



View from the barrage looking towards the Seetanagram hill

5

LANDUSE STRATEGY AND MASTERPLAN

This chapter present the Capital city Landuse plan to guide development in the Amaravati Capital city.

The chapter covers the following topics:

1. Concept Plan
2. Broad Development Strategies
3. City of 9 Cities
4. Landuse Plan
5. Zoning Plan
6. Commercial Plan
7. Industrial Plan
8. SEED Development Master Plan

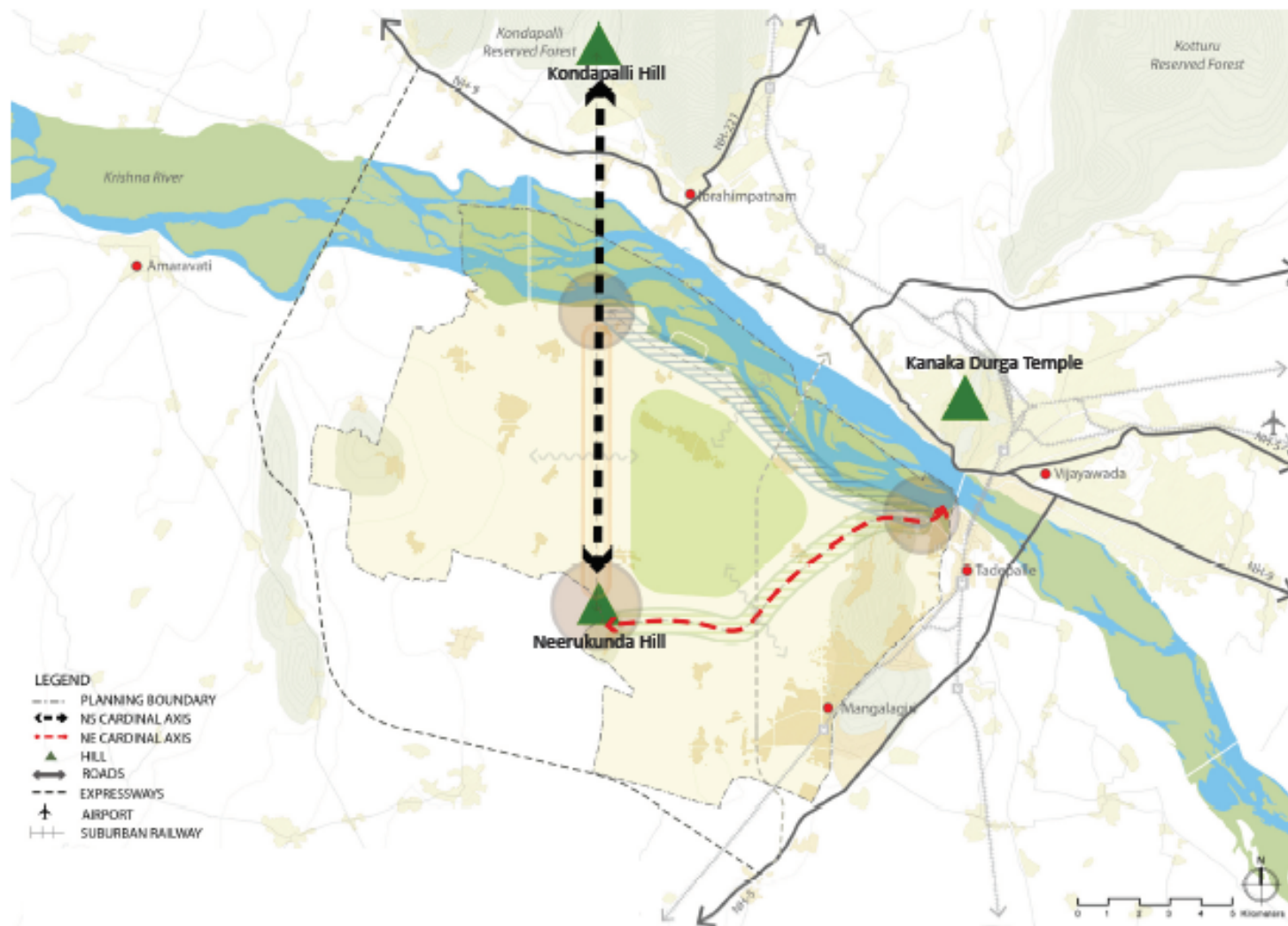


Fig.5.1 Vastu Considerations in Master Plan



Fig.5.2 Site slopes towards river Krishna

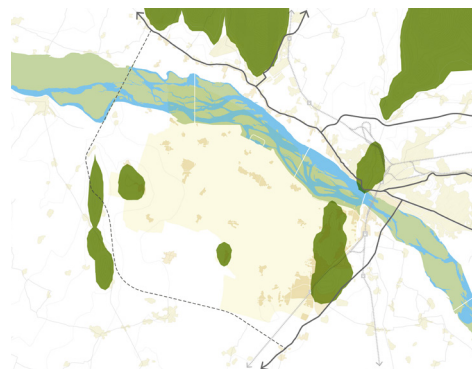


Fig.5.3 Location of hills

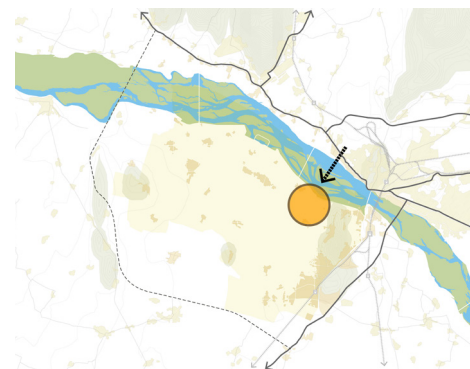


Fig.5.4 Main entry from east

5.1 CONCEPT PLAN

‘Vastu’ has played a critical role in Indian city planning and architectural design since ancient times. The Amaravati Capital city concept has thus, been derived from the ancient Vastu city planning principles. These principles help in identifying the city’s urban pattern, ceremonial axis and ensure positive flow of energy into the new city.

5.1.1 VASTU CONSIDERATIONS

The Amaravati Capital city concept plan encompasses the following Vastu principles to develop a comprehensive city Master plan:

1. SITE SETTING:

Vastu lays emphasis on careful site selection based on its topography and position of nearby hills and water bodies. The Amaravati Capital city site has been carefully chosen within the Capital region due to its proximity to river Krishna, the holy town of Amaravati and existing Vijayawada city.

2. CARDINAL AXIS (ORIENTATION)

Vastu city planning lays emphasis on aligning the primary roads and important city axes along the north-south cardinal direction and the equator. The concept plan adopts this principle to determine the alignment of the central administrative centre and all major city roads.

3. GRID PATTERN:

In line with the above Vastu principle, the concept proposes development

of the Amaravati Capital city in a rectangular grid aligned to cardinal directions with primary roads aligned to north-south poles and the equator. This connects life with cosmic structure, and individual intelligence with cosmic intelligence. This grid network will also help in developing east facing residential developments in the future.

4. NORTH-EAST AXIS:

Vastu suggests that the north-eastern winds bring in positive flow of energy. Hence, the Amaravati Capital city concept suggests development of a north-eastern axis to welcome flow of positive energy into the new city. As the existing Vijayawada city lies in the north-east of the proposed site, the new Amaravati Capital city will tap on the north eastern corridor to tap on the first entry point from the existing Vijayawada city.

5. BRAHMASTAN-GREEN HUB

Vastu city planning, expresses the importance of a ‘Brahmasthan’ (Silent Centre) as the centre of any space such as galaxy, molecule, atom, etc. Thus, it recommends development of a central core open space within each city as the centre magnet of the development. The concept plan acknowledges this recommendation and proposes a central green hub within the Amaravati Capital city.

6. MODULAR PLANNING

Vedic city planning recommends modular development of clusters such as neighbourhoods with central ‘Brahmasthan’ - central open space. The Amaravati Capital city will be planned as

flexible modular towns with adequate public facilities.

5.1.2 PLANNING STRATEGIES

ESTABLISHING GROWTH CORRIDORS

The Concept plan for the Amaravati Capital city proposes 3 important axes which serve as potential corridors within the city.

1. Civic axis

The Concept plan proposes an important North-South cardinal axis housing the states civic core with administrative functions like the state assembly, government offices, etc. The scenic Kondapalli and Neerkunda hills form the anchors to this axis. These hills will form scenic backdrops at either end of the axis.

2. Recreation axis

A north - eastern axis is planned along the existing the Kondaveeti Vagu river anchored by the historic Kanak Durga temple and Neerukunda hill. This axis will be developed as the city's recreational corridor housing a number of parks and open spaces with no development edge along either banks of the river. The recreation axis will also bring in positive flow of energy as highlighted in the vastu principles.

3. Waterfront axis

The Concept plan also proposes an axis along the river front lying between the civic and recreational axis. This axis shall house the city's downtown area with a vibrant waterfront commercial district that will create a distinctive skyline for the Amaravati city.

DETERMINING DEVELOPMENT NODES

The Concept plan proposes 9 themed development nodes across the city. These nodes as discussed in the previous chapter act as the important socio-economic anchors for the Capital city as the anchor of the 3 axes. These include:

4. Government node

Situated close to the waterfront in the north, this node is envisioned to be the vibrant commercial and civic heart of the city housing the state's new administrative core and city's central business district.

5. University node

The university node has been identified close to the Neerukunda hill located more centrally for easy connectivity and ample open spaces in its vicinity.

6. Tourism node

The tourism node is planned in the north-east at close proximity to the famous Undavalli caves housing a number of tourism and cultural activities.

OTHER STRATEGIES:

7. Township Planning

The concept proposes residential developments to be clusters into townships. Each township will be planned in accordance to the township model discussed in the following sections.

8. Industrial Planning

The concept plan carefully integrates industrial clusters within the city along the peripheral national highways. These clusters will be well connected to the residential areas via multiple modes of public transport.



Fig.5.5 Concept structure showing three axis and three nodes



Civic Axis



Recreation Axis



Waterfront Axis

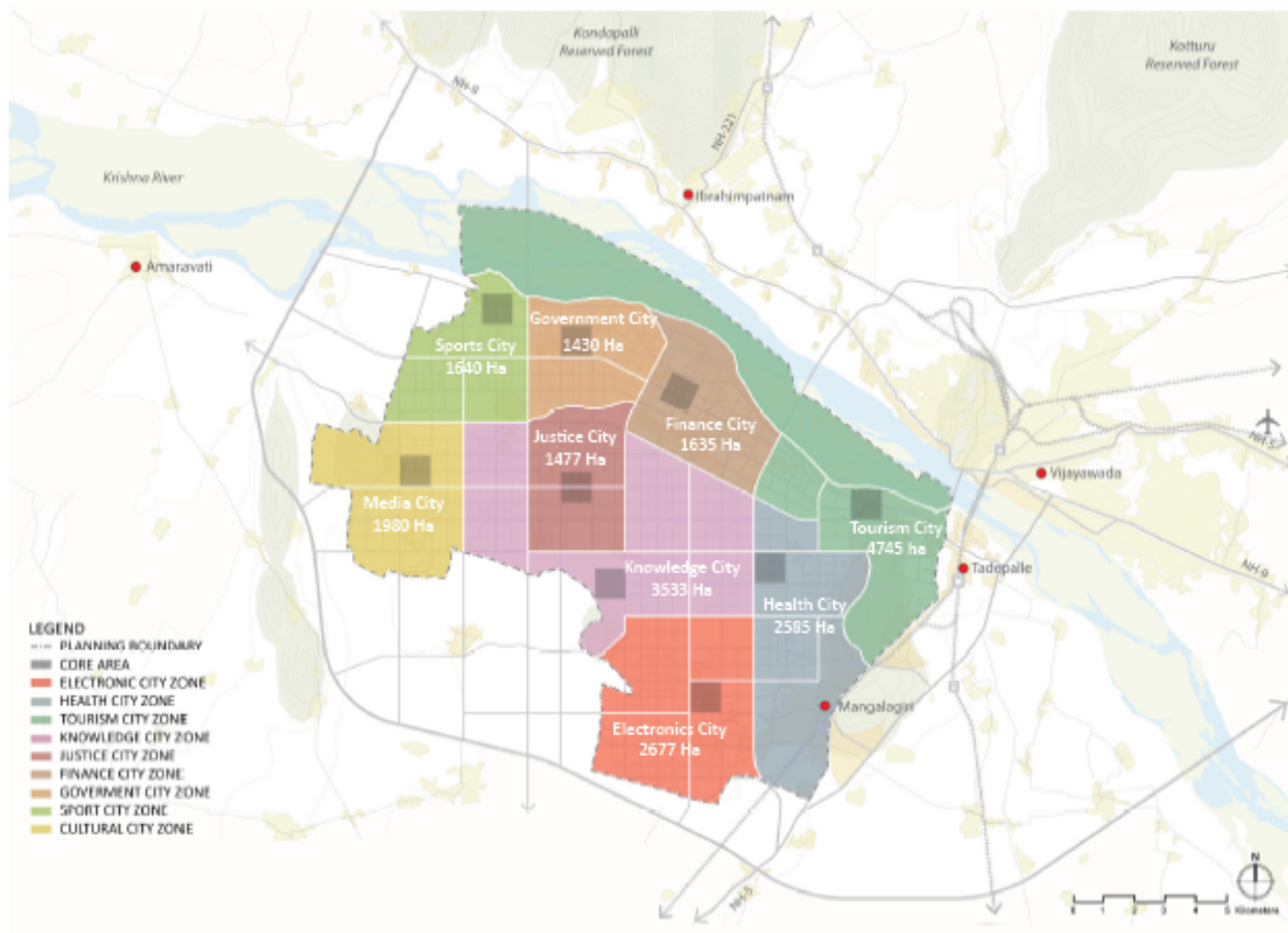
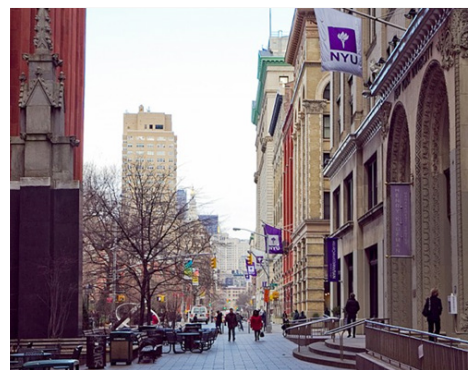


Fig.5.6 9 City Plan



Government City



Justice City



Education and Knowledge City



Finance City



Electronics City

5.2 A CITY OF 9 CITIES

The Concept plan proposes 9 themed development cities within the Capital city. These cities have been planned to accommodate complimentary functions and thematics. It may be noted that these cities do not represent administrative boundaries and can be refined by the CRDA for administrative purposes upon detailed studies.

As discussed in the previous chapter, these cities will act as important socio-economic anchors for the Capital city. As illustrated in Figure 5.6, Nine cities including the Government city, Justice city, Finance city, Education & knowledge city, Health city, Sports city, Cultural city, Electronics city and Tourism city core have been strategically planned across the Capital city.

Each of these cities will be a hub of activities serving a unique function and role within the Capital city. The role, activities and functions of each of the 9 cities has been discussed in the previous chapter. This will further

discuss the location, planning strategy and site setting of these 9 cities.



1. GOVERNMENT CITY

In line with Vastu principles the Government City is planned along the north-south cardinal axis, as explained in the Concept plan earlier. Housing several government functions and residential areas the city covers a land area of about 564 Ha encompassing 2 medium to high density townships that support the central government core.

The various functions to be housed within the government core have been discussed in the previous chapter. A central green ceremonial axis will bind the numerous Government city functions together.

The ceremonial axis will be marked by the state assembly and a large public waterfront plaza at either ends of the green axis. The city will also house a large number of government residences and mixed use developments.



2. JUSTICE CITY

Planned south of the government city along the north south cardinal axis, the Justice city will house the various judiciary functions and their support facilities. The Justice city covers a land area of about 566 Ha and 2 medium to high density townships. Similar to the Government city a central green corridor runs through the centre of the Justice city.



3. FINANCE CITY

As discussed in the previous chapter, the Finance city will be the economic core within the iconic waterfront central business district (CBD). Covering about 566 Ha the finance city primarily houses commercial and mixed use developments which are supported by city level civic and cultural facilities. Well served with 2 MRT lines the finance city will be easily accessible for all.

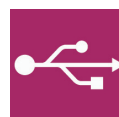
A large waterfront plaza and recreational island development will be a key attraction in the Finance city. Two

iconic towers earmark the waterfront plaza of the Finance city.



4. KNOWLEDGE CITY

As illustrated in Figure 5.6, the education and Knowledge city is planned south to the Justice and Finance cities. Housing a university campus, several colleges and knowledge park, the city cover a land area of about 1445 ha creating over 1,20,000 jobs and accommodating 5,73,575 population by 2050. A central city park sits in the heart of the education and knowledge city.



5. ELECTRONICS CITY

Planned in the south, the Electronics City will thrive on the well established IT and electronics industry in southern India. Covering a land area of 731 ha the city will create over 2,73,500 skilled jobs in the Amaravati Capital city.

The electronic city will have a well balanced mix of industrial and commercial areas as it houses the third Regional centre of the Amaravati

Capital city which is supported by 752 ha of industrial land.



6. HEALTH CITY

A dedicated Health city compliments the well distributed health facilities across the Amaravati Capital city. The primary focus of the Health city core is to provided super specialty clinic and hospitals that provide residents with a one stop centre for overall wellness and wealth.

The Health city core is planned to the high speed rail station and regional centre so that it is easily accessible to people from the Capital region as a whole. This is will help will help in further facilitating the rural and sub urban towns within the Capital region. Covering a land area of 1349 Ha the Health city will create 1,05,000 jobs in the health industry.



7. SPORTS CITY

Planned along the north western riverfront, the sports city is aimed to be a dynamic

waterfront attraction accommodating large stadiums, arena and event venues for international scale sports events. The sports and recreational attractions will be supported by complimentary commercial and mixed use developments to facilitate the spectators of these venues.

Covering a land area of 650 Ha the sports city will provide the Amaravati Capital city with an edge within southern Indian subcontinent in the sports and recreation industry.



8. MEDIA CITY

The Media and Cultural city is planned close to famous temple town of Anantaaram. Covering a land area of 677 Ha the city will accommodate 2,54,071 residential population.

A regional centre strengthen the commercial backbone of the media cultural city creating over 105,000 jobs.



9. TOURISM CITY

The Tourism city is planned in proximity to the historic Undavalli caves along the river Krishna waterfront. Interestingly the Tourism city is also well connected to the scenic Kondaveeti vagu and the primary green network of the city. Housing numerous tourism and cultural facilities, the Tourism city cover a land area of 531Ha and accommodates about 1,33,335 residential population within the Capital city. Several city level water tourism facilities will be planned along the waterfront and the islands to provide tourist with captivating views and serene environment.

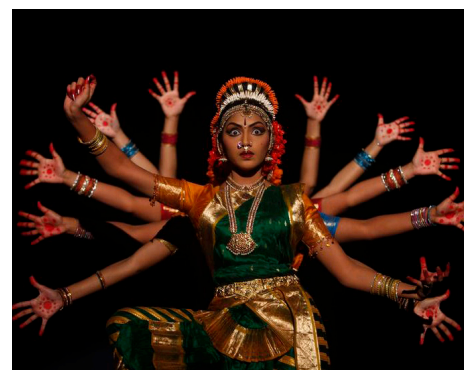
Case studies for each of the 9 cities have been described in Appendix 3.



Health City



Sports City



Media City



Tourism City

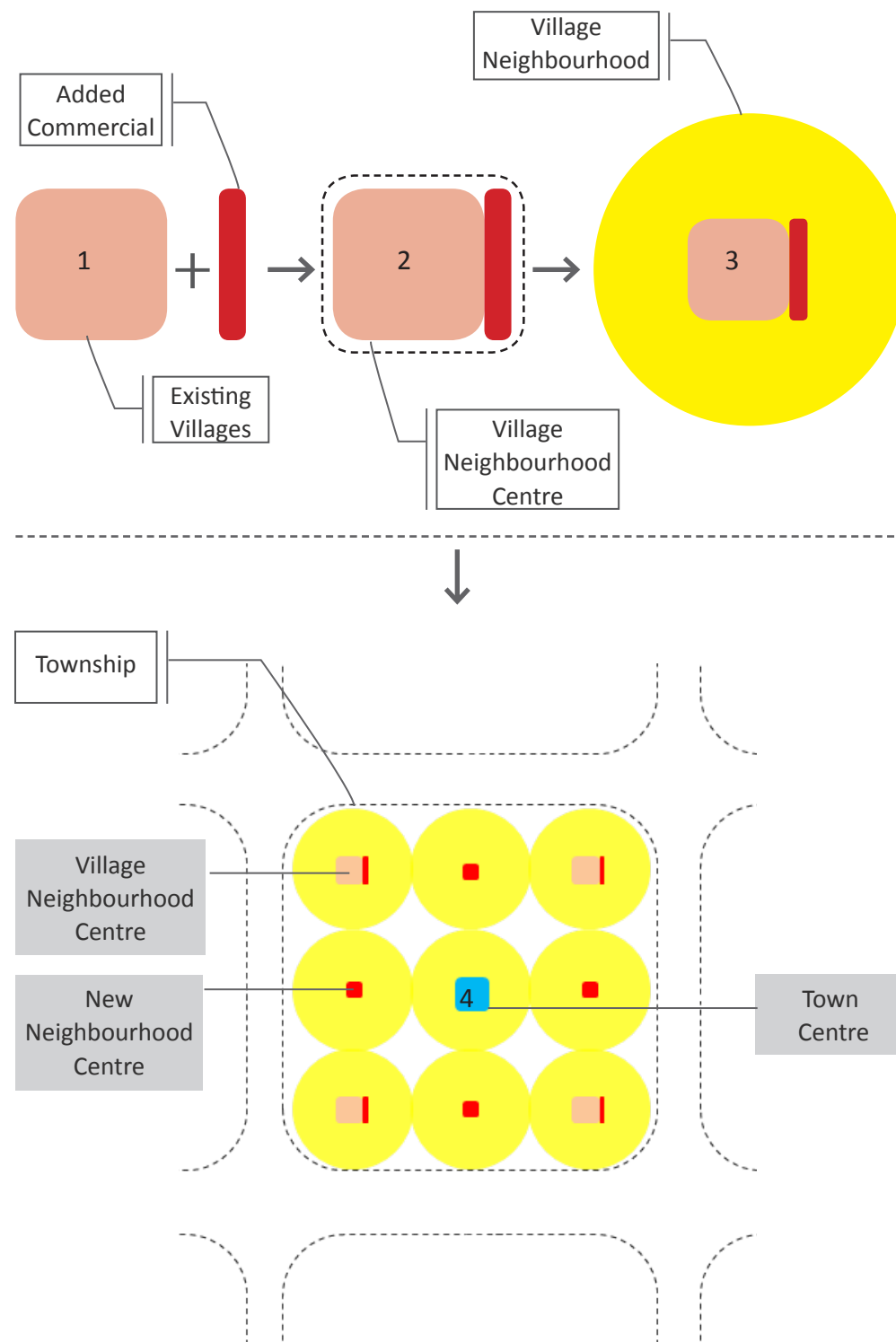


Fig.5.7 Village Township Model

5.2.1 TOWNSHIP MODEL

Township model is an urban planning tool which guides the planning process by providing an integrated landuse module that ensures well balanced provision of residential, commercial, industrial and civic facilities for a projected population. Together with the overall city structure plan, this model helps in preparing an implementable city landuse plan.

Before proceeding with the township model adopted for the Amaravati Capital city, the following section will present the village neighbourhood model which will be adopted in the existing village settlements.

VILLAGE NEIGHBOURHOOD MODEL

The village neighbourhood model (Figure 5.7) is based on an urban integration and village up-gradation strategy. Thus, the main aim of the model is to ensure adequate provision of civic amenities within the existing villages and carefully integrate these areas with future urban settlements within the Amaravati Capital city.

1. Retention of existing villages

The model proposes retention of existing village cores and supporting them by introducing missing civic amenities and commercial centres. These vibrant centres will form the heart of the villages by providing active public spaces.

2. Village Neighbourhood Centre

This civic and commercial node forms a typical model for the Village

Neighbourhood Centre. All existing villages shall be upgraded using this model.

3. Village Neighbourhood

The residential land that needs to be returned to the village land owners under the Land Pooling Scheme Rules, 2015¹ will be allocated within the vicinity of these existing settlements. This shall help in developing a larger community, and form the village neighbourhood.

4. Integration of Village

Neighbourhoods within townships

Village Neighbourhoods will be integrated with new urban neighbourhoods to form a township. Each township will be supported with a Town Centre (TC).

The Capital city township model is illustrated in the following section.

CAPITAL CITY - TOWNSHIP MODEL

The township model (Figure 5.8) proposed for the new Amaravati Capital city, is designed using the strategy of hierarchical distribution of population, landuses, open spaces and infrastructure.

While emphasising on efficient use of land resources to house people and activities, the model ensures efficient movement of people, goods and services, adequate provision of facilities, and a harmonious spatial pattern of landuses. The model does not omit the creation of strong and aesthetically pleasing visual identity.

The township model is guided by the following design principles:

Establishing the Cell as Core of Community Centric Planning

A cell - the smallest unit element in the township model - is designed based on the principle of comfortable walking distance and flexibility of land parcel division in the cell unit.

The dimension of 500x500 meters is dedicated to house up to 4,550 housing units², creating a small community with greenery, playground and vehicle free community spaces essential for a pleasant living environment.

Developing Walkable Neighbourhoods

The cells are amalgamated into walkable neighbourhoods of 15,000 to 30,000 population with the following characteristics:

- Well served by pedestrian friendly "local streets" and pedestrian network
- Supported by basic amenities such as neighbourhood shops, kindergarten, park and primary school, located at walkable distances (approximately 500 m radius)

Creating Vibrant Townships

The neighbourhoods are integrated into townships that accommodate 60,000 to 1,00,000 residential population with the following characteristics:

- Efficient transport system facilitated by the hierarchy of roads, ranging from major arterial

² Estimated number based on the High Density scenario of 182 DU per hectare

¹ Andhra Pradesh Land Pooling Scheme Rule, 2015

road to local access roads. Arterial roads run along the periphery defining the township boundaries and interconnecting the various townships together.

- Self sustainability supported by a hierarchy of commercial and communal centres varied in scale and service catchment, topped by township centre that serve as a one-stop service centre providing retail, social, institutional, health and public transportation services
- Greenery and walkability are brought forward by the preservation of existing water channels as well as flora and fauna, while introducing new and connected parks varied in size and service catchment area

Creating Jobs Close to Homes

The proposed township model proposes a number of employment nodes such as commercial offices, light industries and business parks in close proximity to residential developments. These economic nodes will be well connect to residential developments through public transport.

Integration of Villages

The proposed township model carefully integrates the existing village settlements by creating a peripheral road along the villages and providing commercial centre and public facilities in close proximity to the existing settlements. An example of village integration shall be explained in the later section of the report.

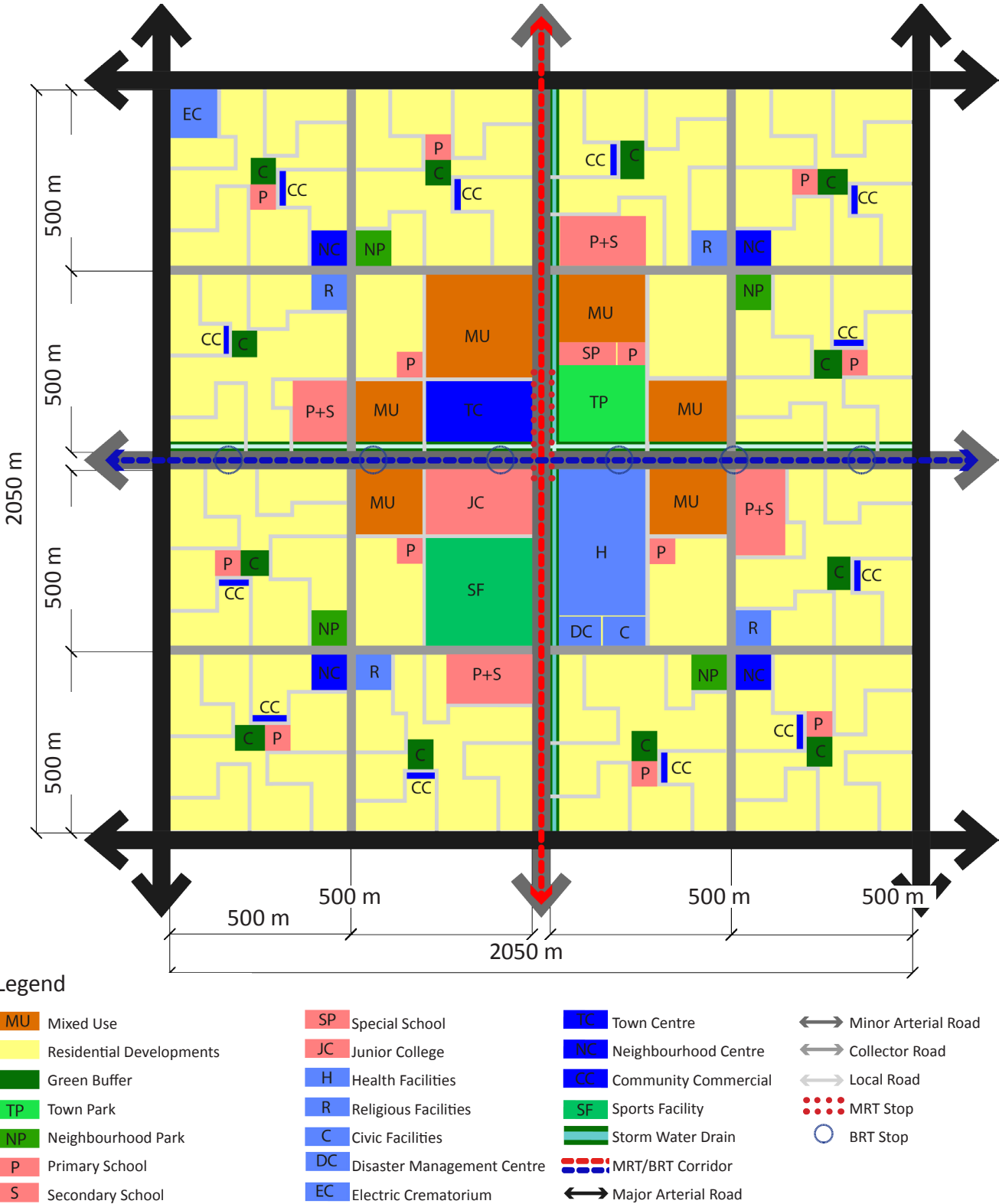
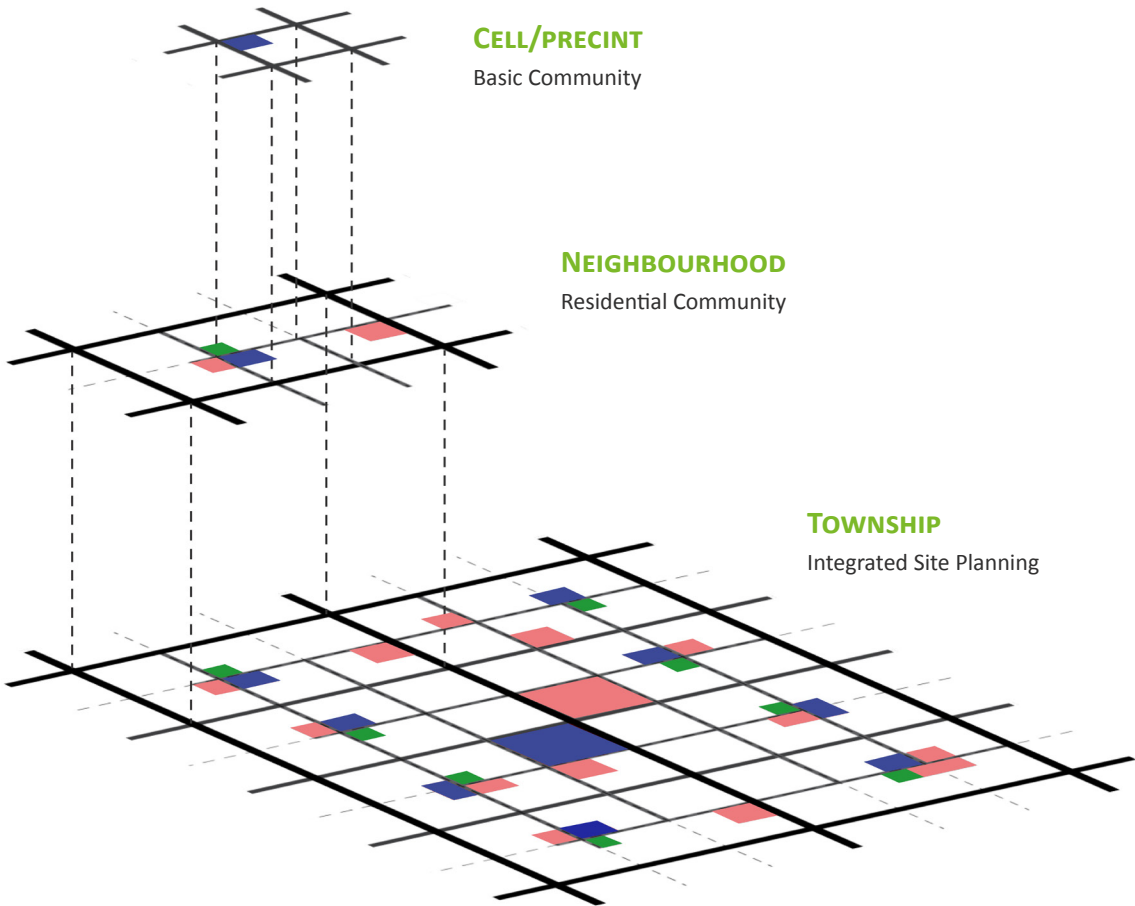


Fig.5.8 Amaravati Capital city Township Model

TOWNSHIP MODEL - DENSITY DISTRIBUTION

The township model represents broad schematic distribution of residential uses under one category as majority of the residential land within the Capital falls under the Land pooling act, 2014.

Hence, a detailed density distribution would be done during preparation of the Land pooling scheme plans to ensure appropriate distribution of densities within communities. Two density distribution options are

indicated in Figure 5.9. The two options explore the ideologies of linear and nodal densification patterns.

Option 1

The first alternative relies in the double public transportation corridors running north-south east west which creates and opportunity for linear densification along these axes. This helps in supporting transit oriented development.

In this case, the detailed land pooling scheme will allocate large high density

residential clusters along the two public transportation axes.

Option 2

The second alternative support a single north-south or east west public transportation corridor and promote nodal densification around the town centre to optimize distance from the main MRT station. In this case, the detailed land pooling scheme will allocate large high density residential clusters in the central core around the Town centre as illustrated in Figure 5.9.

OPTION 1

OPTION 2

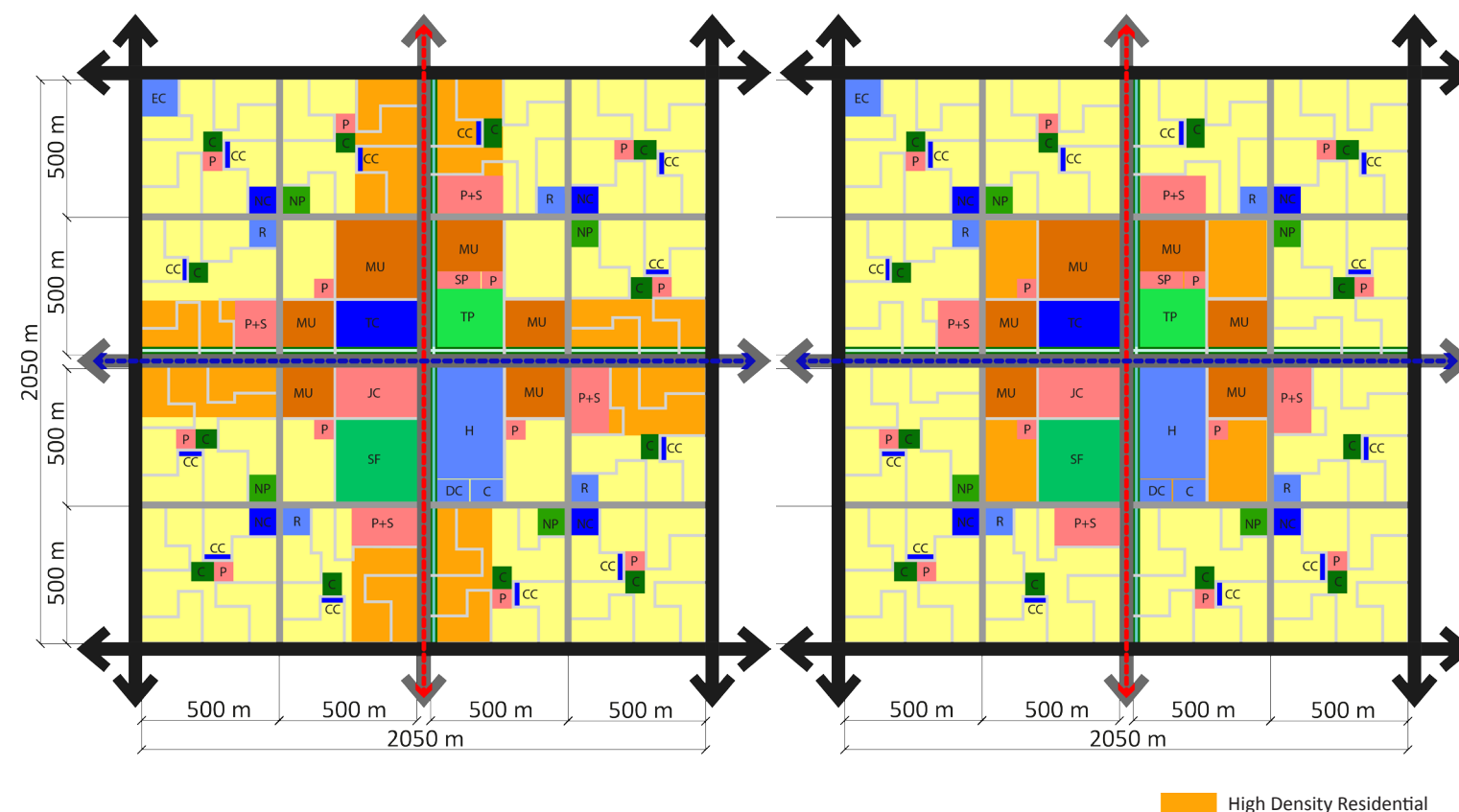


Fig.5.9 Amaravati Township Model - Density Distribution Options

5.3 LANDUSE PLAN

5.3.1 INTRODUCTION

The land use plan establishes a long-term plan for development within the Amaravati Capital city. It identifies and distributes landuses proportionately to accommodate 2.5 million people and create over 1.5 million jobs. It serves as the foundation and basis for the zoning plan and regulations which will be gazetted and implemented across Amaravati Capital city.

PLANNING INTENTION

The planning intention of the landuse plan is order to control the development within Amaravati Capital city by designated land parcels into different zones and landuse in order to provide sufficient programs and facilities within Amaravati Capital city. These landuses have been classified broadly in ten categories of land uses namely Residential, Commercial, Industry, Recreational, Regional Park, Transportation, Utility, Government, Public and Semi Public Facilities and Green and Blue. The development in these landuse zones would be carried out in accordance with the zoning regulations as given in the Development Code.

OBJECTIVES:

The planning objectives for the landuse distribution in the Amaravati Capital city include:

- Need for an integrated planning approach with transportation, infrastructure, ecology and

environmental issues and socio-economic needs

- Strict enforcement mechanism to curtail unauthorized developments
- Need for linking various natural ecosystems, landscapes, water bodies and to protect its environmental quality. This will help to ensure that fragile natural resources are protected by using ecologically sound development practices.
- Conserve and promote the city's historical and cultural heritage: Enhance, preserve and use historic, cultural, scenic, open space and recreational assets which supports community life and civic beauty of the city.
- Public service delivery in a planned manner: Improve public services to the residents by utilizing the infrastructure more efficiently. By supporting investments based on comprehensive planning and providing financial incentives for jurisdictions that cooperate in supplying public infrastructure and shared services, the residents will have the opportunity to enjoy services at a very reasonable cost.
- Land pooling for a win-win situation for both farmers and capital city for a contiguous and planned development

5.3.2 CAPITAL CITY - LANDUSE PLAN

The various planning objectives discussed in the previous section have been translated into a comprehensive

landuse as illustrated in Figure 5.10. As mentioned earlier, the plan creates 1.5 million jobs and accommodates over 2.5 million residential population within the city. The landuse plan proposes the following development strategies:

CITY OF DECENTRALIZED EMPLOYMENT CENTRES

3,554 Ha of land has been allocated for numerous commercial and industrial developments across the city. The plan proposes decentralization of the various employment nodes to create jobs closer to homes. The total commercial area includes the commercial land that is being returned under the land pooling scheme.

CITY OF SELF SUFFICIENT TOWNSHIPS

6,910 Ha of land has been safeguarded for a variety of residential developments across the city. The plan distributes residential developments as per housing densities in line with the township model discussed earlier. The plan protects all the existing village settlements within the city.

WATER NETWORKED CITY

The master plan ensures protection of all the existing rivers and water bodies and integrates them into the proposed green and blue network. These nature areas occupy about 6,270 Ha of the total land area within the Capital city.

WATERFRONT CITY

Careful consideration has been given to the river Krishna waterfront which will house the city's CBD, Civic core, Mixed use development and high end

waterfront housing. The waterfront has been planned in several thematic zones engaging the bund proposed along the river edge.

PEDESTRIAN FRIENDLY CITY

The Master plan proposes a well connected network for non motorized transport along the green and blue corridors of the city. This network will encourage green modes of non motorized transports such as bicycles, skates, segways, etc.

CITY WITH SOCIAL INFRASTRUCTURE

To ensure a good quality of life within the Capital city a set of public facility standards has been prepared. The Master plan distributes civic and cultural facilities in compliance with these standards and the township model discussed earlier.

CITY OF SMART SOLUTIONS

Modern and smart infrastructure provisions have been proposed for the capital. These provisions will ensure good sanitation, and adequate water and power supply across the city. They will also mitigate the flooding issues within the city.

CITY WITH STRONG CULTURAL ROOTS

The Master plan respects and supports the rich cultural and religious heritage of the city. The plan proposes a religious tourism circuit to connect the various attractions within the city.

CITY WITH GREEN IDENTITY

Numerous iconic developments define the city's green identity.

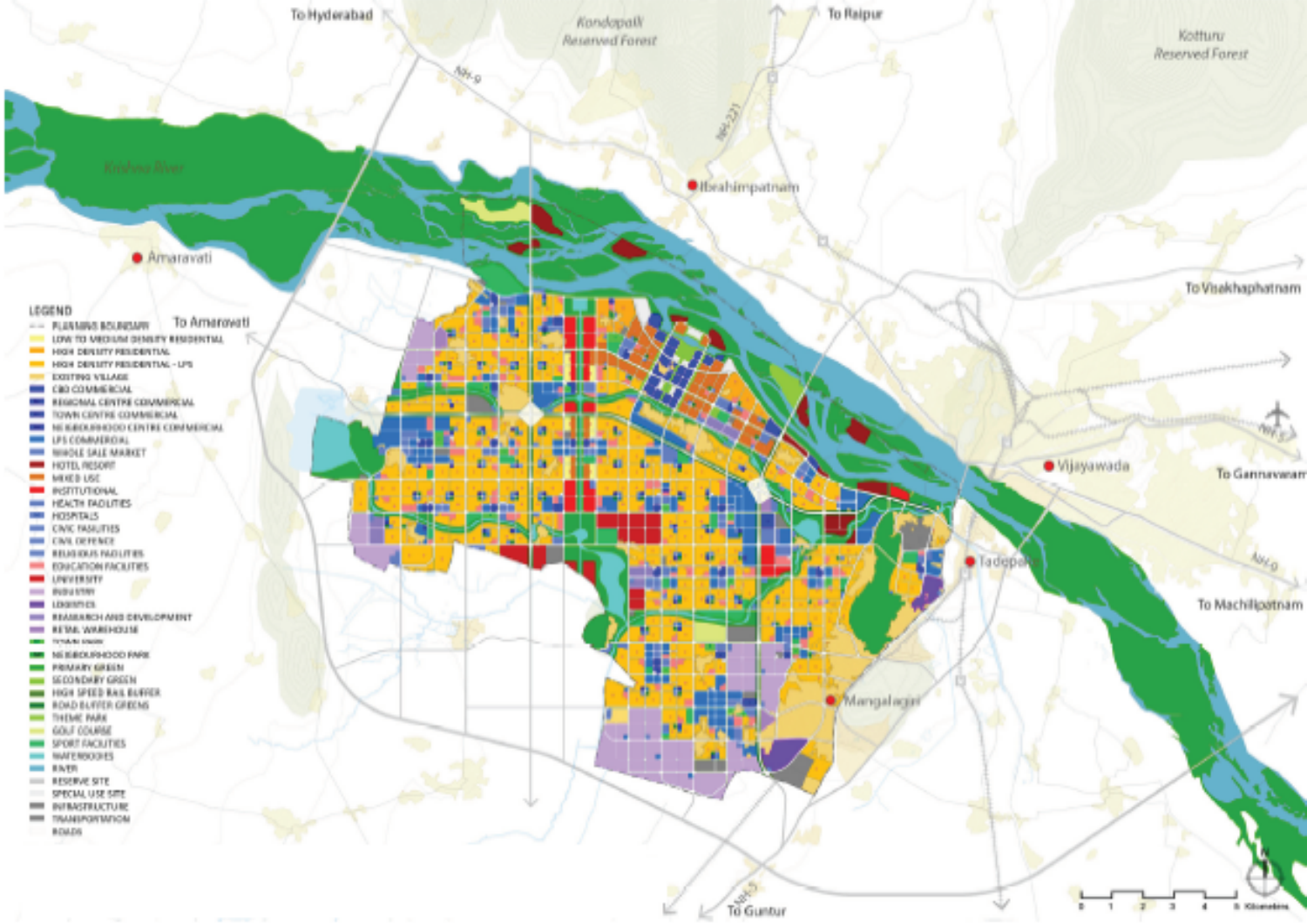


Fig.5.10 Proposed Amaravati Capital city Landuse Plan

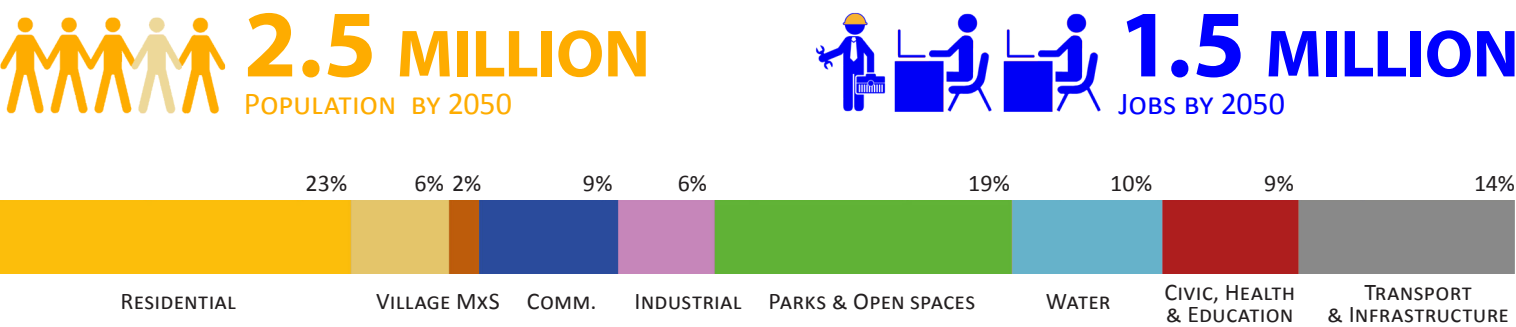


Fig.5.11 Amaravati Capital city Landuse Distribution

*MxS - Mixed Use, Comm. - Commercial, Sports

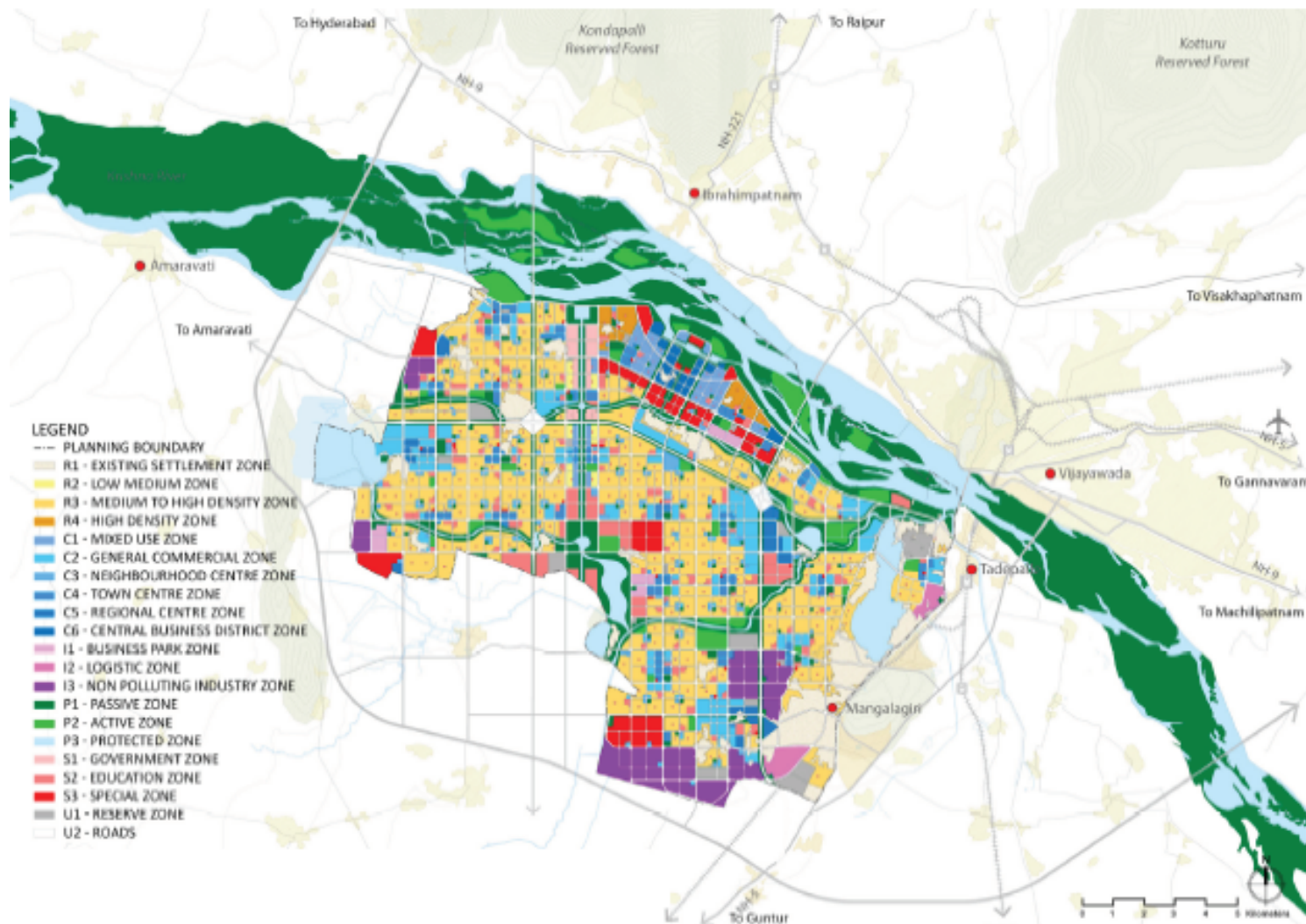


Fig.5.12 Proposed Amaravati Capital city Zoning Plan

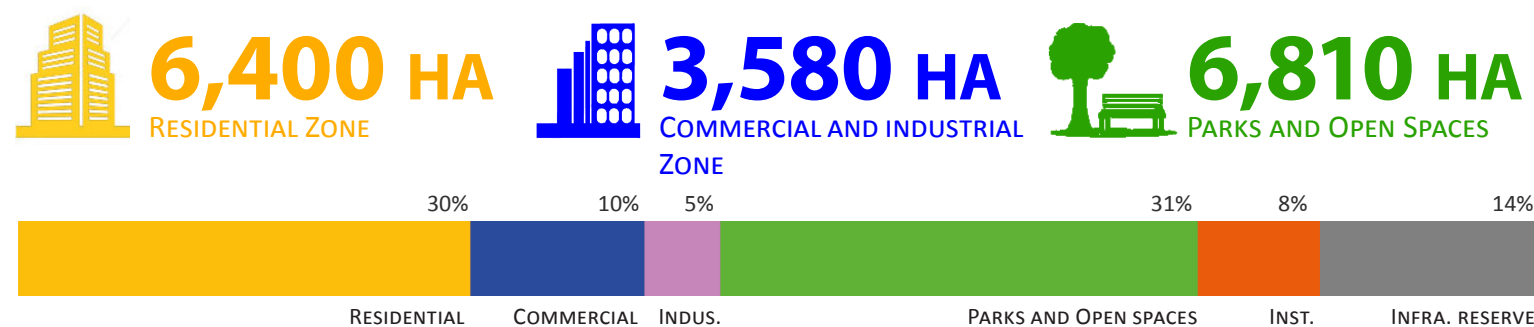


Fig.5.13 Amaravati Capital city Zoning Distribution

5.4 CAPITAL CITY - ZONING PLAN

Figure 5.12 illustrates the Zoning plan proposed for the Capital city. The Zoning Plan and its details were presented in the “Capital city Master plan : Zoning Plan” report. A brief description of the zoning categories is given below:

5.4.1 RESIDENTIAL ZONES

R1 - EXISTING SETTLEMENT ZONE

R1 is a residential district offering low rise developments within the existing villages. The R1 Zone is intended to offer low rise housing as part of the farming community and complementary public facilities as needed, creating pleasant community areas in the villages falling within the capital city.

R2 - LOW DENSITY RESIDENTIAL ZONE

The R2 is a zoning district established to develop low density residential developments. The Zone allows development of detached houses, semi detached, attached houses and apartments. The role of the Low density residential zone is to act as buffer between the village settlements and proposed high residential developments.

R3 - MEDIUM TO HIGH DENSITY ZONE

R3 is a zoning district established to allow medium to high density residential developments across the city, and creating a variety in housing types ranging from single to multi-family dwelling types which include

detached, semi-detached, attached and apartment typologies. Primarily encompassing land to be returned the Land pooling Scheme Rules, 2015; this zone offers a higher building coverage and building height in order to encourage land owners to amalgamate and benefit from the higher FAR offered by the apartment typology within the zone. This is to facilitate the creation of a well planned medium-density residential neighbourhood with a green character.

The High Density Apartment Residential Zone (R4) are multi-family high density housing options planned within the Capital City to provide high-quality public transport oriented lifestyle for those who desire an urban lifestyle with easy access to regional goods and services. This zone is largely planned along the riverfront within the central business district. Communal facilities with generous greenery are encouraged to enhance the quality of living in this high density environment.

5.4.2 COMMERCIAL AND INDUSTRIAL ZONES

C1- MIXED-USE COMMERCIAL ZONE

The Mixed Use Commercial Zone (C1) is an area to be used mainly for mixed residential and commercial purposes, which can have up to 30% GFA used for commercial purpose. The mixed-use commercial zone is largely planned within the central business district to encourage 24 hour vibrancy within the commercial downtown of the city.

C2- GENERAL COMMERCIAL ZONE

The Community Commercial Zone (C2) creates attractive small mixed use establishments at neighbourhood level to foster local businesses. This includes the commercial land that will be returned to the village land owners under the Andhra Pradesh Land Pooling Act, 2014.

C3- NEIGHBOURHOOD CENTRE ZONE

The Neighbourhood Centre Zone (C3) creates attractive small mixed use establishments within each neighbourhood facilitating the daily needs of the residents. Activities within the C3 zone include grocery shops, neighbourhood centre, health clinics, kindergartens, religious centre and other important facilities required by the community.

C4- TOWN CENTRE ZONE

The Town Centre Zone (C4) is an area established to create a medium rise commercial zone within the townships. The purpose is to intensify the land use in order to create a Town centre in the heart of each township providing town level commercial, civic and recreational facilities.

C5- REGIONAL CENTRE ZONE

The Regional Centre Zone (C5) is an area established to create a medium rise commercial zone within the Regional centres. The role of the regional centre zone is to provide a variety of landuses to support regional level civic, commercial and recreational facilities. This zone is usually support by a public transportation interchange.

C6 – CENTRAL BUSINESS DISTRICT ZONE

The Central Business District zone (C6) is an area established to create a high rise commercial zone in the Finance City/Downtown. The purpose is to intensify the land use to create an iconic city centre which provides large city level commercial and civic facilities.

I1 - BUSINESS PARK ZONE

Business Parks are specifically set aside for non-pollutive industries and businesses that engage in high technology, research and development (R&D), high value added and knowledge intensive activities. This zone has strategically been planned in vicinity to city parks and universities to create a knowledge sharing environment

I2 - LOGISTICS

The Logistics zone is planned at major junctions in proximity to the city gateways in order to ease movement of goods and services. Predominant activities are related to transport, logistics, goods distribution and storage for regional, national and international transit. Generally, these developments consist of warehouses, loading & unloading bays, open storage facilities and supporting ancillary services with efficient internal vehicular circulation and external multi-modal transport links.

I3 – NON POLLUTING INDUSTRIES

The I3 zone safeguards land for light and clean non-polluting industries within the Capital City that. These establishments include low-rise detached, semi-detached and terrace

factories to high-rise multi-tenanted, multi-storied factories.

5.4.3 PARKS AND OPEN SPACES

P1 - PASSIVE RECREATIONAL ZONE

Passive Recreational Zone (P1) are districts established to provide recreational and leisure facilities and activities in selected areas that have unique features (including visual corridors, environmentally sensitive areas, buffer areas, or along significant routes). These parks can include recreational commercial or public facilities at the neighbourhood, community, and regional level.

P2 - ACTIVE RECREATIONAL ZONE

The Active Recreational Zone (P2) is established to provide parks that offer active recreational and sporting activities. While structures within the parks are allowed, the general character of the Active Recreational Zone should remain as green and recreational.

P3 - PROTECTED AREA

Protected Areas have been established to conserve and protect the environmentally sensitive areas such as steep slopes and rivers which are rich in nature and biodiversity. These areas are non-developable for other strategic purposes. In the case of highly sensitive areas like forests, rivers and wetlands, the zoning for the protected areas shall supersede.

5.4.4 INSTITUTIONAL ZONES

S1 - GOVERNMENT ZONE

Special Zones ‘Government Zone’

have been allocated within the Capital City, to enable the government in securing land for Strategic Government Institutional Projects like Assembly, Secretariat, Head of Department offices etc. In order to enhance the strategic location and symbolic value of these projects, Urban Design Proposal shall be prepared addressing the character of public spaces as well as functions of the of government institutions. All the development guidelines for subsequent Architectural Design Projects shall be stipulated in the Urban Design Proposal. Zoning regulations for Government Zone are not prescribed for the same purpose.

S2 - EDUCATION ZONE

Special Zones ‘Education Zone’ have been allocated within the Capital city, to enable the government in securing land for Strategic Institutional Projects like University, Colleges, Schools, Hospitals etc. In order to locate these projects at accessible locations and to ensure that adequate land is reserved for its development, this zone is identified as separate zone. For Campus development projects like Universities, large Hospitals detailed Master plan shall be prepared before constructing the buildings to ensure that allocated land is planned well.

S3 - SPECIAL ZONE

Special Zones ‘White Sites’ have been allocated within the Capital city, to enable the government in developing market demand driven necessary urban projects. The “white-site” gives more flexibility in the use of the sites through CRDA’s land allocation program.

Endowed with the switch use options, prospective buyers / developers can respond to the market demand and supply conditions more effectively by instantly adjusting and optimizing the space among different uses available at such time. The prospective buyers / developers could rely on the flexibility granted by the “white” site rules to optimize the development potential of the site in a market with uncertain demand. The successful tenderer / buyer of a white site has the options to develop the site for commercial, residential or hotel use, or a mix of these uses, as well as the rights to choose the quantum and/or the mix of the use when initiating or launching the development with approval from CRDA at such time

U1 - INFRASTRUCTURE RESERVE

Reserve Zone has been allocated within the Capital city, to enable the government in securing land for Strategic Infrastructure and Transportation projects. It includes large scale transport utilities like Bus Terminal, Metro Depot as well as large scale Infrastructure utilities like Water Treatment Plant, Sewage Treatment Plant, and Electrical Substations etc. These projects are strategically located in order to service the Capital City in proper manner and are marked under this zone to ensure that adequate land is reserved for its development.

A detailed zoning area distribution table is attached in Appendix 1.

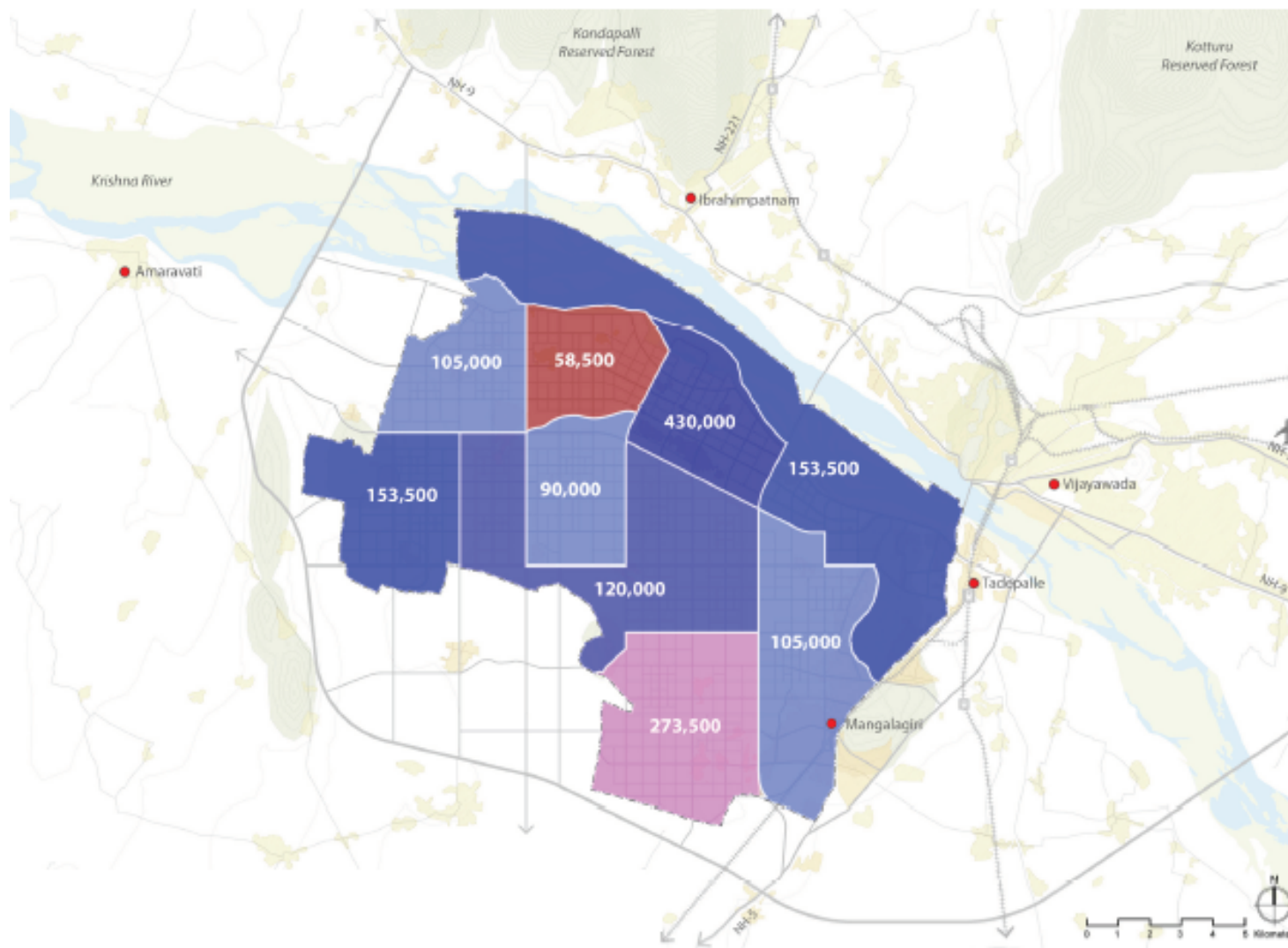


Fig.5.14 Proposed Employment Distribution Map

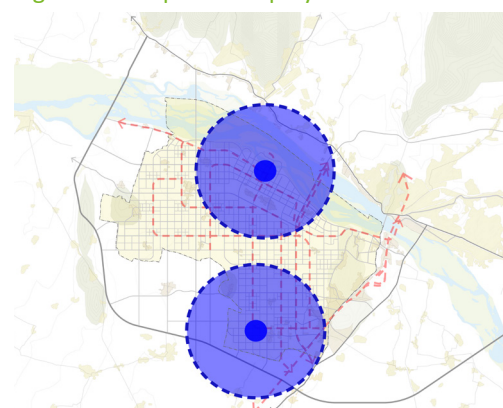


Fig.5.15 Primary Employment Centres

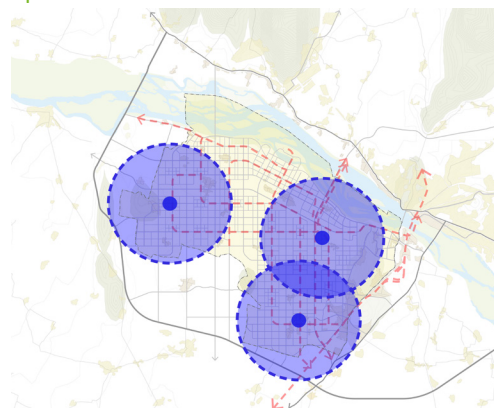


Fig.5.16 Secondary Employment Centres

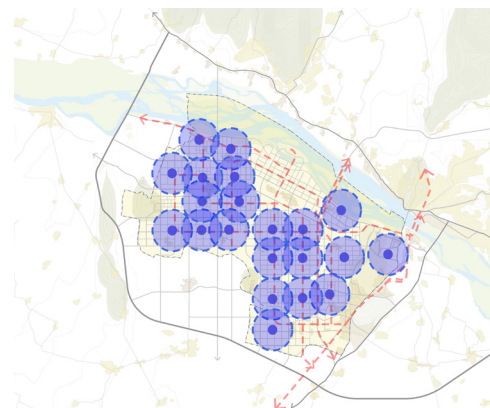


Fig.5.17 Tertiary Employment Centres

5.5 EMPLOYMENT PLAN

One of the primary goals for the new Capital city is to ensure sustainable jobs and quality affordable homes for all. The master plan translates this goal into development strategies through implementable Commercial and Industrial landuse plans. These plans and their development strategies have been discussed in the following sections.

5.5.1 CITY OF DECENTRALIZED EMPLOYMENT CENTRES

The socio-economic study discussed in the previous chapter, suggests the need to create 1.5 million jobs by 2050. These jobs include 1.5 million service sector industrial jobs within the Capital city. The Master plan proposes distribution of these jobs into decentralized employment centres across the new Amaravati Capital city as illustrated in Figure 5.14. The decentralization will help in creating a network well-distributed employment opportunities for all. In line with the broad development strategy employment opportunities have been distributed in the following hierarchy of employment centres:

1. Primary Employment Centres: Central Business District (CBD), Administrative civic core and Industrial developments
2. Secondary Employment Centres: 3 Regional centres and a multi-disciplinary university
3. Tertiary Employment Centres: Town centres, neighbourhood centres and mixed use developments

PROPOSED EMPLOYMENT PLAN

The proposed Employment Plan translates the decentralization strategy into an implementable land use plan by proposing a clear hierarchy of commercial and industrial clusters while ensuring quick accessibility to public transport.

The Employment plan illustrated in Figure 5.18 can be sub divided into a Commercial use plan and an Industrial use plan. The following sections will discuss the Commercial plan and Industrial use plans in detail.

5.6 COMMERCIAL PLAN

To facilitate and accommodate 1.2 million jobs in the commercial sector, the Commercial use plan focuses on the following key features:

- Downtown – Develop a distinct waterfront CBD and administrative core to support economic growth within the city as well as to establish a distinctive city skyline and image.
- Regional Centre (RC) - 3 RCs, have been planned along the loop road. These centres help in decentralising the employment opportunities within the Amaravati Capital city and ease development pressure within the CBD.
- Town Centre (TC)- 21 TCs catering to about 600,000 to 1,00,000 people have been planned within each town. Each centre provides the necessary commercial and public facilities within the township.
- Neighbourhood Centre (NC) - Each

town centre will be supported by a number of NCs providing local level retail and community facilities.

- Mixed-use developments: About 12% of commercial and industrial land has been safeguarded for mixed use developments. These Developments have been planned along the transit corridors close to the regional and town centres. These developments capitalize on the high market value of the land around key commercial centres.
- Village Neighbourhood Centres - As illustrated in township model earlier, these centres will support the daily needs of the village population.
- Other commercial facilities include whole scale market and the commercial land that is being returned under the land pooling Act 2014.
- Accessibility and interconnection between the commercial centres has been ensured through the proposed road and public transport network.

5.6.1 PROPOSED COMMERCIAL CENTRES

This section provides a brief description of the various types of commercial centres discussed earlier:

CIVIC CENTRE AND CENTRAL BUSINESS DISTRICT (CBD)

Downtown shall house the commercial heart of the city housing an iconic waterfront Central Business District (CBD) and administrative civic core. The downtown covers a land area of about

600 Ha constituting about 3% of city's land area.

As the state's capital, the administrative core will house the state legislative assembly, high court, secretariat and other important public and semi-public offices. All these functions have been aligned along the north-south corridor in line with the proposed structure plan. The Central Business District will house the city's primary commercial activities such as large corporate offices, hotels, malls, business centres, convention centre, etc. Planned along the river Krishna this vibrant centre would define the city's iconic skyline. A detailed urban design proposal for the downtown (SEED development area) will be presented in the next stage of the project.

REGIONAL CENTRE

Along with the 9 city cores, the Regional Centres (RC) serve the purpose of decentralisation by establishing commercial hubs of distinctive character outside the City Centre to provide employment opportunities near residential areas. As illustrated in the city structure plan, 3 Regional Centres have been planned along the main city loop road along the transit corridor acting as important transit hubs for the residents. Together these centres occupy about 40 Ha of land creating about 350,000 jobs by 2050. Their primary role is to provide a one-stop destination for retail, office and entertainment facilities within each of the 3 zones in the city. Each Regional

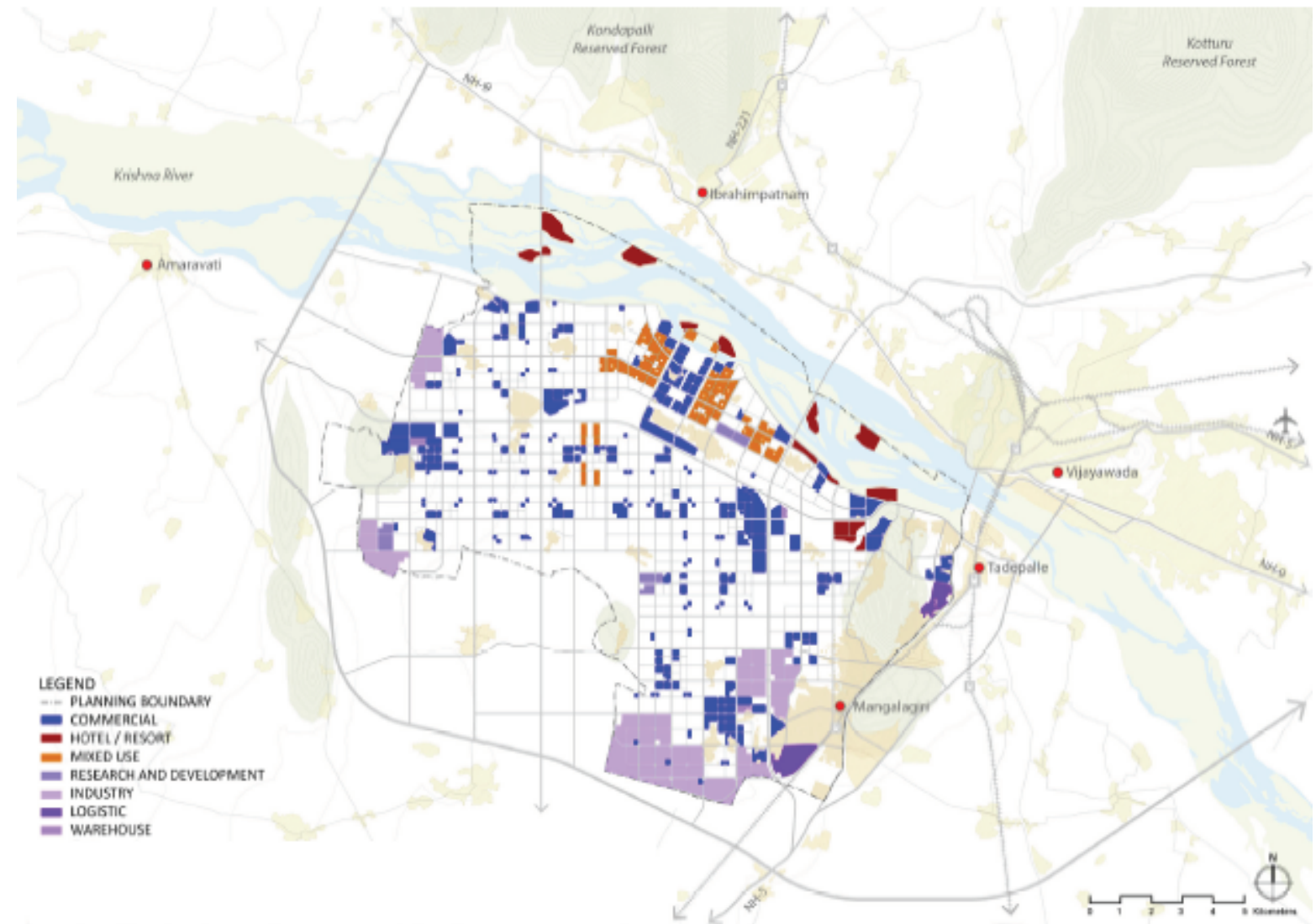
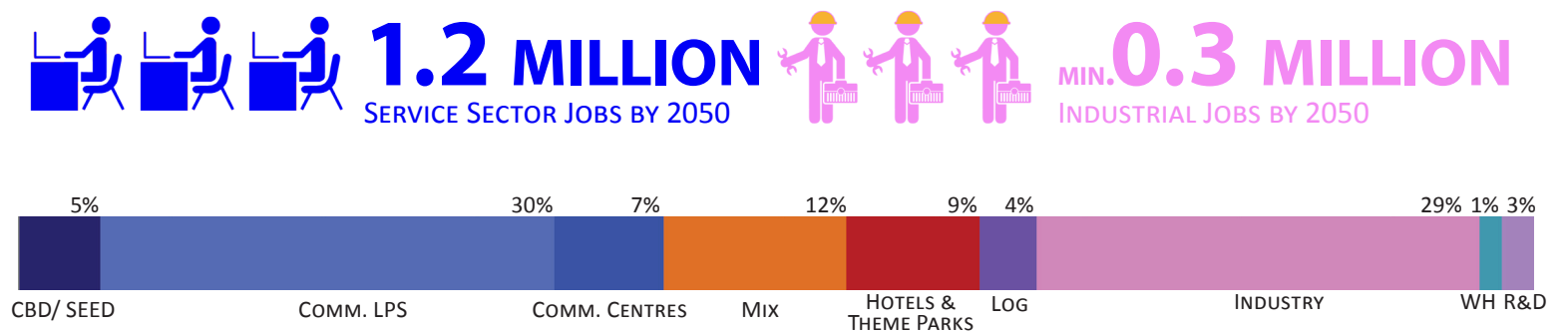


Fig.5.18 Proposed Employment Plan



*Comm. - Commercial, Mix - Mixed Use Areas, WH - Warehouse Retail, R&D - Business Parks, Log - Logistics

Fig.5.19 Distribution of Commercial and Industrial developments



Mood Images - Downtown



Mood Images - Regional Centres



Mood Images - Town Centres and Neighbourhood Centres



Mood Images - Mixed-use Developments

Fig.5.20 Examples of Commercial developments



centre is supported by large city level civic facilities such as hospitals, education institutions, etc.

TOWN CENTRE

The Town Centre (TC) plays a central role in the compact and integrated township development concept. Each of the 22 townships will have a TC integrated with a public transit system that caters to the commercial needs of the township. To best serve the population catchment, the TCs are strategically located in the centre of the towns to maximise their accessibility. Containing a mix of retail and office commercial as well as entertainment uses, the TC is also a source of local employment. Township level facilities, such as library, hospital, town hall, town park and public open spaces have also been planned within the TC to further strengthen its role as the township's activity core.

NEIGHBOURHOOD CENTRE

Neighbourhoods are small communities within a town which comprises of a number of neighbourhoods housing about 15,000 to 25,000 population each. Each neighbourhood is facilitated with a neighbourhood centre (NC) which provides daily need facilities for residents within a short walking distance. These facilities include retail, vegetable and grocery shops, tailor and stationery shops, etc. Healthcare facilities as well as other small-scale businesses and services are also housed within the NC. Besides serving as a local market NC's are proposed to be integrated with Community Centres (CC). This will help to foster a sense

of community through a number of community group activities, enabling social support, information sharing, etc. The facilities provided by the CCs would include a community hall, library, community recreation and leisure areas, child and elderly care centre. Community development projects and activities could also be hosted in the CC. Parks and sports fields are planned in proximity to the NC to offer open spaces for families and community groups to interact and play.

MIXED USE DEVELOPMENT

About 422 Ha of mixed use commercial developments have largely been planned along the public transport corridors within the downtown area to create a 24 hour vibrant mixed use character. Mixed use developments can include a large complex or a single building that comprises a combination of residential, commercial, cultural, institutional functions that are physically or functionally connected. Widely employed as an urban revitalisation tool, the live-in population in mixed use areas ensures activity and vibrancy during both office and non-office hours. High density mixed use developments reduce the walking distance between residences and workplace, thus, encouraging the use of public transportation system. These developments create a greater variety of housing options catering to the needs of a more diversified population.

VILLAGE NEIGHBOURHOOD CENTRES

As illustrated in the township model, small-scale village neighbourhood centres and markets are proposed

within the existing village settlements. These centres will provide daily need shops and act as a gathering point and interaction space for the village community. It will host markets on a regular basis, such as weekend farmers' market, to sell locally produced products as well as promote cottage industries and local arts and crafts. These centres usually possess the characters of flexible sheltered spaces that enable multiple functions.

RETAIL-WAREHOUSE DEVELOPMENT

The Commercial landuse plan proposes about 52 Ha of warehouse retail clusters. These large big box developments will encompass elements of both retail and warehouse functions together.

WHOLESALE MARKETS

In compliance with the URDPFI guidelines, Commercial landuse plan proposes 3 large whole sale markets in proximity to the regional centres. These markets cover a land area of about 27Ha.

OTHER COMMERCIAL

Apart from the above-mentioned commercial development types, several other selected areas in the City will possess commercial character, such as the tourism resorts on the islands in river Krishna, hotels, etc. These are the places of interest where tourists will visit. These special commercial areas will have boutique shops, thematic entertainment facilities, arts and crafts shops promoting local culture and F&B areas. **Note: The commercial land to be returned is also indicated in Employment Plan.**

5.7 INDUSTRIAL PLAN

The New Capital City Amaravati is envisaged to play a role as an economic hub and an administrative centre for the Andhra Pradesh State. In addition, it has a potential larger influence area in the South, complementing and competing for Industrial investment location with existing regional urban centers in India. Therefore, targeting industrial sectors that have higher hinterland synergies while focusing to attract niche & high value sectors and strategic economic drivers are crucial for the new capital which is geographically situated at a strategic location (Figures 5.21 & 5.22). Focusing on nascent and niche sectors also provide a first mover advantage and unique value proposition to differentiate and position the city amongst other established urban centers while avoiding the crowding out effect in the talent market.



Fig.5.21 Location of Amaravati

There is a need to compete for global talents and investment in the next decade or so especially when Andhra Pradesh hopes to embark on a more innovative & attractive industrial outlook. In order to survive & excel well both nationally and in the world arena, a suitable industrial environment has to be established in Amaravati to incubate new business, attract investment, generate jobs and facilitate operations of companies.

This section focuses on both the quantitative and the qualitative aspects. The attention is given to not only the strategic locations of these industries but their relationships with other land uses of the Capital City such as Residential, Commercial, Infrastructure and so forth.

5.7.1 OVERVIEW

The key objective of the overall planning process is to be able to create an effective industrial/business ecosystem (refers to Figure 5.23 overleaf) where the domestic industries in terms of Small Medium Enterprises (SME) as well as multinational companies are able to attract to Amaravati not only to start up business but also to scale up and diversify in the long term.

The existing industrial activities are currently noticed to be concentrated in and around the fringe of Vijayawada, Mangalagiri and Tadepalli. However, to surge forward, there is a need to look beyond these industrial zones and traditional existing industries.

Before embarking further on this, a comparative study of more similar/ relevant examples have been carried out as to ascertain what makes these

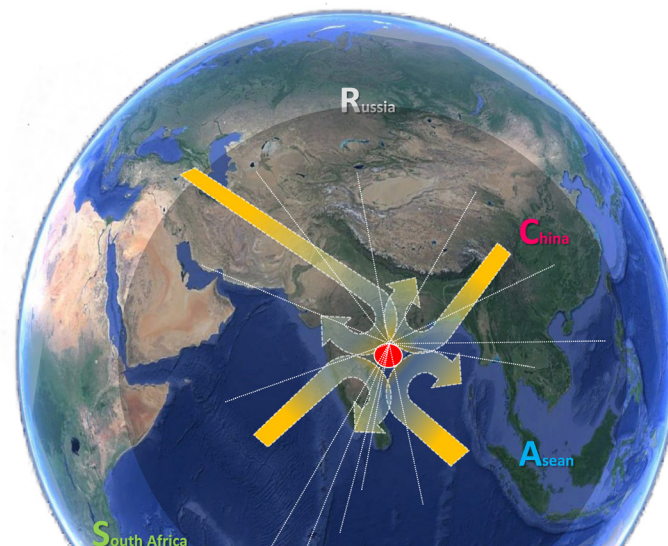


Fig.5.22 Amaravati strategically located in-between BRICS and ASEAN Countries

cases tick, what are the success factors that Amaravati needs to be aware of, and the pitfalls to avoid.

LEARNING ON SINGAPORE'S INDUSTRIALIZATION PROCESS

The shift towards industrialization was promoted as a strategy of diversifying Singapore's traditional role as an entrepot. The very early stages of Singapore's industrialization strategies were based on promoting export-oriented and labor-intensive industrialization. The government formulated and implemented the industrialization program through the Economic Development Board (EDB) in 1968. By the mid-1970s, the country had undergone a quarter-century of rapid industrial advance based on low-cost labor, to middle-level technology. This transformation had also resulted in a rapid increase in exports and foreign revenue earned.

In attracting Foreign Direct Investment (FDI), Export Expansion Incentives (Relief from Income Tax) were introduced. This helped Singapore penetrate export markets and also bring in advanced technology. The manufacturing sector's continued success was largely a function of Singapore's ability to attract foreign investment through a favorable business climate and also to provide investors with an educated, trained, and disciplined labour force.

Singapore's industrial evolution after 1979 was further escalated with improvements in the level of technology. In the process, a further raise in manpower productivity

became the focal point. In terms of product content, there was a shift from labor-intensive products towards those of higher technological content and worker-skilled products.

Information technology was chosen as the strategic principal instrument to bring about further change in the process of industrialization. The second main industry focused was on computers and electronics. This industry constituted Singapore's largest industry, in terms of both number of jobs and "value added-ness" by the late 1980s. Other major sectors of economy in Singapore include entrepot trade, export-oriented manufacturing petroleum refining/shipping, goods/services (domestic economy), and specialized services for the international market in the area of banking and finance, telecommunications, and tourism.

At the present moment, the Singapore government has set its sights on the biomedical sciences cluster. Biopolis in One-North is set-up for this purpose. The government bears the initial cost of infrastructure development. The government believes that in building a vibrant enterprise, a total ecosystem is crucial for its success. Hence, Biopolis was designed and planned with this in mind.

This is because the agglomeration of companies, big or small, foreign or local within a localized geographical area will gain from the synergy and symbiosis of the relationship. Ultimately, this will bring about an increase in innovation

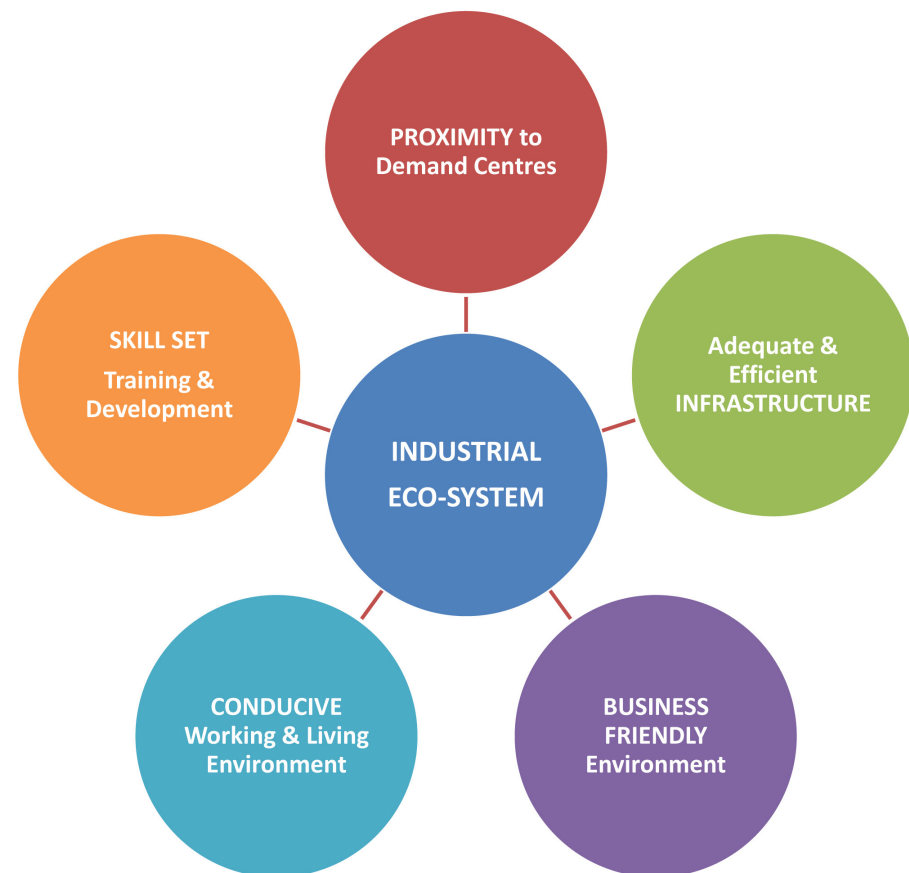


Fig.5.23 Key Factors contributing to Industrial Eco-System

and entrepreneurship. In creating a more conducive environment, Intellectual Property Law was set up to protect this intellectually capital intensive industry.

In a nutshell, Singapore's industrialization is about taking gradual steps to climb up the value chain, and it was not a process that was done overnight. It takes long term planning and bold decisions for Singapore to progress this far.

LEARNING ON TAIWAN'S INDUSTRIALIZATION PROCESS

Taiwan started a new industrialization strategy in the early 1960s. More liberal trading regimes in the export markets of importance to Taiwan were adopted. The manufacturing sector was also switched to focus on the export market and development of a wide range of export-oriented, light and labour intensive industries such as clothing, electrical/electronic products, plastic, wood and metal manufacturing. The government and industries were both very responsive to international market trends. The close government-

industries contact ensured that incentives were regularly adjusted to permit the manufacturing section to adapt to new foreign market shifts.

Although Taiwan is already very successful, it is constantly reinventing itself to stay ahead of the curve. A Six Year Development Plan was implemented in 1976. Firstly, infrastructure investment was made to enhance the performance of the manufacturing sector. Secondly, the government established state owned enterprises to produce a select range of capital intensive goods on a large scale to serve the large and rapidly growing local market and to exploit export opportunities. The diversification of export markets and export products also reduced Taiwan's vulnerability over time.

In anticipation of a slower growth due to the oil crisis in 1979, the government placed greater priority on producing higher quality products with sophisticated technology and more highly skilled labour content. In support of this move, the government granted a range of special incentives, raised its spending on scientific research and education, established industrial parks and zones with each of them housing firms of similar industries to improve efficiency. Incentives were also introduced to encourage export oriented, technology intensive industries which include tax breaks, custom duties exemption, etc.

Taiwan's private and public entrepreneurial capacity has demonstrated time and again that it

can adjust quickly to changing market conditions. It is likely that this high degree of flexibility and resilience together with Taiwan's other assets such as sound economic management and the existence of an educated, resourceful, hard working population will ensure a favorable outlook for both manufacturing and trade in the foreseeable future.

INFERENCE

Almost all countries started from almost a very low industrial base. But what was common in all of the countries studied was that they had definite strategies on how to proceed from their base levels to their targeted goals. Most, if not all strategies are subjected to revision in the face of changing economic and business climate either externally or internally. In other words, these strategies were long term projections but were flexible to adapt very quickly to changes in the business environment. The other critical feature was the existence of institutions that solely took charge of the trade and industry.

Human Capital is by far the most important element in the whole chain of industrialization. Countries in order to move up the value chain will have ensured that their human resource capacity mounds in tandem with the industrial demand. Human capacity may need time to build up especially if the country wants to move up to a higher technological plane (refers to Figure 5.23).

From a physical planning point of view, there was a need to safeguard sites for the construction of institutions of higher learning particularly in the technical line. It was not just about safeguarding enough sites to set up the requisite institutions (i.e. enough for the projected population) but at strategic locations well served by public transportation to ensure maximum accessibility.

The other noticeable feature was the creation of an economic ecological system capable of promoting and enhancing the total industrial and business environment. For ease of doing business, setting up of business park where the clustering of industries could take place as well as a total business corridor/cluster where the locations of higher learning institution, government agencies and business/science/technological park are located in proximity with one another are critical considerations. In addition, there needs to be a good and reliable infrastructure (such as sewerage, power, telecom, water, etc.), and an efficient transportation network to complete the whole industrial ecological system.

Incentives, in the form of tax breaks are another factor considered to be an important feature to attract FDI coming into the state. There is a need for these well-thought and selective incentives or policies to make the country attractive to foreign investment. However, incentives should be very selective and controlled to enhance their effectiveness.

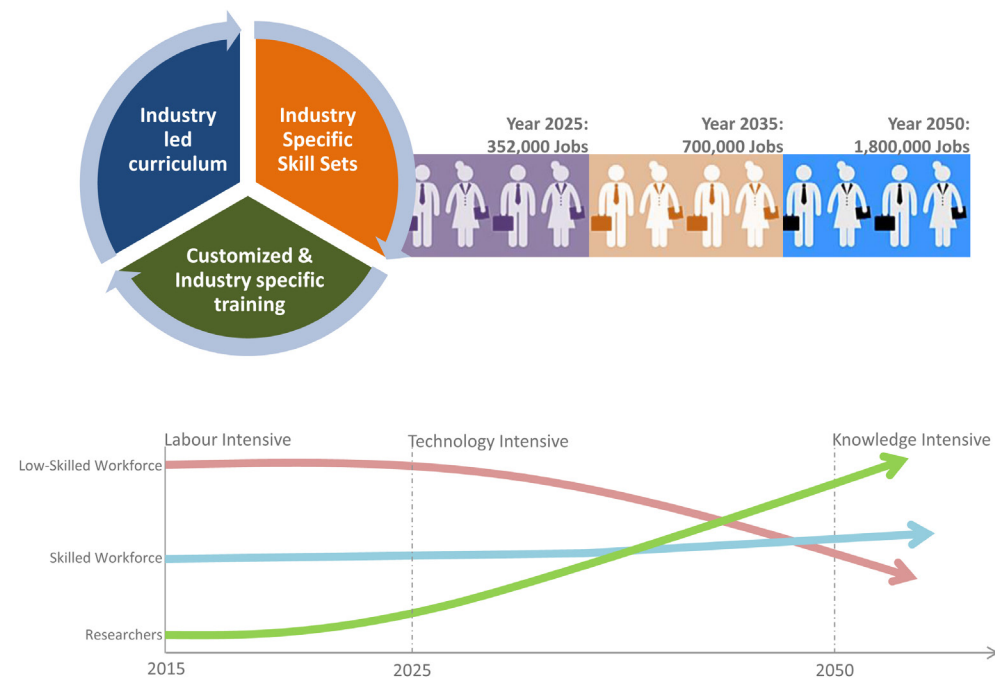


Fig.5.24 Strategic Skill Development facilitating Economic growth of the Capital City

An open economy is another way to go forward. This is basically an outward oriented growth strategy. This approach entails a possibility of technological transfer which is beneficial to the host in the long run. With these possibilities, one can hope for technological spill-overs which can support home growth industries. With the opening up of the domestic market, the local SMEs will have to compete with foreign companies resulting in productivity gain and ultimately, a faster industrial growth rate.

The economy of the Capital City Amaravati has to continue to evolve nimbly, ride on regional economic growth and tap into opportunities from all over the world. Improved productivity in manufacturing and diversity in the industry are essential

to maintain a competitive edge. These are to be accompanied further by the expansion of excellence and creating conditions for clusters of activities to flourish, particularly in tourism, healthcare, tertiary education, financial services and research & development.

Hence, the envisaged industrial clusters and the proposed strategies (refer to Figure 5.24) for Amaravati industrial development will facilitate the industrialization eventually moving from Labour intensive to Knowledge intensive over time. By 2050, these industries to generate approximately 1,5000,000 employment opportunities and minimum 200,000 Industrial Jobs.

OBJECTIVE

The nature of the Industrial Landscape of Amaravati is intended to be dynamic to strike a desirable balance between industrial and non-industrial employment opportunities for a more sustainable economic framework. Hence, the critical objective of industrial planning at the strategic developmental level is to determine the amount of industrial land for the short, medium and long term time frame whilst the new Capital City is evolving and growing. And more importantly, adequate infrastructure provision should go in tandem with the development and phasing strategies.

It is crucial to have ample land supply at strategic locations to cater for the range of industries selected including those of high technological content and those related to Research and Development. The other aspect is to provide for balanced distribution of jobs and housing needs throughout the Capital City. There is a need to bring jobs to the masses where appropriate. This in turn, will have a secondary effect of cutting down the carbon footprint as a result of less people traveling long distances to work.

The industries that have been selected for Amaravati although non-pollutive in nature still do have some degree of nuisance factor possibly through excessive industrial vehicles moving around these areas which may create a certain degree of noise pollution. The operation of these industries itself may also contribute to the noise. Hence, in the selection of locations for these

industries, there is a balance of this anticipated “nuisance” factor with the degree of convenience.

The idea is to buffer and minimize the adverse impacts of “nuisance” factors while optimising land use and increasing the accessibility to the huge labor pool of local skilled and low-skilled workers existing in the region. The R&D, Industrial and Logistics developments have to be planned in tandem with the skill set and housing

availability to support a balanced work-live environment.

TYPES OF INDUSTRIAL ZONE

As described in chapter 4, the Capital City is proposed to house clean and non-polluting industries along with IT/ITeS, Financial and R&D clusters within its jurisdiction. The Mega Food Processing Park scheme and Electronic Manufacturing Cluster schemes could also be explored for the development of physical infrastructure. In addition

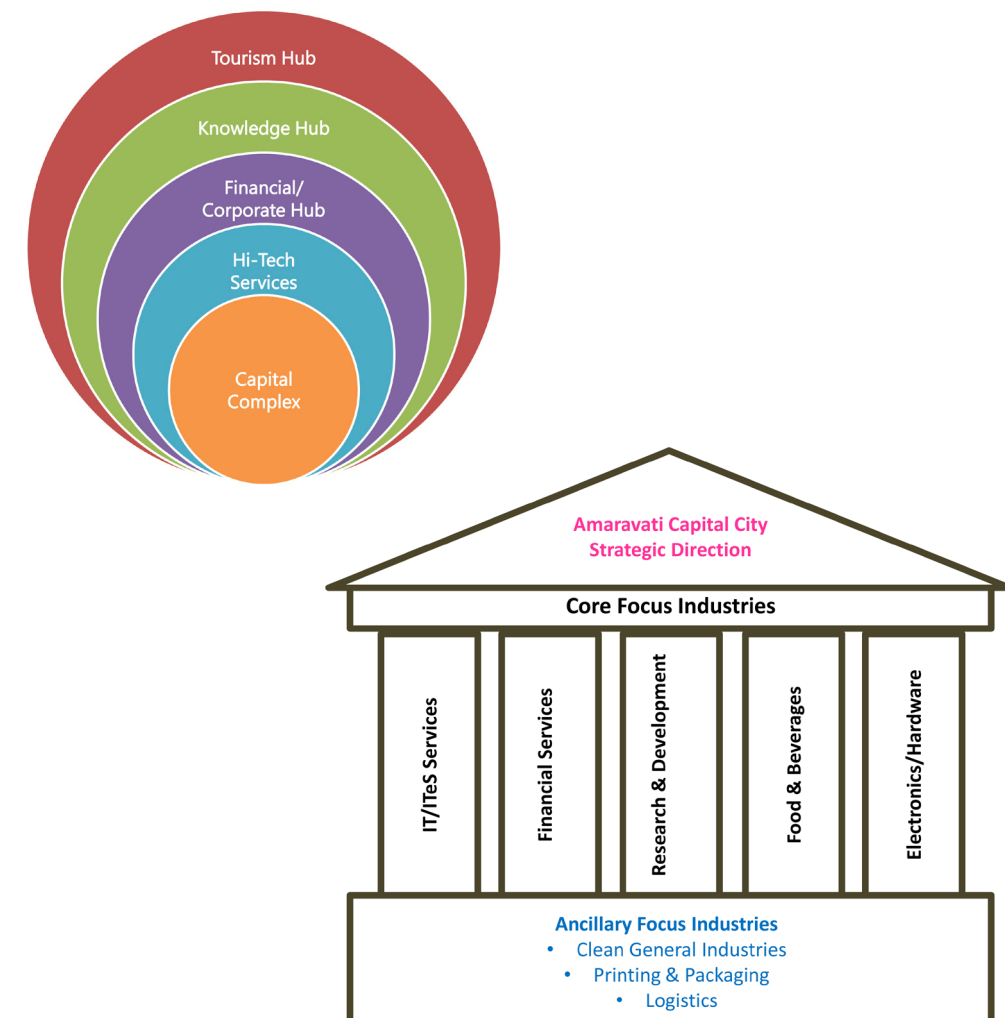


Fig.5.25 Envisaged Eco-System and Focus Industries of Amaravati

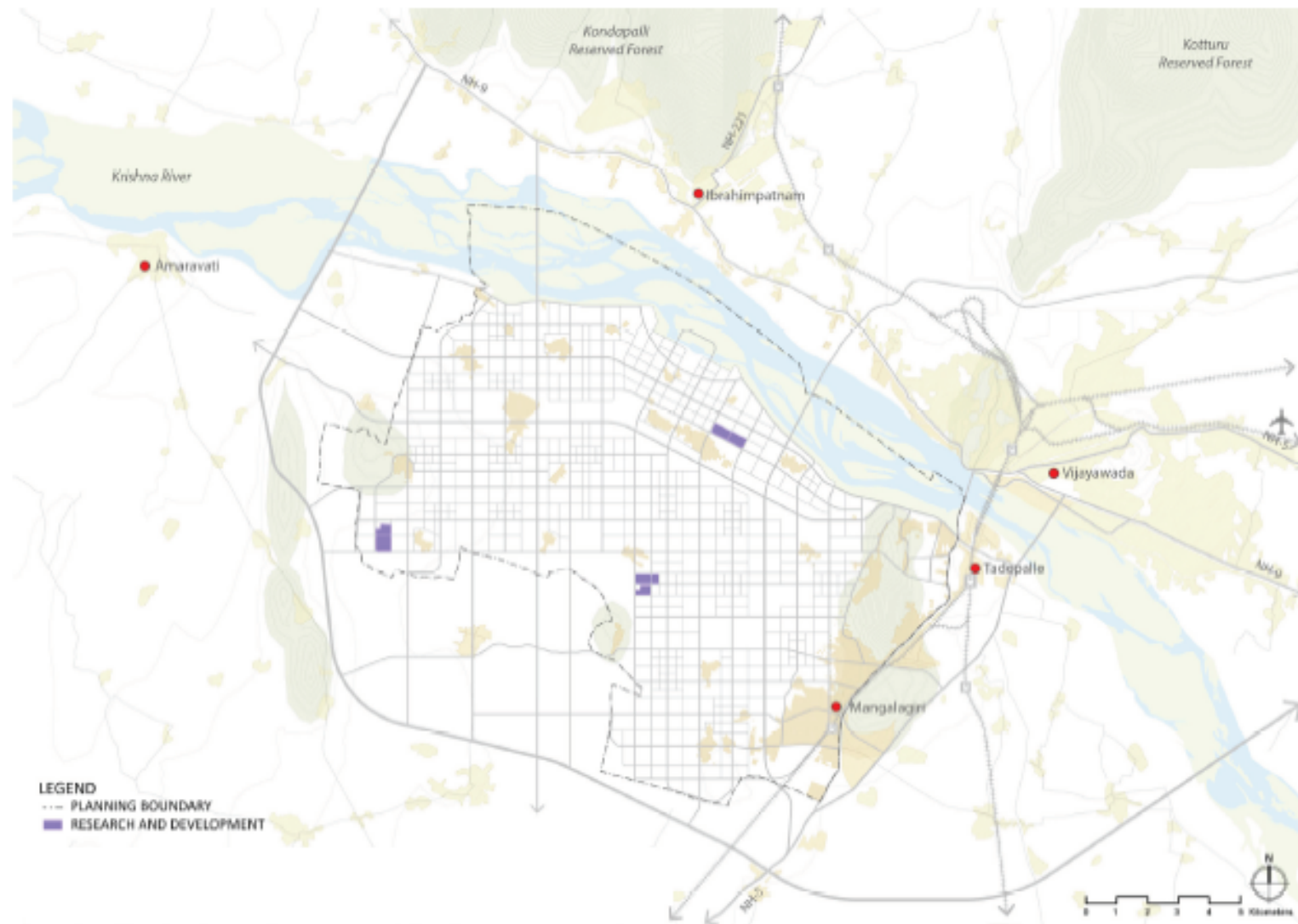


Fig.5.26 Business Park Landuse Plan



Fig.5.27 Examples of Business Park Developments

to the core sectors, support segments such as logistics, packaging and printing are also proposed to be part of the city.

A total land area of approximately 1,380 ha has been safeguarded within the proposed Capital City boundary (217 sqkm) to accommodate these envisaged clusters. These Industrial land areas have been categorized into 3 Zones as follows,

1. Business Park Zone (C5)
2. Industrial Zone (I1)
3. Logistics Zone (L1)

The Business Park Zone (refer to Figure 5.26) is specifically set aside for non-pollutive industries and businesses that engage in high technology, research and development (R&D), high value added and knowledge intensive activities. The value of the business park zone is between industrial and commercial uses. Approximately 108 ha of land area are safeguarded for this purpose

The Industrial Zone (refers to Figure 5.28) is safeguarded especially for light & clean industries. These include low rise detached, semi-detached and terrace factories to high-rise multi tenanted, multi storied factories. As mentioned earlier, the types of industries envisaged in the Capital City Amaravati are predominantly environment friendly as described below:

Clean Industries: These are industries that do not generate air and water pollution and do not generate noise and smell nuisance which can affect surrounding developments. The

factories also shall not use large quantities of hazardous substances such as solvents, acids and other chemicals. No buffer is necessary for such industries.

Green Industries: These industries shall not generate large quantities of trade effluent or solid waste. They shall also not generate excessive impulsive or continuous noise. They shall also not use large quantities of hazardous substances such as solvents, acids & other chemicals. A buffer of 50m-100m is necessary from the nearest residential district for such industries.

Orange Industries: These type of general industries may be allowed subject to adequate buffer from the nearest residential zone.

A total land area of approximately 1,130 ha is safeguarded for this purpose.

The Logistics Zone (refers to Figure 5.30) will accommodate the predominant activities related to transport, logistics, goods distribution and storage for regional, national and international transit. Generally, these developments consist of warehouses, loading & unloading bays, open storage facilities and supporting ancillary services with efficient internal vehicular circulation and external multi-modal transport links. Please refer to Zoning Plan report for more details. Approximately 188 ha of land area are safeguarded for Logistics related activities. If these land areas and locations for industrial activities with adequate infrastructure are not being safeguarded at the early

stage, residential, commercial and other land uses that have a higher real estate value will occupy these locations in no time, leading to the loss of these strategic sites, ultimately, losing out on the industrial strategic intent as a whole.

DISTRIBUTION OF INDUSTRIES

Broadly, the following locational criteria have been used to safeguard the adequate land for Industrial activities.

- Proximity to Vijayawada City, new Amaravati City Centres, existing Machilipatnam Sea Port, existing Gannavaram Airport and the proposed airport.
- Connectivity to the existing national highways and proposed ring road and rail lines
- Topographical condition
- Environmental consideration
- Availability of the existing and proposed utilities
- Optimum land utilisation (vertical distribution)
- Connectivity to public transport
- Compatible synergy with other land uses such as residential, commercial and recreational uses to promote total business environment

Nearer to the residential areas are used mainly for light and clean (Green) industries whilst those further away from the residential are safeguarded for the general (Orange) industries. Based on environmental considerations, some general industries may create some nuisance in terms of noise and smell. These may cause some “disturbances” to the nearby residents, and hence

should be sited at least 500m to 1 km away from the residential areas.

The higher technological content industries particularly those with a high content of innovation and R&D are located close to the location where there are already established institutions, residential, commercial and recreational developments in place.

The locations of these industries contribute to the “total industrial innovative technological eco-system.” Time-sensitive industries, high value but “weight loss” industries (high value products but “light weight” in terms of actual weight of the products produced) will be located closer to the proposed New Airport city area for the conveniences in terms of accessibility to the airport and the whole eco-system of the area.

At a more micro level or within each industrial estate, Clustering Concepts are to be introduced and organized in terms of appropriate industrial zones to arrive at the various types of industrial compatibilities and synergies. Within each individual estate there is a need to demarcate specific plot sizes to accommodate various industrial types. This is to prevent/regulate the first come first served syndrome which may distort the original planning intentions for the development. Within each industrial estate/ technological park there is a need to

- Review the phasing for industrial development and proposed sub-phasing

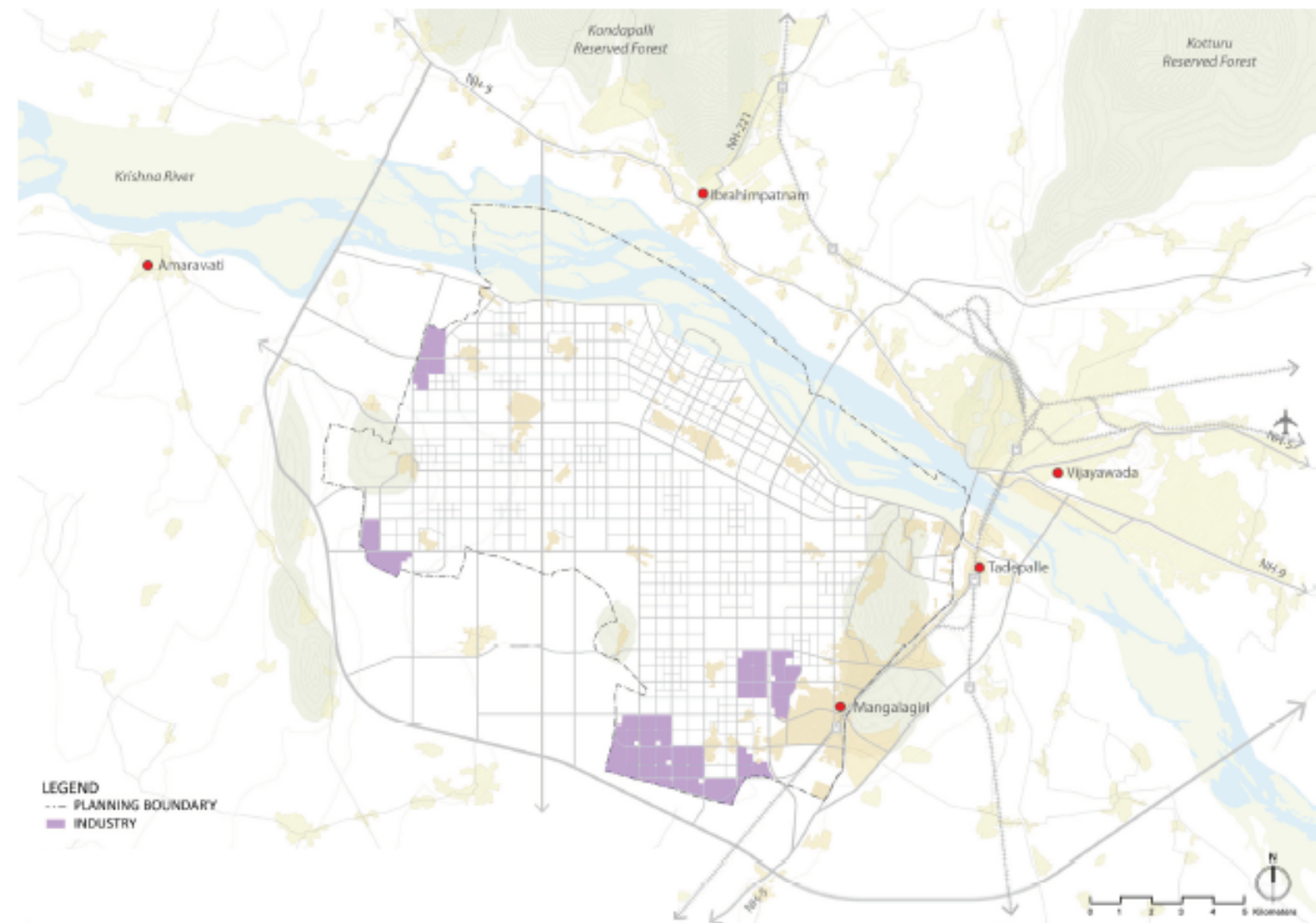


Fig.5.28 Industrial Landuse Plan

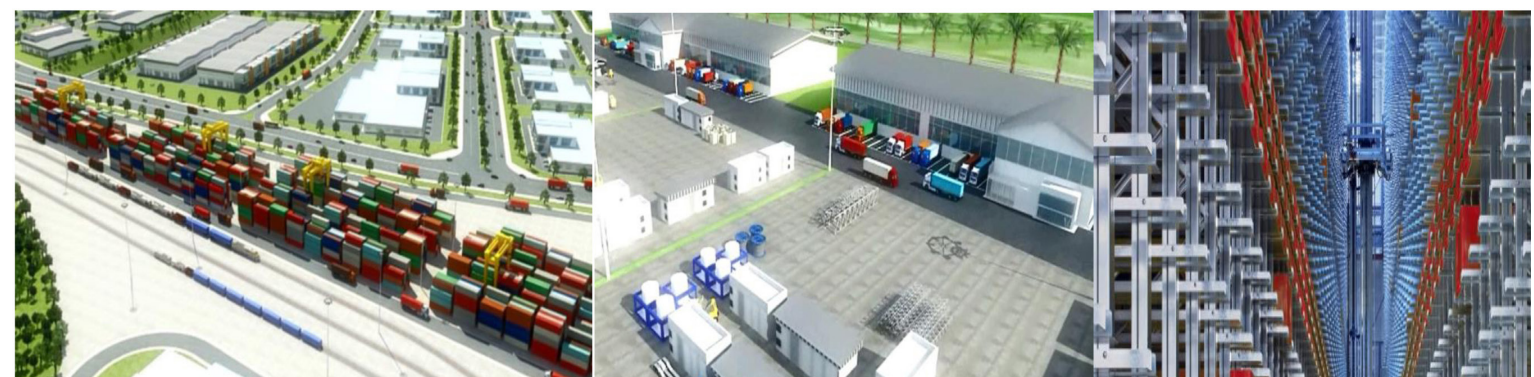


Fig.5.29 Examples of light and heavy industries



Fig.5.30 Logistics Zone Plan



Fig.5.31 Examples of Logistics Industries

- Propose an efficient internal road layout for the smooth functioning of the industrial operations
- Integrate the planning of the industrial area with adjacent developments
- Locate similar industrial types, together within the development so as to allow the sharing of common facilities and to have linkages in production; the feed-stock of one can be the output of another
- Propose a development program to phase the infrastructure development and transportation routes to prevent any operational inconvenience

GREEN AND BLUE NETWORK

Good quality working and living environment can be created through forward planning and strategic distribution of green public open spaces within the industrial zones. The designation of these public open spaces has to be at the appropriate locations and at right sizes with respect to the catchment served to be meaningful and effective.

Prominent green public open spaces include the extensive road-fronting linear park along the major arterial roads, the main Industrial Central Spine straddling across the central portion of the industrial site in the east west direction, informal pocket parks and the green buffers or planting strips. These spaces ensure that all workers and visitors will have full access to active and passive recreational opportunities. The provision of cycling

paths within these linear parks promote eco-friendly and healthy life style. Linear green parks double as buffer between Residential and Industrial as well. More importantly, the formal or informal public open spaces will not only increase property values but also to provide visual relief at any time of day and night.

SUPPORTING USES

The supporting facilities such as Gateway/Administrative Buildings and Amenity centres are suitable to site common facilities to serve the working community, improve orientation and design character of the development. Gateway buildings provide one stop location for all administrative, customs and security matters. Proper mix of activities such as exciting retail, office space, training areas, meeting rooms, incubators, indoor kids play area and interactive landscape, induce vibrancy in these facilities. The amenity centres shall be located with the walkable distance (300m) at the junctions where the Roads and Green Spine interact. Therefore, these centres can be easily accessed by cars, service vehicles and pedestrians. Importantly, tenants will not provide duplicate facilities such as recreational facilities, automated teller machines, postal agencies, clinics, restaurants and eating places, convenience sundry stores, maintenance offices etc.

As logistics facilities provide the basic infrastructure support for the entire industrial area and involve the movement of heavy vehicles, adequate common truck parking, maintenance/

repair/cleaning facilities and fuelling station shall also be provided at suitable locations.

PLANNING PROCESS

The method of allocating the various land clusters and the drawing up of the master plan comprise a step by step process, starting with the identification of site constraints and opportunities, the evolvement of the initial concept for the selected development and the alignment of the concept with development vision. This is followed by the logical location of the cluster identified by the strategic study, and the consideration of the existing land-uses.

The typical layout of industrial

development adheres to the operational efficiency (see Figure 5.32) in terms of industrial clustering and parcellation, transportation and infrastructure practicality, demand capacity and network and the environmental conduciveness for work through the careful planning of workers' accommodation, public open spaces, link-ways and the appropriate provision of amenity centers, fire stations, etc. (Refer to Figure 5-33 for a typical industrial layout).

PRINCIPLE OF CLUSTERING

The main principle guiding the layout for industrial developments is the clustering of the different industrial clusters. This approach is critical as the cluster orientation approach will

serve as a good marketing tool for ease of marketing efforts. By having focus industries identified within the industrial park, anchor tenants will correspondingly attract other supporting industries with higher likelihood of synergies. The grouping of these industries to achieve the clustered effect is based on the following:

- Similar industries can be grouped on planning and environmental grounds.
- Locating similar industrial types together will allow the sharing of common facilities and to have linkages in productions.
- Incompatible industries are not sited next to one another as these industries may be detrimental to one another technically and environmentally.
- Strong synergy between similar industries shall be encouraged to support each other, if the sizes of these sub-zones are adequately large to create an optimal critical mass.

Once this is achieved, it is easier for the various supporting industries or even related institutions to set up in close proximity to these clusters.

PRINCIPLES OF LOT SIZES/ CONFIGURATION

Following the clustering exercise, the next step involves knowing the onset of the type of industries that the new Capital City Amaravati would like to promote in the industrial zones. With the consideration of maximum road frontage and flexible plot amalgamation, a detailed layout plan should be drawn up as quickly as possible.

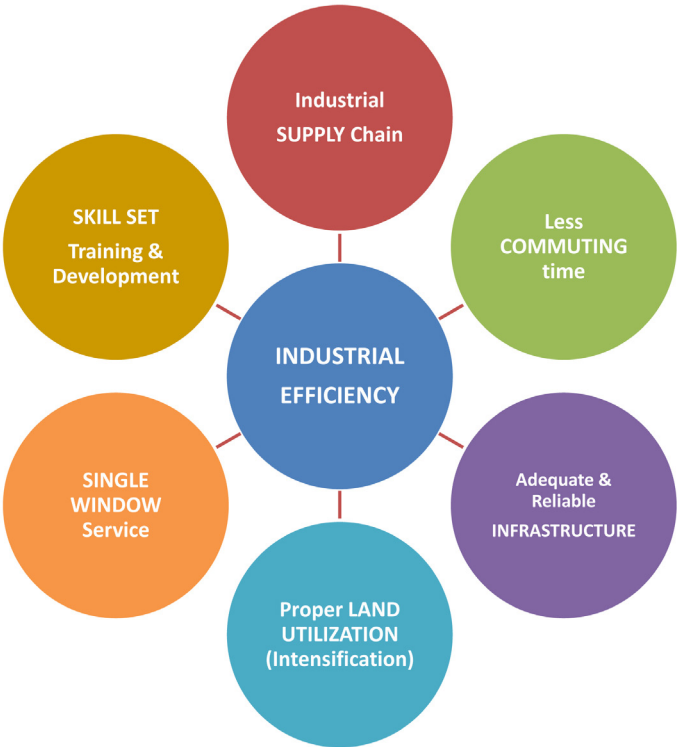


Fig.5.32 Key Factors contributing to Industrial Efficiency

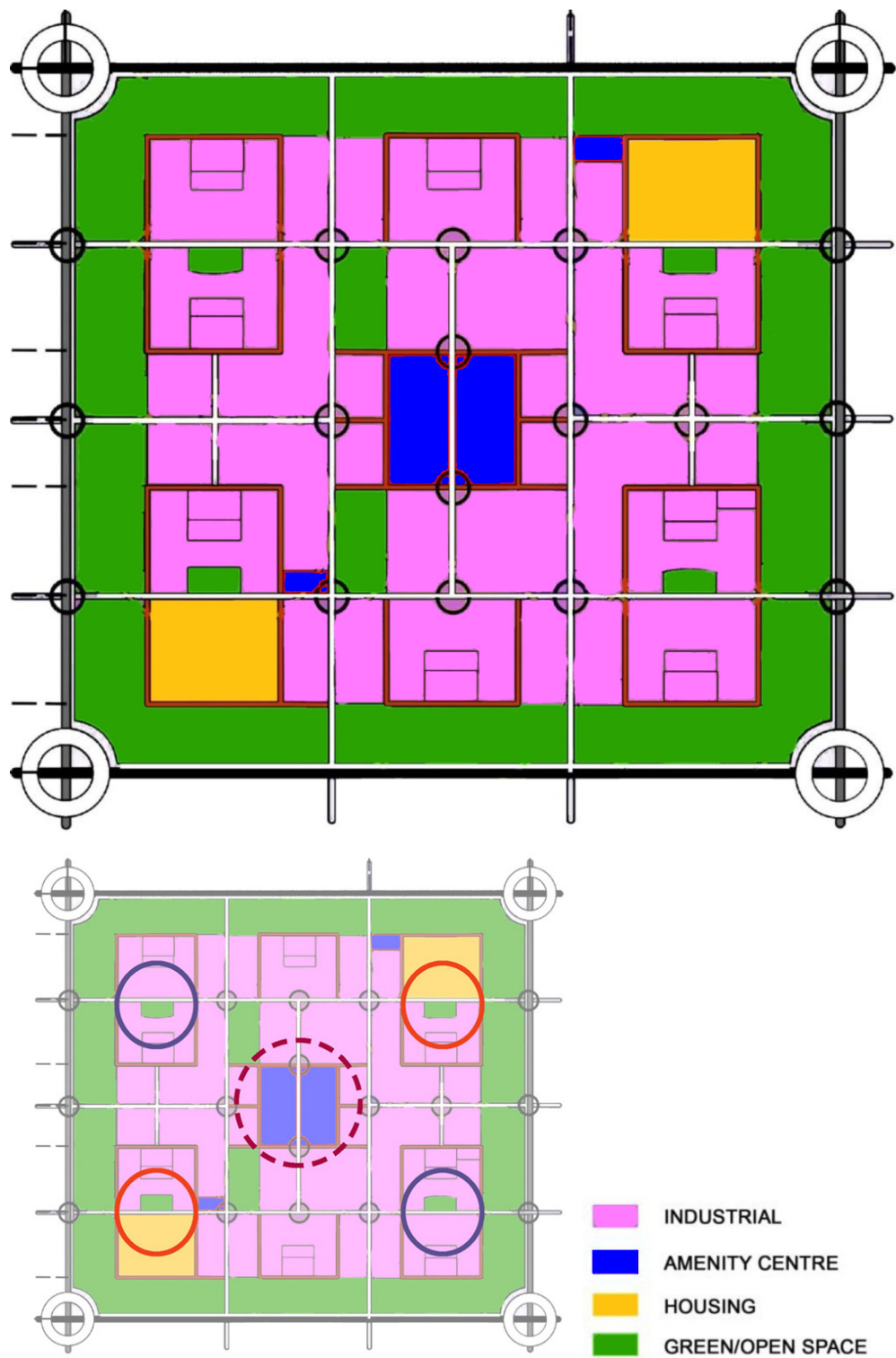


Fig.5.33 Recommended Typical Industrial Layout

Generally, potential locators prefer to select advantageous locations and configure sites to closely meet their own requirements. This situation would make the marketing process more complex and difficult to control. In addition, after the early potential locators have tailored their own sites, there may be a substantial amount of odd shaped remnant pieces of land that will be difficult to sell. Furthermore, the resultant parcel pattern may deviate significantly from the original master plan design and seriously damage the functional and environmental qualities embodied in the plan's design. Infrastructure and utility provisions may also have to be completely redesigned and re-planned.

The logistics developments located within the industrial zones shall be designed in such a way that they allow flexibility of turning some industrial developments into a Special Economic Zone/Bonded Zone in the future if so desired.

DEVELOPMENT PHASING

The general guiding principles for development phasing of the Industrial zones are as follows:

1. To provide a regional balance in the distribution of employment opportunities and residents' population
2. To intensify existing and identified growth nodes where appropriate and strategic to ensure these growth catalysts are effective and fulfilling their intended purposes.
3. Priority to be given to the following wherever possible:

- Areas with existing/ready infrastructure, such as along major transportation routes and within close proximity to other infrastructure network such as sewerage, water and power. This provides the possibility of cutting down up front capital cost.
- Unencumbered areas i.e. no committed developments where the political, development or social pressure is assumed to be at its minimum
- Areas where there is already some form of labour source and expertise

The Capital City is a melange of various attributes and primarily focuses on the IT/ITeS, Research & Development clusters to establish an intellectual capital of Andhra Pradesh in long term. Hence, the economic role of the proposed Capital City will be dynamic and the industrial landscape is programmed with short, medium and long term phasing strategies to facilitate this vision.

As illustrated in Figure 5.34, Amaravati City is located in between the proposed zone of logistics hubs in the east and the zone of manufacturing hubs in the west. Until these manufacturing and Logistics zones are well developed over time, the Capital City will also accommodate all relevant industrial activities besides IT/ITeS, Financial and R&D clusters. In short term, land area safeguarded for Phase 1 of the industrial development within the Capital City will be able to accommodate the industries generating immediate job opportunities.

In medium & long terms, when the suitable skilled workforce is available and the regional level manufacturing & logistics hubs are established with suitable eco-system, the Capital City will steer towards establishing itself as an intellectual capital.

It is recommended to review the market studies, the overall master plan and the phasing strategies at least every 5 years to regulate and manage the growth of the Capital City and the CRDA Region.

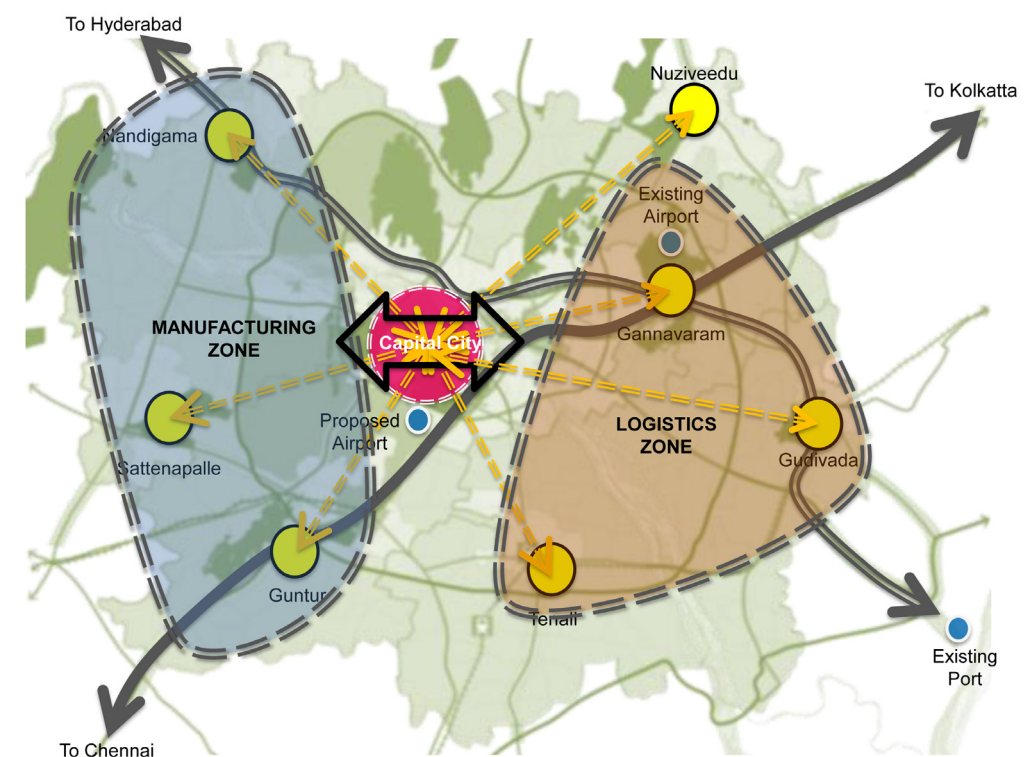
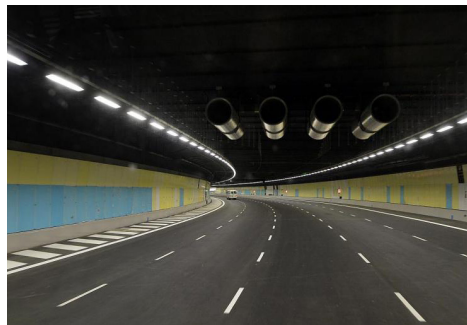


Fig.5.34 Dynamic Role of Amaravati City

5.8 LANDMARK FEATURES

1. River Krishna Under Water Tunnel



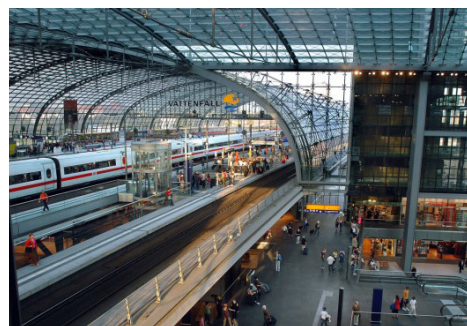
A 5km long underwater tunnel has been proposed to the west of the government complex across Krishna river.

2. Iconic Twin Towers



The Amaravati plaza will be framed with a background of these 2 iconic towers, which will be the tallest buildings in the Capital City.

3. Mega Integrated Transit Hub



This is located at the regional centre where all modes of transport including High Speed Rail, Metro, Roads, Buses and Waterways meet.

4. Amaravati Flyer



An iconic giant wheel is located strategically within the Seed Development offering panoramic views of the city and beyond.

5. Amaravati Sports Hub



Located along the waterfront in the Sports City, this hub, with a core area of 100ha will have the capacity to host Olympic level events.

6. Gardens by Krishna



A combination of traditional and modern landscape design, which includes the Botanic gardens occupies 95ha land on the island.

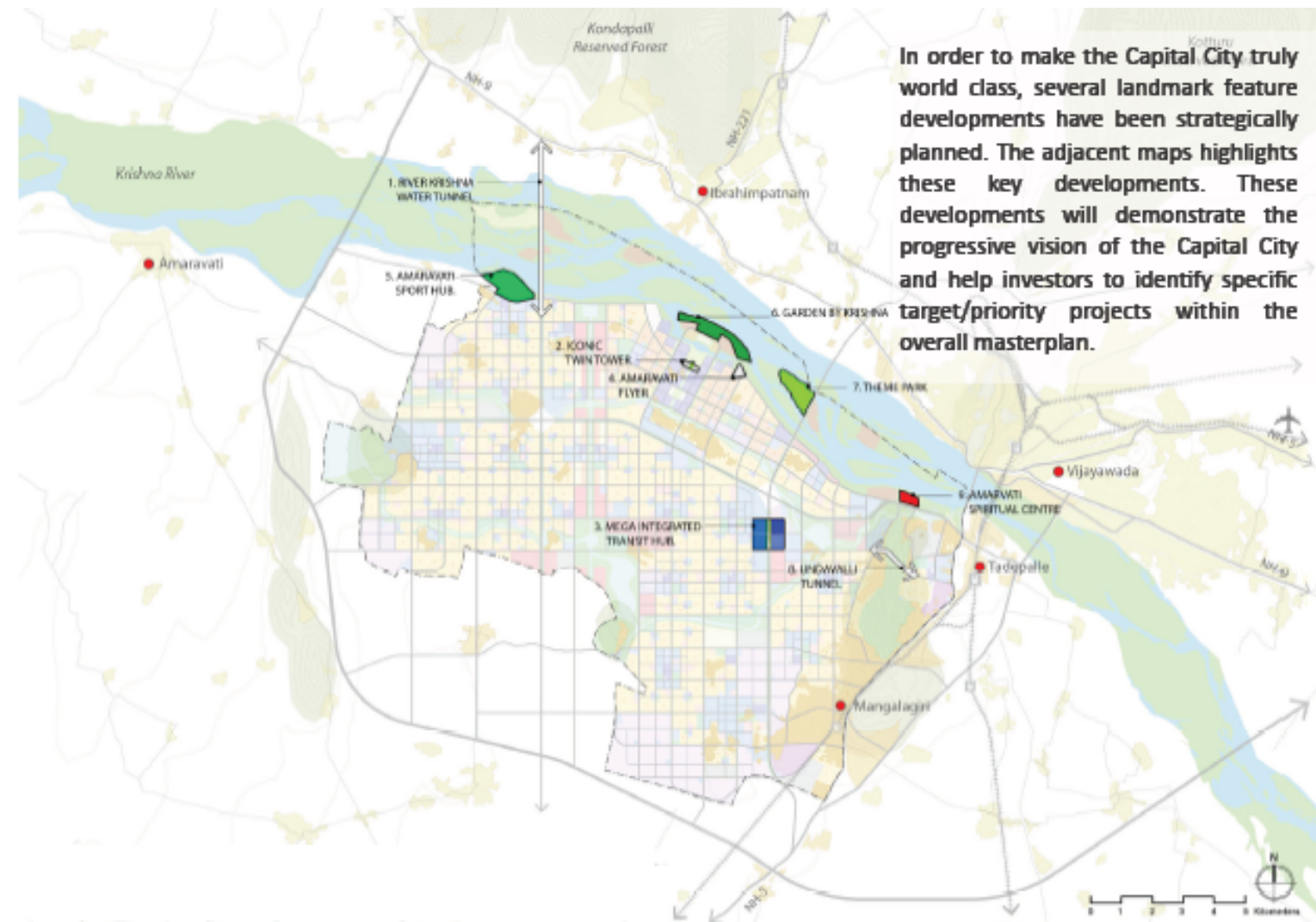


Fig.5.35 Landmark Features Plan

7. Theme Park



A 75 ha water and land based theme park has been planned for on one of the islands within the Krishna river.

8. Undavalli Tunnel



The access road arriving from Undavalli forms a 1km long tunnel through the hills in order to tap on to NH5.

9. Amaravati Spiritual Centre



The spiritual centre will be located at the termination of the Kondaveeti Vaagu near Krishna river forming an ideal setting.

5.9 OTHER CITY FEATURES



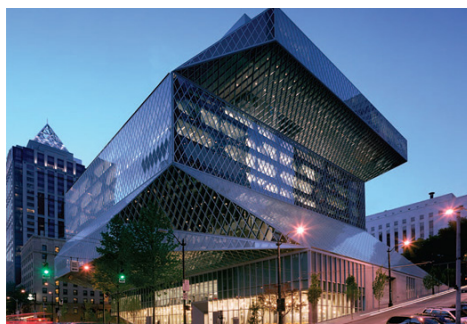
1. Govt. Headquarters / Parade Ground



2. Government City Office



3. City Parks / Health Walks



4. Central Library



Fig.5.36 Other Features Plan



5. Cricket Stadium



6. Zoo/Theme Park



7. Performing Arts Centre



11. Expo/M.I.C.E.



10. High Court



9. City Squares



8. Museums/City Gallery

5.10 SEED DEVELOPMENT MASTER PLAN

5.10.1 CONCEPT PLAN

The following development strategies are proposed, to translate the concept plan into the SEED Development Structure plan:

Maximizing the potential of Transit Corridors:

- SEED development is connected to the rest of the City via two mass rapid transit (MRT) corridors as shown in the adjacent Figure.
- The primary development corridors are aligned along the mass transit corridors in order to utilize the full potential of the public transportation network
- A high density belt wraps around these corridors envisioned to house maximum public activities at the ground level.

Transit Oriented Development Nodes:

- The MRT stations within SEED form the Commercial transit oriented developments (TOD). The primary nodes are:
1. Amaravati Downtown: The central TOD where two transit lines interchange forms the main high density commercial Downtown node.
 2. Amaravati Gateway: The eastern entry to the development is from the Semi express way connecting Gannavaram Airport to the City. To mark a grand arrival to the SEED development, Gateway node is proposed with high density development.

3. Amaravati Government Core: The three arms of the Government, namely the Assembly, the Secretariat & the High court along with the state ministries will lay the administrative foundation for the City. It is one of the major employment generator of the City.

Creating identity & sense of place through landmarks:

- Secondary nodes along the waterfront provide opportunity for special developments creating vibrant waterfront.
- The proposed Convention Centre, Arts & Culture centres and the central iconic downtown towers form the modern skyline of the City.
- The hospitality node along the primary development corridor is proposed complementing the Civic Core.

Seamless connectivity & integration

- The secondary corridors are proposed such that there is seamless movement towards the waterfront from MRT stations.
- These corridors also form the linear parks of the City part of the flood mitigation system.
- The Undavalli axis corridor and the arc host the BRT route.

Activating the Waterfront:

- Public parks and the promenade along the waterfront helps bringing people closer to the waterfront
- Integrating the island creates an intimate waterfront section.
- Realignment of the bund to bring development upto the water edge helps in maximizing the potential of the waterfront development.



Fig.5.37 Structure Plan for SEED Development Area



Fig.5.38 Landuse Plan

5.10.2 SEED: MASTER PLAN

The Seed Masterplan is proposed to create 600,000 jobs and accommodates over 300,000 residential population. Four key nodes within the Seed Development Area form the focus of

this development that are elaborated in the following pages:

- 1. Amaravati Government Core
- 2. Amaravati Downtown
- 3. Amaravati Gateway &
- 4. Amaravati Waterfront

Table 5.1 SEED: Landuse Distribution Table

CATEGORY	LANDUSE	Area Sqkm	Percentage
RESIDENTIAL	EXISTING SETTLEMENTS	0.30	1.4%
	LOW TO MEDIUM DENSITY RESIDENTIAL	0.25	1.2%
	HIGH DENSITY RESIDENTIAL LPS	0.36	1.7%
	HIGH DENSITY RESIDENTIAL	1.70	8.1%
	MIXED USE	3.76	18.0%
COMMERCIAL	NEIGHBOURHOOD CENTRE COMMERCIAL	0.02	0.1%
	TOWN CENTRE COMMERCIAL	0.10	0.5%
	COMMERCIAL CBD	1.85	8.9%
FACILITIES	CIVIC FACILITIES	0.09	0.4%
	HEALTH FACILITIES	0.26	1.3%
	HOSPITALS	0.09	0.4%
	RELIGIOUS FACILITIES	0.14	0.7%
GOVERNMENT	INSTITUTION	1.05	5.0%
EDUCATION	PRIMARY SCHOOL	0.17	0.8%
	SECONDARY SCHOOL	0.26	1.3%
	JUNIOR COLLEGE	0.19	0.9%
INDUSTRY	RESEARCH AND DEVELOPMENT	0.34	1.6%
PARKS AND GREENS	HOTEL RESORT	0.34	1.6%
	NEIGHBOURHOOD PARK	0.17	0.8%
	TOWN PARK	0.13	0.6%
	PRIMARY GREENS	2.78	13.3%
	SECONDARY GREENS	1.07	5.1%
	SPORTS FACILITIES	0.22	1.1%
	ROAD BUFFER GREENS	0.04	0.2%
	WATER	0.40	1.9%
	RIVER	0.58	2.8%
	SPECIAL USE SITE	0.74	3.5%
	INFRASTRUCTURE	0.04	0.2%
	TRANSPORTATION	0.09	0.4%
OTHERS	ROADS	3.33	16.0%
	Total	20.84	



1. Assembly and Secretariat
2. Civic Axis
3. State Ministries
4. State Gallery
5. Civic Plaza
6. Lingayapalem Village
7. Hospitality Node
8. Regional Hospital
9. Uddandrayanipalem Village
10. Canal Parks
11. Botanic Garden
12. Jetty
13. Downtown Core

14. Tallayapalem Village
15. University
16. Gateway Tower
17. Wetland Park
18. Performance Centre
19. Art and Cultural Centre
20. Iconic Tower
21. Indoor Sports Centre
22. Food and Beverage
23. Convention Centre
24. Promenade
25. Paalavagu



Fig.5.39 Illustrative Plan: Amaravati Government Node

5.10.3 PLACE MAKING STRATEGIES

AMARAVATI GOVERNMENT CORE

The government core is probably the most important area of the Capital City. It will house the seat of the state government, which is the very reason for the existence of the capital city. The Amaravati government core houses the 3 civic arms of the Andhra Pradesh state. Special design consideration has been given to this important government axis through the following place making strategies:

- The frontage of the buildings facing the central green space are designed to be vehicle free. Vehicle access is restricted to the rear side not fronting the central green space.
- Physical barriers between the government buildings and the green central park should be avoided as far as possible in order to allow people to experience and be as close the government functions as possible.
- These green spaces can be used for numerous F&B activities such as canteens, coffee shops, alfresco dining, etc. in addition to functioning as a park where people can spend their leisure time.
- At the same time, it becomes critical to maintain the security and allow flexibility of the spaces to increase security as and when required.

The above strategies are illustrated in the adjacent Figures.



Fig.5.40 Location Plan: Amaravati Government Node



Fig.5.41 Artist's Impression - Amaravati Government Node



High Court

Civic Axis

Secretariat and
Assembly

State Ministries

CEREMONIAL: GOVERNMENT CORE

Note: Artist impressions are subjected to detailed design development

AMARAVATI DOWNTOWN

The Amaravati Downtown is the commercial heart of the Capital city. This area has the best access through public transit. Therefore, the following strategies will help exploit maximum potential:

- The buildings along the central boulevard are proposed to have no setbacks and active uses such as retail, restaurants, cafes on the ground storey. These will be allowed to spill over on to the walkways in order to create an active building edge.
- Vehicular access is discouraged along the central boulevard as it is a Major arterial road. This also allows continuity of the active building edges.
- The buildings are designed to be integrated seamlessly with the MRT stations to allow comfort for the

commuters.

- The landmark towers that are illustrated in Figure 5.42, will be integrated with MRT stations so that commuters can directly access the buildings from the station level.
- The corners of the building at the illustrated junction will receive special articulation in order to accentuate its importance as a transit and commercial node.
- Small pocket parks will complement the city level green spaces to create breathing semi-public gathering



Fig.5.42 Illustrative Plan: Amaravati Downtown



Fig.5.44 Location Plan: Amaravati Downtown

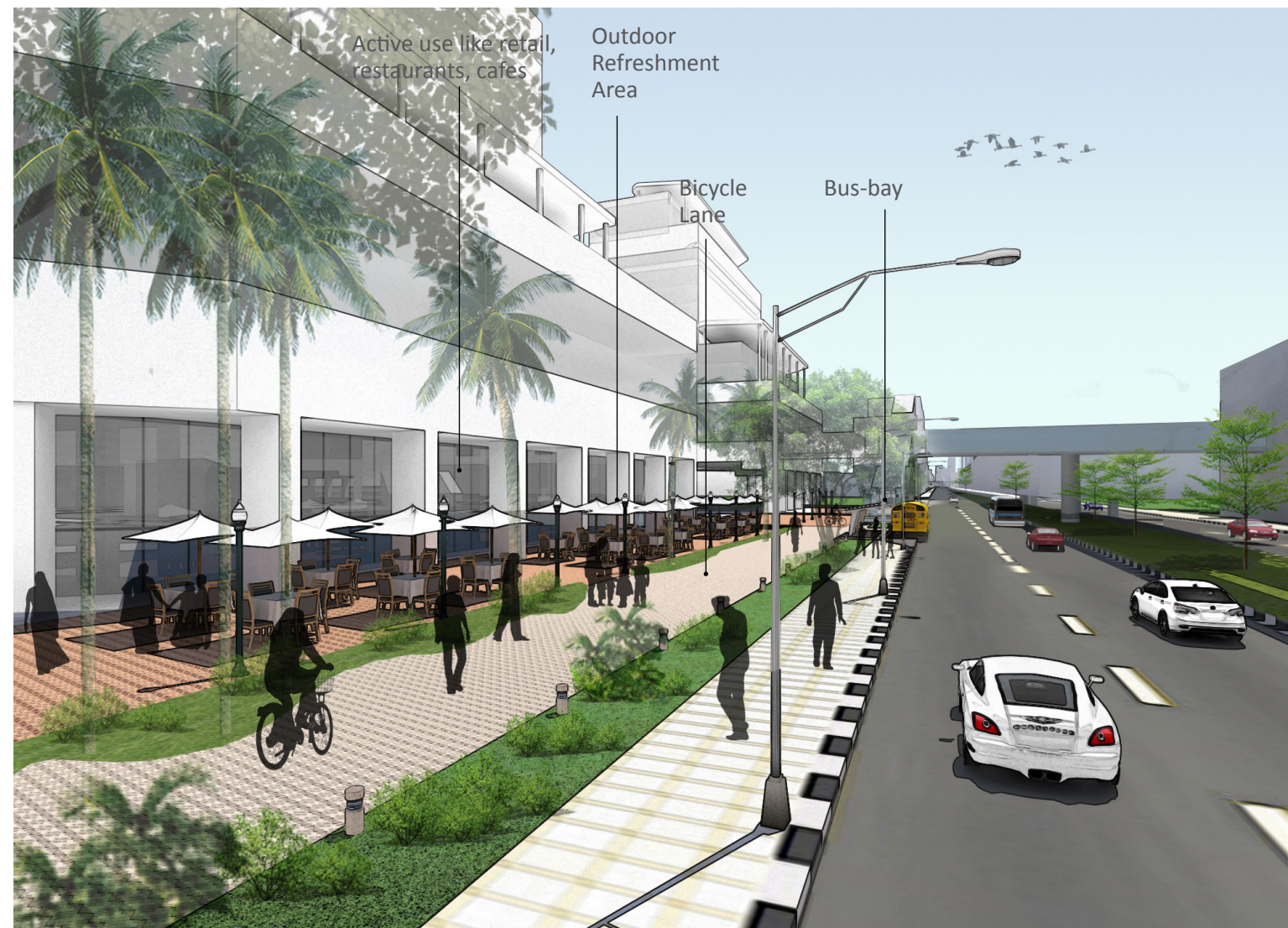


Fig.5.43 Artist's Impression - Amaravati Downtown Road



Note: Artist impressions are subjected to detailed design development

SEED DEVELOPMENT MASTERPLAN



Fig.5.45 Illustrative Plan: Amaravati Gateway

AMARAVATI GATEWAY

This node will create the first impression of the Capital City because it forms the gateway to the city and SEED development. It has been designed in a way to create the necessary impact that one needs to feel while entering the Capital City. Following strategies will help achieve the above:

- The bridge is designed in itself to become a symbol of the city to welcome the arrivals.
- Appropriate parcels have been identified to be developed for the Iconic Gateway towers and to emphasize the grandeur effect of entering the capital city.
- This has been further enhanced by carefully setting back the building to create a larger green/public space in front of the building that allows one to appreciate the buildings. These

will be active urban spaces with F&B, retail, and also showcasing open air performances.

- These spaces are seamlessly connected to the wetland park and the public waterfront.
- The rooftop of the podium building will be visible while arriving from the iconic bridge and is proposed to house open to sky public activities.
- Vehicular access is only provided through sub-arterial and collector roads and vehicular access is discouraged along the waterfront thus maintaining a peaceful and safe environment.

These strategies are illustrated in the adjacent Figures.



Fig.5.46 Location Plan: Amaravati Gateway

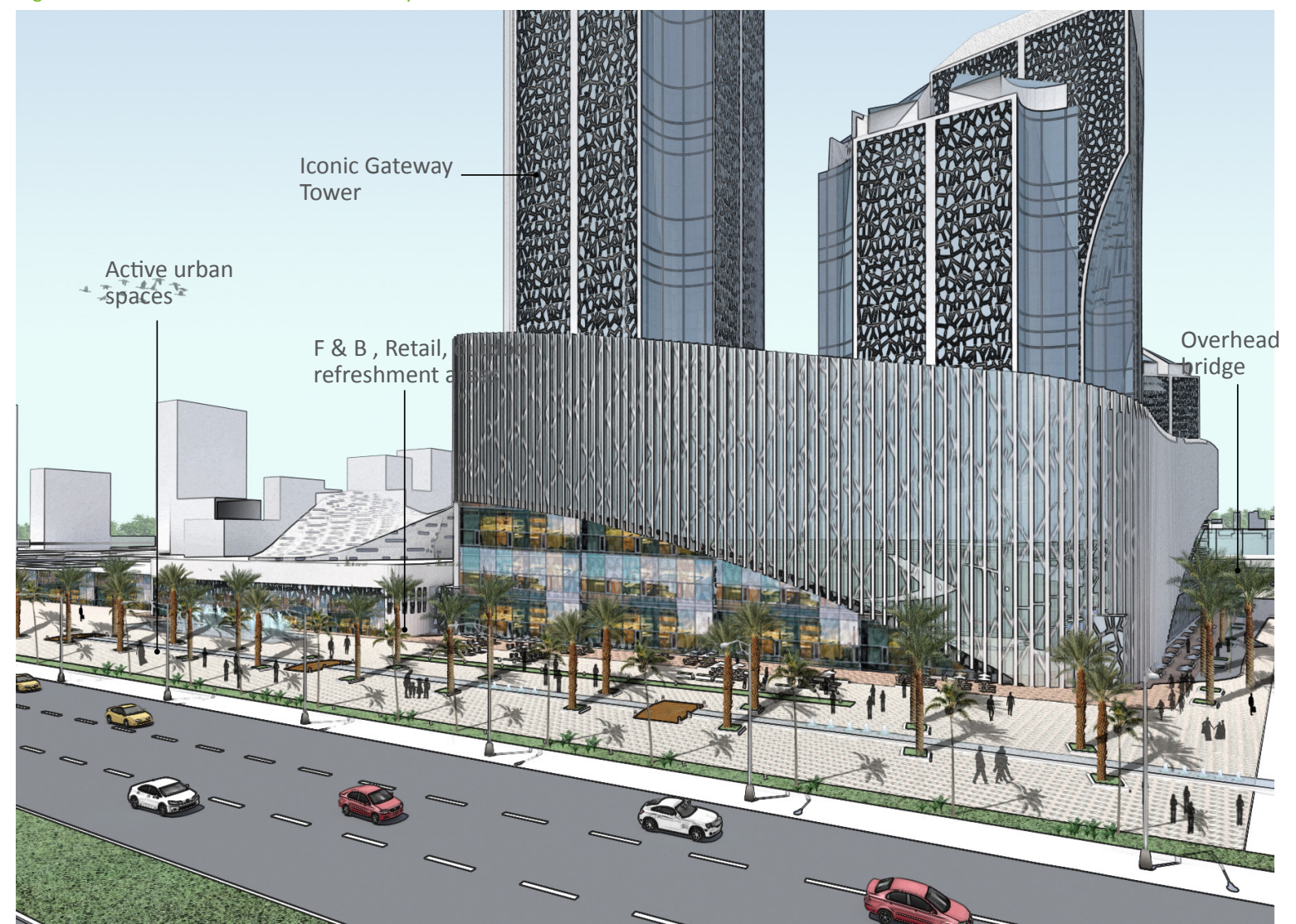


Fig.5.47 Artist's Impression - Amaravati Gateway

High Speed
Rail

Iconic
Gateway

Gateway
Development

Iconic
Bridge

Wetland
Park

Amaravati Gateway

ICONIC: AMARAVATI GATEWAY

Note: Artist impressions are subjected to detailed design development



AMARAVATI WATERFRONT

The Amaravati waterfront is envisioned as an active public waterfront with city level commercial and recreational uses. The key place making strategies for the Amaravati waterfront include:

- Large public buildings are proposed to attract people to the waterfront. In accordance to this, large public spaces have been designed to accommodate these numbers.
- The buildings and public spaces are designed to be barrier free in order to integrate the interiors and exteriors.
- The ground level of these buildings are encouraged to have direct access from the public spaces.
- The Amaravati plaza is a grand plaza

that will be a multipurpose space housing activities such as waterfront amphitheatres, traditional street hawkers, etc in order to create an interesting yet compatible mix of activities.

The adjacent Figures help further illustrate these strategies.



Fig.5.49 Illustrative Plan: Amaravati Waterfront



Fig.5.48 Location Plan - Amaravati Waterfront

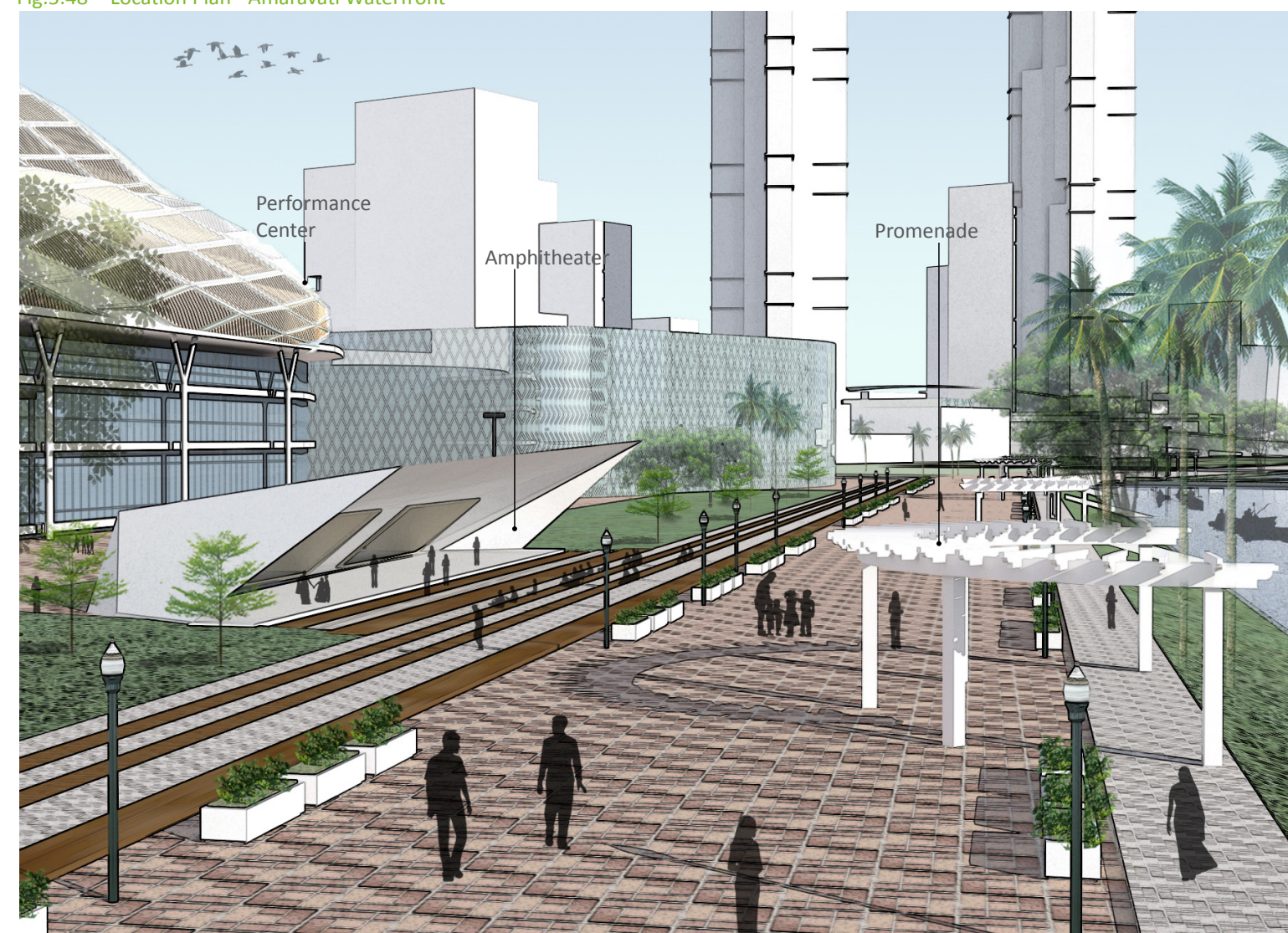


Fig.5.50 Artist's Impression - Amaravati Waterfront



Iconic Towers

Monument/
Statue

Waterfront
Commercial

Amaravati
Flyer

Amaravati
Plaza

Promenade

Performing
Arts Centre

VIBRANT: KRISHNA RIVER

Note: Artist impressions are subjected to detailed design development

5.11 IMPORTANCE OF URBAN DESIGN GUIDELINES

5.11.1 INTRODUCTION

The zoning plan and regulations FOR the capital city and the respective zoning plans are presented in the zoning report. Further to this, there is a need to establish a physical character of certain key areas such as Regional Centres, Town Centres, Neighbourhood CENTRES AND CORE AREAS OF THE 9 CITIES. Such plans seek to ensure the sense of place in these key areas, and creating distinct character districts with a unique identity.

5.11.2 PURPOSE

The main purpose of the urban design (UD) control plans for the key areas is to achieve the desired urban design characters as a whole, the different characters of the key areas and also achieve the desired ambience at the ground level.

The Key Urban Design tools are:

1. To achieve the Urban Design character by definition and placement of Skyline, Landmarks, Gateways, Vistas and Building Edges
2. To enhance the public spaces and connectivity at ground level through definition and placement of Pedestrian Connections, publicly assessable areas, outdoor refreshment areas and activity generating uses at ground level.

5.11.3 TYPES OF URBAN DESIGN CONTROL PLANS.

These urban design requirements are to be observed in addition to the requirements specified in the zoning guidelines. If there is conflict between the two, the UD Control Plans will prevail.

The following are the different types of control plans typically used for the key areas.

PUBLICLY ACCESSIBLE AREAS PLAN:

Publicly accessible areas define the main pedestrian access, pedestrian strips or zones. Major portion of this area should be dedicated for pedestrian activities and sufficiently paved.

ZERO SETBACK AND MANDATORY BUILDING EDGE PLAN:

Mandatory buildings edges are stipulated along the open spaces and public plazas to define the open space character. Mandatory building edges, also defines the alignment of the covered pedestrian walkways which creates a continuous covered pedestrian walkways.

VEHICULAR ACCESS AND PEDESTRIAN CROSSING PLAN:

In terms of vehicular accessibility and movement within the Urban Design Area, emphasis is laid on facilitating

pedestrian comfort by clearly segregating vehicular and pedestrian access. Vehicular entry is provided along the main access roads. Pedestrian movement is maximised throughout by allowing uninterrupted movement along and within all parcels as well as through features including arcades, which enhance pedestrian experiences.

BUILDING USE PLAN:

While most of the parcels within the key areas have to follow the zoning regulations to determine their land use, special parcels in key areas are required to follow special Urban Design Control. For instance, as per this plan, the ground floor in commercial buildings adjacent to the green corridors and public plazas can be designated to be used for activity generating uses like food and beverage outlets, retail uses etc. These retail activities will ensure the vibrancy of the public spaces.

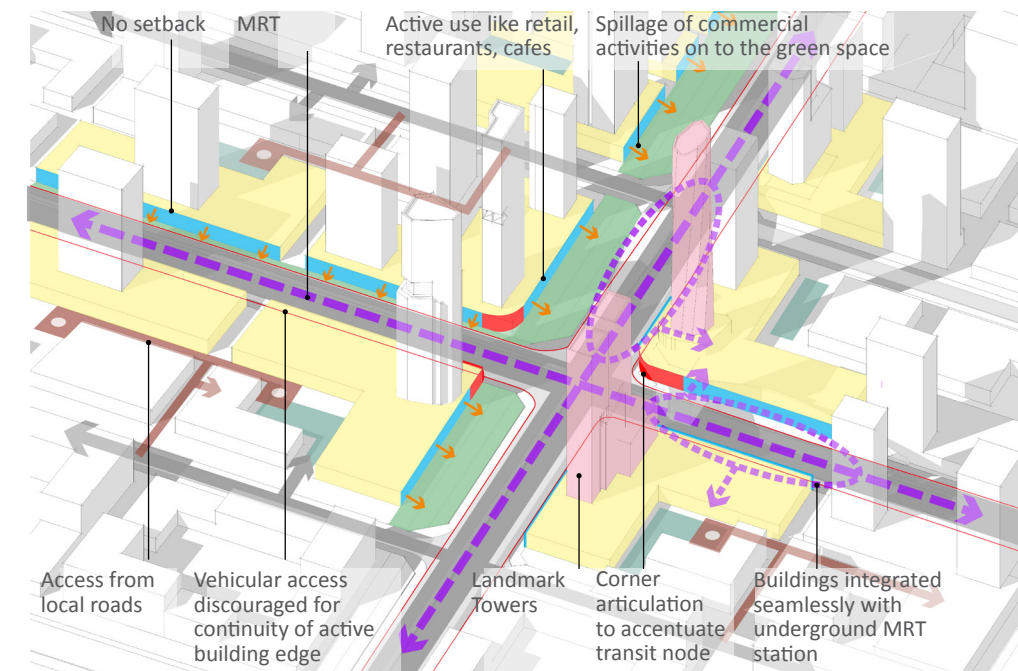


Fig.5.52 Diagram illustrating UD strategies for Amaravati Downtown Core

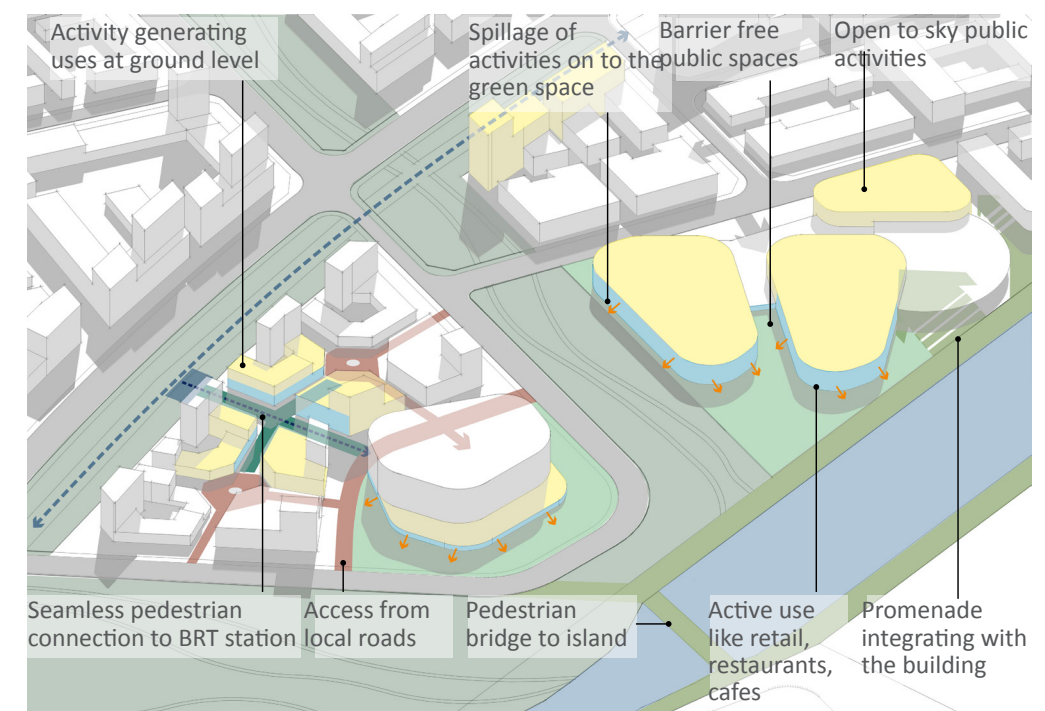


Fig.5.51 Diagram illustrating UD strategies for Amaravati Waterfront

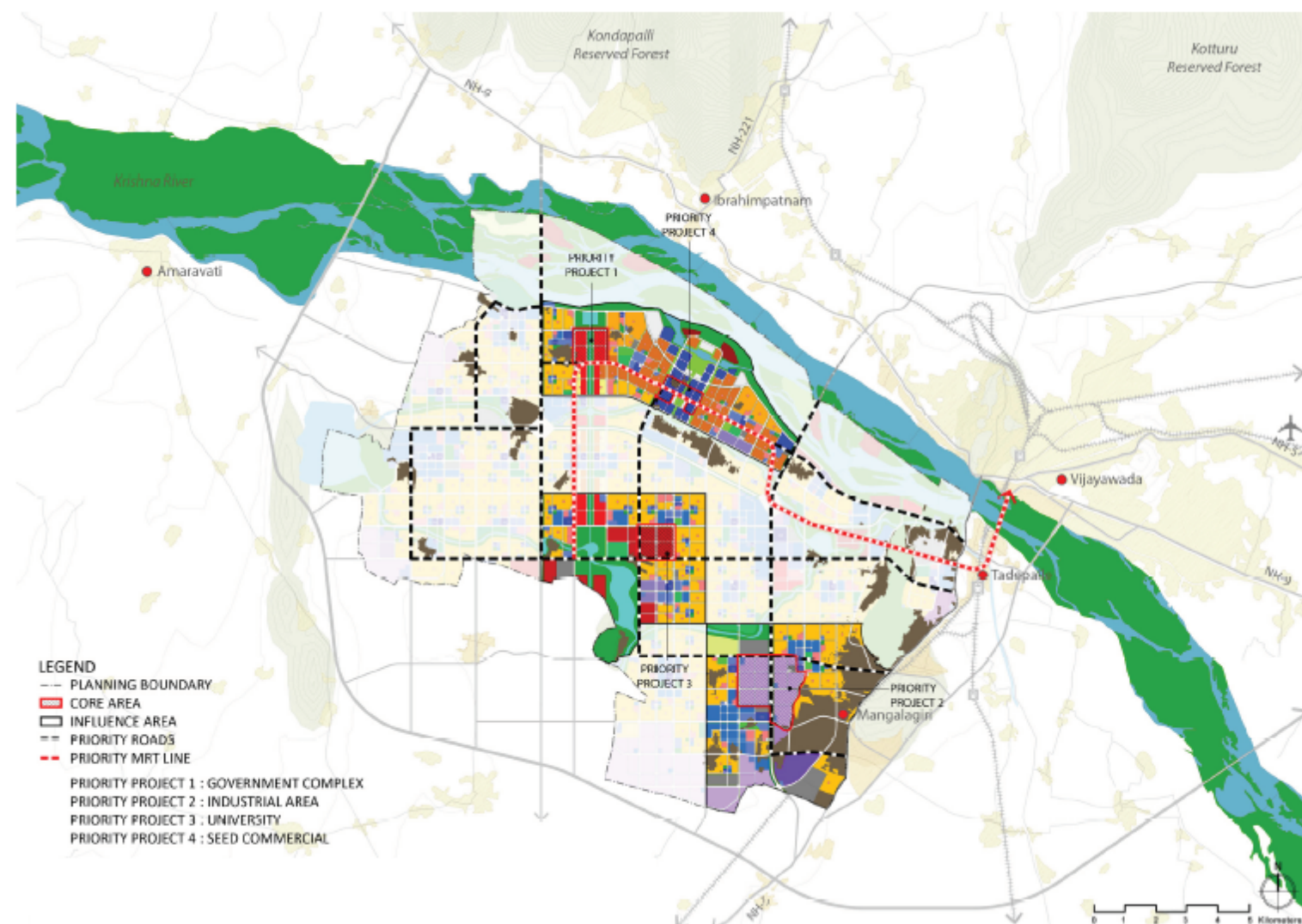


Fig.5.54 Priority Project and Influence Areas



Government Complex



University



High Tech Industries

Fig.5.53 Key projects

5.12 PRIORITY DEVELOPMENTS

To enable successful implementation of the Amaravati Capital city Master Plan, priority projects and their influence areas have been proposed for guiding the implementation and government budget requirements for the immediate and future projects. With this intention, the Amaravati Capital city Detailed Master Plan proposes few priority projects as described below.

5.12.1 INFRASTRUCTURE

ROADS CONNECTING ALL EXISTING SETTLEMENTS

As part of the land pooling layouts, it is necessary to provide access in the first phase to all the existing settlements inside the Capital City. To achieve this, road segments have been identified from the proposed road network, that need to be built at priority in order to give access to these villages.

In the short term of first 10 years, these roads need not be built to the full capacity, but as the demand builds up in the future they can be upgraded. The same routes can also be used for BRT routes in the short term. These roads will also increase the number of access points from adjacent areas from NH5.

87 KM
LENGTH OF ROADS

The priority projects have been categorised in to 2 parts:

1. Infrastructure and
2. Development projects

This is ensure that sufficient infrastructure is laid out to cater to the existing farmers, and at the same time able to kick-off key projects to catalyse the development throughout the capital city.

MRT LINE 1

Vijayawada city has already proposed an MRT network plan for the city. A large percentage of commute to the Capital City will originate from Vijayawada. Therefore, it is very important the MRT line 1, which taps on to the proposed MRT network within Vijayawada is built in the first 10 years. This is to provide for easy commute between the old and new city and also decrease the need for private vehicle commute.

This MRT line will also tap on the suburban railway station at Tadepalli. Therefore, the people commuting from the neighboring towns can also travel in to the Capital city easily in first few years.

22 KM
LENGTH OF MRT

5.12.2 DEVELOPMENT PROJECTS

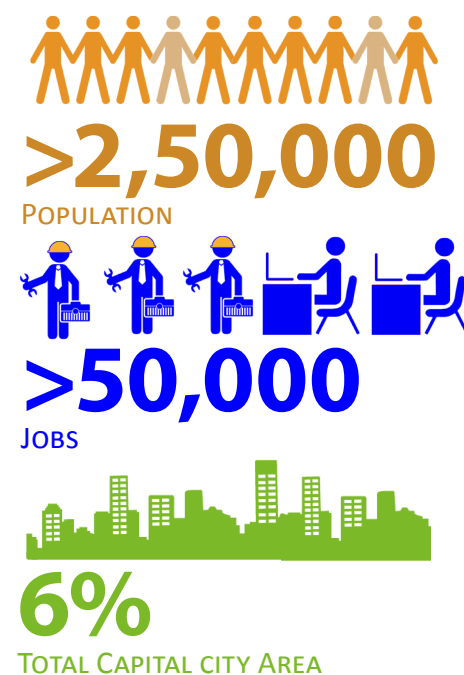
1. GOVERNMENT COMPLEX

Core Area

The core area that has identified for first phase development covers about 100 Ha and will house the 3 arms of the government. It is proposed to create direct employment of about 50,000 in the early phases.

Influence Area

The influence area has been identified as the township within which the government core is located. This township covers an area of 2,360 ha, and is proposed to house about 6,00,000 people. This will also include the housing for high ranked officials and necessary facilities and infrastructure within the township.



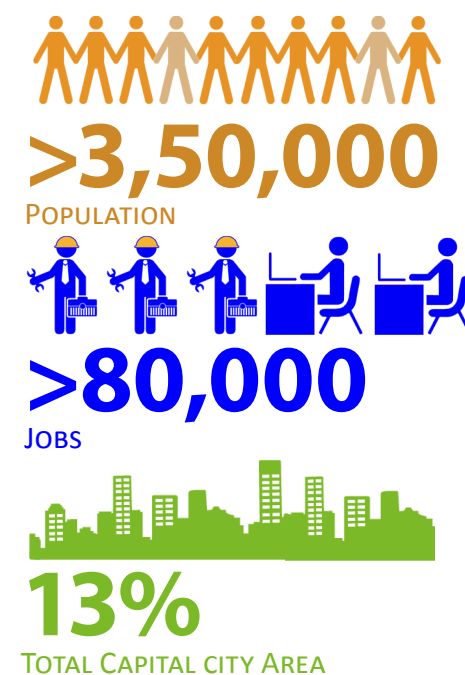
2. INDUSTRIAL AREA

Core Area

Creating jobs in the industrial sector is very important for any new greenfield developments. 140 Ha of industrial land has been identified along the proposed expressway. This will help in creating at least 1,00,000 jobs.

Influence Area

The influence area cuts across 4 townships. These 4 townships together with the industrial areas can house a resident population of about 7,00,000 people. Being in the immediate vicinity of the largely populated Mangalagiri development, the location provides an added advantage to capitalize on this catchment.



3. UNIVERSITY

Core Area

During several discussion with the client and stakeholders, it was learnt that a few key investors as willing and ready to invest in university development. In order to allow to capitalize on these investment opportunities, more than 100a Ha of university land will be released for immediate development.

Influence Area

4 townships in the vicinity of the university will be influenced and can capitalize on this university development catchment. These are located around the central park and proposed to house more than 4,00,000 residents.



4. SEED COMMERCIAL

Core Area

Certain parts of the Seed Development, covering about 65 ha, have been identified to kickstart the development within the Central Business District. These 4 parcels have been located around a transit node around the central station on MRT line 1. They are also located along the downtown road that needs to be built to give access to the government complex.

Influence Area

The above mentioned parcels are intended to catalyse the development throughout the Seed Development covering about 2000 ha.



It is important to note that the priority projects have been strategized based on ideal masterplanning principles and interaction with the stakeholders and investors. It is necessary to relook at this strategy every one year according to the above dynamics that may change. The list is not exhaustive but intended to catalyse the developments within the capital city.

In addition to this, development pressure may necessitate the release of other land parcels along the identified road connections. It has to be decided on a case by case basis to grant permissions for development based on the timeline for infrastructure development.

* The population and jobs numbers need to be verified by APCRDA according to prevailing markets conditions as necessary.