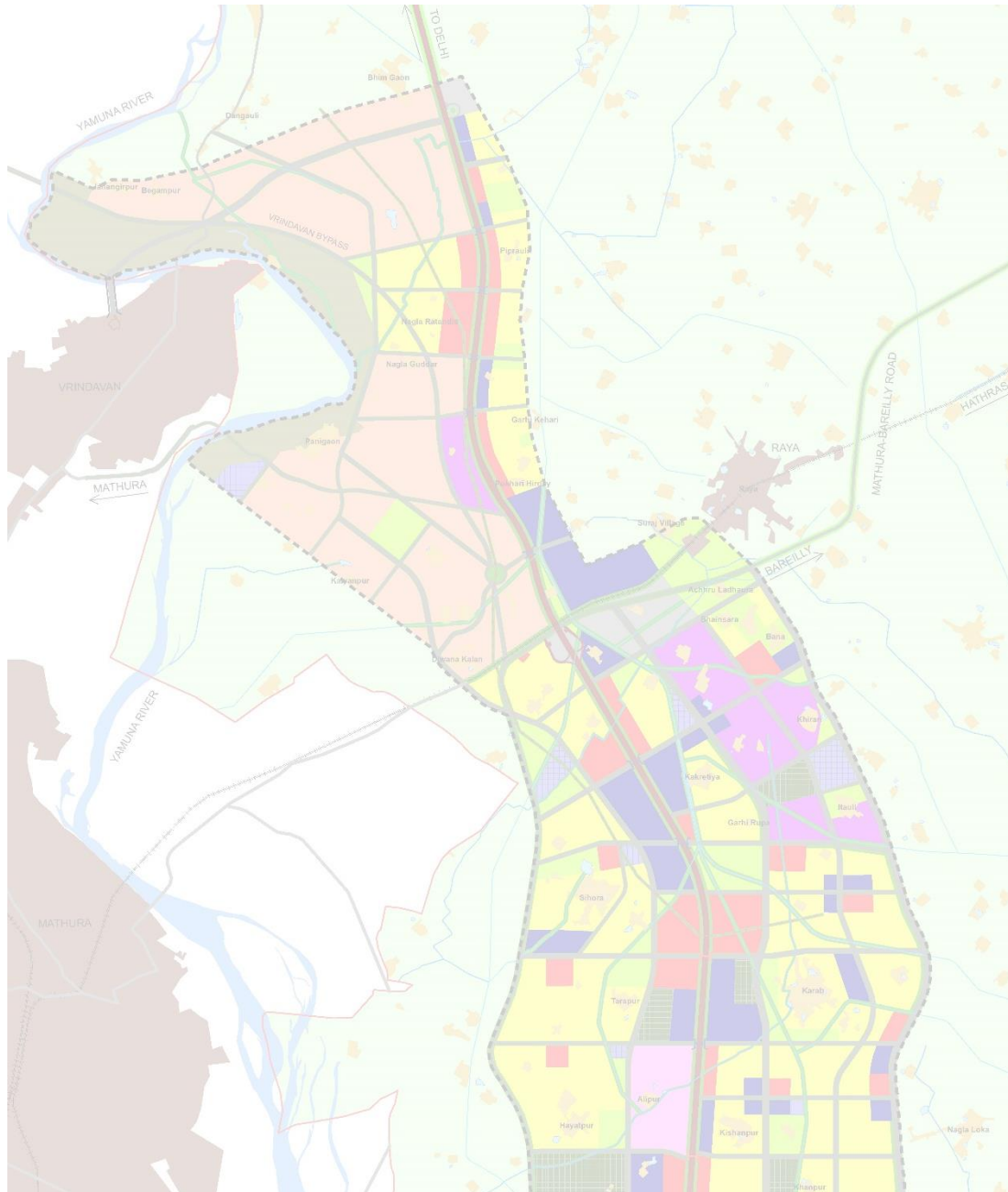


YEIDA Phase-II

[Notified area of Districts of Aligarh, Mathura, Mahamayanagar (Hathras) and Agra]



Draft Master Plan, Raya Urban Centre-2031 (AMENDED)



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Yamuna Expressway Industrial Development
Authority



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LIST OF ACRONYMS

ATM	Air Traffic Movements
BRTS	Bus Rapid Transit System
CBD	Central Business District
CGWB	Central Ground Water Board
CNCR	Central National Capital Region
CPCB	Central Pollution Control Board
CWC	Central Water Commission
DFC	Dedicated Freight Corridor
DMIC	Delhi Mumbai Industrial Corridor
DNGIR	Dadri Noida Ghaziabad Investment Region
FAR	Floor Area Ratio
GIS	Geographical Information System
HCZ	Highway Corridor Zone
HSR	High Speed Rail
LPCD	Litres Per Capita Per Day
LPG	Liquified Petroleum Gas
MDR	Major District Road
MPPA	Million Passengers per Annum
MRTS	Mass Rapid Transit System
MSW	Municipal Solid Waste
NCR	National Capital Region
NCT	National Capital Territory
NH	National Highway
NOIDA	New Okhla Industrial Development Authority
ODR	Other District Road
ORC	Orbital Rail Corridor
PAL	Planning Activity Level
PRT	Personalised Rapid Transit
RORC	Regional Orbital Rail Corridor
ROW	Right of Way
RRTS	Regional Rapid Transit System
SC	Scheduled Caste
SH	State Highway
ST	Scheduled Tribe
STP	Sewage Treatment Plant
TOD	Transit Oriented Development
URDPFI	Urban and Regional Plans Development Formulation and Implementation
WPR	Work Participation Rate
WTP	Water Treatment Plant
YEIDA	Yamuna Expressway Industrial Development Authority

1 INTRODUCTION

1.1 BACKGROUND

The urbanization trends in India are a direct reflection of the structural changes that are taking place in the economy. The combined contribution of industry and services to GDP is significantly higher compared to primary sector. However, it has been a cause for concern that while India has grown impressively in the last 15 years the main contribution to growth has come from the services sector rather than from the manufacturing sector, unlike the trend in most developing and emerging economies & growth in India has not been accompanied by a proportional supply of employment. Hence, Government of India's National Manufacturing Policy, thereby focuses on enhancing the share of manufacturing in GDP, from 15-16% since 1980, to 25% within a decade and creating 100 million jobs by 2022.¹

Simultaneously, the Central Government and various State Governments have initiated ambitious projects and proposals for enhancement of productive capacities of specific territories by creating investment regions and industrial areas. Some of the large scale national level initiatives are Delhi – Mumbai Industrial Corridor, Bangalore – Mumbai Investment Corridor, Chennai – Bangalore Industrial Corridor etc. and the development of Investment Regions and Industrial Areas along them to develop integrated Industrial infrastructure with planned Urbanisation & Infrastructure development.

In similar effort, to contribute to generation of employment in the manufacturing sector and upgrade the urban economy of Uttar Pradesh, the Government of UP has initiated the Yamuna Expressway Industrial Development Project.

1.2 THE YAMUNA EXPRESSWAY INDUSTRIAL DEVELOPMENT AREA (YEIDA)

Yamuna Expressway Industrial Development Area is located along the eastern bank of River Yamuna, comprises of the part of districts Gautam Budh Nagar, Bulandshahr, Aligarh, Mathura, Agra and Hathras. The area has been thought to develop due to conceptualization of the Yamuna Expressway. The concept of Yamuna Expressway was conceived by Govt. of Uttar Pradesh in 2001 with an aim to reduce the travel time between Delhi and Agra between two important tourist destinations. A 165kms, 100m wide 6 lane expressway was planned and developed between Noida and Agra reduces the travel time to 100 minutes and opens up the avenue for industrialization and urban development along the Expressway.

With a view of development in certain areas in the State as Industrial and Urban Development townships and concerned matter therewith, The Uttar Pradesh Industrial Development Act, 1976

¹ Source: Economic times, Aug 10, 2014, http://articles.economictimes.indiatimes.com/2014-08-10/news/52648250_1_100-million-jobs-manufacturing-sector-national-manufacturing-policy

passed by Uttar Pradesh Legislature under which Industrial Development Authorities have been constituted by notification for any industrial development area with an objective to secure the planned development in the area. To implement the conceived Yamuna Expressway Project and allied development, Yamuna Expressway Industrial Development Authority (erstwhile Taj Expressway Industrial Development Authority - TEA) was constituted vide Notification No. 697/77-4-2001-3(N)/2001 dated 24th April, 2001 under U.P. Industrial Area Development Act 1976 with a view to develop a planned industrial development in the region. One of the key functions of the Yamuna Expressway Industrial Development Authority is to prepare a plan for the development of the Industrial Development.

A total of 1187 villages spread over approx. 2,685 sq.km. of area had been notified in aforesaid six districts under Yamuna Expressway Industrial Development Authority vide various Notifications of Govt. of Uttar Pradesh for administration. Therefore, with an expected large scale development and intended industrialization along Yamuna Expressway, YEIDA, Govt. of UP intended to prepare the Master Plan for their notified area. For planning purposes, the development within the region, Authority decided to prepare the plan into two parts, designated as YEIDA Phase-I (*comprise of parts of Gautam Budh Nagar and Bulandshahr district*) and YEIDA Phase-II (*comprise of parts of Aligarh, Mathura, Agra and Hathras district*). Thus, the Master Plan for the YEIDA Phase-II is approved which four urban centres are identified for urbanisation based on detailed analysis presented in Master Plan of YEIDA Phase-II. This report covers the Master Plan of one of the identified urban centre named as “Raya Urban Centre” falling in Mathura District near to Mathura and Vrindavan City.

1.3 NEED FOR MASTER PLAN

Uttar Pradesh intends to promote industrialisation to support economic growth in identified areas. YEIDA has been perceived as one of the captivating destinations for industrialisation. The YEIDA being adjacent to NCR, surrounded by multifunctional centres with potential for influencing the development, existence of Yamuna Expressway, availability of large green field land and existing, ongoing and proposed national and regional level infrastructure projects opens up the avenue for the large scale development in makes the area suitable for industrialisation in UP. Thus, to attract the investment, planned and sustainable development of the YEIDA, to achieve the objective of Govt. of Uttar Pradesh of industrialisation, Master Plan needs to be prepared.

1.4 PURPOSE OF MASTER PLAN

The purpose of master plan preparation is to prepare the development framework for the long term growth of the area over a period of 20 years. Master plan is essentially a strategic legal document governing the land use development with control regulations of the area. However it suggests the broad land use plan with city level facilities and development control regulations for each use zone which shall be detailed out by preparation of zonal plan or sector plan before implementation. Master Plan will also suggest development strategies for all basic physical and social infrastructures for proposed urbanisation.

Although Master Plan allocates the land use for next 20 years, it needs regular monitoring, updating and revision. Thus, Master Plan shall be revised every 5 years to incorporate the actual development as on site, reviewing the pace and direction of development, adopting recent development patterns and change in demand scenarios. Sometimes the economic character and physical growth pattern changes drastically than the envisaged development, such phenomenon can only be tackled through revision of Master Plan in every 5 year. Revisions to Master Plan are important to make the plans more implementable/ workable and realistic by incorporating the changing trends of economy and development in to it.

1.5 OBJECTIVES OF MASTER PLAN

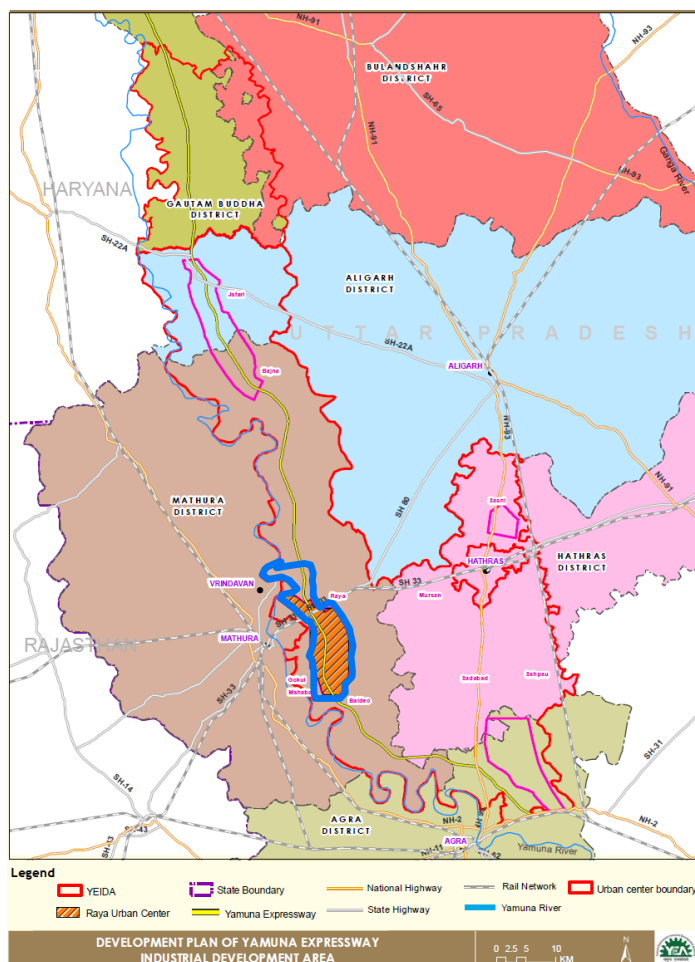
The broad objectives of the preparation of “Master Plan for YEIDA” are:

- To promote industrialisation as the economic development;
- To prepare the land use plan of the urban centre for planned development;
- To promote Heritage and Tourism Development with world class infrastructure;
- To make area attractive for investment by providing good quality infrastructure;
- To capitalise upon the opportunities created by the change in local, regional and global economy and large scale infrastructure coming up in and around the region;
- To provide seamless rural – urban integration while creating enhanced economic opportunities for rural settlements with improved quality of life by provision of quality physical and social infrastructure.

1.6 RAYA URBAN CENTRE

This report focuses on one of them named as “Raya Urban Centre”. The proposed Urban Centre spread over an area of 11653.76 ha, partially located in Mahaban tehsil of Mathura district, parts of which is falling in YEIDA. The urban centre is falling within the identified Taj Trapezium Zone where no polluting activities shall be developed in view of protecting the International Heritage Taj Mahal at Agra. The proposed urbanisation is located on the Eastern end of Yamuna Expressway near Raya ULB, surrounded by the Braj Region covering Mathura, Vrindavan, Gokul, Mahaban expected to tap the existing tourism potential.

Map 1-1: Location and Connectivity of Raya Urban Centre



The urban centre is proposed around interchange at Intersection of Yamuna Expressway and SH-33 and rail line connecting Mathura-Bareilly passing through Raya on both sides of Expressway. The proposed urbanisation is well connected regionally by road and rail network. In western and eastern part, city is connected by road through SH-80 to Aligarh and through SH-33 to Bareilly and by rail through meter gauge line connecting Mathura to Bareilly via Raya and Hathras. From the proposed industrial urban centre, Raya is the nearest railway station on Mathura-Bareilly line and Mathura on Delhi-Agra line. In north and south, the proposed urbanisation is connected to Delhi and Agra through Yamuna Expressway having Interchange near Mathura and Agra city. The urban centre gets connected with eastern UP and Madhya Pradesh via Agra

though network of well developed National Highways. Nearest International Airport is New Delhi approx 150 km away well connected through Expressway.

1.7 NEED FOR AMENDMENT IN RAYA MASTER PLAN 2031

The Govt of Uttar Pradesh has approved the Master Plan 2031 of RAYA Urban Centre through Govt order number 313/77-3-17-275M/15 on dated 08/05/2017. This comprehensive plan is designed to guide the sustainable development of the Raya Urban Centre, addressing various aspects such as land use, infrastructure, transportation, housing, and environmental conservation.

However, recognizing the cultural and historical significance of the nearby areas of Vrindavan, the Authority has identified the area for development of Heritage City near old Vrindavan city with consultation to Uttar Pradesh Braj Teerth Vikas Parishad. The incorporation of this Heritage City area in to RAYA Urban Centre Master Plan, authority has decided to amend the existing master plan of the RAYA Urban Centre. The inclusion of the Heritage City area will aims to create a harmonious blend of modern urban amenities and the preservation of cultural heritage, thereby fostering economic growth through increased tourism and creating a unique identity for the region.

The proposed amendment will ensure that the Heritage City Project is seamlessly integrated into the urban development framework, aligning with the overall vision of sustainable growth and heritage

conservation. By amending the Raya Urban Centre Master Plan 2031 to include the Heritage City area, the Yamuna Authority demonstrates its commitment to balancing development with cultural preservation.

1.8 REPORT OUTLINE

This report named as “Draft Master Plan” covers mainly land use plan with zoning regulations of Raya Urban Centre in Part of Mathura district falling within YEIDA. The outline of the report is as follows:

Chapter 1: Introduction; explains the development context, need, objectives and purpose of Master Plan preparation, YEIDA and Urban Centre Area;

Chapter 2: Development Strategy; explains the development perspective, imperatives, vision and strategies, planning principals adopted to arrive at the concept plan for development of Raya Urban Centre;

Chapter 3: Size of Urban Centre; explains the analysis to arrive at the optimum size of the urban centre using estimated employment and population estimation, per capita space standards and other planning norms and guidelines;

Chapter 4: Proposed Land Use Plans of Urban centre; this chapter explains the proposed land use break, land use zoning and policies for the Raya Urban Centre;

Chapter 5: Transport; this chapter includes the estimated traffic, proposed road hierarchy, circulation, public transport strategy for the proposed Raya Urban Centre;

Chapter 6: Utilities; this includes the demand, broad key infrastructure requirement, planning strategies for the various utilities related to water, sewerage, drainage, solid waste and power;

Chapter 7: Environment and Disaster Management; this chapter includes the environmental hotspots, spatial policies & strategies to mitigate them. This will include the landscape plan, and natural and manmade hazard mitigation strategies;

Chapter 8: Zoning Regulation; permissible uses within various use zones of the proposed urban centres have been detailed out in Chapter 8.

2 DEVELOPMENT STRATEGY

2.1 DEVELOPMENT PERSPECTIVES

YEIDA is expected to be one of the competitive economic centres in State of Uttar Pradesh in next 25-30 years which will absorb impulses from the large scale regional infrastructure development, existing urban centers Agra, Mathura, Aligarh, Hathras and able to compete with evolving surrounding urban centres NOIDA, Greater NOIDA, Dadri-Khurja Investment Region, YEIDA Phase-I etc. It is envisaged that the Raya Urban Centre of YEIDA will come up with a well planned sustainable economic development with industrialisation and tourism as the driving factors.

To achieve the goal it is imperative to make the development liveable and sustainable with world class industrial and tourism infrastructure and state of the art social and physical infrastructure to provide the quality of life to the residents. By virtue of presence of Yamuna Expressway connecting Delhi to Agra, upcoming Western and Eastern DFC, Eastern Peripheral Expressway, Golden Quadrilateral, North-South Corridor etc. in the region and connectivity of the Urban Centre through interchanges on Expressway to the region via regional roads, presence of tourists towns and existing industrial estates in near vicinity, and availability of large chunk of land provides an opportunity for the large scale greenfield urbanisation in Raya Urban Centre of YEIDA Phase-II.

Large scale industries for manufacturing of beverages, petrochemical, pharmaceuticals, medicinal chemical and botanical products, manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber and manufacture of dairy products are expected to attract due to the availability of raw material in the region. However, to attract large scale industrialisation and its sustainability, it is requisite to provide key modern industrial infrastructure logistic hubs, freight complexes, uninterrupted power supply, water supply, which will be integral part of the proposed development in the YEIDA.

Due to surrounded Braj-Agra tourist circuit and fast connectivity with Delhi, there is large potential for tourism and entertainment which is expected to converge in the development of the urban centre as one of the key economic activities. Suitable infrastructure for tourism is proposed to develop in an integrated manner as tourism zone which is envisaged to be the catalyst for achieving the development goals of the area.

A separate non manufacturing economic zone development is proposed to have an high end office zone to attract potential activities like film city, expo mart, trade and exhibition ground, IT, ITES, BPO's, business centres, offices of business and industrial houses, other professional offices to support the main economy are likely to converge in Urban Centre.

The focus will be on the development of the environment friendly urban centre with pollution free urbanisation providing housing for all with world class amenities commercial, recreation, institutions, congestion free wide roads and large green spaces.

2.2 DEVELOPMENT IMPERATIVES

To understand the development context in YEIDA Phase-II and in Raya Urban Centre, various development imperatives have been analysed which are expected to drive the development are:

- Large scale national level corridors like Golden Quadrilateral, East-West and North-South Corridors, DFCs, Yamuna Expressway are converging in the region poised to boost the development;
- Presence of world class road connectivity with Delhi/NCR and other important regional destinations through various existing and proposed linkages;
- Presence of multifunctional centres like Mathura, Vrindavan, Hathras, Aligarh, Agra etc. in the vicinity;
- Part of Golden Triangle of Tourism and Braj-Agra Tourist Circuit: Delhi-Agra-Jaipur is one of the most visited tourist circuits in the world and is famous for world heritage sites;
- There is an opportunity for showcasing sensitive development in context ecologically sensitive area due to presence of Yamuna River on the western belt, network of canals and streams, ponds spread over the Urban Centre;
- Presence of large agriculture hinterland and existing industrial estates supporting the industries for raw material and continued to be the livelihood for the villagers;
- Availability of abundance human resource;

2.3 OBJECTIVES OF MASTER PLAN

The main objectives for the Raya Urban Centre, YEIDA, Phase-II Master Plan for horizon year 2031 for integrated development are -

- To optimise on the present potential, enhance investment climate and promote the economic development of the region through creation of a long term sustainable environment supported by world class infrastructure;
- To promote tourism and industrialisation as the key economic sector with supporting infrastructure followed by service sector and make the area competitive for attracting investments;
- To develop the self sustainable township for people to “work & live” providing quality of life with world class physical and social infrastructure;
- Development of economically and socially balanced new city;
- To promote sustainable development in the area having minimum adverse environmental impact of development;

- To achieve seamless urban –rural interface by provision for better quality of life, diversification of job opportunities and quality physical and social infrastructure for urban villages.

2.4 SWOT ANALYSIS OF THE URBAN CENTRE

Based on the analysis of the existing condition including infrastructure, availability of natural and human resources, land availability, govt. policies and incentives, a SWOT analysis have been done for Raya Urban Centre to capitalise on the strengths and opportunities, overcome the threats and mitigate the weaknesses while preparation of Master Plan within its preview. The SWOT analysis is as follows:

Strength	Weakness
• Strong road and rail transport linkages through Yamuna Expressway, SH-33, SH-80, MDR connecting Mathura to Sadabad; Delhi Agra and Mathura- Bareilly Rail line. • Presence of Braj-Agra tourist circuit with main tourist towns in surrounding Mathura, Vrindavan, Gokul, Agra etc. • Presence of natural features in and around the identified urban centre viz. river, canal etc. providing the green view of the area; • Presence of large chunk of vacant land with road connectivity; • Fertile and well irrigated land between Yamuna and Ganga with abundant water resources;	• Area falls under TTZ restricts development of polluting activities especially coal based industries; • Ecologically sensitive zone close to river is urbanised; • Existing power and energy deficit for large scale industrialisation; • Lack of other industrial infrastructure; • Existing low social development with sex ratio, literacy rate and workforce participation below national average. • Lack of skilled manpower;
Opportunities	Threats
• Interchanges at Raya, Yamuna Expressway, an opportunity for development due to accessibility; • Proposed large scale development can attract large human resource to the region; • Significant presence of tourist destinations in immediate vicinity-rich in heritage and culture; main trigger for development; • Significant presence of different types of industries • Presence of truck line for gas supply in near vicinity, one of the industrial infrastructure; • Existing Gokul barrage on Yamuna River to tap surface water source	• To compete with other existing and upcoming urban centres viz. YEIDA Phase-I, Greater Noida; Mathura, Agra etc. • Possible pollution to Yamuna River due to increased industrialisation and urbanisation; • Loss of agricultural livelihood of existing villages in the notified area of YEIDA; • Possible decline in inherent economies due to shift towards new functions.

2.5 VISION

“Raya Urban Centre is visualised to be a “tourist and industrial destination” predominately appearing on the tourism and industrial map of UP with all basic physical and social infrastructure like water supply, sewerage, drainage, a good integrated road network coordinated with transportation and communication supporting a vibrant healthy life for the citizens and visiting tourists. The urban centre is proposed to develop with world class tourist and industrial infrastructure to attract investors for thriving sustained economy”

Supporting the above vision a set of development objectives has been formulated. The vision envisages the Raya Urban Centre as tourism destination in the tourist circuit of Uttar Pradesh and eventually on tourism map of country. The current potential of rich cultural and heritage in the Braj-Agra circuit indicate promising future industry, shall be enhanced through dedicated efforts.

The objective is to have a **liveable, competitive, and governed development, to achieve sustainability by focusing tourism and industrialisation** capable of absorbing economic development impulses of world class regional infrastructure and to tap existing potential.

To optimise and reap the development benefits of economic sector activities like manufacturing and tourism adequate, well coordinated physical and social infrastructure will be pre-requisite and also to support life and economy on sustainable basis. Therefore, the emphasis on basic infrastructure development such as water, sewerage, drainage, roads and transportation is well placed.

A **sustainable development** is the one with equitable economic impact with no or minimal negative environmental impacts. **The objective is to have sustainability through liveable and competitive development.** To achieve objective, Master plan shall be governed by following parameters:

- Economic Sustainability
- Social Sustainability
- Environmental Sustainability
- Urban Governance

The following factors have been considered in Master Plan preparation to fulfil the vision of a sustainable development.



ECONOMIC SUSTAINABILITY

- **Treating Land as Scarce Resource** – Area being rich in agriculture production, a compact city development to save the land;
- **Industrialisation** – Large scale industrialisation with varied type of industries of different scales, big industries supported by ancillary industries around;

- **Tourism Development** – to tap and enhance the existing potential of tourism in vicinity by developing supporting tourism activities and infrastructure;
- **Incorporating Local Resources** – Proposed development shall benefit to the existing local people by best use of the local resources and available raw material to promote inclusive development. Agro based industries are promoted due to presence of large agricultural hinterland and to support the rural economy of the region and developing support tourism activities by tapping the local heritage, art and cultural potential;
- **Large Scale Infrastructure** – for sustainability, harnessing the benefits of the large scale infrastructure in the region viz. Yamuna Expressway, Dedicated Freight Corridor, Eastern Peripheral Expressway by promoting development around them;
- **Industrial Infrastructure** – Provision of world class industrial infrastructure such as Integrated Freight Complex/Logistics hubs, uninterrupted power supply, 24X7 water supply, effective telecommunication system to become competitive among other industrial centres in the region and in India;
- **Tourism Infrastructure** – Provision of world class tourist infrastructure to attract tourists to visit and stay in proposed urban centre viz. information centre, tourist travel management, restaurants, budget and star hotels etc.;
- **Conducive Development Policies (Legal, Regulatory & Fiscal Policies)** – To become competitive, development policy framework, incentives, legal framework and development control regulations shall be attractive to investors and shall promote foreign direct investment;
- **Human Resource Development** – Skill development of the available human resources through institutionalisation to match the skill sets of National & International standards to improve the employment levels and to utilise local resources;

SOCIAL DEVELOPMENT

- **Housing Development** – To provide accommodation for all providing good quality of life attractive for working and living, well distributed in the city on the concept of walk to work or by using public transport;
- **Roads and Public Transport** – Provision of efficient road network for regional connectivity and smooth local movement and provision of public transport since inception of development to avoid reaching the situation of traffic congestion on roads;
- **Other Physical Infrastructure** – Adequate and efficient water supply, sewerage, drainage, solid waste management system and power supply to provide quality of life to the residents of the city;

- **Recreational and Social Infrastructure** – Provision of world class recreational facilities and educational, health and socio-cultural facilities providing good quality of life attractive for working and living for future population;
- **Abadi Development** – To promote the inclusive development, Abadi's between urban villages shall be facilitated with the physical & social infrastructure at par with urban villages;
- **Rural Development** – Rural areas which are going to be continued with rural character shall be equipped with better economic development opportunities;

ENVIRONMENT FRIENDLY DEVELOPMENT

- **Integration of land use and transport** – Various land uses shall be integrated with transportation system which will minimise the use of private vehicles reducing emissions and promotes pedestrians, cyclists and use of public transport;
- **Pollution Free Industrialisation** – All industries locating in the region shall take suitable measures as per MOEF guidelines especially being into TTZ zone to have pollution free development;
- **Zero Waste Generation** – Infrastructure development so that all the waste generated shall be recycled and reused or safe to discharge;
- **Preserving natural features** – Natural features such as drains, streams, canals, ponds/lakes and forests are spread in the area shall be conserved;
- **Effective Open Spaces** – In the era of dense development, large percentage of open green spaces are distributed to develop environment friendly development;
- **Protecting environmental hot spots and minimising risk of flooding**– suitable measures shall be taken to protect environmentally sensitive zones such as wetlands and adopt measures to avoid flooding;
- **Use of Renewable Source of Energy** – Use of renewable source of energy such as solar, wind, biomass energy for power generation and suitable technology to save energy by using lesser power consumption equipments;

URBAN GOVERNANCE

- **Implementation Strategy** – Effective implementation strategy for timely and in relatively low cost development, which is responsive to citizens needs;
- **Review and Revision of Master Plan** – Implementation framework shall set the time line for continuous review of the implementation of Master Plan and periodic revision of Master Plan with the change in development scenario as per stipulated guidelines;
- **Efficient Monitoring and Evaluation** – efficiency, effectiveness and economy of city administration in delivering the services and implementation that are responsive to citizens needs;

2.6 PLANNING PRINCIPLES ADOPTED FOR THE SPATIAL PLAN OF URBAN CENTRE

The spatial plan of the Raya Urban Centre has been prepared based on the principles which will together bring viable, efficient and sustainable urban structure. The principles have been integrated in such a way that they are consistent, coherent and are in harmony with each other to provide a robust development.

1. **Connect people, goods, services locally, regionally** – Ensuring effective and efficient transportation system for people, goods and services by strengthening regional connectivity to the city and smooth intra city movement through grid iron pattern of road network in an hierarchical manner and suitably located allied infrastructure;
2. **Compact Cities** – In order to minimise the development of scarce resource of land, to minimise the travel distances and short infrastructure networks reducing the capital investment, high density development with efficient distribution of land uses;
3. **Minimises conflict between regional & city traffic and industrial and residential traffic** – The roads and land uses planned in such a manner that regional traffic shall pass through the existing regional roads without mixing with the other city traffic of the urban centre. The main roads in the industrial area shall be connected with regional roads in such a way that heavy industrial traffic, shall not mix with residential traffic;
4. **Provision of Dedicated Public Transport and NMT** – The cross section of the arterial road includes exclusive lanes for public transport and arterial and sub-arterial roads for pedestrian and cyclists to reduce movement by private vehicles;
5. **Integration of Land Uses** – The proposed land uses are distributed in such a way that the industrial areas and other employment areas are close to residential areas so as to reduce the commuting distances. Moreover, it is proposed that all the commercial and institutional areas are well distributed throughout the region to promote walking, cycling and use of public transport and reduced motorisation;
6. **Polycentric Development** – land use distribution of the urban centre are developed on the polycentric spatial model of development with one central business district and institutional area serving the entire area and various district centres and public semi public facilities especially educational and medical facilities are well distributed which will be self sufficient and viable to serve the basic needs of the community level zone;
7. **Conservation of natural flood plains and natural features** – To protect the area from risk of flooding and natural hazards, Yamuna flood plains shall be protected by development of embankment and continuing the agriculture and allied activities, plantation shall be encouraged.

All other environmentally sensitive areas such as streams, natural drains and canals have been given green buffer to conserve them.

8. **Distribution of Green Spaces** – The green spaces in the form of green belts, open spaces, parks and playground in addition to recreational areas have been spread all over the area within both the residential and industrial areas. Green belts are provided all along the roads, canals and drains absorbing air and noise pollution of traffic and to preserve water bodies. Parks and playground again plays an important role as open lung spaces and recreational spaces and hence distributed to make available at equitable distances from all.
9. **Integration of Village Settlements with the development of the Region** – Rural settlements falling within the Urban Centres will inevitably lose their agricultural land for urban development. Alternate employment opportunities need to be created for the population living in these villages through skill development for their livelihood. It is proposed that these villages will get improved quality of life by ensuring the provision of the physical and social infrastructure at par with the residents of urban centres.
10. **Densities of Development** – Since, the urban centre is proposed to be sustainable development with adoption of compact development which suggests dense development to support public transport. The proposed gross density in urban centre is between 100-125pph with 10% less for special townships like knowledge city, industrial township, sports city etc. as per Draft Regional Plan 2021, NCR and the average residential density is proposed to be in between 400 - 600ppha.

2.7 PLANNING AND DESIGN CONCEPT

Based on the experience of several new towns and urban expansion projects implemented in Country and keeping in view the contemporary thought and approaches to the city planning and design, few areas of concern have been identified which have greatly influenced the conceptualisation of the form, structure and design of the proposed urbanisation. These are outlined as follows:

- Ecologically sensitive zone of Yamuna River and its flood plain, network of drains and canals spread in YEIDA;
- Adjoining urban centres Mathura, Vrindavan, Agra, Gokul, Mahaban, Baldeo to the urban centre;
- Access controlled Yamuna Expressway connecting Delhi to Agra providing fast connectivity in the region;
- Existing interchange at convergence of SH-33 and Yamuna Expressway providing regional connectivity;
- Connectivity to Vrindavan through provision of ramp on Northern end of SH-33;
- Presence of Mathura – Bareilly railway line, an opportunity for providing rail connectivity to the region but acts as a barrier for physical development;
- Presence of Delhi Agra Railway Line through Mathura as rail head in immediate vicinity;
- Development in Raya Urban Centre not to cause pollution being part of Taj Trapezium Zone.

2.7.1 Concept of Development

The Raya Urban Centre mainly falling in Mathura district proposed on both sides of the Mathura-Bareilly rail line and Yamuna Expressway with presence of Vrindavan, Mathura, Gokul, Mahaban, Baldeo urban local bodies in immediate vicinity influencing the development. The main features of the design and concept of Raya Urban Centre are as follows:

- Allocation of land for industrialisation as key economic activity based on demand assessment;
- Development of tourism based on heritage, art and culture as an important economic activity;
- A specific zone as “Tourist Zone” providing the unique identity to the city has been proposed to attract the tourists to visit and stay in Urban Centre by creating alternate tourist activities and tourist infrastructure provision;
- Distribution of industrial development mainly in the north-east and south of the planned city in the form of large contiguous pockets considering the wind direction so as to avoid the air from industrial area to pass through residential development;
- An integrated infrastructure system has been proposed for industrial base of the city;
- A separate zone has been proposed as Offices which will include soft economic activities such as film city, corporate offices of industries and others etc. at suitable location;
- Provision of residential development to accommodate the induced population of 8.7lakhs by 2031 with an equitable distance from various work centres;
- A balanced allocation of the industrial, tourism zone and residential areas with other recreational and social facilities to make the city a self contained settlement providing both jobs and homes in an integrated manner;
- Adequate recreational and other socio-cultural facilities to provide quality of life to the residents of the city with an attractive and desirable living environment;
- Developing institutional area and commercial areas in the centre of the city on the arterials of the city;
- Abadi areas will be contained within the proposed urban centres in a planned manner with provision of planned village expansion areas in its vicinity with adequate physical and social infrastructure at par with urban areas as per prevailing policy;
- A well coordinated hierarchical road system to support goods and passenger movement within and outside the city guided by the existing road network;
- Provision of transport logistics area at suitable location to support goods and passenger movement;

- Provision of adequate underpasses with maximising the utilisation of existing ones to provide cross connectivity between the development on both sides of Yamuna Expressway considering its access control nature;
- Adequate provision in right of way with the emphasis on public transport with pedestrians and cyclists to achieve sustainable development;
- Promoting environmental concerns at local level and conserve major hotspots canals, drains, ponds, forests by provision of green belts and maximising the green development such as parks etc. in surrounding;
- Development of “Mixed Use Zone” with integrated development of non polluting economic activities and residential in immediate vicinity on the concept of “walk to work”. The economic activity could be industrial, recreational, institutional, IT/ITES etc. supported by residential, commercial, public semi public facilities etc.;

2.8 PLAN STRUCTURE

The Raya Urban Centre has been planned on grid iron pattern. Major roads have been planned vertically in North-South direction. While few major roads are running East-West direction perpendicular to North-South roads forming a grid and dividing the area into sectors. The town is planned on concept of self sustained integrated township.

One of the key features of the concept of development is planning of city level commercial and institutional on both sides of expressway providing cross connectivity through underpasses so as to centrally locate them within the city and to have visual attractiveness of the area providing identity to the development. The development of the industries is expected in a big way for which adequate land has been kept reserved contiguously on the North-Western and Southern end of the urban centre as per wind direction.

Another key feature of the structure of Raya Urban Centre is the development of the tourism zone on the Northern end of the planned development adjacent to the Vrindavan due to direct connectivity from Expressway. Some of the key elements of planned structure are detailed below.

2.8.1 Industrial Area

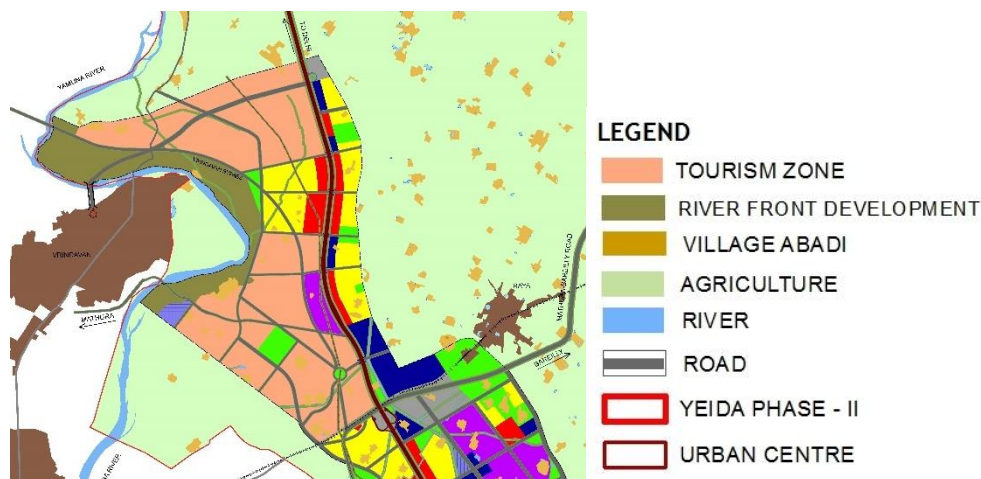
Total of 917.46 ha land has been proposed to be developed under industrial area as per demand analysis as one of the important economic activity. The industrial areas have been planned running North-West to Southern part of the urban centre as per wind direction. Also, the proposed industrial areas provide sufficient spread of industrial work centers within the city with a view to reduce commuting distances.

2.8.2 River Front Development and Tourism Zone

A specific tourism zone is proposed to be developed on the northern end of the urban centre mainly on the western side of the Expressway in order of existing connectivity to Vrindavan from Expressway through ramp and owing to impetus of development due to immediate vicinity to Vrindavan.

Adjacent to the tourism zone along Yamuna River, a River Front Development has been proposed considering the High Flood Level (HFL). However, the tourism zone is proposed to be developed with compendium of various tourist activities with religious tourism as main focus presenting heritage, art and culture of the region. In addition, it is proposed to develop park, playground, amphitheatre, open air theatre, museum, heritage centre convention centre, haat development, mela ground, tourist trails, rural tourism centre, budget hotels, service apartment, dharamshalas, ashrams, temples, tourist facility and information centre etc.

Map 2-1: Tourism Zone & River Front Development



2.8.3 Residential Development

Total of 2430.49 ha land has been proposed to be developed under residential area. The residential area has been planned in the form of sectors with an average size of 60ha. The residential sectors are planned to be developed for medium (<500) and high density (500 & >500). It is proposed that the residential sectors along Expressway, adjacent to city level institutional and city centre shall be developed for high density.

In each sector community and sector level facilities in the form of school, dispensaries, shopping centre, open spaces, parks and playgrounds have been proposed to be provided in a hierarchical manner. However, only city level facilities have been shown on the Land Use Map-2031 and community level facilities have been recommended as per planning norms which shall be provided while detailing the sector layouts.

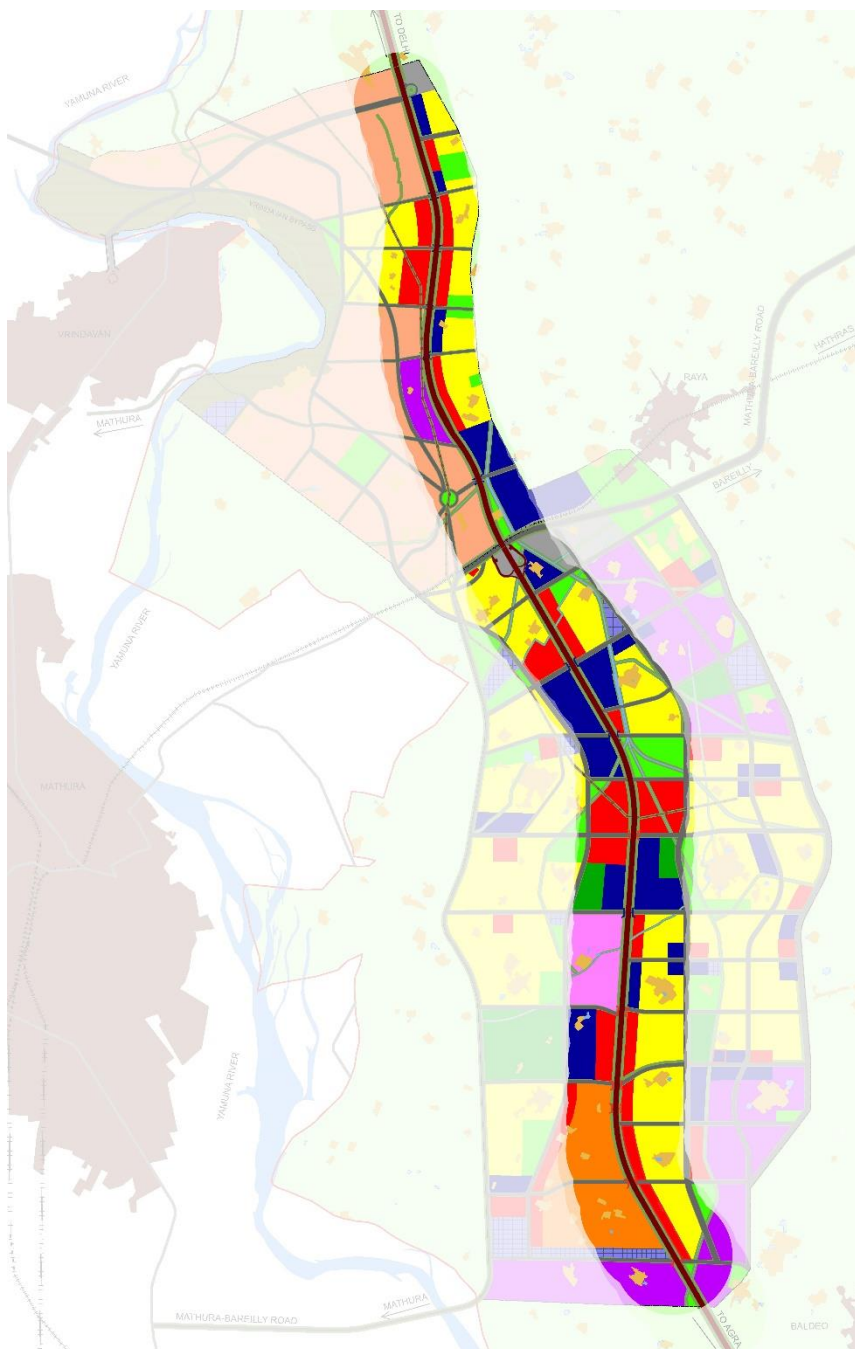
2.8.4 Recreational Zone

While planning recreational areas care has been taken that recreational areas have been distributed in all parts of the city. Natural features such as forest, drains, water bodies and manmade features such as canals etc. are major ecological resources shall be preserved and have been a consideration while planning for recreational areas. This has been made possible by appropriate green along them and integration of land uses for recreational facilities. The recreational areas have been planned mainly along these environmentally sensitive areas.

2.8.5 Development along Expressway

One of the key proposed structures of planning of the urban centre is development of land uses generating secondary and tertiary sector economy such as institutional, commercial, offices etc. providing the view of development along the Expressway providing unique identity and accessibility being centrally located. However, internal movement within the activities will be taken care by underpasses.

Map 2-2: Development along the Yamuna Express Way



2.8.6 Transportation

Keeping in view the development of the area, number of arterial roads running north-south and east west, provision of dedicated public transport, transport facilities for passengers and goods has been proposed to be developed.

- The road hierarchy has been proposed in consideration of regional and city level connectivity for both passengers and goods movement expected with the industrial and tourism zone development. The hierarchy proposed is as follows.
 - ✓ Arterial Roads (100m & 75m)
 - ✓ Sub-Arterial Roads (60m & 45m)

Further, the lower hierarchy roads will form part of sector layout details.

- Yamuna Expressway & SH-33 and SH-80 will continue to be the roads providing regional connectivity to the urban centre. SH-33 and SH-80 are proposed to be widened.
- Considering the access control nature of the arterial roads, the cross connectivity is planned to make the maximum use of available underpasses. Additional underpasses are proposed at suitable locations for providing seamless connectivity between the city zones on either side of Yamuna Expressway.
- Provision has been kept for development of dedicated public transport to be developed on all city arterials;
- Provision has been kept for pedestrian and cycling path in all arterial and sub-arterial roads;
- Transport facilities viz. freight complex is proposed to be developed on the Northern end near Raya along SH-33 and railway line providing rail road connectivity and on the southern end within the industrial area to make them accessible to various zones of industrial development reducing the goods movement.
- A bus terminal with depot has been proposed to be strategically located near the interchange in the north which is accessible through arterial road network. Further, the depot shall be located along with the terminal to avoid having any dead mileage. Also, it is recommended that the accessibility of the passenger transport facility shall be different from the goods facility in case of locating them adjacent to each other so as not to mix the traffic of the two.

3 SIZE OF URBAN CENTRE

3.1 PROPOSED ECONOMIC PROFILE OF THE URBAN CENTRE

Yamuna Expressway Authority being primarily constituted to promote the manufacturing sector in State of Uttar Pradesh and due to the existence of the industries in Mathura supports the industrialisation as one of the main economic activities in Raya Urban Centre. However, the proposed urban centre being well connected with the surrounding existing tourist destinations of Mathura, Vrindavan, Gokul, Agra in close vicinity, tourism mainly based on heritage, art and culture is also expected to be the important economic activity of the urban centre.

Detailed economic analysis has been done to identify prominent industries at global, national, state and regional level which has potential for expanding and developing in Raya Urban Centre due to availability of factors of production, Govt. policies and interventions due to planned development will attract the industries.

As Raya Urban Centre is falling within the notified Taj Trapezium Zone (TTZ), the industries have to follow the environmental measures as per MOEF guidelines and other Supreme Court Orders for industrialisation which not cause harm to Taj.

The Mathura-Vrindavan area, renowned for its deep cultural and religious significance, is also a flourishing center for local handicrafts, which play a pivotal role in the region's economic development. Artisans in Mathura and Vrindavan produce a diverse range of traditional crafts, including intricately designed pottery, handwoven textiles, wooden carvings, and distinctive jewelry, often inspired by the rich heritage and religious motifs of the region. These handicrafts not only preserve traditional skills and promote cultural identity but also provide vital livelihoods for many local families.

The cultural heritage of Mathura and Vrindavan, steeped in stories and traditions, significantly enhances the appeal of these crafts. Tourists and pilgrims visiting the region are drawn to the unique, authentic products that reflect the area's history and spiritual significance. This burgeoning tourism offers a lucrative market for artisanal goods, directly contributing to the local economy. The sale of handicrafts boosts income for artisans and stimulates related sectors such as retail, hospitality, and transportation.

Recognizing the economic potential of local handicrafts, the government and various non-governmental organizations are increasingly investing in initiatives to support artisans. These initiatives include training programs to enhance skills, efforts to improve product quality, and strategies to expand market access both domestically and internationally. Infrastructure

developments, such as craft hubs and artisan villages, provide platforms for artisans to showcase their work, attract tourists, and engage with buyers directly.

Moreover, festivals and cultural events in Mathura and Vrindavan often feature handicraft exhibitions, further promoting these traditional crafts and increasing their visibility. These events not only celebrate the cultural heritage of the region but also drive economic activity by attracting visitors and encouraging spending on local products.

The integration of local handicrafts into the broader economic framework of Mathura and Vrindavan underscores the importance of cultural heritage in driving economic prosperity. By preserving and promoting traditional crafts, the region not only maintains its cultural identity but also fosters sustainable economic growth. This holistic approach ensures that the benefits of economic development are widely distributed, enhancing community well-being and ensuring the longevity of cultural traditions. Through these efforts, Mathura and Vrindavan serve as exemplary models of how cultural heritage and economic development can be harmoniously integrated.

Moreover, due to the presence of Braj-Agra tourist circuit including Mathura, Vrindavan, Gokul, Barsana, Nandgaon, Agra, Fatehpur Sikri in immediate vicinity, urban centre will generate economy which supports the tourists. In this view, in addition to various world class commercial and recreational activities such as amusement park, golf course, sports complex, heritage or cultural centre to attract the tourists to visit and stay in Raya Urban Centre also supporting the residents of the city, a special “Tourism Zone” is proposed to be developed having compendium of various similar activities. These activities shall mainly include hotels and restaurants, convention centres, haat development, cultural centres, wellness centres, tourist trails, tourist travel facilities, tourist information centre, dharamshalas, ashrams, heritage centre, convention centre, museum, amphitheatre, parks, film city etc.

3.2 PROPOSED EMPLOYMENT AND POPULATION ESTIMATES

RAYA will be developed as an Heritage Tourism and Industrial township, benefitting from the proximity to Mathura and Vrindavan city. . The anticipated employment opportunities will arise from commercial, industrial and Heritage Tourism activities. A major portion of population will be attracted to RAYA due to the available employment opportunities in vicinity at local level. **Creation of employment is an essential aspect of social development process and YEIDA aims to cater to the employment needs of the surrounding areas.** To calculate the potential employment generation in RAYA as a Green Field Urban Centre, case studies of NOIDA master plan, Greater NOIDA master plan, Gurgaon master plan and Faridabad master plan was analysed. The activity structure is segmented with respect to the land use and it gives an insight about the employment generation in RAYA.

The Table 3-1 shows the Employment Generation and Population Projections from the land uses from RAYA Master Plan 2031.

Table 3-1: Estimated Population of Raya Urban Centre-2031

Land Use (2041)	Area in Ha	Area in Sq.M.	After reduction of 30%	Assumption	Employment
Commercial	708.67	7086663	4960664	1 in 30 sqm	1,65,355
Tourism	1600.77	16007750	11205425	1 in 130 sqm	86,196
Industrial (Small scale)	917.46	9174581	6422207	100 per ha	91,746
Institution	762.23	7622294	5335606	1 in 40 sqm	1,33,390
Offices	137.84	1378420	964894	1 in 60 sqm	22,974
Mixed Use	1142	11420000	7994000	1 in 100 sqm	79,940
Total Employment Generation (2031)					5,79,601
Work force Participation Rate					36%
Estimated Gross Population					16,10,002
Containment Ratio					60%
Total Population for RAYA Master Plan -2031 (Amended)					9,66,000

Due to the presence of cities and towns such as Mathura, Agra, Raya, Vrindavan etc. in the vicinity, 60% of the above employment generated from manufacturing is assumed to live with their families in the proposed urban centre. Further, assuming that 36% of the total workforce participation of Urban Centre will be contributed by manufacturing sector and tertiary sector activities such as tourism, service, transport etc.

Further, to accommodate the estimated population and density to be achieved, considering planning standards and norms for per capita space requirement, landuse analysis and special Heritage City Project, land area requirement of approximately 11653 ha. has been estimated which is explained in next section. With the estimated population and land area requirement, the gross density expected to achieve in Raya Urban Centre is approximately 80 ppha. This is mainly because in addition to Heritage city with small industrial pockets with commercial and office activities, Raya has a substantial development in tourism zone which further reduces the development density of the area.

4 PROPOSED LANDUSE PLAN

4.1 LANDUSE DISTRIBUTION

The proposed land use allocation in Master Plan of Raya Urban Centre follows a hierarchical order to serve the estimated population of 9.75 lakhs including villages served by the development of urban centre. The total area to be developed has been divided into sectors considering the land requirements and facilities have been distributed as per norms and standards established after careful study of URDPFI guidelines, YEIDA Building Regulation and Master Plans of industrial areas such as NOIDA, Greater NOIDA, Dholera Investment Region, Greater Bhiwadi etc.

4.1.1 Hierarchical Allocation of Landuse

The distribution of facilities is planned at three levels: i) firstly at the city level for a population of 9.75 lakhs by 2031; (ii) secondly at the community level with population of 1,00,000-1,50,000 and (iii) finally at the sector level with average population ranging from 15,000 – 20,000 persons. At all these levels, facilities related to commerce, health, education, communication, socio-cultural, recreational, transportation are planned as per the norms established. However, the city level facilities shall be primarily provided in the allocated land use at Master Plan whereas the community level and sector level facilities shall be provisioned at the time of detailed planning at sector level. The planning Norms and Standards for City level and Community level, presented in Table 4.1, 4.2 respectively are as per URDPFI guidelines and Sector level facilities presented in Table 4.3 are as per Yamuna Expressway Authority, Building Regulations, 2010. These are suggested guidelines and may be changed wherever necessary with stated reason.

Table 4-1: Guidelines for Provision of Facilities to Serve City Level Population

S. No.	City Level Facilities	Population Served per Unit	Number of Facilities	Area per unit (Ha)
I	Education			
1	University	10,00,000	1	10 - 60
2	Engineering College	10,00,000	1	6.0
3	Medical College (including Nursing and Paramedical College)	10,00,000	1	15.2
4	Other Professional College	10,00,000	1	6.0
5	Technical Education Centre A	10,00,000	1	4.0
6	Technical Education Centre B	10,00,000	1	4.0
7	General College	1,25,000	1	5.0
8	School for Mentally Challenged	10,00,000	1	0.2
II	Health			
9	General Hospital	2,50,000	1	6.0
10	Veterinary hospital for Pets & Animals	5,00,000	1	0.2
III	Socio-Cultural Facilities			
11	Old Age Home	5,00,000	1	0.1
12	Orphanage & Children Centre	10,00,000	1	0.1
13	Care centre for Physically & Mentally challenged	10,00,000	1	0.1

S. No.	City Level Facilities	Population Served per Unit	Number of Facilities	Area per unit (Ha)
14	Working women-men hostel	10,00,000	1	0.1
15	Adult Education Centre	10,00,000	1	0.1
16	Night Shelter	10,00,000	1	0.1
17	Religious Facilities	10,00,000	1	4.0
18	Socio-Cultural Centre/Exhibition cum Fair Ground	1,00,000	1	15
19	Science Centre	1,00,000	1	As per requirement
20	International Convention Centre	City level		As per requirement
IV	Postal and Telephone Facilities			
21	Head Post office & Administrative Office	5,00,000	1	0.25
22	Head Post Office with Delivery Office	2,50,000	1	0.075
23	Telephone Exchange of 40,000 lines	4,00,000	1	4
24	Radio-TV Station	5,00,000-8,00,000	1	0.17
V	Recreational Facilities			
25	City Park	10,00,000	1	100
26	District Park	5,00,000	1	25
27	City Level Multipurpose Ground	10,00,000	1	8
28	District Level Multipurpose Ground	5,00,000	1	4
29	City Sports Centre	10,00,000	1	20
VI	Commercial			
30	District Centre	5,00,000	1	40
31	Local Wholesale Market/Mandi	10,00,000	1	10
VII	Miscellaneous Facilities			
32	Electric Crematorium	-	1	2
33	Cremation Ground	5,00,000	1	2.5
34	Burial Ground	5,00,000	1	4.0

Table 4-2: Guidelines for Provision of Facilities at Community Level

S. No.	Facilities	Population Served per Unit	No. of Facilities	Area per Unit (ha)
I	Education			
1	Integrated School without Hostel Facility	1,00,000	1	3.5
2	Integrated School with Hostel Facility	1,00,000	1	3.9
3	School for Physically Challenged	45,000	1	0.7
II	Health			
4	Multi-Specialty Hospital (100-200)	1,00,000	1	9.0
5	Specialty Hospital (100-200 beds)	1,00,000	1	3.7
6	Intermediate Hospital Category A (100-200 beds)	1,00,000	1	3.7
7	Intermediate Hospital Category B (<100 beds)	1,00,000	1	1.0
8	Family Welfare Centre	50000	1	0.08
9	Diagnostic Centre	50000	1	0.08
10	Dispensary for Pet and Animals	1,00,000	1	0.03
11	Nursing Home, Child welfare and Maternity Home	450000-1,00,000	1	0.2-0.3
12	Polyclinic	1,00,000	1	0.2-0.3

S. No.	Facilities	Population Served per Unit	No. of Facilities	Area per Unit (ha)
III	Socio-Cultural Facilities			
15	Recreational Club	1,00,000	1	1.0
16	Music, Dance & Drama Centre	1,00,000	1	0.1
17	Meditation & Spiritual Centre	1,00,000	1	0.5
IV	Commercial			
16	Community Centre with service centre	1,00,000	1	5.0
17	Weekly Markets	1,00,000	1 - 2	0.4
18	Organized informal eating spaces	1,00,000	1	0.2
V	Recreational			
17	District Sports Centre	1,00,000	1.0	8.0
18	Community Park	1,00,000	1	5.0
19	Community Level Multipurpose Ground	1,00,000	1	2.0
VI	Security Services			
20	Police Post (Area inclusive of Staff Quarters)	40,000-50,000	1	0.16
21	Police Station (Area inclusive of Staff Quarters)	90,000	1	1.5
22	Community Post office	1,00,000	1	0.25
VII	Safety Services			
23	Fire Station (5-7km Radius)	2,00,000	1	1.0
24	Sub fire station (3-4 km radius)	-	1	0.6
VIII	Distribution Services			
23	Petrol Pump/Gas Station*	1,00,000	1	0.3
24	LPG Godown/Gas Godown	40000-50000	1	0.110

(Note: 1. Standards for Petrol Pump are based on Yamuna Expressway Authority Building Regulation, 2010 for Group Housing Projects. However, the same is recommended to follow for entire city

2. LPG godown area are based on norms of Department of Explosives)

Table 4-3: Guidelines for Provision of Facilities at Sector Level

S. No.	Facilities	Population Served per Unit	Area per Unit (ha)
	Education		
1	Crèche and Day Care Centre	5000-25000	0.1
2	Nursery School	5000-7500	0.1
3	Primary School	7500-15000	0.2
4	Senior Secondary School (VI-XII)	15000-25000	0.8
	Health		
5	Dispensary	7500-15000	0.1
6	Nursing Home	5000-7500	0.1
	Other Community Facilities		
7	Community Centre	7500-15000	0.4
8	Milk and Vegetable Booth	5000 - 7500	0.02
	Postal Services		
9	Post office counter without delivery	15000	0.0085
	Commercial		
10	Convenient shopping centre, sector shopping cum service centre	7500-15000	0.5
	Recreational		
11	Park & Playground	15000	0.25

S. No.	Facilities	Population Served per Unit	Area per Unit (ha)
	Utilities		
12	Electric Substation (11KV)	As per requirement	0.05
13	Auto & Taxi Stand	As per requirement	0.05

(Note: Sector level facilities listed above are based on Yamuna Expressway Authority, Building Regulation, 2010)

4.2 Proposed Land use – Raya Urban Centre

Within the estimated land requirement to serve the projected population, considering the space standards and to plan the concept prepared for the development of the Urban Centre, proposed land use have been distributed in their hierarchical order. The total area to be developed has been divided into sectors and facilities have been distributed as mentioned above and as per the norms established after careful study of URDPFI guidelines, Master Plans of Noida, Greater Noida, as these two have been established under the U.P industrial act for the promotion of industries, Master Plan of Greater Bhiwadi and Investment Regions along DMIC so as to consider the aspects of the industrially planned cities of other parts of India as well. The proposed land use distribution of the Raya Urban Centre is presented in Table 4.4 and spatially represented in Proposed Land Use Plan of Raya Urban Centre-2031.

Table 4-4: Land use distribution of Raya Urban Centre

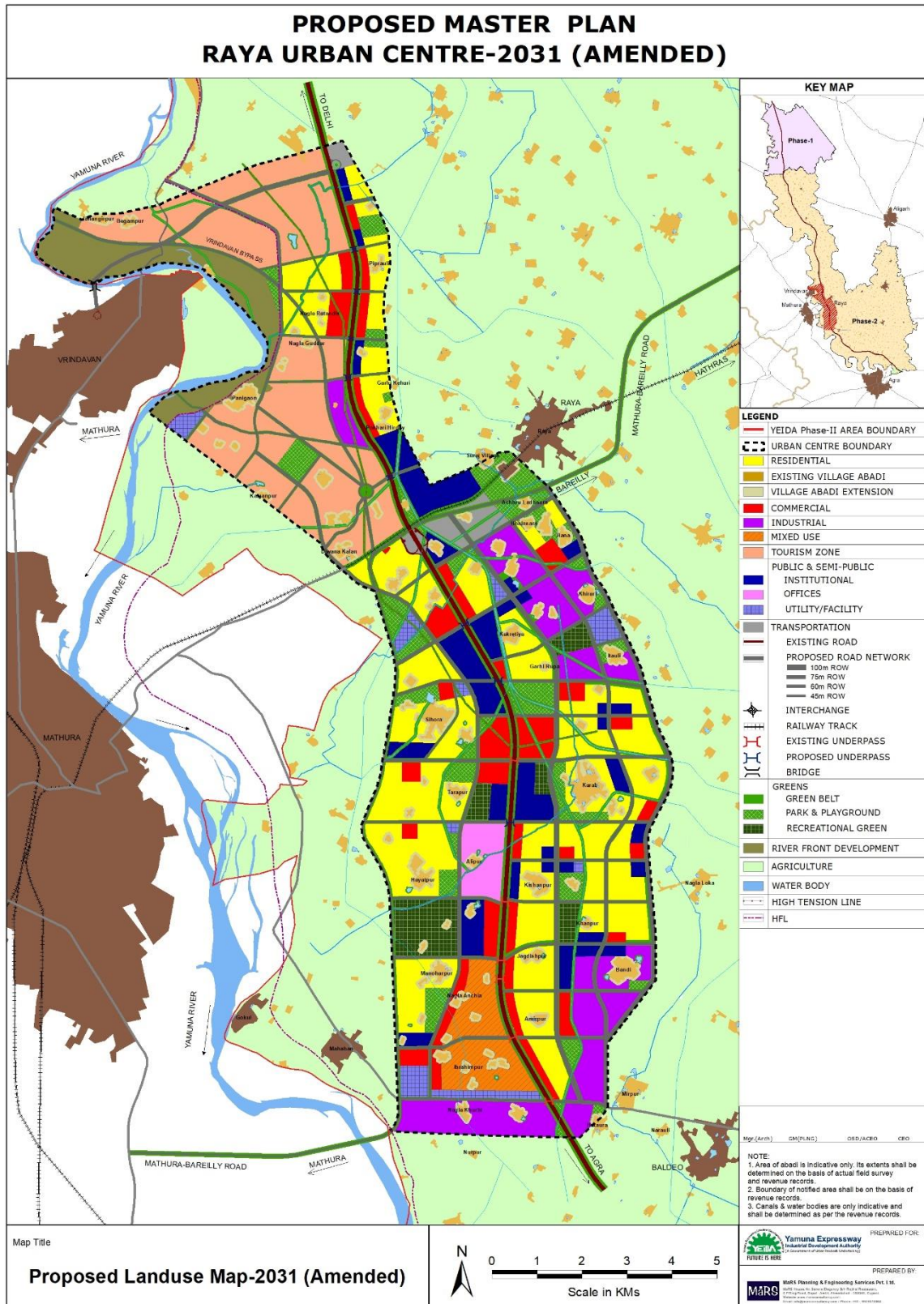
SrNo	Landuse	Landuse	Area (Ha.)	%	Con. Area (Ha)	Con. (%)
1	Residential	Residential	2216.25	19.02	3092.62	26.54
		Existing Village Abadi	416.58	3.57		
		Village Abadi Extension	459.79	3.95		
2	Commercial	Commercial	701.68	6.02	701.68	6.02
3	Industrial	Industrial	853.46	7.32	853.46	7.32
4	Mixed Use	Mixed Use	301.44	2.59	301.44	2.59
5	Tourism Zone	Tourism Zone	1520.51	13.05	1520.51	13.05
6	Public Semi-Public	Institutional	746.83	6.41	1075.94	9.23
		Offices	132.63	1.14		
		Utility/Facility	196.48	1.69		
7	Transportation	Transportation	1592.26	13.66	1592.26	13.66
8	Greens	Recreational	287.10	2.46	1920.45	16.48
		Park & Play Ground	586.87	5.04		
		Green Belt	1046.48	8.98		
9	River Front Development	River Front Development	505.65	4.34	505.65	4.34
10	Water Body	River/Canal/Drain/Lake/Pond	89.75	0.77	89.75	0.77
	TOTAL	TOTAL	11653.76	100.00		

The proposed Raya Urban Centre spreads over an area of about 11654 ha which is expected to serve the residing population of around 9.66 lakhs (including village abadi) by 2031 with gross density of 83 ppha.

To develop compact city, density of urban centre is proposed to be achieved considering Draft NCR Regional Plan 2021 and URDPFI guidelines, 2015. As per the Draft NCR Plan-2021, the proposed density range for the development size of 5-10 lakhs, is 100-150ppha which could be further reduced to 20% for special purpose townships such as Heritage city, knowledge city and sports city etc. However, URDPFI guidelines, 2015 suggests the density range of 125-175ppha for the mentioned size.

Further, to accommodate the estimated population and density to be achieved, considering planning standards and norms for per capita space requirement, landuse analysis and special Heritage City Project, land area requirement of approximately 11653 ha. has been estimated which is explained in next section. With the estimated population and land area requirement, the gross density expected to achieve in Raya Urban Centre is approximately 80 ppha. This is mainly because in addition to Heritage city with small industrial pockets with commercial and office activities, Raya has a substantial development in tourism zone which further reduces the development density of the area.

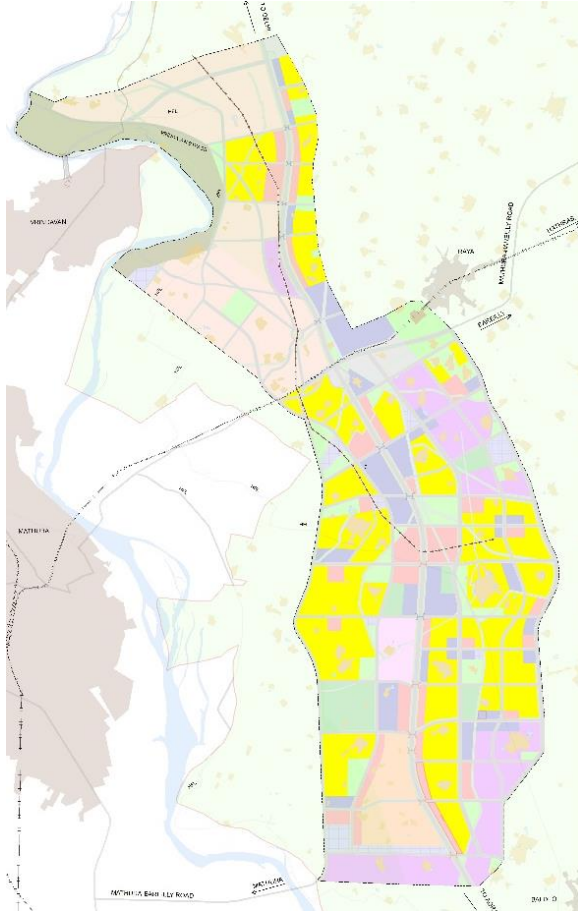
Map 4-1: Proposed Landuse Map



4.3 LAND USE ZONING, PROPOSALS AND POLICIES

4.3.1 Residential Development

Map 4-2: Proposed Residential



The residential development is in the form of residential sectors covering an area 2216.25 ha which is 19.02% of the urban centre. The residential area is provisioned to serve the population of 9.6 lakhs suggesting an average residential density of 398 ppha. The residential sector have been distributed on both sides of the expressway in such a way that these are accessible to various work centres especially industrial areas through walking, cycling and using public transport facilities. The residential pockets are to be developed at varying densities. The residential sectors are planned to be developed for medium density (<500ppha) and high density (500 & >500ppha). The detailing of the master plan as regards the low, medium and high density pockets are to be done at layout level keeping view the city level density. However, preferably the higher density sectors shall be developed in the centre of the city and

around the main commercial centres i.e. along Expressway and medium density sectors shall be developed on the peripheries.

The sectors have been planned to achieve integrated socio-economic development by proposing the housing of different income categories such as economically weaker section, low income group, medium income group and high income group and various forms of development such as group housing and plotted development and public private housing with varying plot and dwelling unit sizes, location factors such as comparative proximity to work centres will be considered while deciding about the density and type of development in a particular sector/pocket. Also, it is proposed that of the total housing, 10% of EWS and LIG each be developed by the Authority as per State/Authority policy. However, In general, the residential development shall be as per prevailing policies for residential development.



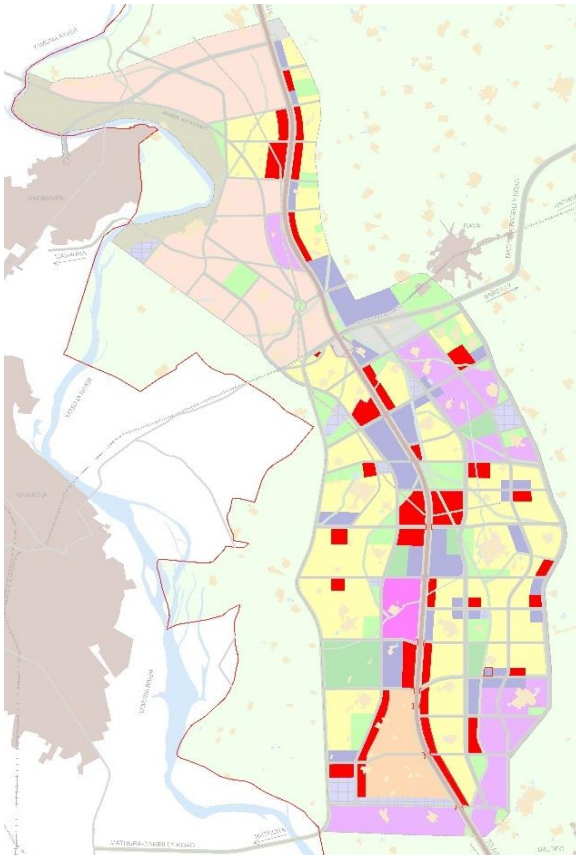
As a strategy of inclusive development of the region, there is need of integrating existing rural settlements with the proposed urban development. Keeping in view, the village abadis will be integrated both spatially and socio-economically through an upgrading programme as per prevailing Abadi Development Policy of State Govt. and guidelines as “Planned Village Abadi Expansion Scheme” of YEIDA Building Regulations or as may be decided by the Authority. As part of it, the planned development of the village abadi’s falling within the urban centre will be carried out to enhance the quality of life of the people of rural settlements. As per prevailing policy and guidelines, the development of

Presently the area covered under Abadi is 416.58 ha which is around 3.57% and area under Village Abadi Extension is 459.79 ha which is around 3.95% of the proposed urban centre. In order to prevent villages from expanding on roads and creating traffic problems, as far as possible, the villages are to be surrounded with planned area.

The natural growth of the village abadis outside the proposed Urban Centre but within the YEIDA is inevitable. Moreover, to make them part of the development process, the rural development measures have been recommended to make basic social and physical infrastructure available to them based on the suggested settlement hierarchy. However, to incorporate the natural growth, the development shall be permitted as per zoning regulations and prevailing policy of the Authority.

4.3.3 Commercial

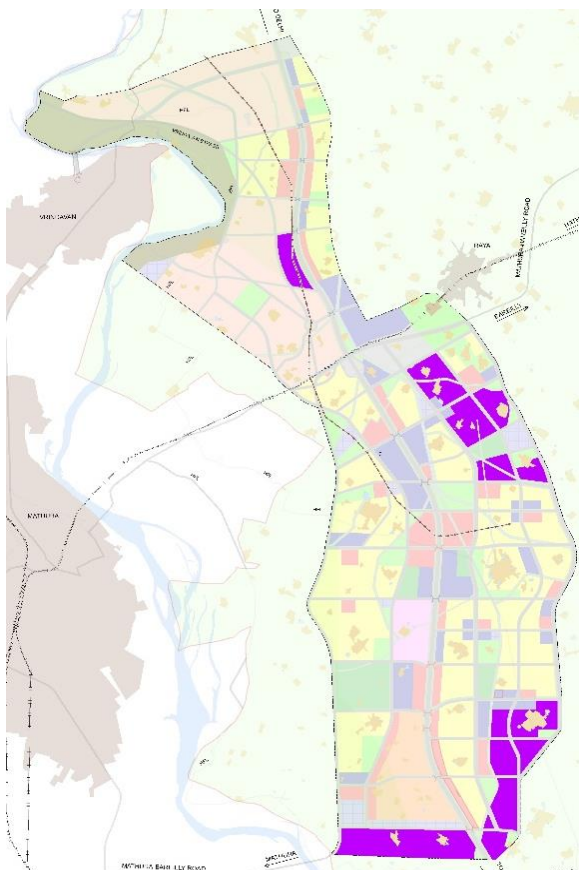
Map 4-4: Proposed Commercial



The commercial areas have been distributed within the city in four major hierarchies, city centre, district centre, other master plan commercials and wholesale & godown. The total area covered under commercial is 701.68 ha, which is 6.02% of the urban centre. A range of commercial uses such as retail, offices, hospitality which includes hotels & entertainment, wholesale, storages will be allowed to be developed in the city centre. The city centre has been proposed at the centre of the city on both sides of the expressway to serve the city distributed on both sides. However, internal movement will be served by the underpasses may continue. Any existing commercial establishment running within the proposed urban centre in any zone other than commercial may be allowed to continue.

4.3.4 Industrial Development

Map 4-5: Proposed Industrial



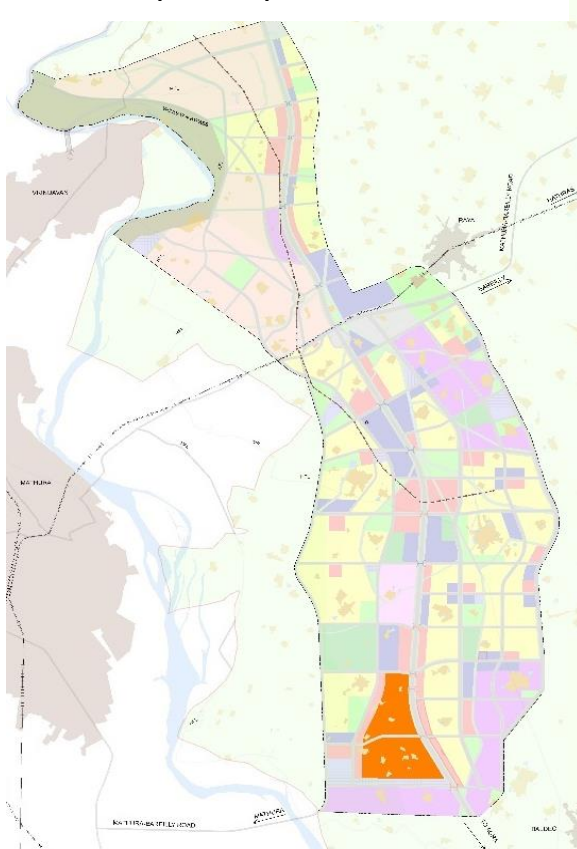
The important economic activity in the urban centres is proposed to be industrial development. Due to the existence of the industrial area in Mathura with large scale industries such as refinery, existence of raw material, presence of infrastructure as water, gas pipeline, there is large potential of manufacturing industries in Raya Urban Centre. The industrial land distributed covers an area of approx. 853.46 ha which is around 7.32% of the urban centre, considering the varying FAR from 1 to 1.5 as per Yamuna Expressway Authority, Building Regulation. Also, it is considered that 1/3 of the economic activities within mixed use zone will be occupied by industries. Polluting industries especially the coal based will not be allowed to be developed in Raya Urban Centre due to falling within the Taj Trapezium Zone (TTZ) and industries shall develop the facilities so as not to release any pollutants as per TTZ norms in accordance to MOEF guidelines. However, the industrial areas have been located largely on the north-east and south of the planned city running from north to south considering the wind direction. The industrial areas shall be developed as per the planned

sector layouts prepared by Authority and prevailing building bylaws. However, the various development incentives shall be provided as per Government Orders with regard to Industrial and Infrastructure Development Policy of Uttar Pradesh-2012 and guidelines of Authority. Industrial development will be supported by key industrial infrastructure viz. provision of Freight Complex 24X7 power supply, water supply, sewerage system etc. Further, the stone crushers and brick kilns presently running within the proposed Urban Centre Area if any, shall be located outside the Urban Centres and TTZ zone being polluting activities. Any manufacturing industry running within the proposed urban centre in any zone other than industries, the operation of that industrial unit shall be governed by the TTZ policy within the framework of MOEF guidelines. Moreover, the expansion or reconstruction more than the existing area shall be governed of that activity by the permissibility as provided in zoning regulation. However, the Authority/State Govt./Central Govt. or its departments/agencies can take appropriate decision/actions as per law with regards to existing structures in the ROW of existing roads and ROW of the proposed Master Plan Roads/Railway/Other Transport Mode.

4.3.5 Mixed Use

Mixed use has been defined differently within various policies and master plan prepared within State of Uttar Pradesh. As per State Urban Housing and Habitat Policy 2013, the mixed use will comprise a mixture of two or more land uses either within a single building (horizontally or vertically) or multiple buildings of different uses within a site. As per this policy, the norm for mixed use development is as follows:

Map 4-6: Proposed Mixed Use



- Residential – 35%
- Institutional/Offices – 25%
- Commercial (Retail only) – 20%
- Industrial (non-polluting and non manufacturing) – 10%
- Community Facilities and Recreational – 10%

However, in Raya Urban Centre, Mixed Use will be a specific zone focused on integrated development of specified economic activities along with related social and physical infrastructure including housing to cater to the demand for mixed uses such as industry & housing and other such combination of activities. A mixed use concept has become popular in recent planning paradigm, which includes the judicious mix of all activities residential, commercial, public-semi-public institutions and facilities, recreational and non polluting economic activities in big chunk of land. Mix use may be allowed horizontally or vertically or combination

of both. In such areas, mixed use development will be permitted as per specified guidelines. The minimum area for any such development within the mixed use zone for various non-polluting economic activities is as follows:

- 25% of the zone for development with minimum area <10ha

- 75% for development with minimum area 10ha and >10ha

However, for IT and ITeS the development shall be as per prevailing policy of the Authority. A strategic location is identified along Yamuna Expressway and existing MDR connecting Mathura-Baldeo - Sadabad for Mixed use zone. The area covered under mixed use is 301.44 ha which is 2.59% of the planned area. The various key non polluting economic activities identified to be developed within the zone are as follows:

- **Industries**
Non polluting manufacturing and processing units
- **Recreational & Tourism**
Amusement Park, Botanical Garden, Theme Parks, Science City, Exhibition & Convention Centre, Expo Mart, Auditorium, Amphitheatre, Sports facility, Sports City, Heritage and Cultural Centre, children traffic park etc.
- **IT Industry, Software Services, IT Services & IT enabled services**
- **Knowledge City**
Specialized educational institutes such as Universities, Engineering Colleges, Medical College, Management institutes, Institute of Chartered Accountant, R&D Centers, Sports Academy, Health institutions, Vocational/Skill Development Centres; Knowledge Park, Knowledge City; All kinds of educational and training institutes

Further, it is proposed that one-third of the mixed use zone shall be the development with core activity as industries. The suggested land use breakup for the development within mixed use zone of Raya Urban Centre is as follows:

- Core Activity (Industrial/Recreational/Tourism/IT/ITES/Knowledge city etc. – 60%
- Residential – 24% (maximum)
- Commercial – 6% (maximum)
- Facilities/Utilities – 10% (minimum)
- Roads/parking & parks & open spaces shall be as per building & sub-division Regulation of YEIDA

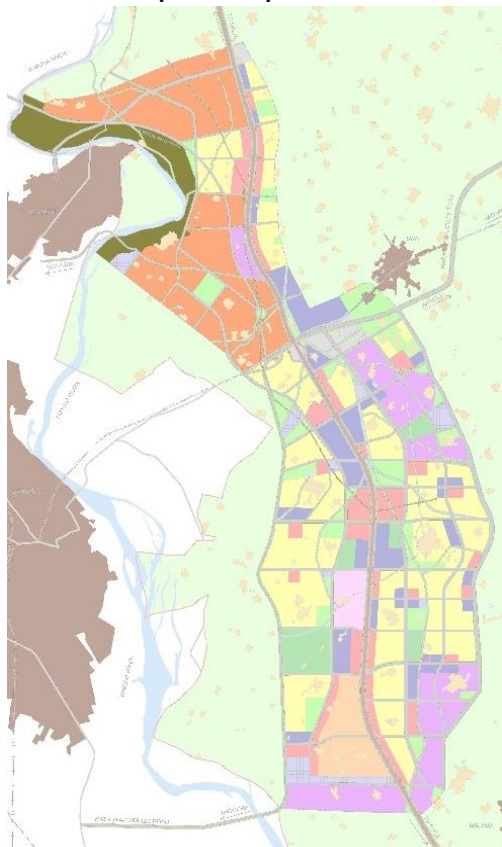
Note-

- 1) Green area & Road/ transportation area requirement shall be as per the norms of Building Regulations & Subdivision norms of Master Plan while preparing the Sector Layout Plan.
- 2) Authority may plan or subdivide a sector into different uses proportionately as per above or Authority may plan mixed use plots as a single unit in Sector Layout.
- 3) If Authority plans mixed use plots as a single unit, in that case only industrial, residential & commercial use shall be allowed proportionately. Support activities/ essential utilities as provided in the zoning Regulations for different uses (mentioned above) shall be allowed in the Plot of the 'Mixed Landuse'.
- 4) Core activities and support activities (with permissibility) are defined in zoning regulations of master plan (support activities to the extent of 25% of permissible FAR). These support activities are essential for the core activity. Hence, support activities shall be permitted in both type of plots as planned by authority as per provision of point 2 of this Note.
- 5) In case of Mixed Landuse plot as a single unit, the authority may decide the permissible FAR and Ground Coverage in the scheme as per requirement and recording the reasons thereof.

- 6) If in mixed use sector, any industrial plot has been allotted by Authority as a core activity at 100% in a separate plot, the support facilities/essential utilities for running industrial or institutional or recreational units shall be allowed upto maximum 25% of permissible FAR. In that case, Institutional (facilities) which is separated on a different plot shall act as a main institutional activity.

4.3.6 Tourism Zone

Map 4-7: Proposed Tourism & RFD



Due to the presence of Braj-Agra tourist circuit including Mathura, Vrindavan, Gokul, Barsana, Nandgaon, Agra, Fatehpur Sikri in immediate vicinity it is proposed to develop tourist attractions and facilities to allow tourists to visit and stay in Raya Urban Centre. This is expected to support the economy of urban centre in a big way.

In an effort, River Front development has been proposed to be developed on the Eastern bank of Yamuna River near Vrindavan within YEIDA as one of the key attraction destination. The detailed planning for the same shall be done during layout preparation. The area proposed under Tourism Zone is 1520.51 ha which is 13.05 % of RAYA urban centre.

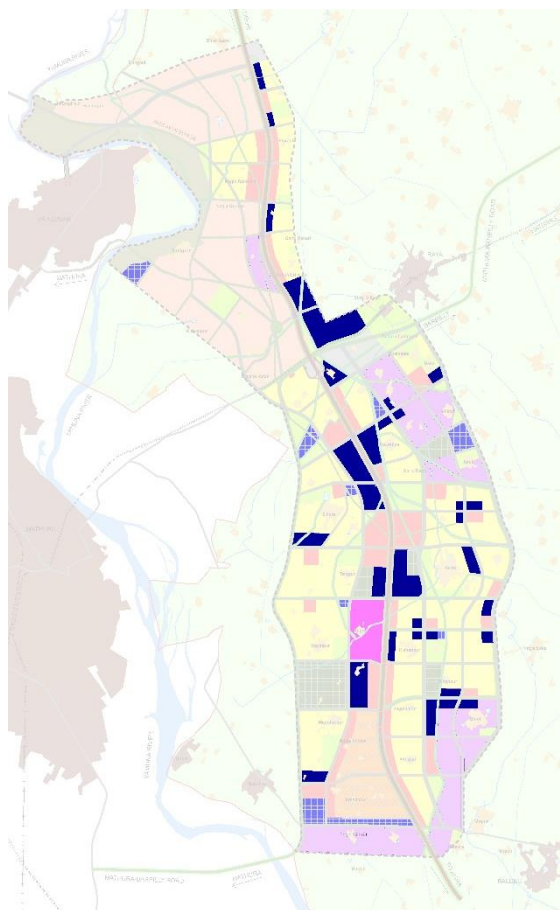
In addition to various world class commercial and recreational activities such as amusement park, golf course, sports complex, stadium etc, a specific tourism zone is proposed to be developed with compendium of various activities which will mainly proposed to have

- Lush green park for Jogging, Walk and Meditate;
- Naturolopathy centre, Ayurveda, Yoga and Wellness Centre;
- Amphitheatre, Open Air theaters, Museum, Convention Centre, theme based heritage centre, theme parks etc.;
- Haat Development for Local Arts & Crafts, Mela Ground, Tourist Trails, Rural Tourism Centre etc.;
- Budget hotels, service apartments, dharmshalas, ashrams, temples, old age homes, orphanages,
- tourist facility and information centre, tourist travel facilities;
- Star hotels for high end tourists;
- Further, a separate plan and policy is proposed to be developed for implementation within tourism zone in accordance with the Uttar Pradesh Tourism Policy and National Tourism Policy. All tourism sites including monuments/heritage areas/natural heritage sites etc. shall be identified by all concerned departments and shall be adequately protected and conserved.
- The authority shall prepare a detail project report for development of tourism zone as a special project. The authority shall decide the size and area of the project, mix of permissible uses/activities within the tourism zone.

4.3.7 Public-Semi Public - Institutional

Provisions have been made for public semi public offices and social infrastructure such as educational, health, socio-cultural facilities, and other community facilities. Provision of social and physical

Map 4-8: Proposed Public & Semi-Public



infrastructure is one of the key principles of planned development. These are provided in a hierarchical manner. The provisions for higher order facilities have been made in the development plan as public semi public facilities whereas lower level facilities have been planned in residential sectors which shall be provisioned while sector plan preparation. The planning norms and standards for hierarchical order of facilities have been presented in Section 4.1.1. Hierarchical allocation of Land uses, Table 4.1, 4.2 & 4.3.

Govt. Semi Govt. Offices and Social Infrastructure

The quality of life in any urban centre depends upon the availability and accessibility to quality social infrastructure. Provision of social infrastructure is one of the key principles of planned development which are provided in a hierarchical manner. The city is planned to cater

to the population of 9.66 lakhs (including abadi). However, the social facilities shall be planned for additional 25% population to cater to the regional requirements to serve other surrounding settlements.

Area covered under public and semi public infrastructure is 746.83 ha.(6.41%) These include the Govt., Semi-Govt. & public undertaking offices, university, specialised educational institutes, research & development centres, other educational, health, socio-cultural & community facilities. Through a comparative assessment of planning norms and standards presented in section 4.1.1 and case studies of Master Plans of similar nature such as NOIDA, Greater Noida, Greater Noida Expansion, Greater Bhiwadi, DMIC Dholera Investment Region etc., provision of city level facilities have been kept in Master Plan of Raya Urban Centre, which is presented in Table 4.6. However, Authority reserves the right to modify them as per demand and requirement by stating the reason. In addition, there is adequate land has been reserved for Govt. Semi-Govt. Offices, Govt. undertaking offices, R & D centres & other specialised institutions.

Table 4-5: City level Public Semi Public Facilities provisioned in Master Plan

S. No.	City Level Facilities	Nos.	Area per unit	Total Area
I	Education			
1	University	1	90.0	90
2	Engineering College	1	10.0	10
3	Medical College and Nursing and Paramedical college	1	20	20
4	Other Professional College	1	6.0	6.0
5	Technical Education Centre A	1	4.0	4.0
6	Technical Education Centre B	1	4.0	4.0
7	General College	10	8.0	80
8	School for Mentally Challenged	1	0.2	0.2
II	Health			
10	General Hospital	5	6.0	30
11	Hospital Category A (>500 beds)	2	4.0	8.0
12	Hospital Category B (200-500 beds)	5	2.0	10
13	Super Speciality Hospital	1	25	25
14	Veterinary hospital for pets & animals	3	0.2	0.6
III	Socio-Cultural Facilities			
15	Old Age Home	3	0.1	0.3
16	Orphanage & Children Centre	2	0.1	0.2
17	Care centre for Physically & Mentally Challenged	1	0.1	0.1
18	Working women-men hostel	1	0.1	0.1
19	Adult Education Centre	1	0.1	0.1
20	Night Shelter	1	0.1	0.1
21	City Public Library	1	1.0	1.0
22	Community Public Library	5	0.5	2.5
23	Auditorium	3	0.5	1.5
24	Socio-Cultural Centre	3	0.75	2.25
25	Open Air Theatre	2	4.0	8.0
26	Convention Centre	1	25.0	25.0
IV	Other Community Facilities			
27	Head Post office & Administrative Office	2	1	2
28	Head Post Office with Delivery Office	5	0.075	0.4
29	Telephone Exchange	3	4	12
V	Miscellaneous			
30	Electric Crematorium	1	2	2.0
31	Cremation Ground	2	2.5	5.0
32	Burial ground	2	4.0	8.0
	Subtotal			358.35

The provisions of land requirement as set out in Table 4.7 are for the purpose of calculating the overall land requirement for public-semi-public land use. However, actual plot size for a particular institution/facility shall be decided by the Authority as per the norms and standards of the concerned department/authorities and the requirement at the time of detailed sector plan.

All Public Semi-Public facilities such as schools, colleges, hospital, community centre, post office, govt. semi-govt. offices, religious facility, cremation ground etc. already existing within the urban centre area in any zone other than public-semi-public may continue. However, the Authority/State Govt./Central Govt. or its departments/agencies can take appropriate decision/actions as per law with regards to existing structures in the ROW of existing roads and ROW of the proposed Master Plan Roads/Railway/Other Transport Mode. Further, expansion or reconstruction more than the existing area shall be governed as per the permissibility of that activity as provided in the zoning regulation.

Educational Facilities

Education is the backbone for development of any community and region as a whole as it enhances the potential human resources available. The higher educational facilities such as University, Engineering, Medical College, R & D centres and other Professional Colleges are proposed to be developed along the Expressway and accessible from other arterials being centrally located and easily accessible. Provision of one general college has been made at city level at every 1.00 to 1.25lakh population. Provision of educational facilities at community level includes the integrated schools, at sector level secondary schools and primary schools are to be provided while preparation of sector level plans as per norms & standards mentioned in Section 4.1.1

Health Facilities

Development of health facilities is one of the key components of habitat planning. Health facilities are proposed to be planned in a hierarchical manner. Dispensaries have been provided at a residential sector level. Additional facilities will be made available at community and at city level. At community level, intermediate hospital category A & B, speciality hospital, multi speciality hospital with <100 beds & 100-200 beds have been provisioned to serve every 1lakh population. At city level, one super speciality hospital and two hospital category A with >500 beds for every 5 lakh population are proposed to be developed on arterial roads of city at suitable location. In addition, general hospital & hospital category B with 250-500beds are proposed for every 2.5lakh population distributed in city. These are also proposed to be located in industrial areas to serve the workers in immediate vicinity.

Social-Cultural Facilities

In view of developing world class facilities, space has been reserved for convention centre to be developed at city level to hold conventions, which will include space for auditorium, concert hall, conference halls, lecture hall, meeting room, conference room etc. In addition, public library, auditorium, socio-cultural centre & open air theatre are proposed to be developed for various miscellaneous purposes at city level. The provision of recreational club, meditation centre, music and dance centre is proposed to be kept at community level and for community hall at sector level to serve every 15000-20000 population which shall be located while preparation of sector level plans.

Telecommunication & Postal Facilities

Head post offices with administrative office and with delivery office are proposed at city level for every 5Lakh & 2.5lakh respectively and one telephone exchange to serve approx. 4lakh population.

Security

Security services are one of the important social facilities to be provisioned in any city to provide quality of life to the residents by making them feel safe and secure. Thus, a police station is proposed to be provided at every 1, 00,000 population whereas a police post at every 50,000 population which will shall be suitably located within the city while preparation of sector plans.

Fire Fighting Services

Fire services are provided one for every 2, 00,000 population within 5-7kms and one within 3-5kms. These shall be located suitably along the main roads preferably on corner plots so that it can easily reach to disaster site within 3-5 minutes and shall be available with adequate water infrastructure for fire hydrants.

Distributive Services

LPG gas storages and distribution facilities will be offered through one gas godown for every 50000 population conveniently located in relation to industrial area and service centres and shall be away from residential areas and shall have open spaces all around as per Explosive rules.

One petrol pump with service facilities shall be provided for every 1, 00,000 population in group housing as per YEIDA Building Regulations, 2010. The petrol pump/filling stations are suitable located in the permissible land uses as per zoning regulations such as freight complex, city centre, sub city centre, industrial area etc. on the main roads not less than 30m approved by the explosive/fire department.

Milk distribution facilities are proposed to be planned at sector level one for every 5000-7500 population.

4.3.8 Offices

However, the Authority/State Govt./Central Govt. or its departments/agencies can take appropriate decision/actions as per law with regards to existing structures in the ROW of existing roads and ROW of the proposed Master Plan Roads/Railway/Other Transport Mode. However, the expansion or reconstruction more than the existing area shall be governed as per the permissibility of that activity as per zoning regulations.

An non-manufacturing economic zone designated as offices has been planned in the urban centre as a step of national convergence with International impacts of economic activities and to exploit opportunities thereof, work areas have been provided to accommodate high end soft economic activities such as Financial Services, Banking & Insurance, IT, ITeS, BPO's, R & D centres, Biotech Parks, other Corporate offices, other professional offices etc. In addition, other activities compatible with the proposed development in form of business tourism, hospitality, entertainment, religious & cultural tourism, recreational, institutions such as trade and exhibition ground, expo mart, convention centre, film city, star hotels, resorts, golf course, theme park etc. to service the corporate world and capture the tourism industry are proposed to be developed. This has been provided along Expressway close to various other tertiary economic centres. Total of around 132.63 ha have been proposed under offices which is 1.14% of the urban centre.

Daily Hawking and Weekly Markets

Informal sector in the form of hawkers or street vendors is an integral part of the economic activity. Studies have shown that this segment account for around 2% of the population. In Raya urban centre with a projected population of 9.66 lakhs, the hawkers are estimated to be 17400. Hawking activities have strong relation with retail commerce thus planning of commercial areas should incorporate these activities in a planned manner at the layout level in addition to other land uses. Demarcation of “restriction free Vending Zones”, “restricted vending zones” and “no vending zones” shall be ensured and guidelines shall be prepared for vending activities taking into account the surrounding activity. The plan for street vending shall be prepared as per prevailing guidelines viz. “The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Bill, “National Policy for Urban Street Vendors”, and “National commission for Enterprises in Unorganised Sectors”, during layout plan preparation.

The Authority shall ensure suitable provision of space for informal units at different hierarchy of commercial areas. On an average, the size of the unit will be about 2.5sq.m. The average space required by various hawking activities range from 1 sq.m for a cobbler to about 6 to 7 sq.m for florist/bookseller etc. Considering that shopping malls have emerged as a phenomenon in large cities, it is suggested that incorporation of area earmarked for hawking activity within malls or adjacent public plazas need to be considered.

Besides in planned commercial areas, hawking activity in an immediate vicinity of other uses is proposed as follows based on URDPFI Guidelines:

S. No.	Category	No. of informal units
1.	Government & Commercial Offices	5-6 units per 1000 employees
2.	Wholesale trade & freight complexes	3-4 units per 10 formal shops
3.	Hospital	3-4 units per 100 beds
4.	Bus Terminal	1 unit per 2 bus bays
5.	Schools	
	5a Primary	3-4 units
	5b Secondary/Sr. Secondary/Integrated	5-6 units
6.	Parks	
	6a Regional Parks/District Parks	8-10 units at each major entry
	6b Neighbourhood Parks	2-3 units
7	Residential	1 unit/1000 population
8	Industrial	5-6 units per 1000 employees
9	Railway Terminal	As per requirement

(Note: Above are the guidelines for incorporation of informal sector, which can be modified, based on location assessment and other requirement)

In addition, sufficient space of around 0.4ha at one or two locations for every 1 lakh population with 300-400 units shall be allocated for temporary ‘Vendors’ Markets viz. Weekly Haats, Rehri Markets, Night Bazaars, Festival Bazaars, Food Streets etc. Since the characteristics of the weekly market is primarily one day use, multiple uses of spaces e.g. parking spaces, public park, ground etc. are more appropriate than allocating exclusive space. Authority need to provide basic civic facilities in vendors

markets which include public toilet, solid waste disposal, electricity, drinking, water, storage facilities etc.

4.3.9 Public Utilities

The area proposed under Public utilities is 196.48 ha which is 1.69 % of RAYA urban centre.

In Master Plan, broad provision of city level utilities have been kept based on URDPFI, CEEPPO guidelines and Consultants experience and thus suitably located. The proposed utilities covers key infrastructure for water, sewerage, solid waste management and power supply which includes Water Treatment Plants (WTP), Sewerage Treatment Plants (STP), Common Effluent Treatment Plants (CETP), Sanitary Landfill Site and Electric Substations. Moreover, as the key physical infrastructure facilities shall be planned for 30 years, these have been planned for 15.6 lakhs population (including villages), considering the scenario when the entire industrial sector employees will shift to the planned urban centre with their families. Moreover, it is recommended that infrastructure shall be planned for addition 25% population considering the visitors and surrounding population and hence the key infrastructure is planned for 19.4 lakhs population. The details of designed population and demand are presented in Chapter-6, Utilities. The location and area has been provisioned in land use plan for city level utilities based on calculated demand. However, these may be relocated and sized during the zonal and sector level utilities shall be planned during detailed planning. The brief plan proposals are explained below:

Water: The total water demand for Raya urban centre is estimated to be 671 MLD for next 30 years considering 15% unaccounted for water distribution losses. It is proposed that the demand for watering the green areas shall be met with recycled sewerage water. Thus, the fresh water demand for the Urban Centre is proposed to be 591 MLD excluding recycled water for green areas. The key development policies recommended are:

Presently the water demand is expected to be met with Mat Branch Canal (a part of Upper Ganga Canal system with augmented water supply from Madhya Ganga Barrage). The ground water will be supplementing the water supply during non-running period of canal for maintenance and other similar reasons. A spate study is also proposed to promote conjunctive used of ground and surface resources in and surrounding areas to promote the judicious use of ground water that should remain available during lean season of canal supplies and surface storage in the form of ponds and lakes in the area.

Nonetheless, the technical feasibility (hydrologic and topographic) may be explored to construct the barrages and weir in the upstream and downstream of the Gokul barrage. The future option of tapping the available unconfined and confined aquifer along the Yamuna river-bed may be explored as alternate and/or supplemental water source for the urban centre.

detailed planning based on sector detailed project reports. If any utilities exists within the urban centre, these shall be retained and considered before provision of new based on its utility. Further,

There are four WTPs proposed to be developed as key city infrastructure to supply safe drinking water in urban centre through Canal as the source. Total of approximately 44ha land, each with 11ha has

been reserved for Water Treatment Plants including provision for Intake and Master Balancing Reservoir.

These shall be preferably located near the source of water and distributed for the various zones of the urban centre so as to have economical infrastructure development and reduce the dependency on one. Thus, two of these are proposed along the Ganga Canal on the North-Eastern side and Central-East and other two are proposed to be developed on the western end. The WTPs to be developed on western side of the Expressway, one of which shall preferably located near Tourism zone and other is proposed on the west of Mixed Use. However, Authority may relocate and resize them while detailed planning and implementation based on Detailed Project Report.

Master Plan envisages an integrated approach that packages mutually supportive infrastructure components water-sewerage-drainage for recycling, harvesting and optimal use of water. It is recommended to use recycled water for non potable uses in industries and other land uses in addition to green areas so as to reduce the fresh water demand and to promote zero discharge through incentivisation. Rain water harvesting and ground water recharge through suitable structures shall be made mandatory to save the scarce resource of water. Also, it is recommended that development of dual piped network shall be explored after detailed feasibility for supplying potable and non potable water separately in industrial, residential and other parts of city so as to reduce the fresh water demand and optimal use water.

Sewerage Treatment Plan: The sewerage generation is estimated to be 80% of water demand which comes out to be 319 mld excluding the industrial effluent. 57 ha land has been reserved for development of decentralised sewerage treatment plants. Three STPs of 19 mld each has been proposed to be developed. The location of treatment plant has been proposed strategically considering the contours of the area so as to collect the sewerage through gravity and to lay the economical infrastructure, preferably away from residential areas or any other habitation. The slope within the area is almost flat. However, considering the minimal existing slope towards the river, two of the STPs are proposed on the north-west and the south-west of the urban centre in south of the Railway Line and third one in the centre of the industrial area in north-west. Authority may relocate them while implementation based on Detailed Project Report.

The sewage is proposed to be treated as per MOEF guidelines for various non-potable uses such as flushing, washing etc. in varied land uses in addition to open and green areas or safe for disposal. However, the zero discharge shall be focused to be achieved. Further, it is recommended to utilise the sludge generated from STP for energy production, natural gas production and for organic agriculture.

Effluent Treatment Plant: The effluent generated from the industries is estimated to be 68MLD for which around 12ha land is reserved to treat the effluent generated from industries. Two CETPs are located of 6ha each within the industrial area. The location of treatment plant has been proposed strategically considering the contours of the area so as to collect the sewerage through gravity and to lay the economical infrastructure, within the industrial area away from residential areas. One of the STP is located in the centre of industrial area on north-eastern end (along with STP) and another on south-eastern end at the edge of the city. It is suggested that before reaching to common effluent

plant, the industrial waste water shall be treated to standard prescribed as per MOEF for treatment. It is proposed that treatment in CETP shall be as per the MOEF guidelines to reutilize in industries and agriculture to achieve zero discharge.

The Master Plan envisages an integrated approach that packages mutually supportive infrastructure components water-sewerage-drainage for recycling, harvesting, reuse which will resolve the problem of disposal of waste water and also reduce the fresh water demand by using recycled water for non-potable uses.

Drainage

The drainage system is an important element of physical infrastructure to avoid flooding and removal of storm water from the area. The drainage system shall be the integral part of the road network planning. To have an efficient drainage system within the area development of drains, protection of natural drainage course, improved ground water recharge, implementation of flood protection measures and other environmental improvement measures play an important role. The natural drainage system of the urban centre is mainly towards the river. The key strategies suggested to achieve an efficient drainage system are;

- Drainage catchment area zoning shall be done during detailed project report preparation based on topography, physiology, morphology, physical impediments (viz. highway, railway, etc.) and points of disposals;
- Drainage network is proposed to be planned as primary, secondary and tertiary network. The storm water from the urban centre will be disposed of through tertiary drains at multiple points into River Yamuna. However, it is proposed that recharge pits shall be developed before each disposal point at Yamuna River for the purposes of water conservation and recharging of ground water and the over flowed water from the recharge well be disposed off into River. Also, it is proposed to create silt pits in recharge wells so that no solid waste flows into the River;
- In addition to Yamuna River, it is recommended to identify few ponds as storm water disposal points within the area for the purposes of water conservation and recharging;
- Storm water drains shall be developed on both sides of all Master Plan roads and these shall be proposed to be concrete covered to avoid solid waste disposal into it and silting of drains. Provision of manholes shall be created for the purpose of operation and maintenance;
- Prevention of storm water drains from pollution – measures shall be taken to prevent conveying sewage and dumping of solid waste into drains.
- Further, it proposed that the bottom of drains shall be developed unlined intermittently to facilitate ground water recharge;
- It is suggested that the development of piped drain shall be explored on pilot basis which ensures faster construction, less maintenance and longer life;

Solid Waste Management: Solid waste management is essential for providing quality of life, to provide better standards of health and sanitation and to develop an eco friendly city. To manage waste of 874MT generated from the city, well planned and efficient integrated solid waste management system of collection, segregation, transportation, treatment & disposal shall be developed as per Municipal Solid Waste Management Rules, 2000. The main development policies suggested to achieve the objectives are:

- Door to door collection and segregation at source as well as at common facility shall be done based on the type of waste, its utility, suitability of treatment and disposal;
- Storage facilities at regular intervals and transportation through efficient modes are important;
- Waste processing techniques which shall be implemented based on the waste composition includes waste to energy, composting/vermi-composting, biogas generation eco-bricks etc. The reject not suitable for any processing, shall be disposed off in Sanitary Landfill site;
- A Sanitary Landfill site of 20ha has been proposed to be developed to dispose the estimated waste generation of 874MT from city. The site is proposed to be selected based on CEEPHO guidelines, away from natural features such as lakes, ponds, flood plains, river, canal and structures such as water supply wells, highway and habitations. In Master Plan, the utility located above the transport infrastructure on the south-eastern end of the urban centre is recommended for landfill site. However, the same shall be verified based on detailed project report during detailed planning;
- Management of Biomedical Waste shall be planned as per Biomedical Waste Rules, 1998, which is the waste generated during diagnosis, treatment and immunisation of human beings and animals. These shall not be mixed with the municipal solid waste and thus separate system shall be developed. Installation of incinerators is recommended to be made mandatory in hospitals for handling the same;
- The Hazardous Waste and E-Waste generated from various activities shall be managed in accordance with Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 and E-Waste (Management & Handling) Rules, 2011. These shall not be mixed with other municipal solid waste. The widely used methods of treatment of hazardous waste include stabilization, incineration and solidification. However, the choice of method depends on evaluation of risks and potential pollution risks based on the waste characteristics;

Electric Substations: Estimated power demand for Raya Urban Centre is approximately 1003 MW of which 677 MW load is expected from Industrial area and 326MW from rest of the development. It is recommended that the power shall be transmitted from the proposed 765kV substation of YEIDA. However, till the time the above substation will develop, the power will be taken from nearest transmission line of utility agencies (UPPCL, Power GRID).

The power from 765kV substation or existing power substations of state shall be received at receiving substation with 220kV network, for dedicated supply within Raya Urban Centre. Further it will be distributed to various areas through four substations of 132kV. It is suggested that out of the four substations two will be dedicated to serve the industrial areas and two for rest of the area. These substations are located based on influence area.

The land has been reserved based on Central Board of Irrigation and Power Manual for Substation Layout, New Delhi. The high tension lines are proposed to be laid all along the planned roads in dedicated cable ducts at the parapet of the road. However, green belt is proposed to be maintained along the transmission tower along the existing and proposed overhead H.T lines as per prevailing Indian Electricity Rule and policy of Authority;

Raya Urban Centre is proposed to be developed on green concept. It is therefore recommended to use natural resources economically using the energy. Thus, it is suggested that

- Non conventional energy sources such as recovering energy from sewerage, solar energy etc. should be used for street lighting, lighting at public places, open areas, traffic signals, hoardings etc.;
- Adoption of load management techniques and improved metering arrangement to minimise power thefts and losses;
- Incentivising energy savings and use of energy saving gadgets such as use of high efficiency fluorescent tubes (CFLs) etc.

4.3.10 Transportation

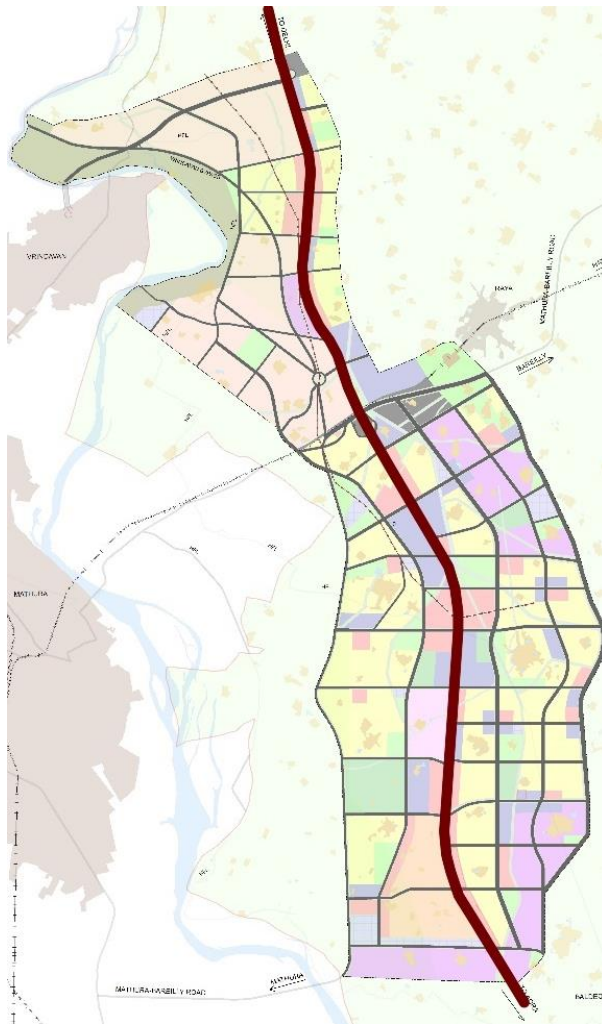
The role of transport in enabling and directing urban development has been long appreciated. Road and Transport is the key for the sustainable development of any city. The proposed transport development within the city has been planned considering the following key objectives:

- To enable the mobility of people and goods for faster economic development and enhance social interactions,
- To improve the accessibility of the township to and from the region and within the city,
- To maximise safe, promote environmental quality of the area and enhance quality of life.

To achieve the objectives, the main strategies adopted are:

- Provision of well-coordinated road network providing intra city and intercity connectivity;
- Promoting and giving priority to public transport with feeder services;
- A multimodal transport system providing opportunity and environment for each potential mode to operate and provide the services at its optimal efficiency, truly integrated with other modes to provide an overall optimal system.

Map 4-9: Proposed Transportation



- Encouraging pedestrians and cyclists for last mile connectivity by provision of adequate and safe infrastructure;

- Provision of user and environment friendly transport infrastructure for passengers and goods;

Estimated Traffic: The estimated passenger trips/day is 12.4lakhs and freight trips of approximately 8000 in Raya Urban Centre with estimated population of 9.66 lakhs and employment of 5.7 lakhs.

Regional Connectivity: Major existing roads providing regional connecting to Raya city are as below:

- ✓ Yamuna Expressway
- ✓ Mathura-Hathras Road (SH-33)
- ✓ Mathura-Raya-Aligarh Road (SH-80)

- **Yamuna Expressway:** Existing Interchange at the Northern end of Raya City at the intersection of SH-33 on Yamuna Expressway is the major

connectivity. The expressway is currently having 4-lane divided carriageway with access control. The alignment of Yamuna Expressway and Interchange has been marked based on secondary data and shall be verified based on primary surveys while detailed planning.

- **Mathura-Hathras Road (SH-33):** As per the study conducted by UPPWD, the road is having 2 lanes proposed to develop to a 4-Lane facility.
- **Mathura-Raya-Aligarh Road (SH-80):** As per the study conducted by UPPWD, the road is having 2 lanes proposed to develop to a 4-Lane facility under PPP mode.

All the three major roads connecting Raya City are proposed to be developed or developed as 4-lane facility and have spare capacity to handle the traffic generated by this new development. In addition, there is MDR passing from Urban Centre connecting the Mathura to Sadabad via Mahavan and Baldeo providing accessibility through underpass below Yamuna Expressway.

Intra City Road Network: Grid iron pattern of road network with efficient hierarchy of transport networks has been proposed to provide alternate connectivity and easy accessibility to various parts of urban centre. The road network has been divided into Arterial & Sub-Arterial Roads.

- **Arterial roads** are proposed to be a high-capacity urban road to collect and deliver traffic from sub-arterial roads and important collector roads to expressways, and between urban zones providing the highest level of service possible. This is achieved through limiting intersections providing proper access to vulnerable road users, limiting friction from adjoining land-use, provision of service roads etc. The proposed ROW for these roads is 75m and 100m. All the intersection along the arterial roads shall be controlled through traffic signals.
- **Sub-arterial roads** are proposed to act as the connecting link between internal sector roads/ collector roads to arterial roads. These often provide cross connectivity between arterials and will be medium to high-capacity urban roads. The proposed ROW for these roads is 45m to 60m.

The typical road cross sections of arterial and sub-arterial roads have been recommended in further chapters. The area covered under Transportation is 1592.26 ha which is around 13.66% of total area Including Yamuna Expressway. Further, green belts of 50m on both sides of Expressway, 30m on Mathura Bareilly Road and 10m on both sides of other Master Plan roads within the urban centre have been provisioned.

Sector Roads Plan: It is proposed that the roads other than arterial and sub-arterial proposed in Master Plan, lower in hierarchy shall be planned while layout preparation. Further, it is recommended that no road lower than 30m and 24m shall be intersecting in arterial and sub-arterial roads proposed in Master Plan.

Traffic Circulation through Underpasses/Overpasses: The Yamuna Expressway divides the city in to two parts. The sector roads cross the Yamuna expressway are roughly located at intervals of 1 km, however, considering the access control nature of the Yamuna Expressway, the cross connectivity is planned to make the maximum use of available underpasses. Additional underpasses/overpasses are proposed at suitable locations for providing seamless connectivity between the city zones on either side of Yamuna Expressway. The proposed facilities are expected to address the required cross connectivity requirements within the urban center. The nature of facility can further be detailed during sectoral plans and implementation based on Techno-Economic feasibility.

The details of modifications in existing underpasses and proposed underpasses/overpasses are presented in Chapter 5: Transport, Table-5.8. The location and widths of existing underpasses which are proposed to be modified are based on the secondary data and shall be verified through primary surveys while detailed planning.

Regional and Intra city Public Transport System

In order to connect the proposed Raya urban centre regionally with various parts of NCR and other urban centres Raya, Agra, Hathras and with YEIDA Phase-I, Regional Rail Transit System (RRTS) has been proposed using the existing rail network wherever possible. Three corridors as follows are proposed to be developed with stations for regional rapid connectivity and presented in Chapter-5 Transport, Map 5.2.

- Rapid Road Rail link along Yamuna Expressway connecting Delhi/ NOIDA in NCR with Agra connecting the three new green cities in YEIDA region namely Tappal, Raya, Agra
- Rapid Rail link connecting Mathura-Raya-Hathras-Aligarh using partially Existing Rail Connectivity
- Rapid Rail Services connecting Delhi/ NOIDA in NCR with Agra via Aligarh and Hathras and Khurja using Existing Rail Connectivity;

Of the total passenger traffic generated in Raya Urban Centre, 3.6lakhs trips are proposed to be served by public transport. In order to cater to the demand of the intra urban traffic due to proposed development, Mass Transport System for commuters such as Bus Rapid Transit System or Light Rail Transit system is proposed to be developed by provision of segregated public transport lanes on all arterial roads of urban centre (100m & 75m). Proposed Corridors with Reservation for Dedicated Public Transport Network is presented in Chapter 5- Transport, Figure 5.4 and the cross sections are presented in Figure 5.1. The transport facilities pertaining to public transport infrastructure such as multimodal transit stations, parking etc. shall be accordingly planned while detailing planning and design of the system.

Non Motorised Transport and Pedestrian Facilities

To achieve the share of public transport and promote cyclists and pedestrians a continuous network of cycle path and pedestrian path with segregated lanes have been proposed to be developed. Hence, the provision has been kept in cross sections of all arterial and sub-arterials presented in Chapter 5: Transportation, Figure: 5.1. The planning for other non-motorised vehicles shall be taken care while detailed planning as per various GoI guidelines.

Transport Facilities

- Regional and city transport network has been supported by range of facilities for passenger and goods movement. To support large scale industrial development proposed in urban centre, integrated freight complex, have been proposed. Also, space has been reserved for intercity passenger transport facility for Bus terminal with Bus Depot etc. The transport facilities are suitably located to function efficiently along the regional roads. The function and facilities in transport facilities have been explained below:

Freight Complex

The freight complexes are proposed to comply following functions:

- ✓ To provide facilities for regional and intra urban freight movement;
- ✓ To provide warehousing and storage facilities and their link with specialised markets;
- ✓ To provide servicing, loading, unloading, idle parking, restaurants and other related functions in the complex.

There are two integrated freight complex proposed within the urban area to avoid congestion on road network and easily accessible to all industrial areas. These are proposed at the interface of the regional and urban transport network and to integrate with the regional railway network. A large land has been

reserved for transport infrastructure at the northern end near existing SH-33 and rail head at Raya and another in south-east along main arterial near industrial area. Raya Urban Centre is well connected with the existing rail network supporting to and fro freight movement for proposed industrial area. The following activities shall be proposed to achieve the objectives of Freight Complex:

- ✓ Facilities for wholesale trade activities (auction areas, wholesale shops with storage, wholesale go downs, cold storages together with handling facilities and equipments)
- ✓ Parking space and facilities for truck (service/ repair facilities, rest/recreation for drivers, weighing for trucks etc.)
- ✓ Facilities for offices/storage activities for trucks (go down, office space, load/unloading facilities, weighing of goods vehicles)
- ✓ Ancillary facilities – provision of goods movement within the complex, amenities for building and security measures such as facilities like banking, postal truckers etc. required for business transactions, amenities for wholesaler, truckers and their employees; areas for shops, eating houses and other service establishments; provision of lighting, water supply, sewerage and waste disposal.

The broad land use break up recommended for Integrated Freight Complex as per URDPFI guidelines is as follows:

S.No.	Use Type	Percentage of Area
1	Wholesale Market	35
2	Warehousing	8
3	Booking Agencies	2
4	Commercial & Public-Semi-Public	5
5	Utilities & Services	3
6	Service Industry	4
7	Parking	12
8	Circulation	25
9	Others	6
	Total	100

(Note: The Authority may decide the share of required facilities depending upon the market and demand while detailed planning and implementation)

• Bus Terminal and Bus Depot

A bus terminal with depot for intercity movement has been proposed to be strategically located on SH-33 near Raya interchange and Raya railway station which is accessible through arterial road network from residential areas and also away from them. Moreover, the accessibility to bus terminal shall be separated from goods transport facilities so as not to intermix the traffic of two. The bus terminal shall be accompanied with the bus depot to avoid having any dead mileage. Further, the city bus terminal will also be co-located close to the regional bus terminal for proper integration and dispersal of passengers.

The main components of the facility includes the terminal station for buses with adequate bus ways, parking facilities, servicing and maintenance facilities with fuelling station, administrative office, small retail area, canteen and medical facilities for staff and accommodation for stand by staff, future expansion etc. However, the Authority shall plan or allow the development of Bus Terminals as per the policies framed by the Authority or state govt. from time to time.

- **Parking Facilities**

It is recommended that provision of parking facilities for varied activities in each of the main land uses such as residential, commercial, recreational, institutional etc. shall be as per YEIDA Building Regulations and may be planned by the Authority while sector plan preparations.

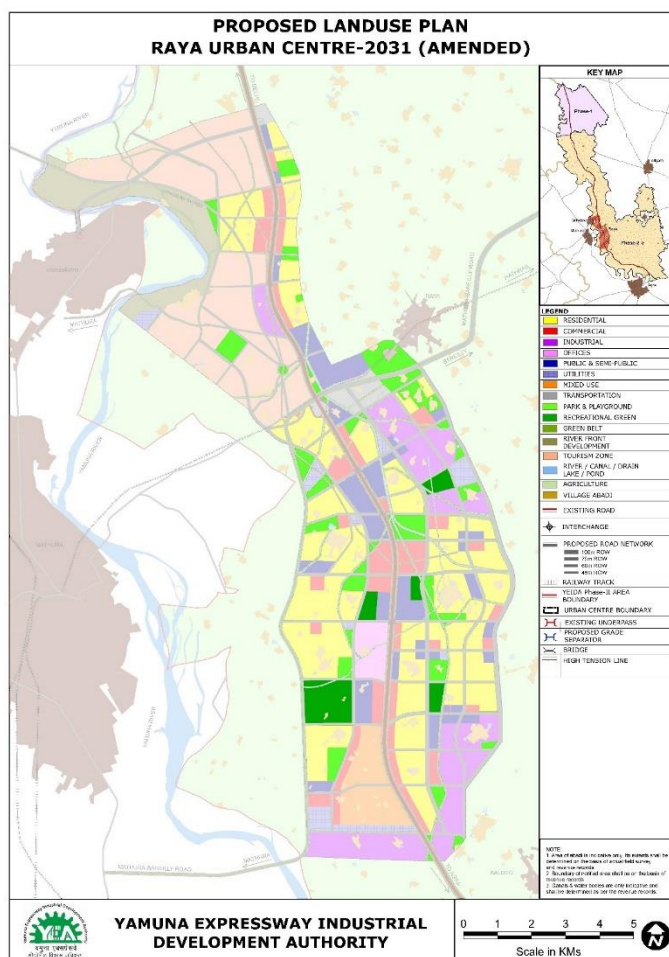
4.3.11 Recreational (incl. Green belts and open spaces)

YEIDA is principled to be developed as eco-city development with huge lung spaces and recreational spaces spread over the entire urban centre. Proposed recreational areas include the green buffers along the roads, drains, canals, between industrial areas and residential areas to segregate them. There is provision for world class recreational facilities for the residents, tourists and business travellers in form of Regional Park, City Parks, Sports Complex, Amusement Park/Golf course etc. which is presented in Table 4-5. However, Authority reserves the right to modify the same with stated reasons.

Table 4-6: Proposed Facilities in Recreational Landuse

S.No.	Proposed Facilities	Number of Units	Total Area (Ha)
1	Trade & Exhibition Ground	1	35.5
2	Amusement Park	1	39
3	Theme Park	1	33.6
4	Golf Course	1	137
5	Stadium	1	38
6	Botanical Park	1	26
7	City Sports Complex	1	20.5
8	Regional Park	1	51.5
9	Sub city level parks	Multiple locations distributed within the city	
10	Playgrounds	Multiple locations distributed within the city	

Map 4-10: Proposed Greens



The recreational facilities proposed and its areas presented in Table 4-5 above are for the guidance and purpose of land use distribution. However, Authority may decide the activity and its area at the time of detailed planning. The area under recreational zone is 1920.45 ha which is 16.48% of the urban centre. Out of the total recreational, 80% is proposed as open green under parks, playground and greenbelts and 20% recreational green. The proposed recreational activities are distributed suitably well within the city. The regional park being serving the entire city and its surrounding is proposed to be centrally located within an eco sensitive zone where network of canal and distributaries are merging. In additions parks and playgrounds have been distributed within the urban centre. Further, the trade and exhibition ground is

proposed to be developed on the western side of the Expressway near city centre and city level institutional.

Since Raya Urban Centre will be the nearest planned city surrounded by religious places Mathura, Vrindavan, Barsana, Goverdhan, provision of facilities various recreational activities attracting the tourists such as haat development, fair ground, tourist trails, amphitheatre, heritage centre etc. are proposed to be developed in tourism zone directly connected to Vrindavan and Mathura through existing road proposed to be strengthened.

All the ecologically sensitive areas such as rivers, canals, natural drains, ponds and other water bodies have to be conserved as per MOEF guidelines. However, the green belts of varying width have been provisioned along Expressway, other roads, drains, canals etc. Green belt of 30m on each side of the canal and 15m on each side of natural drain has been provided to protect natural drains.

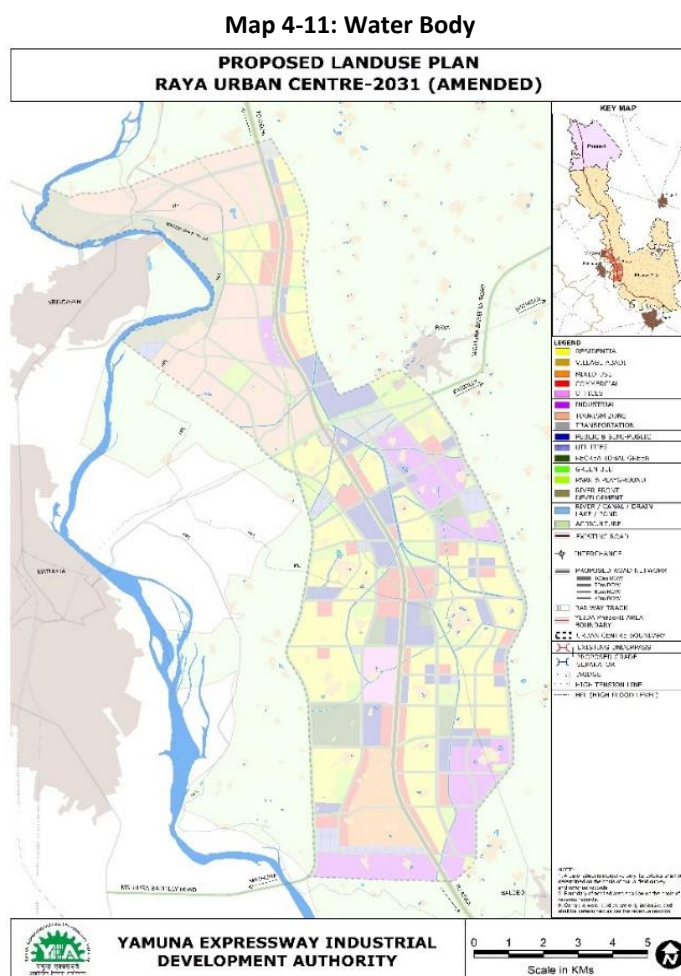
In addition, green belts have been provisioned along roads to provide lung spaces and to absorb the traffic pollution. Green belt of 50m on each side of Yamuna Expressway and 10m on each of other Master Plan Roads including State Highway passing through the urban centre has been proposed. In addition 50m green belt including the 10m proposed along master plan roads has been provisioned towards the residential land use between industrial areas and residential areas to segregate them. Further, the green belt of 50m on both sides of Railway line is proposed to be developed. However, in Raya Urban Centre, the railway line and state highway are adjacent to each other and hence the space left after widening of the state highway and leaving aside the railway land is proposed to be developed

as green belt. Nevertheless, on the northern side of the railway line 50m green belt has been provisioned.

Any existing recreational activity running within the proposed urban centre in any zone other than commercial may be allowed to continue. However, the Authority/State Govt./Central Govt. or its departments/agencies can take appropriate decision/actions as per law with regards to existing structures in the ROW of existing roads and ROW of the proposed Master Plan Roads/Railway/Other Transport Mode. However, the expansion or reconstruction more than the existing area shall be governed as per the permissibility of that activity as per zoning regulations.

4.3.12 Water Bodies (River/Canal/Drain/Lake/Pond)

The area covered under this land use is 89.75 ha which is 0.77% of the urban centre. All the ecologically sensitive areas such as rivers, canals, natural drains, ponds and other water bodies are the main ecological resources which have to be conserved. Mat Branch of Upper Ganga Canal is the main canal



passing within and near the urban centre with network of other minor distributaries and tributaries. These ecological resources conservation has been made possible by provision of green belts along them and provision of green spaces, parks and recreational spaces wherever possible to safeguard them against rampant environmental pollution where waterways have been allowed to be indiscriminately exploited.

The water bodies including river, canals, lakes, ponds have been marked from secondary sources i.e. satellite imagery and toposheets. For above purposes, all natural features including water bodies, river, ponds, canals, drains etc. are to be marked and verified from revenue record and through primary surveys by

Competent Authority at the time of preparation and implementation of layout plans and these shall be protected from any development. The area covered by various water bodies is different in various secondary sources such as toposheet, satellite imagery procured, revenue records etc. In such case Authority shall take suitable decision before implementation. As per Master Plan, canals and drains have been provided with average width based on Satellite Imagery which shall be verified while layout preparation and accordingly space shall be reserved for the same as no development area. Further, green belt of 30m on each side of the canal and 15m on each side of natural drain has been provided

to protect natural drains. Water bodies like lake/ponds identified as per revenue records shall be preserved and thus 30m buffer of 'No Development Zone' shall be maintained around with exception of activities associated with the development and maintenance of lake/pond. There is water logging or swampy areas which are ecologically sensitive, Authority shall identify the same at the time of layout preparation and take appropriate decision to use and preserve them.

River Bank: Moreover, the embankment/bund along the rivers, streams or drains or any other suitable measure shall be taken by the concerned department to protect the area from flooding. Activities along the Yamuna River shall be permitted as per MOEF guidelines. However, basic facilities and amenities as required in the existing Rural Abad Area shall be permitted with the special permission of the Authority.

Other Natural Features viz. forests: All other natural features such as forests are environmentally sensitive and thus needs to be preserved. The forest areas represented in YEIDA Phase-II are based on Survey of India toposheets and these shall be determined from revenue records of forest department while detailed planning. However, as a policy, forest areas are proposed to be conserved which no development permitted within them. Similarly there are open scrubs and any other in the area which is ecologically sensitive, Authority shall identify the same at the time of layout preparation and take appropriate decision to use and preserve them.

In order to protect any other natural features not specified above, a suitable distance from the edge of the natural feature shall be demarcated as "No Development Zone" at the time of detailed planning.

4.3.13 Agriculture Area

The area within YEIDA, other than proposed Urban Centres, wherein Agriculture and Allied activities are continued to be the main economic activity. Activities permitted within this zone such shall be as per permitted as per zoning regulations.

Orchards existing within the urban centre shall be identified by the concerned department and they shall be used or preserved as per prevailing policy of State and Central Government..

5 TRANSPORT

5.1 INTRODUCTION

The primary requirement for the success of the YEIDA will be apart from the facilities within, the connectivity to markets and resources. This can be achieved through careful planning to provide an efficient public transport system for city level mobility, connectivity to major regional transport corridors as Eastern DFC, Yamuna Expressway, development of regional transport corridors to connect Nodes within YEIDA development area etc.

5.1.1 Employment Generation

The Raya Urban centre is being developed in the vicinity of Mathura as green field industrial city to cater to an estimated 966,000 population. Total employment expected to be generated from the development is 579, 601.

5.2 ESTIMATED TRAFFIC DEMAND

Trip Rates

The total estimated daily traffic in the city is estimated based on the Per Capita Trip Rate (PCTR) as projected by the “Study on Traffic and Transportation Policies and Strategies in Urban Areas in India” by Wilbur Smith Associates for cities in population range of 5-10Lakh is 0.8 to 1.02. These estimates are based on the existing cities with varying land-use characteristics. However, the new city being developed is industrial in nature and hence higher trip generations are anticipated. Accordingly, PCTR of 1.0 in the initial periods and increasing up to 1.1 for the full developed scenario has been considered. The intercity trips by the city population are due to its interaction for the purposes of recreation, tourism or social needs. This is generally high for small towns and will reduce in terms of percentage or per-capita trip rate as the city grows. The proposed city is expected to have an ultimate population of under 1.0 million and is close to the important tourist destinations Delhi and Agra along with Mathura. Considering these aspects, a slightly higher share of intercity trips can be expected.

It is also considered that a considerable proportion of employees commute to Raya city. For planning purposes, it has been assumed that 35% of the industrial employees will be commuting from surrounding settlements during the planned period. This high percentage is also due to its proximity to Mathura and Agra. This would also be supported by the presence of high speed transport facility “Yamuna Expressway”.

The proposed development being industrial city, freight traffic generation is an important aspect which needs to be assessed and addressed. The study of potential industries suggest electrical, electronics, medical equipment etc. The Consultant’s past experience suggest freight traffic generation of about 4.2 trucks per Ha per day for industrial areas near NCR. Consultants have adopted the observed trip generation rates for Raya.

The summary of trip generation rates adopted for the Raya city is presented below:

Passenger Trips

Intra City Trips

Per Capita Trip Rate – 1.10

Intercity Trips

Per Capita Trip Rate – 1.8 (for External-Internal-External Trips)

Per Capita Trip Rate – 0.05 (for Internal-External-Internal Trips)

Freight Trips

Industrial Areas

Trucks – 4.10 vehicles /day/Ha

Additionally, the residential and commercial areas also generate freight trips and these are based on the consumption and waste generation by the population. These details are sourced from the earlier studies. Thus considered commodity consumption and waste generation per person per day is 1.216 Kg. These are used for estimation of freight generation by resident population and these are distributed to residential and commercial areas.

The peak hour share (PHS) has been assumed as 10% and peak directional factor has been assumed at 0.55; Even though the PHS for external linkages is generally in the range of 5.0% to 8.0%; the PHS for YEIDA roads has been considered as 10% because for external roads, traffic is distributed throughout the day while for urban roads traffic has peak hour characteristics.

Vehicular trips for the passenger vehicles is estimated by taking population as the base and applying the adopted per capita trip rate, modal shares and occupancy factors. The Per Capita Trip Rate (PCTR) has been considered as 0.05 in line with the general trend observed in similar size cities for internal-external-internal and 1.8 for external-internal-external which primarily correspond to the employees commuting from outside.

The travel demand is estimated for three categories, namely trips generated from the YEIDA to the surrounding cities/region, trips generated from the surrounding cities/regions to the YEIDA and the trips within the YEIDA. The Table 5.3 shows estimated trips per day for all the three types of movement.

Table 5-1: Daily Traffic Estimates for the Urban Centre (Person Trips)

Category	Trips per day	Peak Hour Trips
Passenger Trips		
Internal-Internal	10,73,380	1,07,338
External-Internal-External	1,21,980	12,198
Internal-External-Internal	48,790	4,879
Total	12,44,150	1,24,415
Freight Trips	7,930	793

Except the Internal-Internal trips, all the trips are to be catered to by the external connectivity.

Modal Split

The modal split in the city defines the infrastructure requirements in the city be it physical infrastructure as roads, grade separators etc., or public transport requirements and investments thereof. The observed modal split in cities with population in the range of 5-10lakh is presented in Table 5.4.

Table 5-2: Model split with population in the Range of 5-10 lakh

Mode	Share (%)	
	Overall (incl. walk)	Excl. Walk
Walk	32	-
Cycle	20	29
Two wheeler	24	35
Public Transport	9	13
Car	12	18
IPT	3	5
Total	100	100

(Source: Study on Traffic and Transportation Policies and Strategies in Urban Areas in India, MoUD, 2008)

The study also projected mode shares for the future and has estimated decline in public transport share. This situation is not good for the overall sustainability and to ensure the city smart and green. To ensure this, the efforts and infrastructure needs to be public transport oriented. The transport planning needs to keep public transport in the centre of city transport development. Cities around the world have been targeting to increase the public transport share as part of the smart targets to make cities ecologically sustainable.

The mode shares also depend on the city shape and size. The circular or square cities will have the least average trip lengths compared to elongated, rectangular cities. The proposed development is an elongated one with length along the expressway extending up to 15km. The modal share for the intercity trips will be more inclined towards public and para transport. However, the presence of high speed expressway facility would influence in favour of private and para transit.

Considering the above aspects, it is proposed and recommended to consider higher share for public transport. The NMT and public transport are proposed to be given importance in the infrastructure development. The proposed modal share is presented in Table 5.5.

Table 5-3: Proposed Model Split

Mode	Modal Share (Intra-City) (%)		Modal Share (Inter-City) (%)
	Overall (include. Walk)	Overall (excl. walk)	
Walk	20	-	-
Cycle	20	25	2
Two wheeler	15	18	13
Public Transport	34	43	50
Car	8	10	20
IPT	3	4	15
Total	100	100	100

Occupancy

Daily trips by each of the mode are estimated based on the modal split and the average occupancy. For the purpose following occupancies have been considered which are generally observed in the urban areas are presented in Table 5.6

Table 5-4: Proposed Occupancy for Passenger Vehicles

Mode	Occupancy (Intra City)	Occupancy (Inter-city)
Cycle	1.0	1.0
Two Wheeler	1.2	1.5
Car	2.0	3.5
IPT	1.5	4.0
Public Transport (Bus)	45.0	45.0

Demand Estimation

The daily trips generated in the city are estimated based on the trip rates, modal split and the occupancy rates as discussed above. Thus estimated daily trips are given in the Table 5.7.

Table 5-5: Estimated Daily Demand

Mode	Passenger Trips		Vehicle Trips	
	Intra-City	Inter-City	Intra-City	Inter-City
Walk	2,14,676	0	-	-
Cycle	2,14,676	3,416	2,14,676	3,416
Two wheeler	1,61,007	22,201	1,34,173	14,801
Public Transport	3,64,950	85,385	8,110	1,897
Car	85,871	34,154	42,936	9,758
IPT	32,202	25,616	21,468	6,404
Freight Trips	-	-	320	7,610
Total	10,73,382	1,70,772	4,21,682	43,886

The inter-city trips are to be catered to by the external linkages and primarily by the Yamuna Expressway.

5.3 DEVELOPMENT STRATEGY – EXTERNAL LINKS

Road Connectivity

Major roads providing regional connecting to Raya city are as below:

- ✓ Yamuna Expressway
- ✓ Mathura-Hathras Road (SH-33)
- ✓ Mathura-Raya-Aligarh Road (SH-80)

Yamuna Expressway: Existing Interchange at the northern end of Raya City is the major connection to Yamuna Expressway. The expressway is currently having 4-lane divided carriageway with access control.

Mathura-Hathras Road (SH-33): As per the study “Strategic Core Road Network Plan, Uttar Pradesh”, by UPPWD, the road is having 2 lanes and carried about 13,200PCU in year 2011 and the projected

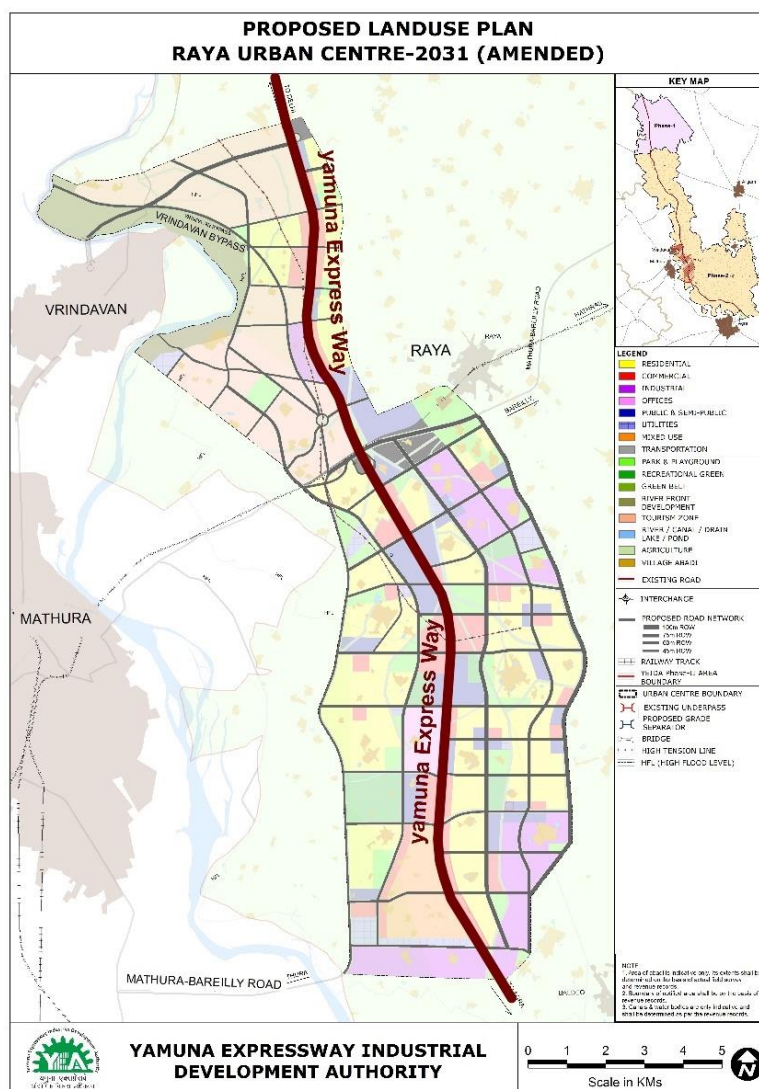
traffic in the year 2016 is about 19,400PCU. The study also proposed to develop this road to a 4-Lane facility.

Mathura-Bareilly Road (SH-80): As per the study “Strategic Core Road Network Plan, Uttar Pradesh”, by UPPWD, the road is having 2 lanes and carried about 6,600PCU in year 2011 and the projected traffic in the year 2016 is about 14,400PCU. The study also proposed to develop this road to a 4-Lane facility under PPP mode.

All the three major roads connecting Raya City are proposed to be developed or developed as 4-lane facility and have spare capacity to handle the traffic generated by this new development. In addition, there is an MDR passing through the proposed Urban Centre connecting Mathura Sadabad. An underpass exists on this road on Yamuna Expressway to provide connectivity within the Urban Centre. The width of the road shall be developed within the urban centre as proposed in Draft Development Plan.

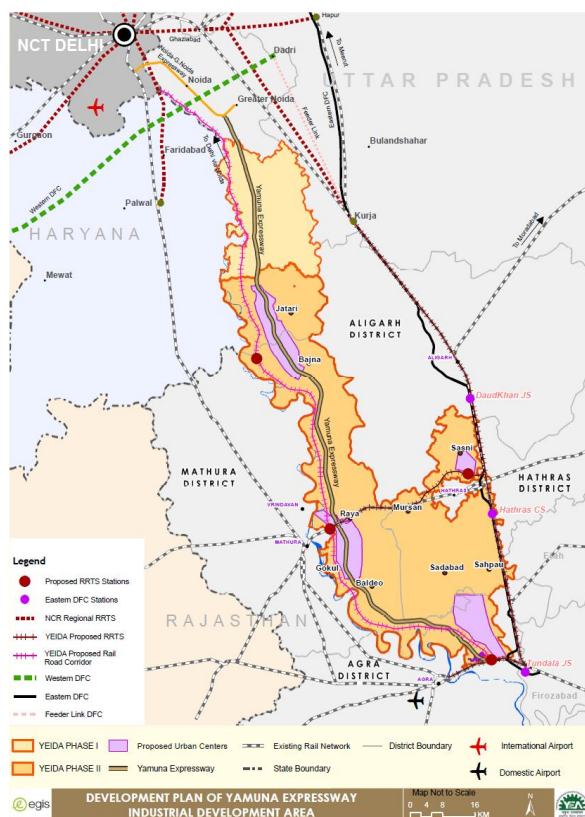
The external road linkages of the Raya Urban Centre with the region are presented in Map 5.1

Map 5-1 External Road Linkages of Raya Urban Centre



Rail Connectivity

Map 5-2 : Existing and Proposed Regional Rail and Air Connectivity



The high targeted share of public transport trips and proximity to major cities as Mathura make the rail based facility a viable option that could be explored. Currently, the nearest railway station is near existing Raya town close to the new proposed city and is located in the north. The existing Mathura – Hathras line is proposed to be converted to broad gauge from the current meter gauge. However, connectivity with other cities proposed within YEIDA area and with NCR is important. Considering this and to improve the rail connectivity among the new cities being developed in the YEIDA region, it is proposed to development of Rapid rail System connecting with Delhi and NCR towns in addition to Mathura and Agra. The summary of proposed rail connectivity is as follows and spatially presented in Map 5.2

Air Connectivity

The city is connected to the airports in Delhi and in Agra. The connectivity of Raya new City through Agra is very limited as there are very few flights. However, UP Government is preparing the plans to develop international airport near Tundla south of south-east of Agra city. For better connectivity, regional airport would be required near YEIDA region which will provide easy accessibility from new cities proposed in YEIDA with rest of India.

5.4 An Integrated Transport Strategy for the City

A multi-modal transport strategy for Raya City is proposed covering both public and private transport. This requires a good system of roads, footpaths and cycle-tracks, and a range of public transport systems that are matched to the level of demands.

The Road System

All planned roads in Raya City are classified in order that the network will work efficiently. Classification is based on the avoidance of conflict, by separating roads serving different purposes from each other and from non-road uses. This consideration is not only to do with the functional efficiency of traffic flow, but also to ensure the safety, amenity and environmental quality of urban areas. The adoption of a hierarchy allows consistent decisions to be taken about the design and

management of a road or street along its length. The classification is based on priority of the different modes and purposes such as freight movement, daily commuting for workers, leisure trips and so on. The division of function can boost efficiency of the system along with ensuring safety for all users involved.

Arterial roads are planned to be associated with strategic routes, heavier traffic flows, higher design speeds, with limited access to minor roads with frontage access. Collector and local roads are planned to be associated with more lightly trafficked, local routes, with lower design speeds and more frequent access points and with access to building frontages.

The spatial Draft Development plan is based upon a grid iron pattern and the transport network has been planned such that the roads form a perpendicular junction giving each sector ease of access as well as division into streets and areas. The internal road hierarchy and widths are based upon the trip forecasts.

5.4.1 Road Hierarchy

Categories and hierarchy of roads with their key design features are illustrated below:

Expressway – Yamuna Expressway shall provide access for the regional traffic;

- Arterial roads with ROW 100m, 75m;
- Sub-Arterial roads 60m, 50m, 45m and 25m;

The road right-of-way for each category is described below with illustrative views of cross-sections. These have been designed in line with the international best practices for major planned developments elsewhere throughout the world. The proposed road network plan is presented in the Map 5.3.

Arterial Roads

Arterial roads are proposed to be a high-capacity urban road to collect and deliver traffic from sub-arterial roads and important collector roads to expressways, and between urban zones providing the highest level of service possible. This is achieved through limiting intersections (typically at 1 km intervals), providing proper access to vulnerable road users, limiting friction from adjoining land-use, provision of service roads etc. The proposed ROW for these roads is 75m and 100m.

The design speeds for the arterial roads is proposed to be 80kph. All the intersection along the arterial roads shall be controlled through traffic signals.

Sub-Arterial Roads

Sub-arterial roads are proposed to act as the connecting link between internal sector roads/ collector roads to arterial roads. These are often provide cross connectivity between arterials and will be medium to high-capacity urban roads. The proposed ROW for these roads is 45m to 60m.

As these roads would primarily collecting traffic from the collector roads internal roads of sectors, it is proposed to have provision for service roads along these roads and will have intersections typically at 500m intervals. The design speed though shall be similar to arterial roads; the expected speeds on these roads shall be 50kph.

The typical cross sections proposed for the arterial and sub-arterial roads are presented in the map

Map 5-3: Proposed Road Network for Raya Urban Centre

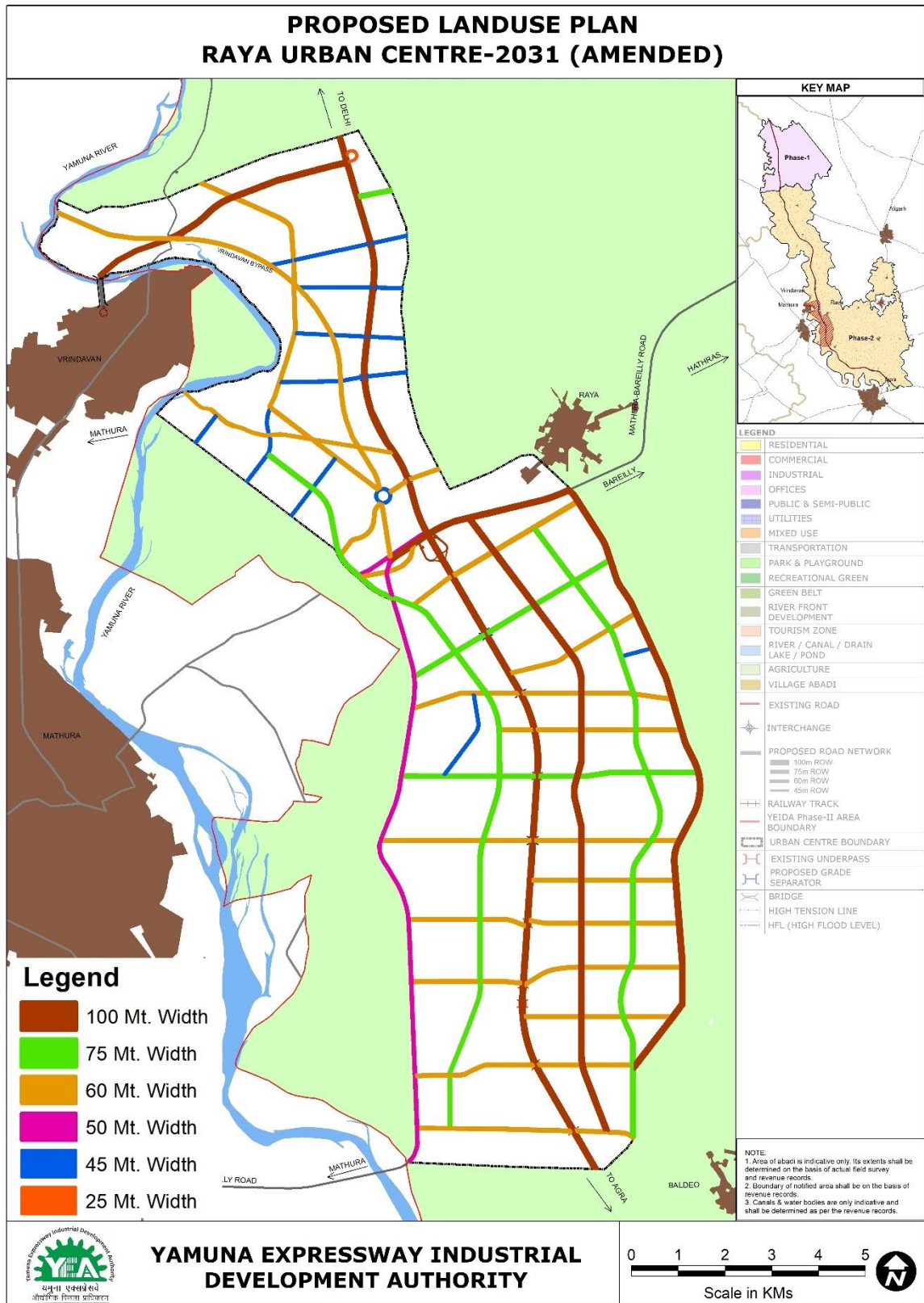
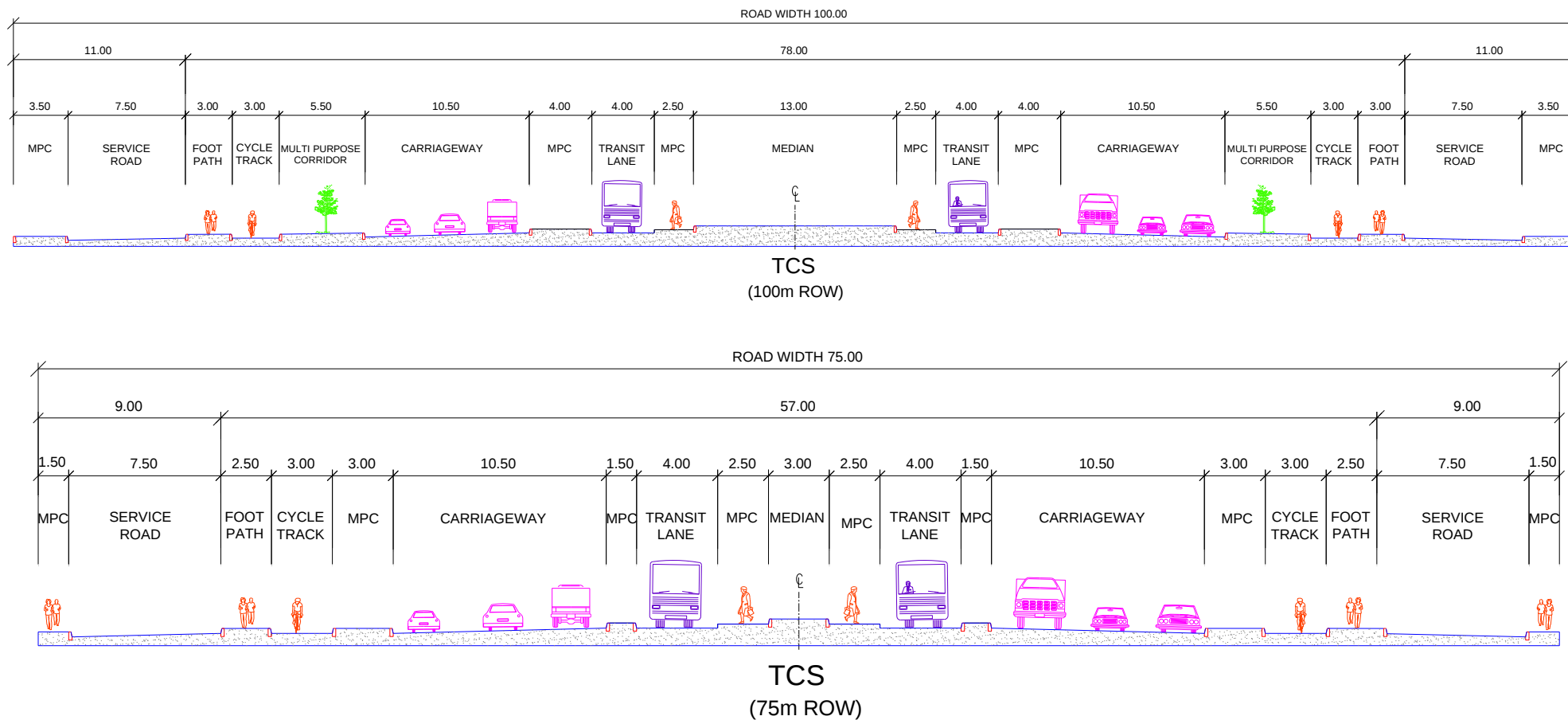
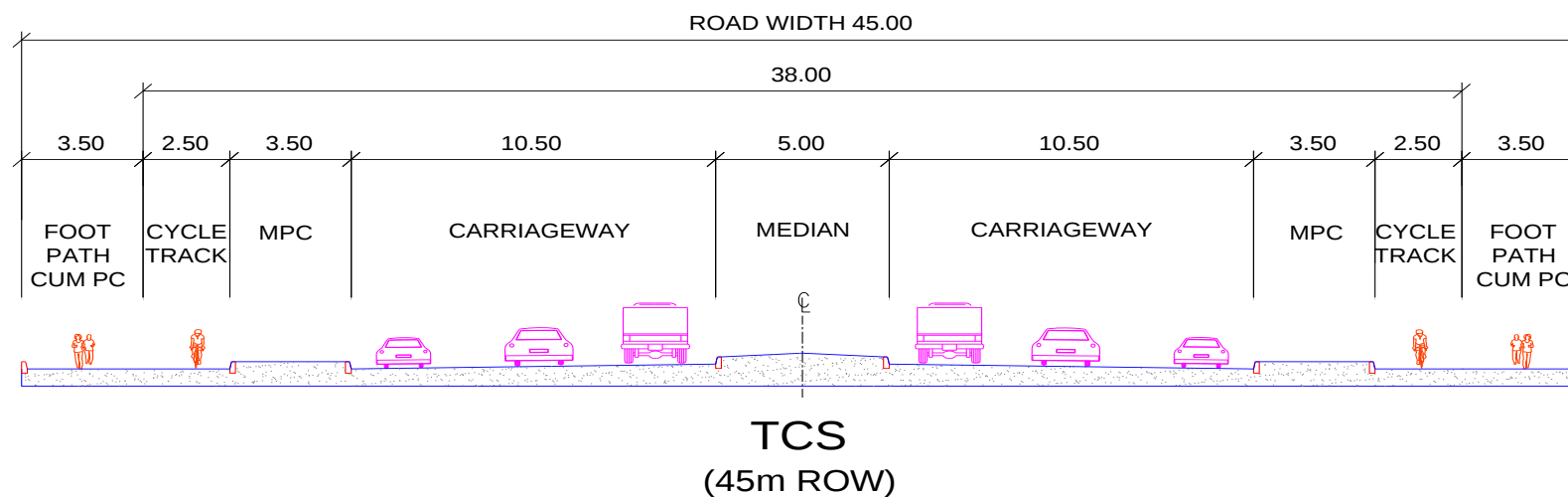
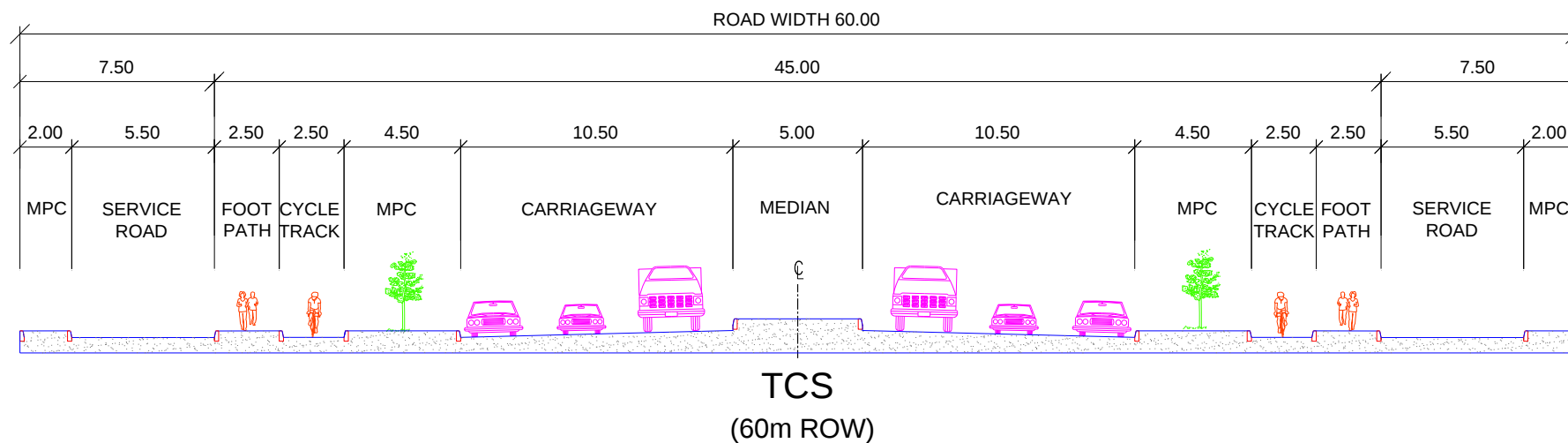


Figure 5-1: Typical Cross Sections of Arterial and Sub-Arterial Roads





5.4.2 Circulation across Yamuna Expressway through Underpasses/Overpasses

The Yamuna Expressway divides the city in to two parts. This limits the connectivity within the city as there are 5 crossings and only one is having a span or horizontal clearance of 25m and rest can only accommodate about 2 lanes only. These are originally planned to provide access across Yamuna Expressway to accommodate existing village or rural roads. These underpasses are very narrow in nature and would not meet the connectivity requirements of the city zones located on either side of Yamuna Expressway.

The sector roads cross the Yamuna expressway are roughly located at intervals of 1 km. However, due to the access control nature of Yamuna Expressway and the city development proposed on both sides of Yamuna Expressway, the required cross connectivity has been proposed through utilising existing underpasses and new underpasses/flyovers.

Additional underpasses/flyovers are proposed at suitable locations for providing seamless connectivity between the city zones on either side of Yamuna Expressway. The proposed facilities are expected to address the required cross connectivity requirements within the urban center. The nature of facility can further be detailed during sectoral plans and implementation based on Techno-Economic feasibility.

The details of the existing underpasses with suggested expansion and proposed grade separators (underpasses/flyovers) are presented in Table 5.8 and underpass IDs are presented in Map 5.3: Proposed Road Hierarchy.

Table 5-6: Cross Connectivity Details across Yamuna Expressway

ID No.	Existing Width (m)	Vertical Clearance (m)	Proposal	Proposal	Located on Road with ROW (m)
Existing Underpasses					
3	12.0	5.0	40	2 new 15m underpass on either side	75
5	12.0	5.0	30	2 new 15m underpass on either side	60
6	7.5	5.0	30	2 new 15m underpass on either side	60
7	7.5	5.0	30	2 new 15m underpass on either side	60
8	25.0	5.5	-	-	60
Proposed Grade Separators (Underpasses/Flyovers)					
1			40	New Proposed	75
2			30	New Proposed	60
4			30	New Proposed	60

5.4.3 Road Intersections

Road junctions in Raya City are planned in such a way that vehicular traffic going in different directions can proceed in a controlled manner to minimize accidents. The traffic at most of the junctions will be controlled by traffic signals. The main junctions with the expressway will be grade-separated.

The signalized intersections are planned on arterial and sub arterial roads where the traffic volume are expected to be high, this will be to ensure the safe crossing of vehicles and pedestrians. At the local roads, traffic control is proposed through provision of roundabout resulting in self-controlled intersections.

5.4.4 Intersection Capacities

Adequate roadway capacity at any junction is desirable. Widening of approach roads at the intersection may be warranted to reduce the delays caused by intersections controlled by traffic signals. Widening of intersecting roadway is often beneficial to operation of arterials because it reduces the signal time that must be assigned to side street traffic. In urban areas the effect of widening can be achieved by elimination of parking at intersectional approaches. It is desirable to have at least two lanes for moving traffic on each approach to a signalised intersection. Additional width may be necessary on the leaving side of the intersection as well as on the approach side, in order to clear traffic through the intersection effectively. A traffic signal will need to be provided if warranted by minimum vehicular volume or interruption of continuous traffic or minimum pedestrian volume. Minimum vehicles of 800 per hour in case of major streets and 1200 vehicles per hour for interruption of continuous traffic are the warrants for provision of traffic signals (Source: IRC 106:1990).

The capacity of interchanges is increased with proper planning of all the components of interchange. It starts with speed change lanes, tapers and islands. Free flow type ramp terminals are planned for the interchanges with Expressway.

5.4.5 Minimising Traffic Conflict

Conflicts between different modes of transport is proposed to be minimized through careful planning of road hierarchy, facility for vulnerable road users as controlled crossings, footpath/ cycle track provisions in cross sections. The local roads will provide access to adjoining properties and most of the trips originate or terminate from these roads. These local roads will allow unrestricted but planned parking and pedestrian movements. The collector roads will collect traffic from the local roads and feed to sub-arterial or arterial roads.

The sub-arterial roads are located in residential neighbourhoods, business or industrial areas. The arterial roads will carry mainly through traffic. Significant intra-urban traffic such as between the city centres and commercial nodes will be served by arterial roads. Arterial roads will also provide the only connection with the expressway and will collect and distribute through traffic and minimise conflict from sub-arterial and collector roads.

5.4.6 The Public Transport Strategy

The public transport strategy shall be based on the targeted public transport share among the characteristics of the city planned. Here in this case, the city is having population less than 1.0 Million and the city size can be termed as medium (90 sq.km). This situation is more favourable to non-public transport as the resulting average trip lengths for intra-city trips is expected to be less than 8km.

However, as the city is being developed as green field and industrial city, the higher public transport shares can be achieved through careful and advanced planning for public transport facilities. Following measures are proposed to achieve the suggested model share of 50% for public transport:

- a. Provision of PT stands/terminals in each of the sectors
- b. PT route planning to consider trunk-feeder concept
- c. Park and ride facilities near all bus stands/terminals
- d. PT stop/routes to be accessible to users within 300m-400m
- e. Connectivity to the regional bus terminal from all sectors
- f. Less waiting period at PT stops and live PT availability information at all stops
- g. Dedicated PT lanes along all arterials
- h. Safe Pedestrian crossing facilities at all PT stops
- i. Easy transfer facilities at the crossing of PT routes
- j. Public Transport priority at intersections

However, All arterial roads have reservation for dedicated rapid transit system as presented in Figure 5.1: Typical Cross sections of Arterial and Sub-Arterial above

5.4.6.1 Transit Modes for Low Demand Corridors

Bus Mixed with other Road Traffic

Although buses, whether petrol, diesel or CNG driven, when mixed with other traffic tend to slow, they provide a very flexible public transport system that can be quickly introduced in any corridor without the need for significant investment in infrastructure. Buses will cater for low levels of demand up to about 2000 in the Peak Hour Peak Direction Traffic (PHPDT), which translates to more than one bus for every 2 minutes.

Segregated Bus Lanes

On corridors where the demand level exceeds the capacity of the buses operating in mixed traffic conditions, bus lanes will be introduced. Roads in these corridors have adequate width to accommodate these lanes. This will improve the travel speed and thus the carrying capacity of buses and the quality of service. The main requirement is a share in the road space marked exclusively for buses, together with preferential signalling at the road intersections. Depending upon the level of exclusivity provided, the capacity can be increased up to 10,000 PHPDT.

Buses and bus lanes are expected to remain as an important component of developing the mass transport system in YEIDA before a higher capacity system is introduced. Even after this point, buses and bus lanes will act as a feeder system to the Light Rail Transit system.

5.4.6.2 Proposed Transit Modes for Medium Demand Corridors

The choice here is either a road based trolley bus system or a rail based tram or light rail transit (LRT). The capacity of all of these systems can be gradually increased as the demand grows by increasing the portions of the exclusive right of way and the length of the unit with segregated facility at intersections. In this scenario, the bus stops shall have to be at level 1 or away from the intersections; in the later situation segregated pedestrian crossings near the stops would be required.

A trolley bus system is the least cost but lowest capacity option and the light rail transit the most costly but offers the higher capacity. At grade tram facility requires the equivalent width of 2 lanes while a bus-way requires 3 to 4 lanes of roadway. The capacity of a LRT is double to that of a standard bus and the life of the vehicle three times that of a bus.

The technology and operation of all of these modes is well developed so that reliable services can be provided for any of the three options.

5.4.6.3 Transit Modes for high demand level routes

Metro is preferred on a corridor only when the demand is expected to be upwards of 25,000 PHPDT and the variation over the day is limited. To derive the full benefit from the high capacity metro rail, it is necessary to provide mass transport services on other corridors in the area to feed into the metro rail.

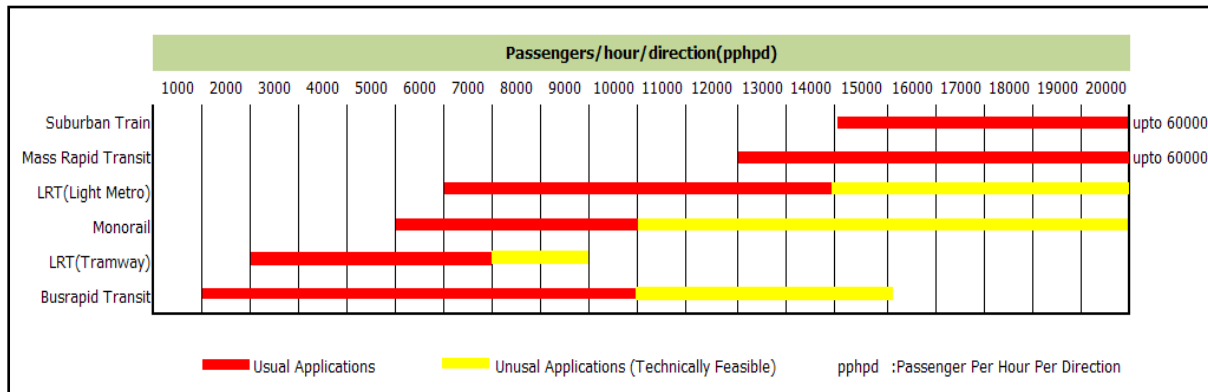
Metro services and routes need to be integrated with the bus route planning for better utilization of network.

5.4.6.4 Choice of Mass Transport Mode

In the first phase of development, well planned bus system may be considered. In the longer run, where passenger demand requires higher capacity systems be planned to complement the existing bus system to ensure faster, smoother and safer travel, as well as offering non-polluting and energy efficient systems.

In case of bus system, then the demand increases, capacity augmentation in terms of grade separation [for Transit corridor] or higher capacity systems shall need to be considered. General philosophy that may be considered for the selection of mode and capacity augmentation is shown in Figure 5.2.

Figure 5-2: Selection of Mode and Capacity



5.4.7 Feeder Services-Para Transit, Non Motorised Transport and Pedestrian Facilities

In order to cater to the increasing demand of the intra urban traffic, Mass Transport System for commuters such as Bus Rapid Transit System and Light Rail Transit system with a provision of feeder system may be developed in a progressive way.

All the arterial and sub arterial roads are proposed to have contiguous pedestrian and cycle paths and thus accordingly the cross sections has been planned and presented in transport infrastructure section. The transport facilities pertaining to PTS such as multimodal transit stations etc. shall be accordingly planned while detailing planning and implementation of the system.

5.4.8 Transport Facilities

A range of facilities are proposed to be developed for passenger and goods movement from and to support regional and city transport network. To support large scale industrial development proposed in urban centre, infrastructure such as integrated freight complex, has been proposed. Also, space has been reserved for passenger transport facility for Bus terminal with Bus Depot and Freight Complex etc.

5.4.8.1 Bus Terminal and Bus Depot

A bus terminal with depot has been proposed and strategically located near the interchange in the north which is accessible through arterial road network. Further, the depot shall be located along with the terminal to avoid having any dead mileage. Also, it is recommended that the accessibility of the passenger transport facility shall be different from the goods facility in case of locating them adjacent to each other so as not to inmix the traffic of the two as illustrated in figure 5.3.

Map 5-4: Accessibility of Bus terminal to Passenger and Freight Transport Facility

The main components of the facility includes the terminal station for buses with adequate bus ways, passenger waiting zones, restaurants/ food joints, relevant commercial activities, parking facilities, servicing and maintenance facilities with fuelling station, administrative office and medical facilities for staff and accommodation facilities for the transport staff, future expansion etc.

The city bus terminal will also be co-located close to the regional bus terminal for proper integration and dispersal of passengers.

The city bus stands shall be located so as to be easily accessible from/to each of the sectors and these facilities will house facilities like bus 'Q' shelters, bus bays, passenger waiting areas, small retail, food joints, toilets etc.

5.4.8.2 Freight Complex

There is an integrated freight complex proposed to provide adequate infrastructure for freight handling in the city. It is located in the central north. These are located close to the industrial areas and are accessible through peripheral arterial roads thus avoiding/ minimising mixing with passenger/ urban traffic. For better integration with regional transport facilities, these are proposed at the interface of the regional and urban transport network and to integrate with the regional rail network. Proposed Raya Urban Centre is well connected with existing rail connectivity and regional freight infrastructure for freight transfer. The main components of the freight complex are presented in Figure 5.3.

Figure 5-3: Components of Freight Complex

	Logistics	Industry	Trade Facilitation
Essential	- Warehouses/Covered Sheds/Cross-docks - Container yard - Open storage yard - Bonded zone - Truck Terminal - Rail Siding	- Light engineering, manufacturing and processing zones - Pre-built Standard Design Factory (SDF) - Testing and certification facility - Office space for logistics companies	- Office space - Exhibition and convention centres - Banks and financial institutions
Support	- Communication and IT facility - Weighbridges - Fuel station - Admin/Office centre - Employee amenities	- Water and power stations - Effluent treatment plants - IT infrastructure	- Hotels, guest-houses - Residences for employees in the park
Auxiliary	- Container fabrication and repair centre - Truck Repair & Service - Logistics equipment leasing/rental centre	- Pallet and packaging fabrication centres - Logistics software and engineering centre - Logistics consultancy centre	- Shopping and retail centres - Recreation/Entertainment centres - Training centres

6 UTILITIES

6.1 Background

The provision of basic infrastructure services such as water supply, sewerage, drainage, solid waste management and power is important for the economic development of the area and thus to provide quality of life to the residents of the city. Moreover, industrialization and change in lifestyle from rural to urban will require massive expansion and development in quantity and quality of utility services. Thus, careful planning of the same have been done based on demand, resource availability to provide adequate, economical, equitable and quality infrastructure within the urban centre. However, for the detailed infrastructure planning, design and implementation of various levels, detailed project report shall be prepared.

6.2 Water Supply

The provision of fresh water/recycled water is one of the prime infrastructure issues to be addressed over a horizon period. An initial assessment of the availability of water from surface and sub surface sources around the development has been conducted. Thereafter, the capacity and location of key water supply infrastructure has been identified based on water demand, source and availability of water.

6.2.1 Source of Water Supply

The area under consideration for developing the Urban Centres has moderately developed water resources that provide sufficient water for the present use under irrigation, domestic and scattered industrial use. The ground water in the area is overexploited except Mat Block (partly covered under Raya Urban Centre. Following are the major sources of water available that could be considered for the purpose.

- a) Barrages and Weirs across Yamuna River
- b) Irrigation canal networks (Upper Ganga and Madhya Ganga Canal)
- c) Ground water in the area and along the Yamuna River Beds

(a) Barrages and Weirs across Yamuna River

The weirs and barrage across the Yamuna River; have been lifeline to a vast agricultural area and some of the major cities like Delhi, Mathura and Agra. For the proposed urban centres also it is being considered to have similar kind of structures as a water supply source. Existing Gokul barrage with its enhanced capacity could have been a vital source, but after studying the recent DPR (by UP Jal Nigam) for augmenting the Gokul Barrage for improved water supply in Mathura-Vrindavan-Agra, it appears that it can hardly meet water requirement of these cities. Furthermore it is desirable to construct the barrage at other locations (Vrindavan, Mathura, Agra etc) to provide sufficient water to the cities in the future. The Gokul barrage presently has available capacity of 2780 hectare-meter, which indicates

that during lean flows in Yamuna, it can support to these cities only. Due to the above reasons Gokul Barrage does not seem to be a viable option to meet the water demands of the urban centres. However, the technical feasibility (hydrologic and topographic) may be explored to construct the barrages and weir in the upstream and downstream of the Gokul Barrage.

(b) Irrigation Canal Networks (Upper Ganga and Madhya Ganga Canal)

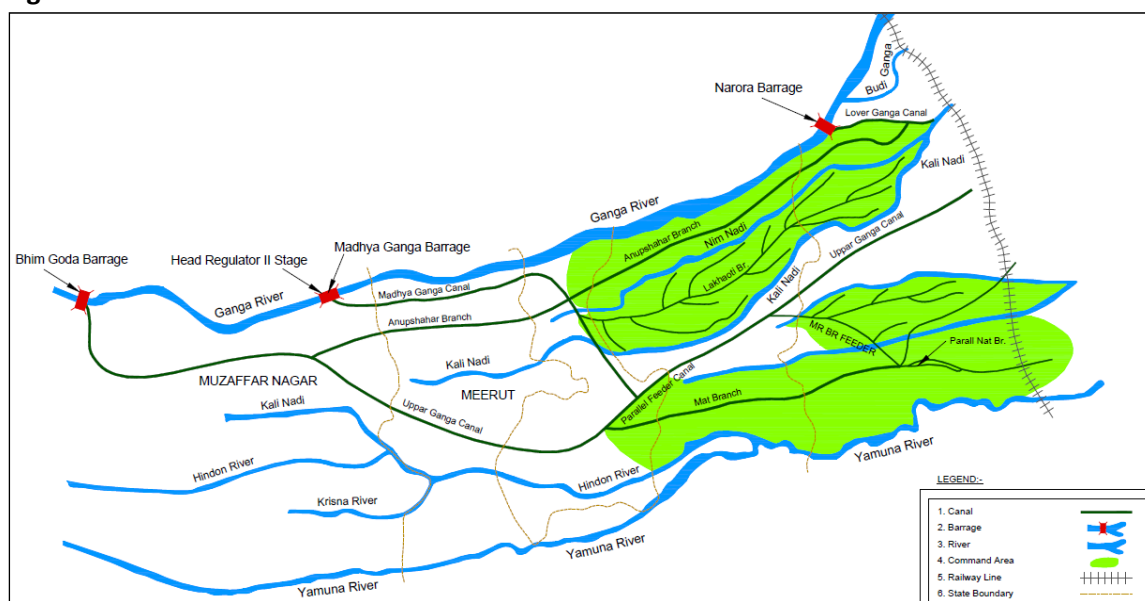
The area under consideration has wide network of Branch canals distributaries and minors of Upper Ganga Canal and Madhya Ganga Canal System. The nearest major source of water for the area is the Mat Branch Canal (Upper Ganga Canal System) and also the tail of Upper Ganga Canal with augmented supply from Madhya Ganga Canal feeder (as shown in Figure 6.1). The average discharge of Mat & Hathras Branch Canals is 55 cumec providing intensive irrigation to about 45,450 ha. Mat feeder channels have additional discharging capacities of 18.5 cumecs. The discharges branch canals, feeder channels etc and the proposed irrigation in and nearby area is as per the following Table 6.1.

Table 6-1: Discharge and Command Area

S. No.	System	Discharge (Cumec)	Command Area (ha)
1	Anupshahar Branch	25.5	20,000
2	Mat & Hathras Branch	55.5	45,450
3	Other Offtakes of Upper Ganga Canal	58.0	47,650
	Additional Through Madhya Ganga Barrage		
4	Lakhaoti Branch	63.0	49,550
5	Mat Feeder Channels	18.5	14,450

(Source: Conjunctive use of surface and ground water in Madhya Ganga Command Area by WALMI UP, & WRDTC University of Roorkee (IIT Roorkee))

Figure 6-1: Canal Network in and around Master Plan Area



Water source location for Raya Urban Centre

Mat & Hathras Branch canal with head discharge about 55 cumec of Upper Ganga Canal system is recommended to be prime source. During canal maintenance and non- running days of canal due to various reasons; the ground water resources have sufficient capacity to support the water demand as a standby/ supplemental water source. Mat Block alone has about 1575 ha-m² (about 16 MCM) of unutilized potential of ground water that can support for the full demand of the center for about a month without any augmented recharge.

Water saving under existing irrigation infrastructure

Generally the canal irrigation has 35-45% of water use efficiency (due to conveyance & distribution losses and water application methods). It is imperative to improve upon the water conveyance and distribution infrastructure and also the field application efficiency to save the required share of water to be taken for the urban center without affecting the agricultural productivity in the area. Separate studies may be conducted to assess improvement needs of the existing canal sections and structures for improved distribution efficiency. The farmers will also be need to be motivated through different awareness programs on water saving requirements and techniques to improve field application efficiency and increase water productivity (production per unit volume of water)

(C) Ground water in the area and along the Yamuna River Beds**The potential water resources development opportunities**

The Urban Centers are near to alluvial plains (*Doab* of Yamuna & Ganga) and the Yamuna river bed is within 20 km (of varying) distance. The alluvial flood plains have high potential water storage zones (unconfined and confined aquifers) for which a separate exhaustive study need to be conducted to assess the groundwater potential (annual drafting) for future use. The unconfined aquifers along the river bed may prove to be potential water resources for industrial and domestic use;

The Yamuna River has 80% of its flows during monsoons only and significant low-lying areas are inundated with providing a decent ground water recharging opportunities during monsoon. During Monsoon period, only 30-50 % of discharge (river flow) is utilized till Okhla barrage and rest is allowed to flow the downstream areas which makes a very good opportunity of recharging the confined and unconfined aquifers through the river reach between Okhla Barrage to Agra and also in the down streams. For augmenting the natural recharge, the modern artificial recharging techniques be used in combination to replenish the groundwater reservoir to the desired level.

Other prospects for improved water availability in the area**Conjunctive use of water**

It is proposed that a scientific study needs to be conducted to understand the conjunctive water use of surface (canals & ponds) and ground water sources in area both for industrial and irrigation/agricultural use

² Stage of Ground Water Development, 2008, State Ground Water Board

Improving water use efficiency and water productivity through mini & micro irrigation techniques

The water use efficiency under conventional flood method of irrigations is pretty low (35-45%) as compared to that in mini & micro-irrigation (70-85%) methods (Sprinkler, Micro-sprinkler & Drip). The micro irrigation techniques further improves the quality and quantity (kg/ha) of agricultural/horticultural productivity of land. The micro irrigation further reduces the overall cost of production in spite of its bit higher capital cost (1.25 to 2.0 lakhs per ha for a life cycle of 10 years). With all the above facts the promotion of micro-irrigation will be a pronounced water saving tactic in the irrigation commands.

6.2.2 Estimated Water Demand

The development in Raya Urban Centre is induced development by attracting the industries and developing support infrastructure to make the townships self sustainable. Water supply is one key infrastructure to be provisioned in adequate quantity and quality. Thus, water demand is calculated based on various assumptions considering CPEEHO Manual, Delhi State Industrial and Infrastructure Development Corporation Ltd. (DSIIDC)³, URDPFI standards etc.

The Raya Urban Centre is expected to serve the population of 9.76 lakhs including village abadi's. However, considering URDPFI guidelines infrastructure has been planned for 25% additional population to serve the surrounding area. Moreover, as the key infrastructure shall be planned for 30 years of its lifecycle, the water demand has been estimated for 30 years.

Thus, for target year 2031, the water demand has been estimated for 12.2 lakhs population (including additional 25% population). Further, for 30 years, the scenario has been considered when all workers with their families will reside within the urban centre. Therefore, the water demand is estimated to serve the population of 19.4 lakhs (including additional population 25% population).

Further, based on various landuses and estimated population, the water demand estimated is presented in Table 6.1, considering following assumptions:

- 150 litres/capita/day for housing in planned urban area and village settlements;
- 45000 litres/hectare/day for commercial, industrial, Offices, Public-Semi-Public and Mixed use, tourism zone, transport facilities, development within river front zone;
- 67000 litres/hectare/day for recreational development including parks and playground;

Table 6-2: Estimation of Water Demand

Sl. No.	Land Use	Water Demand 2031 (mld)	Water Demand for next 30 years (mld)
1	Residential & Abadi	183.0	291.5
2	Commercial, Industrial Offices, PSP, Mixed use, Tourism Zone, development within river front zone	191.67	191.67
3	Recreational	100.4	100.37

³ <http://dsiidc.org/dsidc/services.html>

Sl. No.	Land Use	Water Demand 2031 (mld)	Water Demand for next 30 years (mld)
	Net Water Demand	475.1	583.5
	Unaccounted for Water (UFW) 15%	71.2	87.5
	Gross Water Demand	546.3	671.0

6.2.3 Proposed Water Supply System

The total water demand for Raya Urban Centre for next 30 years is about 671 mld including unaccounted for water. As per Service Level Benchmark for provision of Infrastructure by MOUD, 20% of the recycling and reuse of waste water is recommended. Thus, it is proposed that the atleast demand for watering the open green areas such as parks and playground shall be met with recycled waste water. Thus, the fresh water demand is proposed to be 591 mld which needs to be treated before distribution within the urban centre.

Presently the water demand is expected to be met with Mat Branch Canal (a part of Upper Ganga Canal system with augmented water supply from Madhya Ganga Barrage). The ground water will be supplementing the water supply during non-running period of canal for maintenance and other similar reasons. A spate study is also proposed to promote conjunctive use of ground and surface resources in and surrounding areas to promote the judicious use of ground water that shall remain available during lean season of canal supplies and surface storage in the form of ponds and lakes in the area. Nonetheless, the technical feasibility (hydrologic and topographic) may be explored to construct the barrages and weir in the upstream and downstream of the Gokul Barrage. The future option of tapping the available unconfined and confined aquifer along the Yamuna river-bed may be explored as alternate and/or supplemental water source for the urban centre.

Water Treatment Plant is planned to treat total of 591 mld. To have equitable, efficient and adequate supply of water, four WTPs are proposed to be developed on a modular approach with equal capacity of treatment to reduce the dependency on one. Thus, each of the WTP is proposed to be designed to treat the 147.75 mld of water. The WTPs have been located considering the source, main physical considerations like Yamuna Expressway, Railway line with almost equal catchment area for the economical infrastructure development. The recommended locations of the WTPs are represented in Figure 6.2. Two of the WTPs are proposed to be developed on the eastern end of the Yamuna Expressway along the Mat Branch of Upper Ganga Canal, one near Yamuna River on the Northern end of the Mathura Bareilly Railway line and one on the western end of Expressway.

The total land provisioned for four water treatment plant is 44 ha with 11 ha each including Intake Well and Master Balancing Reservoir. Additional detailed infrastructure planning and design shall be done at the time of detailed planning by preparing the detailed project reports.

**PROPOSED LANDUSE PLAN
RAYA URBAN CENTRE-2031 (AMENDED)**

**WTP
Location**

KEY MAP

LEGEND

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- UNIMIXED
- PUBLIC & SEMI PUBLIC
- UTILITIES
- MIXED USE
- TRANSPORTATION
- PARK & PLAYGROUND
- RECREATIONAL GREEN
- GREEN BELT
- RIVER FRONT DEVELOPMENT
- TOWNSHIP ZONE
- RIVER / CANAL / DRAIN
- LANE / ROAD
- AGRICULTURE
- VILLAGE AREA
- EXISTING ROAD
- INTERCHANGE
- PROPOSED ROAD NETWORK
- NEW ROAD
- RAILWAY
- URBAN CENTRE BOUNDARY
- EXISTING OVERPASS
- PROPOSED GRADE SEPARATOR
- BRIDGE
- HIGH TENSION LINE
- MFL (HIGH FLOOD LEVEL)

NOTE:

1. AREA OF RIVER IS INDICATED ONLY FOR THE CURRENT FLOOD LEVEL.
2. AREA OF RIVER IS INDICATED ONLY FOR THE CURRENT FLOOD LEVEL.
3. AREA OF RIVER IS INDICATED ONLY FOR THE CURRENT FLOOD LEVEL.
4. AREA OF RIVER IS INDICATED ONLY FOR THE CURRENT FLOOD LEVEL.
5. AREA OF RIVER IS INDICATED ONLY FOR THE CURRENT FLOOD LEVEL.

YAMUNA EXPRESSWAY INDUSTRIAL DEVELOPMENT AUTHORITY

0 1 2 3 4 5
Scale in KMs

- The Master Plan envisages an integrated approach that packages mutually supportive infrastructure components water-sewerage-drainage for recycling, harvesting and optimal use of water.
- Water demand for recreational and green areas is expected to be met through the recycled water from the sewerage treatment plant.
- It is proposed that the additional recycled water after meeting the demand of the green areas shall be distributed partly to industrial area and to institutional, commercial uses etc. for non drinking purpose to reduce the load of potable water demand.
- Dual piped water supply network system, one for potable water and another for recycled water are proposed to be developed in the planned townships to optimise use of scarce water resource.
- Water auditing shall be practised both in the production and distribution system by installing bulk and consumer meters to estimate the losses and take measures to minimize them.
- Water tariff structure and the connection charges shall be determined on volumetric basis with different pricing for different uses or the peak pricing policy shall be practised where higher rates will be charged for water used beyond the prescribed limit.

- Incentives shall be given to consumers for using small amount of water for encouraging water conservation. Moreover, recycle and reuse of treated water as per standards shall be incentivised.
- Suitable and appropriate method of leakage control in the distribution system shall be practised. Common methods adopted for leak control include the passive control which evident leak leaks either due to consumer's complaints or due to water appearing on the road surface are repaired and active control methods, an organized and systemic program is undertaken in order to detect, locate and repair leaks. Active methods of leak control include pressure control, regular sounding, district metering and waste metering.
- For sustainable ground water table it is advisable that provision of ground water recharge and rain water harvesting shall be made mandatory in the form of building bye-laws and approval of schemes.
- Discharge of untreated industrial waste shall be strictly prohibited to reduce contamination of water and Industries producing zero discharge of industrial waste shall be incentivised.

6.3 Sewerage

A well developed sewerage and sanitation system is required for maintaining the health and hygiene of the residents of any city and also to improve the quality of life. YEIDA Phase-II being predominately rural area no piped sewerage system exists and sewage flows in open drains often getting mixed with storm water, which finally gets disposed off into Yamuna River creating pollution.

To develop Raya Urban Centre as sustainable development with world class infrastructure, well planned sewerage system needs to be developed. The sewerage network shall be planned to collect the waste from all parts of the city and transport it to the treatment plants either by gravity or pumping. The treated waste shall be reused or disposed off into the river/stream/ponds after getting treated as per the SPCB or CPCB standards.

6.3.1 Estimated Sewage Generation and Extent of Recycling and Reuse

The sewage generated which needs to be treated, reuse or disposed off for which the infrastructure needs to be planned has been estimated based on 80% of the water demand as recommended by CEEPHO Manual and URDPFI guidelines. The quantity of waste generated and extends of potential of recycling and reuse is presented in Table 6.3.

Table 6-3: Estimated Sewage Generation and Potential of Recycling and Reuse

S.No.	Components	Quantity in mld	
		2031	30 years
1	Total Estimated Net Water Demand	475.1	583.5
2	Estimated domestic sewage (includes housing, commercial, institution, tourism zone, mixed use, parks & playground) (80% of water demand)	232.0	319.0
3	Estimated industrial sewage generation (80% water demand)	67.8	67.8
	Total Estimated Sewage Generation	300	386.5
4	Potential of Recycled Waste Water (80% of waste water generation)	239.8	309.2
5	Water Requirement in open green areas expected to be met by treated wastewater	80	80
6	Rest of the treated wastewater which can be used for non potable uses in industries, hotels, institutions and agriculture etc.	219.8	229.2

The sewage generation in Raya Urban Centre is estimated to be 300 mld till 2031. However, as the key infrastructure such as STP, CETP shall be planned and designed for 30 years, the sewage generation in next 30 years is estimated to reach to 386.5 mld.

To make the city sustainable, optimal utilisation of scarce resource of water by recycling and recharging is proposed to be adopted. Thus, it is proposed that the need of watering of green areas covering parks, playgrounds and green belts shall be met by recycled water, as also MOUD recommends the utilisation of 20% of recycled water in an efficient system. Thus, 80 mld demand of watering of green areas shall be met by recycled water. Out of the total recycled water of 229 mld (2031), rest of the treated waste shall be either used for non potable purposes in industries, commercial, institutions etc. or disposed off into natural streams/ponds for recharging of ground water.

6.3.2 Proposed Sewerage System

The main components of sewerage system includes the

- trunk sewers collecting sewers from various areas and conveying it to the STPs and CETPs,
- sewage pumping stations to transport sewage to treatment plants,
- sewage and common effluent treatment plants (STP/CETP),
- network to reuse the treated waste water for irrigation, green areas or any other purposes and
- Outfall drains to transport treated effluent to the final disposal point.

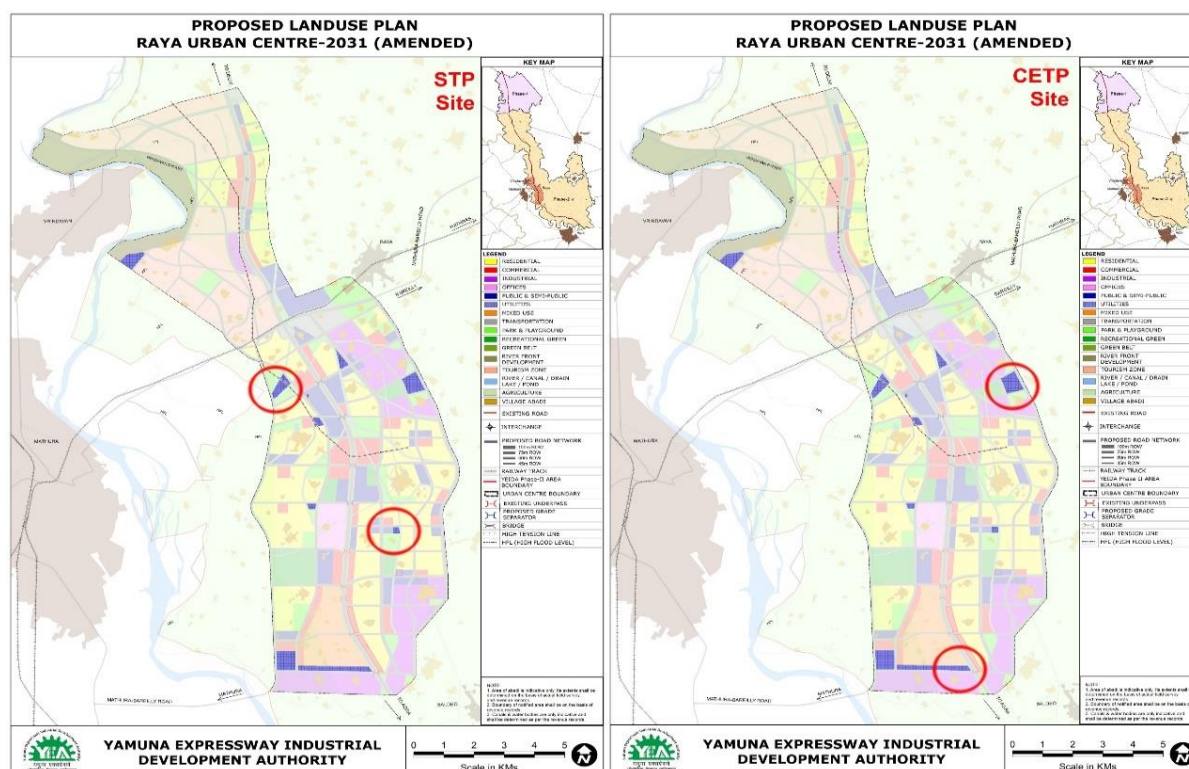
The sewerage network shall be planned to collect the waste from all parts of the city and transport it to the treatment plants either by gravity or pumping. To convey the sewage to the STPs, sewage pumping stations shall be constructed intermittently to lift the sewage and avoid laying of deep sewers.

Waste water generated will be treated at sewage treatment plants (STPs) and common effluent treatment plants (CETPs) to a standard that enables it to be use for the irrigation of agricultural land, parks and playground, green spaces, industrial use etc. The balance treated waste would be disposed off into the river or any other natural stream or pond. The waste water both for reuse and disposal shall be treated as per the standards of SPCB/CPCB. Moreover, the industrial wastes before transporting into CETP shall be treated to the acceptable extend as per SPCB/CPCB standards considering the design of CETP. However, the zero discharge of waste shall be promoted through incentivisation.

Three sewage treatment plants and two common effluent treatment plants have been planned at decentralized locations within urban centre to treat waste water generated from different user groups. STPs have been planned to treat total of 319 mld excluding industrial effluent. Three STPs, each is proposed to treat 106.3 mld on modular approach. Two of them are located on the western side of the Expressway considering the slope within the urban centre and away from residential areas. Similarly CETPs have been planned to treat total of 68 mld industrial effluent and thus two CETPs are planned to treat 34 mld each.

Total of 57 ha land has been reserved for development of STPs with 19 ha for each of three STPs. Similarly 12 ha land has been reserved for CETPs with 6 ha for each of the two CETPs. The recommended location of STPs and CETPs are represented in Figure 6.3

Figure 6-3: Location of STPs and CETPs



6.3.3 Other Sewerage System Development Strategies

- A well planned piped sewerage system shall be laid in Urban Centre
- The Master Plan envisages an integrated approach that packages mutually supportive infrastructure components water-sewerage-drainage for recycling, reuse which will resolve the problem of disposal of waste water and also reduce the water demand by using it for non drinking purposes.
- Decentralised Sewerage Treatment Plants shall be planned using appropriate bio-technologies requiring less energy and land.
- The sewage shall be treated as per SPCB and CPCB standards to the level to be reuse for irrigation, green spaces and for non potable purposes.
- The unused treated sewage shall be safely disposed off either in River or stored in streams/ponds for appropriate use including recharging ground water after it has been treated to the required standard by CPCB or SPCB or any other competent body.
- Industrial sewage shall be treated to the acceptable extend as per standards before transporting into CETP for treatment.
- For safe disposal of the sludge generated from STP, it shall be utilised for energy production which can be reutilised in the Sewerage Treatment Plant.
- Incentive shall be given for utilising the sewage organic waste for organic agriculture and natural gas generation plant shall be encouraged. SCADA system shall be installed for the effective operation and maintenance of the STP especially for maintaining the quality of treatment which is expected to be reused for other purposes.
- Public-Private-Partnership shall be encouraged in operation and maintenance of Sewerage Treatment Plants.

6.4 Storm Water Drainage

Storm water drainage for the urban areas shall be planned with an objective to drain the storm water during rainfall to avoid water logging and flooding and to manage the quantity of surface storm water drained into the system due to urbanisation. The natural slope of the area is towards the River Yamuna presently allows flow of storm water through natural drains. However, in case of fully developed urbanisation, a well planned drainage network needs to be developed to manage the increased runoff. However, the natural drainage system shall be protected and augmented to avoid flooding and loss of lives and property during heavy rainfall and monsoon season.

6.4.1 Development Strategies for Drainage System

The detailed drainage system shall be designed through detailed project report preparation before implementation. However, development strategies recommended for the effective storm water drainage and flood control measures for the planned urbanisation are as follows:

- Drainage catchment area zoning shall be done based on topography, physiology, morphology, physical impediments (viz. highway, railway, etc.) and points of disposals;
- Drainage network is proposed to be planned as primary, secondary and tertiary network. The storm water from the urban centre will be disposed of through tertiary drains at multiple points into River Yamuna.
- Storm water drains shall be developed on both sides of all Master Plan roads and these shall be proposed to be concrete covered to avoid solid waste disposal into it and silting of drains. Provision of manholes shall be created for the purpose of operation and maintenance;
- A well planned system shall be developed to ensure that maximum possible storm-water runoff, particularly during the monsoon period can be captured for recharging of the groundwater as well as provide a source of water to be used during the dry or drought period.
- In addition to Yamuna River, it is recommended to identify ponds as storm water disposal points within the area for the purposes of water conservation and recharging. This will also help to minimise the length of drains and to reduce the depth of water channels.
- There has been a constant depletion of ground water table and also deterioration of ground water quality in the YEIDA Phase II. This situation arisen due to indiscriminate extraction of ground water for all uses and discharge of untreated waste water into open spaces and river. Thus suitable measures shall be taken for rain water harvesting and ground water recharging.
- To ensure recharging of ground water using surplus flood water of rivers, overland runoff water as well as restricting ground water extraction in dark and grey blocks.
- It is proposed that recharge pits shall be developed before each disposal point at Yamuna River for the purposes of water conservation and recharging of ground water and the over flowed water from the recharge well be disposed off into River. Also, it is proposed to create silt pits in recharge wells so that no solid waste flows into the River;
- To ensure recharge of flood plains of the River Yamuna for ground water recharge it is proposed that basin recharge structures, stream recharge structures and vertical shaft structures shall be established wherever feasible.
- Further, it proposed that the bottom of drains shall be developed unlined intermittently to facilitate ground water recharge;
- It is suggested that the development of piped drain shall be explored on pilot basis which ensures faster construction, less maintenance and longer life;
- Flood control measures such as formation of small check dams at desired locations based on contours.
- Augmentation and maintenance of natural streams and rivers by de-silting, increasing the depth and width based on the volume of water flow.

- Formation of embankment and guide bunds along the river wherever doesn't exists for the flood control.
- Channelizing smaller streams towards main streams and connecting with the main streams.
- Development of green belts along the entire course of streams to preserve the natural drainage and to provide flood storage areas.

Rain water harvesting and other ground water recharge methods recommended in urban areas are:

- **Roof Top Rain Water Harvesting:** It requires connecting the outlet of storm water channels and pipes from rooftop to existing wells/tube wells/bore wells or especially designed recharge wells.
- **Storm Water Harvesting:** To harness the available runoff, trenches with recharge tube wells are constructed inside the drain bed itself.
- **Recharge from Mega Urban Structures:** Mega urban structures such as flyover, stadium etc generate large amount of runoff during the rains. Certain recharge structures should be constructed in the vicinity of these mega structures.
- **Waste Water Recharge:** Wherever the soil and ground water conditions are favourable, artificial recharge of the aquifer system with partially treated waste water to infiltrate into the soil and percolate to the ground water.

6.5 Solid waste Management

6.5.1 Introduction

Solid Waste Management is one of the essential services necessary for ensuring health, hygiene and thus maintaining a quality of life in urban environment. Appropriate waste management practices need to be adopted in order to prevent urban waste causing environmental pollution and health hazards. Effective and efficient solid waste management can be achieved through well planned collection, segregation, storage, transportation, treatment and disposal system in an environmentally acceptable manner as per Municipal Solid Waste (Management & Handling) Rules 2000.

6.5.2 Legal and Policy Mandate

The solid waste management system is expected to be developed as per Municipal Solid Waste (Management & Handling) Rules 2000 which applies to collection, segregation, storage, transportation and disposal of solid waste. As per the rule, the local body is responsible to manage the waste generation in the city and to set up the waste processing and disposal facility.

The Industrial Hazardous Waste is to be managed through Hazardous Waste (Management & Handling) Forth Amendment Rules 2010 or whichever the latest version of the Rule. According to the Hazardous Waste Management Rule, 2010, the onus of managing and treating hazardous waste lie with the waste generator and the Urban Local Body has to ensure that such waste does not get mixed with municipal solid waste stream, failing which will result in economic losses and health & safety hazards.

Biomedical Waste is the waste generated during diagnosis, treatment and immunization of human being or animals and in research activities. This waste should not be mixed with municipal solid waste and hence a separate system for its management has been specified, as per Biomedical Waste (Management & Handling Rules), 1998 or whichever the latest version of the rule.

Similarly the E-Waste is the waste electrical and electronic equipment, whole or in part, or rejects from their manufacturing and repair process which is intended to be discarded shall not be mixed with municipal waste and thus shall be managed as per E-Waste (Management & Handling Rule), 2011 published by MOEF or if any latest version of it or any other guidelines.

6.5.3 Source of Waste Generation

The various kinds of solid waste generated in a city which needs to be collected and disposed off includes general household waste (including kitchen waste), drain silt, market and commercial waste, institutional waste, slaughter house waste and dead animals, Sludge from STPs and ETPs, treated biomedical waste, horticulture waste, construction & demolition waste, road sweeping waste. Raya urban centre with sizeable area in industries, there will be industrial waste or Hazardous waste expected to be generated in addition to other kind of wastes such as biomedical waste and E-Waste.

6.5.4 Solid Waste Generation

As per the Manual on Solid Waste Management published by CEEPHO, Ministry of Urban Development and Report of the Technology Advisory Group on Solid Waste Management constituted by Ministry of Urban Development, New Delhi, per capita waste generation varies from 0.2 to 0.6kg/capita/day in cities with a population of ranging from 0.1 and above⁴. Further, then yearly increase in growth of the waste generation in city is expected to be 5% due to increase in per capita waste generation of about 1.3% per year and growth of urban population per year 3-3.5%.⁵

However, for Raya, Urban Centre, the average waste generation has been considered as 450 gms/capita/day. Since, the key infrastructure shall be planned for 30 years, the solid waste generation in Raya Urban Centre has been estimated for 30 years as well. For planning purposes of infrastructure, in addition to the estimated population for Raya Urban Centre additional 25% population has been considered to be served by the proposed city infrastructure.

The solid waste generation for Raya Urban Centre till year 2031 is estimated to be 549 m.ton/day and for 30 years with estimated population 19.4 lakhs, the solid waste generation works out to be 874 m.ton/day.

⁴ Toolkit for Solid Waste Management, JNNURM, Ministry of Urban Development, Nov 2012,

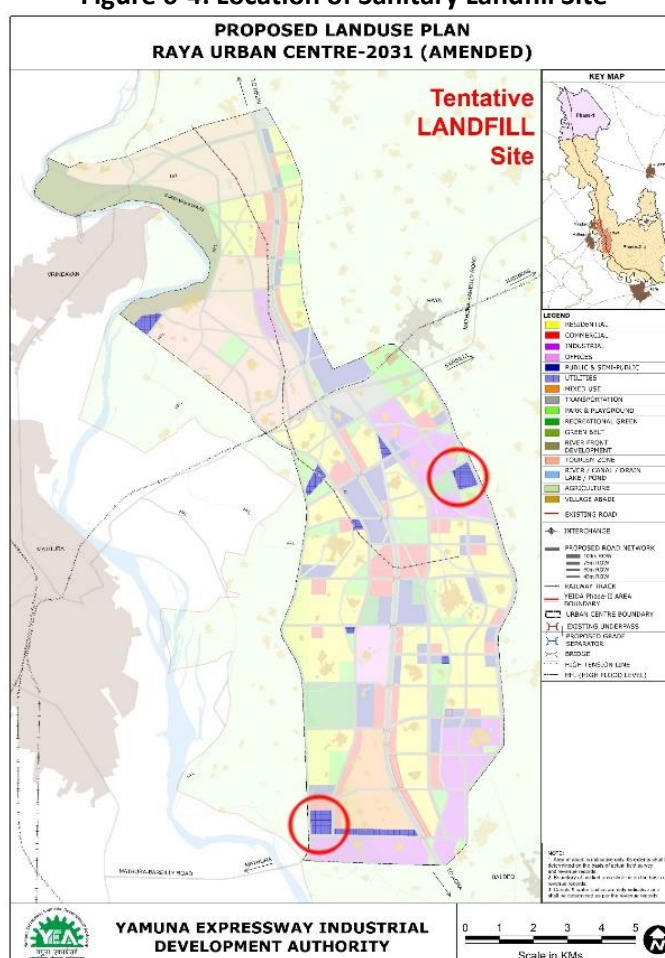
⁵ Ready Reckoner on Municipal Solid Waste Management for Urban Local Bodies, Commissionerate of Municipal Administration, Chennai, 2008

6.5.5 Solid Waste Management Strategies and Proposals

For a well planned and efficient integrated solid waste management system of collection, segregation, transportation, treatment & disposal shall be developed as per Municipal Solid Waste Management Rules, 2000. However, the following strategies and proposals have been recommended for solid waste management in Raya Urban Centre:

- Door to door collection and segregation at source as well as at common facility shall be done based on the type of waste, its utility, suitability of treatment and disposal;
- Storage facilities at regular intervals and transportation through efficient modes are important;
- Efficient secondary collection and transportation: channelizing the collection and transportation of waste from the community bins/dhalos for treatment and disposal through covered mechanized equipments using GIS and GPS enabled vehicle tracking system;
- Reduce manual handling of waste in collection and transportation;
- Waste processing techniques which shall be implemented based on the waste composition includes waste to energy, composting/vermi-composting, biogas generation eco-bricks etc. based on techno-economic feasibility. The reject not suitable for any processing, shall be disposed off in Sanitary Landfill site;
- A Sanitary Landfill site of 20ha has been proposed to be developed to dispose the waste generated which cannot be treated. The site is proposed to be selected based on Manual on Solid Waste Management, 2000, CEEPHO, away from natural features such as lakes, ponds, flood plains, river, canal and structures such as water supply wells, highway and habitations. In Master Plan, the utility located above the transport infrastructure on the south-eastern end of the urban centre is recommended for landfill site and represented in Figure 6.4. However, the same shall be verified based on detailed project report during detailed planning;
- Management of Biomedical Waste shall be planned as per Biomedical Waste Rules, 1998, which is the waste generated during diagnosis, treatment and immunisation of human beings and animals. These shall not be mixed with the municipal solid waste and thus separate system shall be developed. Installation of incinerators is recommended to be made mandatory in hospitals for handling the same;
- The Hazardous Waste and E-Waste generated from various activities shall be managed in accordance with Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 and E-Waste (Management & Handling) Rules, 2011. These shall not be mixed with other municipal solid waste. The widely used methods of treatment of hazardous waste include stabilization, incineration and solidification. However, the choice of method depends on evaluation of risks and potential pollution risks based on the waste characteristics;
- Safety and precautions to be followed such as clear safety measures in the form of notice to be displayed at all concerned areas, regular training and capacity building of all workers and supervisors for appropriate procedures and safety measures etc.

Figure 6-4: Location of Sanitary Landfill Site



6.6 Power

6.6.1 Existing Power Scenario

Power is one of the key industrial infrastructures to be provided for sustainable economic development of the area. Currently Uttar Pradesh is drawing power from the Northern Grid (overseen by the Northern Regional Electricity Board). The region is facing acute shortage of power and this is attributed to the power deficit in the Northern Grid and due to low generation of power in the state. At present the procurement of electricity for Uttar Pradesh is the key responsibility of Uttar Pradesh Power Corporation (UPPCL) and implementation, execution, testing and commissioning of substations, transmission lines and other associated equipment is undertaken by UP Power Transmission Corporation (UPPTCL). UPPCL procures power from various State owned projects managed by Uttar Pradesh Rajya Vidyut Utpadadan Nigam Ltd. (UPRVUN) and Uttar Pradesh Rajya Jal Vidyut Utpadadan Nigam Ltd. (UPRJVN), central sector, joint sector project, private sector etc. In 2003, UPPCL was further divided into five companies of which Dakshinanchal Vidyut Vitran Nigam Ltd (DVVNL) is responsible for the power distribution in all the districts of YEIDA Phase-II. The actual power supply in Uttar Pradesh as per Central Electricity Authority during 2014-15 has been presented in Table 6.4 whereas the anticipated power supply during 2015-16 has been presented in Table 6.5.

Table 6-4: Actual Power Supply in UP during 2014-2015

Peak Demand	Peak Met	Surplus (+) / Deficit (-)	
MW	MW	MW	%
15670	13003	-2667	-17.0

(Source: Load Generation Power Report, 2015-16, Central Electricity Authority, Ministry of Power)

It can be observed that against the peak demand, 17% less power had been supplied in Uttar Pradesh during year 2014-2015.

Table 6-5: Anticipated Power Supply position in UP during 2015-2016

Peak Demand	Peak Availability	Peak Surplus(+)/Deficit(-)	
(MW)	(MW)	(MW)	(%)
16350	13991	-2359	-14.4

(Source: Load Generation Power Report, 2015-16, Central Electricity Authority, Ministry of Power)

Further, the anticipated availability of power supply against the demand for year 2015-16 is expected to be deficit of 14.4%. This suggests that the power generation needs to be focused to provide 24x7 power supplies to attract investors to achieve sustainable economic development of the planned induced development.

6.6.2 Existing and Proposed Power Sources by Central and State

Existing power generation sources which support the power source requirement of Uttar Pradesh have been presented in Table 6.6

Table 6-6: Existing Power Availability for UP State from various Sources

S.No.	Source of Power	Share of UP (MW)
1	Generating stations of Uttar Pradesh Rajya Vidyut Utpadadan Nigam Ltd. (UPRVUN)	4082
2	Generating station of Uttar Pradesh Rajya Jal Vidyut Utpadadan Nigam Ltd. (UPRVUN)	432
3	Micro hydro stations of UPRJVUN	23
4	Independent Power Plants (ROSA, Anpara C, Vishnu Prayag)	1552
5	Captive Power Plant	90
6	Generating stations of Central Sector (gas, thermal, hydro, nuclear)	4868
7	Co-generation (sugar mills, biomass etc.)	951
	Total	11998

(Source: UP Sub-Regional Plan 2021 referred to UPPCL, Meerut, 2012)

It is observed that the present available power sources are not adequate to meet the future requirement of the state which will further increase with the growing brownfield and green field cities and upcoming developments such as YEIDA. Thus, it is necessary to further augment and develop new sources of power generation to supply adequate power in State of Uttar Pradesh.

Thus, power generation sources augmented under 11th five year plan and proposed and under construction under 12th five year which will cater to the power requirement of Uttar Pradesh and thus of YEIDA-II have been assessed.

Table 6-7: Actual Benefit to UP due to Capacity Augmentation during 11th Plan (2007-2012)

S. No.	Power Source Owner	Share of UP in MW
1	State Sector Projects	250
2	Private Sector	2850
3	Central Govt. Project	460
4	Others	60
	Total	3620

(Source: Power Scenario at a Glance, CEA, November 2012)

As per UP Sub Regional Plan, 5238MW was planned to be augmented in share of state power sources. However, CEA, approximately 69% of the planned projects could be augmented by the end of 11th five year plan. Thus, the total power source capacity in Uttar Pradesh by the end of 11th five year plan is 15618 MW. Further, under 12th five plan, UP is expected to augment the power from various sources which is presented in Table 6.8.

Table 6-8: Power Capacity Expected to be augmented under 12th Five Year Plan (2012-2017)

S. No.	Power Source Owner	Approximate Share of UP in MW
1	State Sector Projects	3550
2	Private Sector (Independent Power Project)	6290
3	Power Procurement (Case-I)	5000
4	Joint Sector	990
5	MoU Route as per GoUP Policy 2009 (Central sector/Joint sector/Private Sector)	3564
6	Central Govt. Project	3346
	Total	27030

(Source: UP Sub-Regional Pan 2021)

Again, it is considered that 90% of the projects will be implemented on time. Also, as per Perspective Transmission Plan for 20 years 2014-2034, CEA, PGCIL & POSC, the estimated power generation in State will be 24484 MW by 2016-17, 38800 MW by 2026-27 and 73707MW by 2031-32. It is assumed that share of Uttar Pradesh in other than state power sources will consider the same till 2031 as panned till 2017 at the end of 12th five year plan.

Table 6-9: Anticipated Power Status in Uttar Pradesh till Year 2031

Year / End of Five year Plan	Installed Capacity (MW)	Peak Demand (MW)	Surplus (+) /Deficit(-)
2016-2017 (12 th)	24484	23081	+1403
2021-2022 (13 th)	26854	36061	-9207
2026-2027 (14 th)	38800	53690	-14890
2031-2031 (15 th)	55232	73708	-18476

(Source: Perspective Transmission Plan for 20 years 2014-2034, CEA, PGCIL & POSCO, EGIS)

It can be observed that with the planned projects till 2017 will be in place on time, the power in UP will be adequate to meet the demand. However, the demand will continue to increase with time and development. As per the projections of CEA, the planned projects will not be in pace with the demand and thus, additional sources need to be identified for future purposes.

6.6.3 Estimation of Power Load and Proposed Power Source

Power demand within the YEIDA Phase-II has been estimated based on load taking into account the suitable land use factor and diversity factor. The load estimated at Master Plan stage will be approximate in view of varied type and scale of manufacturing units, share of multistory or plotted development, multiple use within a main land uses at plot level etc. However, the same needs to be verified and detailed through preparation of detailed project report. The estimated power demand within Raya Urban Centre is presented in Table 6.10.

Table 6-10: Estimated Power Demand -2031

S. No.	Landuse	Power Demand (MW)
1	Residential	110.6
2	Abadi	16.7
3	Commercial	112.8
4	Industrial	677.8
5	Mixed Use	5.0
6	Recreational	5.3
7	Tourism Zone	15.3
8	River Front Development	2.3
9	Offices	35.3
10	Public-Semi-Public	6.6
11	Roads and Transport	15.1
	Total	1003.05

In addition to the estimated power demand of 73708 MW in State, development of Raya Urban Centre will generate additional power demand of 1003 MW in a phased manner. It is recommended that the power from Gas based Yamuna Power Project shall be reserved for supply to the Raya Urban Centre especially as it is falling in TTZ zone. However, the same shall be considered and confirmed during preparation of detailed projects report of power infrastructure sector while detailed planning.

6.6.4 Electric Substations

Estimated power demand for Raya Urban Centre is approx.1003 MW of which 677 MW load is expected from Industrial area and 326 MW from rest of the development. It is recommended that the power shall be transmitted from the proposed 765 kV substation of YEIDA. However, till the time the above substation will develop, the power will be taken from nearest transmission line of utility agencies (UPPCL, Power GRID).

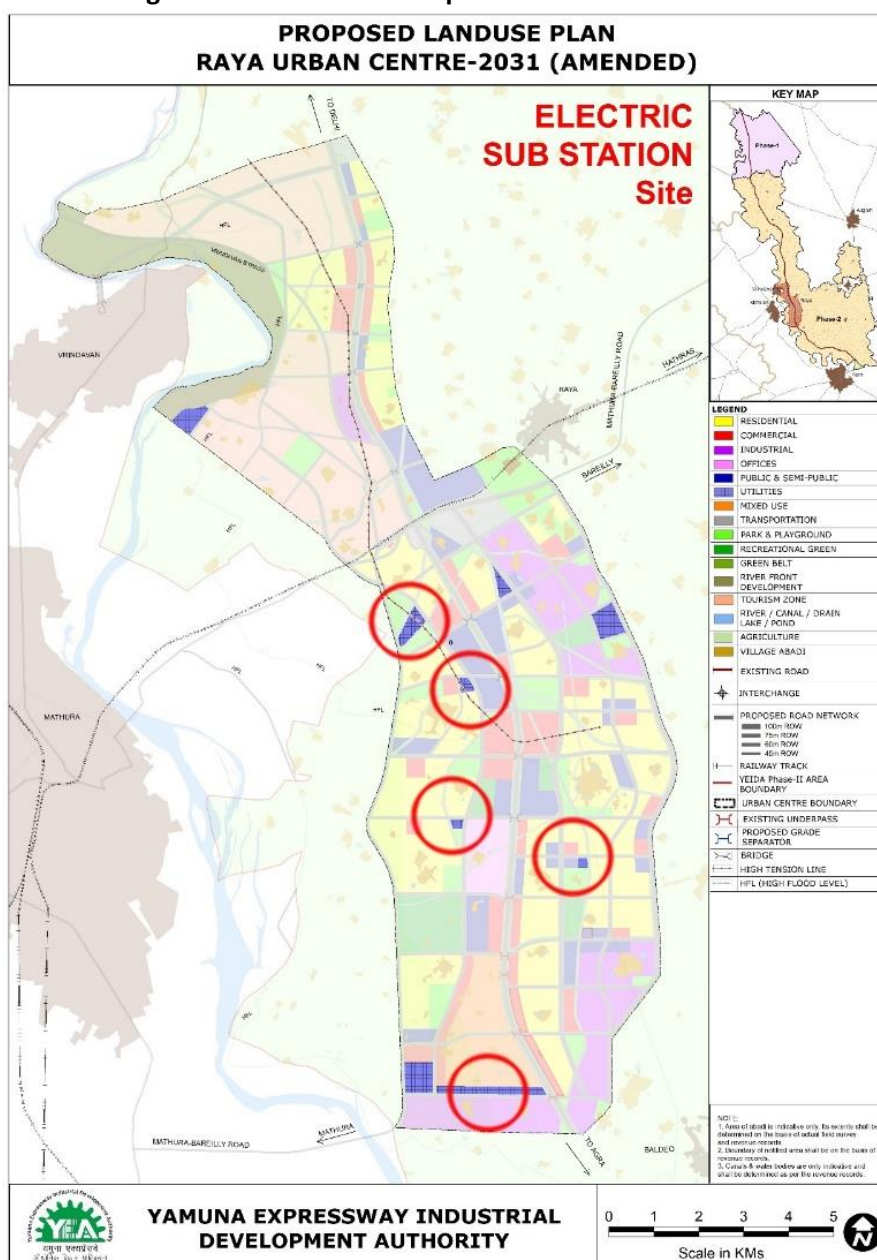
The power from 765kV substation or existing power substations of state shall be received at receiving substation with 220kV network, for dedicated supply within Raya Urban Centre. Further it will be distributed to various areas through four substations of 132kV. It is suggested that out of the four substations two will be dedicated to serve the industrial areas and two for rest of the area. These substations are located based on influence area. The suggested locations of electric substations are presented in Figure 6.5.

The lands for substation have been reserved as per Manual on Substation Layout, Central Board of Irrigation and Power (CBIP), New Delhi. Switchyard layout design depends on switching scheme, shape and size of land. Considering increasing cost of land but keeping provision for future extension, land

for a substations have been reserved. For 220kV, 15-18 acres land and for 132kV, 8-10 acres land has been proposed to be reserved in Master Plan.

Power transmission lines are proposed to be laid all along the planned roads in dedicated cable ducts at the parapet of the road. However, green belt is proposed to be maintained along the transmission tower along the existing and proposed overhead H.T lines as per prevailing Indian Electricity Rule and policy of Authority;

Figure 6-5: Location of Proposed Electric Sub Stations



6.6.5 Other Sector Development Strategies

Raya Urban Centre is proposed to be developed on green concept. It is therefore suggested to use natural resources economically using the energy. Thus, it is recommended that

- Non conventional renewable energy sources such as recovering energy from sewerage, solar energy etc. shall be used for street lighting, lighting at public places, open areas, traffic signals, hoardings etc.;
- Incentivising energy savings and use of energy saving gadgets such as use of high efficiency fluorescent tubes (CFLs) etc.
- Adoption of load management techniques and improved metering arrangement to minimise power thefts and losses;
- To optimise the development and investment in conventional and renewable energy sources efforts shall be made to minimise the use of energy. Thus, GRIHA National Rating System developed by TERI/LEED India or the equivalent IGBC green building code shall be introduced in building guidelines.

7 ENVIRONMENT & DISASTER MANAGEMENT

7.1 environment

7.1.1 Introduction

The desired green field development within Raya Urban centre will defiantly have environmental impact within the area. Development of a sustainable urban environment is one of the key objectives of the plan to provide quality of life. Moreover, Raya Urban Centre being falling in Taj Trapezium Zone (TTZ), implementing environment measures is mandatory for development. The urban area environment mainly covers two components, one, environment per se or habitat and second services management. The former pertains to the natural features and resources including air, water (w.r.t river, lake, ponds, ground water and drains), noise and land (w.r.t open spaces, green areas etc.) and later related to built environment and includes environmental infrastructure – water supply, sewerage, solid waste management.

In view of the proposed planning interventions and initiatives, Raya Urban Centre is expected to grow rapidly within the next few years and this growth will obviously create pressure on the natural resources. To minimise the negative environmental impact of urbanisation and to achieve sustainable development suitable measures shall be taken.

7.1.2 Air Quality

The air quality in city in terms of pollution level will be a matter of concern with the development which is responsible for many respiratory diseases, heart ailments, eye irritation, asthma etc. Further, the presence of International tourist destination, Taj Mahal, the air pollution within TTZ is one of the major concern. The major sources of air pollution in urban centre are expected to be vehicular emissions, industrial emissions, construction activities and other sources such as diesel generators, domestic cooking and burning of biomass. It has been observed that in urban areas large share of private vehicles in modal split creates tremendous pressure on road space, parking and creates pollution and congestion. Air pollution due to construction activities is also one of the major concerns in cities especially the upcoming green field cities during construction phase which needs to be controlled through policy measures.

Nearest to Raya urban centre air monitoring station of UP Pollution Control Board is located within Mathura City. The annual average ambient air quality parameters quantity monitored is presented in Table 7.1. Air quality parameters monitored shows critical situation and thus needs attention.

Table 7-1: Status of Air Quality in Mathura, 2014

City	Place	Class	Quantity (Mg/cu.m)		
			PM ₁₀	SO ₂	NO ₂
Mathura	Regional Office	Sensitive	152.6	9.9	25.7
	Combined Effluent Treatment Plant	Sensitive	171.1	10.9	28.7

Source: <http://www.uppcb.com/ambient-quality.htm>

Policies and Proposals for Air Pollution Control

The following policies and proposals have been suggested for controlling air pollution within the urban centre:

- Air quality monitoring shall be monitored and controlled regularly as per Central and State Acts and Policies developed by MOEF, CPCB and SPCB considering the Taj Trapezium Zone;
- Air quality monitoring shall be carried out for all parameters identified under National Ambient Air Quality Standards (NAMP). The monitoring stations shall be further increased at identified hot spots to control pollution;
- Discouraging private vehicles growth and movement through green tax, congestion tax, central area tax, peak hour tax etc.;
- Encouraging use of public transport by developing strong public transport network, providing reliable, efficient and quality public transport;
- Promote and use cleaner fuels such as ULSD (ultra-low-sulphur-diesel)/CNG/Electric Vehicles. Mandatory use of low emission and fuel efficient vehicles in public transport buses;
- Use of cycles and eco-friendly common vehicles should be encouraged. All Master Plan roads are proposed to have dedicated cycle lanes;
- To control heat and air pollution generated from industries, green spaces and green belts shall be developed;
- Industrial operations shall be encouraged to use non-conventional and renewable energy sources and practice ISO standards through incentivisation;
- Building capacity and generating awareness among industrial community;
- Green House Gas (GHG) emissions shall be monitored. Develop GHG emission inventory and plan for reduction and management;
- Create public awareness to minimise emissions and increase fuel efficiency;
- As per GOI Notification, it is mandatory for all construction agencies to use fly ash bricks along with pond ash in the construction of roads/flyovers embankments and reclamation of low-lying areas. The same shall be enforced efficiently;
- The new power plants proposed in the vicinity shall be gas based. Moreover, the thermal plants located in vicinity to urbanisation shall be gradually converted to gas based;

- In addition, large green and open spaces along with green belts are proposed all along the Master Plan Roads, Canals, Drains, in between industrial and residential development distributed all over the city to which will further support in controlling air pollution.

7.1.3 Water Quality

The key water resource in the area includes River Yamuna, canal and its distributaries and tributaries, surface water bodies and ground water. The main source of water pollution in surface water bodies includes untreated sewage and industrial effluents being discharged into water bodies and dumping of solid waste are leading to deterioration of water quality. These impurities may be generated from natural (soil erosion) or manmade activities (industrial- industrial operations, municipal waste disposal, leaching of pesticides and chemical fertilizers etc). Water quality of Yamuna River has been monitored near Mathura city by Uttar Pradesh Pollution Control Board during the year 2014, which is presented in Table 7.2.

Table 7-2 Status of Water Quality of River near Mathura, 2014

Sl. No.	River	Sample Collection Point	DO (ml.)	BOD	Total Coliform (mpn/100ml)
1	River Yamuna	Shahpur	4.7	6.97	64,083
2		Vishram Ghat	3.8	9.22	1,19,167
3		Kesi Ghat	4.1	8.17	73,250

Source: http://www.uppcb.com/river_quality.htm

As per pollution control norms, for drinking water source after conventional treatment and disinfections, the BOD shall be 3 mg/l or less, which is monitored to be higher in samples of Yamuna River collected near Mathura. Similarly, dissolved oxygen is being found less than the prescribed limit at one of the monitoring location Vishram Ghat.

Ground water is the main source of water for villagers for purpose of drinking and ground water and canal both is being used for irrigation purpose. As per State Ground Water Board, 2010 water is safe/semi-critical in Mat block whereas over exploited in Nohjhil, Raya and Baldeo block. The ground water quality in various blocks of Mathura district is presented in Table 7.3

Table 7-3: Ground Water Quality near Raya Urban Centre

S.N	Block	PH	TDS (PPM)	Sodium Adsorption Ratio	Salt Index	Result
1	Nohjhil	7.2	1180	5.0	-0.6	Moderate
2	Mat	7.2	1332	3.8	2.0	Moderate
3	Raya	7.9	311	0.7	-22.0	Good
4	Baldeo	7.4	2780	16.0	59.0	Bad

(Source: Chemical Analysis Result of Water Sample, Ground Water Department, Agra, U.P. 2010)

The ground water is overexploited in most parts of Mathura district and also the quality is moderate to bad except Raya block. However, urbanisation will lead to reduction in recharge of aquifers due to decreased availability of permeable surfaces and demand of water extraction for industrial, residential

sectors will put stress on ground water sources. Thus, ground water needs to be protected and surface water sources need to be exploited.

Policies and Proposals for Water Resource Protection and Pollution Control

- Water quality monitoring for all surface water bodies and ground water shall be carried out on regular basis as per Central and State prescribed standards;
- Establishment of Common Effluent Treatment Plant (CETP) for industrial area with zero liquid discharge at terminal end;
- All industries shall provide primary treatment to the effluent standard of the CETP before reaching there;
- Establishing and promoting recycling and reuse of STP and CETP water through fiscal incentives;
- Development of parks and green corridors along nallahs/natural drains shall incorporate conservation of ground water and water bodies and to protect them from encroachment and silting;
- To recharge the ground water, conservation of water bodies and rain water is essential;
- To increase sub surface soil water through seepage of rain water, porous paving tiles shall be used in pavements and soft parking areas;
- All water bodies having a minimum size of surface area of 1 ha shall be preserved by the concerned authorities. Further, efforts shall be made to retain smaller water bodies. Existing water bodies shall be revived through all possible measures like connecting them to existing tail clusters- canal, distributaries etc.
- Well-developed organised solid waste management with efficient collection, transportation, disposal and treatment to avoid spreading the waste into drains and rivers causing silting and pollution.

7.1.4 Noise

With the increase in urbanization within the Raya Urban Centre, noise is expected to be emerges as one of the pollutant and irritant. Against a permissible level of 50-60 dB (A), the sound level in Indian cities often exceeds to 80 dB (A). This is mainly within commercial and industrial activities with faulty and leaking silencers, overuse of horns etc. In addition, noise pollution occurs due to unabated use of sound amplifiers, generator sets and fire crackers.

Policies and Proposals for Noise Control

- The Noise Pollution (Regulation and Control) Rules 2000 specify the noise levels in the industrial area, commercial area and residential area. It is important to implement and regularly monitor the recommended noise levels;

- Effective landuse planning with development of commercial and public semi-public areas along major roads;
- Provision of green belts all along the master plan roads provide effective barriers to transmission of noise;
- Noise Monitoring and Control Plan shall be prepared.

7.1.5 Green and Recreational Areas

Green and open spaces along with the other recreational areas play an important role in providing the quality of life to the people residing in the area to achieve sustainable healthy environment. At city level, Raya Urban Centre has been provisioned with around 15% of large green spaces out of which more than 75% is under open green such as parks, playground, green belts and buffers and rest of the area is proposed as recreational activities such as amusement park, golf course etc. In addition to city level green, there will be adequate provision of community and sector level recreational facilities.

The green spaces are well distributed within the city in form of City Park, District Park, City Level Multipurpose Ground, District Level Multipurpose Ground, Fair Ground, Botanical Park, Theme Park, Haat Development etc. Green belts have been developed all along the roads, canals and drains with parks and open spaces connected with them developing a green-blue web. In addition, wherever the residential and industrial areas are adjacent to each other green belt of 50m on residential end has been provisioned in addition to road and its green belt.

7.1.6 Built Environment

Built environment mainly includes provision of water supply, sewerage system, solid waste management etc. which affects the overall environment of the area and contributes to air and water pollution substantially. The Master Plan envisages an integrated approach that packages mutually supportive infrastructure components water-sewerage-drainage for recycling, harvesting and optimal use of water.

Depletion of ground water resources due to over extraction with development pressure is one of the key environmental aspects with impacts the life cycle. In order to maintain the quantity and quality of water resources, in Master Plan, it is proposed to explore canal water and Yamuna water in long term for all potable uses. Further, the ground water recharge and rain water harvesting has been emphasized through various means to continue replenishing the ground water resources. Moreover, the recycling and reuse has been proposed to reduce the fresh water demand.

All domestic and industrial sewage shall be reached to STP and CEPT for treatment before disposal or reuse. Waste water generated shall be treated at sewage treatment plants (STPs) and common effluent treatment plants (CETPs) to a standard that enables it to be use for the irrigation of agricultural land, parks and playground, green spaces, industrial use etc. The balance treated waste would be disposed off into the river or any other natural stream or pond. The waste water both for reuse and disposal shall be treated as per the standards of SPCB/CPCB. Moreover, the industrial

wastes before transporting into CETP shall be treated to the acceptable extend as per SPCB/CPCB standards considering the design of CETP. However, the zero discharge of waste shall be promoted through incentivisation.

The storm water drainage shall be developed integrated with the water supply and sewerage system. No untreated waste shall be flowing into the storm water. No solid waste shall be thrown into drains to avoid silting. Moreover, suitable measures such as development of silt pit on drains before the storm water enters into river to avoid solid waste entering into the river are proposed to be taken up in Master Plan.

Organised solid waste management plays a critical role in maintaining the built environment of the area. To avoid littering of waste all over the area, flowing into the drains and rivers and scientific treatment and disposal of waste, the solid waste management system will be developed as per Municipal Solid Waste (Management & Handling) Rules 2000 which applies to collection, segregation, storage, transportation and disposal of solid waste.

The Industrial Hazardous Waste is to be managed through Hazardous Waste (Management & Handling) Forth Amendment Rules 2010 or whichever the latest version of the Rule. It is to be ensured that such waste does not get mixed with municipal solid waste stream, failing which will result in economic losses and health & safety hazards.

Also, Biomedical Waste, should not be mixed with municipal solid waste and hence a separate system for its management has been specified, as per Biomedical Waste (Management & Handling Rules), 1998 or whichever the latest version of the rule.

Similarly the E-Waste is the waste electrical and electronic equipment, whole or in part, or rejects from their manufacturing and repair process which is intended to be discarded shall not be mixed with municipal waste and thus shall be managed as per E-Waste (Management & Handling Rule), 2011 published by MOEF or if any latest version of it or any other guidelines.

7.1.7 Environmental Administration

GOI- Environmental Legislations:

Acts and Rules relevant to environment protection prevail and will be applicable during pre-development and project development stages are as follows:

- The Environmental Protection Act, 1986
- The Environmental Assessment Notification, 2006
- Environment Impact Assessment Rules, 1994
- The Forest Conservation Act, 1980
- The Water (Pollution, Prevention & Control) Act 1974, amended in 1988
- The Air (Pollution, Prevention & Control) Act 1981, amended in 1987
- The Noise Pollution (Regulation & Control Rules) 2000
- The Motor Vehicle Act 1988
- Central Motor Vehicle Rules (Rule 129 through 137), 1989
- Fly Ash Notification, 2003
- Manufacture Storage and Import of Hazardous Chemical Rules, 1989

- National Environment Policy, 2006
- State Environment Policy, 2005
- Rain Water Harvesting Policy, 2001
- Central Forest Policy, 1998

The MOEF is responsible for setting policy and standards for the protection of the environment along with the CPCB. This includes air, noise and water quality standards and the requirements for the preparation of the EIA statements for developmental projects.

7.1.8 Environmental Management Measures

Environmental Management Measures has been proposed to be taken up during the planning, construction and operational stages of the Master Plan Area so as to minimise any adverse environmental impact and ensure sustainable development of the area. State Pollution Control Board/Central Pollution Control Board will monitor the operational performance of the various mitigation/enhancement measures carried out after development and operational phase.

The following are the suggested measures at pre-development phase:

- **Land Acquisitions:** The acquisition of land shall be as per prevailing policy of YEIDA and acquisition of private properties will be carried out in accordance with the Resettlement and Rehabilitation Policy of Govt. of U.P.
- **Quarrying:** The quarrying activities to level the proposed individual sites for development will be done ensuring that the areas in the vicinity are not adversely affected.
- **Preservation of Trees:** The development activity shall not involve any tree cutting. However, if any tree cutting is involved it shall be taken up only after all the legal requirements including obtaining of in principle and formal clearances from the Forest Department/MOEF/Collector are completed and subsequently written order is issued.

Stacking, transport and storage of the wood shall be done as per the relevant norms.

- **Relocation of Community Utilities and Common Property Resources:** Relocation of common property resources such as tube wells, hand pumps, wells, schools etc. shall be relocated in consultation with locals before dismantling the existing common property resources.
- **Crushers, Hot Mix Plants and Batching Plants Locations:** Hot mix plants and batching plants will be located atleast 1.0 km away from the nearest village settlement, agricultural operations and commercial activities preferably in the downwind direction.

The operators will submit a detailed layout plan for all such sites and approval of relevant Authorities will be necessary prior to their establishment. It will also be ensured that all such plants will comply with the requirements of the relevant current emission control legislations and consent/NOC for all such plants shall be taken.

- **Other Construction vehicles, Equipment and Machinery:** All vehicles, equipment and machinery procured for construction will comply with the Bureau of Indian Standard (BIS)

norms. The discharge standards formulated under the Environmental Protection Act, 1986 will be strictly adhered to.

Noise limits for construction equipments such as compactors, rollers, front loaders concrete mixers, cranes, vibrators and saws shall be as per Environmental (Protection) Act, 1986

The following are the suggested measures at the operation phase:

- **Monitoring Operation Performance:** State Pollution Control Board/Central Pollution Control Board will monitor the operational performance of the various mitigation/enhancement measures carried out after development and operational phase.
- **Air Pollution:** Ambient air concentrations of various pollutants will be monitored as per requirement of State pollution Control Board/Central Pollution Control Board. Green belt development will be carried out and maintained;
- **Noise Pollution:** Noise pollution will be monitored as per requirement of State Pollution Control Board/Central Pollution Control Board. Noise control programs will be enforced strictly;
- **Pollution Monitoring:** The periodic monitoring of the ambient air quality, noise level, water (ground water & surface water) quality, soil pollution/contamination in selected location specified by State Pollution Control Board/Central Pollution Control Board.
- **Maintenance of Drainage:** Authority will ensure that all drains are periodically cleared especially before monsoon season to facilitate the quick passage of rain water and avoid flooding;
- **Maintenance of Surface Water Bodies:** State Authorities will ensure that no effluent from the proposed development will be discharged into any surface water bodies. If any, only the treated effluent will be disposed off as per the MOEF standards. However, it will be ensured that water conservation measures are being implemented and the treated effluent is effectively reused within the site;
- **Solid Waste Management:** Authority will ensure that the municipal solid waste generated during the operation phase of the proposed project will be handled as per the Municipal Solid Waste Management & Handling Rules, 2000;
- **Waste Water Treatment:** Sewerage Treatment Plants will be planned for waste water treatment. For industrial waste water CETPs will be planned. Waste water generated is treated in STP will be planned for reuse for landscaping, flushing, HVAC and fire fighting purposes.
- **Water Conservation:** Water conservation will be ensured by water recycling for landscaping, flushing, HVAC and fire fighting purposes. Apart from recycling, rain water harvesting will also be carried out in order to recharge ground water so as to reduce the fresh water consumption demand and conserve water resources.

7.2 LANDSCAPING

Landscaping includes the development of public spaces to achieve environmental or aesthetic outcomes. The proposed development would have the provisions for lush green plantations, which

will contribute to better environmental conditions. The objective of landscaping is to provide clean air to breathe within the planned air overcoming the pollution. The city landscape will integrate the city parks, open green and green buffers along transport corridors, canals, ponds, and other water bodies. The key landscape components proposed in urban centre include the Regional Park, City Parks, and Green belts along roads, canals and drains connected with open spaces.

Canal Promenade

YEIDA and thus Raya Urban Centre experience a very fine network of canals. These canals have regional and local utility for various reasons like irrigation, supply of potable water etc. Canal promenade in this regard constitutes aesthetic development of canals passing through the urban centre to enhance the urban image. 30m on both sides of canal has been reserved for development of green spaces. Canal shall be developed with a distinctive landscape character that would visually set apart their hierarchy. Special design emphasis is given to the land adjoining canal and thus it is proposed to develop a promenade with ornamental trees, walkways, areas for passive recreation and relaxing along water front. World class street furniture with a recurrent theme would form part of this water front promenade. The uses which could form part of this includes the orchard, plant nursery, area for water harvesting, walkways, road side planting, street furniture, parks etc.

Buffers and Linkages

Green buffers and linkages are the linear spaces that include buffers or green belts between different land uses such as residential and industrial, interconnecting green linkages serving to connect major open spaces to create park systems and green corridors along roads, canals, drains, high tension power lines etc.

These buffers and linkages constitute linear landscape spaces which would essentially be in the form of linear parks with dominance of tree plantations. Pedestrian trails and cycle tracks etc. are proposed within the green belts to allow for access and their alternate use as movement corridors.

Natural drainage channels would be lined with trees would be derived considering the aesthetic or productive value of plantation. Colour, texture and flowering schedules would be used to enhance visual quality of landscape. Adequate street furniture, signage and street lighting would be employed to satisfy functional requirements and safety concerns.

Roadside Landscape

In conjunction with the transport network, each category of the proposed road type shall be developed with a distinctive landscape character that would visually set apart the hierarchy of roads. The key features of the roadside landscape would constitute tree avenues with consideration of physiognomy and color, hedge buffers between pedestrian and vehicular carriageway, central median planting to cut off glare from headlights, planting highlights for intersections, services laid in easily serviceable trenches to avoid digging for augmentation of infrastructure; signage, street furniture etc.

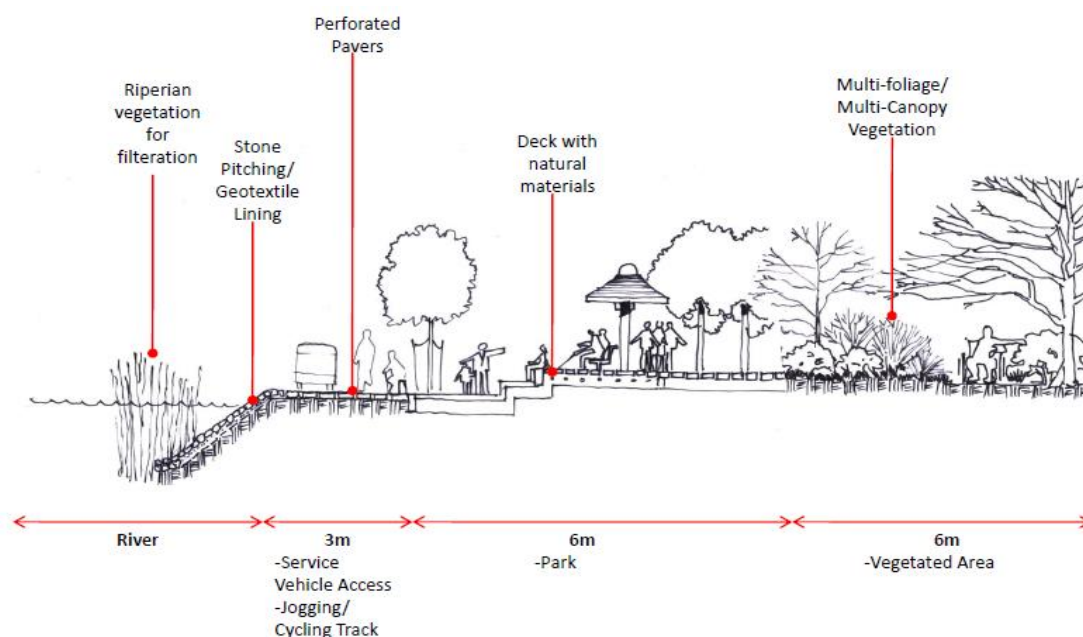
Master Plan Level Parks

Regional Park and city level parks constitute consolidated chunk of land earmarked for recreational use. The size of the land parcel, its adjacencies, access and hierarchy determines the sub designation

and permitted uses therein. These open spaces have been perceived as parks in the traditional sense of the word, with dominance of active and passive recreation. The landscape character would be determined by the site characteristics and its location parameters. Visual, functional and environmental concerns must be evaluated in the design of these open spaces.

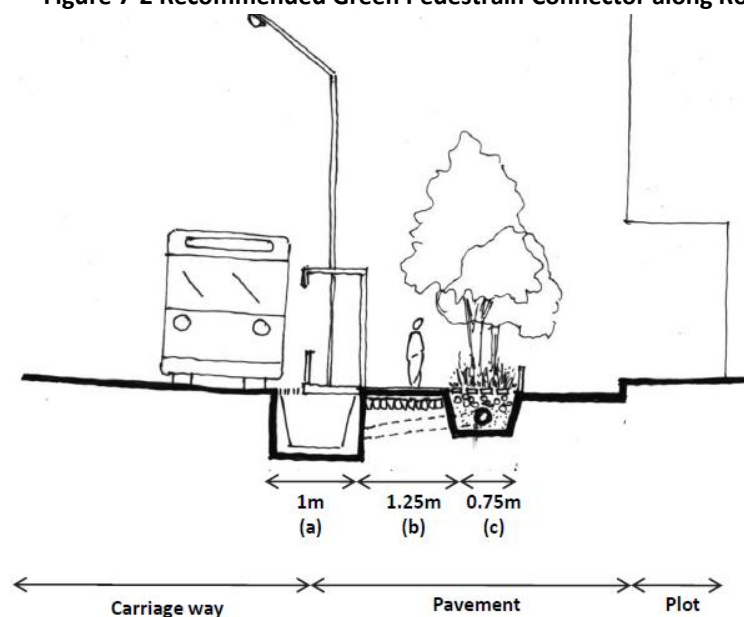
Recommended Development along the River

Figure 7-1 Recommended Development along the River



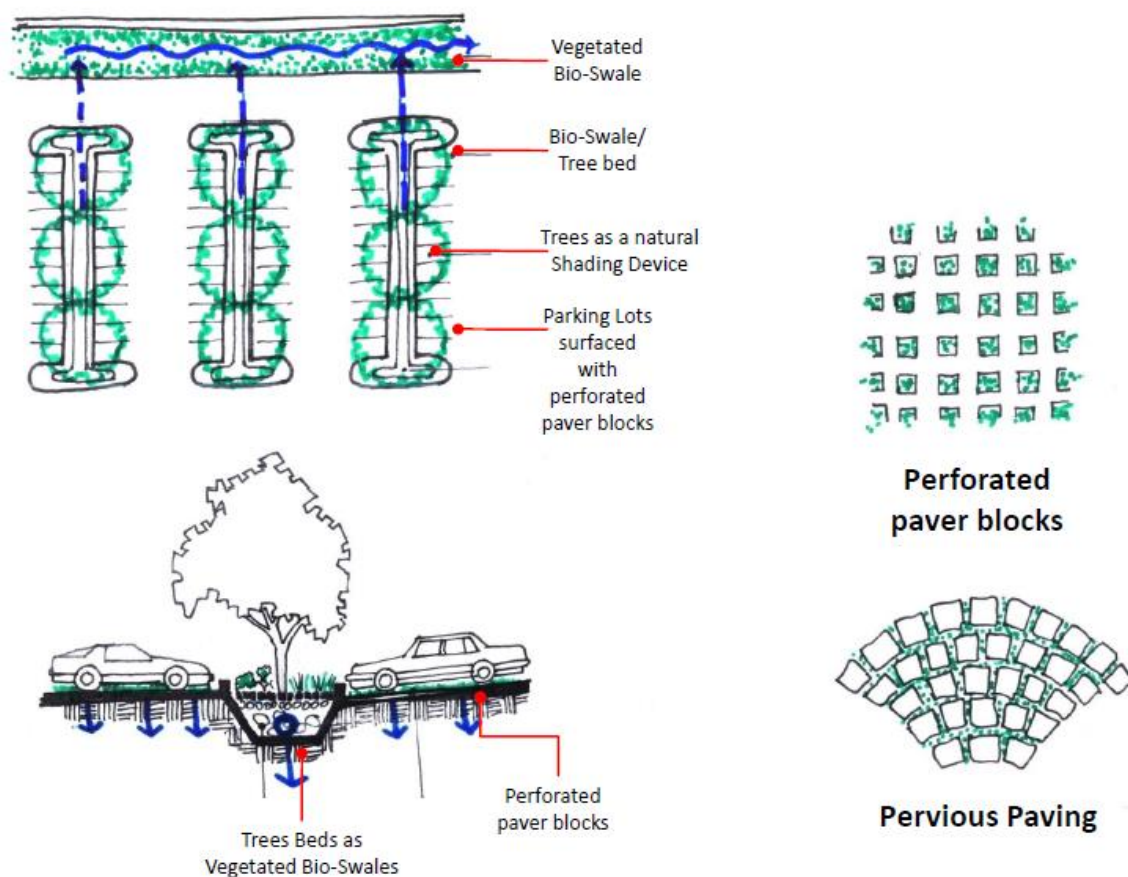
Recommended Green Pedestrian Connector along Roads

Figure 7-2 Recommended Green Pedestrian Connector along Roads



Guidelines for development of Green Parking Lots

Figure 7-3 Guidelines for development of Green Parking Lots



7.3 Disaster management

7.3.1 Introduction

The hazards which may lead to disasters in the development can be broadly classified as natural hazards, flood and manmade hazards such as fire and explosion. In the context of YEIDA and thus Raya Urban Centre it is imperative to identify the type, pattern and potential severity of the hazards which can cause loss of life, damage to property and environment and to assess the vulnerability and risks there from with a view to outlining an appropriate response mechanism.

The disaster management is to encompass all the administrative and operational programmes and responses to reduce the risk of emergencies of hazardous events likely to occur at any point of time during construction as well as operational phases of the project.

7.3.2 Existing Status

(A) Natural Disasters

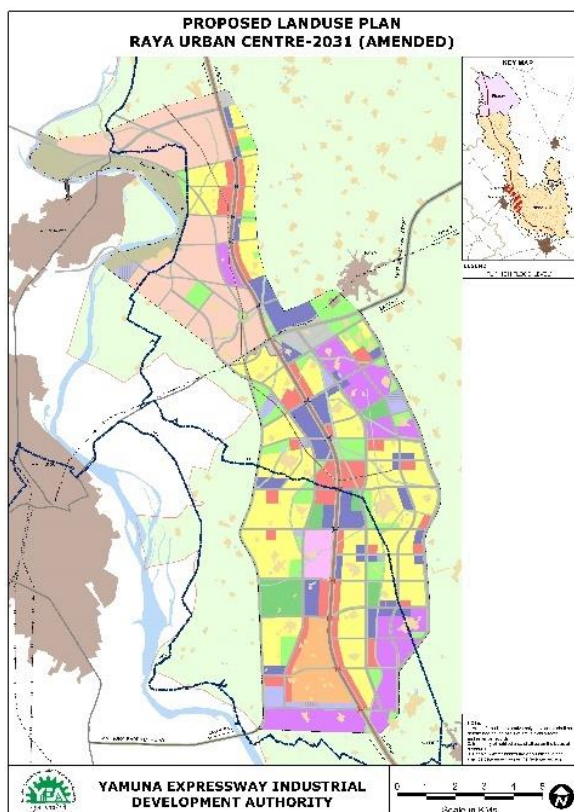
(i) Earthquake

UP is broadly divided into three Earthquake Risk Zones- High Damage Risk Zone-IV, Moderate Damage Risk Zone III and Low Damage Risk Zone II. Raya Urban Centre area of YEIDA Phase-II falls in zone III which is termed as moderate. . In zone III the intensity of the earthquake will be up to 7 on the Richter scale. It is categorized as moderate damage risk zone. The earthquake zones are presented in Map 7.2.

(ii) Floods

YEIDA Phase-II Area is located on the western bank of Yamuna River. The area is falling in between two major rivers Ganga and Yamuna. Due to the release of water from Okhla, Hindon & Tajewada dam water level gets increased in Yamuna River at Mathura District. Further, due to heavy rain fall, creates the flood like situation in district. As per Flood Management Plan, Mathura District, 2011, approximately 48 villages of the Mahavan Tehsil (parts of which are falling in YEIDA) gets affected due to heavy rainfall. Further, it has mentioned that there was increase in high flood levels in year 1995 & 2010 from the danger level which is presented in Table 7.4.

Map 7-2 High Flood Level (HFL)



Map 7-1 EarthQuake Zone

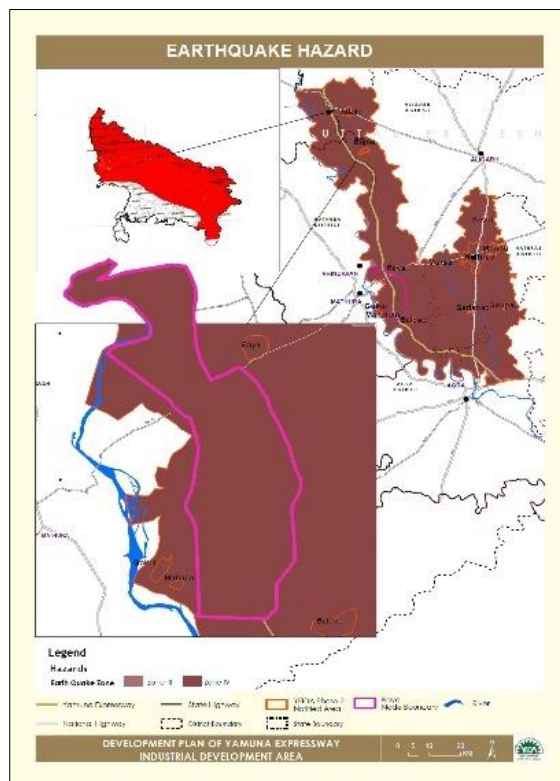


Table 7.4: Flood Danger Level and Flood Levels in Past Years

Warning level (in Meters)	Danger level (in meters)	Highest Flood Level (HFL) (in meters)	HFL Attained Date
164.2	165.2	169.7	Sept 1978
		167.4	Sept 1995
		167.4	2010

Source: Flood Management Plan, Mathura District, 2011

The High Flood Level data has been collected from respective department shows that some area of the RAYA Urban Centre are experiences flood, particularly during the monsoon season.

To address this, YEIDA has proposed embankment road in the boundary of Yamuna River towards developable area. The construction of embankment roads is partially completed and acting as a vital preventive measure. These embankments act as barriers, effectively containing the river's waters and preventing them from inundating the surrounding areas. Master Plan has a provision of low-density activity towards Yamuna River side assuming that the embankment will safeguard the proposed activities.

Integrating green infrastructure, such as planting vegetation along the embankments, can further enhance their stability and reduce erosion. By implementing these measures, the Yamuna Authority can significantly mitigate the impact of floods, protect valuable land, and improve the resilience of the region against future flood events.

(iii) Wind

As per Wind and Cyclone Hazard Map of India (BMPTC), entire YEIDA Phase-II and Raya Urban Centre is located in high wind velocity zone ($V_b=47$ m/s). This may cause uprooting of electric poles, trees, temporary and unstable structure.

(B) Manmade Disasters

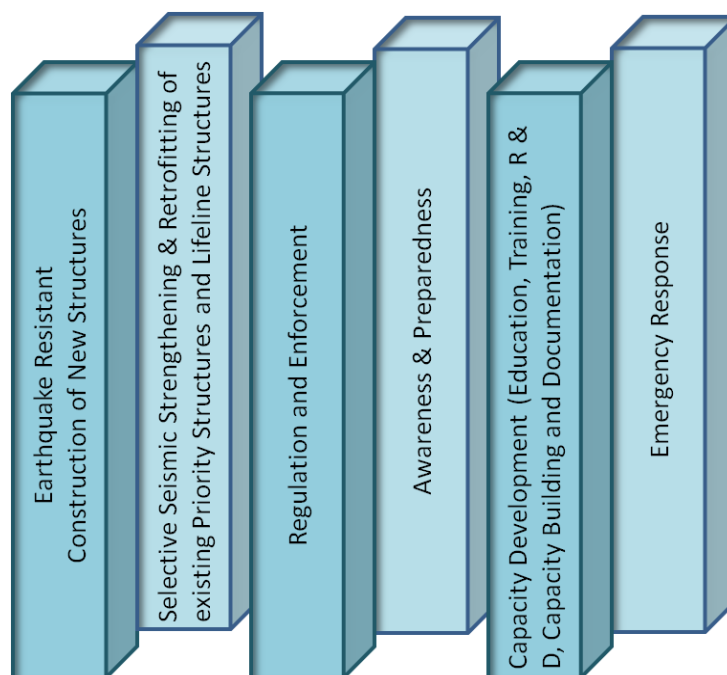
Manmade disasters are disasters from manmade hazards such as threats having an element of human intent, negligence or error or involving a failure of manmade system. These mainly include technological hazard, fire hazard and chemical hazard. These include industrial hazards, structural collapse caused due to engineering failures and improper manufacture, transport, storage and handling of hazardous toxic materials. These hazardous substances include chemical, biological, radiological and nuclear materials. In addition, accidents occur on road, rail and air transportation which results in substantial loss of life. In case of YEIDA, especially abadi areas are prone to fire due to nonimplementation of fire safety norms and encroachment, overcrowding and haphazard growth affect the movement and timely approachability of fire tenders in emergency.

7.3.3 Measures, Policies, and Strategies for Disaster Management

(i) Earthquake

There are 6 important parameters for Earthquake Management

Figure 7-4 There are 6 important parameters for Earthquake management



Pre-Disaster Preventive Measures

Long-term measures

- Re-framing buildings codes, guidelines, manuals and byelaws and their strict implementation. Tougher legislation for highly seismic areas.
- Incorporating earthquake resistant features in all new buildings at high-risk areas.
- Making all public utilities like water supply systems, communication networks, electricity lines etc. earthquake-proof. Creating alternative arrangements to reduce damages to infrastructure facilities.
- Constructing earthquake-resistant community buildings and buildings (used to gather large groups during or after an earthquake) like schools, dharamshalas, hospitals, prayer halls, etc., especially in seismic zones of moderate to higher intensities.
- Supporting R&D in various aspects of disaster mitigation, preparedness and prevention and post-disaster management.

- Evolving educational curricula in architecture and engineering institutions and technical training in polytechnics and schools to include disaster related topics.

Medium Term Measures

- Retrofitting of weak structures in highly seismic zones.
- Preparation of disaster related literature in local languages with does and don'ts for construction.
- Getting communities involved in the process of disaster mitigation through education and awareness.
- Networking of local NGOs working in the area of disaster management.

Post-Disaster Preventive Measures

- Maintenance of law and order, prevention of trespassing, looting etc.
- Evacuation of people.
- Recovery of dead bodies and their disposal.
- Medical care for the injured.
- Supply of food and drinking water.
- Temporary shelters like tents, metal sheds etc.
- Repairing lines of communication and information.
- Restoring transport routes.
- Quick assessment of destruction and demarcation of destroyed areas, according to the grade of damage.
- Cordoning off severely damaged structures that are liable to collapse during aftershocks.

Policies and Strategies:

The policies adopted shall be in line with the Central and State Disaster Management Mechanism.

1. National Disaster Management Act 2005 shall be followed. State Government has disaster management department under the framework of National Disaster Management Act 2005.
2. Undertake the vulnerability and risk assessment due to natural hazard and prepare prevention cum preparedness plan.
3. Building Bylaws to be strictly followed. However, these shall be regularly reviewed and amended if needed to include safety aspects from natural hazards.
4. All Government buildings, lifeline structures and other infrastructure should adhere to the UP Building Byelaws 2008 and "Yamuna Expressway Industrial Development Area Building Regulations, 2010". Adequate space should be earmarked which can be used as refuge area like an open space during earthquakes or raised shelter during flood. Provide adequate ROW to facilitate movement of emergency vehicles and escape routes.

5. Third party certified independent agencies could be designated to check the safety of construction as per the approved building plans and the findings of this agency for each case shall be made available in the public domain and wide publicity about the provisions should be done.
6. Latest technology for earthquake resistant construction and retrofitting for the abadi areas needs to be disseminated among communities for adoption. Unsafe old structures should be dismantled/ redeveloped. There is a need for technical skill up gradation of workers.

(ii) Flood

District wise Flood Management Plan gets prepared for prevention and preparedness of the natural hazard flood. As per Flood Management Plan, Mathura District, 2011-12, reconstruction of Naujhil bandh and development of Panigoan bandh is proposed to be developed along River Yamuna to protect the affected villages from flood. The bund/embankment shall be developed along Yamuna River especially wherever the urbanization is proposed on priority.

However, as an immediate measure, to prevent flooding river banks shall be raised to guide the flow to avoid spreading the river water towards habitation. River banks would be lined and protected from erosion. The flood estimation shall be worked out by flood frequency method for 1 in 25 years return period. The areas which are liable to flooding in rivers of return period of 5, 10, 25, 50 years need to be identified and mark the areas which are flood prone.

(iii) Mandmade Disaster- Fire

- Fire safety norms shall be followed as per prevailing YEIDA Building Regulations and Building bylaws which shall be as per National Building Code and U.P Fire Act.
- Safety norms shall be regularly reviewed and amended if needed to include safety aspects from natural hazards.
- Comprehensive risk evaluation should be undertaken in order to identify areas vulnerable to fires and database in terms of available equipments and personnel should be compiled and periodically updated.

(iv) General Disaster Mitigation Policy Measures

Table 7-4 General Disaster Mitigation Policy Measure

KEY COMPONENTS	POLICY MEASURES
Disaster mitigation/prevention to be mainstreamed into the development process	(i) Each institution (state/local) which has a role in mitigation/prevention will make appropriate outlays for schemes addressing mitigation/prevention (ii) Where there is a shelf of projects /schemes, projects/schemes contributing to mitigation to be given a priority. (iii) Wherever possible schemes/projects in areas prone to natural hazards to be so designed as to contribute to mitigation and preparedness. (iv) Projects in vulnerable areas/areas prone to natural hazards to be designed to withstand natural hazards.
Techno-Legal Regime	(i) Regular review of building codes and its dissemination (ii) Construction in seismic zones III, IV and V to be as per BIS codes/National Building Codes. (iii) Construction in areas vulnerable to cyclones to be so designed as to withstand the wind hazard as per BIS codes/National Building Codes. (iv) Comprehensive review and compliance of - Town and Country Planning Acts - Development Control Regulations - Planning and Building - Standards Regulations (v) Put in place appropriate techno financial regime (vi) Capacity enhancement of Urban Local Bodies to enforce compliance of techno legal regimes
Land-use Planning and Zoning Regulations	(i) Legal framework for Land-use planning and zoning regulations to be reviewed. (ii) Zoning Regulations to be enforced.
Specialized Response Teams at Regional level	(i) Designation of units for conversion into Specialist Response Teams (ii) Designation of training centers (iii) Training of trainers (iv) Procurement of equipment using CRF, OSDMA resources (v) Training of teams
Setting up Emergency Operations Centre [EOC]	(i) Multi hazard resistant construction (ii) Communication system linkages (iii) Mobile EOCs for on-site disaster information management
Emergency Support Function Plan (ESP Plan)	(i) Departments/agencies which perform emergency support functions to draw up ESF plans constitute teams, and set apart resources in advance so that post disaster response is prompt.
Disaster Management Plan	(i) To be drawn up under the supervision of District Magistrate/Collector and to include mitigation, preparedness and response (ii) Emergency Support Functions by various Departments to be included.

KEY COMPONENTS	POLICY MEASURES
	(iii) To be drawn up in consultation with all relevant departments (iv) District inventory of resources to be maintained
(i) State of the Art Sensors to be set up (ii) Hazard Monitoring, Tracking and Modelling	(i) IMD/CWC/OSDMA to carry out a review of sensors available and draw up plans for strengthening the system (ii) Models to be updated to improve prediction accuracy
Warning Protocols	(i) Warning protocols to be user friendly (ii) Warning to be communicated as quickly as possible to the States/districts/community (iii) Protocols should be simple to understand (iv) Districts to set up protocols for communication of early warning to the community (v) Panchayats/local bodies to be used for early warning communication (vi) Communication linkages for early warning
Training for Services /Cadres/ Agencies involved in Mitigation, Preparedness or Response	(i) Training needs analysis/ Human Resource Development Plan (ii) Drawing up of capsule courses for training. (iii) Training of trainers. (iv) Setting up/strengthening training institutions in state faculties of Disaster Management in Administrative Training Institutes
Mass Media Campaign for Awareness Generation	Design and develop a communication strategy for awareness campaign use audio, visual and print medium to implement awareness campaign. Development of resource materials on mitigation, preparedness and response
Non-Government Community Based Organizations Involved in Awareness Generation and Community Participation	(i) Facilitate network of Non-Govt. community based organizations at district level/Regional/ULB (ii) Co-opted into the planning process and response mechanisms at all levels
Promote research in state and regional institutions in the areas of disaster risk reduction	(i) Assessment and evaluation of ongoing programmes and activities regular documentation of key lessons (ii) Establish Regional Disaster Resource Network as knowledge portal to pool and exchange information and knowledge among all concerned institutions and organization

8 ZONING REGULATIONS

8.1 INTRODUCTION

This chapter details out guidelines for enabling the preparation of detailed Layout Plan for the sectors in the Master plan. It includes designation of use zones and use premises, use premises to be permitted in the use zone, use activities to be permitted in use premises and restrictions on subdivision of use zones.

8.2 USE ZONES AND USE PREMISES DESIGNATED

8.2.1 Use Zones

Use Zone means an area for any one of the specific dominant uses of the urban functions. There shall be 15 use zones classified in 10 categories as under:

SrNo	Landuse
1	Existing Village Abadi
2	Residential
3	Commercial
4	Industrial
5	Offices
6	Mixed Use
7	Public Semi-Public
8	Public Utilities
9	Transportation
10	Recreational
11	Park & Play Ground
12	Green Belt
13	Tourism
14	River Front Development
15	River/Canal/Drain/Lake/Pond

8.2.2 Use Premises

Use premises means one of the many sub-divisions of a use zone, designated at the time of preparation of layout plan, for a specific main use or activity.

8.3 ZONING REGULATION

8.3.1 Objective of Zoning

Residential, Commercial, Mixed Use, Industrial, public semi public, recreational green, parks & green belts and water bodies are shown in the Master Plan. The ancillary/incidental activities that are not displayed separately in the land use map are to be permitted according to the zoning regulations. The provision of ancillary and incidental activities is required to be made by competent Authority according to the zoning regulations and the specific requirement of a particular scheme so that public health, welfare and security may be ensured in the proposed planned area.

8.3.2 Salient Features of Zoning Regulations

The development of various activities in ever changing physical, social and economic scenario of cities is an on-going process. In these submitted zoning regulations, the approval of various activities under main land-use zones has been laid down in order to simplify the procedures of permission and responding to the requirements of development. The salient features of the zoning regulations are as under:

- 1) The permission of various activities in the main land-use areas are made user-friendly through matrix.
- 2) The concept of flexible and multi-utility use of land is adopted instead of regimented use of land, so that it may promote the fast development of the town.
- 3) The planning and permission of multi-utility of a piece of land will be on the basis of their ancillaries and market demand, so that the operational and economic capability of inter-dependent multi-utility land may be enhanced and main land use also retain the basic character.
- 4) The concept of floating land-use has been adopted in zoning regulations, according to which the activities that are not envisaged in the general scheme/layout plan and these Zoning Regulations may be considered in future according to their merits.

8.3.3 Categories of Different Activities

The different activities to be provided or planned in the proposed main land-use are as under

(a) Permissible Uses

These activities are ancillary to the main land use and are planned and permitted.

(b) Conditional Uses

These activities which are planned and permitted under the required terms and conditions in connection with the main land-use on the basis of their specific requirements. The required terms and conditions are given with the zoning matrix.

(c) Permissible uses under the specific permission of the Authority

These activities will be planned or permitted under specific permission of the Authority keeping in view the infrastructure and its environmental impact on the surrounding area etc. i.e. on the basis of their merits and demerits.

(d) Prohibited Activities

These activities will generally not be permitted in the respective land-use.

8.3.4 Floating Activities

After coming of the scheme in force some activities are proposed according to the changing physical, social, economic and political scenario of the city, which become essential according to the demand of time, but are not envisaged in the scheme of zoning regulations. Such activities could be bus/ truck/ rail terminal, public utilities and services, electric substation, treatment plant etc. To permit such activities it becomes inevitable at times, to change the land-use. Therefore, to permit for such activities, as per demand, the concept of floating use/activity is included.

Its advantage is that there will be no centralization of non-performing activities in any single land use zone. In addition to that, to curb any ill effect or deterioration on the dominant character of a land-use zone due to extra floating activities and to control the pressure on the establishments in the concerned area, a provision has been laid down that if floating activities are not permissible in a particular zone, it may be allowed by the Authority by specific permission on the ground of the merits/ demerits of the case.

8.4 DEFINITIONS OF USE PREMISES

Use premises means one of the many sub-divisions of a use zone, designated at the time of preparation of layout plan, for a specific main use or activity. The use premises are defined as follows:

Table 8-1: Activities in a Use Premise

S. no	Activities /Uses	Definition
1.	Residential	
1.1	Single House/ Plot/ Flat	Residential House/Plot – Plotted Housing: A premise for one or more than one dwelling unit and may have on it one main building block and one accessory block for garage / garages and servant quarters. Residential Flat: Residential accommodation for one family (one household) which may occur as part of group housing or independently
1.2	Group Housing	A premise of size not less than 2000 sq.m. comprising of residential flats with basic amenities like parking, park, convenient shops, public utilities etc.
1.3	Guard chaukidar residence	Residential accommodation for watch and ward staff responsible for security and/ or maintenance of principal use.
2.	Commercial	
2.1	Retail shops/Platform	A premise for sale of commodities directly to consumers with necessary storage
2.2	Repair shops	A premise equivalent of a retail shop for carrying out repair of household goods, electronic gadgets, automobiles, cycles etc.
2.3	Personal Service shops	A premise equivalent of a retail shop providing personal service like tailor, barber etc.
2.4	Vending booth	A premise in the form of booth for sale of commodities of daily needs either through a mechanical installation or otherwise.
2.5	Showroom	A premise with facilities for display, sale, and storage of commodities.
2.6	Weekly market	An area used in a week by a group of informal shop establishments in The form of a market. These markets shift from one area to another on different days of the week.
2.7	Convenience shopping centre	A group of shops not exceeding 50 in number in residential areas serving a population of about 5,000 persons
2.8	Local/sector level shopping centre	A group of shops not exceeding 75 in number in residential areas serving a population of about 15,000 persons.
2.9	Shopping centre/ commercial centre/ shopping mall	Shopping Centre/Commercial Centre: A premise having group of shops/commercial establishments Constructed on designated plots. Shopping Mall: A Shopping Mall is one or more buildings forming a complex of shops representing merchandisers, with interconnecting walkways enabling 2.visitors to easily walk from unit to unit, along with a parking area – a modern, indoor version of the traditional marketplace with controlled Environment.

S. no	Activities /Uses	Definition
2.10	Informal commercial unit/platform	A premise meant for commercial activities for informal sector.
2.11	Wholesale market/Mandi	A premise from where goods and commodities are sold/delivered to retailers. The premise includes storage, godown, loading and unloading
2.12	Bakery/Confectionary/Atta Chakki	Bakery: A Bakery (also called baker's shop or bakehouse) is an establishment which produces or/and sells baked goods from an oven such as bread, pies, bagels etc. Confectionary: A premise for retail sale of confectionary items directly to consumers with necessary storage. Atta Chakki: A premise where grinding of grain, spices and dried eatables are carried out.
2.13	Coal/wood/Building material market	Coal Market: A premise for retail sale of coal directly to consumers with necessary storage. Wood Market: A premise for retail sale of fuel wood directly to consumers with necessary storage Building Material Market: A premise for retail sale of building materials like timber, stone, bricks, cement, hardware, paints etc. directly to consumers with necessary storage.
2.14	Vegetable/Fruit market	A premise for retail sale of fruits and vegetables in shops (area not more than 10 sq.m.) or platforms.
2.15	Cold storage	A premise where perishable commodities are stored in covered space using mechanical and electrical devices to maintain the required temperature etc.
2.16	Hotels	A premise used for lodging of 15 persons or more on payment with or without meals.
2.17	Service Apartment	A serviced Apartment is a type of furnished apartment available for short term or long-term stays, which provides amenities for daily use.
2.18	Restaurant/ Canteen/ Food Court	Restaurant: A premise used for serving food items on commercial basis including cooking facilities. It may have covered or open space or both for sitting arrangement. 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.

S. no	Activities /Uses	Definition
		Food Court: A Food Court is a (usually) indoor plaza or common area within a facility that is contiguous with the counters of multiple food vendors and provides a common area for self-serve dining. Food Courts may be part of shopping malls etc. or may be stand-alone development.
2.19	Cinema/Multiplex	A premise with facilities for projection of movies and stills with a covered space to seat audience
2.20	Drive-in cinema	A cinema with facilities for projection of movies and stills for car audience including an audience for other audience.
2.21	Exhibition hall/ Exhibition centre	Exhibition Hall: A hall or part of a premise with facilities for exhibition and display of paintings, photographs, sculptures, murals, ceramics, handicrafts or products of specific category/ class. Exhibition Centre: A premise with facilities for exhibition, display and storage of paintings, photographs, sculptures, murals, ceramics, handicrafts, or products of specific category/ class
2.22	Banquet hall/ Barat Ghar	A premise used for marriage and other social functions and run by an individual, or institution or a public agency.
2.23	Electric Charging Station	A premise and an infrastructure that supplies electric energy for the charging of plug-in electric vehicles- including electric cars, neighbourhood electric vehicles and plug-in – hybrid to consumers. It may include servicing of automobiles.
2.24	Petrol pump/Diesel station	Petrol/Diesel / Gas filling station: A premise for sale of petroleum products to consumers. It may include servicing of automobiles.
2.25	Oil depot and LPG refilling plant	Oil Depot: A premise for storage of petroleum products with all related facilities LPG Refilling Plant: A premise for refilling facilities of LPG on bulk basis
2.26	Gas godown	Gas Godown: A premise where cylinders of cooking gas or other gas are stored.
2.27	Warehouses for non-hazardous items	Warehouse/ Godown for Non-Hazardous items: A premise for exclusive use of storage of non-hazardous goods and commodities in a manner as per requirement of respective goods/ commodities. The premises include loading and unloading facilities
2.28	Warehouses for hazardous items	Warehouse/ Godown for Hazardous items: A premise for exclusive use of storage of hazardous goods and

S. no	Activities /Uses	Definition
		commodities in a manner as per requirement of respective goods/ commodities. The premises include loading and unloading facilities
2.29	Automobiles showroom/Automobile Showroom cum Service Station	Automobiles Showroom: A premise for display, sale, and repair of automobiles. Automobile Showroom cum Service Station: A premise for display, sale, repair and servicing of automobiles.
2.30	Weigh bridge/ Dharmkanta	A premise with weighing facilities for empty or loaded trucks.
2.31	Storage Godown for Inflammable Items (LPG, Petrol, Diesel, Kerosene, Lubricants, Aviation Fuel etc)	A premise where inflammable items are stored in covered space
2.32	Agriculture Produce Selling Market/ Grain Market	A premise having storage and sale facilities for agricultural products.
2.33	Junkyard	A Junkyard is an establishment or place of business which is maintained, operated or used for storing, keeping, buying, or selling junk, or for the maintenance or operation of an automobile graveyard.
2.34	Steel/ Cement/ Building Material Yard	A premise having storage and sale facilities for bulk building materials like cement, steel etc.
3.	Industrial	
3.1	Service industries	Any industry which is engaged in producing, servicing or repairing goods, or articles for consumption in the neighbourhood/local area.
3.2	Cottage industries	An industry where the creation of products and services is home based, rather than factory based
3.3	Flatted factories	A premise having a group of small industrial units having up to 50 workers with non-hazardous performance. These units may be located in multi-storeyed buildings
3.4	Information/ software technology industry	A premise where computer software etc. is prepared for information technology and I.T. enabled services
3.5	Small/light industry	Small/light industries as per classification of the State Government
3.6	Industrial plot (specific industry type)	A premise for a unit within a group of such units for manufacturing of specific products like electric goods etc.
3.7	Industrial Plot (integrated use)	A premise where industrial use is allowed along with staff housing commercial and facilities as an integrated use.
3.8	Medium & Large-scale industry	Medium and large-scale industries as per classification of the State Government.
3.9	Film centre/ TV radio programme production centre	A premise with facilities for shooting, recording, broadcasting and transmission of news and other programs through the respective medium. It may include some hostel accommodation for guest artists, and transmission facilities like tower.
3.10	Biotechnology/ Biotech Park	A Premise which is dedicated to scientific research or production, or business related to biotechnology.

S. no	Activities /Uses	Definition
3.11	Non- Polluting Agro based & food processing units	A premise having a group of industrial units with non-hazardous performance primarily working on agro based products
3.12	Milk Pasturing Plant	Milk processing plant means a place, premises, or establishment where milk or milk products are collected, handled, processed, stored, bottled, pasteurized, aseptically processed, bottled, or prepared for distribution, except an establishment that merely receives the processed milk products and serves them or sells them at retail.
3.13	Milk Collection Centre	Milk Collection Center or Milk Bulking Center means any place, premises or establishment where raw milk is received, collected, handled, stored or cooled and prepared for further transportation
4.	Logistics	
4.1	Freight complex/ Logistic Park	Freight Complex: A complex having premises for booking and storage of goods that a train, truck, ship, or aircraft carries Logistic Park: A premise within which all activities related to transport, logistics and the distribution of goods- both of national and international Transmit, are carried out by various operators on commercial basis and includes facilities like warehouses, distribution centres, storage areas, offices, truck services etc. and relates public facilities.
5.a	Public/Semi-Public (Institutional & Offices)	
5.1	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.
5.2	Office/corporate office	A premise used for office of commercial establishment, profit making organization
5.3	Professional/personal office	A premise where professional consultancy services are provided by an individual or a small group of professionals like Chartered Accountant, Lawyer, Doctor, Architect, Designer, Computer Programmer, Tour & Travel Agent etc.
5.4	Project development/management/ maintenance office	A premise used by a Real Estate Developer for project development, management office within the project site for a specified period with previous approval of the Authority.
5.5	Satellite/wireless/Telecommuni cation centre	A premise used for installation of a tower for communication purpose.
5.6	Guest house/lodging/boarding house	Guest House is a premise for housing the staff of Government, Semi- Government, Public Undertaking and Private Limited Company for short duration. Boarding house is a premise in which rooms are let out on a long-term basis as compared to hotels. Lodging House is a premise used for lodging of less than 50 persons.
5.7	Hostel	A premise in which rooms attached to “Institutions” or otherwise, are let out on a long-term basis.
5.8	Reformatory & Orphanage	Orphanage would mean a premise with facilities for boarding of children who are bereaved of parents. It may or may not

S. no	Activities /Uses	Definition
		have educational facilities. Reformatory would mean a premise with facilities for confinement and reform of offenders.
5.9	Old age home	A premise with commercial or non-commercial arrangement for long or short term stay of old people. It may include arrangement for recreation, general health, catering etc. which may be managed by an individual or an institution.
5.10	School for mentally challenged persons	A premise with facilities for education, treatment, reformation, and empowerment of mentally and/or physically challenged persons. It may be managed by an individual or institution on commercial or non-commercial basis.
5.11	Crèche & day care centre/ play & nursery school	A premise having nursery facilities for infants during daytime. The centre may be managed by an individual or institution on commercial or non-commercial basis.
5.12	Primary school	A premise having educational and playing facilities for students up to 5 th standard.
5.13	Secondary school/ integrated residential school	Secondary school- A premise having educational and playing facilities for students from VI to X standard. It shall include existing middle schools, which are up to VIII standard for the purpose of this code. Integrated Residential School- A premise having educational and playing facilities up to XII standard. It shall have boarding facilities for students and may have residence for faculty.
5.14	Vocational Institute / training Institute / ITI	A premise with training facilities for short term courses for discipline, predatory to the employment in certain profession and trade. It shall be run by public or charitable institution on non-commercial basis. It includes training-cum-work centre.
5.15	Degree / PG college	A premise with educational and playing facilities for under-graduate and post-graduate courses under a university. It includes all professional disciplines
5.16	University	An institution for higher learning with teaching and research facilities. A university may exist without having any college connected with it but have assemblage of colleges affiliated to it.
5.17	Post office	A premise with facilities for postal communication for use by the public
5.18	Telephone exchange	A premise having facilities for central operation of telephone system for a designated area.
5.19	Police station	A premise having facilities for the offices of local police station.
5.20	Fire station	A premise with facilities for firefighting for a catchment area assigned to it. It may include residence of essential staff.
5.21	Police post	A premise having facilities for a local police post of a temporary nature or on small scale as compared to a police station
5.22	Library	A premise having large selection of books for reading and reference for general public or specific class
5.23	R & D centre	A premise having facilities for research and development for any specialized field.

S. no	Activities /Uses	Definition
5.24	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. It includes family welfare centre
5.25	Trauma centre	A premise having medical facilities of specialized nature for providing instant treatment to patients under trauma.
5.26	Medical college/ hospital	Medical College: A premise where teaching, treatment, operation, and research & development related to human bodies is carried out. Hospital: A premise providing medical facilities of general or specialized nature for treatment of indoor and outdoor patients.
5.27	Clinic	A premise with facilities for treatment of outdoor patients by a doctor. In case of a polyclinic, it shall be managed by a group of doctors
5.28	Nursing home	A premise having medical facilities for indoor and outdoor patients having up to 30 beds. It shall be managed by a doctor on commercial basis.
5.29	Clinical laboratory / Diagnostic centre	A premise with facilities for carrying out various tests for confirmation of symptoms of a disease.
5.30	Veterinary hospital/ Dispensary	A premise offering medical and similar facilities for domestic pet care.
5.31	Health club/ Gym	A room or building equipped for indoor sports.
5.32	Dance/ Music/Art centre	A premise having facilities for imparting training and coaching for dance, music, and art.
5.33	Yoga/ Meditation centre	A premise having facilities for self-attainment, achieving higher quality of mind and body etc.
5.34	Religious building/centre	A premise dedicated to accommodations and service of God and other objects of religious nature. It may have different nomenclature in different religions like temple for all faiths, mosque, church, gurudwara, synagogue, ashram, bathing ghats, gaushala etc.
5.35	Community centre	A premise having an enclosed space for various social and cultural activities of a neighbourhood of 15000 population.
5.36	Convention centre/ conference centre/ Auditorium	A premise having all facilities for meeting, symposium, seminar etc. where a number of people from different organizations will be participating.
5.37	Socio-Cultural centre	A premise with facilities for activities of socio-cultural nature runs by a public, voluntary or individual on primarily non-commercial basis.
5.38	PCO Public call office	A premise with facilities to make phone calls from telephone to local, STD and international subscribers on payment basis.
5.39	Internet/Information centre	A premise used for internet system for communication purposes

S. no	Activities /Uses	Definition
5.40	Social welfare centre	A premise with facilities for welfare and promotion of community development. It shall be run by a public or charitable institution.
5.41	Crematorium/ Burial ground/ cremation	Cremation ground would mean a premise with facilities for performing last rites of dead bodies by burning. Burial ground would mean a premise with facilities for burying of dead bodies. Crematorium would mean a premise with facilities for disposing off dead bodies in an electrical/ electronic furnace
5.42	Night shelter (rain basera)	Premise with facilities for accommodation usually given without fees or a minimal fee for resting during night
5.43	Disaster management centre	Premise having facilities for carrying out studies and identify the potential risks related to any disasters
5.44	Metrological station	Premise having facility for meteorological observations, weather forecasting facility, seismology etc.
5.45	Banks	A premise for office to perform banking functions and operations.
5.46	ATM	A premise that allows customers to complete basic transactions without the aid of a branch representative or teller.
5.47	Milk Booth	A premise for retail sale of milk directly to consumers by manual or other means.
5.b	Public & Semi-Public (Utilities/Facility)	
5.48	Sewerage treatment plant	A premise with treatment facilities used for treatment of sewage.
5.49	Pumping station	A premise with a pumping station used for pumping sewage/ water on to a higher gradient.
5.50	Solid Waste Treatment Plant:	A premise where solid waste is collected, treated mechanically /Electrically and processed for reuse.
5.51	Sanitary landfill site/ solid waste treatment plant	A Premise where solid waste is disposed of for short or specific period.
5.52	Recycling plant	A premise with treatment facilities used for recycling of solid waste
5.53	Tube well/ Overhead tanks/ Underground tanks/ Renny wall	Tube well: A system to extract water from underground sources using mechanical means. It may consist of a room for operation and maintenance. Overhead tank: A premise having overhead tank for storage and supply of water to its neighbouring areas. It may or may not include a pump house. Underground tank: A premise having underground tank for storage and supply of water to its neighbouring areas. It may or may not include a pump house. Rainy well: A system to extract water from underground sources on the banks of a water body.
5.54	Water treatment plants	A premise with treatment facilities used for treatment of water
5.55	Electric sub station	A premise having electrical installation and transformation for

S. no	Activities /Uses	Definition
		distribution of power
5.56	Public toilets	A premise having latrines and urinals for use of public.
5.57	Transmission tower/ mobile tower as per YEIDA policy	A transmission tower or Cellular mobile tower which may be erected on ground or roof top of a building as per policy of YEIDA
5.58	Drinking water booths	Premise having water distribution kiosk for use of public
5.59	Water Works	An establishment for managing a water supply
5.60	Electric Post	An electric tower which is erected on the ground for distribution of power
6.	Recreational Green	
6.1	Park/Playground	Park: 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. Playground: A premise used for outdoor games. It may have on it landscaping, parking facilities, public toilet etc.
6.2	Multipurpose open spaces	Space / Area which is essentially open and can be used for multiple temporal functions.
6.3	Golf course/ Racecourse	Golf course: Area earmarked for playing golf sport which is essentially open along with minimal built space which supports the sports. Racecourse: Area earmarked for racing with minimal built space for supporting the race.
6.4	Stadium/ Sports training centre/Sports complex	Stadium: A premise for outdoor games with pavilion building and stadium structure to seat spectators including related facilities for players Sports training 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 Sports Complex: A premise for outdoor and indoor games with pavilion building, stadium, and related facilities.
6.5	Picnic spot	A premise within the tourist/ recreational centre which is used for short duration stay for recreational or holiday purpose.
6.6	Indoor stadium/ games hall	A premise for indoor stadium with play area and spectator seating including related facilities for players.
6.7	Planetarium	A premise with necessary facilities and equipment for studying planets
6.8	Aquarium	A premise with necessary facilities and equipment in which aquatic plants or animals are kept or displayed

S. no	Activities /Uses	Definition
6.9	Amusement/ Theme Park Specialized/	Amusement Park and Theme Park are terms for a group of rides and other entertainment attractions assembled for the purpose of entertaining a large group of people. An Amusement Park is more elaborate than a simple park or playground, usually providing attractions meant to cater to children, teenagers, and adults.
6.10	Recreational club/ Swimming pool	Recreational Club -A premise for outdoor and indoor games with pavilion building. Swimming Pool - A premise with facilities for swimming and spectators seating which shall vary with standard and purpose.
6.11	Museum cum Auditorium	Museum means a premise with facilities for storage and exhibition of objects illustrating antiques, natural history, art etc... Auditorium means a premise having an enclosed space to seat audience and stage for various performance like concerts, play, recitals, functions etc.
6.12	Open air theatre	A premise having facilities for audience seating and a stage for performance open to sky.
6.13	National Memorials	A protected area that memorializes a historic person or event of national importance. The memorial need not be located on a site directly related to the subject.
6.14	Biodiversity Park	Premise having facility for conservation of flora and fauna.
6.15	Shooting Range	A shooting range, firing range, gun range or shooting ground is a specialized facility, venue, or field designed specifically for firearm usage qualifications, training, practice, or competitions.
6.16	Zoo, Wildlife/ Bird Sanctuary	A park where many kinds of wild animals are kept so that people can look at them and where they are bred, studied and protected
6.17	Tourist Facility Centre	Premise having facility for receiving tourists, guiding, and providing necessary information and support during their visit.
6.18	Sports City	A multipurpose sports and leisure facility
7.	Transportation	
7.1	Open Parking	A premise open to sky used for parking of vehicles. The public parking lots may be run on commercial or non-commercial basis
7.2	Covered/ multi-level parking	A covered premise of one or more levels for parking of vehicles. It may be run on commercial or non-commercial basis
7.3	Taxi/Auto stand	A premise used for parking of intermediate public transport vehicles run on commercial basis. The parking lots may be run on commercial or non-commercial basis
7.4	Truck terminal/ transport Nagar	A premise for parking of trucks on short term or long-term basis. It may include agency offices, workshops, Dhaba's, spare part shops, god owns, petrol/ diesel filling stations and such other operational facilities

S. no	Activities /Uses	Definition
7.5	Bus depot/Bus terminal	Bus Depot: A premise used by a public transport agency or any other such agency for parking, maintenance, and repair of buses. This may or may not include a workshop Bus Terminal: A premise used by a public transport agency to park the buses for short
7.6	Bus stand/ Shelter	A Bus Stand or Bus Shelter is a designated location on a road away from carriageway to park buses for short time periods for embarkation and disembarkation of passengers
7.7	Motor garage/ service workshop	A premise for servicing and repair of automobiles
7.8	Traffic Park/ children traffic park/ training centre	A premise in the form of park with facilities for introducing and Educating public/ children about traffic and signals. The training centre shall have facilities for training of driving automobiles.
7.9	Loading/ Unloading facilities	The provision and management of loading and unloading facilities / spaces for pickup-delivery vehicles
7.10	Transport/ cargo booking centre	Place where (advance) arrangements made for a specific shipment of goods.
7.11	Container depot	Open storage area for shipping containers
7.12	Toll plaza	A premise/facility for collection of tolls for use of toll road. It may include office building for management of toll collection process.
7.13	Heli pad	Helipad (helicopter landing pad) is a landing area for helicopters. Usually a helipad does not have fuel and service facilities, and does not maintain a full-time air traffic controller
7.14	Railway Godown/ Railway Yard/ Siding Terminal	The whole system of tracks, the trains and the organization and people needed to operate them
7.15	Airport Strip	A runway without normal air base or airport facilities
7.16	Roads	Premise for travel in roads which are primarily paved
8.	Agriculture	
8.1	Orchard/ Plant nursery/ Social forestry	Orchard would mean a premise with a thick growth of fruit trees. It may also include garden with fruit trees. Plant nursery would mean a premise with facilities for rearing and sale of young plants. Forestry would mean a premise with thick natural flora including social forestry, which may have part natural flora and part man made flora.
8.2	Farmhouse	A dwelling house on a farm.
8.3	Dairy/ Poultry Farm	A premise with facilities for rearing and processing of dairy/ poultry products. It may have temporary structures for sheds of cows/ birds
8.4	Agriculture Equipment workshop/ Service Centre	A premise with facilities for servicing and repair of agricultural equipment's like tractor, trolley, harvesters etc.
8.5	Agriculture/ Horticulture/ Cash Crops	The science or practice of farming, including cultivation of the soil for the growing of crops and the rearing of animals to provide food, wool, and other products

S. no	Activities /Uses	Definition
8.6	Apiary/ Pisci Culture	A premise with facilities for rearing and processing of bee/ fisheries products. It may have temporary structures for sheds of birds/ fish

8.5 Permissible Uses in a Land Use Zone

Table 8-2: Permissible Use and Supporting Facility of a Use Premise

Sr.No	Activities /Uses	Permissible Use
1	Residential	
1.1.	Single House/ Plot/ Flat	Residence Support Facilities- Professional practice by the residents
1.2.	Group Housing	As per Building Regulations Support Facilities- As per Building Regulations
1.3.	Guard chaukidar residence	Guard/Chaukidar residence Permissible uses- Residence for Guard/ Chowkidar
2	Commercial	
2.1.	Retail shops/Platform	Retail Shop/Plat Form Permissible uses- Retail Shop, Hawkers' Platform
2.2.	Repair shops	Permissible uses- Repair shop, spare parts shop
2.3.	Personal Service shops	Permissible uses- Personal service shop
2.4.	Vending booth	Permissible uses- Vending booth/kiosk
2.5.	Showroom	Permissible uses- Showroom
2.6.	Weekly market	Permissible uses- Weekly market, informal retail trade, kiosks, (all structures will be temporary and mobile, only for one day in a week, public conveniences temporary or permanent as per decision of the Authority)
2.7.	Convenience shopping centre	Permissible uses- Retail, Repair and Personal Service shop, Showroom, Restaurant, Canteen, Food Court, Clinic and Polyclinic, Clinical Laboratory, Kiosk/ Vending booth, Bakery, Confectionary, Atta Chakki , Office, Bank, Coaching Centres/ Training Institutes, Informal Commercial units / platform, Multilevel Parking. Support Facilities- Guest House, Service Apartment, Health centre/ Dispensary, Nursing home, Health club/Gym, Yoga/ Meditation centre, Dance/Music/Art centre, religious centre, Barat Ghar, Exhibition Hall

Sr.No	Activities /Uses	Permissible Use
2.8.	Local/sector level shopping centre	Permissible uses- Retail, Repair and Personal Service shops, Showroom, Restaurant, Canteen, Food Court, Clinic and Polyclinic, Clinical Laboratory, Kiosks, Vending booth, Bakery, Confectionary, Atta Chakki, Office, Bank, Coaching Centres/ Training Institutes, Informal commercial units / platform, Cinema/Multiplex, Multilevel Parking, Support Facilities- Guest House, Service Apartment, Banquet Hall, Exhibition Hall, Health Centre/Dispensary, Nursing home, Health club/Gym, Yoga/ Meditation centre, Dance/Music/Art centre, Religious centre, Convention/ Conference centre, Auditorium, Barat Ghar.
2.9.	Shopping commercial centre/ shopping mall	Permissible uses- Retail shop, Showroom, Personal Service shop, Bakery, Confectionary, Food Court/ Canteen/ Restaurant, Office, Cinema/Multiplex, Drive in Cinema, Bank, Hotel, Guest House, Service Apartment, Banquet Hall/ Barat Ghar, Convention/ Conference centre, Auditorium, Art Gallery, Health Club/ Gym/ Spa, Guest House/ Lodging/ Boarding House, Vending Booth/ kiosk, Milk Booth, Clinic and Polyclinic, Clinical Lab, Internet/ Information Centre, Petrol / Diesel/ Gas filling Station, Coaching Centres/ Training Institutes, Fruit and Vegetable market, Informal Commercial unit/Platform, Multilevel Parking, Taxi/Auto/Rickshaw Stand, Bus Shelter, Transport /Cargo Booking Centre, Residential (as per Building Regulations) Support Facilities- Repair Shop, Motor garage and Workshop, Automobile showroom/ Showroom cum service centre, Warehousing, Exhibition Hall /Exhibition Centre, Recreational Club/Swimming pool, Socio Cultural centre, Dance/ Music/ Art Centre, Yoga/ Meditation Centre, Museum, Indoor Stadium/ Games Hall, Amusement/ Specialised /Theme Park, Open Air Theatre, Library, R&D Centre, Religious Centre, Community Centre, Social Welfare Centre, Health Centre/Family Welfare Centre/ Dispensary, Nursing Home
2.10.	Informal commercial unit/platform	Permissible uses- Informal commercial unit / Platform
2.11.	Wholesale market/Mandi	Permissible uses- Wholesale shop, Repair Shop, Bank, Automobile showroom/ Showroom cum service centre, Restaurant/Canteen/Food court, Coal/Wood/Building Material Market, Vegetable/ Fruit Market, Cold Storage, Warehouse/ Godown for Non-Hazardous items, Loading/unloading facility, Vending Booth/kiosk, Multilevel Parking, Taxi/Auto Rickshaw/Rickshaw stand, Office, Weighbridge/ Dharam Kanta, Petrol / Diesel/ Gas filling Station, Cinema/Multiplex, Informal

Sr.No	Activities /Uses	Permissible Use
		Commercial unit/Platform Support Facilities- Guest House/Lodging/Boarding House, Hotel, Showroom, Retail Shop, Personal Service Shop, Truck Parking and other logistics, Health Centre/Family Welfare Centre/ Dispensary, Nursing Home, Service apartment
2.12.	Bakery/Confectionary/Atta Chakki	Permissible uses- Bakery/Confectionary/Atta Chakki
2.13.	Coal/wood/Building material market	Permissible uses- Wholesale shop, Repair Shop, Showroom, Bank, Automobile showroom/ Showroom cum service centre, Restaurant/Canteen/Food court, Warehouse/ Godown for Non-Hazardous items, Loading/unloading facility, Truck Parking and other logistics, Vending Booth/ Kiosk, Multilevel Parking, Taxi/Auto Rickshaw/Rickshaw stand, Office, Weighbridge/Dharam Kanta, Petrol / Diesel/ Gas filling Station, Informal Commercial unit/Platform, Support Facilities- Guest House/Lodging/Boarding House, Retail Shop, Personal Service Shop, Health Centre/Family Welfare Centre/ Dispensary, Nursing Home, Service apartment
2.14.	Vegetable/Fruit market	Permissible uses- Wholesale shop, Retail Shop, Repair Shop, Personal Service Shop, Bank, Restaurant/Canteen/Food court, Warehouse/ Godown for Non-Hazardous items, Cold Storage, Gas Godown, Loading/unloading facility, Truck Parking and other logistics, Vending Booth/Kiosk, Multilevel Parking, Taxi/ Auto Rickshaw/ Rickshaw stand, Weighbridge/ Dharamkanta, Petrol / Diesel/ Gas filling Station, Informal Commercial unit/Platform Support Facilities- Guest House/Lodging/Boarding House, Showroom, Office, Health Centre/Family Welfare Centre/Dispensary, Nursing Home
2.15.	Cold storage	Permissible uses- Cold storage, Loading/unloading facility, Truck Parking and other logistics, Support Facilities- Office, Canteen, Vending Booth/Kiosk,
2.16.	Hotels	Permissible uses- Lodging facility, Restaurant /Canteen/ Food court, Dining hall, Cafeteria, Tourist Information centre, Convention Centre/Conference centre/ Auditorium, Seminar Hall, Exhibition Hall, Banquet Hall Laundry, Recreational Club/Swimming pool, Internet/Information Centre, Health Club/Gym/Spa, Discotheque, Yoga/ Meditation Centre, Multilevel Parking, Office, Support Facilities-

Sr.No	Activities /Uses	Permissible Use
		Bank, Creche, Automobile showroom/ Showroom cum service centre, Retail Shop, Personal service shops, Showroom, Service Apartment, Health centre/Dispensary.
2.17.	Service Apartment	Permissible uses- Guest Suite, Conference Facilities, Office, Support Facilities- Bank, Creche, Health Centre/Dispensary, Retail Shop, Personal Service Shop, Restaurant/Canteen/Food Court.
2.18.	Restaurant/ Canteen/ Food Court	Permissible uses- Restaurant, Canteen, Food court, Banquet Hall, Vending Booth, Support Facilities- Office, Bank extension counter
2.19.	Cinema/Multiplex	Permissible uses- Cinema/ Multiplex, Retail Shop, Personal Service Shop, Showroom, Office, Restaurant, Food Court, Vending booth/ kiosk, Multilevel Parking Support Facilities- Bank, Gym/ Health club/ Spa, Taxi/Auto/Auto rickshaw stand,
2.20.	Drive-in cinema	Permissible uses- Open air theatre, Drive in cinema, Open Air Restaurant, Support Facilities- Office related to cinema activity.
2.21.	Exhibition hall/ Exhibition centre	Permissible uses- Exhibition Hall, Exhibition centre and art gallery, Library, Store/Godown facility, Auditorium, Multilevel Parking, Support Facilities- Office, Showroom, Dance/ Music/ Art Centre, Yoga/ Meditation Centre, Museum, Restaurant/Canteen/Food court, Vending Booth/Kiosk,
2.22.	Banquet hall/ Barat Ghar	Permissible uses- Banquet Hall, Barat Ghar, Guest suite/room, Restaurant, Food court, Vending Booth/kiosk, Multilevel Parking Support Facilities- Retail shop, Personal service shop, Bank, Auto-rickshaw stand, Office
2.23.	Electric Charging Station	Permissible uses- public electric charging station, Automobile Repair Shop, Automobile Service station, Support Facilities- Office, Retail shop/Departmental Store, Showroom.
2.24.	Petrol pump/Diesel station	Permissible uses- Petrol/Diesel Pump/Fuel Station, Gas filling station, public electric charging station, Automobile Repair Shop, Automobile Service station, Support Facilities- Office, Retail shop/Departmental Store, Showroom.
2.25.	Oil depot and LPG refilling plant	Permissible uses- Oil and Gas Depot, LPG refilling plant, Truck Parking

Sr.No	Activities /Uses	Permissible Use
		Support Facilities- Booking Office
2.26.	Gas godown	Permissible uses- Gas Godown, Truck Parking, Support Facilities-Booking Office,
2.27.	Warehouses for non-hazardous items	Permissible uses- Store/Godown, Loading unloading facility, Truck Parking, Support Facilities- Booking Office,
2.28.	Warehouses for hazardous items	Permissible uses- Store/Godown, Loading unloading facility, Control/Inspection room, Truck Parking, Support Facilities- Booking Office,
2.29.	Automobiles showroom/Automobile Showroom cum Service Station	Permissible uses- Automobile showroom, Licensed service centre, Parking, Retail shop (Spare Parts), Truck Parking, Support Facilities- Office, Retail shop, Kiosk/Vending Booth,
2.30.	Weigh bridge/ Dharmkanta	Permissible Use Weigh Bridge, Dharmkanta, Vending Booth, Kiosk Support Facilities- Booking Office,
2.31.	Storage Godown for Inflammable Items (LPG, Petrol, Diesel, Kerosene, Lubricants, Aviation Fuel etc)	Permissible uses- Store/Godown, Loading unloading facility, Control/Inspection room, Truck Parking, Support Facilities- Booking Office
2.32.	Agriculture Produce Selling Market/ Grain Market	Permissible uses- Wholesale shop, Retail Shop, Repair Shop, Personal Service Shop, Bank, Restaurant/Canteen/Food court, Warehouse/ Godown for Non-Hazardous items, Cold Storage, Gas Godown, Loading/unloading facility, Truck Parking and other logistics, Vending Booth/Kiosk, Multilevel Parking, Taxi/ Auto Rickshaw/ Rickshaw stand, Weighbridge/ Dharmkanta, Petrol / Diesel/ Gas filling Station, Informal Commercial unit/PlatformSupport Facilities-Guest House/Lodging/Boarding House, Showroom, Office, Health Centre/Family Welfare Centre/Dispensary, Nursing Home
2.33.	Junkyard	Permissible uses- Junkyard, Loading unloading facility, Truck Parking, Support Facilities- Booking Office, Office
2.34.	Steel/ Cement/ Building Material Yard	Permissible uses Storage Yard, Loading Unloading Facility, Truck Parking, Weigh Bridge Support Facilities- Office, Storage Godowns
3	Industrial	
3.1.	Service industries	Permissible uses-

Sr.No	Activities /Uses	Permissible Use
		Service/Cottage Industry (Non-Hazardous, Non-polluting) as per stipulation of Industries department, residential unit Support Facilities- Crèche/ Day-care centre, Retail shop for the product manufactured, Storage
3.2.	Cottage industries	Permissible uses- Service/Cottage Industry (Non-Hazardous, Non-polluting) as per stipulation of Industries department, residential unit Support Facilities- Crèche/ Day-care centre, Retail shop for the product manufactured, Storage
3.3.	Flatted factories	Permissible uses- Industrial units (Non-Hazardous, Non-polluting) as per stipulation of Industries department, Canteen, Loading Unloading Facility, Truck parking, Multilevel Parking Support Facilities- Office, Bank, Gym, Storage, Taxi/Auto/Auto rickshaw stand, vending booth/kiosk, internet Centre, Creche and Day care centre.
3.4.	Information/ software technology industry	Permissible uses- IT plots/buildings Support facilities a) Commercial Shops, Ares for storage, display and sale of merchandise, Cinema halls, Hotels, Restaurants, open eating kiosks b) Residential uses, Hostel, Guest house, Staff quarters c) Institutional Facilities- Waiting and transit areas, Areas designated for public utilities, Travel services, Telephone Exchange, Electric substation, water works, Export related facilities, Canteen/Restaurant, Creche and day care centre, operation and maintenance by specialized agencies, Training centre and library, Health Club and Gym for users/residents of IT and ITES, Games/entertainment room for users/residents of IT and ITES, Banking and Financial services, Business and Financial services, Business Centre/Conference facilities, Shops, Open eating kiosks. Note: The extent of support facilities under Commercial, Residential, and Institutional uses for different size if plots shall be decided by the Authority in the scheme from time to time.
3.5.	Small/light industry	Permissible uses- Industrial units (Non-Hazardous, Non-polluting) as per stipulation of industry department, Canteen, Loading Unloading Facility, Truck parking, Vending booth/kiosk, Storage, Multilevel Parking Support Facilities- Office, Bank, Showroom for display/sale of industrial products manufactured in the unit, Gym/Health club, Crèche and day care centre, Internet centre, Dispensary, Taxi/Auto/Auto rickshaw

Sr.No	Activities /Uses	Permissible Use
		stand,
3.6.	Industrial plot (specific industry type)	Industrial units (Non-Hazardous, Non-polluting) as per stipulation of industry department, Canteen, Loading Unloading Facility, Truck parking, Vending booth, kiosk, Storage, Internet centre, Multilevel Parking Support Facilities- Office, Bank, Showroom for display/sale of industrial products manufactured in the unit, Gym/ Health club, Crèche and day care centre, Internet centre, Dispensary, Taxi/Auto/Auto rickshaw stand,
3.7.	Industrial Plot (integrated use)	In Industrial plot having area more than 25 Acre, integrated use of Industrial, Commercial and Staff Housing shall be allowed, where industrial activity shall remain as a core activity with minimum 75% of permissible FAR. Staff Housing:- Dormitory, field hostel etc. other than Bangalow shall be allowed with maximum 12% of permissible FAR. Commercial:- Commercial activity shall be allowed with maximum 8% of permissible FAR. Support Facilities:- Support facilities shall be allowed as- waiting transit area, area designated for public utilities, travel services, telephone exchange, Electric sub-station, water works, Export related facilities, canteen, creche and day care centre, operations and maintenance by specialized agencies, training center and library, health center and Gym for end users if institutions. ATM services with 5% of permissible FAR.
3.8.	Medium & Large-scale industry	Industrial units (Non-Hazardous, Non-polluting) as per stipulation of industry department, Showroom for display/sale of industrial products Canteen, Creche and day-cares centre, Loading Unloading Facility, Truck parking, Vending booth/kiosk, Storage, Internet centre, Multilevel Parking Support Facilities- Office, Bank, Showroom for display/sale of industrial products manufactured in the unit, Gym/Health club, Crèche and day-care centre, Internet centre, Dispensary, Taxi/Auto/Auto rickshaw stand,
3.9.	Film centre/ TV radio programme production centre	Permissible uses- Film Centre/TV Centre, Radio Programme Production Centre, Auditorium, Media Centre, Canteen, Library, Vending booth/ Kiosk Support Facilities- Office, Bank, counter Gym/ Health club, Creche and day-care centre, Taxi/Auto/Auto rickshaw stand.
3.10.	Biotechnology/ Biotech Park	Permissible uses- BT plots/buildings/Incubators/labs/ Virtual information Centre/Patent Facilitating Centre/Central Analytical Instrumentation Facility/Bioprospecting facility/Micro

Sr.No	Activities /Uses	Permissible Use
		propagation Facility/Medicinal Plant Extraction Facility/Fermentation Facility/Food processing/Testing facility/Bioinformatics Support facilities a) Commercial- Shops, Ares for storage, display and sale of merchandise, Cinema halls, Hotels, Restaurants, open eating kiosks b) Residential- Residential uses, Hostel, Guest house, Staff quarters c) Institutional Facilities-Waiting and transit areas, Areas designated for public utilities, Travel services, Telephone Exchange, Electric substation, Neutralization tank and guard pond for process effluents, water works, Compressed Air generators, Vacuum generators, Chemical Store building, central treatment facilities, Cold room, Export related facilities, Canteen/Restaurant, Creche and day care centre, operation and maintenance by specialized agencies, Training centre and library, Health Club and Gym for users/residents of BT park, Games/entertainment room for users/residents of BT park, Banking and Financial services, Business and Financial services, Business Centre/Conference facilities, Shops, Open eating kiosks, Note: The extent of support facilities under Commercial, Residential and Institutional uses for different size if plots shall be decided by the Authority in the scheme from time to time.
3.11.	Non- Polluting Agro based & food processing units	Permissible uses- Industrial units (Non-Hazardous, Non-polluting) as per stipulation of industry department, Canteen, Loading Unloading Facility, Truck parking, Vending booth/kiosk, Storage, Multilevel Parking Support Facilities- Office, Bank, Showroom for display/sale of industrial products manufactured in the unit, Gym/Health club, Crèche and day care centre, Internet centre, Dispensary, Taxi/Auto/Auto rickshaw stand,
3.12.	Milk Pasturing Plant	Permissible Use Milk Pasturing Plant
3.13.	Milk Collection Centre	Permissible Use Milk Collection Centre
4	Logistics	
4.1	Freight complex/ Logistic Park	Permissible uses- Booking Office, Warehouse, Store/ Godown, Cold Storage, Space for Container Stocking, Truck Parking, Loading /Unloading facilities, Repair shop, Weighbridge, Vending Booth/Kiosk Support Facilities- Office, Petrol/Diesel/Gas filling station, Bank, Service Station, Restaurant/Canteen/ Food court,

Sr.No	Activities /Uses	Permissible Use
5.a	Public/Semi-Public Institutional facilities -	
5.1	Govt./Semi Govt./Public undertaking/local body office	Govt./Semi Govt. /Public Undertaking/Local Body Office Permissible uses- Govt./Semi Govt./Public Undertaking/Local Body Office, Multilevel parking, Conference facilities, Seminar Hall, Support Facilities- Auditorium, International conference centre, Cultural and information centre, Stationary shop, Book store, Chemist store, Vending booth/Kiosk, Health Club / Gym, Bank extension counter, General store, Crèche, Indoor games halls, Dispensary, Internet centre, Library, Museum, Planetarium, R&D centres, Radio and television station, Canteen, Staff Housing, Guest house, Hostel, Transit Hostel.
5.2	Office/corporate office	Permissible uses- Office/Corporate office, Conference room, Seminal Hall, Multilevel Parking Support Facilities- Auditorium, International conference centre, Cultural and information centre, Stationary shop, Book store, Chemist store, Vending booth/Kiosk, Health Club / Gym, Bank extension counter, General store, Crèche, Indoor games halls, Dispensary, Internet centre, Library, Museum, Planetarium, R&D centres, Radio and television station, Canteen, Staff Housing, Guest house, Hostel, Transit Hostel.
5.3	Professional/personal office	Permissible uses- Professional/Personal/Agent Office, Conference room, Support Facilities- Canteen, Bank extension counter
5.4	Project development/management/maintenance office	Permissible uses- Project development/ Management/ Maintenance office, Support Facilities- Bank extension counter, Canteen,
5.5	Satellite/wireless/Telecommunication centre	Permissible uses- Satellite/Wireless/Telecommunication Centre, residential flat (for maintenance staff), Support Facilities- Research laboratory, Canteen
5.6	Guest house/lodging/boarding house	Guest house/lodging/boarding house Guest room/Suite, Conference Facilities, Banquet Hall, , Support Facilities- Office, Canteen, Retail Shop, Personal Service Shop, Bank, Crèche, Health Centre/Dispensary
5.7	Hostel	Permissible uses- Rooms/suites, dining facilities, Support Facilities- Office, Canteen, Personal service shops, retail store for daily needs, Indoor/ outdoor games

Sr.No	Activities /Uses	Permissible Use
		facilities, Bank extension counter, Creche, Health Centre/Dispensary, Caretaker/ warden residence.
5.8	Reformatory & Orphanage	Permissible uses- Reformatory and orphanage, Hostel. Support Facilities- Health centre/ Dispensary, Residence of Caretaker and maintenance staff, Personal service shop
5.9	Old age home	Permissible uses- Rooms/suites, Dining facilities, Canteen, Support Facilities- Guest Room, Bank, Retail shop, Personal service shop, Chemist, Health Centre/Dispensary, Nursing home, Health club/Gym, Yoga/ Meditation centre, Dance/Music/Art centre, Religious centre, Bank extension counter, Vending booth/Kiosk
5.10	School for mentally challenged persons	Permissible uses- School for mentally, physically challenged, Hostel. Support Facilities- Health centre / Dispensary, Medicine shop, Residence of Caretaker, and maintenance staff, Personal service shop
5.11	Crèche & day care centre/ play & nursery school	Permissible uses- Crèche & Day Care Centre/Play & Nursery School, Support Facilities- Residence of caretaker and maintenance staff,
5.12	Primary school	Permissible uses- Primary school, Canteen, Swimming pool, Auditorium, Library, Indoor games Hall, Hostel. Support Facilities- Retail shop for books and stationery, uniform, Bank extension counter, Staff housing, Vending booth/Kiosk
5.13	Secondary school/ integrated residential school	Permissible uses- Senior secondary school, Canteen, Swimming pool, Auditorium, Library, Indoor games Hall, Hostel Support Facilities- Retail shop for Books and Stationery, Uniform, Chemist; Bank extension counter, Vending booth/Kiosk, Staff housing
5.14	Vocational Institute / training Institute / ITI	Permissible uses- Vocational training centre, Canteen, Swimming pool, Auditorium, Library, Indoor games Hall, Hostel Support Facilities- Guest house, Transit hostel, Retail shops for Books and Stationery, Chemist, Fruits and vegetables, general store; Personal service shop, Repair shop, Vending booth/Kiosk, Bank extension counter, Staff housing
5.15	Degree / PG college	Permissible uses-

Sr.No	Activities /Uses	Permissible Use
		Degree/P G/professional (MBA /Engg etc.) college, Canteen, Swimming pool, Library, Auditorium, Indoor games Hall, Hostel Support Facilities- Guest house, Transit hostel, Retail shop for Books and Stationary, Chemist, Fruits and vegetables, general store; Personal service shop, Repair shop, vending booth/Kiosk; Bank extension counter, Staff housing
5.16	University	Permissible uses- University, Educational Colleges, Canteen, Swimming pool, Indoor games Hall, Convention Centre, Exhibition Hall, Support Facilities- Auditorium, Indoor games Hall, Hostel, Guest house, Canteen, Retail shop for Books and Stationary, Chemist, Flowers, Fruits and vegetables, general store; Personal service shop, Repair shop, Vending booth/Kiosk, Bank extension counter, Staff housing, Cultural and information centre, International conference centre, internet café, Library, Museum, Planetarium, R&D Centre, Radio and Television station, Gym/ Health club, Guest House, Transit Hostel
5.17	Post office	Permissible uses- Post and Telegraph Office, Canteen,
5.18	Telephone exchange	Permissible uses- Telephone exchange/RLU/RSU, Support Facilities- Canteen, Bank Extension Counter, Staff Housing,
5.19	Police station	Permissible uses- Police Station, Support Facilities- Canteen, Bank Extension Counter, Staff Housing,
5.20	Fire station	Permissible uses- Fire Station, Service workshop, Hostel/dormitory, , Support Facilities- Canteen, Bank extension counter, Staff Housing
5.21	Police post	Permissible uses- Police post Support Facilities- Canteen, Bank extension counter, Staff Housing
5.22	Library	Permissible uses- Library, Internet/information centre, Exhibition Hall, and art gallery, Support Facilities- Auditorium, Canteen, Staff housing, Bank extension counter,
5.23	R & D centre	Permissible uses- Research and Development Centre, internet/Information Centre, Hostel, Library, Support Facilities- Auditorium, Canteen, Staff housing, Guest House, Transit hostel, Bank Extension counter, Health/Gym

Sr.No	Activities /Uses	Permissible Use
5.24	Health centre/ family welfare centre	Permissible uses- Health centre, Dispensary, Family welfare centre, Support Facilities- Canteen, Chemist shop, Vending Booth/kiosk, Office,
5.25	Trauma centre	Permissible uses Trauma centre, hostel, Support Facilities- Canteen, Vending Booth/ Kiosk, Bank extension counter, Chemist shop, Books/Stationery Shop, General Departmental store, Personal service Shop, Office, Staff Housing, Patient attendant accommodation, Gym,
5.26	Medical college/ hospital	Permissible uses- Hospital Support Facilities- Auditorium, Bank extension counter, Cultural and Information Centre, Chemist shop, Canteen, Books/Stationery /Flower Shop, Indoor Games Hall, International conference centre, Internet Centre, Library, Museum, Planetarium, R&D centre, Radio and Television Centre, General Departmental store, Personal service Shop, Office, Staff Housing, Patient attendant accommodation, Health club/Gym, Guest House, Hostel, Transit Hostel, Vending booth/kiosk
5.27	Clinic	Permissible uses- Clinic Support Facilities- Chemist shop
5.28	Nursing home	Permissible uses- Nursing Home, Clinical lab, Support Facilities- Chemist shop, Vending booth/kiosk,
5.29	Clinical laboratory / Diagnostic centre	Permissible uses- Clinic laboratory, Support Facilities- Clinic, Chemist shop, Vending Booth/kiosk,
5.30	Veterinary hospital/ Dispensary	Permissible uses- Veterinary Hospital/Dispensary, Diagnostic Centre, Support Facilities- Canteen, Chemist shop, Staff Housing
5.31	Health club/ Gym	Permissible uses- Health club/Gym, Vending booth/Kiosk
5.32	Dance/ Music/Art centre	Permissible uses- Dance/Music/Art centre, Support Facilities- Auditorium, Guest House, Canteen, Vending booth/Kiosk, hostel
5.33	Yoga/ Meditation centre	Permissible uses- Yoga/Meditation centre, Library, Conference Facilities, , Hostel

Sr.No	Activities /Uses	Permissible Use
		Support Facilities- Guest House, Auditorium, Canteen, Vending booth/Kiosk
5.34	Religious building/centre	Permissible uses- Religious Building/Centre, Yoga and Meditation Hall, Library, Ashram, Bathing Ghat, Gaushala, Dargah, Support Facilities- Residence for essential staff/ priest, Retail shop for flowers/ offerings, Charitable Dispensary, Dining Hall with kitchen,
5.35	Community centre	Permissible uses- Community centre/ Barat Ghar, Support Facilities- Indoor games, Library, Restaurant, Vending booth/kiosk, Guest rooms
5.36	Convention conference centre/ Auditorium	Permissible uses- Convention centre/Conference Centre/Auditorium, Exhibition Hall, Art Gallery, Internet/ information centre, Multilevel parking, Support Facilities- Restaurant, Hostel, Canteen, Library, Guest room, Bank extension counter, Caretaker and Maintenance Staff Housing,
5.37	Socio-Cultural centre	Permissible uses- Socio-cultural Centre, Exhibition Centre, Art Gallery, Dance/ Drama/Music Training centre, Swimming Pool, Multilevel parking, Support Facilities- Auditorium, Library, Museum, Canteen, Vending Booth/kiosk, Bank extension counter,
5.38	PCO Public call office	Permissible uses- PCO
5.39	Internet/Information centre	Permissible uses- Internet/Information Centre Support Facilities- Bank Extension counter, Canteen, Library
5.40	Social welfare centre	Permissible uses- Social Welfare centre, Support Facilities- Canteen, Library, Vending Booth/kiosk, Bank extension counter
5.41	Crematorium/ Burial ground/ cremation	Permissible uses- Cremation/Burial ground/Crematorium, Support Facilities- Retail shop of wood, flowers and related material, Maintenance staff residence
5.42	Night shelter (rain basera)	Permissible uses- Night shelter Support facilities

Sr.No	Activities /Uses	Permissible Use
5.43	Disaster management centre	Permissible uses- Disaster Management Centre Support Facilities Office, Canteen, Training Centre,
5.44	Metrological station	Permissible uses- Metrological station Support Facilities Office, Canteen, Training Centre,
5.45	Banks	Permissible Uses- Bank Support Activities Bank, Canteen
5.46	ATM	Permissible Uses- ATM
5.47	Milk Booth	Permissible uses- Rooms/suites, Dining facilities, Canteen, Support Facilities- Guest Room, Bank, Retail shop, Personal service shop, Chemist, Health Centre/Dispensary, Nursing home, Health club/Gym, Yoga/ Meditation centre, Dance/Music/Art centre, Religious centre, Bank extension counter, Vending booth/Kiosk
5.b	Public/Semi-Public (Utilities/Facility)	
5.48	Sewerage treatment plant	Permissible uses- Sewerage treatment plant/Pumping station, Support Facilities- Office, Maintenance staff residence
5.49	Pumping station	Permissible uses- Pumping Station Support Facilities- Office, Maintenance staff residence
5.50	Solid Waste Treatment Plant:	Permissible uses- Solid waste treatment plant Support Facilities- Office, Maintenance staff residence
5.51	Sanitary landfill site/ solid waste treatment plant	Permissible uses- Sanitary landfill site Support Facilities- Office, Maintenance staff residence
5.52	Recycling plant	Permissible uses- Recycling Plant Support Facilities- Office, Maintenance staff residence
5.53	Tube well/ Overhead tanks/ Underground tanks/ Renny wall	Permissible uses- Tube well/Overhead tanks/Underground tanks/Rainy well Support Facilities- Office, Maintenance staff residence

Sr.No	Activities /Uses	Permissible Use
5.54	Water treatment plants	Permissible uses- Water Treatment Plant Support Facilities- Office, Maintenance staff residence
5.55	Electric sub station	Permissible uses- Electric sub-station Support Facilities- Office, Maintenance staff residence
5.56	Public toilets	Permissible uses- Public toilet
5.57	Transmission tower/ mobile tower as per YEIDA policy	Permissible uses- Transmission tower/Mobile tower as per Noida Policy
5.58	Drinking water booths	Permissible Use, Drinking Water Booth
5.59	Water Works	Permissible Use, Water Works
5.60	Electric Post	Permissible Use, Electric Post
6	Recreational Green	
7.1	Park/Playground	Permissible uses- Park, playground Support Facilities- Vending Booth/ Kiosk (max. 4 in number/ 40% depending on plot size)
7.2	Multipurpose open spaces	Permissible uses- Multipurpose open space Support Facilities- Vending Booth/ Kiosk
7.3	Golf course/ Racecourse	Permissible uses- Golf Course, Racecourse, Swimming Pool, Indoor/ Outdoor games facilities, Multilevel Parking Support Facilities- Pro shop/ Sports goods shop, Bar/ Restaurants, Vending booth/ Kiosk, Conference facilities, Bank extension counter, Caretaker Residence, Guest house, Golfers' temporary accommodation
7.4	Stadium/ Sports training centre/Sports complex	Permissible uses- Stadium/ Sports Training Centre/ Sports Complex, Indoor/ Outdoor games facilities, Hostel, Swimming pool, Multilevel parking Support Facilities- Staff housing, Grocery shop, Sports goods shop, Personal service shop, Canteen, Vending booth/Kiosk, Conference facilities, Bank extension counter, Caretaker Residence, Guest house, Players' temporary accommodation
7.5	Picnic spot	Permissible uses- Picnic huts, Camping site, Park, playground, landscaped garden Support Facilities-

Sr.No	Activities /Uses	Permissible Use
		Restaurant/Food court/ Canteen, Vending booth/ Kiosk, Caretaker Residence
7.6	Indoor stadium/ games hall	Permissible uses- Multipurpose Indoor Stadium, Indoor Games Hall, Indoor Games facilities, Swimming pool, Outdoor sports facilities, Park, Playground Support Facilities- Hostel, Canteen, Office related to sports facilities, Vending booth/ Kiosk, Conference facilities, Bank extension counter, Caretaker Residence, Guest house, Players' temporary accommodation
7.7	Planetarium	Permissible uses- Planetarium Support Facilities- (20% of permissible FAR) Restaurant/ Food court/Canteen, Vending booth/ Kiosk, Bank extension counter, Indoor games, Retail shop, Caretaker Residence
7.8	Aquarium	Permissible uses- Aquarium Support Facilities- (20% of permissible FAR) Restaurant/ Food court/Canteen, Vending booth/ Kiosk, Bank extension counter, Indoor games, Retail shop, Caretaker Residence
7.9	Amusement/ Specialized/ Theme Park	Permissible uses- Amusement/ Specialised/ Theme Park, Playground Support Facilities- (30% of permissible FAR) Restaurant/ Food court/Canteen, Vending booth/ Kiosk, Bank extension counter, Indoor games, Retail shop, Caretaker Residence
7.10	Recreational club/ Swimming pool	Permissible uses- Recreational Club, Swimming Pool, Indoor/Outdoor games facilities, Park, playground Support Facilities- Restaurant/ Food court/ Canteen, Vending booth/ Kiosk, Caretaker residence, Library, Bank extension counter,
7.11	Museum cum Auditorium	Permissible uses- Museum cum Auditorium/Conference Hall/ Art Exhibition Gallery, Open air theatre, Multi level Parking Support Facilities- (10% of permissible FAR) Canteen, office, Vending booth/ Kiosk, Caretaker residence, Library, Bank extension counter,
7.12	Open air theatre	Permissible uses- Open Air Theatre, Support Facilities- Canteen, Office, Vending booth/ Kiosk, Caretaker residence,
7.13	National Memorials	Permissible uses- National Memorial, Support Facilities Canteen, Office, Card/gift shop, Vending booth/ Kiosk, Caretaker residence,

Sr.No	Activities /Uses	Permissible Use
7.14	Biodiversity Park	Permissible Activity Biodiversity Park + support activity 10%
7.15	Shooting Range	Permissible Activity Shooting Range Support Activity- (10% of permissible FAR) Restaurants, Food Court, Canteen, Gift shop, Retail Shops, Caretaker Residence, Bank Extension Counter
7.16	Zoo, Wildlife/ Bird Sanctuary	Permissible uses- Zoo, Wildlife Sanctuary, Bird Sanctuary Support Facilities- (20% of permissible FAR) Restaurants, Food Court, Canteen, Gift shop, Retail Shops, Caretaker Residence, Bank Extension Counter
7.17	Tourist Facility Centre	Permissible uses Tourist facility Centre Support Facilities- Restaurant/ Food court/Canteen, Vending booth/ Kiosk, Bank extension counter, Indoor games, Retail shop, Caretaker Residence
7.18	Sports City	Permissible Uses: All kinds of Indoor/ Outdoor sports Facilities, Training centre, Swimming pool Complex- in 15% of the area Support Facilities- (in 15% of the area) Hostel, Staff housing, Guest house, Office, Retail shops of grocery, sports goods, Chemist, Restaurant/ Food court/ Canteen, Vending booth/ Kiosk, Caretaker residence, Library, Bank extension counter, Players' temporary accommodation Ground Coverage in green area 20%, FAR 0.40, + FAR 20% purchasable
7	Transportation	
7.1	Open Parking	Permissible uses- Open Parking, Vending booth/Kiosk
7.2	Covered/ multi-level parking	Permissible uses- Multi-level parking, Support Facilities- Office, Maintenance staff residence
7.3	Taxi/Auto stand	Permissible uses- Taxi/Auto/Rickshaw Stand Support Facilities- Vending Booth/kiosk,
7.4	Truck terminal/ transport Nagar	Permissible uses- Truck parking, Service Garage, Spare parts shops, Repair shop, Transport Agencies offices and other related offices, Showroom, Weighbridge/Dharamkanta, Storage Godowns, Multi-level parking, Support Facilities- Retail shop, showroom, Office, Restaurant, Hotel, Bank, Vending booth/kiosk
7.5	Bus depot/Bus terminal	Permissible uses-

Sr.No	Activities /Uses	Permissible Use
		Bus Terminal, Support Facilities- Office, Canteen
7.6	Bus stand/ Shelter	Permissible uses- Bus stand/ Shelter
7.7	Motor garage/ service workshop	Permissible uses- Motor Garage/Service Garage/Workshop, Service Station Support Facilities- Automobile showroom, Spare parts shop, office, Vending Booth/kiosk
7.8	Traffic Park/ children traffic park/ training centre	Permissible uses- Traffic Park/Children Traffic Park/Training Centre, Support Facilities- Restaurant, Vending Booth/kiosk
7.9	Loading/ Unloading facilities	Permissible uses- Loading/Unloading Facilities/Space, Weighbridge, Support Facilities- Vending booth/kiosk
7.10	Transport/ cargo booking centre	Permissible uses- Transport/Cargo booking office, Warehousing/Godown, Truck Parking Support Facilities- Office, Vending booth/kiosk, Canteen,
7.11	Container depot	Permissible uses- Storage of Containers, Weighbridge, Truck parking, Warehousing/Storage Godown, Office Support Facilities- Vending booth/kiosk, Canteen,
7.12	Toll plaza	Permissible uses- Toll plaza, Maintenance office Support Facilities- Office
7.13	Heli pad	Permissible uses- Helipad, Office, Waiting Area,
7.14	Railway Godown/ Railway Yard/ Siding Terminal	Permissible uses- Railway, Godown, Railway Yard, Siding Terminal
7.15	Airport Strip	Permissible uses- Airport Strip
7.16	Roads	Permissible Uses Roads, Green belt, footpath
8	Agriculture	
8.1	Orchard/ Plant nursery/ Social forestry	Permissible uses- Orchard/ Plant nursery/ Social forestry Support Facilities- Shop selling seeds, Plants, gardening equipment, vending booth/ Kiosk, Caretaker residence (all structures shall be temporary in nature)
8.2	Farmhouse	Permissible uses- Farmhouse Support Facilities-

Sr.No	Activities /Uses	Permissible Use
		Caretaker residence
8.3	Dairy/ Poultry Farm	Permissible uses- Dairy Farm, Poultry Farm Support Facilities- Caretaker residence
8.4	Agriculture Equipment workshop/ Service Centre	Permissible uses- Agriculture Equipment workshop/ service centre Support Facilities- Spare parts shop, Repair shop
8.5	Agriculture/ Horticulture/ Cash Crops	Permissible uses- Agriculture, Horticulture, Cash Crops Support Facilities- Caretaker residence
8.6	Apiary/ Pisci Culture	Permissible uses- Fish Farm, Bee Farm Support Facilities- Caretaker residence

Support activities are exclusive of the activities mentioned in the definition of the use premises so all such activities mentioned in the definition of use premises are permissible for the same.

Note:

- 1) For support facilities maximum 25% of Permissible FAR may be allowed.
- 2) Support facilities mentioned below are permissible in all use premises mentioned from 2.0 to 9.0 (unless otherwise specifically prohibited by the Authority in any premise)
 - Guard/ Chowkidar residence
 - ATM
 - PCO
 - Open Parking, Covered parking
 - Public conveniences
 - Helipad
 - Public facilities and utilities(Post office counter, Post office, Post and Telegraph office, Police Post, Police Station, Fire Post, Fire Station, Telephone exchange, RLU/RSU, Electric Sub Station, Sewage Treatment plant, Sewage pumping station, Water works, Underground Reservoir, Water treatment plant)
 - Satellite wireless telecommunication centre or tower,
- 3) In addition to the permissible activities mentioned above, if any other uses have been permitted in earlier schemes, allotment or lease conditions prior to these regulations, the same uses shall continue to be permissible unless otherwise specially prohibited under special circumstances, if any by the Authority in any particular scheme.

8.6 PROVISION FOR EXISTING STRUCTURES/ESTABLISHMENTS

Any existing establishment running within the proposed urban centre in any zone other than its core landuse zone may be allowed to continue. However, the Authority/State Govt./Central Govt. or its departments/agencies can take appropriate decision/actions as per law with regards to existing structures in the ROW of existing roads and ROW of the proposed Master Plan Roads/Railway/Other Transport Mode. Moreover, the expansion or reconstruction more than the existing area shall be governed as per the permissibility of that activity as per zoning regulations.

Further, existing structures used for non conforming uses, that are not permissible as per zoning regulations may be maintained, repaired, or renovated without changing, extending, expanding its external dimensions as per the detailed policy on the same that shall be prepared by Authority for regulating such uses from the date of Master Plan coming into force.

8.7 SUB DIVISION OF USE ZONES AND SUB DIVISION REGULATION

The Sub division of land with a view to prepare a layout plan is done for a sector or area, which is designated primarily for a specific use zone already specified earlier as per the Master Plan. The objective of regulations detailed herein is to guide the preparation of layout plans for use areas. These regulations include norms for provisions of circulation system, open spaces, and facilities. The service plans corresponding to these layout plans for provisions of physical infrastructure like water supply, sewerage, drainage, power, telecom, gas and solid waste management etc. shall conform to the norms framed by the Authority from time to time.

8.7.1 Residential Use Zone

The sub-division of this use zone shall be governed by the provisions stated below:

- This use zone will have plotted development or flatted development or group housing or mix of both or all as per the scheme.
- Green and Open Spaces
 - The minimum area required under open space for tot-lots, parks and playground shall be 15%.
 - Area under green and open spaces of the scheme or sector shall be in addition to the area under Master Plan green areas.
 - The minimum average width of the green and open space shall be 7.5m. The green and open spaces can be of varied shapes provided they fulfil the recreational need of the community.

- The landscape plan shall be prepared and submitted in accordance with the provisions of building regulations.
- Roads
 - i. The minimum area under roads shall be 12%.
 - ii. The minimum Right of Way (ROW) of a vehicular road shall be 12 m. However in situations where the road adjoins a park or any open space with building only one side, it may have a minimum width of 9 m.
 - iii. In case of group housing development the minimum width of road shall be 18 meters.
 - iv. The roads shall have minimum width depending on the length of the road as follows-
 - a) Up to 400.0m. - 12.0 m.
 - b) 401-600.0m. - 18.0 m.
 - c) 601-1000.0m. - 24.0 m.
 - d) Above 1000.0m - 30.0 m.
 - v. The minimum width of Loop Street shall be 12.0 m. and maximum length 400.0 m.
 - vi. Maximum length of a 12.0 m wide dead end road shall be 100.0m. The road shall be provided with a cul-de-sac of 7.5 m radius at the dead end. Roads of less than 25 m length, cul-de-sac will not be required
- The provisions for rainwater harvesting shall be in accordance with the provisions of Building Regulations or as per policies of the State Government issued from time to time.
- The maximum area under commercial use shall be 5%.
- The minimum area under facilities shall be 5%.
- Provision of Social and Physical Infrastructure –
In addition to the city level facilities proposed in Land Use Plan, provision of physical and social infrastructure shall be planned for community & sector level as suggested in section ‘hierarchy of land uses’, chapter “Proposed Land Use Plan”. Authority reserves the right to change the provisions mentioned above by recording the reasons for the change.

8.7.2 Non Residential Use Areas

The sub-division of these use zones shall be governed by the provisions stated below:

- These use zones will have plotted development or flatted development or both as per the scheme.
- Green and Open Spaces-

- a) 10% of the total area of non-residential sector/area shall be green
- b) Area under green and open spaces of the scheme or sector shall be in addition to the area under Master Plan green areas.
- c) The landscape plan shall be prepared and submitted in accordance with the provisions of building regulations.
- Roads
 - (i) The minimum area under roads shall be 10%
 - (ii) The roads shall have minimum width depending on the length of the road as follows-
 - a) Up to 400.0m. - 18.0m.
 - b) 401-1000.0m. - 24.0m.
 - c) Above 1000.0m. - 30.0 m.
 - (iii) The width of other roads shall be in accordance with the width specified in Master Plan.
- The provisions for rainwater harvesting shall be in accordance with the provisions of Building Regulations or as per policies of state Government issued from time to time.
- The maximum area under commercial use shall be 2% (For areas other than commercial use zones).
- The minimum area under facilities shall be 5%.

8.8 USE PREMISES PERMISSIBLE IN USE ZONES

Table 8-3 Use Premise Permissible in Use Zone

Sr No	Activity/ Use	Permissible Use				Not Permissible				Conditional Permissible Use (1-7)				With Special Permission of the Board		
		Residential	Existing Village Abadi	Commercial	Industrial	Mixed Use	Tourism Zone	Institutional	Offices	Utility/Facility	Transportation	Green Belt	Park & Playground	Recreational Green	River Front Development	Agriculture
1	Residential															
1.1	Single House/ Plot/ Flat			6												
1.2	Group Housing			6			4									
1.3	Guard chaukidar residence															
2	Commercial															
2.1	Retail shops/Platform	1			1			1	1	1	1					
2.2	Repair shops	1			1											
2.3	Personal Service shops	1								1						
2.4	Vending booth	1			1			1	1							
2.5	Showroom	1			2						1					
2.6	Weekly market	3	3	3	3	3	3				3					
2.7	Convenience shopping centre	1			1			1	1		1					
2.8	Local/Sector level Shopping centre	1			1			1	1					1		
2.9	Shopping centre/ commercial centre/ shopping mall	1			1		4									
2.10	Informal commercial unit/platform	1			1		4									
2.11	Wholesale market/Mandi			1												
2.12	Bakery/Confectionary/Atta Chakki	1														
2.13	Coal/wood/ Building material market															
2.14	Vegetable/ Fruit market	1														
2.15	Cold Storage															
2.16	Hotels	1			1			1	1	1						
2.17	Service Apartment							1	1	1						
2.18	Restaurant/ Canteen/ Food Court	1														
2.19	Cinema/Multiplex	1			1									1		
2.20	Drive-in cinema															
2.21	Exhibition hall/ Exhibition centre	1														
2.22	Banquet hall/ Barat Ghar	1			1			1	1	1						
2.23	Electric Charing Station	1														
2.24	Petrol pump/Diesel station/ Gas Filling Station	1						1	1	1						
2.25	Oil depot and LPG refilling plant															
2.26	Gas Godown															
2.27	Warehouses for non-hazardous items															
2.28	Warehouses for hazardous items															

	SYMBOLS	Permissible Use				Not Permissible				Conditional Permissible Use (1-7)				With Special Permission of the Board		
Sr No	Activity/ Use	Residential	Existing Village Abadi	Commercial	Industrial	Mixed Use	Tourism Zone	Institutional	Offices	Utility/Facility	Transportation	Green Belt	Park & Playground	Recreational Green	River Front Development	Agriculture
2.29	Automobiles showroom/Automobile Showroom cum Service Station															
2.30	Weigh bridge/ DharmKanta															
2.31	Storage Godown for Inflammable Items (LPG, Petrol, Diesel, Kerosene, Lubricants, Aviation Fuel etc)															
2.32	Agriculture Produce Selling Market/ Grain Market															7
2.33	Junkyard/ Kabadkhana															
2.34	Steel/ Cement/ Building Material Yard															
3	Industrial															
3.1	Service industries															
3.2	Cottage industries															
3.3	Flatted factories															
3.4	Information/ software technology industry															
3.5	Small/light industry															
3.6	Industrial plot (specific industry type)															
3.7	Industrial plot (Integrated Use)															
3.8	Medium & large-scale industry															
3.9	Film centre/Film City/ TV radio programme production centre															
3.10	Biotechnology/ Biotech Park															
3.11	Non-Polluting Agro based Industries															
3.12	Milk Pasturing Plant															
3.13	Milk Collection Centre															
4	Logistic															
4.1	Freight complex/ Logistic Park															
5.A.	Public & Semi-Public (Institutional & Offices)															
5.1	Govt./Semi Govt./Public undertaking/local body office	5			5											
5.2	Office/corporate office	5			5											
5.3	Professional/personal/Agent office															
5.4	Project development/management/maintenance office	5			5											
5.5	Satellite/wireless/Telecommunication centre	5														
5.6	Guest house/lodging/boarding house	4														
5.7	Hostel	4														
5.8	Reformatory & Orphanage	4														
5.9	Old age home															
5.10	School for mentally/ physicallychallenged persons	4														

	SYMBOLS	Permissible Use				Not Permissible				Conditional Permissible Use (1-7)				With Special Permission of the Board		
Sr No	Activity/ Use	Residential	Existing Village Abadi	Commercial	Industrial	Mixed Use	Tourism Zone	Institutional	Offices	Utility/Facility	Transportation	Green Belt	Park & Playground	Recreational Green	River Front Development	Agriculture
5.11	Creche & day care centre/ play & nursery school															
5.12	Primary school	4			4			4	4							
5.13	Secondary school/ integrated residential school	4			4											
5.14	Vocational Institute / training Institute / ITI	4														
5.15	Degree / PG college/ Professional College	4														
5.16	University															
5.17	Post office															
5.18	Telephone exchange	4			4											
5.19	Police station	4			4											
5.2	Fire station	4			4											
5.21	Police post															
5.22	Library															
5.23	R & D centre	4														
5.24	Health centre/ family welfare centre	4			4											
5.25	Trauma centre	4														
5.26	Medical college/ hospital	4														
5.27	Clinic															
5.28	Nursing home	4			4											
5.29	Clinical laboratory / Diagnostic centre	1			1											
5.30	Veterinary hospital/ Dispensary															
5.31	Health club/ Gym	4														
5.32	Dance/ Music/Art centre	4			1											
5.33	Yoga/ Meditation centre		4													
5.34	Religious building/centre	4			4											
5.35	Community centre / Barat Ghar	4			4						4					
5.36	Convention centre/ conference centre/ Auditorium	4			4											
5.37	Socio-Cultural centre	4														
5.38	PCO Public call office															
5.39	Internet/Information centre	1			1											
5.40	Social welfare centre	1														
5.41	Crematorium/ Burial ground/ cremation									4						
5.42	Night shelter (rein basera)															
5.43	Disaster management centre															
5.44	Metrological station															
5.45	Banks	5														

	SYMBOLS	Permissible Use				Not Permissible				Conditional Permissible Use (1-7)				With Special Permission of the Board		
Sr No	Activity/ Use	Residential	Existing Village Abadi	Commercial	Industrial	Mixed Use	Tourism Zone	Institutional	Offices	Utility/Facility	Transportation	Green Belt	Park & Playground	Recreational Green	River Front Development	Agriculture
5.46	ATM															
5.47	Milk Booth															
5.B	Public & Semi-Public (Utilities/Facilities)															
5.48	Sewerage treatment plant	4		4							4			4		
5.49	Pumping station	4												4		
5.50	Solid Waste Treatment Plant															
5.51	Sanitary landfill site															
5.52	Recycling plant	4			4			4	4							
5.53	Tube well/ Overhead tanks/ Underground tanks/ Renny well															
5.54	Water treatment plants	4		4	4						4			4		
5.55	Electric sub station	4														
5.56	Public toilets															
5.57	Transmission tower/ mobile tower as per YEIDA policy	4														
5.58	Drinking water booths															
5.59	Water Works	4		4	4			4	4	4						
5.60	Electric Post															
6	Recreational Green															
6.1	Park/Play ground															
6.2	Multipurpose open spaces															
6.3	Golf course/ Race course															
6.4	Stadium/ Sports training centre/Sports complex	4			4											
6.5	Picnic spot															
6.6	Indoor stadium/ games hall	4														
6.7	Planetarium	4														
6.8	Aquarium	4														
6.9	Amusement/ theme park	4														
6.10	Recreational club/ Swimming pool	4			4											
6.11	Museum cum Auditorium/ Conference Hall/ Art/ Exhibition Gallery	4			4											
6.12	Open air theatre	4			4											
6.13	National Memorials															
6.14	Bio diversity park															
6.15	Shooting Range															
6.16	Zoo, Wildlife/ Bird Sanctuary															
6.17	Tourist Facility centre															

	SYMBOLS	Permissible Use				Not Permissible				Conditional Permissible Use (1-7)				With Special Permission of the Board		
Sr No	Activity/ Use	Residential	Existing Village Abadi	Commercial	Industrial	Mixed Use	Tourism Zone	Institutional	Offices	Utility/Facility	Transportation	Green Belt	Park & Playground	Recreational Green	River Front Development	Agriculture
6.18	Sports City	1														
7	Transportation															
7.1	Open Parking															
7.2	Covered/ multi-level parking															
7.3	Taxi/Auto stand	1												4		
7.4	Truck terminal/ transport nagar				4											
7.5	Bus depot/ Bus terminal				4											
7.6	Bus stand/ Shelter															
7.7	Motor Garage/Service Garage/Workshop				4	4										
7.8	Traffic park/ children traffic park/ training centre	4			4											
7.9	Loading/ Unloading facilities			4												
7.10	Transport/ Cargo booking centre	1														
7.11	Container depot															
7.12	Toll plaza															
7.13	Heli pad															
7.14	Railway Godown/ Railway Yard/ Siding Terminal															
7.15	Airport Strip															
7.16	Roads															
8	Agriculture															
8.1	Orchard/ Plant nursery/ Social forestry															
8.2	Farm house															
8.3	Dairy/ Poultry Farm															
8.4	Agriculture Equipment workshop/ Service Centre															
8.5	Agriculture/ Horticulture/ Cash Crops															
8.6	Apiary/ Pisci Culture															
9	Floating Activities															
9.1	Residential															
9.2	Commercial	1			1			1	1							
9.3	Public and Semi Public															
9.4	Transportation															
9.5	Industry															
9.6	Recreational															
9.7	Abadi Extension, Resettlement & Rehabilitation	4	4	4	4	4	4	4	4	4	4	4	4	4		4

Sr No	Conditions
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1	In planned designated commercial plot area.
2	Only for the products of industry /factory.
3	Only for 30m or more wide roads earmarked by YEIDA.
4	Planned and designated plot.
5	Planned Commercial or Facility or Institutional plot
6	The Authority may allow maximum 30% of permissible FAR for residential activities in the commercial plots of 4 hectare and above size, but the rate applicable in the total plot shall be that of the commercial land
7	Only on 24 meter or more wide roads earmarked by YEIDA or 24 meter wide Existing Road.
Sr No	Notes
1	These zoning regulations shall be applicable for planning of land uses at Master Planning/ Sector level.
2	The Authority may decide the activities to be permitted in Special Projects.
3	The authority may decide the activities to be permitted within Abadi Settlements area or abadi Extension Area.
4	Activities already permitted in the various schemes shall continue as per the terms & conditions specified in the scheme.
5	Commercial activities in other land uses shall be permitted on the basis of additional reserve price as decided from time to time by the authority.
6	Non-residential activities in the Village Abadi/ Abadi extension shall be permitted only on 12.0 m or wider roads.
7	In SDZ core and non-core activities shall be permitted as per SDZ policy.
8	No activity other than incidental to riverfront development land use (to be decided by the authority) shall be permissible in river front development land use
9	Any government scheme or activity approved or decided by State Government shall be allowed in notified Area of Authority.
10	Electric Sub Station/ water works/ other essential utilities shall be developed as per their controlled designs.
11	The Authority may alter or determine the Master plan Road Alingment paritally on the basis of ground feasibility/survey.