Urban Design and Architectural Guidelines for Amaravati Capital City

Draft Abridged Version

September 2025

A Collaborative "People Place and Planet" Approach

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1 Introduction

1 Introduction

Vision

The vision for Urban Design and Architectural Guidelines (UDAG), is to guide the future development of Amaravati to become a walkable, liveable and happy city with a unique image and identity. Amaravati is envisioned to celebrate the waterfront and integrate the existing villages with smart planning, architectural, landscape and sustainable urban design to create an inclusive, world-class people's capital city. Amaravati, together with the existing cities of Vijayawada and Guntur across the river has the potential to eventually become the smart mega city of Andhra Pradesh.

Guiding Principles

Nurture a People-First, Socially Inclusive and Equitable City

People's needs will be prioritised in Amaravati. The people-first principle reckons every individual as a valuable stakeholder of the city, regardless of age, physical status, income etc. The inclusiveness and equality being treasured with a 'People-first' lens will make Amaravati the true 'People's Capital'.

Reposition the Krishna River as the Heart and Soul of the City

The new Capital City can take advantage of its location near riverfront like many international cities. Amaravati can develop Krishna River as the heart and soul of the city. The riverfront and the canals together form the blue and green network which will provide an enjoyable environment and opportunities for tourism development.

Encourage a Transit and Pedestrian Oriented Development

Sustainable transit will be backbone of mobility in Amaravati with effective Transit and Pedestrian Oriented Development. The convenience of enhanced mobility with efficient multi-modal transit, including rail, bus, tram, water transit, as well as biking and walking and less dependence on cars.

Ensure Mixed Use Development Throughout

Encourage horizontal and vertical mixed use developments in Amaravati to create a vibrant city bustling with activity 24/7. The mix of land uses and activities will also foster diverse economic opportunities for Amaravati and its people.

Preserve Local Heritage, Art and Culture

Local heritage, art and culture are keys to create a sense of place and community ownership to strengthen the local identity and collective memories of the city. Amaravati with its emphasis on village integration, local art and culture will nurture local craftsman and artists to become an attractive city for residents and visitors alike.

Strive for a Liveable, Walkable and Connected City

A liveable, walkable and connected Amaravati encourages people to live an active lifestyle and walk to their destinations with a pleasant experience under comfortable and safe conditions. Design responding to the micro-climate needs of the people and the local environment to create a memorable city life.

Develop a Vibrant City with High Quality of Life

Amaravati with its high quality public spaces and diverse opportunities will become an attractive destination. The city will be able to attract a diverse group of people, businesses and activities to create a vibrant city offering a high quality of life to its people and visitors alike.

Build a Clean, Green, Healthy and Happy City

Amaravati embraces the idea of clean, green, healthy and happy city to minimise the impacts of the development to the environment and ensure the well-being of its inhabitants. Amaravati will become a great city to live, work, play, learn and have fun for all age and income groups.

Promote Smart and Sustainable Development

The design of Amaravati will look for ways to improve the efficiency and convenience in daily lives, not limited to technological advancements but also smart thinking, planning and design with a focus on People, Place and Planet. This will also enhance the city's resiliency in physical, social, environmental and economic aspects.

Create a Unique City Image and Identity

Amaravati will become a city with a unique image and identity contributed by its rich Andhra culture and local heritage together with its context-specific new development. Amaravati will be a new world class capital city, a model for other cities in AP, India and beyond.

Key node along River Krishna offering open space to enjoy views of the river and city as well

1 Introduction

Amaravati Masterplan

The Amaravati Masterplan proposes the land use, road network, grid pattern and themed clusters of the future developments of the capital city. However, there are still issues with regards to the masterplan that needed to be addressed and taken forward by the UDAG. The following summarises some of the key issues from the masterplan:

- Riverfront development and integration with capital complex and LPS needs to be reviewed with respect to built form as well as transit connectivity
- Bund road is proposed to prevent flooding to the hinterland, but this should also be designed to become a key feature and ensure public accessibility to the riverfront area
- Connections of River Krishna and internal water canals need to be considered through planned green corridors and buffer zones
- Open space network system is not interconnected; pocket parks and green spaces need to form part of the open space network
- While existing villages are preserved and protected, they need to be reviewed for their integration with the surrounding LPS layouts in terms of physical, socio-economic, built-form, heritage, culture, infrastructure, functional and administrative requirements
- Percentage of mixed use distribution is low and needs to be reviewed to encourage a vibrant city with 24/7 life in all the clusters
- Public transportation routes including alignments and station locations need to be well integrated with land use, density to create transit nodes to increase catchment and maximize ridership
- While the road hierarchy anticipates for future traffic needs for Amaravati, the current capacity may not fully utilise the space given for the proposed road network for some time. The potential for interim open space use on road network until further road capacity is needed should be explored to create a more walkable environment to help reduce car dependency

Land Pooling Scheme (LPS)

Land pooling taken up by the government of Andhra Pradesh along with APCRDA is an innovative step in creating adequate land for the new People's Capital. Guarantee return of developed and reconstituted plots and other benefits are provided for land owners volunteering to offer their land. The LPS was instrumental to help define the masterplan and determine the shape of the City. However, the LPS resulted in the following issues that need to be addressed:

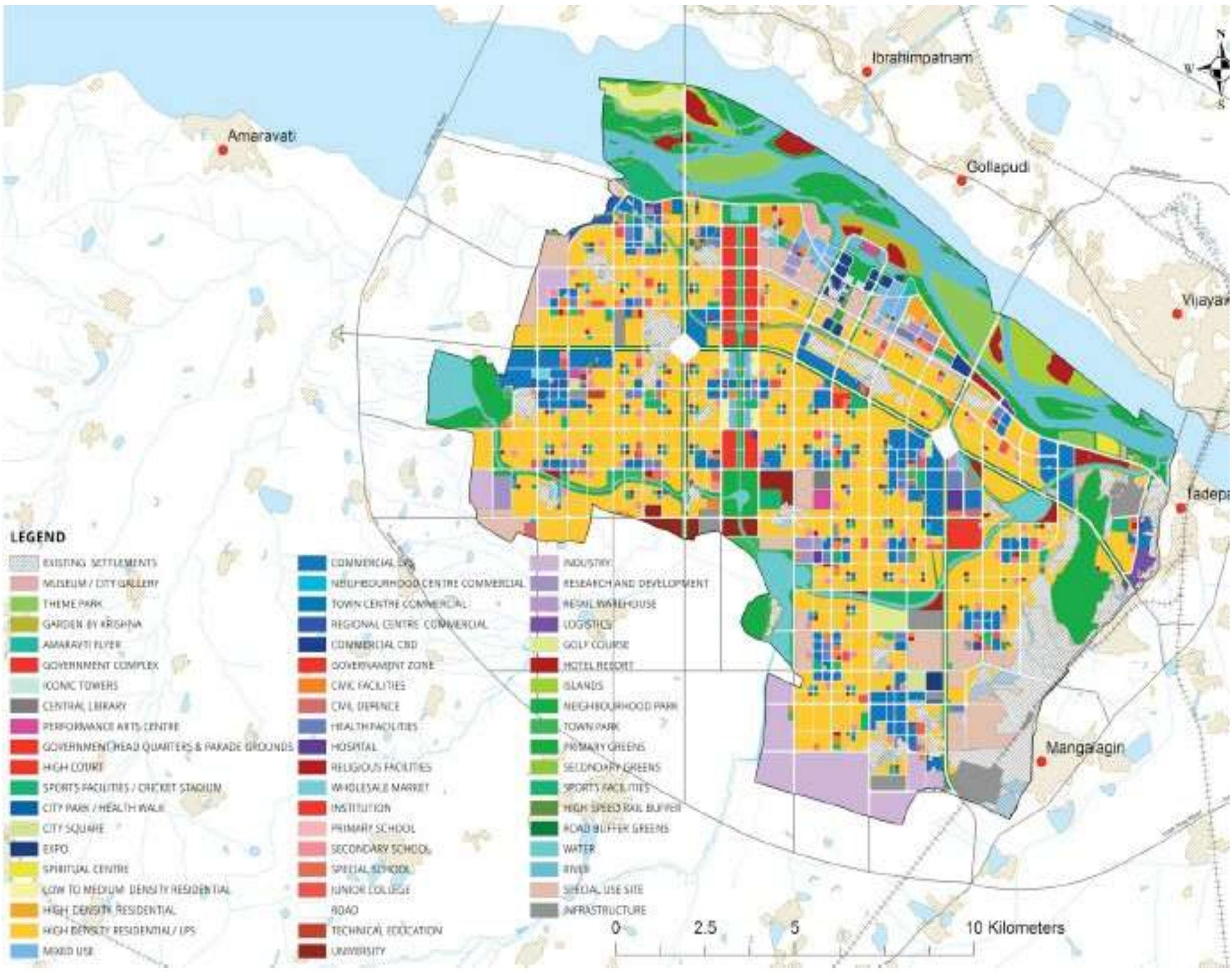
- The LPS compromised on open space provision within the capital city as some of the core principles of planning were not followed in certain areas during the process of allotting the returnable lands
- As a result of the LPS, the overall planning and design of the capital city looks monotonous, potentially missing opportunities for a distinct urban form as well as some of the elements of surprise and curiosity within the new capital city
- There are numerous small plots that may be develop but currently plot amalgamation is not allowed, which might restrict comprehensive developments and should be looked into in the future

Zoning Regulations (ZR)

The ZR have jurisdiction over the entire city and address the land uses, design, areas, heights and other regulations of the buildings and structures. Currently, the ZR do not associate building heights with the FSI consideration and the impact on the overall development for Amaravati. A city should have variations and allow transition in the urban form of the city within its neighbourhoods to create a memorable skyline. Also, the urban grain and the FSI consideration very small in consideration of the ground coverage, which makes a very uniform flat skyline and does not work well to create a sense of place and character.

Building Regulations GO119

The Building Regulations controls the building activities to protect the environment and provide better living conditions to the citizens as well as enable business friendly structures. However, some regulations are too general and needed to be further specified, such as disabled access, setbacks, visual connectivity, open space provisions, etc.



Amaravati land use plan

1 Introduction

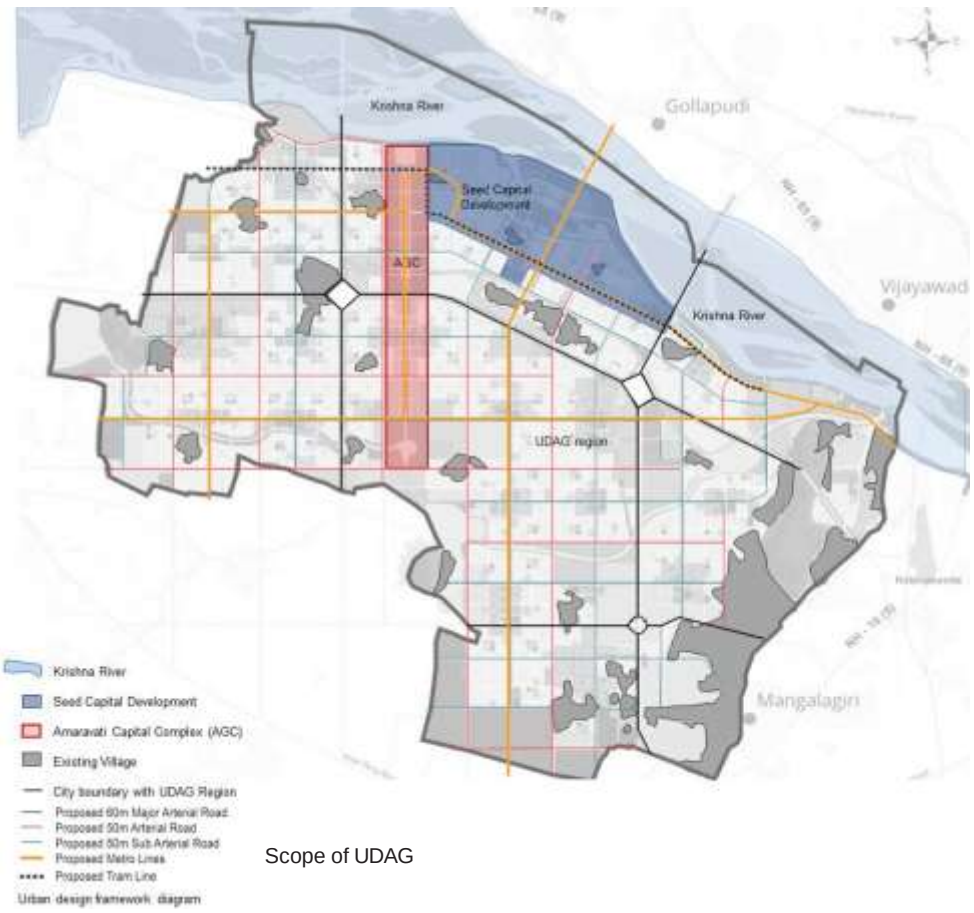
Scope and Purpose

APCRDA (the Client) has appointed UDP International, in a Consortium Agreement with Green Space Alliance (GSA) and Terracon Ecotech for the Preparation of the UDAG for Amaravati Capital City. The scope of UDAG covers the riverfront, the canals and open space network, villages and surrounding LPS areas, the streetscape, built form along the streets, TPOD, commercial, mixed use and large scale developments. The guidelines are aimed to play a critical role in shaping Amaravati, the new capital city, with a unique image and identity. The city is supported by sustainable urban mobility and infrastructure, the blue and green network with high-quality public open space, the existing villages well integrated with the LPS areas to showcase the local heritage, art and culture. The UDAG will also help to guide ongoing and future new developments to be undertaken by institutional, public and private sectors within the city. UDAG will ensure a high quality, cohesive built environment that enables the new capital city to not only become a model city of Andhra Pradesh but also put Amaravati on the world map.

River Krishna is a valuable natural asset of the new capital city with a potential to become the heart and soul of Amaravati. The river offers an opportunity for Amaravati to become an attractive tourist destination, but also adds to the city's image, identity and uniqueness. The river should form the basis of the blue and green network with various types of open spaces, to make Amaravati, a green, clean, healthy and happy city, with a high quality of life.

ZR should be more flexible to promote vertical zoning, mixed use and mixed-income developments, interim uses with more sustainable development regulations. Developments along the riverfront should contribute to the city skyline along the river and provide views to the river, including higher density development along transit corridors and key developments such as the AGC and the Seed Capital. They will further help shape the city's urban form, which can be viewed from key vantage points, such as the Kanaka Durga Temple across River Krishna and the Undavalli Caves.

To make Amaravati liveable, affordability must be maintained; several social infrastructure and public facilities must be implemented to increase the overall happiness and social well-being of the community. Amaravati should ensure fair economic opportunities for all sectors of society by implementing informal sector and encouraging mixed-income households into communities.



Scope of UDAG

Smart and Sustainable City Framework by ISU and UDP International

Additionally, building a cohesive community through social integration and engagement with local villages will be critical in making Amaravati a successful new capital city. Preserving heritage and integrating local art and culture will help create a unique image and identity for the new capital city. Amaravati should be a welcoming place integrating the local people within existing villages, as well as future residents. The UDAG will guide the future development of the city and its built environment and dictate the character of the city with respect to the local character and vernacular architecture especially within the existing villages and the surrounding LPS areas.

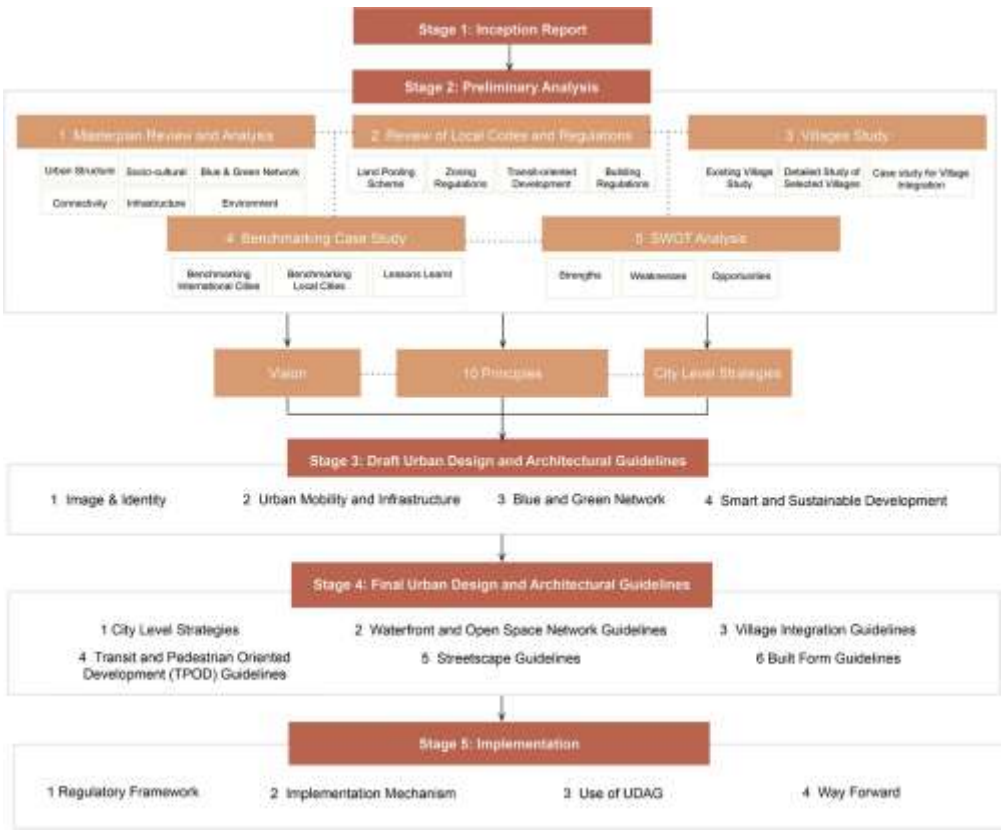
To facilitate the increase in urban mobility, Amaravati must develop sustainably with efficient use of transit, resources, green building, smart and innovative technologies, etc. Pedestrian pathways and accessibility must be emphasized in existing villages to promote NMT and walkability throughout the city and within the neighbourhoods creating a healthy, and happy city with a sense of community. Amaravati should be a liveable, walkable and connected city through Transit and Pedestrian Oriented development (TPOD). Streetscape should develop in line with the transport and infrastructure plans to form the urban structure of the city with well-landscaped, pedestrian-friendly streets, thereby creating a vibrant and pleasant environment for pedestrians while being sensitive to the micro-climate.

The new capital city should be developed to be a place where children, elders, as well as women are empowered to have equal involvement and engagement within the community and the city. Amaravati should continue to strive to be a socially inclusive, and equitable city that is vibrant, pedestrian friendly and safe.

Approach and Methodology

A collaborative place-making approach with a focus on People, Place and Planet as shown below in the Smart and Sustainable City Framework developed by The Institute of Sustainable Urbanisation (ISU) and UDP International is used to develop the UDAG for Amaravati.

The project consists of five stages as shown in the methodology below, which includes Inception, Preliminary Analysis, Draft UDAG, Final UDAG, as well as Implementation. The Preliminary Analysis Stage began with project appreciation involving a review of the Amaravati masterplan, land pooling scheme, and the local codes and regulations. Several site visits and meetings with APCRDA, ADCL, various village representatives and other key stakeholders resulted in an in-depth understanding of the masterplan, the site and surrounding context including the existing villages. A benchmarking study of international and local cities helped highlight best practices in city development and urban design guidelines resulting in lessons learnt that were adapted to develop the UDAG for Amaravati.



UDAG Methodology

2 City Level Strategies

2 City Level Strategies

Based on the ten guiding principles, 'City Level Strategies' were developed to ensure that Amaravati will become a liveable and walkable city offering a high quality of life for its people. With the help of UDAG, Amaravati has the opportunity to become a smart, sustainable and resilient city, a model for other cities in India and beyond.

Image and Identity

Amaravati, being developed along River Krishna, should have a unique image and identity with a skyline that increases the attractiveness of the city as viewed from various vantage points. The character of the city comes from not only the built form but also its people, which can be seen through the local heritage, art, culture, music, traditions, customs, food etc. Together they create the image and identity of the city. Strategies for image and identity are as follow:

- River Krishna is the heart and soul of Amaravati and should be enjoyed by all. The view of the river not only needs to be appreciated from afar, but also adjacent to the riverfront at ground level. The entire riverfront should be treated as a publicly accessible waterfront, so the riverfront is enjoyed by all, including views towards the river as well as the views of the city from the islands across the river
- The vantage points such as Kanaka Durga Temple, Undavalli Caves, or riverfront location including the islands across River Krishna should not be compromised. City views should not be obstructed by any new developments of the existing built heritage and natural features. Major developments such as AGC, Seed Capital should carefully consider the importance of the natural heritage, built landmarks, existing villages and surrounding context, especially with the future high density mixed use developments
- Views of key developments such as AGC and Seed Capital framed by view corridors should form important vistas contributing to views within the city

Urban Form and Density

The urban form of the city is made up of the built form, building height profile, density and its development context. As part of the 10 Principles of Amaravati, creating a Transit and Pedestrian Oriented Development (TPOD) with mixed use developments within key developments such as AGC, Seed Capital and major transit corridors to help shape the urban form of the city. The development of waterfront and open space network is also a key element to the built environment of Amaravati. It is important to note that developments should respect the surrounding context and the human scale to create a harmonious city. Strategies for urban form and density are as follow:

- Creating TPOD with mixed use developments throughout should be the main focus in shaping the city for the future. Population and development density should be increased for TPOD along major transit corridors
- Developments of different density need to be planned with an integrated approach in consideration of the quality of life, environmental impact as well as effective use of streets network and transportation infrastructure. Amaravati should encourage higher density developments along the transit corridors, or areas designated for town centres with the city
- LPS development should be of lower density and building height to be compatible to the existing villages to maintain existing local character. Integration between the existing villages and the surrounding LPS area is key to foster local community and organic growth
- Building configuration should be compatible so that appropriate lot size can be utilised, which also encourages street activities and creates a sense of community. The urban grain formed should enhance accessibility with a priority for pedestrians within a hierarchy of open spaces of the city

Mixed Use and Flexible Zoning

As a new capital city for Andhra Pradesh, Amaravati should be designed to support the long term growth of the city in terms of population and economy. Having the opportunity to do things right from the beginning, Amaravati should look to create a compact city that encourages vibrancy and economic opportunities through mixed use developments and flexible zoning throughout. Strategies for mixed use and flexible zoning are as follow:

- Amaravati should aim to create communities providing different land uses through horizontal mixed use zoning. TPOD zones within a radius of 500m should include a mix of land use such as retail, commercial, residential, education, healthcare, open spaces and other functions
- Vertical mixed use zoning should also be encouraged in the city especially in key development areas such as AGC, the Seed Capital and TPOD zones to activate the city using diverse pattern of public spaces, and exploit the full potential of the development
- ZR should provide more diversity in FSI with varying building heights to allow for more flexible developments with interesting and unique built forms
- There are numerous small sized plots in Amaravati, which may be difficult and unviable to develop. These plots should be amalgamated through micro pooling if they provide benefits to the city, community and the developers so it is a win-win situation for all
- Planned Unit Developments (PUDs) can encourage diversification and variation through comprehensive planning and design in relation to the land uses, buildings, open spaces with varied building heights to form a cohesive development. PUDs should be required to include a masterplan layout highlighting the benefits of the development and should only be permitted if it offers more public benefits at a neighbourhood, township or city level

Viewing deck along the riverfront offering excellent views of the river

2 City Level Strategies

Blue and Green Network

Establishing a blue and green network is essential in protecting Amaravati's natural assets and creating a socially inclusive and a resilient city. The built environment should be enhanced through careful and sensitive planning to create a network of open spaces as well as connection with the river, the canals and other water bodies. Strategies for blue and green network are as follow:

- Amaravati should reposition itself with River Krishna as the heart and soul of the city, to form part of the blue and green network connecting to the canals, and other water bodies and green open spaces together within the city
- Distinct precincts along River Krishna should be created with different themes corresponding to the surrounding existing context and proposed land use to provide a diverse experience along the riverfront
- Water bodies should be preserved with buffer zones to restrict developments from building too close to the water edge. Waterfront should be connected with open spaces with footpaths and welcoming entrances ensuring public accessibility to avoid waterfronts from becoming private development areas
- Amaravati should define a hierarchy of open spaces in different scales, sizes, and functions catering to the needs of the residents to promote a happy and healthy lifestyle

- The capital city has about 251 acres of forest land which should be preserved as green lungs of the City and not to be diverted for non-forestry uses or even for uses like parks or recreational activities as that will alter its natural characteristics and deprive the capital of the ecosystem services which a natural forest provides, as opposed to a plantation forests.

Mobility and Infrastructure

A city's transport network is the backbone of its urban mobility and it is critical to have an efficient transport network that connects the city with less dependency on private vehicles. Amaravati in addition to the vehicular circulation should promote a multi-modal transit including NMT and pedestrian walkability with a well designed network of streets and public spaces to make the city walkable and enjoyable. Amaravati should also ensure proper infrastructure is in place for generations to come, from road and sewage to water supply and energy resources; infrastructure needs of the city should be world class. TPOD should help optimise the transport network and other public realm infrastructure to ensure that Amaravati becomes a walkable and liveable city. Strategies for mobility and infrastructure are as follow:

Amaravati should adopt a sustainable transport network that ensures smooth vehicular flow without traffic congestion and is also pedestrian friendly with generous footpaths, cycle tracks, paving, lighting and street furniture. Streets should be human scale with context sensitive landscaping, inclusion of art and sculpture help create a high quality public realm, allowing for a memorable pedestrian experience

Amaravati should follow a phased development strategy where part of the right-of-way of the road network including the cloverleaf areas can be developed as open space including urban agriculture in the interim as it is likely that the road capacity will only be needed much later, when the interim open space can be reinstated as appropriate.

- TPOD keeps residents within close proximity to public transport, helps improve the catchment and ridership to increase the viability of the transit network. Mixed use development with a concentration of residential and commercial use creates a compact environment where facilities are shared among users. This minimises intra city travel thereby reducing the cost of infrastructure per capita
- Streets should accommodate all amenities and facilities that are required on a daily basis by people, cyclists or transit users to result in a comfortable and pleasant pedestrian experience
- Encourage environmentally friendly transport like public transport and non-motorized transport and discourage usage of personal cars by devising disincentives for private car use, in the form of both spatial (like parking control) and physical (like levies on car, fuels, congestion charges).
- Promote and encourage use of electric vehicles.
- Provide adequate parking facilities by giving priority to public vehicles and non-motorized transport vehicles.

Smart and Sustainable Development

A smart and sustainable city should be responsive to climate change, and promote a healthy lifestyle, is participatory in decision making, multi-modal and uses efficient, clean technologies for infrastructure development. Amaravati has the golden opportunity by doing this right and setting a high standard to become an example for India and the world. Smart City strategies should target the liveability, happiness and well-being of the residents by improving the infrastructure, climate, health and inclusiveness of the city through technology driven initiatives. Strategies for smart and sustainable development are as follow:

- Water bodies should be to the nearest storm water drainage line allowing a specified quantity of treated storm water to be discharged into the water body during monsoon period
- Sustainable drainage elements should be adopted such as bio-swale on street level and areas of high risk inundation
- Green space should be protected and managed by planting of native and ecosystem based species of flora, limiting the use of concrete and providing softer interface between waterbodies and green buffer zones
- Open spaces should act as areas for short-term storage, retention or infiltration of surface runoff to reduce pressure on the city's infrastructure
- Existing water bodies should be protected and managed from pollution, encroachment, dumping or any other activity which would endanger the water body
- Given Amaravati's agricultural heritage, it is appropriate to provide urban agriculture within the city for interim uses to begin with at appropriate locations
- Climate control measures including cooling materials on road pavement, provision of green spaces, and installation of thermal sensors and mist control systems should be adopted to reduce the ambient temperature of Amaravati
- Energy efficient designs in buildings, lighting system, parking senor systems, electric vehicle charging etc. should be adopted to achieve smart living and smart infrastructure
- Cashless payment for public transport should be set up under one universal system to offer convenience to commuters, similar to the Octopus Card in Hong Kong

Town park with TPOD node in the backdrop

2 City Level Strategies

Quality of Life and Well-Being

Improving the quality of life for the people of Amaravati is about creating a happy city giving people the opportunity to thrive, excel and make positive changes for a healthy lifestyle. The liveability, happiness, health and wellbeing of the people of Amaravati will be enhanced by catering to the various needs of the people in health, skills development, education and employment opportunities as well. Providing high quality blue and green network, connecting the city with a reliable public transit, and promoting the heritage, art and culture of Amaravati will be the key to create a liveable, sustainable and economically viable city that is an attractive place for the people of Andhra Pradesh, India, and beyond. Strategies for quality of life and well-being are as follow:

- The concept of compact city should be promoted to increase accessibility to quality open spaces, public facilities and amenities to be shared among residents to encourage vibrancy in public spaces resulting in more social interaction
- Amaravati's performance should be assessed and monitored based on Livability Index, Happiness Index and WELL Standards

Healthy living

Social Equity and Integration

The existing villages in Amaravati are key to building a People's Capital. The development of the new capital city should integrate the new development with the village while uplifting the quality of life of the villagers. The informal sector plays a significant part to the livelihood of the people, which should be preserved and maintained, but better organized within the city. By integrating the villages and accommodating the informal sector within the new capital city results in the social equity and interaction of all levels of society which will help build a more inclusive and cohesive society. Strategies for social equity and integration are as follow:

- New development of the capital should be sensitive and integrate well with the villages and the LPS developments, and should not be isolated by large gated communities
- To organize informal sector in villages and LPS areas, hawking zones should be provided near transit and bus stations. Activity areas, open space and urban centres should become potential zones for informal markets

Conceptual image showing access street to Malkapuram temple with elements for enhancements

Heritage, Art and Culture

The city's heritage, art and culture gives a distinctive character differentiating Amaravati from other cities. To preserve and foster these unique elements, Amaravati should celebrate the local culture and heritage through art and sculpture and should be showcased throughout the city. Conservation of existing built and natural heritage is a must. To introduce Amaravati's local heritage, art and culture to a wider audience, a heritage tourism circuit and walk should be developed to invite more people to learn about Amaravati. The current practice of using the airport as a venue for promoting Andhra heritage, art and culture is great and should be developed further, as airports function as gateways to the city. Strategies for heritage, art and culture are as follow:

- Art installations should be in specific zones of public buildings or commercial areas such as art galleries, multipurpose halls, institutional areas like school and collage campus, malls, cinema halls and performance theatres. Art can also be placed inside APCRDA plots in government buildings, public parks and green buffer zones while considering protective measures to promote public art
- Prohibited areas and regulated areas should be identified within close proximity to heritage areas to preserve and protect the heritage character
- The heritage character of the existing areas should be assessed for their significance like historic, cultural, architectural, ecological, aesthetic, technological, scientific etc
- Heritage Tourism Circuit along NH-16(5) highway and railway route to Vijayawada and Heritage Tourism Circuit connecting old Amaravati town to connect heritage sites together should be developed to offer a unique experience to the people of Amaravati
- Heritage walks around religious sites and heritage precinct should be proposed to promote Amaravati's local art and culture

Undavalli caves - monolithic example of Indian rock-cut architecture

Place-Making and Branding

To make Amaravati the People's Capital, it is crucial to make the city a place for the people and the community. The city should not only be a composition of urban spaces, streets, buildings, and greenways, but also places where people gather, enjoy, and love; for events, festivities and happy memories. The UDAG promotes urban design excellence, community and place making which should be the key for the city's development in creating a sense of place and sense of ownership. Amaravati is a city with rich natural and local heritage art and culture with abundant natural resources. The people of Amaravati should be united through community and place making initiatives and events showcasing the art, culture, heritage and natural assets. Strategies for place-making and branding are as follow:

- Public spaces with respect to the surrounding land use should be Identified to create opportunities for community and place making. Different scale of place-making space can be explored depending on functionality, from town level parks to streets or even public spaces within buildings
- Villages, communities, universities and businesses should collaborate to work together with APCRDA to organize events and programs that contributes to the branding of Amaravati

Dance form Kuchipudi

Source: http://www.hyperactivz.com/active-lifestyle, https://www.inrootz.in/mythology-articles-stories/ar312/7-best-heritage-places-to-visit-in-andhra-pradesh

3 Waterfront and Open Space Network Guidelines

3 Waterfront and Open Space Network Guidelines

Blue and Green Network

Amaravati's "Blue and Green Network" is a planning strategy that seeks to protect the ecological and hydrological assets of the new Capital City to create a smart, sustainable and resilient city that is attractive for residents and visitors.

Amaravati is blessed with a bounty of natural resources which need careful and sensitive planning and management. River Krishna with its natural heritage and unique character should provide public access along the waterfront with landscaped promenades, walking trails and flexible open space. A diverse range of events and programmes should be organised with a rich mix of uses and activities to promote place making and place marketing as well as. Waterfront strategies are detailed below, which are applicable to River Krishna the canals, lakes and other water bodies.

Waterfront Strategies

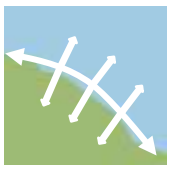
The waterfront strategies help guide the development of the riverfront, canals, lakes and other water bodies to make Amaravati a resilient and socially thriving city by providing an accessible waterfront with both active and passive areas for the public enjoyment for all.

Develop a continuous and accessible waterfront

River Krishna along with the canals, lakes and other water bodies should be showcased as attractive destinations for both residents and visitors. A continuous and accessible waterfront promenade should provide various opportunities for activities for public enjoyment, including strolling, jogging, cycling, sitting, or fishing where appropriate. A pedestrian-friendly environment should be provided to ensure that residents and visitors can fully enjoy the waterfront experience. Waterfront development should aim to complement the scale, extent and natural setting of the waterfront.

Create a diverse range of distinct nodes behind the bund and buffer zone

Waterfront sites should be reserved for cultural, tourism-related, recreational and retail activities. An active waterfront with diverse range of activities and functions would ensure public enjoyment and instill a sense of city pride among the people of Amaravati. Nodes should offer active and passive areas with points of interest such as landscaping areas, outdoor seating areas, lookout areas, boardwalks, and piers help create a diverse range of activities along the waterfront. These will become destinations which attract local and tourists alike. It is important to create a diverse range of distinct nodes along the waterfront in line with the view corridors and pedestrian linkages from the hinterland.



Connect the hinterland to the waterfront

Efforts should be made to bring the city to the waterfront and the waterfront to the city, so people can easily access and engage well with the waterfront. The water edge should be protected by a buffer zone along the riverfront, which is abutted by a public zone with no development and should have visual access and direct pedestrian linkages from the hinterland areas to the waterfront. Building heights and spaces should respect the human experience of the waterfront in terms of usage, interaction and perception by the users. Stepped building height profile should be followed along waterfront so as to prevent walled development and offer waterfront views from the developments behind.

Riverfront

Precincts

Located to the north of Amaravati, the River Krishna stretches across the entire city. The riverfront should be publicly accessible, socially inclusive and become an attractive destination for the residents and visitors. A Waterfront Boulevard along the riverfront provides pedestrian, cycle, transit, and vehicular access to the waterfront. The 22km riverfront should be developed as precincts to showcase the character of the adjacent areas while bringing the city to the waterfront. The nine precincts proposed are unique with distinctive nodes offering riverfront views as well as abundant public space and amenities with both active and passive uses. The precincts along the riverfront aim to correspond with the adjacent areas either existing or proposed developments and include the following:

1. Eastern Gateway
2. Heritage
3. Art/Culture
4. Tourism
5. CBD
6. Eco Park
7. Civic
8. Western Gateway
9. Health/Sports

Starting with the Eastern Gateway Precinct close to the bridge, the main access point to Amaravati will be the first precinct. Moving towards the west along the river, there are existing villages of Venkatapalem and Tallayapalem, Undavalli Caves that could be developed as the heritage and tourism area complemented by local art and culture. These together form the Heritage, Art/Culture, and Tourism Precincts. The Seed Capital forms the CBD Precinct with finance and commercial mixed use, offering a vibrant waterfront experience. Further towards the west before reaching the AGC or the Civic Precinct there is a need for a break in the pace. This can be in the form of an Eco Park Precinct providing a natural pause point, a more relaxing passive area between the hustle and bustle of the CBD and a more formal AGC. Beyond the Civic precinct is the proposed bridge, which forms the Western Gateway Precinct. Further west is the proposed stadium that forms part of the Health/Sports Precinct.

Waterfront Framework

Publicly accessible riverfront with public space promenades, walking trails, amenities with both active and passive uses

3 Waterfront and Open Space Network Guidelines

Riverfront

Nodes

River Krishna should become the attractive destination of Amaravati for people to experience the riverfront and also enjoy the city views from the islands across and other higher vantage points. Therefore it is crucial that the riverfront has a diverse range of distinct nodes where residents and tourists enjoy the themed precincts. Nodes guidelines are as follows:

- There should be a maximum of 1 km distance between nodes to create a variety of destinations along the riverfront
- Riverfront signage should provide a map showing all nodes and the distance to other nodes and key areas along the riverfront, such as landmarks, recreational space, etc.
- Clear wayfinding should be provided, including directions to other key nodes, landmarks, pedestrian crossings on waterfront boulevards, public transport and more
- Nodes should be connected by the promenade linking other nodes with walking trails and open spaces in between
- Local artwork should be integrated into the key nodes to create distinct character for the nodes

Promenade

A promenade is a linear public space along the riverfront that provides for various activities and uses. More than just a pedestrian pathway along the waterfront, it acts as a moving vista providing different viewpoints and transition between active and passive zones. Promenade guidelines are as follows:

- Riverfront promenade should be 5m to 20m wide and connect the nodes along the riverfront
- Distinct pavement should be provided for the promenade
- Clear signage and way finding should be provided to key nodes, to the hinterland
- Seating should be provided and oriented towards the riverfront where appropraite

Flexible Open Space

The design and use of open spaces along the riverfront should be accessible and sensitive to the environment. Open space should remain flexible and adaptive so that it can be operational year-round. Flexible use of open space should be allowed for temporary or permanent installations, such as public art, sidewalk cafés, street fairs, festive and other events. The attractive open space along the riverfront will become a landmark for Amaravati. Flexible open space guidelines are as follows:

- Open space should be located along the riverfront, accessible and linked by pedestrian paths and view corridors from the hinterland
- Open spaces along the riverfront should be linked with walking trails and clear wayfinding
- Planting should not block visual access to the riverfront, of open space, entrance/ exit from the street
- Seating should be provided and oriented towards the riverfront as far as possible

Walking Trails

Walking trails should be designed with respect to the physical setting including landscape and vegetation of the environment. Trails should be natural and continuous so that people can experience the natural environment to the fullest. The walking trails should be unique in exploring the different conditions and opportunities of the surroundings. Walking trails guidelines are as follows:

- Walking trails should be minimum 6 m wide
- Clear signage and wayfinding should be provided at 50 m interval
- Pedestrian scale lighting should be provided at 9 m interval
- Permeable surface should be provided for walking trails
- Seating should be provided at 500 m interval

View Corridors and Pedestrian Linkages

Major streets from the hinterland to the riverfront should encourage pedestrian movement to the waterfront and should be designed such that the buildings and landscape form view corridors with a continuous and pedestrian-friendly street. Developments along the major view corridors should have active street frontages with primarily public uses at ground level, such as retail shops and restaurants. View corridors and pedestrian linkages guidelines are as follows:

- Setback should be provided as an easement for plots facing or connecting to the riverfront
- Built form at the riverfront should enable maximum view of River Krishna
- Building lines should be maintained along major streets that form view corridors to the riverfront
- Curb-cuts should be provided at crossings to accommodate people of all levels of mobility, and removable bollards should be installed to restrict vehicular access for safety
- Service entrances should not be permitted along major streets that disrupt pedestrian linkages and view corridors to the riverfront
- Visibility of public space should be maintained with storefront glazing on ground level floors of developments facing public space. Building corners should use storefront glazing to provide visual connections to the publicly oriented uses from all approaches
- Building and shop entrances should face the view corridors and pedestrian linkages to the riverfront to encourage pedestrian movement
- Outdoor dining with café seating and arcaded ground floors should be encouraged for retail and restaurants along the view corridor
- Wide pedestrian crossings of 10 m should be provided at intersections to provide safe pedestrian access to the riverfront from the hinterland
- Private developments should be designed with publicly accessible POPS and public pathways providing linkages to the riverfront

Connecting Open Space to the Riverfront

Developments along the riverfront should be intertwined with public spaces, such as parks and plazas. The design of the pedestrian linkages should become as an extension from the riverfront so that it forms part of a public space network between the riverfront and the hinterland. Connecting open space to the riverfront guidelines are as follows:

- Changes in elevation should be provided for with steps, landscape, screening and enclosures as appropriate
- A finished edge should be provided along the connection
- Pedestrian crosswalks should be provided at 100m interval
- Public amenities, such as seating, toilets and signage, etc. should be located at the ends of the connection to encourage movement along the streets connecting to the hinterland and the waterfront
- Street furniture such as seats, benches, wayfinding and signage should be provided at the pedestrian crossings along waterfront boulevard
- Adequate lighting should be provided at a human scale at 15m intervals to ensure visibility and safety
- Spatial pattern of street lights and trees along the waterfront boulevard should be designed such that it creates a character of the pedestrian linkage to ensure the visibility of the road and the views of the riverfront remains uninterrupted

3 Waterfront and Open Space Network Guidelines

Riverfront

Stepped Building Height Profile

Stepped building height profile should be encouraged and aims to create an interesting skyline along the riverfront and maximize views to the River Krishna. Strategies for Stepped Building Height Profile are as follows:

- Stepped building height should be encourage up to 200m beyond the waterfront boulevard and designed to create an interesting skyline along the riverfront and maximize views to the River Krishna
- Landmarks with viewpoints to the river should be ensured to provide key images of the city and reinforce the city's image and identity
- Stepped building height profile should be followed to provide river views to buildings directly facing River Krishna

Waterfront Boulevard

waterfront boulevard should be created as a vibrant and pedestrian-friendly street. Waterfront boulevard guidelines are as follows:

- Developments on the hinterland along the street edge should be mixed use with retail on lower floors with active shop fronts
- Pedestrian walkways should be 10m wide on the riverfront side to encourage a pedestrian-friendly environment
- Environmental Friendly Transit System (EFTS) such as Tram/bus lanes should be provided on riverside of the street to encourage use of public transport and direct pedestrian access to the riverfront
- Ample street tree plantation should be provided along the waterfront boulevard to offer shading
- The waterfront boulevard alignment should be sensitive to existing buildings and villages adjacent and near the waterfront

Waterfront boulevard with EFTS (tram/bus) and waterfront promenade

3 Waterfront and Open Space Network Guidelines

Canals

The canal system forms part of the blue and green network of Amaravati and offers a unique opportunity to be part of the public realm and overall open space and also serves as flood mitigation measure for the city. The canal buffer zone should be in place to protect the natural landscape along the water's edge from any development/ construction as seen in the image below. Canal guidelines are as follow.

- No developments along water edge should be permitted
- A continuous green buffer 30 m should be provided on either side of the canal
- Restricted developments on the water edge and a stepped building height profile should be followed for 100m on either side to maximize canal front views
- Mixed use development is encouraged for developments up to 100 m on either side, facing the canals with pedestrian paths along the waterfront so they do not become private areas
- Buffer zone should include trails, promenades and bike paths for walking and cycling
- Clear wayfinding and signage should be provided along and to the canals
- Higher quality public realm should be provided along the promenades
- Promenade should provide a distinct sense of place along the canal
- Appropriate lighting features that balance safety and natural environment should be selected
- Soft tree lined and landscaped edge should be provided along the canal
- Consistent landscaped entry features for the canal front should be identified
- Safe and clearly marked access points to the canal need to be identified at 500 m regular intervals
- Pedestrian path of minimum 3m to 6m wide should be provided
- Bike paths of minimum 2m to 3m wide should be provided
- Landscaping should be provided where appropriate
- Pedestrian scale lighting should be provided at a 9m interval for safety and visibility
- Seating at 300m intervals should be provided facing the waterfront as far as possible
- Developments within buffer zone are not permitted
- Clear access points to the canal shoreline should be provided

Water Transit and Pedestrian Oriented Development

Water Transit and Pedestrian Oriented Development (W-TPOD) has the potential to reconnect Amaravati around and within the city through River Krishna and along the canal network. Water transport avoids traffic on the roads while providing a pleasant scenic mode of transport, as shown in the section below.
W-TPOD guidelines are as follow.

- Water transit network connection to BRT/MRT should be developed with commercial development along the canals
- Private residential developments should not be permitted along canals
- Stepped development profile should be followed with no buildings permitted at water edge along canals to maximise waterfront views
- Mixed use development with green roofs and terraces towards the canal edge should be provided to achieve maximum frontage of towards waterfront
- Building should be a maximum of 20m with min 6m no building zones with active building frontage with balconies and semi or fully covered space
- Waterway transit stops with pedestrian linkage to other public transport should be provided
- Low building heights for developments close to the canals with maximum building height restriction of 8 m
- Landscaping along waterfront should be provided
- Clear pedestrian signage and wayfinding should be provided to connect water transit to BRT/MRT at waterway stops and pedestrian path intersections

Lakes and Ponds

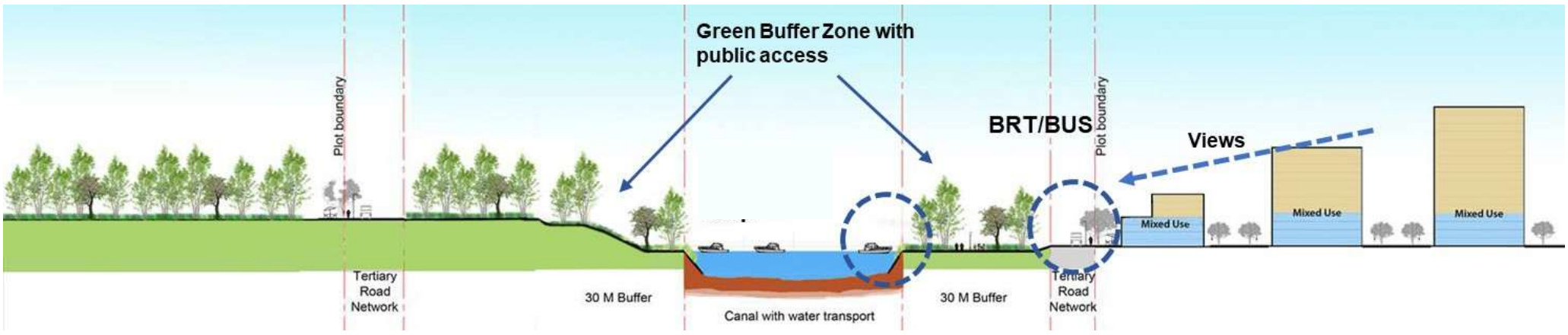
Lakes/ponds are not only an important source of water, but often provide valuable habitats to plants, birds and animals, moderate the hydrological extreme events such as drought and floods, influence microclimate positively. They also enhance the aesthetic beauty of the landscape and extend many recreational opportunities as seen in the image below. Lakes and ponds guidelines are as follow.

- Lakes/ponds should not be filled or reclaimed and any development that divides the water bodies should not be allowed
- Multiple accessibility points should be ensured from all sides and the water body and should not surrounded by private developments
- Benches and seating areas at points of interest facing the lakes/ponds for relaxation should be provided
- Appropriate lighting features that balance safety and natural environment should be provided and selected
- Appropriate shrubs and grass species should be planted near the water edge as a riparian
- A stepped development profile with 100 m mixed use development zone beyond the buffer zone should be provided to maximize views with no development on the water's edge
- Building should be a maximum of 20m with min 6m set back with active building frontage with balconies and semi or fully covered space
- Buildings should be beyond the buffer zone and limited to a building height restriction of up to a maximum of 8 m closer to the waterbody

Lake Buffer Zone

Similar to the riverfront and canals, there should be a buffer zone to protect the water bodies and prevent developments from surrounding it. Lake Buffer Zone guidelines are as follow.

- Lakes and ponds should consist of a minimum 50m buffer zone all around that has green coverage, trees and ecological landscape
- Buffer zone should consist of walking trails and pedestrian paths
- Pedestrian path of minimum 3m to 6 m wide should be provided
- Cycle tracks of minimum 2m to 3 m wide should be provided
- Landscaping should be provided around the water body and where appropriate
- Pedestrian scale lighting should be provided at 9 m interval for safety and visibility
- Seating areas should be provided at a 100m interval along pedestrian paths facing the water body
- Pedestrian paths should ensure multiple entrances and exits minimum of 4 to the lake for accessibility and safety
- Signage and wayfinding should be at entrances, exits, and by the lake as well as intersections of pedestrian paths
- Buildings should be beyond the buffer zone and limited with a building height restriction of a up to maximum of 12m
- Building should be a maximum of 20m with min 6m no building zones with active building frontage with balconies and semi or fully covered space



Section showing water transport, mixed use development and open space along the canal

Active canal development with recreational spaces in Seoul

Lakes and ponds, with accessible open space and public park for leisure and recreation

Source: https://blogs.yahoo.co.jpgunmano_kumasan26089299.html,https://commons.wikimedia.org/wiki/File:(1)Lake_Northam_Victoria_Park.jpg

3 Waterfront and Open Space Network Guidelines

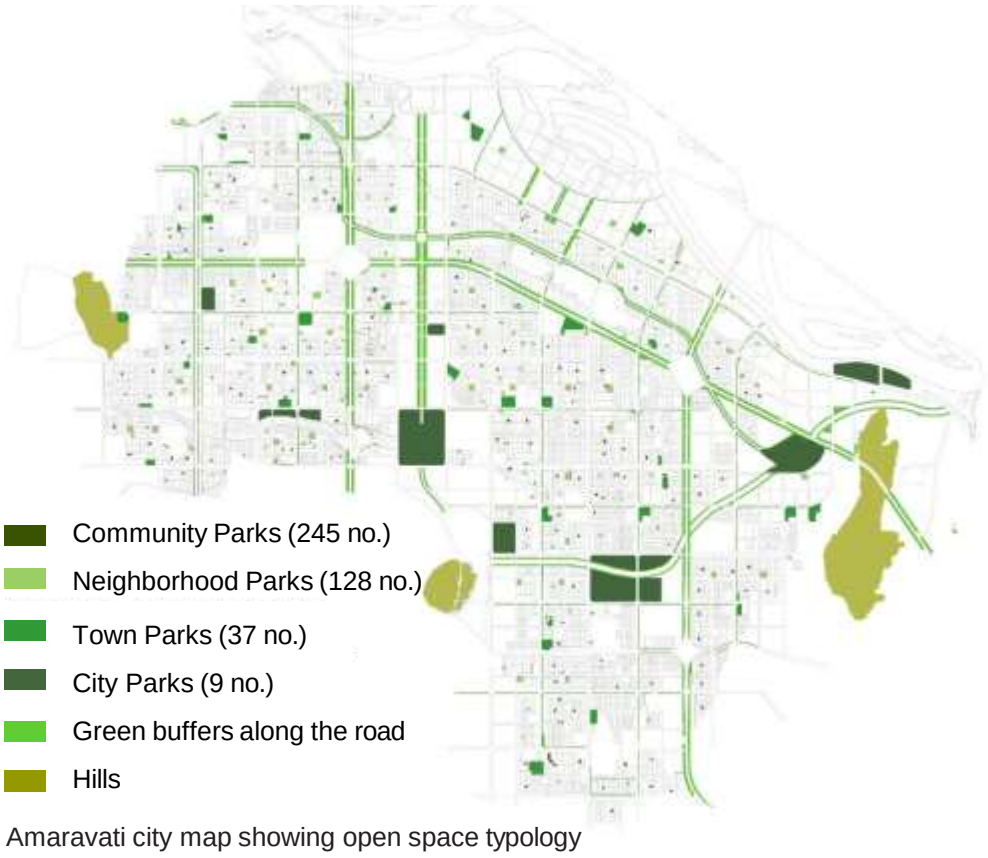
Open Space Network

Hierarchy Of Open Spaces And Parks

The parks and open space system should be envisioned to become a layered collection of high quality spaces at different scales, knit together with a pedestrian and cycling-friendly street network and transit system. The network of open spaces should follow a hierarchy that reflects the following three components:

- The catchment size
- The type of activities facilitated, and
- Its physical size

Open spaces should be designed for the experience of people, and to encourage a culture of walking and outdoor activities through all seasons. The thoughtful design of scale is a first step to building a successful high quality public realm.



Amaravati city map showing open space typology

This information is categorized from Amaravati masterplan zone P1, P2, P3. Any changes in the masterplan zones based on committed projects, needs to be verified and updated by relevant departments and authorities and to be reflected in open space categories.

Focus On People

Human centered approach is fundamental in the development of open spaces which becomes the living room of the city. Understanding the needs, patterns of uses and daily life of the people will help to promote happy and healthy life within the city. Therefore, it is important to focus on People, Place and Planet in open space development. Defined, at various scales to offer high quality open spaces for use throughout the year, during days, nights, weekdays, weekends, festive seasons and special occasions.

Privately Owned Publicly-accessible Spaces (POPS)

Urban Plazas

Public Squares

Community Parks

Neighborhood Parks

Town Parks

City Parks

Buffer Zone Along Roads

Hills

Hierarchy of open spaces and parks

Open Space Demonstration – Community Park

Source: Revised Masterplan Report 04042017

3 Waterfront and Open Space Network Guidelines

Open Space Network

Hills

Amaravati has 3 major hills Undavalli, Neerukonda and Ananthavaram. Undavalli Hill area is categorized as Reserved Forest Area and no interventions are proposed. Neerukonda and Ananthavaram Hills have the potential to become focal points and provide opportunity to view Amaravati"s urban form from different angles. These hills should be considered for environmental, tourism and heritage value preservation. Two third of the hill area should be protected and maintained under such cover in order to prevent erosion and land degradation and to ensure the stability of the fragile eco-system.

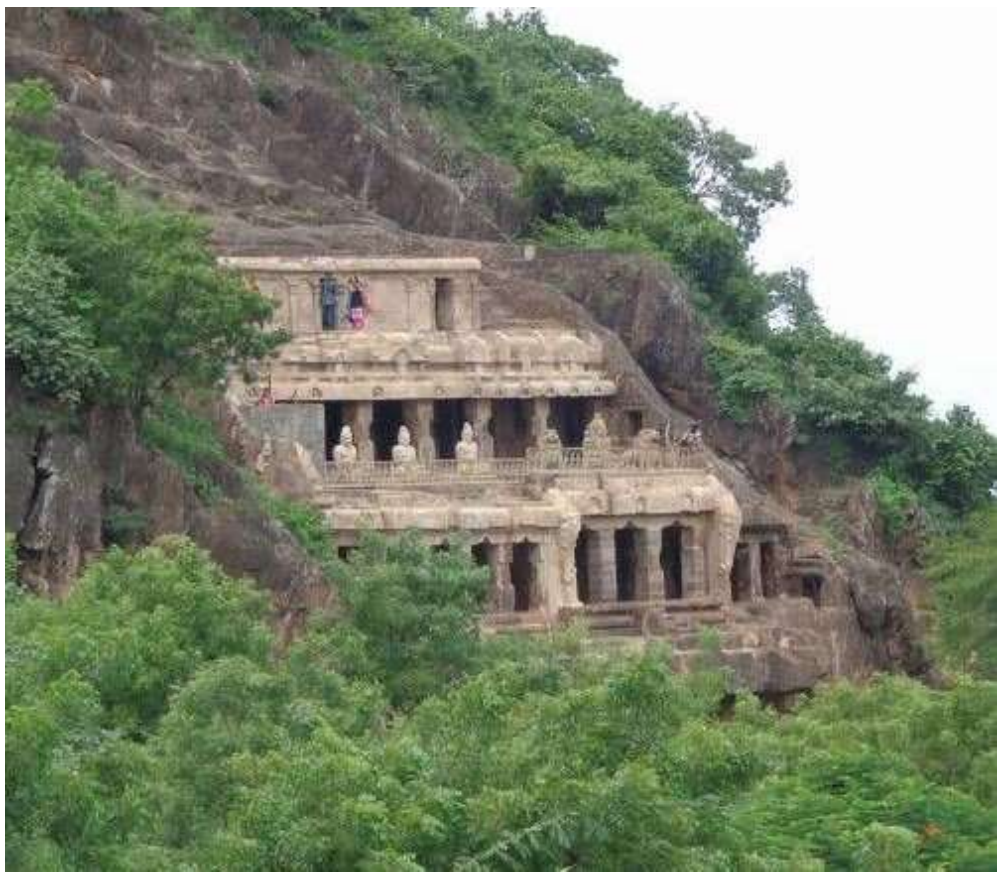
Biosphere Reserves (BRs) are representative parts of natural and cultural landscapes extending over large area of terrestrial ecosystems or a combination thereof and representative examples of bio-geographic zones/provinces. Biosphere reserves are demarcated into following 3 inter-related zones

- Core Zone
- Buffer Zone
- Transition Zone

Cultural and Religious Areas on Hills

Pilgrim sites located inside Protected Areas must be designated as sacred groves, with strict building and expansion controls, in accordance with the Forest Conservation Act, 1980 and the Environment Protection Act,1986. (As per Ministry of Environment and Forest India). Development on hills should be as follows:

- All development built up including religious, tourism, iconic structures should be limited to max 1% of the hill development site area
- Temporary structures should be restricted to min of 5 % in areas excluding the areas of plantation
- Plantation - Existing flora fauna should be conserved / retained.
- Native and local species should be planted
- Minimum 75 % of tree cover should be provided
- Minimum 90% of permeable spaces should be provided



Undavalli Caves

Roads Side Buffer Zones

Buffer zones adjacent to roads and other transportation corridors reduces traffic impact on surrounding habitats.

- Buffer zones increase the distances between roads and adjacent habitat and habitats remain undisturbed
- Buffer zones should be provided to help reduce the inputs of pollutants from vehicle exhausts to nutrient-poor shrub land ecosystems

Buffer Zone Elements and Amenities

Pause points, Jogging track , shaded seating areas, tree grooves, herbal gardens, thematic gardens, public art etc. should be provided within buffer zones

Klyde Warren Park's road side green linear park buffer zone

Buffer zone plantation

Schematic section of Buffer zone along the 60 m wide major arterial road

Source: https://dallas.eater.com/2015/7/13/8953267/klyde-warren-park-palate-food-festival-lineup

3 Waterfront and Open Space Network Guidelines

Open Space Networks

City Parks

City parks, above 15 acres to 50 acres should form important venues for place making for Amaravati city. They should be places for gathering, social interaction, events, place for marketing, and branding. The design of city parks should keep the concept of community and place-making in consideration. City parks should be the destination for citizens as well as for visitors and should designed to become landmarks and contribute to the image and identity of the Capital City.

City Park Elements and Amenities

City parks should become tourist destinations with botanical gardens, conservatories, sensitive theme parks, water bodies – lakes , ponds , with nonpolluting recreational activities, jogging tracks/cycle track, leisure lawn areas, gathering spaces, public plazas, exhibitions spaces, play area and recreational activities for all age groups etc.

Tourism destination.

Town Parks

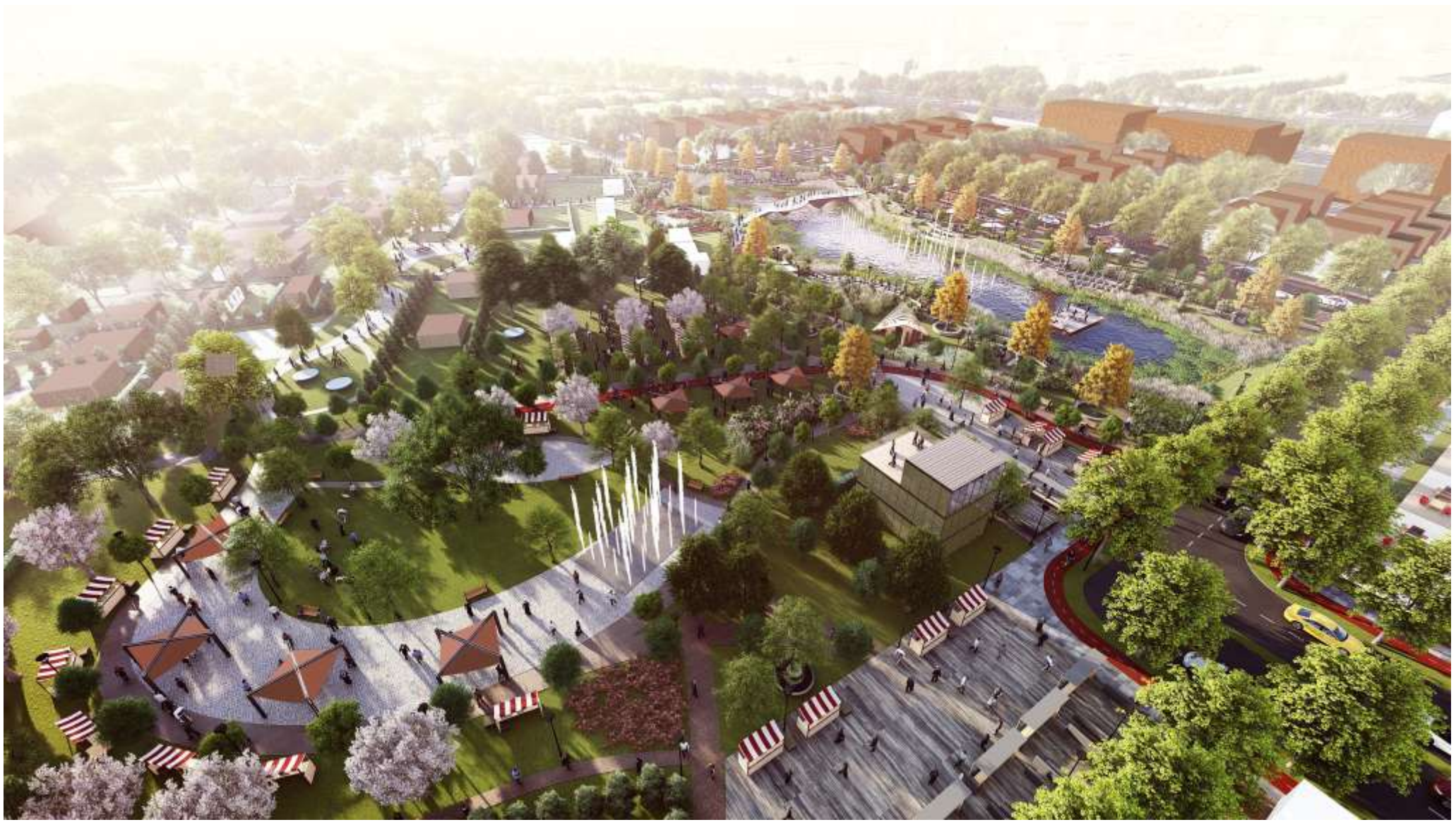
Town parks, above 5 acres to 15 acres should be an area designated for recreational and leisure activities for citizens along with protection of natural habitats in the township.

Town Park Elements and Amenities

Town parks should cater to the needs of the township and include sports clubs, sports courts and open fitness area, play area and recreational activities for all age groups, senior citizen – recreational and resting area, jogging tracks, cycle track, pets park etc.

Jogging tracks

Playscapes



Community park with community centre, street markets and public space

Sources: http://www.gardensbythebay.com.sg/en/book-a-venue/silver-leaf.html/, , http://www.londontown.com/LondonInformation/Leisure/, https://www.archdaily.com/139145/sculptural-playground-annabau

3 Waterfront and Open Space Network Guidelines

Open Space Networks

Neighborhood Parks

Each neighbourhood should have its own park and urban squares of 1 acres to 5 acres as an outdoor “living room” for leisure and social interaction as part of people’s daily lives. Parks should be designed as a interactive space for social, local festival and cultural events. These parks should be accessible from all directions for residents as part of extension of urban fabric, public buildings, neighbourhood center. Parks should be primary organizing element within the urban fabric / development with respect to street and block layout, land use configuration and built form character.

Neighborhood Parks Elements and Amenities

Neighborhood parks should include play area and recreational activities for all age groups, informal flexible lawn space, comfortable seating areas. Bicycle parking at park entrances and cycle tracks, including pockets of rain gardens with full infiltration with reservoirs showcasing native plants. Permanent, flexible use of park shelter should provide shade and accommodate group use, multipurpose sport’s courts and open fitness area, skate zones, fitness equipment’s, community farming etc.

Community Parks and Gardens

Community parks and gardens up to 1 acre should be easily accessible and form an integral part of the open space network and add values to the residents nearby. Community parks should be visually accessible from neighbouring uses and public areas as much as practical to provide passive surveillance. Community parks and gardens should be designed to meet the following:

- Community park and gardens should form part of an open space network with other public amenities, such as parks and playgrounds, by sensitive positioning and design
- Community parks and gardens should distinguise themselves by hedges and/or fencing, maximum 1.2 m
- Decorative entrance should be provided
- Seating and landscape with shading should be provided
- A clear way-finding and signage system should be established
- Auxiliary structures for equipment storage should be provided if needed
- Raised planting beds should be provided for wheelchair users and others with mobility issues
- Accessibility and walkability should be ensured by provision of walkways

Creative seating areas

Seating in Community park

Pedestrian bridge across waterbody within neighbourhood park

Source: https://www.straitstimes.com/singapore/car-lite-green-vibrant-community-spaces-uras-vision-for-new-neighbourhoods, https://www.archdaily.com131747shanghai-houtan-park-turenscape

3 Waterfront and Open Space Network Guidelines

Privately Owned Public Spaces

Privately Owned Public Spaces (POPS) is a type of privately owned and maintained outdoor space which is publicly accessible and varies in scale based on the size of the development. The location and design of POPS should be planned to enhance the development and complement the larger public realm network.

POPS Elements and Amenities

POPS should be partially enclosed spaces formed by building facades, water features/ fountains to create a tranquil environment and ambient noise. Public art and signages, pedestrian scale lighting, seating areas and trees for shade, creative changes of elevation as a source of play or seating, shaded seating areas and interactive spaces, playscapes etc.

Large scale POPS area with seating

Public Squares

Public Squares should be social spaces for daily urban life, framed by the surrounding buildings. Squares should include social space and amenities for daily life, activities relate to surrounding uses depending on their size and context. For smaller sized public squares, facilities such as cafes, shops, cultural and transit facilities should be provided. For larger size squares, facilities for community gatherings or temporary markets should be provided.

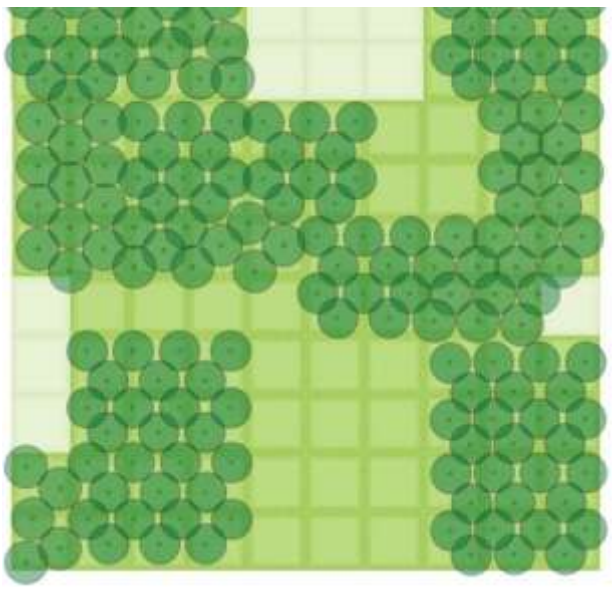
Public Square Elements and Amenities

Typical elements of a public square should include an open space, potential commercial concessions with food kiosks/open air cafes in the square or in adjacent uses. Fountains / water features, seating areas, pedestrian access ways, contemporary LED lighting, public art installations, shade structure like trellis and pergola, gardens and contemporary planting, outdoor game areas etc .should also be included.

Public square

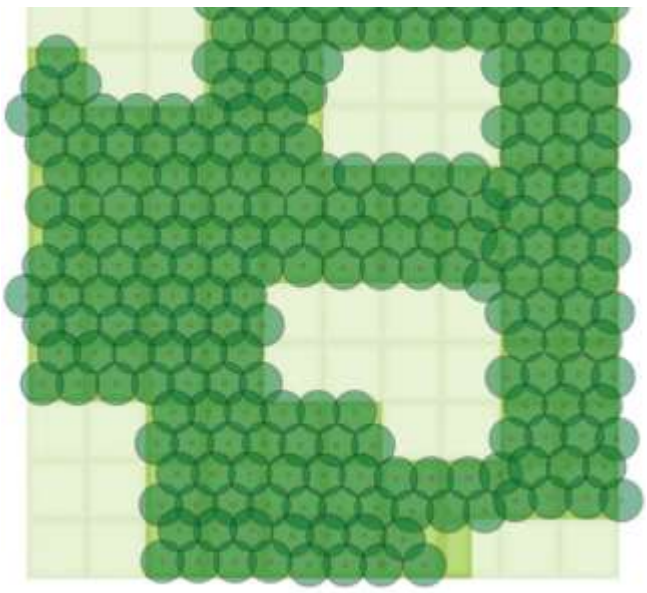
Tree Coverage Demonstration

The following demonstration diagrams shows various tree coverage ratio for various parks to achieve desired ecological, shading and functional requirements.



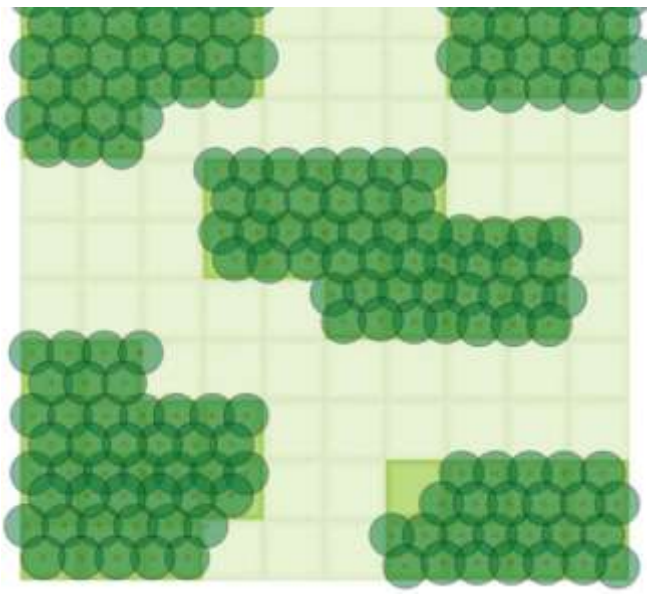
Hills

75 % Tree cover
90 % Permeable land



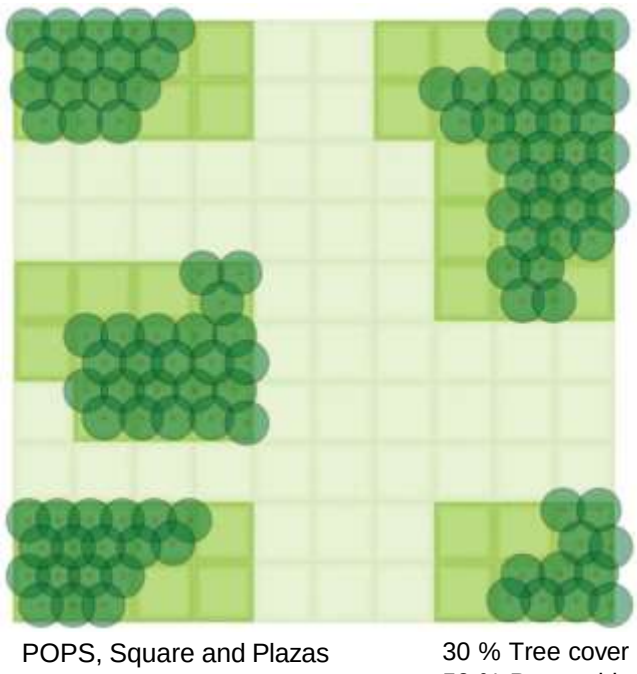
Rivers and Canals , Green buffer along the road

70% Tree cover
75 % Permeable land



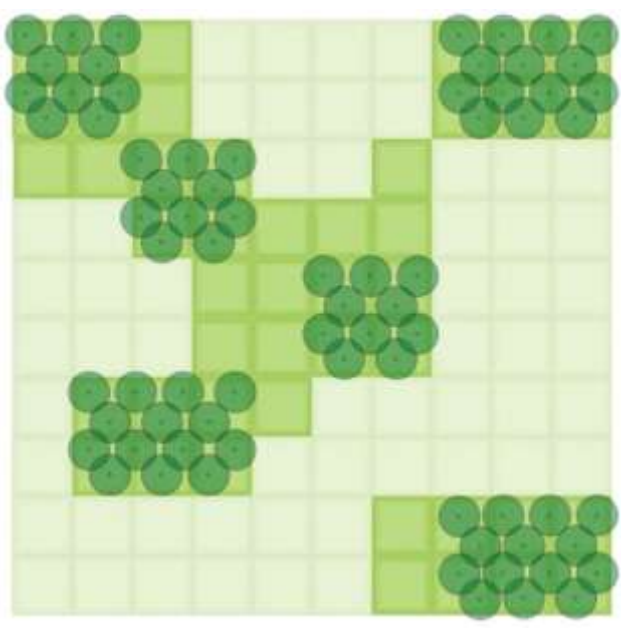
City Parks , Town Parks
Neighborhood Park

50 % Tree cover
60 % Permeable land



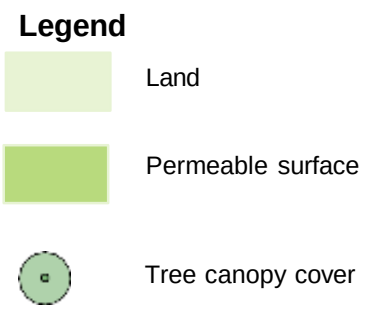
POPS, Square and Plazas

30 % Tree cover
50 % Permeable land



Community Parks

30 % Tree cover
75 % Permeable land



Source: http://www.twipu.com/LON2NYC/tweet/1095301422290227200, https://www.land-studio.org/project/public-square-redesign

4 Village Integration Guidelines

4. Village Integration Guidelines

Amaravati Capital City includes 29 villages within its limits as shown in the masterplan. These existing villages should be integrated well with the surrounding new development for effective functioning of the overall city. It is necessary for the existing villages to be integrated well in order to have an inclusive and balanced relationship with the urban fabric. The following aspects should be addressed:

- Development of infrastructure facilities should cater to the needs of the population while retaining the human scale of the villages
- Quality of life of residents should be improved through development and upgrade of amenities like education and healthcare
- Traditional character and cultural heritage of the villages should be retained
- Means of income and livelihood of the villagers should transform from an agrarian community into an urban community after land pooling
- Any adverse impact of social and political changes brought about by new developments on the functioning of existing villages should be minimised

To address the issues mentioned above, research has been conducted, including a background study of existing 29 villages in Amaravati, detail study of 3 selected villages and case studies of village integration were also undertaken. Village integration can broadly categorised in the following frameworks:

- Physical integration
- Socio-Economic integration
- Environmental integration
- Community integration
- Administrative integration

From the selected village analysis, key issues and opportunities within the villages are identified to ensure the seamless integration of the villages. Guidelines are formulated by using the selected three villages as examples. A summary of the key issues and opportunities learned from each of the selected villages are as follow:

Nelapadu

- Rich in natural resources
- No connection to proposed arterial road
- Linear development along lake
- Did not fully utilize the lake
- Lake being fragmented by new road cutting through
- An increasing trend of people especially younger population leaving for other cities to work

Malkapuram

- Rich in historical assets
- Lack of internal road network to connect
- An increasing trend of people especially younger population leaving for other cities to work
- Lack of basic infrastructure including water, electricity and road network
- Lack of prominence for the heritage sites
- Risk of being surrounded by commercial development for being in close proximity to Seed Capital and adjacent to commercial zones
- High percentage of women population within the village

Rayapudi

- Close proximity to the Amaravati Government Complex
- Lack of internal road network connecting internal layout of the village
- Presence of water assets but the water quality is deteriorating
- The southern part of the village is fragmented by arterial road
- Presence of unauthorized development
- Proposed road network does not connect to main access road in the village
- Rayapudi II is in close proximity to River Krishna riverfront
- There is a risk of being surrounded by high density development
- Some of the villagers are interested in construction and real estate business

Context sensitive village integration showing market improvement

4. Village Integration Guidelines

Physical Integration

The Amaravati Masterplan proposed a grid pattern for the capital city's road network to be adopted city wide, which does not align with the existing roads and dissects some of the existing ponds and villages. Therefore, connectivity from the existing villages to LPS and surrounding areas should be established and ponds should be restored. Additionally, other infrastructure such as water supply, electricity, sewage and drainage should be provided for the villages to accommodate the needs of the residents and future requirements.

It is important that, the character of the villages should be maintained and preserved. New developments should be sensitive to the village in terms of building height, materials and colours. The fragmented villages should be reconnected through the use of pedestrian linkages and vacant areas between LPS plot and villages should create multifunctional spaces for activities. Villages should be pedestrian friendly and avoid being car dominated. Vehicular accesses should mainly be provided only as needed, such as for emergency vehicles. Strategies for physical integration are as follow:

Connectivity to LPS and surrounding areas

- Existing village access roads should connect with the proposed road network
- Vehicular and pedestrian crossings should be provided at junctions where village is connected to proposed road network for free movement
- Villages should be planned with less traffic prone areas with a low speed zones
- Villages should connect to nearby transit points and major activity areas
- Junctions where proposed road network connects the village should act as major node with entry points of the village

Enhancing Village Character

- Fragmented villages should be connected by pedestrian priority zone to retain the village character
- Vehicular speed a max 30km/h should be followed in pedestrian priority zones
- Vacant plots between the village and new development should be used as multi-functional spaces for activities
- Minimum 60% of the multi-functional space should be permeable / softscape surface with greening
- Village edges should be refined to ensure no marginal lands are created
- Minimum 6m of wide roads should be provided at the periphery of the multi-functional space for emergency vehicle access
- New developments / redevelopments of existing buildings should be sensitive to the existing village character
- Socio-cultural events, festivals, weekly markets, fairs, exhibitions, recreation etc. should be organised in the multi-functional space every month
- Pedestrians should have right of way to the streets within villages and happy Sunday's should be organised weekly

Infrastructure Development

- Existing and new road network should be enhanced and developed
- Existing sewage system should be upgraded for future needs
- Utility (water supply, electricity, sewage) connections for households should be provided underground to free up space on the street
- Storm water drainage in the villages with bio swale and permeable surface on ground level should be provided
- Decentralized waste water treatment facility should be included in villages
- Rain water harvesting should be provided for plots more than 200 sq. m.
- Treated water should be used for irrigation in landscaped areas

Parking

- Vehicular access points to a site should be limited with a max of 2 spaces
- Parking basements should not be permitted in the village core area due to narrow streets but should allow parking at the periphery of the villages
- Parking spaces should be avoided on building fronts and main streets; instead they should provide surface parking on the side or rear end instead
- Street parking should be provided in the interim as appropriate screened with landscape/wall or screening compatible with the building design
- Parking should be accessed from secondary streets, where possible, in order to decongest main roads
- Visitor parking should be provided on vacant plots adjacent to the villages depending on the activity

Emergency Vehicle Access

- For access of emergency vehicles like ambulance, fire engine and hearse, road width should be 9m; minimum road width for fire tender movement is 6m
- As per IS code 13039 - External Hydrant Systems Provision and Maintenance: In towns/cities, fire hydrants either stand post type or underground type should be provided at intervals of 100m connected to sufficient capacity water reservoir. It should be located at a distance of not less than 2m from face of the buildings
- For buildings along a pedestrianized street, emergency vehicle access should be provided towards rear side of the plot
- As per NBC 2016 – Fire and Life Safety (Part 4), the above provisions are applicable to the following buildings:
  a. Hotel, educational, institutional, business, mercantile, industrial, storage, hazardous and mixed occupancies, where any of these buildings have floor area more than 500 sq. m on any one or more floors
  b. Educational buildings having height 9m and above
  c. Institutional buildings having height 9m and above
  d. All assembly buildings
  e. Buildings having area more than 300 sq. m of incidental assembly occupancy on any floor
  f. Buildings with two basements or more, or with one basement of area more than 500 sq. m
- Amalgamation should be considered for small village plots becoming unviable for developments due to road widening

Rayapudi village demonstration plan

4. Village Integration Guidelines

Socio-Economic Integration

As Amaravati is all set to become the new capital city for AP, the villages are also going through their own transition as part of the city development. Villages will have to adapt to a new way of living as the city is moving away from its agricultural heritage. Therefore it is important to create more economic opportunities for the villagers by providing skills development programs to enhance their economic livelihood. Also improving the villages with high quality public open spaces, community facilities and amenities will make their quality of life better. In addition to active street frontages with mixed use developments, community and place making programs and events should be organized together with the villagers which will add value to their life experience as well. APCRDA should also take this opportunity to improve the quality of life of the villagers through provision of community and public spaces, multi-functional spaces, education and healthcare facilities. The villages should be treated as a unique aspect of Amaravati as part of the city's image and identity by promoting the local culture with landmarks such as entrance gateways and heritage sites.

Strategies for socio-economic integration are as follow:

Village and Activity Centre

- There should be at least one Village Centre in a multi-functional space with provision of skill development training programs (like trade, construction business, surveying etc.) and public amenities in each village
- Village Centres should have a min area of 150 sq.m. and vernacular design elements should be included as part of its built form
- Village Centre should also consist of outdoor spill-out spaces for gatherings, cultural events and community discussions

Community and Public Spaces

- Traditional gathering spaces in the villages should be identified, preserved and enhanced by creating activity areas/plazas. The spaces should be re-activated with events and programs such as light and sound shows etc.
- Cultural events intrinsic to the identity of the village should be organised
- Traditional arts, crafts, textiles and articles should be promoted through exhibitions, fairs, weekly markets etc.
- Tourist precincts should be developed with public art installations within villages with religious, heritage and eco-tourism potential

Entrance Gateways

- Entrance points of existing villages have gateways, which helps to create image and identity of the village and should be retained
- Landmarks should be created near the entrance or alternatively the entrance gateway should be designed as a landmark
- Next to each entrance gateway there should be clear directional signage to ensure the village is legible

Multi-functional Space

- Vacant plots at the village edge and open space within the villages should be identified as buffer areas for multi-functional space
- A 6m wide road should be provided at the periphery of the multifunctional space for fire tender movement
- Socio-cultural events, festivals, weekly markets, fairs, exhibitions, recreation etc. which are temporary structures, should be permitted
- Development should be limited to only 10% of the plot area with uses such as public amenities, kiosks, small cafes etc.
- Minimum 60% of the multi-functional space should be open space with permeable / soft-scape surface

Heritage

- Heritage sites should be enhanced with open space and landscaping
- Any development encroaching heritage sites should be relocated and re-provisioned in the periphery of the heritage site or village.
- No new development should be permitted within 300m radius from the heritage sites
- Heritage sites should have clear signage to improve legibility of the area
- An information board or plate should be available to introduce the history and significance of the heritage
- Wayfinding tools should be clear to bring people to the heritage sites with ease, from public transport, village gateway to main streets within the village
- *Mixed use Development*
- Active retail frontage with spill-out should be provided to create interactive spaces along water bodies, open spaces, multi-functional activity areas and main pedestrian routes
- Rental accommodation should be permitted on upper floors for working population and home stays for tourists
- Areas for informal sector and vending activity or daily/weekly market should be identified
- Retail frontage along arterial roads should set up for commercial and service-oriented establishments.
- Small-scale food processing unit and milk marketing with support of a functional dairy cooperative should be available

Improved Social Amenities

- Education and healthcare facilities should be provided within the village or nearby
- Healthcare facilities for livestock should be provided within the village or nearby
- Water fountains and public toilets should be provided in villages
- Adequate shading, lighting and seating should be provided in villages
- Landscaped streets and paved pedestrian paths should be provided in villages
- Medium to large plots (over 500m2) in LPS should be identified to be used for education and health facilities
- Public amenity should be available within 500m radius of village

Pedestrian priority zone with pedestrian crossing connecting fragmented Rayapudi village

4. Village Integration Guidelines

Environmental Integration

Many of the villages are located within close proximity of natural assets, especially water bodies given the need for farming and agriculture. As the villages are transitioning the functionality of the water bodies can change to recreational spaces for the villagers and residents of the surrounding areas. The natural assets and water bodies should be protected for biodiversity restoration and conservation. Enhancements to the green space can also improve the village from flooding and soil erosion. Drainage and vegetation can play a huge part in the quality of life of the villages and should be monitored and maintained thoroughly. Strategies for environmental integration are as follow:

Open space and waterfront connectivity

- A network of recreational spaces should be created providing connectivity between different types of open spaces
- A network of pocket parks should be provided with pedestrian connections
- Buffer zone along water bodies should be provided with bio-swales
- High quality pedestrian linkage and network should be formed between the waterfront and internal nodes with high footfall
- Pedestrian linkages such as bridges should be provided across water bodies to not only connect villages, but also offer a pleasant pedestrian experience as well
- Open space should be high quality and easily accessible
- Existing water features such as rivers, lakes and ponds should be transformed into attractive places through restoration and water management

Ecology and Biodiversity Action Plan (BAP)

- Mitigation measures and proposals for biodiversity restoration/ conservation / enhancement should be provided

Slope Protection

- Vegetation on slopes should be provided to reduce soil erosion
- Appropriate design of drainage system should be provided to control the storm water discharge, which includes surface channel, stepped or trapezoidal channel, catch pit and/or sand trap
- Subsoil drainage system should lay beneath the surface for ground water discharge
- The water pressure in subsoil drain system should be maintained by the following methods:
- Introducing a filter layer behind the slope leading water to outlets
- Provision of weep holes, cut-off drain and subsoil drain pipe

Monitoring and surveillance

- Monitoring and surveillance mechanism should be provided to maintain natural assets
- The protection and management of the water bodies should be undertaken by the Advanced Locality Management (ALM) committee of the area

Enhancement of the Stambha in Malkapuram with open space making it an attractive destination

Revitalisation of Stambha and temple in Malkapuram offering high quality open space with improved accessiblity for people to appreciate and enjoy

4. Village Integration Guidelines

Community Integration

As part of the guiding principles, Amaravati should be a people-first, socially inclusive and equitable city. Public engagement is therefore critical to gather the community needs in creating the best scenario for village integration. It is important to set up a channel of communication for the public sector to discuss with the private sector, villagers, communities, and other key stakeholders on strategies and projects as Amaravati moves forward to become the capital city. The communication should be two-way, such that the public sector is able to educate and raise awareness while receiving feedback from the community and village representatives. This proactive approach to public outreach and citizen engagement will make the community engagement process more inclusive and transparent. This will be the key to differentiate Amaravati as a smart and sustainable city with a people-first mentality. Strategies for community integration are as follow:

- Village Improvement Group (VIG) should be set up with inclusion of village representatives with equal percentage/ratio of male-female/minority from the village population. VIGs should work together with the government to ensure that the Local Area Plans woul result in the smart and sustainable development of the villages.
- Village Centre should be provided for community interaction, for meetings and events such as sports and other socio-cultural activities
- Community centre should be provided within the village centre for community engagement, education and awareness including grievance redressal mechanism; it should have a minimum area of 50 sq. m.
- Village representatives should organise and document consultative meetings with stakeholders at monthly intervals
- Citizen outreach should share information through different channels, such as TV, news media, social media and more
- Consultation should include direct interaction with the community through meetings with elected representatives, opinion surveys, open house events etc.
- Community members should be engaged in collecting data and mapping data to inform stakeholders of facts and trends

Administrative Integration

To ensure village integration as a continuous and ongoing practice for Amaravati, village preservation and community engagement should be required at an administrative level to ensure the voices of the community can be heard. Panchayats and village representatives should be aware of any upcoming projects and strategies with regards to their respective villages so that they are well informed and give feedback about their aspirations and concerns. The panchayats should be equipped to resolve any disputes or concerns raised by the community. The Zoning Regulations should include an ‘urban villages’ zone and develop a Village Improvement Plan to preserve and enhance the village character. Strategies for administrative integration are as follow:

- Village panchayat areas should be included in Amaravati Capital City’s administrative boundary as part of the administrative setup
- For representation of village, there should be inclusion of at least 2 administrative representatives from the village population
- R1-village planning zone should be designated as ‘urban village zones’
- Local development authority should have a separate team responsible for urban village zones
- Local Area Plans should be developed in detail for different urban villages by the local development authority to help in better understanding the infrastructure/ developmental/socio-cultural/economic needs of the villages
- Grievance redressal mechanism should be setup for resolving any disputes on land pooling, acquisition and any other issues raised by the people

Pubic Consultation with local land owners done by APCRDA

Chief Minister with farmers on a flagging occasion

Land Pooling Scheme agreements with the Villagers done by Commissioner, APCRDA

Rally conducted for environmental awareness in the villages

Source: https://www.conftool.com/landandpoverty2018/index.php/04-09-Cherukuri-540_ppt.pdf?page=downloadPaper&filename=04-09-Cherukuri-540_ppt.pdf&form_id=540&form_index=2&form_version=final, http://www.unnati.org/pdfs/books/OwnerDrivenHousingProcess.pdf, http://vro-india.org/women-empowerment/, https://www.archdaily.com/870856/m-a-c-made-in-earth/59111e24e58ece3310000221-m-a-c-made-in-earth-image

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

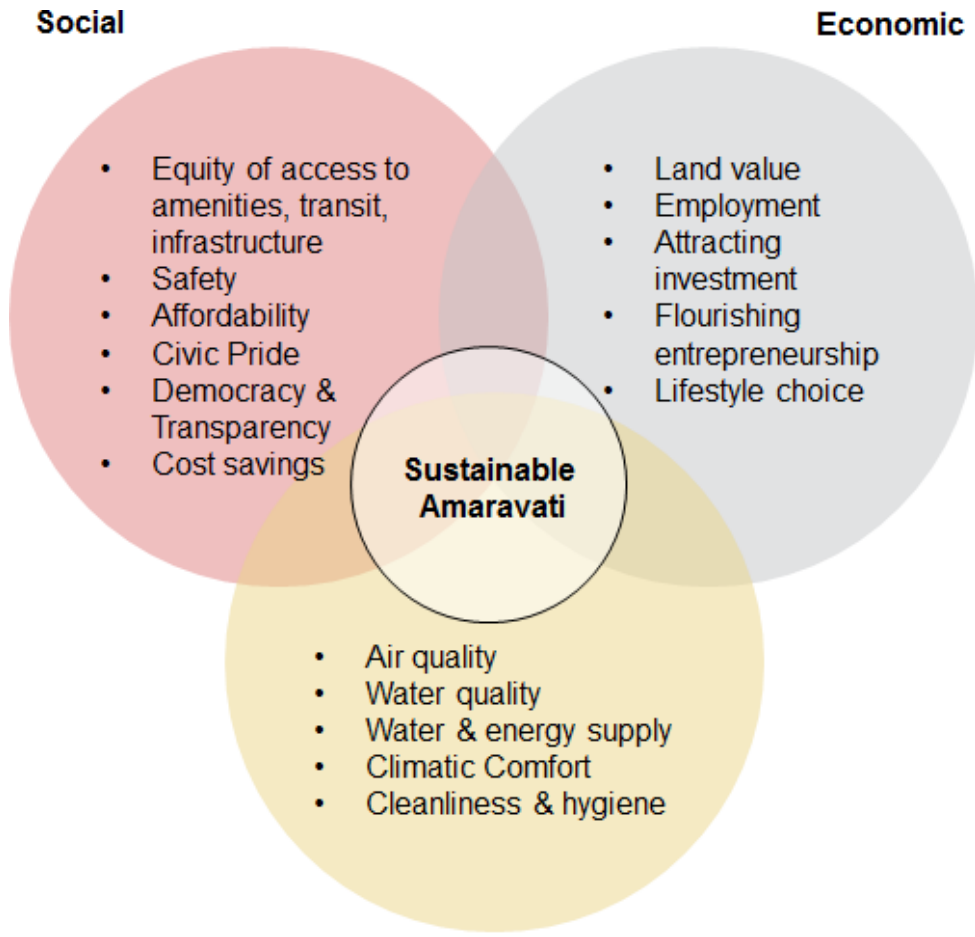
Transit and Pedestrian Oriented Development (TPOD) refers to creating high density developments concentrated within close proximity of public transport connected by pedestrian network to promote walkability. TPOD concept uses a pedestrian first approach with priority given to people over transit and vehicles. TPOD uses the transport node as the central core; usually a BRT stop or a MRT station.

There are benefits in increasing density near transit zones and locating land-uses with a mix of residential, commercial, business, recreational, amenities and open spaces in a cluster. It increases catchment and transit ridership and improves accessibility to facilities, reduces time and cost of travel, as well as reduces the need for car ownership by providing alternative transit modes. TPOD offers sustainable urban mobility and improves the quality of life of the residents and visitors to Amaravati.

An efficient and well connected pedestrian network is therefore important within a transport node. TPOD helps businesses as they are more likely to prosper with high footfalls. Active transport also improves the health of people from the increased amount of walking compared to a car-driven community. There are likely less noise and emission pollution as the result of less vehicles on the road.

To maximise the advantages of transit nodes, changing the development density and connecting neighbourhoods on a human scale is a solution to forming a smart and sustainable neighbourhood.. Amaravati should incorporate a TPOD concept to create an integrated pedestrian and public transport network connecting transit with developments and end users. To form an efficient and effective TPOD, the following strategies were derived:

1. Prioritise walking, biking and transit over cars
2. Create districts with **short commutes**
3. Develop neighbourhoods that **promote walking**
4. **Prioritise Non-Motorized Transport (NMT)** networks
5. Create **vibrant networks** of streets and paths
6. Place **high density development** near high-quality **public transit**
7. Plan for **mixed use development, both vertically and horizontally**
8. Optimise **catchment, transit capacity and operation**
9. **Improve urban mobility** by regulating parking and vehicular use
10. Adopt a phased development approach transitioning from BRT to MRT




Example of a transit node


View showing corner plaza at TPOD node with people first approach

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

TPOD Nodes Network Plan

Transit nodes have different levels of significance as per location of the node, intersection and neighbouring land uses. Based upon these criteria TPOD nodes are identified with the network plan

Criteria for TPOD nodes

The level of influence is considered based on the following:

- Mass transit corridor
- Density and land use
- Major intersections

Primary TPOD Node - City Level

Primary TPOD Nodes are at city level and typically are interchange nodes of two transit lines, BRT and MRT lines, or intersection of two MRT lines connecting different places or zones of the city. They are major zones with respect to land use and source of large pedestrian generators. Primary TPOD nodes should have Public Transit Interchange (PTI) with other public transit modes to achieve last mile connectivity in city transit network.

Secondary TPOD Node - Township Level

Secondary TPOD Nodes are at township level usually near commercial zones and important locations, such as city gateway, river water and city park, etc. They are potential business centres for the area. Secondary TPOD Nodes should be connecting to other transport modes.

Tertiary TPOD Node - Neighbourhood Level

Tertiary TPOD Nodes are at neighbourhood level and are transit stations near major residential developments. The neighbourhood is complemented by a small mix of retail and commercial for small businesses. An abundance of open spaces should be in close proximity for the local residents. Tertiary TPOD Nodes should be within walking distance to nearby residential areas and/or have cycle tracks and other transport modes.

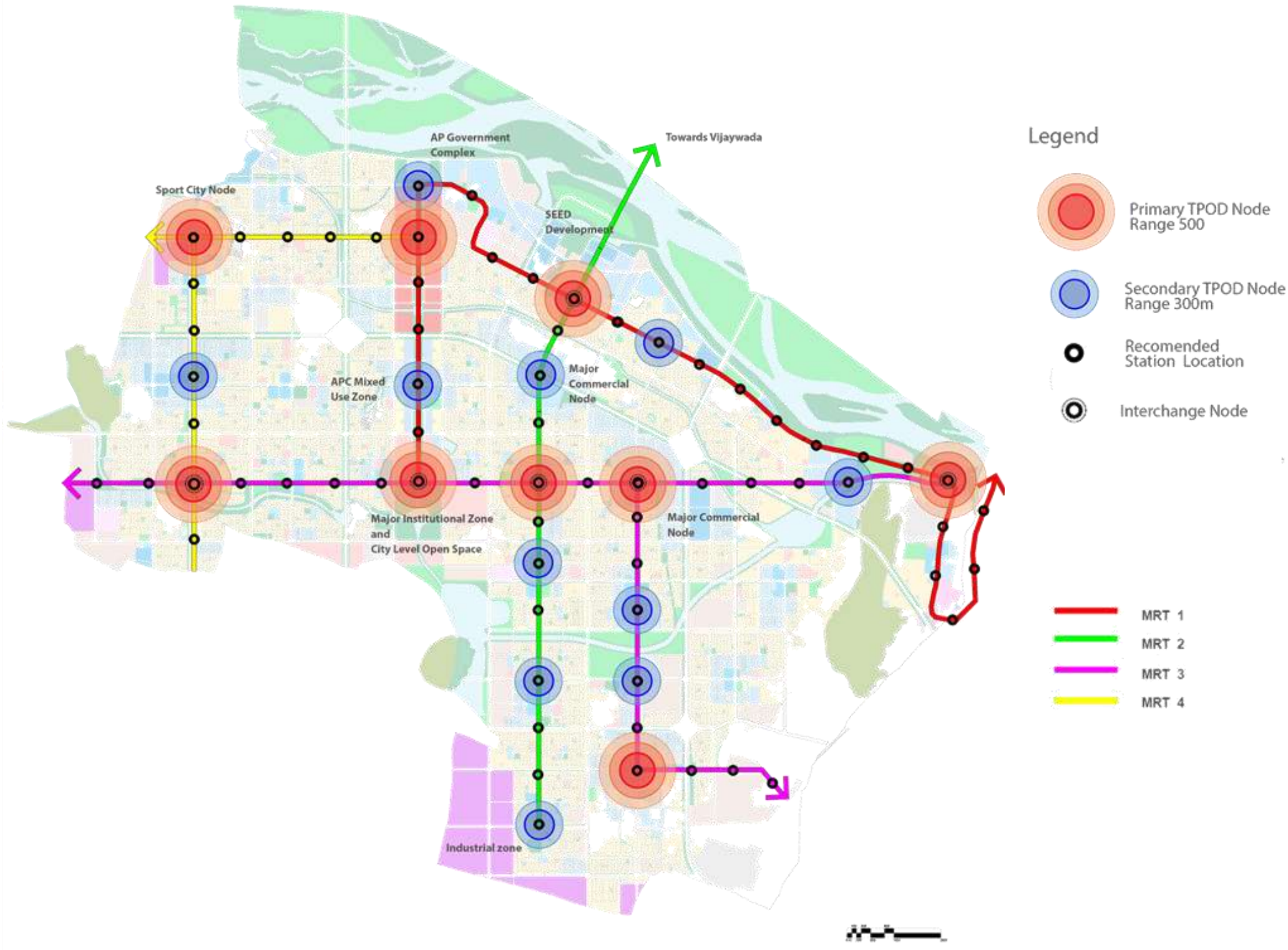
Criteria for Transit Nodes

- Nodes should be located at intersection of two transit lines, intersection of BRT and/or MRT lines. A TPOD Node covers a range of 500m radius from transit stop.
- Large scale development parcels should be within Transit nodes.

Note:

- Masterplan zoning regulations and minimum building heights should be followed as a base norm.
- Additional FSI and building heights for parcels within TPOD node are incentive based and described in the TPOD guidelines.
- All incentive-based policies for TPOD should be governed within the regulations of respective authorities.

TPOD Nodes	Key Characteristics	Minimum mixed use Percentage
Primary	Major interchange hub and commercial area	Min 30%
Secondary	Commercial Area	Min 25%
Tertiary	Residential Area	Min 20%



Plan showing city level strategic locations for TPOD nodes

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

Built Form, Density and Mixed Use

The built environment should correspond with local needs of the residents. There should be adequate mixed use developments surrounding the transit nodes. A diverse mix of residential, commercial, retail and open space should be distributed horizontally and vertically to accommodate and create a sustainable environment within TPOD. Developments should aim to maximise land use with anticipation of the growth of the neighbourhood as well as the catchment for increased ridership of the public transport.

Placing developments near public transport should increase catchment and ridership while reducing the time of commute by bringing destinations closer to people. At the same time, a high density area provides economic opportunities that encourage businesses to open near transportation nodes as well. People will have shorter commutes as transit is more accessible to their daily necessities as it is within walking distance, which shortens the need to commute longer distances or use private vehicles. Real estate value and property prices also increase at TPOD nodes as well.

Influence Zones of TPOD Nodes

Setting up TPOD will influence the density and built form of the area surrounding transit nodes. Increasing the density along transit corridors provides the opportunity to create a walkable environment and create a more connected and vibrant community. A high density core should be planned surrounding the transit station, followed by a gradual reduction in height and density as one would move away from the TPOD.

Influence Zone 1

Zone 1 denotes the area within 150m radius from the transit nodes. Being the closest to transit stations, Zone 1 has high density commercial and residential mixed use to form a City, District or Neighbourhood centre. There is high level of footfall in Zone 1 as people come from public transport or walking from Zone 2 or Zone 3. A well-connected pedestrian and open space network is linked from transit stations to surrounding developments.

Influence Zone 2

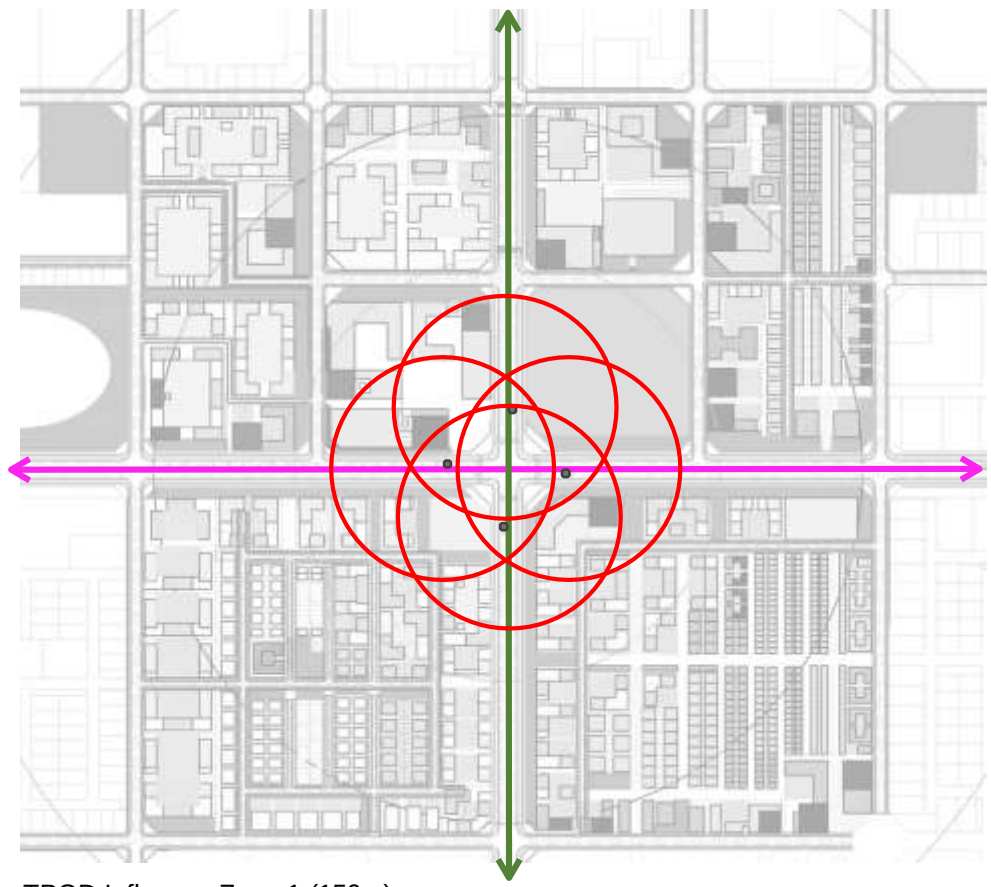
Zone 2 refers to the area within 300m radius of transit nodes but outside of Zone 1. Residential mixed use would be a dominant land-use in Zone 2 to house a high density of population while providing an active frontage on ground level to create vibrant walkable streets extending from Zone 1. Open space continues to link from Zone 1 with pedestrian linkages to promote commuting by walking or cycling.

Influence Zone 3

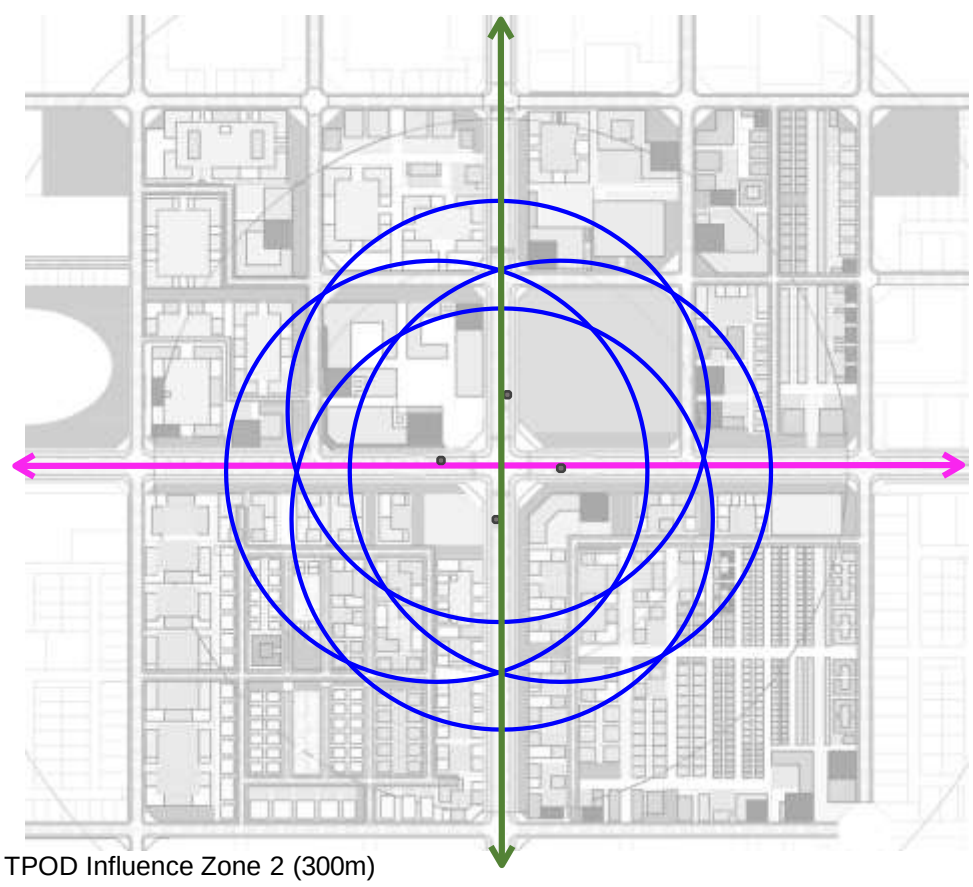
Zone 3 reaches beyond the 300m and all the way to 500m radius of transit nodes. The density of Zone 3 is lower than Zone 1 and Zone 2 with a mix of commercial and residential available catering to the local needs. Zone 3 connects TPOD with communities outside of the influence zones providing retail, school, and public facilities.

TPOD Node

Cycle Racks near bus station



TPOD Influence Zone 1 (150m)



TPOD Influence Zone 2 (300m)

TPOD Influence Zone 3 (500m)

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

Incentive Based Bonus Plot Ratio Distribution Policy and Density Management

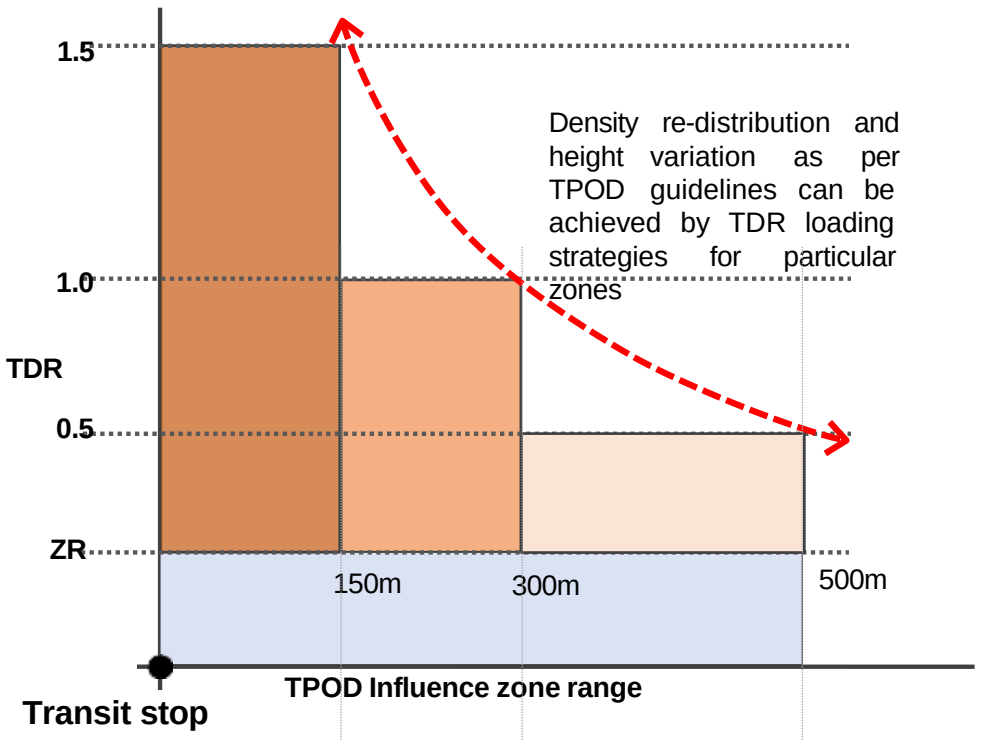
	TPOD–INCENTIVE BASED BONUS PLOT RATIO BASED IN TPOD ZONE AND ALONG TRANSIT CORRIDOR Listed parameters to be followed in respective TPOD zones for additional plot ratio		
Parameters	**500m radii**	**300m radii**	**150m radii**
Privately owned open spaces (POP's)	Min. 10 % additional open space	Min.15 % additional open space	Min.20 % additional open space
Green area coverage	Min. 10% G.O.R	Min. 20% G.O.R	Min. 50% G.O.R
Mixed use development	✓	✓	✓
Green building	Not applicable	✓	✓
Adopting utilities in private plots e.g. fire station, police station, post office, local government offices etc.	Not applicable	✓	✓
On-site utility management .eg. STP, waste, water recycling, renewal energy supply etc	Not applicable	✓	✓
Constructing city level public infrastructure on site	Not applicable	✓	✓
Developing city parks, maintaining and handing over to departments	Not applicable	✓	✓
Adopting public utilities and constructing on site	Not applicable	Not applicable	✓
Public amenities(under Govt. Authority)	Not applicable	Not applicable	i. Compulsory provision of at least one public amenity under Govt. zone. ii. If private STP is provided then STP under public amenity is optional

*Note-All incentive-based policies for TPOD should be governed within the regulations of respective authorities

Zone 1- Up to 150 metres (from BRT transit stop)
High density development should be allowed within 150 m from the transit station.
i. Additional FSI up to 1.5 should be permitted
ii. Building Height of 100 m to 120 m should be permitted
Zone 2- 150 to 300 metres (from BRT transit stop)
High density development should be allowed between 150m to 300 m from the transit station
i. Additional FSI up to 0.5 should be permitted
ii. Building Height of 40 m to 60 m should be permitted
Zone 3- 300 to 500 metres (from BRT transit stop)
Medium density development should be allowed between 300m to 500m from the transit station
i. Additional FSI up to 0.5 should be permitted
ii. Building Height of 40 m to 60 m should be permitted

Mixed use Development within TPOD Zones
Parcels within TPOD zone should be mixed use development and consist of the following vertical distribution:
i. 50% to 70% residential
ii. 20% to 40% commercial
iii. 0% public amenities

- Commercial and retail activities should be located on the ground and lower floors of the building
- Min 40% land reserve should be for public open space and additional 10% publicly accessible privately owned public space (POPS)



The relationship between the distance from transit Stop and applicable additional FSI


Base model


Revised urban design model

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

Multi-modal Transit and Last Mile Connectivity

The aim of road system strategy should be to create a well connected circulation for both pedestrians and vehicles. A well-designed transit node should seamlessly connect the various transit options together for commuters to change from one to another. The different modes of transit should work together like a system rather than individually competing against each other. Mass transit volume should bring commuters from furthest distance, which they will change to local level transport for the last mile connectivity. Therefore a mix of different modes of transit should help facilitate the various destinations for users. Typically a transit node consist of a combination of the following:

- MRT
- BRT
- Buses
- Shuttle Buses
- Feeder Buses
- Taxis
- Para Transit
- NMT
- Water Transport
- Other Modes of Transit

The design of public transport interchange should also provide a welcoming environment for people while waiting or deciding the type of transport to be used. The area should allow people to comfortably stay instead of a mere space to pass by. A sizeable area with seating and landscape is recommended as a way to create a “place”. Interchange does not have to be single functioned as a waiting area but also has other uses, such as café or shops for people to spend their time in between transits.

Aside from the design of transit node and interchange, the design of the pedestrian should ensure a high priority is given to pedestrians and environment, creating an uninterrupted and environmental friendly pedestrian network for people within their neighbourhoods and the city. It is important to connect people to transit centre, public buildings and open space from all places within the city. The benefits of a connected pedestrian network is not only to encourage walking and reduce the private vehicle dependency, but also to increase mobility within the neighbourhood. Hence it is crucial that within TPOD node, a well linked and comprehensive pedestrian network is built to connect residents access to daily necessities, such as shopping, commuting to work or school, and using public open space.

For a pedestrian network should function well and encourage opportunities to develop neighbourhoods that promote walking. More spaces should be given to pedestrians walkways with proper lighting so that pedestrians feel comfortable and safe to travel. Adequate pedestrian crossings should be made available to allow pedestrian movements across streets. Around the transport nodes, there should be slower traffic speed on local roads for the footfall by putting in traffic calming measures or changing the streets to shared spaces. Specifically, direct universally accessible pedestrian access should be provided from the buildings oriented towards the transit station to minimize conflict with vehicles.

In addition, a strong and well connected cycling network is an important element for a successful TPOD, which is an effective way to solve the “last mile connectivity” problem and connect people to public transit network. More spaces should be given to cycle tracks and the non-motorized transport network should be considered and integrated with pedestrian network as a whole so that people can seamlessly transition between different transportation modes within the neighbourhoods. Strategies for multi-modal transit and last mile connectivity are as follow:

- The shortest direct route for pedestrians and non-motorized modes of transport should be provided to access transit stops within TPOD zone 1 and 2 through buildings or complexes using POPS or open spaces, plazas and squares
- Narrow roads of 9m to 12m within TPOD zone 1 and 2 should consider pedestrianisation/shared streets and proposed as public spaces, depending on the pedestrian movement and activity time slots
- A well connected pedestrian network should be provided to create a walkable and environment friendly space for citizens to promote healthy lifestyle and encourage last mile connectivity to transit stops
- All parking requirement should be located under the built structure at the rear side. (Area - Stilt and basement)
- Basement and podium parking should be provided as per zoning requirement. No surface parking is permitted
- Parking should be provided under public parks or town centres
- A minimum 10 cycle parking racks should be provided within walking distance from the transit stop in TPOD zone 1 within MFZ area
- On-street surface parking is discouraged; instead mixed use developments near transit stations should provide underground parking that links to public transport and driveways to adjacent plots

Signage


Bus Stop with Facilities


Pedestrian Linkage

Mobile Apps

Source: https://www.citylab.com/transportation/2017/03/singapore-may-have-designed-the-worlds-best-bus-stop/518226/; https://www.externalworksindex.co.uk/entry/136636/Trueform/Digital-SBS-wayfinding-totems-for-New-York-City/; https://www.imore.com/transit-app-goes-free-adds-real-time-vehicle-location-and-more

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

Street Interface and Multi-Level Linkages

- Large scale public, commercial and mixed use development plots should provide multi-level pedestrian connectivity towards transit node
- Building pedestrian entrances should be oriented towards transit stops and provide direct pedestrian access
- Ground floor should be designed with active uses such as shops, retail, restaurants, outdoor cafes along the street to provide street level interface within TPOD zone 1 and 2
- Street planting should form boulevards to create pedestrian-friendly environment
- Public art should be used at Transit nodes to create landmarks that help establish a character for each transit stop

Colonnades

- Colonnades should act as a semi-public interface/spill-out area between the street and building and as an essential protection against harsh sun and rain and also improve the micro climate of the area ; local architectural elements should be introduced as appropriate
- These buildings should ideally be placed with zero setback or 2m setback to be considered from the front property line to maintain same built edge line with colonnades within 300m TPOD zone
- Maximum level difference of 0.15m should be permitted between shop and internal colonnade facade and it shall not project beyond the building line
- Height of colonnade should be maintained at clear min 4.5 m to 6 m as per shops heights and width minimum 3m. This is to ensure that visibility to active uses are not hindered, and that it provides a sufficient amount of space for movement and permeability
- Buildings within TPOD zone 1 and 2 (within 300m radius) should provide colonnades at the street frontage with active street edge.
- Commercial and mixed use development within TPOD zone of 300m radius should provide colonnades along the street frontage or POPS

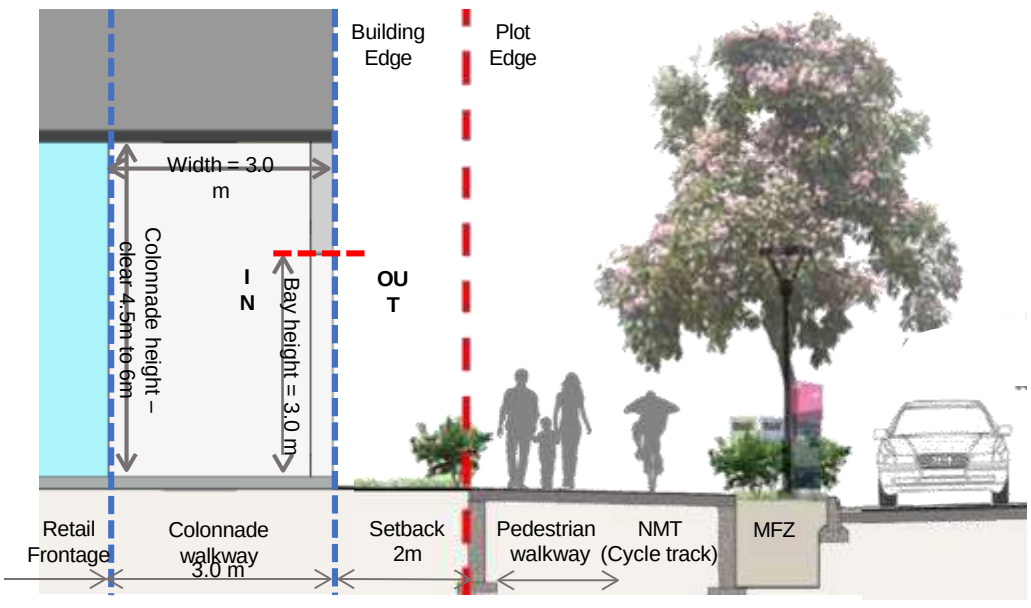
Mixed use transit-oriented development in Guangzhou

Amsterdam, The Netherlands

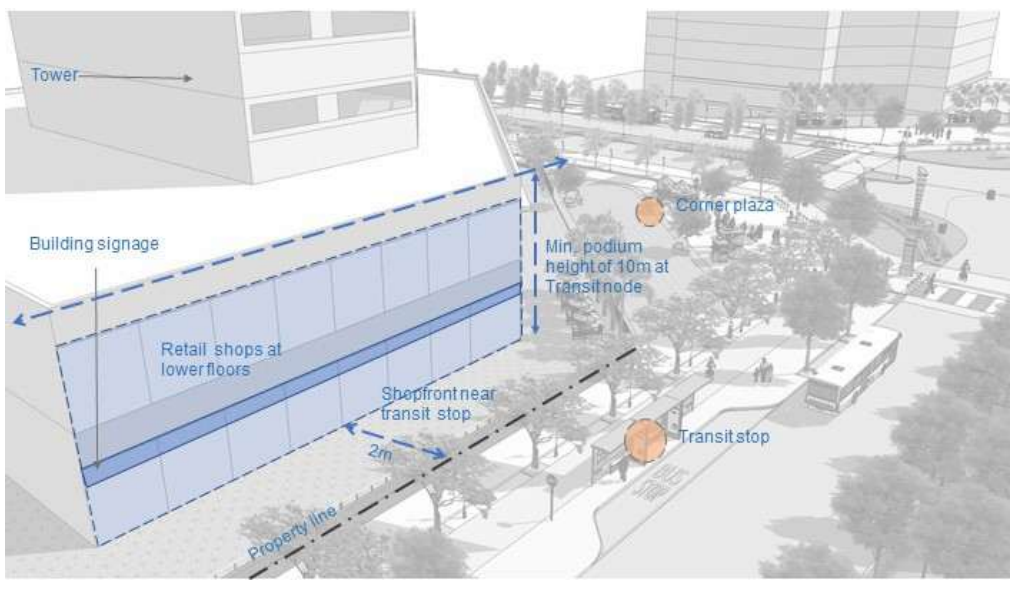
Key Plan showing location of colonnade at transit stop

Location of Colonnade

Image showing modern interpretation of colonnade design at Richtiring Office Building, Wallisellen, Switzerland



TPOD node street section showing colonnades



TPOD node street interface view

Source: https://www.itdp.org/city-transformations/buenos-aires/, http://www.itdp-china.org/enbus/?lang=1, https://www.archdaily.com/568946/richtiring-office-building-maxdudler/546bcdcde58ece78db000027-12_richtiring-c-stefan_mueller-jpg

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

Phased Development of Public Transportation

TPOD should be implemented in phases as per transport infrastructure should initially with BRT corridors to form TPOD nodes within large commercial areas and integrated with MRT at later stage when appropriate.

BRT will be at grade and developed in a phased manner, starting on major arterial roads with stations at commercial zones. Mixed use development at higher density at the TPOD nodes.

The implementation of MRT will allow the transit corridor to continue to provide for expected future capacity of commuters living in close proximity of transit nodes. The provision of MRT has the following benefits:

- MRT should be provided below ground level to avoid congestion
- It will not replace but rather complement the existing BRT to create a seamless network of public transport
- Underground pathway should connect both MRT and BRT to ensure easy transfer and safe access to both public transport

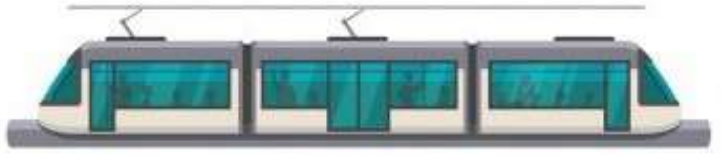
The concourse platforms should be linked with underground pedestrian network to ensure the safety of pedestrian during the change of transit mode. It also enhances the connectivity of different modes of transit by connecting all transit modes. Strategies of phased development of public transportation are as follow:

- TPOD should be implemented in phases as per transport infrastructure that is initially at BRT corridors within TPOD node with large commercial areas and integrated with MRT at later stage
- In view of targeted transportation strategy for 2050 as per APCRDA. Phasing of different modes based on priorities is recommended below:
  - Bus Lines – Initial Phase – (1-2 yrs)
  - BRT* – Intermediate Phase – (3-5 yrs)
  - MRT* – Final Phase – (6-12 yrs)

  *Intermodal transit connection

Initial Phase
1-2 yrs

Intermediate Phase
3-5 yrs



Final Phase
6-12 yrs

Bus lines in initial phase

BRT corridor in intermediate phase

MRT in final phase

TPOD transit node

Source: https://www.shutterstock.com/video/clip-19855279-hong-kong-china---circa-november-2015, https://commons.wikimedia.org/w/index.php?curid=3014894, http://thecityfix.com/blog/

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

TPOD Nodes

Representative Master plan subject to detail design plans.

3D views of TPOD around transit nodes

5 Transport Pedestrian Oriented Development (TPOD) Guidelines

TPOD Nodes

Birds Eye View of TPOD Node Demonstration

3D view showing high density mixed use developments at TPOD nodes

6 Streetscape Guidelines

6 Streetscape Guidelines

Streetscape Design Approach

Complete streets with an integrated land-use transportation system should demonstrate the global standards to offer high levels of convenience to people of all walks of life and varying mobility abilities as well. The sustainable urban transport system should form a unique identity for the new capital city.

Potential transportation means includes:

- Rail system: Regional Rail/MRT/LRT/Tram
- Other Public Transport: BRT/Electric Bus/ Electric Taxi/ Ferries etc.
- NMT: Walking, Smart Bikes, e-Rickshaw

Amaravati has been planned with BRT/LRT as the public transport system to cater the needs of growing population which should be upgraded to MRT system. Dedicated lanes are reserved for public transport system, cyclists and pedestrians. Regional towns/cities are well connected by rail network with Capital City region.

Masterplan has set the percentage modal split as

- Public Transport (avg.) = 60%
- Public Transport (CBD)= 70%
- Car Occupancy Rate = 1.2

The streetscape guidelines illustrated are suggestive and to be adapted as per detailed requirements.

Street Typologies

Amaravati city transport vision addresses the changing streetscape approach for roads in terms its use from vehicular to pedestrian oriented sidewalks interacting with surrounding land use at its edge to improve the quality of life of people. Streets are also important and contribute to the image and identity of the city.

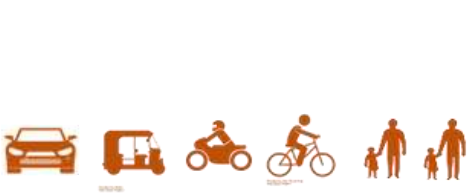
Major Arterial Road, Arterial road, Sub Arterial Roads of the city have been designed for major Rapid Transit Lanes connected to neighbourhoods by the network of collector roads and local streets. Streetscape along collector roads and local streets emphasizes creating a more pedestrian friendly public realm to make active streets where as city level public Rapid Transit corridors kept for fast connectivity to city within and to AP capital region. Streets should help people make healthy decisions by creating favourable environment for walking, bicycling, and use of transit modes. Streets lined with healthy trees provide beauty, shade and improved air quality to bring happiness to city user and ensure a smart and sustainable development for Amaravati capital city.

60m wide Major Arterial Road

50m wide Arterial Road

50m wide Sub Arterial Road

25m wide Collector Road



17m wide Local street

15.6m wide Local street

12m wide Local street

9m wide Local street

Street types and typical sections as per ROW

Streetscape

6 Streetscape Guidelines

Street Components

Following street components have been identified that should contribute to the success of complete street approach of Amaravati capital city.

Frontage Zone

- Keep this space as clear as possible so that people should walk and stand in the shadow of buildings
- Vertical changes between the pedestrian realm grade and ground floor levels should be addressed internally within buildings / plots
- For mixed use and commercial development the frontage zone should be constructed at the same grade and level as the sidewalk zone
- The surface material within the frontage zone should differentiate public and private zone by accent paving material or colour
- Commercial plots should have common frontage for colonnade or seating areas without compromising on planting strip from boundary edge

Pedestrian Walkway (NMT)

- Pedestrian walkway forms part of the NMT corridor along roads of different ROWs qnd should be a within range of dimension making it flexible as per guidelines without compromising on MFZ corridor
- Walkway width should be determined by street types and its ROW, land use and as per universal accessibility measures
- Greening in MFZ should be in consideration of pedestrian walkways to provide shading and noise buffer
- Pedestrian path should be clear and accessible to all. No obstructions should be considered within this corridor
- Bollards should be provided at specific areas to remind pedestrians they are entering into different spaces, such as between plot entrances/exits, cycle tracks, or at intersections/crossings to restrict vehicular entry
- Pedestrian walkway should raise to a higher level than carriageways and should be separated by curb. It should have uniform height 0.15m above road level.
- Curb ramp for entry/exit points at plot should be accomodated into MFZ /Green corridor at 1.4 m
- Where raised pedestrian walkway is not possible then railing, bollard, curb stone separator should be provided to create walkway separated from carriageway
- On streets with ROW of 18 m or less, if pedestrian traffic is greater than 8000 per hour in both 'directions together, the entire ROW should be notified for pedestrianization.

Cycle Track (NMT)

- Cycle track also forms part of the NMT corridor, and should be meant only for non-polluting, slow moving modes like cyclists and e-bikes.
- No obstructions or street furniture should be considered within this corridor.
- Cycle track should be on same level of pedestrian walkway 0.15m above with road level separated by color and texture for demarcation
- Cycle track should be free of obstacles such as furniture, plantation, utility covers etc
- E-shared bikes drop off and charging stations should be at strategic points along NMT corridor preferably in MFZ
- Asphalt or concrete with different color texture should be used to improve visibility to follow the same track while riding
- Proper gradient should be maintained with provision of storm water drains to avoid water logging

Multi Functional Zones

MFZ 1

MFZ 1 is along the commercial edge and should be of partially paved areas with direct access to shopfront.
Along residential edge maximum shrubbery with trees should be provided as buffer for increasing green cover thereby addressing privacy issues

MFZ 2

Greening should depend on the width of pedestrian walkways to provide adequate shading for pedestrians and reduce noise pollution from vehicular movement
All walkways should have bollards to prevent through vehicular movement.

MFZ 3

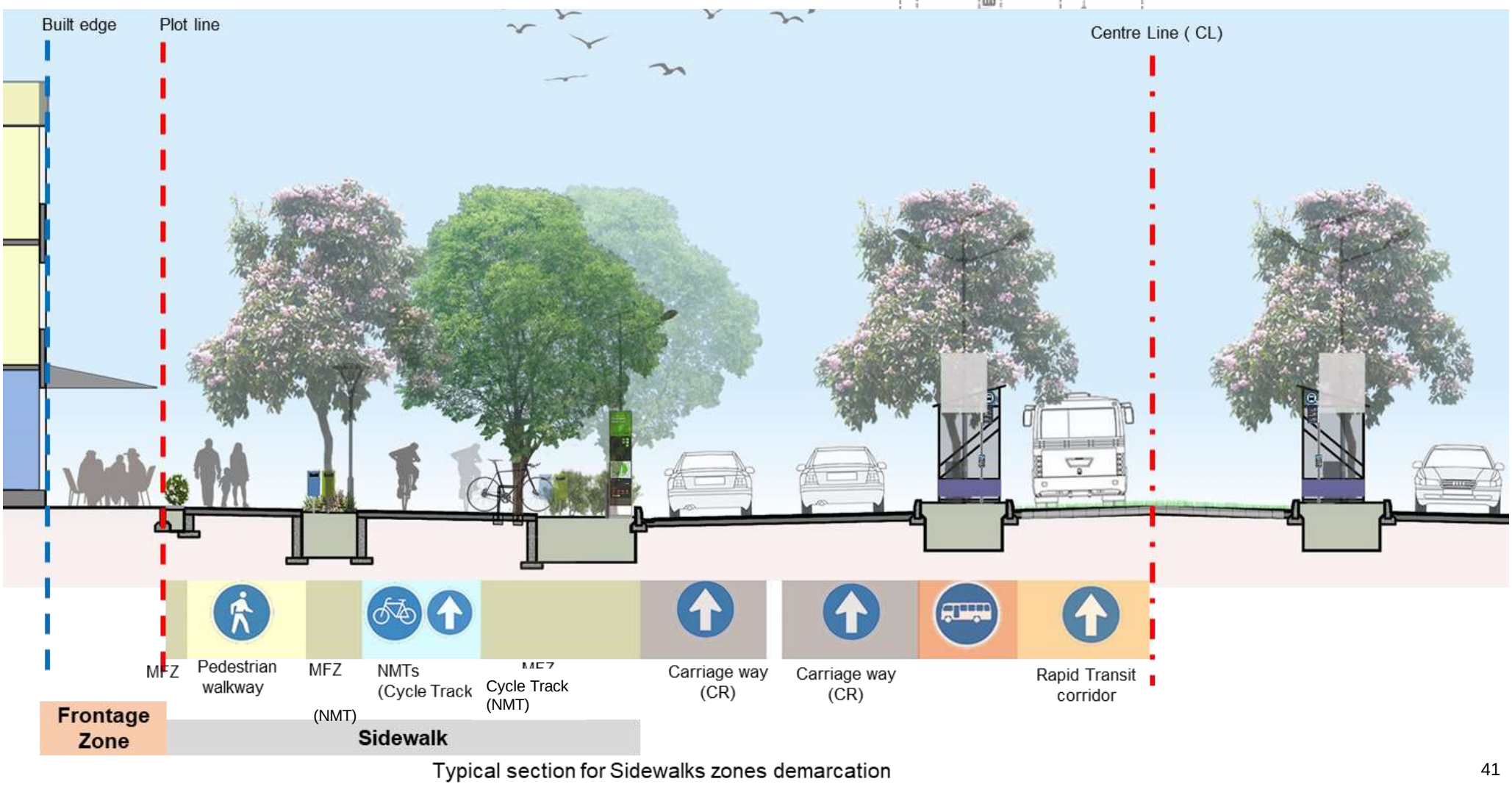
Street furniture and utilities should be provided, such as lighting, bus stops and cycle racks.
Medium to large size trees with dense shrubs should be planted in this zone
Bio-swales should be provided for sustainable measures and storm water management

MFZ 4 – Central Median

Median spaces should be 100 % covered with trees and shrubs except for pedestrian crossings and intersections
Central median should be 150mm above carriage way level

Note:

- At least 5 safe street-level crossing opportunities per kilometer of street with 250m being maximum spacing between two crossings shall be ensured. Depending on context, these crossings may be signalized and or traffic calmed (through raising crosswalk over street level by 150 mm) to reduce vehicular speed.
- Limiting speed on urban arterial roads and sub-arterial streets to 50 kmph and on collector and local streets to 30 kmph shall be ensured. Traffic calming of all streets with ROW of 12m or less through narrowing of driveway and meandering path with use of trees, islands and street furniture should be done and speed should be limited to 20 km/hr by design.
- Develop at least 5 safe street crossings per km for bicycles with spacing between two crossings not more than 250m.
- Provide secure parking for cycles at transit stations, all public places and commercial and institutional buildings.
- Encourage battery operated vehicles by providing separate lane with a provision for recharging.



Typical section for Sidewalks zones demarcation

6 Streetscape Guidelines

Recommended Streetscape Guidelines Matrix

Elements of Street	9 m	12 m	15.6 m	17 m	25 m	50 m (Arterial)	50 m (Sub Arterial)	60 m wide (Major Arterial and Seed Access Road)	Criteria Fpr Placement and Location / Remark
	Range	Range	Range	Range	Range	Range	Range	Range	
Sidewalk	1.75m	3m	5m	4.8m	5m	12m	12m	11m	
Pedestrian Walkways	1.00m	2.00m	2.00m	2m	2m	2.40m - 4.00m	2.40m - 4.00	2.40 - 4.00	
NMT Zone	N.A	N.A	2.00m	2m	2m	2m - 3.00m	2m- 3.00m	3.00m	
Multi Functional Zones(MFZ-(M1 ,M2 ,M3,M4).	M1 = 0.75m	M1 = 1m	M1 = 1 m	M1 =1 m	M1= 1m	M1= 0.6m	M1= 1.4m	M1 = 1m	
					M2= 1m	M2=1.4m	M2= 4m	M2=4m	
						M3=4m	M3=2.5m	M3= 3m	
						M4=5m	N.A	N.A	
Bicycle Rack	NA	NA	750m -1000m	750m -1000m	750m -1000m	750m -1000m	750m -1000m	750m -1000m	Close to bus stop , accessible to public.
Trapezoidal Hump	For pedestrian crossing minimum width of 2.5 m- 4 m flush with sidewalk and curb with speed calming measures.								
Curb Ramps Width	For pedestrian and NMT track 3m - 5m of width to be provided on both sides of each pedestrian crossing at each quadrant. never on the corner of the intersection.								
Street Lights for Pedestrian on Sidewalk	8-10m	8 - 10m	8 - 10m	8 - 10m	8 - 10m	8 - 10m	8 - 10m	8 - 10m	Height of these light post are about 3 m-4m
Street Lights for Vehicles at Median	N.A	N.A	N.A	N.A	21 c/c (median)	21 c/c (median)	36 c/c (median)	36 c/c (median)	Height of these light post are about 7m-9m .
Turning Radius	Turning radius at the intersections - Intersections with different ROW's with allocated chamfer will be applicable as per higher ROW turning radius, wherever chamfer is not allocated minimum turning radius as per ROW turning criteria.Turning radius for small to medium size vehicle is 5m.Entry to heavy vehicles is restricted during day time except emergency vehicles and school buses.If heavy vehicles allowed on local streets minimum 7.5 m turning radius to be adopted.								
	5m	5m	5m	5m	12m	12m	12m	12m	
Mast Lighting	High mast lighting to b eprovided at major intersections of 25m and above ROWs and height 30m (As per UTTEPEC Guidelines)								
Police Booth	Traffic control management at intersections for signalized and non-signalized junction.At all intersections Camera electronic devices to be provided for traffic monitoring and management. (Suggestive -In absence of electronic monitoring devices Traffic control kiosk and shelters for traffic police to be provided at intersection.)								
Traffic Signals	Traffic signals to be provided at all intersections								
Benches - Center to Center c/c	In combination of 2 seats without obstructing cycle and pedestrian movement - Min 1.2m(L) height 0.45m seat Locations 50 m c/c Intervals, seating near transit stops, Public plaza's, Public buildings, Commercial buildings, also at intersections.								
Bus Stops	NA	NA	NA	NA	750-1000m	750-1000m	750-1000m	750-1000m	
Litterbins	Dry and wet waste separate bins to be provided at intersections, plazas, public amenities, transit stops, parks etc. Location 30m c/c interval near transit stops, Public plazas, Public buildings, Commercial buildings, also at intersections.								
Public Art	To enhance public realm and locate near TPOD , Transit hubs, Waterfronts to create public spaces as landmarks.								
Kiosk / Public Toilets	Arrangement near Intersections, public / Commercial area /APCRDA Plots of city.(Refer urban and streetscape plugins guidelines)								
Trees (Center to Center)	On side walk of every ROW tree interval distance = 3 m- 6m c/c								
	For centeral median tree interval distance = 5m-7m distance c/c								
Tree Grates	Tree grates wherever required for every tree. dim 1.2 x 1.2 m (Street Corners of intersections and public plaza areas)								
Tree Guard	On every road minimum guard size 1.2 x 1.2 m height of about 2 m.								
Types of Curbs	Straight Curb - Straight curbs to be provided 0.15m above road level								
	Mountable Curb - Mountable curb to be provided at the start of every curb ramp flush with road level.								
	Curved Curb - Curved curb to be provided at every curb ramp turning 0.15m above road entry/exit point of plot and at every intersection corner for turning radius								
Tree Pit	Street Corners of intersections and public plaza areas - minimum pit size 1.2 x 1.2 m depth of about 1.2 m								
Shrubs	Depth of shrub bed is minimum 0.6m								
Bollards	Provided with maximum 1.2 m to 1.2 m c / c interval distance at Intersections, Entry /Exit of plots ,at median crossing								
Signages	Signage's to be placed as part of MFZ, integrated with transit stop, light poles, cycle racks, information kiosks								

Note:
1. All Dimensions are in metres.
2. These guidelines consider flexible range for pedestrian walkway + cycle track / shared Sidewalks*
3. Given range is in meters and those are to promote design flexibility for creativity
4. The Street Cross-sections are suggestive and to be adapted as per detailed requirements.

N.A – Not applicable.

6 Streetscape Guidelines

Street Furniture

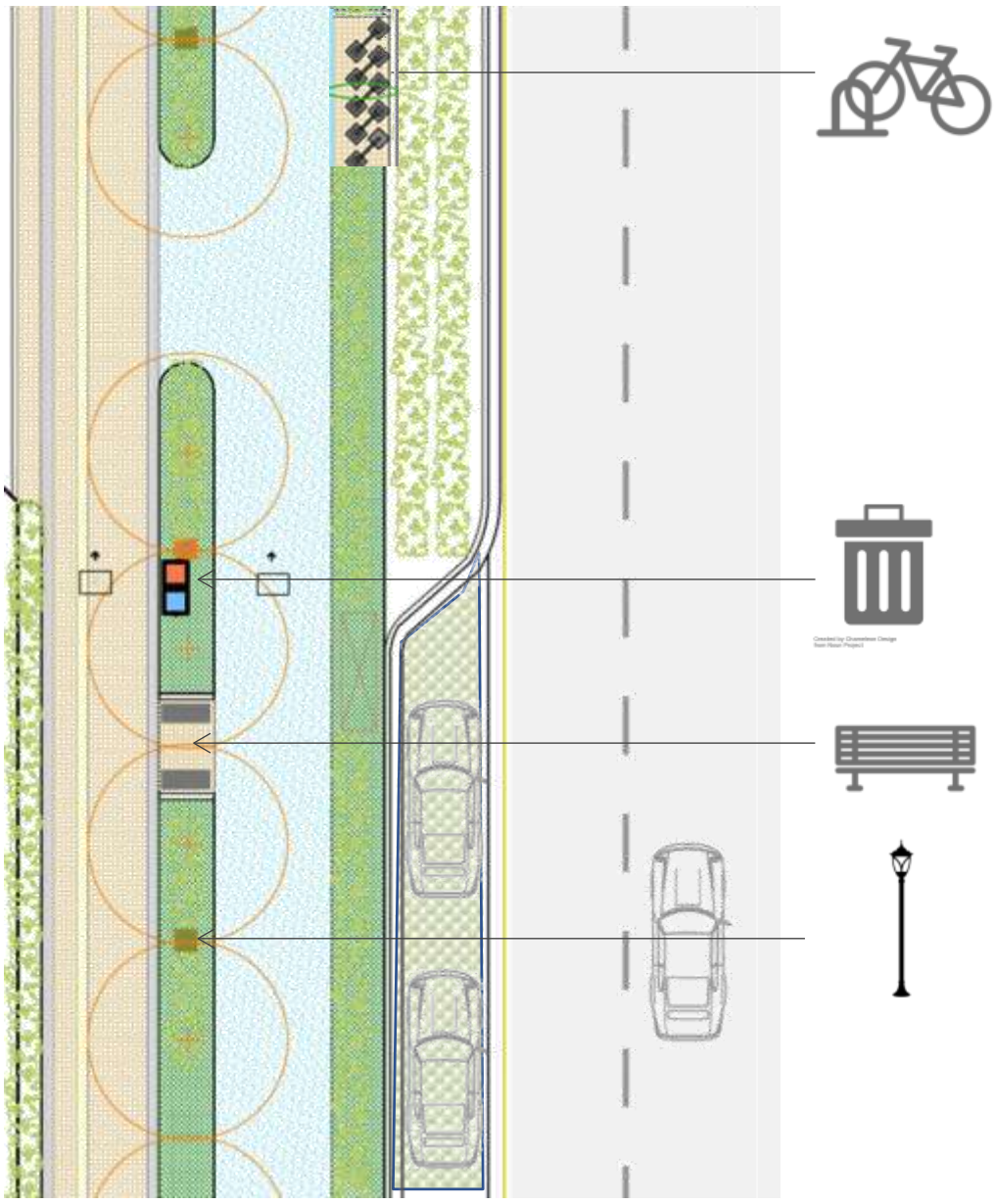
- Street furniture should be installed in the landscape /MFZ. It should also be considered in the Frontage Zone or on curb extensions at intersection for place making
- Street furniture should not be installed in or protrude into the NMT zone including pedestrian walkways and cycle tracks
- Street furniture should enhance the identity and character of the corridor and surrounding district in accordance with context

Street Furniture Components

1. Shade Structure
2. Benches and Seating
3. Litter and Recycling Receptacles
4. Drinking Fountains
5. Pedestrian Signs and Way finding
6. Street Lighting
7. Tree Grates and Guards
8. Cycle Racks
9. Bollards
10. Utility Covers and Screens

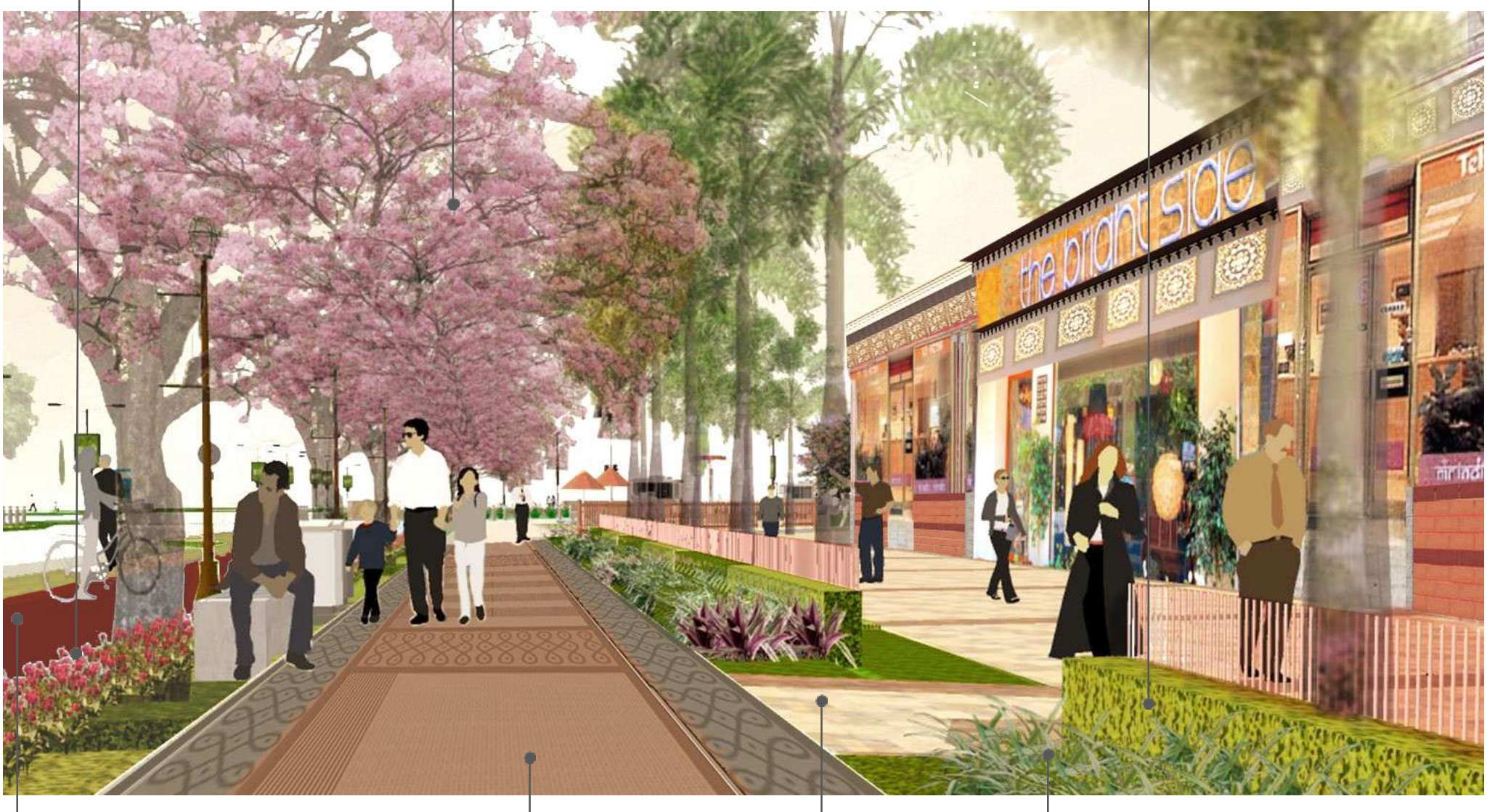
Note:

- All pedestrian facilities should be barrier free for universal access by all persons with reduced mobility including those with hearing and visual impairments.
- Vending spaces should be marked in addition and adjacent to the walking path, especially along high pedestrian volume areas to activate the street and make it safe. Space to be planned for utilities including drinking water kiosks and toilets so that the walking space is enhanced but not compromised.



Typical street plan view _50 m Sub Arterial Road

Typical Streetscape view of 50m Arterial Road



6 Streetscape Guidelines

Street Furniture

Shade Structures


Shade structure - Port Hedland – Kiwis and Kangaroos

- Shade structures wood, metal or synthetic fabric should be used as shade material
- Shade structures finishes and style should complement other street furnishings

Benches and Seating


Well shaded, easy-to-maintain Seating, Beijing

- Ample seating should be provided in shaded locations
- Seating surfaces should be low heat conducting

Tree Grates and Guards


Yuba City, California

- Tree grates should permit ample tree growth and provide a comfortable walking surface
- Tree guards should be provided as part of plaza and where trees are prone to damage by vehicles, machinery, or animals

Planters


Bloor street, Toronto

- Planters should be considered in areas of high pedestrian activity or hardscape with planting constraints
- Planter should be located not to impede pedestrian flow and accessibility
- Irrigation and maintenance aspects of planter should be considered

Cycle Racks


- Cycle rack should be provided at transit stops and key cycling destinations
- Cycle rack location should not impede pedestrian flow and accessibility

Bollards


- Bollards should be used to delineate pedestrian and vehicular areas where no vertical curb is present
- Spacing of bollards should be adjusted to permit universal accessibility

Utility Covers and Screens


Paving expert – Recessed Tray Covers for manhole

- Functional elements such as utility covers and screens should be integrated with the streetscape or paving pattern (tray type)
- Utility covers and screens should contribute to the identity of a district or neighbourhood

Pedestrian Lighting


- Pedestrian-scaled lighting should be provided in all pedestrian areas to create a safe and pleasant environment
- Light intensity should coincide with surrounding land use

6 Streetscape Guidelines

Street Intersections

Street intersections should be treated as nodes within capital city LPS layout plan to create identity and character to the neighbourhood clusters.

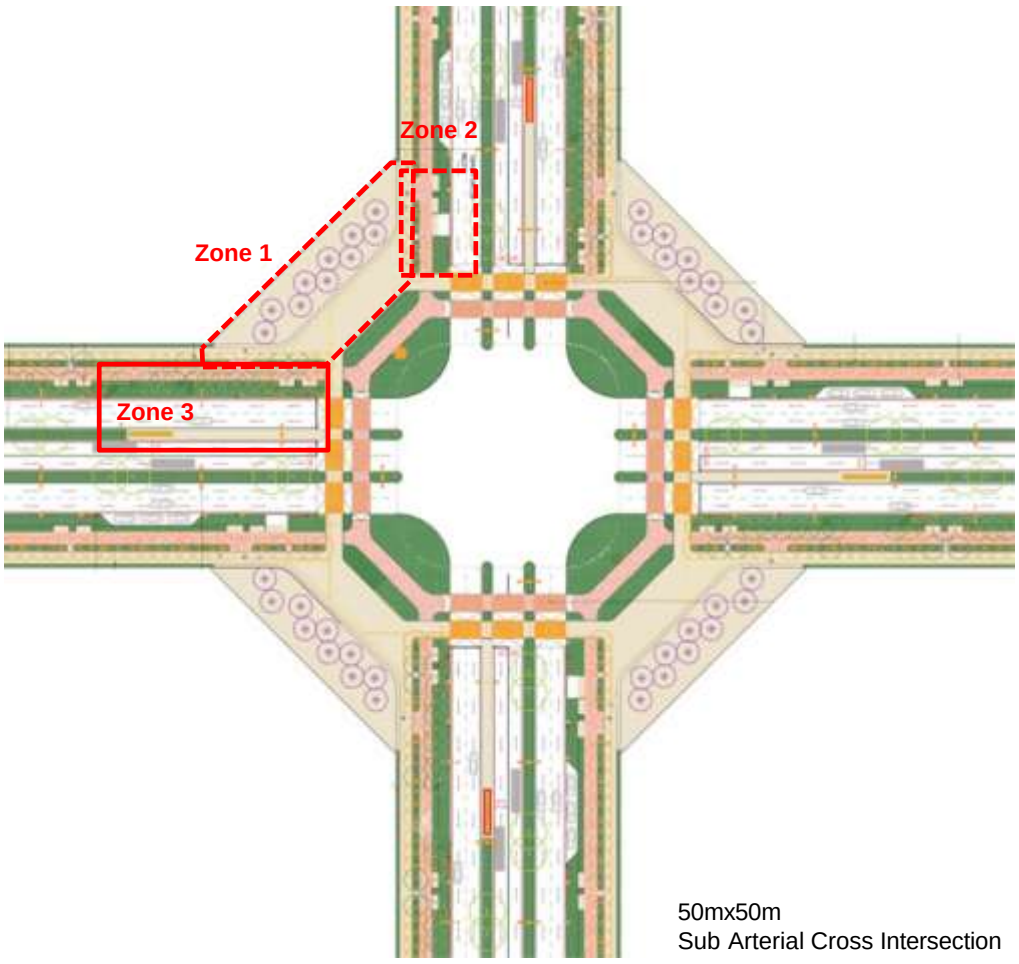
- All intersections should be signalised
- Corner space at intersections should be designed for place making bringing vibrancy and liveliness to public realm
- Each intersection corner should be designed with 3 zones as shown in key plan
  - Zone 1 – Corner plaza
  - Zone 2 – Public realm infrastructure and services
  - Zone 3 – Public transit stop

Zone1 Corner Plaza

- Corner plaza should be designed as public plazas to create identity and character at intersections
- Corner plaza at intersections should provide safer, greener space for pedestrians before crossing road
- Corner plaza should provide activites that encourage and engage people for various social and cultural events
- Land uses and private development at the corner plots should promote public uses at the intersection to boost business and invigorate street life in a neighbourhood
- Parking should not be allowed or permitted within the corner public plaza
- Refer waterfront and open space guidelines for plaza design and landscape

Zone 2 Public Infrastructure and Services

- Digital tags and information panels should be provided for easy navigation and providing directions to surrounding area
- Information panels and displays should be visually attractive and located strategically at each intersection
- Digital information panels and tags should be integrated into a support network that ensures web links to reflect real time information and create public awareness
- Panels should not obstruct the pedestrian walkway
- Digital panels should be supported by advertising revenue from local shops, restaurants, sports, and entertainment venues
- Small newspapers stalls, ATM, smart infrastructure installations, charging stations for shared vehicles, smart phones etc. should be designed to add character to the intersection
- Utilities and services structure should be placed in MFZ landscape area screened by plantation, art work or decorative screens
- Refer streetscape and urban plugin guidelines



50mx50m
Sub Arterial Cross Intersection

Zone3 - Public Transit Stop

- Transit stops should be designed to attract riders, improve operational efficiency, build the brand identity of a system, and foster local economic development.
- Transit stop zone should be integrated in MFZ areas keeping traffic lanes clear for movements and should be located 30m away from pedestrian crossing at intersections
- The design, prominence and comfort of a transit stop should be considered for enhancing experience as passengers
- Transit stops should be resilient against different weather conditions by providing adequate covered areas for commuters
- Wayfinding and transit scheduling signage should be integrated at transit stop zones for commuters to plan their trips
- Multi-modal transit service with immediate transit change should be provided to improve the connections between destinations
- Public transit stop zone should provide cycle racks to promote last mile connectivity
- Refer TPOD guidelines for details

6 Streetscape Guidelines

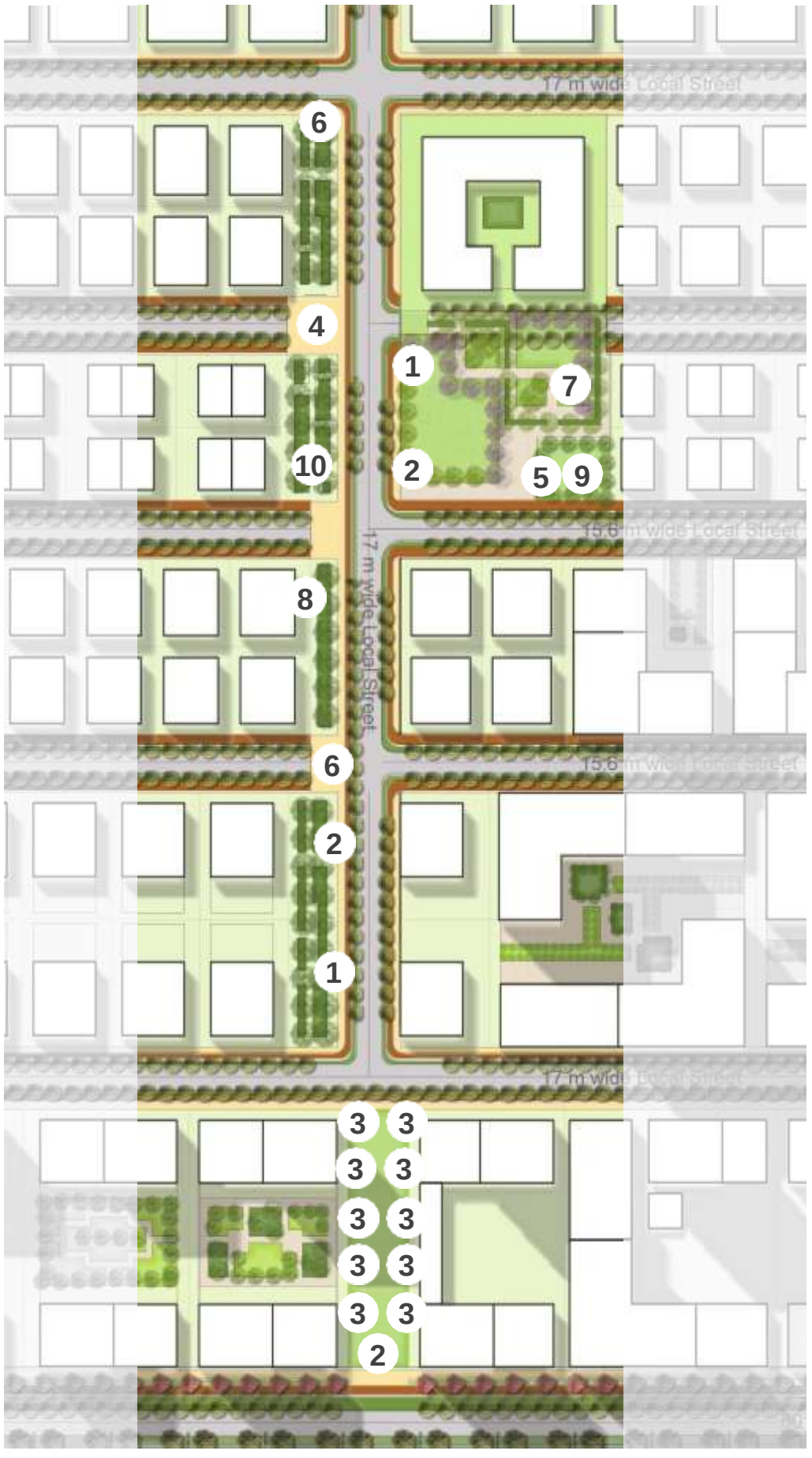
Public Realm Infrastructure

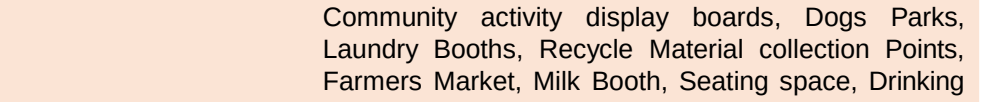
Streetscape and Urban Plugins

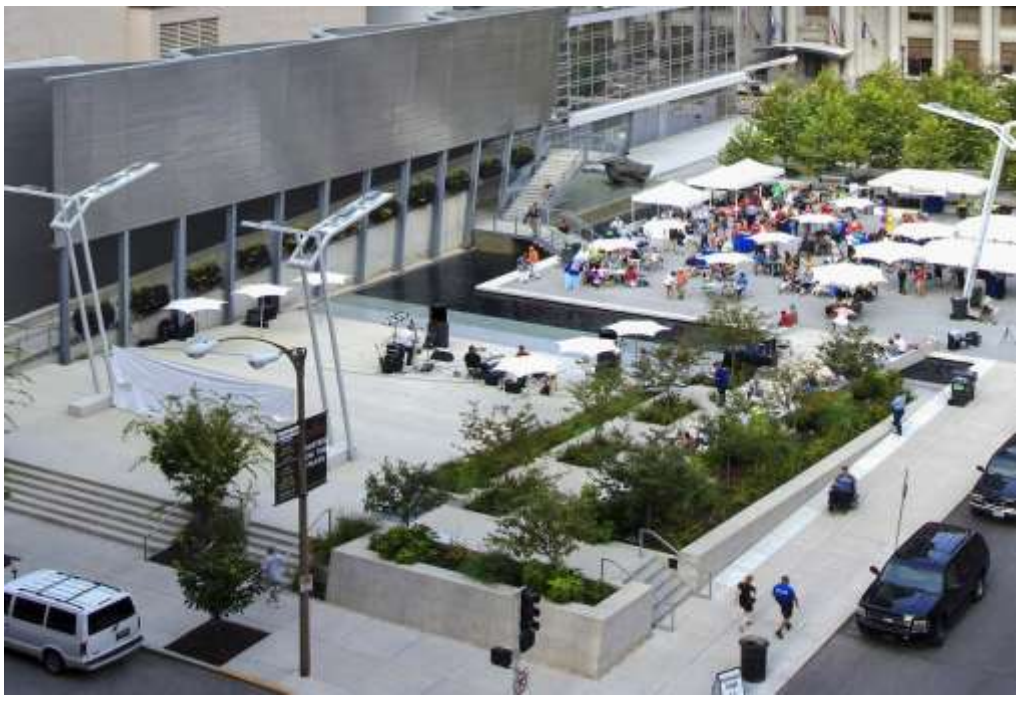
- Streetscape and Urban Plugins should be proposed within vacant plots and MFZ to facilitate community needs at convenient locations within walkable distance
- Small APCRDA vacant plots and returnable plots reserved with purpose to avoid T junctions should function as small scale public amenities and social spaces catering to the communities and neighbourhoods using streetscape and urban plugins
- Streetscape and urban plugins should be restricted only to pedestrian movement and should not be allocated for parking areas
- Universal accessibility measures should be considered for all streetscape and urban plugins
- All POPS, street corner plaza, open spaces and parks should be provided with streetscape and urban plugins to fulfil community needs

List of recommended streetscape plugins –

Location	Streetscape and Urban plugins
APCRDA plots	Public toilets, Play Area/Tot Lots, Outdoor Gym, service staff storage and changing rooms, Branding and marketing, news paper stand and reading corner, news paper stand and reading corner, Flea Market, ATMs, Pocket Park, Service Amenities, Sand Box, Community activity display boards, Dogs Parks, Laundry Booths, Recycle Material collection Points, Farmers Market, Milk Booth, Seating space, Drinking water fountains, feeder bus stop, Public art installation
Waterfront, Canal front and Parks	Public toilets, Play Area/Tot Lots, Outdoor Gym, emergency booths and dispensers, service staff storage and changing rooms, news paper stand and reading corner, Flea Market, Pocket Park, Sand Box, community activity display boards, Dogs Parks, Recycle Material collection Points, Farmers Market, Seating space, Drinking water fountains, Feeder bus stop, Public art installation
Multifunctional zone	Way finding signage's, emergency booths and dispensers, Branding and marketing, News paper stand and reading corner, ATMs, Laundry Booths, Recycle Material collection Points, Milk Booth, Drinking water fountains, Public art installation
POPS	Public toilets, Play Area/Tot Lots, Pocket Park, Service Amenities, Recycle Material collection Points, Seating space, Drinking water fountains, Public art installation
Street corner plaza	Recycle Material collection Points, Seating space, News paper stand and reading corner, ATMs, Community activity display boards, Drinking water fountains, Public art installation







Corner plazas offer pause spaces

Interim public plaza at intersection

Source: https://www.airnewzealand.com.au/destination-tokyo, National Association of City transportation officials

6 Streetscape Guidelines

Street Plantation

Street plantation and landscaping improve the livability and quality of green space in context of streets. Street plantation should play a functional role in providing shade to pedestrians, cyclists, vendors and public transport passengers. It should also enhance the aesthetic quality of the streets.

Landscape should be pivotal in creating comfortable, clean and memorable street environment. It should help to shape the character of the place, improve environment from different perspectives, such as energy saving and storm water management.

A city enjoys plantation benefits in different ways and thus should be classified into following categories:

Environmental Benefits of Trees

- Reduce energy use and heat island effects
- Reduce greenhouse gases and airborne particulates
- Improve water quality and groundwater recharge
- Support of natural diversity

Social Benefits of Trees

- Enhance comfort, beauty, and attractiveness of streets and public spaces
- Reduce stress
- Reduce exposure to UV rays
- Symbolic connection to the natural world
- Psychological connection with landscape

Economic Benefits of Trees

- Improve comfort and appeal of retail districts
- Perception of quality and care, which extends to adjacent businesses
- Increase residential and commercial property values

Road Side Plantation

One of the main objectives of roadside avenue plantation should be to provide shade. Shade bearing trees should be selected for road side plantation with an average spacing of 3m to 6 m, which should provide ample growing space for most species.

Medium size trees should be grown in the medians. If medium trees grow to their optimum height and spread, they may cover approximately 8 to 10m of space.

The shade trees in the last available row should be planted at a spacing of 8-12m. These tree species should be of local significance and should be mostly evergreen in nature. This ensures that no substantial leaf-fall in winters and prevent the problem of blockage of roadside drains. Trees with the following characteristics should be planted as shade trees:

i) Trees with high crown forms secure better visibility and should be adopted for plantation

ii) Trees that retain their foliage longest should be preferred over deciduous trees

(Note - Follow IRC : SP 21- 2009 standards.)

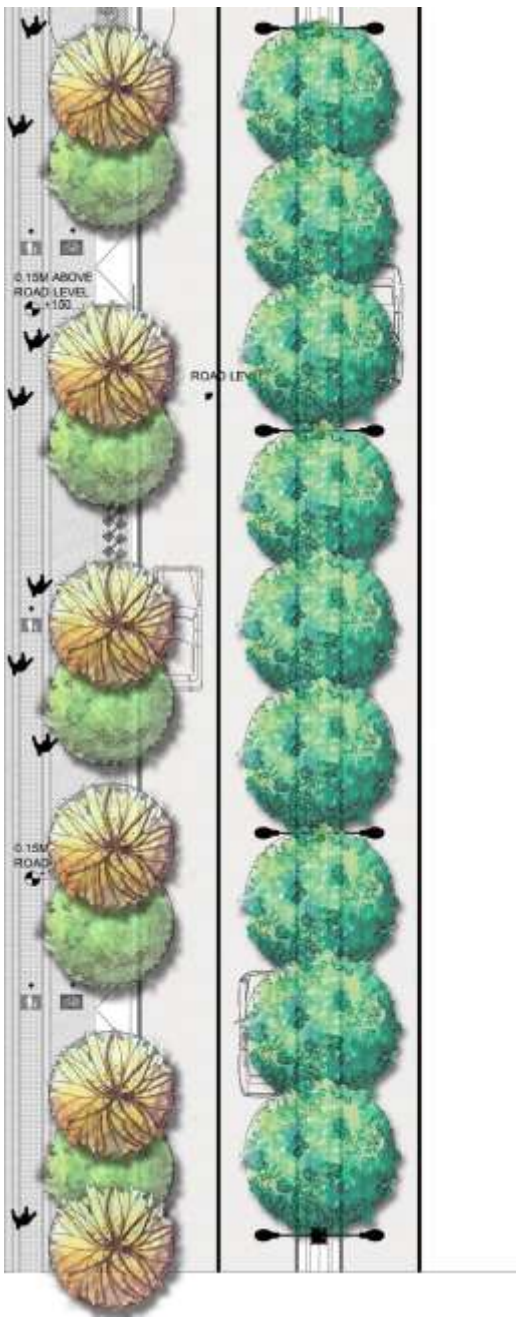
Deep rooted large foliage Plantation along the side of the roads and in the open spaces shall be developed to act as sinks of air pollutants

Shrub Beds in Medians

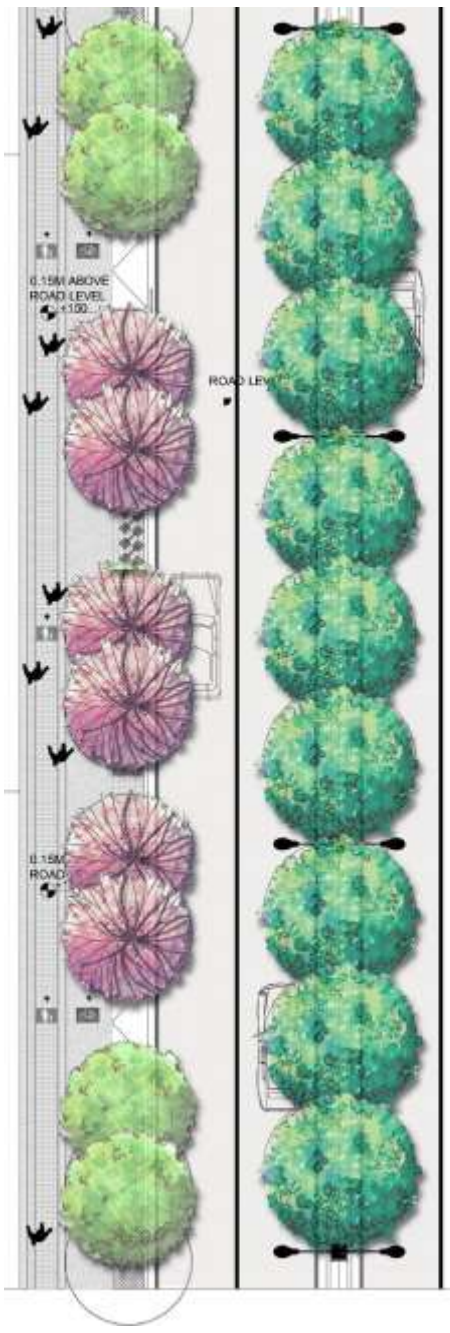
The species planted in median should be low or medium height with ornamental value to enhance the visual experience of the road corridor and also act as a screen to prevent glare from incoming vehicles.

- Median width of less than 1.5m should have only small shrubs, ground covers or lawn
- Median with width of 2.5m should have 2 to 4 rows in combination of shrubs, ground covers and lawn
- Median with width up to 5m should have 5 to 8 rows in combination of shrubs, ground covers and lawn
- Tree plants should be placed at distance 3m c/c and pit size for planting should be 60 x 60 x 60cm (Note - Follow IRC : SP 21- 2009 standards)

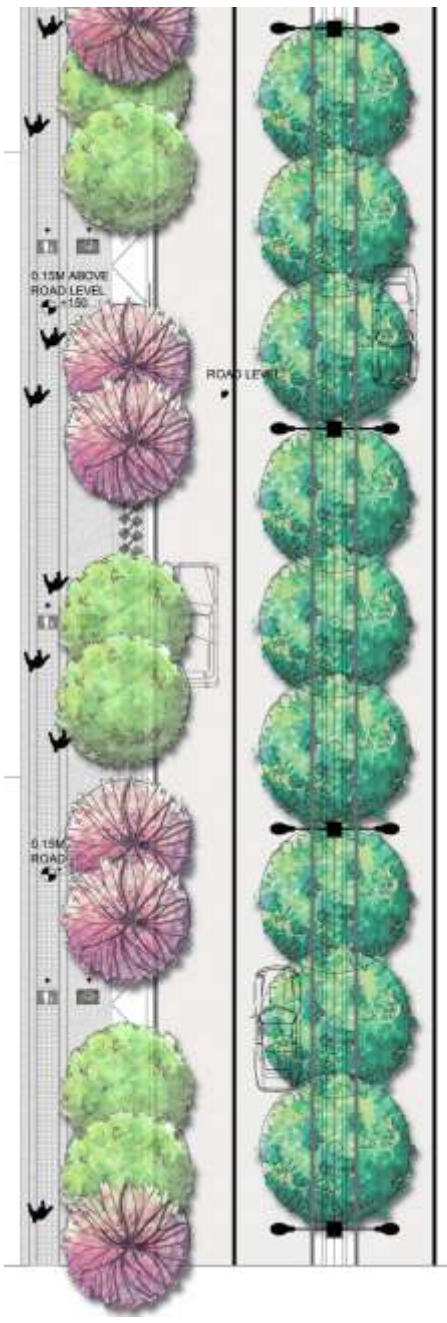
Planting Possibilities



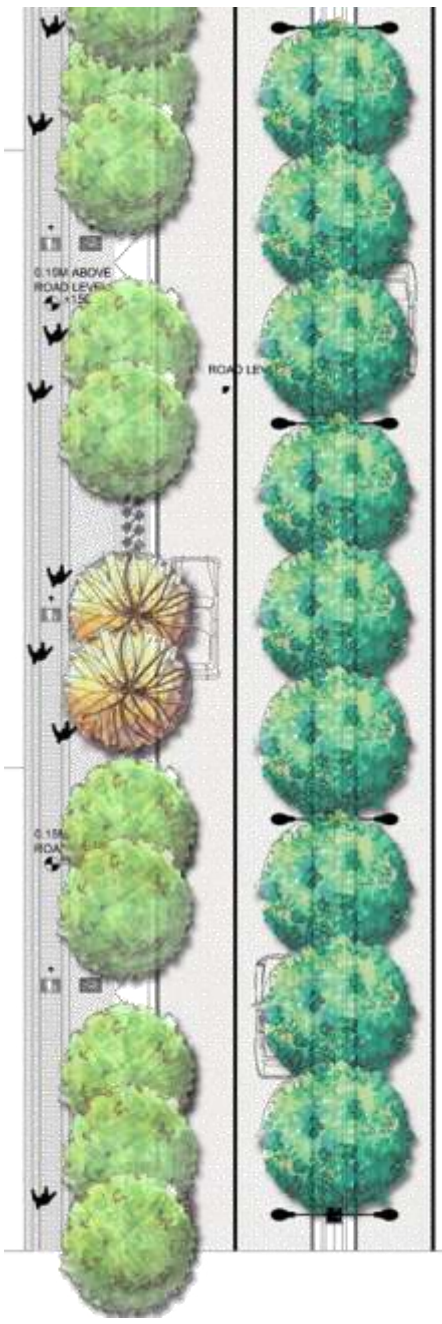
✓ Option 1 – Alternate Combination of Medium Evergreen and Flowering Trees



✓ Option 2– Avenue Plantation In Combination of Medium Evergreen and Flowering Trees



✓ Option 3– Group Of 2 Trees In Combination of Medium Evergreen and Flowering Trees



✗ Option 4– Single or Group of 2 Flowering Trees In Between Evergreen Trees

6 Streetscape Guidelines

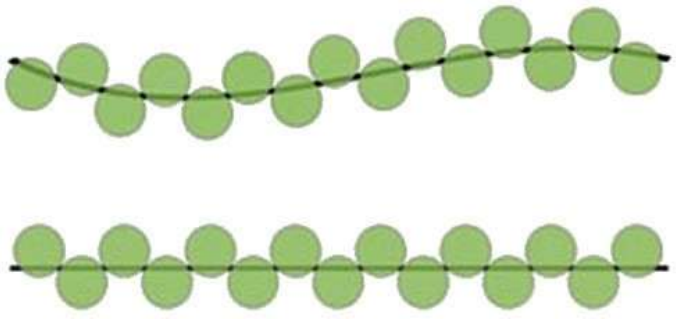
Street Plantation Design Criteria

Vibrancy in Street through Plant Material

A sense of place should be created and altered by the landscape design. It should be integrated to the street according to the adjacent land use and character of the area.

Tree Pits and Underground Utilities

Tree pits should have dimensions of at least 1.5m x1.5m to accommodate roots at full maturity. Narrow planting strips should use small to medium scale trees. Hume pipes should be placed at lower level to avoid conflict with tree roots.



Continuous Staggering Tree Line

A continuous tree line compatible with underground utility lines should be planted in median and buffer zones.

C/C Distance between Trees

Appropriate distance between trees should provide continuous shading, depending on the individual trees' canopy size and shape.

Location of Tree Pits

Tree pits locations should be coordinated with the position of street lights and other utilities. Trees with high branching structures should be preferred.

Visual Clearance and Tree Canopy

Medium-height vegetation should be trimmed directly adjacent to formal crossings to improve the visibility of pedestrians and cyclists.

Planting along Sidewalks

Continuous planting zones along the residential frontage should be suitable. Character plantation should be introduced as potted plant on light poles.

Shaded walkways

Large canopy to trees should be planted to create shaded sidewalks for comfortable microclimatic conditions.

Tree Gratings

Tree gratings finished at the same level as surrounding pavement should be provided to allow people to walk while still allowing water, air and nutrients to access the roots.

Continuous Planting along Walkways

Retail (shopping streets) should have trees in tree-guards and not in continuous planting strips to allow more flexibility and space for pedestrian movement.

Plant Character

Only native trees should be planted on streets in order to minimise irrigation requirements and prolong tree life.

Tree Guards

Tree guards should be provided for young trees. Local materials like bamboo should be used.

Source: http://freebird-chaithra.blogspot.in/2012/03/flowering-trees-in-india.html, http://www.conteches.com/Products/StormwaterManagement/Biofiltration-Bioretention/Filterra, https://www.google.co.in/imgres?imgurl=https%3A%2F%2Fwww.wilsonbrosgardens.com%2Fassets%2Fimages%2FScreen-Planting, https://content.ces.ncsu.edu/extension-gardener-handbook/15-tree-fruit-and-nuts, http://www.conteches.com/Products/StormwaterManagement/Biofiltration-Bioretention/Filterra, Street Design Guidelines, UTTIPEC, DDA Pradeep Sachdeva Design Associates, Nov 2009

7 Built Form Guidelines

7 Built Form Guidelines

Built form has a great influence on the character of the city space and its identity in a neighborhood cluster. The built form guidelines within the plot reflects building massing, proportions, materiality integrated into site development directly impacts on the street environment. Green Buildings, Low-Carbon and Net-Zero Buildings should be encouraged. Following guidelines define the spaces between the building edge and plot boundary.

Site Development and Building Typologies

Setbacks

Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Building setbacks for plots should be as per Amaravati Zoning Regulations.
- For plots within transit zone refer TPOD guidelines for specific building setback requirements.
- Mandatory planting strip along plot boundary as per plot size excluding plot access should be followed (Refer plot boundary and edge treatment for details)
- Ancillary buildings should be located within building line. (Refer Plan showing setbacks with mandatory planting area)
- Ancillary buildings for services like DG sets, electrical substation and HSD yards etc. should be placed in setbacks with proper screening and access for maintenance.
- Utility and services should be screened with decorative fencing or landscaping.

Services

Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Service infrastructure of the building should be planned on the rear side of the site
- It should be separated and screened from public access points.
- Service yards on the site should be screened with creative fencing or landscaping

Plot Access

Small and Medium Plots
Plot area below 300sqm (small)
Plot area 300sqm – 500sqm (small)
Plot area 500sqm – 2000sqm (medium)
Plot area 2000sqm – 4000sqm (medium)

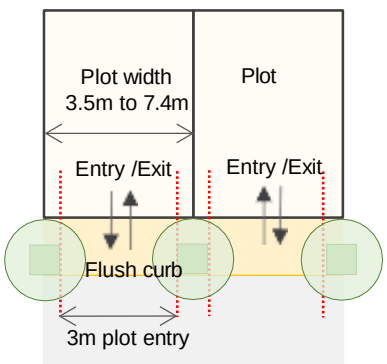
Following guidelines should be adopted for plot access of small and medium scale developments:

- Plots street frontage width ranging from 3.5m-7.4m entry-exit should be provided with a mountable curb
- Plots street frontage width ranging from 7.5m-49m entry-exit should be provided with a curb ramp.
- Small scale plots at street intersection cannot have vehicular access from the street corner. Vehicular access should be provided from the sides of the plot.
- For all medium scale plots entry-exit gate access width should be between 2.4m-3m.
- For medium scale plots vehicular entry–exits curb ramps provision should be located at minimum 15m distance from any pedestrian crossing at intersections.

Plot Size	Entry type with curb	Entry/exit size
Plot width facing street below 7.5m	Mountable curb	3m
Plot width facing street between 7.5m to below 50m	Curb ramp	3m to 5m

Plot access as per plot width consideration

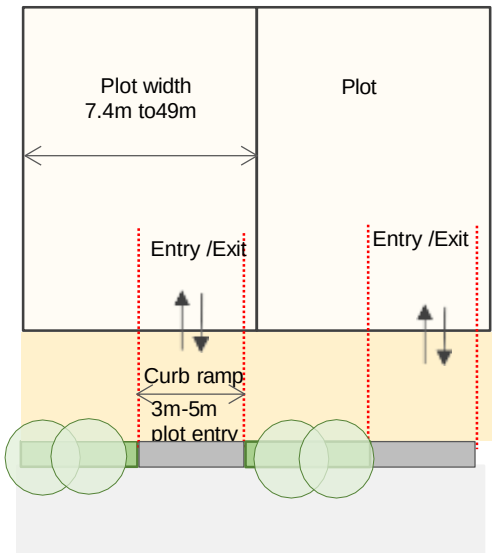
1. For plot width range 3.5m to 7.4m



For the plots of width range 3.5m-7.4m entry-exit to be provided with flush curb.

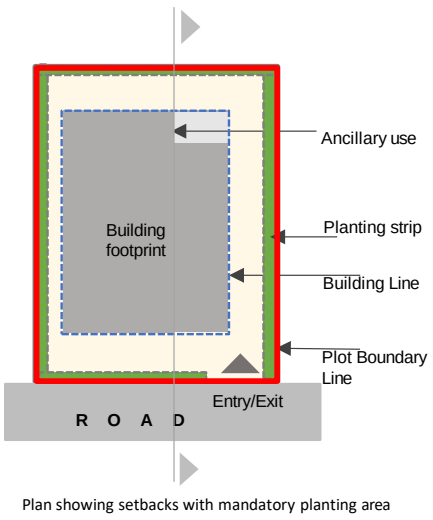
Road
Sidewalk
Curb ramp

2. For plot width range 7.5m to 49m

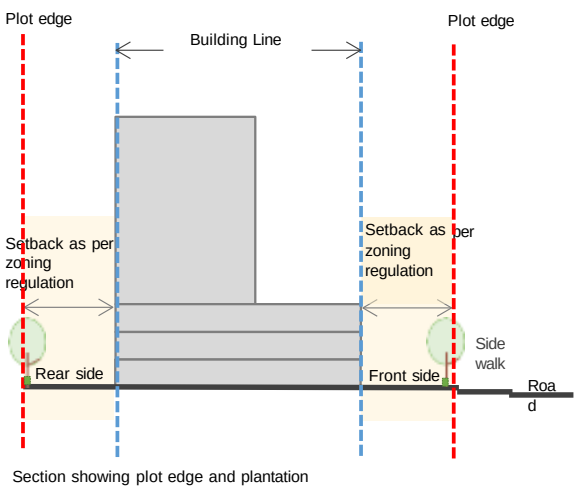


For the plots of width range 7.5m-49m entry-exit to be provided with curb ramp

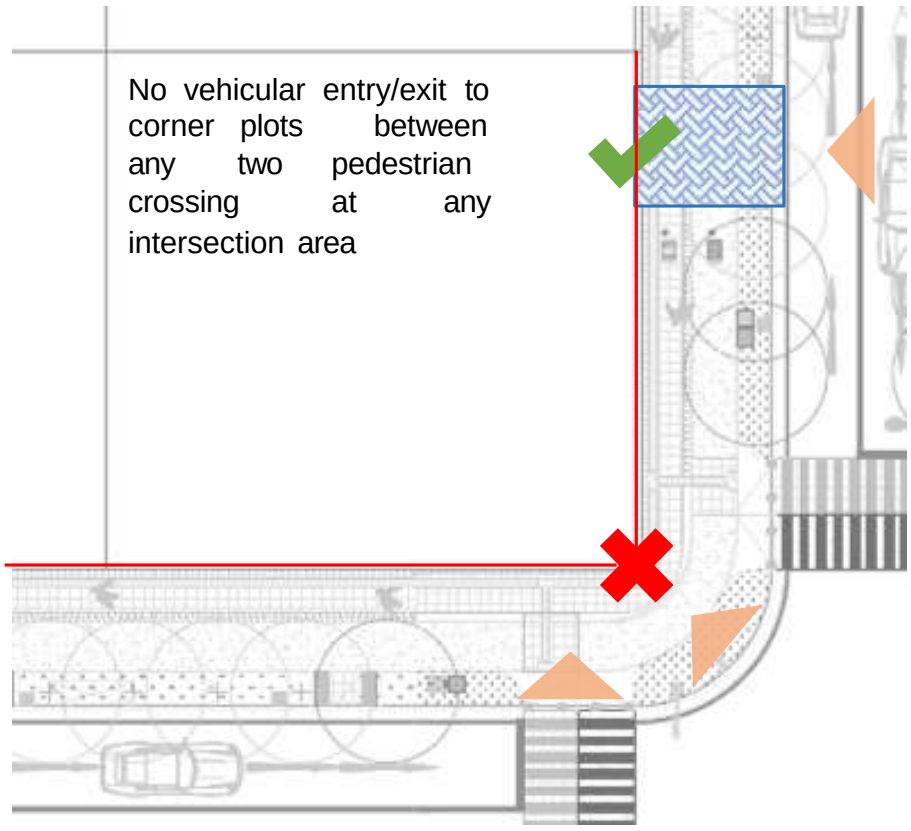
Plot Access - Illustrations showing small and medium scale development



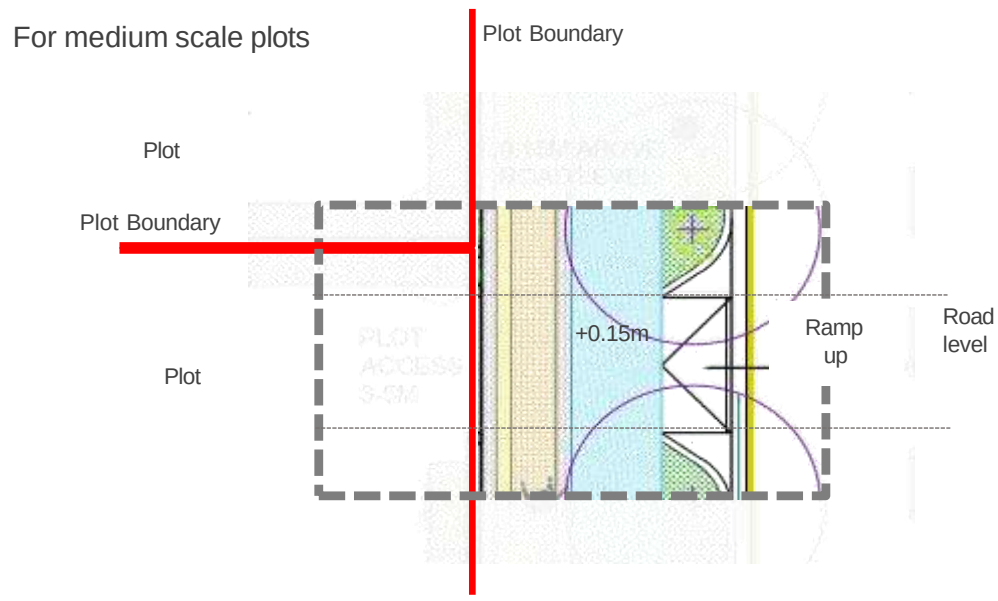
Plan showing setbacks with mandatory planting area



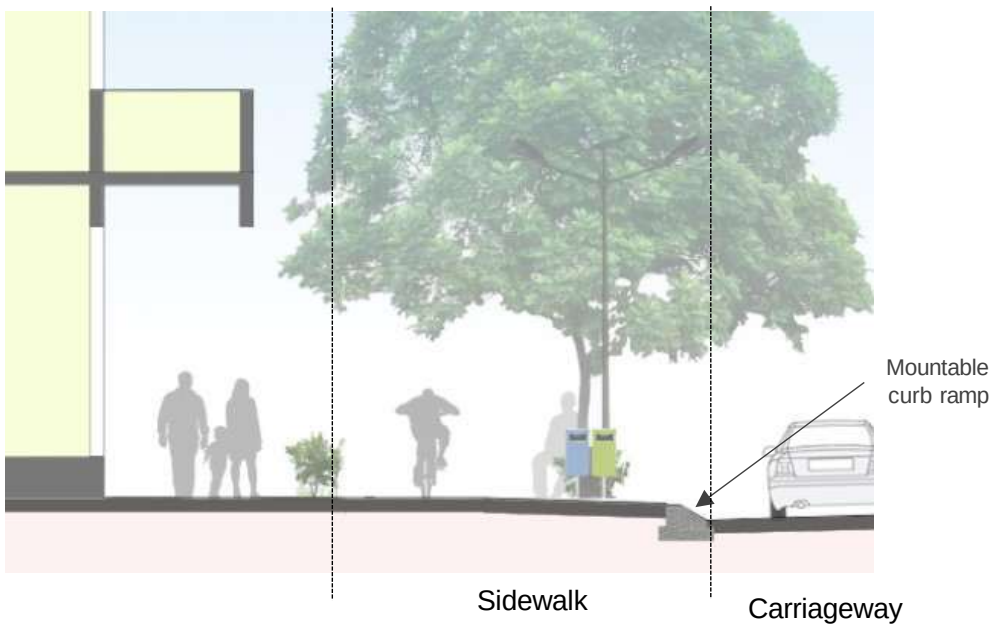
Section showing plot edge and plantation



Plot Access - Illustrative plan showing Intersection without entries / exits



Plot access - Illustrative plan showing curb ramp typical scenario for plot width 7.5m and above.



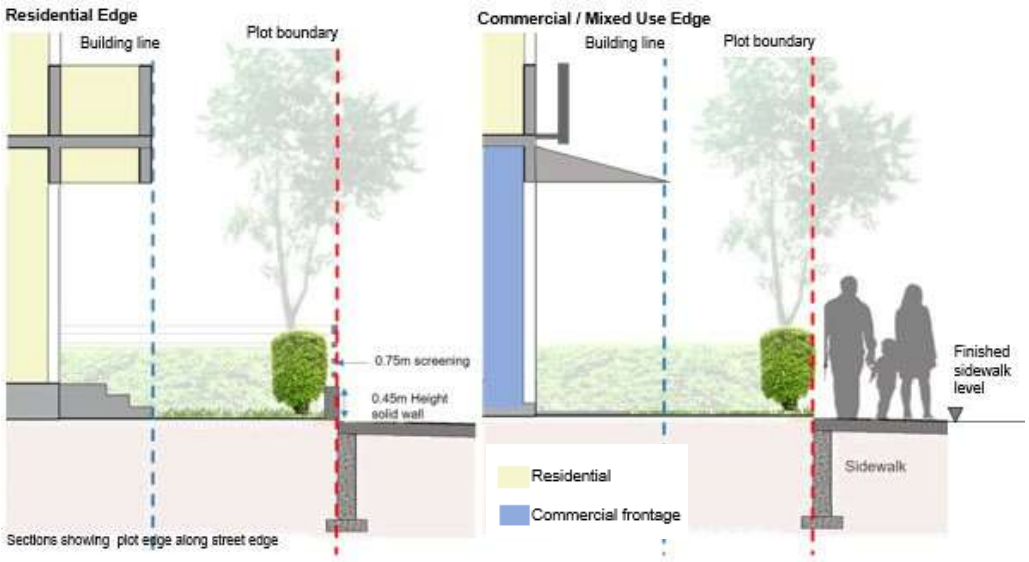
Plot Access - Section showing through plot edge

7 Built Form Guidelines

Plot Boundary and Edge Plantation

Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Hedges and planting should be used to replace solid walls as an alternative way to distinguish plot boundaries. Landscape screening though hedges and shrubs allows transparency to the building frontage and improves pedestrian safety as it provide better visibility of the streets from the buildings
- Planting strips should be used to create a natural transition between buildings and sidewalks compared to solid compound walls where buildings are noticeably separated from the streets
- Planting strip along the plot boundary should be kept free from services / utilities.
- Plot boundary edge treatment with compound wall height should be maximum 1.2 m - consisting of 0.45 m solid wall and 0.75 m screening above the solid wall with min 50% visibility that should be built above the finished level of sidewalk
- All commercial plots street frontage boundary edge should not be fenced. Bollards or low height planting strips should be used along the street edge for better accessibility to shop front
- Low lying solid compound wall or transparent fencing should be provided to discourage misbehaviour from sidewalks
- Fencing materials should be in combination of stained wood, concrete posts, metal of white, black, grey, brown colours. Compound wall can be of brick, stone, artificial stone or structural RCC



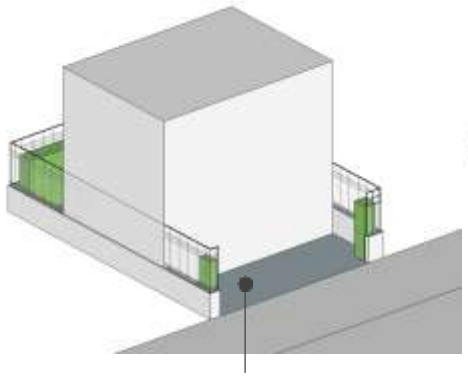
Small and Medium Plots

Following guidelines should be adopted for Plot Boundary and Edge plantation of small and medium scale developments:

- For following plot sizes minimum clear width for landscape strip should be provided in front, back and side boundary edges as mentioned in table below
- These landscape strips should be reserved for tree, shrubs and ground cover planation

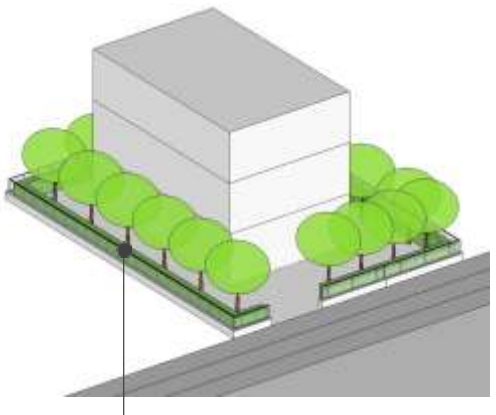
Landscape strip width for small and medium plots		
Plot Size	**Front and Back**	**Sides**
below 300 sqm (small)	0.60m to 0.75 m	N/A
300 to 500 sqm (small)	0.75m to 0.90m	0.60m to 0.75m
500 to 2000 sqm (medium)	1.20m	0.75m to 0.90m
2000 to 4000 sqm (medium)	1.50m	1.50m

For Plot area - Below 300 sqm



Min. planting strip for front and back boundary edge.

Medium scale plots

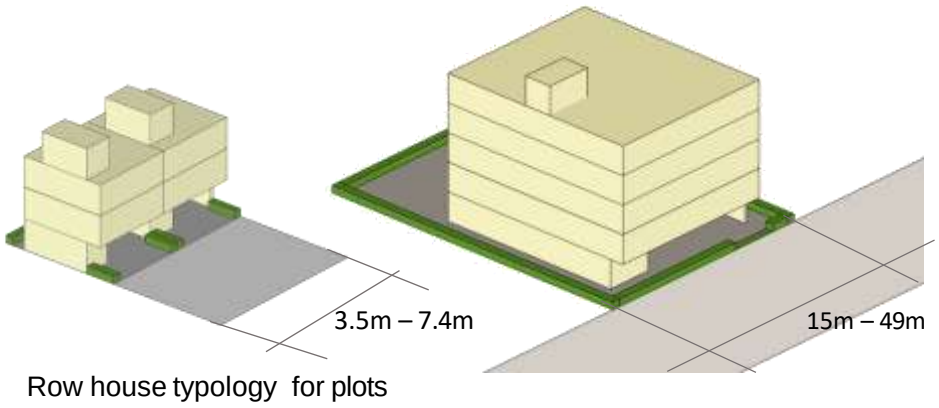


All along planning strip as per plot sizes mentioned in table

Built Massing

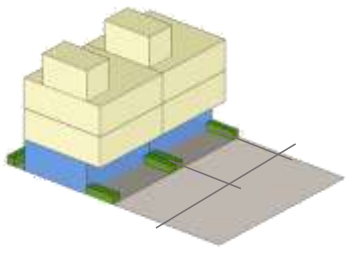
Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Building heights should follow Amaravati Zoning Regulations
- Building heights should not be considered individually but part of a community as a whole maintaining floor lines, colonnades, street level continuous retail frontage
- It should be compatible with surrounding context of parks, canals, waterfront and transit nodes. Views and shading of a building should ensure that it corresponds with adjacent streets, open spaces and buildings
- A step down building profile and respectful spacing between buildings should be planed to create a harmonious built environment
- Buildings on corner lots shall be oriented to address both streets and generally located close to the street edge



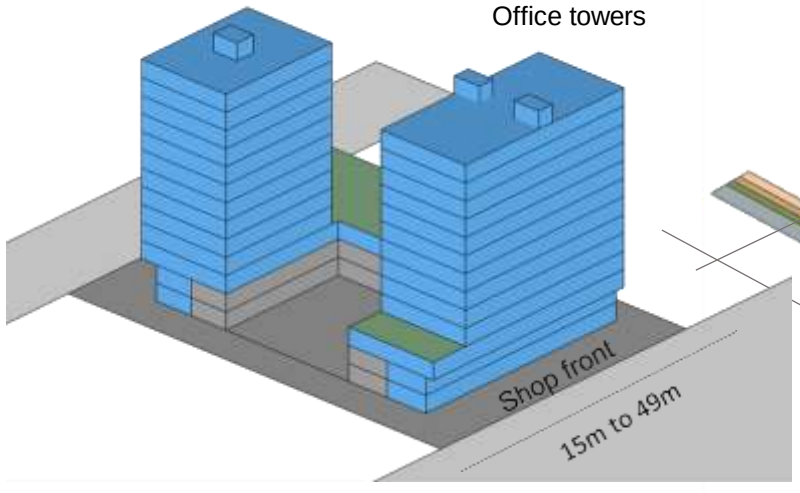
Row house typology for plots street frontage range from 3.5m to 7.4m

Bungalow or apartment typology for plots street frontage range from 15 m to 49 m

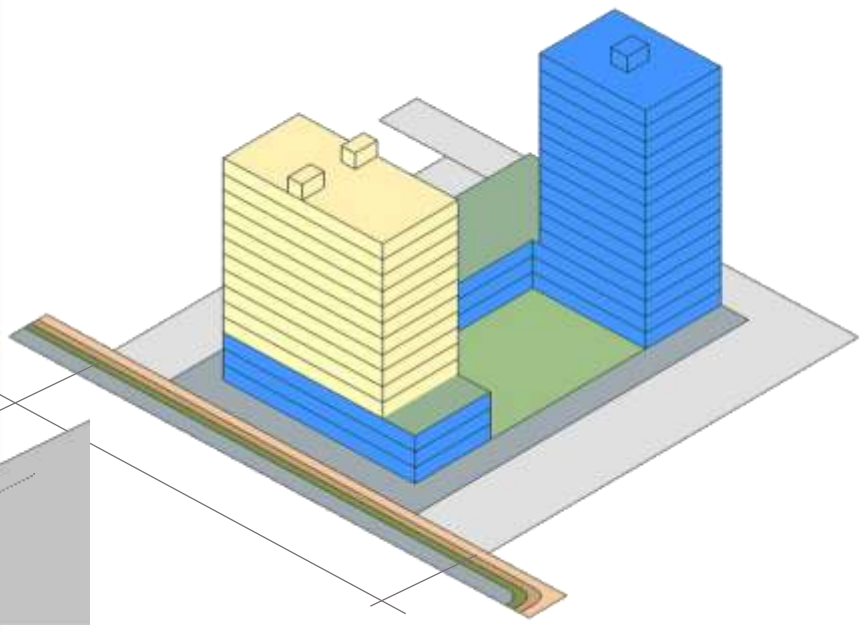


Plot width (3.5 m - 7.4m)

Shop House Typology for plots street frontage range from 3.5m to 7.4m



Office towers



Retail Shops and Offices for plots street frontage range from 15 m to 49m

7 Built Form Guidelines

Building Height Profile

Waterfront, Public Space and Transit Corridors

- Stepped building height profile for transit corridor should be highest at the transit node and step down further (Refer to TPOD Guidlines for details)
- Stepped building height profile should be followed to provide waterfront views to buildings directly facing public spaces such as riverfront, canals, open spaces and parks, as well as buffer zone

Small & Medium Scale Plots

Following guidelines should be adopted for building heights and profile of various scale development.

- Building heights as per Amaravati Zoning Regulations
- For plots within TPOD zone, buildings shall comply with heights as per TPOD criteria for zone 1 & 2
- Building profile should respond to the context and help in identity creation

Building Footprints

Following guidelines should be adopted for footprints of various scale development.

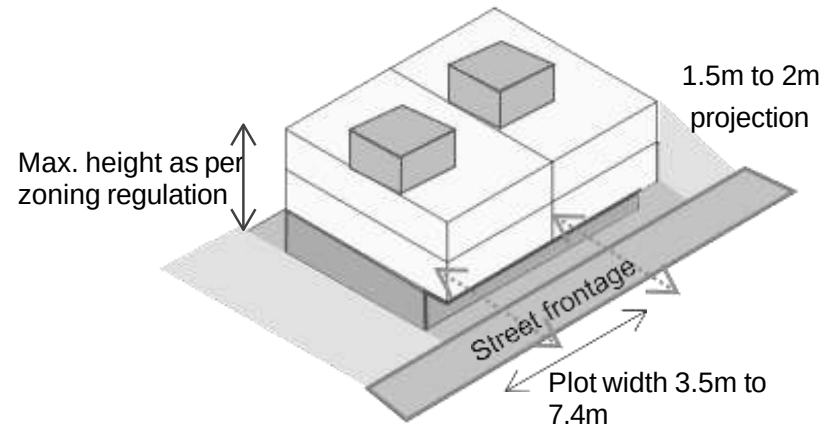
Large Scale Plots

- Public and large scale building's roof and podium should provide 20-50% area of ground coverage as an intensive green (vegetated) cover

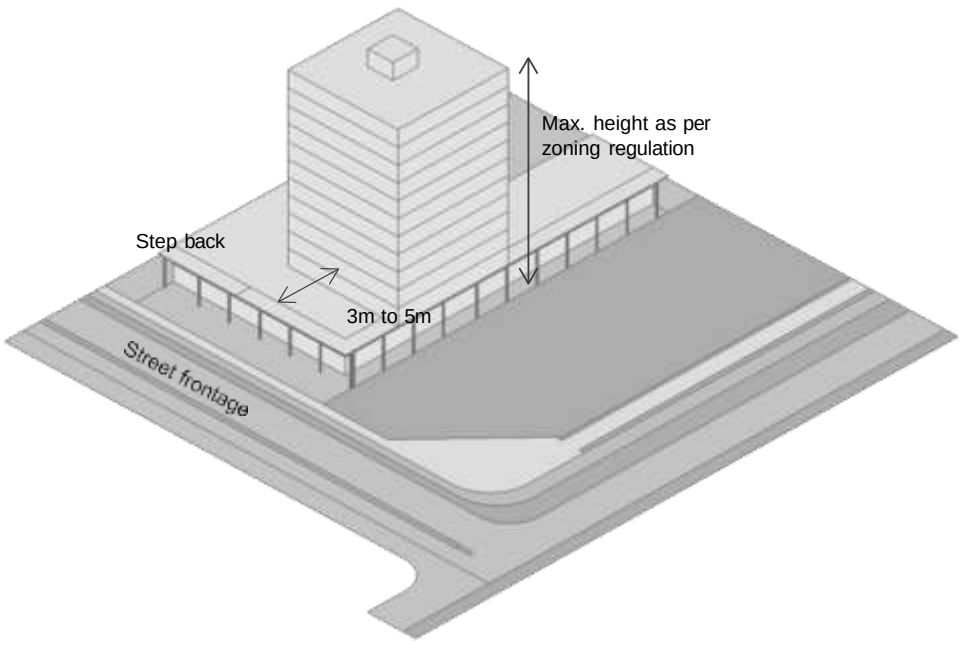
Small & Medium Scale Plots

- Minimum building ground coverage should follow as per Amaravati Zoning Regulations

Small scale plot –
Plot less than 300 sq.m

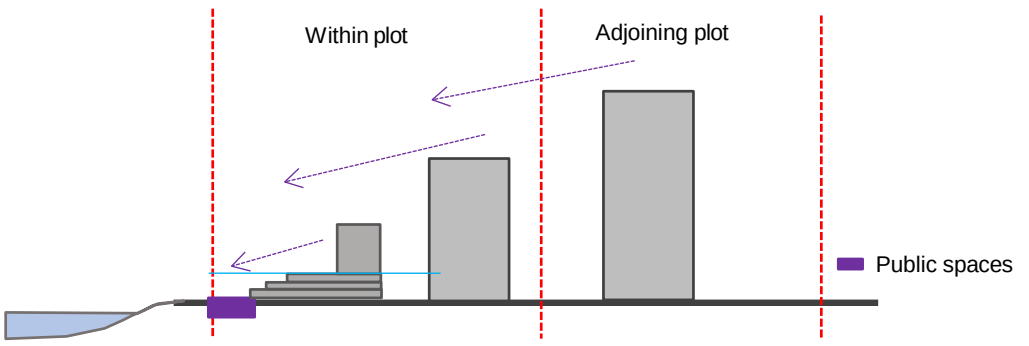


Medium scale plot-
Plot area 300 sq.m to 4000 sq.m

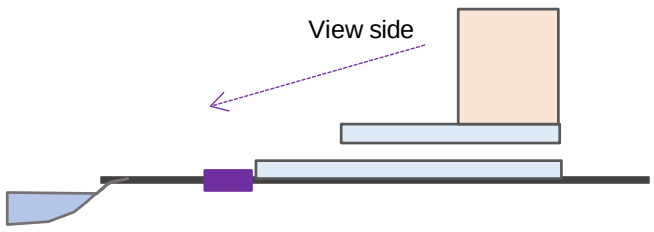


Section showing stepped building height profile along transit corridor

Stepped building height profile



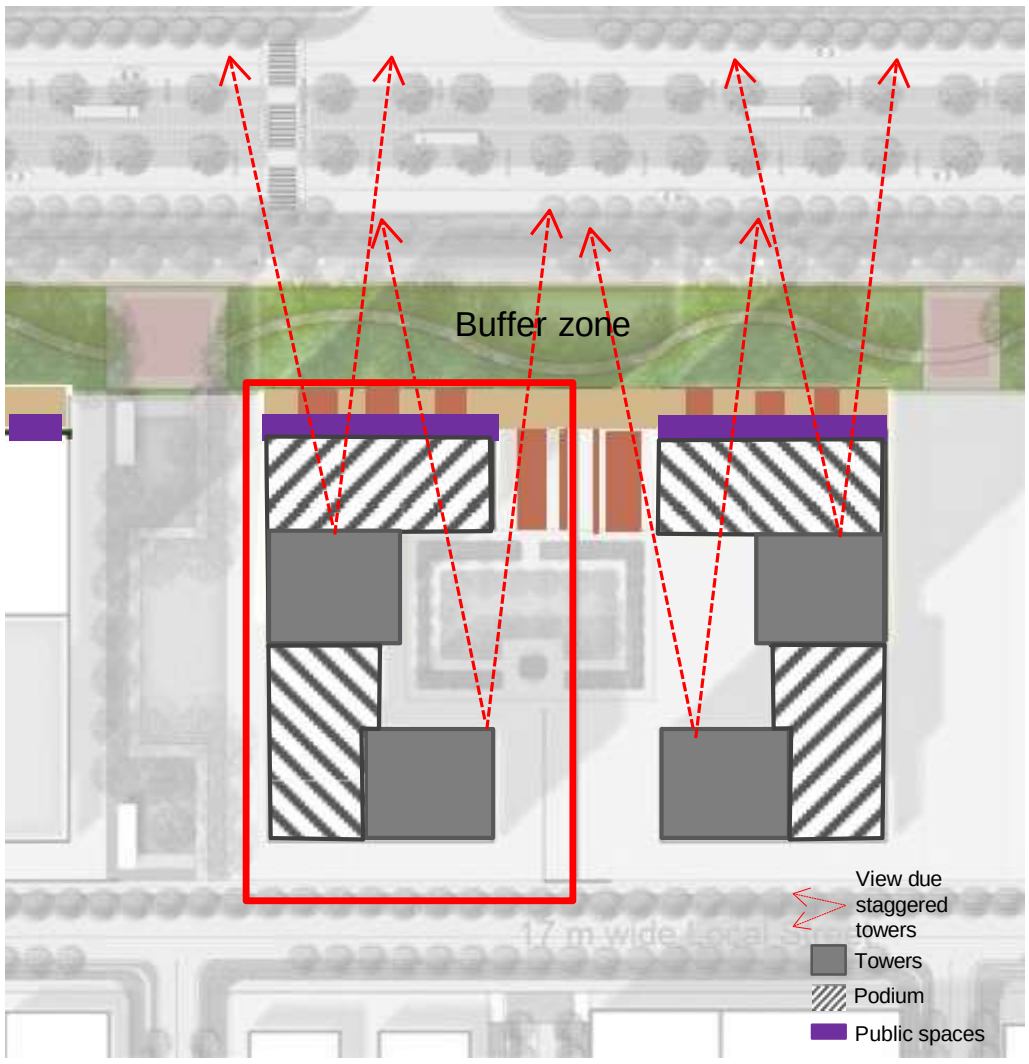
Section showing built form typology with stepped profile building along water front, open space, public transit corridor within and adjoining plots



Section showing step profile with mid level terracing to achieve maximum viewpoints

Stepped building height along the riverfront

Buffer zone



Plan showing building and tower footprints along public spaces should be staggered within plot

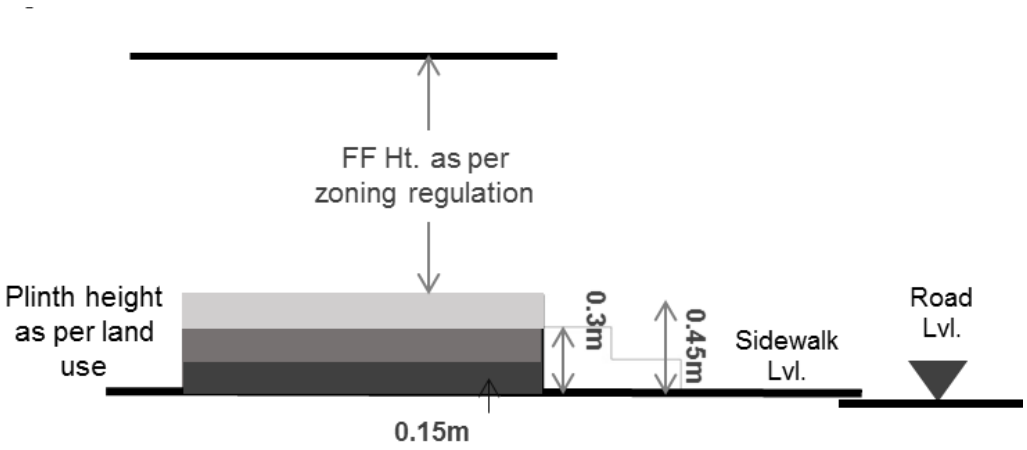
7 Built Form Guidelines

Plinth Level

Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Minimum plinth height of the habitable spaces should be 0.45m above finished sidewalk level
- Minimum plinth height of the parking stilt structures should be 0.15m above finished sidewalk level
- Plinth height of commercial shops should be 0.15m above finished sidewalk level preferably for ease of access
- Steps should be considered within plinth only and projected out steps from plinths for building entry access should not fall out of plot boundary into public pedestrian walkway
- Semi sunken plinth for commercial/Mixed use buildings should be considered with segregated pedestrian and vehicular access
- For semi sunken structures 1.5m plinth level is preferable
- If semi sunken structure is proposed with stilt or slab level at 1.5m within the flood demarcation zone, the habitable spaces should be above the flood line level

Note- Building design NBC guidelines to be followed for plinth heights.
http://mohua.gov.in/upload/uploadfiles/files/Chap-4.pdf



Plinth height for various buildings	
Land use	**Plinth height in meter from road level**
Residential	0.45m to 1.5m
Commercial	0.15m to 1.5m
Institutional	0.15m to 1.5m
Industrial	0.15m to 1.5m
Special zone	0.15m to 1.5m

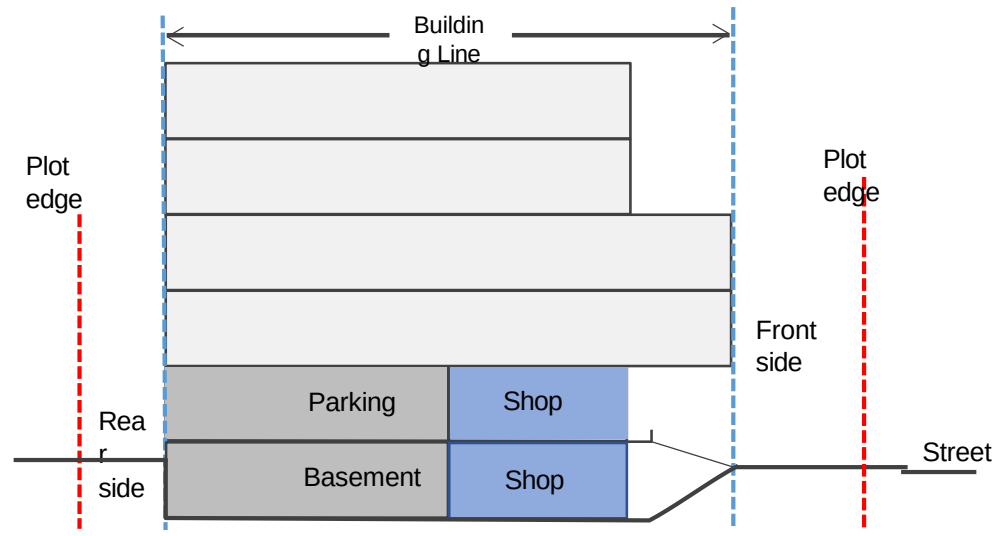
Parking

Small and Medium Plots

Following guidelines should be adopted for parking of small and medium scale developments:

- Following table illustrating parking space provision for various plot sizes
- Provision of mechanical stack parking for additional or future car parking requirements should be considered
- For stilt parking floor height should be minimum 3.2m and should consider additional height for provision of stack parking.

Parking (small and medium plots)	
Plot Size	**Parking space**
Below 300 sqm (small)	Stilt with provision of mechanical stack parking
300 to 500 sqm (small)	Stilt with provision of mechanical stack parking
500 to 2000 sqm (medium)	Stilt and semi sunken basement parking provision of mechanical stack parking
2000 to 4000 sqm (medium)	Podium and sunken basement parking provision of mechanical stack parking



Section showing medium size plots

- Parking area on rear side under building footprint with active frontage.
- Semi sunken floor

Open Space within Plot

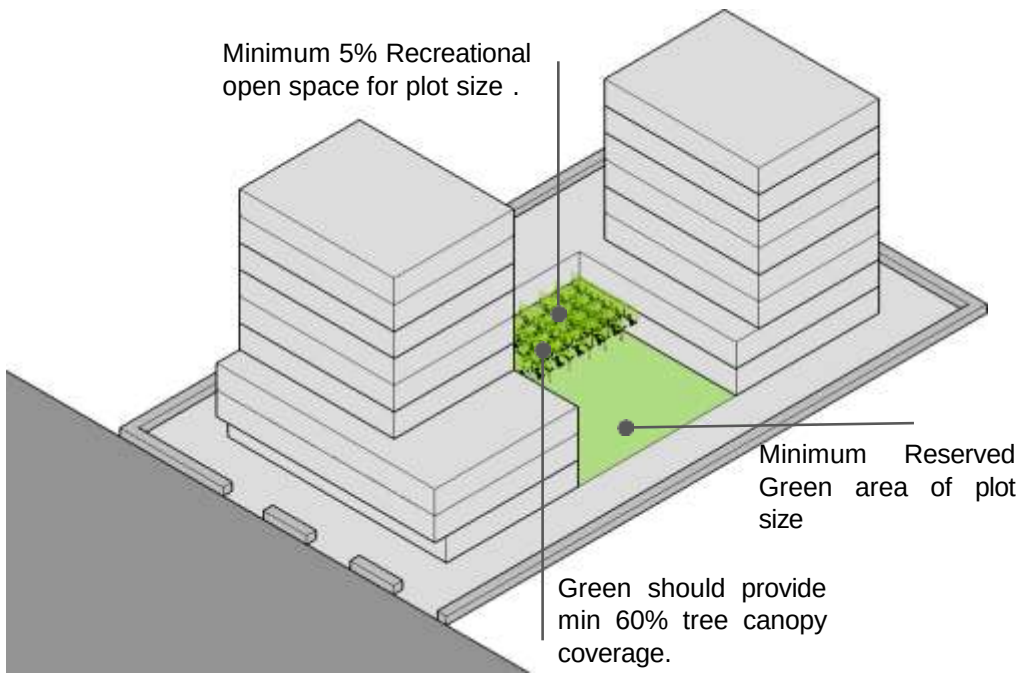
Following guidelines should be adopted for all plots sizes with land use from Amaravati masterplan:

- Mandatory planting strip along plot boundary as per plot size excluding plot access.
- All government, semi-public and public plots should develop 30- 50% of the open space area along the street edge as a privately owned publicly accessible spaces (POPS) as square and plaza.

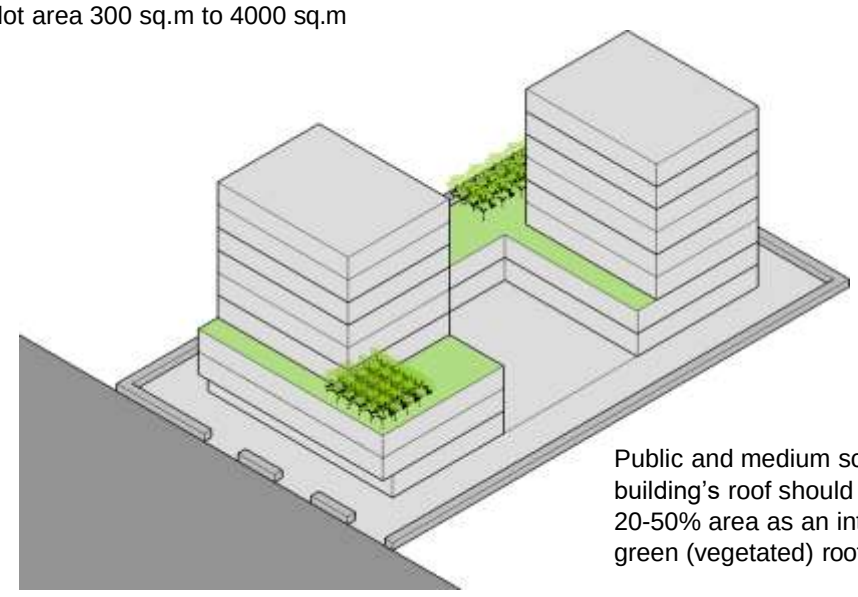
Small and Medium Plots

Following guidelines should be adopted for open space within plots of small and medium scale development:

- Minimum Reserved Green area should be provided as per table for plot sizes more than 300 sqm and up to 4000 sqm. Reserved Green should provide min 60% tree canopy coverage.
- Minimum Recreational open space should be provided as per table for plot sizes more than 500 sqm and up to 4000 sqm consisting of landscaping, seating and play areas
- Table summarize the plot size and its open space guidelines



Medium scale plot- (Vegetated podium)
Plot area 300 sq.m to 4000 sq.m



Public and medium scale building's roof should provide 20-50% area as an intensive green (vegetated) roof.

Open space (small and medium plots)		
Plot Size	**Reserved Green**	**Recreational open space**
below 300 sqm (small)	As per zoning regulation	N/A
300 to 500 sqm (small)	5% Reserved Green area of plot area should be provided	N/A
500 to 2000 sqm (medium)	10% Reserved Green area of plot area should be provided	5% Recreational open space area of plot area should be provided
2000 to 4000 sqm (medium)	10% Reserved Green area of plot area should be provided	5% Recreational open space area of plot area should be provided

7 Built Form Guidelines

Large Scale Development

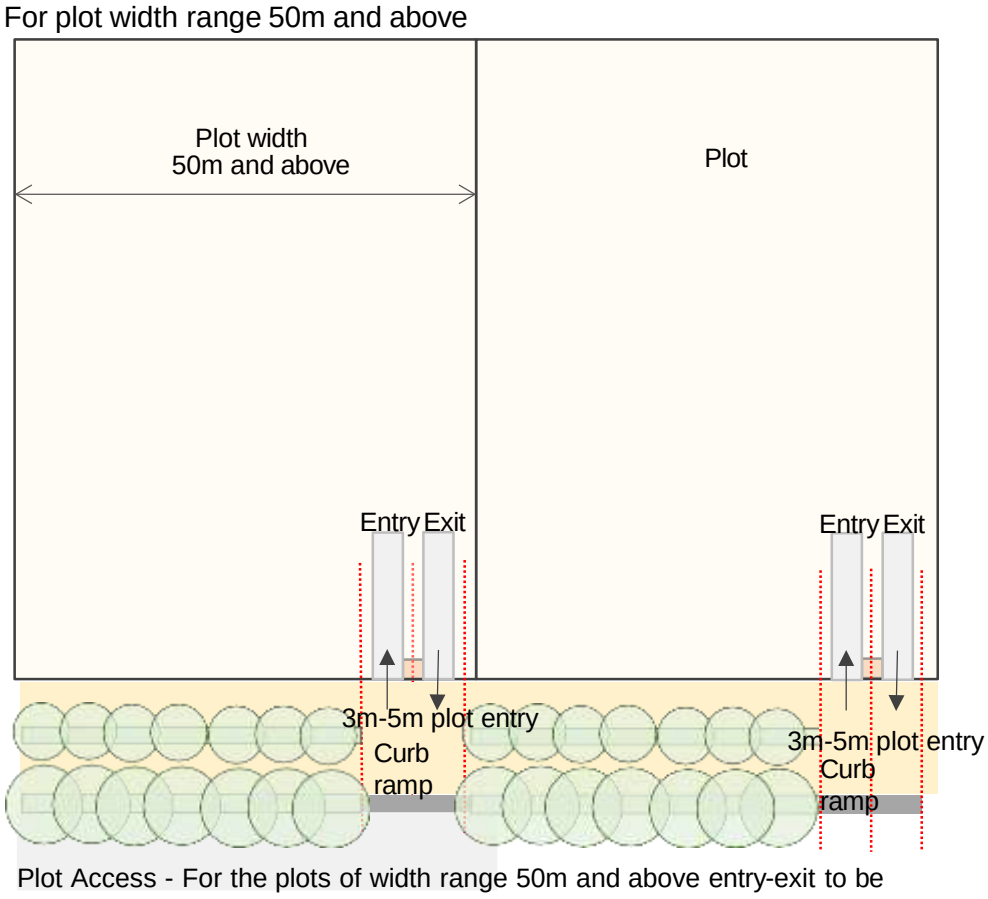
Plot Area above 4000 sqm

Plot Access (Large Scale Plots)

Following guidelines should be adopted for plot access of large scale development:

- For all large scale plots entry-exits should have provision for curb ramps and universal accessibility design features
- For all large scale plots entry exit gate access width should be between 3m to 5m
- 3m to 5m curb ramp to be provided for plots with plot width 7.5m
- Separate entry and exit points with curb ramp to be provided with plot width more than 50m on street frontage
- For large scale plots vehicular entry–exits curb ramps provision should be located at minimum 15m distance from any pedestrian crossing at intersections
- Large scale plots at street intersection cannot have vehicular access from the street corner. Vehicular access to be provided from the sides of the plot

For plot width range 50m and above



Plot Access - For the plots of width range 50m and above entry-exit to be provided with curb ramp

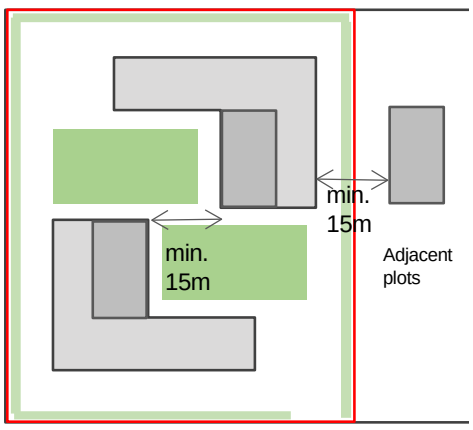
Plot Boundary and Edge Plantation (Large Scale Plots)

- For plots sizes above 4000 sqm provide clear landscaped strip of minimum 1.8 m width should be provided without any underground services

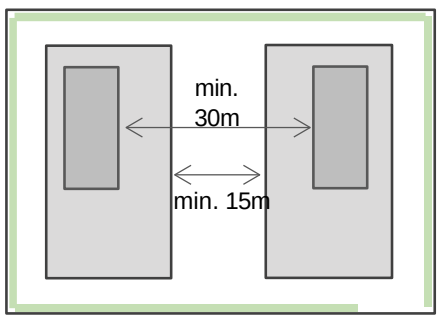
Building Heights and Profile (Large Scale Plots)

Following guidelines should be adopted for large scale plots:

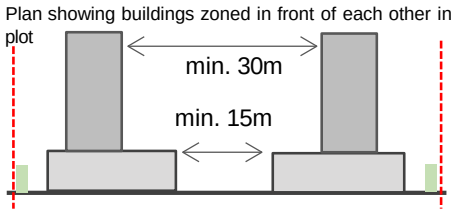
- Building heights should be as per Amaravati Zoning regulations.
- For plots within TPOD zone, buildings shall comply with heights as per TPOD criteria for zone 1 and 2
- Site development should respond to the context and help in identity creation
- Plots with more than two buildings should achieve staggered layouts with minimum distance of 15m between the towers
- The buildings oriented or facing each other in adjacent plots should have a minimum distance of 15m between each other
- Buildings within a plot facing each other should have minimum distance of 15m between the podium of the buildings and minimum 30m between the building towers
- Height and orientation of the towers should allow natural air movement within the plots



Plan showing
1) Staggered buildings in a plot
2) Buildings zoned in front of each other in adjacent plots



Plan showing buildings zoned in front of each other in a plot



Section showing buildings zoned in front of each other in a plot

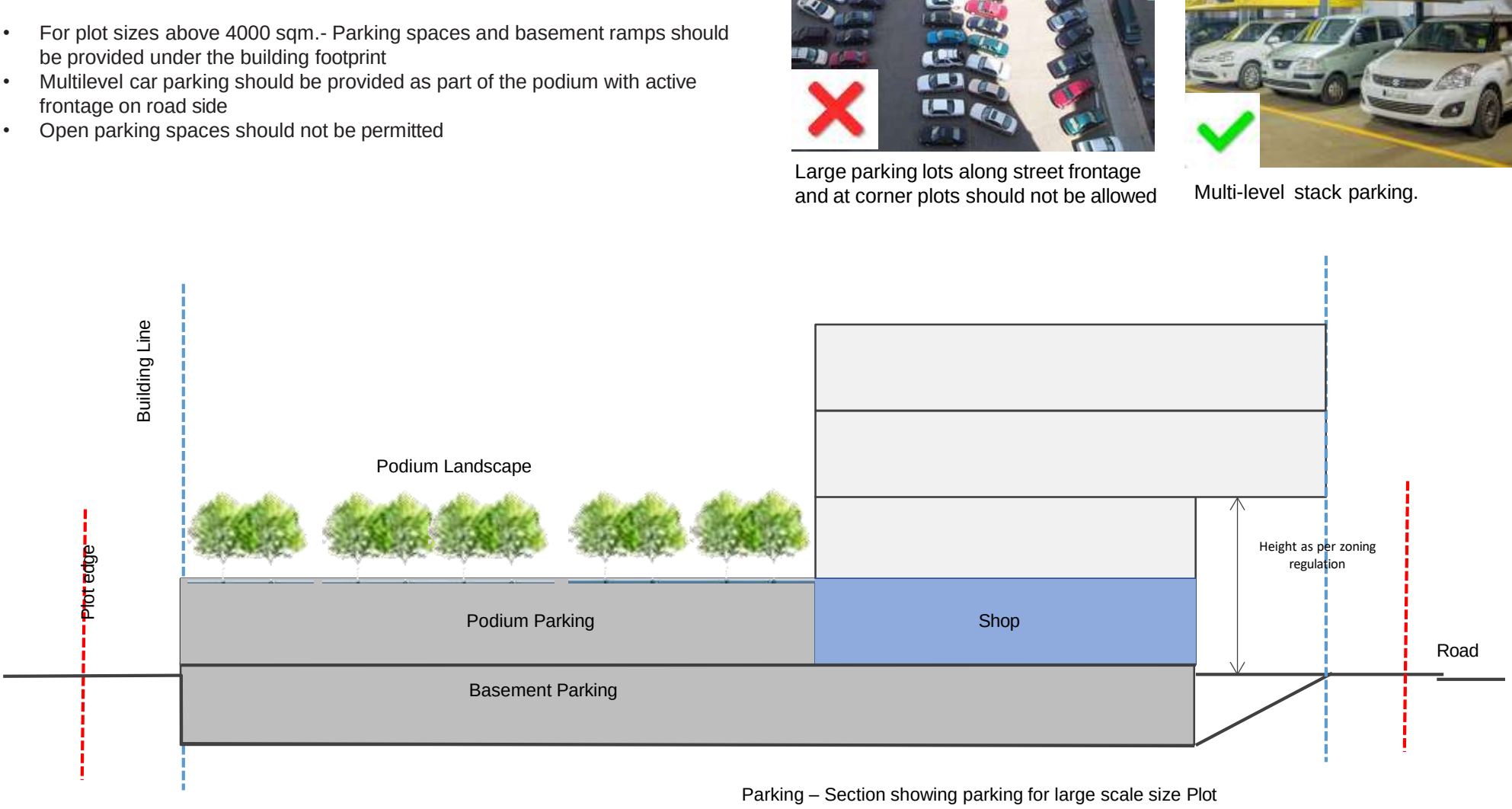
Parking (Large Scale Plots)

Following guidelines should be adopted for parking of large scale development:

- For plot sizes above 4000 sqm.- Parking spaces and basement ramps should be provided under the building footprint
- Multilevel car parking should be provided as part of the podium with active frontage on road side
- Open parking spaces should not be permitted

Large parking lots along street frontage and at corner plots should not be allowed

Multi-level stack parking.



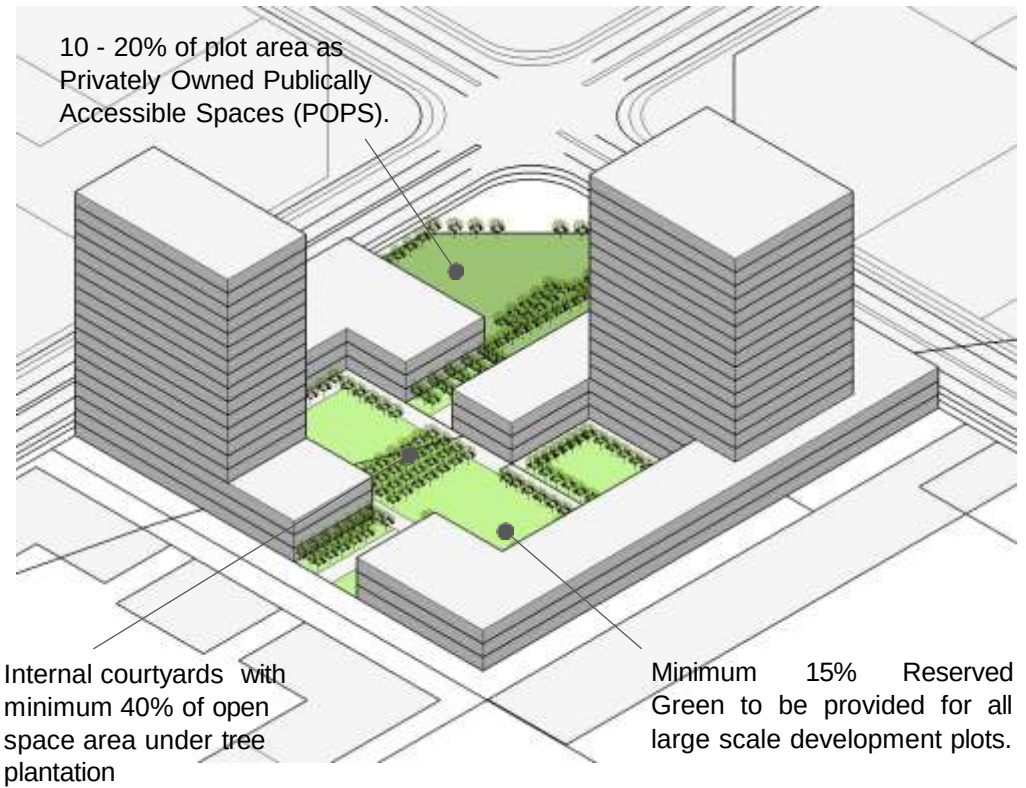
Parking – Section showing parking for large scale size Plot

7 Built Form Guidelines

Open Space within Plot (Large Scale Plots)

Following guidelines to be adopted for open space within plot of large scale development:

- All large-scale development plots (Residential, Commercial, Institutional) having areas above 4000 sqm should provide 10 - 20% of plot area as Privately Owned Publically Accessible Spaces (POPS).
- Minimum 5% additional reserved green should be provided for all large scale development plots. Reserved green should provide min 60% tree canopy coverage
- Large scale development plot having internal courtyards should provide minimum 40% of courtyard to be landscaped with plantation
- Large scale public, commercial and mixed use development plots should provide pedestrian connectivity towards transit node and parks
- Plantation within large scale development plots should follow MOEF guidelines.



Permeability and Connectivity (Large Scale Plots)

Following guidelines should be adopted for permeability and connectivity of large scale development:

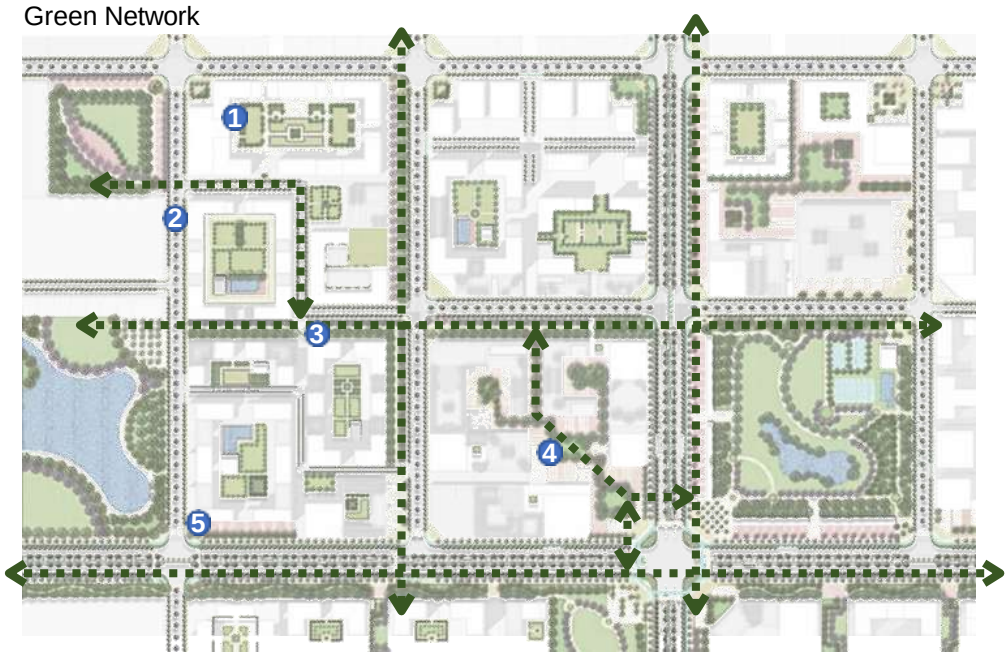
- Large blocks of masterplan layout should be subdivided for providing pedestrian and NMT connection to maintain permeability through blocks.
- Plot subdivisions should consider adjacent plot size and road alignments to continue urban fabric.
- Internal roads and pedestrian movement should follow structure of existing LPS layout for movement and access to transit stops.
- Plot size of length above 250m should consider for plot subdivision.
- For plot division, plot size of length or width should be 100 to 150 m to achieve permeability and connectivity for pedestrian movement.

Pedestrian Network

Green Network (Large Scale Plots)

- Adjoining plots building layout should consider combining private open spaces as courtyard to increase functionality and sharing larger open spaces.
- Streets should include adequate planting to form boulevards to create pedestrian-friendly environment.
- Large scale plots should provide green corridors as POPS connecting surrounding parks or open spaces to maintain ecology and pedestrian connectivity of the area.
- Large scale plots should provide pedestrian access through POPS to create shorter routes and reduce the walking distance. Desired line should be followed for creating pedestrian network, POP's and green space network which connects public spaces
- Pedestrian network should connect open space and internal plazas to transit nodes

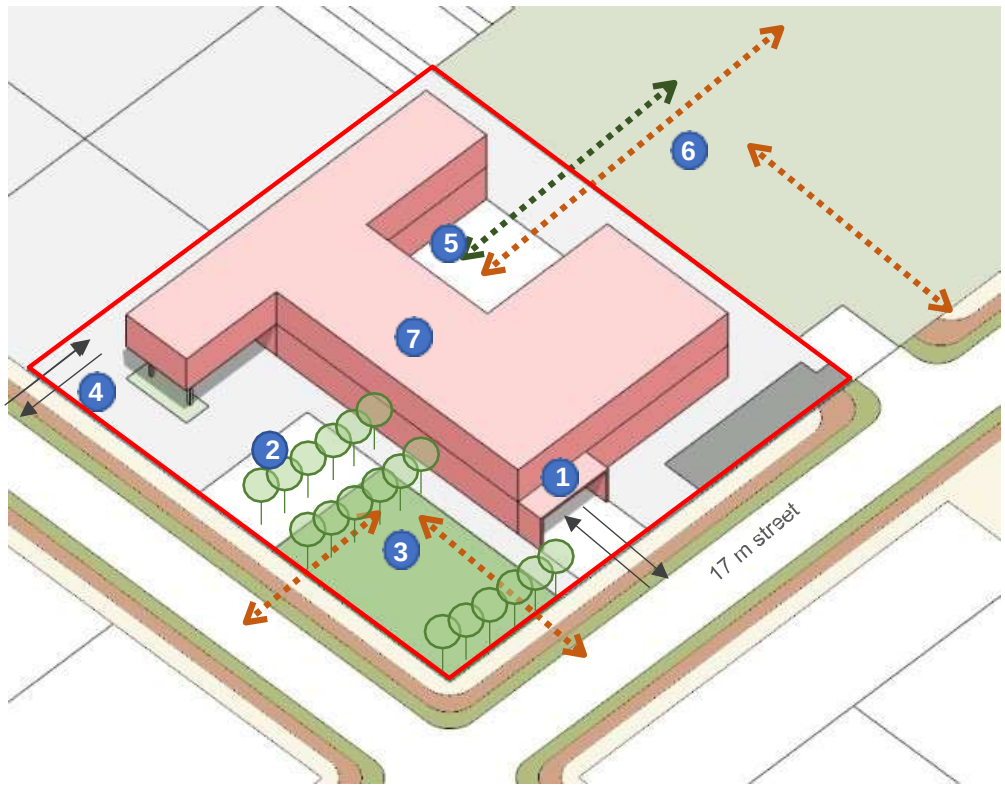
Green Network



7 Built Form Guidelines

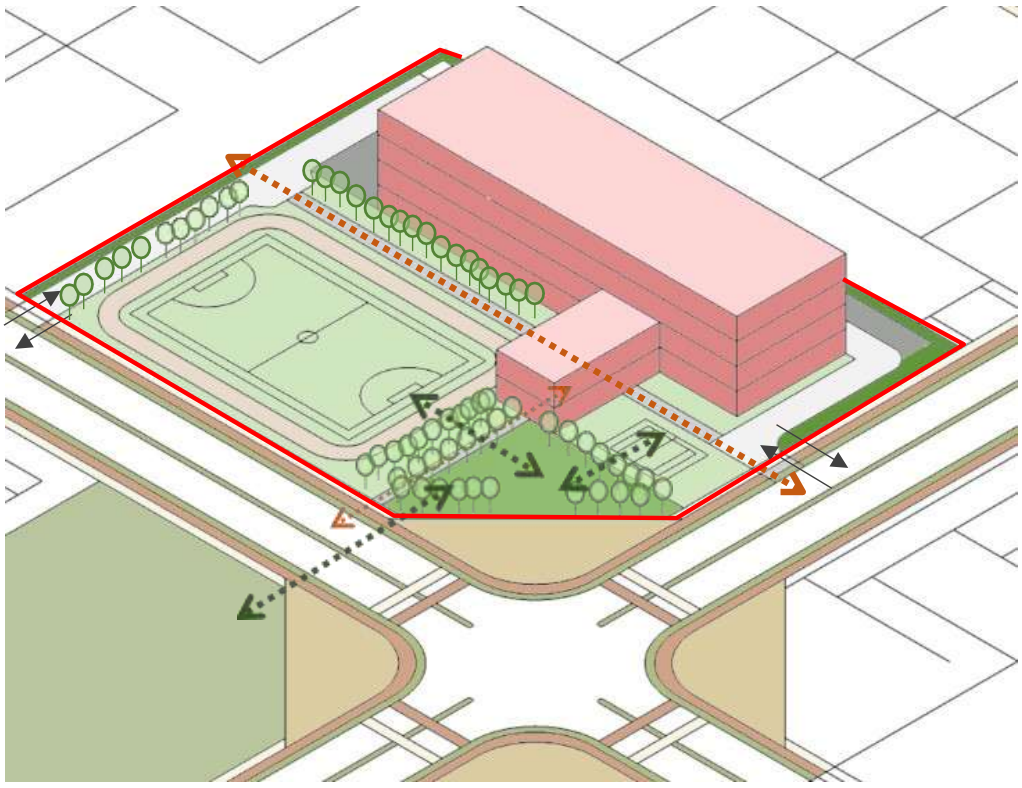
Institutional

- Criteria for assessment for education facilities of area and public amenities allocation should follow Amaravati zoning regulation plan for primary school, secondary school and higher education institutes colleges and universities
- Criteria's for assessment for education institutes should follow the Amaravati Zoning Regulations
- Plots within TPOD zone should refer TPOD chapter for guidelines



Primary School View

1. Main entrance with canopy addressing street front
2. Shaded bus parking
3. Minimum 10 % shared open space for public use (POPS)
4. Service entry
5. Private open space
6. Green network connection addressing adjacent community park
7. Institutional Building
8. Service Yard



Secondary School View

Secondary School View

1. Main entrance with canopy addressing street front
2. Shaded bus parking
3. Minimum 10 % shared open space for public use (POPS)
4. Service entry
5. Private open space
6. Green network connection addressing adjacent community park
7. Institutional Building
8. Service yard
9. Street Corner

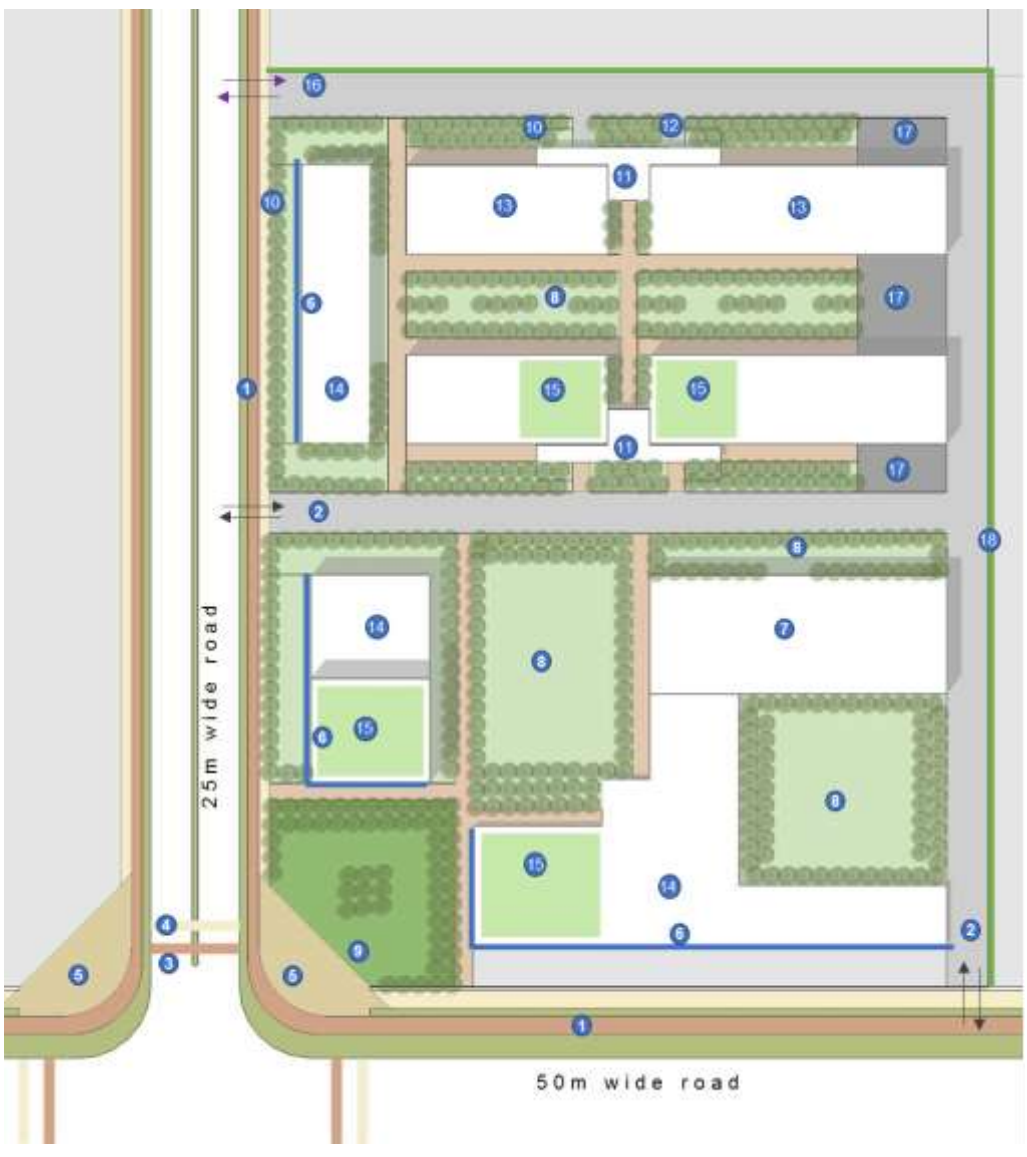
Industrial

Industrial development should support the logical distribution of buildings, parking and loading- unloading areas in an integrated way to minimize the impact of heavy vehicles in those area

1. Sidewalk (refer streetscape guidelines streetscape guidelines)
2. Plot Entry / Exit (Refer built form guidelines for industrial plot access)
3. Cycle crossing
4. Pedestrian crossing
5. Street Corner
6. Commercial Active Street frontage
7. Industrial building
8. Internal private courtyard of institutional building (Refer guidelines in open space within industrial plots)
9. Internal courtyard for open space and permeable to pedestrian movement
10. Buffer Plantation for screening and air purification
11. Canopies
12. Loading and Unloading areas
13. Manufacturing units/ Workshop
14. Showroom
15. Administration block
16. Service entry /exit
17. Surface Parking
18. Edge Plantation

LEGEND

- Plot access
- POPS
- Private open space
- Commercial street front
- Plot boundary
- Multi-functional zone
- Cycle track
- Pedestrian walkway



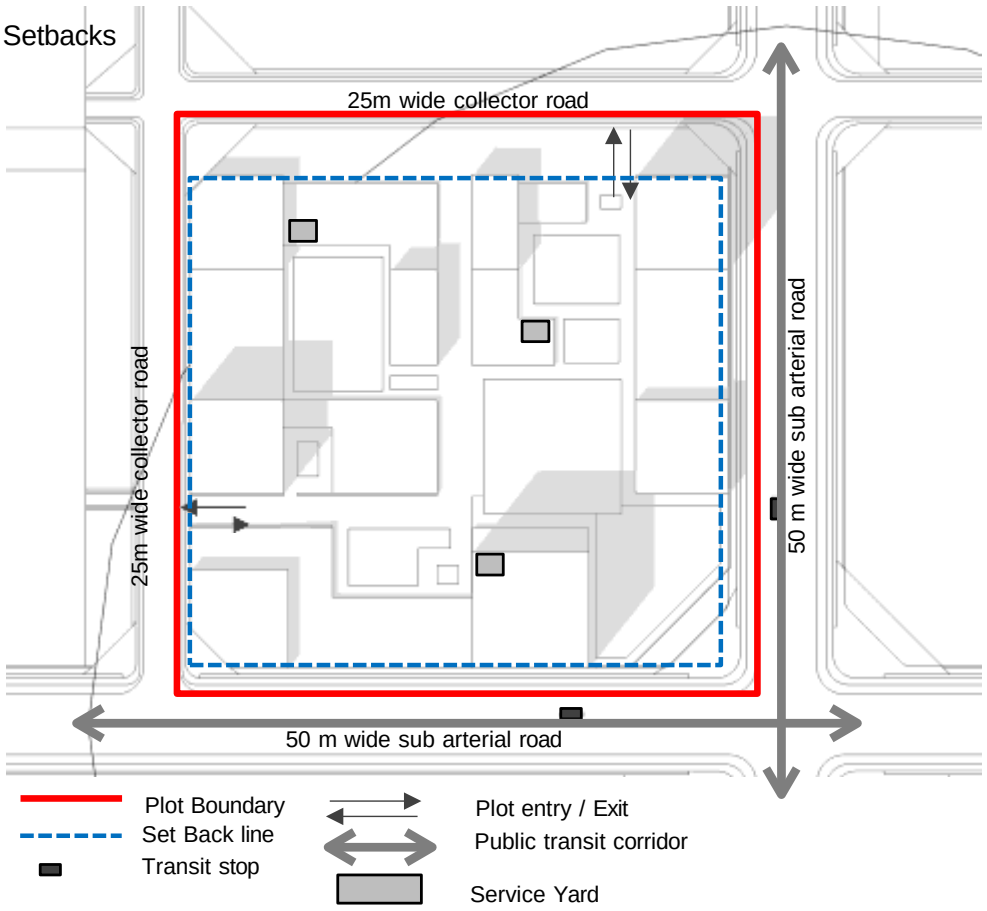
7 Built Form Guidelines

Town Centre

- Town centre should envision to be vibrant, strong, and connected with a great sense of place for Amaravati. Vision for town centre should be achieving an integrated mixed use development with focus on well-designed public realm.
- Town centres should be proposed within reserved areas of town centre zones as per Amaravati zoning regulations
- For plots within TPOD zone should refer TPOD guidelines

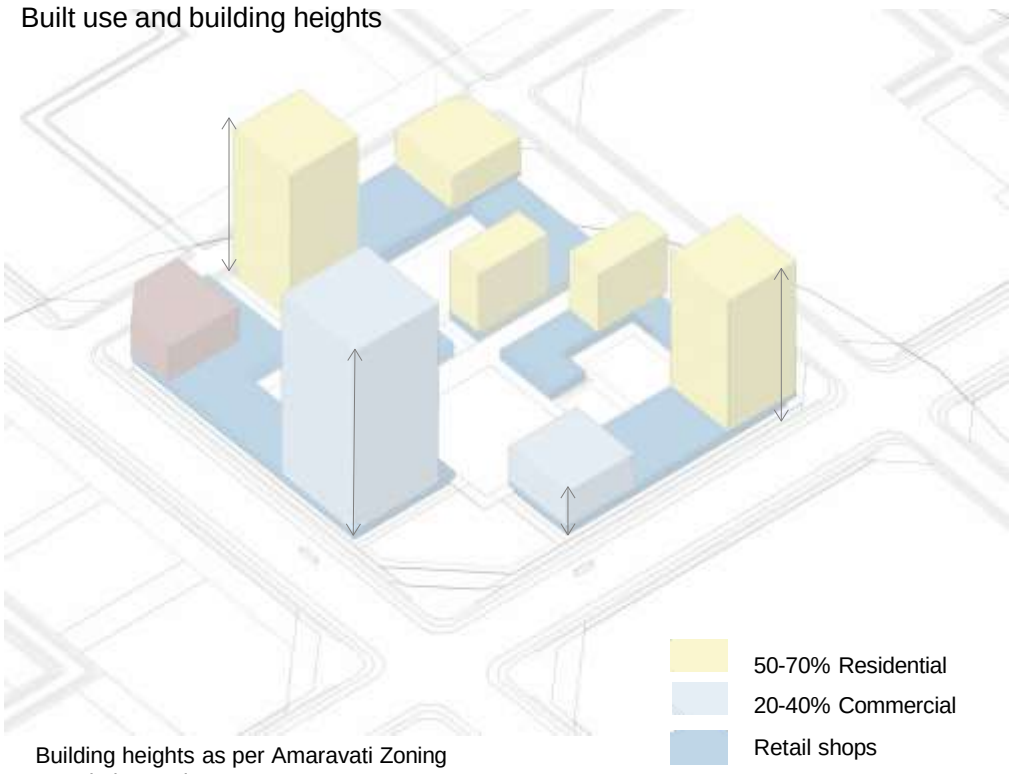
Site Development

Setbacks



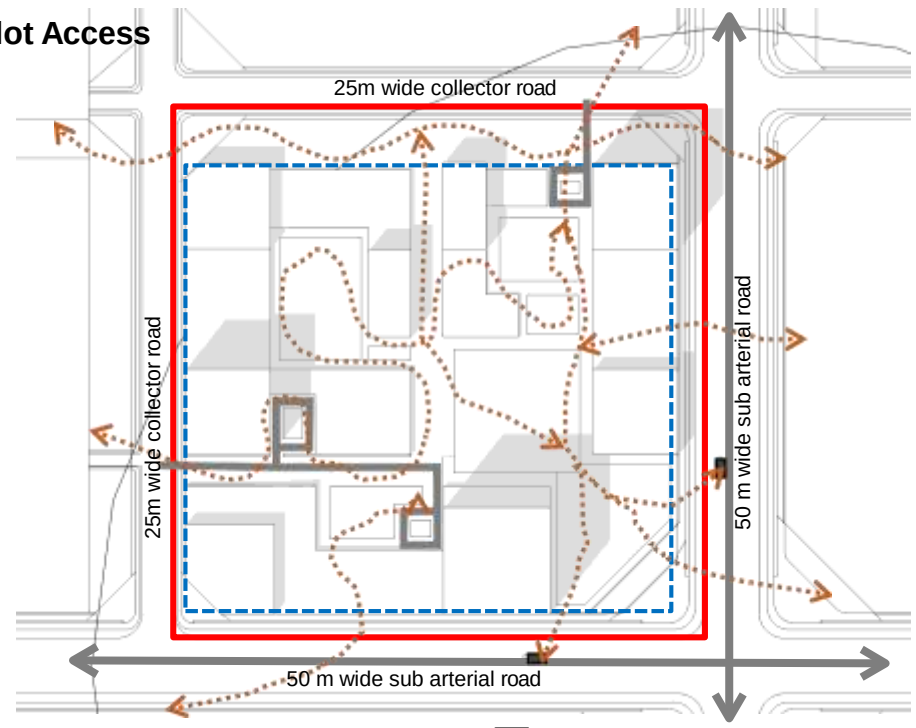
Built Massing

Built use and building heights



Building heights as per Amaravati Zoning Regulation and as per TPOD zone

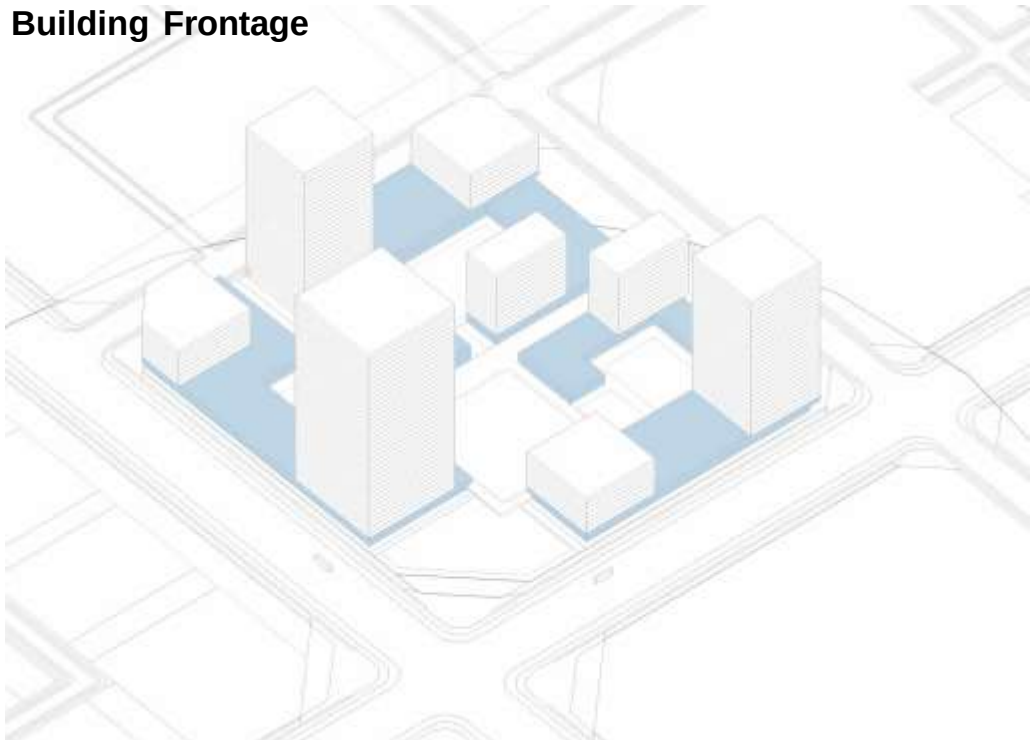
Plot Access



Pedestrian connectivity towards transit nodes and parks Vehicular entry and movement is restricted inside plot

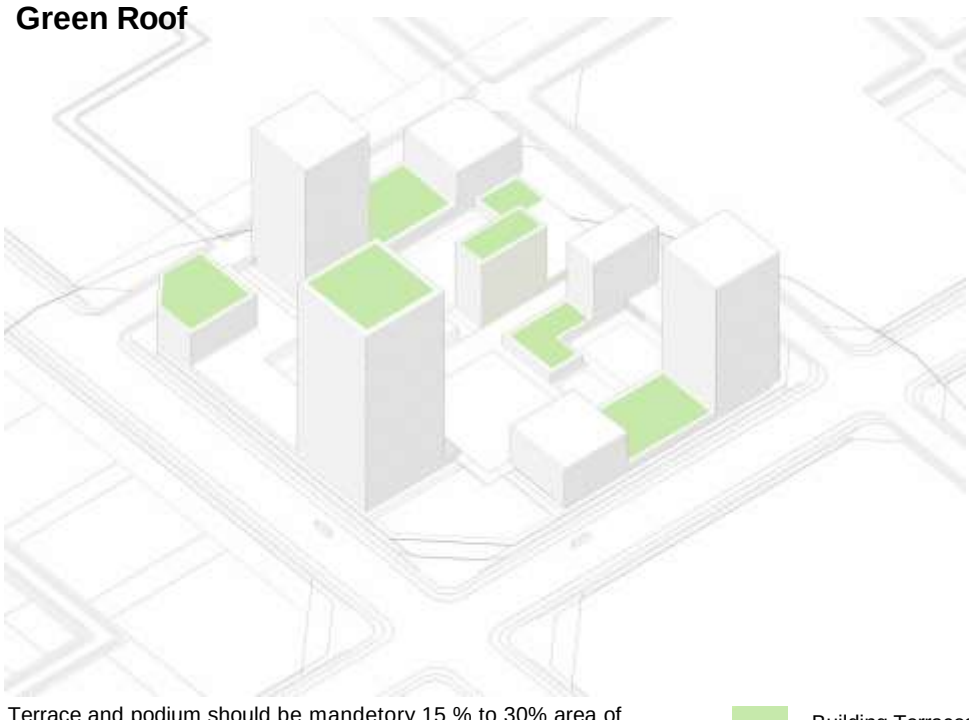
Transit Bus Stop
Internal vehicular movement
Pedestrian connection

Building Frontage



60 % of retail shop at street front on ground floor

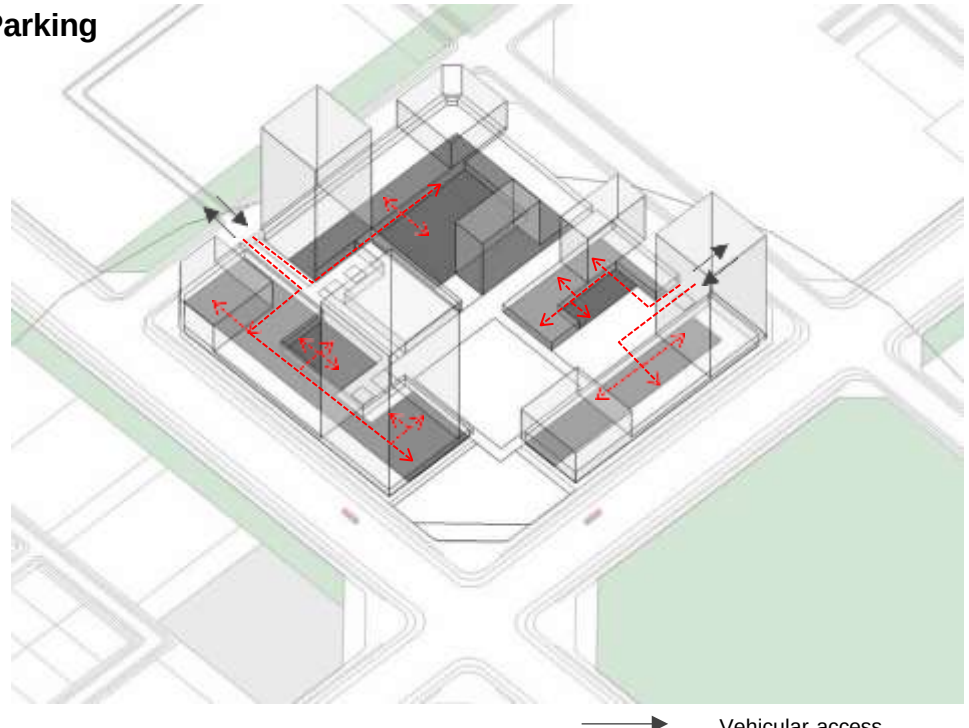
Green Roof



Terrace and podium should be mandetory 15 % to 30% area of ground coverage as an intensive green (vegetated) cover and 30 %to 50 % intensive green area should be suggestive.

Building Terraces

Parking



Parking should locate rare side of the building and to the basement

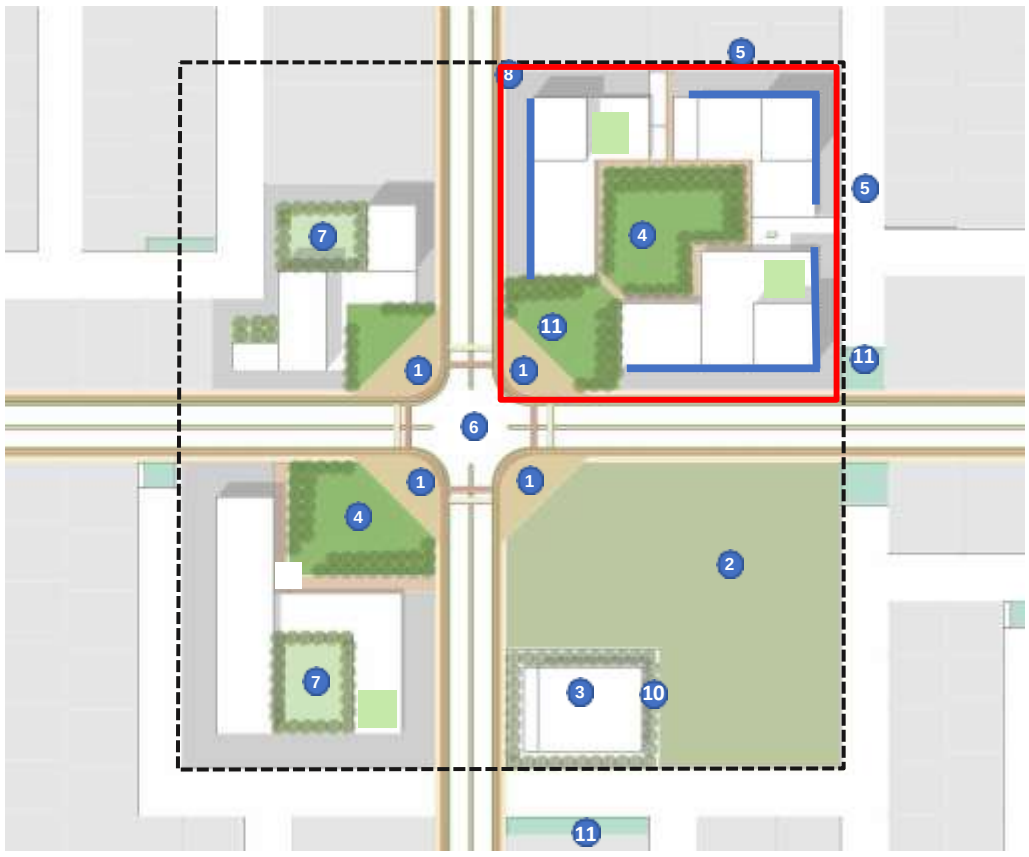
Vehicular access
Vehicular circulation

7 Built Form Guidelines

Neighbourhood Centre

- Neighbourhood centres should be proposed within reserved areas as per Amaravati Zoning Regulations
- For plots within TPOD zone should refer TPOD guidelines

Plot access
Commercial street front
Plot boundry
Neighbourhood canter zone
Plot boundary
Multi-functional zone
Cycle track
Pedestrian walkway
Street corner
POPS
Private open space
Neighbourhood park
Public amenities
Residential
Commercial
Amenity
Utility and Service infrastructure

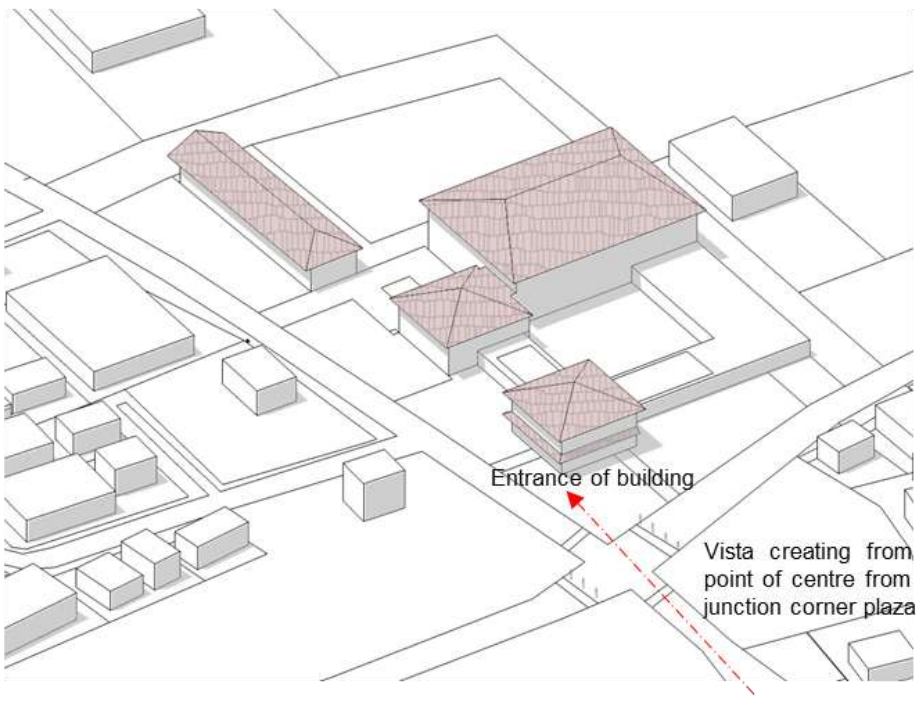


1. Street corner plaza (Refer guidelines in open spaces chapter)
2. Neighbourhood park (Refer guidelines in open spaces chapter)
3. Parking and services building (Refer guidelines in)
4. Internal courtyard for open space and permeable to pedestrian movement (Refer guidelines for utility plots)
5. Access points to neighbourhood centre from community (Refer guidelines in)
6. Major intersection node of neighbourhood (Refer guidelines in)
7. Internal private courtyard of institutional building (Refer guidelines in)
8. Neighbourhood centre feeder bus stop
9. Cycle parking racks
10. Buffer planation along utility plot
11. Streetscape and urban plugins

Village Centre

Village centre development project should consider the following site selection criteria:

- Village centre should locate possibly at the centre of the village and should easily accessible to villagers
- It should integrated with LPS layout as equally as to village
- Relationship to transit corridors should be considered
- Proportional plot size should be min 2000 sqm and above, possibly mix use arrangement of existing buildings in context with land use
- Placement of parking within walkable distance should be considered



Building heights as per Amaravati Zoning Regulation and as per TPOD zone
- Sloping roof
- Courtyard typology
- Welcoming entry point of building and addressing local context creating vistas

1. Plot Entry / Exit
2. Parking Zone
3. Internal Driveway
4. Active Commercial frontage
5. Administrative Offices
6. Training Center
7. Community Multipurpose Hall
8. Library
9. Internal private courtyard
10. Private Terrace Garden
11. Screening / Buffer planation along utility plot
12. Outdoor Open Space
13. Shared Street
14. Cycle crossing
15. Pedestrian crossing
16. Street Corner
17. Urban & streetscape plugin
18. Shared Street

Plot access
Commercial street front
Plot boundary
Village Centre Building
Temple
Street Corner Plaza
Urban Plaza
Public Open Space
Urban and streetscape plug-in
Park
Internal Walkway
Internal Driveway
Shared Street

Built Form

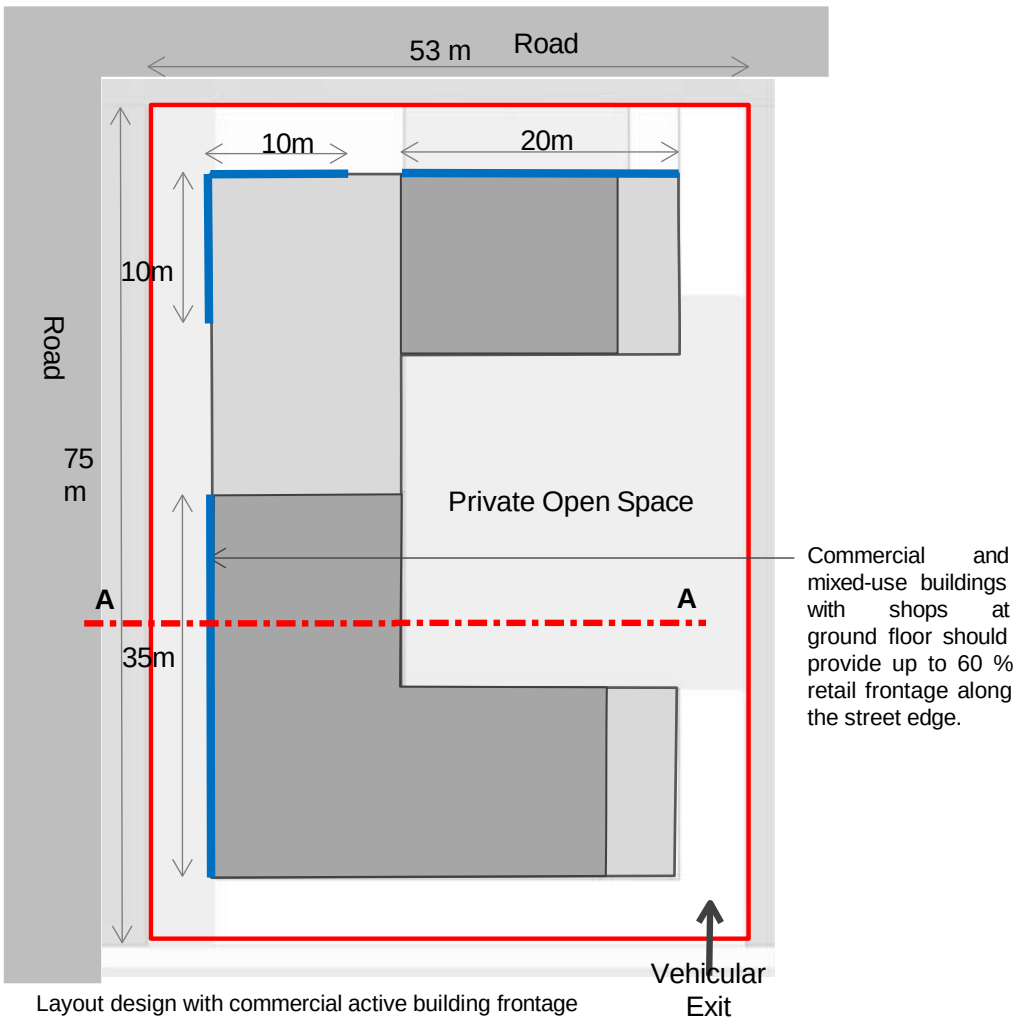
7 Built Form Guidelines

Architectural and Facade Treatment

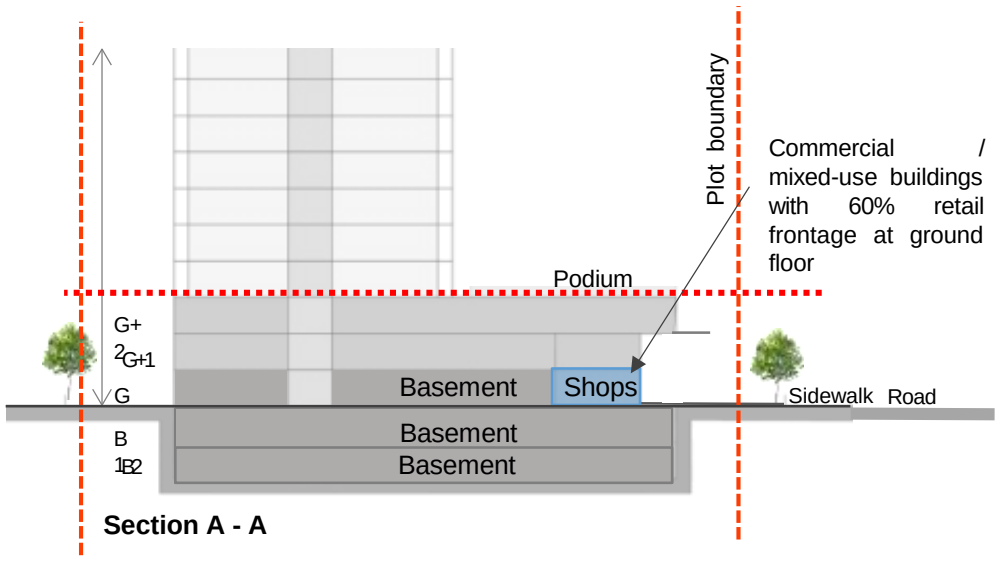
Building Frontage and Facades

The building frontage and facades should be designed with a welcoming frontier and in context of the street. It should have common heights followed for the ground and first 2 floors to enable continuity with retail and commercial uses on the ground floor.

- Commercial and mixed use buildings should provide up to 60% of total of street frontage with retail shop at ground floor. Shop street frontage should be transparent through opening and shop windows.
- 40 to 50 % of building facades at the street level should consist of vision glass or entrances.
- Podium along the street edge should be treated with public or semi-public commercial activities and parking spaces should be accommodated at rear side of active frontage
- Podium heights more than G+2 should adopt stepped/ terraced building profile
- Residential building's entrance lobby and community recreational spaces should be planned along the street frontage and locate parking at the rear side
- All building services facing streets should be avoided and covered with screened as part of elevation treatment
- Dead walls, window less facades should be avoided along the street edge.
- Commercial and public buildings facade treatment should reflect unique character inspired from local cultural and vernacular architectural elements to create identity
- Commercial and public buildings entrance should be grand and integrated with landscaped plazas for creating public spaces defining character



Layout design with commercial active building frontage



Schematic section stepped Building profile above G+2 Floor

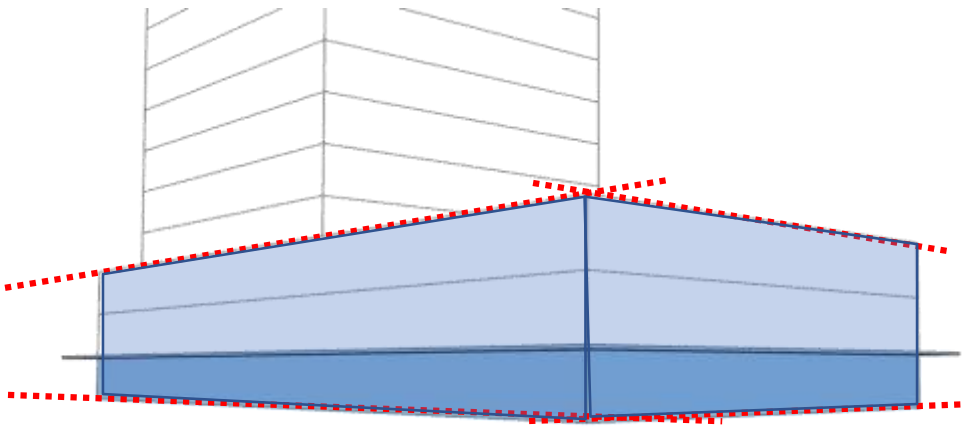
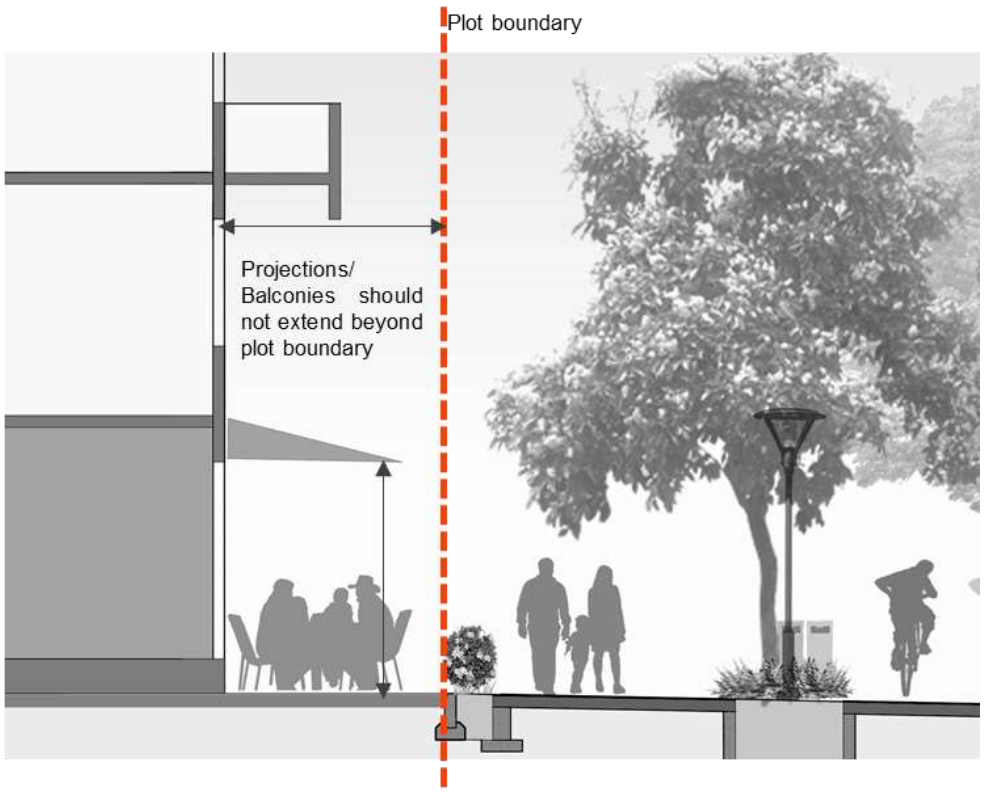


Illustration showing maintained height profile along street frontage

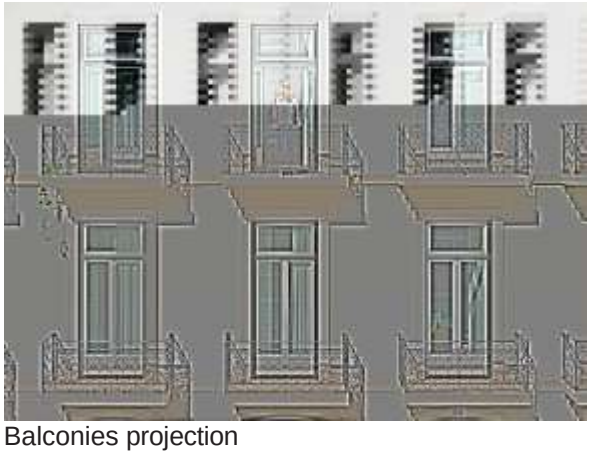
Balconies and Projections

Any projections such as balconies and canopies should follow certain standards and restrictions in terms of its sizes and uniformity in terms of the projection line from the setback. They should be aesthetically maintained by design and function with transparent railings and space for planters. They should not be enclosed on all sides and function as a semi-outdoor space for rooms within the buildings.

- All projection widths of balconies and canopies should follow the Amaravati Zoning Regulations
- Entrance canopies with minimum vertical clearance of 4.5m from finished ground level
- Building balconies should orient toward public spaces such as waterfront, open space and public transit corridors.
- Active street frontage should be provided with canopies or shading devices for creating comfortable microclimatic outdoor spaces as part of plazas



Canopies along street frontage with minimum vertical clearance above finished sidewalk level



Balconies projection

Awing along street frontage /

Building entrance canopy

7 Built Form Guidelines

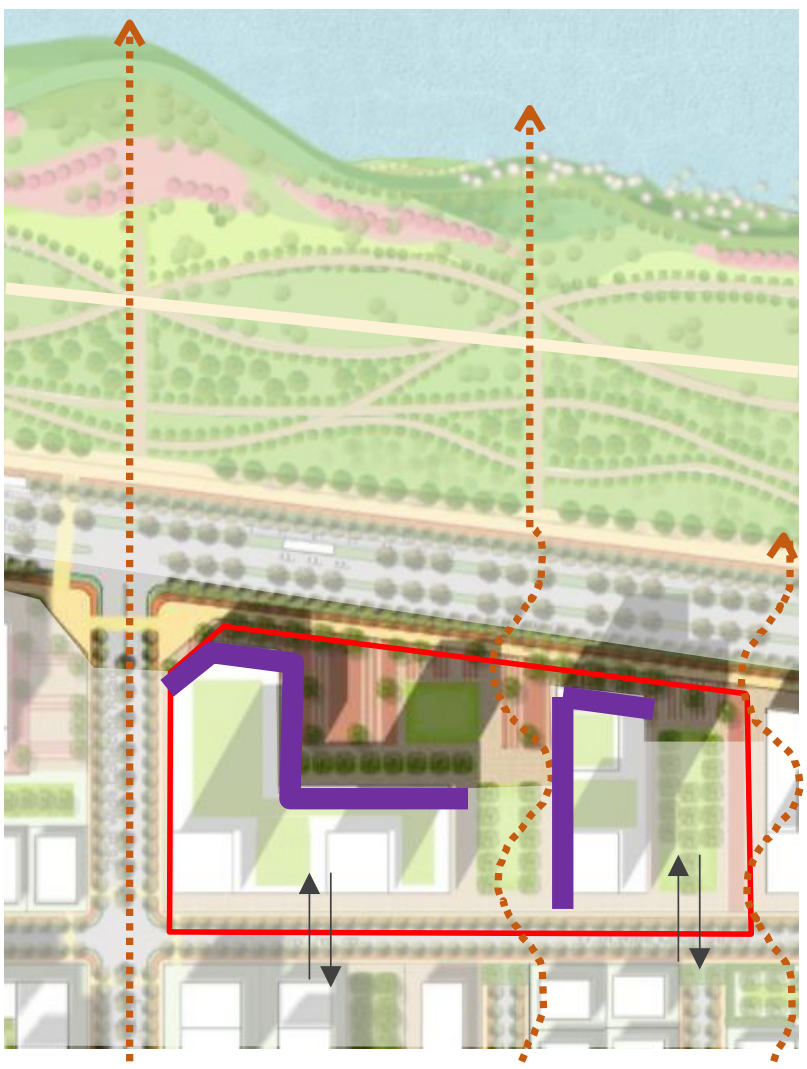
Building Frontage

Public Spaces, Major Roads and Transit Corridors

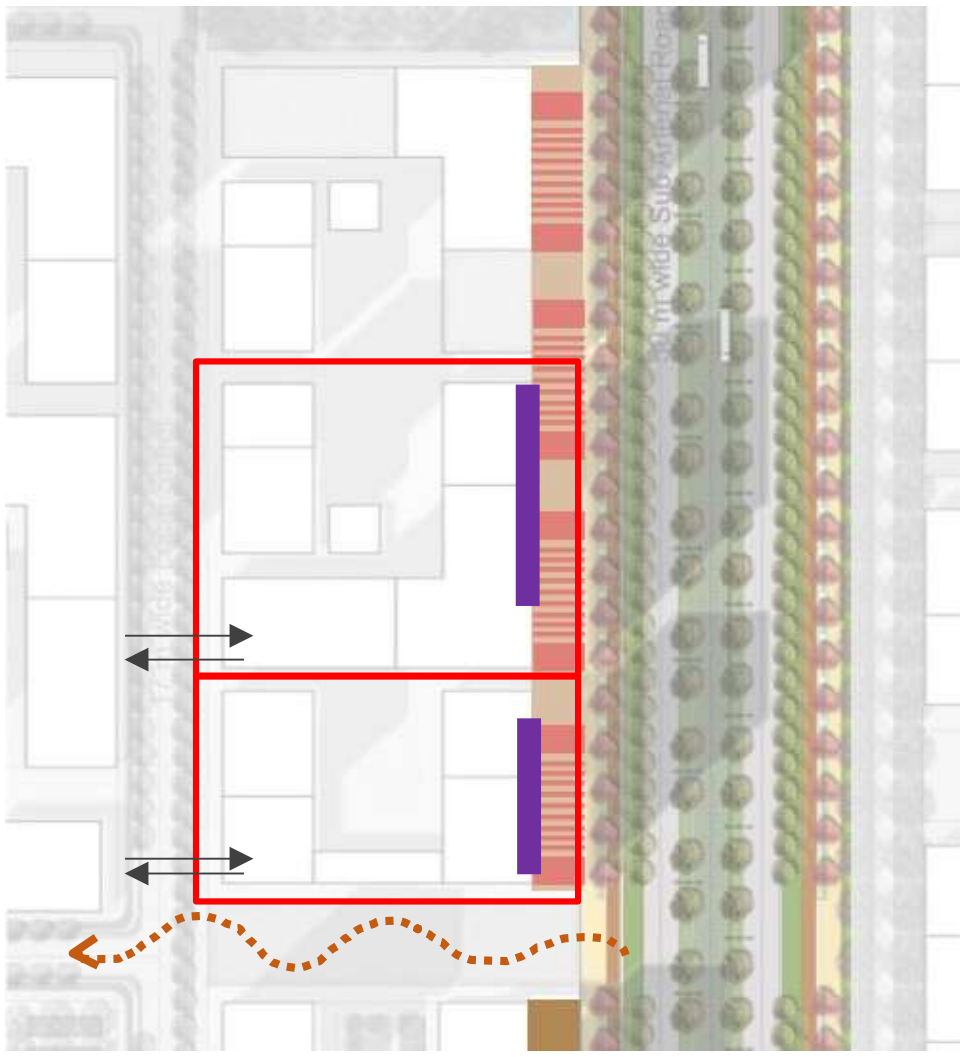
Plots with buildings facing public spaces such as waterfront, open spaces and parks, buffer zone and public transit corridors should have following considerations for orienting buildings to ensure active urban edges.

- Plots with buildings facing waterfront, open space, buffer zone, major roads and public transit corridor should be designed with active frontage of the plot as mixed use development
- These plots with development oriented towards public spaces should have direct pedestrian access with the drop off and potentially having on street parking facilities
- These plots should also be considered for having vehicular access from the roads adjoining the public spaces irrespective of its ROW
- Buildings should be placed at the corners or strategic view corridors to create visual focal points along the public spaces
- Buildings orientation and position along the public spaces should be addressing the view corridors and maximizing the views towards waterfront and parks
- The public spaces facing buildings should have colonnade character. (refer TPOD guidelines for colonnade details)
- Publicly accessible POPS and urban squares should include retail and public amenities along the public spaces. (refer Waterfront and Open Space Network Guidelines for further details)

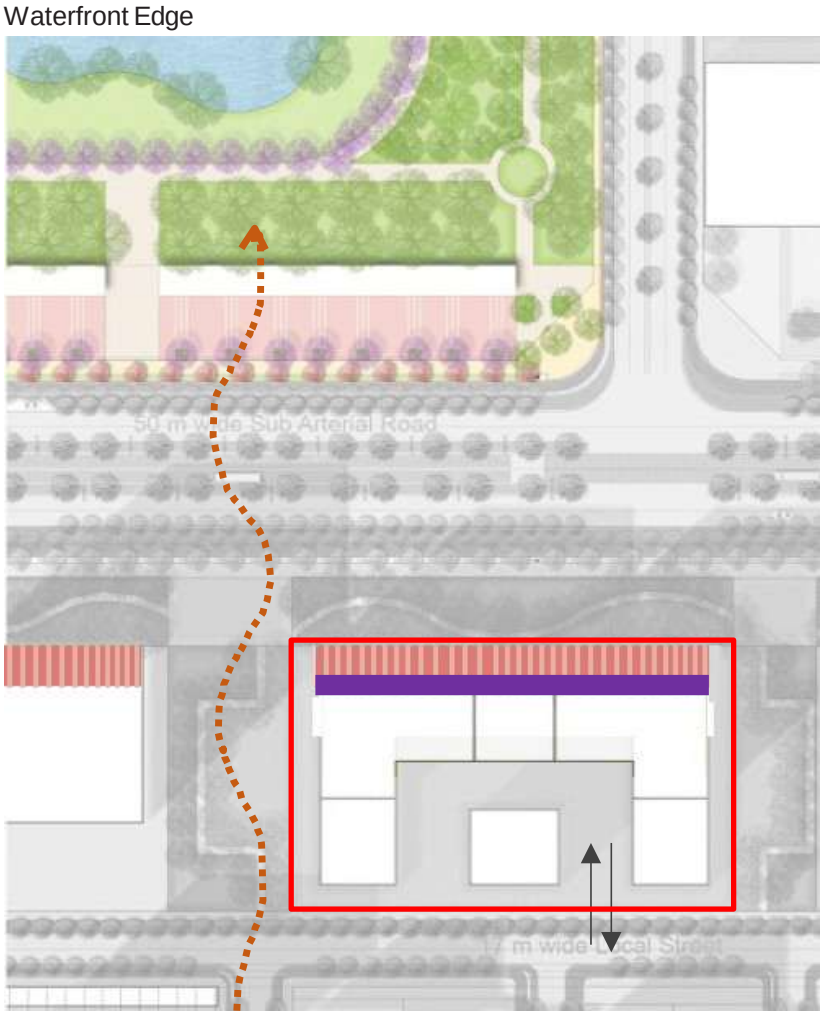
Buidling frontage along waterfront



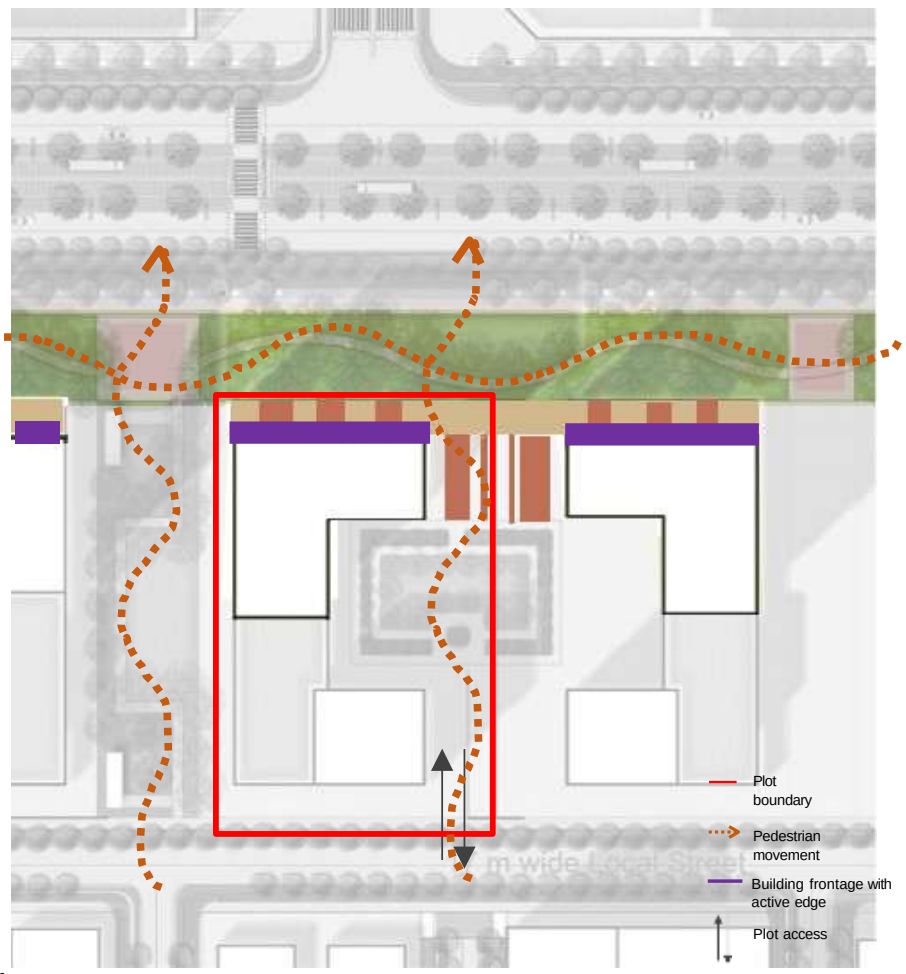
Waterfront Edge



Major roads and public transit corridor



Open Space



Buffer zone

7 Built Form Guidelines

Architectural Materials

Locally available climate responsive materials and colours reflecting cultural identity should be used for all buildings. Highly reflective cladding materials should be avoided.

- Excess glazing should be avoided at South and West facades.
- All buildings should use materials that compliment the streetscape and responds to the human scale
- High quality durable materials such as brick, stone, architectural concrete masonry units and glass should be used in retail and commercial office developments
- All projections such as balconies, grills, railings should be attractive, well crafted, and easy to maintain

Local materials

Granite

Tandur stone

Kadapa stone

Mangalore roof tiles

Energy efficient materials

Clay Hollow Bricks

Insulated Glass

Fibre cement sheet

Green roofing trays

Colours

Public and commercial buildings should be as follow:

- Colours used for buildings should be light and cool colour shades so that they create a cooler environment that is soothing to the eyes
- Combination of cool and warm colours or locally available stone or artificial cladding should be used for highlighting the design element and character of the building
- Residential buildings should avoid the use of overly bright colours and tones that are light shaded
- Maximum 30% use of glazed facades should be used for energy efficient buildings
- Maximum 40% of facade area with warm colours or locally available stone cladding should be used for highlighting the design element and character of the building
- Minimum 60% of the facade area should be using cool colours or stone textured paint

Residential

Simple palette of materials for low rise buildings with less glazing and landscaping along sidewalk

Commercial

Commercial building with glazing and green facades

Industrial

Contemporary Industrial buildings with large panels for exteriors

Institutional

Institutional building with material finish color palette
NIFT Campus , New Delhi

Building Signage

Types:

a. Projecting and wall mounted
b. Free standing
c. Address signboard
d. Awning and canopy sign

Building signage should be as follow:

- All building signage should be clear, visible, and easy to understand
- Different languages including local preferences for public buildings should be used
- Plot address should be displayed on plot boundary edge facing road at entry/exit points
- Commercial hoarding/signage should be limited to 20% of building facade and should be placed according to architectural façade. treatment avoiding covering of windows and doors
- Projecting signs should not exceed more than 1 meter from building face/ building line towards street frontage
- Way finding signage should be integrated with building and landscape elements
- High glare intensity signage lighting such as neon lighting should be avoided
- Awning and canopy type signage should be installed at same level of height with minimum clear height of 2.4m from finished level of side walk
- Commercial signage and shop names should follow alignment and form placed in context of the building frontage
- The overall street front when viewed with the buildings in a line should have continuity with fixed height from the sidewalk
- Hoardings and large signs should not be allowed and signs can cover a minimal of the building elevation

Neighborhood shopfront

Oxford street, UK

Midland, Ontario

IIM Bengaluru

Source: Vancouver, Google street view , https://londonist.com/2015/10/secrets-of-oxford-street , http://vedosyruzy.scificities.com/chinatown-handbag-2-26.php?i=1 , http://howardrideoutarch.com/ , http://blog.ticketgoose.com/ameerpet-the-software-trainer/ , https://www.deccanchronicle.com/nation/current-affairs/061117/iimbs-israel-centre-opened.html

7 Built Form Guidelines

Proposed Incentives for Green Buildings

Green Buildings

- Proposed property tax rebate in the range of 5% to15% offered for building projects rated by an accredited green building rating system
- The Industries and Commerce Department of the Government of Andhra Pradesh offers 25% subsidy on total fixed capital investment of the project
- Municipal Administration and Urban Development Department of Andhra Pradesh offers the following incentives to projects obtaining the rating from IGBC/LEED/ GRIHA:
  - 20% reduction on permit fees
  - If the property is sold within three years, one-time reduction of 20% on duty on transfer of property (surcharge on stamp Duty) on the submission of Occupancy Certificate issued by the Local Authority

Rainwater Harvesting

- Existing state government's incentive of 10% rebate in property tax for owners who undertake waste water and rain water harvesting structures on their plots (as per Government of Andhra Pradesh G.O.Ms.No.168 dated 7th April 2012)

Solar Photovoltaic (PV) Systems

- 1/3 of terrace top should be covered with PV panels along with Solar Heaters
- Existing national scheme by IREDA through NABARD for provision of 40% subsidy on capital costs of solar PV Systems for units. The manufacturer/ supplier and the PV model must be approved by the MNRE (Ministry of New and Renewable Energy)

Waste Management

- All bulk generators of municipal solid waste in the proposed constructions, both residential and non-residential, must necessarily segregate waste at the source and process entire biodegradable waste by composting or bio methanation within the premises.
- Two receptacles: one for the storage of food / organic / biodegradable waste and another for non- biodegradable recyclable and other types of solid waste generated. Hazardous waste generated by households shall be kept separately in suitable container as and when such a waste is generated.

Matrix for Green Buildings as per Land Use

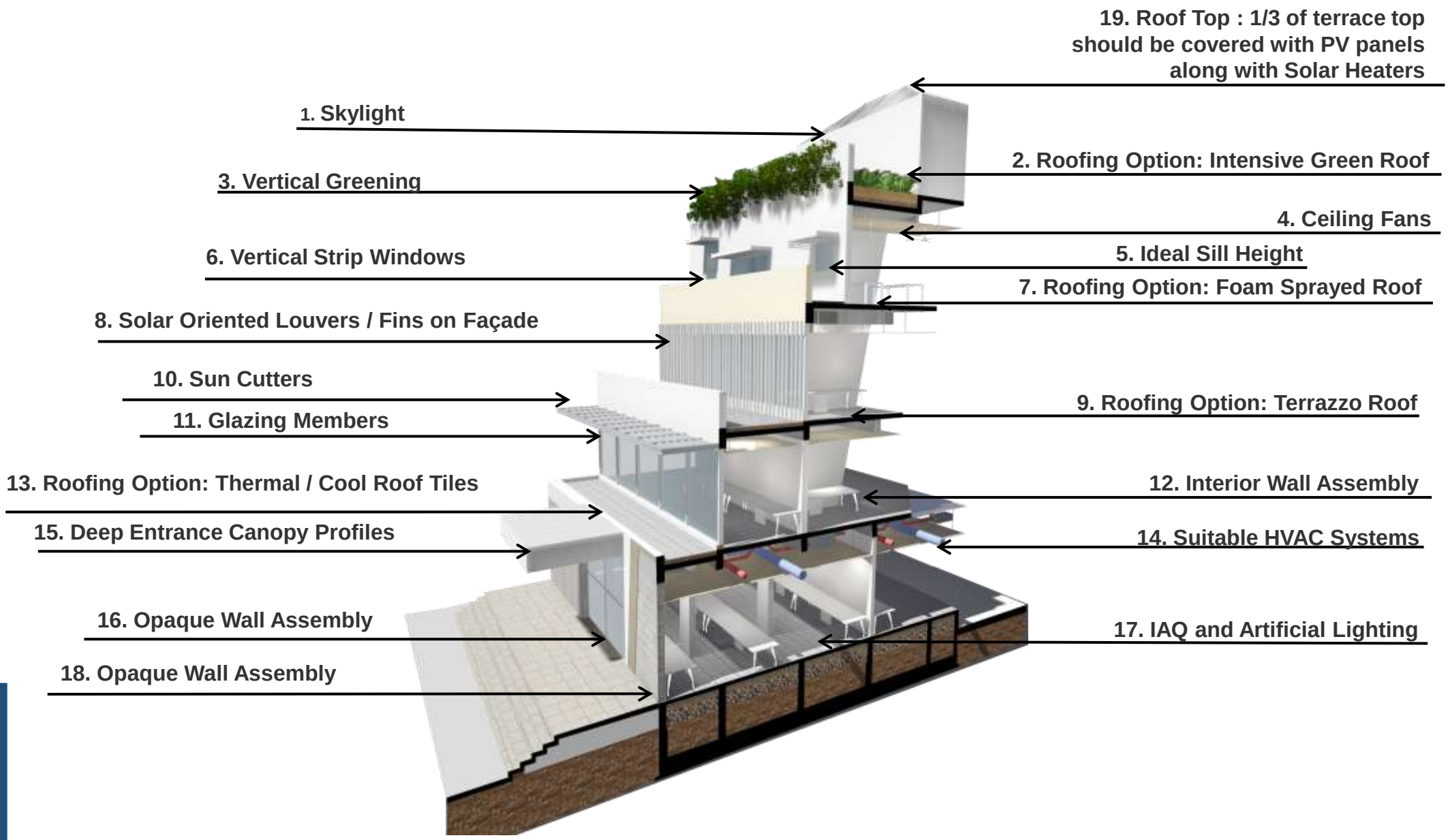
Building Type	Recommended green building minimum rating to be followed	
Residential	GRIHA	Star Rating : 25 - 40 points, 1 star (minimum range)
	IGBC	Certification Level :Certified (minimum)
Commercial	GRIHA	Star Rating : 41 - 55 points, 2 star (minimum range)
	IGBC	Certification Level :Silver (minimum)
Industrial	GRIHA	N.A
	IGBC	Certification Level :Certified (minimum)
Public / Semi-public Buildings	GRIHA	Star Rating : 56 -70 points, 3 star (minimum range)
	IGBC	Certification Level :Gold (minimum)
Institutional Building	GRIHA	Star Rating : 56 -70 points, 3 star (minimum range)
	IGBC	Certification Level : Gold (minimum)

Note : Any other equivalent national and international rating system with similar weightage may be followed such as

- LEED
- BREEAM
- Any other national and international rating system

Note :

- The State or its instrumentalities should notify Building bye laws for rain water harvesting, use of solar energy, to have water saving fittings and fixtures in buildings, including use of treated grey water for non-consumptive uses like flushing and gardening and other horticultural and agricultural uses, use of fly ash bricks for building construction etc.
- Ensure development and meeting of not less than 10% of energy needs from the renewable energy sources like Solar, Wind, WTE, Bio mass etc.



Conceptual Section for Energy Efficiency Strategies in Commercial Buildings of Amaravati

8 Implementation

8 Implementation

Next Steps

Urban Design Masterplans

As a follow up of UDAG, city level strategies need to be further detailed. Also, it is important to undertake more detailed urban design plans for specific areas and city level strategies to ensure that Amaravati is developed as envisioned. These detailed urban design plans should be undertaken following UDAG to iron out any issues that may surface during design, planning, and implementation. The following detailed urban design plans should be developed:

- Waterfront Masterplan
  As demonstrated in the Waterfront and Open Space Network Guidelines the overall waterfront masterplan should be developed following UDAG. It is important to establish continuous accessibility, build active and passive nodes along the waterfront, and provide linkages from the hinterland to the waterfront. Stepped building height profile along the waterfront should also be further explored.

- Village Integration Plan
  Village integration plans should be further developed for integrating with the public space and surrounding LPS layout and street network. The village integration plans for the selected three villages of Rayapudi, Malkapuram and Nelapadu should be further developed as pilots in the initial stage to guide all other existing villages.

- Streetscape Design and Built Form
  A more detailed design and mock ups of the different streets and intersections should be undertaken to ensure that the streets of Amaravati will be developed as a pleasant and walkable environment as envisioned in the guidelines. Built form along the key streets should also be explored in more detail to ensure better correlation between built form and streetscape.

- TPOD Design
  A transit study should be undertaken to assess the feasibility of the EFTS (Tram/ Bus) along the waterfront and possibly along the Central axis of AGC as well. The transit network hierarchy should also be established based on the transit modes and routes. In the initial phase, three transit nodes should be selected to create a detailed design for station related developments, including potential locations of pedestrian linkages and exits.

Interim Development Strategy

As the development of any new city is usually a long process, Amaravati will take time to develop over the next decade or so. Therefore an interim development strategy with temporary use of the land within the city will be required, with a phased development of the road network. Urban agriculture and community farming, public outreach and community engagement, community and place making, as well as public art programs should be further explored as interim strategies that could be implemented.

Waterfront framework

Village integration plan

Streetscape design and built form

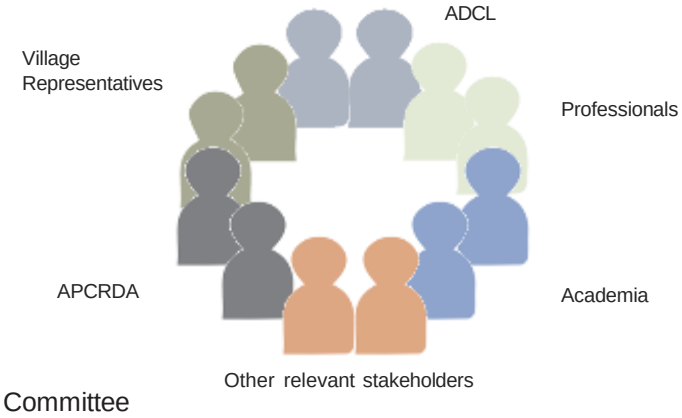
TPOD design

8 Implementation

Regulatory framework and implementation mechanisms should be in place to use the UDAG to guide future development of the People's Capital of Amaravati as envisioned. APCRDA should adopt and implement the UDAG by working together with the public sector, private sector, community, academia, non-profit organisations and other relevant stakeholders to shape Amaravati as a smart and sustainable city that is liveable and walkable.

Regulatory Framework

The APCRDA oversees the development of Amaravati, the People's Capital, to create a liveable and walkable city with a blue and green network connected with sustainable transit including walking and biking. It is important to integrate existing urban villages with the surrounding LPS development providing good access to transit, services, amenities, and other infrastructure and facilities in the city. The Amaravati Masterplan was developed to provide land use, street network, zoning regulations, building guidelines, etc. to assist with development of the city. These plans and regulations will need to be reviewed and revised according to the UDAG to guide the future development of Amaravati. Proactive steps should be taken by APCRDA for public outreach and create awareness among key stakeholders regarding the use and role of UDAG in shaping the city. Stakeholders including other public and private sector, the local community, village representatives etc should understand the importance of Amaravati to be developed as envisioned and the role of UDAG in shaping the city. Public private community partnerships should be formed to work on specific projects



Urban Design Committee

Urban Design Committee

To ensure the concept of people focused and sustainable development is achieved throughout Amaravati, UDAG should be used during implementation of the future development of the city. To facilitate this, an Urban Design Committee (UDC) should be formed to assess key development projects. The UDC should have a minimum of 12 to 20 members maximum consisting of experts from urban design and related fields including urbanists, urban designers, planners, architects, landscape architects, conservationists, engineers etc. The UDC should also consist of other representatives from APCRDA, ADCL, village representatives, academia and other relevant stakeholders. The UDC should include a Chairman from the government and a Vice-Chairman not from public sector but from the community, each serving 2-3 years.

Planning and Development Application

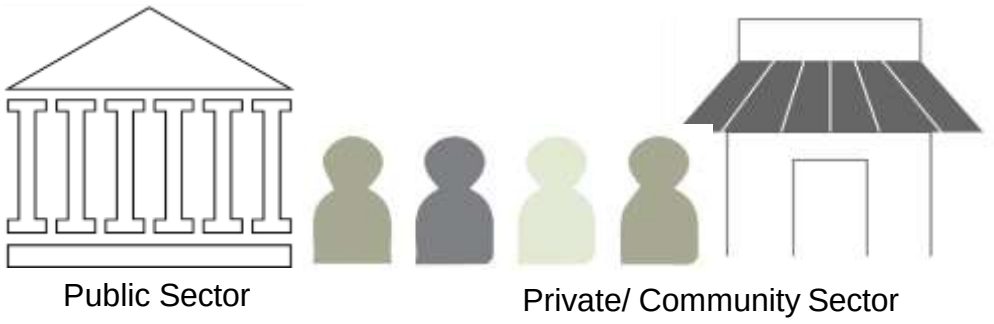
All project proponents should submit a planning and development application to APCRDA to seek approval before the commencement of project construction. Similar to the DUAC, there should be specific parameters which are used to examine if projects are following the UDAG. Related UDAG checklist should be completed to evaluate if the projects are complying with the relevant guidelines.

The planning team within APCRDA should review the application in accordance with the UDAG checklists and prepare technical assessment for the UDC to assess the proposed development for approval. The planning and development application evaluation process should be divided into 3 categories. The UDC will make a decision based on their categories and advice to APCRDA. The different categories and scenarios are illustrated in the chart below.

The UDC should meet every month or at least once in two months or convene special meetings to discuss and evaluate any ongoing projects or submitted applications and review the effectiveness of the UDAG regularly. The masterplan and the UDAG should be monitored and reviewed every two years, and refined as necessary after evaluation of the outcomes.

Use of UDAG

UDAG helps guide all parties involved to work together effectively and efficiently, as the design and development of a city is a complex multi-disciplinary process. UDAG provides a common ground to guide everyone involved in the development of Amaravati including city officials, administrators, planners, urban designers, architects, landscape architects, transport planners and infrastructure engineers and professionals from relevant industries and sectors as well.



Potential Users of UDAG

Public Sector

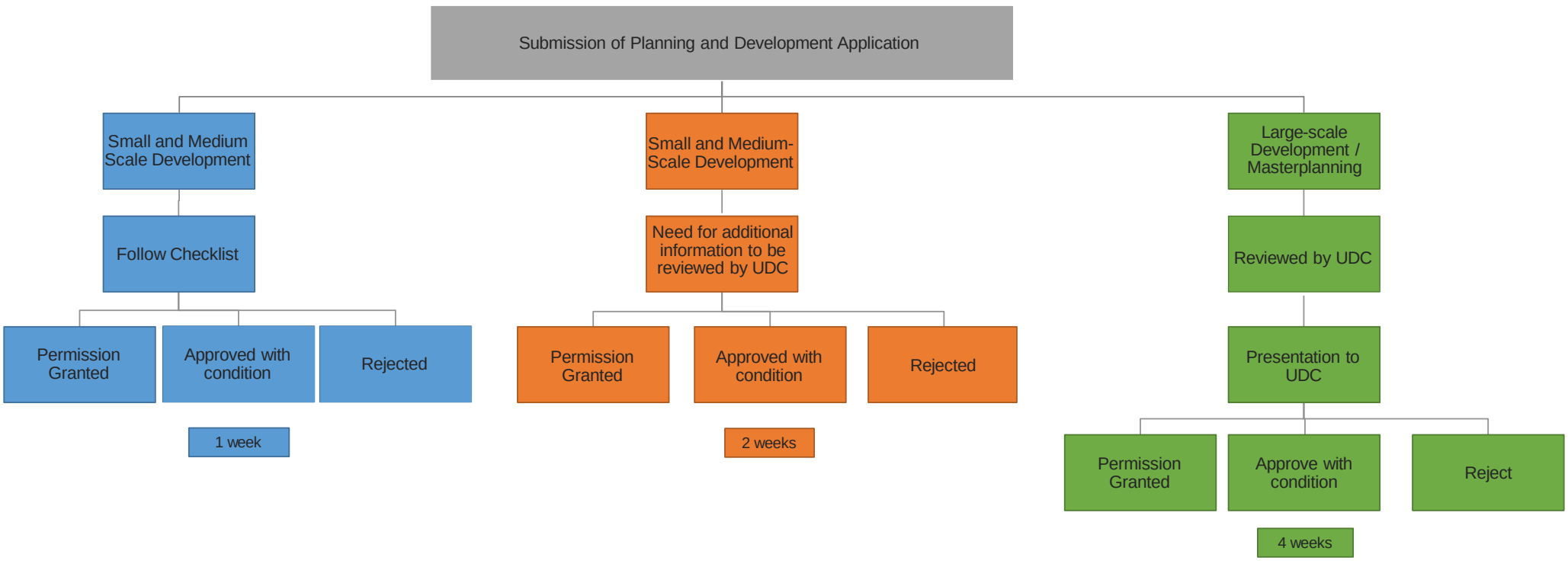
Public sector should make sure it adheres with the suggested guidelines, as well as the relevant legislations and bylaws are in place. APCRDA should regularly organise different activities for public engagement such as forums, workshops and exhibitions to share UDAG so people are better informed and understand their role and give feedback as well.

Private Sector

UDAG will guide private developers to create sensitive developments with public space offering pedestrian priority. Designers and developers are encouraged to follow and incorporate the UDAG in their planning and design work. To pursue a smoother approval process, developers should ensure their designs and plans adheres to municipal bylaws and legislations, as well as the UDAG strategies and principles.

The Community

UDAG creates a better understanding between the government and the community regarding the future development of the city as it lists out the long term goals for Amaravati. Also, it helps the community to identify potential community and commercial opportunities, which promotes investment and economic enhancement.



8 Implementation

Next Steps

Public Engagement

Public Engagement is an interactive two-way process that encourages public participation, exchange of ideas and flow of information. It reflects the government's willingness to share information about the development of the city and treat citizens as partners in decision-making process. It also enhances citizen's recognition of their responsibility, sense of ownership of development processes and the implementation of development programs.

Governments should encourage public participation to ensure that the feedback received is taken into account when making policies and project proposals. This will ensure the needs and interests of the citizens are considered in the decision-making processes. Furthermore, public engagement improves the political position of marginalized or vulnerable groups, such as women, youth, children and minorities whose inputs are often not taken into consideration. Methods of public engagement are as follow:

Information Sharing
Information can be shared through different means including local T.V. channels, national / local newspapers, mobile based voice or text messages, posters, radio stations and social-media platforms.

Consultation
Consultative meetings with the stakeholders should be undertaken at different stages of key developments regularly. Consultation methods include direct interaction through electronic media, workshops, exhibitions, citizen outreach centres, etc. to provide information on current and proposed developments.

Joint assessment
Participatory assessment and monitoring with the stakeholders are used as tools for enhancing public engagement. These include joint citizen monitoring by youth clubs, self-help groups, guilds and professional associations.

Participatory planning
Comprehensive planning and local plans such as village layout plans should use participatory planning to take into consideration the needs and aspirations of the citizens for shared decision making..

Real time engagement
A platform should be created for public participation and community engagement to ensure that community feedback and public opinion is collected, addressed and monitored effectively (for example, the Real Time e-Governance).

Public Engagement Strategies

Creating Public Engagement Fund

- Creation of Public Engagement Fund is important not only for developing methodologies for public engagement but also for funding the actual citizen engagement pilots which will demonstrate the utility of the concept. This could come from the Amaravati Foundation as well
- APCRDA should work with Department of Information Technology (DIT) and take the initiative in launching the public engagement program
- This Fund should also enable various state Ministries/Departments to undertake public engagement for current e-Governance projects
- For all new projects, appropriate funding arrangement should be made from within the project budget

Creating Citizen Report Card (CRC)

- Citizen Report Card (CRC) is a simple yet powerful tool to provide systematic feedback to public agencies from users of public services
- CRC should be explored to help monitor government services in terms of efficiency and accountability
- Feedback received from CRC helps to exert public pressure on the agencies to initiate reforms

Happy Cities Summit: Amaravati 2018


Real Time Governance in Amaravati


Examples of community engagement in Amaravati

Sources: https://twitter.com/andhrapradeshcm/status/940259269982666753, https://pre-empt.bcchr.ca/clip-india-site-visit-august-23-28-2014

8 Implementation

		Regulatory Framework				
		Masterplan	Land Pooling Scheme	Zoning Regulation	Building Regulation GO 119	Urban Design and Architectural Guidelines
Codes/ Strategies/ Guidelines	Urban Structure	✓				✓
	Connectivity	✓				✓
	Infrastructure	✓				✓
	Environment	✓				✓
	Population/ Density	✓				✓
	Employment	✓				✓
	Land Use	✓		✓		✓
	LPS Scheme/ Layout	✓	✓			✓
	Heritage Buildings and Landmark	✓				✓
	Plot allotment	✓	✓			✓
	Built Form	✓			✓	✓
	Vernacular Architecture	✓			✓	✓
	Waterfront and Open Space	✓				✓
	Local Landscape Character					✓
	Road Network	✓				✓
	TPOD	✓				✓
	Flooding	✓				✓
	Micro Climate	✓				✓
	Sustainable Building	✓				✓
	Public Engagement		✓			✓
	FSI/FAR		✓	✓	✓	✓
	Height Restriction		✓	✓	✓	✓
	Buffer Zone			✓		✓
	Building Density	✓		✓	✓	✓
	Parking			✓	✓	✓
	Streetscape Design					✓
	Plot Size			✓	✓	✓
	View Corridor					✓
	Skyline					✓
	Walkability					✓
	Social Amenities					✓
	Village Layout	✓				✓
	Village Integration					✓
	Urban Design Committee					✓
	Image and Identity					✓
	Urban Grain and Form			✓	✓	✓
	Mixed-Use and Flexible Zoning			✓		✓
	Blue and Green Network	✓				✓
	Mobility and Infrastructure					✓
	Smart and Sustainable Developments					✓
	Quality of Life and Well-Being					✓
	Social Equity and Integration					✓
	Heritage, Art and Culture					✓
	Place-Making and Branding					✓

A Collaborative "People Place and Planet" Approach