day |
|--------------|-----------------|-------------------------|
| 12.          | Kashipur-Jaipur | 2                       |
| <b>TOTAL</b> |                 | <b>40</b>               |

Source: Depot Manager, Kashipur Bus Terminus

### 9.5.2. Intra-City Transport Service

The public transport system is not very much developed in Kashipur city. The increased number of private vehicles like cars, motorcycles, scooters, lightweight scooters, etc. has reduced intra-city distances. In the city, Auto rickshaws and E-Rickshaws are mainly used as public transport within the city. A certain number of cycle rickshaws are also present in the city to travel shorter distances. Auto-rickshaws and buses are also being used to travel to nearby villages located on the periphery of the city. School buses also contribute to the bus traffic of Kashipur city.

### 9.5.3. Truck Terminal

There is no organized truck terminal in the city of Kashipur or within KPA. The trucks are being parked near the industrial area. Having a considerable number of industries, there is a need for the truck terminal in the city to fulfill the industrial needs.

### 9.5.4. Rail Based Transport

Besides road traffic, rail transport also plays a vital role in the traffic and transportation network of the city. There is one railway station present in the Kashipur planning area i.e., Kashipur Junction railway station has two platforms (refer to **Figure 9-20**). The railway line is a broad gauge in nature. The list of trains and their timings are given in **Table 9-20**.

*Table 9-20: Train Timings*

| Train Name                                              | Timing |       |
|---------------------------------------------------------|--------|-------|
|                                                         | UP     | DOWN  |
| Amritsar - Lalkuan Express                              | 19:05  | 01:10 |
| Moradabad Ramnagar Passenger                            | 05:45  | 7:34  |
| Moradabad Kathgodam Passenger                           | 07:55  | 19:25 |
| Ramnagar - Delhi - Jaisalmer Corbett Park Link Express. | 22:28  | 4:18  |
| Ramnagar - Haridwar Intercity Express.                  | 08:53  | 23:05 |
| Chandigarh - Ramnagar Weekly Inter City Express.        | 23:05  | 06:10 |
| Bandra Terminus Ramnagar Express.                       | 10:25  | 16:58 |
| Ramnagar - Agra Fort Express                            | 18:20  | 23:05 |



|                                                     |       |       |
|-----------------------------------------------------|-------|-------|
| Ramnagar - Delhi Uttarakhand Sampark Kranti Express | 10:28 | 20:15 |
| Lalkuan - Anand Vihar Terminal (Delhi) Express.     | 06:10 | 19:05 |

Source: Railway Station, Kashipur

**Figure 9-20: Kashipur Junction Railway Station**



**Figure 9-21: Goods Shed, Kashipur Junction Railway Station**



In addition to the passenger trains, 1 goods train also passes through Kashipur on daily basis. Major goods which are exported include Rice, Sugar, Husk, and public food grain seeds. The goods imported include cement, coal, and fertilizers (refer to **Figure 9-21**). In terms of infrastructure, there is a dedicated parking space for two-wheelers having an area of 548.64 m<sup>2</sup> and parking space for 3w/4w of an area of 400 m<sup>2</sup> present outside the railway station.

## **9.6. Major Traffic Problems**

### **9.6.1. Parking Problems**

There is a parking problem in the city center area of the city due to the mushrooming of informal commercial on road. Also, there is a presence of specialized markets like vegetable and fruit markets. These create severe traffic problems due to negligible parking space which also causes traffic congestion (refer to **Figure 9-22, Figure 9-23, Figure 9-24 & Figure 9-25**).

**Figure 9-22: On-street parking, Gandhi Ashram Road, Kashipur**



**Figure 9-23: On-street parking, Gandhi Ashram Road, Kashipur**



**Figure 9-24: Traffic congestion, Gandhi ashram road, Kashipur**



**Figure 9-25: Traffic congestion, Gandhi Ashram Road, Kashipur**



## 9.7. Key Issues

- 1) Increased Number of registered vehicles in Kashipur, which has directly impacted increasing road jams and accident cases. Most of these are private rather than public ones.
- 2) Due to lack of enforcement, almost all the shopkeepers encroached on the road space resulting in traffic problems.
- 3) Lack of organized parking spaces near the activity areas leads to traffic jams, especially for Intermediate Public Transport.
- 4) The absence of dedicated space for stops of auto rickshaws and regulation for streamlining movement without hindrance is required.
- 5) Unauthorized conversion of residential to commercial needs to be regulated as it leads to traffic chaos.
- 6) There is no such provision for the safe movement of pedestrians and cyclists within the city

## 9.8. Future Requirements

Kashipur has the potential in many diverse sectors, Kashipur Planning area is growing famous for development in industrial sectors; the trade and commerce of the planning area are well developed due to the presence of the Kumaon Garhwal Chamber of Commerce & Industry (KGCCI); due to the development of IIM Kashipur in 2011 and with good educational infrastructure Kashipur has the potential to be developed as an educational hub; Kashipur also has a huge potential of Tourism with famous tourist spots and ASI recognized site. Its proximity to Jim Corbett National Park is also advantageous to the planning area as the tourist could be diverted to Kashipur and increase its footfall.

As it has potential in various sectors the city demands a good public transport system in the future and the city lacks a proper public transport system which is required in the city. For the selection of public transport, the peak hours trips have been calculated for 2041 for all the mid-block points. The growth rate for projections has been kept the same as the growth rate of the Kashipur Planning Area i.e., 41.74%. Of the projected trips, 30% have been assumed for the design of the Public Transport facility (refer to **Table 9-21**). The maximum number of trips under public transport comes in one direction and comes to be 2048 on Ramnagar road. According to URDPFI for 5000-7500 trips per day Bus Priority Lane has been suggested and for below 1000 City Bus has been suggested. So, for Kashipur Planning Area, as the trips are higher than 1000, a bus priority lane has been proposed with a total trip of 6744 per day.

**Table 9-21: Projected Trips for Public Transport System**

| Name of Mid-Block Point | Projected Trips (Overall)                   |      |      |      |      | Projected PT Trips (BAU)        |      |      |      |      |
|-------------------------|---------------------------------------------|------|------|------|------|---------------------------------|------|------|------|------|
|                         | Decadal Projected Population Growth Percent | 2031 |      | 2041 |      | Assumed PT trips of total trips | 2031 |      | 2041 |      |
|                         |                                             | UP   | Down | UP   | Down |                                 | UP   | Down | UP   | Down |
| Ramnagar road           | 41.74%                                      | 4735 | 4817 | 6711 | 6828 | 30.00%                          | 1420 | 1445 | 2013 | 2048 |
| Rudrapur road           |                                             | 3356 | 2952 | 4756 | 4184 |                                 | 1007 | 886  | 1427 | 1255 |

Source: Calculated by Town and Country Planning Department

To develop a bus priority lane in Kashipur Planning Area five routes have been identified. The five routes with distances have been provided in **Table 9-22**. All the nearby cities like Jaipur, Thakurdwara, Bazpur, Ramnagar, and Mahua Kheraganj have been covered under the routes. Route 1 starts from the bus stand to Jaspur town on the north-western side, covering a total distance of 14.8 Km, Route 2 is from the bus stand to Thakurdwara on the west side with a total distance of 7.9 Km, Route 3 is from the bus stand to Ramnagar on the eastern side covering a total distance of 28.7 Km, Route 4 is from bus stand to Ramnagar on the northern side with

a total distance of 30.4 Km, and Route 5 is from the proposed bus stand to Mahua Kheraganj on the south side with a total distance of 12 Km.

**Table 9-22 Routes for Public Transport System**

| Routes                                | Distance (Km) |
|---------------------------------------|---------------|
| Route 1 - Bus Stand - Jaspur          | 14.8          |
| Route 2 - Bus Stand - Thakurdwara     | 7.9           |
| Route 3 - Bus Stand - Bazpur          | 28.7          |
| Route 4 - Bus Stand - Ramnagar        | 30.4          |
| Route 5 - Bus Stand - Mahua Kheraganj | 12            |

Source: Town and Country Planning Department

The specification of the Bus Public Transport System has been provided in **Table 9-23**. The interval of each bus has been kept at 5 minutes. The service time is from 7 am to 9 pm i.e., for 14 hours. The average speed of the bus is kept at 20 Km/hr, it includes the time of stoppage at each bus stand which should be at an interval of 800m.

**Table 9-23 Design parameters for Public Transport System**

|                                 |                          |
|---------------------------------|--------------------------|
| Bus Interval (min)              | 5                        |
| Service Time (Hr)               | 7 a.m - 9 p.m (14 hours) |
| Average Speed of Bus (Km/Hr)    | 20                       |
| Distances between bus stops (m) | 800                      |

Source: Consultant Analysis

Based on **Table 9-23** the total number of buses required for each route has been calculated (refer to **Table 9-24**). For routes, 1 – 10 buses are needed, for routes 2 – 6, routes 3 – 18, routes 4 – 19, and routes 5 – 8. The total number of buses required is 61. So, parking for these 61 buses needs to be provided at the bus stand. Now, the total number of bus bays for loading and unloading has been calculated by taking peak hour trips (10%- URDPFI) of the total projected trips for 2041(refer to **Table 9-25**). The average occupancy of a bus is taken as 20. The loading and unloading bus ratio is considered to be 2:1 with 12 min as loading time and 6 min as unloading time about URDPFI guidelines. Based on this the total bus bays calculated was 6.

**Table 9-24 Total number of buses required**

| Routes                                | Distance (Km) | Time is taken by bus to cover the distance | No. of bus required for the route |
|---------------------------------------|---------------|--------------------------------------------|-----------------------------------|
| Route 1 - Bus Stand - Jaspur          | 14.8          | 44.4                                       | 10                                |
| Route 2 - Bus Stand - Thakurdwara     | 7.9           | 23.7                                       | 6                                 |
| Route 3 - Bus Stand - Bazpur          | 28.7          | 86.1                                       | 18                                |
| Route 4 - Bus Stand - Ramnagar        | 30.4          | 91.2                                       | 19                                |
| Route 5 - Bus Stand - Mahua Kheraganj | 12            | 36                                         | 8                                 |

|              |  |  |           |
|--------------|--|--|-----------|
| <b>Total</b> |  |  | <b>61</b> |
|--------------|--|--|-----------|

Source: Consultant Analysis

**Table 9-25 Number of bus Bays**

|                                                                |      |
|----------------------------------------------------------------|------|
| Projected number of Trips                                      | 6744 |
| Number of buses (occupancy 20)                                 | 337  |
| Peak hour (10%)                                                | 34   |
| Bus Bays (considering 12 min loading and 6 min unloading time) | 6    |

Source: Consultant Analysis

Apart from parking, all the facilities have been considered for the bus terminal like the Workshop area for buses, public/semi-public facilities like Offices/Administration, Police Post, Post office, Telephone, First Aid, etc., parking of other vehicles, commercial, circulation, and open spaces.

**Table 9-26 Bus Terminal Area**

| <b>Bus Facility (30%)</b>                                                                                    | <b>Number</b>      | <b>Area per Unit (sqm)</b> | <b>Area (Sqm)</b> |
|--------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------------|
| Bus Parking                                                                                                  | 61                 | 104                        | 6344              |
| Bus Bays                                                                                                     | 6                  | 145                        | 870               |
|                                                                                                              |                    | <b>Total</b>               | <b>7214</b>       |
| <b>Another facility</b>                                                                                      | <b>Percentage</b>  | <b>Area (Sqm)</b>          |                   |
| Workshop (6%)                                                                                                | 6                  | 1443                       |                   |
| Public/Semi-Public -<br>Offices/Administration, Police Post, Post<br>office, Telephone, First Aid, etc. (3%) | 3                  | 721                        |                   |
| Parking (18%)                                                                                                | 18                 | 4328                       |                   |
| Commercial (3%)                                                                                              | 3                  | 721                        |                   |
| Circulation (30%)                                                                                            | 30                 | 7214                       |                   |
| Open Spaces (10%)                                                                                            | 10                 | 2405                       |                   |
|                                                                                                              | <b>Total</b>       | <b>16833</b>               |                   |
|                                                                                                              | <b>Grand Total</b> | <b>24047</b>               |                   |

Source: Proposed by Consultant

Based on the case study, the area of bus parking and bus bays have been considered as 30% and the other facilities areas have been calculated (refer to **Table 9-26**). The total area under this comes to be 24047 Sqm/ 2.4 Ha.

## **9.9. Proposed Hierarchy of Roads**

The total land under roads is 1270.28 Ha in the proposed road network, a road hierarchy has been maintained. In the road hierarchy, each roadway is defined in terms of its function such

that appropriate objectives for that roadway can be set and appropriate design criteria can be implemented. A road hierarchy has, for some time, been accepted as one of the important tools used for the road network and land use planning. The hierarchy of roads categorizes roads according to their functions and capacities. Developing a hierarchy of roads for any urban area separates various types of traffic from different directions. Hence reducing the overall traffic. The road hierarchy for Kashipur Planning Area has been presented in **Table 9-27**.

There is five level of road hierarchy that has been proposed for the Kashipur Planning Area. These are 60m, 50/45 m, 33/30m, 24/21m, and 18m in width.

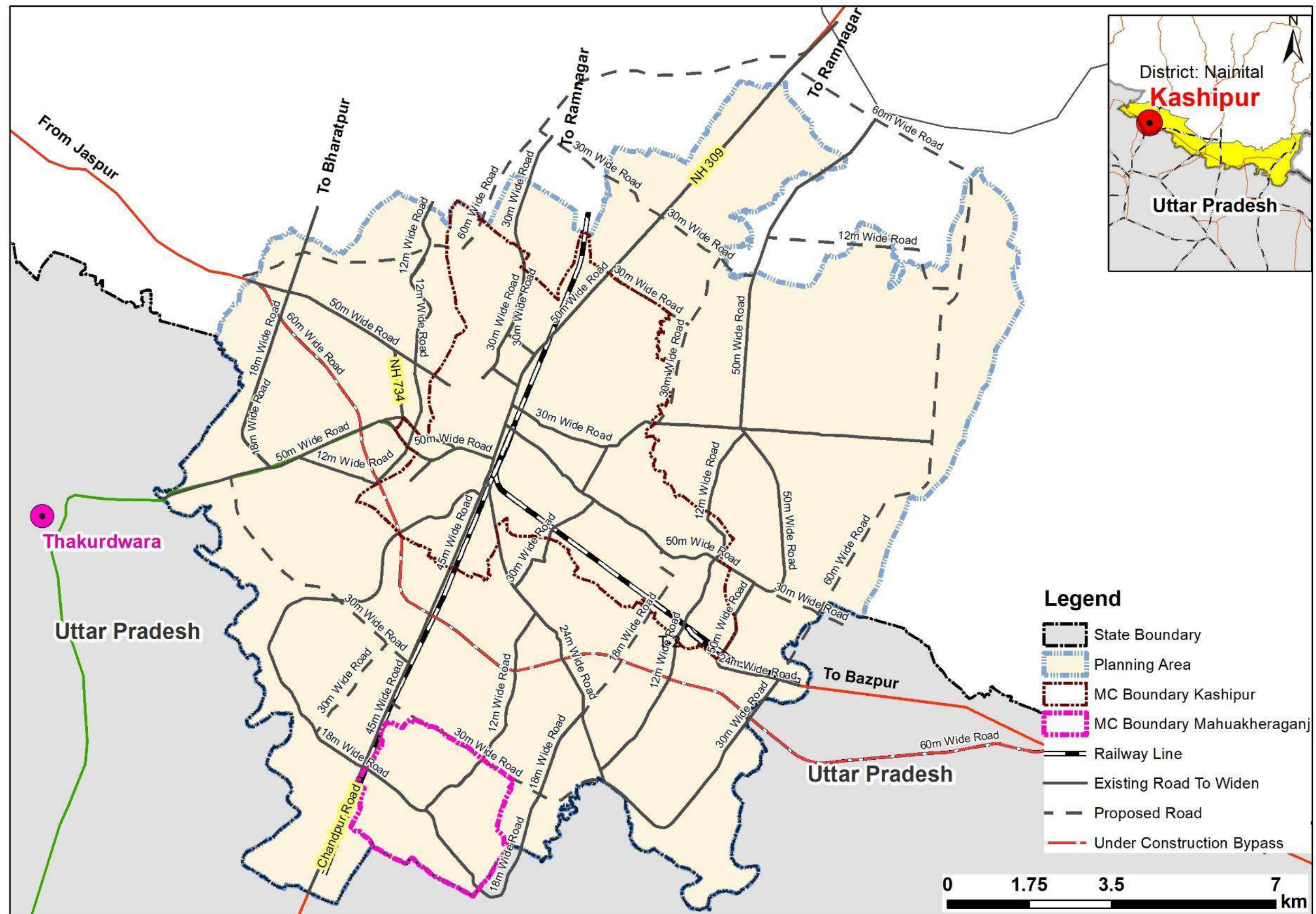
**Table 9-27 Proposed Road Hierarchy**

| Hierarchy | ROW    | Description            | Road Name                                                                         | Proposed Hierarchy   | Properties                                                                            |
|-----------|--------|------------------------|-----------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------|
| R1        | 60m    | New Bye Pass Ring Road | Proposed Bypass Ring Road                                                         | Bypass Road          | Access controlled carriageway                                                         |
| R2        | 45/50m | Arterial Road          | Rudrapur Road, Moradabad Road, Ramnagar Road, Ali Ganj Road, and Kundeshwari Road | Arterial/ Expressway | Carriageway with separate non-motorized, MUZ, and pedestrian facilities on both sides |
| R3        | 33/30m | Sub-Arterial           | All roads connecting Arterial roads and Bypass Road with each other               | Sub-Arterial         | Carriageway with service lane on both sides                                           |
| R4        | 24/21m | Residential            | Internal Roads                                                                    | Collector            | Carriageway with MUZ and Pedestrian facilities                                        |
|           |        | Commercial             | Internal Roads                                                                    | Collector            | Carriageway with parking and pedestrian facilities                                    |
| R5        | 18m    | Residential            | Internal Roads                                                                    | Collector            | Carriageway with MUZ and Pedestrian facilities on both sides                          |
|           |        | Commercial             | Internal Roads                                                                    | Collector            | Carriageway with parking and pedestrian facilities on both sides                      |

Source: Proposed by Consultant



Map 9-3: Proposed Road Network



Source: Proposed by Town and Country Planning Department



The two National Highways i.e., NH 309 and NH 734 forms the spine of the planning area, from which a new bypass (Ring Road) has been proposed with a 60m right of way which has access controlled carriageway. It is the highest ROW in the Planning Area. According to URDPFI, it falls under the Arterial Road category based on its width. The next proposed hierarchy is 50 meters and 45 meters which also falls under the arterial road having separate carriageways for non-motorized vehicles and pedestrian facilities on both sides.

The other major roads in the planning area have been proposed to be 33m and 30m based on the existing road width availability, density, and need of the area. These roads act as the sub-arterial road for the planning area connecting arterial roads and bypass roads with each other having carriageway with service lanes on both sides. The next proposed hierarchy is of 24/21 meter right of way which is the internal roads that fall under the collector road having a carriageway with MUZ, pedestrian, and parking facilities on both sides. The rest have been covered by 18m collector road. The design of these roads is different based on the requirement of the area and its functions.

#### **9.10. Proposed Cross- sections**

Urban roads in Kashipur Planning Area have a heterogeneous mix of traffic. These include the pedestrians, slow-moving vehicles like bicycles, rickshaws both for passenger and freight movement, and fast motorized vehicles like motorcycles, scooters, three-wheelers, cars, and public transport vehicles. The space occupied by each of these vehicles, accelerations and deceleration characteristics, and possible maximum speeds by each user are variable. Therefore, space allocation to different vehicles must be carefully ensured to achieve a smooth and safe flow of traffic.

The type and character of each urban road need to be carefully detailed to respond to the functions it performs, i.e., providing mobility or access or both. The safety of road users is a major concern now because the number of traffic accidents and fatalities on urban roads has continued to increase in the past few years. Therefore, the application of appropriate geometric design standards on urban roads is essential to ensure the safety of all road users. Hence, the design of each road hierarchy in the Kashipur Planning Area has been carefully carried out separately. The guidelines from IRC 86-1983 standards for urban roads in plains have been followed. Apart from this reference from the Unified Traffic and Transportation Infrastructure

(Planning and Engineering) Centre, UTTIPEC, Delhi Development Authority, and Urban Street guidelines, Pune has been considered for the preparation of the cross-sections.

### **9.10.1. Design components of Cross-Section**

#### **9.10.1.1. Carriageway/Motorized vehicle zone**

The carriageway is the reserved portion of the street only for moving vehicles. This includes the number of lanes required for the throughput of motorized traffic. It is divided by railing/median or undivided depending on ROW for to and fro traffic. The motorized vehicles include public transport vehicles too. The lane widths of a carriageway affect the safety and driving behavior of drivers. Wide lanes encourage higher speeds. The carriageway should not be used for parking, hawking, walking, and laying utilities. The public transport proposed here is Bus Priority Lane and hence in the carriageway, a lane is dedicated for Buses. These dedicated bus lanes are only provided till 30 m wide road.

#### **9.10.1.2. Non-motorized vehicles zone**

The non-motorized vehicle zone is reserved for non-motorized vehicles or slow-moving vehicles like cycles, rickshaws, e-rickshaws, etc. Generally, a separate cycle track is provided for the movement of bicycle riders. But in Kashipur Planning Area there are plenty of people who use cycles as well as e-rickshaw for regular travel. As both are slow-moving vehicles, combining them with a dedicated zone for non-motorized vehicles has been introduced in the planning area. This improves the capacity of the lanes designed for motorized vehicles and increases the safety of bicyclists too.

#### **9.10.1.3. Multi-Utility Zone (MUZ)**

Multi Utility Zone or MUZ is a new and highly appreciated concept that has been successfully implemented in the city of Nanded in Maharashtra. As its awareness increased Urban Street Guidelines for Delhi have made it a mandatory element on Urban Streets. The concept is all the stationary elements on the streets are organized in a dedicated space which generally results in the obstruction of free streets. Stationary elements include trees, hawkers, bus stops, underground and overhead utilities like electric supply, light poles, and similar other elements organized in a space in between the footpath/cycle tracks and motorized lanes. This concept has brought high efficiency and improvements to the streets.

#### **9.10.1.4. Service lane**

Service lanes are provided to provide vehicular access to properties, and minor roads are channelized through service lanes reducing the number of punctures on bicycle facilities to the

bare minimum required for accessing this lane. These are generally spaces at an interval of 200m or more. Most urban roads require the provision of parking facilities that can be conveniently integrated with service lanes eliminating conflicts between parked vehicles and bicycle lanes

#### **9.10.1.5. Parking**

Parking is a huge issue in Kashipur Planning Area. The roads of the cities are mainly encroached by parking of vehicles. Hence, parking has not been assigned along the carriageway. The parking facility where ever possible has been incorporated with service lanes. As arterial roads also serve the flow function, it is desirable that parking be limited to dedicated service lanes.

#### **9.10.1.6. Pedestrian Zone**

A pedestrian zone or footpath or sidewalk is the portion of the street reserved only for people who commute through the walk. It is provided on both edges of the street. It should be walkable and safe for pedestrians and should be free from encroachments, parking, and utility obstructions. The width of the pedestrian zone is determined by the hierarchy of the road.

### **9.10.2. Design principle**

The design principle of the cross-sections of roads varies from place to place according to the requirement of the city. In consideration of this, the design principle of the Kashipur Planning Area has also been developed. The new concept of a multi-use zone has been introduced in the urban roads of the city to organize the stationary elements of streets in a single dedicated zone, stop the encroachment of carriageway, and ease the movement of motorized vehicle zone. As the name suggests it can be utilized for multiple purposes and hence it has been kept adjacent to the carriageway in all the road types so that it can be utilized for various purposes according to the demand of the different types of roads. In residential areas, it has been incorporated with a pedestrian zone and on commercial roads, it has been combined with a carriage way. Also, it is kept adjacent to the non-motorized vehicle zone wherever it has been introduced to provide the same facilities as the motorized vehicle zone.

#### **9.10.2.1. The cross-section of 60 m road**

The outer bypass ring road in the planning area is proposed to be 60 m in width. Along the NH 734 and NH 309 mixed-use has been proposed. The cross-section of 60 m roads is designed to cater to the mixed-use proposal for the planning area. The cross-section is represented in **Figure 9-26**. The road is proposed with a median of 10m and then 3 carriageways or motorized

vehicle zone of 5m each. After the carriageway, 3 m of Paved shoulder has been proposed which can also be utilized for needed fixtures for the road like lights.

#### **9.10.2.2. The cross-section for 50 m**

The cross-section of the 50m road type has been illustrated in **Figure 9-27**. The median is kept at 8 m and then in a similar manner as a 60 m wide road, a total of 3 carriageways with two carriageways as 3.5 m and one carriageway as 4 m (Bus priority lane) has been proposed. Adjacent to the carriage way is the MUZ of 3 m and adjacent to it is the non-Motorized Vehicle zone for e-rickshaw and cycles of 4 m. The MUZ will be used for bus stands, e-rickshaw stops, public utilities, etc. Adjacent to it is the pedestrian zone of 3m.

#### **9.10.2.3. The cross-section for 45 m**

The 45m cross-section of an arterial road is presented in **Figure 9-28**. This cross-section is the same as the 50m cross-section with only one difference i.e., instead of 8m median 3m median has been proposed in this section.

#### **9.10.2.4. The cross-section for 33 m road**

The cross-sections of the 33m road have been presented in **Figure 9-29**. The cross-section of 33m has been proposed with a median of 4m and a carriageway of 10 m. The buses can also travel on the 33 m wide road. Adjacent to the carriageway, 0.5 m for road fixtures and separation of motorized and non-motorized traffic has been developed. Adjacent to the service Lane of 4 m has been proposed

#### **9.10.2.5. The cross-section of 30 m road**

The 30 m wide roads which are in the category of sub arterial road has been illustrated in **Figure 9-30**. Here a motorized vehicle zone/carriageway/ shared lane of 10m has been proposed with a 4m service lane. The median is kept at 1m and a buffer of 0.5m in between the carriageway and service lane has been provided.

#### **9.10.2.6. The cross-section for 24 m road**

The cross-section for the 24 m road has been illustrated in **Figure 9-32**. On 24 m as well two cross-sections have been developed. One is a general cross-section which is mostly found in residential areas and the other is for commercial areas in Kashipur. In the general section two carriageway with shared traffic of each 3.5m, has been proposed. Adjacent to the carriageway is a 2.5m MUZ and 2.5m pedestrian zone. The MUZ here can be utilized for street vendors and public utilities. In the commercial cross-section, the median and carriageway are kept the same

but instead of MUZ, a parking lane of 2.5m has been provided, as it is a commercial zone where parking is needed.

#### 9.10.2.7. **The cross-section of 18 m road**

The cross-section for the 18 m road has been illustrated in **Figure 9-33**. Two alternatives one for residential and one for commercial have been proposed. A shared lane of 10 m in total with 2m MUZ and 2m pedestrian on each side has been proposed for residential areas. The proposed 18 m wide road in the core city of predominant commercial use has been proposed with a 10 m carriageway with 2m parking and 2 m pedestrian on each side. The parking facility has been given importance in commercial areas.

Figure 9-26: Proposed 60m Cross Section

## Road Cross Section - 60 m (Bypass)

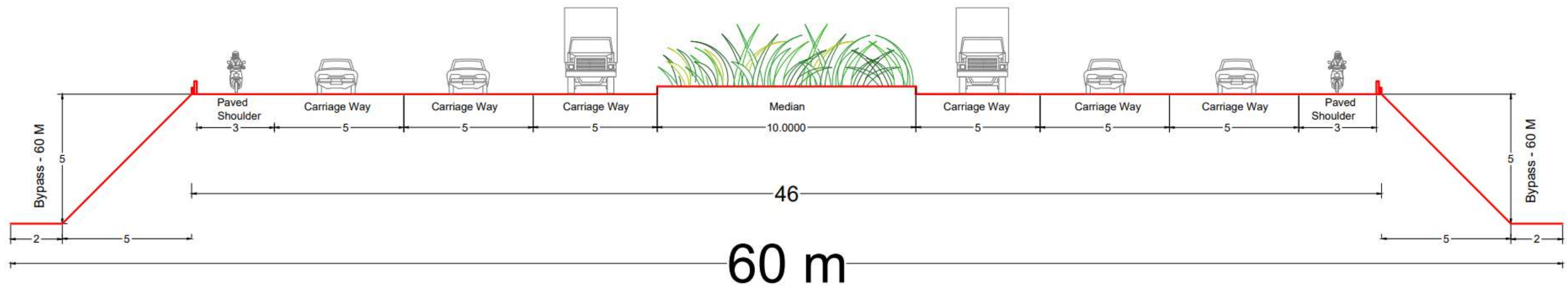


Figure 9-27: Proposed 50m Cross Section

## Road Cross Section - 50 m

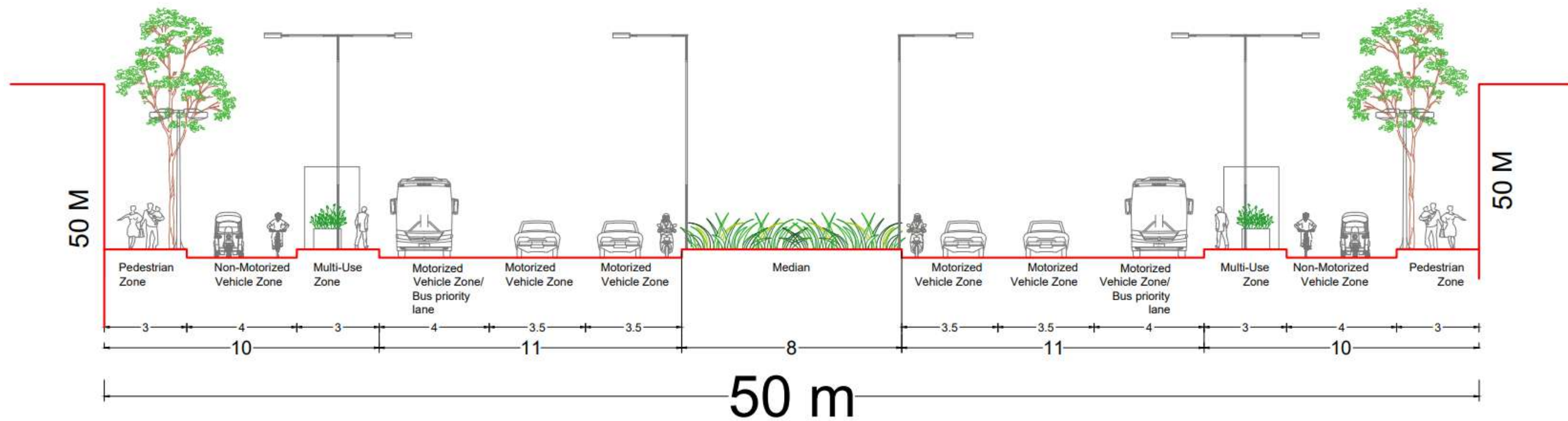




Figure 9-28: Proposed 45m Cross Section

## Road Cross Section - 45 m

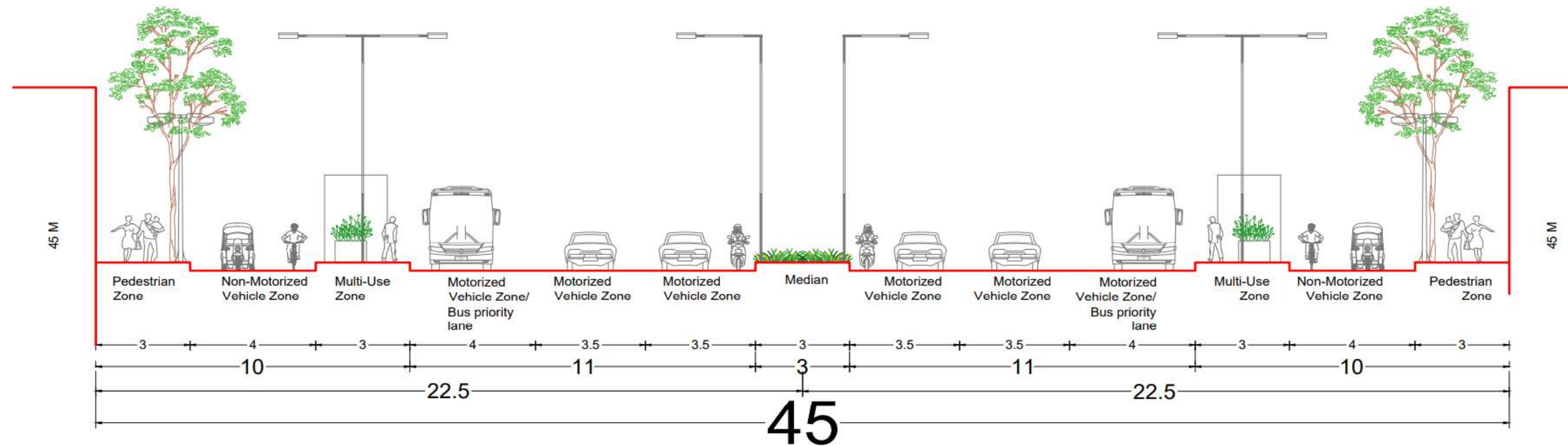


Figure 9-29: Proposed 33m Cross Section

## Road Cross Section - 33 m

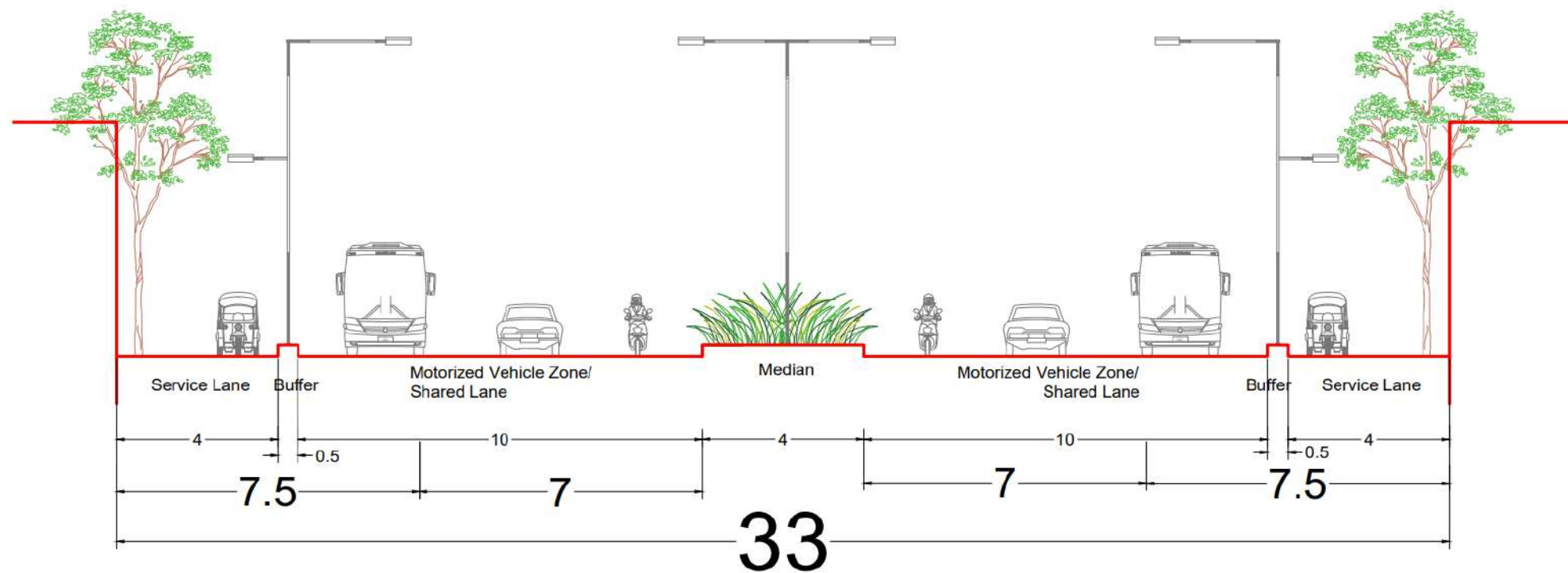


Figure 9-30: Proposed 30m Cross Section

### Road Cross Section - 30 m

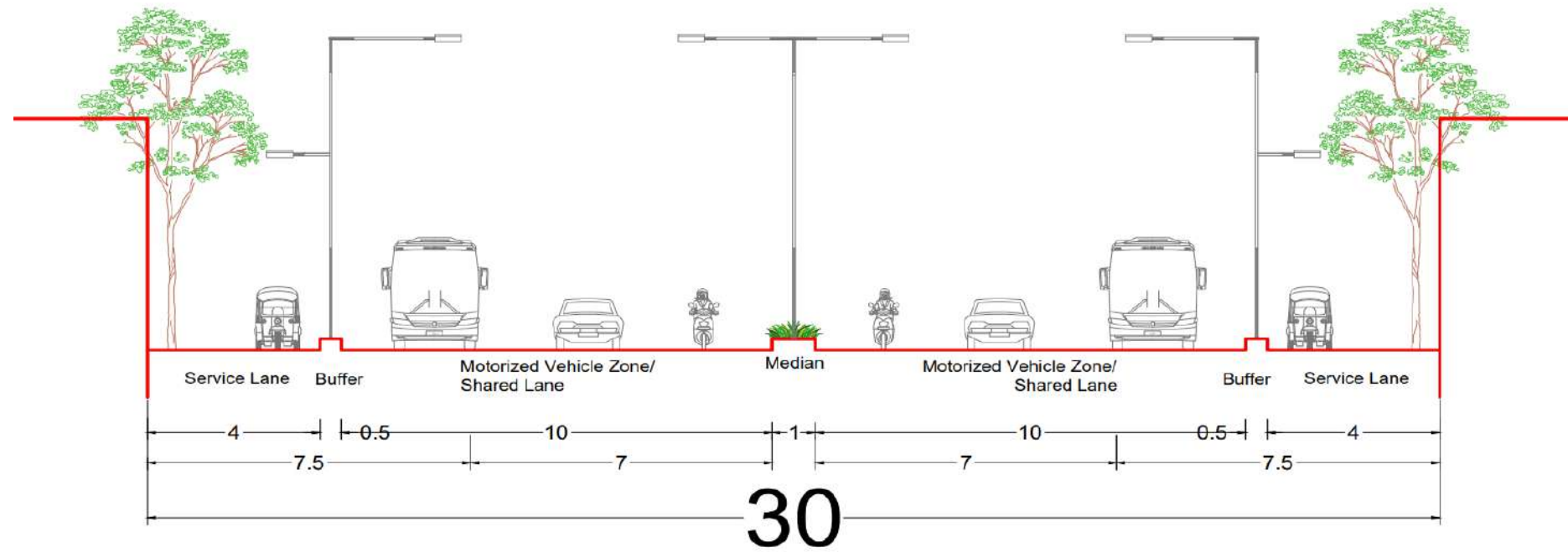


Figure 9-31: Proposed 24m Cross Section

### Road Cross Section - 24 m (Residential)

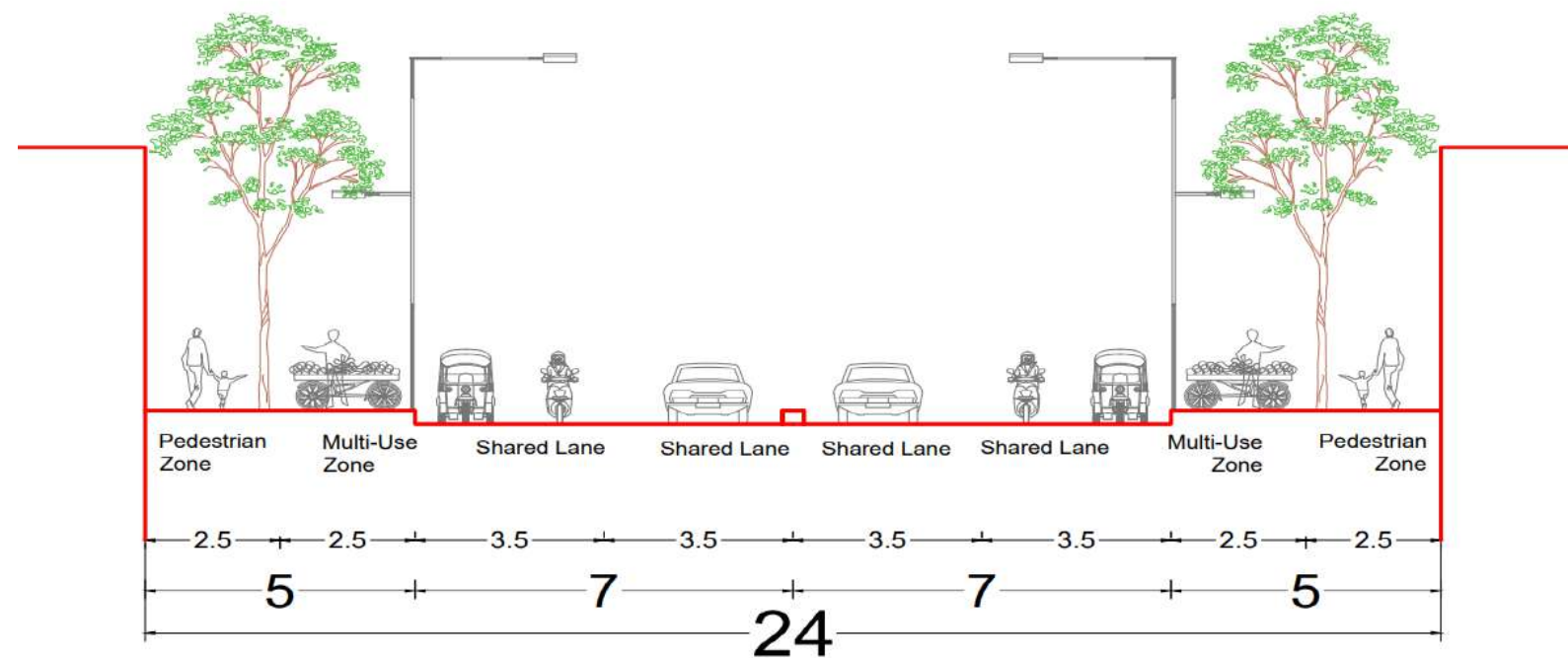


Figure 9-32: Proposed 24m Cross Section

### Road Cross Section - 24 m (Commercial)

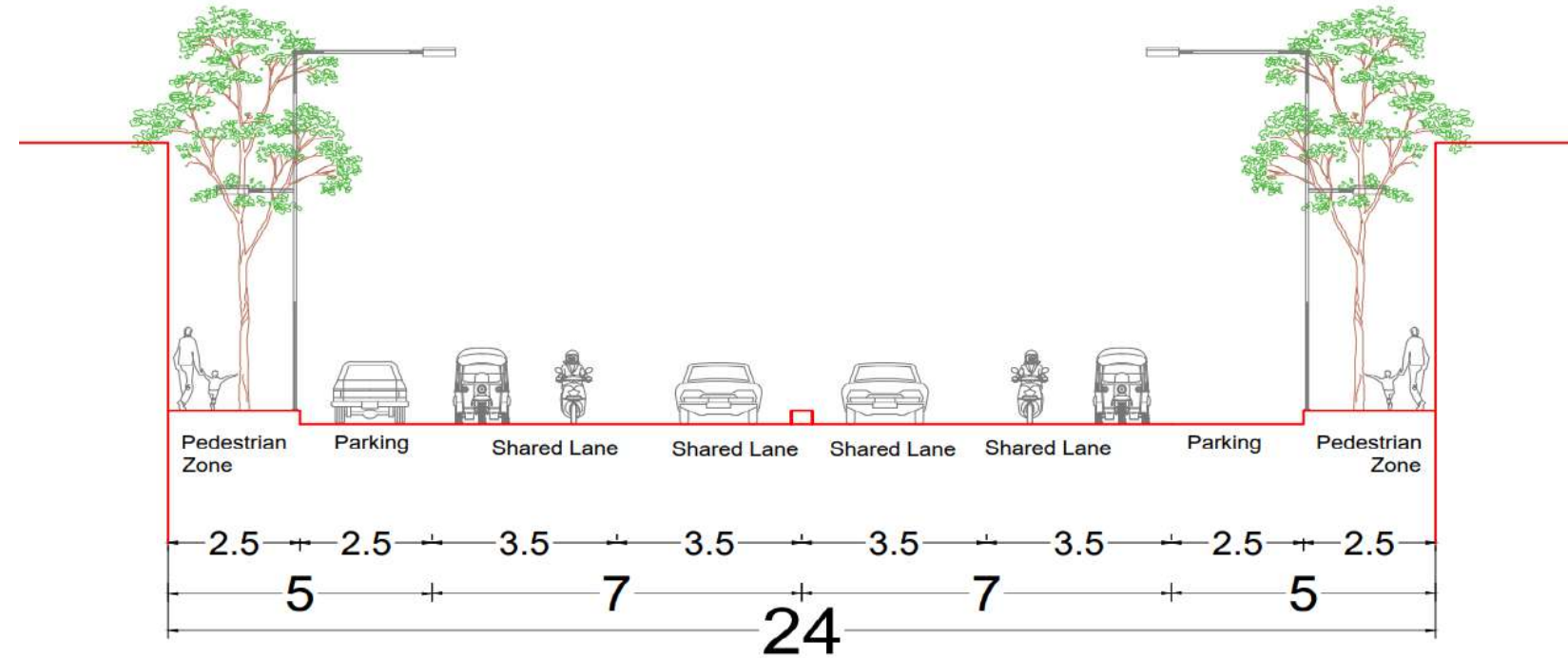
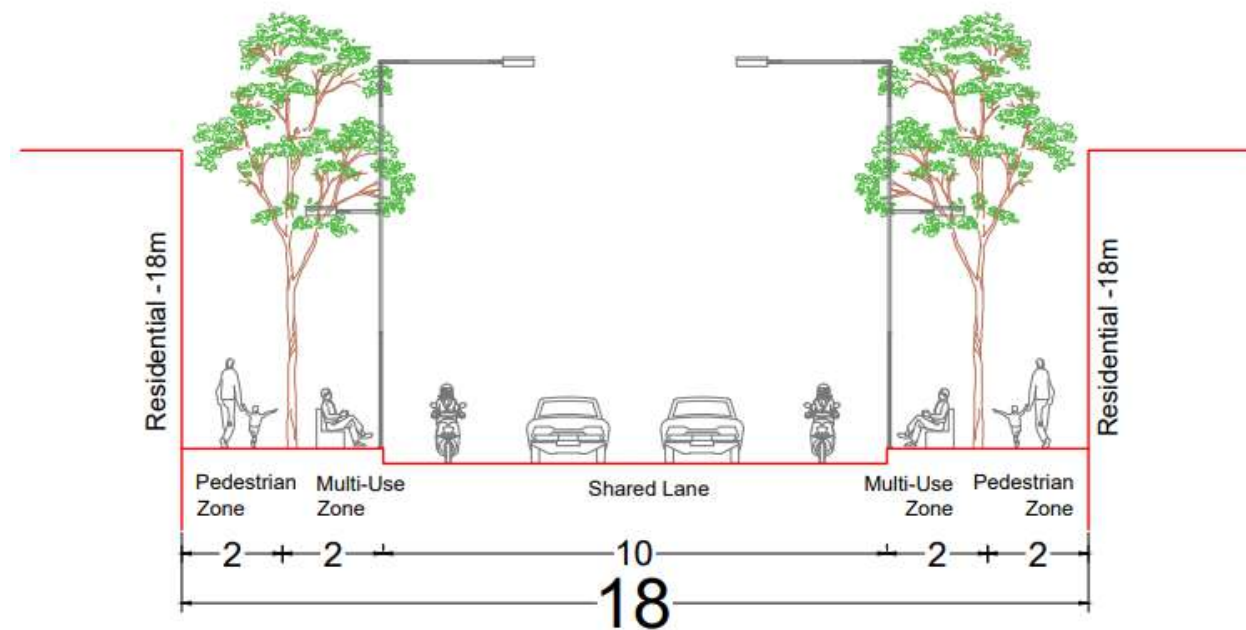
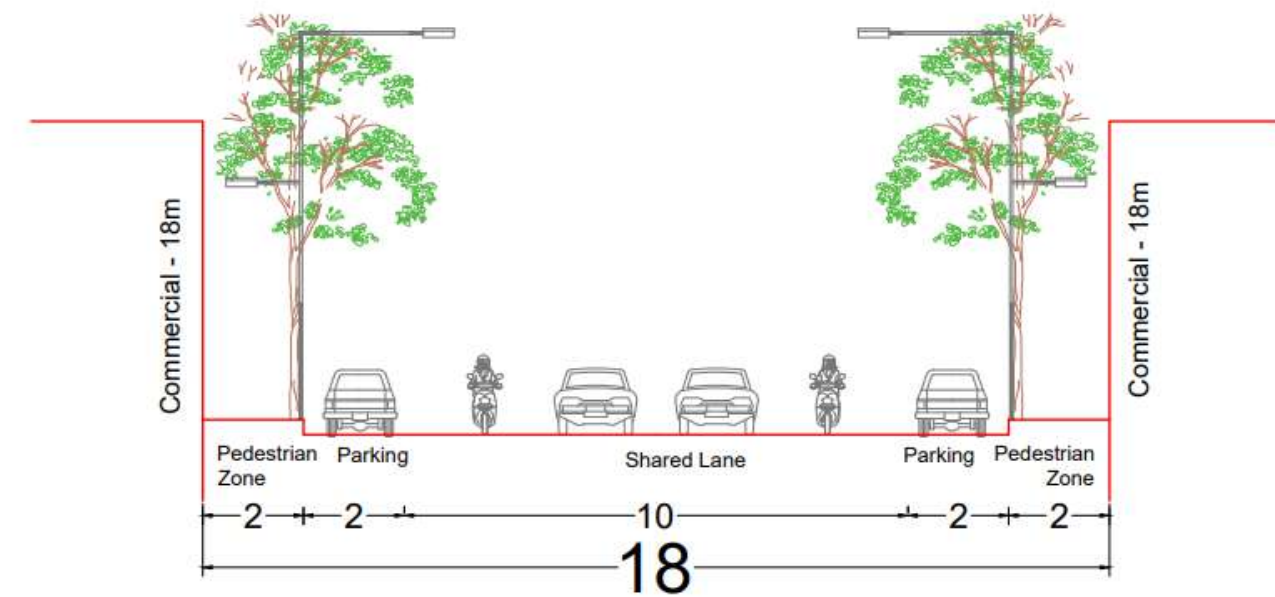


Figure 9-33: Proposed 18m Cross Section

### Road Cross Section - 18 m (Residential)



### Road Cross Section - 18 m (Commercial)





### 9.11. Proposed Junction Improvement Plan

Kashipur has grown organically over the years. Without any planning of transport facilities and lack of management, the city has developed a few choke points where intervention is necessary to improve its condition or else it would become worse with time. Junction improvement has been proposed for six major junctions namely Stadium Chowk, Cheema Chauraha, Chatri Chauraha, Tanda Tiraha, Tanda Ujjain, and Chatri Chauraha. (Refer to **Table 9-28**).

*Table 9-28 Improved junctions*

| Junction Name   | Road                                                             | Remarks                                                                  |
|-----------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| Stadium Chowk   | Ramnagar Road                                                    | The Junction Improvement plan needs to be improved on an immediate basis |
| Cheema Chauraha | Ramnagar Road                                                    |                                                                          |
| Chatri Chauraha | Ramnagar road (North), Kashipur Road (South), Bajpur Road (East) | Overhead ROB and Junction improvement is under construction              |
| Tanda Tiraha    | Moradabad Road                                                   | The Junction Improvement plan needs to be improved on an immediate basis |
| Tanda Ujjain    | Kashipur Road                                                    |                                                                          |
| Chaiti Chauraha | Bajpur Road                                                      |                                                                          |

Source: Proposed by Town and Country Planning Department

#### 9.11.1. Proposed Rail over Bridge (ROB)

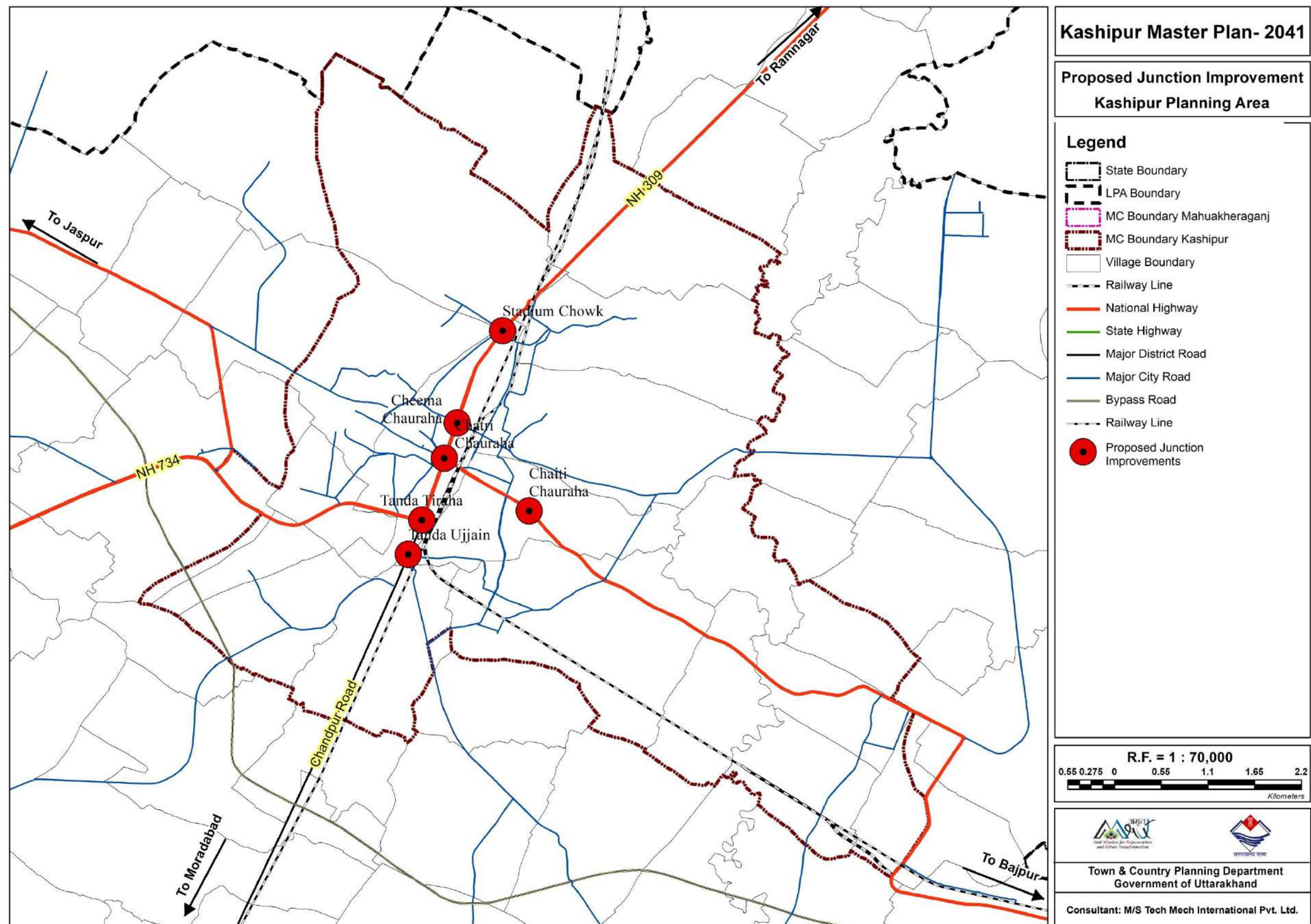
With the presence of a railway station in the central part of the city, the railway line is a broad gauge in nature and acts as a central spine. Due to this, there are many railway crossings which increase the travel time of commuters and is a major reason for city-level traffic congestion. The best solution to solve this is to propose ROB or RUB but due to shallow water conditions in kashipur, the only solution is to propose Rail over Bridges at major railway crossings. For the same, Six ROB have been proposed as described in **Table 9-29**.

*Table 9-29 Proposed Rail over Bridge*

| Rail Over Bridge | Road                                                                                        | Type    | Remarks                                                       |
|------------------|---------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------|
| 1                | Ramnagar Road                                                                               | Linear  | Proposed                                                      |
| 2                | Ramnagar road (North)<br>Kashipur Road (South)<br>Bajpur Road (East)                        | T- Type | Overhead ROB is under construction                            |
| 3                | Kashipur-Darhiya Road                                                                       | Linear  | Proposed on the junction where two crossings on the same road |
| 4                | Rudrapur Road                                                                               | Linear  | Proposed                                                      |
| 5                | Chandpur/ Moradabad Road (South)<br>Kashipur-Darhiya Road (North)<br>Mahua kheraganj (East) | T- Type | Proposed                                                      |
| 6                | Road Connecting Chaiti Churaha and Tanda Ujjain                                             | Linear  | Proposed                                                      |

Source: Proposed by Town and Country Planning Department

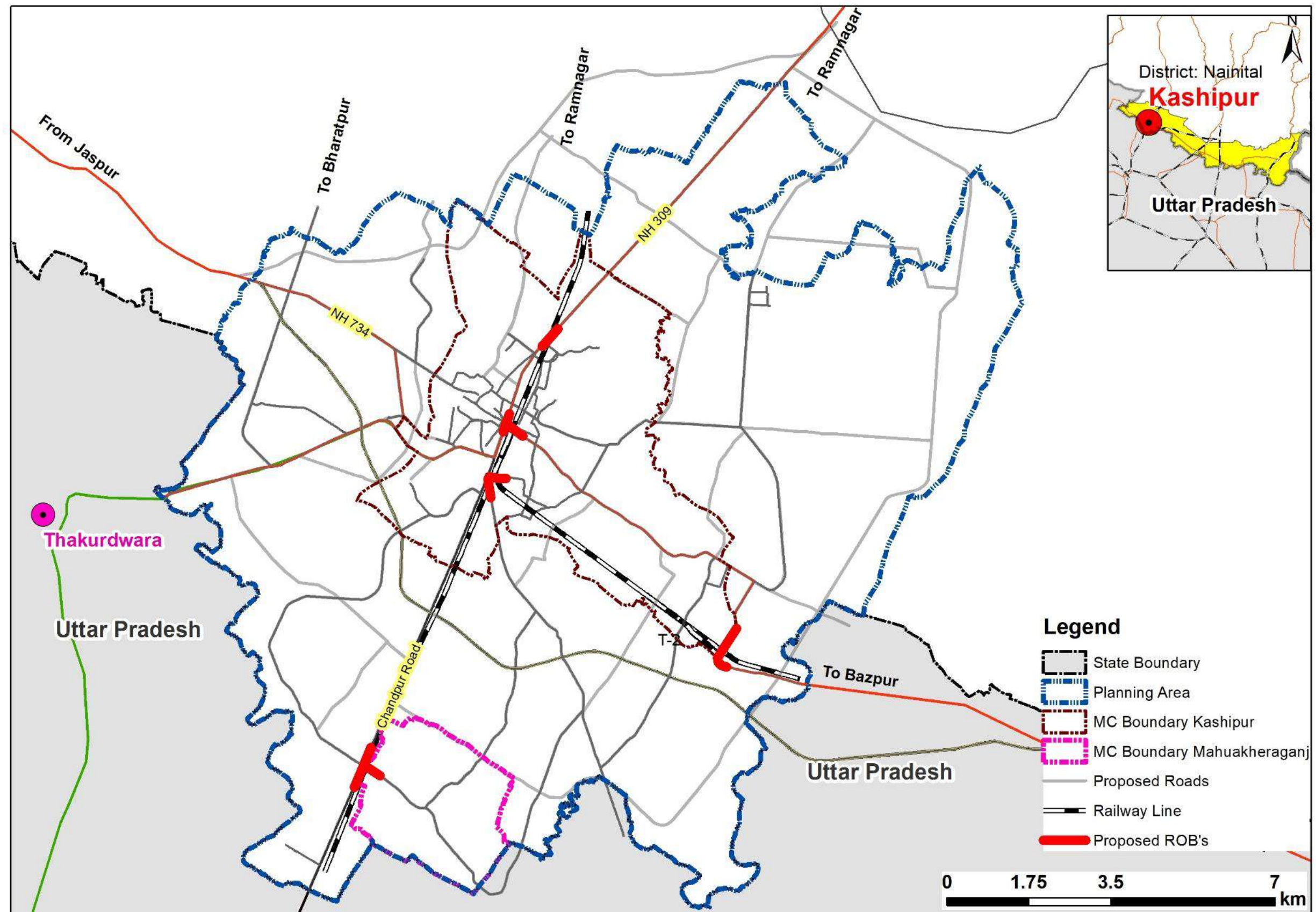
Map 9-4 Proposed Junction Improvement



Source: Proposed by Town and Country Planning Department



Map 9-5 Proposed Rail Over Bridges (ROBs)



Source: Proposed by Town and Country Planning Department



## **9.12. Proposed Terminal Facilities**

### **9.12.1. Bus Stand**

The existing bus terminal of Kashipur is located on Kashipur road in the central part of the city near Maharana Pratap Chowk. The existing number of buses departing from Kashipur Bus stand is 44 per day which includes 39 buses and 5 mini-buses. However, there is a need for organized bus bays. This bus terminal is sufficient to cater to the existing requirement of the Kashipur planning area. So, the existing bus stand is sufficient for the regional bus traffic with a total area of 1.33 Ha. Other than this one more bus stand is proposed on Moradabad Road and New Bypass Road with an area of 8.04 Ha.

### **9.12.2. Railway Station**

176.25 ha of land is under railways in the kashipur planning area with a total share of 11% under the transportation sector.

### **9.12.3. Integrated Freight Complex**

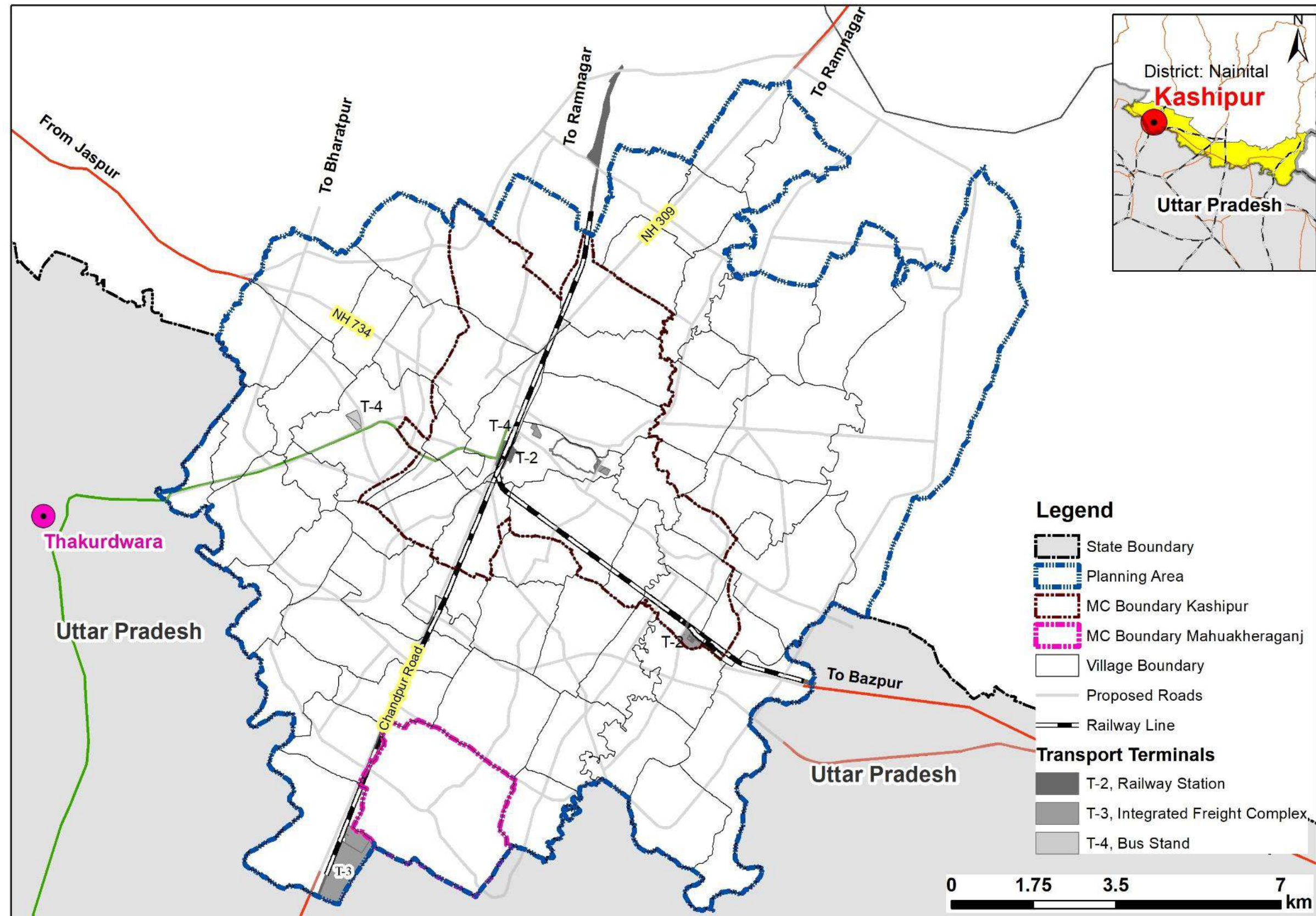
Kashipur Planning Area is flourishing as an industrial town and in trade and commerce. Hence, it receives a lot of goods traffic regularly and there is a lack of facilities in the planning area for the goods traffic. To determine the requirement for Integrated Freight, Complex goods traffic data of Kashipur Planning Area has been utilized. The area calculation of the Integrated Freight Complex has been explained in **Table 9-30** and **Table 9-31**. The total number of goods traffic in the Kashipur Planning Area is 7593.

**Table 9-30 Parking Requirements for the Transport Nagar**

| Total goods traffic on Outer Cordons as Origin/destination | No. of trucks required for Parking | Provision of Parking (25%) |
|------------------------------------------------------------|------------------------------------|----------------------------|
| 7593                                                       | 3797                               | 949                        |

Source: Calculated by Town and Country Planning Department

Map 9-6: Proposed Transport Terminals



Source: Proposed by Town and Country Planning Department

**Table 9-31 Truck Terminal Area Calculation**

| Integrated Freight Complex      | Number       | Area per unit | Area  |
|---------------------------------|--------------|---------------|-------|
| Parking (12%)                   | 949          | 76            | 72124 |
| Other Facilities                | Percentage   | Area          |       |
| Wholesale Market                | 35           | 210362        |       |
| Warehousing                     | 8            | 48083         |       |
| Booking Agencies                | 2            | 12021         |       |
| Commercial & Public/Semi-Public | 5            | 30052         |       |
| Utilities and Services          | 3            | 18031         |       |
| Service Industry                | 4            | 24041         |       |
| Circulation                     | 25           | 150258        |       |
| Others                          | 6            | 36062         |       |
|                                 | <b>Total</b> | <b>601033</b> |       |

Source: Proposed by Town and Country Planning Department

Assuming only 50% of vehicles are traveling to the city. 25% parking has been provided for the trucks (referred from Logistics Park at Hubli-Dharwad) which comes to be about 949 trucks (refer to **Table 9-30**).

As per URDPFI, the Equivalent Car Space (ECS) is the same for buses and trucks. Hence 76 sqm has been provided for each truck for angular parking which is considered 18% of the total land use as per URDPFI. Based on this the other areas have been calculated as per Integrated Freight Complex Land Use break up as per URDPFI. The land requirement for the Integrated Freight Complex is to be 601033 sqm/60 Ha. In total three freight complexes have been proposed near every industrial zone to minimize the heavy vehicle traffic inside the city. The proposed land for Integrated Freight Complex is 112.12 Ha.

### **9.13. Recommendations of Traffic System and Management Plan - Kashipur**

There is a need to propose TSM Plan in kashipur for the old build-up area and for the existing road network which includes the following

- Provision of Parking along the periphery of the core city
- Provision of Parking Facilities along all major commercial Roads
- Provision of Fees for parking on an hourly basis within the core city
- Removal of encroachments from all major roads

- The pedestrianization of all commercial streets within the core city
- Channelization of the traffic flow with directional distribution through management e.g.
  - One side flow of traffic
  - Entry and exit time management for goods traffic within the city roads
  - Restriction of entry of two-wheelers/ Four Wheelers within the commercial street of the core city
- Installation of CCTV Cameras in main junctions for safety

Road markings for all major roads as well as for the on-street parking areas.

## 10. Tourism and Heritage

The environment is an important aspect to be given due consideration in the Master Plan as everything that supports the survival of human beings is dependent on it. The wellness of the environment directly relates to the wellness and health of human beings and every other species. Hence the quality of the environment is an indicator of the quality of life of the people living in the Planning Area.

### 10.1. Heritage

Heritage is tradition, a practice, set of values, or property that has been passed down in families or institutions through generations. Heritage is a diverse topic that covers buildings, gardens, monuments, archaeological sites, etc. It is more than material but reveals the whole history of a place, what it was and what it went through. Heritage is a contemporary activity with far-reaching effects. It can be an element of far-sighted urban and regional planning. According to the Ancient Monuments and Archaeological Sites and Remains Act 1958, “Ancient Monument means any structure, erection or monument, or any tumulus or place of interment, or any cave, rock-sculpture, inscription or monolith, which is of historical, archaeological or artistic interest and which has been in existence for not less than 100 years and includes – remains of an ancient monument, site of an ancient monument, such portion of a land adjoining the ancient monument as may be required for fencing or covering in or otherwise preserving the monument and the means of access to, and convenient inspection of, an ancient monument.”

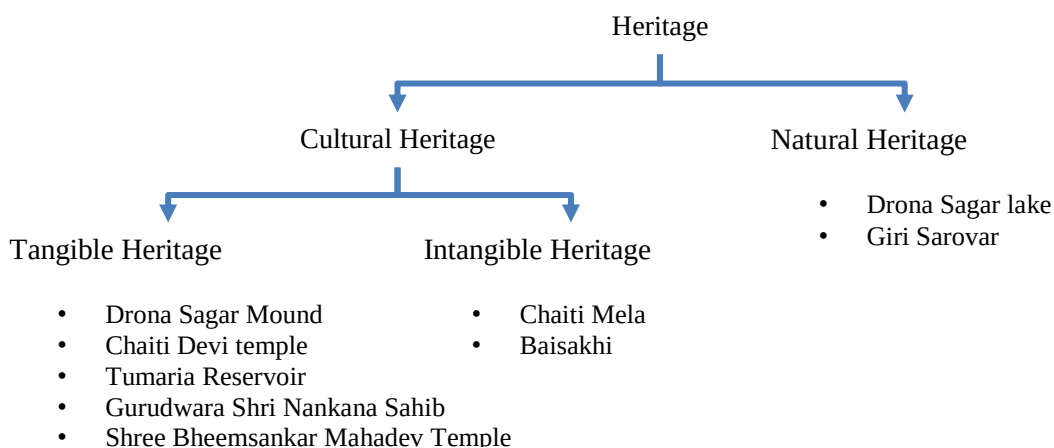
The conservation of heritage is generally perceived to be in the long-term interest of society. It has to be done so that the next generations should know the importance of the place and the history associated with it. As per CPWD, conservation “means all the processes of looking after a place to retain it is historical and/or architectural and/or aesthetic and/or cultural significance and includes maintenance, preservation, restoration, reconstruction, and adoption or a combination of more than one of these.”

In general, Heritage is of two types Cultural and Natural (refer to **Figure 10-1**). Cultural heritage includes historic buildings, monuments, and collections of information on how people lived such as photos, paintings, stories, newspapers, and books that reflect the history and culture of a place. It further has two types of tangible and intangible heritage. Tangible heritage refers to all material traces, things we can touch like monuments, books, and paintings whereas intangible heritage is nonphysical intellectual wealth, such as folklore, customs, beliefs, traditions, knowledge, and language. Kashipur is rich in both tangible and intangible heritage.



Natural heritage refers to the natural elements of biodiversity. It includes flora, fauna, ecosystem, geological structures, etc. Kashipur has regional tourism influence but is limited due to Jim Corbett National Park being present at a distance of 26 km.

**Figure 10-1: Heritage Classification**



*Source: Compiled by Consultant*

Kashipur has a lot of cultural significance in the district and is believed to be an important part of Mahabharata stories. This strong heritage gives Kashipur a lot of scope for tourism and hence develops the area as well as the economy of the region. Kashipur found its name after the founder Kashi Nath Adhikari, who was the governor of the Chand rulers of the Kumaon region. In the village of Ujjain which is about 1.6 km from the east of Kashipur and falls under the KPA extensive archaeological remains have been discovered. Girital and Dronasagar are the main tourist spots of Kashipur. But Dronasagar is the only one that is recognized by ASI. The famous fair of Kashipur, The Chaiti Mela is held around an old temple of Chaiti Devi about 2.5 km from Kashipur. Heritage and Tourism go hand in hand nowadays. People have become more interested in the history and culture of a place nowadays. They travel miles to enjoy the rich culture. This helps the local people to boost their income level and flourish the heritage of that area. It's a win-win situation for both sides. But proper care must be taken to not overuse the historical sites which would hamper their existence. Apart from cultural and religious tourism Kashipur also has the potential for eco-tourism at the regional level due to Jim Corbett National park, the oldest National Park of India which is just 26 km away from Kashipur. The major tourist destination at the district, regional and local levels are discussed below.

## **10.2. Tourism**



Tourism is related to the activities of people traveling, staying maybe for pleasure or business. The act of spending time away from home in a new place to explore. It is also a business of attracting, accommodating, and entertaining tourists. However, tourism is a vital part of heritage conservation and the economy. it creates a sense of cultural exchange among the tourists and also creates jobs and employment for the local people, hence, boosting the revenue of the government. In the next section, the tourist spots are discussed at the state, regional and local levels.

### **10.2.1. Tourism Nodes at District Level**

The district of Udham Singh Nagar is dotted with several sacred shrines both for Hindu and Sikh devotees which attract a major quantum of tourists. Overall, there are a total of 13 major tourist nodes in the district of Udham Singh Nagar which mainly includes religious places and recreational places. The list of the tourist nodes has been given below:

1. Gurudwara Nanakmatta Sahib,
2. Atariya Devi Temple, Rudrapur
3. Chaiti Temple, Kashipur
4. Panch Mandir, Rudrapur
5. Drona Sagar, Kashipur
6. Giri Sarovar, Kashipur
7. Lake Paradise, Rudrapur
8. Haripura and Baur Lakes, Gularbhoj
9. Nanak Sagar, Nanakmatta
10. Dhaura Reservoir, Kichha
11. Begul Reservoir, Sitarganj
12. Tumaria Reservoir, Kashipur
13. Hari Mandir, Rudrapur

These nodes attract a large number of tourists on a day-to-day basis which can be further developed for leveraging the tourism potential and for providing the required impetus to tourism. Further, it has been observed that despite the large no. of tourists visiting the city, their actual stay is highly restricted as most of the tourists stay only for one day. Hence, efforts have to be done to increase their stay in the area to at least two to three days. Also, the city has very good accommodation options catering to low-budget tourists as well. However, these options are not enough and require certain other hotels to be established or some innovative measure

to be adopted in this regard. A scheme for accommodating tourists in residential houses (bed and breakfast) can also be considered as an option for providing affordable accommodation to tourists. An incentive-based scheme will have to be framed for creating an appropriate level of budget accommodation. Another way of increasing the stay of the tourists is to provide them with certain options which they can visit. This could be done by developing tourist circuits at various levels like Local and Regional levels. The entire approach to promoting tourism shall revolve around the provision of 4 as including

1. Promoting a high degree of Accessibility,
2. Providing comfortable and affordable quality Accommodation, including low-budget accommodation.
3. Creating more opportunities for Attracting tourists, and
4. Providing a state of art tourism-related Infrastructure and Amenities.
5. Provision of Information Centre.

### **10.2.2. Tourist Inflow at District Level**

The district is well connected with other parts of the country by rail, road, and airways. The district attracts tourists from all walks of life. **Table 10-1** represents the tourist inflow in the district in the last 5 years. Data provided by the tourism department shows that the number of tourists coming to the district has increased from 130624 in 2014 to 154875 in 2018.

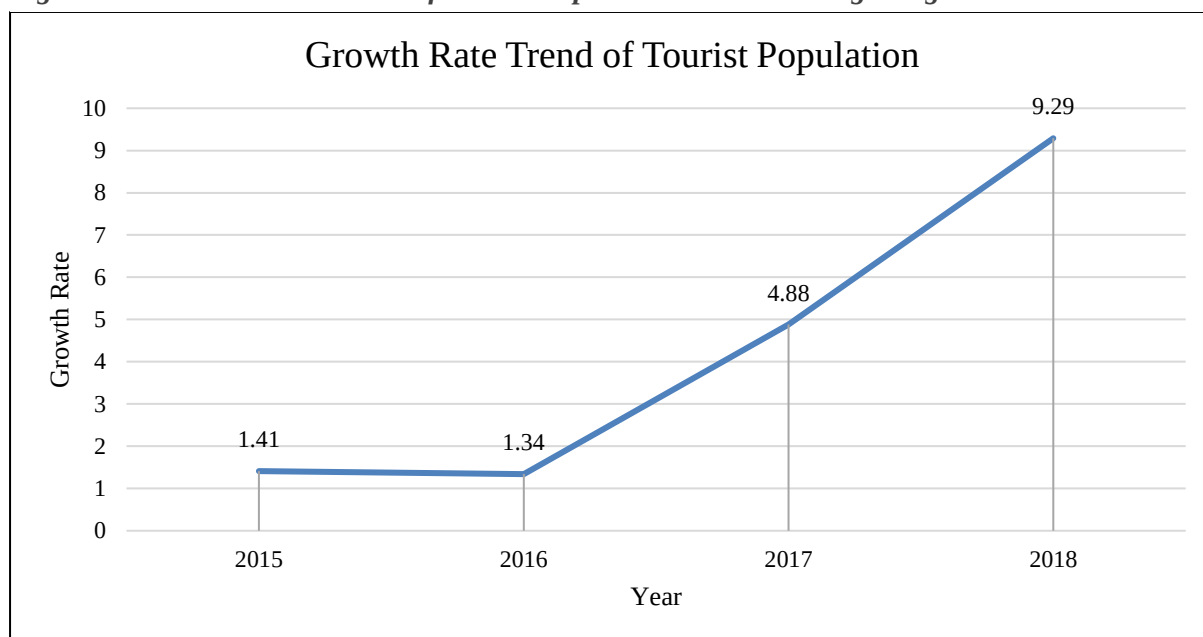
*Table 10-1: Tourist Inflow in Udham Singh Nagar District*

| Year | Domestic Tourists | Foreign Tourists | Total Tourists | Growth Rate |
|------|-------------------|------------------|----------------|-------------|
| 2014 | 128903            | 1721             | 130624         | -           |
| 2015 | 130703            | 1771             | 132474         | 1.41        |
| 2016 | 132515            | 1728             | 134243         | 1.34        |
| 2017 | 139140            | 1654             | 140794         | 4.88        |
| 2018 | 152022            | 1853             | 153875         | 9.29        |

Source: Tourism Department, US Nagar

The growth rate of tourists has increased in the last 4 years as shown in **Figure 10-2**. The growth rate is almost constant in the years 2015 and 2016 as there is a variation of 0.7% only. In the year 2017, the growth increased to almost 5% while in 2018, it has increased to 9.29%. It implies that the number of tourists is increasing with an increasing growth rate indicating that there is a potential of developing the tourism industry in the district.

**Figure 10-2: Growth Rate Trend of Tourist Population in Udham Singh Nagar**



*Source: Tourism Department, US Nagar*

### **10.2.3. Tourism Nodes at Regional Level**

#### **10.2.3.1. Jim Corbett National Park**

Established in 1963 as Hailey National Park to protect the endangered Bengal Tiger, Jim Corbett National Park is the oldest national park in India. It is located near Ramnagar village and is 26 km from Kashipur. It was established under the Project Tiger initiative. The total area of the park is 520.8 km<sup>2</sup> which includes grasslands, hills, marshy lands, riverine belts, and a large lake. More than 70% of the land is covered with forests which consist of mango, Rohini, peepal, sal, and Haldu trees.

An excellent destination for ecotourism, which houses 50 species of mammals, 580 bird species, and 25 reptile species. The park is divided into five zones to encourage tourism these are Bijrani Safari Zone, Jhirna Safari Zone, Dhela Safari Zone, Dhikala Zone, and Durga Devi Zone. With tourism reaching its peak in the park it has also caused issues in the natural ecosystem of the park. Excessive trampling of the soil has led to a decrease in the number of plant species and also a decrease in pressure in soil moisture content. The use of forest wood as cooking fuel for tourists has pressurized the ecosystem. With these, the tourist creates noise and throws garbage and litter which causes a general disturbance. So, the influx of tourists should be controlled and regulated to avoid hampering the ecosystem of the park.

The important point to be noticed is that due to the National Park there is already a good amount of footfall every year. These could be used in advantage to develop tourism for Kashipur. Tourist generally visits nearby places when they visit. So, with proper infrastructure development and facilities, those tourists can be attracted to Kashipur, and hence tourism will naturally grow in the Kashipur region.

#### **10.2.3.2. Tumaria Reservoir**

Tumaria Reservoir has been constructed on the Phikka river at a height of 15.9 meters and 10000 meters long. River Ganga serves as the basin area for the dam. The Tumaria dam was completed and commissioned in the year 1970. The water of this dam is used for irrigating the fields. Due to the construction of the dam, the nearby lands have become fertile over the period. This dam is located near Malthan road and is famous among tourists for a picnic. This place is easily accessible by Auto rickshaw, e-rickshaw, or any private mode of transport (refer to **Figure 10-3**).

*Figure 10-3: Tumaria Reservoir, Kashipur*



#### **10.2.4. Tourism Nodes at the Local Level**

Within the planning area, there are six major tourist locations. One of them is ASI certified and some have historical significance in the Indian culture. Various religious locations are also famous in the planning which receives a lot of people around the year. In the planning area, we

do not just find monuments, temples, or gurudwaras but also famous festivals for the local people is found. The details of each location are discussed in the next section and the locations are represented in **Map 10-1**.

#### **10.2.4.1. Govishana Mound at Drona Sagar (Mauza Ujjain Kashipur)**

In the case of Kashipur, Govishana Mound at Drona Sagar is the only heritage site recognized by ASI located within KPA. It was recently declared the site of “national importance”. The city of Kashipur itself belonged to the Harshvardhana era ruins of settlement can be still seen near the city.

Kashipur is identified by A. Cunningham with Kiu-pi-showing-na of Hiuen Tsang, which is rendered into Sanskrit by Julien as Govishana. Cunningham traced the remains of a large structure at Bhim-Gaja the highest place at the site. The ASI conducted excavations there in the year 1939-40, 1965-66, and 1970-01 to reveal the details of the structure traced by Cunningham. Excavation revealed a substantial part of the plan of the temple built in three different phases. Initially, the temple appears to have started as a soiled brick-built high platform surmounted possibly by a sanctum during the Gupta period but later, two encircling walls probably in the 6th -7th century AD laid around it covering it finally into an extensive and impressive Panchayatana complex.

Since the excavation was aimed to obtain a detailed plan of the temple, hence, no attempt was made to reveal the complete cultural sequence of the site; however, pottery collected from the site revealed that the site remained under occupation by the Painted Grey Ware period to the early medieval time. The thick brick debris accumulated against the wall of the temple contained copper coins, copper and glass bangles, copper rings, terracotta, stone beads, nails, and chisels of different periods (refer to **Figure 10-4**).

**Figure 10-4: Govishna Mound at Dronasagar.**



#### **10.2.4.2. Drona Sagar Lake**

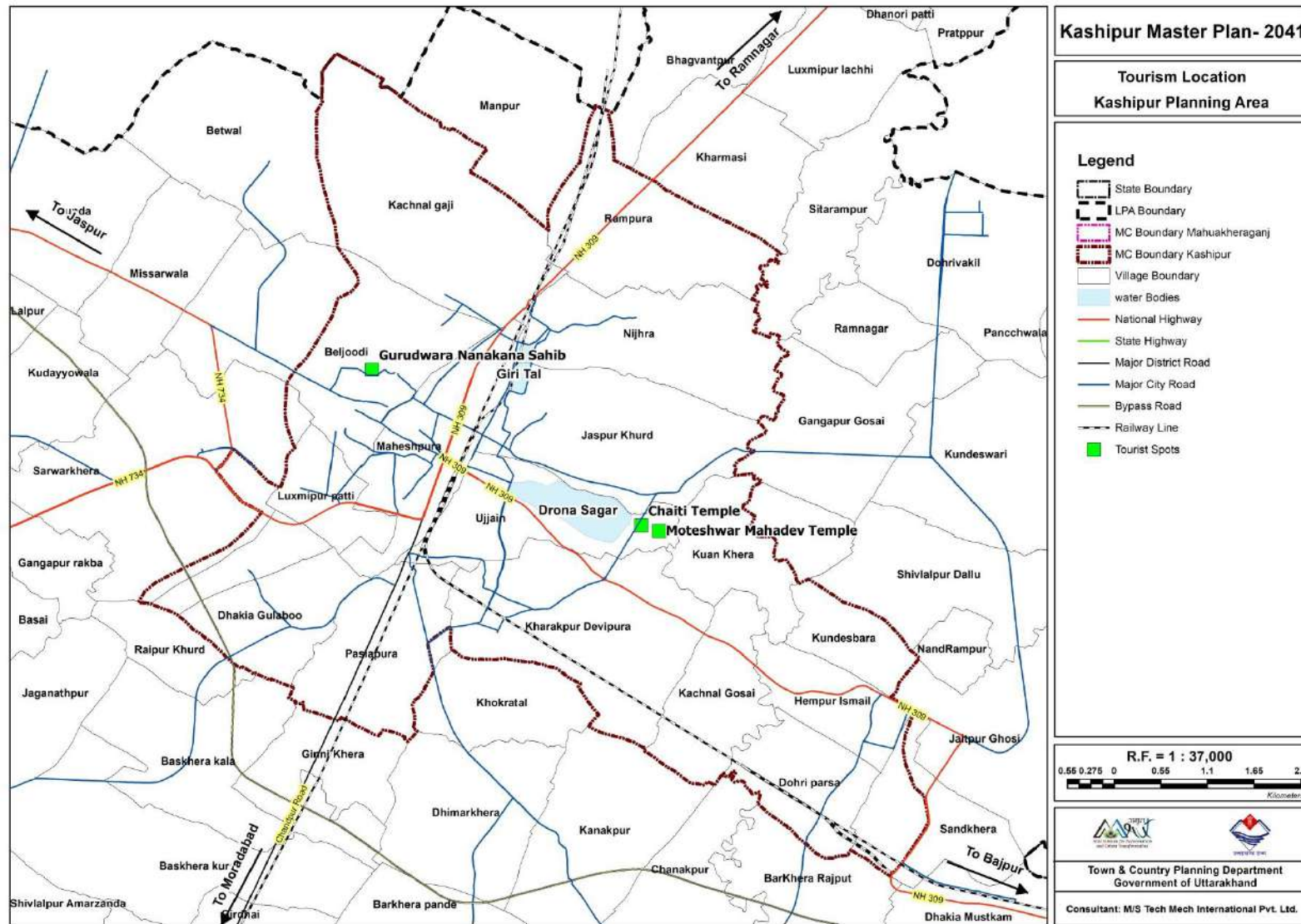
Drona Sagar Lake is nestled in the quaint city of Kashipur in the Udham Singh Nagar district. The pristine lake is associated with Guru Dronacharya, the royal guru of the Kauravas and Pandavas of the epic Mahabharata. According to a legend, the Pandavas created the Drona Sagar lake for their guru Dronacharya as Guru Dakshina. As cited in Puranas, the water of this lake is as divine as the water of the Ganges. It is surrounded by various temples. This lake is maintained by the Archaeological Survey of India. This place is easily accessible by Auto rickshaw, e-rickshaw, or any private mode of transport (refer to **Figure 10-5**).

**Figure 10-5: Drona Sagar, Kashipur**





**Map 10-1: Tourists Location at Local Level**



Source: Location obtained from primary Survey

#### 10.2.4.3. Chaiti Devi Temple

Chaiti Devi Temple is a sacred Hindu temple adorned in Kashipur city of Udham Singh Nagar district. It is located at Chaiti Mela Marg at a distance of 2 km from the railway station and 2.5 km from the bus stand. It is popular for its mythical and religious significance and is regarded as the most important tourist spot of Kashipur where people come from far-off places to pay their obeisance. This temple has been part of the Mahabharata stories which has been confirmed by the ASI. This temple is easily accessible by Auto rickshaw, e-rickshaw, or any private mode of transport. It is an ancient temple that is one of the 51 Shakti Peethas of Mata Sati (refer to **Figure 10-6**). Every year in March during Navratri, a grand fair known as Chaiti Mela is held here where lakhs of pilgrims come here to worship the goddess from various places (refer to **Figure 10-7**).

*Figure 10-6 Chaiti Devi Temple. Kashipur*

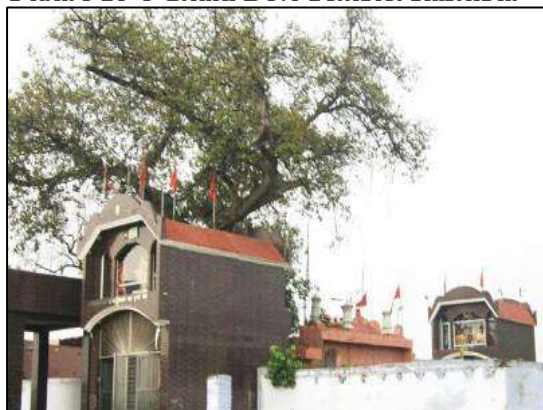


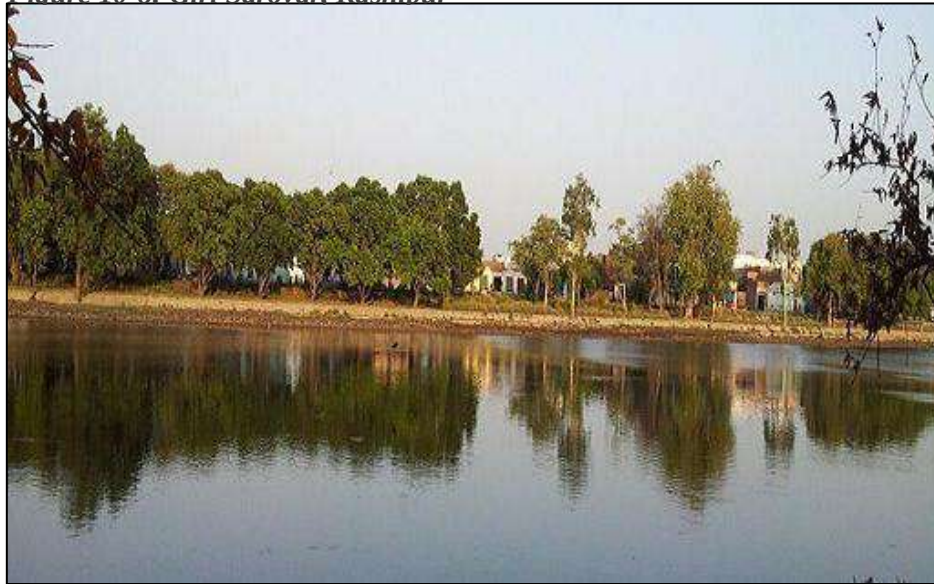
*Figure 10-7: Chaiti Mela, Kashipur*



#### 10.2.4.4. Giri Sarovar

Giri Sarovar is a placid lake bejeweled in the city of Kashipur in Udham Singh Nagar. The lake is adjoined by a temple. People come here to enjoy the natural scenic beauty and are a popular picnic spot for locals as well as tourists. As it is present in the heart of the unadulterated Kumaon region, where the lake offers scenic splendor. Many people have a picnic, camp, and trek near Giri Sarovar. Surrounded by vegetation all over it is one of the most destined places for nature lovers. It is located at Giri Taal lake at a distance of 2 km from the bus stand. This place is easily accessible by Auto rickshaw, e-rickshaw, or any private mode of transport (refer to **Figure 10-8**).

**Figure 10-8: Giri Sarovar, Kashipur**



#### **10.2.4.5. Gurudwara Shri Nankana Sahib**

Gurunanak Dev Ji has a history of saving the people of Kashipur from floods. According to legends when the people of the city were on the verge of leaving the city due to continuous floods Guru Nanak Dev Ji performed the Ardas and after that, the city has never faced any flood again. The Gurudwara is associated with first Guru, Guru Nanak Dev Ji who came here after visiting Sri Nanakmatta and Nanakpuri Tanda. Baisakhi and the birthday of Guru Nanak Dev Ji are the main functions celebrated here (refer to **Figure 10-9**).

**Figure 10-9: Gurudwara Shri Nankana Sahib, Kashipur**



#### **10.2.4.6. Shree Bheemsankar Mahadev Temple**

Shree Bheemsankar Mahadev also known as Shree Moteshwar Mahadev temple is the home or house of Lord Shiva in Kashipur. In earlier days it was known as Dakini State. Like the Chaiti Devi temple, it is also recognized in many tales of Mahabharata. The temple is regarded as one of the Jyotirlinga of Lord Shiva. The temple is easily accessible and is just 3 km from the Kashipur bus stand. It receives a lot of Shiva devotees over the year.



**Figure 10-10: Shree Bheemsankar Mahadev Temple, Kashipur**



### **10.2.5. Infrastructure for Tourism**

There are 28 hotels and 7 Dharamshala in the city of Kashipur according to Udham Sigh Nagar Tourism Department, 2018. Some of the prominent hotels in the city are The Bliss, The Manor by Leisure Hotel, and Lipisa Inn. There are rooms available with AC and Non-AC Facilities having a cost that varies from Rs 100 per day to Rs 4000 per day. There are various good options available for tourists who do not want to spend much on accommodation. However, these options are not enough to cater to the tourists who wish to stay in budget accommodation. Therefore, there is a need for creating affordable and budget accommodation with quality facilities for tourists in the city. This would be beneficial to attract more tourists and even help the tourists to extend their stay by a day or two. Considering the potential of Kashipur in terms of its connectivity and location of a few places of historical and tourist interest in the close vicinity, the stay of the tourist could be increased from a single day to a minimum of 2-3 days. This would help to facilitate the city's trade and commerce and boost its economy. Lack of organized mode of travel is also a reason for the low footfall of tourists, as the tourist spots become less accessible due to its absence. Awareness centers and information centers are also not found in the region.

### **10.3. Key Issues**

Kashipur's rich heritage is not promoted properly. Its major attraction is Jim Corbett National Park but Kashipur has its individual local cultural and natural heritage which cannot be found anywhere else. It has huge potential for tourism if properly organized and promoted. This would also boost the economy of the city, hence increasing the quality of life of people. But these need to be done with proper caution as heritage areas are sensitive and need proper conservation for them to survive through the years.

The above key issues related to tourism have been identified and listed, which are as follows:

- i. No conservation activities are currently executed on the heritage sites. It is not properly maintained and the construction around it is not controlled. Building bye-laws should be followed in the surrounding area for future development purposes and protection of the historical site.
- ii. Limited options for affordable accommodation are found in the area. With an increase in affordable accommodation, it can attract many more tourists than what is existing right now. Infrastructure is the main component for attracting tourists. So, the focus should be given to infrastructure.
- iii. There is a need to come up with strategies for promoting tourism such as promoting famous eating joints, opening up food streets, Bazaar Culture, etc. to promote the old as the role model of urban heritage.
- iv. The absence of tourist circuits connecting various places of tourist interest in KPA is restricting people to spend only a day or even less than that in Kashipur and they prefer certain other areas in the region.
- v. There is an absence of an organized mode of travel connecting different tourist sites/destinations within the city and in its surroundings.
- vi. No holistic awareness centers or information centers are found in the region for promoting tourism.
- vii. There is a need for parking spaces for visitors within hotels and sites.

#### **10.4. Tourism and Heritage Plan**

Tourism is related to the activities of people traveling, staying maybe for pleasure or business. The act of spending time away from home in a new place to explore. It is also a business of attracting, accommodating, and entertaining tourists. However, tourism is a vital part of heritage conservation and the economy. it creates a sense of cultural exchange among the tourists and also creates jobs and employment for the local people, hence, boosting the revenue of the government.

##### **10.4.1. Tourist Projections**

In total in Udham Singh Nagar there are 12 major tourist spots, they are Tumaria Reservoir, Dronasagar, Girital, Chaiti Temple, Haripura Lakes, Atariya Devi Temple, Panch Mandir, Lake Paradise, Gurudwara Nanakmatta Sahib, Nanak Sagar, Begul Reservoir and Dhaura Reservoir. The existing tourist flow is presented in **Table 10-2**.

**Table 10-2 Existing Tourist flow**

| Year | Total Tourists of Udham Singh Nagar | Total Tourist in Kashipur Planning Area (25% of UDN) |
|------|-------------------------------------|------------------------------------------------------|
| 2014 | 130624                              | 32656                                                |
| 2015 | 132474                              | 33119                                                |
| 2016 | 134243                              | 33561                                                |
| 2017 | 140794                              | 35199                                                |
| 2018 | 153875                              | 38469                                                |

Out of these three major tourist spots are in Kashipur i.e., Dronasagar, Girital, Chaiti Temple which comes about to be 25% of the total number of tourists spots and hence it is assumed that 25% of tourists out of total tourists in Udham Singh Nagar travel to Kashipur. (Refer to **Table 10-3**).

**Table 10-3 Projected Tourist Flow**

| Year | Geometric Projection |
|------|----------------------|
| 2021 | 38950                |
| 2031 | 40598                |
| 2041 | 42315                |

Source: Analysis by Town and Country Planning Department

The tourist population projection for 2041 comes to be 42315 via the Geometric mean projection method.

#### **10.4.2. Kashipur Tourism Plan – At the Local level**

The district is dotted with several sacred shrines both for Hindu and Sikh devotees which attract a major quantum of tourists. Overall, there are a total of 13 major tourist nodes in the district of Udham Singh Nagar which mainly includes religious places and recreational places. (Refer to **Table 10-4**)

**Table 10-4 Local Level Tourism**

| Tourist Spots                   | Distance (Km) | Travel time (min) | Visit Time (min) | Total (min)    |
|---------------------------------|---------------|-------------------|------------------|----------------|
| Bheemsankar Mahadev Temple (A)  | 0             | 0                 | 30-45            | 30-45          |
| Chaiti Devi Temple (B)          | 0.29          | 1                 | 30-45            | 31-46          |
| Dronasagar/Govishana Mound(C)   | 1.5           | 4                 | 45-60            | 49-64          |
| Giri Sarovar(D)                 | 1.8           | 7                 | 30-45            | 37-52          |
| Gurudwara Shri Nankana Sahib(E) | 3.7           | 10                | 30-45            | 40-55          |
| <b>Total</b>                    | <b>7.3</b>    | <b>22</b>         | <b>165-240</b>   | <b>187-262</b> |

Source: Proposed by Town and Country Planning Department



The tourist circuit is proposed to promote a high degree of accessibility to create more opportunities for attracting tourism both at the local and regional levels (Refer to **Figure 10-11**). The total distance to cover 5 major spots is 7.3 km which generally took 22 minutes to travel by vehicle and 1 hour 30 minutes by walk and the total

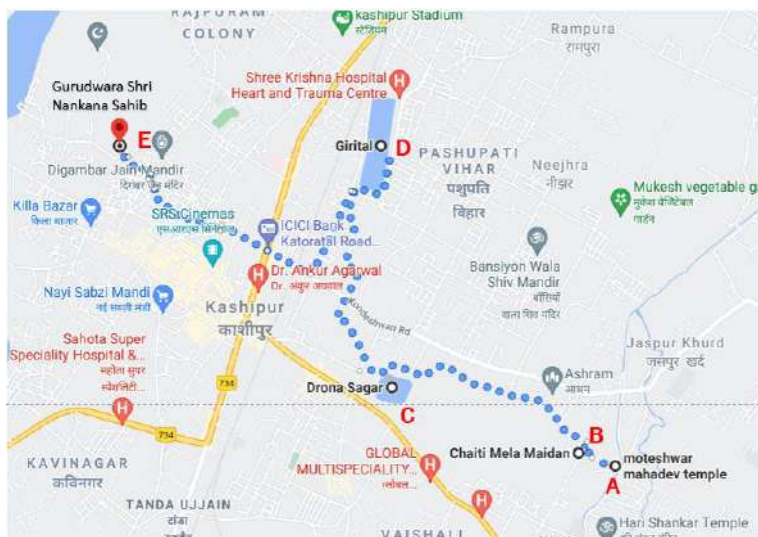


Figure 10-11 Tourist Circuit at local level

time to complete the circuit is 3 hours to 5 hours depending upon the mode of travel.

#### 10.4.3. Kashipur Tourism Plan – At the Regional level

According to Uttarakhand Tourism Development Master Plan 2007 – 2022 Udham Singh Nagar Falls in Zone 2. Within Zone 2 Corbet National Park Development has been proposed which is just 30 Km from Kashipur. In 2017, by the Forest Department of Uttarakhand new eco-tourism circuits have been proposed which are from Ramanagar to Nainital. The Kashipur Tourism Plan is proposed to be in alignment with these projects. (Refer to **Table 10-5**)

Table 10-5 Regional Level Tourism

| Item                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of the Project               | Development of Corbett National Park as a Tourist Circuit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Location/ Circuit                 | <ul style="list-style-type: none"> <li>Nainital District; National Park; Ramnagar; Dhikuli (10km from railhead); Dhaila (12km); Mohan (30km)</li> <li>The nearest Railhead is Ramnagar</li> </ul>                                                                                                                                                                                                                                                                                                                                                                               |
| Rationale for development         | <ul style="list-style-type: none"> <li>The outer circle of Corbett</li> <li>Develop areas to visit outside Corbett</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Sites to be Developed             | <ul style="list-style-type: none"> <li><i>Tamara Barrage</i>: Will be developed as a tourist spot in future</li> <li><i>Dhikuli</i>: Eco-huts</li> <li><i>Dhaila</i>: tourism development – Eco-huts</li> <li><i>Mohaana</i>: Tourism Development – Eco-huts; Meditation center</li> <li><i>Dhiala Tourism Zone</i>: Museum; Interpretation center; Renovation of accommodation; +basic facilities</li> <li><i>Bijrani Tourism Zone</i>: Elephant shed; renovation of accommodation; +basic facilities</li> <li><i>Jhirna Tourism Zone</i>: Renovation of facilities</li> </ul> |
| Development proposals and impacts | <ul style="list-style-type: none"> <li>Increase job opportunities for local guides, caretakers, maintenance, construction, transporters, and local markets</li> <li>Currently, 3,00,000 tourists visit the area</li> <li>Increase of tourist traffic by 20% to 25% of tourists/trekkers within 3 years</li> <li>Some items rejected by the central government (i.e., purchase of generator; museum; auditorium, etc.)</li> </ul>                                                                                                                                                |

Source: Proposed by Uttarakhand Tourism Development Master Plan 2007 – 2022 Udham Singh Nagar

The tourist circuit is proposed to promote a high degree of accessibility to create more opportunities for attracting tourism at a regional level. The distance between Ramnagar to Kashipur is 30 km which takes 30 minutes to travel through a vehicle. The average price of hotels

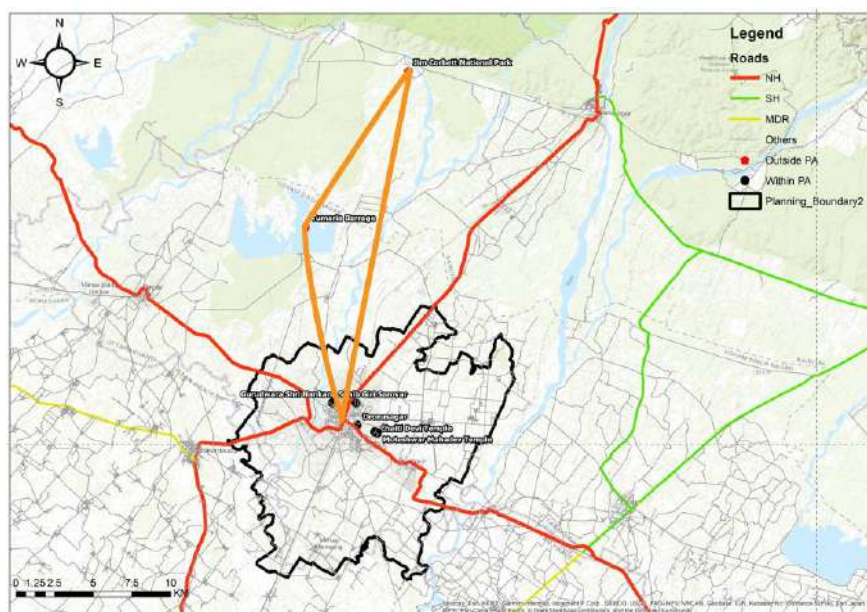


**Figure 10-12 Tourist Circuit at regional level**

in Ramnagar is 2300 and in Kashipur is 1600, So Kashipur can opt as the destination for a stay. At the regional level, there are majorly two tourist spots namely Jim Corbett National Park and Tumaria Barrage where a Circuit among them has been proposed.

#### **10.4.4. Heritage Plan**

In Kashipur, Govishana Mound at Drona Sagar is the only heritage site recognized by ASI located within KPA. It was recently declared the site of “national importance”. The city of Kashipur itself belonged to the Harshvardhana era ruins of settlement can be still seen near the city.

##### **10.4.4.1. Proposed Heritage Zone**

The proposed area under heritage is 93.16 Ha which is 0.84% of the total developable area which is enclosed by Ramnagar Railway line on the west, Bajpur Road on the South, Kundeshwari Road on the North, and Moteswar Mandir Road on the east. **(Refer Figure 10-13)**

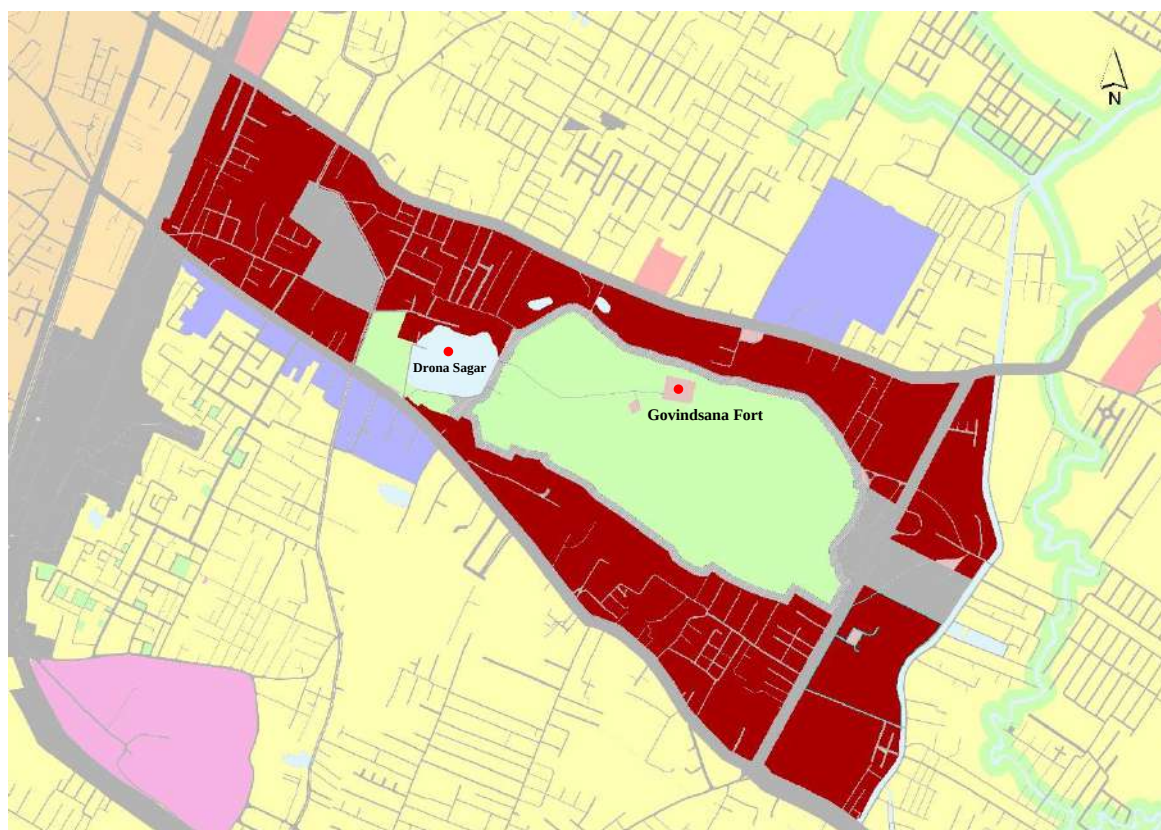


**Figure 10-13: Proposed Heritage Zone**

#### **10.4.4.2. Façade Control and Development Measure for Heritage Zone**

Façade treatment and the architectural detail of buildings contribute significantly to the way a building reads from the street and to the character and continuity of the streetscape. The composition and detailing of the building façade also have an impact on the apparent bulk and scale of a building. It is important when considering the design of new development that the predominant patterns, compositions, and articulation of façades reinforce the character and continuity of the streetscape. Design consideration is to be given to the underlying building materials that contribute to the character of a building. Such things include roof shape, pitch, and overhangs; entry porches, verandas, balconies, and terraces; materials, finishes, fixtures, patterns, fenestrations, colors, and detailing; the location and proportion of windows and doors.

#### **10.4.4.3. Control and Regulation**

In the case of Kashipur, the heritage zone depicts a special character and there is a need to frame façade control measures for this area. Following are the suggestive measures for facade control in this area.

1. The façade of the building/blocks shall be maintained on old lines in case of reconstruction of existing buildings, however, the internal changes shall be permissible



2. The façade of the new building on vacant plots shall conform with the architectural features and elements of the adjoining buildings
3. The existing parks and green open spaces shall be preserved as such.
4. The exterior design and height of buildings should have their approval to preserve/improve the beauty of the area rather than the beauty of such buildings.
5. Signs and Outdoor Display Structures / Including Street Furniture on heritage sites shall be framed by Urban Design Wing (proposed in the Development Authority). In addition, regulations or guidelines to regulate signs, outdoor display structures and street furniture on heritage sites/ or in areas shall also be framed.
6. After the guidelines are framed, buildings within heritage precincts or in the vicinity of heritage sites shall maintain the skyline in the precinct and follow the architectural style (without any high-rise or multi-storeyed development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of or the view from the heritage site.
7. The development within the precinct or in the vicinity of the heritage site shall be under the guidelines framed by the Executive Commissioner, Municipal Council / Vice-Chairman, Development Authority on the advice of the Heritage Conservation Committee or separate regulations/guidelines, if any, prescribed for respective zones by Municipal Council / Development Authority.

#### **10.4.4.4. Implementation of these Regulations**

- All authorities competent to grant permission for layout or sub-division of land or construction of building or development of land in any other form shall ensure that the permitted development complies with the Regulations.
- Landowners desirous of developing their land can obtain, by applying to the designated authority in writing and giving details of their land along with necessary maps, a list of permissible uses.
- Similarly, landowners proposing the development of certain uses on their land can obtain a certificate of “Compliance with Master Plan” from a designated authority.

#### **10.4.4.5. Archaeological Site**

To conserve the heritage site as per the archeological department, 100m (Prohibited Area), 200m (Regulated Area), and 300m (Regulated Area) is marked as non-developable area and zoning regulation for all these zones are explained in the zoning regulation chapter. The regulated parking space of 7.78 Ha is also been proposed on the western and eastern sides of

the site. Along with it, a dedicated lane of 10 meters is proposed separately for the movement of E-rickshaws to increase the to

**Figure 10-14: Figure 10 14 Heritaze Zone- Govindsana Fort**



## 11. Environment Pollution Generation & Consequences

The environment is an important aspect to be given due consideration in the Master Plan as everything that supports the survival of human beings is dependent on it. The wellness of the environment directly relates to the wellness and health of human beings and every other species. Hence the quality of the environment is an indicator of the quality of life of the people living in the Planning Area.

### 11.1. Air Pollution

Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust, pollen, and mold spores may be suspended as particles. Inhaling them can increase the chance of health problems. People with heart or lung disease, older adults, and children are at greater risk from air pollution. To monitor the quality of Air in Kashipur, an air quality monitoring system has been set up which is located at L.D Bhatt Govt. Hospital, Kashipur is keeping a check on the concentration of air pollutants in the air.

*Table 11-1: Air Pollution Concentration ( $\mu\text{g}/\text{m}^3$ ) in Kashipur*

| Type of Pollutant | Concentration | Standard |
|-------------------|---------------|----------|
| SO <sub>2</sub>   | 13.5          | 80       |
| NO                | 21.76         | 80       |
| PM <sub>10</sub>  | 128.92        | 100      |

Source: EPPCB, Kashipur

Note: + depicts more than the standard and – depicts less than the standard.

**Table 11-1** depicts the concentration of various air pollutants in the city of Kashipur in July 2019. It can be analyzed that the concentration of SO<sub>2</sub> and NO is less than the standard which is a good approach while the quantity of PM<sub>10</sub> is more than the standard by 28.92 which is a matter of great concern. The major cause of air pollution in Kashipur is industries and car emissions and dust from construction work. Exposure to high concentrations of PM<sub>10</sub> can result in several health impacts ranging from coughing and wheezing to asthma attacks and bronchitis to high blood pressure, heart attack, strokes, and premature death. The young and old and persons with existing medical conditions are most likely to be adversely affected by exposure to high PM<sub>10</sub> concentrations.

### 11.2. Noise Pollution

Noise pollution is defined as unwanted or excessive sound that can have deleterious effects on human health and environmental quality. Noise is measured in dB (A) which indicates the loudness of the sound. Noise level refers to the decibel levels of noise that are produced by any



appliance or machine. In general, the human ear can tolerate noise levels up to 85 dB and anything beyond that can affect their productivity as well as their quality of life. The decibel levels of common sounds above 80 dB are considered 'loud' while the decibel levels of common sounds between 100-125 dB are termed as 'uncomfortable'. So, all the machines operating in an area should produce noise within the acceptable noise level to maintain the well-being of the people around.

**Table 11-2: Level of Noise Pollution (Db) in Kashipur**

| Day         | Pre-Diwali Day | Diwali Day | Standard | Variation (Pre-Diwali) | Variation (Diwali) |
|-------------|----------------|------------|----------|------------------------|--------------------|
| Residential | 50.98          | 72.07      | 45       | +5.98                  | +27.07             |
| Commercial  | 80.14          | 83.89      | 55       | +25.14                 | +28.89             |
| Silent Zone | 68.05          | 54.14      | 40       | +28.05                 | +14.14             |

Source: EPPCB, Kashipur

Note: + depicts more than the standard and – depicts less than the standard.

**Table 11-2** represents the level of noise pollution as per various land uses in Kashipur on pre-Diwali and Diwali days. This noise level pollution has been analyzed by comparing it with the standards to know the variation. In general, the noise pollution level is high as compared to the permissible noise pollution level as per government standards. In the case of the residential area, there is a variation of 5.98 on pre-Diwali day but this increase considerably on Diwali day where the variation is more than 27 Db which is a great concern. The variation in commercial areas is almost the same in both cases having a variation of around 25 Db. The least variation on Diwali day is in the case of the silent zone where it is 14.14 Db. But in the pre-Diwali scenario, the maximum variation is in the silent zone.

### 11.3. Water Pollution

Water pollution is the contamination of water bodies, usually as a result of human activities. Water pollution results when contaminants are introduced into the natural environment. For example, releasing inadequately treated wastewater into natural water bodies can lead to the degradation of aquatic ecosystems. In turn, this can lead to public health problems for people living downstream. They may use the same polluted river water for drinking or bathing or irrigation. There are three major water bodies in Kashipur namely, Bhela, Dhela, and Koshi rivers which are being monitored at different locations.

**Table 11-3** highlights the level of water pollution in three rivers flowing through Kashipur based on various parameters under study. The Ph level at all the locations is within the standard range which means that the water is neutral. The Dissolve Oxygen (DO) is less than the

standard at all the locations having a variation of between 1.4 to 6 which is a demerit as less the level of DO, worse is the quality of water. The level of BOD is also higher in three scenarios with a variation of 4-38 mg which means that the water is moderately or highly polluted which is due to the dumping of wastewater and solid waste in the river at some locations. TDS level is very less compared to the standard value in all the cases which implies that the quality of water is comparatively fine. Overall, the river which is most polluted based on the above analysis is the Bhela river followed by the Dhela river.

**Table 11-3: Level of Water Pollution in Kashipur**

| Aspect              | Standard | 1                       |           | 2                               |           | 3                                         |           | 4    |           |
|---------------------|----------|-------------------------|-----------|---------------------------------|-----------|-------------------------------------------|-----------|------|-----------|
|                     |          | Bhela D/S Lohiya Bridge | Variation | Dhela U/S Moradabad Road Bridge | Variation | Dhela U/S Thakurdwara Aliganj Road Bridge | Variation | Kosi | Variation |
| <b>Ph</b>           | 6.5-8.5  | 7.1                     | 0         | 7.4                             | 0         | 7.4                                       | 0         | 7.6  | 0         |
| <b>DO</b>           | 6        | 0                       | -6        | 3.6                             | -2.4      | 1.8                                       | -4.2      | 4.6  | -1.4      |
| <b>BOD</b>          | 2        | 40                      | +38       | 6                               | +4        | 12                                        | +10       | 2    | 0         |
| <b>COD</b>          | -        | 130                     | -         | 30                              | -         | 28                                        | -         | 20   | -         |
| <b>TDS</b>          | 500      | 234                     | -266      | 185                             | -315      | 407                                       | -93       | 279  | -221      |
| <b>Conductivity</b> | -        | 360                     | -         | 284..6                          | -         | 389                                       | -         | 429  | -         |

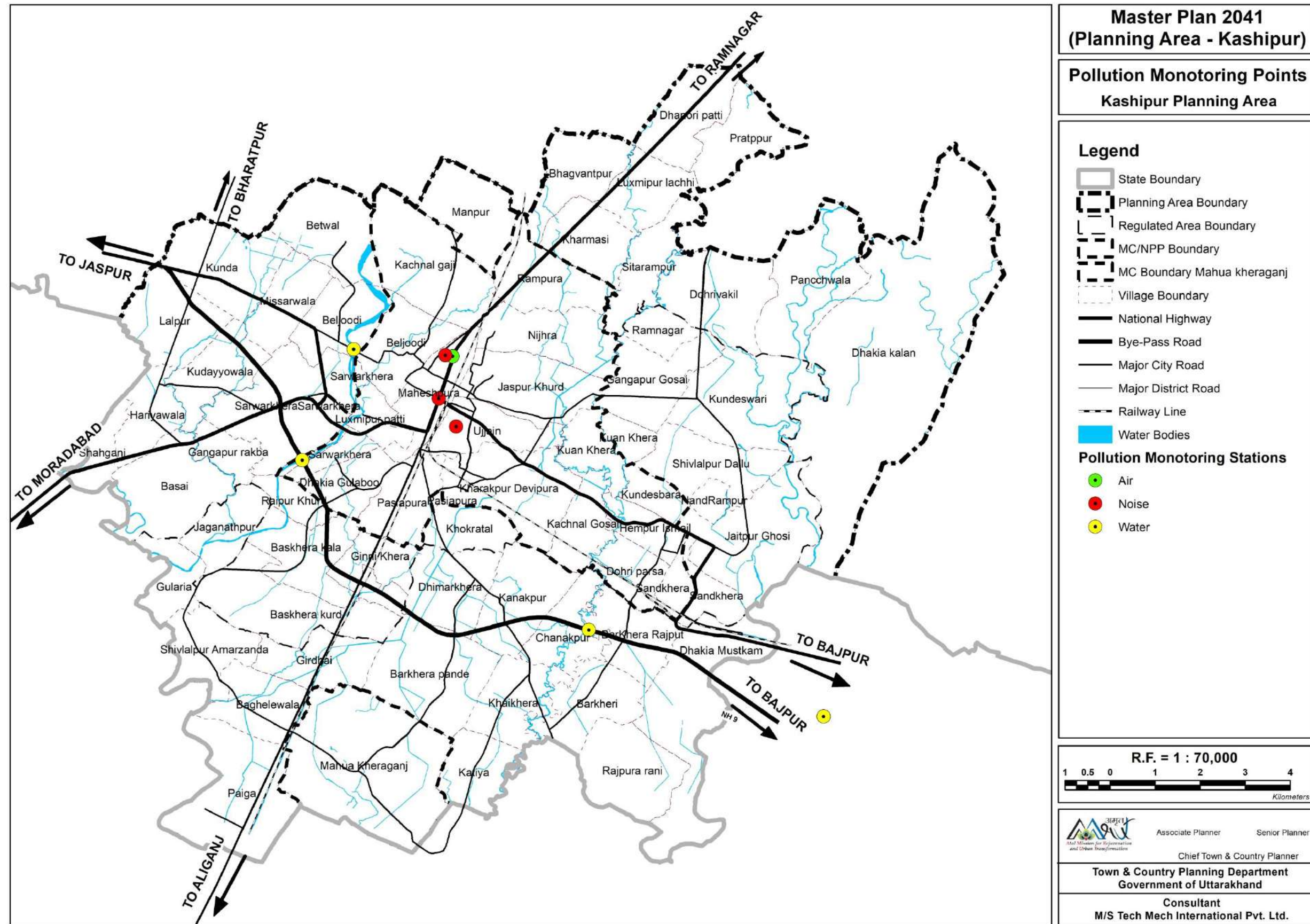
Source: EPPCB, Kashipur

Note: + depicts more than the standard and – depicts less than the standard.

#### **11.4. Key Issues**

1. There is a higher concentration of PM10 in the air by a value of 28.92 which can cause various health impacts among people.
2. The level of noise pollution in the city is higher than the standards in all the three land uses which is a matter of great concern. The variation is in the range of 5.98-28.89 Db in all three uses.
3. Bhela river is the most polluted river as per the comparisons with the standards given by CPCB. Dhela river is moderately polluted which also needs to be given due consideration.

Map 11-1: Poillution Monitoring Stations in Kashipur Planning Area



Source: Source: EPPCB, Kashipur

### **11.5. Environment Plan**

Healthy ecosystems clean water, purify air, maintain soil, regulate the climate, recycle nutrients and provide us with food. They are at the foundation of all civilization and sustain our economies. Kashipur falls under the Terai region in the sub-tropical and temperate zone of Uttarakhand.

As whole state of Uttarakhand lies in Ganga basin therefore it has very strategic role in Namami Ganges project of GOI. Therefore the various guidelines of this project is applicable to Kashipur planning area. This area also falls under the Terai region in the sub-tropical and temperate zone of Uttarakhand.

The act, policies and guidelines which are applicable to Kashipur planning area is as under:

#### **National Environmental Policy (NEP), 2006**

Reforms suggested through policy that can be applicable to Kashipur Planning Area

- Environmental and Forest clearance
- Economic principles for environmental decision making by costing the resources
- Environmentally sensitive zones: environmental sensitive zones may be defined as areas with identified environmental resource with ‘incomparable values’ which require special attention for their conservation.
- Monitoring & enforcement of environmental compliance.
- Use of economic principles in environmental decision making so that costs are associated with the degradation and depletion of natural resources.
- Enhancing and conserving environmental resources through production and consumption practices with focus on regulatory and institutional reforms. Land degradation, forests and wildlife, biodiversity, freshwater resources; ground water and wetlands are the thrust resources of concern.
- Pollution abatement: ecosystems have some natural capacities to assimilate pollution; however these vary considerably with the nature of the pollutant and the ecosystem.
- Climate change issues

#### **Environment Protection Act, 1986**

The Environment Protection Act, 1986 (EPA) has notified various rules under EPA for protecting the environment which are chronologically mentioned below:



- The Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organism Genetically Engineered Organism or Cells Rules, 1989
- The Hazardous Wastes (Management and Handling) Rules, 1989
- The Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989
- Scheme of Labelling of Environment Friendly Products (ECO-MARK)
- Restricting certain activities in special Specified area of Aravalli Range
- The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
- The Bio - Medical Waste (Management and Handling) Rules, 1998, as amended to date
- The Recycled Plastics Manufacture and Usage Rules, 1999
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Noise Pollution (Regulation and Control) Rules, 2000
- The Ozone Depleting Substances (Regulation) Rules, 2000
- The Batteries (Management and Handling) Rules, 2001

#### **Forest Conservation Act, 1980**

- This Act has five Sections, which deal with conservation of forests.
- The Act was enacted with the twin objectives under Section 2 of restricting the use of forestland for non-forest purposes, and preventing the de-reservation of forests that have been reserved under the Indian Forest Act, 1927. However, in 1988 the Act was further amended to include two new provisions under Section 2, where it sought to restrict leasing of forest land to private individuals, authority, corporations not owned by the Government, and to prevent clear felling of naturally grown trees.
- The Act empowers Central Government to constitute a committee to advise the Government with a grant of approval under Section 2, as also on any other matter connected with the conservation of forest and referred to it by the Central Government.
- The Act provides for punishment of offenders from the Government Departments, including Head of the department.

#### **Sewage Treatment in Class I Towns: Recommendations and Guidelines:**

As Kashipur Planning area falls under Ganga river basin. These guidelines have prepared by National Ganga River Basin Authority under provisions of EPA 1986. These guidelines have

formed the basis for the selection of technologies for Sewage Treatment Plants so that after treatment the effluent achieve bathing quality standards before discharging into river.

### **Urban Greening Guidelines, 2014**

It is the outcome of blatant and random concretization of pavements in Indian cities. Of late, a number of Urban Development Authorities and Urban Local Bodies have undertaken large scale concretization of pavements which has resulted in destruction of a large number of trees by first rendering those weak and reducing their lives and consequently most of them falling down on account of moderate winds and storms. In 2000, Ministry of Urban Affairs and Employment had published Guidelines for Greening of Urban Areas and Landscaping. Its objectives are:

- To highlight the impact of urbanisation on urban greenery.
- To suggest practices and methods for protecting and enhancing urban greenery in a sustainable manner.
- To identify the key stages in planning and development where urban greenery maybe integrated with the built environment.
- To recommend suitable guidelines for enhancing urban greens.

### **Urban Climate and importance of green spaces within Urban Area:**

Relationship between cities and nature is a basic challenge for nature conservation in future urban development and also for the future of the wilderness (Kowarik, 2013). The ecological footprint of cities affects ecosystems indirectly from regional to global scales and the ecological functions within open green spaces involve the whole system of plants, animals, soil and human activity.

### **Urban heat islands increase in artificial and**

Due to rapid increase in artificial urban pavement and concrete, which are different in thermal, optical and geometric properties (Feyisa, Dons & Meilby, 2014), urban settlements are hotter than rural areas and cities all over the world are experiencing more common urban heat islands (Skoulika, Santamouris, Kolokotsa & Boemi, 2014). Urban heat islands can negatively affect the health and welfare of urban dwellers (Song & Park, 2014), particularly infants, the elderly and poor people who are highly affected by thermal stress (Feyisa et al., 2014). Furthermore, temperature increase from UHIs worsens the thermal comfort conditions, intensifies the pollutant concentrations (Skoulika et al., 2014), and considerably increases the energy consumption for cooling, (Mirzaei & Haghighat, 2010) and the aggregated effects from UHIs



can cause changes in urban ecosystems. This problem is associated with worldwide environmental issues and expected to worsen global warming (Bowler, Buyung-Ali Knight, & Pullin, 2010)

Various categories of green spaces have been specified in URDPFI guidelines.

- Housing parks
- Neighbourhood Park
- City level Park
- Botanical Garden
- Recreational complex including zoo

The open spaces shall be provided at the rate of 1.4 to 1.6 ha per 1000 persons. The lower income areas shall be provided with more open spaces and the area under facilities like community halls etc. can be merged with the open spaces to suit their social requirements.

These green spaces help create liveable micro climate. Following are the benefits from green spaces.

### **Urban Heat Island Mitigation and Reduced Energy Demands**

Urban heat islands form as cities replace natural land cover with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. The displacement of trees and vegetation minimizes their natural cooling effects. Additionally, tall buildings and narrow streets trap and concentrate waste heat from vehicles, factories, and air conditioners. By providing increased amounts of urban green space and vegetation, green infrastructure can help mitigate the effects of urban heat islands and reduce energy demands. Trees, green roofs and other green infrastructure can also lower the demand for air conditioning energy, thereby decreasing emissions from power plants.

### **Improved Air Quality**

Green infrastructure facilitates the incorporation of trees and vegetation in urban landscapes, which can contribute to improved air quality. Trees and vegetation absorb certain pollutants from the air through leaf uptake and contact removal. If widely planted throughout a community, trees and plants can even cool the air and slow the temperature-dependent reaction that forms ground-level ozone pollution (smog).

### **Additional Wildlife and Recreational Space**

Greenways, parks, urban forests, wetlands, and vegetated swales are all forms of green infrastructure that provide increased access to recreational space and wildlife habitat.

### **Improved Human Health**

An increasing number of studies suggest that vegetation and green space – two key components of green infrastructure can have a positive impact on human health. Recent research has linked the presence of trees, plants, and green space to reduced levels of inner-city crime and violence, a stronger sense of community, improved academic performance, and even reductions in the symptoms associated with attention deficit and hyperactivity disorders.

### **Reduced and Delayed Stormwater Runoff Volumes**

Green infrastructure reduces storm water runoff volumes and reduces peak flows by utilizing the natural retention and absorption capabilities of vegetation and soils. By increasing the amount of pervious ground cover, green infrastructure techniques increase storm water infiltration rates, thereby reducing the volume of runoff entering our combined or separate sewer systems, and ultimately our lakes, rivers, and streams. When rain falls in natural, undeveloped areas, the water is absorbed and filtered by soil and plants. Storm water runoff is cleaner and less of a problem. Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the neighbourhood or site scale, storm water management systems that mimic nature soak up and store water.

### **Enhanced Groundwater Recharge**

The natural infiltration capabilities of green infrastructure technologies can improve the rate at which groundwater aquifers are 'recharged' or replenished. This is significant because groundwater provides about 40% of the water needed to maintain normal base flow rates in our rivers and streams. Enhanced groundwater recharge can also boost the supply of drinking water for private and public uses.

### **Stormwater Pollutant Reductions**

Green Infrastructure techniques infiltrate runoff close to its source and help prevent pollutants from being transported to nearby surface waters. Once runoff is infiltrated into soils, plants and

microbes can naturally filter and break down many common pollutants found in storm water. Storm water runoff is a major cause of water pollution in urban areas. When rain falls on our roofs, streets, and parking lots in cities and their suburbs, the water cannot soak into the ground as it should. Storm water drains through gutters, storm sewers, and other engineered collection systems and is discharged into nearby water bodies. The storm water runoff carries trash, bacteria, heavy metals, and other pollutants from the urban landscape. Higher flows resulting from heavy rains also can cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure. While single-purpose gray storm water infrastructure is conventional piped drainage and water treatment systems and is designed to move urban storm water away from the built environment, green infrastructure reduces and treats storm water at its source while delivering environmental, social, and economic benefits.

### **Reduced Sewer Overflow Events**

Utilizing the natural retention and infiltration capabilities of plants and soils, green infrastructure limits the frequency of sewer overflow events by reducing runoff volumes and by delaying storm water discharges.

### **Increased Carbon Sequestration**

The plants and soils that are part of the green infrastructure approach serve as sources of carbon sequestration, where carbon dioxide is captured and removed from the atmosphere via photosynthesis and other natural processes.

### **Increased Land Values**

Several case studies suggest that green infrastructure can increase surrounding property values. A green retrofit program can convert unsightly abandoned lots into "clean & green" landscapes resulted in economic impacts that exceeded expectations. Vacant land improvements led to an increase in surrounding housing values by as much as 30%.

#### **11.5.1. Strategies for Environmental Plan**

In Kashipur the pollution of the largest natural Drain i.e., Della River is a major concern and many natural drains in the Planning Area fall under the eco-sensitive zone which needs to be protected. The strategies to attain environmental sustainability are as follows:

1. Ensuring the preservation of natural drains and sensitive zones by providing buffer space along with it.
2. Development of Parks and Open spaces along with the water bodies
3. Restrict the discharge of pollutants in the natural drains

#### **11.5.1.1. Preservation of Natural Drains and Sensitive Zones/Water Bodies**

The natural drains of the planning area have been presented in **Map 11-2** along with other proposed green spaces within the planning area. Throughout the planning area, various channels of water bodies can be found, which are being encroached currently by the people of Kashipur. Due to encroachment and solid waste dumping these channels are polluted and will cause harmful effects to the environment as well as to people. These channels are extremely important for the natural drainage of the planning area hence it needs to be reserved and preserved. The construction along these drains hampers the natural flow of the drains.

To rejuvenate these areas a large chunk along both sides of Della River has been proposed as riverfront recreation, in addition to that, 10 m width of green belt on both sides of all other drains/ has been proposed. These green belt zones are an excellent opportunity for creating recreational zones along the natural drains. No construction zone of 25m and 10 m along the alignment of the tributary is earmarked on both sides. In these areas, a recreational zone or forestation has been proposed. The recreational zones need to be carefully established without hampering the natural flow and with minimum construction. These zones will play the role of lungs in the planning area with green areas. With open spaces all along the planning area, it will increase the quality of life and would become a getaway space for the people in Kashipur.

The forestation to revive flora and fauna along the tributaries at a localized level is proposed to be done by the Miyawaki method. The method involves planting two to four trees per square meter. Miyawaki forests grow in two to three years and are self-sustaining. They help lower temperatures in concrete heat islands, reduce air and noise pollution, attract local birds and insects, and create carbon sinks. The benefit of the Miyawaki Technique, is a unique methodology proven to work worldwide, irrespective of soil and climate conditions.

- Approximately 30 times more trees have been planted, as compared to conventional plantation techniques.
- A minimum of 300% more species in the same area as compared to conventional plantation species.
- A substantial 3000% increase in noise and dust isolation

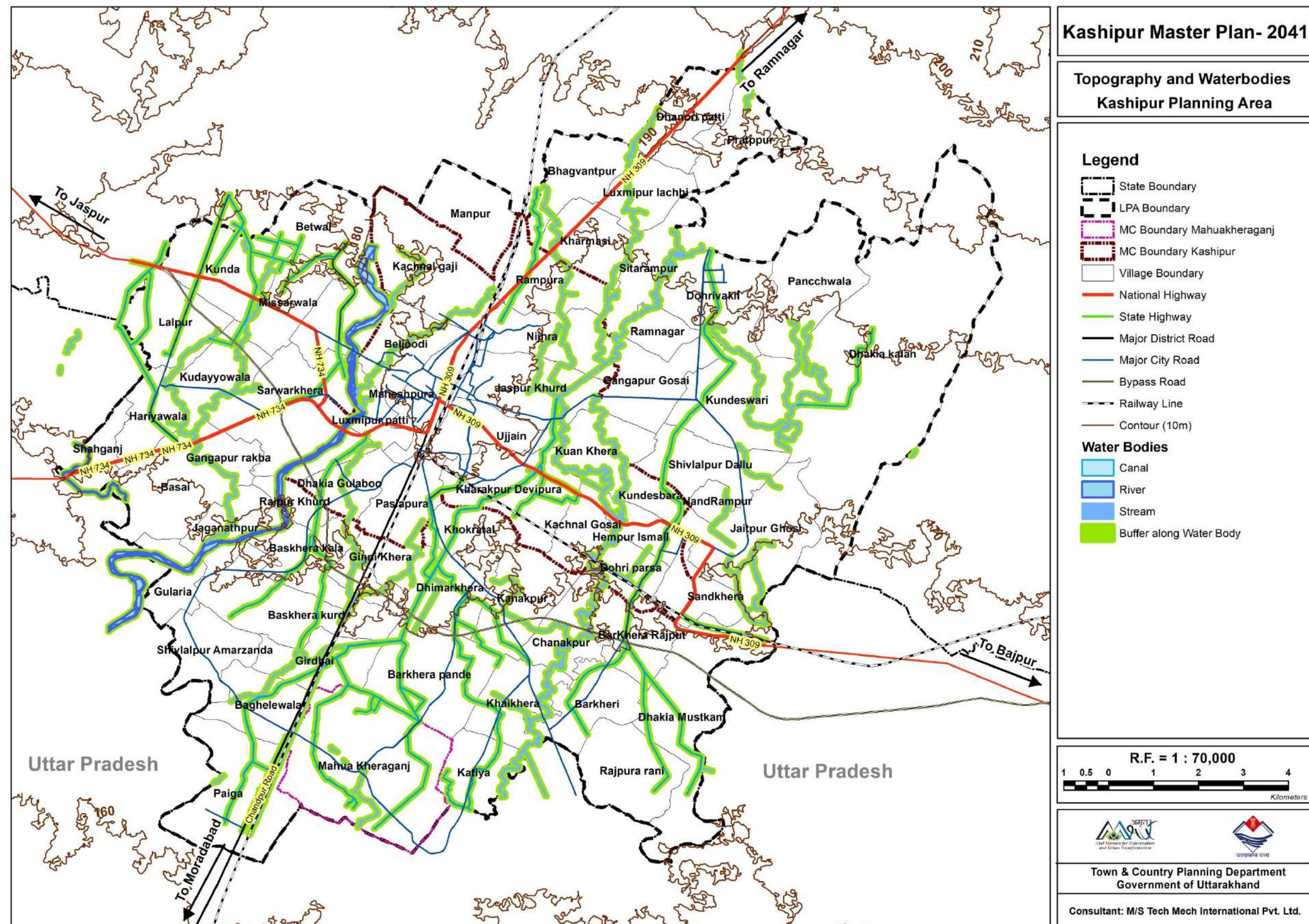
- Up to 30 times or more Carbon-dioxide absorption as compared to conventional forest
- Guaranteed growth of at least 1 meter every year, in tree height
- A completely maintenance-free, wild, and native forest after the first three years
- A completely chemical-fertilizer-free forest that sustains itself and supports local biodiversity.

#### **11.5.1.2. Parks and Open Spaces**

The lack of parks and open spaces could be seen in the Kashipur Planning Area which has been discussed in the gap analysis part. Therefore, it is of utmost importance to provide parks and open spaces which act as breathing space for the people of the planning area. To achieve this all the vacant plots and existing parks in the core city have been reserved for the proposal of parks and open spaces. Many other recreational spaces have been proposed within the planning area. These are along the major roads than in every residential area and a buffer belt along the water bodies has been proposed. Agro forest has been proposed near the riverfront area. Apart from this, two eco-parks are being proposed near NH 302 (Bajpur road). This would enhance the recreational activities in the planning area as well as act in support of the environment.



Map 11-2: Proposed Environment Plan



Source: Proposed by Town and Country Planning Department



Furthermore, to reduce the harmful effects of pollutants from the landfill site, it has been proposed as a recreational space and the solid waste from the landfill site would be processed in the Solid Waste Processing Plant slowly.

### **11.5.1.3.Landscaping along with Road network**

Landscaping along the road network has become an integral part of road sections when looking from an environmental point of view. It provides shade to pedestrians, making it more user-friendly for people. **Table 11-4** highlights a few of the native species of trees for different road sections for landscaping along the roads.

**Table 11-4 Recommended Native Tree Species for Landscaping along the Road Network**

| ROW of Road      | Recommended Native Tree species for Arboriculture in Planning Area of Kashipur                                                                                                                                                                                                                                                                                                  |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>60m -45m</b>  | KOSAM(Schleichar oleos): Large Deciduous Tree; Height: 16m<br>SAL(Shorea Robusta): Large Deciduous Tree: Height: 15m<br>Jamun(Syzygium cumini): Large Evergreen; Height: 16m<br>Grey OAK (Quercus leucotrichophora): Large Semi-Evergreen; Height:18m<br>KAKKAR (Pistacia integerrima): Large Deciduous; Height:16m<br>HARADH(Terminalia chebula): Large deciduous; Height: 15m |
| <b>30m – 45m</b> | Haldu(Haldina cordifolia): Middle Size Deciduous; Height:12m                                                                                                                                                                                                                                                                                                                    |
| <b>24m – 30m</b> | Amaltas(Cassia Fistula): Middle Size Deciduous; Height: 10m                                                                                                                                                                                                                                                                                                                     |
| <b>18m- 24m</b>  | Kachnar(Bauhinia variegata): Middle Size Deciduous; Height:10m<br>Kamala(Mallotus Philippensis): Small Evergreen; Height:8m<br>Barna(Crataeva adansonii): Small Deciduous; Height:6m<br>Dheu(Artocarpus laucha): Middle size Deciduous; Height:10m                                                                                                                              |

*Source: Proposed by Town and Country Planning Department*

### **11.5.1.4.Recommended Strategy Guidelines**

Kashipur is an important industrial city in the district which also has natural drains all along with the Planning Area and Della River. These areas are eco-sensitive, where industrial waste is being dumped by industries and solid waste by the people residing along the river. Because of these major environmental issues, few strategies have been recommended.

- i.Banning of discharge of untreated Industrial waste into Della River.
- ii.Demarcation of the entire length of Della River and removal of encroachments.
- iii.Desilting of Della River should be ensured.
- iv.The entire length of Nallah especially within the city limits should be channelized.
- v.Conversion of the whole Della River into a green belt acting like a bio point runoff from the city.

- vi. Greening of Della River within the city limits.
- vii. A treatment Plant for Water supply must be installed to improve the water quality

### **11.1. Other Mandatory Recommendations**

Green spaces or parks in urban areas are often called lung spaces and are one of the most important public spaces in the city. According to the World health organization, urban green spaces such as parks, playgrounds, and residential greenery can promote mental and physical health, and reduce morbidity and mortality in urban residents by providing psychological relaxation and stress alleviation, stimulating social cohesion, supporting physical activity, and reducing exposure to air pollutants, noise and excessive heat<sup>1</sup>. A city with attractive and accessible green spaces provide opportunities to the resident for exercise, sports, active mobility, and recreation, it is likely that these spaces also act as a counter mechanism for urban heat island due to extreme heat waves and essential cost-effective resilient green infrastructure to manage and reduce surface runoff as well as act as sponge spaces to avoid urban flooding within the city during heavy rainfall. The urban green spaces have numerous health benefits for every group of society, especially for economically deprived communities, children, pregnant women, and senior citizens. With the immense benefits of these gifts from nature to human mankind, it is our utmost responsibility to take full advantage by fixing up essential land areas within the urbanized limits to provide the citizen with improved, healthy, and blissful urban environs so that all the land under green spaces (G1, G2 and G3) has to be acquired and developed by Kashipur Municipal Corporation and District Development Authority, US Nagar. The Change of Land Use (CLU) will not be permitted on the land reserved for these Green Spaces.

## 12. Disasters

A Disaster is a sudden, calamitous incident that seriously disrupts the functioning of a community or society and causes human, material and economic, or environmental losses that exceed the community's or society's ability to cope using its resources. It is imperative to identify the type, pattern and potential severity of hazards, which can cause loss of life, and damage to property and environment, and to assess the vulnerability and risks there from which a view to outlining an appropriate response mechanism. Kashipur planning area is prone to certain disasters including earthquakes, flash floods, storms, and fires as per the data provided by District Disaster Management Office, US Nagar, and Kashipur Tehsil office.

### 12.1. Earthquake

Uttarakhand state, on the whole, falls in two seismic zones i.e. Zone IV (high damage risk zone) and Zone V (the most active region). According to the National Institute of Disaster Management (NIDM) Report, the entire Udham Singh Nagar district falls in zone IV which implies that the Kashipur planning area also falls in Zone IV (refer to **Map 12-1**). Hence, there is a need to adopt construction practices that are best suited in this zone following the specifications and standards laid down by the concerned authorities. Also, it is necessary to figure out a response plan in case any sort of damage/loss occurs. These measures should be part of building bye-laws and zoning rules and regulations which need to be thoroughly adapted for approval of building plans.

### 12.2. Floods

Kashipur planning area falls under flood zone according to 'Hazard Profiles of Indian Districts' (National Capacity Building Project in Disaster Management, UNDP, archived from the original in May 2006, retrieved in October 2016). The area is most vulnerable to flash floods as per data provided by the District Disaster Management Office, US Nagar. There was 17 times occurrence of flash floods in Kashipur tehsil in the year 2018 which caused partial damage to 3 pukka houses, 17 kuccha houses, and damage to 6 jhuggis. The occurrence of flash floods was mainly witnessed from July to September in the year 2018 and 2019 as per the data given by the District Disaster Management Office, US Nagar. There is a need for a stormwater drainage plan which should be implemented that would help to carry the surface runoff during a storm and heavy rains. For details refer to Error! Reference source not found.:

**Map 12-1: Uttarakhand Earthquake Zonation**



Source: Uttarakhand Disaster Report (2013), NIDM

**Table 12-1: Type, Occurrence, and Damage due to Disasters**

| Disaster            | No. of occurrence | House partially damaged |        | Jhuggis damaged | Loss of domestic animal |       |
|---------------------|-------------------|-------------------------|--------|-----------------|-------------------------|-------|
|                     |                   | Pukka                   | Kuccha |                 | Large                   | Small |
| 2018                |                   |                         |        |                 |                         |       |
| Flood               | 17                | 3                       | 17     | 6               | 0                       | 0     |
| Storm               | 1                 | 0                       | 0      | 28              | 1                       | 1     |
| Fire                | 3                 | 0                       | 0      | 8               | 1                       | 3     |
| 2019 (up to August) |                   |                         |        |                 |                         |       |
| Flood               | 0                 | 0                       | 0      | 0               | 0                       | 0     |
| Storm               | 6                 | 14                      | 0      | 50              | 1                       | 0     |
| Fire                | 4                 | 0                       | 0      | 6               | 0                       | 0     |

Source: Disaster Management Office, US Nagar

As per District Disaster Management Plan (2018-2019), there are five major water bodies in Kashipur Tehsil, namely, Kosi River, Dhela River, Bhela River, Arjun nallah, and Laxmipur Patti minor canal which cause flooding in the area. The plan also highlights the critical areas identified by the authority which include Beljuri, Laxmipur Patti, Patti Haru, Sarwar Khera, Jagganathpur, Gularia, Banskhera Khurd, and Dhakia Gulaboo affected by flooding in Dhela River. Other identified critical areas include Dabhauramustahkam (Ajeetpur) affected by the Kosi river, Dhakia Kalan, and Laxmipur Patti by Arjun Nallah. In the Kashipur city area, Laxmipur Patti minor canal affects the Main market area, Kashipur-Ramnagar road, Kashipur-Moradabad Road, and other low-lying areas in the city. 7 flood protection posts have been made in the Kashipur planning area to deal with the occurrence of floods. 2 flood relief camps are also set up in the area which will work 24 hrs. in case of flooding. The DDMP also proposes the use of private boats, divers, and help from the military in case of an emergency.

Hence, there is a need to adopt precautionary and recovery measures to ensure the safety of people and property. There is a need for a stormwater drainage plan which should be implemented that would help to carry the surface runoff during the storm and heavy rains. Also, precautionary measures like rainwater harvesting must be included within building bye-laws so that rainwater could be stored in a better way and reused, thus reducing dependence on groundwater and maintaining groundwater levels in the region as well.

### **12.3. Storm:**

Kashipur falls under a high damage risk zone for wind and cyclones according to ‘Hazard Profiles of Indian Districts’ (National Capacity Building Project in Disaster Management, UNDP, archived from the original in May 2006, retrieved in October 2016). There was a 1-time occurrence of a storm in 2018 which caused damage to 28 jhuggis. There was 6 times

occurrence of a storm in Kashipur tehsil in the year 2019 (up to August) which is the highest amongst all disasters in the same year. These caused damage to 50 jhuggis, partial damage to 14 pukka houses, and loss of life of 1 animal. The occurrence of the storm was mainly witnessed in May and June in the year 2018 and 2019 as per the data given by the District Disaster Management Office, US Nagar. For details refer to **Table 12-1**. Precautionary measures should be made part of building by-laws and zoning rules and regulations which need to be thoroughly adapted for approval of building plans.

#### **12.4. Forest Fire:**

As per the data provided by District Disaster Management Office, US Nagar, there were 3 incidences of fire in the year 2018 which caused damage to 8 jhuggis and the loss of life of 1 animal. In the year 2019, the incidence of fires has occurred 4 times up to August which has damaged 6 jhuggis. From the data above, it can be inferred that EWS and LIG groups are more vulnerable to the incidence of fire than other income groups. For details refer to **Table 12-1**. Hence, there is a need to restrict any sort of heat-producing agents in the forest area or its vicinity. Also, it is necessary to make stronger bye-laws to prevent any kind of loss.

#### **12.5. Funds Disbursement**

**Table 12-2** highlights the details of fund disbursement for losses that occurred due to disasters in Kashipur Tehsil in the last 5 years. Fund allotted in the year 2015-16 was 1.77 crores out of which 1.56 crores had been transferred to the beneficiaries. The amount allotted from district headquarters has remained constant from 2016-17 to 2019-20 i.e., 25 lakhs. The Tehsil office is utilizing this money for providing compensation for loss of life, loss of crops, damage to buildings, winter support, and perplexing support. The maximum amount given for perplexing support was maximum in the year 2018-19 i.e., 2.47 lakhs. Also, in the same year, the maximum number of houses were damaged due to which 1.32 lakhs were given as compensation to 14 beneficiaries. The maximum number of deaths occurred in the year 2015-16 i.e., 18 for which 12.62 lakhs were given as compensation. Also, there was a heavy loss of crops in the same year which indicates that there might be a major incident of disaster/s that has occurred this year which caused such a loss. Hence, there is a need to adopt precautionary and recovery measures to ensure the safety of people and property.



**Table 12-2: Funds Disbursement in Kashipur Tehsil**

| Year           | Fund allotted from District Headquarter | Perplexing support | Number of beneficiaries | Compensation for home | Number of beneficiaries | Ex Gratia grant | Number of beneficiaries | Loss of crop | Number of beneficiaries | Landslide | Winter support | Number of beneficiaries | Dedicated fund | Note (balance) |
|----------------|-----------------------------------------|--------------------|-------------------------|-----------------------|-------------------------|-----------------|-------------------------|--------------|-------------------------|-----------|----------------|-------------------------|----------------|----------------|
| <b>2015-16</b> | 17750000                                | 18000              | 21                      | 10400                 | 4                       | 1262900         | 18                      | 14814000     | 9876                    | 0         | 0              | 0                       | 1556900        |                |
| <b>2016-17</b> | 2500000                                 | 3400               | 21                      | 45100                 | 11                      | 150000          | 4                       | 15566        | 6                       | 0         | 0              | 0                       | 2205934        |                |
| <b>2017-18</b> | 2500000                                 | 64600              | 17                      | 47000                 | 11                      | 196000          | 4                       | 0            | 0                       | 0         | 40000          | 200                     | 2162400        |                |
| <b>2018-19</b> | 2500000                                 | 247000             | 66                      | 132100                | 14                      | 123900          | 7                       | 0            | 0                       | 0         | 0              | 0                       | 1997000        |                |
| <b>2019-20</b> | 2500000                                 | 51000              | 15                      | 16000                 | 5                       | 600000          | 2                       | 0            | 0                       | 0         | 0              | 0                       |                | 1626100        |

Source: Disaster Management Office, US Nagar

## **12.6. Key issues**

- 1) There is a need to adopt construction practices that are best suited as per Zone IV (high damage risk zone) following the specifications and standards laid down by the concerned authorities.
- 2) There is a need for a stormwater drainage plan which should be implemented that would help to carry the surface runoff during a storm and heavy rains.
- 3) There is a need to adopt precautionary and recovery measures to ensure the safety of people and property in case any sort of disaster occurs in the area.

There is a requirement to incorporate any sort of preventive/precautionary measure within building bye-laws or zoning regulations

## **12.7. Recommended proposals**

### **12.7.1. Earthquake Risk Mitigation At Municipal And Village Levels**

The Disaster Management Act, 2005, seeks safety of built environment under the action of all perceivable hazards. The matter of structural safety under earthquake hazard is precariously positioned because the subject is NOT taught in any college in the country as part of the mandatory curriculum in any of the degree programs – bachelor, master or doctoral programs; most engineers and architects are self-taught with only minimal continuing education options available in the country. Therefore, a robust statutory system is required to steer carefully the nation towards an earthquake resistant built environment. A few actions towards building such a robust system are included in the NERMP, which are described hereunder

The component of introducing earthquake risk mitigation at municipal and village levels has five sub-components namely:

#### **i. Earthquake Risk Reduction Act:**

- Strengthening existing Laws and their implementation, and
- Preparing a bill to enact a law towards Earthquake Risk Reduction, including provisions on Structural Safety

#### **ii. National Seismic Safety Commission:**

A national level technical think tank is needed to identify the needs, steer R&D activities, and facilitate the implementation of earthquake safety initiatives. This think tank will address all technical aspects that lead towards ensuring earthquake safety of the 140 Crore people, of which at least 100 Crore people live in Seismic Zones III, IV and V (wherein moderate to severe level earthquake ground shaking is expected). NDMA will establish a National Seismic

Safety Commission (NSSC), as an apex technical body to deliberate on the subject of earthquake safety and guide the NDMA on possible policies to be taken forward for the earthquake safety of India. NSSC will establish collaborations with similar bodies worldwide to establish international good practices in India

**iii. Techno-Legal Regime:**

A robust techno-legal regime has three components namely: (a) State-of-the-art Building Codes, (b) State or UT region-sensitive Building Bye-Laws, and (c) Legally empowered, objective and transparent Building Permit System

**iv. Earthquake Risk Insurance Pool for States & UTs:**

All States and UTs, especially those in seismic zones IV and V, will pool their insurance premiums collected annually, and compensate those persons who are affected by earthquakes. The Earthquake Risk Reduction Act is expected to offer incentive through rebate in income tax to those who adopt earthquake safe practices articulated in the Techno-Legal Regime of the said Act. Also, Earthquake Risk Insurance is another aspect on the demand side. The proposal also includes sensitisation of home owners to adopt earthquake safe construction of houses and purchase the earthquake risk insurance. An affordable insurance scheme is envisaged by pooling the risk of states and UTs. Further, the insurance is perceived to address multiple hazards.

**v. Post-Earthquake Investigations:**

Often, Governments face a contentious issue of determining the amount of compensation to be paid to a person whose house is damaged (to different levels), partially collapsed or completely collapsed during an earthquake. NERMP will develop and approve (before the next earthquake) legally empowered processes for:

(1) Post-Earthquake Damage Assessment (PEDA) to address key aspects, including: (a) Purpose of assessment, namely Rapid Assessments for paying compensation immediately, and Detailed Assessments for use in Reconstruction Programs; (b) Objective and transparent method of post-earthquake damage assessment, based on a published Indian Standard; (c) Composition of Post-Earthquake Damage Assessment Teams (PEDATs), consisting of the trained technical persons who can carry out the assessments; (d) Timing of the assessment; and (e) Levels of damage for which the compensation will be paid.

(2) Post-Earthquake Reconnaissance Surveys (PERS) to address key aspects, including: (a) Method of post-earthquake reconnaissance survey, based on pre-agreed protocol; (b)

Composition of a multi-disciplinary Post-Earthquake Reconnaissance Team (PERT), consisting of the persons with different background to assess holistically the earthquake scenario; (c) Timing of the survey, and (d) Purpose of survey, namely: (i) provide quick input to governments on the gravity of the situation, (ii) advise governments on the need for detailed damage and collapse studies, (iii) estimate broadly likely loss, and (iv) capture lessons for reconstruction activities and possible improvements towards earthquake safety in India.

NERMP will support these two activities for the duration of the program. Subsequently, NDMA will take this forward. In particular:

- (1) NDMA will form the proposed Standing Committees. and
- (2) NERMP will provide grants to Standing Committees for studying behaviour of structures. NERMP will work with BIS to identify the possible members of Standing Committees from amongst the Working Groups of the Earthquake Engineering Sectional Committee engaged in the different technical thematic areas. In addition to that, all the Guidelines given in Comprehensive National Earthquake Risk Mitigation Program has to be followed and implemented.

#### **12.7.2. Proposals to Mitigate Floods**

The natural drains of the planning area have been presented in Map along with other proposed green spaces within the planning area. Throughout the planning area, various channels of water bodies can be found, which are being encroached currently by the people of Kashipur. It is proposed that green belt along the all-water bodies, where a dense manmade forest will be developed which will control the floods as well as preserve the flood catchment areas of these drains. These channels are extremely important for the natural drainage of the planning area hence it needs to be reserved and preserved. The construction along these drains hampers the natural flow of the drains.

### **13. Review of Kashipur Master Plan, 2011**

Before the formulation of the long-term master plan of Kashipur city, it is important to get an insight into its continuous development process, its origin, industrial importance, and its strategic and administrative importance, and also to review the impact of proposals of the previous master plan of 2011. Kashipur Master Plan 2011 was the first development plan prepared for Kashipur city under order number 295/S.A./R.B.O./Kashipur/2003, dated 08-09-2003.

Kashipur is one of the important administrative, historical, Industrial, and commercial centers in the district of Udham Singh Nagar falling under the region of Kumaon. In the year 1901, the city population was 12,023 which increased to 92,000 in the year 2001. This unexpected growth in population from 1901 to 2001 was mainly because of its administrative importance, industrialization, and its nodal location. Rapid urbanization helped in the spatial growth of the city but due to absence of long-term planning standards and guidelines for the city created an unplanned and unregulated development. The uncontrolled development of the city heavily affected the cultural heritage areas through illegal encroachments. Due to this, the overall impact on the city was seen on unbalanced development, increasing population density, mixed land use, and transportation issues, along with the unequal distribution of the social infrastructure and services in the city. The city was facing continuous pressure on public infrastructure. The pressure was seen mainly along major roads of the city on which the lack of parking and the increased number of retail businesses had encroached a major portion of the road areas resulting in crossing their designed capacity.

In order to plan the unorganized development of Kashipur city, the Uttar Pradesh government in its government order number 30/0-AA-3-91 RA-9 Lucknow, Date 19<sup>th</sup> June 1992 declared Kashipur and its adjoining 36 villages as Regulated Area. Thereafter, for the preparation of the Master Plan of Kashipur city, Uttar Pradesh government order number 3426/9-AA-3-93-12-MHA/93 Lucknow, date 7<sup>th</sup> December 1993 declared the urban and rural planning department as the nodal agency. The Master Plan was prepared with the help of collection and analysis of geographical and socio-economic data collected from various departments including the Kumaon planning division, the Urban and rural planning department, and the Haldwani region. The main intention behind the preparation of this Master Plan was to keep the traditional values of the city while at the same time reducing the geographical distance between the work and

entertainment places for the present and future population. Integrating all kinds of land uses under a well-organized system in order to give a future planning direction for the city.

Kashipur Master Plan 2011 was prepared to take 1991 as the base year with a projected growth of 1,83,000 population by 2011. The proposed population of Kashipur city as per Master Plan 2011 was an overestimation of about 8 thousand figures when compared with the actual city population by 2018 which is 1,75,819.

In the master plan of Kashipur, 2011 the total projected population of the urban settlement, as well as 36 villages, was 1,83,000 and all the proposals were given for this population. The government of India launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015 as a Centrally Sponsored Scheme. One purpose of the Mission is to improve governance through a set of Reforms. During the Mission period, 11 reforms are being implemented. Formulation of GIS-based Master/Development Plans for 500 AMRUT Cities is one of the important reforms under AMRUT, which has been approved as a 100% centrally funded sub-scheme with a budget outlay of Rs. 515.00 crores. Kashipur is one of those 500 cities for which GIS based Master Plan is being prepared. The total area of the master plan 2011 was 104.34 square kilometers while the area of Kashipur master plan 2041 is 179 square kilometers for which plan preparation is underway.

### **13.1. Town Development as per proposed land use**

The proposals given in the previous master plan of the city for the year 2011 have been reviewed aspect-wise mainly focussing on the urban area before preparing a GIS-based master plan of the city. The total area proposed under the master plan of 2011 is 104.34 square kilometers. The intent behind reviewing the master plan of the city aspect-wise is to know the status of development that has occurred over time and the relevance of planning envisaged in the master plan is also reviewed.

#### **13.1.1. Residential Proposals**

In the master plan of 2011, it was expected that 1,83,000 people will reside in the city by the year 2011 which was projected based on the past trends of population growth in the city. As per 2011 census, the total population of the city was 1,71,467 and as per the latest municipal data collected in August 2019, the city has been divided into 40 wards having a total population of 1,75,819. In order to accommodate the proposed population for Master Plan 2011, additional 1152.02 hectares of land were proposed under residential use along with the 311.1 hectares of



land as per existing land use of 1991. The total land under residential use came out to be 1463.12 hectares which accounted for 52.32% of the total area. As per the URDPFI guidelines, the maximum share of residential area in a medium town is 48%. There is a variation of 4% in the case of the proposed residential area when compared with URDPFI standards. The residential area was proposed in all directions of the city in order to decentralize the city.

The residential areas had been divided into three categories based on the proposed residential densities, namely, high density residential, medium density residential, and low density residential. Keeping in view of different expected physical development, 244.83 hectares of land was proposed as high-density residential area, 574.58 hectares was medium density and 534.30 hectares was low-density area. The present density of the built and non-built areas in the city was 19 and 133 persons per hectare. The major portion of the existing built area was proposed under the high-density category, for the future, it is restricted to up to 300 persons per hectare. Adjacent to this high dense area, low and medium dense areas have been proposed with having 534.30 and 574.58 hectares respectively. The provision of low and medium-density development around these developed residential areas was mainly to boost the population and prevent the acquisition of agricultural land for residential development. Therefore, in order to fulfill the needs of people in terms of community and commercial needs, there was a provision for land reservation near the residential area.

### **13.1.2. Commercial**

Since, Kashipur is one of the prime trade center in Kumaon region, the importance, and level of trade and commerce functions has increased with time. The major commercial area of the city was located in the core area in the form of mixed land use. To decentralize the core, there was the provision of setting up of 3 commercial sub-commercial centers along 24m and 30m wide roads to reduce dependence on the core. In addition to this, there was provision of two whole sale markets/mandies in the periphery location.

Other proposals include the provision of commercial strip along major road having commercial in nature, provision of support infrastructure including warehouse, petrol pump. The total area under commercial use was 82.88 hectares which is 2.96% of the total area.

### **13.1.3. Industrial**

Kashipur is one of the prime industrial areas in the district as well as for the state of Uttarakhand. The setting up of industrial units in Kashipur was possible only because of the easy access to the raw material and the good government intention for the city to grow as an

industrial hub. But the units were more set up towards the fringe area or along the major roads outside the city area rather than centralized towards the city area.

For the promotion and organized development of the large industries under the state's industrial policy in the master plan, 99.7 hectares of land along the Ramnagar railway line were proposed for industrial development whereas for the promotion of small-scale industries another 67.8 hectares of land were proposed in the village of Sarwarkheda and Gangapur along Moradabad road. Thus, a total of 601.43 hectares of land was proposed under the industrial land use category in Master Plan 2011.

#### **13.1.4. Administration**

This city is the headquarters of Kashipur Tehsil. For use of the administrative area, in the Master Plan, 22.08 hectares of the land were proposed for the same which was about 0.79 percent of the total land area. Under this, 2.4 Hectares of land was kept for rest house whereas the remaining 19.68 hectares of land was for administrative purposes. Kashipur proposed urban area was envisaged as an industrial center as well as an administrative center. In the Master Plan proposals, it was envisaged to make necessary provisions for the development of the premises as well as other regional services for the purpose of upgradation of services.

#### **13.1.5. Community level Facilities and Services**

In the previous master plan, 125.73 hectares of land was reserved for provision which accounts for 4.49% of total area. In this, provision of educational, post office, Medical, police station, firefighting, and other community facilities was proposed in accordance with planning standards.

##### **a) Education**

As far as the number of educational institutions is concerned, then it was seen concluded that the educational institutions were present in sufficient numbers for the need of urban and adjoining areas. However, to meet the educational requirement of the planning period in accordance with the planning standards, their provision was proposed to be contained in the various land use zones set in the master plan, which were mentioned in the regulation of the various zones. A provision of 30.4 hectares of land area was made under the educational facilities.

##### **b) Health**

In Kashipur city, for the upgradation of health facilities, it was proposed to expand the existing state hospital in which increase in number of beds and provision of an additional 4.4 hectares of land for health facilities were included. For the Master Plan period, no provision was made for additional health centers and nursing home hospitals in private areas.

#### ***c) Technical and Research Centers***

There was a provision of a total of 15.44 hectares of land for the technical and research centers, in which the areas of 9.6 and 5.2 hectares for the existing technical and research centers were kept unchanged.

#### ***d) Other Facilities***

For the post office facility, with keeping the main post office unchanged other sub-post offices were proposed to expand. For expansion of the sub-post offices, an additional 0.9 hectares was proposed under the Master Plan area. For security facilities, for the expansion of the existing police station, fire station, and prison facilities there was a provision of additional 1, 1, and 0.3 hectares of land respectively. For water, to increase the capacity of the existing water infrastructure which was just 50 percent of the requirement, there was a provision of additional 10 tube wells and four water storage tanks in the city for the Master Plan period.

For the electricity substation, in the master plan, it was seen that there was a requirement for an additional sub-station for the city for which 3.10 hectares of land was proposed for the same. For the Sewerage farm, in view of the additional future population pressure, the land for the same was proposed under the Agri-green zones regulations. It was proposed to connect the entire city area with the sewerage lines by 2011. Therefore, in place of the present proposals, by the year 2011, the proposed sewerage line in the proposed residential areas was proposed to be done separately by the Uttarakhand Jal Nigam.

For community facilities, there was no separate land proposed for different types of community facilities and services rather a total of 45.12 hectares of land was proposed for the social facilities and services. In Kharakpur Devipura, 6.5 and 3.3 hectares of land on both sides of the main road, 12 hectares near the proposed bypass in Jaspur Khurd, and 19.54 hectare of land between the Moradabad road and the proposed 30-meter-wide road was proposed for community facilities. For religious and cultural activities, there was a proposed land of about 1.87 hectares for worship places in the Master Plan. For Cemetery/ Crematorium, 14.7 hectares of land were provided for the same keeping the existing facilities unchanged.

For parks and green spaces, there was a provision of 28.95 hectares of land for the same which was about 1.03 percent of the proposed Master Plan area. Along with this, 33.7 hectares of land areas were proposed under green area for conservation of Khotar Taal area, it was also proposed to develop green areas by planting trees along the drains in the proposed Master Plan.

### **13.1.6. Traffic and Transportation**

394 hectares were proposed for traffic and transportation in the previous master plan of Kashipur. For all the existing internal and regional connecting roads, the provision of their upgradation, expansion as per the ROW, asphalt, and parking facilities were made in the Master Plan. 3.4 hectares of Transport Nagar was proposed on Moradabad road. For ease of transport connectivity, there was an additional provision of 82.16 hectares of land for new roads. Which, Moradabad road and Jaitpura Ghosi road were proposed to be developed as a bypass road with proposed width of 60 meters on an area of around 61.84 hectares of land in the outer area of the city. Apart from this, another route was proposed to connect Ramnagar road with the Tanda Ujjain Fort. It was proposed to keep unchanged the 100.6 hectares of land under the railway. For proposed roads and expansion of existing roads refer to **Table 13-1**.

**Table 13-1: Proposed road width in master plan 2011**

| Sr. No               | Main Roads                                   | Proposed width as per Master Plan (in meters) |
|----------------------|----------------------------------------------|-----------------------------------------------|
| <b>Bajpur Road</b>   |                                              |                                               |
| 1                    | Chatri Chawrah to Railway Crossing           | 18                                            |
| 2                    | Railway crossing to Avaas Vikas Colony Drain | 24                                            |
| 3                    | Drain to Chati Chawrah                       | 30                                            |
| 4                    | Chati Chawrah to proposed bypass road        | 45                                            |
| 5                    | Proposed bypass to Towards Bajpur            | 50                                            |
| <b>Ramnagar Road</b> |                                              |                                               |
| 1                    | Chatri Chawrah to Banrasi Baag               | 21                                            |
| 2                    | Banarasi Baag to stadium                     | 33                                            |
| 3                    | Stadium to Railway Crossing                  | 45                                            |

| Sr. No                              | Main Roads                                                        | Proposed width as per Master Plan (in meters) |
|-------------------------------------|-------------------------------------------------------------------|-----------------------------------------------|
| 4                                   | Railway crossing towards Ramnagar                                 | 50                                            |
| <b>Moradabad Road – Jaspur Road</b> |                                                                   |                                               |
| 1                                   | Chatri Chawrah to Tanda Tirah                                     | 21                                            |
| 2                                   | Tanda Tirah to Dakiya Gulabo road T Junction                      | 24                                            |
| 3                                   | Above route T Junction to Dela river                              | 45                                            |
| 4                                   | Dela river to Towards Moradabad and Jaspur                        | 50                                            |
| <b>Aliganj Road</b>                 |                                                                   |                                               |
| 1                                   | Irrigation department office to Dadiyaal Tirah                    | 21                                            |
| 2                                   | Dadiyaal Tirah to T Junction of Dakiya Gulabo                     | 24                                            |
| 3                                   | Above road T Junction to 30-meter proposed road                   | 30                                            |
| 4                                   | Above road to towards Alingaj                                     | 45                                            |
| <b>Dadiyaal Road</b>                |                                                                   |                                               |
| 1                                   | Tirah to Railway crossing                                         | 12                                            |
| 2                                   | Railway crossing to T Junction of 30-meter-wide proposed road     | 24                                            |
| 3                                   | 30-meter-wide proposed road towards Dadiyaal                      | 45                                            |
| <b>Other roads</b>                  |                                                                   |                                               |
| 1                                   | Tirah to Towards Sugar Mill road                                  | 24                                            |
| 2                                   | Ramnagar Road to the road going towards Manpur before the stadium | 30                                            |
| 3                                   | Chati Chawraah to proposed 30-meter-wide road                     | 30                                            |
| 4                                   | T Junction of the above road to the railway crossing              | 24                                            |
| 5                                   | Kundeswar Road                                                    | 30                                            |

| Sr. No | Main Roads                                             | Proposed width as per Master Plan (in meters) |
|--------|--------------------------------------------------------|-----------------------------------------------|
| 6      | Kundeswar Chawraah to Bajpur Road and towards Ramnagar | 50                                            |
| 7      | Kunda Chawraah via Village Kunda towards Ramnagar      | 50                                            |

Source: Kashipur Master Plan, 2011

### 13.2. Proposed Land Use Distribution

The total notified area in the previous master plan was 98.22 sq.km. out of which 27.96 sq. km. is urban area while the remaining 70.26 sq. km. is under non-urban or other uses which mainly includes agriculture and water bodies. Error! Not a valid bookmark self-reference. represents the comparative analysis of proposed land use distribution with the standard land use distribution of a medium town.

**Table 13-2: Comparative Analysis of Proposed Land Use Distribution in 2011 Master Plan**

| Sr. No: | Land Use                                | Area (Hectares) | Area (in percentage) | Standard Percentage* | Variation (in Percentage) |
|---------|-----------------------------------------|-----------------|----------------------|----------------------|---------------------------|
| 1       | Residential                             | 1463.12         | 52.32                | 43-48                | +4                        |
| 2       | Commercial                              | 82.88           | 2.96                 | 4-6                  | -1                        |
| 3       | Industrial                              | 601.43          | 21.50                | 7-9                  | +12                       |
| 4       | Administrative                          | 22.08           | 0.79                 | 6-8                  | -2                        |
| 5       | Community Level Facilities and Services | 125.73          | 4.49                 |                      |                           |
| 6       | Traffic and Transportation              | 394             | 14.09                | 10-12                | +2                        |
| 7       | Green Areas and Open Spaces             | 107.39          | 3.84                 | 12-14                | -8                        |



| Sr. No: | Land Use                  | Area (Hectares) | Area (in percentage) | Standard Percentage* | Variation (in Percentage) |
|---------|---------------------------|-----------------|----------------------|----------------------|---------------------------|
|         | <b>TOTAL AREA (URBAN)</b> | <b>2796.63</b>  | <b>100</b>           | -                    | -                         |
| 8.      | Non-Urban and Other Uses  | 7026.67         | -                    | -                    | -                         |
|         | <b>TOTAL AREA</b>         | <b>9823.3</b>   |                      |                      |                           |

Source: Master Plan, 2011; URDPFI Guidelines; Computed Values

Note: \* Standard Percentage has been taken as per the land use distribution given in URDPFI guidelines. + sign in variation indicates more than the standard percentage and – sign indicates less than the standard percentage.

The maximum variation is in the case of industrial land use which is more than 12% indicating that the town is functioning as an industrial town compared with the adjacent town Rudrapur which has just only 5% positive deviation as per 2031 Master Plan. A detailed study on this high share of the industrial area needs to be studied in detail for a better assessment of the condition. The residential area covers around more than 52 percent of the previous master plan area which is about 4 percent above the standards. The presence of community facilities is comparatively less than the standards with about 2 percent in variation. There is a sharp 8 percent negative deviation in green and open space available in the city which shows an urgent need for proper green and open space planning in the Master Plan 2041. The proposed land use distribution has been represented in **Map 13-1**.

### 13.3. Current Deviation in Land Use as per previous Master Plan 2011

Although majority of development in the period after the implementation of last Master Plan has come as per provisions I Master Plan, but a large amount of area is developed not following the land use provisions in the Master Plan which has been categorised as deviated land use. This deviation is observed primarily in the agricultural land use (66.51%), followed by Flood Prone Area (18.78%), Residential (11.59%), Public / Semi-Public (2.97%) land use. (refer to **Table 13-3**).

**Table 13-3: Use-wise Deviation in the Proposed Land Use (2011)**

| Land Use (Master Plan 2011) | Deviated land use | Area (Ha) | Area (Ha) | Share (%) |
|-----------------------------|-------------------|-----------|-----------|-----------|
| Agricultural                | Commercial        | 12.10     | 657.59    | 74.30%    |

|                        |                      |               |                 |             |
|------------------------|----------------------|---------------|-----------------|-------------|
|                        | Industrial           | 141.63        |                 |             |
|                        | Mixed                | 11.20         |                 |             |
|                        | Plotted Vacant       | 261.55        |                 |             |
|                        | Public & Semi-Public | 42.04         |                 |             |
|                        | Residential          | 189.07        |                 |             |
| Commercial             | Industrial           | 1.06          | 1.06            | 0.12%       |
| Flood Prone Area       | Commercial           | 1.59          | 134.68          | 15.22%      |
|                        | Industrial           | 8.31          |                 |             |
|                        | Mixed                | 2.81          |                 |             |
|                        | Plotted Vacant       | 87.17         |                 |             |
|                        | Public & Semi-Public | 5.86          |                 |             |
|                        | Residential          | 28.94         |                 |             |
| Industrial             | Commercial           | 4.57          | 14.57           | 1.65%       |
|                        | Public & Semi-Public | 10.00         |                 |             |
| Public and Semi-public | Commercial           | 1.94          | 27.73           | 3.13%       |
|                        | Industrial           | 0.70          |                 |             |
|                        | Residential          | 25.09         |                 |             |
| Residential            | Commercial           | 31.89         | 48.17           | 5.44%       |
|                        | Industrial           | 16.28         |                 |             |
| Transport              | Commercial           | 0.43          | 1.31            | 0.15%       |
|                        | Industrial           | 0.07          |                 |             |
|                        | Mixed                | 0.30          |                 |             |
|                        | Public & Semi-Public | 0.12          |                 |             |
|                        | Residential          | 0.39          |                 |             |
| <b>Total</b>           |                      | <b>885.10</b> | <b>885.1032</b> | <b>100%</b> |

Source: Computed Values through GIS Platform

### 13.1.1. Agricultural

A major part of deviated land use from proposed land use has been observed in the proposed agricultural area. About 74% of total deviated land use is from proposed agricultural land use. It got deviated to land uses like Plotted Vacant Land (261.55 ha), Residential (189.07 ha), Industrial (141.63 ha), Public & Semi-Public (42.04 ha), and Commercial (12.10 ha) land use. Agricultural areas have deviated majorly to the plotted vacant land and residential land use, which are undeveloped residential colonies and developed residential colonies. In addition to this, manufacturing activities have come up at proposed agricultural land use due to low land prices in the hinterland and good connectivity to regional roads. Further, some of the retail activities have also come up due to the economic potential near settlements (refer to Error! Reference source not found.).

### 13.1.2. Flood Prone Area

A large portion of the area demarcated as flood prone area, has been deviated to developed area, constitutes 15.22% of total deviated area. It got deviated to land uses like Plotted Vacant Land (87.17 ha), Residential (28.94 ha), Industrial (8.31 ha), Public & Semi-Public (5.86 ha),

Mixed (2.81 ha) and Commercial (1.59 ha) land use. Flood Prone areas have deviated majorly to the plotted vacant land and residential land use, which are undeveloped residential colonies and developed residential colonies due to low land prices. Majority of these areas

### **13.1.3. Residential**

From the **Table 13-3** it is clear that the 5.44% of proposed land use deviation is only in the proposed residential area. In core areas, the proposed residential use got deviated to the commercial and mixed use units due to the better income opportunities and market forces. Whereas, some portion of residential land use proposed along the main roads got deviated to industrial land use due to the growth potential of industries.

### **13.1.4. Commercial**

From the **Table 13-3**, it is clear that the proposed commercial land use has deviated to the Industrial use which accounts for 1.06 ha.

### **13.1.5. Industrial**

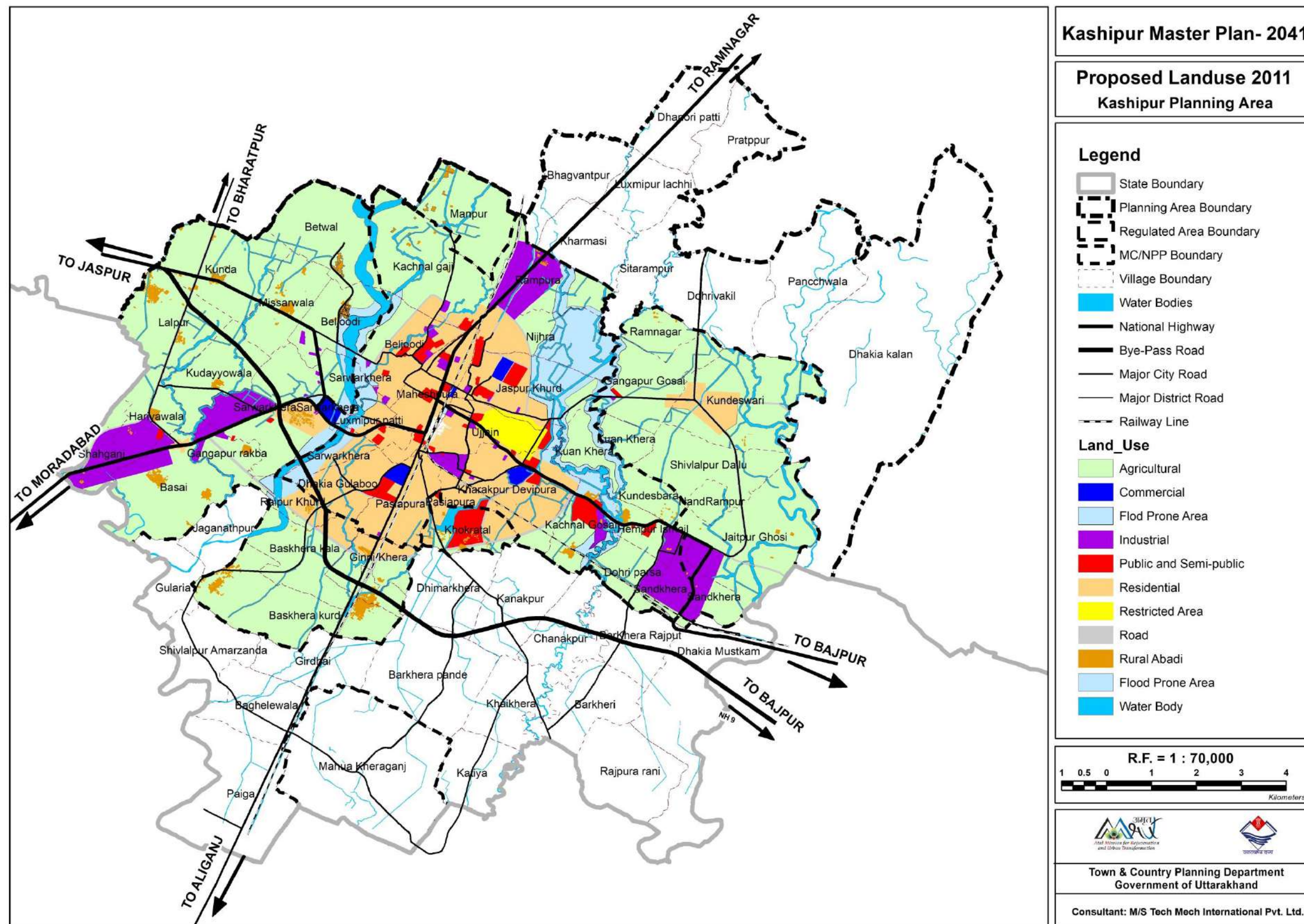
From the **Table 13-3** it is clear that the proposed industrial land use got a minor deviation (1.65% only), to the commercial land use i.e., 4.57 ha, majorly in the municipal areas because of higher commercial potentiality and higher land value, toward Public & Semi-Public (10 ha) because of increasing demand of services like schools and healthcare facilities.

### **13.1.6. Public & Semi-Public**

Proposed Public & Semi-Public land use got a 3.13% deviation, to Commercial (1.94 ha), Industrial (0.7 ha) and Residential (25.09 ha). Proposed public/semi-public areas have deviated majorly to the residential areas.



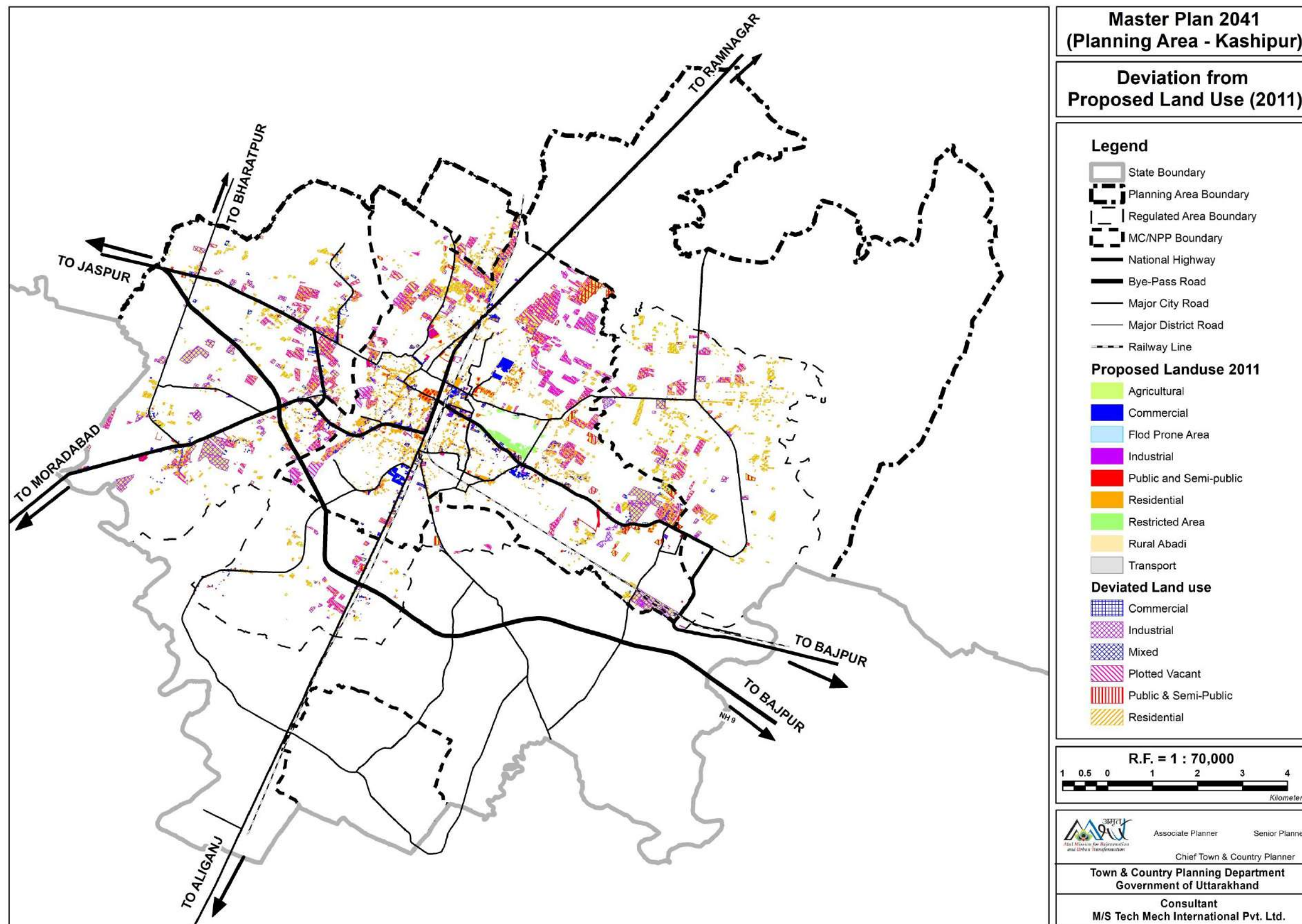
Map 13-1: Proposed Land Use Map of 2011



Source: Town and Country Planning Department



Map 13-2: Deviation from proposed land use 2011



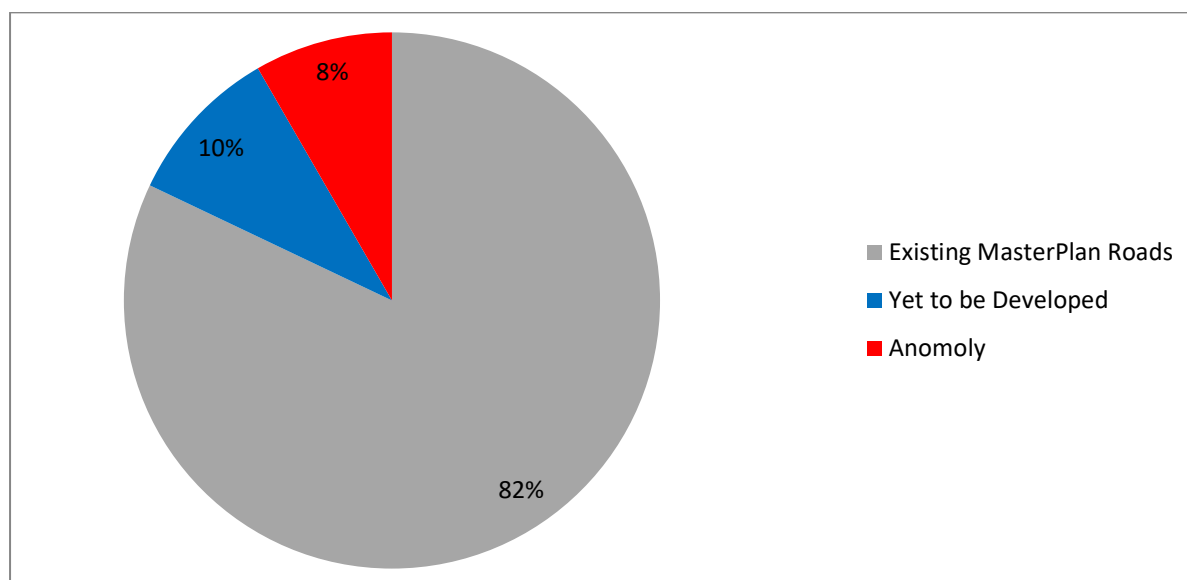
Source: Town and Country Planning Department

are extremely vulnerable to flood as these areas are low lying areas along rivers and streams. (refer to Error! Reference source not found.).

#### **13.4. Present Deviation in Proposed Road Network as per previous Master Plan 2031**

So far, Kashipur Planning Area got implemented 82% of the variety of proposed master plan road networks. Out of the remaining 18% of the proposed network, around 8% got anomaly due to coming up of development and 10% is under agricultural and vacant use, which could be developed.

**Figure 13-1: Deviation in Proposed Master Plan Road Network**



Maximum anomaly is observed in the proposed roads of 50 meters, which is followed by 30 meters and 24 meters, which have road length anomaly of 8.12 km, 7.79 km and 3.31 km respectively with a total deviation of 19.02 km road. Among this, only 10.18 km road is developable at present situation. Road width-wise present status of the road network is given in the Table 13-4, Figure 13-1 and **Error! Reference source not found..**

**Table 13-4: Deviation Status in the Proposed Master Plan Road Network (2011)**

| Proposed Roads' ROW | Present Status of Proposed Master Plan Roads | Length of Proposed Roads | % of total Proposed Road Length |
|---------------------|----------------------------------------------|--------------------------|---------------------------------|
| 18 Meter            | Existing Road                                | 2.07                     | 2.24%                           |
|                     | Anomaly                                      | 0.00                     | 0.00%                           |
|                     | <b>Sub-total</b>                             | <b>2.07</b>              | <b>2.24%</b>                    |
| 21 Meter            | Existing Road                                | 1.76                     | 1.91%                           |
|                     | Anomaly                                      | 0.00                     | 0.00%                           |
|                     | <b>Sub-total</b>                             | <b>1.76</b>              | <b>1.91%</b>                    |
| 24 Meter            | Existing Road                                | 11.77                    | 12.76%                          |
|                     | Anomaly                                      | 3.06                     | 3.31%                           |

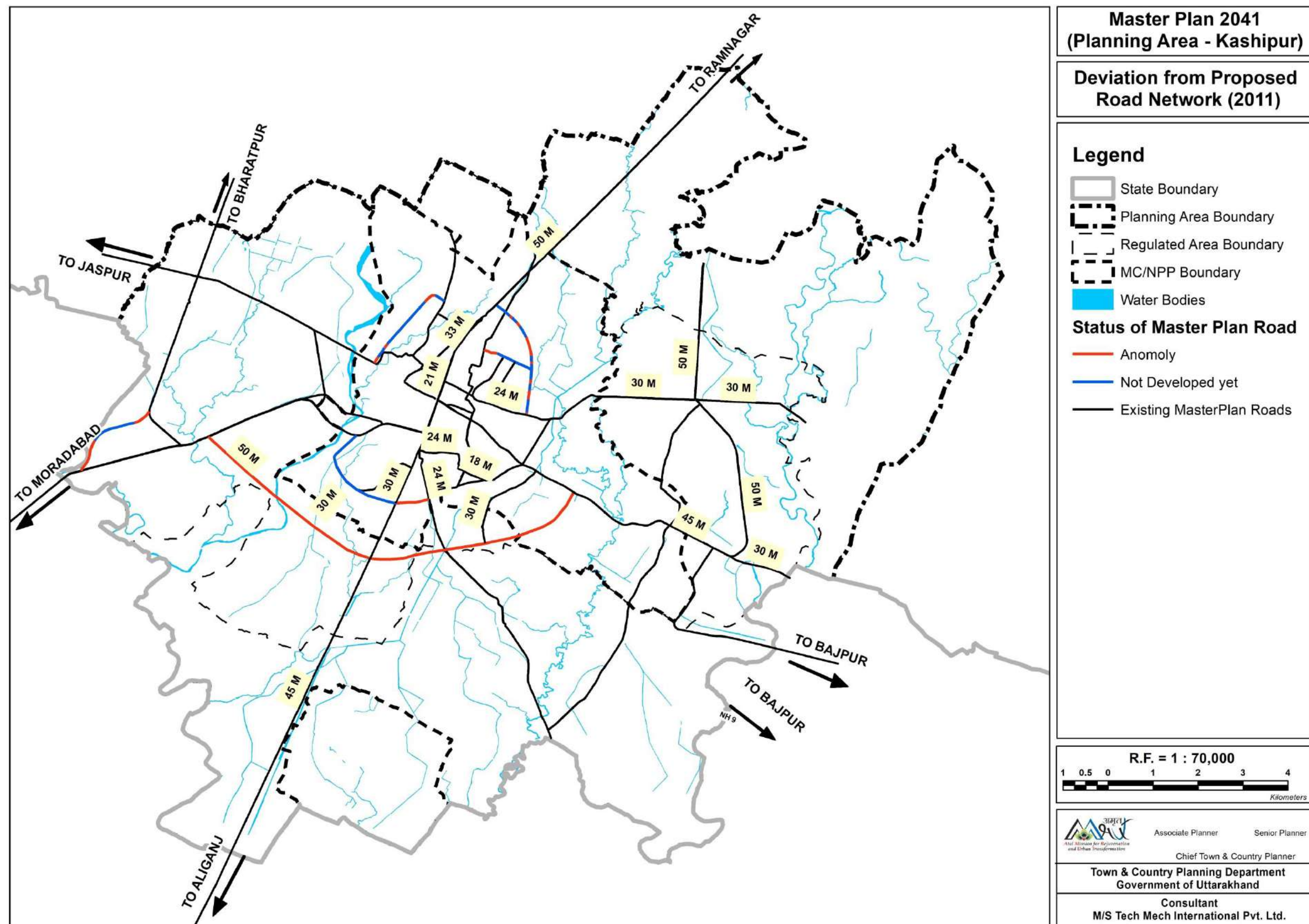


|              |                  |              |               |
|--------------|------------------|--------------|---------------|
|              | <b>Sub-total</b> | <b>14.83</b> | <b>16.07%</b> |
| 30 Meter     | Existing Road    | 20.21        | 21.91%        |
|              | Anomaly          | 7.79         | 8.44%         |
|              | <b>Sub-total</b> | <b>28.00</b> | <b>30.35%</b> |
| 33 Meter     | Existing Road    | 1.06         | 1.15%         |
|              | Anomaly          | 0.00         | 0.00%         |
|              | <b>Sub-total</b> | <b>1.06</b>  | <b>1.15%</b>  |
| 45 Meter     | Existing Road    | 8.98         | 9.73%         |
|              | Anomaly          | 0.00         | 0.00%         |
|              | <b>Sub-total</b> | <b>8.98</b>  | <b>9.73%</b>  |
| 50 Meter     | Existing Road    | 27.42        | 29.72%        |
|              | Anomaly          | 8.12         | 8.81%         |
|              | <b>Sub-total</b> | <b>35.54</b> | <b>38.53%</b> |
| <b>Total</b> |                  | <b>92.23</b> | <b>100%</b>   |

### 13.5. Conclusion

The review of the master plan has provided insight into the variation in the proposed land use distribution in comparison to the URDPFI standards. It depicts that the percentage of community facilities and green areas is less than what is required which would be given due consideration in the formulation of the Master Plan. The industrial character of the town has also been highlighted in the review of the previous master plan of the town.

Map 13-3: Deviations in the Proposed Road Network Map



Source: Derived from Kashipur Master Plan 2011

## 14. SWOT Analysis

SWOT analysis is a powerful technique for providing a basic straightforward model that provides direction and can serve as a basis for the development plan. It has concentrated on issues that potentially have a major impact on the planning area. It is an important step in planning and also helpful in accomplishing the objectives of the development plan and obtaining the desired results by maximizing the potential of the strengths and opportunities and minimizing the impact of weaknesses and threats. Hence, while developing the plan of Kashipur, a SWOT analysis has been conducted.

Based on an analytical study of the journey made in the realm of growth and development during the last centuries of its existence, a SWOT analysis has been carried out for the Kashipur planning area illustrating its inherent strengths and weaknesses, opportunities offered and threats faced both from within and outside, which has been used as a framework for redefining the agenda for future growth and development of the planning area.

*Table 14-1: SWOT Analysis*

| 14.1. Strength                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14.2. Weakness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Kashipur is one of the gateways for passenger and goods traffic movement to the Kumaon Region of Uttarakhand.</li> <li>Kashipur is one of the Class-I cities of the Kumaon region and the state as well.</li> <li>Kashipur acts as a regional centre for satellite towns in terms of employment opportunities.</li> <li>Soon Mahua Kheraganj NPP will act as an industrial town as it comprises of new SIDCUL industrial complex which will provide employment opportunity for Kashipur Planning Area.</li> <li>Having located on the tourist route to Jim Corbett National Park and Ramnagar</li> </ul> | <ul style="list-style-type: none"> <li>Kashipur receives a low level of investment from the private sector</li> <li>City and Planning Area growth is marked largely by haphazard and unauthorized growth leading to the uneconomical use of land.</li> <li>As the master plan has expired in 2011, weak implementation of the master plan has led to land use violations.</li> <li>In absence of a clear policy framework for the old and heritage area, it is resulting in overcrowding and congestion of land and people in the old city.</li> </ul> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>city, Kashipur is an important tourist spot.</p> <ul style="list-style-type: none"> <li>• Kashipur holds historical significance in the district as a few tales and a monument has been recognized by ASI.</li> <li>• It acts as the regional destination and prime distribution centre for goods and services for the surrounding urban and rural settlements.</li> <li>• Kashipur acts as the hub of the furniture and blanket market.</li> <li>• Availability of RBM minerals within the planning area for construction base.</li> <li>• Kashipur has traditional food processing and Agro-based industries.</li> <li>• Kashipur has a high degree of trade and commerce which act as an attractive point for the Planning Area as well as surrounding areas.</li> <li>• Nearby town, Mahua Kheraganj NPP is an industrial town and the presence of Mahua Kheraganj NPP railway station on the outer boundary of the Planning area acts as a boon for the region, which can be used for goods and service movements.</li> <li>• Essentially the town has been divided into two parts i.e., the old and new city. The older part is rich in heritage and can be made a heritage town.</li> <li>• Having a diversified economy, the city provides a high degree of buoyancy.</li> </ul> | <ul style="list-style-type: none"> <li>• The road network has a poor geometry pattern and inadequate capacity for demand.</li> <li>• Extreme vehicular congestion is found and the absence of parking within and outside the core area of the city makes the situation worse.</li> <li>• No sewerage network system is found in the Planning Area.</li> <li>• The absence of quality level tourism infrastructure is resulting in a reduced number of tourists despite having good tourism potential.</li> <li>• A high degree of road congestion caused by an intermediate mode of transport and bud stand</li> <li>• Lack of awareness on conserving and preserving valuable heritage among the people has led to a worsening of the condition of the heritage sites.</li> <li>• The absence of an adequate number of parks and open spaces (core area) reduces the quality of life for people.</li> <li>• The absence of stormwater drainage leads to flash floods.</li> <li>• Due to industries, we find a high degree of air, noise, visual, water and land pollution</li> <li>• Kashipur Planning Area boundary touches the U.P. boundary in the south which restricts the growth of the</li> </ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <ul style="list-style-type: none"> <li>Due to the presence of IIM Kashipur and educational institutes, it acts as an education hub in the region.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>planning area because of limited administrative control.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14.3. Opportunity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14.4. Threats                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Kashipur is emerging as a major tourist spot because of its rich cultural and historical heritage and strategic location on the road leading to Ramnagar and Jim Corbett National Park.</li> <li>The natural slope of the town supports a gravity-based sewerage system, which is economical in long run.</li> <li>The Planning Area is surrounded by two rivers in the east and west direction, which can be used as water resources in future.</li> <li>Kashipur acts as a major collection and distribution centre for goods and services, which also helps other sectors.</li> <li>With a good educational infrastructure, Kashipur will act as an education hub for the surrounding region.</li> </ul> | <ul style="list-style-type: none"> <li>The city is under the shadow of Moradabad city, as it is just 53 km away from Kashipur and is an important urban centre of Uttar Pradesh.</li> <li>In the future, due to the lack of green preserve area, Conurbation will likely take place in Kashipur city with surrounding towns.</li> <li>Through traffic will put a huge burden on the town roads because of the absence of a bypass road in Kashipur</li> <li>Delay in placing appropriate framework for proper preservation and conservation of old city area might hamper the heritage of the place.</li> <li>Non-rationalization of inter and intra-city traffic and improving/up-gradation of the transportation network.</li> <li>Delay in the decongesting of the core city and rationalizing policy of its development.</li> </ul> |





## 15. Stakeholder Consultations

The Government of India has envisaged the preparation process of GIS based Master Plan of AMRUT cities through a consultative and participatory approach and stakeholder consultations play a very crucial role to achieve it. Stakeholder consultation results in mutual benefit, as it enables us to identify challenges that might affect the future of the area. It is at this level that local issues, people's vision, and hopes for the area are highlighted and discussed thoroughly. Paying attention to stakeholders' concerns and feedback results in a better outcome for the project and designs.

The consultant team conducted consultative meetings at the ULB level along with focus group discussions with various stakeholders to discuss the status and performance of the service delivery mechanism in the Planning area development and to ensure a participatory and inclusive development process. Part of the consultation was a written consultation. The results and analysis of the consultation are given in this report.

### 15.1. Summary of Consultations

A focus group discussion (FGDs) is a form of qualitative research involving a group of people and understanding their perceptions, opinions, and views regarding the development of the area. This is a forum, where participants are free to express their views and give suggestions on the development front. As part of the Master Plan preparation for Kashipur, FGDs were conducted to gather the collective opinion of key stakeholders.

The purpose of focus group discussions with key stakeholders is to exclusively bring out the opinions and suggestions toward the Vision for Kashipur, future economic base, and future urban form/ structure for development along with local issues.

These meetings were conducted to review the master plan preparation, incorporate their feedback, and also to finalize the concepts and preliminary plans. The list of meetings held in ascending order is given in **Table 15-1**.

**Table 15-1: Meeting held at the highest level**

| Date       | Meeting with                                                                                                     | Venue                                           |
|------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 13/10/2020 | Meeting with various stakeholders of the different departments under the chairmanship of the District Magistrate | Dr. A.P.J Abdul Kalam conference hall, District |

| Date       | Meeting with                                                                                                                                                                             | Venue                                                            |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|            |                                                                                                                                                                                          | collector office,<br>Rudrapur                                    |
| 03/12/2020 | Meeting with all elected representatives including MLA, Mayor & ward members along with Municipal commissioner. The meeting was held under the chairmanship of Honorable Mayor, Kashipur | Conference Hall,<br>Municipal<br>Corporation Office,<br>Kashipur |

## 15.2. Stakeholders Key Suggestions

### 15.2.1. Meeting with various stakeholders of different departments at the District collector office, Rudrapur

- There are several Water Schemes currently active in Kashipur which need to be listed in the Master Plan
- Nagar Palika, and Local bodies need to be consulted for Open Defecation status in their area and cross-check other census data
- Trenching ground for solid waste management in Kashipur has been donated by villages which need to be marked in the Master Plan
- ISBT Kashipur will not be converted to the PPP model for upgradation
- Land notified for road construction in the old Master Plan has been encroached already by houses and no further construction can be done. This issue should not crop up in the new Master Plan.
- The presence of slums in Kashipur needs to be revaluated with the help of the Municipal Corporation as data from the census can be old.

#### 15.2.1.1. List of Attendees

Attendance of all the members present in the meeting has been carefully undertaken. The list is given in (Annexure 15.1)

### 15.2.2. Meeting with all elected representatives at Municipal Corporation

Focus group discussions with stakeholders were conducted to ascertain their perceptions regarding the future vision, economic base, urban form, and local issues of Kashipur. Elected representatives were conveyed about the process adopted for Master Plan preparation as well as the current status. Further, Performa's were circulated to MLA, Mayor, Municipal

commissioner as well as all elected ward counselors for their suggestions at ward level and vision formulation for the master plan. Documentation of all stakeholders' consultations including photography, attendance sheets, etc., has been carefully undertaken.

Extensive stakeholders' consultations were carried out in which broad suggestions from Hon'ble MLA, Mayor, Municipal commissioner, and all elected ward counselors were given for various infrastructure development. The summary and suggestions are as follows:

#### **15.2.2.1. Visions for Kashipur planning area**

For the vision of the Kashipur planning area, after analyzing the existing situation and future potential four options were presented to the stakeholders which are represented in the **Table 15-2**.

*Table 15-2 Options for the vision of the Kashipur planning area*

| Sl. No. | Options                                | Percentage of votes |
|---------|----------------------------------------|---------------------|
| 1       | Development of Trade and Commerce      | 41%                 |
| 2       | Industrial hub                         | 41%                 |
| 3       | Enhancing Regional Tourism Destination | 13%                 |
| 4       | Administrative Centre                  | 6%                  |

The vision of "Development of trade and commerce" and "Industrial hub" received the majority of support with 41% votes each. Then enhancing regional tourism destinations received 13 % support. It reflects that the stakeholders want to go along with the existing growing areas as trade and commerce and industries are already developed in the planning area.

#### **15.2.2.2. Visions for Kashipur municipal corporation**

Seven options were provided for the vision of Kashipur municipal corporation as given in Table 15-3. The majority of the stakeholders supported the vision of a "Clean & Green City". It has received 91% of support among all the stakeholders. The second vision was Livable City with Balanced development of activities with 6% support. It shows people want to live in a clean and green environment which must be highlighted in the master plan.

*Table 15-3 Options for the vision of Kashipur municipal corporation*

| Sl. No. | Options                                    | Percentage of votes |
|---------|--------------------------------------------|---------------------|
| 1       | Clean & Green City                         | 91%                 |
| 2       | Industrial Hub                             | 3%                  |
| 3       | A Prosperous Religious Heritage City       | 0%                  |
| 4       | The city with Safety and Security features | 0%                  |
| 5       | Slum Free City                             | 0%                  |

|          |                                                      |    |
|----------|------------------------------------------------------|----|
| <b>6</b> | Enhancing transport mobility                         | 0% |
| <b>7</b> | Livable City with balanced development of activities | 6% |

### 15.2.2.3. **The future economic base of the Kashipur planning area**

Considering the preference of the economic base of Kashipur, out of six options 41% of stakeholders supported the new and clean industrial ventures which would boost the livelihood opportunities. 28% of stakeholders wanted to develop Kashipur into an automobile and Value-added industry. 13% also supported the tourism industry. As Kashipur has a lot of potential for industries they want to utilize its full potential.

*Table 15-4 Options for the future base of the Kashipur planning area*

| <b>Sl. No.</b> | <b>Options</b>                                                                                    | <b>Percentage of votes</b> |
|----------------|---------------------------------------------------------------------------------------------------|----------------------------|
| <b>1</b>       | Auto Mobile and value-added Industry                                                              | 28%                        |
| <b>2</b>       | New and clean industrial ventures boost livelihood opportunities                                  | 41%                        |
| <b>3</b>       | Enhancing Regional tourism base with diverse tourism and recreational activities.                 | 13%                        |
| <b>4</b>       | Expansion of existing Agro Market and development of food processing industries                   | 9%                         |
| <b>5</b>       | Encouraging and uplifting indigenous arts and skills like local crafts and small-scale industries | 9%                         |
| <b>6</b>       | Encouraging Agriculture, Animal Husbandry, and agriculture Allied activities                      | 0%                         |

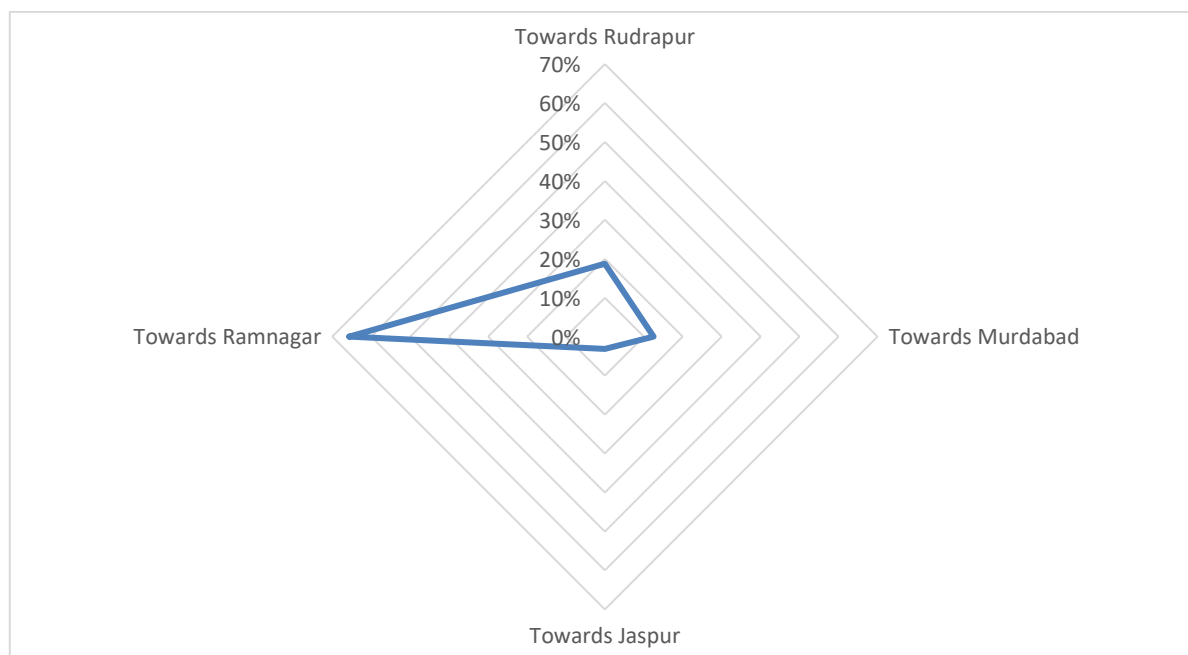
### 15.2.2.4. **Future urban form & growth scenario**

For future urban growth, ten questions were asked to the stakeholders based on the existing urban form and growth of the Kashipur planning area. The results of these questions are discussed below

#### 15.2.2.4.1. **The preferable growth direction of the city**

Four directions of growth were presented before the stakeholders, which are Rudrapur, Ramnagar, Jaspur, and Muradabad. The results have been shown in the radar graph given below. 66% of stakeholders wanted the growth of the city towards Ramnagar, 19 % towards Rudrapur, 12% towards Muradabad, and 3% towards Jaspur. The commercial activities towards Ramnagar are high as tourism activities have been increasing in Jim Corbett National Park and the access to the National park is through Ramnagar (refer to **Figure 15-1**).

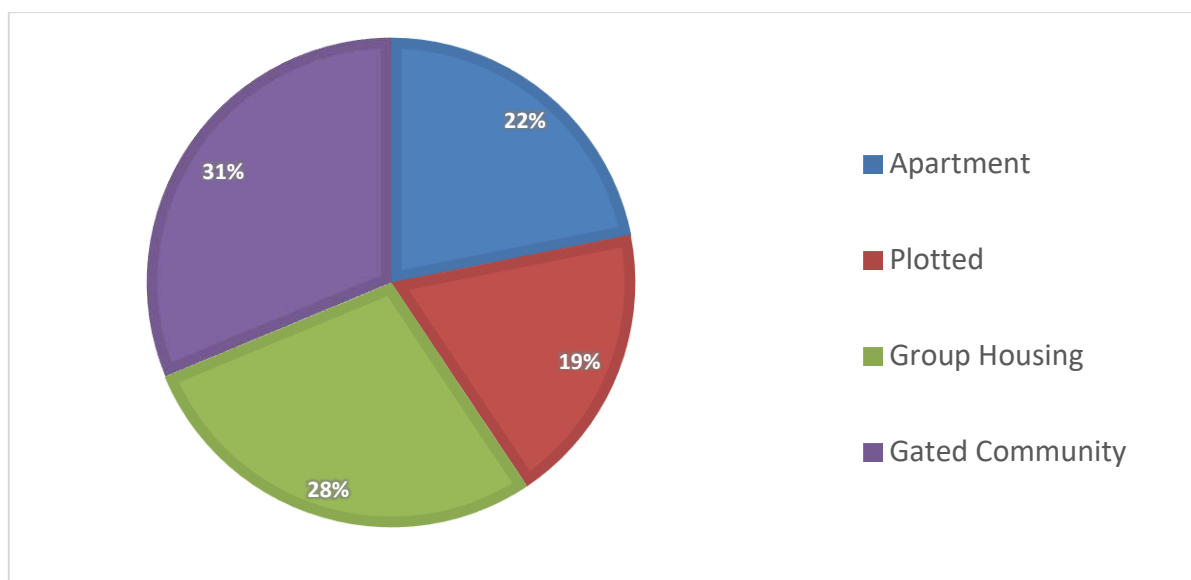
**Figure 15-1: Radar graph for future urban form and growth direction**



#### 15.2.2.4.2. Preferred Housing Typology

For preference of housing typology, 31% of stakeholders supported gated community, 28% group housing, 22% plotted, and 19% apartment. A gated community provides safety for the people and group housing can provide housing to all classes of people (refer to **Figure 15-2**).

**Figure 15-2 Preferred housing typology**



#### 15.2.2.4.3. Central Business District (CBD)

While focusing on the number of the central business district, 72% of stakeholders supported a single CBD and 28% supported multiple CBDs. It shows they want a centralized city than a decentralized one.

#### 15.2.2.4.4. **Density**

When asked about the intensity of density for the planning area none of the stakeholders wanted high-density development. 66% wanted medium density and 34% wanted low-density development.

#### 15.2.2.4.5. **Preferred Transportation System in Kashipur planning area**

The most preferred transportation system in Kashipur with 66% of support is non-motorized transportation, then feeder bus with 25% then intermediate transport with 9%. This reflects the stakeholders want to encourage cycles and walking and want to reduce the use of vehicles.

#### 15.2.2.4.6. **Facility Distribution (Hospitals, School)**

Two types of the scenario were proposed for providing facilities i.e., compact and distributed. 91% of stakeholders want distributed type of development and only 9% of people want a compact system. Distributed system will be advantageous as it will be accessible to people in nearby areas without traveling far.

#### 15.2.2.4.7. **Mixed Use**

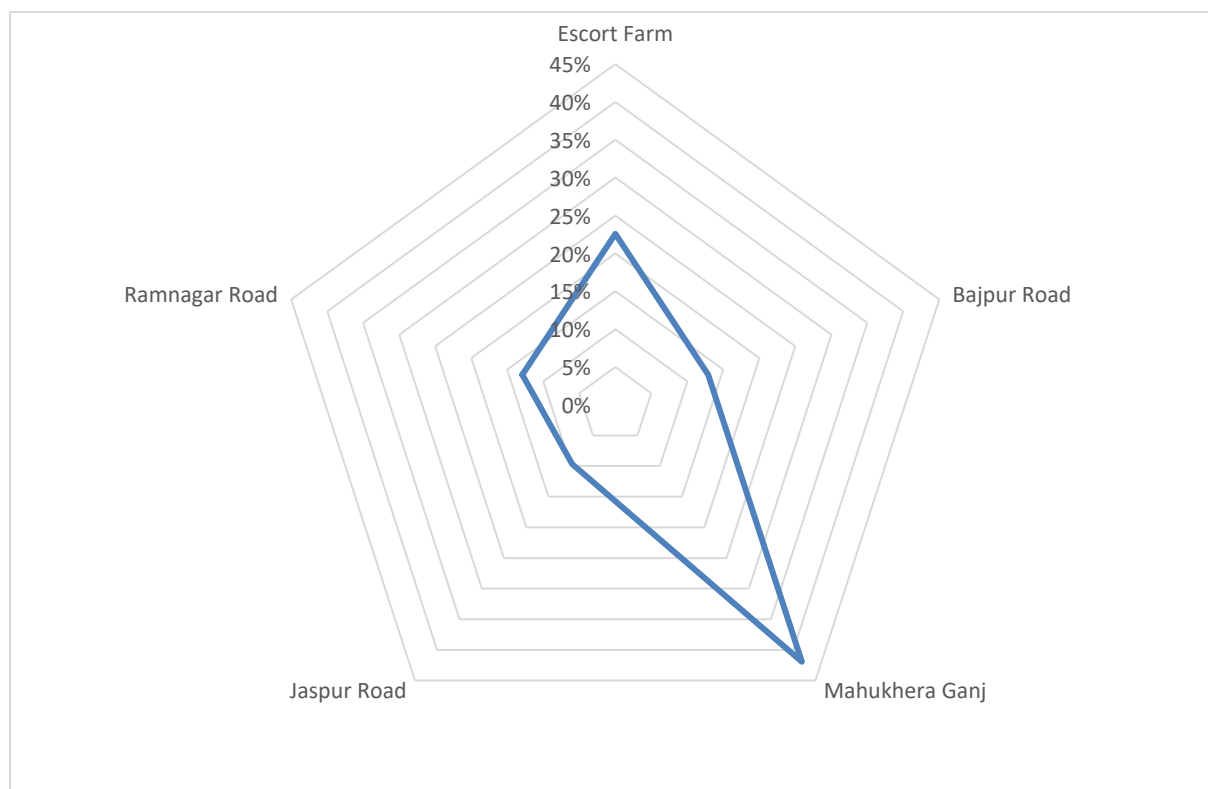
When asked about the preference for mixed land use, 72% preferred mixed-use type development and 28% did not prefer mixed-use.

#### 15.2.2.4.8. **Preferred Industrial Zone**

Five options came out for the location of the preferable industrial zone. The majority of stakeholders preferred the industrial zone i.e., 42% towards Mahua Kheraganj as it already exists and growing on that side as represented in the radar graph below. While 22% also voted for escort farm as it is a new industrial area proposed by SIDCUL in Kashipur. 13% support was received for Bajpur road and Ramnagar road and 10% was received by Jaspur road (refer to **Figure 15-3**).



**Figure 15-3 Radar graph for preferred industrial zone**



#### 15.2.2.4.9. Preferred type of industries

Most of the stakeholders preferred agriculture-based industries with a support of 84% due to the availability of agricultural products. The automobile industries were supported by 13% and only 3% supported small-scale industries.

#### 15.2.2.4.10. Suggested short-term projects

Only a few responses were received for short-term project suggestions, which were a solar planet, park, and telecom. This shows the interest of people in renewable energy, recreational spaces, and telecom. This also reflects that these things must have been lacking in the planning region.

#### 15.2.2.4.11. Ward level issues

To get more insight into the ward-level issues, questions based on infrastructure were presented and the results are discussed below.

##### 15.2.2.4.11.1. Water

According to the stakeholder's responses the water supply scenario is not good, as it receives an average of 3.5 scores, the source of water supply received 4, quality of water 3, and water logging is 3.1. the overall score for water supply is 3.4 showing which is a big concern and should be looked after in the master plan.

#### **15.2.2.4.11.2. Sewerage and Sanitation**

The sewerage system has received the lowest score of 0.7, it puts a lot of pressure on the city without a sewerage system. The sanitation and hygienic condition of the city have also received low scores i.e., 2.6. If the area has open or closed drains it has received a score of 2.8. With such a low score it is a high issue of concern.

#### **15.2.2.4.11.3. Solid waste management**

The condition of the solid waste system is also bad with scores ranging from 2-3. The condition for the garbage disposal parameter received 2.4, the location of the garbage disposal parameter received 3.3 and the frequency of collection received 2.6 score. Overall, the condition of garbage disposal, dumping of garbage, and frequency of collection needs to be improved.

#### **15.2.2.4.11.4. Power**

Power infrastructure received a better score than other infrastructure i.e., 5.9 still it needs to improve to a large extent.

#### **15.2.2.4.11.5. Transport**

The road condition and access to public transport have received 5.1 and 4.4 respectively. Whereas the parking facility has received 2.7 reflecting there is a huge lack of parking facilities in the area. The score for road condition is not satisfactory but still, it is better than other infrastructure.

#### **15.2.2.4.11.6. Health Facilities**

The health facilities in the area also received a score below 5, showing there is a lack of health facilities.

#### **15.2.2.4.11.7. Housing**

The housing scenario has received a score of 6.3 which is the best among all others. Housing facilities must have been meeting the demands of the people. Still, there is room for improvement.

#### **15.2.2.4.11.8. Industries**

The number of household industries is less as it received only 3.6 scores and the number of skilled people in the region is also limited (score of 4.1). this needs to be catered to in the master plan by providing a good opportunity for skilled people.

**Figure 15-4: Meeting with Hon'ble Mayor along with all Ward members**



### **15.2.3. Other Review Meeting**

Various meetings have been conducted at different levels for the status report and progress of work. The inputs and valuable comments given in these meetings have been incorporated into the reports.

| Date       | Purpose                                                        | Venue                               |
|------------|----------------------------------------------------------------|-------------------------------------|
| 16/07/2019 | Chairman ship of chief development officer for data collection | Vikas Bhavan, District Collectorate |

| Date       | Purpose                                                                                                                                                                                  | Venue                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 27/02/2020 | To present status of work                                                                                                                                                                | Haldwani Town and Country Planning Department                              |
| 27/05/2020 | CERC                                                                                                                                                                                     | Online                                                                     |
| 13/10/2020 | Meeting with various stakeholders of the different departments under the chairmanship of the District Magistrate                                                                         | Dr. A.P.J Abdul Kalam conference hall, District collector office, Rudrapur |
| 16/10/2020 | Review meeting with TCPD                                                                                                                                                                 | (Online)                                                                   |
| 28/10/2020 | Review meeting with TCPD                                                                                                                                                                 | (Online)                                                                   |
| 07/11/2020 | Meeting with all elected representatives including MLA, Mayor & ward members along with Municipal commissioner. The meeting was held under the chairmanship of Honorable Mayor, Rudrapur | Conference Hall, Municipal Corporation Office, Rudrapur                    |
| 15/01/2021 | Final draft report -Stage 1 + Vision Formulation + Population Projections                                                                                                                | TCPD                                                                       |
| 19/01/2021 | Spatial strategy formulation + Land use Analysis (Spatially superimposition of violations)                                                                                               | TCPD                                                                       |
| 27/01/2021 | Gap analysis and space requirements + Planning concepts with special reference to the town's special needs, problems, and potentials, the growth trend                                   | TCPD                                                                       |
| 04/02/2021 | Drafting of Zoning regulations                                                                                                                                                           | TCPD                                                                       |
| 25/02/2021 | Draft proposals - Transport, Environment, Disaster                                                                                                                                       | TCPD                                                                       |
| 16/03/21   | CERC                                                                                                                                                                                     | UDD                                                                        |

| Date     | Purpose                                                                                                               | Venue                                    |
|----------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 20/04/21 | Proposed Land Use                                                                                                     | Divisional office Dehradun               |
| 19/05/21 | Transportation Plan and proposed land use                                                                             | Online                                   |
| 27/05/21 | Solid Waste Proposals                                                                                                 | Online                                   |
| 31/05/21 | Tourism and Ecology                                                                                                   | Online                                   |
| 04/06/21 | Zoning Regulations                                                                                                    | Online                                   |
| 05/06/21 | Changes in Zoning regulations                                                                                         | Online                                   |
| 14/06/21 | Proposed Residential and associated Zoning Regulations                                                                | Online                                   |
| 17/06/21 | Proposed Mixed and Commercial Land Use along with associated Zoning Regulations                                       | Online                                   |
| 24/06/21 | PSP, Recreational, Industrial, Transport, and Agriculture land use proposals along with associated Zoning Regulations | Online                                   |
| 31/07/21 | Review Meeting by Chief Town and Country Planner                                                                      | TCPD, Dehradun                           |
| 27/08/21 | Review Meeting by Divisional Commissioner, Kumaon Division                                                            | Divisional Commissioner Office, Haldwani |
| 04/09/21 | Review Meeting by Chief Town and Country Planner                                                                      | TCPD, Dehradun                           |
| 25/10/21 | Review Meeting by Chief Town and Country Planner and Senior Planner                                                   | TCPD, Dehradun                           |
| 03/12/21 | Review Meeting by Chief Town and Country Planner and Senior Planner                                                   | TCPD, Dehradun                           |
| 04/12/21 | Review Meeting by Chief Town and Country Planner and Senior Planner                                                   | TCPD, Dehradun                           |

| Date       | Purpose                                                                                      | Venue               |
|------------|----------------------------------------------------------------------------------------------|---------------------|
| 13/12/21   | Review Meeting by Secretary (Urban)                                                          | UDHA, Dehradun      |
| 12/01/22   | Review Meeting by Chief Town and Country Planner and Senior Planner                          | TCPD, Dehradun      |
| 09/03/22   | CERC                                                                                         | UDD                 |
| 21/07/22   | Review of Draft Master Plan by DM, US Nagar and VC, District Development Authority, US Nagar | DM office, Rudrapur |
| 13/08/2022 | CERC                                                                                         | UDD                 |



## 16. Vision 2041 & Strategy Formulation

### 16.1. Uttarakhand State Government Vision 2030

The Vision for Uttarakhand outlines the vision for the SDGs and the targets/indicators as applicable for the state for the coming years till 2030 and indicates the strategy to achieve the same. A set of indicators suitable for the state have been developed for the targets under the individual SDGs, which can be monitored over time. The Vision for Uttarakhand State Government was framed with the background of 17 Sustainable Development Goals. The framework is focused on the people for the development process. SDGs are categorized into four groups, each of which contributes toward enhancing the development process for the people of Uttarakhand. The four categories are:

1. Sustainable Livelihoods,
2. Human Development,
3. Social Development and
4. Environmental Sustainability (refer to Error! Reference source not found.).

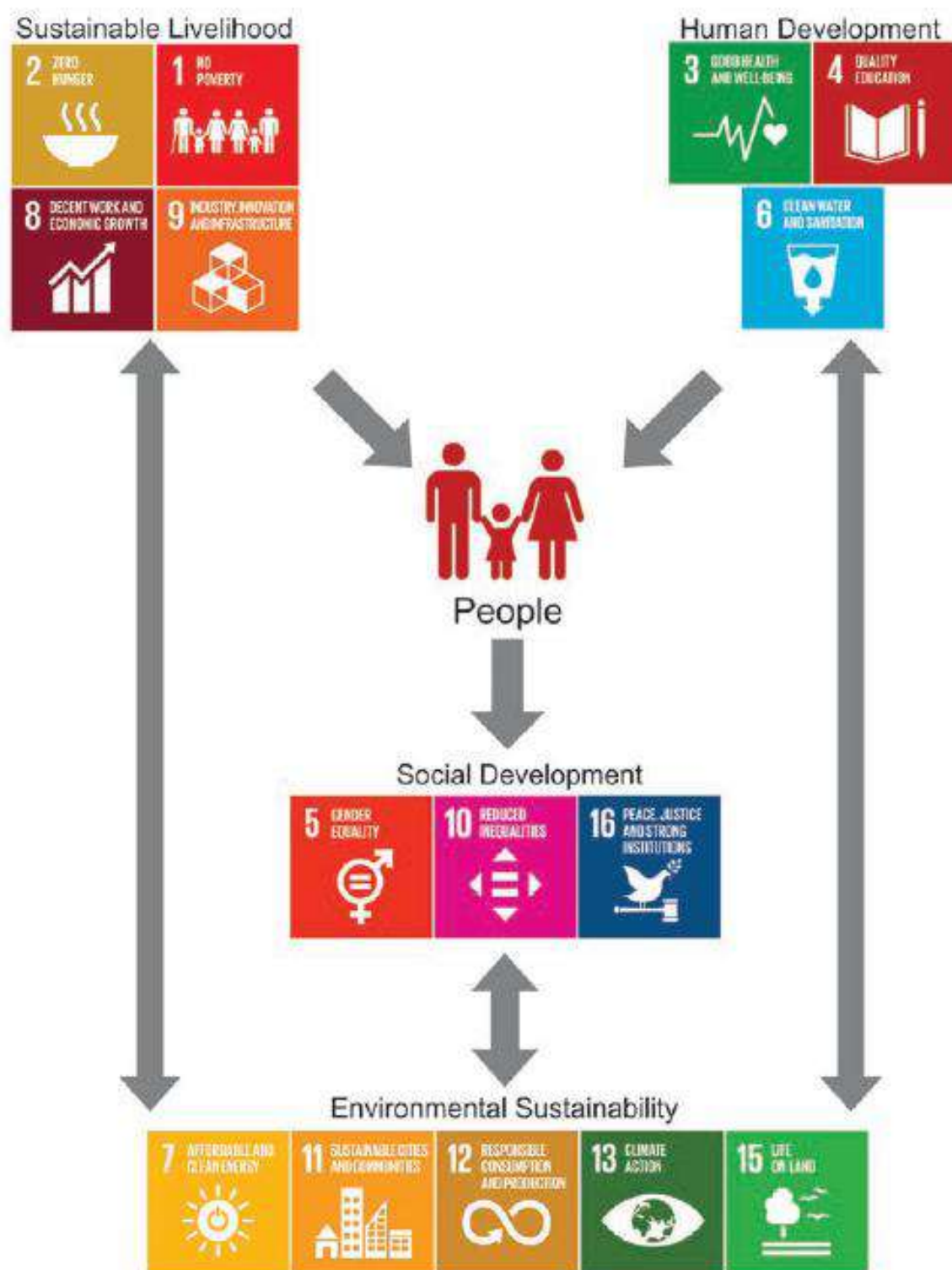
The Vision 2030 for the state, keeping in mind the implementation of the SDGs, is the following:

***“Transform the Uttarakhand economy into a prosperous, healthy state such that the people are educated and gainfully employed in an equitable society, a synergy between the environment and the inhabitants is enhanced, and the development process is sustainable and inclusive.”***

The vision centers on the creation of sustainable livelihoods for the people of the state and also enhancing human and social development in a sustainable manner which would conserve natural resources and protect the environment, such that no one is left behind.

The four groups as represented in **Figure 16-1**, Sustainable Livelihoods, Human Development, Social Development, and Environmental Sustainability center around people. Sustainable livelihoods and human development directly influence the people which as result help us to achieve social development. And all the above three together influence environmental sustainability. To achieve environmental sustainability, all sectors have to come together.

*Figure 16-1: Framework for Uttarakhand Vision 2030*



Source: Uttarakhand Vision Document 2030

## **16.2. Vision for the Kashipur Master Plan, 2041**

The evolution of the vision for the Kashipur Master Plan was through various stages of stakeholder consultations and thorough discussions with the representative of the client agencies. A detailed analysis of the existing situation, current development scenario, and future perspective was also recognized during the development of the vision. Also, the strengths, weaknesses, opportunities, and threats of the Kashipur Planning Area have been considered. The Vision for Kashipur Planning Area 2041 is as follows:

***To evolve Kashipur Planning area into a Diversified Economy, with a focus on Trade and Commerce Centre for Surrounding Regions, Planned Industrial Areas, National/Regional Level Education Hub, Tourist Destination Centre through Providing High-Class Tourist Infrastructure while conserving the Built and Natural Heritage. Kashipur will also act as a parent city for Surroundings Satellite Towns like Bazpur, Jaspur, Ramnagar, Mahuakheraganj, and Thakurdwara (Uttar Pradesh) through the provision of a High-class Transportation network.***

Kashipur has the potential in many diverse sectors, it is growing famous for development in industrial sectors; the trade and commerce of the planning area are well developed due to the presence of the Kumaon Garhwal Chamber of Commerce & Industry (KGCCI); due to the development of IIM Kashipur in 2011 and with good educational infrastructure Kashipur has the potential to be developed as an educational hub; Kashipur also has a huge potential of Tourism with famous tourist spots and ASI recognized site. Its proximity to Jim Corbett National Park is also advantageous to the planning area as the tourist could be diverted to Kashipur and increase its footfall. On the environmental front, there are a few eco-sensitive sites in the planning which need to be conserved and preserved along with the heritage sites.

## **16.3. Goals and Strategies**

In alignment with the Vision for Kashipur Planning Area five goals are developed and to achieve these goals strategies are also prepared. The goals for Kashipur Planning Area are as follows (refer to **Figure 16-2**):

1. Developing Kashipur as Trade and Commerce Centre
2. Facilitating Planned Industrial Development
3. Amplifying Tourism Development

4. Creating National and Regional level Educational Hub
5. Accomplishing Environmental Sustainability
6. Parent City for the surrounding Satellite towns
7. Providing High-Class Transportation Network

**Figure 16-2: Goals for Kashipur Master Plans**



### **16.3.1. Enhancing Industrial Development**

The industry is a growing sector in Kashipur Planning Area.. The potential for industrial development is huge here due to the availability of raw materials as well as the workforce. It could boost the economy of Kashipur Planning Area and provide plenty of employment opportunities. The strategies for enhancing industrial development are as follows:

1. To foster industrial development based on local resources available.
2. To develop and improve existing transport infrastructure for facilitating easy movement of goods and vehicles.
3. To create an attractive environment for private sector investment through planned industrial areas.

### **16.3.2. Strengthening Trade and Commerce**

Kashipur has a well-established Trade and Commerce sector. There are 6672 shops including both wholesale and retail that exist in Kashipur city which is scattered all over the city and is growing towards transport corridors. There are also 4 informal markets and a Mandi. There is a need to regularize these markets for enhancing the growth of Trade and Commerce in the Kashipur Planning Area. The strategies to strengthen trade and commerce are as follows:

1. To initiate and support economic activities along the transport corridors.
2. To ensure the implementation of the NULM mission and PM SVANidhi for street vendors.
3. To preserve the informal street food culture by regularization of these markets.

#### **16.3.3. Creating an Educational Hub**

Kashipur already has a surplus educational facility and where students from nearby regions also travel to avail the facilities. And the establishment of IIM Kashipur has increased its potential for being an educational hub at a regional level. The strategies for making Kashipur an Educational Hub are as follows:

1. To provide good educational infrastructure.
2. To facilitate easy accessibility of educational infrastructure by providing good connectivity to nearby regions.

#### **16.3.4. Amplifying Tourism Development**

Kashipur has major tourist destinations like Dronasagar, Girital, Chaiti Devi Temple, Gurudwara, and Mahadev temple which receives a lot of tourists over the years. And due to its proximity to Corbett National Park, many tourists travel via Kashipur to reach the park which is an advantage for the planning area. The economy of the city could be boosted with the help of tourism development. The strategies are as follows:

1. To improve transportation links for better movement of tourists within the city.
2. To provide infrastructure supporting tourism like hotels and restaurants.
3. To create a tourism zone for providing Tourist Infrastructure.
4. To conserve the Heritage Sites/ Archeological Sites.

#### **16.3.5. Accomplishing Environmental Sustainability**

In Kashipur the pollution of the major natural Drain i.e., the Kalyani River is a major concern and there are many natural drains in Kashipur Planning Area that fall under the eco-sensitive zone that needs to be protected. The strategies to attain environmental sustainability are as follows:

1. To protect the eco-sensitive areas.
2. To provide recreational/green/ open spaces in the planning area.
3. To reduce air, water, land, and noise pollution.

#### **16.3.6. Primary City for the surrounding Satellite towns**

Kashipur acts as a parent city according to the settlement hierarchy for the surrounding region's satellite towns which include Bazpur, Jaspur, Ramnagar, Mahuakheraganj, and Thakurdwara (Uttar Pradesh). All these towns depend on Kashipur for infrastructure facilities. The strategies for strengthening these facilities are as follows.

1. To provide good quality social infrastructure (Education, HealthCare, Sociocultural, Recreational).
2. To provide good commercial infrastructure to cater to all nearby towns as well.
3. To provide good connectivity for easy accessibility.

#### **16.3.7. Providing High-Class Transportation Network**

With such a diverse economy the city demands a good transportation network to connect it to surrounding regions, to make the facilities of the planning area easily accessible, to facilitate the movement of goods and vehicles for industries, to attract tourists, and to manage the city's vehicular movement. Transportation acts as the backbone of all other strategies. The strategies are as follows.

1. To create a high-class transport infrastructure facility.
2. To encourage a mode of public transport to make traveling accessible to the majority of the population.
3. To develop a hierarchy of roads to facilitate both passenger and goods movement.
4. To develop a Transport Nagar for organized movement of vehicles.
5. To provide a bypass in the planning region to separate the various kinds of traffic traveling through the planning area.
6. To propose various cross-sections for different parts of the city to accommodate all the users (car, auto, cycle, pedestrian).



## **17. Spatial Growth Strategies**

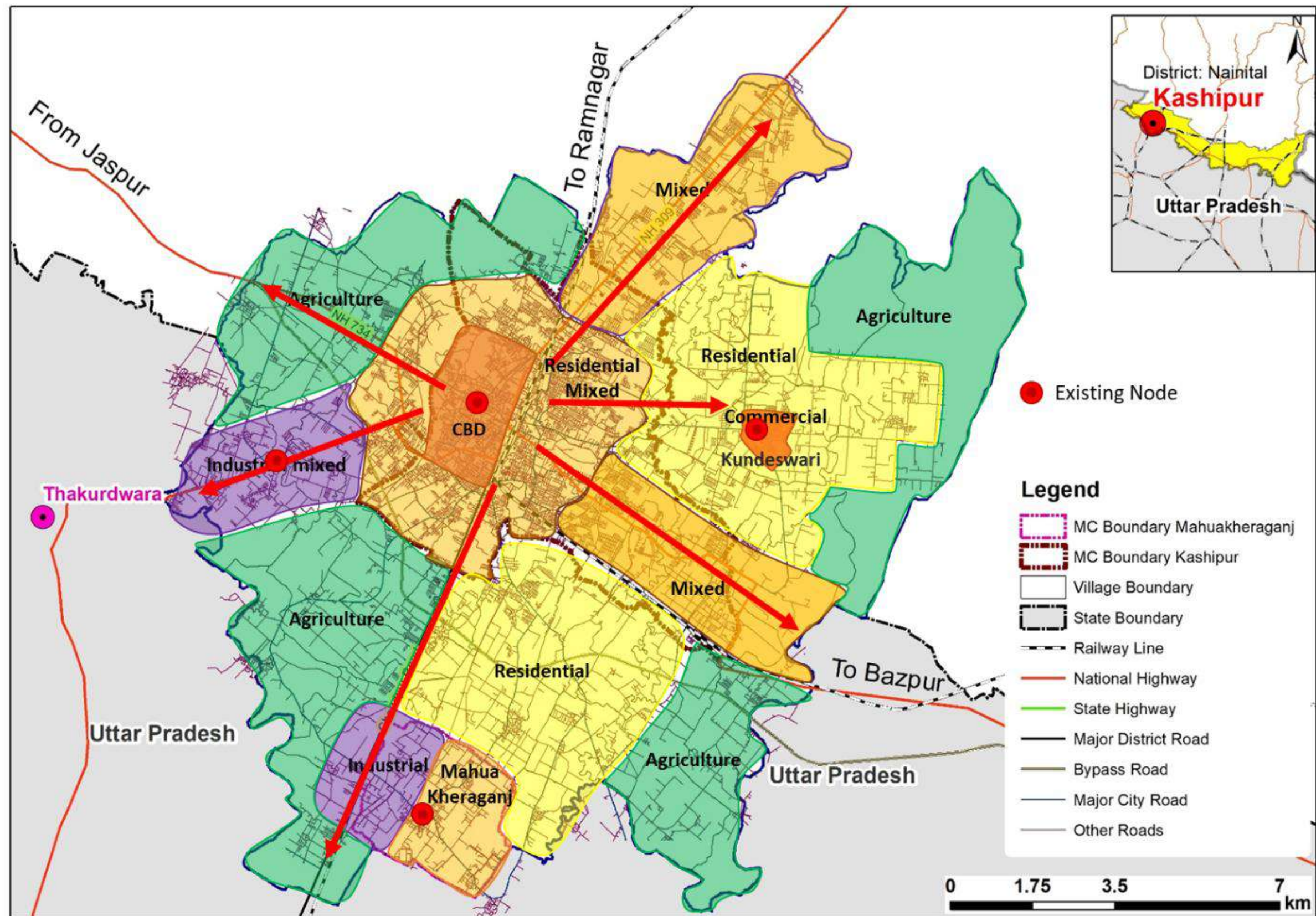
This chapter deals with the Spatial growth strategies for the Kashipur planning area which is directly based on the need and requirements of the city. To analyze these various land-use models were analyzed like Burgess Model or Concentric Zone Model, Sector Model, Multiple Nuclei Model, and Compact city model concerning existing urban form. All the methods have been considered for the future growth of the Kashipur Planning Area and discussed below and the best-suited method is adopted for the planning area.

### **17.1. Morphology and Direction of growth**

Kashipur has organically developed over the years on the National Highways 309 and 734. The city has mainly grown on the west side of this junction; hence we can see the old city character here. The nature of the city is completely mixed where we can find major residential areas. The old city is the major commercial district of the town where major government offices, educational institutes as well as health facilities are found. Major transport facilities like railway stations and bus stands are also found in the old city. Apart from this household industry can also be found. We can see the old city has multiple characters and is the most crucial area of the Kashipur Planning Area. Along with the old city on all sides, residential development could be seen, and to cater to these residential areas commercial development has come up. But along the major roads' the commercial is prominent. That's the character of this zone is mixed but predominantly residential. After the mixed residential zone, we can see development majorly along with the transport linkages.

The area along the Kashipur-Rudrapur road has Mixed land use characteristics including commercial, residential as well as industrial could be seen. But the Kashipur-Thakurdwara road has developed as an industrial zone. This is because this zone has been developed as an industrial zone in the previous master plan. Industrial development can also be in Mahua Kheraganj which falls on Kashipur-Chandpur road and the UP border. Other low-dense residential areas are developed on the eastern side of the city on both sides of the Kashipur-Rudrapur road. On the northeastern side of the city, a commercial estate has been established as it was proposed in the previous master plan.

The Kashipur Planning Area is divided into two parts by Dhela River and along this river, various inhabitable settlements have been formed illegally. This is harmful to the people as well as the environment. The growth along the city has to be regulated. In the planning area,



Source: Analysis by Town and Country Planning Department



we can also find ASI-certified sites and tourism potential sites where tourists have been increasing every year, but due to lack of infrastructure, they have to face inconvenience.

Overall, there are four major nodes formed in the Kashipur Planning Area with different characteristics each. The first node is CBD or the old city which is the Major Centre for all facilities of the Planning area as well as for the nearby regions. The second node is Mahua Kheraganj which is the industrial town of the Planning Area lying on the outskirts. It has been developing as a town for itself with industrial, residential, commercial as well as public/semi-public facilities. The third node is Kundeswari which is currently acting as a commercial center for the Planning Area. The fourth node is along the Kashipur-Thakurdwara road where there is a development of a lot of industries. Unlike Mahua Kheraganj this is developing only as an industrial node, whereas Mahua Kheraganj is acting as a town as it is a Municipal Council (refer to **Map 17-1**).

## **17.2. Concept Alternatives**

In this section different concepts like Burgess Model or Concentric Zone Model, Sector Model, Multiple Nuclei Model, and Compact city model for Kashipur Planning Area have been discussed. These concepts attempt to explain the spatial arrangement and settlement patterns and their relationship with each other.

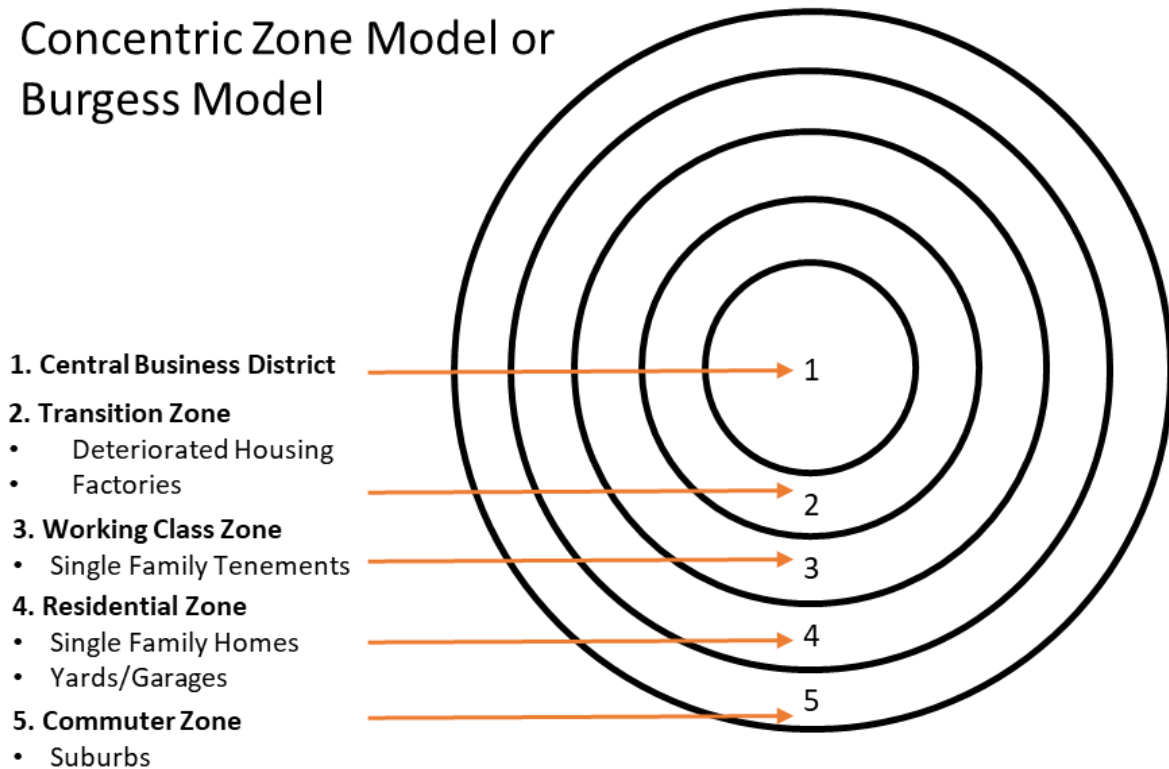
### **17.2.1. Concept Alternative 1: Concentric Zone Model**

The concentric zone model also known as the Burgess Model was created by Ernest Burgess and is based on how different social groups are located in a metropolitan area. The Burgess model is one of the well-known models which have been used widely in urban planning. The zones are based on the distance from the Central Business District. The concentric zone model was developed between 1925 and 1929 based on the study of American cities. According to the model, five different zones were arranged concentrically from the center (refer to **Figure 17-1**). The center/zone 1 is the oldest part of the city around which the city has developed over time. The development of the city is also in a concentric manner with the newest development on the edge. Zone 2 is the transition zone from where mixed residential and commercial could be found leading towards completely residential and hence, called the transition zone. Zone 3 is the working-class zone which is mainly for residential purposes of the workers but with better conditions than zone 2. The area is found to be a mixture of old and new buildings. Zone 4 is also a residential zone for middle-class families. Most of the homes are detached unlike in zone 3 where single occupants were mostly found. Better facilities are available in this zone but the communication cost is higher. Zone 5 is the peripheral area and the farthest from the

city with a high communication cost. But this provides a better quality of life and houses are more spacious.

**Figure 17-1: Concentric Zone Model**

## Concentric Zone Model or Burgess Model

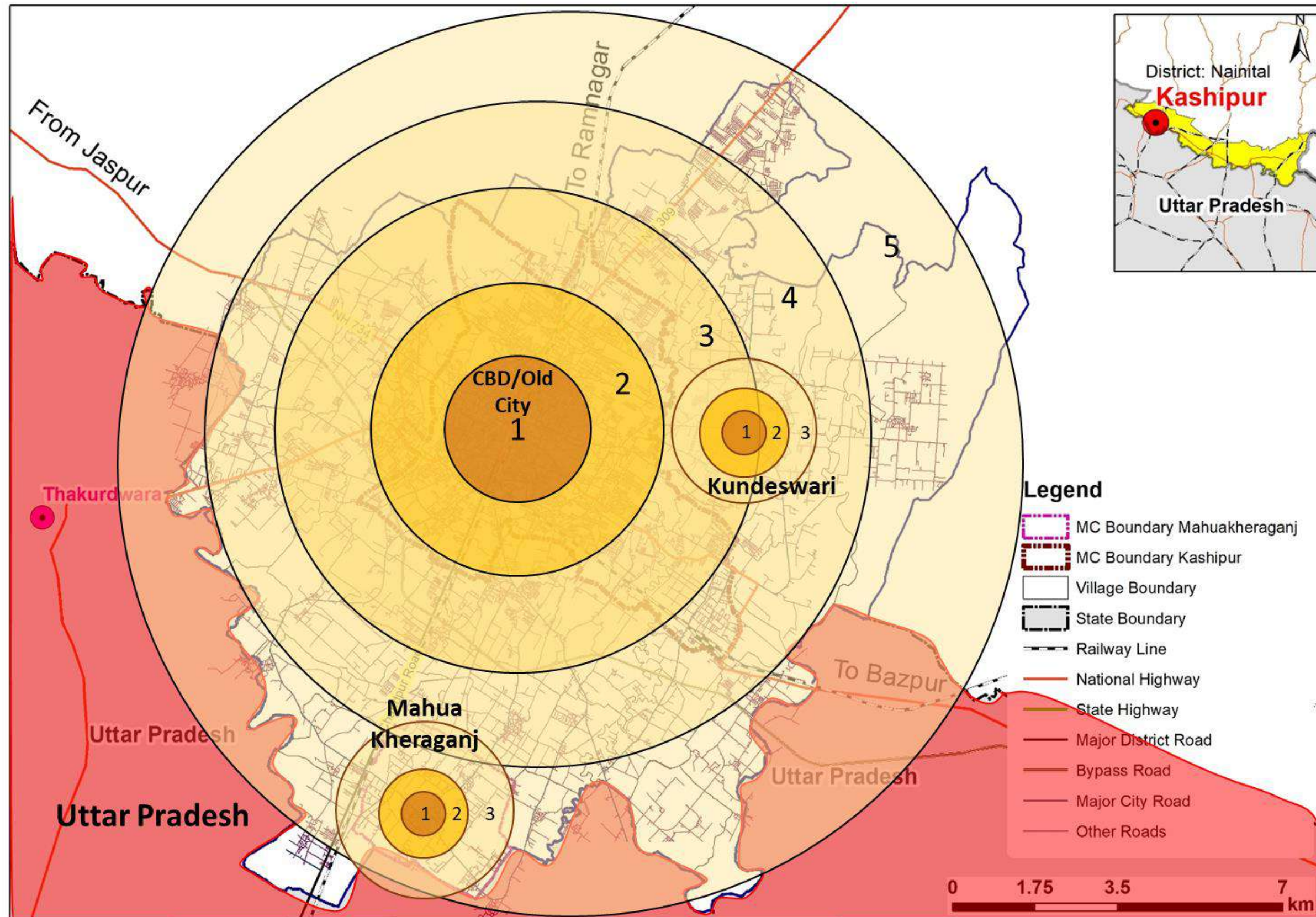


Source: Planning Tank

The concentric zone model has been tried to be implemented in Kashipur Planning Area as given in **Map 17-2**. Zone 1 is the Core area of Kashipur which has a mixed character including commercial, residential, and public/semi-public. It is the densest area of the Kashipur Planning Area. Zone 2 is the transition zone where we can find residential development along with commercial. Zone 3 has mainly residential development and with-it industrial development could be seen along the roads towards the southern part of the city. Zone 4 could be mainly seen as agricultural land and rural settlements but along the roads, there is commercial and industrial development. Zone 5 falls is mainly agricultural land. But in zone 5 Mahua Kheraganj NPP falls in the outskirts and is attached to the UP border.

Apart from this within the Kashipur Planning Area two other major nodes i.e., Kundeswari and Mahua-Kheraganj, are developing as smaller-level nodes, which are showing concentric rings in their center. So, the concept of one single CBD in the concentric zone is not in alignment with the existing development of the city.



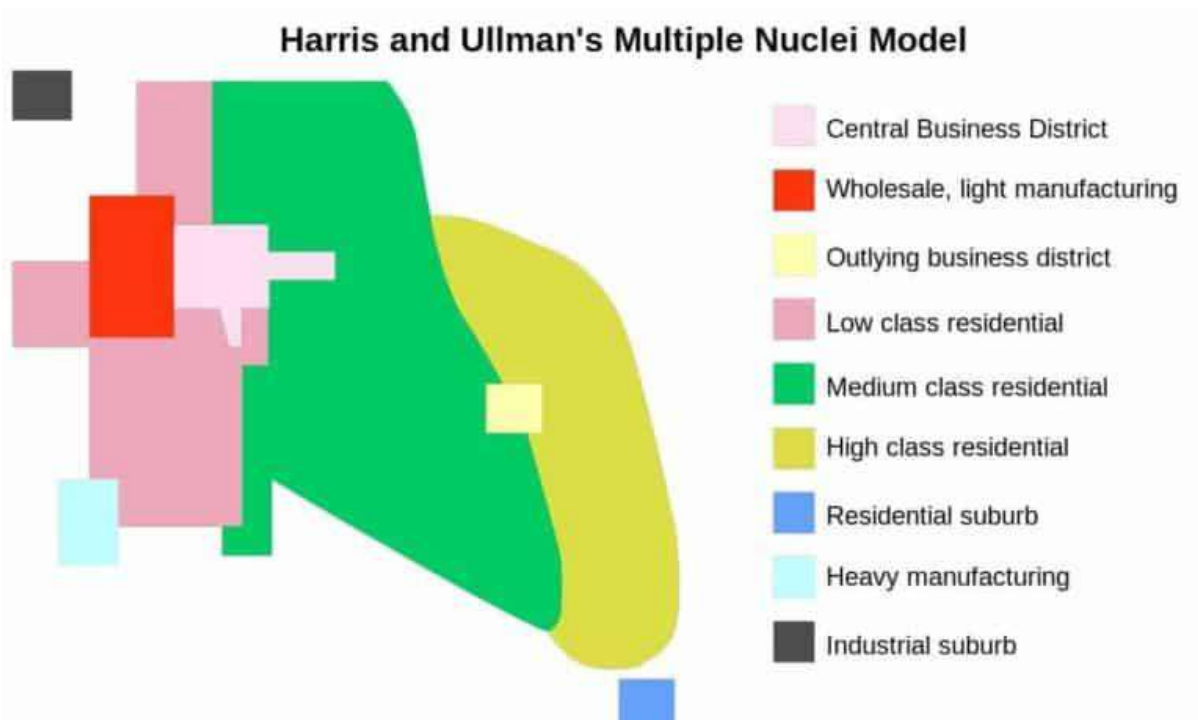


Source: Analysis by Town and Country Planning Department

### 17.2.2. Concept Alternative 2: Multiple Nuclei Model

The multiple Nuclei model was given by C.D. Harris and Edward L. Ullman in 1945 which was based on the argument that a city has multiple growth points which are referred to as nuclei. This is one of the widely adopted models which applies to modern cities as the city developed it undergoes many changes and the structure of the city and its land-use patterns have distinct characteristics and noticeable patterns. Based on these patterns the model can be developed and help understand the city. The multiple Nuclei Model is contrary to the monocentric model like the Concentric Zone Model. The argument presented in the Multiple Nuclei Model is that the city might start with the central business district but with time the activities are scattered and get modified, where each dominant activity is formed as a nucleus. The model is presented in **Figure 17-2**. With the central business, the district is attached to wholesale and manufacturing industries, and closer to the CBD are the low-class residential. From low-class residential, the model gradually moves to medium-class residential and then high-class residential. An additional outlying business district is formed to cater to the needs of the residential areas of the outside which are far away from the CBD. Heavy manufacturing, Industrial suburbs, and Residential Suburb are present outside of the city.

Figure 17-2 Multiple Nuclei Model



Source: Planning Tank



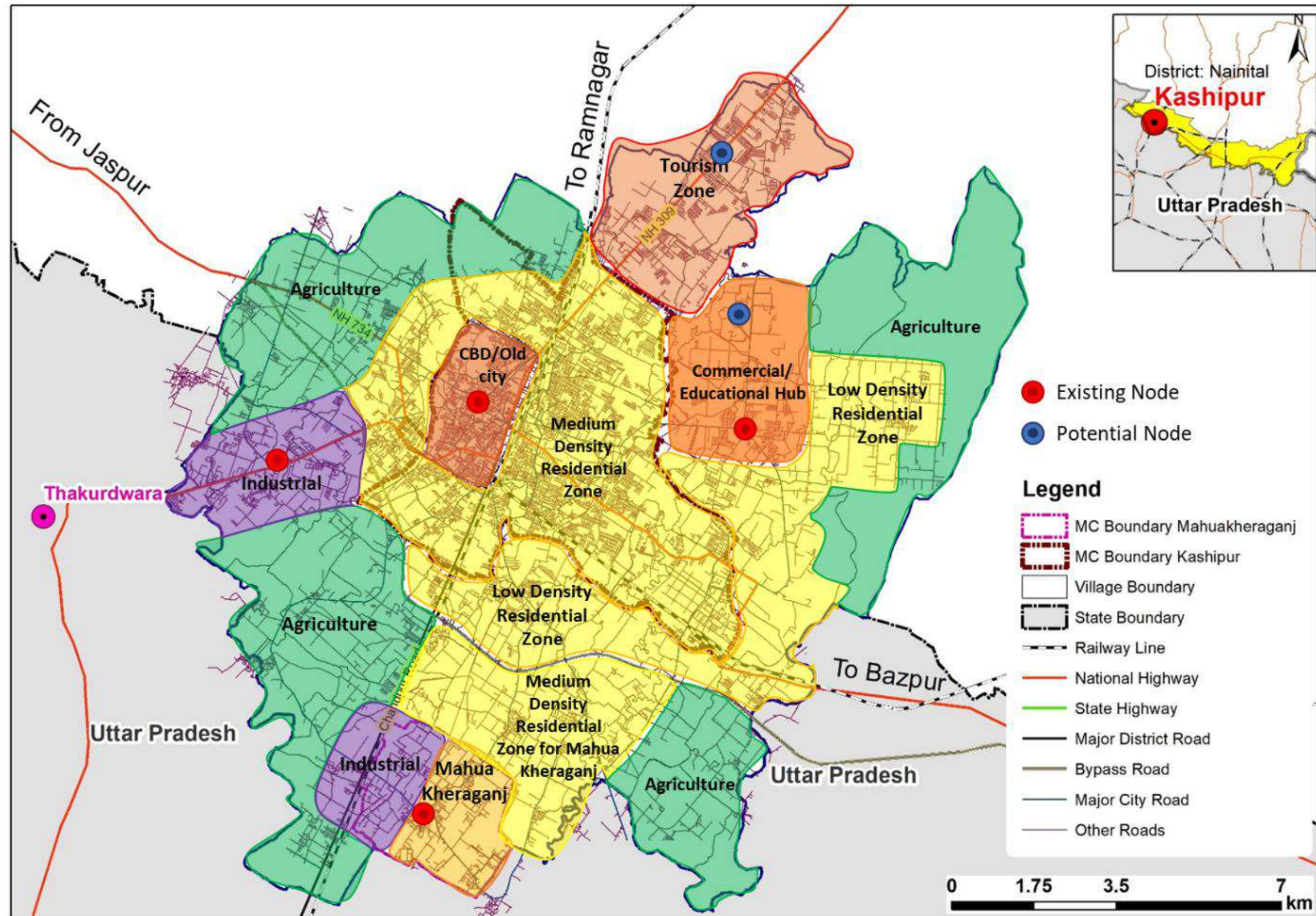
When the Multiple Nuclei Model is applied to Kashipur Planning Area Error! Reference source not found. was generated. The existing four major nuclei could be established in Kashipur Planning Area as discussed in the current form section (refer to Error! Reference source not found.). First is the core city which acts as the main CBD for the planning area and second is Mahua Kheraganj along the Kashipur-Moradabad road, on the UP border, which acts as the industrial town with both industries and residential development for the city. The third is the commercial zone in Kundeswari which has been proposed in the previous master plan. The fourth Nucleus is an industrial corridor along the Kashipur-Thakurdwara road which was also proposed in the previous master plan.

Kashipur also has potential in two more sectors. Due to its high tourism potential, a tourism zone can be developed towards Ramnagar and due to the presence of IIM Kashipur, it has the potential to be developed as an educational hub near that area. The area near IIM Kashipur is commercial nuclei Kundeswari and hence both of them could be combined to form a new zone. Hence in total five nuclei can be formed in Kashipur Planning Area. On all sides, agricultural land has been proposed as Kashipur is also an agriculture-based town.

### **17.2.3. Concept Alternative 3: Sector Model**

Sector Model (also known as Hoyt Model and Hoyt Sector Model) is an urban land use model which talks about the spatial arrangement of activities in an urban area. Homer Hoyt gave a sector model in 1939 which explains how cities grew and activities arranged themselves in the form of a sector radiating out from the main central district. He argued that cities do not develop as simple rings but instead develop various sectors. He suggested few activities grow in the form of sectors that radiate out along the main travel links. The land use in each sector would remain the same as like attracts like. These sectors generally grow along railway lines, highways, or rivers. The components of the Hoyt Model include the Central Business District (CBD), Factories and industries, low-class residential, middle-class residential, and high-class residential as given in **Figure 17-3**. The main center is the CBD which is complex and dynamic and from this radiates out the industries because of the presence of transport linkages along which the activities grew and thus a continuous corridor or sector is developed. Manufacturing industries have a huge influence on how a city grows and shapes the overall geometry of the area.

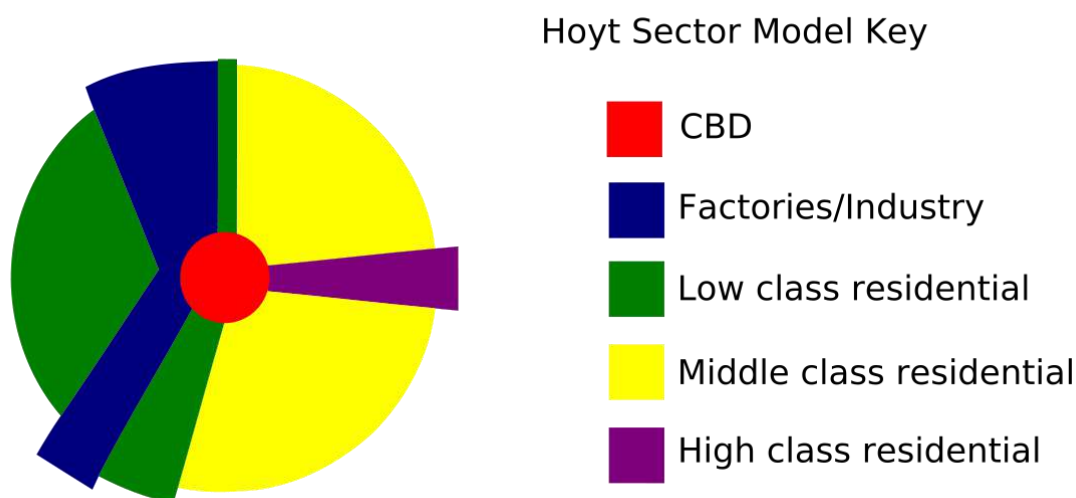
Map 17-3: Multiple Nuclei Model in Kashipur Planning Area



Source: Analysis by Town and Country Planning Department

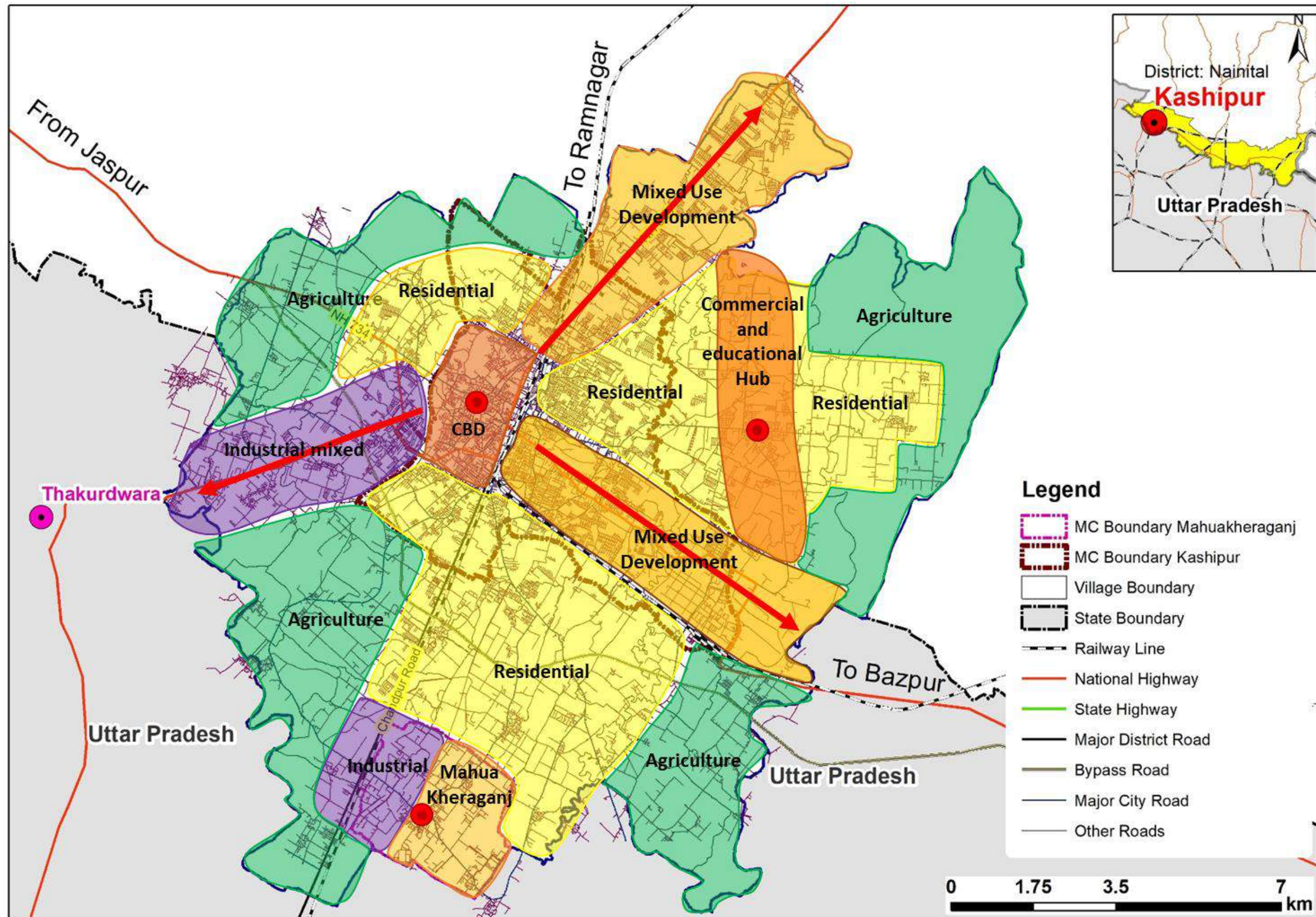


**Figure 17-3 Sector Model**



Source: Planning Tank

**Map 17-4** represents the overlapping of the Sector Model in the Kashipur Planning Area. The main center is the core area where the city originated and is the main commercial as well as the residential district of the planning area. The CBD is formed at the junction of the three major highways NH 734 and NH 309 and along with these linkages the city has grown gradually. The growth of the cities is radially in all directions. On the east-west and north goes highways and on the south two major roads. On the Kashipur-Ramnagar road, major commercial development could be found, in Kashipur-Jaspur the development is comparatively less and more oriented towards residential, in Kashipur-Thakurdwara road industrial development could be found. Another wedge that could be found in the commercial and educational hub in between the two mixed-use development zone on the commercial node Kundeswari and educational institute IIM Kashipur. The Kashipur-Rudrapur road is developing mainly commercial and also industrial. The road along Mahua Kheraganj is not mainly residential and only near and around the NPP we can find industries. The areas in between these linkages are developing as residential. So, we can see the formation of sectors the along the transport linkages but not on all of them



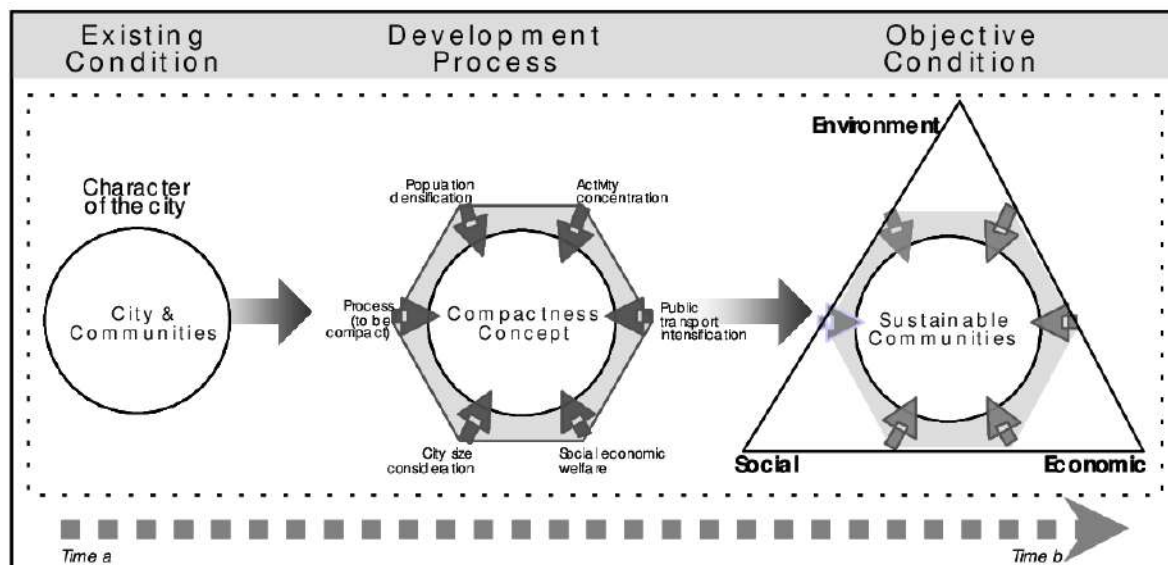
Source: Analysis by Town and Country Planning Department



#### 17.2.4. Concept Alternative 4: Compact City Model

The compact city also known as the city of short distances is a currently emerging concept in urban planning. It is a sustainable approach to planning which mainly emphasizes urban activities to be located closer together to ensure better access to services and facilities via public transport, walking, cycling, and other efficient utility and services. It promotes high-density development with predominantly mixed land use and provides infrastructure facilities within walkable distance. The advantage of compact city development is that it consumes less territory and creates an efficient network of public utilities and public transit systems. The three pillars of the compact city are Environmental sustainability, Economic sustainability, and Social sustainability. **Figure 17-4** represents the development process of the compact city. It focuses on a convergent process where all the activities are concentrated in one place compactly to achieve environmental, economic, and social sustainability. In terms of transportation, it suggests the provision of outer and inner ring roads for connecting the entire city with the core.

*Figure 17-4 Compact City Concept*



Source: semanticscholar.org

In Kashipur planning Area as per **Map 17-5**, the compact city has been developed conceptually. As the compact city supports high-density development the entire planning area cannot be converted to high-density development as the character of the city differs. Only the zone highlighted in orange can be achieved as high-density development. Along with the highly dense development, development zone 2 is also demarcated. The areas beyond this high dense development zone have to be developed differently as we can see plotted housing has been coming across in parts of the land that cannot be converted to high dense development. Also,

in the compact city, a green belt is preferably left on the outskirts of the city which act as a no-development zone. The entire planning area needs to connect from the outside via a ring road where on the southern portion a bypass is already proposed and can be achieved in Kashipur Planning Area. But a green belt on all sides is not possible as Mahua Kheraganj is growing on the outskirts and beyond it is the UP border.

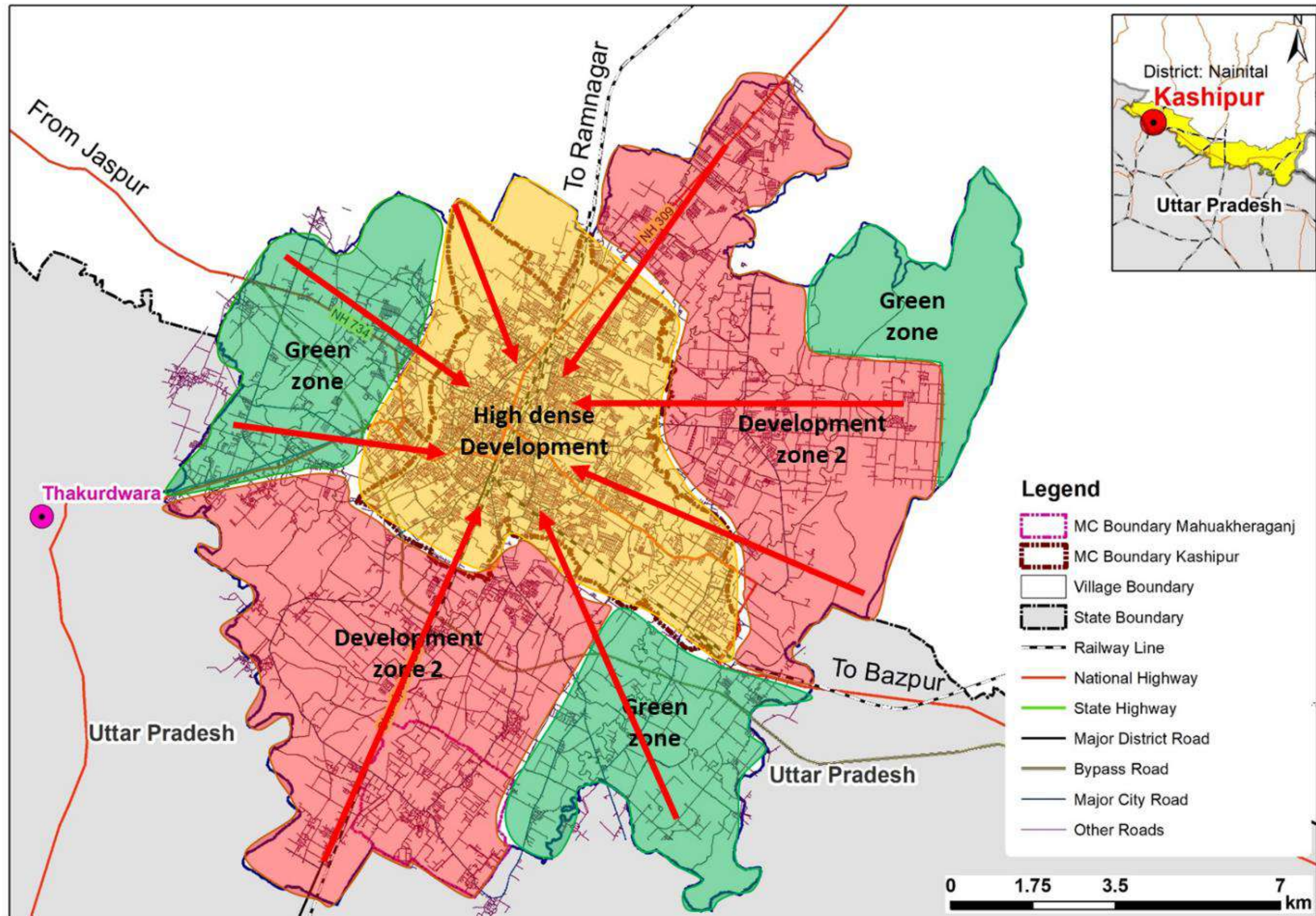
#### **17.2.5. Concept Alternative 5: Parent city and Satellite Town with quick transportation facility**

The concept of parent city and satellite city is the relationship between them. As the name suggests the parent city act as the main urban center for the cities around it. The satellite towns are smaller municipalities that are adjacent to a major city. Kashipur MC here acts as the major Urban Centre for the towns around it. These towns are Jaspur, Ramnagar, Bazpur, Thakurdwara, and Mahua Kheraganj. They depend on Kashipur for various public services, commercial, employment as well as leisure. Kashipur acts as a parent while the nearby towns act as Satellite towns. At the local level, two major nodes are formed in the Planning area Mahua-Kheraganj and Kundeswari. As the dependency of these towns on Kashipur is so high, it is imperative to provide a high-quality infrastructure facility that would facilitate quick accessibility of the five major Satellite towns with Kashipur MC as well as the major nodes of the city as represented in **Map 17-6**. The transportation facility also needs to be at different hierarchies where Kashipur and major Satellite towns are connected by higher-level roads and Kashipur and major nodes and major nodes and Satellite towns are connected by the next level of roads (refer Error! Reference source not found.).

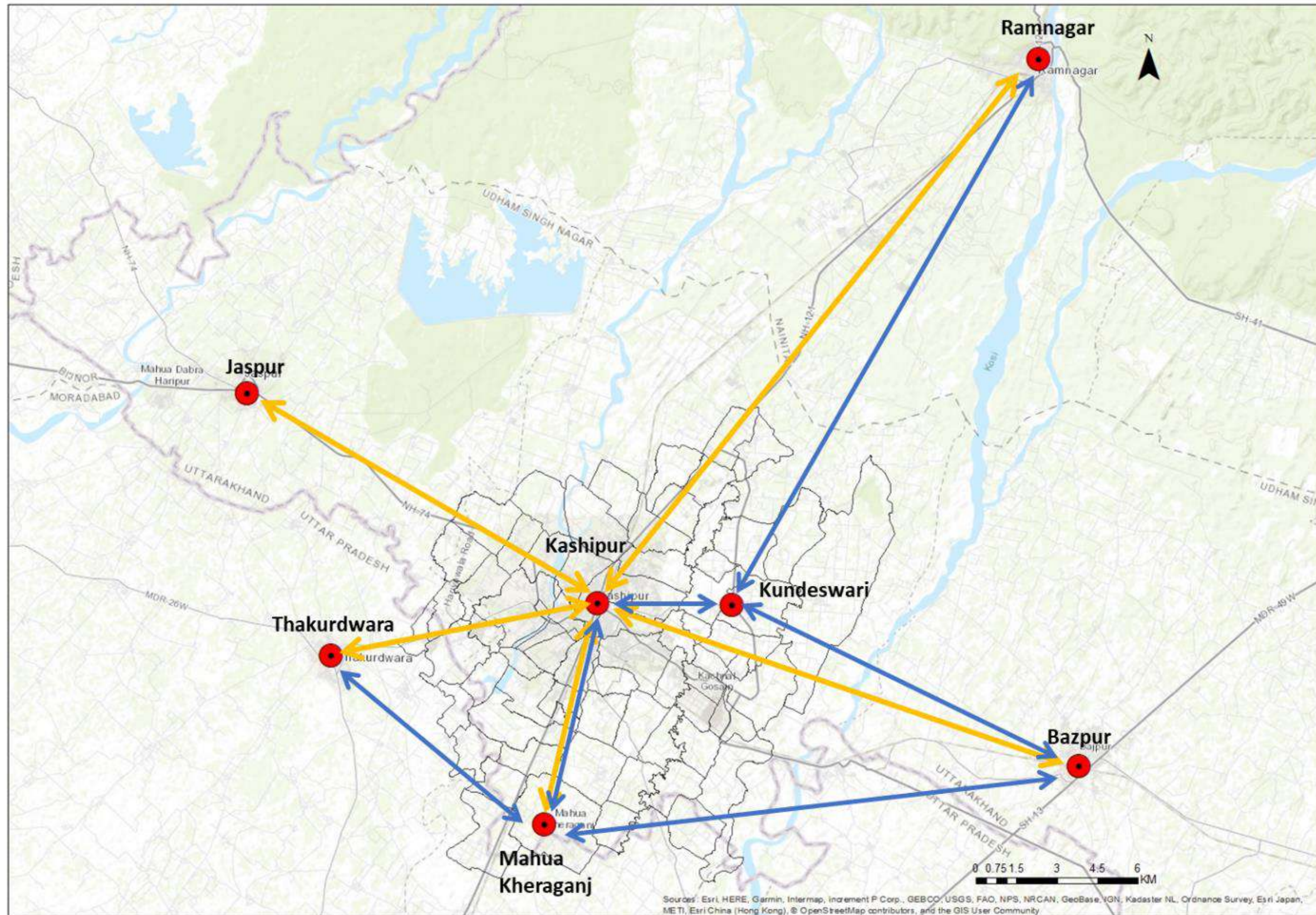
### **17.3. Selection of Preferred Concept**

As discussed in the previous section four concept alternatives are developed and discussed in detail for Kashipur Planning Area. All the models have been tried and tested to be implemented in the Kashipur Planning Area. The gist of each model and selected model for Kashipur Planning Area is discussed in this section and based on this discussion the best-fit alternative is used for Kashipur Planning Area. With the selected model, the spatial growth direction and strategies for Kashipur Planning Area 2041 are identified. The final proposals for the master plan are in alignment with these strategies and growth directions.





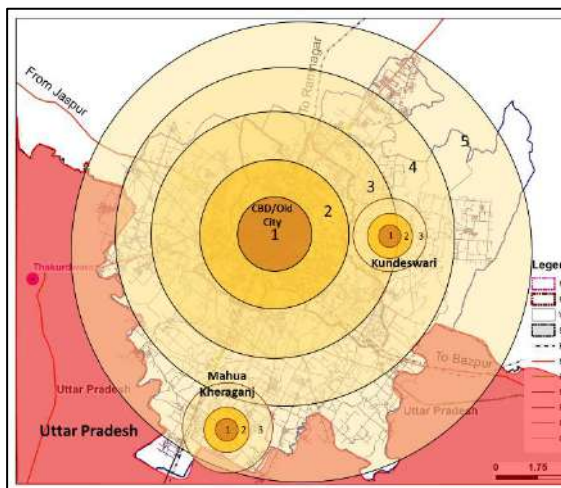




Source: Analysis by Town and Country Planning Department

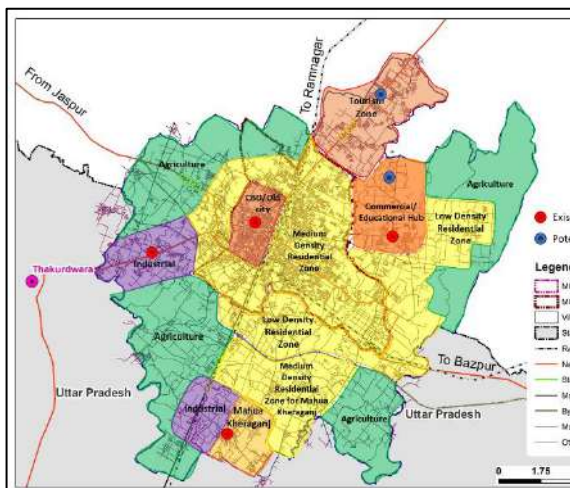


Concentric Zone Model



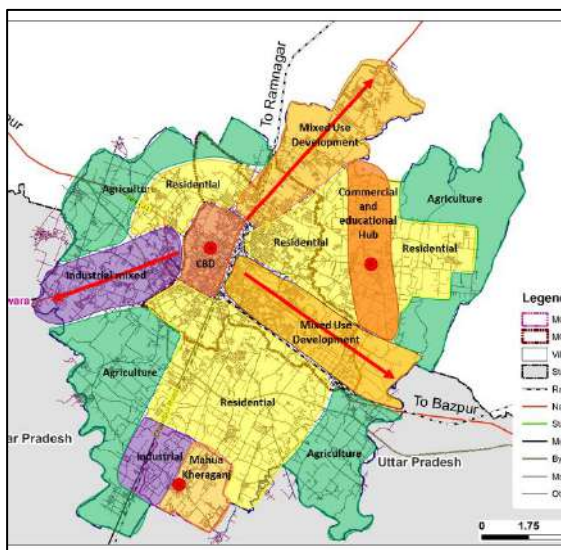
Growth is hindered due to the UP border on the south and existing growth does not fit the model concept. Major nodes form their zones of concentric rings.

Multiple Nuclei Model



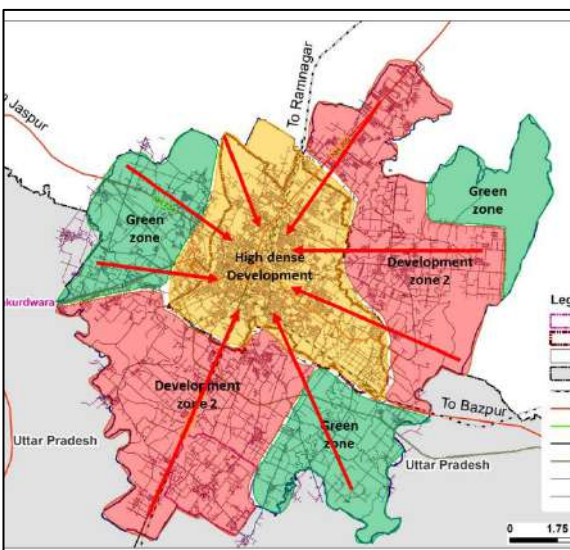
Existing four major nuclei could be found and has the potential for the development of two more nuclei.

Sector Model



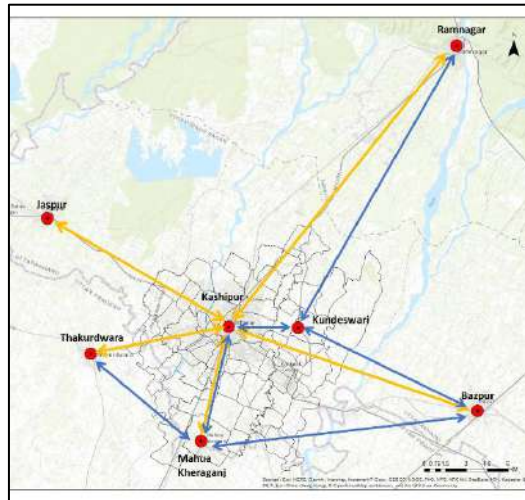
Growth along with the transport linkages but not on all the roads and with-it residential growth could be seen. Sectors can also be developed on other roads not necessarily from CBD. Different sectors radiate from the core area.

Compact City Model



High-density development can only be achieved in a limited area. But the core area is already congested and needs to be revived and regulated.

### Parent City and Satellite Town



Kashipur is acting as the main Urban Centre or the Parent City for the nearby towns which act as the Satellite towns. Connecting these towns with Kashipur MC and Major nodes of Kashipur with Kashipur MC through high-quality infrastructure for easy accessibility and better connectivity.

All the above five models have a few common strategies with Kashipur Planning Area. The center of the city acts as the CBD as per the concentric zone model and along with it has developed residential all around. The potential of multiple nuclei is the aptest fit because the diverse economy can develop multiple nuclei in the Planning Area. As per the sector model, it is observed that the growth along with the transport linkages and the concept of connecting the entire city can be achieved in Kashipur Planning Area, but it is very important to provide high-quality infrastructure between the Parent city and Satellite Towns. With this, a hybrid model is prepared for the Kashipur Planning Area including all the models discussed above.

## **17.4. Spatial Strategies**

Based on the Vision, Goals, and Strategies and the selected model for spatial growth in the above sections the spatial strategies are developed.

### **17.4.1. Transport**

Kashipur Planning Area is one of the major economic drivers and has the potential for future enhancement and development. Kashipur plays a heterogeneous character with its different economic activities and acts as a regional center for its surrounding areas. Kashipur city is located at the intersection of two national highways i.e., NH-309 and NH-734, the traffic gets converged and it becomes a choke point near the core city area. Further, industrial expansion can be seen in the southern portion of the Planning Area. So, there is a need for good transportation infrastructure to facilitate the movement of heavy goods and vehicles. Also, from the transportation analysis, it was found that the city needs bypass roads as there is a lot of thru traffic passing through the city. In the southern portion of the Planning Area, the traffic movement for external-to-external traffic of goods vehicles can be seen highest along Aliganj

Road i.e., 51%, which enters the city. So, there is a need for a bypass in the southern portion which has already been proposed and is under construction. It starts from NH-309 near Jagannathpur village and ends on NH-734 in Kunda village crossing Aliganj road in Banskhedha village (refer to **Map 17-7**).

Furthermore, in the same line, a bypass is required in the northern portion of the Planning Area as per the transportation analysis to create a ring road for the city which will decongest the city in the future. The traffic movement for external-to-external traffic of passenger and goods vehicle has a substantial share along Ramnagar Road i.e., 23% and 35% respectively. This traffic movement is entering the city and then diverting. So, there is a need for a bypass proposal that will start from Kunda village on NH-734 crossing the Ramnagar road near Dhanauri Patti village, and will merge on the existing Bannakhera road near Kosi river (refer to **Map 17-7**). The Bannakhera road connects NH-309 in Jagannathpur village which will create a complete ring for the city. It is imperative to propose a bypass road on the northern part of the Planning Area since an industrial estate (IIE-Escort Farm) is also proposed in Dohari Vakil village beside IIM Kashipur. This will increase vehicular movement in the future which should be looked upon. Moreover, for the future tourism potential of the city, the northern zone along Ramnagar Road will be developed as a tourism zone which will subsequently attract hotels and commercial activities.

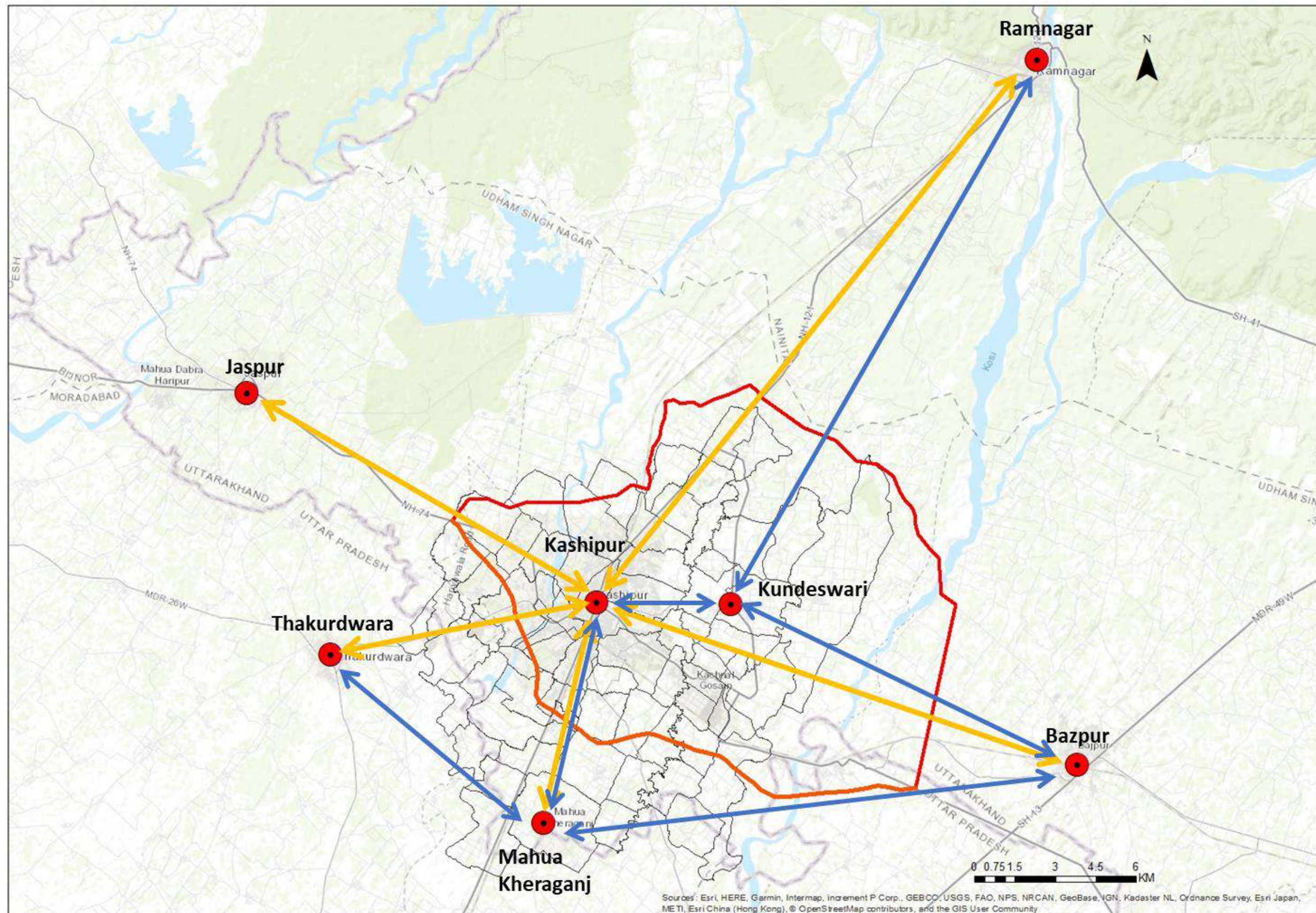
Kashipur acting as the Parent city for the Satellite towns Jaspur, Ramnagar, Bazpur, Thakurdwara, and Mahua Kheraganj, needs a high-quality infrastructure facility connecting these towns to the Parent city. The major nodes i.e., Kundeswari and Mahua-Kheraganj, of the Parent city also need to be connected to the nearby towns. **Map 17-8** represents these conceptually. The yellow lines are the highest level of roads connecting the satellite town with Kashipur MC and the blue lines are the next level of roads connecting major nodes to Kashipur MC and nearby Satellite towns. The proposed ring road in **Map 17-7** also connects all of these Satellite towns where the vehicles do not have to enter the Kashipur MC and hence a major advantage to the planning area.





Source: Analysis by Town and Country Planning Department





Source: Analysis by Town and Country Planning Department



#### 17.4.2. Environmental Considerations

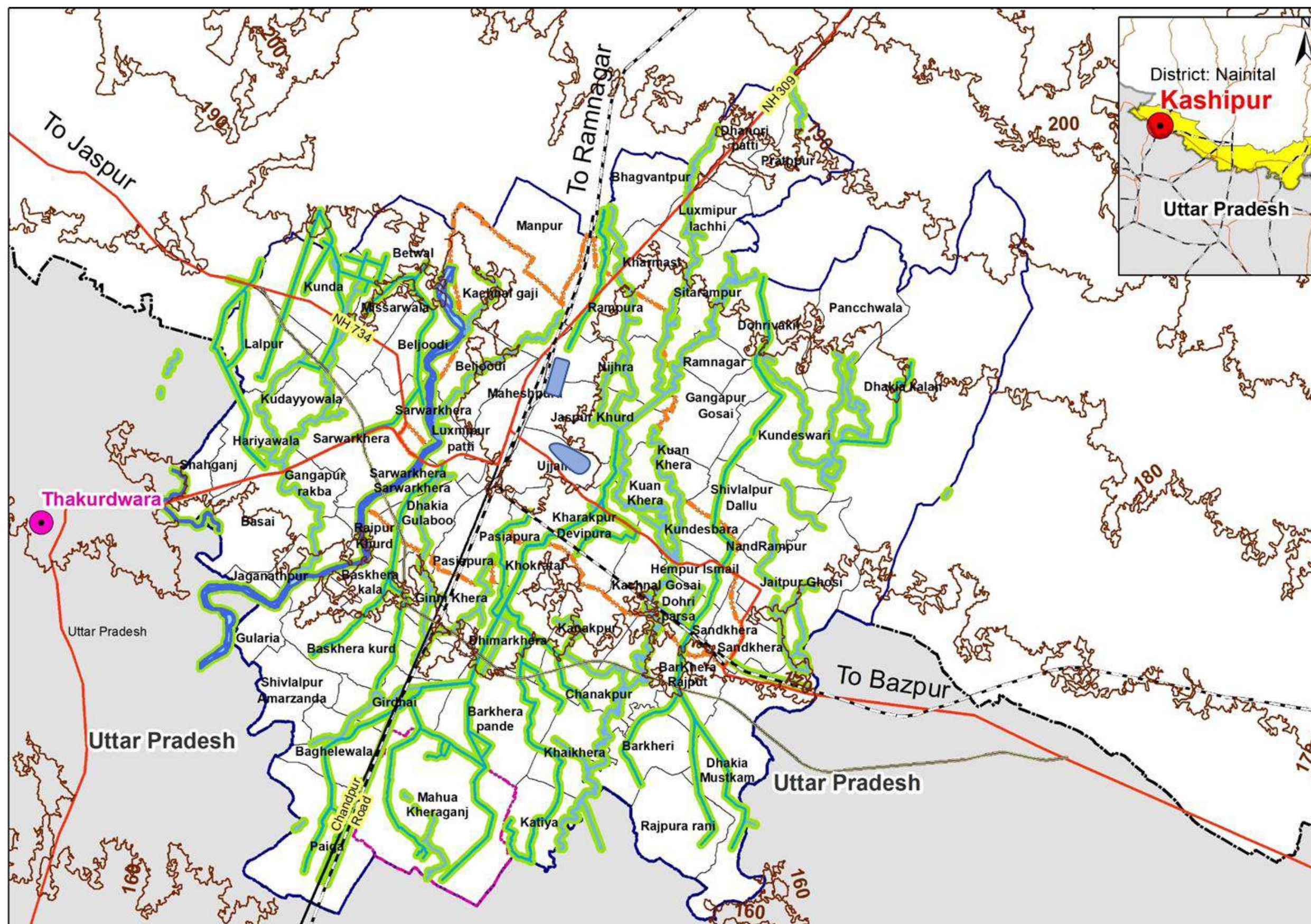
**Map 17-9** represents the natural drains that run along the Kashipur Planning Area. These natural drains if not protected will be a major concern for the planning area. These natural drains are eco-sensitive areas and these areas have been encroached on by local people for residential purposes. The construction along these drains hampers the natural flow of the drains. If this encroachment is not rectified it could lead to disaster in the future and leads to tremendous human and property loss. So, to preserve the natural flow of the drains a buffer is proposed on both sides of the natural drains. These buffer zones are an excellent opportunity for creating recreational zones along the natural drains. The recreational zones need to be carefully established without hampering the natural flow and with minimum construction. These recreational zones could be utilized as a tourist attraction point and in return would help in enhancing the economy of the Kashipur Planning Area. Also, the recreational zones will play the role of lungs in the planning area. With open spaces all along the planning area, it will increase the quality of life and would become a gateway space for the people in Kashipur.

Furthermore, the Dhela river which is passing through the Planning Area is one of the major sources of water for agriculture purposes. The river is getting contaminated by the industrial effluent discharge from the nearby industries. So, there is a need to protect the river by creating spatial buffers which will help to protect the river as well as create recreational space for the citizen of the city. Moreover, some portion of the buffered zone can be developed with a high-class infrastructure facility which will become a potential tourist destination and will enhance tourist footfall in the future.

Kashipur Planning area has heritage and tourism sites and a few of them are eco-sensitive areas. Drona Sagar and Girital (refer to **Map 17-9** highlighted in light blue color) are eco-sensitive areas and also major tourist attractions which should be conserved and protected. This is proposed to be done by providing depth all along with the sites. Dronasagar is recognized by ASI and hence a no-construction zone of 100m and a restricted zone of 100m more are proposed along the site to conserve the area. Parks and recreational facilities are also proposed along with the site for tourism purposes and also keeping environmental consequences in mind.



*Map 17-9 Natural Drains in Kashipur Planning Area*



Source: Analysis by Town and Country Planning Department



### **17.4.3. Spatial growth directions**

**Map 17-10** represents the new spatial growth direction of the Kashipur Planning Area. Developing spatial strategies for all five models has been considered and a hybrid model was established for the Kashipur Planning Area. The Old City is the core which has a mixed character where we can find all the uses, i.e., residential, commercial, public/semi-public as well as industries but mostly household industries. All the major offices, commercial centers, educational centers, and healthcare facilities are present in the old city. Here the major needs of the city are fulfilled and hence making it the Central Business District. The CBD also acts as a parent town for the nearby satellite Towns. The transport facilities like bus stands and railway station are also in the CBD.

From the CBD all around there is the development of the mixed residential zone. All around the CBD the residential has developed and to cater to the needs of the city along the roads commercial and public-semi-public uses have developed. Hence, it is established as a mixed residential zone. This is kept as medium density as the old city is highly dense and to provide a transition and breathing space to the city it is developed as a medium density mixed residential zone.

On the eastern side along with the Kashipur-Rudrapur road, mixed-use development has been proposed as we can see the commercial, industrial and residential activities pre-dominant here and the areas along the roads need to be treated differently. The industrial estate of District Industrial Centre (DIC), Kashipur Infrastructure and Freight Terminal Pvt Ltd., and Kumaon Garhwal Chamber of Commerce & Industry (KGCCI), all are present in this zone and hence this zone plays a huge role in the planning area.

On the northern side towards the Kashipur-Ramnagar road tourism zone has been proposed. This is because towards Ramnagar we have Jim Corbett National Park. Tourists have to travel from this zone to travel to the National Park and which is only 25 km away. So, this opportunity could be utilized to create a halting station that is accessible to both Kashipur tourists' destinations as well as Jim Corbett National Park. And hence the tourism zone towards the northern end of the planning area is the most suitable location for travelers to visit Kashipur as well as the Jim Corbett National park. Here high commercial development to support tourism is to be developed.

Just below the tourism zone, a commercial and educational hub has been proposed. Here in this zone IIM Kashipur at Sitarampur and a commercial zone at Kundeswari are present. The

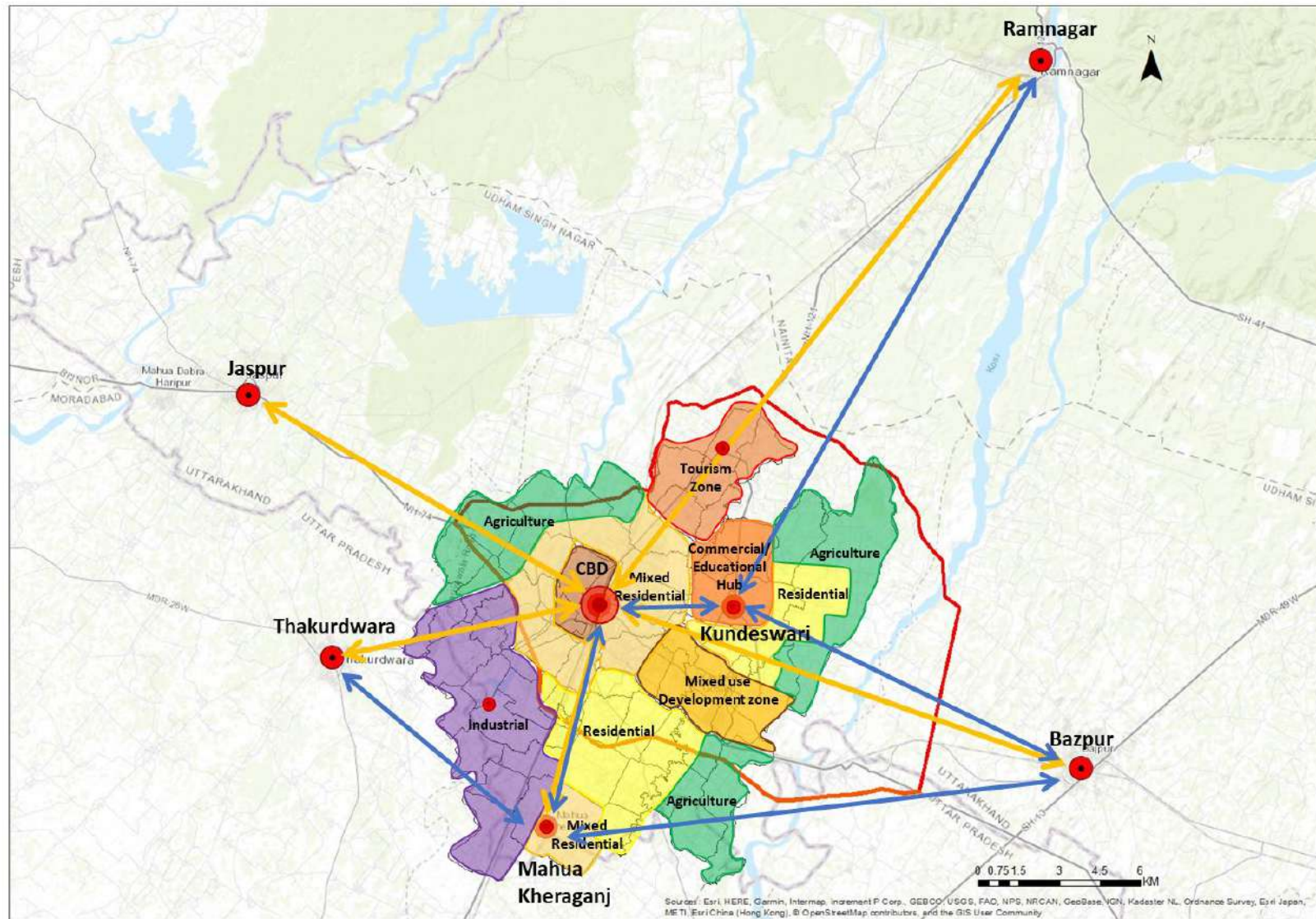
distance between these two is only 2.5 km and combining these two a commercial and educational hub is proposed. Here various other colleges, as well as hostel and commercial activities, could be developed. This could be a zone for students. Along with it is the proposed residential zone and at the end, the agriculture zone to save land for agriculture and also to have a smooth transition from built to open.

Kashipur is growing in the industrial sector so it is imperative to provide an industrial zone. On the south-western side, the proposal is for an industrial area. The major growth of industries is towards Kashipur Thakurdwara road towards the west and Mahua Kheraganj towards the south. And that's why combining these two the southwestern zone has been proposed to be developed as an industrial zone. Along with this has been proposed pure residential zone to cater to the housing needs of the planning area. On the east, west, and north side of the city green zones have been proposed to conserve green areas or agricultural areas, and also to conserve land for future growth.

The proposal for various zones in the planning area is also in alignment with the vision for Kashipur Planning Area. The industrial area is in support of industrial growth, and the education and the commercial zone are in support of the educational hub development and strengthening of trade and commerce. The tourism zone is in support of tourism development and the environment is a concern for the entire planning area various strategies have already been discussed above to cater to it. Good connectivity to the nearby Satellite towns makes Kashipur the Parent city with high-quality infrastructure.

## Kashipur Master Plan -2041

Map 17-10 Spatial Strategies for Kashipur Master Plan 2041



Source: Previous master plan and Analysis by Town and Country Planning Department





## 18. Proposed Land Use, 2041

### 18.1. Introduction

The Land Use Plan has been developed for the regulation of land use of the Kashipur Planning Area. After an in-depth study of the existing situation, calculating future requirements of the city and land suitability analysis, a sustainable development plan has been developed. Based on various surveys and studies detailed analysis has been carried out to identify the city's potential, strengths and weaknesses. Rigorous discussions have been carried out with the client's representative and also with various stakeholders to arrive at the final Land Use Plan for the Kashipur Planning Area. The provisions/ proposals of the previous master plan have also been incorporated for the preparation of the final Land Use plan. The major land use categories have been adopted from URDPFI guidelines.

### 18.2. Proposed Land Use Distribution

The total land under Kashipur Planning Area is 15733 Ha. This area has been divided into two broad categories i.e. Developable area and Non-developable area. 8664 Ha is the developable area which is 55% of the total Planning Area. The developable area contains proposals for future requirements for the horizon year 2041 while undevelopable area shall act as a reserved resource so that the goal of sustainable development can be achieved. This area is comprised of Agriculture land, Highway Facility Zone, and Water Bodies. The impact of development in the developable area on the environment can be balanced by undeveloped areas. The land use distribution of the Kashipur Planning Area has been presented in **Table 18-2**

**Table 18-1: Breakup of Developable area, Proposed Land Use**

| Land Use    | Proposed In New Master Plan | Deviated From Previous Master Plan | Total     | Share (%) | Standard        | Remarks |
|-------------|-----------------------------|------------------------------------|-----------|-----------|-----------------|---------|
| -1          | -2                          | -3                                 | (2+3)     |           | (As per URDPFI) |         |
| Residential | 3117.454                    | 690.0873                           | 3807.5412 | 43.946123 | 43-48           |         |
| Commercial  | 118                         | 0.018                              | 118.018   | 1.3621477 | 4-6             |         |

|                        |                 |                 |                 |               |       |                                             |
|------------------------|-----------------|-----------------|-----------------|---------------|-------|---------------------------------------------|
| Industrial             | <b>666.3258</b> | <b>90.77034</b> | 757.09618       | 8.738301<br>1 | 7-9   |                                             |
| Public and Semi Public | 754.5622        |                 | 754.5622        | 8.709054<br>3 | 6-8   |                                             |
| Recreation             | 2027.6106       |                 | 2027.6106       | 23.40240<br>6 | 12-14 |                                             |
| Mixed                  | <b>218.5268</b> |                 | 218.52685       | 2.522207<br>2 |       | Balanced through Residential and Commercial |
| Transport              | 980.75671       |                 | 980.75671       | 11.31976<br>1 | 10-12 |                                             |
| <b>Total</b>           | <b>7883.236</b> | <b>780.8756</b> | <b>8664.112</b> | <b>100</b>    |       |                                             |

The future land use for the horizon period has been proposed as per URDPFI Guidelines and existing ground conditions. A total of 43.94% (**3117.454 Ha.**) land share of the total planning area has been allocated to residential use which is lies as per URDPFI guidelines. A land share of 1.36 % (118.018 Ha.) has been proposed for commercial use and a land share of 2.52% (281.52 Ha) has been put to mixed-use in the proposal. As per the URDPFI guideline, the city should have 4%-6% area under commercial use while there is no provision for mixed land use in the guideline. Thus, by combining Residential, commercial, and mixed land use, we have tried to balance the ratio of residential and commercial land use of the city. Kashipur is the tehsil headquarter and as such has a huge area under different government offices which constitutes of 5.82% (466.44) of total developable area. The land share of 8.7% (754.56 Ha.) has been proposed for public and Semi-public use. This not only includes existing land under Public and Semi-public use but also additional land required to serve the future population of the Planning Area. For efficient travel within the Planning Area, 11.31 % (980.75 Ha.) of total area has been proposed under Transportation. This area includes the existing area under transportation use, additional land required for the proposed road network, and the area required for proposed road widening. Considering the quality of the urban environment a land share of 23.40% (2027.01 Ha.) area has been proposed for recreational use. This use comprises parks, green belts along natural drains, the area under tree cover, theme parks, and multipurpose open spaces and the land of Green belt and Flood Prone area along the Della River has been proposed.

**Table 18-2: Land Use Distribution of Kashipur Planning Area**

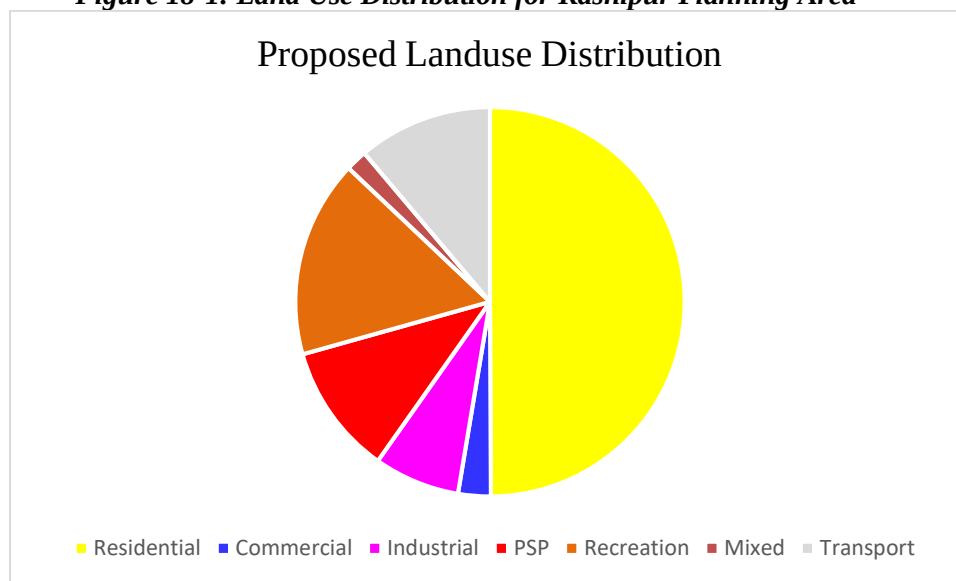
| Developable Area |              |           |          |          |           |
|------------------|--------------|-----------|----------|----------|-----------|
| Level I          |              |           | Level II |          |           |
| Cod e            | Use Category | Area (Ha) | Code     | Use Zone | Area (Ha) |

|                        |                        |                  |              |      |                                     |                                           |         |         |
|------------------------|------------------------|------------------|--------------|------|-------------------------------------|-------------------------------------------|---------|---------|
| R                      | Residential            |                  | 3117.45      |      | R 1                                 | Built up (Urban)                          |         | 280.82  |
|                        |                        |                  |              |      | R 2                                 | Rural Settlement                          |         | 198.95  |
|                        |                        |                  |              |      | R 3                                 | Residential Zone                          |         | 2293.84 |
|                        |                        |                  |              |      | R4                                  | Affordable Housing                        |         | 343.84  |
| C                      | Commercial             |                  | 115.27       |      | C 1                                 | Commercial Zone                           |         | 101.18  |
|                        |                        |                  |              |      | C 2                                 | Wholesale Markets/ Mandis                 |         | 14.10   |
| I                      | Industry               |                  | 666.33       |      | I                                   | Industrial                                |         | 666.33  |
| M                      | Mixed Use              |                  | 218.53       |      | M1                                  | Mixed Use                                 |         | 86.15   |
|                        |                        |                  |              |      | M2                                  | High Rise Building Zone                   |         | 132.37  |
| PS                     | Public/Semi-Public     |                  | 616.83       |      | PS 1                                | Govt./ Semi Govt./ Public Office Use Zone |         | 136.98  |
|                        |                        |                  |              |      | PS 2                                | Educational and Health Zone               |         | 416.24  |
|                        |                        |                  |              |      | PS 3                                | Socio-cultural and Religious Zone         |         | 63.61   |
| U                      | Utilities and Services |                  | 137.73       |      | CR                                  | Cremation and Burial Ground/Graveyard     |         | 16.44   |
|                        |                        |                  |              |      | ESS                                 | Electric Sub-station                      |         | 18.21   |
|                        |                        |                  |              |      | STP                                 | Sewage Treatment Plant                    |         | 101.16  |
|                        |                        |                  |              |      | SWM                                 | Landfill Site                             |         | 1.93    |
| G                      | Green Zone             |                  | 1879.32      |      | G 1                                 | Parks                                     |         | 284.98  |
|                        |                        |                  |              |      | G 2                                 | Green Belt Along Natural Drain            |         | 1594.35 |
| P                      | Recreational           |                  | 148.29       |      | P1                                  | Play Grounds                              |         | 1.75    |
|                        |                        |                  |              |      | P2                                  | Multi-Purpose Open Space                  |         | 138.75  |
|                        |                        |                  |              |      | P3                                  | Stadium                                   |         | 7.79    |
| T                      | Transportation         |                  | 980.76       |      | T 1                                 | Roads                                     |         | 812.28  |
|                        |                        |                  |              |      | T 2                                 | Railway Property                          |         | 61.65   |
|                        |                        |                  |              |      | T 3                                 | Bus Stand/Railway Station                 |         | 31.47   |
|                        |                        |                  |              |      | T 4                                 | Integrated Frieght Complex                |         | 60.36   |
|                        |                        |                  |              |      | T5                                  | Parking                                   |         | 14.99   |
| DLU                    | Deviated Land Use      |                  | 783.60       |      | DR                                  | Deviated Residential                      |         | 217.32  |
|                        |                        |                  |              |      | DRC                                 | Deviated Residential Colonies             |         | 472.77  |
|                        |                        |                  |              |      | DC                                  | Deviated Commercial                       |         | 2.74    |
|                        |                        |                  |              |      | DI                                  | Deviated Industries                       |         | 90.77   |
| Total Developable Area |                        |                  | 8664.11      |      | 58% of total Kashipur Planning Area |                                           |         |         |
| Undevelopable Area     |                        |                  |              |      |                                     |                                           |         |         |
| Level I                |                        |                  |              |      | Level II                            |                                           |         |         |
|                        |                        | Use Category     | Area<br>(Ha) | Code |                                     | Use Zone                                  | Area    |         |
| Code                   |                        |                  |              |      |                                     |                                           |         |         |
| PA                     |                        | Primary Activity | 5474.91      | PA-1 |                                     | Agriculture                               | 5279.95 |         |

|                                  |                        |                |                                            |                           |               |
|----------------------------------|------------------------|----------------|--------------------------------------------|---------------------------|---------------|
|                                  |                        |                | PA-2                                       | Highway Facility Corridor | 194.96        |
| <b>E</b>                         | <b>Protective area</b> | 716.40         | E 1                                        | Water Bodies              | <b>589.19</b> |
|                                  |                        |                | E2                                         | Orchards                  | <b>127.21</b> |
| <b>S</b>                         | <b>Special area</b>    | 94.51          |                                            | Govishan Fort             | <b>35.85</b>  |
|                                  |                        |                |                                            | Heritage Zone             | <b>58.66</b>  |
| <b>Total Un Developable Area</b> |                        | <b>6285.80</b> | <b>42% of total Kashipur Planning Area</b> |                           |               |
|                                  |                        |                |                                            |                           |               |

The land use allocation under each category is composed of proposed land use and deviated land use from the previous Master Plan. There is 507.15 Ha. of the area which is of deviated land use from the previous Master Plan (**Table 18-1 and Figure 18-1**).

**Figure 18-1: Land Use Distribution for Kashipur Planning Area**



### 18.2.1. Residential

The land proposed for residential use is 3117.45 Ha, which is 43% of the total developable area. The area under residential land use is composed of four types of residential land use, viz., R1: Urban Built-up, R2: Village Settlements, R3: Residential Zone and DR: Deviated Residential. The Housing proposals have been elaborated under the Residential Use of Proposed Land use to accommodate the upcoming population of 6,16,411. Proposals have been categorised as mentioned in the following table:



**Table 18-3: Proposed Residential Area**

| Code | Residential          | Area (Ha) | Proposed Density (PPH) | Population    | Dwelling units required | Net residential Area (ha) | DU/ Ha | Average Plot Size (m <sup>2</sup> ) |
|------|----------------------|-----------|------------------------|---------------|-------------------------|---------------------------|--------|-------------------------------------|
| R 1  | Built up (Urban)     | 280.82    | 220                    | 65755.8       | 14934                   | 137.46                    | 109    | 92                                  |
| R 2  | Rural Settlement     | 198.95    | 200                    | 38972         | 9098                    | 87.73                     | 104    | 96                                  |
| R 3  | Residential Zone     | 2293.84   | 150                    | 515326.5      | 103574                  | 1310.85                   | 79     | 127                                 |
| R4   | Affordable Housing   | 343.84    | 200                    | 68768         | 15282                   | 172                       | 89     | 127                                 |
| DR   | Deviated Residential | 690.09    | 200                    | 138017        | 30671                   | 345                       | 89     | 127                                 |
|      | <b>Total</b>         | 3932.83   |                        | <b>620590</b> |                         |                           |        |                                     |

- R1 Urban Builtup:** Existing Built-up areas are developed in the form of old city and an unorganized manner like core area. The total area considered under this use is 280.82 Ha. Existing Built-up Condition is in the form of single or dual stories with very small plot size with almost full built coverage. It is proposed to prepare a DPR for the In-situ slum Redevelopment and Rehabilitation Plan. In these Proposals, it is recommended to develop this area into a multi-storey and Land for Parks/Open spaces/Utility Infrastructure can be obtained from this land only. The proposed Gross Density for this is 220 pph and the proposed Average household plot size is 92 sqm. **(Refer Table 18.3)**. The total population to be accommodated under this use will be 65755.
- R2 Rural Settlements:** All the existing Village settlements/ Abadi areas have been considered under this use. All abadies falling outside the municipal limit is considered under this category. The total area under this Category is 198.95 ha. The proposed Gross Density for this is 200 PPH and the proposed Average household plot size is 96 sqm. **(Refer Table 18.3)**
- R3 Residential Area:** New Residential areas have been proposed under this use in the planned form with Proposed Gross Density for this being 150 PPH and the proposed Average household plot size is 127 sqm. The total area under this residential category is 2293.84 Ha.

- **Affordable Housing:** As per the Government of India, area for affordable housing is also proposed as per requirement for which District Development authority also acquired a land parcel and project has been initiated.

### 18.2.2. Commercial

To cater to the need of the present as well as the upcoming population of Kashipur Planning Area of 238.07 Ha of the commercial area covering 2.97% area of the total developable area has been proposed which is composed of C1: Built-up Commercial, C2: Commercial Zone, C3: Wholesale Markets/ Mandis, C4: Warehouse/Godown, and DC: Deviated Commercial(**Table 18-4**) and the spatial distribution of all this category has been shown in **Table 18-4**.

**Table 18-4 Proposed Commercial Area**

| Code | Use Zone                  | Area(Ha) |
|------|---------------------------|----------|
| C 1  | Commercial Zone           | 101.18   |
| C 2  | Wholesale Markets/ Mandis | 14.10    |

- **C1 Commercial Zone:** This have been proposed all around the planning area with a total land of 101.18 ha of land. Commercial area has been proposed in the residential areas to meet the commercial needs of the projected population. It has been taken into consideration that all the residential areas have access to these commercial areas.
- **C3: Wholesale Market/Mandis:** Under this total 11.91 ha. of land has been earmarked at two locations, one is the Existing Grain Mandi along the Moragdabad Road,

### 18.2.3. Mixed Use

A new land use i.e., mixed-use has been introduced in the Kashipur Master Plan. Mixed land Use reduces the need for people to travel. In mixed-use areas, we can find housing, restaurants, services, schools, cultural facilities, parks, and more. This connectivity reduces the need for private vehicles, thus increasing the viability of public transport, walking, and bicycling. Mixed Use encourages development within dense, more compact areas of land and reduces traffic and pollution by encouraging residents to use their cars/vehicles less. It creates pedestrian-friendly environments due to the short distances between living, work, commercial and recreational destinations.

In Kashipur along the Ramnagar and Aliganj road Mixed Use has been proposed. A stretch of 50 m on both sides of Road has been proposed for mixed land use. High-rise development with higher FAR and density are provided within this 200 m mixed land use to have higher growth along the

transport corridors which would facilitate the planning area as well as its nearby areas. The total proposed land under mixed land use along the corridors is 218.53 Ha which is 4.56%. The proposed mixed land use will act as an attractive point of facilities in Kashipur and hence efficient public transport would be required for the planning area. So, to successfully implement the mixed land use, bus priority lanes and pedestrian-friendly roads have been proposed along the stretch (refer to **Table 18-5**).

**Table 18-5: Proposed Mixed Use**

| Code | Use Zone                   | Area(Ha) |
|------|----------------------------|----------|
| M1   | Residential and Commercial | 86.15    |
| M2   | High Rise Building Zone    | 132.37   |

#### 18.2.4. Industrial

The total proposed area under industrial use is 436.98 Ha which is 7.13% of the total developable land (refer to **Table 18-6**). Overall, no additional area has been proposed for manufacturing in the planning area as there is a separate dedicated zone for industrial use, i.e., SIDCUL with an area of 978 Ha. (Which is outside of Planning Area). The existing industrial establishments are scattered throughout the planning area which is not suitable as per the Land Use compatibility are proposed to be new Industrial area proposed near the Lalpur Village.

**Table 18-6 Proposed Industrial Land Use**

| Code | Use Zone            | Area(Ha)    |
|------|---------------------|-------------|
| I    | Industrial          | 666.3258398 |
| 11   | Daviated Industries | 90.7703357  |
|      | Total               | 757.0962    |

. A Wind Direction to avoid air Pollution and the slope of the Planning area has been taken into consideration while proposing this Industrial land use. The area proposed under Industrial is 757 ha. . Which is a total of 8.7 of the Developable area.

#### 18.2.5. Public and Semi-Public

To cater to the Future need of all social infrastructure including Education, Health Care, Socio-Cultural Facilities, Open Spaces, Multipurpose grounds, Sports Facilities, Police, Civil Defence, Fire and Disaster, Telephone, Postal, and Banking facilities land uses of Public/Semi-public and its subcategories have been proposed as mentioned in **Table 18-7**.

**Table 18-7 Proposed Public/Semi-public Area**

| Code | Use Zone                                  | Area (Ha)       |
|------|-------------------------------------------|-----------------|
| PS 1 | Govt./ Semi Govt./ Public Office Use Zone | 136.98          |
| PS 2 | Educational and Health Zone               | 416.23          |
| PS 3 | Socio-cultural and Religious Zone         | 63.61<br>98.99  |
|      | <b>Total</b>                              | <b>616.8306</b> |

An area of 616.83 Ha. has been proposed for Public and Semi-public facilities to cater to the need of the present as well as the upcoming population in the Planning Area (refer to **Table 18-7**). Spatial Distribution throughout the planning area to serve the catchment area and population for this land use has been taken into consideration.

#### 18.2.6. Public Utilities and Services

To serve the reserved utilities and services in the proposed land use following land has been earmarked (refer to **Table 18-8**). These activities will come under the mandatory services to be provided and no change of land use (CLU) will be allowed.

**Table 18-8: Proposed Public Utilities and Services**

| Code | Use Zone                              | Area (Ha)   |
|------|---------------------------------------|-------------|
| CR   | Cremation and Burial Ground/Graveyard | 16.44       |
| ESS  | Electric Sub-station                  | 18.20       |
| STP  | Sewage Treatment Plant                | 101.1557115 |
| SWM  | Landfill Site                         | 1.93        |

#### 18.2.7. Recreational Zone and Green Zone

To improve the quality of life of the people residing within the Planning Area 148.28Ha area has been allocated. The details of allocated land and their distribution over the Planning Area have been provided. Spatial Distribution throughout the planning area to serve the catchment area and population for this land use has been taken into consideration (**Table 18-9**).

**Table 18-9 Proposed Recreational Space Area**

| Code | Use Zone     | Area(Ha) |
|------|--------------|----------|
| P1   | Play Grounds | 1.74     |

|    |                          |               |
|----|--------------------------|---------------|
| P2 | Multi-Purpose Open Space | 138.74        |
| P3 | <b>Stadium</b>           | 7.78          |
|    | <b>Total</b>             | <b>148.28</b> |

### 18.2.8. Transportation

Transportation and Communication are like the backbone of a Master Plan. Kashipur is Industrial city transportation plays a major role in it. Both passenger and goods traffic has been given equal importance in the Master plan. The total area under transportation is 980.75Ha which is 10.25% of the total developable area. In the transportation sector, four zones have been proposed, they are, T1 – Roads, T2 – Railway Property, T3 – Bus Stand/Railway Station, and T4 – Transport Nagar / Truck Terminal (refer to **Table 18-10**).

**Table 18-10 Proposed Transportation Zones**

| Code | Use Zone                          | Area          |
|------|-----------------------------------|---------------|
| T 1  | Roads                             | 812.28        |
| T 2  | Railway Property                  | 61.65         |
| T 3  | Bus Stand/Railway Station         | 31.47         |
| T 4  | <b>Integrated Freight Complex</b> | 60.35         |
| T5   | <b>Parking</b>                    | 14.99         |
|      | <b>Total</b>                      | <b>980.75</b> |

### 18.2.9. Undevelopable area

The undevelopable area consists of agriculture, rural settlements, and water bodies. The total land under undevelopable area is 8664.11 Ha which is 100 % of the total Planning Area (refer to **Table 18.2**). The three land uses do not have any sub-zones.

### 18.2.10. Primary Activity

Primary activities are related to natural materials and man's natural environment. Under this zone, only Agriculture and Highway Facility Corridor have been proposed (refer to **Table 18-11**). Agriculture – PA-1 is one of the economic activities as well as a source of livelihood in the planning area. Hence, it is important to preserve agricultural land within the planning area. The land is being preserved for agricultural purposes in the entire planning area in the Eastern, Western, North-eastern, North-western, and South Eastern outskirts of the Planning area.

Two Highway Facility Corridors of 45 m have been proposed on both sides of the newly proposed bypass road and along one side along Haldwani Road (northern stretch from Dineshpur Chowk) to facilitate Highway facilities as per the IRC Norms.



**Table 18-11 Primary Activity**

| Code | Primary Activity          | Area (Ha)      |
|------|---------------------------|----------------|
| PA-1 | Agriculture               | 5279.94        |
| HFC  | Highway Facility Corridor | 194.95         |
|      | <b>Total</b>              | <b>5474.90</b> |

#### **18.2.11. Protective Zone**

The physiography of the Kashipur Planning area comprises natural water bodies. These bodies are comprised of perennial and non-perennial water bodies. Perennial water bodies include drainage channels and a manmade lake. Non-perennial bodies include seasonal ponds/low-lying areas which are part of the natural drainage system having great significance in managing discharge from the urbanized area during the rainy season. These bodies need to be protected and should remain in natural form i.e. free from any encroachment by human activities. The GIS-based master plan has helped to identify these bodies with accuracy. These areas have been identified during the physical survey and have been marked in Proposed Land Use. A secondary database (Sajra maps from the Revenue department) of these bodies have also been referred for proper identification of these bodies with the accurate area. The code for protective zones is E with a total land of 589.19 Ha (refer to **Table 18-12**). It is proposed that all the revenue water bodies, along with others shown in the Proposed Land Use map should come under a protective zone, whether these bodies exist or not on the ground. A 10 m green belt has been kept around these water bodies.

The code for the Orchards is E2 and there will be no construction allowed in this area. Orchards considered as eco sensitive and should be preserved in same way .it is constituting the total area of 127.20 Ha of land in planning area.

**Table 18-12 Protective Zone Area**

| Code | Protective Zone`               | Area (Ha) |
|------|--------------------------------|-----------|
| E1   | Existing/ Revenue Water Bodies | 589.19    |
| E2   | Orchards                       | 127.20    |

#### **18.2.12. Special Area**

In Kashipur, Govishana Mound at Drona Sagar is the only heritage site recognized by ASI located within KPA. It was recently declared the site of “national importance”. The proposed area under

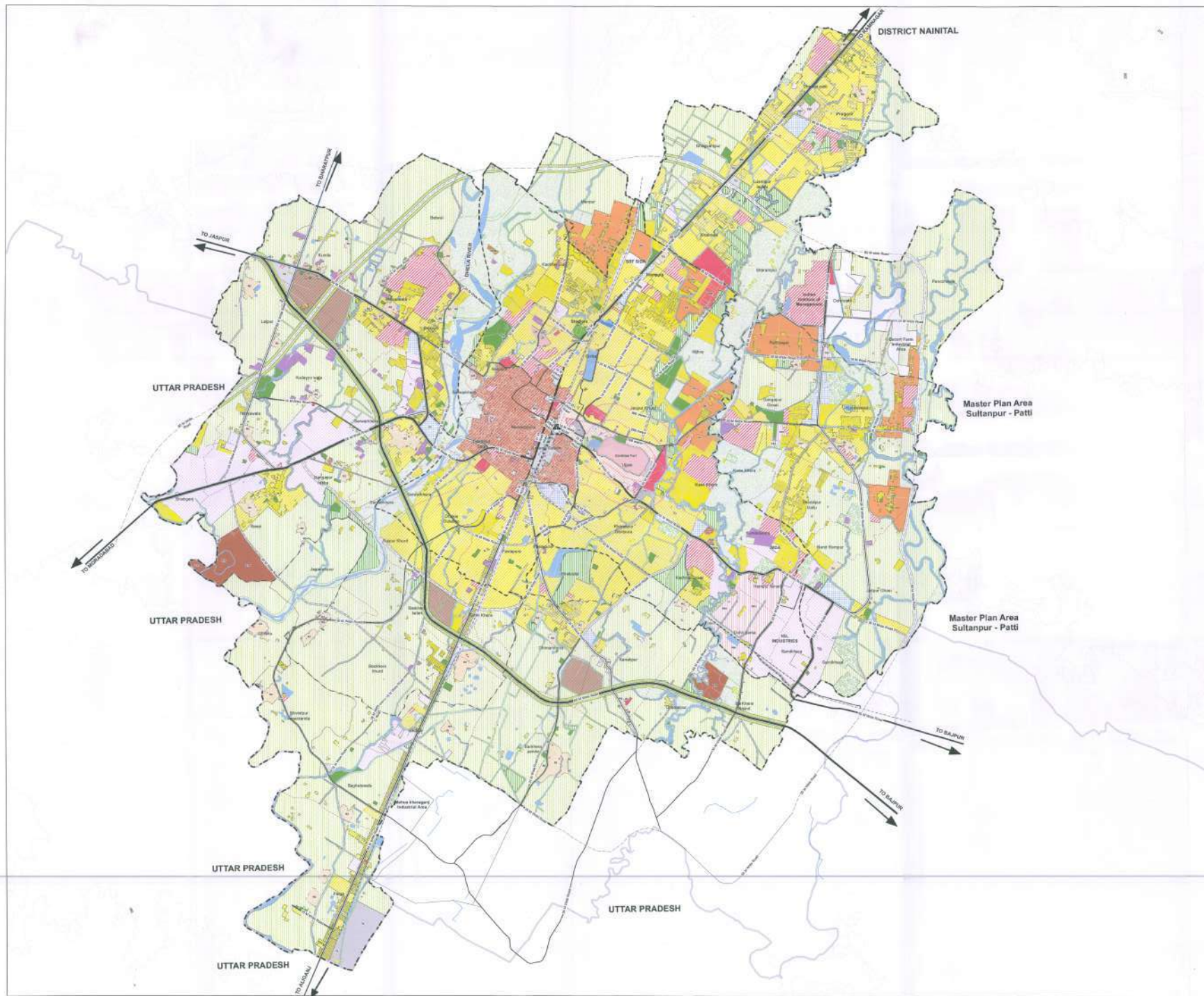
Special area is 94.50 Ha. Which is enclosed by Ramnagar Railway line on the west, Bajpur Road on the South, Kundeshwari Road on the North, and Moteshwar Mandir Road on the east. Under special area, two zones have been proposed, (refer to Table 18-12). The code F is used for Govishan fort which is having 35.84 ha. Area and it depicts a special character of the Harshvardhana era.

**Table 18-13 Special Area**

| Code | Special Area      | Area (Ha)      |
|------|-------------------|----------------|
| F    | Govishan Fort     | 35.84          |
| H    | Heritage Zone     | 58.65          |
|      | <b>Total Area</b> | <b>94.5062</b> |

Heritage Zone of area 58.65 ha. Have been proposed to conserve the heritage site as per the archeological department. 100m (Prohibited Area), 200m (Regulated Area), and 300m (Regulated Area) is marked as area in heritage zone.

Kashipur Master Plan- 2041



## Kashipur Master Plan - 2041

### Proposed Land Use

#### Legend

- State Boundary
- Planning Area Boundary
- Municipal Corporation Boundary
- Village Boundary
- NH- National Highway
- SH- State Highway
- Major City Road
- Existing Road
- Proposed Road
- Streams / Drains
- Developable Area
- Residential
  - R1 Builtup Residential
  - R2 Village Settlement
  - R3 Residential Zone
  - R4 Affordable Housing
- Commercial
  - C1 Commercial Zone
  - G2 Wholesale Market/ Mandi
- Mixed Use
  - M1 Residential & Commercial
  - M2 High Rise Building Zone
- Industrial
  - I1 Industrial Zone
- Public & Semi-Public
  - PS1 Govt/Semi Govt/Public Office Zone
  - PS2 Education & Health Zone
  - PS3 Socio-Cultural & Religious Zone
- Utilities and Services
  - CR Crematorium/ Burial Ground / Grave Yard
  - ESB Electric Sub-Station
  - SWM Land Fill Site
  - STP Sewage Treatment Plant
- Recreational
  - P1 Play Ground
  - P2 Multi-Purpose Open Space
  - P3 Stadium
- Green Zone
  - G1 Parks
  - G2 Green Belt
- Transportation
  - T1 Roads
  - T2 Railway Property
  - T3 Bus Stands/ Railway Stations
  - T4 Integrated Freight Complex
  - T5 Parking
- Undevelopable Area
  - PA-1 Agriculture
  - HFC Highway Facility Corridor
- Protective Zone
  - E1 Existing / Revenue Water Bodies
  - E2 Orchards
- Special Area
  - Govishan - Fort
  - Heritage Zone
- Deviated Building / Area from Master Plan - 2011
  - DR Deviated Residential
  - DC Deviated Commercial
  - DI Deviated Industrial

R.F. = 1: 22000



N



Ministry of Panchayats  
Government of India



उत्तराखण्ड सरकार

Chief Executive Officer  
Town & Country Planning  
Department, Government of Uttarakhand

Town & Country Planning Department  
Government of Uttarakhand

Consultant: M/S Tech Mech International Pvt. Ltd.

## **19. Zoning Regulation**

### **19.1. Introduction**

Zoning regulations are laws of development authorities that dictate the use of land and the construction of buildings/ Premises. In zoning, the land is divided into different zones where different land use patterns are enforced. For developing the zoning regulations for Rudrapur Planning Area the existing situation analysis, URDPFI guidelines and previous master plan 2031 zoning has been considered. The activities listed in “Permitted”, in the following section of different Land Use and its sub-zones are allowed in the particular land use and subzones. The activities listed in “Permitted by board” under each land use and its sub-zones will be permissible under the permission of the Competent Authority after analysing the merits and demerits of activity in any Land use Zones and its immediate surrounding.

### **19.2. Objective**

The objective of the development/control regulations of Rudrapur Master plan 2041 is to promote and regulate development controls for buildings/activities within use premises following the development policies and land use proposals contained in the Rudrapur Master Plan 2041. These regulation will be effective throughout the Rudrapur Planning Area. To achieve compatibility between the different land uses that are proposed in the plan, a set of broad Zoning Regulations are proposed defining the proximity of such uses with each other, so that adverse externalities do not arise. The various activities/Land uses have been grouped into classes (use zones) and sub-classes (premises use) where they can or cannot be put together in a geographical domain.

### **19.3. Classification of regulations**

The various land use zones mentioned in the Master Plan will be regulated through the zoning regulation by two classes mentioned below.

#### **19.3.1. Permitted activities**

These activities are permitted within the particular land use zone. There may be further conditions imposed, like approach road width, minimum plot or maximum plot area for some particular activity (mentioned along with the activity).

#### **19.3.2. Permitted by board**



Approval of these activities are subject to prior application to the concerned authority. The approval may be provided by the competent authority after satisfactory conclusion of its location and impact to surrounding areas, carrying capacity of the area as well as cost-benefit of that particular project/activities/building/premises.

### **19.3.3. Prohibited Activities**

The activities which can have adverse impact or are of non-confirming activity to the defined land use zone are mentioned under this class and activities /land uses which are not listed under permitted and permitted by board category will be treated as prohibited activity and permission for those activities shall not be allowed.

### **19.3.4. Issue resolution**

Permission for any activity or use by the applicant under the zoning regulations may not be obtained as a right.

### **19.4. Impact Fee:**

If a land use category is allowed which is relatively more active urban use under the "permitted and permitted by board" category of the zoning regulation, these activities will likely result in attracting more traffic, stress on infrastructure and comparatively have more environmental impact in the immediate surrounding area. Therefore, in such cases "Impact Fee" will be applicable. It is to clarified that, only Impact Fee will be payable for permitted activities /uses based on the zoning regulation. Impact fee will be decided by the board of development authority but, it should not be less than the land use conversion fees (as applicable zone wise).

1. Impact fee will not be payable under the following circumstances -
  - Permitted activities/ uses in the built up area.
  - Public facilities developed by government and semi-government agencies
  - Public / semi-public recreational activities.
2. Impact Fee will be applicable on the regularization/approval of Land Uses for Deviated Land Uses from Master Plan- 2031, i.e., Deviated Residential (DR), Deviated Commercial (DC), Deviated Industries (DI), Deviated Public/Semi-public(DSP) undr the category of unauthorised development which is defined in ‘The Uttarakhand (The Uttar Pradesh Special Area Development Authority Act, 1986) Adaptation and Modification

Order, 2006 (Amendment) Act, 2008' and Uttarakhand (Uttar Pradesh) Revenue Code, 2006.

### 19.5. Other requirements

1. Permission for any activity or use by the applicant under the zoning regulations may not be obtained as a right.
2. Such activity/use whose change of land use has been done already by Government of Uttarakhand or layout has been approved by District Development Authority/Competent Authority, is deviation from land use allocated in the present Master plan, the changed Land use/approved layout will be considered valid.
3. Construction of all Activities listed in the zoning regulation will be permitted as per prevalent building bylaws.
4. To preserve natural water body/stream and forest, provision of built green belt will be there as per applicable rule. These green belt may be use, as per requirement, for tree plantation/open space/development of parks etc.

| Sl. No. | Preserved Area                                                                 | Buffer (mtr.) |
|---------|--------------------------------------------------------------------------------|---------------|
| 1       | Main River (Distance from river bank/highest water level, whichever is higher) | 30            |
| 2       | Other river/Nalah                                                              | 10            |
| 3       | Natural waterbody and stream                                                   | 15            |

5. To maintain the building line along main road, a setback as per mention below/as per building by-laws (whichever is higher) will be applicable:

| Sl. No. | ROW of Road | Building Line (Mtr.) |
|---------|-------------|----------------------|
| 1       | 60          | 8                    |
| 2       | 45          | 7                    |
| 3       | 30          | 6                    |
| 4       | 24          | 5                    |
| 5       | 18          | 4                    |
| 6       | 12          | 3                    |

6. If existing ROW of any road under the category of NH, SH or comes under PWD, is more than proposed ROW in the Master Plan, the existing ROW will be considered.

7. If any activity has been rewritten in all categories of zonal regulation or having a conflicting situation arises, in such cases matter shall be settled on merit basis through the Authority
8. No change of Land Use will be allowed in the following land uses –
  - a. Affordable housing
  - b. All categories under public utilities like fire station, cremation and burial ground, water treatment plant, sewage treatment plant etc.
  - c. All categories under Green zone /Orchards
  - d. Waterbodies
  - e. All Categories under protective zone
9. Individual Houses will be permitted as per zoning regulations (listed in permitted by board Category) subject to the condition that applicant must have land registry before the date of notification of this master plan.
10. Such activities in Master Plan which is not defined than the consent report of chief town and country planner will be treated as final decision.

#### **19.6. General Conditions for Public Utilities and Services**

1. No other activities will be allowed in the area earmarked for STP, WTP, CETP, graveyards, SWTP, etc.
2. Activities like STP, CETP, graveyards, SWTP, etc. shall be permitted only on earmarked areas in the master plan.
3. Activities like Water Treatment Plant, Water Pumping stations, Ground Level reservoirs, Electric Power Plant, Electric Sub-Station, Rain Water Harvesting systems, Effluent Treatment Plant, and OHTs are permitted in all the land use categories.

#### **19.7. Board Land Use Classification**

The proposed land use plan incorporated in the Rudrapur Master Plan, 2041 notified area depicts the following land use class and sub-class (refer to **Table 19-1**).

**Table 19-1: Classification of Proposed Land Use in Rudrapur Master Plan, 2041**

| Sr. No. | Class              | Sub-Class            | Code |
|---------|--------------------|----------------------|------|
| 1       | <b>Residential</b> | Built up Residential | R1   |
|         |                    | Rural Settlement     | R2   |
|         |                    | Residential Zone     | R3   |
|         |                    | Affordable Housing   | R4   |

| Sr. No. | Class                             | Sub-Class                                 | Code |
|---------|-----------------------------------|-------------------------------------------|------|
| 2       | <b>Commercial</b>                 | Commercial Zone                           | C 2  |
|         |                                   | Wholesale Markets/ Mandis                 | C 3  |
| 3       | <b>Mixed</b>                      | Residential and Commercial                | M 1  |
|         |                                   | High Rise Building Zone                   | M 2  |
| 4       | <b>Industry</b>                   | Industry                                  | I    |
| 5       | <b>Public and Semi-Public</b>     | Govt./ Semi Govt./ Public Office Use Zone | PS 1 |
|         |                                   | Educational and Health Zone               | PS 2 |
|         |                                   | Socio-cultural and Religious Zone         | PS 3 |
| 6       | <b>Utilities and Services</b>     | Cremation and Burial Ground/Graveyard     | CR   |
|         |                                   | Electric Sub-station                      | ESS  |
|         |                                   | Sewage Treatment Plant                    | STP  |
|         |                                   | Landfill Site                             | SWM  |
| 7       | <b>Recreational</b>               | Play Ground                               | P 1  |
|         |                                   | Multipurpose Open/Green Spaces            | P 2  |
|         | <b>Green</b>                      | Parks                                     | G 1  |
|         |                                   | Green Belt                                | G 2  |
| 8       | <b>Traffic and Transportation</b> | Roads                                     | T1   |
|         |                                   | Railway Property                          | T2   |
|         |                                   | Bus Stand/Railway Station                 | T3   |
|         |                                   | Transport Nagar / Truck Terminal          | T4   |
| 9       | <b>Primary Activity</b>           | Agriculture                               | PA   |
|         |                                   | Highway Facility Corridor                 | HFC  |
| 10      | <b>Protective Use Zone</b>        | Water Bodies                              | E1   |
|         |                                   | Orchards                                  | E2   |
| 11      | <b>Special Areas</b>              | Govishan Fort                             | S1   |
|         |                                   | Heritage Zone                             | S2   |
|         |                                   | <b>Outside Regulated Area</b>             | OC   |
| 12      | <b>Deviated Land Use</b>          | Deviated Residential                      | DR   |
|         |                                   | Deviated Commercial                       | DC   |
|         |                                   | Deviated Industries                       | DI   |

## **Residential**

### **R1: Built up Residential**

#### **Permitted Activities**

**In this Landuse Maximum Building Height permitted will be G+2 based on the abutting road width mentioned in the building Bye Laws Uttarakhand clause 7.1. (ii).**

1. Individual House
2. Government Housing Scheme (Only for slum redevelopment/improvement schemes)
3. Government Quarter
4. Renovation and Modification of Existing/ Sanctioned Hostel
5. Retail Shop
6. Daily Need shops
7. Private Office (The plot area must not be larger than 45 sq.m.)
8. Service Industry (As per Zoning Anex –A)
9. Cottage and Household Industry (Maximum Plot area 200 sq m only)
10. Existing/ Sanctioned School
11. Anganwari Centre
12. Clinic / Dispensary (Maximum Plot area 45 sq m only)
13. Veterinary Dispensary / Hospital for pets only
14. Government Offices (It must be on minimum 18m wide approach road only)
15. Bank/ATM
16. Police Station / Police Post
17. Public Library
18. Creche / Day Care / Kindergarden
19. Public Toilet
20. Religious Building
21. Milk Collection Centre (Minimum 18m wide approach road)

#### **Permitted by Board**

1. Hospitals/Nursing Home/ Diagnostic Centre/Other Medical Units (Maximum Plot area (750 sq M) (Impact fee applicable)



2. Community Hall (on 18 M wide approach/ Master Plan Road) -
3. Multi-Storey Parking (Minimum 18m wide approach road)
4. Orphanage / Old Age Home/Home for Handicapped Children (It must be on minimum 18m wide road)
5. Sports Centre/Complex
6. Gymnasium
7. Club House with Swimming Pool (**Impact fee applicable**)
8. Government Night Shelter
9. Bus Stop
10. Taxi / Auto Stand (Applicable on a minimum 18m wide approach road)
11. Parking Space / Area
12. Electric Vehicle Charging Dairy Booth
13. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

## **R2: Village Settlements**

**In this Landuse Maximum Building Height permitted will be G+1 based on the abutting road width mentioned in the building Bye Laws Uttarakhand clause 7.1. (ii).**

### **Permitted Activities**

#### **Permitted Activities**

1. Individual House
2. Daily Need shop
3. Private Office (The plot area must not be larger than 45 sq.m.)
4. Cottage and Household (Maximum plot area 200 sq m)
5. Anganwari Centre
6. Clinic / Dispensary
7. Milk Collection Centre (Minimum 18m wide road)

### **Permitted by Board**

1. School (Minimum 12m wide approach roads)

2. Bus Stop
3. Taxi / Auto Stand (Applicable on a minimum 18m wide approach road)
4. Electric Vehicle Charging Station
5. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

### **R3: Residential Zone**

#### **Permitted Activities**

1. Individual House
2. Sub Division Residential Layouts
3. Group Housing (Apartment / Flatted Housing)
4. Residential Township
5. Government Housing Scheme
6. Retail Shop
7. Private Office (The plot area must not be larger than 45 sq.m.)
8. Hostel (Maximum area 1000 sqm )
9. Service Industry (As per Zoning annexure III)
10. Cottage and household Industry (Maxumum area 200 sq m)
11. Anganwari Centre
12. School (Minimum 12m wide approach roads only)
13. Clinic/ Dispensary (maximum plot area 45 sq.m. only)
14. Veternary Dispensary / Hospital for Pets only
15. Government Offices (It must be on minimum 18m wide approach road only)
16. Government Quarter
17. Bank / ATM
18. Police Station / Police Post
19. Guesthouse (It must be on a minimum of 18m wide approach road only)
20. Art Gallery
21. Public Library
22. Creche / Day Care / Kindergarden

23. Public Toilet
24. Orphanage / Old Age Home/Home for Handicapped Children
25. Fire Station (Minimum 24m wide approach roads)
26. Religious Building
27. Playground
28. Recreational Club (Minimum 18m wide approach road)
29. Sports Centre/Complex (ROW – Minimum 24 m wide road)
30. Gymnasium **Impact fee applicable**
31. Swimming Pool
32. Milk Collection Centre (Minimum 18m wide road)

#### **Permitted by Board**

1. Shopping Mall (On minimum 24 m wide road and outside municipal limit only. The maximum ground coverage area of 35%) **Impact fee applicable**
2. Multiplex / Cinema (On minimum 24 m wide road and outside municipal limit. The maximum ground coverage area of 35%) **Impact fee applicable**
3. Petrol Pump / LPG filling station (It must be on a minimum of 24m wide approach road only. Applicant must obtain NOC for fire safety from the fire department) **Impact fee applicable**
4. College (Minimum 24m wide approach roads and Minimum area 1 acre)
5. Indoor / Outdoor Stadium (Must be within 12m and 18m wide approach roads only)
6. Multi-Storey Parking (Minimum 18m wide approach road)
7. Hotel /Lodge / Restaurant (On minimum 18m wide approach road and area greater than 1000 sq m only) **Impact fee applicable**
8. Hostel (area greater than 1000 sq m only)
9. Hospital and Nursing Home (It must be on a minimum of 18m wide approach road only) **(Impact fee applicable for Private Facility)**
10. Dharmashala (Minimum 18 M wide Road)
11. Diagnostic Centre/Other Medical Units
12. Community Hall. (It must be on minimum 18m wide road)
13. Bus Stop
14. Taxi / Auto Stand (Applicable on a minimum 18m wide approach road)

15. Parking Space / Area
16. Electric Vehicle Charging Station Dairy Booth
17. Golf Course / Race Course
18. Hotel /Lodge / Restaurant/Tourist unit as defined in building bylaws (On minimum 18m wide approach road and Maximum area 1000 sq m only) **Impact fee applicable**
19. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

#### **R4: Affordable Housing**

In this Land use Maximum Building Height permitted will be G+3 based on the abutting road width mentioned in the building Bye Laws Uttarakhand clause 7.1. (ii).

#### **Permitted Activities**

1. Affordable Housing Projects under Housing policy
2. Government Housing Scheme
3. Retail Shop
4. Primary School (Minimum 12m wide approach roads only)
5. Anganwari Centre
6. Clinic / Dispensary
7. Bank / ATM
8. Police Station / Police Post
9. Public Library
10. Crèche / Day Care / Kindergarden
11. Public Toilet / Community Toilet
12. Religious Building
13. Playground
14. Dairy Booth

#### **Permitted by Board**

1. Individual House
2. Multi-Storey Parking (Minimum 18m wide approach road)

3. Bus Stop
4. Taxi / Auto Stand (Applicable on a minimum 18m wide approach road)
5. Parking Space / Area
6. Electric Vehicle Charging Station
7. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

## **Commercial**

### **C1: Commercial Zone**

#### **Permitted Activities**

1. Retail Shop (As per Zoning Annexure A)
2. Daily need Shops
3. Wholesale (Maximum area 500 sq M)
4. Private Office
5. Shopping Mall
6. Multiplex Cinema
7. Service industry (As per Zoning Annexure A)
8. Clinic / Dispensary (maximum plot area 45 sq.m. only)
9. Primary / Community Health Centre (Govt. only)
10. Veterinary Dispensary / Hospital for pets only
11. Government Offices (It must be on minimum 18m wide approach road )
12. Bank / ATM
13. Police Station / Police Post
14. Guesthouse
15. Auditorium / Convention Centre
16. Art Gallery
17. Public Library
18. Public Toilet
19. Dharmashala
20. Religious Building



21. Recreational Club
22. Gymnasium
23. Dairy Booth

### **Permitted By Board**

1. Hotel /Lodge / Restaurant/ Tourist unit as defined in building bylaws (Maximum Plot area 1000 sqm)
2. Hostel (Maximum Plot area 1000 sqm)
3. Petrol Pump / LPG filling station (It must be on a minimum of 24m wide approach road only. Applicant must obtain NOC for fire safety from the fire department)
4. Apartment / Flatted Housing (For studio apartments only)
5. Individual House (Only applicable to plot  $\leq 90 \text{ m}^2$ )
6. Hospital and Nursing Homes (It must be on a minimum of 18m wide approach road only)
7. Diagnostic Centre/Other Medical Units
8. Multi-Storey Parking
9. Fire Station (Minimum 24m wide approach roads.)
- 10. Function Hall / Marriage Garden / Banquet Halls (Impact fee applicable)**
11. Bus Stop (Applicable on a minimum 18m wide approach road.)
12. Taxi / Auto Stand (Applicable on a minimum 18m wide approach road.)
13. Electric Vehicle Charging Station
14. Parking Space / Area
15. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

### **C2: Wholesale Markets/ Mandis**

#### **Permitted Activities**

1. Wholesale
2. Private Office (Maximum Area 45 sq m)
3. Clinic / Dispensary (maximum plot area 45 sq.m. only)
4. Bank / ATM
5. Police Station / Police Post

6. Public Toilet
7. Religious Building
8. Bus Stop (Applicable on a minimum 18m wide Master Plan/Existing road)
9. Taxi / Auto Stand(Applicable on a minimum 18m wide approach road)
10. Parking Space / Area
11. Dairy Booth

#### **Permitted By Board**

1. Warehouse (It must be on a minimum of 30m wide approach road only. Applicant must obtain NOC for fire safety from the fire department)
2. Storage Godown (It must be on a minimum of 30m wide approach road only. Applicant must obtain NOC for fire safety from the fire department)
3. Cold Storage (It must be on a minimum of 30m wide approach road only. Applicant must obtain NOC for fire safety from the fire department)
4. LPG Godown (Applicant must obtain NOC for fire safety from the fire department)
5. Petrol Pump / LPG filling station (It must be on a minimum of 30m wide approach road only. Applicant must obtain NOC for fire safety from the fire department.)
6. Retail Shop
7. Fire Station(Minimum 24m wide approach roads)
8. Multi-Storey Parking
9. Electric Vehicle Charging Station
10. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

#### **Mixed**

##### **M1: Residential and Commercial**

##### **Permitted Activities**

All activities listed in permitted category of **Residential Zone (R3)** and **commercial Zone (C1)**

##### **Permitted By Board**

All activities listed in permitted by board category of **Residential Zone (R3) and Commercial Zone (C1)**

**Conditions for Other Permitted activities for Mixed Land use**

- Plots that are abutting to Kashipur – Kichha road and Dineshpur Road may avail benefits as mixed-use, any other plots which are not accessible directly from the main Kashipur – Kichha road and Dineshpur Road will be treated the same as adjoining land use behind the mixed land use.
- If more than 50% of the plot area is falling under mixed use, will be treated as mixed land use with the satisfactory consent report given by the Town and Country Planning Department.

**M2: High Rise Building Zone**

**Permitted Activities**

All activities listed in permitted category of **Residential Zone (R3) and commercial Zone (C2) but in vertical Mix Only**

**Permitted By Board**

All activities listed in permitted by board category of **Residential Zone (R3) and Commercial Zone (C2) but in vertical Mix Only**. In addition to that Board can decide the vertical mixing following activities with the consent of Chief Town and Country Planner.

- Residential / Commercial – Multi-story buildings with residential units above and commercial units on the ground floor facing the street
- Urban Residential / Commercial – multi-story residential buildings with commercial and civic uses on the ground floor
- Office Convenience – office buildings with small retail and service uses oriented to the office workers.
- Office / Residential – multi-family residential units within office building(s).
- Shopping mall conversion – residential and/or office units added (adjacent) to an existing standalone shopping mall.
- Retail District Retrofit – retrofitting of a suburban retail area to a more village-like appearance and mix of uses

- Live / Work – residents can operate small businesses on the ground floor of the building where they live
- Studio / Light industrial – residents may operate studios or small workshops in the building where they live
- Hotel/ Residence – mix hotel space and high-end multi-family residential
- Parking structure with ground-floor retail
- Single-family detached home district with standalone shopping centre

## **I: Industry**

### **Permitted Activities**

1. Manufacturing (It must be on minimum 18m wide approach road. Applicant must obtain NOC from SPCB for pollution)
2. Service Industry
3. Chemical (It must be on minimum 18m wide approach road. Applicant must obtain NOC from SPCB for pollution)
4. Pharmaceutical (It must be on minimum 18m wide approach road. Applicant must obtain NOC from SPCB for pollution)
5. Textile (It must be on minimum 18m wide approach road. Applicant must obtain NOC from SPCB for pollution)
6. Agro based & Food Processing
7. Obnoxious (It must be on minimum 18m wide approach road. Applicant must obtain NOC from SPCB for pollution)
8. Cottage and Household
9. Individual House(Only applicable to plot  $\leq 90 \text{ m}^2$ )
10. Retail Shop
11. Clinic /Dispensary (maximum plot area 45 sq.m. only)
12. Bank / ATM
13. Police Station / Police Post
14. Public Toilet /
15. Religious Building
16. Fire Station (Minimum 24m wide approach roads)

### **Permitted By Board**

1. Warehouse (It must be a minimum of 30 m wide road)
2. Storage Godown (It must be a minimum of 30 m wide road)
3. Cold Storage ((It must be a minimum of 30 m wide road)
4. Petrol Pump / LPG filling station (It must be on a minimum of 30m wide approach road only. Applicant must obtain NOC for fire safety from the fire department)
5. Bus Stop
6. Taxi / Auto Stand
7. Parking Space / Area
8. Multi-Storey Parking
9. Electric Vehicle Charging Station
10. Weight Bridge
11. Dairy Booth
12. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

### **Public and Semi-Public**

#### **PS1: Govt./ Semi Govt./ Public Office Use Zone**

##### **Permitted Activities**

1. Government Offices
2. Government Quarter
3. Bank / ATM
4. Police Station / Police Post
5. Auditorium / Convention Centre
6. Art Gallery
7. Public Library
8. Public Toilet /
9. Fire Station (Minimum 24m wide approach roads)
10. Religious Building
11. Retail Shop



12. Private Office (The plot area must not be larger than 45 sq.m.)
13. Playground
14. Swimming Pool
15. Indoor / Outdoor Stadium
16. Dairy Booth
17. Police lines

**Permitted by Board**

1. Bus Stop
2. Taxi / Auto Stand
3. Parking Space / Area
4. Multi-Storey Parking
5. Electric Vehicle Charging Station
6. Government Housing Scheme
7. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse affect on its immediate surrounding, will be allowed through the consent report of Competent officer

**PS2: Educational and Health Zone**

**Permitted Activities**

1. School
2. College
3. University
4. Research and Development Centre
5. Vocational Institute / Training Institute / Research Centre
6. Anganwari Centre
7. Hospital and Nursing Home
8. Diagnostic Centre/Other Medical Units
9. Clinic / Dispensary
10. Primary / Community Health Centre (Govt. only)
11. Bank / ATM
12. Police Station / Police Post

13. Auditorium / Convention Centre
14. Art Gallery
15. Public Library
16. Crèche / Day Care / Kindergarden
17. Public Toilet
18. Playground
19. Sports Centre/Complex
20. Indoor / Outdoor Stadium
21. Dairy Booth

**Permitted by Board**

1. Orphanage / Old Age Home/Home for Handicapped Children
2. Retail Shop
3. Private Office (The plot area must not be larger than 45 sq.m.)
4. Government Offices
5. Government Quarter
6. Fire Station (Minimum 24m wide approach roads)
7. Religious Building
8. Bus Stop
9. Taxi / Auto Stand
10. Parking Space / Area
11. Multi-Storey Parking
12. Electric Vehicle Charging Station
13. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of Competent officer.

**PS3: Socio-cultural and Religious Zone**

**Permitted Activities**

1. Community Hall (It must be on minimum 18m wide road)
2. Art Gallery
3. Public Library

4. Public Toilet
5. Orphanage / Old Age Home/Home for Handicapped Children
6. Dharmashala / Night Shelter
7. Bank / ATM
8. Police Station / Police Post
9. Fire Station (Minimum 24m wide approach roads)
10. Religious Building
11. Retail Shop
12. Playground
13. Dairy Booth

**Permitted by Board**

1. Crematorium Burial Ground / Grave Yard / Incinerator
2. Sports Centre/Complex
3. Indoor / Outdoor Stadium
4. Bus Stop
5. Taxi / Auto Stand
6. Parking Space / Area
7. Multi-Storey Parking
8. Electric Vehicle Charging Station
9. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

**Recreational**

**P1: Play Ground**

**Permitted Activities**

1. Playground
2. Public Toilet
3. Park
4. Outdoor gym

**Permitted by Board**

1. Mela ground
2. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

**P2: Multipurpose Open Spaces**

**Permitted Activities**

1. Playground
2. Shooting range
3. Open air theatre
4. Multipurpose recreational park/special recreational and educational park
5. Temporary use (trade fair/circus/exhibition place)
6. Rescue Pockets during any Hazard or disaster occurrence

**Permitted by Board**

1. Police post/fire post/structure related to utility services
2. Public Toilet
3. Bus Stop
4. Taxi / Auto Stand
5. Parking Space / Area
6. Electric Vehicle Charging Station
7. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

**Green Zone**

**G1: Parks**

**Permitted Activities**

1. Park
2. Outdoor Gymnasium

3. Botanical Garden
4. Picnic spot
5. Open air theatre

**Permitted by Board**

1. Water park
2. Amusement Park
3. Theme park
4. Golf course
5. Public Toilet
6. Parking
7. Structure associated to utility services

**G2: Green Belt**

**Permitted Activities**

1. Park
2. Garden
3. Plantation
4. Afforestation
5. Nursery
6. Picnic spot

**Permitted by Board**

1. Public Toilet
2. Structure associated to utilities

**Traffic and Transportation**

**T1: Roads**

**Permitted Activities**

1. Bus Stop

**Permitted By Board**



1. Street vending Zone
2. Parking Space / Area
3. Public Toilet

**T3: Bus Stand**

**Permitted Activities**

1. Bus Parking / Bus Bays
2. Bus Stop
3. Parking Space
4. Electric Vehicle Charging Station
5. Public Toilet

**Permitted by Board**

1. Bus Depot/ Workshop
2. Auto/ Taxi Stand
3. Retail Shop
4. ATM
5. Dairy Booth
6. PPP Mode Bus Terminal with Mix of Commercial and Terminal facilities

**T4: Integrated freight complex**

**Land will be acquired by HRDA and it will be developed by District Development authority**

**T5: Parking**

**Land will be acquired by HRDA and it will be developed by District Development authority**

**Primary Activity**

**PA: Agriculture**

**Permitted Activities**

1. Nursery

2. Dairy Booth
3. Milk Collection Centre
4. Biogas Plant
5. Scrap yard
6. Public Toilet
7. Parking Space / Area
8. Dairy farm / Gaushala
9. Poultry farm
10. Private Garage
11. Weight Bright (Minimum 30m wide road)
12. Cottage and Household industry
13. Animal Husbandry

**Permitted by Board**

1. Shopping Mall (Minimum 45m wide road and outside of municipal limit only) **(Impact Fee Applicable)**
2. Multiplex / Cinema (Minimum 45m wide road and outside of municipal limit only) **(Impact Fee Applicable)**
3. Function Hall / Marriage Garden / Banquet Halls (Minimum 30m wide road and outside of municipal limit only) **(Impact Fee Applicable)**
4. Storage Godown for Agriculture Products only
5. Petrol Pump / LPG filling station (45 M Wide Road)
6. LPG Godown
7. School (Minimum 12m wide approach roads)
8. College (on 30 M wide Road)
9. Research and Development Centre (on 30 M wide Road)
10. Vocational Institute / Training Institute / Research Centre (on 30 M wide Road)
11. Anganwari Centre
12. Clinic / Dispensary (maximum plot area 45 sq.m. only)
13. Primary / Community Health Centre (Govt. only)
14. Veterinary Dispensary / Hospital for Cattle's Only
15. Police Station / Police Post

16. Crematorium Burial Ground / Grave Yard / Incinerator
17. Orphanage / Old Age Home/Home for Handicapped Children
18. Fire Station (24 M wide Road)
19. Religious Building
20. Sports Centre/Complex (24 M wide Road)
21. Swimming Pool
22. Golf Course / Race Course
23. Brick kiln as per NGT Norms
24. Individual House/Farm House (maximum 250 sq./35%ground coverage whichever is larger)
25. Slaughter House (The competent authority must verify that it is not affecting the existing surrounding areas/ proposed areas)
26. Amusement Park (Minimum 30m wide road) (Impact Fee Applicable)
27. Shooting Range (Minimum 30m wide road)
28. Bus Stop
29. Taxi / Auto Stand
30. Hospital (Hospitals for mentally restarted patients and infectious diseases)
31. Diagnostic Centre/Other Medical Units (Hospitals for mentally restarted patients and infectious diseases)
32. Electric Vehicle Charging Station
33. Mining (RBM), stone crusher (Impact Fee Applicable)
34. Zoo/zoological park/botanical garden
35. Jail
36. Reformatory house
37. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

#### **HFC: Highway Facility Corridor**

#### **Permitted Activities**

1. Petrol Pump / LPG filling station (It must be on a minimum of 45m wide approach road only. Applicant must obtain NOC for fire safety from the fire department.)
2. Public Toilet
3. Bus Stop
4. Taxi / Auto Stand
5. Parking Space / Area
6. Nursery
7. Dairy Booth
8. Milk Collection Centre
9. LPG Godown (It must be on a minimum of 45m wide approach road only. Applicant must obtain NOC for fire safety from the fire department.)
10. Park
11. Weight Bridge

#### **Permitted By Board**

1. Retail Shop
2. Individual House (Only applicable to plot  $\leq 90 \text{ m}^2$ )
3. Function Hall / Marriage Garden / Banquet Halls (Minimum 30m wide road and outside of municipal limit only) **(Impact Fee Applicable)**
4. Dhabas/ Restaurant
5. Electric Vehicle Charging Station
6. All Government/semi government Institutions/ Activities which contribute to public welfare, and does not have any adverse effect on its immediate surrounding, will be allowed through the consent report of competent officer.

#### **Protected Areas**

##### **E1: Water Bodies**

All the water Bodies, On Ground Existing on ground/ as per revenue records will be treated as water bodies, Green belt will be applicable as per the clause 4.4 (iii) mentioned in building bye laws

##### **E2: Orchards**

No new Construction (other than Existing) is allowed will be treated as Eco- sensitive Areas.

#### **Special areas (Heritage Zone and Govishan Fort)**

## **S 1 - Heritage Zone**

In case of Kashipur, the heritage zone depicts a special character and there is a need to frame a façade control measures for this area. Following are the suggestive measures for facade control in this area.

1. The façade of the building/blocks shall be maintained on old lines in case of reconstruction of existing buildings, however the internal changes shall be permissible
2. The façade of new building on vacant plots shall be in conformity with the architectural features and elements of the adjoining buildings
3. The existing parks and green open spaces shall be preserved as such.
4. The exterior design and height of buildings should have their approval to preserve/improve the beauty of the area rather than beauty of such building.
5. Signs and Outdoor Display Structures / Including Street Furniture on heritage site shall be framed by Urban Design Wing (proposed in the development Authority). In addition, regulations or guidelines to regulate signs, outdoor display structures and street furniture on heritage sites/ or in area shall also be framed.
6. After the guidelines are framed, buildings within heritage precincts or in the vicinity of heritage sites shall maintain the skyline in the precinct and follow the architectural style (without any high-rise or multi-storeyed development) as may be existing in the surrounding area, so as not to diminish or destroy the value and beauty of or the view from the heritage site.
7. The development within the precinct or in the vicinity of heritage site shall be in accordance with the guidelines framed by the Executive Commissioner, Municipal Council / Vice- Chairman, Development Authority on the advice of the Heritage Conservation Committee or separate regulations / guidelines, if any, prescribed for respective zones by Municipal Council / Development Authority.
8. Other than old and archaeological buildings redevelopment and related activities are totally prohibited within the 100 meters of Govind Shan fort
9. Upto 200 and 300 meters, any other development is allowed with the special no objection certificate from archaeological department only.

### **A. Category-wise Details of Buildings Permitted**

| Retail | Service Industry | HH Industry |
|--------|------------------|-------------|
|--------|------------------|-------------|

| Retail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Service Industry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | HH Industry                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Retail Stores (Kirana &amp; Muniyari Store, Bread, Vegetables, Fruits, Soft Drinks, Canned Juices, Dairy Booth)</li> <li>• Sweets Shop without Restaurant Facility</li> <li>• Stationary / Book/ magazine/newspaper Store</li> <li>• Medical Clinics / Pet Clinics / Medical Stores</li> <li>• Utensil Shop</li> <li>• Mobile Repair Shop</li> <li>• Cloth-Iron / Dry-Clean Shop</li> <li>• Clock/Spectacle Shop/repair</li> <li>• Shop for fruit juice</li> <li>• Typing/photostate/cyber cafee</li> <li>• Shop for sports equipments</li> <li>• Telephone booth/PCO</li> <li>• Readymade garments</li> <li>• Beauty paulor</li> <li>• Cosmetics</li> <li>• Hear drying</li> <li>• Tailoring and butic</li> <li>• Kadaai and painting</li> <li>• Cable TV operator</li> <li>• Plumber shop</li> <li>• Electrical equipments</li> <li>• Hardware</li> <li>• Cycle repairing/servicing</li> <li>• Shop for daily needs</li> <li>• Production of milk products including Ghee/Butter</li> <li>• Printing press/book binding</li> <li>• Jewellery shop</li> <li>• Shop for shoe</li> <li>• Blacksmith</li> <li>• Workshop for sign board</li> <li>• Photo framing</li> <li>• Photo framing</li> <li>• Cobbler</li> <li>• Electrician</li> <li>• Bakery</li> <li>• Atta Mill (upto 10 HP)</li> </ul> | <ul style="list-style-type: none"> <li>• Bakeries &amp; Confectionaries</li> <li>• Junk Yards</li> <li>• Printing Press</li> <li>• Ice Factory</li> <li>• Automobile servicing, repairing</li> <li>• Carpenter Store with Saw Mill</li> <li>• Laundry/Dry Cleaning</li> <li>• Repairing of TV/Radio etc</li> <li>• Production of milk products including Ghee and Butter.</li> <li>• Cycle repairing</li> <li>• Printing Press/Bok Binding</li> <li>• Jewellery works</li> <li>• Kadaai/weaving</li> <li>• Manufacturing of shoe laces</li> <li>• Tailoring</li> <li>• Blacksmith</li> <li>• Clock/Spectacle Shop/repair</li> <li>• Making of sign board (except for board made of iron)</li> <li>• Photo framing</li> <li>• Cobbler</li> <li>• Electrical repairing</li> <li>• Bakery</li> <li>• Atta Mill (10 HP)</li> <li>• Furniture</li> <li>• Cyber cafee</li> </ul> | <ul style="list-style-type: none"> <li>• Atta Chakki (Flour Mill)</li> <li>• Small Scale Spices Industry</li> <li>• Dairying</li> <li>• Cottage</li> <li>• Book Binding</li> <li>• Paper Bag Making</li> <li>• Cloth-Iron / Dry-Clean Shop</li> <li>• Tailoring</li> <li>• Carpenter Store without Saw Mill</li> <li>• Portable Water Mill</li> </ul> |



| Retail                                                                                                                                                                                                                                                                                           | Service Industry | HH Industry |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|
| <ul style="list-style-type: none"> <li>• Furniture</li> <li>• Private Office</li> </ul> <p>The conditions to satisfy the above criteria is to the total shop area will not be more than 20 m<sup>2</sup>. And a maximum number of workers will be 2 including the owner/manager of the shop.</p> |                  |             |

**Note: Other activities with the approval of competent authority, if not listed in the above table.**

## 20. Implementation Plan

To support the proposed Kashipur Planning Area Land Use list of projects has been identified for implementation works.

*Table 20-1: Identified Projects for 2041*

| Sector                         | Projects                                                                                                                                        | Time       | Implementation Agency          |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------|
| <b>Commercial</b>              | Development of Street Vending Zones                                                                                                             | Short Term | Municipal Corporation          |
|                                |                                                                                                                                                 |            |                                |
| <b>Physical Infrastructure</b> | Development of Water Supply Network (Phase wise)                                                                                                | Long Term  | Payjal                         |
|                                | Development of Sewerage Network Phase wise                                                                                                      | Long Term  | Payjal                         |
|                                | Development of Solid Waste Treatment Plant                                                                                                      | Short Term | Municipal Corporation          |
|                                | Development of Faecal and Sludge Treatment Plant                                                                                                | Short Term | Municipal Corporation          |
|                                |                                                                                                                                                 |            |                                |
| <b>Industry</b>                | Development of Escort Farm Industrial estate by SIDCUL                                                                                          | Short Term | SIDCUL                         |
|                                |                                                                                                                                                 |            |                                |
| <b>Transportation</b>          | Bus Terminal along with Public Transport System (Last Phase)                                                                                    | Short Term | PWD                            |
|                                | Widening of NH and Other Roads                                                                                                                  | Long Term  | PWD                            |
|                                | Development of Northern Bypass connecting Jaspur Road, Ramnagar Road, and Bajpur Road                                                           | Long Term  | NHAI                           |
|                                | Junction Improvement Projects at Stadium Chowk, Cheema Chauraha, Chatri Chauraha, Tanda Tiraha, Tanda Ujjain, and Chatri Chauraha (First Phase) | Short Term | PWD                            |
|                                | Development of Five ROBs (3 Linear and 2 T-Type)                                                                                                | Short Term | PWD and NHAI                   |
|                                | Development of Integrated Freight Complex (First Phase)                                                                                         | Short Term | District Development Authority |
|                                |                                                                                                                                                 |            |                                |

| Sector             | Projects                                                            | Time        | Implementation Agency                                    |
|--------------------|---------------------------------------------------------------------|-------------|----------------------------------------------------------|
| <b>Environment</b> | Afforestation along the Della River and natural drains (Phase wise) | Long Term   | Municipal Corporation and District Development Authority |
|                    | Development of parks and open spaces (Phase wise)                   | Long Term   | Municipal Corporation and District Development Authority |
|                    |                                                                     |             |                                                          |
| <b>Tourism</b>     | Development of Tourist Circuit along with promotional activities    | Short Term  | District Development Authority                           |
|                    | Development of heritage zone as per urban design guidelines         | Medium Term | Municipal Corporation and District Development Authority |
|                    | Development of archaeological sites and their conservation          | Medium Term | Municipal Corporation and District Development Authority |

*Source: Proposed by Consultant*

The projects are categorized as short-term, medium-term, and long-term based on the time required for the completion of projects and the priority to complete the project. The details of the project are discussed below and the list is provided in **Table 20-1**.

## **20.1. Short Term**

Short-term projects are important to solve the immediate issues in the planning area. The projects under short-term projects are discussed below:

### **20.1.1. Development of Street Vending Zones**

Street vending zones are dedicated areas for vendors to provide their services. The existing situation of Street Vendors is unorganized which creates a lot of traffic during peak hours of the city. Street vendors play an important role for people in India and are a major source of income for various families. The street vending zones are already working along the main

bazaar road within the core city of Kashipur. Only Parking Facilities, Pedestrianization facilities are to be provided by Municipal Corporation.

#### **20.1.2. Development of Solid Waste Treatment Plant**

The existing system of Solid Waste Management is carried out by the Municipal Corporation of Kashipur. The land required till 2041 with current practice is 169.61 Ha. The current Landfill site is 224 Ha, where more than 60% of the land is still available and the entire waste can be easily accommodated at the current landfill site. On the same site, a larger capacity of the SLRM center would be designed based on the space allocated. For 1 SLRM center for 600 households 4000 sq.m of land is required. Total 294 Centres of 4000 sq.m each are required till 2041 which can be easily designed within the current landfill site. For the preparation of the SLRM center, the DPR, tendering and construction works need to be carried out and the implementation agency would be a Municipal corporation.

#### **20.1.3. Development of Faecal and Sludge Treatment Plant**

The Kashipur Planning area is divided into three zones by railway lines. Hence, the proposal for sewerage is also divided into three zones for the feasibility of the project. The Three STP plants have been proposed which are located in Village Gularia and Basai in the west, Muhah Kheraganj in the South, and along New Bypass in the East. The implementation agency for setting up the STP plants would be a Municipal corporation.

#### **20.1.4. Development of Escort Farm Industrial estate by SIDCUL**

IIE Kashipur has a total land area of 310.96 acres. IIM Kashipur is close to the Industrial Estate. An Aroma Park is being developed in an area of around 40 acres in Kashipur. Motorable Roads, Electricity and lead street lights, Water supply, Internet services, Fire & Police Stations, Common Effluent Treatment Plant (CETP), and Incubation services by STPI are all the facilities within the estate.

The Target Industries mainly electronics manufacturers in the sectors like Automobile, Pharma & Medical devices, Defence Electronics, Power & Utilities, E-Mobility, Unmanned Aviation Vehicles (UAVs), Telecommunication and Electronics Goods, etc. are under construction by SIDCUL

#### **20.1.5. Bus Terminal along with Public Transport System**

Kashipur does not have any proper Public Transport System. The local transport is only via e-rickshaw and autos with no dedicated stops or parking spaces. Hence, according to the

requirement of the City Public Transport System with Bus Priority Lane has been proposed. The public transport system would provide an organized flow of movement of people as well as traffic. On all the roads from 60m to 30m Bus priority lanes have been proposed which cover most of the area of the planning area. The bus terminal is proposed on Moradabad Road and New Bypass Road with an area of 8.04 Ha which would help in easier movement of the buses. The implementation agency for the project would be PWD (Public welfare Department)

#### **20.1.6. Junction Improvement Projects**

Kashipur has grown organically over the years. Without any planning of transport facilities and lack of management, the city has developed a few choke points where intervention is necessary to improve its condition or else it would become worse with time. Junction improvement has been proposed for six major junctions namely Stadium Chowk, Cheema Chauraha, Chattri Chauraha, Tanda Tiraha, Tanda Ujjain, and Chattri Chauraha. The implementation agency for the project would be PWD (Public welfare Department)

#### **20.1.7. Development of Rail Over Bridges**

With the presence of a railway station in the central part of the city, the railway line is a broad gauge in nature and acts as a central spine. Due to this, there are many railway crossings which increase the travel time of commuters and is a major reason for city-level traffic congestion. The best solution to solve this is to propose ROB or RUB but due to shallow water conditions in kashipur, the only solution is to propose Rail over Bridges at major railway crossings. For the same, Five ROB have been proposed (3 Linear types and 2 T-types) on Ramnagar Road, Kashipur Road, Rudrapur Road, and Bajpur Road. The implementation agency for the project would be PWD (Public welfare Department) and NHAI (National Highway Authority of India).

#### **20.1.8. Development of Integrated Freight Complex**

Integrated Freight Complex/ Parking cum facility centers with a total area of 117.76 Ha have been proposed as the city is flourishing as an industrial town and in trade and commerce. Hence, an Integrated Freight Complex is proposed to provide parking and other facilities for the goods traffic in the planning area. This Complex has been proposed on Chandpur - Kashipur Road and Bajpur Road near the industrial sector. The implementation agency for the project would be District Development Authority.

#### **20.1.9. Development of Tourist Circuit along with promotional activities**

At the Local Level, the tourist circuit is proposed to promote a high degree of accessibility to create more opportunities for attracting tourism. There are 5 major tourist spots i.e., Bheemsankar Mahadev Temple, Chaiti Devi Temple, Dronasagar/Govishana Mound, Giri Sarovar, and Gurudwara Shri Nankana Sahib. The total distance to cover 5 major spots is 7.3 km which generally took 22 minutes to travel by vehicle and 1 hour 30 minutes by walk and the total time to complete the circuit is 3 hours to 5 hours depending upon the mode of travel.

At Regional Level, the tourist circuit is proposed to promote a high degree of accessibility to create more opportunities for attracting tourism. At the regional level, there are majorly two tourist spots namely Jim Corbett National Park and Tumaria Barrage where a Circuit among them has been proposed. The implementation agency for the project would be District Development Authority.

## **20.2. Medium Term**

Medium-term projects are important to solve the major issues in the planning area. The projects in the medium-term are discussed below:

### **20.2.1. Development of heritage zone as per urban design guidelines**

In Kashipur, Govishana Mound at Drona Sagar is the only heritage site recognized by ASI located within KPA. It was recently declared the site of “national importance”. The city of Kashipur itself belonged to the Harshvardhana era ruins of settlement can be still seen near the city. The proposed area under heritage is 93.16 Ha which is 0.84% of the total developable area which is enclosed by Ramnagar Railway line on the west, Bajpur Road on the South, Kundeshwari Road on the North, and Moteswar Mandir Road on the east. The implementation agency for the project would be Municipal Corporation and District Development Authority.

### **20.2.2. Development of archaeological sites and their conservation**

To conserve the heritage site as per the archeological department, 100m (Prohibited Area), 200m (Regulated Area), and 300m (Regulated Area) is marked as non-developable area and zoning regulation for all these zones are explained in the zoning regulations. The regulated parking space of 7.78 Ha is also been proposed on the western and eastern sides of the site. Along with it, a dedicated lane of 10 meters is proposed separately for the movement of E-rickshaws to increase the tourism flow within the site. The implementation agency for the project would be Municipal Corporation and District Development Authority.

## **20.3. Long Term**



Long-term projects are important to solve the major issues in the planning area. The projects in the long term are discussed below:

#### **20.3.1. Development of Water Supply Network**

Water supply is one of the basic facilities which needs to be provided to the people. The existing system of water supply is done via Pey Jal Nigam. They have already proposed a water supply network covering the old Municipal Area. For the rest of the Municipal Area, DPR, tendering and construction works need to be completed in Phase Wise. Pey Jal Nigam is also responsible for the water supply in the new planning area. The project would be carried out phase-wise as the city grows. In rural areas, the water supply is the responsibility of the panchayat and in urban areas Pey Jal Nigam is responsible.

#### **20.3.2. Development of Sewerage Network**

A new sewerage network has been proposed for the entire Kashipur planning area. As the city is divided into three parts by the railway line and for each zone, a sewerage network is proposed. The sewerage network would be collected in three different Faecal Sewage Treatment Plant. The DPR, tendering and construction works need to be carried out and Payjal Nigam is fully responsible for the same.

#### **20.3.3. Widening of NH and Other Roads**

According to the previous master plan 2011, the National Highways 734 and 309 of Kashipur Planning Area are proposed to be 50 m but due to unauthorized development, the road width of the National Highways varies from 18m-30m, not more than that. Hence, the widening of National Highways is a crucial project for the planning area. It would help in the reduction of traffic by facilitating easy movement of vehicles, and removal of unauthorized buildings. This National Highway connects various surrounding towns i.e Rudrapur, Jaspur, Bajpur, Ramnagar, Thakur Dwara, and Mahua Kheraganj. The widening of these roads to 50m should be the foremost priority in the upcoming master plan.

#### **20.3.4. Development of Northern Bypass**

Kashipur highly needs good transportation infrastructure to facilitate the movement of heavy goods and vehicles. From the transportation analysis view, it was found that the city needs bypass roads as there is a lot of traffic passing through the city. Hence new bypass roads have been proposed to better serve the Kashipur Planning Area at both the regional level and local levels. The two National Highways i.e., NH 309 and NH 734 forms the spine of the planning

area, from which a new bypass (Ring Road) has been proposed with a 60m right of way which has access controlled carriageway. It is the highest ROW in the Planning Area. According to URDPFI, it falls under the Arterial Road category based on its width. The implementation agency for the project would be NHAI.

#### **20.3.5. Afforestation along the Della River and natural drains**

Kashipur has a lot of natural drainage running throughout the planning area from north to south and from west to east. It is seen that Kashipur has a rich factor in terms of water bodies and to use it properly green belts have been proposed along with it with a total area of 715.76 ha which has a 44% share of total recreational facilities. To rejuvenate these areas a large chunk along both sides of Della River has been proposed as riverfront recreation, in addition to that, 10 m width of green belt on both sides of all other drains/ has been proposed. These green belt zones are an excellent opportunity for creating recreational zones along the natural drains. No construction zone of 25m and 10 m along the alignment of the tributary is earmarked on both sides. In these areas, recreational zone or forestation has been proposed. The recreational zones need to be carefully established without hampering the natural flow and with minimum construction. These zones will play the role of lungs in the planning area with green areas. With open spaces all along the planning area, it will increase the quality of life and would become a getaway space for the people in Kashipur. The implementation agency for the project would be Municipal Corporation and District Development Authority.

#### **20.3.6. Development of Parks and Open Spaces**

It is envisaged that the urban population in Kashipur will touch 5,55,431 by 2041 hence acquiring the form of major development. The provision of quality recreational facilities will enhance the quality of life of the citizen and create an aesthetic in the city. Major city-level parks and recreational areas are proposed along with residential areas and a continuous green belt will be proposed along with the water bodies for both safety and aesthetic reasons.

The parks, open spaces, Eco-parks, and Stadiums are proposed in every residential area along with all parts of the city with a total area of 423.96 Ha. In the same category, two eco-parks are also been proposed in the eastern and western parts of the city along the river to make it a city-level park as well. 17.42 ha area is proposed for stadiums to full fill the existing shortage and make kashipur a sport-oriented city as well. The implementation agency for the project would be Municipal Corporation and District Development Authority.

