

Volume – I

- PKDA Area Overview
- Sector Wise Situation Analysis
- Demand Assessment
- Summary of issues

Volume – II

- Proposed Land use
- Infrastructure Proposals
- Tourism Proposals & Special Projects
- Institutional Framework
- Cost Estimation
- Implementation Mechanism



ACKNOWLEDGEMENTS

We sincerely acknowledge the valuable inputs and support rendered by the following individuals during the course of this exercise:

Sri. Naveen Patnaik, Hon'ble Chief Minister, Orissa
Sri Sarada Prasad Nayak, Minister of Housing & Urban Development, Orissa
Sri. Gajapati Maharaja Dibyasingha Deb, Chairman, Sri Jagannath Temple Managing Committee, Puri
Mr. Maheshwar Mahanty, MLA, Puri
Dr. Saurabh Garg (IAS), Commissioner cum Principal Secretary, H & UD Department, Govt. of Orissa
Dr. P. K. Mohanty (IAS), Joint Secretary, JnNURM, Govt. of India
Mr. Arvind Agrawal (IAS), Collector, Puri and Vice Chairman, Puri Konark Development Authority
Mr. Sanjib Mishra, Joint Secretary, H & UD Department, Govt. of Orissa
Ms. Santilata Pradhan, Chairperson, Puri Municipality
Mr. Prasanta Kumar Patnaik, Director, Directorate of Town Planning, Orissa Bhubaneswar
Mr. J. B. Kshirsagar, Chief Town Planner, Town & Country Planning Office, New Delhi
Dr. U.C. Majhi, Sub collector, Revenue Department, Puri
Mr. Ram Mohan Mishra, Secretary, Puri Konark Development Authority
Mr. P C Gochikar, Tech, Asst., Puri Konark Development Authority
Mr. P.K. Senapati, Additional district magistrate, collectorate
Mr. P.K. Mohapatra, Project engineer, project management unit, Puri, OWSSB
Mr. A. K. Mohapatra, IFS, Chief Executive, Orissa Remote Sensing Application Centre (ORSAC), Bhubaneswar
Dr. Debajit Mishra, Sr. Scientist, Orissa Remote Sensing Application Centre, Bhubaneswar
Mr. D.K.Raut, Scientist, Orissa Remote Sensing Application Centre, Bhubaneswar
Mr. Sitanath Rath, Ex. Executive officer, Puri Municipality, Puri
Mr. Rajat Mishra, Municipal Engineer, Puri Municipality, puri
Mr. Bindeshwar Patra, Temple Administration Trust, puri
Mr. Lalbahadur Sahoo, Chairman, Konark NAC
Mr. S.N. Pratihari, Executive officer, Konark NAC
Mr. B.K. Jena, Tourist officer, PKDA
Mr. Bhagaban Sahu, Executive Engineer, PHD and engineer member PKDA, Puri
Mr. Bharatchandra Dadi, Executive Engineer, RWSSB, Puri
Mr. Manojkumar Das, Executive Engineer, Irrigation Div., Puri
Mr. B. Sahoo, Directorate of Census, Bhubaneswar
Dr. C. B. Patel, Superintendent, State archeology department, Bhubaneswar



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ABBREVIATIONS

CEPT: Centre for Environmental Planning & Technology
PKDA: Puri Konark Development Authority
CDP: Comprehensive Development Plan
OTDC: Orissa Tourism Development Corporation
DoT: Department of Tourism
GoO: Government of Orissa
IDCO: Orissa Industrial Infrastructure Development Corporation
ORSAC: Orissa Remote Sensing Application Centre
UNESCO: United Nations Educational, Scientific and Cultural Organization
CPHEEO: Central Public Health and Environmental Engineering Organization
NBO: National Building Organisation
IRC: Indian Road Congress
CPCB: Central Pollution Control Board
CTP: Chief Town Planner
NH: National Highway
SH: State Highway
HTL: High Tide Line
RoW: Width of Road
MLD: Million liter per day
LPCD: Liter per capita per day
PCU: Passenger Car Unit
EIC: Engineer in Chief
EWS: Economical Weaker Section
C.C.: Cement Concrete
R.C.C.: Reinforcement Cement Concrete
OWSSB: Orissa Water Supply and Sewerage Board
RWSSB: Rural Water Supply and Sewerage Board
PKRIT: Puri Konark Regional Improvement Trust
PS: Police Station

ANCGR: Annual Compounded Growth Rate
CESS: Centre for Earth Science Studies
SPCBO: Central Pollution Control Board Orissa
CMZ: Coastal Management Zone
CZMP: Coastal Zone Management Plan
DCR: Development Control Rules
DP: Development Plan
ELU: Existing Land Use
Govt.: Government
Ha: Hectare
HH: Household
HP: Horse Power
Kmph: Kilometer per hour
LU Plan: Land Use Plan
NAC: Notified Area Council
NDZ: No Development Zone
NGO: Non-Governmental Organisation
RTZ: Recreation and Tourism Zone
S. No: Survey Number
SOI: Survey of India
SPA: Special Planning Authority
Sq.km: Square Kilometer
Sq.m: Square Meter
SW: Solid Waste
TCPO: Town and Country Planning Organisation
TPVD: Town Planning and Valuation Department
WB: Water Body
WFPR: Work Force Participation Rate
GP: Gram Panchayat



1. DRIVERS of PKDA CDP



1. DRIVERS OF PKDA COMPREHENSIVE DEVELOPMENT PLAN

Comprehensive development plan as the name suggests should look into all the sectors and aspects of development, ensuring sustainable growth and a better standard of living that what exists in the plan design stage. The Puri Konark development region has myriad potential through its natural bounties and its human resource. However, the key to its sustainable future lies in striking right balance between the development and the opening up of its lesser explored dimensions and a meticulously driven conservation efforts.

The previous volume was dedicated in understanding the baseline scenario. The existing situation the way it operates and the issues and concerns of the same were explored. Various gaps in the service in the existing as well as the proposed scenario were studied and the projections were undertaken. The studies aspects were those of Demography, socio- economic conditions, Land use set up, traffic and transportation scenario, physical and social infrastructure availability, heritage status, environment and disaster related aspects. While volume 1 was heavier in understanding what exists, the volume 2 is dedicated to the proposals and interventions that may eventually lead to the larger development vision of the region. It also consists of the design details of various pilot interventions and projects that on shorter run shall set the stage to the long and medium term interventions suggested in the plan.

Land use planning strategies have been identified as an important tool to percolate growth in the desired direction, spatially, socially, economically and in an environmentally sustainable manner. Provisions for infrastructure and the specific areas which require further studies have been elucidated through this proposal. Owing the special nature of the region dedicated heritage proposals has been suggested. This shall aid in the strengthening and development of the heritage base of the city as well as contribute to the revenue generation of the city. The tourism management land helps in reiterating the unexplored bounties of the region and the interventions through which PKDA and its people can better manage these. The disaster management plan identifies the components of disaster planning and addressing the same with minimal damage to life and assets, suitable interventions have been suggested.

The final sections consists of the institutional strengthening and highlighting the capacity building needs of the authority for the better implementation of the proposed plans and the programs in the region. This section also highlights the phasing of the several activities based on the investments required, institutional strength and the need of the same owing to the rising demand.

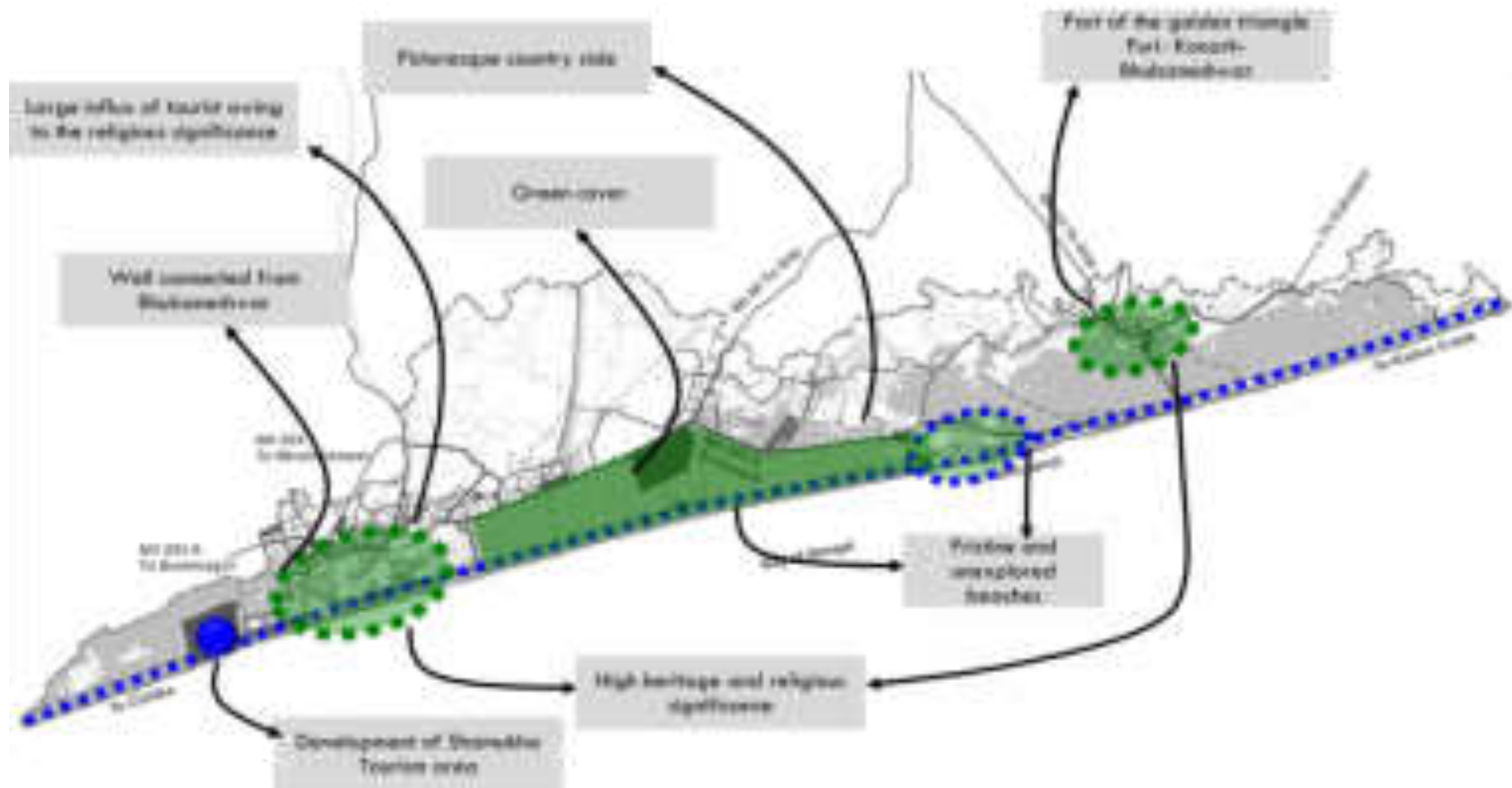
The proposals for the PKDA region are based on the following

- Addressing the issues and concerns derived from the situation analysis
- Understating the future growth trends in the region, natural as well and desired and plan for the same.
- Identification of the infrastructure gaps in the region and planning for the same, both consolidated demand in the urban areas and the fragmented demands in the rural areas.
- Development of a robust institutional framework for the better management and implementation of the plan



- Strengthening and development of the tourism opportunities in the region
- Identification and development of suitable phasing plan for the region such as to make the project/plan financially viable and sustainable.

The proposed comprehensive development plan of PKDA is rooted in the various regional opportunities. The attached image indicates the opportunities for the development of the various proposals.



The following section gives a gist of the various issues in the region. These shall be used as input parameters in developing the land use plan followed by the services for the region.

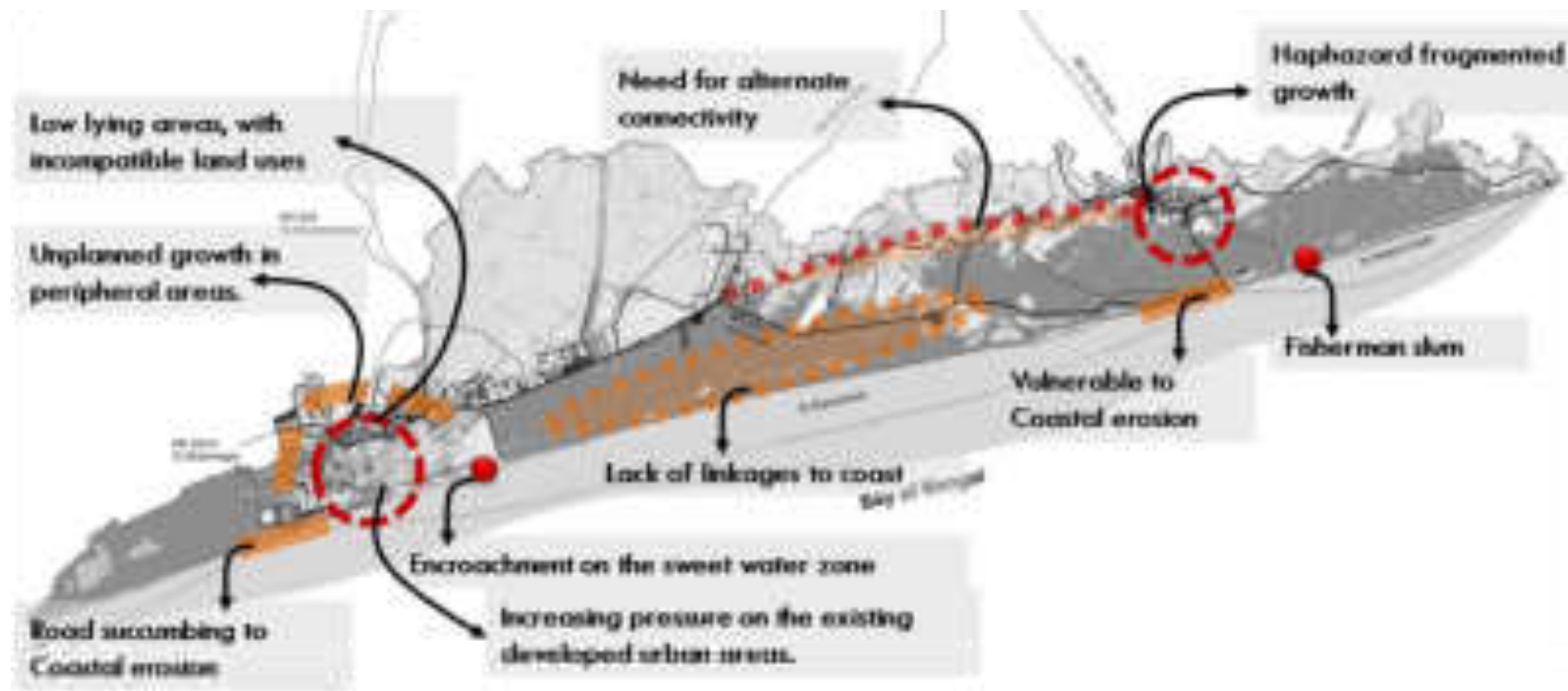


Figure 1: Land use issues and concerns of PKDA

The existing land use and management pattern is skewed towards the urban centers, specifically Puri. The efforts at regional development and growth dissipation have been limited. The increased pressure on land and haphazard densification is the chief problem of Puri urban area. This has resulted in the encroachment of the sweet water zones, which has severe environmental and health implications is underway. The proposed Land distribution should aim at an

equitable distribution of the urban amenities and infrastructure and economic opportunities to aid in the dissipation of the growth centers and hence reducing stress on the environmentally sensitive areas.

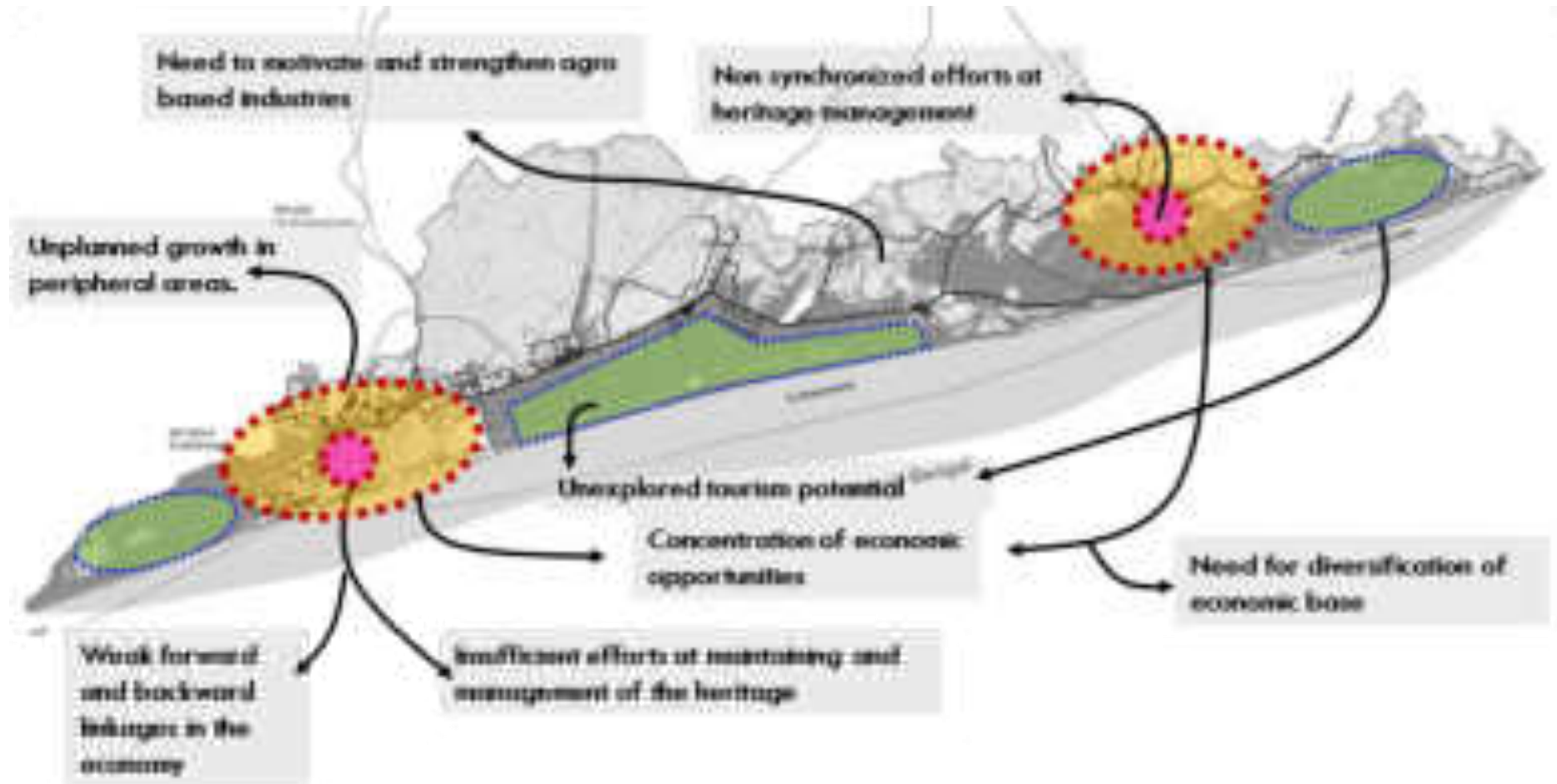


Figure 2: Socio-economic issues and concerns of PKDA

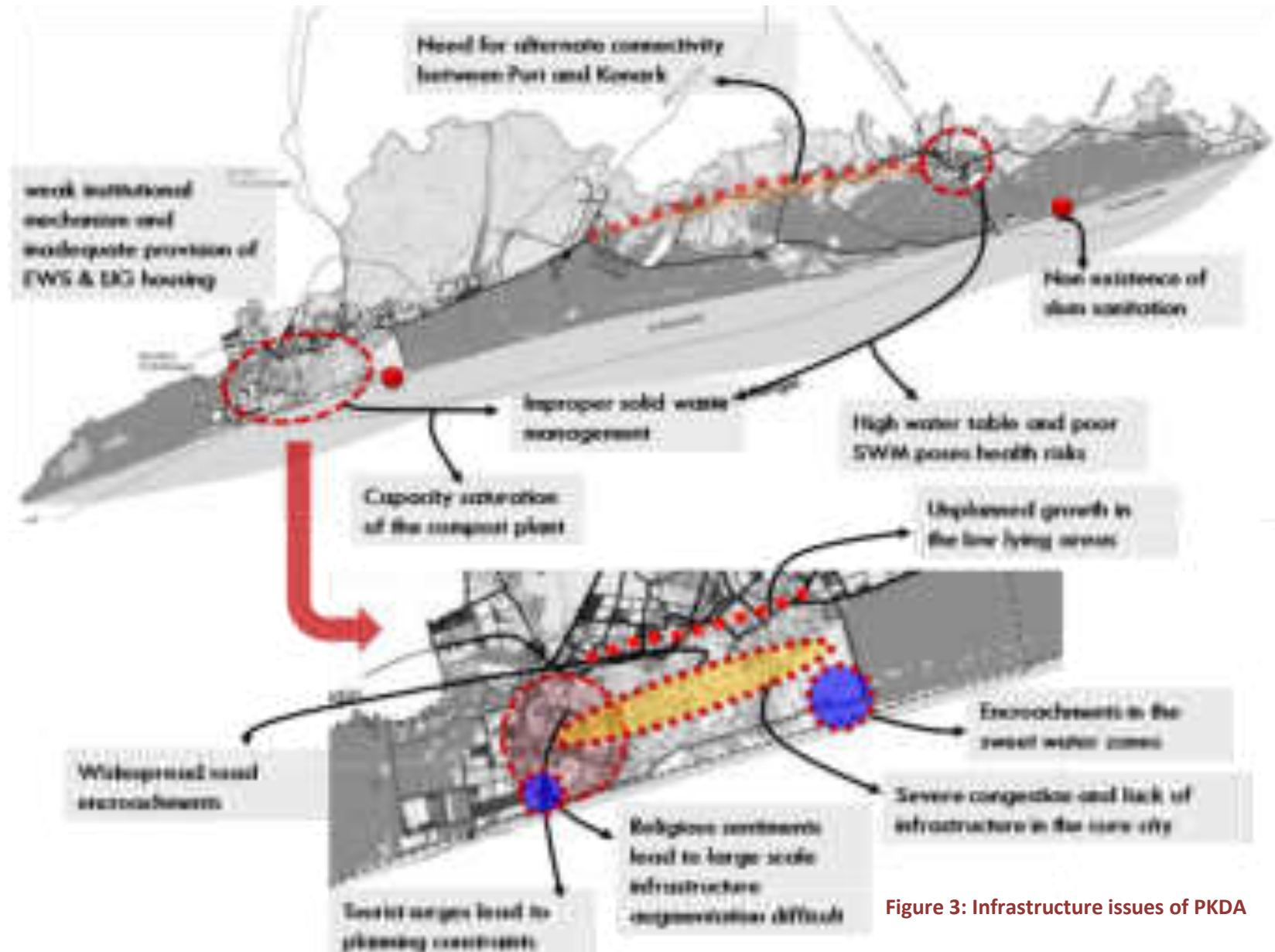


Figure 3: Infrastructure issues of PKDA

The economic base as well as the study of the worker distribution indicates that tourism and allied activities form the economic base of the region. The other economic activities include those of fishing and allied activities and also agriculture. It is essential to regulate and promote tourism as an economic activity into a more formalized sector. Endowed with natural scenic beauty there are several tourism opportunities and destination lying unexplored in the region. These are to be opened up and promoted through the proposed plan. Also there is a requirement to promote the fishing and ancillary industries. Hence allocations for the same have been considered in the proposed plan. The infrastructure issues range from inadequacy in the urban areas to the utter inexistence of the same in the rural areas. Solid waste management, rather the lack of it has emerged as one of the pressing issues in the urban areas. The solid waste disposal site consisting of the Compost plant and the solid waste dump has reached its capacity and also does not comply with the CPHEEO norms. The infrastructure is also plagued by the tourist surges. The unequal distribution of the density, leads to the crumbling of the infrastructure in Puri.

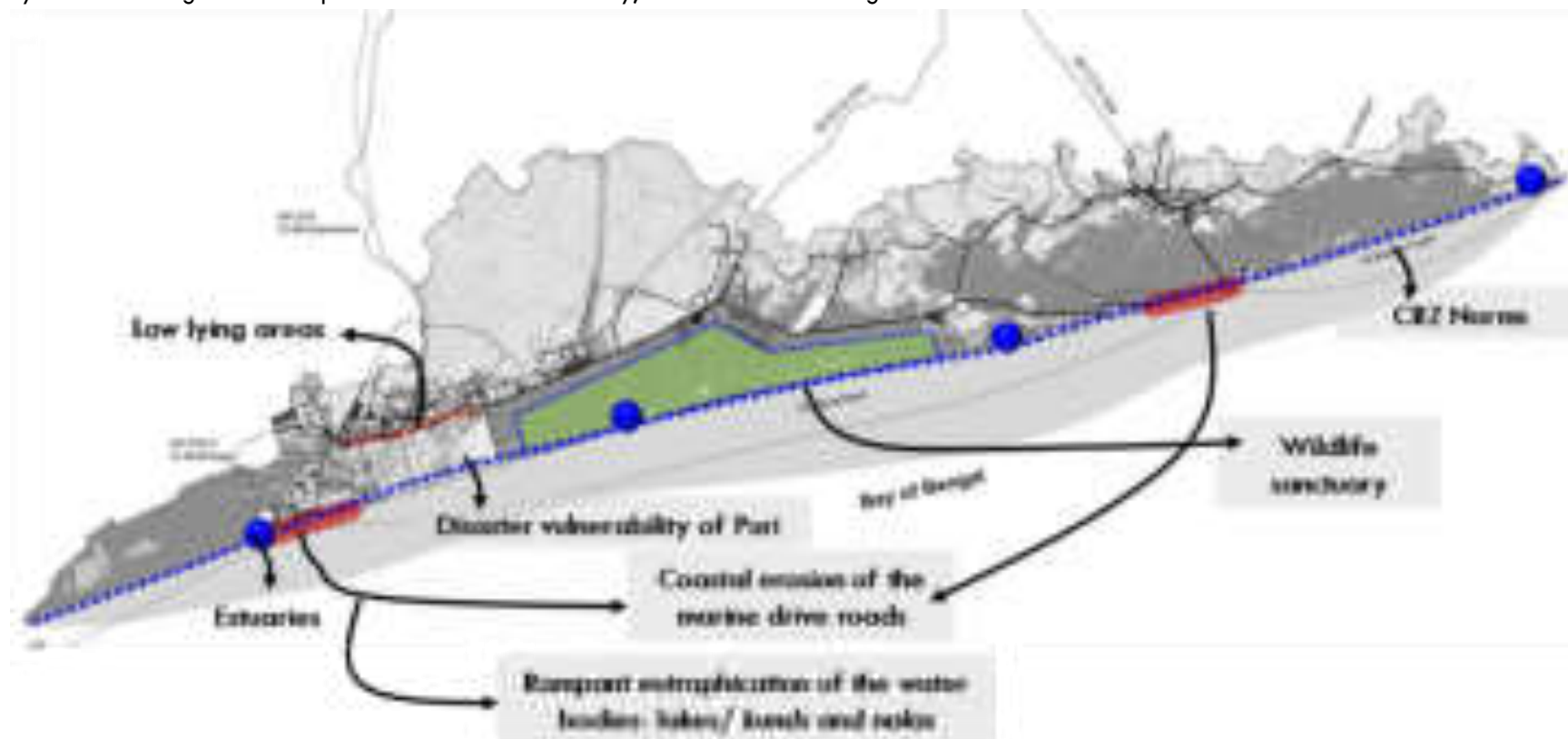


Figure 4- Environmental issues of PKDA

The environmental issues of the region are rooted in the poor infrastructure facilities. The rampant eutrophication of almost 70% of all the water bodies, both lakes/*kunds* and *Nalas*, indicate lack of sewage management. The estuaries of the rivers of Kushabhadra, Nuanai, Ramchandi and Kadua, need to be protected and conserved. The proposal of the activities in these region, are asymptotic to these concerns. The coastal zone norms and the amendments in 2011 should be adhered to in all the developments that are proposed. The interventions of tourism that are proposed in the forest areas are strictly based on the clearances from the forest department.

Addressing these issues this volume of the Comprehensive Development plan shall focus on formulation of Land use planning strategies, Land and Housing development and slum up-gradation schemes, Physical and social infrastructure arrangements, Heritage and tourism development the cost estimation for investments along with the institutional arrangements as well as capacity building for regional development of Puri Konark Development authority area.

1.1 SWOT of Study Region

The following section summarizes the SWOT analysis of the site.

1.1.1 Strengths

- Rich Cultural and built Heritage
- Pristine Beaches and Landscape
- Regional Connectivity
- Abundant tourism opportunities

1.1.2 Weakness

- Old City Core requiring renewal
- Internal Circulation and Traffic Infrastructure
- In adequate sanitation infrastructure
- Lack of Social and Community Spaces
- Limited Economic Opportunities

1.1.3 Opportunities

- Long scenic unexplored coastline
- Eco tourism
- Tangible and intangibles heritage



1.1.4 Threats

- Disaster vulnerability
- Unplanned development
- Fragile ecosystems

1.2 Vision 2031 PKDA

Having understood the existing situation of Puri Konark development area the vision for the region can be developed at this juncture. The ways and means of achieving the vision shall be discussed in the subsequent sections. The vision for Puri Konark Development Authority area has been elucidated as under:

Developing PKDA into a vibrant tourist destination by weaving within its scenic fabric, the religious significance, culture and heritage, while augmenting the economic development and hence improving the quality of life while sustaining the growth with regional development, is the vision with which the CDP has been prepared.

The various contributing components of the Vision 2031 of PKDA have been indicated in the following illustration.





Vision 2031

1.3 Objectives of Comprehensive Development Plan

The main objectives of the CDP are:

- Developing a sustainable pattern of economic development
- Conservation, maintenance and promotion of the special features like Forests, water bodies and heritage structures to develop a more meaning partnership between the citizens of PKDA and their built and natural heritage
- Strengthening the traditional economic base
- Improvement of the infrastructure levels in the region hence improving the quality of life and creation of more economic opportunities in the region. .
- Strengthening the role of the Puri Konark Development Authority for better and more responsive administration and development of the region.

The Comprehensive Development Plan focuses on:

- Generating the up-to-date urban land use map of the area using revenue maps and recent period satellite imageries using GIS technology in 1:2000 scale
- Formulating a meaningful physical development Plan to regulate and guide the urban growth in the region by 2031 A.D. in a planned and healthy manner as per the provisions indicated in ODA Act 1982 and ODA rule 1983.

1.4 Structure of Comprehensive Development Plan 2031 Report

The report has been structured as under:

The drivers and vision of the PKDA region has been elucidated in Chapter 1. This chapter sums up the issues identified in the volume 1 of the report. These issues have been understood as the drivers of the proposed development. Chapter 2, details the vision of the Puri Konark Development, the underlying principals and the concepts of development have been explained in this chapter.

Chapter 3 introduces the land use proposals of 2031, the density calculations and the identification of the nodes and corridors dispersing the development have been studied in this chapter. The 4th Chapter details the land use proposals of the region zone wise, and land use allocations have been elucidated in this chapter. The integrated land use chapter sums up Chapter 4. The means of securing the desired development pattern has been explained in Chapter 4, under



zoning regulations. The three layers of development from development regulations, building regulations and the urban design guidelines have been explained in this Chapter.

Chapter 5 and 6 explain the infrastructure proposals of Puri Konark Development area. The proposals under water supply, sewage management, solid waste management, transport and mobility, storm water management, education health and housing have been discussed in these chapters. Focus is mainly on the management of the urban infrastructure and requirement of the same. The proposed implementation mechanism and the financial implications of the interventions have been suggested in these chapters.

Chapter on infrastructure provision and delivery is followed by the chapter on Tourism Promotion and management plan as chapter 7, which is one of the important components of the development plan of this region. New opportunities of tourism and proposals for better management of the existing heritage, both tangible and intangible have been discussed in this chapter. The costs incurred under the proposals have been suggested in these chapters. Chapter 8 details the disaster management proposals that are suggested for the region. Institutional setup, the overlaps and the suggested interventions along with the capacity building needs along with the implementation mechanism have been discussed under Chapter 9.



2. ENVISIONING PKDA



2. ENVISIONING PKDA

Puri Konark is a special area, a region which is deeply rooted in its culture, tradition and heritage. Its planning concerns are more complicated and challenging than the usual demand supply gap driven planning approaches. The development has to be a balance of conservation, promotion, management and provision of new opportunities for the region to grow, in terms of economy and the quality of life of its citizens and also the quality of life of its tourist.

Through the comprehensive development plan the sectors which need conservation, promotion and development have been identified. These interventions need to be visualized spatially also. Identification of germane growth catalysts for PKDA is the need of the hour. The role of the CDP does not end at formulation vision and plan, but to also need to identify the mechanism and tools through which these plans may be implemented. The sustainability of the proposals based on financial, environment and understanding the carrying capacity of the region to withstand these planned interventions have been identified through the course of the study. The following sections give a brief idea, of “envisioning PKDA”, the identified activity patterns and the driving forces of the planning decisions that have been take for the same. The vision for PKDA has been developed in three layers

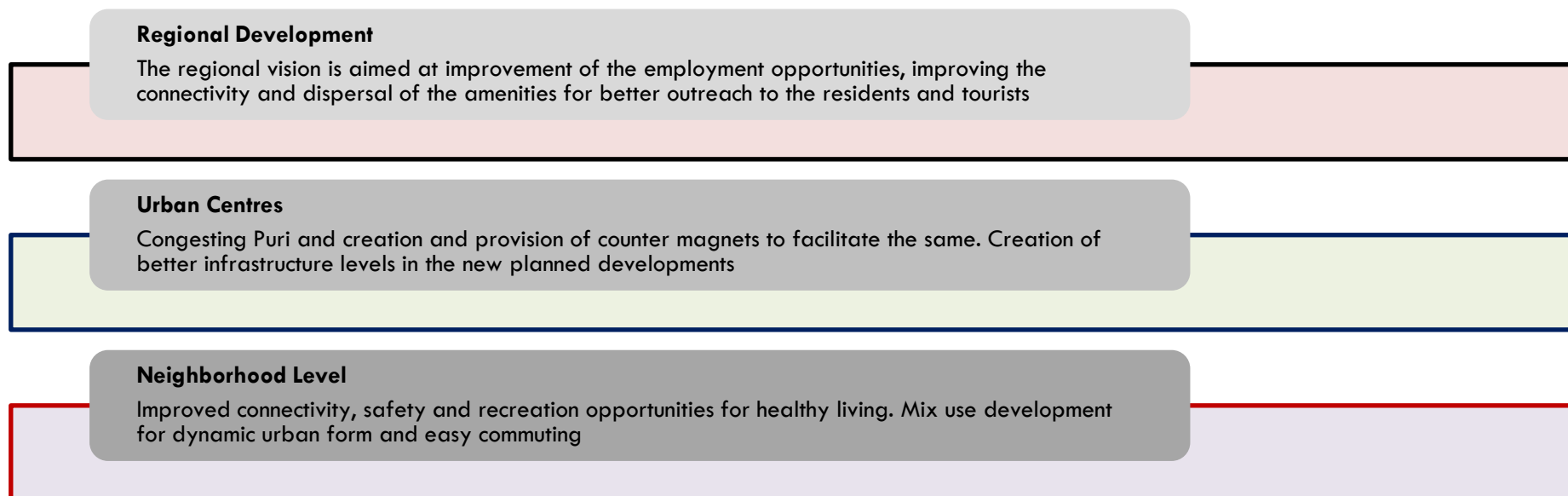


Figure 5- Envisioning PKDA



2.1 Regional Development

The regional development of the Puri Konark region is the first layer while envisioning the development pattern of the region. The development vision at this scale is to primarily bring the two towns of Puri and Konark closer, more so in a twin town concept. The mobility pattern and the choices of system to traverse between the two need to be augmented. Puri and Konark are envisaged as developing symbiotically through strong physical social and economic links. The following sections discuss the intricacies of the Puri Konark development pattern.

2.1.1 *Twin Towns of PKDA*

PKDA area comprises of Puri city, Konark NAC and other administrative units primarily rural in nature. In current scenario all areas are being developed independently, without the consideration of the other's development patterns, and lack a coherent development plan. The land use proposal therefore promotes twin town development especially for Puri and Konark. These are the two main growth nodes of the region, with a concentration of economic opportunities, as well as tourist attractions. The induced growth patterns in the region have been oriented at inter weaving the two cities in terms of employment opportunities and the amenities.

To implement the twin town concept, addressing the corridor development between the two is crucial. The growth demands till 2031 do not allow the entire corridor to be developed equivalently, however at this point the identification of the intermediate growth nodes has been done. Growth nodes are the development nodes which would help PKDA develop rather rapidly and would help diversify the economy of the city and would also at the same time enhance opportunities to live and work in the such area. The proposal therefore provides such “driving forces” or growth nodes for future development. Such growth nodes are

- Special commercial zone
 - IT hub
 - SIZ to promote economic development and to invite large businesses and companies to India
- Tourism zone
 - Puri , Konark and the area surrounding has unique potential to attract tourism and related business such as
 - Shamuka beach development
 - Area near Ramchandi to be developed for mainly tourism infrastructure, hotels, resorts and similar activities
- Targeting tourist infrastructure, hotels, golf courses, budget hotels to international brands of hotels and resorts etc.
- Regional bus station
 - The proposed bus terminal would act as a growth node for Puri City and would be instrumental in bringing in more small and medium scale commercial development.



- Strategic location
 - Proximity to the temple and other touristic places
 - Connectivity to NH connecting Konark, BBSR

Studying the existing development pattern and the location based carrying capacity of the land for such an intervention has been undertaken. A special institutional hub, special commercial zones and eco villages have been included. These activities proposed at the identified nodes are such that they may sustain on themselves, with patronage not only from Puri and Konark but a larger region. These activities have been discussed in detail in the section detailing the activity pattern identified for the PKDA region.

2.1.2 Special Zone for Tourism Development

The special nature and the immense tourism potential of the PKAD region, calls for identification of special tourism nodes and development of facilitating facilities for linking the same and provision of enjoyable experience to the visitors of the region. The proposed tourism activities aim at all the user sections from high end luxury tourism to middle and lower middle class user section.

- Shamuka beach resort proposal
 - High end hotels
 - Resorts
 - Beach side cafes, restaurants
 - Golf courses
 - Boating and sightseeing areas
- Special tourism zone near Ramchandi mandir
 - Cater to local as well as international tourists
 - International hotels and resorts
 - Budget hotels and Dharmasala
 - Landscaped areas
 - Beautification of beach area
 - Boating and other related activities
- Village tourism models for Block B
- Beleshwar area development
- Tourist trails and treks
- Demarcation of Puri and Konark Heritage Precincts
- Nuanai Riverfront



The attached illustration indicates the various growth and activity hubs in the proposed PKDA CDP.

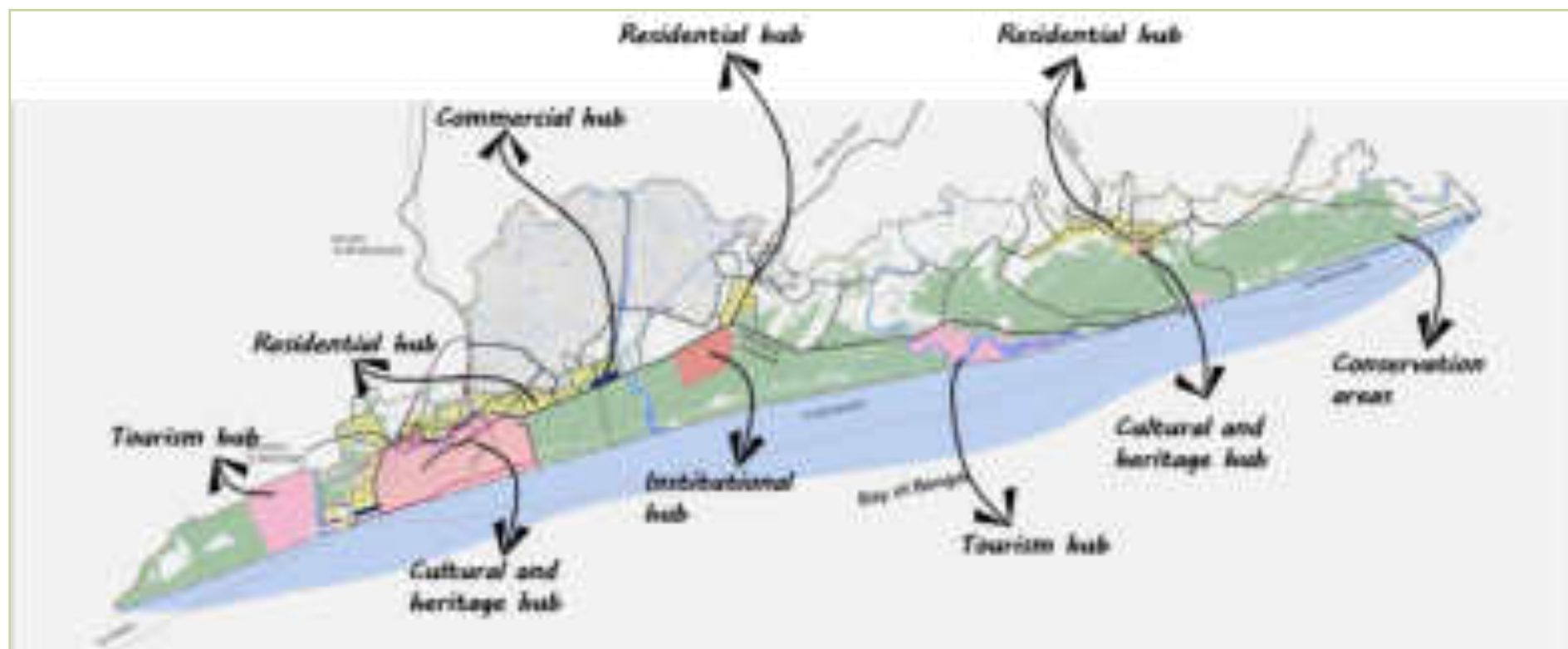


Figure 6: Hubs of specialized activity

2.1.3 Improvement of Economic Opportunities

For the regional growth creation of economic opportunities has to be created. The economic opportunities should be asymptotic to the skill levels, existing and induced in the locals for them to gain meaningfully from the proposed economic opportunities. The various provisions for the improvement of the economic opportunities and the diversification of the economic base of the region are elucidated as under

- Creation of counter magnets in the peri-urban areas like IT SEZ and allocations for industries



- The economic opportunities in terms of the commercial and the industrial allocations have been dispersed hierarchically at the sector level; concepts of walk to work have been incorporated.
- Strengthening of the existing economic base of tourism through the provision of the eco-villages, better heritage management and infrastructure provision.
- Provision of agriculture markets and facilitating infrastructure to promote agriculture and allied industries
- Creation of alternate transport links between Puri and Konark shall open up the villages of Block A.
- The regularization and handholding of the fishermen, which are an important alternate economic base, should be undertaken.
- Opening up of the coast to tourism shall strengthen the economic opportunities.
- Regularization of the tourism activities and the formalization of the allied activities shall lead to the improvement of the revenue streams from the same.
- Strengthening the infrastructure levels, the basic services allow better productivity and efficiency at work.

The basic services to the poor and the rural areas need to be augmented and attempts at the improvement and strengthening of the existing facilities and improving the outreach of the facilities has been taken care of. They have been enforced through design interventions and also strengthened through policy interventions.

2.1.4 Improving Mobility

Transit corridors have been the growth precipitators. Hence the mobility corridors have been identified along the selected growth nodes of PKDA. The road development pattern has been designed such as to reciprocate the development pattern. It has been attempted to induce public transport into the region through the identification of corridors which generate sufficient ridership, through the proposed interventions. Bus stops, terminal facilities and parking needs have been calculated and translated into the land use and moderated through the development control regulations.

Even though Puri and Konark are the main tourist attractions as well as the economic centers of the region, they are not well served or connected by public transport networks. To promote the use of public transport and to provide mobility corridor and modal choice to the residents, commuters as well as to the tourists the proposal indicates efficient shuttle bus service between Puri and Konark. The plan also proposes a loop / ring BRT route all at the periphery of the Puri city. This shall act as an outer ring road for Puri town and connect the places of interest both tourism and economic activity based. This proposed bus transport system will also serve the newer area developed areas beyond Atharnala, Narendra tank as well as the new business/ tourism centre “Shamuka Beach”

To efficiently implement the transport system proposed activities are mentioned below.

- Regional bus stand
- Bus stop
- Parking areas



- Administrative services for bus service
- Passenger and staff facilities
- Budget hotels and Dharmasala
- Garage and similar bus repair and maintenance activities
- Small and medium scale restaurant and eateries
- Entertainment zone having theatres, Shopping areas etc.

The proposed plan for PKDA is transit friendly at all hierarchal levels, from the region to the neighborhood levels. Inert-modal transfers have been made convenient. The attached illustration indicates the aspects of improvement of mobility and the development of counter magnets for Puri Konark region



Figure 7: Development of growth nodes and improved mobility

2.1.5 Hierarchy of Amenities

The development of areas specifically urban and peri-urban areas need a hierarchy of facilities. The city centers, sector centers and the neighborhood have been designed hierarchy. The scales of each facility various based on the catchment section it is to cater to.

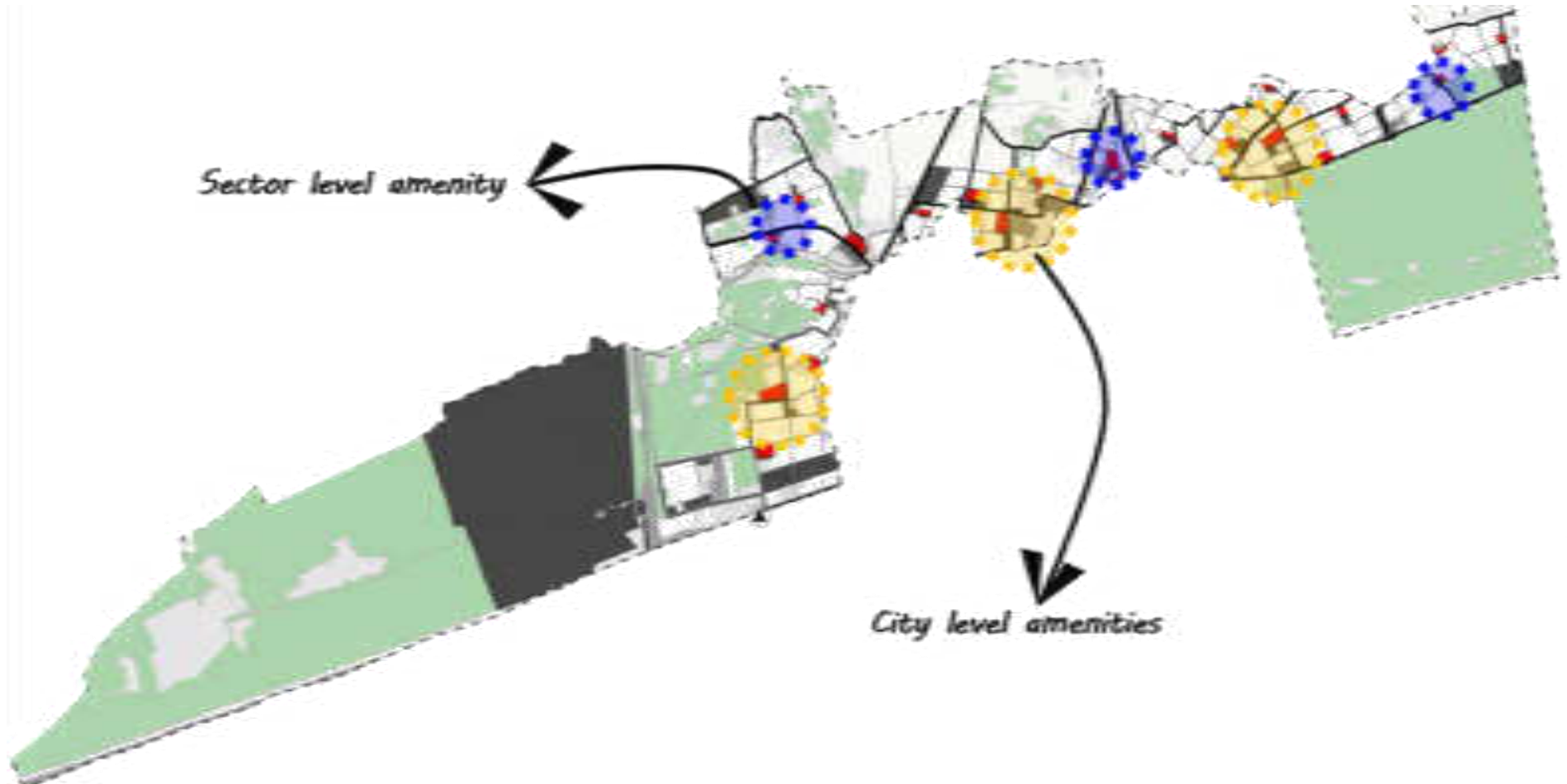


Figure 8: Hierarchy of amenities



Figure 9: Planned green spaces in PKDA

The attached illustrations indicate the same. Provision of the recreation areas and the greens has also been designed with the same concern. The city level greens flow into the district and neighborhood level greens through a continuous green network along the major road corridors. The setbacks under the development control have been mandated to bring out the same. The attached illustration indicates the planned green spaces in PKDA.

2.2 Urban Centers

The twin urban centers of PKDA, Puri and Konark should have different growth strategies based on the existing and the envisaged growth patterns. While in Puri the current requirement is de-congestion of the existing areas and the conservation of the heritage and natural features, Konark needs a more cohesive growth strategy for the future development pattern. The following sections detail the envisaged development patterns of the urban centers in the region.

2.2.1 De-congest Puri Town

Due to religious and spiritual significance, the city has experienced rapid growth especially around the temple area. Importance of the Jagannath temple and the proximity to beach are 2 main driving forces for people to reside in the city. Over a period time the city has experienced inward growth. It is quite evident that growth over the last few decades have overburdened the infrastructure that city had. This has resulted in

- Stress on heritage precincts
 - Densification of heritage core
 - Congestion on road
 - Extremely narrow roads and no scope for widening due to dense development in both sides and the religious sentiments of the people.
- Overburdened services delivery/ Lack of adequate infrastructure
 - Water management
 - Sanitation
 - Transportation
 - Water supply
- Lack of developable land
 - The city has very limited government land to provide public amenities and infrastructure to enhance the quality of life within the city
 - The prime lands are developed as residential areas, without sufficient allocation for amenities
 - Major chunk of land owned by temple trust and is mostly used for religious activities / infrastructure only
 - Due to lack of available land - unable to provide green spaces and open areas for residents of Puri, this can be understood from the over all percentage of open green recreation areas in the city
- Due to above mentioned reason the land use plan provides minimum development within the city. the development proposed would cater to only



- Special tourism related infrastructure
- Commercial activity and enhance the economic base
- public green spaces
- small residential development to incorporate the natural growth of the city

2.2.2 Develop “New Puri”

In order to ease the increasing stress on Puri town and the house the increased population of Puri, new areas need to be planned. It is suggested that the peripheral areas of Puri, Puri Sadar can be developed as “New Town- Puri” to absorb the increasing population. This is a sparsely populated area when compared to Puri, and hence there is opportunity for better urban management and lay trunk infrastructure before actual development. It is suggested that provision of infrastructure shall permeate growth in this region. The planned counter magnets of Puri have been provided in this region, to provide with alternate employment opportunities. The overall objectives of the development of “New Town- Puri” is to

- Relive Puri Town of congestion
- Planned development in the new areas
- Provide better quality of life to people
- Provide multiple residential options as well as opportunities for employment
- Concept of green infrastructure - by providing adequate green cover, public parks and open areas for residents of the new communities
- Provide adequate social amenities
- Provide employment opportunity.
- Improved connectivity to maintain the connection with Puri and the larger region
- Public transport option

The newer development is envisaged keeping the modern design and site planning principles. The area not just caters to the need of the growing population but also helps to develop the area and attract people to come and reside in the envisaged development. New Puri is developed to de- congest the existing city.

2.2.3 Planned Density Variation

To secure the envisaged development pattern it is required to regulate the densities based on the growth potential. Density regulation is an important tool to manage the stress on land. The areas which lack the carrying capacity to sustain high intensity development need to be balanced with density slabs. It is envisaged to reduce the densities from the major transport corridors to the inner areas. The proposed residential categories are of R1 R2 and R3, which decreasing densities respectively. Most of the residential development along the major road or surrounded by commercial activities have high density



residential development. The inner city development is low density to release more green areas; also the development in proximity to agricultural areas or water bodies also is low density with sufficient buffer area to reduce undue stress on the land and the environment receptors. The attached images indicates the planned density variation in the peri urban area of Puri, the “New Town-Puri”



The attached image indicates the planned density variations. The areas in close proximity to the Puri town and the road corridors have been permitted higher density. These are also mixed use in nature, with permissible activities being that of residential and light commercial.

The residential areas abutting the agricultural fields, or water bodies have been kept purely residential with amenities located in close proximity.

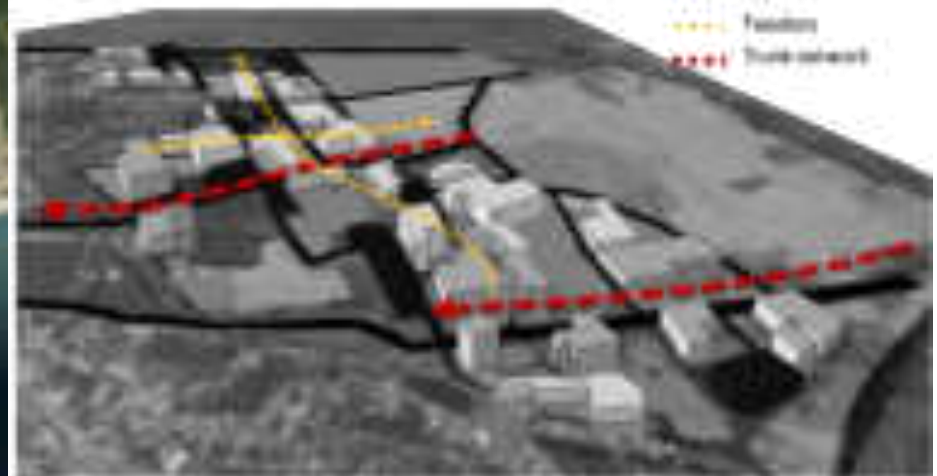


Figure 10: Planned density variation

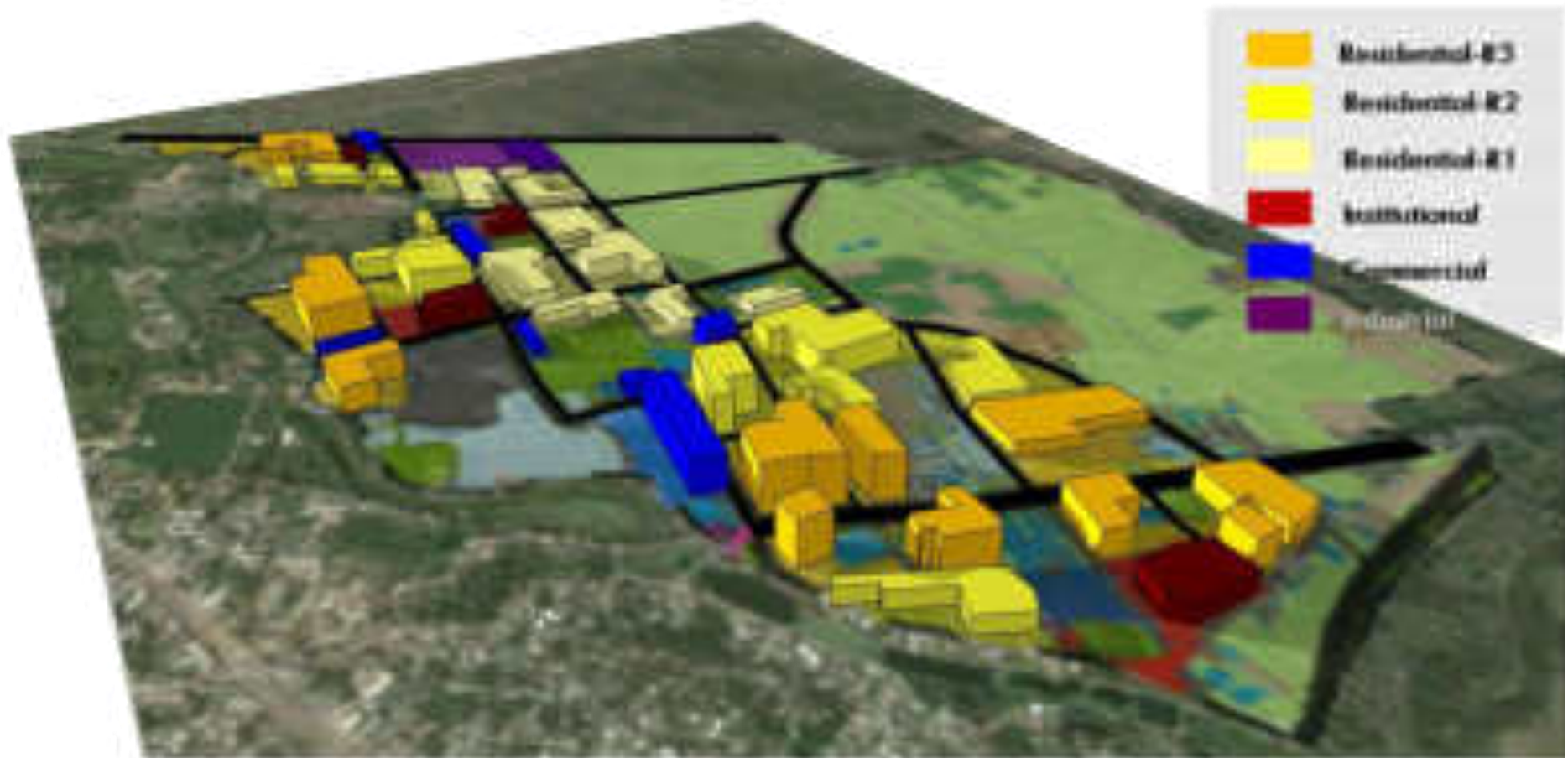


Figure 11: Three dimensional character of proposed uses

2.2.4 Cultural and Ecological Sensitivity

PKDA area has a high percentage of the agriculture and no-areas like those of wetlands, forests and water bodies. The proposed development should maintain and enhance the same. The heritage stock of the region comprises of both tangible and non tangible heritage. The various components that have been included in conservation and restoration are -



- Acknowledge the rich heritage of city
 - Tanks / kunds
 - Temples and mathas
 - Ancient ashrams and jagaghars
 - ASI / UNESCO protected monuments
- Weaving the natural recourses into the proposed future developments such that they may be conserved and contribute meaningfully to the quality of life at the neighbourhood level.
- Minimum interventions in the no go areas
- The agricultural lands have been preserved as much as possible, and only in areas where the development pressure is too high has the agriculture land been converted for development purpose.

2.3 Neighborhood level

Managing growth, reducing traffic, creating sustainable development, and making smart transportation investments; these are all challenges we face today. New Urbanism is a development strategy that addresses these issues more by creating communities that are livable, walkable, & sustainable, while improving the quality of life. The principles of New Urbanism can be applied increasingly to projects at the full range of scales from a single building to an entire community.

The neighborhoods have been planned based on the concept of new urbanism. The attached chart indicates the tenets of new urbanism that have been used for developing the Puri Konark region.



Figure 12: New Urbanism Concept

The attached illustration explains the concept of walkable amenities and the planned variation in density and mixed use at the neighborhood level in the Puri Konark Development. A typical sector has been taken for the development of the concepts. Similar neighborhoods have been identified in the region and the similar configuration has been used.



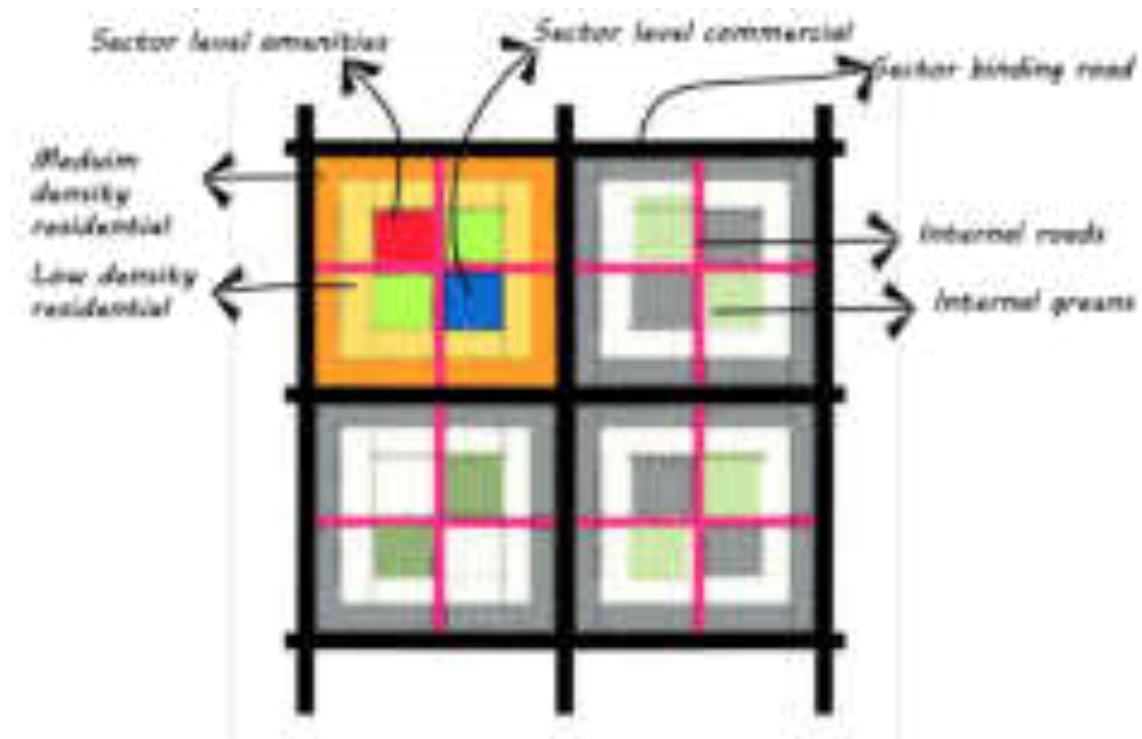


Figure 13: Typical neighborhood- Mix use clusters

It can be observed that the medium density development about the sector binding roads and the low density purely residential clusters follow suit. The neighborhood level commercial and institutional facilities are located at a walkable distance from the residential.

The greens are planned such as to absorb and give opportunities for the spillover activities from not only the residential but also the commercial and the institutional.

This is a sample module, and similar modules join to form the sectors. These sectors have a sectoral node, for locating higher order amenities of health, education and commercial facilities.

While the sector binding roads and the internal roads are for the motorized traffic, the internal roads may be used for non motorized means of transport. The intermodal facilities are located in the sectors, such as to make it convenient for people to avail the public transport opportunities.

2.4 Mixed use Development

Indian cities have been traditionally mixed use in nature. The modern experiments of urban planning in the country have attempted to secure segregation and compartmentalization of land uses, the likes of the cities of Chandigarh, Bhubaneswar and Gandhinagar. However in a traditional setting of Puri and its surroundings, it is suggested to develop mixed use, because of the following advantages that this has in the context of PKDA area

- Dynamic urban form
- Blending of functions
- Safer neighbourhoods
- Walk able amenities



- Opportunities for trade and commerce
- Compact urban form
- Higher suitability to the existing urban features

While the allocation of land uses have been designated so as to allow the appropriate dispersion of amenities in the form of commercial, public amenities and recreation areas, the permissible activities in each of these earmarked land uses have also been designed such as to allow a variety of uses and the areas to be developed based on the demand in the future. These permissible activities for example allow the construction of primary schools in the areas earmarked as residential. The R3 category of residential has a reservation up to 5% for the commercial uses. The intention is such that the ground floor may be allocated for commercial activities while the upper floors may have residential uses. The attached illustrations indicate the mixed use development versus the compartmentalized land uses



Mixing of commercial and recreation, with open areas acting as spill over areas



Mix use allows a more dynamic and safer night life



Small shops in the ground floor for residential buildings is a symbiotic combination



Dedicated and compartmentalized land uses on the contrary lead to drab urban forms. The roads allow high speed of traffic with no stop over's. The night life is also compartmentalized, with the purely institutional and the industrial areas being secluded and not used after working hours.

The following illustrations detail the various layers of the land uses in a sample sector of the Puri Sadar area.



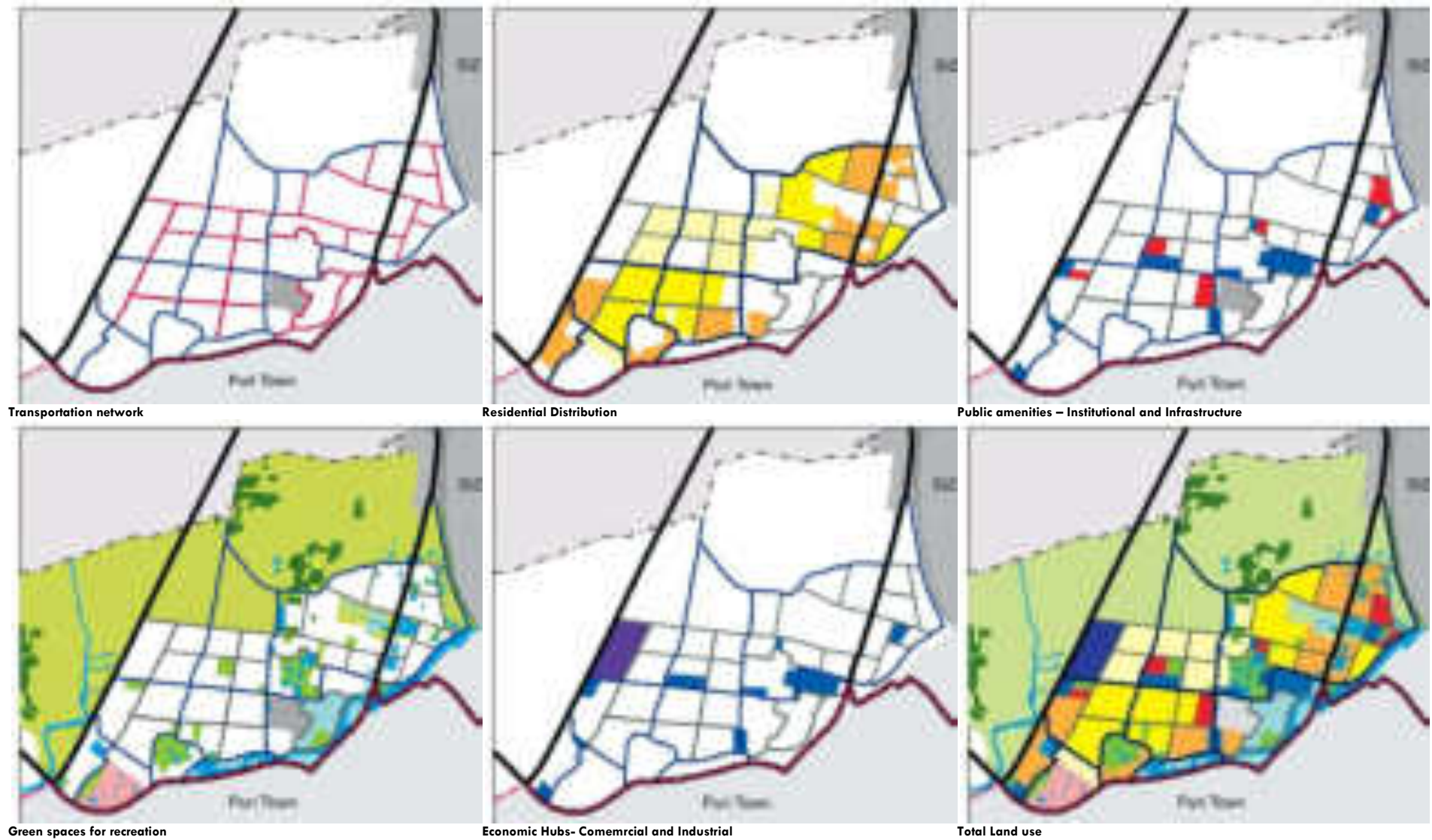


Figure 14: Network of proposed facilities

3. INTRODUCTION TO PKDA LAND USE – 2031



3. INTRODUCTION TO PKDA LAND USE – 2031

This chapter gives an introduction to the land use planning and calculation procedure for the proposed Landuse 2031. The various assumptions taken based on the envisaged growth scenario has been discussed. The assumptions and the growth scenarios and the growth pattern have been discussed in this chapter.

3.1 Land Requirement Determination

The process of determining the land use distribution is dependent on the standards, the requirements of the region and the existing level of amenities. The area requirements have been calculated based on the same. The attached table elucidates the assumptions for area calculations. The residential areas of PKDA have been defined in three categories namely

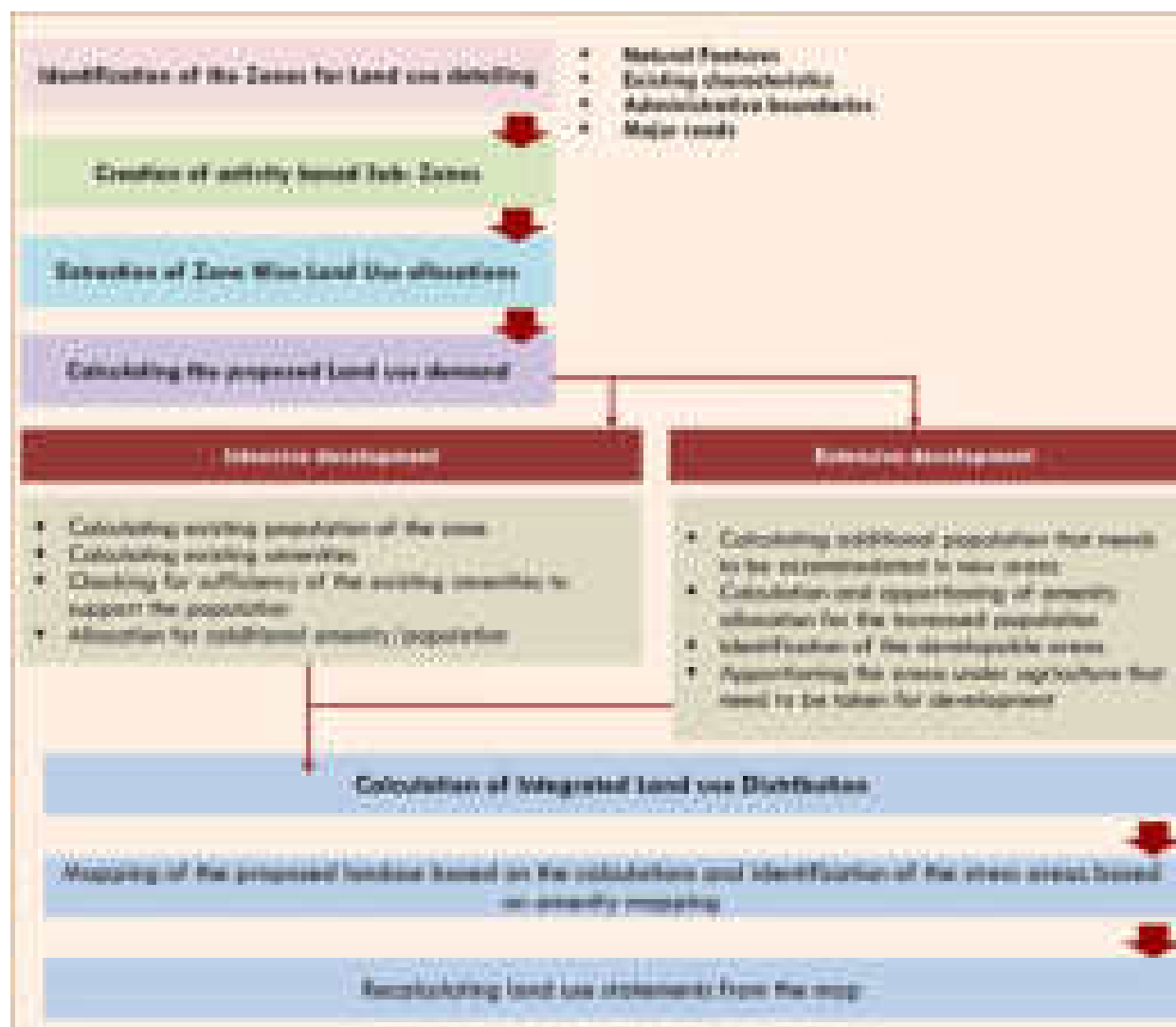
- R1- Purely residential low rise low density development. This is typically characterized by the planned low rise housing.
- R2- Medium rise medium density development
- R3- High rise high density development with allocation of commercial facilities

The facilities for commercial, industrial, institutional and amenities and green recreation areas have been calculated based on these categories. The attached table indicates the per person area requirement under the various categories. UDPFI has been taken as the minimum basic standards and the additional areas have been suggested based on the growth and density pattern that has been envisaged in the region.

Table 1: Land use calculation assumptions

	R1	R1	R3	Assumptions/Remarks
Per person residential area	0.004	0.003	0.0025	Based on case studies
Per person commercial area	0.001	0.001	0.001	Based on UDPFI and moderated as per the PKDA area. Allocations for the special zones have been taken over and above these assumptions.
Per person institutional area (School, hospitals, banks, religious, police, jail, petrol pump)	0.002	0.002	0.002	
Per person green/recreational areas	0.0035	0.0025	0.0025	Based on UDPFI and moderated as per the PKDA area
Per Person transport	0.001	0.001	0.001	Based on road density per person and UDPFI standards
Per person industry	0.0006	0.0006	0.0006	40% WPR and 150sqm per worker of BUA and FSI 1
Per person space	0.0121	0.0101	0.0096	
Gross density	80	95	110	





These assumptions have been used to identify the area requirement under the various categories of land use. The attached figure indicates the process of land use calculations.

The identification of the growth areas has been done through the process of intensive and extensive development. While areas under intensive development are characterized by higher density and compact urban forms the areas undergoing for the extensive development are more of peripheral areas of the urban areas, which have the propensity to grow fast.

After having calculated the proposed total and additional areas that need to be accommodated in the PKDA region based of the envisaged needs, this has been mapped. The final land use tables have been derived from the maps and they have been cross checked and triangulated with the calculations.

The following density and area calculations have been derived from the same. The allocations for the special areas for commercial and institutional activities have been taken over and above the UDPFI norms since they are meant at region else city level and shall me mis-leading if areas are included in the other activity zones.

Figure 15- Process for Land use distribution

3.1.1 Density Calculations

The density calculations have been done considering the relation between the existing development and the proposed development corridors. The density patterns have been regulated based on the location of the activity hub and the identified intensive and extensive development scenario. The residential density in the three classes have been identified as 80 PpH in the low rise areas, 95 PpH in the medium rise and 110 PpH in the high rise areas. The high density residential areas are off-setted with the provision of sufficient institutional, commercial and public areas. The plot sizes in the low rise low density have been kept high such as to initiate the process of development dispersion from the core city areas. It should be also noted at this point that PKDA constitutes of quite a high percentage of non developable lands constituted of forests, wetlands, gullied and eroded lands and water bodies. Hence the gross PKDA as well as the zonal densities are much lower than the calculated densities of 80, 95 and 110 PpH. The allocation of these amenities has been indicated in the annexure and has been further elaborated on the development control regulations.

The residential areas from R3 to R1 have been dissipated from the major road corridors which have the R3 category abutting the road followed by R2 and R3 in the fringe areas. The proposed densities have been achieved by examining the difference between the carrying capacity of the existing urban area from the projected population such as to assess the spillover population, which needs to be dissipated over the developable land.

The land potential analysis and the land suitability analysis layers were then superimposed over the existing land use so as to identify the density patterns. The density was regulated with the FSI and the plot sizes. The ground coverage was also regulated such as to meet the per person open area norm. It is estimated that the low density areas shall expand to meet the future requirements through densification and intensification with the increase in the municipal area limits.

The residential clusters are to be fragmented into low density low rise, medium density and high-rise developments depending on the location. The areas abutting the roads are to have high density mixed use development such as to garner the advantage of road frontage. These blocks can have commercial amenities in the G and G+1 and residential development on the higher levels.



3.1.2 Identification of Government land

The identification of government land for locating the public amenities, institutions, roads, recreation areas is essential for the speedier implementation of the proposed land use allocation. The ideal distribution of the land use classes have been considered based on the requirement and the travel distance and time to these amenities from the residential sectors.

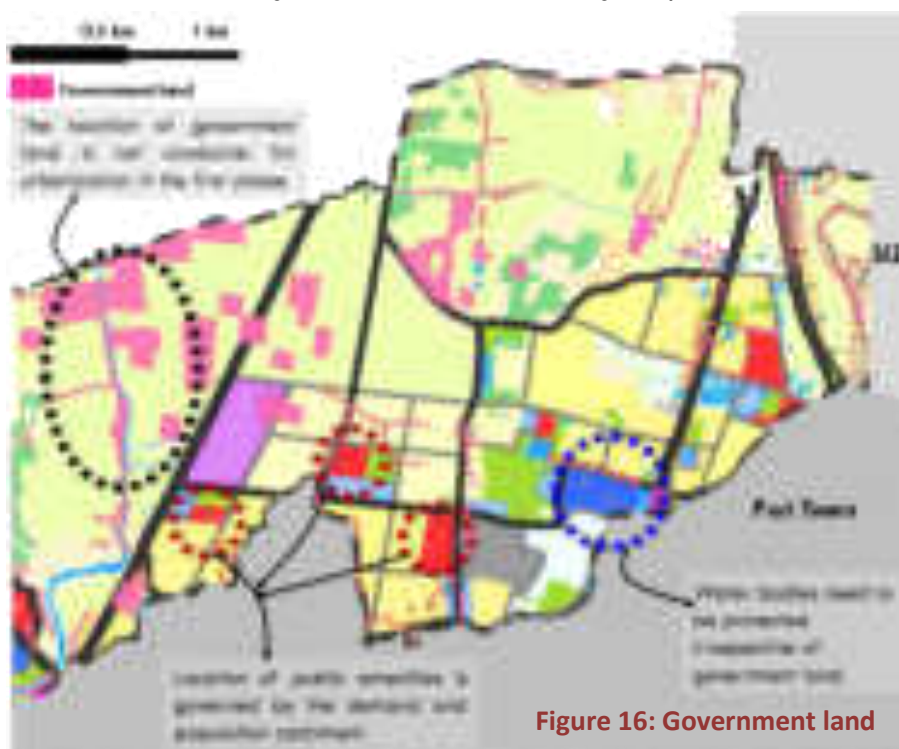


Figure 16: Government land

However it has been observed that the government lands have been lesser than that required to put all the public uses on them. Hence CEPT suggests the adoption of the TP scheme mechanism in areas where the government land is lesser than that required. The attached illustration explains the limitations of allocating all the amenities on the government land.

The parcels of government lands are located on the outer periphery of the Puri Sadar area, the propensity of these areas to urbanize shall be only after the intervening areas have become urban, and hence the redistribution of the sectors based on the government land is not feasible.

Despite not being located on the government lands the water bodies need to be conserved on the proposed land use, and hence the recreation areas have been suggested accordingly.

3.2 Growth Corridor Identification

The process of designating growth corridors and the identification of potential lands for the future expansion of the designated activities is governed by the development vision of the area and the existing growth trends. The land allocation for various activities is based on the demand in the region. The demand can be further segregated into two categories. The first is the natural trend based growth of the region and the second is the induced demand which is originated from the activity pattern that is envisaged in the region.

The spatial distribution of the land is based on the land suitability and the availability of the conducive amenities in the region such that the area may support the proposed activities. The area distribution and the calculation of the land requirement is done through guidelines, case studies and customizing it to the local requirements. A reasonable objective would be for 70-80 percent of new development to occur within the designated growth areas.

The UDPFI specifies the land requirement and the norms for the distribution of land according to the various categories. These standards were followed for identification of the area required under the various heads. However these were also customized to the regional requirement since the UDPFI details for urban areas and there is a considerable share of rural areas in the region. The UDPFI details the land requirements based on threshold population. However in the case of rural areas the population is often not enough to house the proposed amenities based on normative planning principals. Hence in these cases a developmental planning policy has been followed such that the amenities are assessable to the rural population which shall induce development in these areas and also help in dispersing the development and reliving the stressed urban areas.

With these guidelines for designating rural and growth areas in mind, consideration has to be given to the characteristics of each area. The identification of the growth areas are based on the absorbing capacity of the region for new developments, environmental constraints that the area might have, and the existing development characteristics' of the area.

There are different kinds of growth areas (residential, commercial, and industrial), and different kinds of rural areas (agricultural and forest). Among growth areas, it may designate (for example) one or more types of residential growth areas, one or more types of commercial or industrial growth areas, traditional downtown areas, other mixed use areas, and/or seasonal resort areas. These concerns have been addressed by identifying the lands as the Special Institutional areas, differentiating the residential areas, classification of the commercial areas based on the feasibility of each.

Identification of the area for growth have been classified under three categories

3.2.1 Land Suitability Analysis

Land suitability analysis is a tool to identify the suitability (or the unsuitability) of the different land parcels for development. While planning for the PKDA region the sensitivity of the environmental receptors and the need to protect and conserve them was felt. Hence environmental suitability to understand the land parcels that can sustain development and the areas which need to be conserved was undertaken. A GIS based analysis was carried out, based on the detailed land classes and sub classes received from ORSAC. The suitability evaluation supports a preferential decision to provide certain type of activities within a particular landscaped/land covered condition. The suitability analysis was done through a systematic, multi criteria analysis of different conditions, land type, and landscape. Two broad zones were identified based on the land suitability

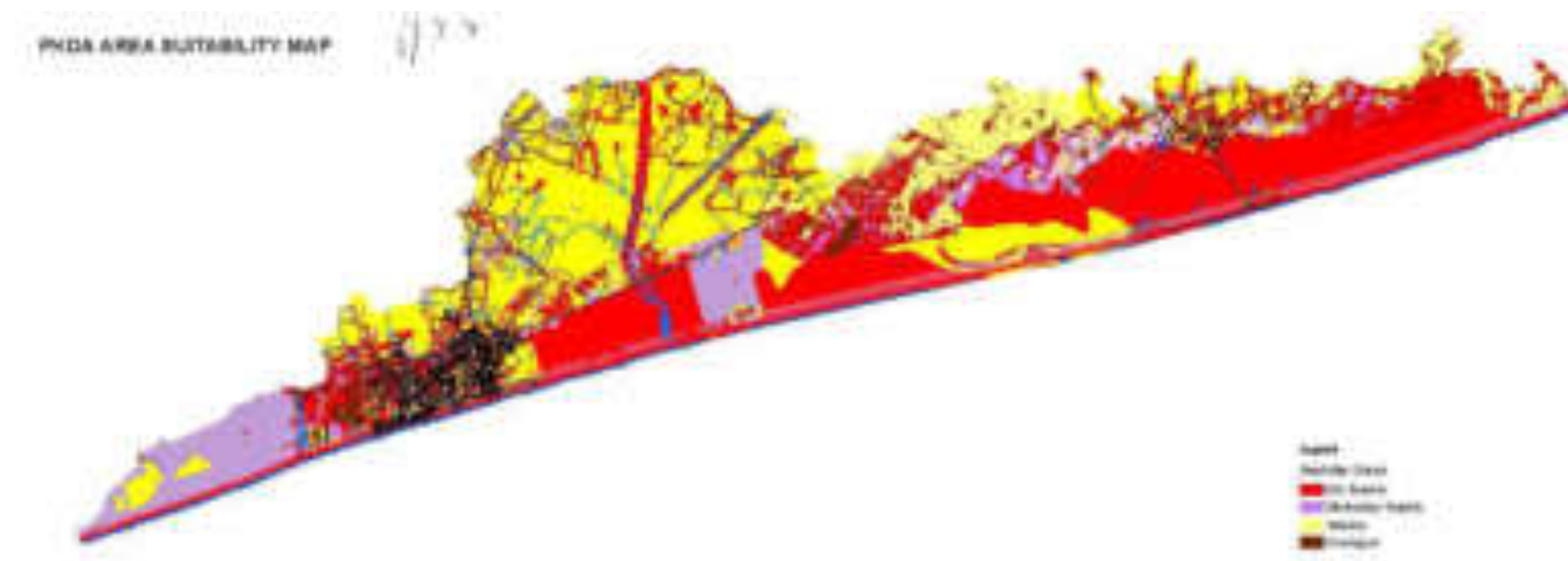


3.2.1.1 Conservation Zone

Conservation zones are primarily high ecologically sensitive areas and include most of natural features, environmentally sensitive areas such as beach, aquifer areas and forests. PKDA region also has land parcels under wetlands, gullied and ravenous lands etc. These have been identified as conservation areas, and suitable buffers were included such as to preserve these areas.

3.2.1.2 Development Areas

The development areas have been through the existing developments, areas with development potential and the absence of any environmentally sensitive receptor. The development areas have been further sub divided into suitability and moderately suitable, such as to differentiate between the intensity of development. The attached map indicates the output of the land suitability assessment for PKDA.



Map 1: Land Suitability Assessment - PKDA

The various parameters considered for the land suitability assessment are

- Ecologically sensitive areas
 - Mud flats
 - River beds
 - Marshy/Swampy areas
 - Aquaculture ponds
- Aquifer areas- Two sweet water zones in Puri
- Water Bodies
 - Rivers
 - Tanks
 - Lakes
 - Reservoirs and Dams
- Forests
 - Forests
 - Coastal strips and plantations
 - Land with scrub
- Waste lands
 - Water logged areas
 - Coastal sands
 - Eroded lands
- Agricultural
 - Agricultural plantations
 - Crop lands
 - Horticulture areas
 - Orchards
- Coastal Regulation Zone
 - 200m from high tide line
 - 300m restricted development zone

The outcome of the land suitability analysis is indicated in the attached table. This indicates the maximum development potential of the land in PKDA area. However the proposed development plan is till 2031 and hence the developed areas are much lesser than the developable areas. Also as might be noted from the map that a substantial area under highly suitable is under the SIZ, hence which has not been included in the proposed development plan 2031.

The area near Ramchandi is indicated as highly suitable in the Land suitability analysis. However CEPT suggests a low intensity development in this region, owing to the environmental concerns of a meandering river course and the estuarine conditions that could not be reflected through the LSA



To identify the areas which have the immediate potential of development, a land potential study has been taken up as discussed in the subsequent section.

Table 2: Land suitability summary

Region	Land Suitability	Area (Sq.Km)
Puri Konark Development Authority	Highly Suitable	135.32
	Moderate Suitable	8.03
	Least Suitable	152.97
Total Region		296.32

Identification of Development Zone (Land Potential Analysis)

Once the conservation zone was demarcated, the remaining area was opted for developmental activities. Based on information of existing proposals and ownership some areas were demarcated as moderately suitable because of future development potential.

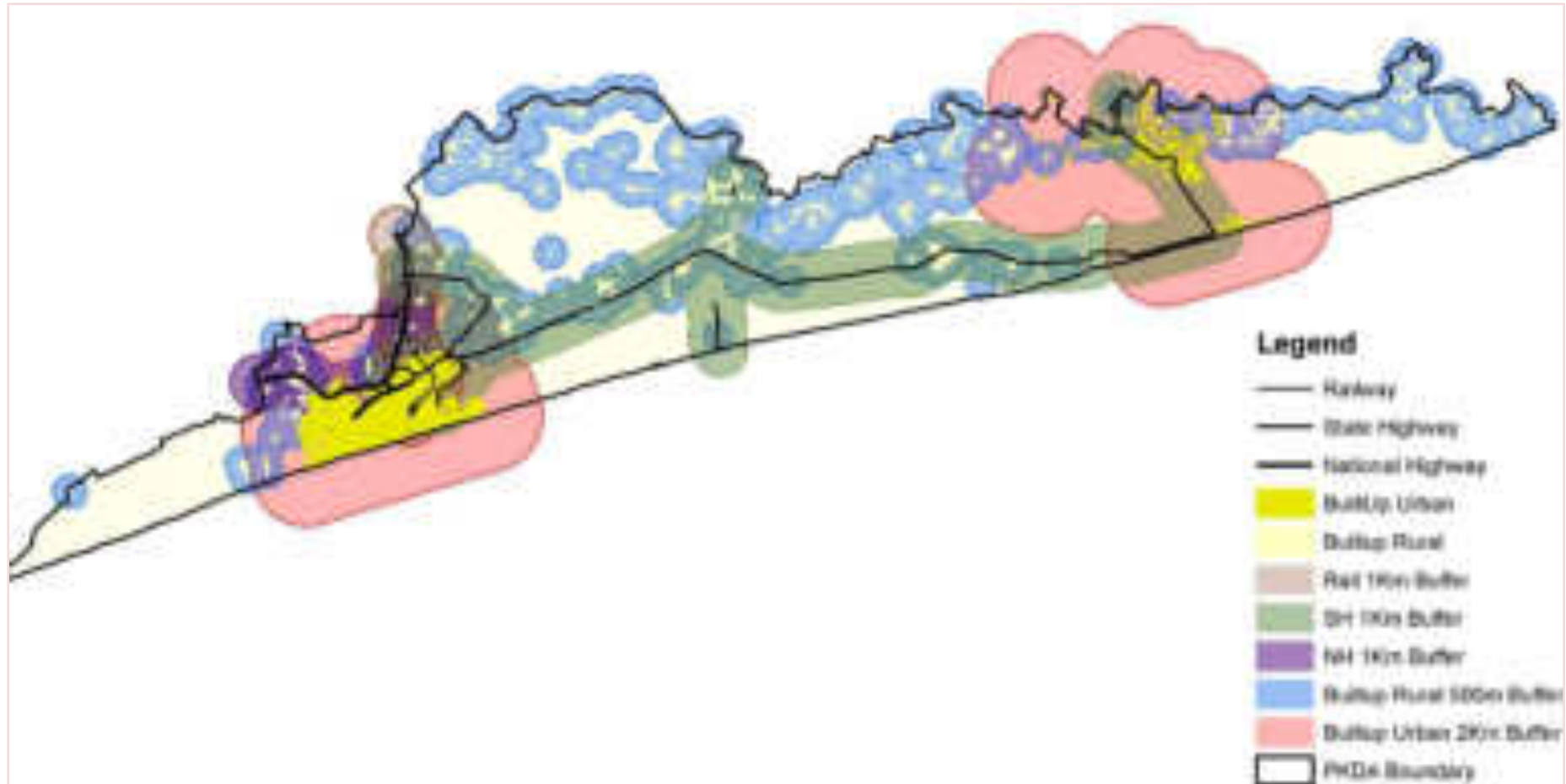
Prioritization of land for development has been done based on the following parameters which are conducive for bringing new development activities.

- Proximity to roads
- Proximity to railways
- Proximity to urban centres
- Proximity to religious centres

The attached map indicates the land potential studies undertaken under for the PKDA region. The areas within 2km of the urban centers and along the major roads have the highest potential to urbanize. This is followed by the alternate corridor that may be developed between Puri and Konark parallel to the existing marine drive connection.

The existing growth needs do not fuel the development till Block B, towards Kakatpur, hence this area in the current plan purview has been marked for future developments beyond 2031.





Map 2: Land Potential Analysis

3.2.2 Growth Nodes

Growth nodes are located in close proximity to the developed urban areas which have the propensity to be developed in the immediate phase. These have been identified as the future hubs of development. They are characterized by the creation of urban/regional level magnets and activities. They shall be acting



as the next hierarchical level of development dispersion points. The identification of the growth nodes has been done based on the availability of the “urbanizable” lands, proximity to existing development and also the presence of transport network. The identified growth nodes have been marked conceptually on the attached map.

Growth areas have been designed with the following criteria:

- Have, or can efficiently obtain, public facilities and services.
- Have natural characteristics suitable for development.
- Are large enough to accommodate the expected growth over the next 10 years.
- Can accommodate a variety of housing types.
- There should be sufficient scope of integrated development around these areas for development beyond 2031.

3.2.3 Growth corridors

Growth corridors as the name suggest are the links between these growth nodes which create a corridor sort of development linking these identified hubs. There are heavier on the residential and the institutional required to support this residential land uses. This model of development helps in the penetration of the infrastructure facility and the urban amenities in the peri-urban and rural areas through the transport corridors. Promoting mixed use within these areas shall aid in the reduced job-home distance. This also allows the transit corridors to be developed as mass transit corridors, creating sufficient demand along the same.

3.2.4 Rural Areas

PKDA region is characterized by lush and productive agriculture fields and rustic rural settlements. It is crucial to conserve as much as possible of agriculture lands and the rural settlements that are not prone to urbanization through the CDP horizon. The rural areas have been designed such as to

- Include important agricultural and forestlands.
- Include large areas of contiguous, undeveloped land used by wildlife, for resource protection, and for outdoor recreation.
- Include important natural resources and scenic open spaces.
- May have very low densities of development interspersed among fields and woodlands.
- Should not include areas in which a significant portion of the community's development is planned to occur.

Rural settlement and rural character conservation has been attempted along with installation of social and physical infrastructure as per requirement. The identification of these areas has been done based on mapping of the existing amenities and the need forecast in the region. Thrust on access has been given for the amenities.



The attached map indicates the growth corridors and the growth nodes in the region. For a region like PKDA it is crucial to identify the opportunities for tourism in the region. These shall be the secondary growth nodes in the region and shall help in absorbing the tourist/floating population of the region. The nodes of tourism have been identified near the proposed Shamuka Resort, near the forest areas close to the beach, the river and areas of the Block B which shall be used as sustainable tourism models like eco tourism and eco villages.

The concepts of Transit oriented development and the concepts of new urbanism have been used for envisioning PKDA in 2031.



Figure 17: Growth Corridors in the region

3.3 Activity Allocation

Based on the understanding of the results of the land suitability analysis and the growth potential of the various parts of PKDA, activity based zones have been identified in the PKDA area. The development intensity shall vary in these identified zones made on the LSA outcomes of suitable, moderately suitable and not suitable. The unsuitable areas identified from the LSA are categorized under conservation zones, and the suitable and moderately suitable likewise. These are discussed as under.

3.3.1 Development Zones

The development zones have been marked based on the growth potential of the subzones. It has been observed that the Puri town has significantly high population concentration as compared to the region. The plan attempts to decongest Puri town and disperse development in the region. Hence these Development Zones have been identified and the activity pattern has been developed such as to create counter-magnets to Puri and induce growth the peri urban areas. The intermediate growth node shall help in brining Puri and Konark close through an intermediate development. This area is in close proximity to the proposed Institutional Hub and SIZ and shall also have impacts of the same. A region level commercial and recreation hub can be created in this location. Primarily residential area shave been suggested and this area is estimated to have high real estate demand driven by the “second home” concept. Sandwiched between lush agricultural fields and dense forestation this zone is poised for extensive development in the future.



Map 3: Development Zones



3.3.2 Heritage Zone and Institutional Zone

The heritage zone has been marked for Puri and Konark with the aim of preserving and promoting heritage based tourism in the region. The other developments in these heritage precincts have been closely moderated through stringent development control in these areas. While the *Bhadrasahi* area and the Grand road has been earmarked as heritage precinct in the temple town of Puri in Konark the temple precinct and the adjacent layer of built ups has been identified under the heritage zone. Demarcation of the heritage area especially in Puri not only takes into consideration of the temples and religious establishments but also the holy tank in the city. It is expected that identification of the Heritage Subzone shall contribute to better implementation of the protection and preservation schemes. Special projects that are suggested for the same have been indicated in the relevant chapters.

An institutional area has been marked as puncture in the forest areas. This is envisaged to develop into a knowledge hub of the region and not confined to PKDA but state and national level. Theme based education entrepreneurship training; traditional studies and art forms are suggested for this region.



Map 4: Heritage and Institutional Zone

3.3.3 Restricted Development Zone

As has been already discussed the population pressure and the crippling infrastructure issues of Puri Town, in the proposed land use 2031, Puri Town has been suggested as a low intensity development. Hence the growth magnets are to be shifted/created to the peripheries and the identified growth zones as the developed zones.

It is suggested that the vacant areas in the periphery of Puri to be developed as green/recreation areas for the city, which it currently lacks. However considering the natural growth patterns and the need for urban lands within Puri some areas have been proposed for Intensive development. The aquifer areas have been conserved, and no development plan has been prepared for the no development zones.



Map 5: Restricted Development Zone

3.3.4 Tourism Zone

The areas with special opportunities for tourism has been put in dedicated Tourism Zone. These shall have all the opportunities as well as the amenities required for the tourism. The proposed Shamuka Project has been included as one of the major tourist hubs of the region. Another location identified in the area is that of the river mouth close to Ramchandi beach. The proposed ferry service links these points on the region. In the Zone 6 new areas for the proposed eco village has been suggested. This is a very low intensity and subtle approach for tourism development in the region and shall aid in improving the socio economic conditions of the locals as well contribute to the overall regional development.



Map 6: Tourism Zones

3.3.5 Agriculture Zone

PKDA region has considerable tracts of agriculture lands. There are coconut plantations and orchards in the region. The agriculture areas have been conserved as much as possible, especially in Block A, Konark and Block B. The development in the Agriculture zone has been controlled through development a control regulation which mandates the permissible FSI, ground coverage and the type of development that is permissible in the region.

Proposals for agriculture markets and the improvement of infrastructure needs for promoting agriculture have been suggested in the region.



Map 7: Agriculture Zone

3.3.6 Conservation Zone

Almost 60% of the PKDA land is under forests. This has been clearly demarcated as no development regions. Small scale tourism activities like treks and camps have been suggested in these areas, as an alternate link between Puri and Konark. A road widening proposal has also been suggested in the forest land connecting Puri and Konark. However an alternate route has been suggested with shuttle bus service which shall aid in the reduction of traffic along the existing Puri- Konark road which passes through the forest.

A dedicated Institutional zone has also been suggested in the forest area. A low density and low rise development has been suggested such that it does not create any disturbance to the flora and fauna of the vicinity. The water bodies in the form of rivers and lakes have also been provided with a green buffer, such that they may be conserved and protected. The other no go areas of the PKDA region are those of gullied and eroded lands, wetlands etc. These had been taken care of during the land suitability assessment, where the no go areas have been clearly marked



Map 8: Conservation Zone

3.4 Components of Land Use Planning PKDA

The proposed land use for the PKDA area has been evolved based on the concepts of new urbanism and Transit oriented development respectively. Proposed Land use plan for PKDA 2031 not only meets the need of the future growth of the area but also takes in to consideration the existing natural and built heritage. The proposed land use plan aims to achieve the following:

- Balance between conservation and sustainable development
- Protecting yet opening up to tourism the rich natural heritage in the region comprising of the dense forest areas, the pristine beaches, the vital agricultural lands, and the two aquifer zones within Puri (the only source of sweet water in the region)
- Restoring and strengthening the **ancient architecture & heritage structures** – the Jagannath Temple Puri, Sun Temple Konark, and other heritage precincts within Puri such as the numerous Temples, Mathas, Ashrams, Jagaghars, Tanks
- Creation of the opportunities for the development and planning for the **rich cultural heritage** of the region – the arts and crafts of the region, along with the traditional dance forms.
- Creation of employment opportunities dispersed along the region for the various residential clusters.

Table 3: Components of land use planning for PKDA

	Conservation areas	Restoration and Strengthening	New Development areas
Areas	Forest, wetlands, water bodies, rivers and lakes	Heritage precincts of Puri and Konark	Peri-urban areas , Puri Konark road
Activities	<ul style="list-style-type: none"> - No go areas - Buffered with the green belts - Proposed activities in the vicinity have low ground coverage and the buffers can be used to absorb spill overs - Low intervention activities such as forest trails and low intervention water based activities. 	<ul style="list-style-type: none"> - Strengthening road connectivity - Provision of public transport corridors - No new development zones in the vicinity of heritage precincts - Strengthening areas and craft based activities to restore the intangible heritage of the area. 	<ul style="list-style-type: none"> - Development of roads to open these areas - Development of clusters with designated threshold population for better management of urban services - Development of a modular urban cluster which can be repeated in the future development areas such as to develop the areas cohesively.



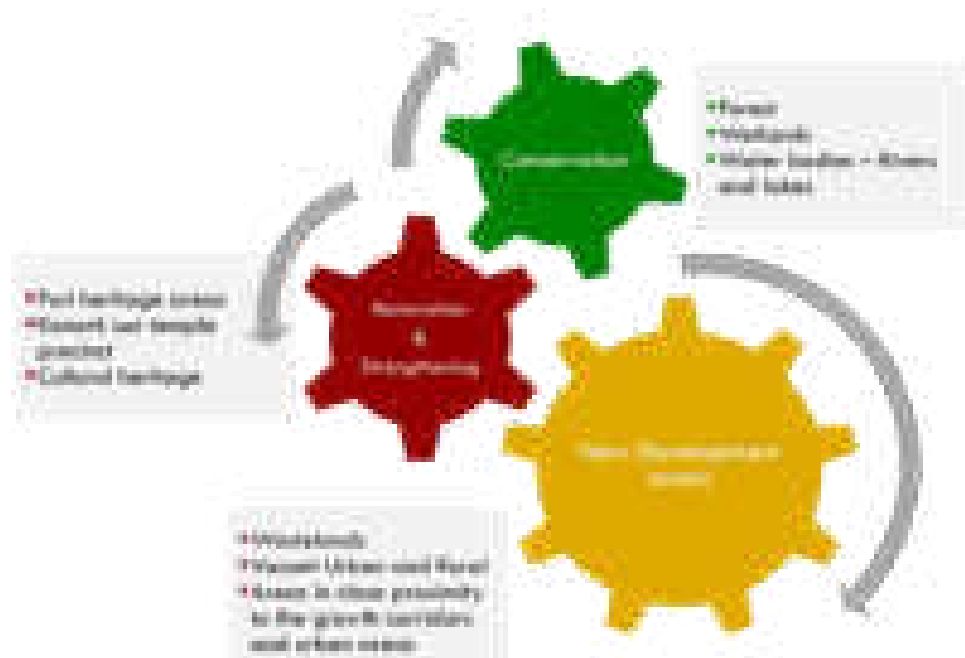


Figure 18 Land Use considerations in PKDA

proposed land use map however the vacant lands within the developed areas have been proposed for future development based on the densification approach.

The developable areas in close proximity to the developed areas have been proposed in the first phase of development. It has been observed that the categories like wastelands occur within the forest areas also. These have been untouched in the proposal with an intention that these may be converted to forest areas, hence providing a continuous and un-fragmented stretch of forests in the PKDA region.

The non developable areas have not been interfered with in the proposed land use. Efforts to strengthen these have been undertaken. The lakes and tanks which are in the urban areas or in the proposed new development areas have been coupled with the proposed green recreational areas. These can have community level management such as to preserve them better. The natural features like forests and water bodies have been sufficiently buffered in locations wherever possible. Provisions of activities which help in awareness generation for the preservation of nature and forests have been provided in this region.

Due to the diverse geographical conditions and the market forces of land development the characteristics of PKDA area varies greatly from Puri to Konark. The development in the region comprises of the two main urban areas where most of the population concentration has been observed. The population concentration

The existing land use has been stratified in three segments

1. Developed areas – Consisting of all the developed land use classes both urban and rural. The intervention in the proposed LU has been restricted to density control measures such as to induce the desirable growth pattern. Amenity provision in the amenity deficient areas has been taken up, as well as certain pockets of vacant lands has been taken up

2. Developable areas – Consisting of Vacant urban and rural areas, wastelands (land with or without scrubs). Wherever the need was felt agriculture land has been converted for urban use. However this has been kept minimal. The permissible activities in the agriculture areas have been elucidated in the permissible activity pattern.

3. Non developable areas – Wetlands, water bodies, wastelands (gullied, eroded lands, coastal sand, river beds and water logged areas)

While the developable areas have not been touched in the

in Puri city is mainly due to its religious significance and importance. Whereas Konark has more of a low density urban development and a concentration of commercial activities near the temple precinct. The intervening areas of Block A and Block B which is beyond Konark towards the Kakatpur area is predominantly rural agriculture based hamlets. The coast line of PKDA region is mostly covered with dense forest areas and hence much development is not witnessed within the vicinity of the coastal line. PKDA region has the typical characteristics of sprawled corridor based development. One village is made up of 3-4 clusters of hamlets located along the roads.

However such a model of development is not suggested for future developments. This inflates the infrastructure provision costs. This leap frog nature of development leads to unplanned and fuzzy patches which is difficult to plan and provide services for. Hence the proposed land use looks at a more integrated and cohesive development model.

3.4.1 Proposed Land Use Categories in PKDA

The proposed development / land use allotment follows past trend of PKDA, however it suggests more effective and sustainable development scenarios. Mentioned below are the descriptions of the various categories that have been proposed for PKDA. The proposed land use of PKDA for 2031 not only takes care of the increased population of the region till 2031 and assigns land for the development but also helps in opening up remote and under connected areas of the region to the two urban centers.

3.4.1.1 Residential Use Zone (R)

Table 4: Assumed residential stratification in exiting residential classes

Residential Sub Classes	
Planned Plotted Houses	R1
Multi Storied Housing	R3
Project Housing Schemes	R1
Irregular Layout	R1
Clustered Settlement	R2
Slums Squatters	R2
Scattered Houses	R1

The residential zones of PKDA have been divided into R1, R2 and R3. These have been developed based on the existing nature of development and the proposed scenario. It has been noticed that the R3 category which is essentially a high density development, with higher permissible number of floors (G+4) is comparatively lower than the other two categories of medium and low rise. However based on the existing trends and superimposing the desirable scenario the composition of the residential areas of R1, R2 and R3 have been proposed. The assumptions have been taken as under in the attached table.

These have been mentioned in the attached table. While calculating the proposed land use distribution it has been summed that 50 % of the slums will be regularized by 2031. The category of dilapidated houses has been added while calculating the housing stock that is required for 2031.



The R3 category has a 5% allocation for commercial facilities while the R2 category has that of 3%. The development control regulations of the R1, R2 and R3 have been discussed in the chapter dedicated to the development regulations and controls.

The proposed residential development in the region has been divided into three main categories with varying densities. The high density development is proposed along the main growth corridors and the growth centres (R3). The medium density (R2) areas are proposed in between the high density residential areas and the low density residential areas. These medium density areas act as transition zone between the high and the low density areas. The low density areas (R1) are proposed in areas which are away from the main growth nodes and corridors. These areas are such that they have more open spaces merging these areas with the agricultural areas.

The attached charts indicate the percentage share of the R1, R2, and R3 in the existing and the proposed scenario.

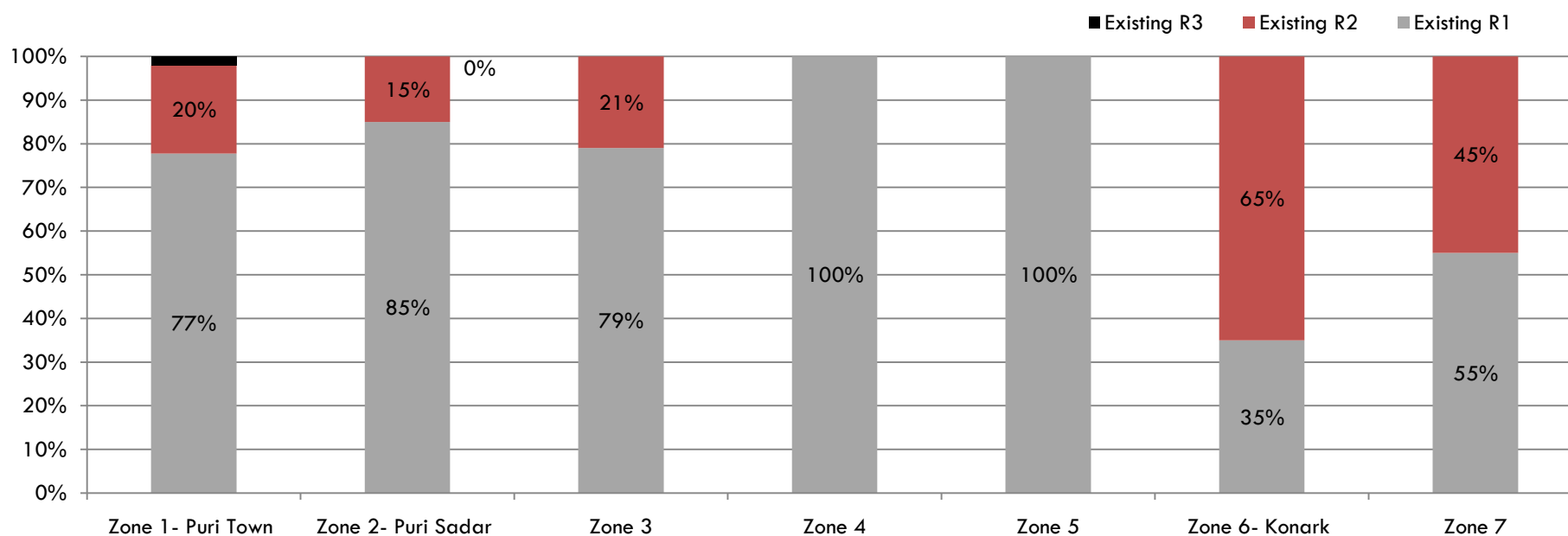


Figure 19: Existing Residential composition of PKDA

The proposed scenario has been developed based on the following criteria

- The existing development trends
- Density pattern that is envisaged, since the density increases from R1 to R3, based on the desired scenario the residential typology mix has been derived
- Environment factors such as location of water bodies and gullied lands, where low rise development has been promoted to reduce the stress on land.
- The sprawl pattern and the infrastructure outreach
- Distance from the town centres- Plots located away from the town centres have the tendency being bought as second homes and also demand higher floor area as a trade off to the proximity to town centre.

The proposed residential distribution has been indicated in the attached chart.

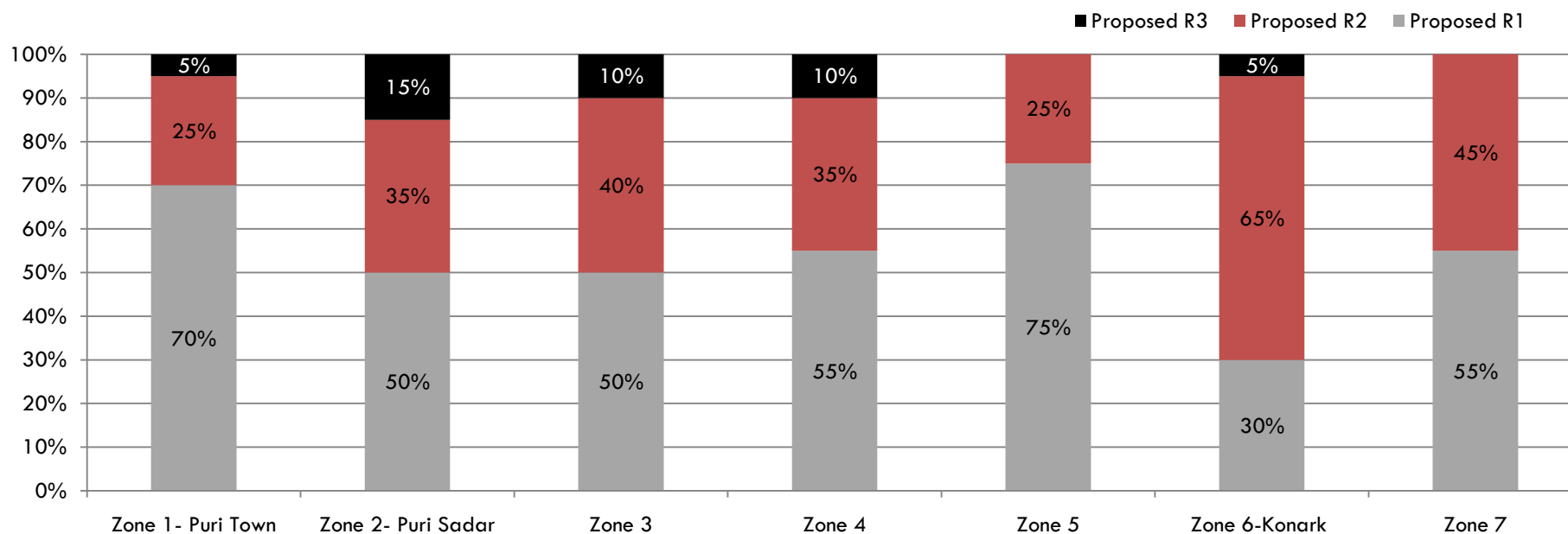


Figure 20: Proposed Residential composition of PKDA

3.4.1.2 Commercial Use Zone (C)

The proposed commercial development in the region are also been differentiated in to Commercial zones (C1) and Commercial Zones (C2). While developing the proposed land use plan, it has been attempted to maintain a hierarchy of the commercial facilities such as to differentiate between the neighborhood level shops, cluster level commercial to district level large commercial conglomerations.

The special commercial zone includes special integrated facilities such as resorts and tourism, IT parks and eco villages. These have been special treated and the proposed activity pattern in these has been mentioned in the relevant sections. Public amenities such as parking and toilets have been clubbed with commercial establishment and the same has been mandated through the DCRs.

3.4.1.3 Industrial Use Zone (I)

Industries are important economy generators in the region and area reservations for the same have been allocated along the proposed residential pockets. These have been dispersed throughout the area close to the residential areas such as to reduce the travelling distances and also promote the same.

The study of the census trends indicate a predominance of the tertiary sector which when observed on the site indicated that the tertiary sector primarily was made up of the tourism industry. Other industrial activities include small scale arts and crafts activities and fish processing. Opportunities for the same has been discussed and indicated in the relevant chapters.

3.4.1.4 Utility and Services Use Zone (US)

The public amenities have been mapped based on the demands at the neighbourhood, cluster and city level. A hierarchy of the same has been maintained. The various activities in the public amenities include education, health, banks and financial institutions religious institutes and the allocation for the areas of physical infrastructure. The permissible activities in the areas marked as public amenities have been indicated in the relevant section.

3.4.1.5 Open Space Use Zone (OS)

The open space use zone includes the recreation areas, green belts etc. Recreational areas have been proposed as lungs for the cities. A hierarchy has been maintained for the same, from neighbourhood levels parks and gardens to the city level amusement parks. The development and the type of activities have been regulated through the use of development control for this zone.



3.4.1.6 Transportation Use Zone (T)

The transportation network follows a clear hierarchy of 24m, 18m and finally 12m which are the sector binding roads. The internal roads have been suggested to the tune of 9m and have not been indicated at the CDP level. It has been suggested that the same should be looked into while dealing with the zonal plans and the TP schemes.

The other components of the transportation are city level parking lots, bus stands, bus terminals and the BRTS corridor. The BRTS system has been suggested as a hybrid of dedicated lane BRT and mixed BRT on the Marine drive road.

3.4.1.7 Agricultural and Forest Use zone (A)

PKDA region has large tracts of fertile agricultural land. Other than the urban centers - Puri and Konark most the residential development is in or around large agricultural land. The proposed Land use proposal attempts to retain the fertile agriculture lands as much as possible. Since the envisaged growth model is a more cohesive and compact process of development

Land use proposal therefore tries to retain the fertile agricultural land. The proposed developments within the two urban areas are in such a manner so as to reduce the sprawl and allow concentrated developments so as to facilitate the better infrastructure facilities. This shall help in managing urban sprawl over the agricultural areas. Most of the future development therefore is low density low rise in the existing agricultural zone with large open spaces and possibility to still use for agricultural activities.

3.4.1.8 Coastal Regulation Zone

Located along the Bay of Bengal the CRZ has been marked and adhered to in all the proposals. The activity pattern as postulated in the same in the relevant section adheres to the regulations and small scale, inbuilt tourism activities have been proposed. The areas adjacent to coastal zone has also been kept at a low density to reduce the pressure on the same. Also this aspect has been closely studied based on the disaster mitigation and relief plan.

3.4.2 Conservation areas

3.4.2.1 Forest

The forest areas have been retained as it is in the proposed land use map 2031. These areas have been marked with minimal intervention. Certain small scale tourism activities have been suggested in these areas, which shall not impact the forest lands adversely. The fragments of wastelands in the forests have been retained as it is and it has been suggested that these should be converted to forests to maintain an uninterrupted patch of forests.



3.4.2.2 *Water bodies*

PKDA region has a vast gamut of water bodies ranging from rivers, lakes and tanks. There are also certain areas under wetlands and marshes. These areas are to be preserved and should not be burdened with built forms. The water bodies in the proposed Land use has been conserved and protected through the means of provision of green spaces wherever the water bodies are in close proximity of the urban areas or proposed built areas. This will not only aid in the improvement in the quality of the green spaces in the neighborhoods but also help in the conservation and protection of the same.

3.4.3 *Specialized Land Use Categories*

Owing to the special nature and character of the PKDA region, specialized activity hubs need to be developed. This cannot be covered under the gamut of conventional land uses. The description of the same has been indicated in the following section.

3.4.3.1 *Special Tourism Area*

Tourism and the related activities have been envisioned as one of the key growth drivers of PKDA. After analysis the site, the carrying capacities and the various opportunities of tourism these dedicated special tourism zones have been marked in the proposed land use. The activity pattern ranges from high end golf courses, plush hotels and convention centers to the subtle tourism models of eco tourism, in the case of PKDA through the concept of eco villages. The water bodies, dense forest areas invite the possibility of treks and camping. These have been explained in detail in the chapter dedicated to conceptual zoning.

3.4.3.2 *Special Institutional Area*

Along with the religious and heritage significance, the region also had a rich ancestry of culture, literature arts and craft. Proposed land use plan for PKDA promotes regional art and crafts.

This special Institutional zone includes area allotment for

- i. Gurukul
- ii. Sanskrit University
- iii. Dance Institute
- iv. Arts and Crafts Institute
- v. Museum
- vi. Orissa *Haat*
- vii. Medical tourism -
 - Ashrams and health institutes



- Ayurvedic plantation / trails
- Medical tour / spa centres
- Naturopathy institutes / ashrams

Proposed as a very low density development this is expected to become a traditional education and knowledge hotspot of the region. The setting between the religious town of Puri and the Heritage town of Konark, the impetus for the development and sustenance of such an intervention is highly recommended.

3.4.3.3 *Special Heritage Zone (SH)*

The high religious and the heritage value of the two towns of Puri and Konark calls for the protection and promotion of the same, for a better regulated in terms of the revenues that are generated from the same for the local government and also better managed in terms of the amenities that are there for the tourists in the region. The heritage precincts have been identified by mapping the existing points of heritage and religious interest in the area; conservation needs and linking them in a circuit or package for ease of access and better coordinated tourism planning. Various proposals for the enhancement of the same has been identified and designed meticulously. They have been included in the chapter of tourism planning and management.



4. Zonal Plans – Proposed land Use – 2031



4. ZONAL PLANS – PROPOSED LAND USE – 2031

4.1 Introduction

The proposed land use plan has been developed to induce the growth in desired direction, in a socially, economically and environmentally sustainable manner. To achieve the aforesaid objectives, the land use plan is prepared based on the following factors:

- Social, economical and environmental issues
- Existing land use distribution
- Existing transportation networks
- Development potential
- Future population distribution
- Planning concepts– New Urbanism, transit oriented development
- Administrative zones
- Availability of government land

4.2 Administrative Zones

The Proposed Land use plan for PKDA 2031 has been divided into eight administrative zones. This has been done for establishing a stronger link between the comprehensive development plan, to the Zonal Development Plans and finally the TP-Schemes that may be used for the faster implementation of the Plan.

The major zoning of PKDA region has been done based on the following parameters

- Administrative boundaries – Puri town, Puri Sadar, Konark, Block A and B and the village boundaries
- Natural features like forests, rivers etc.
- Major roads

While Puri town, Puri Sadar, Konark and Block B has been taken up with their existing boundaries for the block demarcation, Block A owing to its size has been divided into 3 zones.

The area comparison of the same has been indicated in the attached table.



Table 5: Area and Population composition of the Zones

Zones	Location	Population	% Population of PKDA	Area (In Sqkm)	% Area of PKDA
Zone 1	Puri Town	157837	74	16.29	5
Zone 2	Puri Sadar	14880	7	47.82	16
Zone 3	Block A	1667	1	20.91	7
Zone 4		6381	3	39.03	13
Zone 5		9190	4	40.30	14
Zone 6	Konark	16979	8	34.93	12
Zone 7	Block B	6872	3	34.36	12
Zone 8	Special Institutional Zone (SIZ)	NA	NA	62.70	21
	TOTAL	213806		296.33	

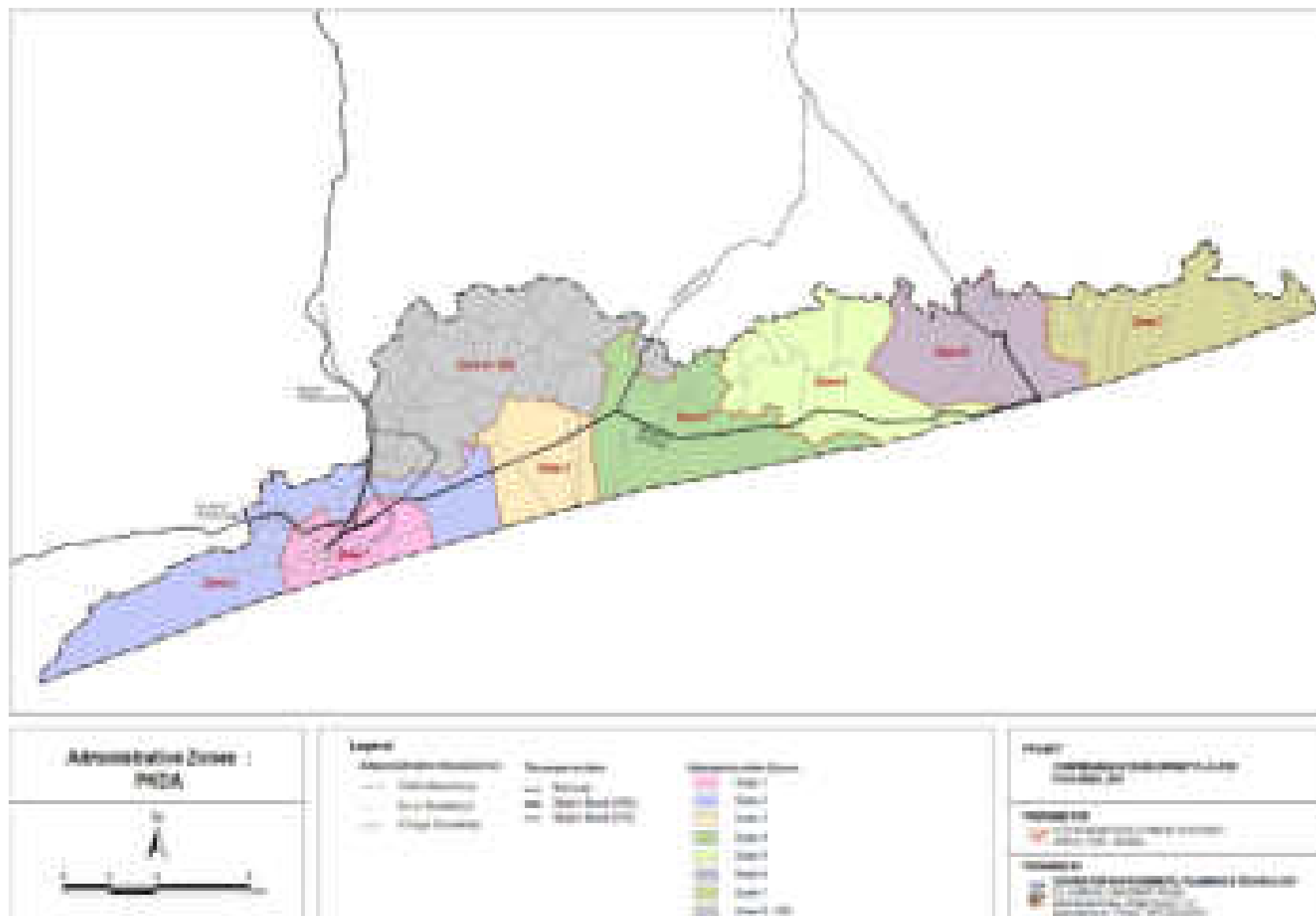
The attached table indicates that Puri is much densely populated than the other zones in the region. With 5% of the area of the total site it accommodates 74% of the population of the region. This growth hub needs to be dispersed in the region, hence suitable policies for the establishment of counter magnets need to be created throughout the region, reflected in the proposed land use plan 2031.

Puri Sadar emerges as the second growth hub of the region. Puri Sadar is emerging as the second growth hub in the region, accommodating its natural growth and also the spillover from Puri. It is suggested that the Puri Municipal limits should extend to accommodate Puri Sadar, for better and planned urban service delivery. The density variation between Puri and Puri Sadar indicates the possibility of planning interventions before Puri Sadar gets congested like Puri.

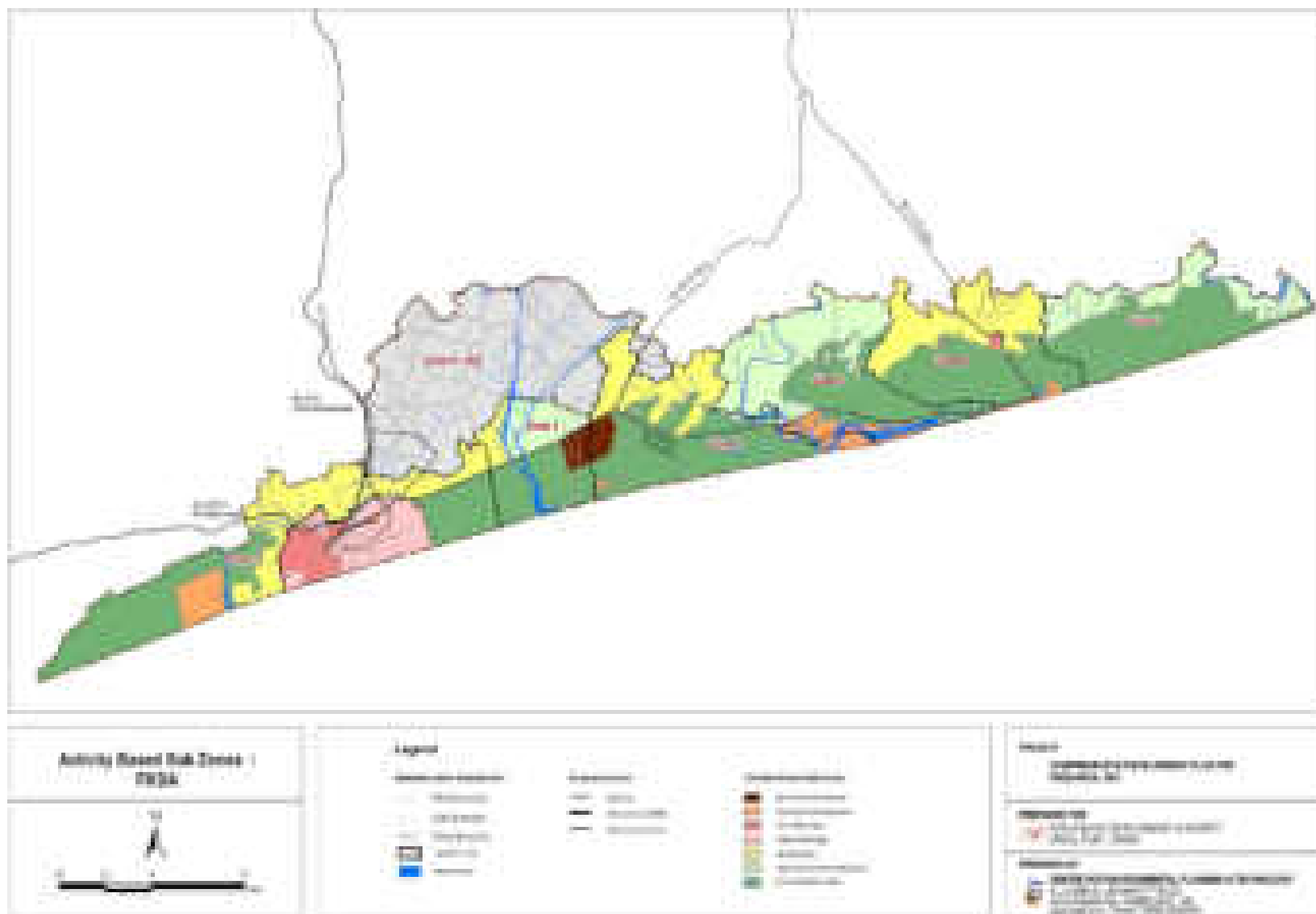
Other, activity based zones as mentioned in previous chapter are for the conceptualization and appropriate distribution of the Land uses in the administrative zones.

The attached maps show the proposed administrative zones, and proposed administrative zones integrated with the activity based zones.





Map 9: Proposed Administrative Zones, PKDA Region



Map 10: Integrated Zones (Administrative & activity based zones), PKDA Region

4.3 Land Ownership

In the proposed land use, the locations of the public amenities, roads, institutions, recreation areas etc has been governed on the availability of the government lands wherever possible. The plot wise land ownership details have been collected for identification of the government land parcels to facilitate better implementation of the plans and proposals, and to reduce the land acquisition need.

The government land category includes Abada Jogya Anabadi, Anabadi and Sarbasadharana etc., and all the land is owned various government departments. The government reserved category includes the land whose kissam are Patita, Bagayata, Bagayata, sarada, Gochara, gramya jungle etc.

The zone wise land ownership of PKDA area has been summarized in the following table.

Table 6: Zone Wise Land Ownership

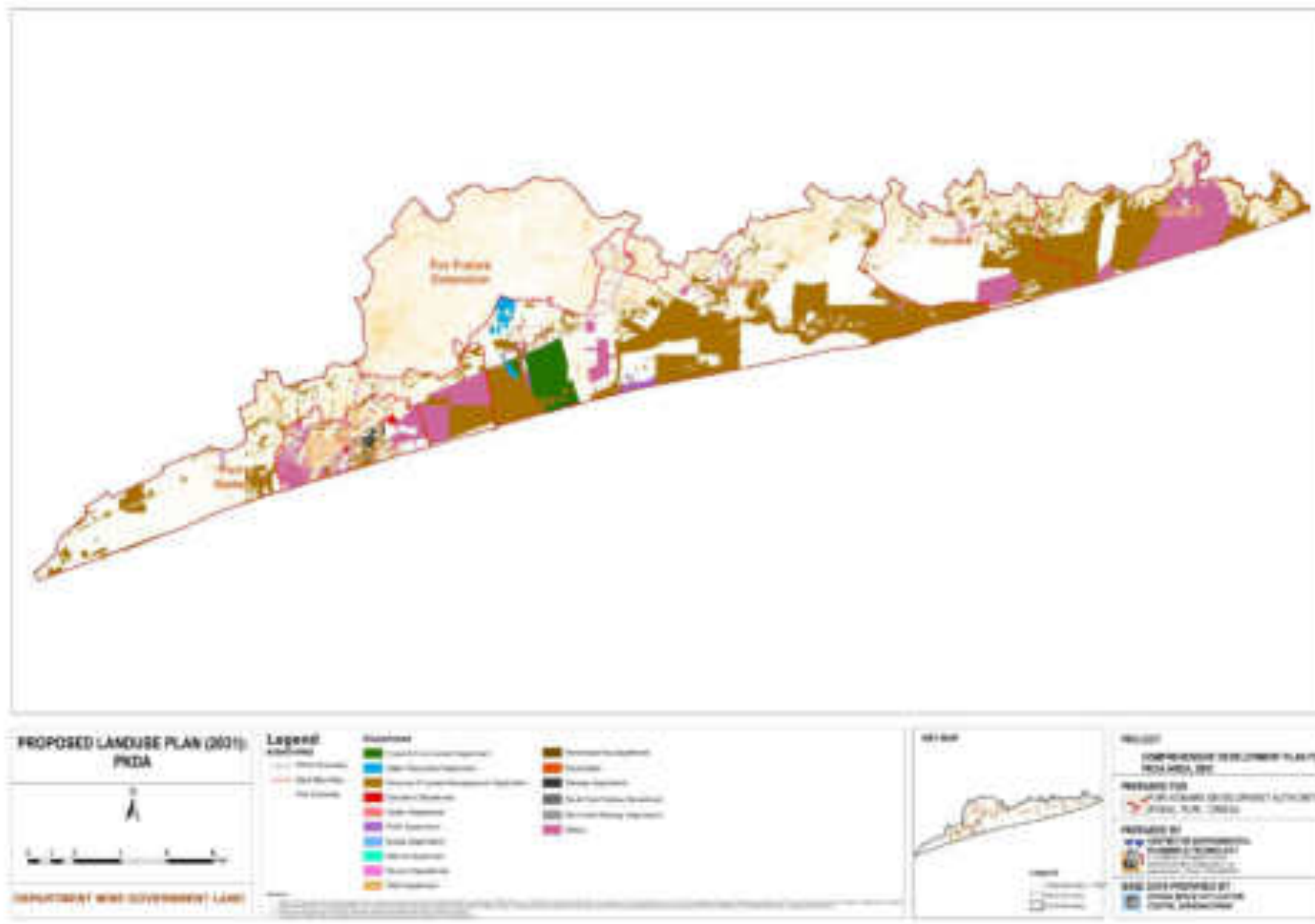
Zone (Block)	Land Ownership (Area in Sq.Km.)					Remarks (Data Not Available)
	Government Land	% GL to the total area of the zone	Private land	% PL to the total area of the zone	Total	
Zone 1 (Puri Town)	7.01	43.03	9.28	56.97	16.29	
Zone 2 (Puri Sadar)	12.70	26.56	35.11	73.44	47.81	Bastu
Zone 3 (Block A)	12.17	58.23	8.73	41.77	20.90	
Zone 4 (Block A)	16.33	41.84	22.70	58.16	39.03	
Zone 5 (Block A)	14.44	35.83	25.86	64.17	40.30	Tarakor
Zone 6 (Konark)	10.18	29.14	24.75	70.86	34.93	
Zone 7 (Block B)	22.57	65.69	11.79	34.31	34.36	
Zone 8 (SIZ)		0.00	62.70	100.00	62.7	
Total Area (PKDA)	95.40	32.19	200.92	67.81	296.32	

The attached table indicates that 32.19 % of land is owned by various government agencies in region. A considerable percentage of this land lies within the forest, thus the actual availability of government land that can be used for locating urban facilities is less. And, there is very less government land available in the growth zone like Puri Sadar, hence there is a need to adopt various other infrastructure provisioning and financing mechanism like Town Planning Schemes (TPS), land pooling and land readjustment. The attached map shows the available government land in PKDA.





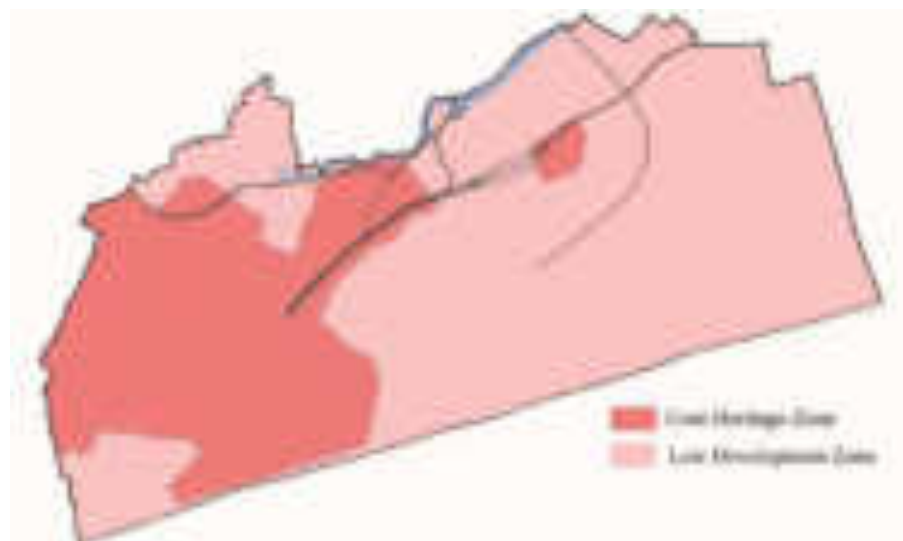
Map 11: Land Ownership, PKDA



Map 12: Distribution of Government Land under Various Departments

4.4 Zonal Land Use 2031

4.4.1 Zone 1 - Puri Town



Puri town is the most densely populated zones in the region with area of 16.29 sqkm. Over a period of time Puri has experienced inward growth for many years due to its religious significance. It is home for 74 % of population with 5 % of total PKDA area. The gross density of Puri is 97 PpH while that of the entire region (including Puri) is of just 9 PpH.

The existing population of Puri in 2001 is that of 157837, and it is expected to increase to 344098 by 2031. However in the given condition this entire population cannot be accommodated within Puri town, and has to be accommodated in its peri-urban area. It is estimated that almost 50-60% of the population that increase between 2001 and 2031 has to be accommodated in the Puri Sadar.

Upon analyzing the existing land use it can be understood that only 18% of Puri falls under the developable category. This is made up of vacant lands both urban and rural and the scrub lands. Almost 70% of Puri is completely developed, without much scope of densification.

Map 13: Activity zones, Zone 1

Proposed land use therefore tries to restrict haphazard development in Puri and be more sensitive towards natural resources such as tanks, water bodies, ground water recharge zones and agricultural areas within the city as well as heritage precincts and religious centers. Hence, the core heritage and low development zones are identified for unified distribution of proposed land use.

The proposed land use mainly focused on identification of recreational areas, commercial and parking spaces, as there is a prime need of providing open spaces and traffic control. Other land uses like residential, institutional etc. are distributed as per the location existing land uses.

After analysing current land use and conditions, context and neighboring activities, existing residential development of Puri is categorized in R1, R2 and R3 in addition with proposed residential development. Area in proximity to ground water zone, heritage precinct and religious centers are proposed to be low density development. Slum areas/EWS housing is categorized in R1. The increased demand for housing, fuelled by natural growth processes, has been suggested to be provided within the developable areas in the town and extra population can be provided in the Puri Sadar Zone.



Commercial development is categorized in C1, C2 & special commercial. Most of the commercial areas along the marine drive are proposed as special commercial / tourism infrastructure. Most of the development proposed is envisioned as hotels, resorts, guest houses, beach development, water sports and tourism such as boat ride, supporting infrastructure and similar catering to tourism industry. Other commercial developments proposed are C1 & C2, which are city and neighborhood level commercial. These commercial areas are proposed along Grand road and VIP road.

The calculations indicate that even in the existing population of 2001, the town demands an additional 176.77Ha of land for just green open spaces. It is observed from the existing land use of Puri city is that there are some green and open areas in the city which are either temple trust land or are part of Matha and hence are categorized as private land. Having dense residential development, the city does not have any open spaces for residents, parks gardens and open playgrounds within the city. The proposed land use for Puri provides recreational areas around water bodies, lakes and ponds, and recreational / green areas in the city centre attached with institutional, residential and commercial areas. These open spaces shall also act as a relief areas post floods or other such disasters. These areas become congressional areas for speedier disaster reliefs.

There are four major parking areas [refer mobility plan] proposed in Puri to control the congestion and traffic problem during festival season.

The aquifer areas are proposed to be regulated by stringent development controls, as presently it encroached by various developments.

The attached images indicate the possible development pattern in the Puri Town.



City Level open spaces



Multilevel car parking at Jagannath Vallabh Math



BRTS



Disaster shelters in open spaces

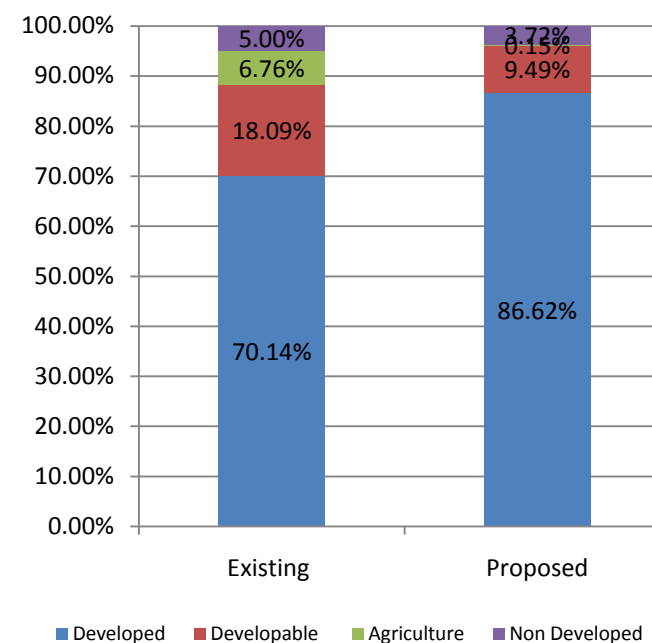
Sources: indiaonline.com, different case studies and CEPT designs

The proposed integrated Land use breakup has been indicated in the attached table. **The integrated land use is the total of existing and proposed land use.**



Table 7: Proposed and Existing integrated land use statement, Zone 1

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	4.77	28.61	6.04	36.41	7.80
Commercial	0.91	5.56	1.06	6.51	0.95
Industrial	0.03	0.19	0.03	0.19	0.00
Institutional	3.50	21.48	3.54	21.71	0.23
Recreational	0.60	3.68	1.66	10.20	6.52
Transport	1.51	9.26	1.67	10.25	0.99
Agriculture	1.21	6.76	0.14	0.15	-6.61
Non developable	0.81	5.00	0.61	3.72	-1.28
Developable	2.95	18.09	1.55	9.49	-8.60
Total	16.29		16.29		



Changing Land Utilization Pattern

The attached chart indicates the land dynamics both in the existing and proposed scenario. It can be seen that, about 9% of developable area and 7% of agriculture & non developable area have been used for proposed land use. There is an increase of 16.48% residential, 6.52% recreational, and 1% transportation in proposed land use. The overall developed area has been increased by 9%.

Table 8: Proposed Land uses with sub classes, Zone 1

Land Use Category	Sub Classes	Proposed Area	Ownership
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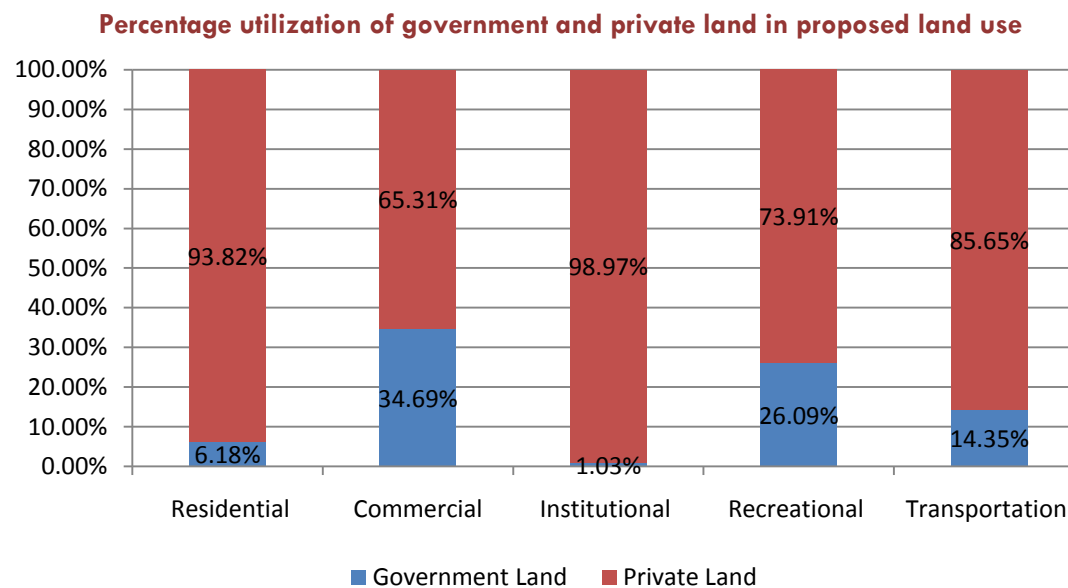
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1	0.44		0.02		0.421	
	R2	0.49		0.03		0.463	
	R3	0.33		0.03		0.307	
Sub total		1.27	47.25	0.08	6.18	1.19	93.82
B. Commercial	C1						
	C2	0.08		0.01		0.067	
	Special Commercial/Tourism	0.08		0.04		0.034	
Sub total		0.15	5.76	0.05	34.69	0.10	65.31
C. Institutional	Institutional/ public utilities	0.04		0.0004		0.038	
	Special Institutional						
	Major Utility						
Sub total		0.04	1.44	0.0004	1.03	0.04	98.97
D. Recreational		1.06	39.50	0.28	26.09	0.78	73.91
E. Industrial							
F. Transportation	24.00 m Road	0.02		0.01		0.02	
	18.00 m Road	0.05		0.01		0.04	
	12.00 m Road	0.01		0.00		0.01	
	BRTS	0.08		0.01		0.07	
	Bus Stand/Parking	0.004				0.004	
Sub Total		0.16	6.05	0.02	14.35	0.14	85.65
Total		2.69	100.00	0.43	16.11	2.25	83.89

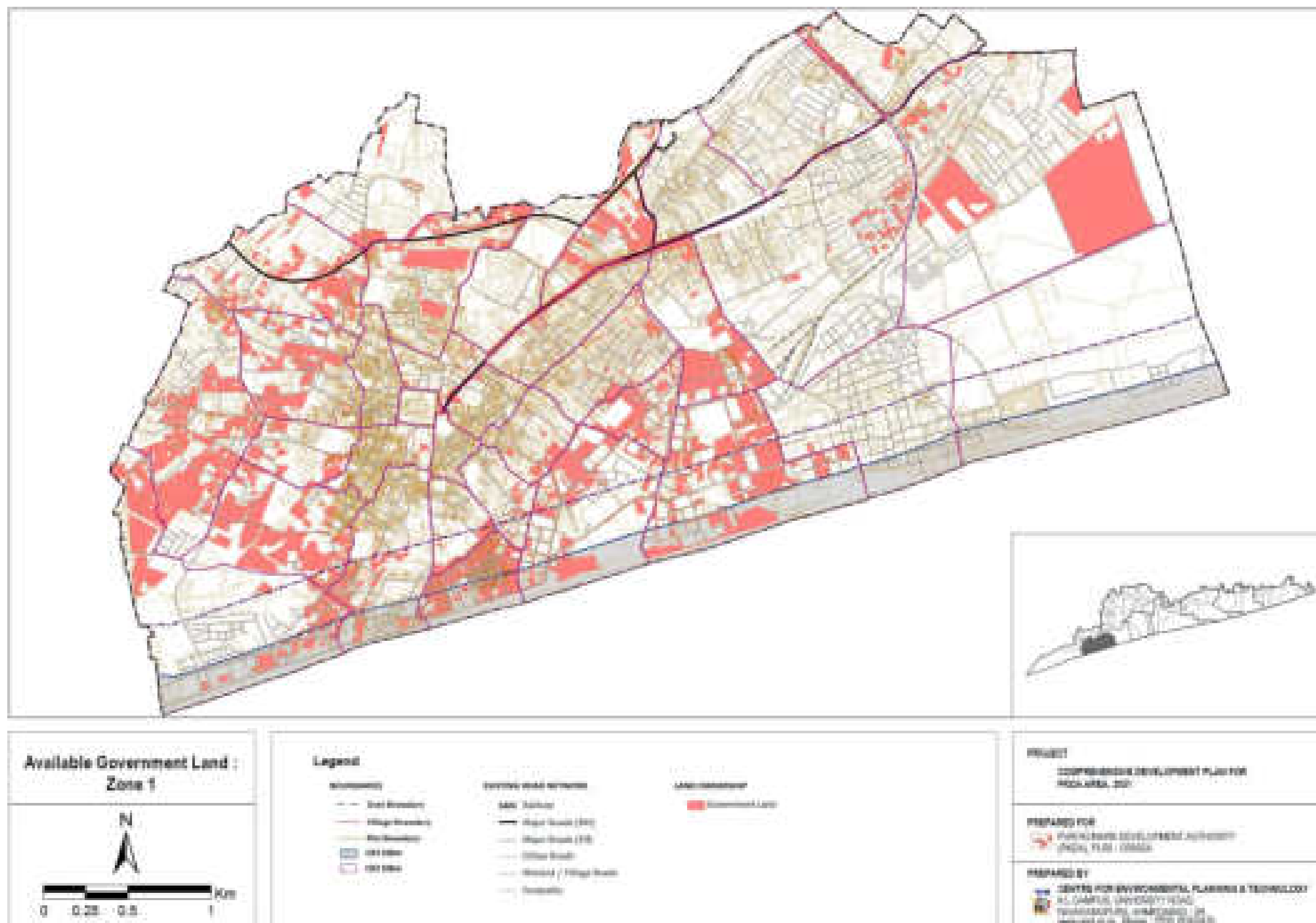
The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The total newly proposed land use in the zone is around 2.69 sqkm.



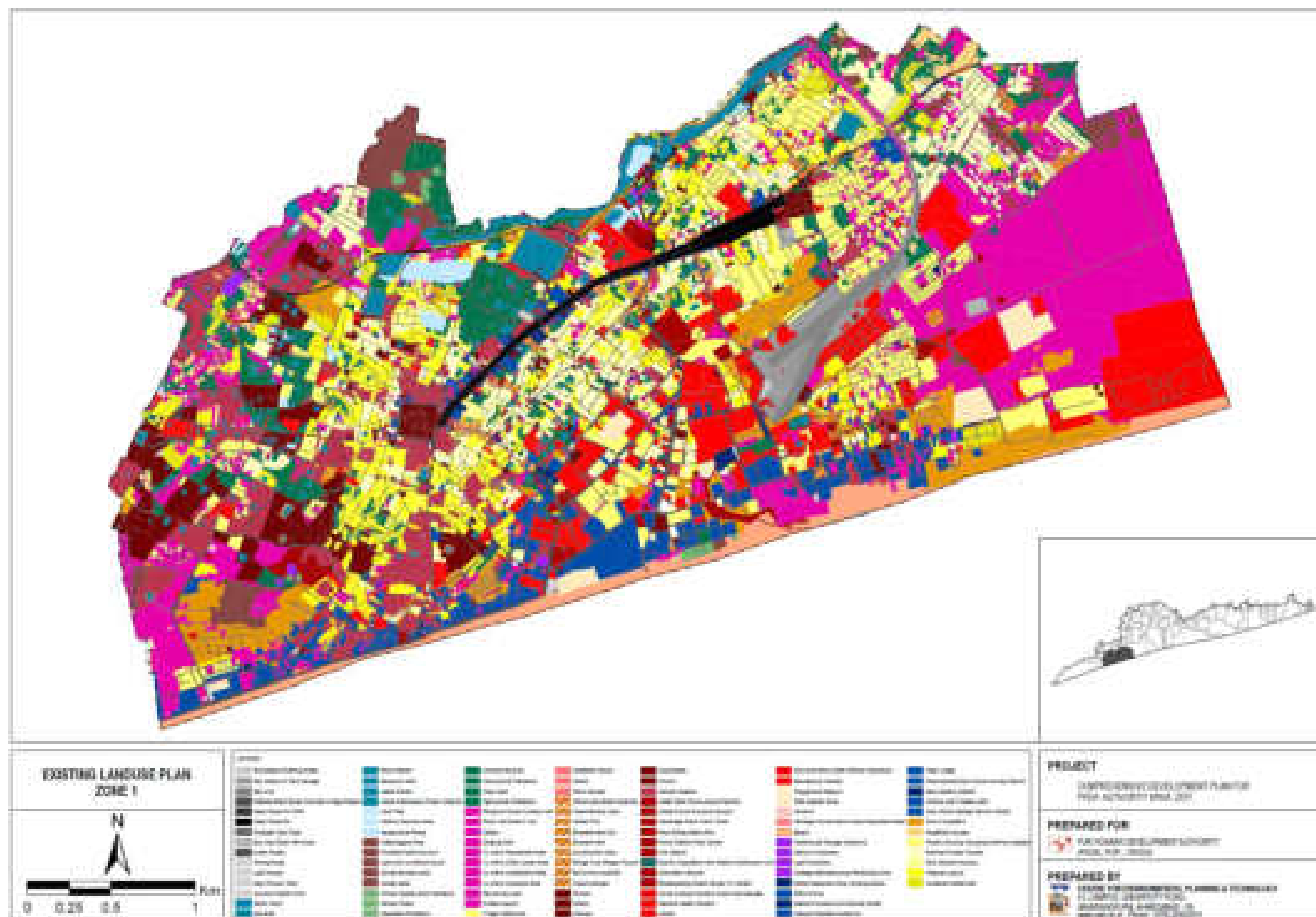
The attached chart shows percentage of proposed land use allotted over government land. The total government land available is 2.91 sqkm, which is around 17.84% of total area of zone 1.

About 15% (0.43 sqkm) of total government land in zone 1 has been used under proposed land uses. More than 25% of proposed recreational and commercial are falls under government land.

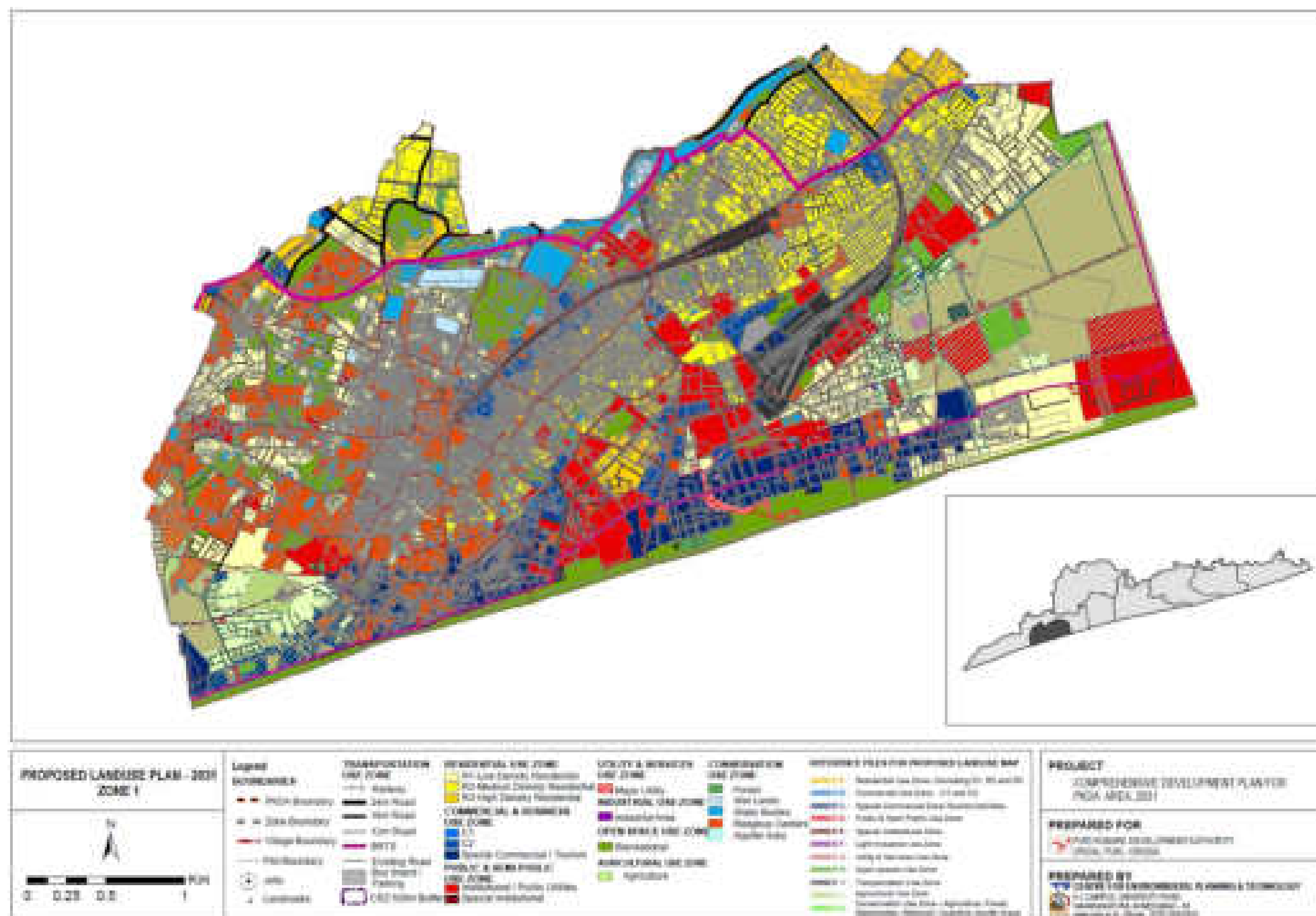




Map 14: Land Ownership, Zone 1



Map 15: Existing Land Use, Zone 1



Map 16: Proposed Land Use, Zone 1

4.4.2 Zone 2- Puri Sadar

Puri Sadar has been identified as the development zone in the region. Presently, there is very low density development in the zone. About 3 % of the total zone area is under existing developed area and total developable area available is around 8.20 sqkm, which is 17% of total zone area.

The existing population of Puri Sadar is that of 14880 and this has been projected to be increasing to 33328. However Puri Sadar would also have to accommodate the spillover population from Puri, since Puri cannot accommodate its entire projected population of 2031. After calculating the carrying capacity of Puri by 2031, the additional population needs to be distributed in the Puri Sadar zone.

Puri Sadar has the potential to be an important growth node in the PKDA region. Presently, new developments can be observed all along the major roads, and projects like Shamukha, NH expansion, bypass is approved by the government.

The proposed land use in Puri Sadar is mainly focused on the general development. The corridors along the major road network have been carved for intensive development.

The major residential use categories, R3 has been proposed along the major corridors, R2 adjacent to R3 and R1 in peripheral & near environmentally sensitive areas. All the city and neighborhood level commercial, institutional areas are equally distributed. Recreational areas are proposed near commercial & institutional use, and around environmental features like wetlands, tanks, lakes, natural drains etc. Special commercial & tourism has been proposed near beach between 200 and 500 m CRZ line. A bus stand has been proposed to cater Puri town and Puri Sadar area.

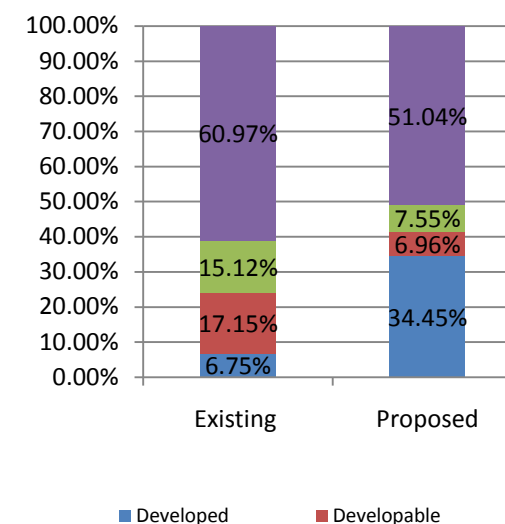
The attached table indicates the comparison of the existing land use and the proposed integrated land use.



Map 17: Activity zones, Zone 2

Table 9: Proposed and Existing integrated land use statement, Zone 2

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	1.53	3.20	7.68	16.07	12.87
Commercial	0.25	0.52	4.52	9.45	8.93
Industrial	0.03	0.07	0.31	0.65	0.58
Institutional	0.19	0.39	0.84	1.76	1.37
Recreational	0.51	1.07	1.37	2.87	1.80
Transport	0.51	1.06	1.53	3.21	2.15
Agriculture	7.44	15.12	3.82	7.55	-7.57
Non developable	29.15	60.97	24.40	51.04	-9.93
Developable	8.20	17.15	3.33	6.96	-10.19
Total	47.80		47.80		

**Changing Land Utilization Pattern**

The attached chart compares between the various sub-categories of the land use. This indicates the possibility of future development in the zone for 2031, and the change in the land use dynamics in the region. It can be seen that the percentage share of Non developable has decreased to 51% from 61%. This involves primarily the Proposed Shamuka Project and the creation of roads and other trunk infrastructure which are essential for the development of the region. However large chunks of forests towards the coastal side have not been touched or disturbed. The overall developed area has been increased by 28%. The attached images indicate the possible development in Puri Sadar.



Sources: Multiple case studies



The attached chart compares the changing pattern of the developed areas in Puri Sadar. This does not include the Shamuka project, and it is expected that this project shall substantially contribute to the effective area under the commercial and recreational. The proposed recreational allocation has been kept less than desired, owing to Shamuka project.

In the zonal guidelines and the development control regulations the residential allocation permits the development of internal roads, hence on a CDP level only 11% of the Roads has been proposed. The internal roads are to be regulated and designed through the town planning scheme as explained in the section under implementation mechanism.

Comparisons between existing and proposed land use

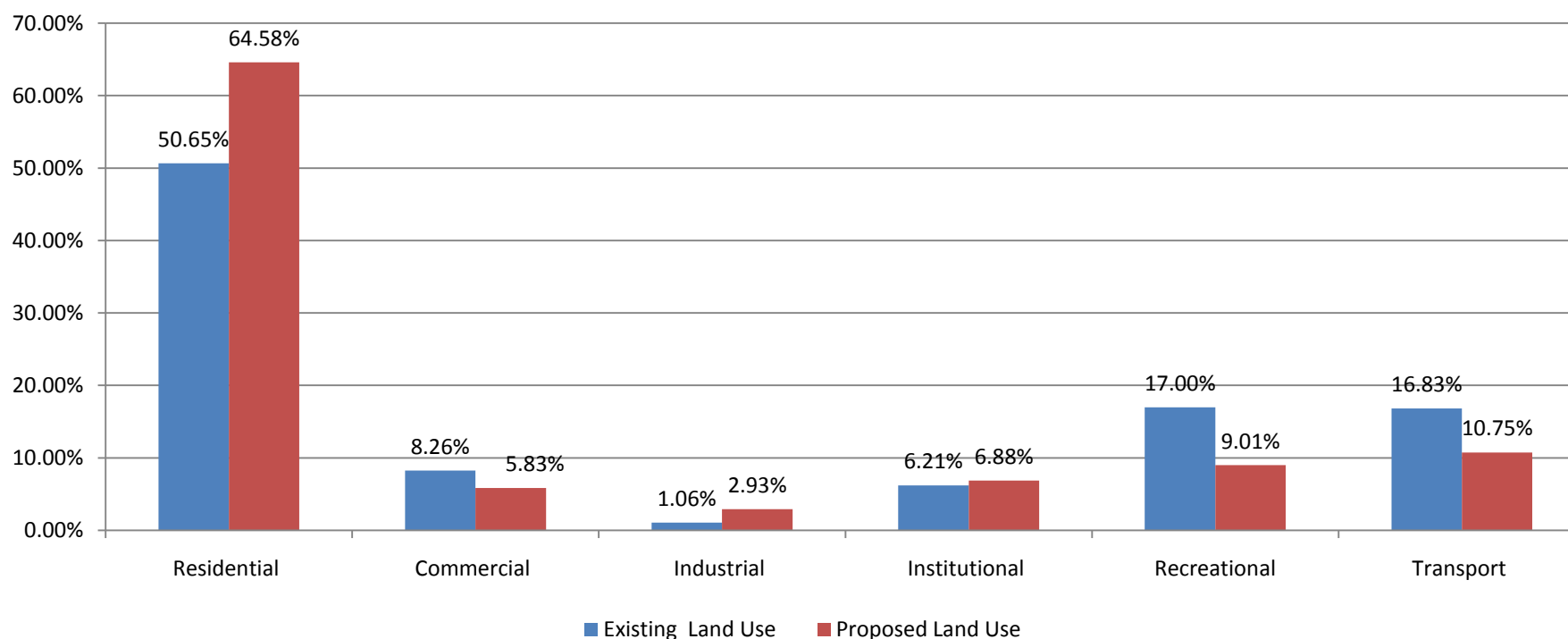


Table 10: Proposed Land uses with sub classes, Zone 2

Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1	3.44		0.70		2.74	
	R2	2.23		0.24		1.99	
	R3	0.48		0.04		0.44	
Sub total		6.15	64.58	0.99	16.09	5.16	83.91
B. Commercial	C1	0.14		0.01		0.13	0.01
	C2	0.28		0.01		0.27	0.01
	Special Commercial/Tourism	0.14 (excluding Shamuka area)		0.29		3.56	0.29
Sub total		0.56	5.83	0.30	7.12	3.96	92.88
C. Institutional	public utilities	0.51		0.32		0.19	
	Special Institutional						
	Major Utility	0.14		0.05		0.09	
Sub total		0.66	6.88	0.37	56.21	0.29	43.79
D. Open space/recreational		0.86	9.01	0.19	21.61	0.67	78.39
E. Industrial		0.28	2.93	0.02	5.58	0.26	94.42
F. Transportation	24.00 m Road	0.16		0.02		0.13	
	18.00 m Road	0.30		0.07		0.23	
	12.00 m Road	0.40		0.09		0.32	
	BRTS	0.11		0.01		0.10	
	Bus Stand/Parking	0.05				0.05	
Sub Total		1.02	10.75	0.20	19.18	0.83	80.82
Total		9.53		2.06	15.56	11.18	84.44



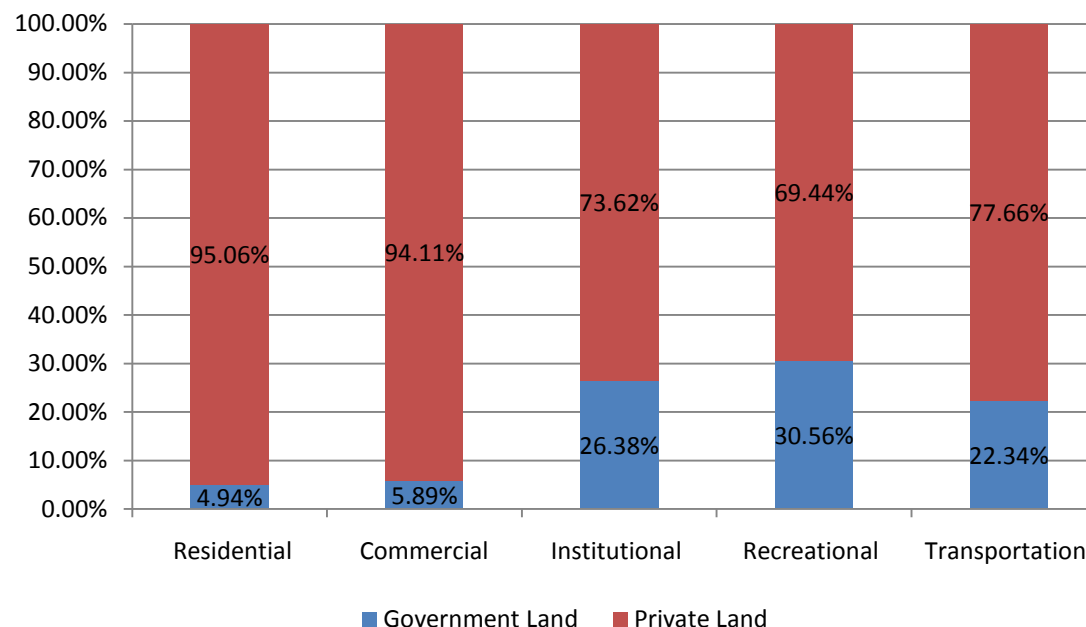
The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 13.24 sqkm.

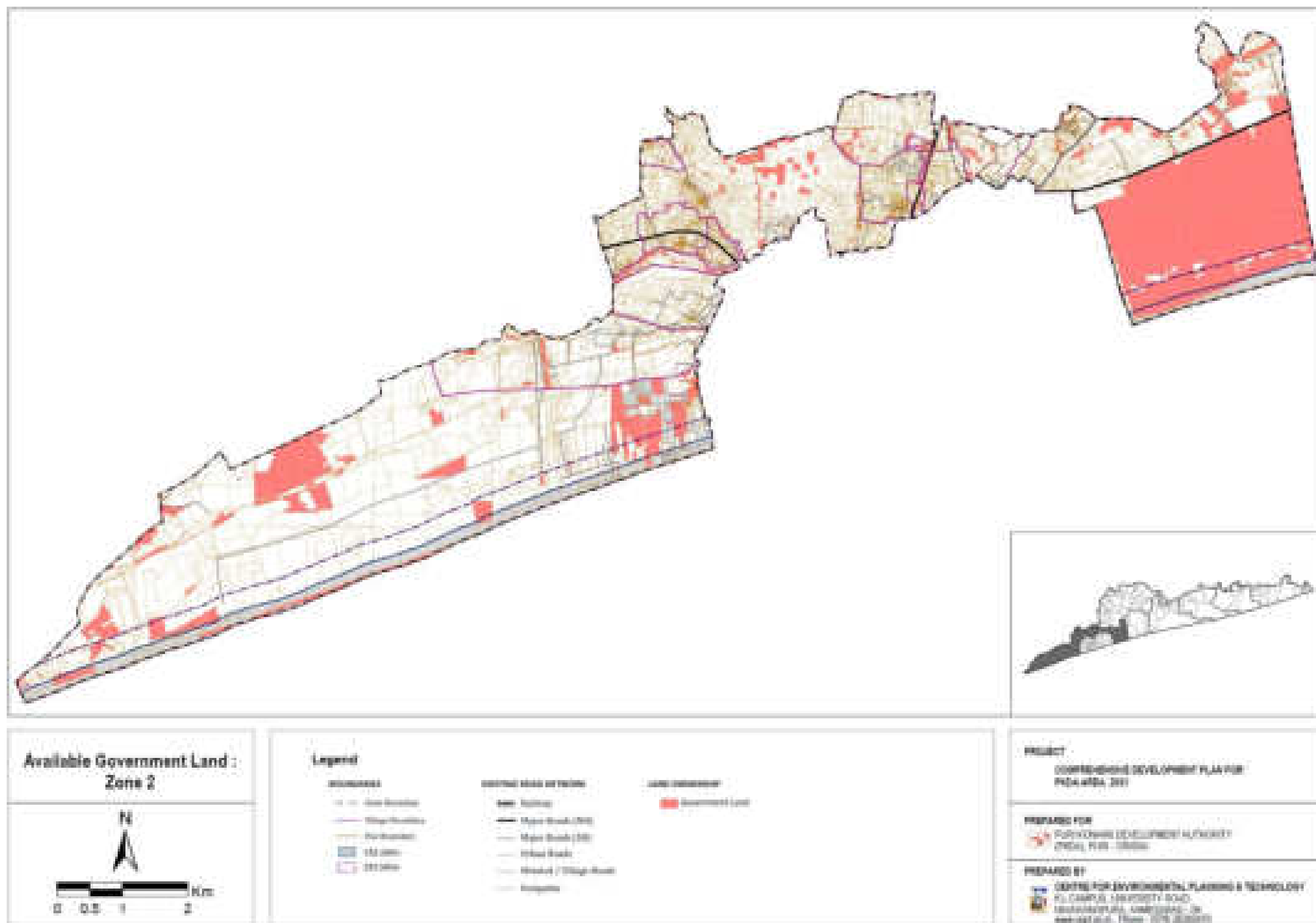
The attached chart shows percentage of land allotted over government land. The total government land available is 11.63 sqkm, which is around 24.33% of total area of zone 2.

An effort has been made to allocate major institutional, recreational, on the government land even though the government land available is scattered.

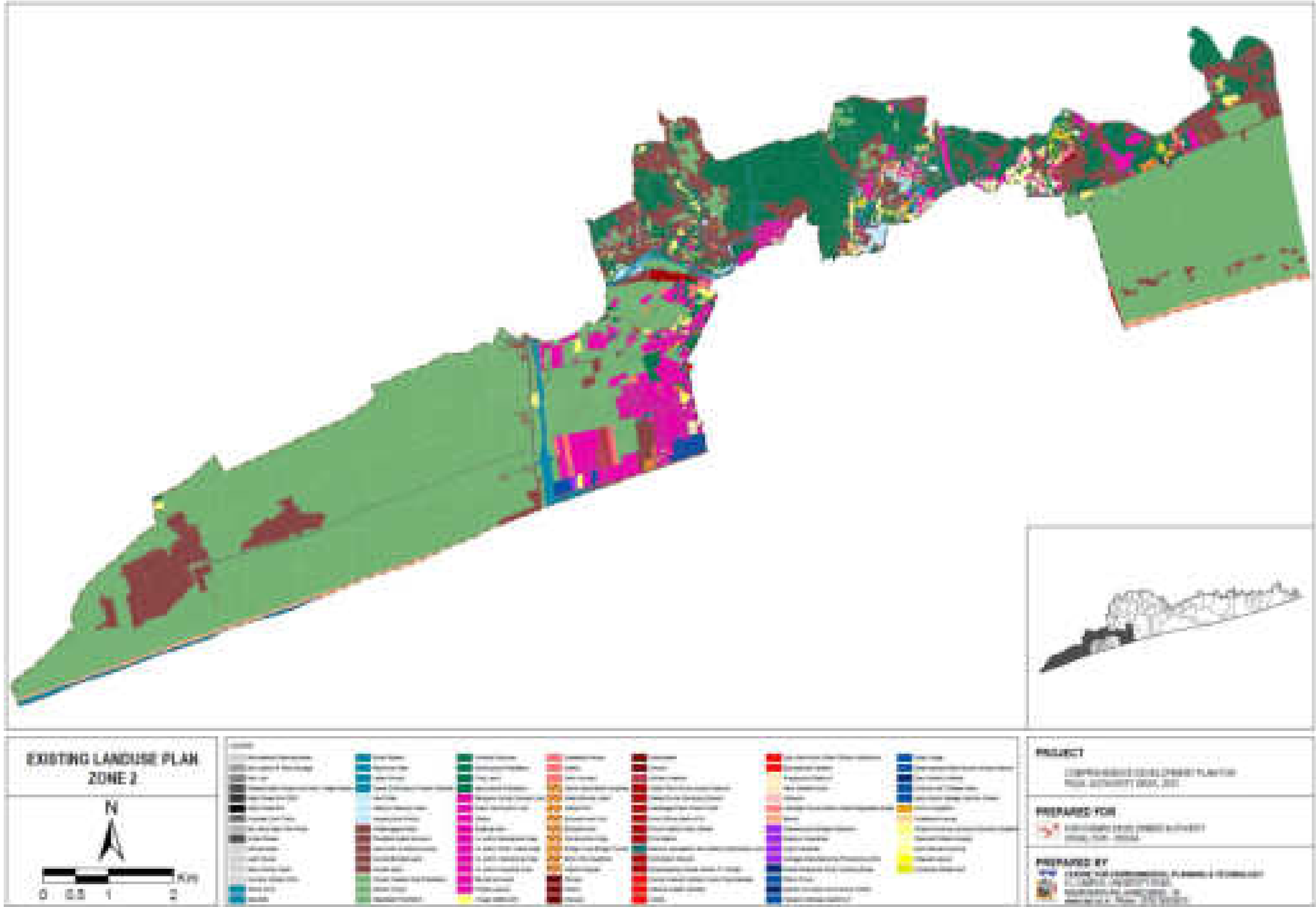
About 17.71% (2.06 sqkm) of total government land in Zone 2 has been used under proposed land uses. More than 20% of proposed institutional area falls under the government land.

Percentage utilization of government and private land in proposed land use

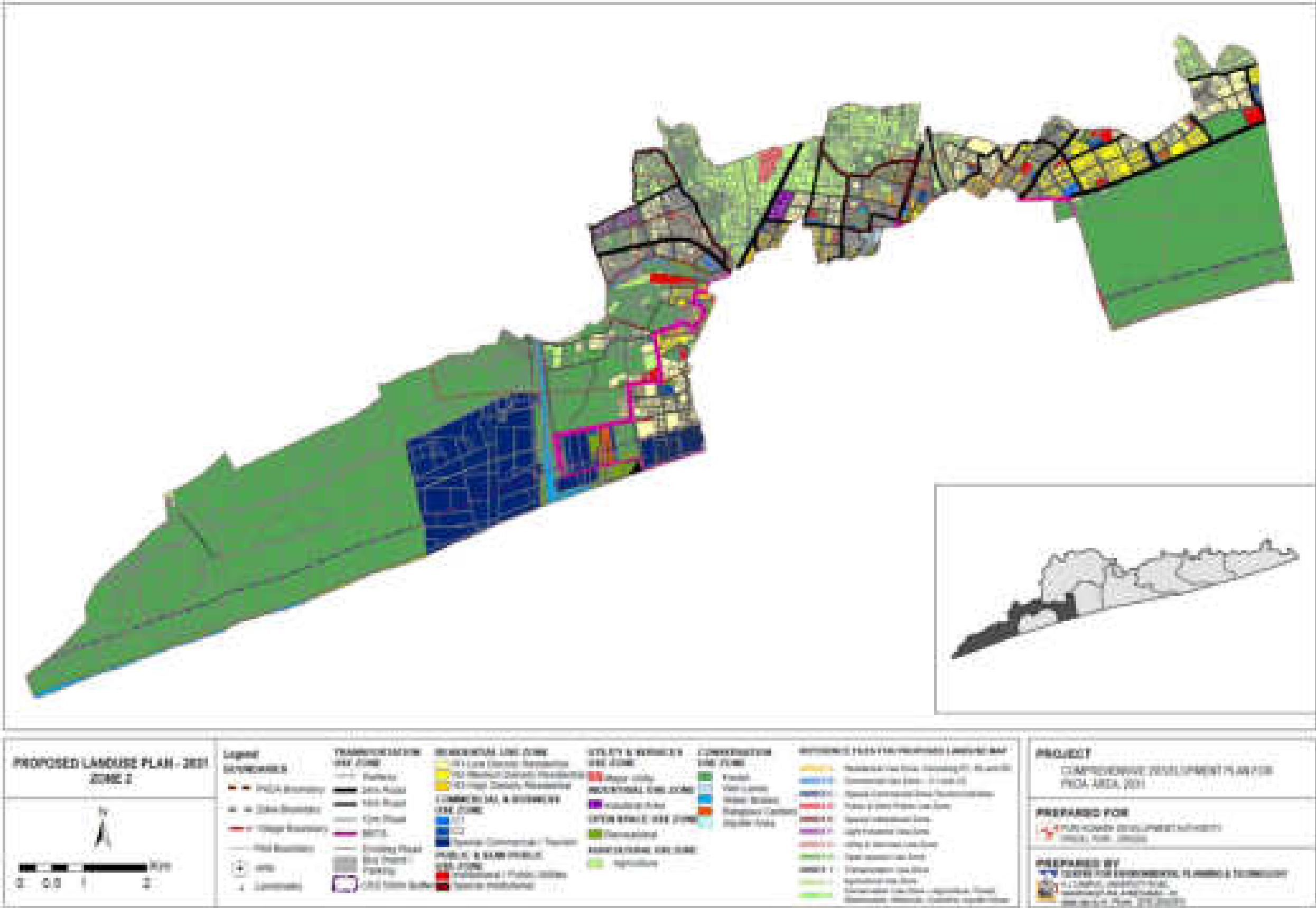




Map 18: Land Ownership, Zone 2

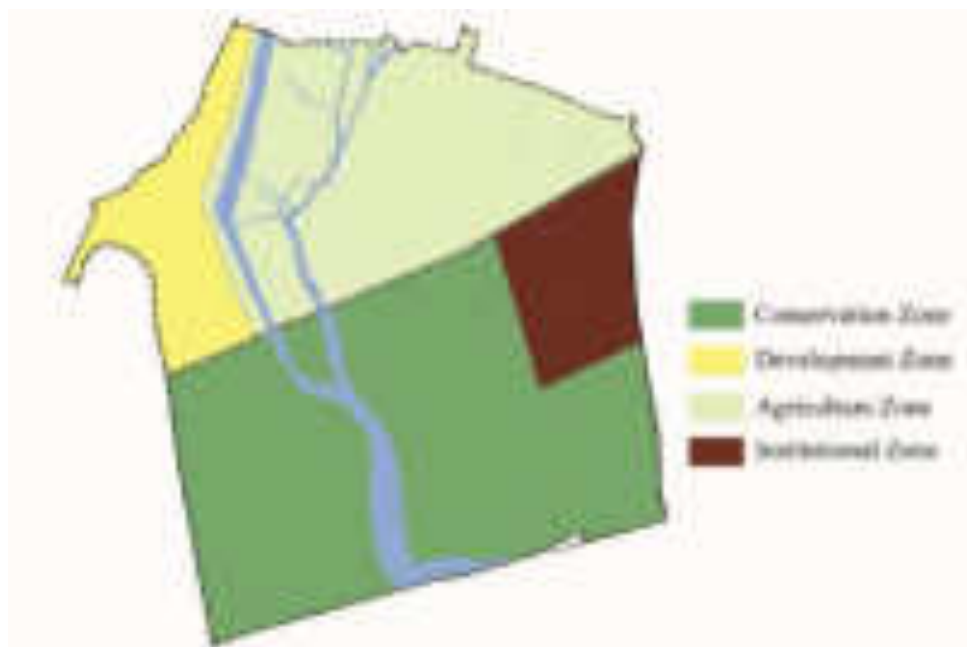


Map 19: Existing Land Use, Zone 2

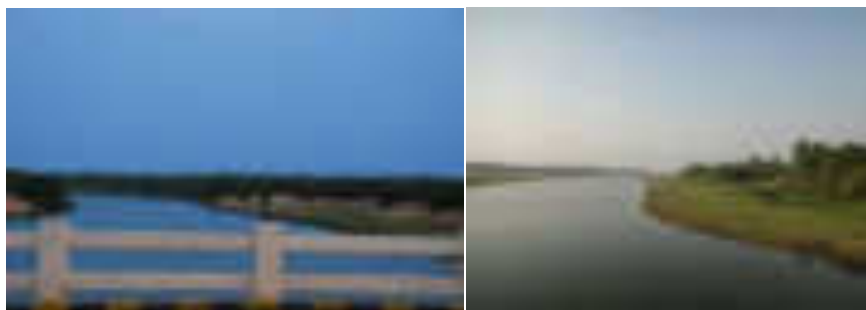


Map 20: Proposed Land Use, Zone 2

4.4.3 Zone 3- Block A



Map 21: Activity zones, Zone 3



Zone 3 has been carved out of the Block A. The development pattern is primarily of rural residential, scattered houses and irregular development. There are also quite a few religious structures in the zone.

This zone constitutes of 7 % of the total PKDA land and has 1 % of the present population of the region.

The analysis of the growth corridors and the possible growth hubs in the region suggests that this zone shall observe a lesser growth rate as compared to the others zones. The reasons for the same are the location, proximity of the urban amenities, transport corridors and the nature of existing development. Hence not much development has been proposed in this zone and it is estimated that in the proposed scenario this region shall continue to maintain its rustic character.

The zone has been segregated in to development zone, institutional zone, agriculture zone and conservation zone as per potential for land use proposal.

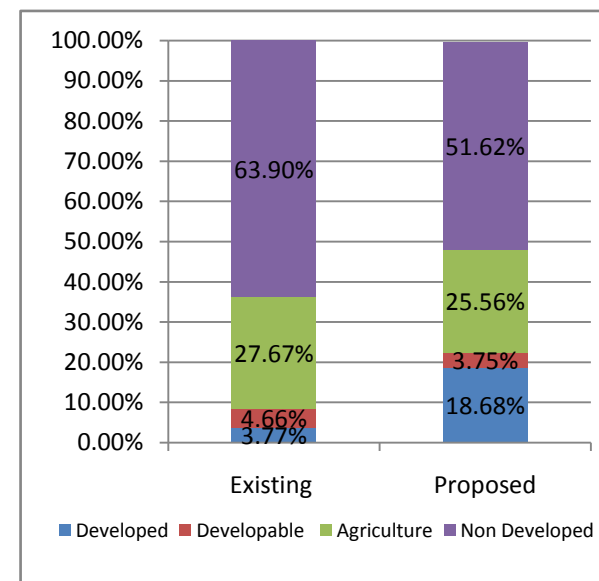
Mainly, tourism based interventions are proposed in this zone. The major proposed uses are special institutional, Special commercial (IT hub), Residential (R2) and recreational areas. Special institutional includes facilities like Ayurvedic centers, spiritual centers etc. About 8% of area which is under private ownership has been earmarked for special institutional and rest part of it has been proposed in zone 4. Development other than special institutional is confined till Nuanai river, as the area is contiguous to the Puri Sadar Zone.

A green belt has been created along the river. This may be developed as a city level green, recreation area. The proposed special commercial area dedicated for IT industries shall act as an employment generator in the region.

The comparative statement of the existing and proposed integrated land use has been indicated in the attached table.

Table 11: Proposed and Existing integrated land use statement, Zone 3

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	0.27	1.29	0.56	2.29	1.00
Commercial	0.04	0.19	0.22	1.04	0.85
Industrial	0.01	0.03	0.01	0.03	0.00
Institutional	0.27	1.32	2.77	13.27	11.95
Recreational	0.01	0.04	0.10	0.50	0.46
Transport	0.05	0.22	0.18	0.87	0.65
Agriculture	5.92	27.67	5.48	25.56	-2.11
Non developable	13.34	63.90	10.78	51.62	-12.28
Developable	0.97	4.66	0.78	3.75	-0.91
Total	20.88		20.88		



Changing Land Utilization Pattern

The attached chart indicates the land dynamics both in the existing and proposed scenario. The non developable has been used for development of road and in proposing special institutional areas. The overall developed area has been increased by 15%. The attached images indicate the nature of development in the zone.



Sources: Multiple case studies,

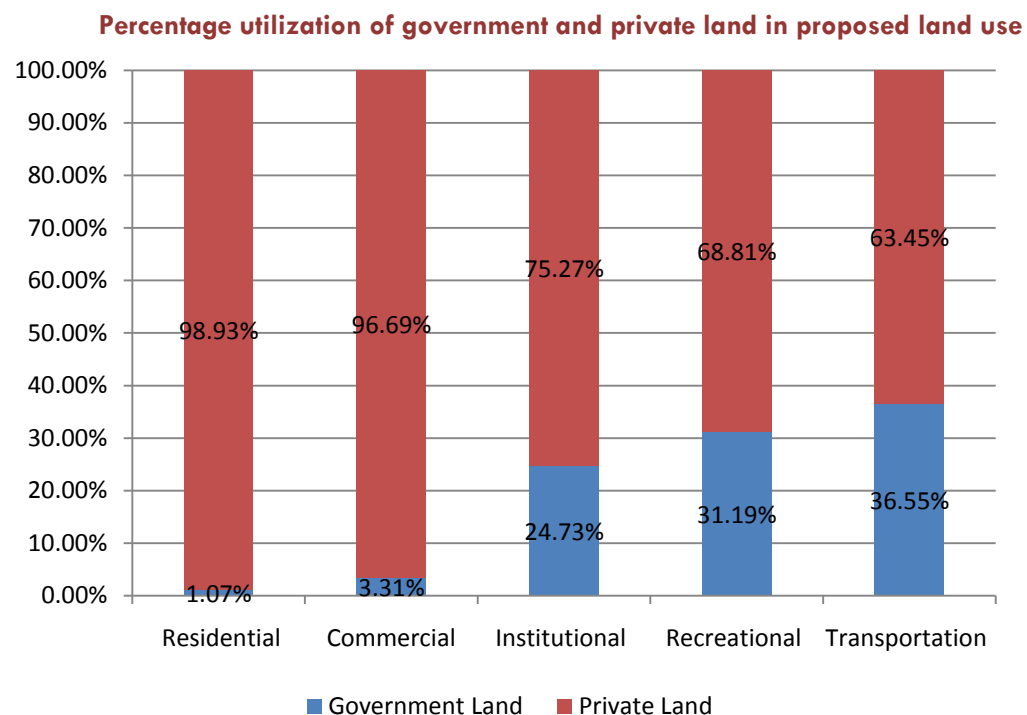
Table 12: Proposed Land uses with sub classes, Zone 3

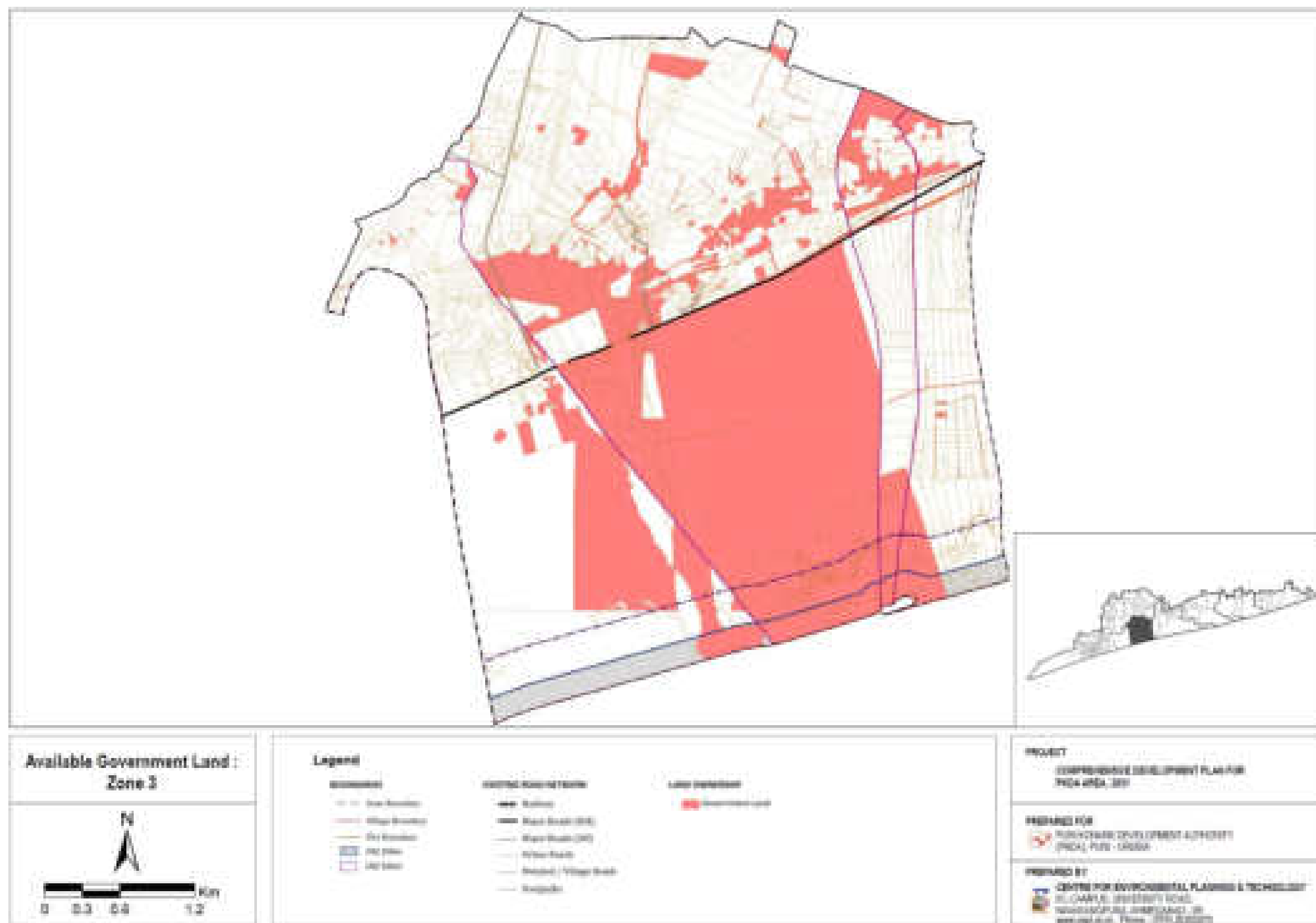
Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1						
	R2	0.24		0.003		0.24	
	R3						
Sub total		0.24	10.82	0.003	1.07	0.24	98.93
B. Commercial	C1						
	C2						
	Special Commercial/Tourism	0.18		0.01		0.18	
Sub total		0.18	8.20	0.01	3.31	0.18	96.69
C. Institutional	Institutional/ public utilities	0.01		0.01		0.00	
	Special Institutional	1.50		0.36		1.14	
	Major Utility					0.00	
Sub total		1.51	67.31	0.37	24.73	1.14	75.27
D. Recreational		0.14	6.15	0.04	31.19	0.10	68.81
E. Industrial							
F. Transportation	24.00 m Road	0.04		0.03		0.01	
	18.00 m Road	0.10		0.03		0.07	
	12.00 m Road	0.03		0.00		0.03	
	BRTS						
	Bus Stand/Parking						
Sub Total		0.17	7.53	0.06	36.55	0.11	63.45
Total		2.25	100.00	0.49	21.70	1.76	78.30

The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 2.25 sqkm.

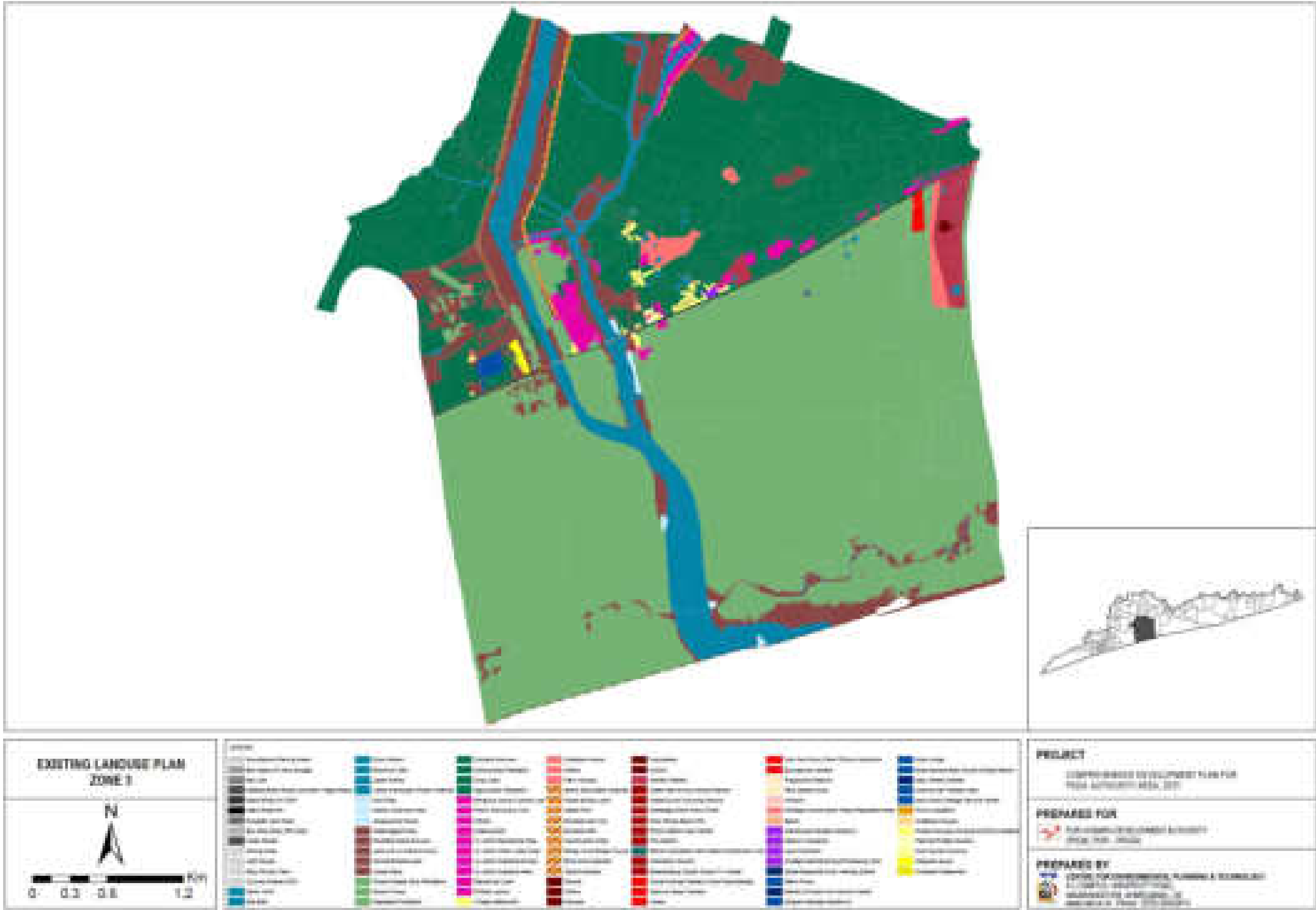
The attached chart shows percentage of land allotted over government land. The total government land available is 8.27 sqkm, which is around 39.54 % of total area of zone 3. The maximum part of government land comes under forest land.

About 6% (0.49 sqkm) of total government land in zone 3 has been used under proposed land uses. More than 25% of proposed institutional, recreational, and transportation area falls under government land.

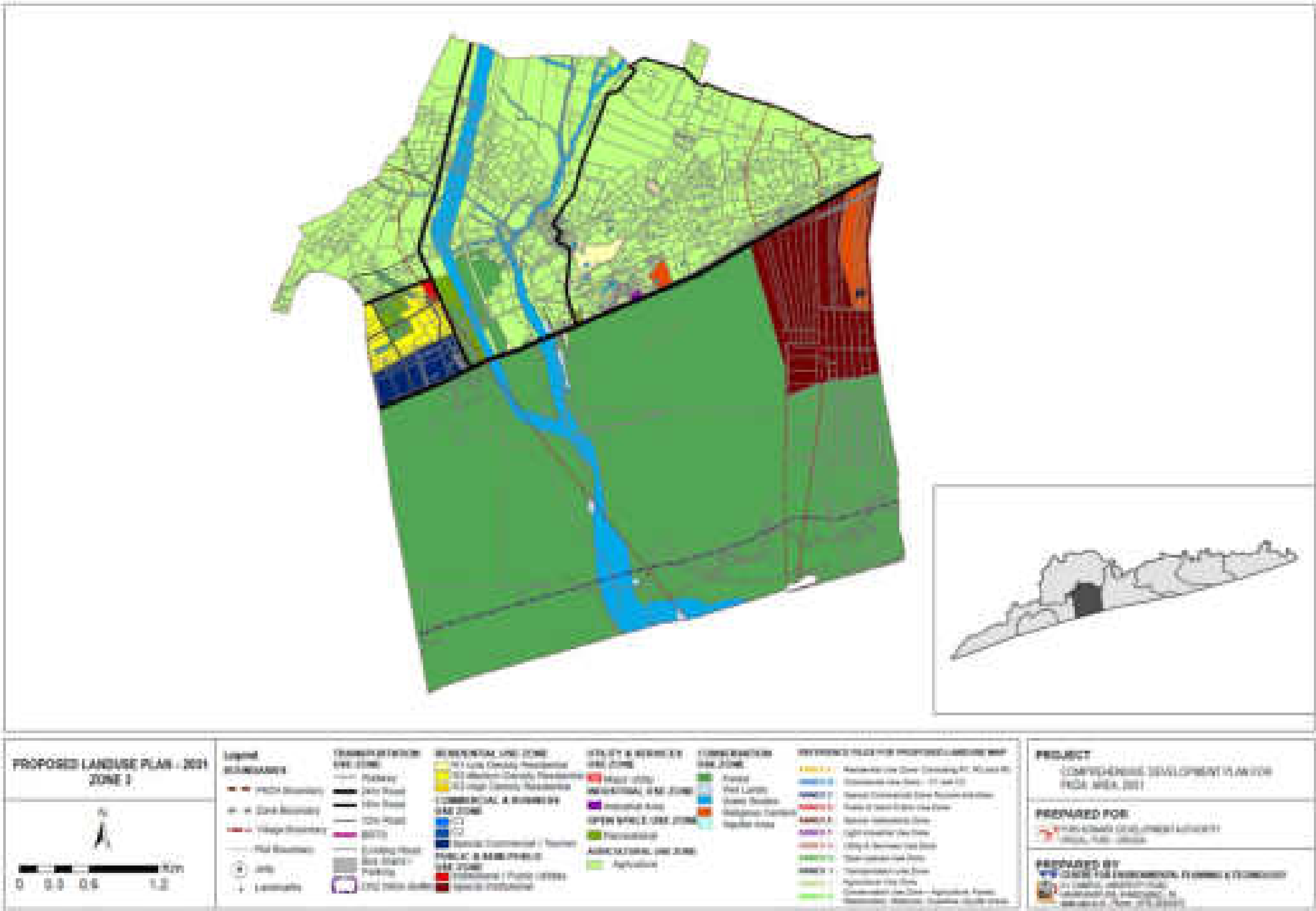




Map 22: Land Ownership, Zone 3



Map 23: Existing Land Use, Zone 3



Map 24: Proposed Land Use, Zone 3

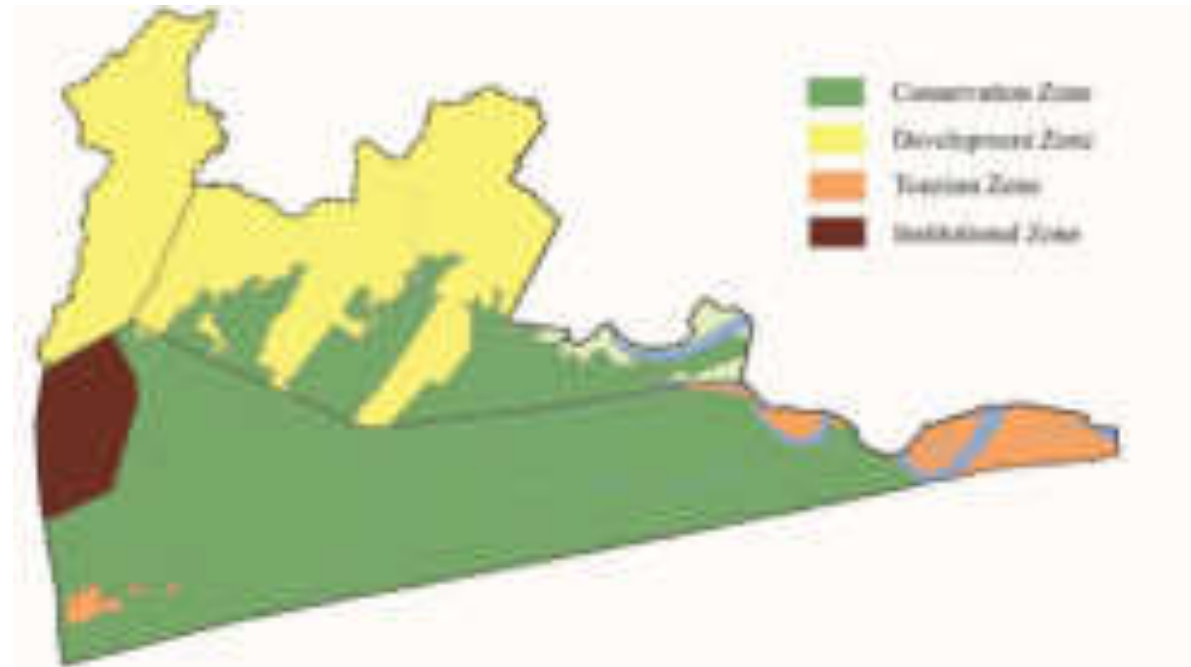
4.4.4 Zone 4 – Block A

Zone 4 has been carved out of the Block A. The development pattern is primarily of rural residential, scattered houses and irregular. There are also some institutions in the zone.

The zone constitutes 13 % of the total PKDA land and has 3% of the present population of the region.

The market mechanics, trend observation, projected scenario and the vision of PKDA together indicate that this zone is poised to become the intermediate growth hub between Puri and Konark. It is suitably located in between the two towns and also linked with Gop, Pipli and Bhubaneswar through SH 60.

The node between Puri and Konark has been proposed with commercial, institutional and residential development. It is suggested that city level amenities such as schools and junior colleges may be located in this region, to open it up to the residents of Puri and Konark. Another growth catalyst in the zone shall be proposed institutional hub (part of this hub is also proposed in Zone3), tourism village and SIZ.

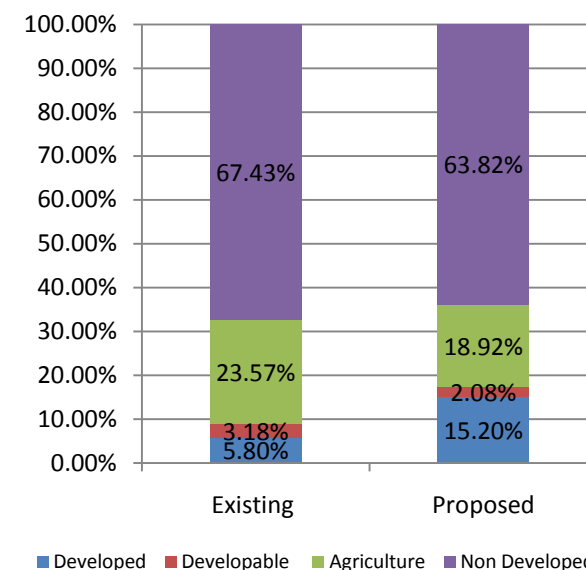


Map 25: Activity zones, Zone 4

The attached table gives a comparative statement of the existing and proposed integrated land use statement of the zone.

Table 13: Proposed and Existing integrated land use statement, Zone 4

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	0.68	1.74	2.19	5.56	3.84
Commercial	0.00	0.01	0.20	0.50	0.51
Industrial					0.00
Institutional	1.13	2.88	2.74	6.95	4.09
Recreational	0.03	0.07	0.15	0.38	0.31
Transport	0.29	0.74	0.55	1.41	0.66
Agriculture	9.42	23.58	7.59	18.92	-4.65
Non developable	26.52	67.43	25.10	63.83	-3.61
Developable	1.25	3.18	0.82	2.07	-1.09
Total	39.33		39.33		



Changing Land Utilization Pattern

The attached chart indicates the land dynamics both in the existing and proposed scenario. The non developable has been used for development of special institutional, tourism village. Other land uses are proposed in available developable and agriculture land. The overall developed area has been increased by 5%. The attached images indicate the nature of development in the region.

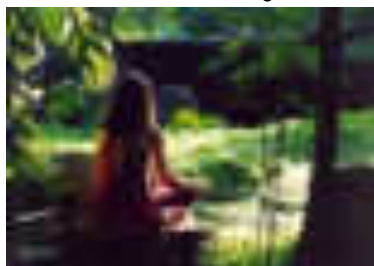


Table 14: Proposed Land uses with sub classes, Zone 4

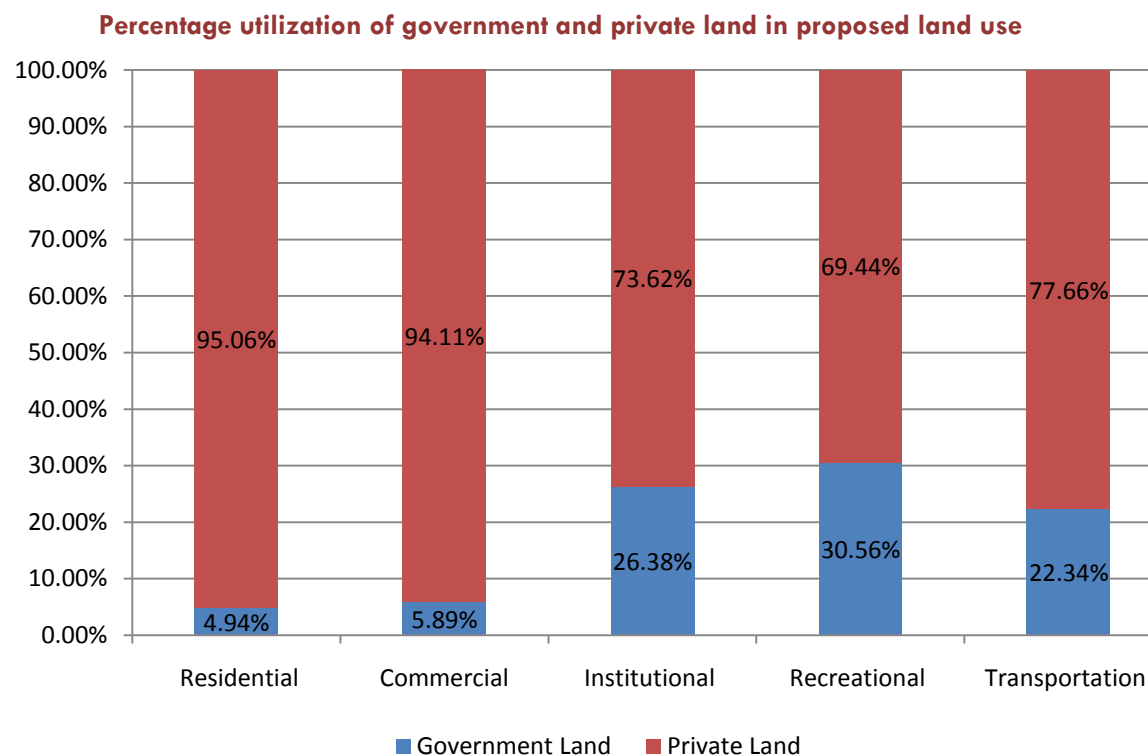
Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1	0.73		0.027		0.027	
	R2	0.47		0.011		0.011	
	R3	0.30		0.018		0.018	
Sub total		1.50	40.82	0.07	4.94	1.43	95.06
B. Commercial	C1	0.06		0.001		0.062	
	C2	0.02		0.002		0.014	
	Special Commercial/Tourism	0.11		0.01		0.105	
Sub total		0.19	5.21	0.01	5.89	0.18	94.11
C. Institutional	Institutional/ public utilities	0.03		0.004		0.03	0.004
	Special Institutional	1.57		0.42		1.15	
	Major Utility						
Sub total		1.60	43.57	0.42	26.38	1.18	73.62
D. Recreational		0.12	3.27	0.04	30.56	0.08	69.44
E. Industrial							
F. Transportation	24.00 m Road	0.05		0.01		0.04	
	18.00 m Road	0.14		0.04		0.09	
	12.00 m Road	0.08		0.005		0.07	
	BRTS						
	Bus Stand/Parking						
Sub Total		0.26	7.14	0.06	22.34	0.20	77.66
Total		3.68		0.60	16.41	3.08	83.59

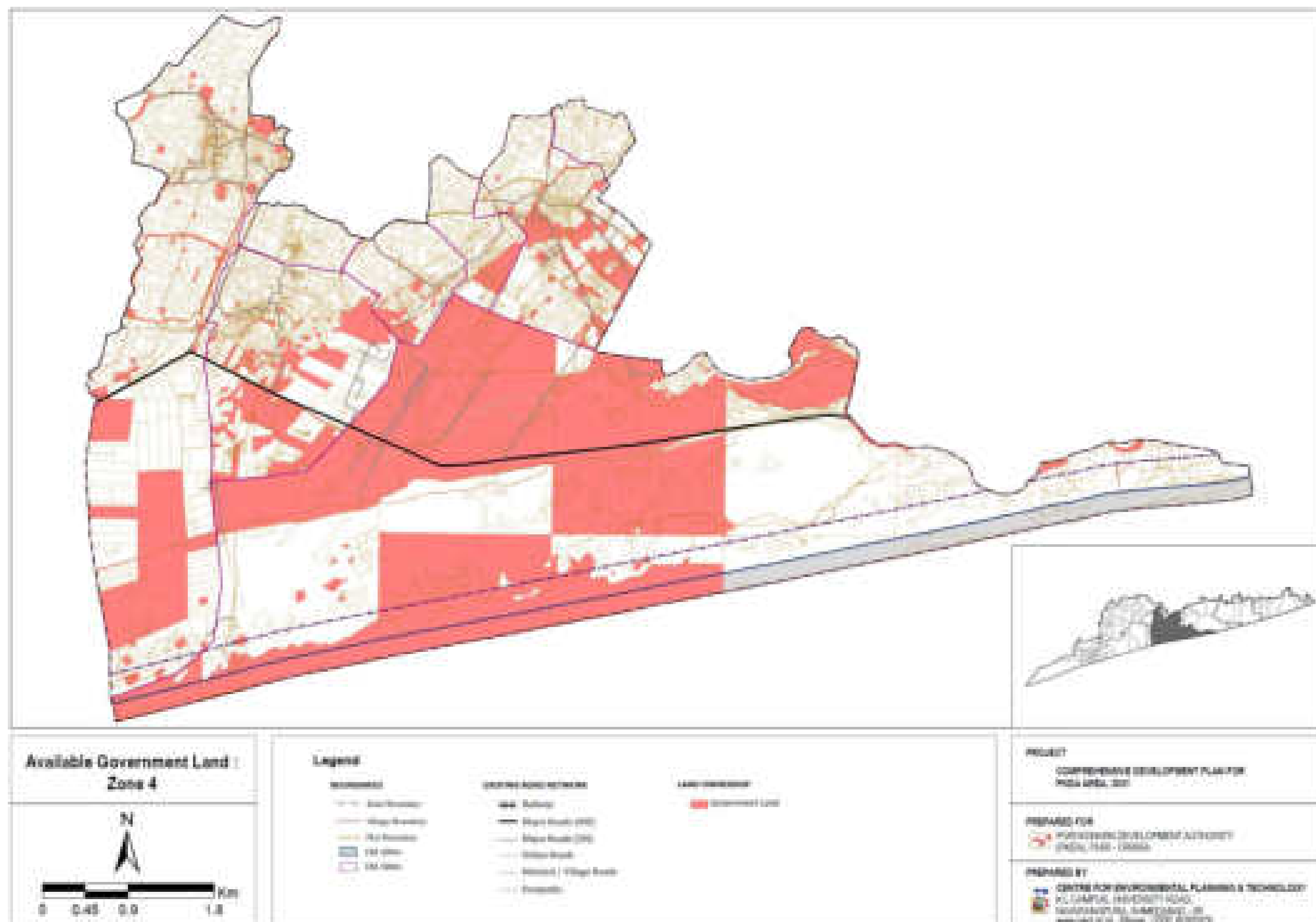


The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 3.68 sqkm.

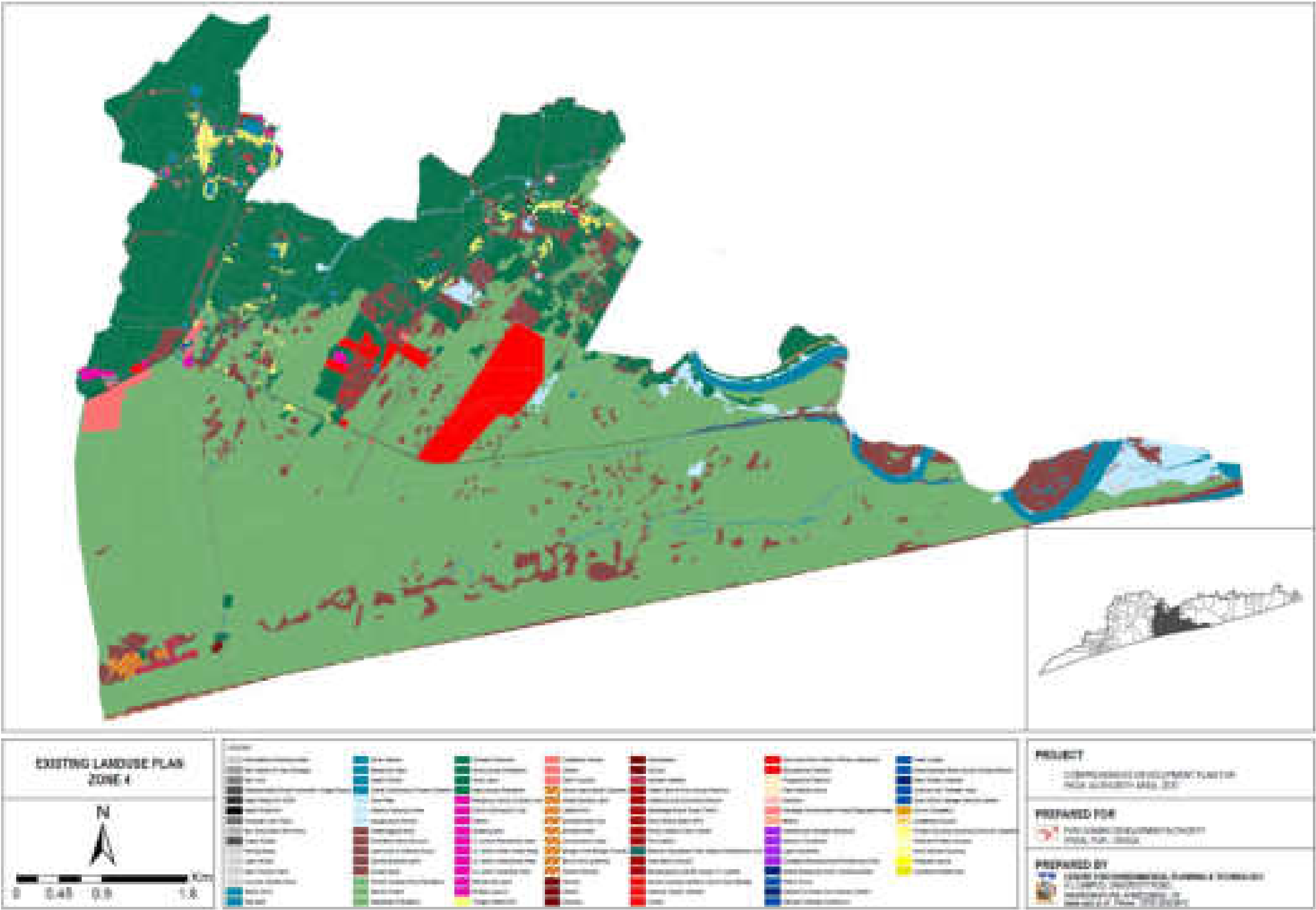
The attached graph shows percentage of land allotted over government land. The total government land available is 19.52 sqkm, which is around 50 % of total area of zone 4.

About 3% (0.60 sqkm) of total government land in zone 4 has been used under proposed land uses. More than 25% of proposed institutional and recreational area falls under government land.

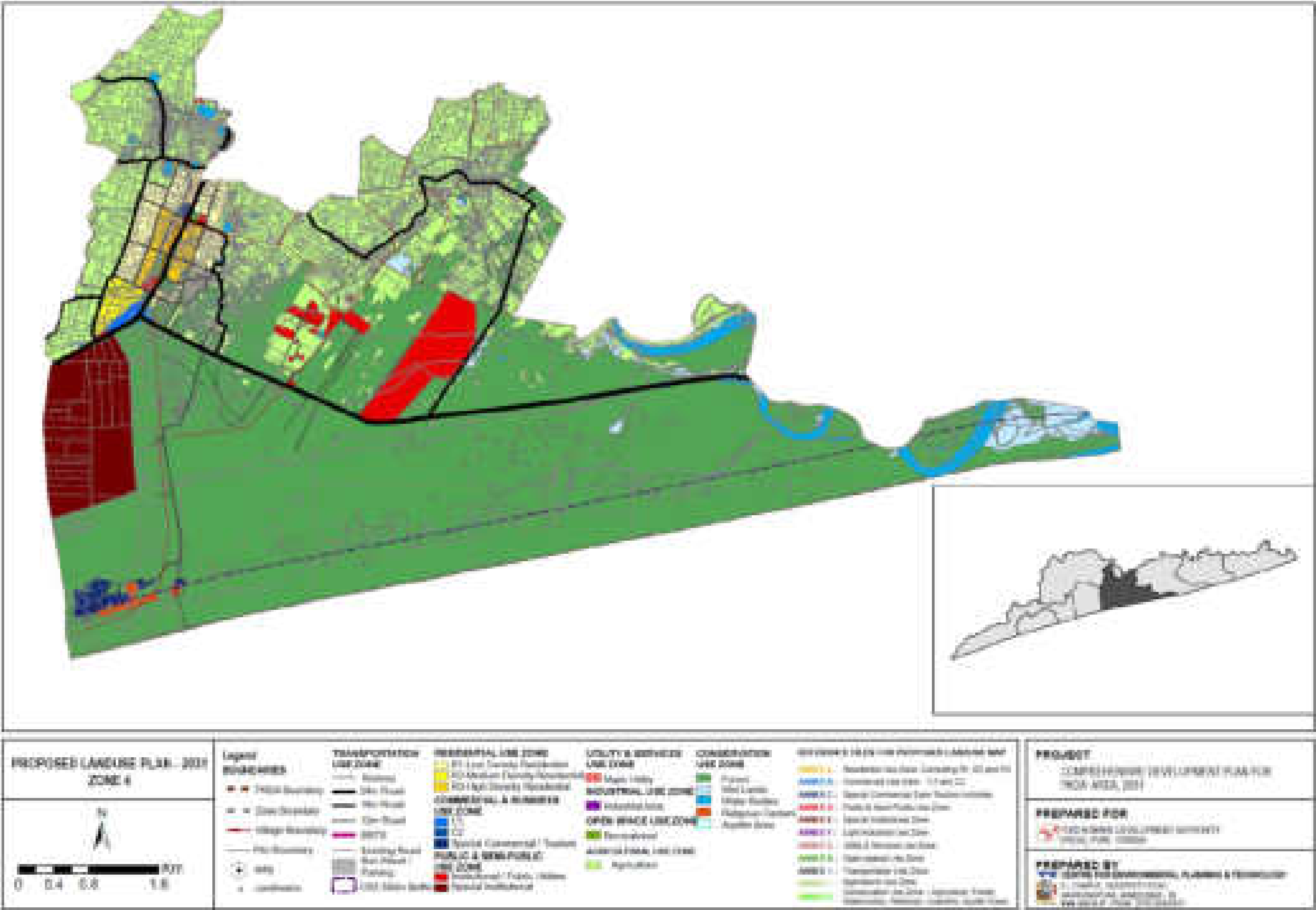




Map 26: Land Ownership, Zone 4



Map 27: Existing Land Use, Zone 4



Map 28: Proposed Land Use, Zone 4

4.4.5 Zone 5- Block A



Map 29: Activity zones, Zone 5

Zone 5 has been carved out from the Block A. The development pattern is primarily of rural residential, scattered houses and irregular development.

The zone constitutes 14 % of the total PKDA land and has 4% of the present population of the region.

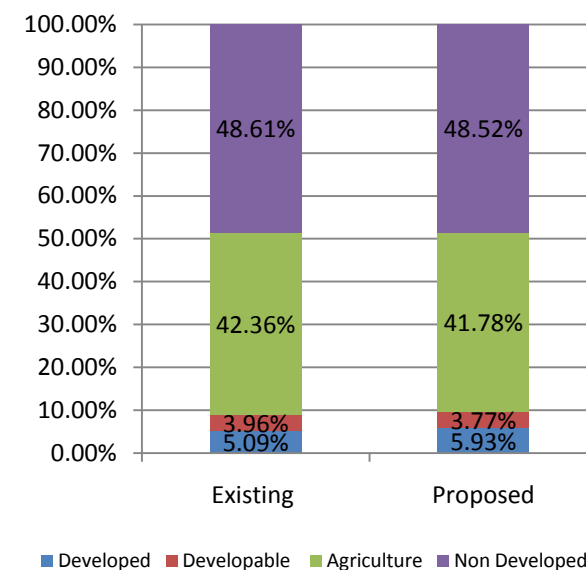
The only intervention suggested in this zone is that of the Tourism Zone, which constitutes almost 7% of the total zonal area. This can be a smart product mix of various categories of tourism and related activities which caters to all economic classes. Other than the tourism zones nothing substantial has been proposed.

It is expected that till 2031 the region shall maintain agriculture as the chief economic activity and rural residential and allied activities shall be the character of the region.

The attached table gives a comparative statement of the existing and proposed integrated land use statement of the zone.

Table 15: Proposed and Existing integrated land use statement, Zone 5

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	0.99	2.45	0.99	2.45	
Commercial	0.04	0.09	0.27	0.68	0.57
Industrial					
Institutional	0.03	0.06	0.03	0.06	
Recreational	0.37	0.91	0.37	0.91	
Transport	0.44	1.08	0.55	1.37	0.27
Agriculture	17.25	42.37	16.98	41.69	-0.59
Non developable	19.59	48.62	19.83	49.20	-0.09
Developable	1.60	3.96	1.28	3.18	-0.19
Total	40.30		40.30		



Changing Land Utilization Pattern

The attached chart indicates the land dynamics both in the existing and proposed scenario. The agriculture land has been used for development of special tourism area. The overall developed area has been increased by 1%. The attached images indicate the nature of development in the region.



Table 16: Proposed Land uses with sub classes, Zone 5

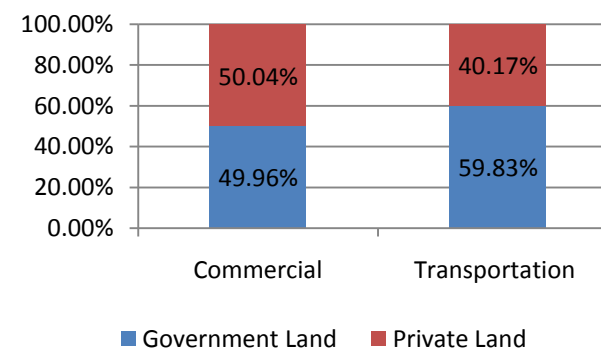
Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government Area (in sqkm)	Percentage	Private Area (in sqkm)	Percentage
A. Commercial	C1						
	C2						
	Special Commercial/Tourism	0.24		0.12		0.12	
	Sub total	0.24	67.39	0.12	49.96	0.12	50.04
B. Transportation	24.00 m Road	0.06		0.06		0.00	
	18.00 m Road	0.05		0.01		0.04	
	12.00 m Road						
	BRTS						
	Bus Stand/Parking						
Sub Total		0.11	32.61	0.07	59.83	0.05	40.17
Total		0.35	100.00	0.19	53.18	0.16	46.82

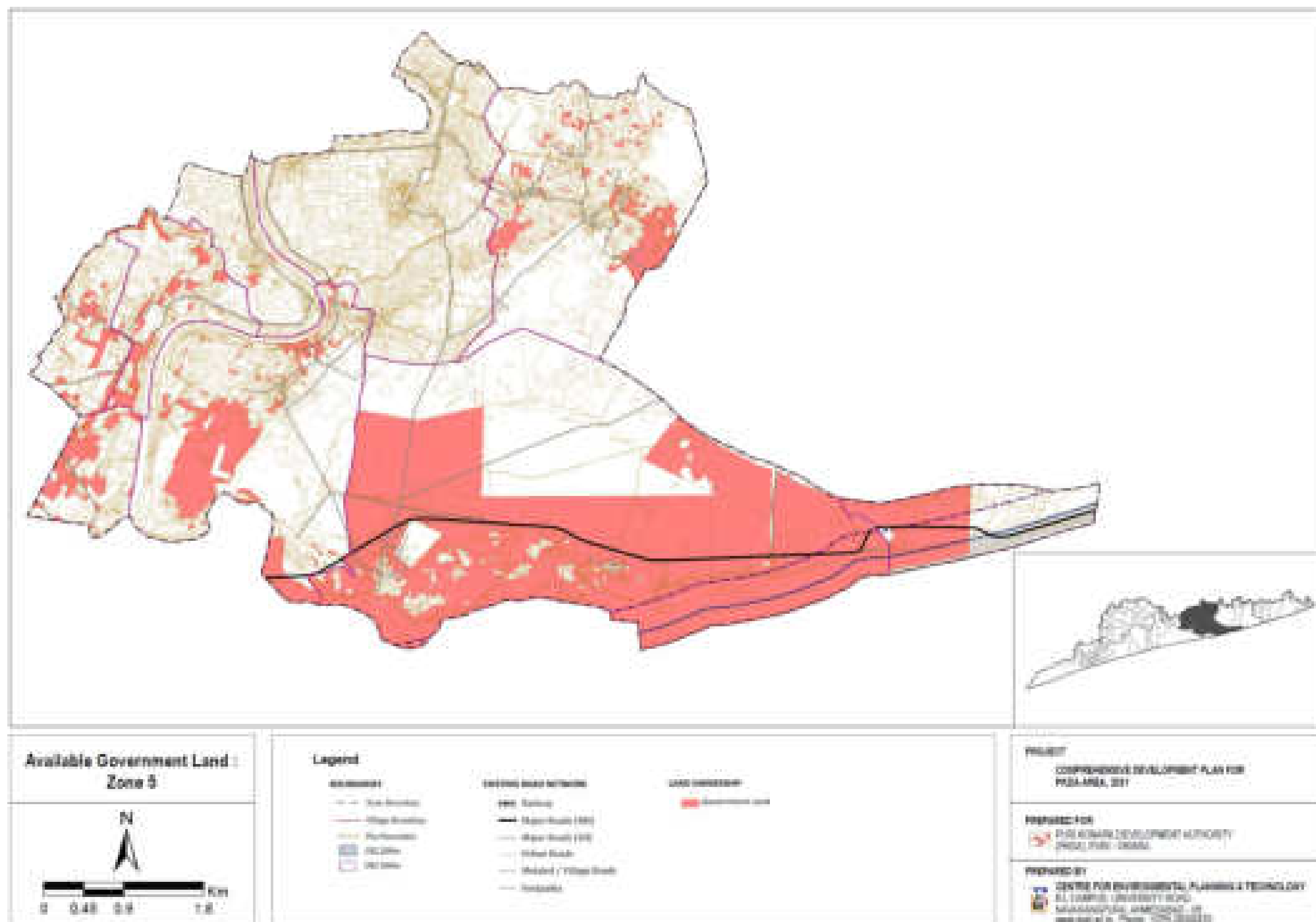
The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 0.35 sqkm.

The attached graph shows percentage of land allotted over government land. The total government land available is 13.47 sqkm, which is around 33.43 % of total area of zone 5.

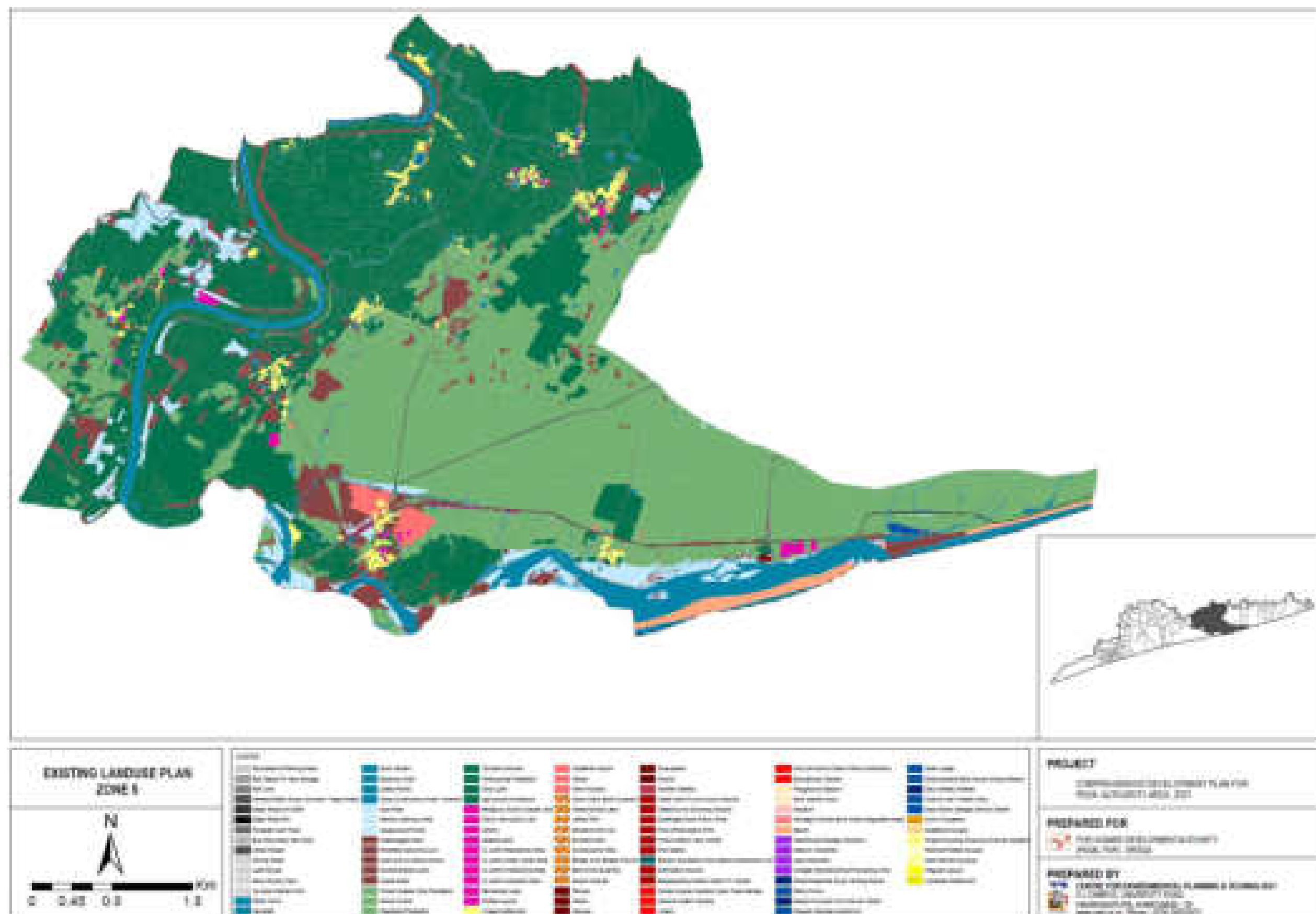
About 1.4 % (0.19 sqkm) of total government land in zone 5 has been used under proposed land uses. More than 50% of proposed commercial and transportation area falls under government land.

Percentage utilization of government and private land in proposed land use





Map 30: Land Ownership, Zone 5



Map 31: Existing Land Use, Zone 5



4.4.6 Zone 6- Konark



Map 33: Activity zones, Zone 6

Konark is known to the world for the Sun temple. It is located at a distance of 35 kms from Puri by road. It is home for only 8% of total PKDA population and constitutes 12% of total PKDA area. The present population of Konark in 2001 is 16979, and expected to increase to 61487 by 2031.

As, Konark is famous for Sun temple, it is frequented by lots of tourists. The existing development in Konark urban area is sprawled, and unplanned. Hence, there is a need of an organized development.

The zoning of Konark has been done keeping in mind the heritage value of the town; hence the temple precinct has been marked as a dedicated heritage zone. Other zones are dedicated for residential and area along the coast bounded by the marine drive road from Puri has been earmarked under the tourism zone. Ongoing project for development of tourism infrastructure in and around Konark precinct is also considered during proposal.

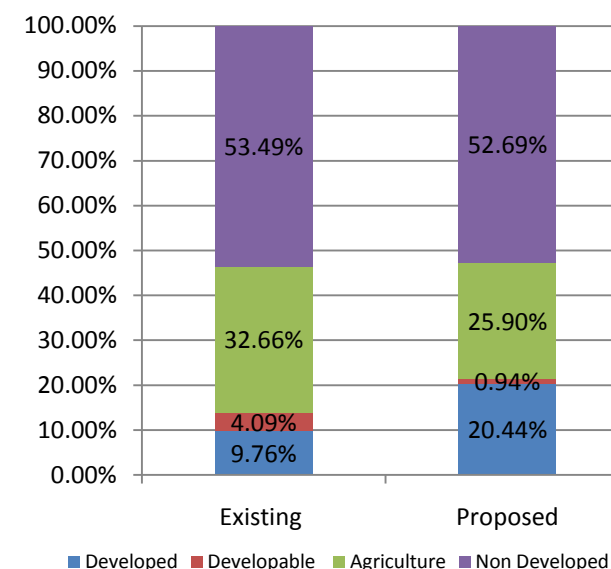
The existing development calls for a ring radial pattern of development, considering temple as the nucleus. A more cohesive growth pattern has been suggested in proposed land use. The development has been proposed along the major corridors. Since Konark has been envisaged to be developed as the Cultural Hub of the region the proposed land use allocation have been higher in the institutional and tourism component. Other developments are tourism related and in situ up-gradation of existing fishermen slum near Chandrabhaga.

The attached table gives a comparative statement of the existing and proposed integrated land use statement of the zone.



Table 17: Proposed and Existing integrated land use statement, Zone 6

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	1.49	3.67	3.75	10.14	6.47
Commercial	0.22	0.63	0.42	1.19	0.57
Industrial	0.01	0.02	0.12	0.33	0.31
Institutional	0.51	1.47	0.62	1.79	0.31
Recreational	0.32	0.93	0.92	2.64	1.72
Transport	0.65	1.85	1.10	3.15	1.29
Agriculture	11.62	32.65	9.26	25.89	-6.75
Non developable	18.69	53.51	18.41	52.70	-0.80
Developable	1.43	4.08	0.33	0.96	-3.15
Total	34.94		34.94		



Changing Land Utilization Pattern

The attached chart indicates the land dynamics both in the existing and proposed scenario. Mostly, developable and agriculture land has been used under proposed land use. The overall developed area has been increased by 11%. The attached images indicate the nature of development in the region.



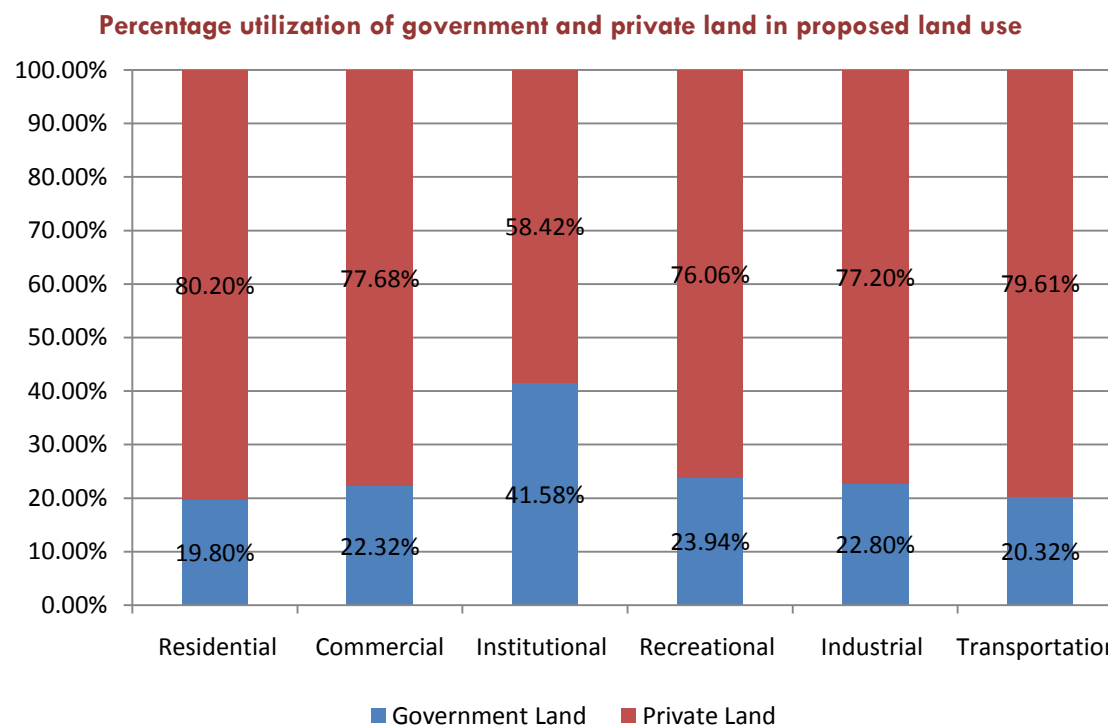
Table 18: Proposed Land uses with sub classes, Zone 6

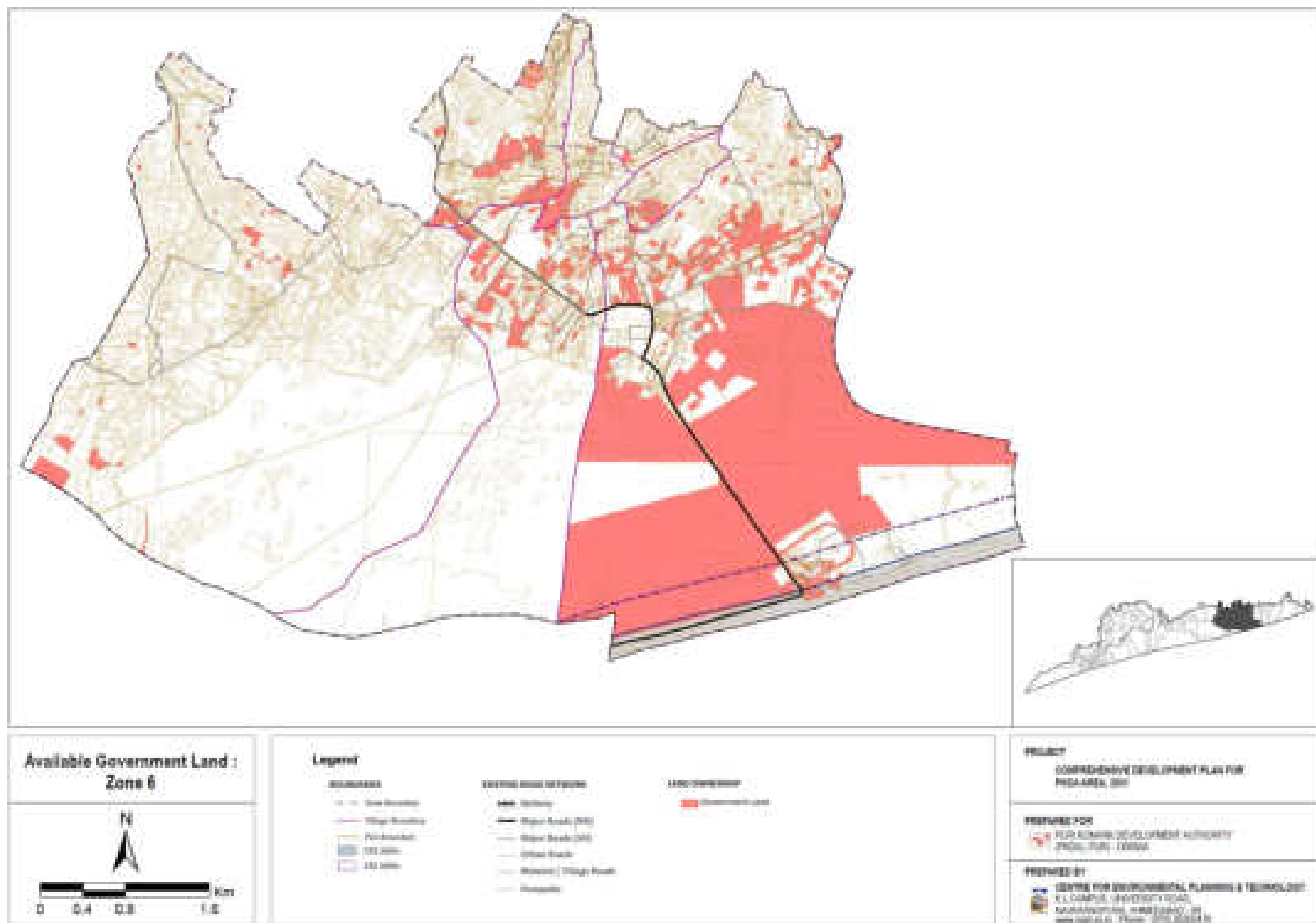
Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1	1.00		0.20		0.80	
	R2	1.00		0.19		0.82	
	R3	0.26		0.06		0.20	
Sub total		2.26	60.59	0.45	19.80	1.81	80.20
B. Commercial	C1	0.02		0.00		0.02	
	C2	0.12		0.03		0.09	
	Special Commercial/Tourism	0.06		0.01		0.04	
Sub total		0.20	5.25	0.04	22.32	0.15	77.68
C. Institutional	Institutional/ public utilities	0.09		0.03		0.06	
	Special Institutional						
	Major Utility	0.02		0.02		0.003	
Sub total		0.11	2.98	0.05	41.58	0.06	58.42
D. Recreational		0.60	16.01	0.14	23.94	0.45	76.06
E. Industrial		0.11	2.95	0.03	22.80	0.09	77.20
F. Transportation	24.00 m Road	0.07		0.02		0.05	
	18.00 m Road	0.19		0.03		0.17	
	12.00 m Road	0.17		0.05		0.12	
	BRTS						
	Bus Stand/Parking	0.03		0.000		0.03	
Sub Total		0.46	12.23	0.09	20.32	0.36	79.68
Total		3.73	100.00	0.80	21.39	2.93	78.61

The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 3.73 sqkm.

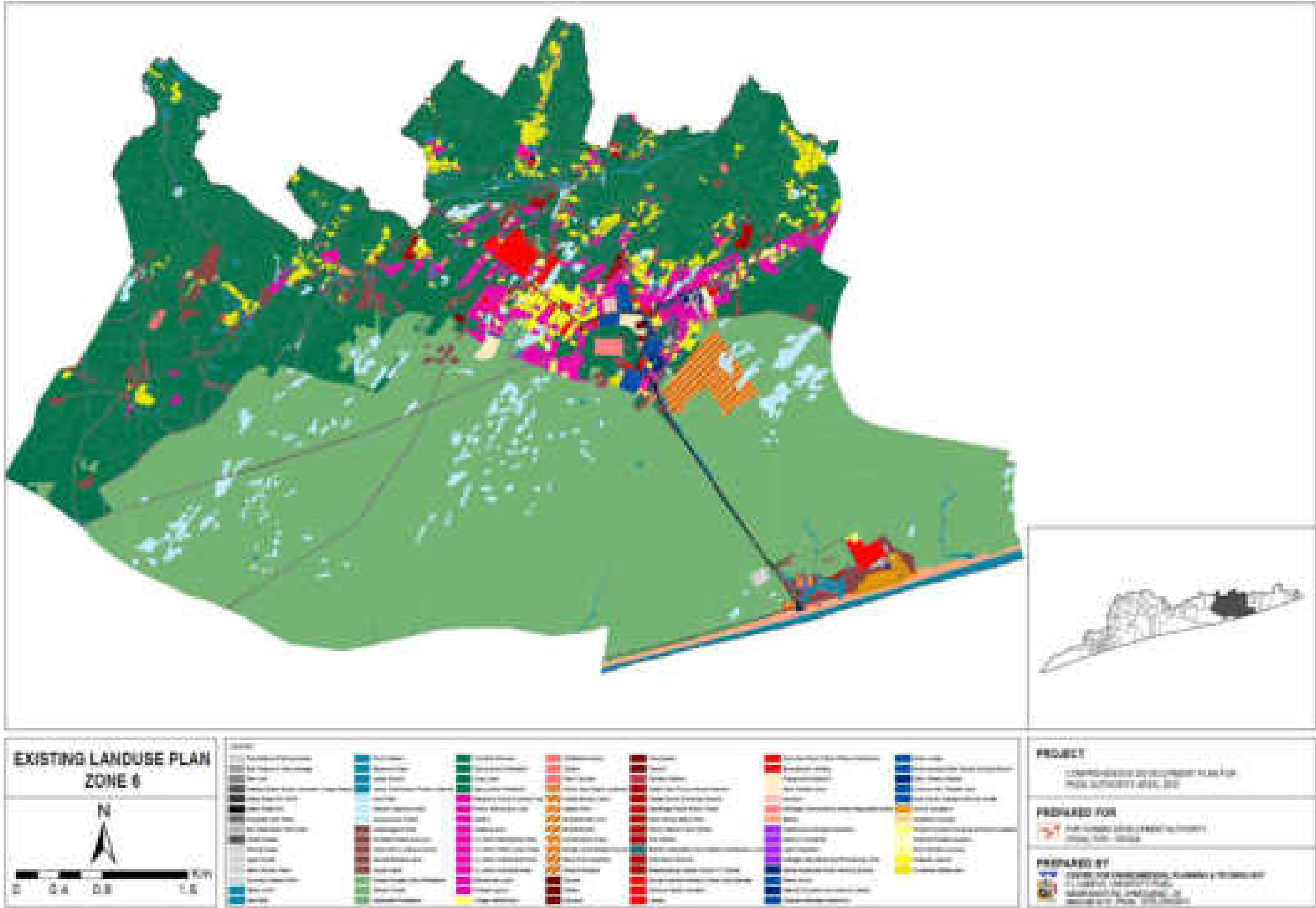
The attached graph shows percentage of land allotted over government land. The total government land available is 10.55 sqkm, which is around 30.22 % of total area of zone 6.

About 8% (0.80 sqkm) of total government land in zone 6 has been used under proposed land uses. More than 20% of all proposed land use areas fall under the government land.

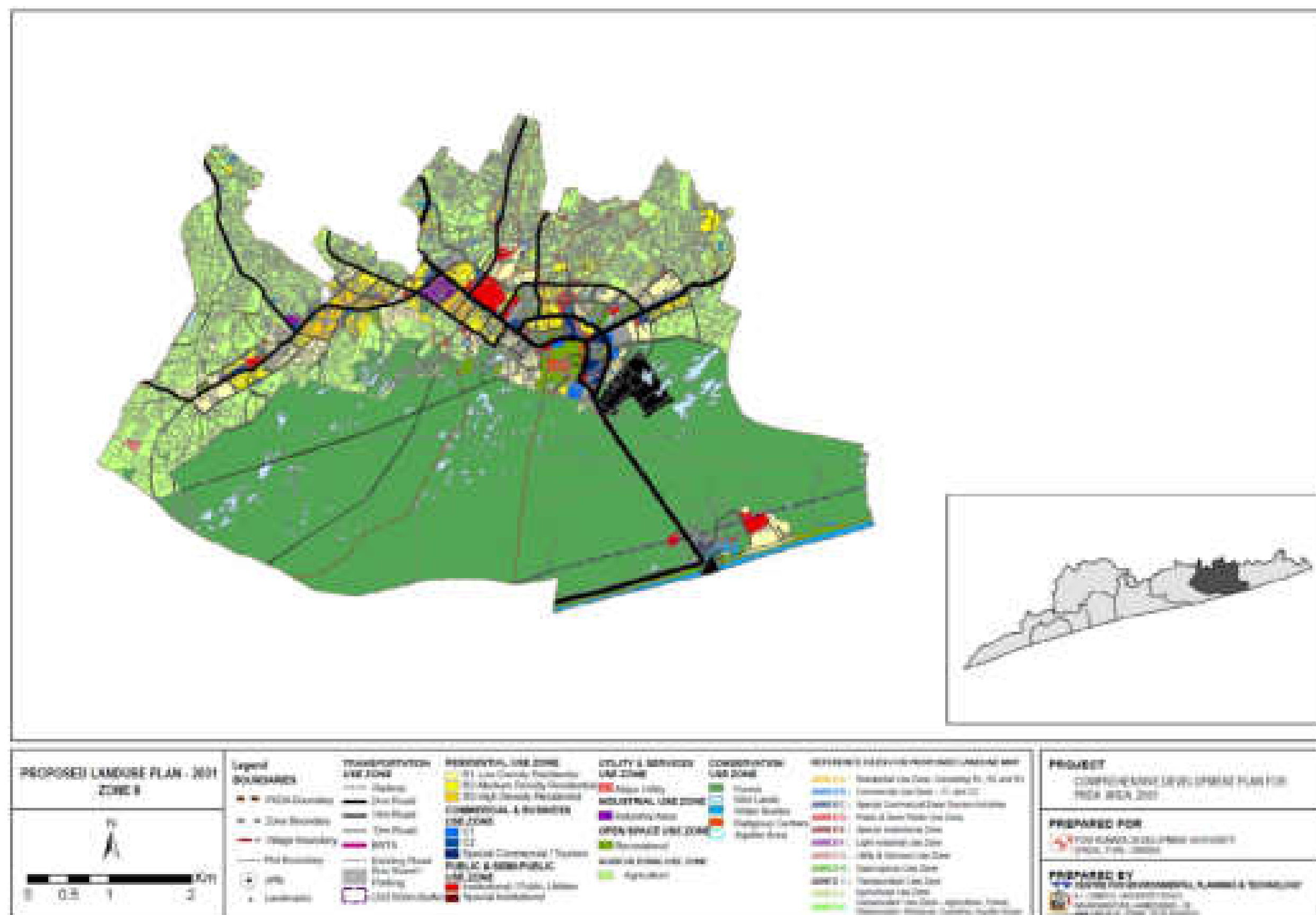




Map 34: Land Ownership, Zone 6



Map 35: Existing Land Use, Zone 6



Map 36: Proposed Land Use, Zone 6

4.4.7 Zone 7- Block B



Map 37: Activity zones, Zone 7

Block B entirely has been marked as Zone 7. This is a low /no development zone in the site. This is characterized by rural settlements and agricultural fields. There are small fishing villages along the coast towards Kakatpur. It is home for only 3% of PKDA population with 12 % of PKDA area.

No intervention has been proposed in this zone. However observing the existing development pattern this area might be used to develop the eco villages. The concept has been discussed in the previous chapter. The Jetty for the tourist ferry has been proposed in this zone.

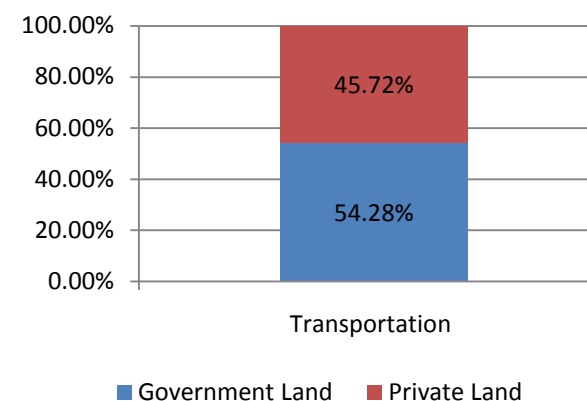
The exact location and the villages to be taken up for the same, shall have to be decided based on a feasibility study, taking care of the accessibility, location of the villages, availability of amenities and the willingness of the people. This area has also been found to be deficient in terms of amenities like schools, hospitals etc. Mobile facilities like mobile clinics, mobile computer labs etc have been proposed in this region.

The road connectivity has been improved and this shall aid in better reach to these facilities, since proposing a higher order stationary facility might not be possible in such cases.

The following tables indicate the proposed and existing integrated land use, and proposed land use.

Table 19: Proposed and Existing Integrated Land Use Statement, Zone 7

Land Use category	Existing LU		Proposed integrated LU	
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage
Residential	0.75	2.19	0.75	2.19
Commercial				
Industrial	0.004	0.01	0.004	0.01
Institutional	0.15	0.43	0.15	0.43
Recreational	0.70	2.03	0.70	2.03
Transport	0.21	0.62	0.34	0.99
Agriculture	8.03	23.33	7.95	23.09
Non developable	23.66	68.91	22.50	65.53
Developable	0.82	2.40	1.97	5.74
Total	34.34		34.34	



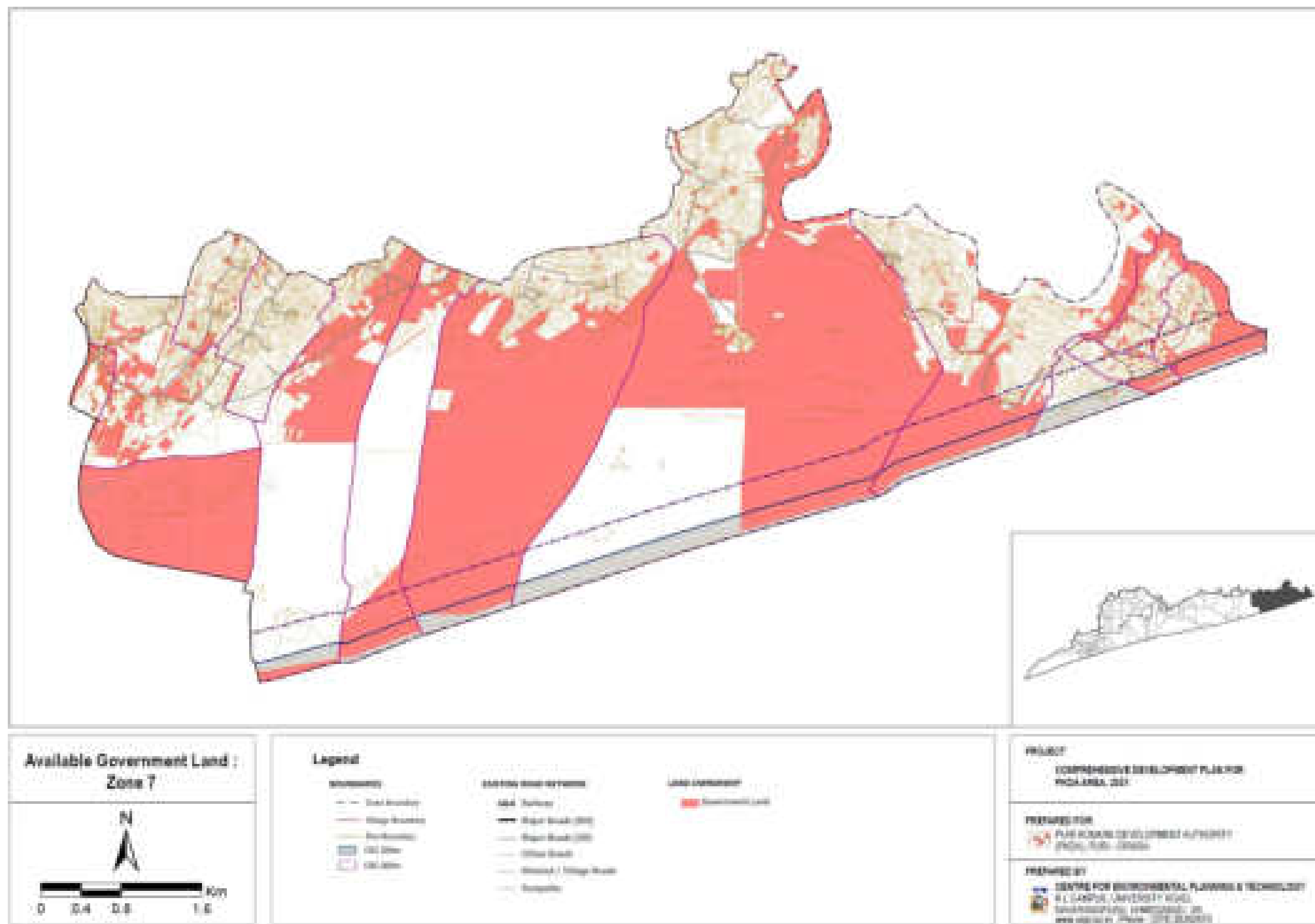
Percentage utilization of government & Private Land in proposed land use

Table 20: Proposed Land uses with sub classes, Zone 7

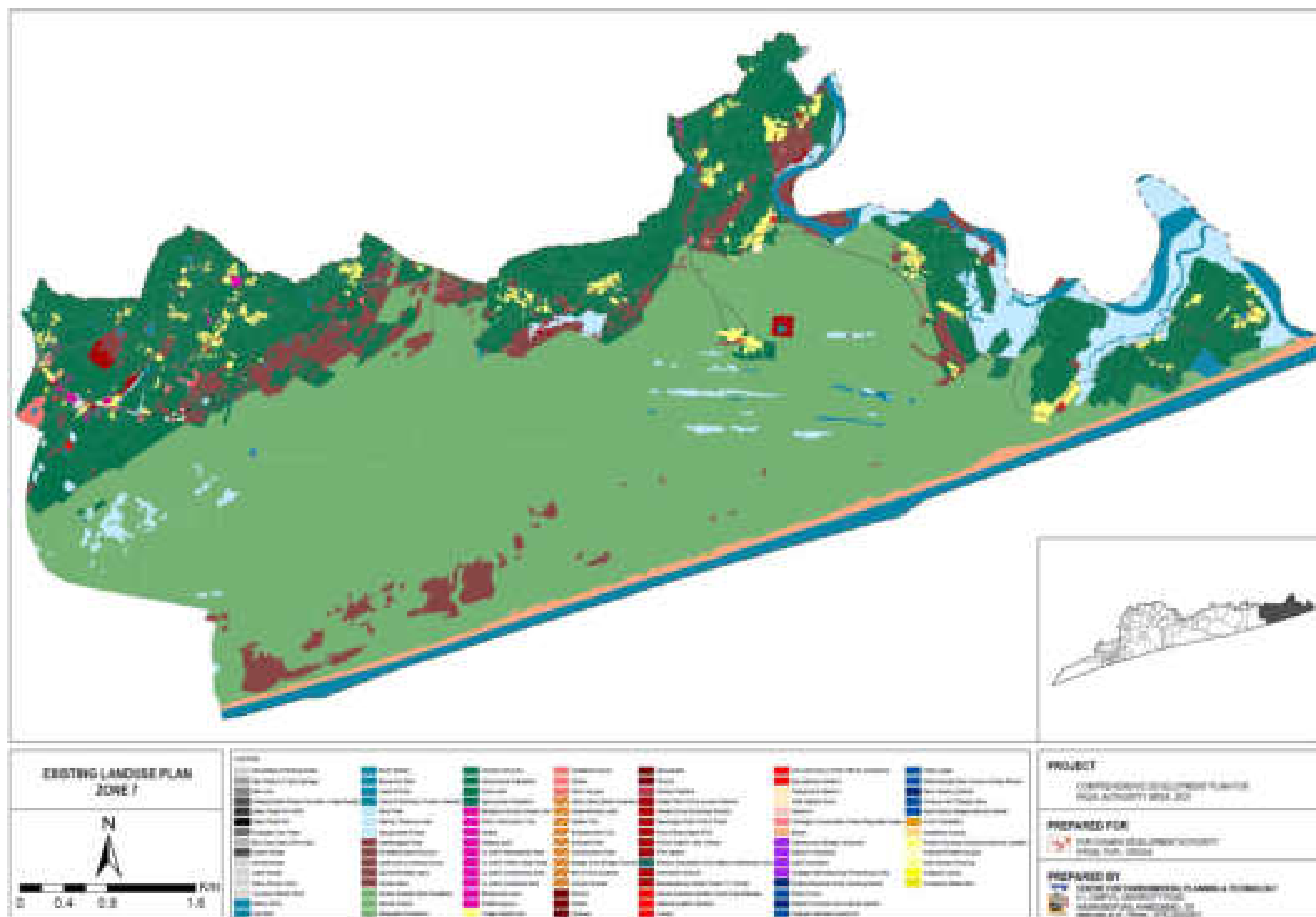
Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Transportation	24.00 m Road	0.06		0.04		0.02	
	18.00 m Road	0.06		0.03		0.04	
	12.00 m Road						
	BRTS						
	Bus Stand/Parking						
Sub Total		0.12	100	0.07	54.28	0.06	45.72
Total		0.12		0.07	54.28	0.06	45.72

The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The total government land available in zone is 19.11 sqkm, which is around 55.60 % of total area in Zone 7. In proposed land use, about .07 sqkm of government land in Zone 7 fall under proposed land use.

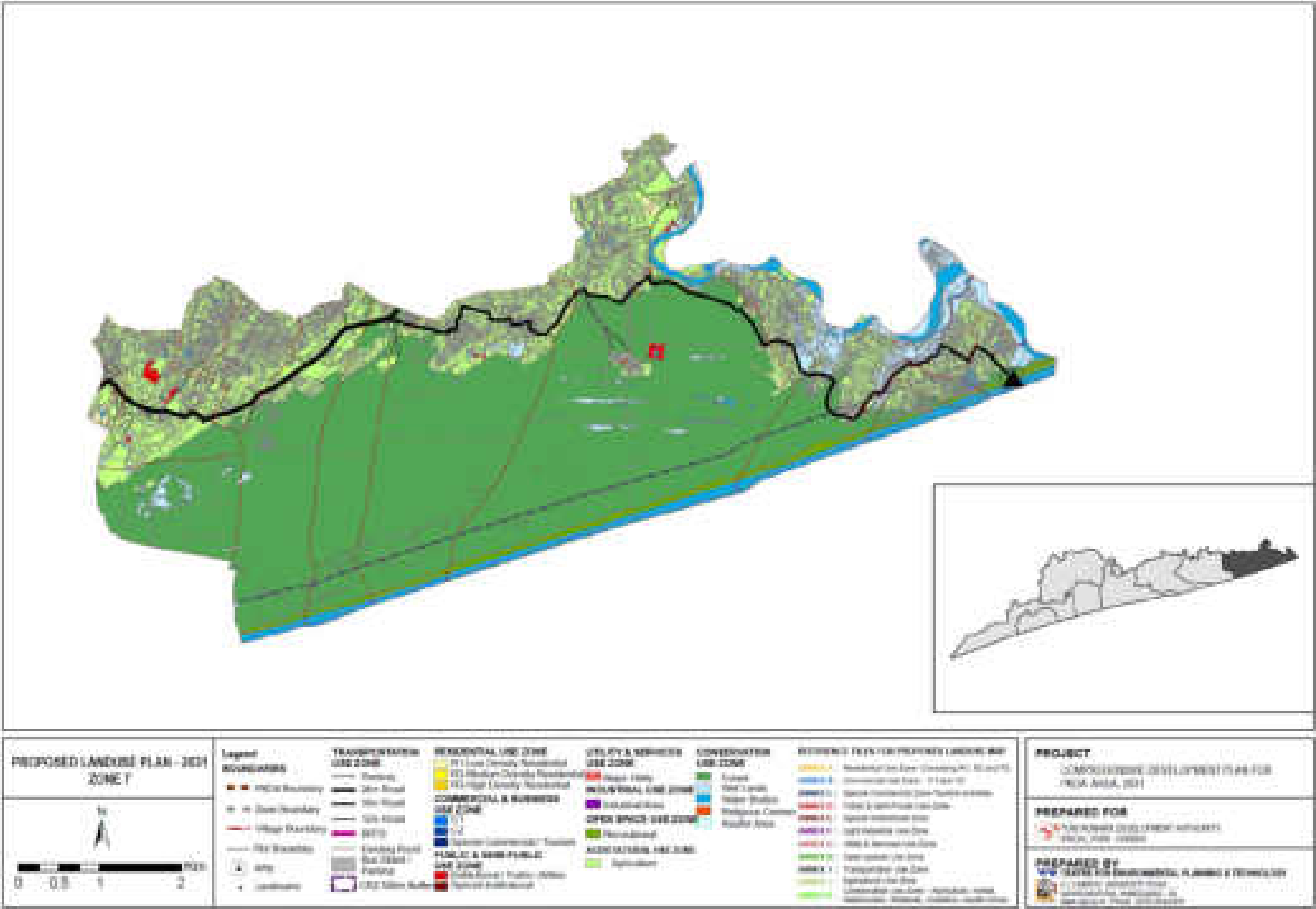




Map 38: Land Ownership, Zone 7



Map 39: Existing Land Use, Zone 7



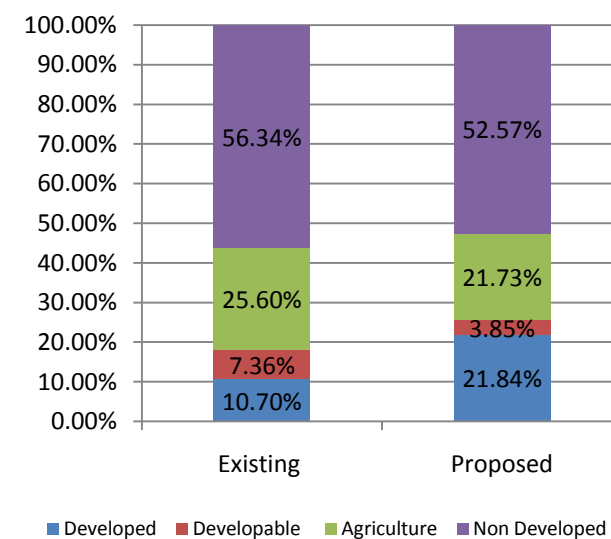
Map 40: Proposed Land Use, Zone 7

4.4.8 Integrated Land use PKDA 2031

Having discussed the various zones and sub-zones of Puri Konark Development Area, we can now sum up the integrated land use and analyze the changing land utilization patterns of PKDA. The attached table indicates the existing and proposed integrated land use of the region.

Table 21: - Proposed and Existing integrated land use statement, PKDA

Land Use category	Existing LU		Proposed integrated LU		Change in LU
	Area (in Sqkm)	Percentage	Area (in Sqkm)	Percentage	Percentage
Residential	10.48	4.48	21.96	9.39	4.91
Commercial	1.46	0.62	6.69	2.86	2.24
Industrial	0.08	0.03	0.47	0.20	0.17
Institutional	5.78	2.47	9.70	4.15	1.68
Recreational	2.54	1.09	5.31	2.27	1.18
Transport	3.65	1.56	5.96	2.55	0.99
Agriculture	60.89	26.04	51.23	21.91	-4.13
Non developable	131.76	56.34	122.93	52.57	-3.78
Developable	17.21	7.36	9.01	3.85	-3.51
Total	233.86		233.86		



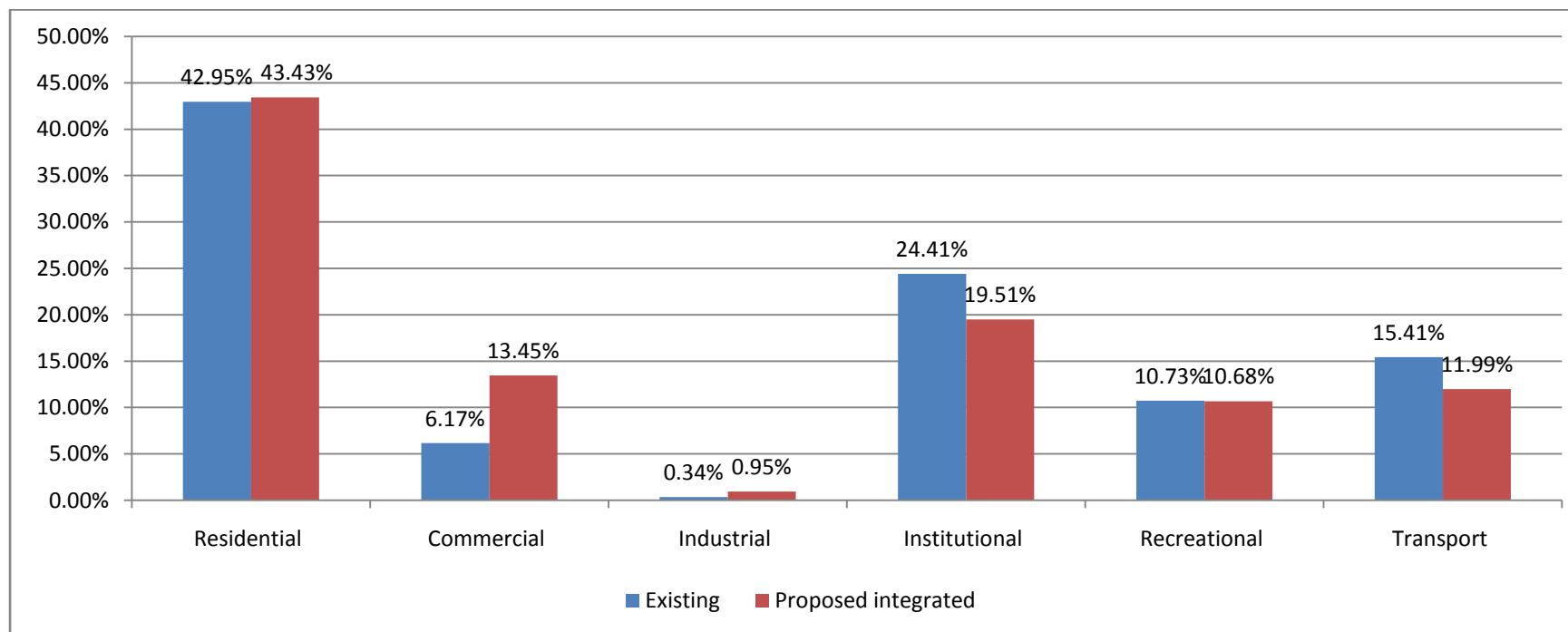
Changing Land Utilization Pattern

The changing share of land within the developed, non developable, and developable has been indicated in the attached chart. It can be observed that the developed lands have been doubled. Agriculture, non developable lands have been consumed only by 4% effectively.

The attached chart indicates the changing land use patterns between the existing and proposed, in the developed lands.



Comparison between existing and proposed integrated developed areas



Note: The percentages in graphs are calculated from the total area of land uses like, Residential, commercial, industrial, institutional, recreational and transportation.

The proposed land use pattern indicates a higher percentage share of commercial, fuelling the vision to provide PKDA with alternate economic opportunities. The commercial areas of PKDA as discussed in the previous sections also include the allocations for special tourism areas. In the proposed land use it has been attempted to minimize the demand supply gap of the infrastructure components both social and physical.

The overall mobility both intra-region and regional has been augmented by the provision of better roads, improved and strengthened public transport corridors and the provision of alternate modes of transport especially for the tourist. Although promoting tourism has been the thrust area of the PKDA development plan, equivalent attention has been given to the improvement of the life and living standards for the people of PKDA.



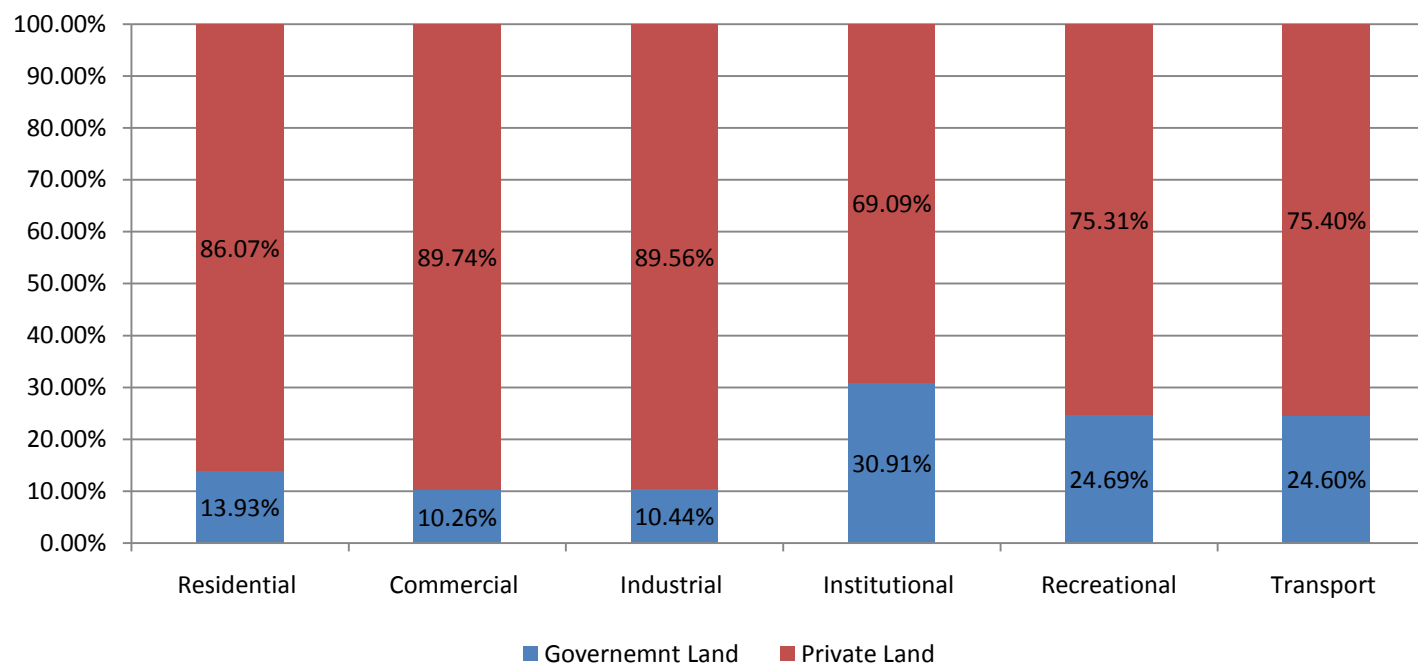
Table 22: Proposed Land uses with sub classes, PKDA

Land Use Category	Sub Classes	Proposed Area		Ownership			
		(in Sqkm)	Percentage	Government		Private	
				Area (in sqkm)	Percentage	Area (in sqkm)	Percentage
A. Residential	R1	5.61		0.95		4.65	
	R2	4.44		0.49		3.95	
	R3	1.38		0.15		1.23	
Sub total		11.43	43.86	1.59	13.93	9.84	86.07
B. Commercial	C1	0.22		0.01		0.22	
	C2	0.48		0.05		0.44	
	Special Commercial/Tourism	4.52		0.48		4.04	
Sub total		5.23	20.07	0.54	10.26	4.69	89.74
C. Institutional	Institutional/ public utilities	0.69		0.36		0.32	
	Special Institutional	3.07		0.78		2.29	
	Major Utility	0.16		0.07		0.10	
Sub total		3.92	15.05	1.21	30.91	2.71	69.09
D. Recreational		2.78	10.65	0.69	24.69	2.09	75.31
E. Industrial		0.39	1.50	0.04	10.44	0.35	89.56
F. Transportation	24.00 m Road	0.47		0.19		0.27	
	18.00 m Road	0.89		0.21		0.68	
	12.00 m Road	0.69		0.14		0.55	
	BRTS	0.19		0.02		0.16	
	Bus Stand/Parking	0.08		0.00		0.08	
Sub Total		2.31	8.88	0.57	24.60	1.74	75.40
Total		26.06		4.64	17.79	21.42	82.21

The above mentioned table indicates the purely proposed land use sub-categories in the zone along with the percentage of government land used. The newly proposed land use in zone is 26.06 sqkm.



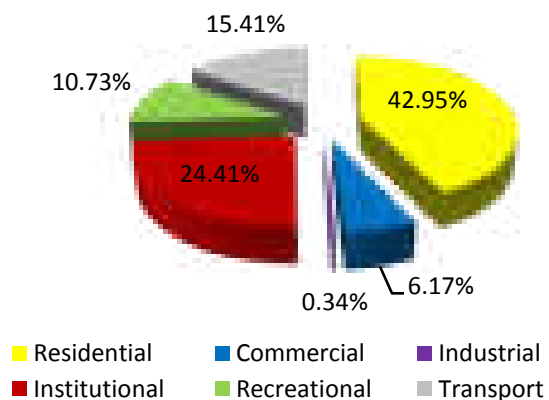
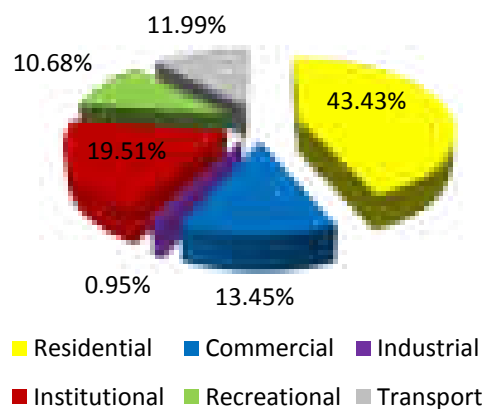
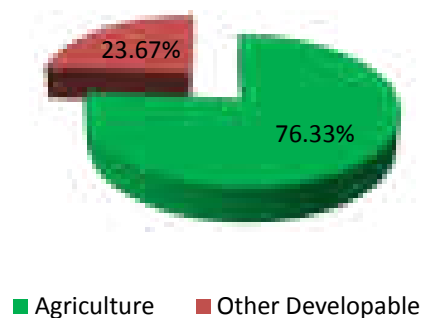
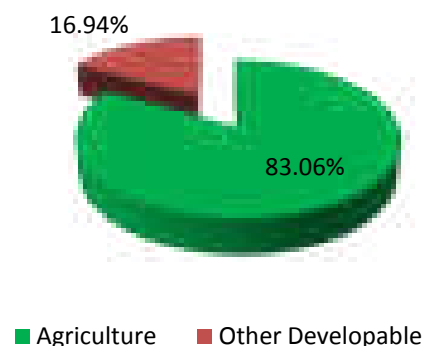
Percentage utilization of government and private land in proposed land use, PKDA



The attached chart indicates the percentage share of government and private land in the proposed land use of PKDA. Out of total proposed land use, 4.64 sqkm (18 %) fall under available government land. It may be observed that in transport the land acquisition needs is the highest. The proposed plan caters to the desired standards of road density and ensures connectivity to the region. The unavailability of government land may be addressed through land readjustment mechanisms and the also through the mechanism of premium FSI being awarded to the plot owners who lose their plots (partially or totally) to road construction. In the residential land use category, a minimum of 20% of the land should be developed for EWS housing. Only 14% of the total proposed residential is over government lands. Suitable mechanism for development of the EWS and catering to the government needs of own housing the land may be distributed.

In the institutional category the major utilities like solid waste management sites have been located over government land with minimal acquisition needs. For the other utilities like schools, offices, colleges, hospitals etc, may be shared appropriately between the government and the private players.



Existing**Developed Lands****Proposed Integrated****Developable**

The following charts indicate the comparison between the proposed integrated and existing land use pattern in the PKDA region.

The developed areas and the changing land use shares have been devised carefully, to fuel the envisaged growth pattern in the region.

The land use proposal has been carefully developed and planned to make it cohesive and consolidated. Location of amenities and other public spaces have been designed keeping in mind the accessibility of the same.

Agriculture is one of the major occupations of the region along with tourism based activities. Hence agriculture has been preserved as much as possible.

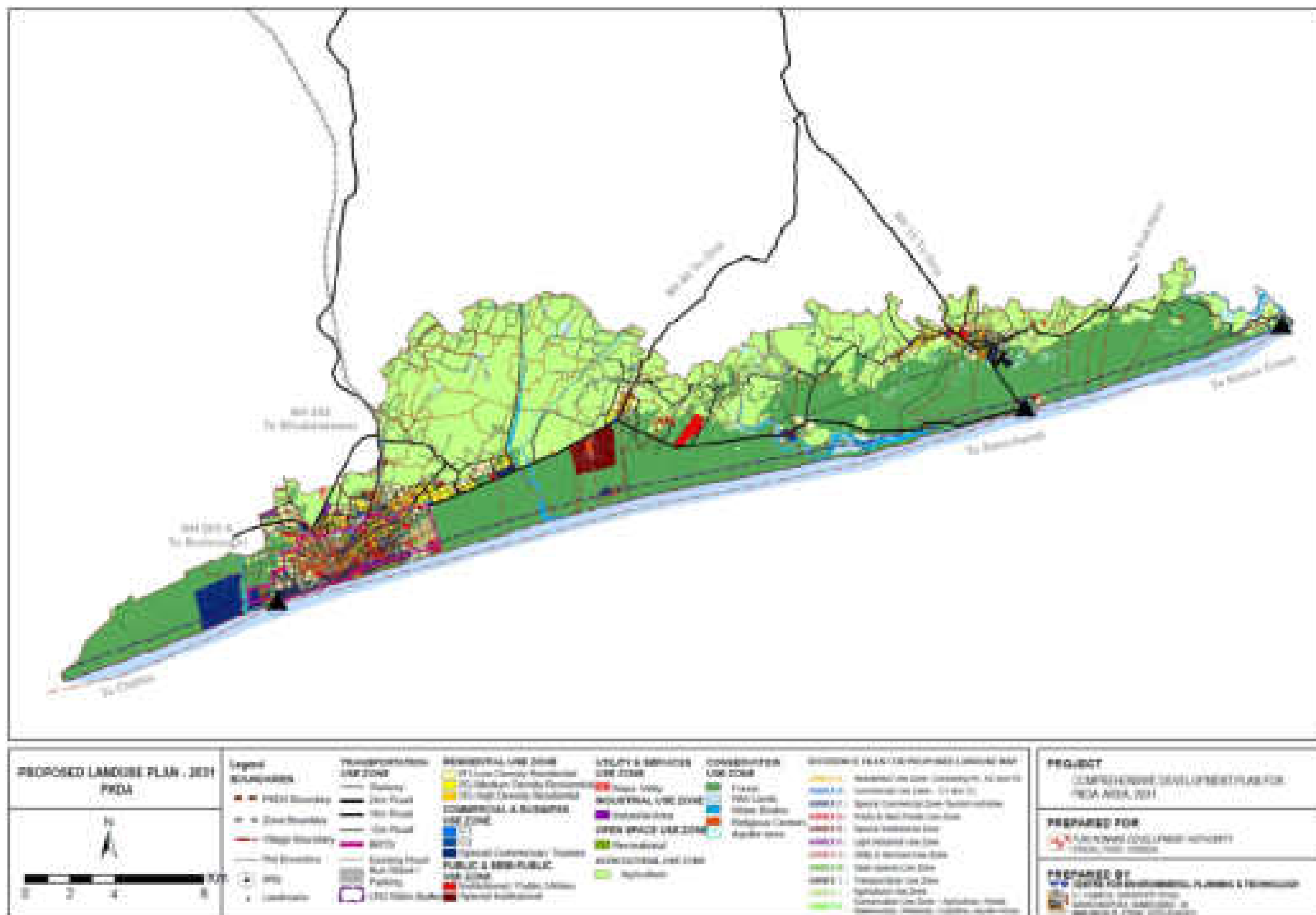
The attached map shows the PKDA land use for 2031.

Changing Land use Pattern 2001-2031

Note: The percentages in graphs are calculated from the total area of land uses like, Residential, commercial, industrial, institutional, recreational and transportation.

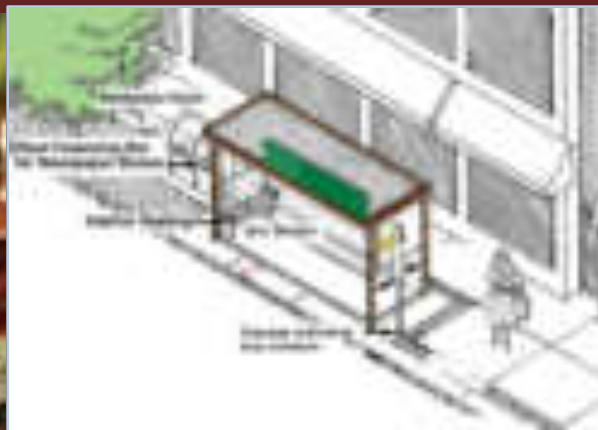
Note: The percentages in graphs are calculated from the total area of land uses like Agriculture and other developable areas.





Map 41: Proposed Land Use, PKDA

5. DEVELOPMENT REGULATIONS



5. DEVELOPMENT REGULATIONS

5.1 Introduction

The purpose of zoning regulations is to promote healthy and livable environment along with safety and general social welfare of the community. Zoning regulations ensures that the area develops according to the vision and carrying capacities envisaged in the development plan. Zoning regulations followed by the development control regulation ensure that the proposed development pattern is realized with optimum distribution of the amenities and the envisaged urban form. The proposed development control regulations of the Puri Konark Development Authority area are a multilayered guideline, to regulate the form, use and product mix of the region. The attached table indicates the same.

Criteria	Number of Zones	Purpose
Administrative boundaries	Zone 1- Puri Sadar Puri Town Zone 2- Block A Zone 3- Block A Zone 4- Block A Zone 5- Konark Zone 6- Block B	These have been carved to facilitate the process of Zonal development plans that should follow the Comprehensive Development Plan. The Zonal guidelines or the DCR's do not mandate these boundaries specifically. They are identified through the list of villages each zone has.
Use based	Residential (R1, R2, R3) Rural residential Commercial (C1, C2, Special commercial) Public utilities Industrial Recreational Transport Conservation areas – Forests, Wet lands, Water bodies, Existing Religious centers, Aquifer areas Non- Built up areas- Agriculture, waste lands, Other non- built up areas, Vacant lands	These are use based zones and are identified through a set of permissible, restricted and prohibited uses. The combination of these uses mandated through the zonal guidelines form each theme based zone. The development control guidelines act as a tool for achieving the density patterns and the desired use mix for each area. The building regulations mandate the urban forms, and help in developing a climate friendly, disaster safe and sustainable urban form. The conservation areas have been identified based on the environmental importance and susceptibility to unplanned development.
Guidelines for special areas	Coastal regulation zone Heritage zone Urban design guidelines	The coastal zones and the regulations are in line of the revised CRZ regulation 2011. The heritage zone in Puri and Konark (sun temple precinct) has been identified and relevant heritage guidelines have been suggested. The urban design mandates the visual expression and the architectural and design treatment to the heritage areas.
Building regulations		The building regulations should follow the prescribed FSI and other regulations given by th BDA Planning anf Building Standards Regulations-2008 (amended-2012)



The development control regulations ensure that the development of the region takes place in accordance with the land use plan. By regulation the spacing of buildings, adequate light, air, protection from fire etc. can be provided. It prevents overcrowding in buildings and land thus ensures adequate facilities and services.

Zoning does not prohibit the uses of land and buildings that are lawfully established prior to the coming into effect of the zoning regulations. If these uses are in conflict to the newly proposed uses, they are termed as non-conforming uses and are gradually eliminated over years without inflicting unreasonable hardship upon the property owners.

The zoning regulations and their enforcement are a major tool in securing the land use pattern as per the Comprehensive Development Plan. While formulation of the zoning regulations due care has been taken to integrate the BDA Planning and Building Regulations-2008 (Amended-2012).

While the zoning guidelines have been given specifically for each zone with the relevant activity mix, for the desired development, the permissible uses mix allows the character of each zone to be retained. The use based guidelines detail the permissible, restricted and non permissible activities in each use based zone. Finally the layer of Building regulation and urban design guidelines help in retaining the urban form and the service allocation in each use based zone.

5.2 Objectives of Zonal Guidelines and Development Control Regulations

The objectives of the Zoning and development regulations are to:

- To Safeguard Public Interest
- Eliminate and Phase out polluting and conflicting land uses
- Anticipatory and responsive to the envisioned needs of the region
- Are realistic in nature and asymptotic to the market conditions and forces
- Are coherent regulations which recognize the dynamics of land values, densities and infrastructure
- The regulations of Floor space index (FSI) as Development control parameters can help match the development needs and demands of individuals and the city.
- To permit mixed use and a dynamic urban form

The mono functional parcel based land wise proposals are rigid and do not recognize the larger trends in areas/territories. Hence to enable diverse zones with land uses responsive to the ground realities, strategies for appropriate mixed land use approach is proposed both in terms of physical planning and regulations and guidelines. The mix in use and the market forces have to be sufficiently regulated yet flexible to allow an appropriate service provision both from the public and the private sector.



5.3 Activity Pattern

The table below elaborates the activities permissible in each zone as well as the activities that are restricted and prohibited. The permissible activities are the activities for which the zone is primarily intended for. The restricted activities are the activities that might be permitted in the area by the PKDA. Prohibited activities in the list are the activities that are not intended in the zone and hence may not be allowed.

Table 23: Activities permitted in the PKDA land use categories

Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
Residential Use Zone (consisting R1, R2, R3)		
<ol style="list-style-type: none"> 1. Detached housing 2. High end plotted development 3. Farm Houses 4. Plotted development for detached housing (small plots) 5. EWS housing and slum redevelopment (if any) 6. Residential apartments 7. Hostel, Boarding and lodging houses with density limitations 8. Night shelters, foreign missions, dharamshala, guest houses 9. Professional offices not exceeding one floor 10. Educational institutions (nursery, primary, high – school, college) 11. Social, cultural and neighbourhood, recreational institutions with adequate parking facilities 12. Marriage hall, community hall 13. Convenience shopping centres, local(etail) shopping community centres, club, auditoriums 	<ol style="list-style-type: none"> 1. Places of worship, Convenience shopping, 2. Professional, commercial, government and semi- government offices 3. Colleges and research institutions of non-commercial nature 4. Petrol Filling Stations 5. Places of entertainment 6. Cinema halls 7. Markets for retail goods, weekly markets, multi – technical shops 8. IT, IT enabled services 9. Motor vehicle repairing, workshop/ garages, 10. Storage of LPG gas cylinders 11. Burial – grounds, Crematories and electric crematorium 12. Restaurants and hotels 13. Bus depots without workshop 14. Hospitals and sanctorum not treating contagious diseases mental patients, if setback and coverage of plots such as not to constitute nuisance to the 	<ol style="list-style-type: none"> 1. Heavy, large and extensive industry- noxious, obnoxious and hazardous industries 2. Warehousing, storage godowns of perishables hazardous, inflammable goods 3. Turnkey yards 4. Workshop for buses etc. 5. Slaughter houses 6. Wholesale mandis 7. Hospitals treating contiguous diseases 8. Sewage treatment plant/disposal of sewage 9. Water treatment plant 10. Solid waste dumping ground 11. Outdoor and indoor games stadiums, shooting range 12. Zoological garden, botanical garden, bird sanctuary 13. International conference centre 14. Reformatory district battalion offices, forensic science laboratory 15. All uses not specifically permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
14. Any neighbourhood recreation uses including clubs and other semi-public recreational uses 15. Exhibition and art galleries 16. Library, gymnasium 17. Medicals, clinics, dispensaries, nursing home, health centres (20 beds) 18. Public utilities and public buildings 19. Non-commercial agricultural gardens 20. Household occupation if the area for such use does not exceed one 21. Banks and other financial institutions not exceeding one floor 22. Taxi stand, Bus Stop 23. Services for households (saloon, parlours, bakery, sweet shop, dry cleaning, internet kiosk, etc) not part of a residential building 24. Police post 25. Park/ tot – lots, technical training centre, yoga centre/health clinics 26. Accessory uses clearly incidental to residential use (except service uses) which will not create a nuisance or hazard	residential area 15. Rearing of poultry and cattle for non-commercial use if no bird or animal is housed closer than 6 metres of the dwelling 16. Removal of gravel, clay sand or stone for development of site which will not result in the stagnation of water or cause other nuisance 17. Service industries and storage yards incidental to main use philanthropic uses 18. Service industries/ cottage industries	
Commercial Use Zone (C1 and C2)		
1. Retail business, mercantile 2. Shops 3. Services 4. Business and Professional Offices 5. Hostels/Boarding houses, social and welfare institutions	1. Associated residential uses 2. Place of entertainment and recreational uses 3. Place of worship 4. Petrol filling, service station 5. Service garage – only if	1. Heavy, large and extensive industry-noxious, obnoxious and hazardous 2. Hospitals/ research laboratories treating contiguous diseases 3. Poultry farms/dairy farms, slaughter houses



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
6. Restaurants, hotels, eating houses 7. Convenience/ neighbourhood shopping centre, local shopping centres, weekly/ formal markets, bakeries and confectionaries 8. Government/ institutional offices, and semi government offices 9. Cinema hall/theatre, banquet halls, auditoriums 10. Convention Centre 11. Guest houses 12. Marriage hall, 13. Clinics/nursing home 14. Religious activities and infrastructure 15. Commercial centres 16. Research/training institute 17. Public utilities and buildings 18. Parking lots 19. Meat, fish, Vegetable & Fruit markets 20. Banks and financial services/stock exchange 21. Bus stop, taxi stand/ 3-wheeler stands 22. Petrol pumps and service stations on roads with 12 M or more ROW 23. IT and IT enabled services 24. Telephone exchange 25. Services uses like hair salon, tailoring shops, beauty parlour, laundry and dry cleaning shops, etc 26. Public recreational uses 27. Wholesale and retail shops 28. Wholesale storage yards	not directly along the main road 6. Printing presses employing not more than 10 persons. 7. 20 bed hospitals not treating contagious diseases and mental patients 8. Wholesale storage yards. 9. Weigh bridge and other incidental main use 10. Polytechnics and higher colleges and technical institutes 11. Sports/ stadium 12. Public utility 13. Incidental/ancillary residential use Schools, clinics, social and welfare institutions 14. Bank offices 15. Residence on floor other than ground floor 16. Coal and wood depot 17. Service industries 18. Truck terminal and parking 19. Freight terminal 20. Junk-yards 21. Service garage 22. Non- polluting, non- obnoxious light industries 23. Warehousing/storage godowns of perishable, inflammable goods, coal, wood, timber yards	4. Sewage treatment plant/disposal of sewage sites 5. Agricultural uses, 6. Storage of perishable and inflammable commodities 7. Quarrying of gravel, sand, clay and stone 8. Zoological garden and botanical gardens, bird sanctuary 9. International convention centre 10. Reformatory district, battalion offices, forensic science laboratory 11. All uses not specifically permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
29. Godowns/covered storage and warehousing 30. Parks, playgrounds, clubs 31. Service industries like motor garage workshop, radio and television repairing shops 32. Flour rice mills not engaging more than 10 Horse Power motors. 33. Museums, library 34. Police station/ posts, post offices	24. Bus and truck depots 25. Gas installation and gas works 26. Railway yards/ stations 27. Night shelter	
Special Commercial Zone- Tourism Related Activities		
1. Resorts 2. Hotels 3. High-end residential cottages 4. Beach resorts 5. Golf courses 6. Restaurants 7. Bus services / tour and travel services / taxi services / car rentals 8. Parks / gardens 9. Green , walk trails 10. Malls / shopping centres 11. Water sports 12. Boating activity 13. Convention centres 14. Theme parks 15. Clubs / swimming pools 16. Picnic areas 17. Shooting range, amusement park 18. Entertainment -Cinema, auditorium 19. Art galleries, museum 20. Staff residential (minimal)	1. Outdoor and indoor games stadiums 2. Health care centres 3. Corporate commercial 4. Small scale handicraft industries	1. Heavy, large and extensive industry-noxious, obnoxious and hazardous industries 2. Warehousing, storage godowns of perishables hazardous, inflammable goods 3. Turnkey yards 4. Workshop for buses etc. 5. Slaughter houses 6. Wholesale mandis 7. Hospitals treating contagious diseases 8. Sewage treatment plant/disposal of sewage 9. Water treatment plant 10. Solid waste dumping ground 11. Zoological garden, botanical garden, bird sanctuary 12. International conference centre 13. Reformatory district, battalion offices, forensic science laboratory 14. All uses not specifically permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
21. Zoological garden and botanical garden, Bird sanctuary 22. Public utility (police station, fire station, Health Facilities and other infrastructure services)		
Public and Semi-public Use Zone		
1. Local, State and Central Govt. Offices 2. Semi-government offices 3. Public undertaking offices 4. Universities and specialized educational institutions, schools 5. Educational and Medical Institutions, Research institutions, colleges 6. Social and cultural institutions/welfare centres 7. Libraries 8. Community hall 9. Conference halls, auditoriums 10. Marriage hall, dharamshala 11. Hospitals/nursing home/health centre/clinic/ dispensary 12. Hostels 13. Uses incidental to Govt. Offices 14. Local Municipal offices 15. Convention centre 16. Banking and financial services 17. Police stations, police lines, jails, fire stations, post offices 18. Bus and Railway Passenger terminals 19. Incidental/ancillary residential use	1. Residential flats, residential plots for group housing and staff housing 2. IT,ITES, Financial services 3. Hotels 4. Entertainment and recreational complexes 5. Nursery and kindergarten 6. Open air theatre, playground 7. Residential club, guest house 8. Bus and Truck terminals, helipads 9. Residential and other uses which is no way causing any nuisance and hazard incidental to main use 10. Retail shops, shopping complexes 11. Bus and railway passenger terminals 12. Reformatory district, battalion offices, forensic science laboratory 13. Public utilities 14. Multi level Parking 15. Uses for defence purpose, defence quarters, educational and police headquarters 16.	1. Heavy, large and extensive industry-noxious, obnoxious and hazardous 2. Hospitals/ research laboratories treating contagious diseases 3. Poultry farms/dairy farms, slaughter houses 4. Sewage treatment plant/disposal of sewage sites 5. Agricultural uses, 6. Storage of perishable and inflammable commodities 7. Quarrying of gravel, sand, clay and stone 8. Zoological garden and botanical gardens, bird sanctuary 9. International convention centre 10. All uses not specifically permitted 11. Junkyard



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
20. Radio transmitters and wireless stations. 21. Bus Stops and Taxi Stands 22. Interpretation centres		
Special Institutional Use Zone		
1. Educational institutions – Schools college 2. Canteen and eateries 3. Conference halls 4. Accommodation for the students and staff 5. Meditation centers 6. Primary health care centre 7. Naturopathy and wellness centers 8. Camping sites 9. Open recreation areas 10. Parking and small service centres 11. Open air theatres 12. Small commercial of the C2 category 13. Tourism infrastructure (information centre, tour bookings, heritage walks) 14. Interpretation centres 15. Bus services / tour and travel services / taxi services / car rentals 16. Parks / gardens 17. Green , walk trails 18. Shopping centers 19. Gymnasiums and sports training institutes 20. Picnic areas 21. Staff residential (minimal) 22. Public utility (police station, fire station, Health Facilities etc)	1. Hotels 2. Restaurants 3. Art galleries, museum 4. Cinema 5. Auditorium 6. Nursery and kindergarten 7. Clubhouses 8. Residential and other uses which is no way causing any nuisance and hazard incidental to main use 9. Retail shops, shopping complexes 10. Local, State and Central Govt. Offices 11. Semi-government offices 12. Public undertaking offices 13. Multi level car parking 14. Hospitals/nursing home/health centre/clinic/ dispensary 15. Outdoor and indoor games stadiums	1. Heavy, large and extensive industry- noxious, obnoxious and hazardous industries 2. Warehousing, storage godowns of perishables hazardous, inflammable goods 3. Turnkey yards 4. Workshop for buses etc. 5. Slaughter houses 6. Wholesale mandis 7. Hospitals treating contiguous diseases 8. Sewage treatment plant/disposal of sewage 9. Water treatment plant 10. Solid waste dumping ground 11. Zoological garden, botanical garden, bird sanctuary 12. Reformatory district, battalion offices, forensic science laboratory 13. All uses not specifically permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
Utility and Services use zone		
<ol style="list-style-type: none"> 1. Solid waste management site 2. Sorting yard 3. Parking 4. Weighing scale 5. Compost Plant 6. Recycling plant 7. First Aid center 8. Packaging plant 9. Canteen 10. Small offices for waste management purpose only 11. Rest house for staff only 	<ol style="list-style-type: none"> 1. Service areas 2. Information/payment kiosk 3. Health center for public and staff or any other use incidental to public utilities and services 4. Warehouse, storage, godowns 5. <i>All other uses specifically not permitted and not compliant to the CPHEEO and MSW 2000 norms</i> 	
Light industrial use zone		
<ol style="list-style-type: none"> 1. Light Industries 2. Arts and crafts related industries 3. Pharmaceuticals 4. Food and beverages 5. Light engineering 6. Auto components 7. Electrical and electronic goods 8. Computer hardware 9. Machine tool industry 10. Cold storage and ice factory 11. Residential building for staff 12. Transport terminals 13. BUS Stands, bus depots, logistics park, taxi stands, 3 wheeler stands 14. ATM 	<ol style="list-style-type: none"> 1. IT,ITES, Financial services 2. Entertainment and recreational complexes 3. Helipads 4. Retail shops, shopping complexes 5. Bus and railway passenger Terminals 6. Water treatment plants 7. Recreational areas (park, garden, playgrounds) 8. Medical centre /primary health centre 9. Junkyards 	<ol style="list-style-type: none"> 1. Heavy, large and extensive industry- noxious, obnoxious and hazardous 2. Hospitals/ research laboratories treating contiguous diseases 3. Poultry farms/dairy farms, slaughter houses 4. Sewage treatment plant/disposal of sewage sites 5. Agricultural uses 6. Quarrying of gravel sand, clay and stone 7. Zoological garden and botanical gardens, bird sanctuary 8. International convention centre 9. General business unless incidental to and on the same site with industry. 10. Any manufacturing establishment



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
15. Agro industries 16. Services for industrial workers 17. Residential buildings for essential staff 18. Public utilities 19. Loading unloading space 20. Warehousing, storage and depots of non perishable and non-inflammable commodities and incidental use 21. Wholesale business establishments 22. Petrol filling station with garages 23. Industries which will not cause excessive or objectionable noise, vibrations, smoke, gas, fume, odour, dust effluent and objectionable conditions 24. Railway and road freight terminals 25. Railway siding 26. Incidental and utility use incidental to the main use		detrimental by way of nuisance or hazard 11. Industries not permitted by Orissa Pollution Control Board 12. Residential dwellings other than those essential operational and watch and ward staff 13. Schools and colleges 14. Hotels, motels 15. Caravan parks, recreational spots or centres 16. Other non-industrial related activities 17. Irrigated and sewage farms 18. Major oil depot and LPG refilling plants 19. Commercial offices 20. All uses not specifically permitted in permissible and restricted activities
Open space use zone		
1. Specialized parks/ maidans for multipurpose use 2. Special recreational zones 3. Special education areas 4. Regional parks, district parks, playgrounds, children traffic parks 5. Botanical/ zoological garden, bird sanctuary 6. Clubs 7. Community hall 8. Stadiums, picnic huts, holiday	1. Building and structure ancillary to use permitted in open spaces and parks such as stands for vehicles on hire, taxis and scooters 2. Commercial use of transit nature like cinemas, circus and other shows 3. Public assembly halls 4. Restaurants and 5. Caravan parks 6. Residential club, guest house 7. Fire post, police station, post and telegraph	1. Any building or structure, which is not required for open air recreation, dwelling unit except for watch and ward and uses not specifically permitted therein. 2. All uses not specifically Permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
9. resorts 10. Shooting range, sports training center 11. Swimming pools 12. Open air cinemas/ theatre 13. Bus and railway passenger terminals 14. Car parking area 15. Library 16. Public utilities and facilities such as police post, fire post, post and telegraph office, health center for players and staff 17. Incidental/ancillary residential use	office, polytechnics 8. Commercial uses center, other uses/activities 9. Dwelling for watch and ward staffs 10. Uses clearly incidental use which will not create any nuisance and hazard 11. Open air theatre and cinemas/theatre 12. Camping sites 13. Yoga and meditation centre 14. Animal racing and riding stables	
Transportation Use Zone		
1. Roads 2. Footpaths 3. Parking areas 4. Multi level car parks 5. Bus stops, bus and truck terminals 6. Airports 7. Ferry ghats and Jetties 8. Commercial areas 9. Public toilets 10. Commercial areas 11. Filling stations 12. Service centres 13. ATM 14. Workshop for buses etc. 15. Restaurants and eateries 16. Automobile spares and services, godowns 17. Utility networks (drainage, sewage, power, tele-communications)	1. Wayside shops and restaurants, Hotels and dharamsalas 2. Medical facilities 3. Warehousing, storage godowns of perishables hazardous, inflammable goods 4. Corporate commercial 5. Vegetable markets 6. Planned vending areas 7. Ancillary residential use 8. Emergency health care center 9. Tourism related projects 10. Night shelters and boarding houses	1. Residential areas 2. Heavy, large and extensive industry-noxious, obnoxious and hazardous industries 3. Turnkey yards 4. Hospitals treating contagious diseases 5. Sewage treatment plant/disposal of sewage 6. Water treatment plant 7. Solid waste dumping ground 8. Schools and colleges 9. Reformatory district, battalion offices, forensic science laboratory 10. All uses not specifically permitted in permissible and restricted activities



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
Conservation areas – Agriculture		
<ol style="list-style-type: none"> 1. Agriculture / crop land 2. Horticulture Plantation 3. Dairy and poultry farming 4. Milk chilling centre 5. Storage and processing of agricultural goods 6. Brick kilns and extractive areas 7. Agriculture by-product industry 8. Farm houses - low density housing only for farmers 9. Commercial activity only for agricultural products (vegetables, cotton, fruits, flowers, arts and crafts) 10. Shopping areas for agricultural goods, compost, by-products, farming equipments 11. Public utility (police station, fire station, post office 12. Farm houses and residential for farmers 	<ol style="list-style-type: none"> 1. Sewage Treatment Plants 2. Solid Waste Landfills 3. Sewage farms 4. Residential flats, residential plots for group housing and staff 5. housing 6. Residential club, guest house 7. Residential and other uses which is no way causing any nuisance and hazard incidental to main use 8. Retail shops, shopping complexes 9. Local, State and Central Govt. Offices 10. Semi-government offices 11. Public undertaking offices 12. Public utility 13. Hospitals/nursing home/health centre/clinic/ dispensary 14. Cottage industries 	<ol style="list-style-type: none"> 1. Heavy, large and extensive industry-noxious, obnoxious and hazardous industries 2. Warehousing, storage godowns of perishables hazardous, inflammable goods 3. Turnkey yards 4. Workshop for buses etc. 5. Hospitals treating contiguous diseases 6. Sewage treatment plant/disposal of sewage 7. Outdoor and indoor games stadiums 8. Zoological garden, botanical garden, bird sanctuary 9. International conference centre 10. Reformatory district, battalion offices, forensic science laboratory 11. All uses not specifically permitted
Conservation areas – Forests*		
<ol style="list-style-type: none"> 1. Forest Trails 2. Camping sites 3. Temporary shelters 4. Fire lookout structure 	<ol style="list-style-type: none"> 1. Building and structure ancillary to use permitted in open spaces and parks such as stands for vehicles on hire, taxis and scooters 2. Dwelling for watch and ward staffs 3. Eco-tourism, camping sites, eco-parks, eco-lodges 4. Special outdoor recreation 	<ol style="list-style-type: none"> 1. Hunting 2. Permanent structure 3. All uses not specifically Permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
	5. Any uses incidental to eco-tourism	
*All proposed activities are subject to clearance from the Forest Department		
Conservation areas – Waterbodies (Rivers/Lakes/Tanks/Canal)		
<ol style="list-style-type: none"> 1. In situ measures of lake cleaning such as de-silting, de-weeding, bioremediation, aeration, bio-manipulation, nutrient reduction, withdrawal of anoxic hypolimnion, constructed wetland approach or any other successfully tested eco- technologies etc depending upon the site conditions 2. Washing and Bathing ghats 3. Catchment area treatment which may include afforestation, storm water drainage, and silt traps etc. 4. Strengthening of bund, lake fencing, and shoreline development if required. 5. Lake front eco-development including public interface. 	<ol style="list-style-type: none"> 1. Dhobi Ghaats 2. Water front development – fountains and recreation areas 3. Boating 4. Fishing 5. Other activities depending upon location specific requirements 6. Water extraction and Irrigation 7. Religious bathing 8. Development of fisheries 	<ol style="list-style-type: none"> 1. Solid waste dumping 2. Discharge of waste water 3. All uses not specifically permitted
† Any non conforming uses as per the Forest Conservation Act, 1980, The Wildlife Act, 1972, The Water (Prevention & Control of Pollution) Act, 1974, and the Environment (Protection) Act, 1986 and the National Environment Policy (NEP), 2006 shall not be permitted		
Conservation areas – Wetlands		
<ol style="list-style-type: none"> 1. Harvesting of Macrophytes: water hyacinth and other vegetation that cause eutrophication 2. Eco tourism 3. Biodiversity conservation and habitat improvement 4. Creation of buffer zones for the protection of wetlands 5. Tourism infrastructure – in the buffer zones 6. Studies and research which do not have any 	<ol style="list-style-type: none"> 1. Recreational facilities 2. Boating fishing, washing 3. Wetland development for recreation 4. Water extraction 5. Development of fisheries 	<ol style="list-style-type: none"> 1. Commercial fishing 2. Discharge of waste water 3. Solid waste dumps 4. Activities that have an impact on the landform like Excavation, filling or dumping 5. All uses not specifically permitted



Permissible activities	Restricted Activities (permissible on recommendation)	Prohibited Activities
negative impact on the wetland ecology		
Conservation areas - Coastline		
Refer to the Coastal Regulation Zone notification by the Ministry of Environment and Forest, 2011 for permissible uses and activities		
Conservation areas – Aquifer		
<ol style="list-style-type: none"> 1. Controlled recharge of aquifers 2. Water quality monitoring 3. Recharge enhancement activities 4. Areas of historical importance 	<ol style="list-style-type: none"> 1. Water extraction 2. Permanent construction under public utilities 	<ol style="list-style-type: none"> 1. Waste dumping 2. Waste water discharge 3. Open defecation 4. Activities that have an impact on the landform like Excavation, filling or dumping 5. All uses not specifically permitted
Special Heritage Zone		
<ol style="list-style-type: none"> 1. Residential with special bye laws 2. Public –semi public with special bye laws 3. Commercial with special bye laws 4. Recreational with special bye laws 5. Theme Parks , Archaeological Parks / Gardens with special bye laws 6. Amphitheatres with special bye laws 7. Open Air Museums with special bye laws 8. Restoration of protected and enlisted monuments and precincts by the concerned authority only (ASI / State Archaeology) 	<ol style="list-style-type: none"> 1. Heritage interpretation centre, art galleries & sculpture complex 2. Educational and research Institutions 3. Social and cultural institutions 4. Commercial activities 5. Craft based cottage industries 6. Hotels, guest houses, lodges , resorts 7. Group Housing , apartments 8. Auditorium 9. boating, picnic huts, camping sites , special training camps 10. Hospitals & health centers 11. Multi-storeyed Parking 	<ol style="list-style-type: none"> 1. Use/activity not specifically related to Special Heritage Use Zone not permitted herein. 2. Multi-storeyed building 3. Multiplex, Shopping Mall 4. Dumping ground 5. Sewerage Treatment 6. All uses not specifically permitted in Permissible and restricted activities

5.4 Zonal Regulations

The entire PKDA area has been divided into 8 zones depending on the characteristics and needs of the areas. Each of the zones is then envisioned having different type of land uses.

Land use categories under each zones

- Residential use
- Commercial use
- Public and semi public use
- Light Industrial zone
- Open space use
- Utility and service use
- Agriculture use
- Conservation

Building control regulations and FSI / FAR provisions would be as per the BDA regulations – Bhubaneswar Development Authority PLANNING & BUILDING STANDARDS REGULATIONS – 2008 (AMENDED-2012)

5.4.1 Residential Use Zone

5.4.1.1 Intent

The intent in establishing a residential zone is:

- To promote residential development on a range of building typologies on existing undeveloped land;
- To provide for the development of recreational, religious and educational facilities as basic elements of a balanced community;
- To protect the residential communities from nuisances arising from incompatible uses.

5.4.1.2 Development Control Regulations

The development regulation of the residential zones should follow regulation-31 of Bhubaneswar Development Authority Planning and Building Standard Regulation 2008 (Amended 2012) Table-5 where it gives details of permissible limits of the buildings depending upon the plot size and the access to the buildings. The attached table gives the details of building control regulation:



Table 24: Development Control Regulations for Residential Use (as per BDA Planning and Building Standard Regulation, Amendment 2012)

Plot size (in Sq. Mts)	Maximum height of building permissible (in M)	Minimum front setback (in m) as per the abutting road width					Minimum setbacks on other sides (in m)	
		Less than 9m.	Between 9 and 12 m.	Between 12 and 18 m.	Between 18 and 30 m.	Above 30 Mts.	Rear side	Other side
1	2	3(a)	3(b)	3©	3(d)	3(e)	4	5
Less than 100	7	1.0	1.0	2.0	2.0	3.0	--	--
100 & upto 200	10	1.0	1.0	2.0	2.0	3.0	1.0	--
Above 200 & upto 300	10	1.5	1.5	2.5	2.5	3.5	1.0	1.0
Above 300 & upto 400	12	1.5	1.5	2.5	2.5	3.5	1.5	1.5
Above 400 & upto 500	12	1.5	2.0	2.5	3.0	3.5	1.5	1.5
Above 500 & upto 750	Less than 15	1.5	2.0	3.0	3.0	4.0	2	2
Above 750	Less than 15	1.5	2.0	3.0	4.0	4.0	3	2.5

In addition sections 1- 22, 25, 26, 27, 28, 29, 33-69 of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** are applicable to all buildings in the land use category.

The R3 category of proposed housing is specifically for the integrated housing and apartments. Regulation 46-52 of the Puri Konark Development Authority Planning and Building Standards Regulations 2010 should be referred for this. Regulation 47 for high rise apartments, Regulation-48 for high rise group housing, regulation-50 for Basti area housing shall be considered. In addition to the same, an **“Integrated waste management plan”** should be submitted for plan clearances.



5.4.2 Commercial Use Zone

5.4.2.1 Intent

The intent in establishing commercial zone is:

- To promote concentration of and mixture of commercial office and retail facilities
- To promote the neighborhood level commercial facilities
- The commercial facilities are categorized as C1- city level commercial and C2- Neighborhood level commercial
- Creating some special commercial zone for the zonal economic upliftment

5.4.2.2 Development Control Regulations

As per section 30 Table 4 Column 1,4,5 and 6 & as per section 31 table 5 of Puri Konark Development Authority (Planning and Building Standards) Regulations - 2010 minimum setback is to be followed and for plantation requirement Section 27 of Puri Konark Development Authority Planning and Building Standards Regulation-2010 should be considered.

Refer Section 34(1) table 9 of the **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** for parking requirements and area allocation.

In addition sections 1- 22, 25, 26, 27, 28, 29, 33-69 of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** are applicable to all buildings in the land use category. Provision of Public toilets in the ratio of 1 seat for 100 users should be provided. In the commercial areas allocation for the same should be considered while planning. Public toilets should be included within the commercial complex with plot sizes exceeding 500 sq. m.

Annexure V Table 1 Sl. No. 6 **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** indicates the water requirement for the commercial occupancies. Table 4, 5, and 16 of Annexure V indicate the sanitation requirement for shops and commercial offices, hotels, restaurants respectively. The attached table¹ indicates the number of toilets that are required based on the built up areas.

¹ A Code of Practice for Public Toilets in Britain- Dr. Clara Greed



Table 25: Facilities for Customers in Shopping Malls

Sales area of Shop	Appliances	Male	Female	Disabled
1000m ² to 2000 m ²	WC	1	4	2
	Urinal	1	Nil	Nil
	Washbasin	1	3	2
2001 m ² to 4000 m ²	WC	1	7	3
	Urinal	2	Nil	Nil
	Washbasin	2	6	3

5.4.3 Public and semi-public Use Zone

5.4.3.1 Intent

Under public and semi-public use zone, public and semi-public office areas special institutional areas have been considered.

The intent in establishing public and semi-public zone is:

- To promote development of public, semi public offices in the area.
- To act as disaster relief centres in case of an emergency
- To promote the development of special institutional area

5.4.3.2 Development Control Regulations

Maximum FSI, ground coverage, building height, minimum setback for the public and semi-public buildings should follow section 1-22 of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** . Section 34(1) Table 9 for off street parking and public space, section 35 for interior open spaces, 27 for plantation, 28 for access road, section 30(1) subsection 3 for setbacks and building heights, section 32(1) subsection 3 for FAR as per plot size of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** to be referred.

Furthermore, Table 1, 2, 9, 11 of Annexure V of the same regulation is to be considered for provision of sanitation facilities in hospitals, schools etc. Section 4 of Annexure V is to be referred for fire protection and safety requirements.

5.4.3.3 Disaster Shelters

It is suggested that some of the institutions may be used as the disaster shelters. These are to be earmarked for the disaster relief. The specifications for such multi utility disaster shelters are as under.



Each earmarked utility should be able to accommodate 1000 persons. Such utilities are to be identified based on the population catchment. It is assumed that during disasters 50-60% of the population uses the disaster shelters. The floor area per person is to be taken at 3 sq. ft. per person². The building design should allow an accommodation of 200-250 per room. The specifications³ are as under:

Design Specifications

- RCC or brick masonry two storied building with or without stilt depending on the storm tide levels is considered suitable. Height depends on the storm tide levels. In view of general soft top soil in coastal areas, pile foundations may be preferable. However, suitable type of foundations should be considered based on local conditions and soil strata.
- Shape: Any shape (circular, hexagonal, octagonal) is suitable. However, square or rectangular may be used provided the peripheral corners are rounded for improving the aerodynamics of the structure.
- Doors: Should be opened outwards into a box having four heavy duty stainless steel hinges fixed firmly to the holding medium.
- Windows: Louver type of window is suggested with non-breakable and non-brittle items made of Fiber Reinforced Plastics (FRP).
- For RCC buildings: The height of the RCC parapet over the first floor roof will depend upon design storm surge height and may be taken from 0.8m to 1.35 having holding-pipes on top or inside of the parapet depending on the design surge levels.
- For masonry buildings: The parapet may be made of brick masonry up to a height of 0.8 m with pipe railing at top.
- Plinth level - A minimum of 1 m should be ensured between the ground level and the high-tide level.

Structural specifications

- Imposed Load for design of floor slab and beams: 500 kg/m².
- Basic wind speed 65m/sec with modification factors K1=1.08, K2=1.05, and K3=1.0 as per IS 875 -standards with specified normal load factors.
- Roof Terrace: Design for same imposed load as that of the first floor in case of larger than 7 m storm surge height; for lower surges design for 250 gm⁻².
- Earthquake load will not be considered simultaneously with that of wind loading. EQ Importance Factor is to be taken as 1.8 for the shelter design. Rest of the norms should be followed from the relevant IS codes. The floor live load will be taken as for secondary uses (say school, community gathering etc) as per IS:875 Part II.
- Vents: Provide as per the norms for adequate ventilation. Louvered vents to be used in shelter in various walls just above floor level to drain water flowing in and out in case of higher than first floor surge height.
- Shelves: Provided at door-window level in line with seismic band at that level.

² & ³ Guidelines for Design and Construction of Cyclone/Tsunami Shelters_ Gol-UNDP Disaster Risk Management Programme



5.4.4 Light Industrial Use Zone

5.4.4.1 Intent

The intent in establishing commercial zone is to promote light industrial development in the area

5.4.4.2 Development Control Regulations

Light industrial zone should follow section 30 Subsection 3(E). Column 1, 4, 5 and 6 & as per section 31 table 5 for minimum setback and other building regulations and section 27 of Puri Konark Development Authority (Planning and Building Standards) Regulations -2010 for plantation requirement.

In addition to that Section 34(1) table 9 for off street parking space, section 27 for plantation requirement, section 28 for access road provision, section 30(1) subsection 3E for setback and building height, section 32(1) subsection (5) for FAR as per plot size are to be followed as per **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010**. Moreover, under Annexure V, table1 Sl. No. 7 for sanitation facilities, Section 4 of Annexure V of the same regulation is to be considered for fire protection and safety.

5.4.5 Open Space Use Zone

The open space use zone contains open spaces, recreational areas, parks and playgrounds etc.

5.4.5.1 Intent

The intent for establishing this zone is:

- To provide open spaces, recreational areas
- To protect city environment
- Conservation of natural resources

5.4.5.2 Development Control Regulations

Section 75 gives provision for parks and open spaces, Section 57 (1) sub section 3E of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** allows 12-14% recreational in any integrated township.



5.4.6 Utility and service zone

The intent for this zone is:

- To provide sufficient infrastructure for PKDA area
- Better management of resources

5.4.6.1 Development control regulations

Establishment of buildings should be regulated by taking into consideration of the proximity to the basic trunk infrastructure from the concerned authority.

5.4.7 Special regulations

All the measures mentioned within the regulation would be enforced while envisioning the plan, however PKDA area has some unique features and opportunities to develop few of the areas differently with different sensibilities. Heritage precincts, beach areas, areas in and around forest and other natural resources would have to be dealt with. Mentioned below are few of the selective measures that would have to be taken during Zonal Development Plan (ZDP) the next stage of Comprehensive development Plan (CDP) implementation.

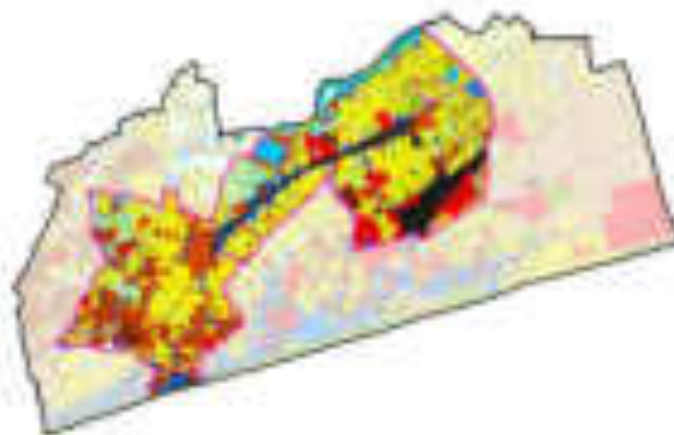
5.4.7.1 Heritage area planning

Each of the zones would be detailed out at the stage of Zonal development Plan. Separate regulation for heritage areas within Puri town and Konark zone would be detailed out to preserve and conserve heritage significance of the PKDA area. Section 41 of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** deals with the heritage regulations which focuses on the building development /redevelopment/repairs, heritage listing, management of heritage precinct, maintaining the aesthetics and heritage character of the zone. Mentioned below are few of the areas where change would be proposed to maintain the character of the area:

- **Land Use density**- low density development is to be suggested to control the pressure on the area.
- **Land use restrictions**- check on establishment of industries and other activities which might cause deterioration of the heritage building and precinct should be there.
- **Height restrictions** for new and existing development should be checked to maintain the visibility and dominance of the heritage assets of the area.
- **Facade details and regulations**- facades of the buildings should be in accordance with the existing architectural character. There can be regulations on colour schemes, materials used and other visible architectural elements.
- **FAR/ FSI regulation**- this should be regulated as per the guidelines for lesser density.



Below is an example of heritage area demarcation. In zone 1 i.e. Puri Town, the heritage buildings have been marked and a precinct surrounding the tangible and intangible assets have been demarcated for special regulations mentioned above.



Map 42: Heritage zone delineation in Planning Zone 1

Within the zone 1: Puri Town, some of the areas as mentioned below have large number of heritage precincts and many temples, Mathas and other important religious precincts. Mentioned below are few of the wards within the Puri town that requires special treatment and attention to address issues of heritage conservation and livelihood upliftment.

Areas/villages within the Puri Town
Bada Deula Sahi - 09
Balagandi Sahi - 21
Bali Sahi(1) - 11
Basuli Sahi - 08



Chudanga Sahi - 18
Daitapara Sahi - 22
Dandimala Sahi - 20
Dola Mandap Sahi(1) - 15
Jhadeswari Sahi - 29
Kalika Devi Sahi - 16
Kumbharapada - 30
Mani Kanika Sahi - 10
Matiapada - 31
Talabania - 28

All of the mentioned above would be detailed out differently because of the nature of these areas. Detail zonal regulations and heritage zones would be derived at a stage of zonal plan detailing. Likewise from every planning zone special heritage precinct can be identified for better management.

5.4.7.2 Special Commercial zone planning

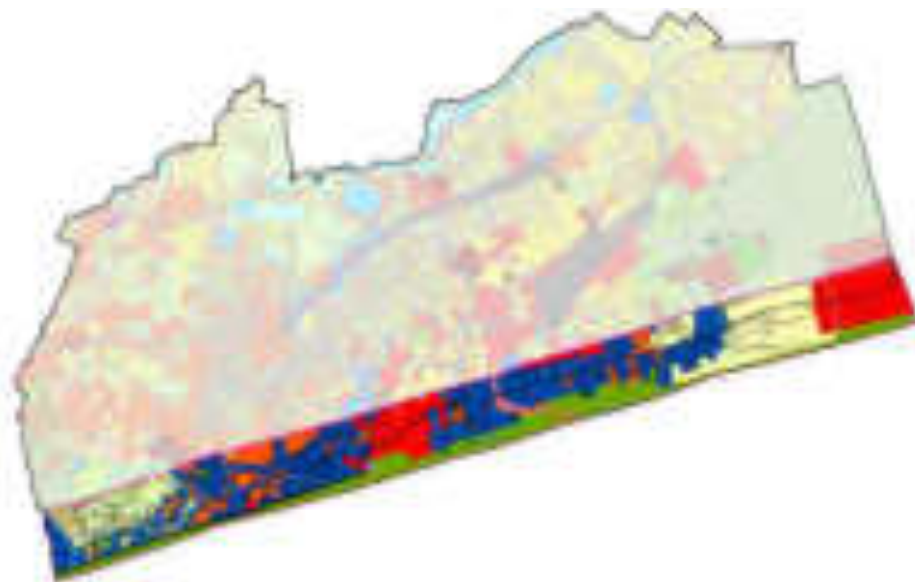
Along with rich natural resources such as water bodies, rivers and forest areas, PKDA also has a long coastline all the way from Puri to Konark. This long coast line has immense tourism potential and good opportunity for economic development if it is developed sensitively.

The attached map demarcates the area considered for special commercial usage. This area is mainly devoted to tourism related commercial activities, thus, harp on hotel business, resorts, restaurants, golf course, tourism related bus services etc.

Keeping in mind CRZ regulations and acknowledging economic development and tourism opportunities area along the beach especially within the Puri Town would be dealt with differently and would be detailed out during the zonal plan development stage. Special provisions would be identified to develop beach area within the city and also outside along the forest cover.

An example of Puri town is given below which depicts the area for special commercial use.





Map 43: Special commercial zone demarcation in Planning Zone 1

Some of the measures along with the existing CRZ regulations and *Puri Konark Development Authority (Planning and Building Standards) Regulations -2010* which would be taken in to considerations are as mentioned below:

- Height and density restrictions
- Land use permissions
- Promotion of tourism related activities
- Special considerations for uses which could help city's economic growth and tourism
- Special safety measures for construction

5.4.7.3 Conservation of natural resources



Map 44: Marking the natural resources to be conserved

PKDA area comprises of almost 40% of forest, water bodies and other natural features. Special measures are required to be taken within these areas as well as in surroundings to protect the natural treasure of the area. Forest Trails, Camping sites, Temporary shelters, Fire lookout structure are some of allowable activities in the forest area.

Separate measure would be detailed out during zonal development plan level to prevent these areas as well as develop surrounding areas to minimize stress on above mentioned areas.

5.4.8 Coastal Regulation Zone

Refer Part VIII section 70 of **Puri Konark Development Authority (Planning and Building Standards) Regulations -2010** and Refer Notification under Section 3(1) And Section 3(2) (V) of the Environment (Protection) Act, 1986 and Rule 5(3) (D) of the Environment (Protection) Rules, 1986 Declaring Coastal Stretches as Coastal Regulation Zone (CRZ) and Regulating Activities in the CRZ-2011 wherever applicable.

5.5 Urban Design Guidelines

5.5.1 Roads

5.5.1.1 Introduction

Roads in PKDA: Various types of roads traverse the PKDA region, connecting the urban and rural centres.

Puri is a city of religious importance and significant in terms of tourism. The monuments and religious sanctity, way of life of the people with their rich traditions are compelling attributes of this picturesque city. The urban design guidelines for roads would help in transforming these transition spaces within the existing urban fabric of Puri.

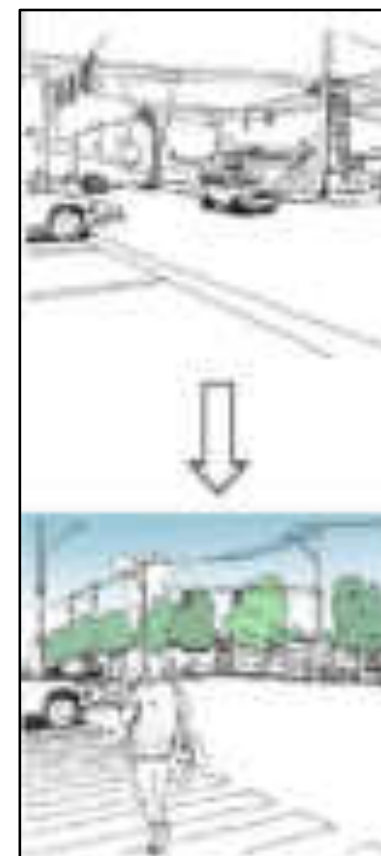
Konark is home to the famous Sun Temple, which is a World Heritage Site and a major tourist attraction. The guidelines would help in planning and implementation of new road projects as well as improvement of the existing roads.

These guidelines aim to accomplish the following:

- Reduce Congestion
- Serve land uses adjacent to the streets
- Encourage people to travel by walking, bicycling, and use public transit, as an alternative
- Enhance the safety and security of streets, from both traffic and pedestrian perspectives
- Reduce the total amount of paved area through green interventions
- Reduce street water runoff
- Promote the economic well-being of both businesses and residents
- Increase civic space and encourage human interactions
- Better Road safety (through proper lighting, levels and materials)

Street improvement through urban design initiatives has been illustrated in Fig 1.4. The following factors need to be considered during design interventions to existing roads or proposed street infrastructure:

- Land suitability and limitations
- Physiology of the region
- Existing infrastructure (utilities, sewerage, water supply lines etc.)



Street View: Before & After Urban Design



Issues (Puri & Konark): Some of the roads in Puri and Konark are and have potential to be vibrant streets with a mix of various activities like residential, commercial etc. There are certain commonly observed problems on the streets of Puri and Konark:

- Narrow or Absent sidewalks
- Traffic congestion
- Unsafe for pedestrians
- Unsightly and auto-oriented, uninviting streets
- Poor street water runoff systems
- Poor selection/ absence of street trees
- Excessive paved surfaces leading to heat-island effect



Lack of Litter bins



Activities on Street



Haphazard Traffic on Street

Sources: CEPT Study

Topic Structure: This chapter discusses in detail the existing conditions of roads and street furniture in the PKDA region and various design initiatives for both existing and proposed roads to make them more utilitarian, approachable and attractive.

5.5.1.2 Road Design in PKDA Region

TYPES OF PROPOSED ROADS: Three widths of roads are proposed in the proposed land use and mobility plan of PKDA region, namely, 24m wide, 18m wide and 12m wide. These widths are applicable to both existing and proposed roads and take into consideration the requirement of ample street furniture and proper design for efficient use.



STREET SECTIONS: The following street sections define the characteristics of the proposed roads. As mentioned above, the roads are categorized according to their functions and capacities; this categorization is termed as road hierarchy. For the 24m & 18m roads, parking and no-parking alternatives have been designed.

On the 24m wide roads, parallel parking of four wheelers has been proposed in the parking option. As shown in the figure below, one row of parking has been provided on the either side of the road, with trees planted intermittently to discourage its usage as a moving lane.



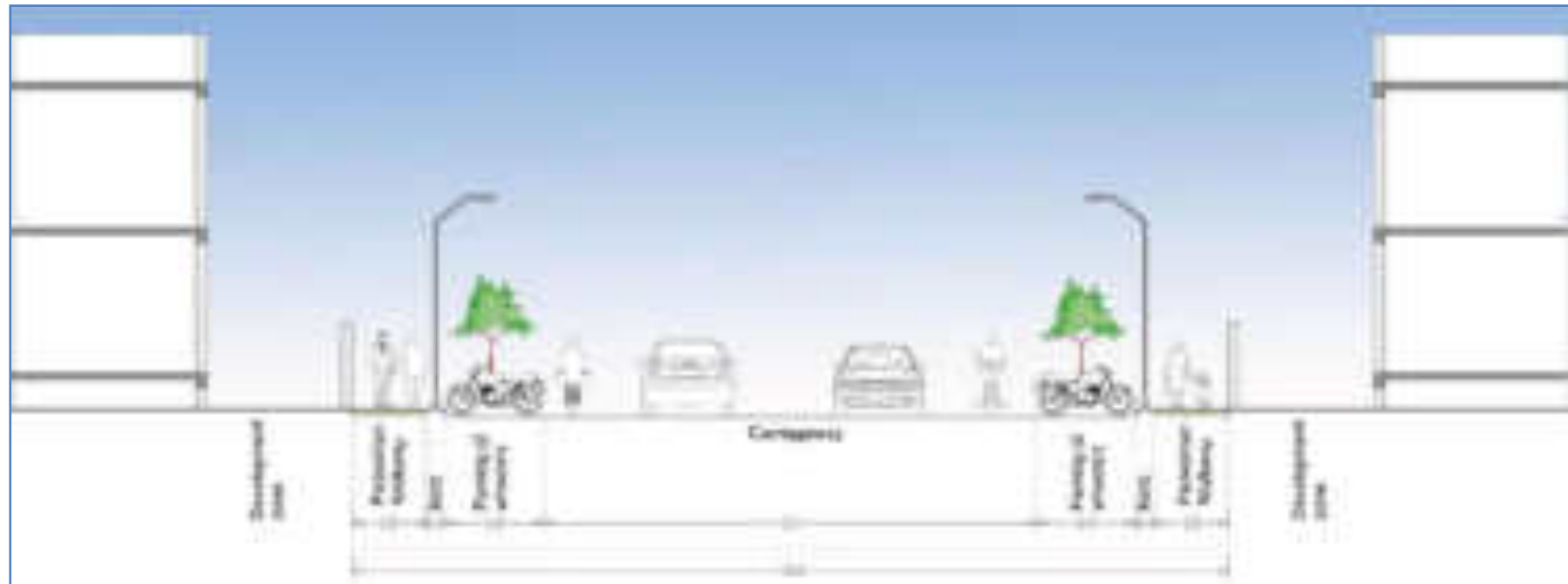
24 m Road Section with Parking

In case of the No-Parking option, a normal 7.2m carriageway has been proposed with area dedicated to planting and seating area.



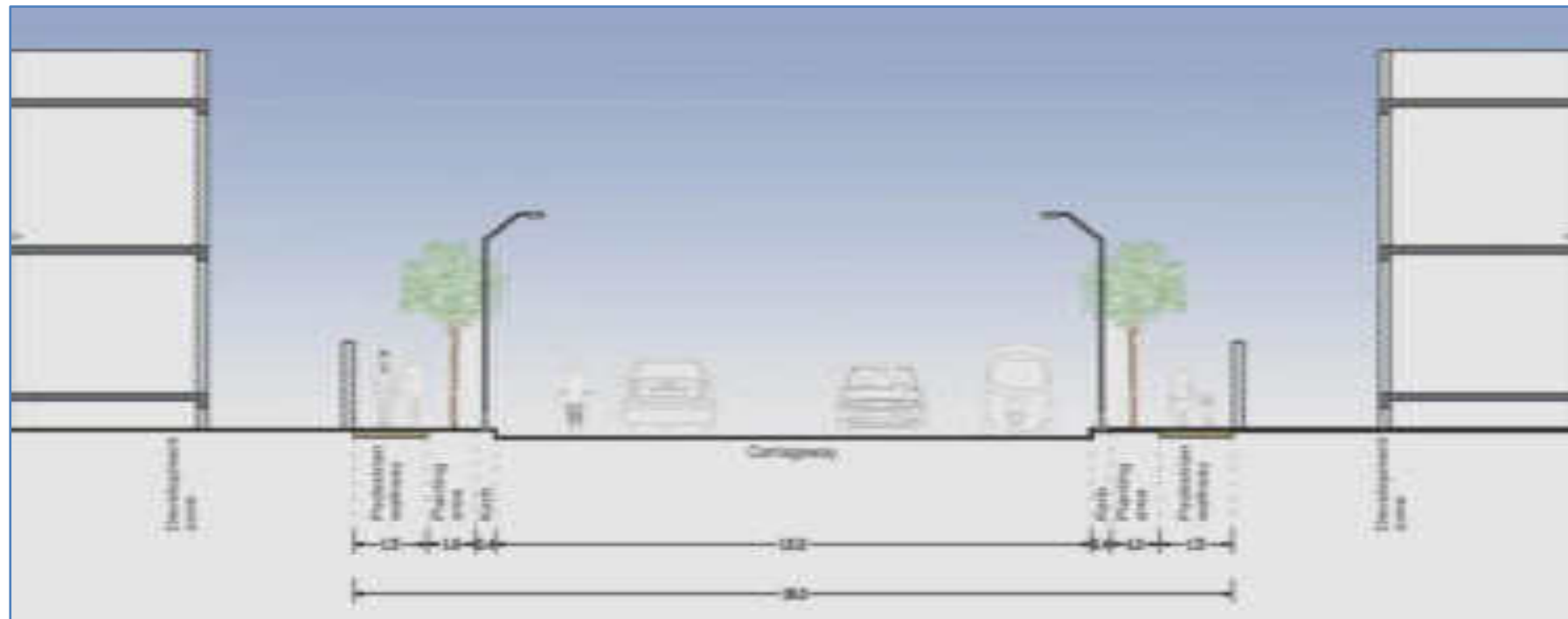
24 m Road Section without Parking

On 18m wide roads, one row of two-wheeler parking space has been provided in the Parking option, as shown in the figure below:



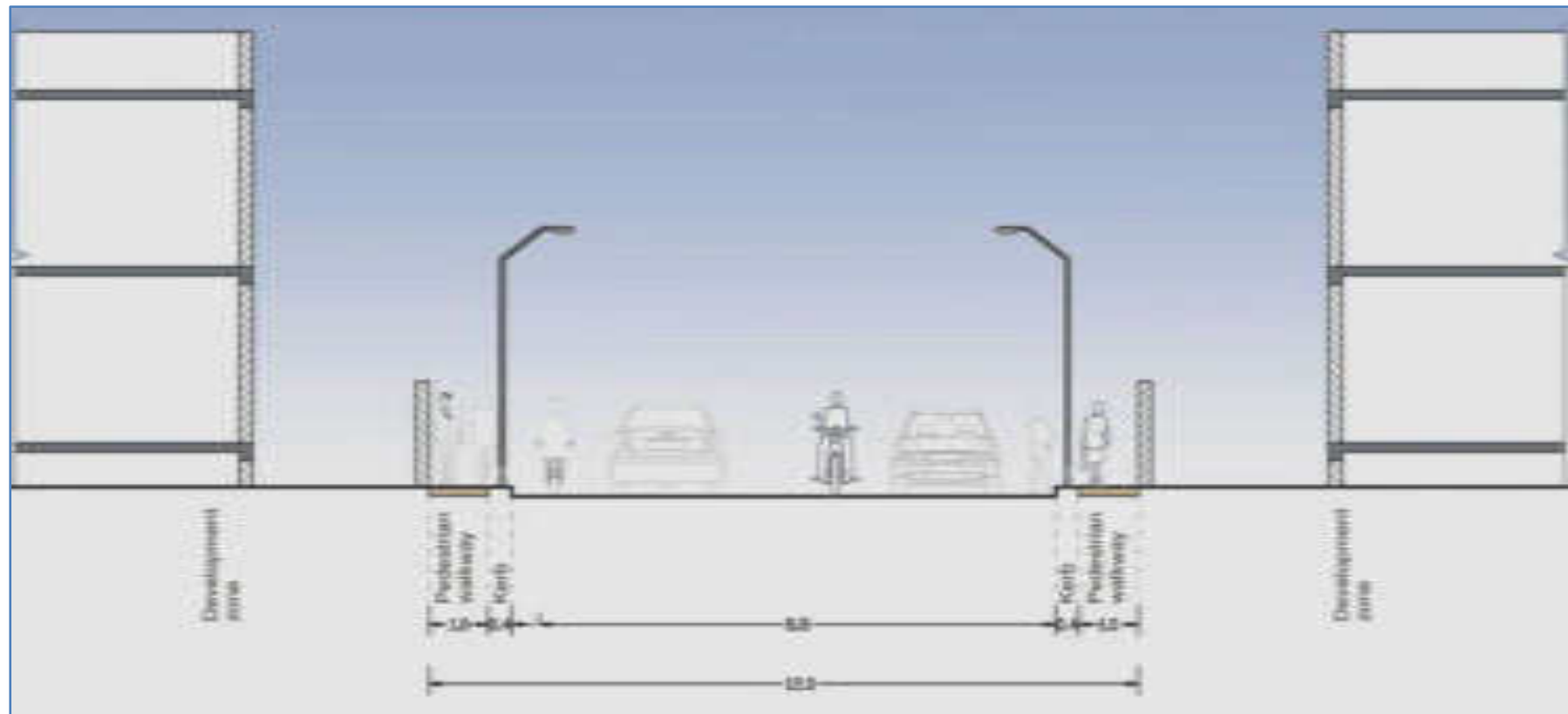
18m Road Section with Parking

In case of No-Parking option, the area for parking has been assigned as a dedicated planting area along with seating space, as shown in the below figure:



18 m Road Section without Parking

On 12m wide roads, it is not suggested to provide any on-street parking (due to restriction of width) and hence, only one option has been given, as shown in the figure below:



12 m Road Section

On Street Parking: Marked on street parking is necessary to avoid people parking all along the road stretch. There will be specific areas demarcated for parking facilities on street. The parking areas would depend upon the parking requirement of a street, traffic volume and road width. If parking facilities are present in the vicinity, on street parking should be avoided. If a road stretch has high traffic volume, parking facilities would lead to increased congestion`.



On street Parking

Pedestrian Crossing: Marked pedestrian crossing alerts the drivers to expect crossing pedestrians and directs pedestrians to desirable crossing locations. Marked pedestrian crossing should be considered at mid-block locations other than the junctions where there is strong evidence that pedestrians want to cross there and if there is an overly long walking distance to the nearest controlled crossing. Markings shall consist of solid white lines not less than 500mm in width and 2000m in length.

The best locations to install marked pedestrian crossing are

- All intersections with signals
- Crossings near transit locations
- High land use generators
- School walking routes
- When there is a preferred crossing location due to sight distance



Where needed to enable comfortable crossings of multi-lane streets the between controlled crossings space should located at convenient distances.



Pedestrian Crossing

Street Furniture: Street furniture is a part of the sidewalk area. Street furniture is a collective term given to number of elements that define the streetscape. The elements of street furniture that are discussed subsequently include seating or benches and litter bins. The design of street furniture must prioritize the needs of pedestrians and users with appropriate sizes and scales. Design solutions should respect the variety of urban conditions in Puri and Konark. The street furniture must be accessible to all the individuals. Street furniture elements should be designed with a series of modular parts that are available in a range of sizes for use in different site conditions (i.e. smaller number of elements for narrow sidewalks, additional elements for larger spaces).

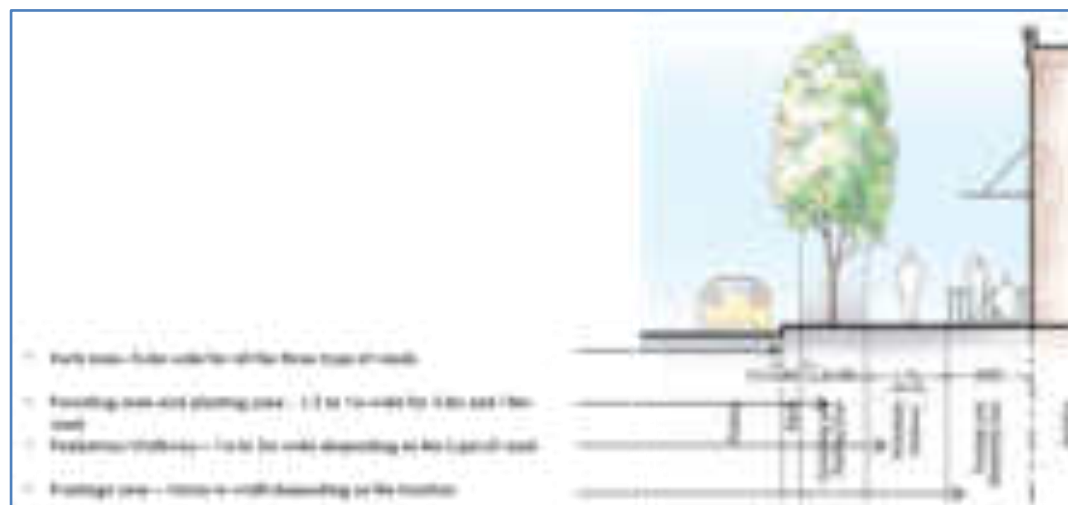
No furniture will be placed:

- Within 2 metres of the end of corner radius
- Within 1 metre of kerb cut, designated to facilitate disabled persons
- Within 0.4 metres of the Kerb zone
- Within 0.5 metres of a driveway
- Within 1 metre of traffic signal pole, pedestrian crossing, decorative street light pole, or tree
- In a manner which interferes with boarding, disembarking or queuing by transit passengers
- Within the Pedestrian Clearway zone or such that use of the furnishing will interfere with the pedestrian walkway
- In a manner that obstructs pedestrian, cyclist or driver sight lines
- In a manner that compromises the safety of pedestrians, cyclists or drivers
- On top of utility, manholes, pole or other equipment
- On any unpaved surface

Pavements:

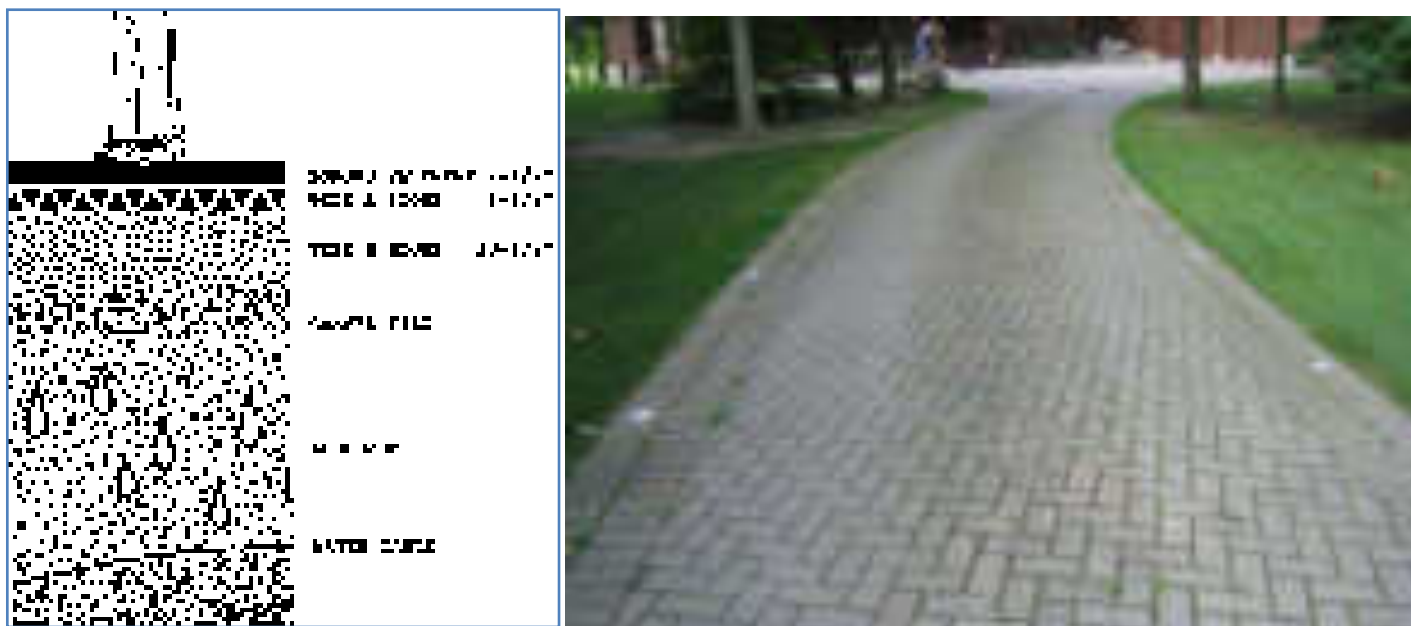
Specifications: Sidewalks vary according to the type of street and its width. A local street with residences will require a different sidewalk dimensions than a major road with commercial establishments. The three parts of the sidewalk include – Kerb zone, pedestrian walkway and furnishing and planting zone. The width of frontage zone varies depending on the type of road (eg: Commercial area would have adequate frontage zone). The descriptions below indicate the specified width of pedestrian walkway and their respective expected landuse and zones

- **1.0m wide:** Absolute minimum clear width between obstacles for walking. This width is suitable for narrow roads and streets. 1m wide road is consistent for 12m wide roads.
- **1.5m wide:** Minimum acceptable clear width under most circumstances, giving sufficient space for people walking to pass one another. This is the optimum width that can be used in all the major arterial and collector roads. 1.5 m pedestrian walkways can be used for 24m and 18m wide roads.
- **2.0m wide:** The preferred minimum clear width that, under normal circumstances, allows passage for pedestrians to pass one another in a comfortable manner. This width is suitable in residential area, tourist areas where informal commercial activities are present on the street and wherever the road width permits.



Pavement Specifications

Materials: Porous Paving blocks are the best material to be used for pavements, as these are easy to install, allow water seepage, and are easily replaceable when broken.



Pavement Cross Section

Tree Guards:

Specifications: Street trees are an important visual and environmental asset for any settlement. Trees provide visual interest, shade, shelter, a place for wildlife and a contrast to the built environment. They not only help to define or reinforce the character of a locality, by making attractive places for people to live and work, but also help modify the local climate by providing shade and trapping pollutants (suspended particles). Before planting locations are confirmed, it is essential to establish existing ground conditions.

Most important is the ability of the existing soil, sub-soil and sub-base to allow tree roots to survive and grow beyond the confines of the tree pit. Narrow “columnar” trees can be used where pavement space is limited. The bottom portion of the trees can be pruned to allow clear vision. Tree guards should be provided for young trees. Local materials like Bamboo can be used. Tree gratings finished at the same level as surrounding pavement – allow people to walkover them and avoid dust, while still allowing water, air and nutrients to access the roots.

Materials: Various materials can be used for planters and tree guards. The most popularly used ones are made of cement concrete or mild steel, as shown below:





Different Types of Tree Gaurds

Lighting:

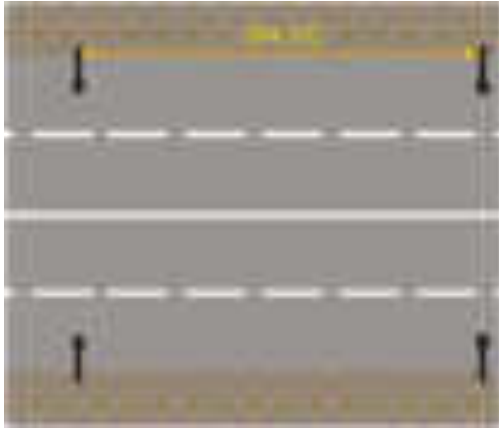
Specifications: Lighting has an important role to play in reducing risks of nighttime accidents, assisting in the protection of property, discouraging crime and vandalism, making residents feel secure and enhancing the appearance of the area after dark. A well-lit city is always a reassuring place for its residents to stay and move around. It has an economic benefit by way of attracting tourists and assuring its residents to stay out longer. Restaurateurs, Shop owners, Clubs and Social areas are direct beneficiaries, which contribute positively to the overall economy. Lighting is important to include at all pedestrian crossing locations for the comfort and safety of the road users. Lighting should be present at all marked crossing locations. Better infrastructure leads to more comfortable driving conditions. At the same time, speed of driving increases which re-emphasizes the need to have upgraded lighting conditions.

Streetlights can be located on the central median or along the shoulder, depending on the road conditions and illumination requirements.

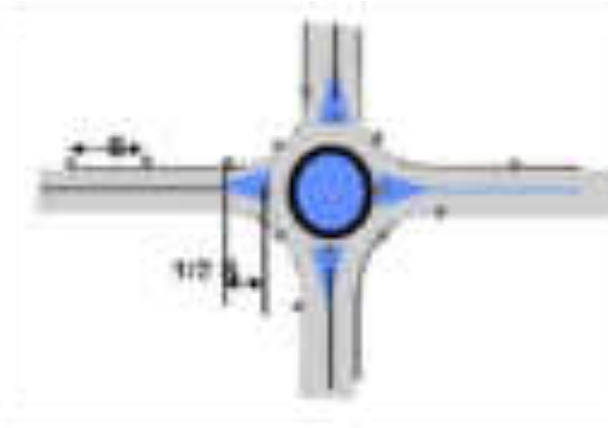
These are the conventional criteria used in streets lighting, but after scientific and systematic manner of study of the city's requirements conventional measurements can be modified.

- Pole height - 8.5 to 10 Meters
- Mounting height - 7 to 8 meters
- Span between - Poles 30 Meters
- Over hang - 1.5 to 3 Meters
- Angle of Tilt - 15 Degrees

- Wattage of Luminaries - 250 W MV/SV

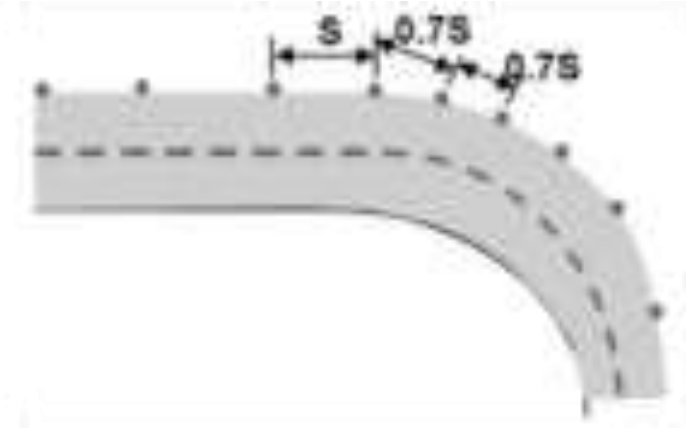


Lighting for linear roads



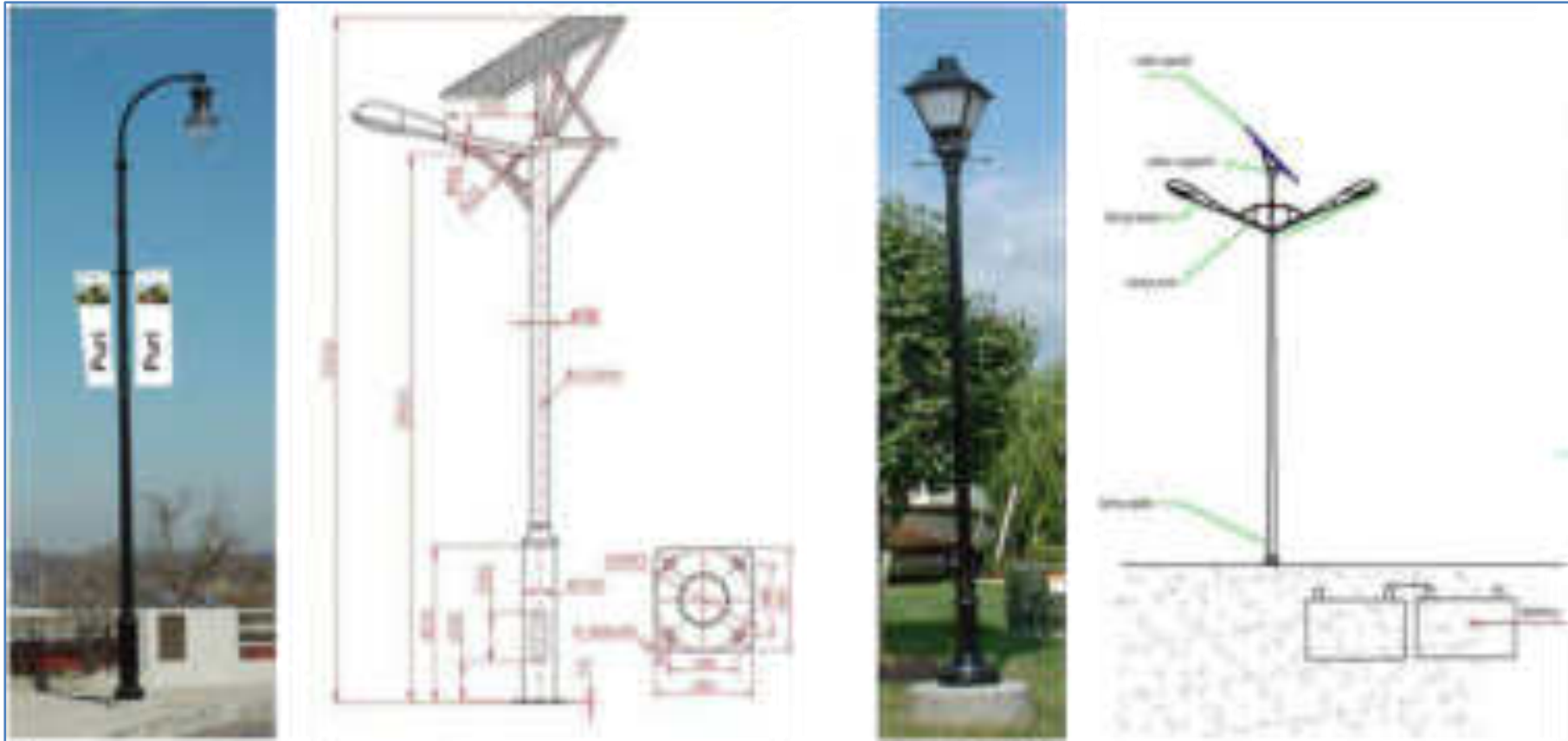
Lighting for junction

Streetlight Specifications



Lighting for turning (S is C/C distance)

Materials: Depending on the location and type of street, different street lights are mentioned below (ornate lights can be used in Heritage areas). Solar based street lights do not use power from electricity grid, hence can be located in areas which are deficient power supply.



Different Types of Streetlights

Bus Stops:

Specifications: A bus stop is a designated place where buses stop for passengers to board or leave a bus. A well-placed and configured transit stop offers the following characteristics:

- Clearly defines the stop as a special place
- Provides a visual cue on where to wait for a transit vehicle

- Does not block the path of travel on the adjacent sidewalk
- Has a Disable access
- Amenities (like newspaper, telephone booth)
- Proper lighting facilities

The provision of well-designed bus shelters at bus stops is important in improving the total journey quality for people using buses. It is also important to recognize that the bus stop is part of the streetscape rather than simply a location along a bus route where buses stop. The footway should be well-laid and drained in the vicinity of the bus stop. The bus stop shelter and surrounding footway should be well illuminated and maintained. Seating, information boards and litter bins should be provided where space allows. The location of bus stops will be decided on policy, consultation and operational considerations and should also address passenger convenience, pedestrian and traffic safety. Consideration should also be given to the impact of the bus stop on commercial and residential land uses, such as inconvenience to adjacent property users and the visual impact on sensitive landscape and townscape locations and listed heritage buildings.



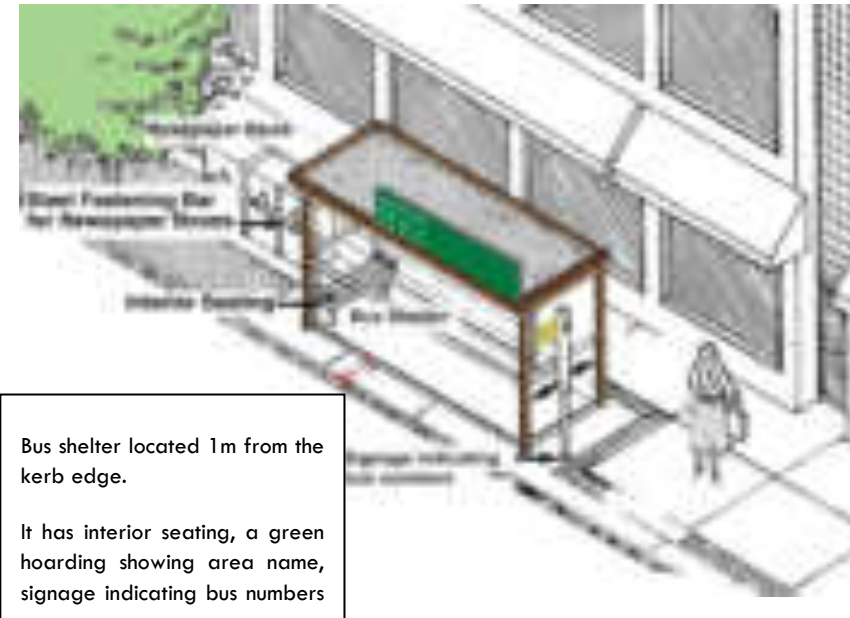
Different Types of Bus Shelters

Materials: The shelter design must also be able to accommodate the numbers of pedestrians likely to wait for buses and bus information systems. The choice of style, size and configuration must be agreed with Puri Konark Development Authority

Layout guidelines include the following:



- Consolidate streetscape elements to create a clear waiting space and minimize obstructions between the sidewalk, waiting area, and boarding area
- Consider the use of special paving treatments or curb extensions (where there is on-street parking) to distinguish transit stops from the adjacent sidewalks
- Integrate transit stops with adjacent activity centers whenever possible to create active and safe places
- Avoid locating bus stops adjacent to driveways, curb cuts, and land uses that generate a large number of automobile trips (gas stations, drive-thru restaurants, etc.)



Bus shelter located 1m from the kerb edge.

It has interior seating, a green hoarding showing area name, signage indicating bus numbers

Details of a Bus Shelter

Storm Water Runoff Outlets:

Design Guidelines: It is essential to provide adequate storm water drainage for proper road drainage to ensure that a road pavement performs satisfactorily. The main functions of a road drainage system are:

- To prevent flooding of the road and ponding on the road surface
- To protect the bearing capacity of the pavement and the sub grade material

For the collection of storm water collection an inlet should be provided on the road. There are different types of kerb inlets in common use

- Grate only inlets
- Side inlets
- Combination grate

The carrier drain may be a channel or a pipe (rectangular, square, bread-loaf shaped, oval, inverted pear-shaped, and more commonly, circular).





Different Types of Storm Water Outlets

Materials: Due to the varying amounts of traffic coming in direct contact with the roadside storm water runoff outlets, cement concrete and MS (for grating) is the preferred material.

Litter bins:

Design Guidelines: Litter bins or dustbins should be provided in the Furniture zone of the sidewalk, to avoid littering on the street and to keep the street clean. Along with provision of dust bins their frequent cleaning and maintenance are key aspects to the cleanliness of a city. Dustbins must be provided at each bus-stop, hawker zone, public amenities and street intersection in order to discourage people from throwing trash on the road. Criteria for Placement of Dustbins:

- Must not be located directly in front of an entrance to or exit from a building
- Ease of access for vehicles to clean and maintain



Different Types of Dustbins/ Litter bins

Materials: It is preferred to use powder coated MS bins mounted on MS frames bolted into the surface. Steel has a longer life span and powder coating helps minimize corrosion. Tempered plastic bins can be colour coded and used for segregation of waste.

Seating:

Design Guidelines: Seating is required to provide resting places for pedestrians and to provide places where people can enjoy the view or interact socially. Seats should be provided on key pedestrian routes to schools, transport interchanges, work places, social facilities and shops.

- Must be situated to face pedestrian clearway (or street at transit stop)
- Must be weighted or affixed to boulevard



- Seating should be located where it does not cause an obstruction and offers the user a view
- Public spaces that are attractive and in sunlit positions are preferred
- Provision should be made at regular spacing (ideally 50m) along recognized pedestrian routes
- Seating should be associated with bus stops and places where people wait, wherever possible.
- A continuous run of seating will add to people's enjoyment of the streetscape where high usage is anticipated and space allows

Seats may be provided by the local authority, subject to the approval of the road department.



Different Types of Street Seating

Materials: The most commonly used materials for street seating and benches are pre-treated wood, mild steel and cast iron. But for easy manufacture, installation and maintenance, cement concrete benches (both in-situ and precast) are widely used.

Signage

Design Guidelines: Location of these signages:

- Must not be located directly in front of an entrance to or exit from a building
- If placement of information or wayfinding signage blocks a display window, the owner of the building and occupant of the business must provide in writing that they have no objection to the location of the information signage
- Way finding information must be located in the kerb area visible to the vehicles on the carriageway

In addition to the normal road signage, there should be signage which helps in reminding the people of their social responsibility in public places and are essential in maintaining places that have high tourist population.

Materials: The usual material used for street signage is Mild steel bars or pipes and steel plates coated with graded reflective paint or sticker. Also, cement concrete signage can be used at lanes and by lanes of residential areas.



Signage Material



Different Types of Signage

5.5.1.3 Conclusions

Checklist for efficient street functioning: One can understand if a street is performing well through the following aspects that can be observed on the street

- Street fatalities and injuries decrease for all age groups
- The number of trips by walking, cycling, and transit increases
- Vehicle travel is reduced
- Prevailing speeds of vehicles on local streets decrease
- Street water runoff is reduced
- Retail sales and tourism increase
- Resident satisfaction increases



5.5.2 Heritage Zones

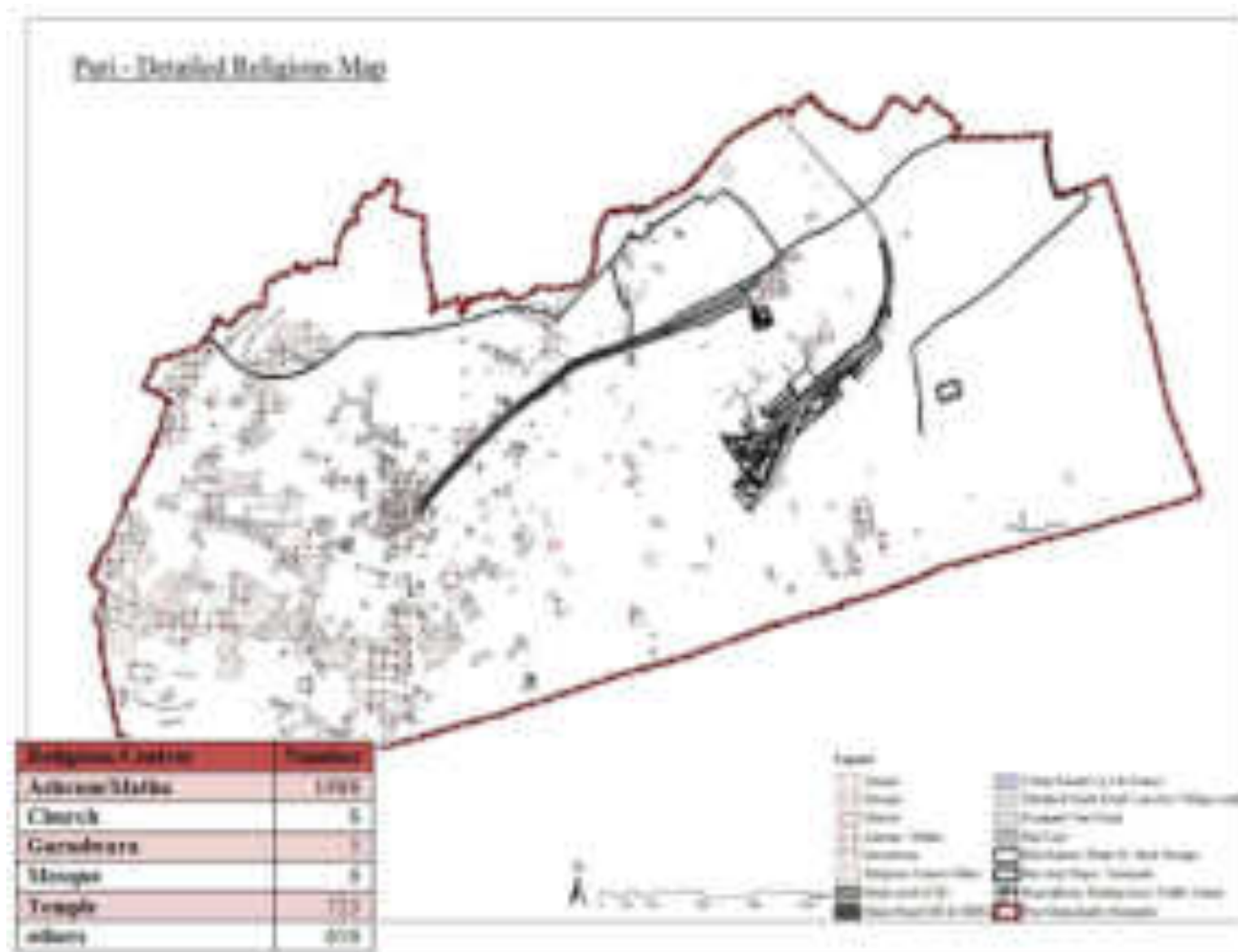
5.5.2.1 Introduction

Heritage area in Puri: Puri has a rich artistic heritage spread across the town comprising of numerous religious structures that portrays local art and architecture. Along with the religious precincts there are number of structures in the core city area of the Puri town that illustrate the aesthetic features of the indigenous architecture. In Puri very few structures are part of the list of monuments documented by ASI. There are number of temples, ashrams, akhadas and buildings in the core city of Puri with admirable elements of detail. It is necessary to retain the specific visual identity of the place created by the presence of this architectural heritage. All these structures can be preserved in the manner to accommodate the imperatives of change in making the heritage relevant in contemporary society.



Some of the old structures in Puri

Demarcation of Heritage zone: Based on the primary survey carried out a heritage zone has been demarcated (discussed in volume 1) comprising of number of old buildings of heritage value in Puri. This conservation of architectural heritage sites could be implemented under the Heritage Zone concept propagated by INTACH. In general, Heritage Zones are sensitive development areas, which are a part of larger urban agglomeration possessing significant evidence of heritage. Under the Heritage Zone concept the conservation of unprotected architectural heritage and sites is planned sensitively. According to the existing attributes, the heritage zone is divided into three distinct Zones as shown in the map below. The idea of the demarcation of different zones was to find out broad areas having similar characteristics where specific interventions can be undertaken to maintain and revive the heritage values of the town.



Map 45: Heritage structures of religious importance in Puri

This heritage zone was demarcated after mapping out all the religious and cultural buildings in Puri as shown in above map.





Demarcated heritage zones in Puri

5.5.2.2 Approach for Conservation and Maintenance of Heritage areas

A two-tier approach is used for conservation of heritage buildings in Puri comprising of heritage zone guidelines and heritage building guidelines. Heritage zone is a demarcated area containing number of buildings of heritage value. Heritage building guidelines would help in maintaining the important buildings and heritage precincts (Grade 1 and Grade 2) within the heritage zone. For identifying heritage buildings listing and grading method is used. The heritage zone guidelines will help in maintaining a sense of cohesiveness in the entire area.

Urban design is concerned with the physical characteristics of the city and the implications of design and planning decisions for the city. The urban design serves as an integrating tool for this sensitive area, which coordinates how various public and private development proposals, including transportation and public infrastructure that will affect the visual image of the city. The Urban design guidelines aim at improving, promoting and maintaining the architectural integrity that physically expresses heritage area in Puri. The guidelines would insure that new buildings are compatible with and reinforce the visual character of Puri heritage area. The guidelines would help in regulating or mediating development within the Heritage Zone, including new construction, demolition or modification to existing buildings.

Listing (detail documentation) and grading of Heritage Buildings:

Listing can be an approach that can be used by Puri heritage cell to document the structures and buildings more than 100 years old that have historic, aesthetic, architectural and cultural significance. Listing should be carried out by or under the supervision of experienced conservation architects. At least one photograph of the property or building should be recorded for identification purposes. A bibliography of all books, publications, articles and unpublished work containing information and details about the structure or property must be provided. A uniform format should be followed throughout the process of listing.

The outcome of this process should invariably be to grade the listed heritage into a hierarchical series. This Charter recommends that buildings and sites be classified as Grade I*, I, II and III (as per the ASI rules , Grade I most important, followed by Grade II and Grade III). This process must be undertaken in a rigorous and transparent manner by a multi-disciplinary team of experts whose recommendations should be available for public scrutiny. The importance of this process cannot be underestimated because its results determine subsequent conservation decisions. Such hierarchical categorization facilitates the prioritization of decisions relating to the future of architectural heritage and sites.

The process of listing should be constantly upgraded and the list should be updated, keeping with the availability of fresh information, financial and material resources, advances in technology and developments in the understanding of architectural heritage and its constituents.

The table below illustrates the buildings documented in Puri that in a specific format. The Heritage cell can document all the heritage buildings in this format.



S.No.	Heritage Importance	Location	Matha Name	Period	Present use	Description	Photograph
1	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery of the monastery. The governing bodies are Matha and Prasad. There is a library and a hall.	Prasa Matha	
2	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery. The Matha is used for religious activities. The Matha is used for religious activities and social welfare. The Matha is used for religious activities and social welfare.	Prasa Matha (Prasa Matha) Complex, Puri	
3	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery, used for religious activities and social welfare.	Prasa Matha is located on the right side of the main road (Prasa Matha) in the Old Bazaar. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha.	
4	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery, used for religious activities and social welfare.	Prasa Matha is located on the right side of the main road (Prasa Matha) in the Old Bazaar. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha.	
5	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery, used for religious activities and social welfare.	Prasa Matha is located on the right side of the main road (Prasa Matha) in the Old Bazaar. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha.	
6	High	Old Bazaar Karnataka Karnataka	Prasa Matha	13th-15th C.	Living monastery, used for religious activities and social welfare.	Prasa Matha is located on the right side of the main road (Prasa Matha) in the Old Bazaar. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha. It is a living monastery of the Prasa Matha.	

Intangible Heritage (rituals, beliefs and customs):

There are number of Mathas, Akhadas, and Jagaghars belonging to different sects located in Puri, mainly centering around the Shrine of Lord Jagannath. These structures are associated with culture, religious customs and rituals that need to be considered while conservation of these structures. Due consideration should be given to intangible heritage while conserving the structures of religious and cultural importance. Intangible Cultural Heritage means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artifacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their culture. This intangible cultural heritage is transmitted from generation to generation within communities and groups.



This heritage is in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity. Several countries, as well as UNESCO, are making efforts to protect intangible culture.

5.5.2.3 Urban Design Guidelines for Heritage Buildings (Based on Ahmedabad GDCR for Heritage)

The listed Heritage buildings Grade I and Grade II would follow the guidelines mentioned below

- No development or redevelopment or engineering operations or additions-alterations, repairs, renovation including the painting of buildings, replacement of special features or plastering or demolition of any part of the listed heritage buildings or listed heritage precincts shall be allowed except with prior written permission, the competent authority or the owner shall consult the heritage conservation committee for the same(part of Heritage cell)
- Before granting any permission for demolition or major alterations or additions to listed heritage buildings objections and suggestions from public shall be invited and duly considered by the Heritage Conservation Committee for reconsideration.
- It shall be the duty of the owners of heritage building and heritage precincts to carry out regular repairs and maintenance of the building at their own cost. The Government, the Municipality or local bodies and authorities shall not be responsible for such repairs and maintenance except for the buildings owned by the Government, the Municipality or the local bodies.
- Before finalizing the special regulations for precincts, the draft of the same shall be published in the official gazette and in leading newspapers for the purpose of inviting suggestions and objections from the public. All the suggestions and objections received within a period of 60 days from the date of publication in the official gazette shall be considered by the Heritage Conservation Committee or a Competent Authority.
- After consideration of the above suggestions and objections, the Heritage Conservation Committee, shall modify (if necessary) the aforesaid draft special regulations for Precincts and forward the same to Government for sanction.
- Provided that pending consideration of suggestions and objections and pending final sanction from Government to the above draft special regulations for precincts, the Heritage Conservation Committee or competent authority shall have due regard to the above draft special regulations while considering applications for development or redevelopment in the respective precincts.
- If the owner or owners or lessees agree to maintain the listed heritage building as it is in the existing state and to preserve its heritage state with due repairs and the owner or owners or lessees would give a written undertaking to that effect, the owner or owners or lessees may be allowed by a competent authority under the guidance of heritage conservation committee. The part or whole of the non-commercial area within such a heritage building



is converted to commercial use or hotel. Provided that if the heritage building is not maintained suitably or if the heritage value of the building is allowed to be spoiled in any manner, the commercial or office or hotel use shall be disallowed.

- Incentives may be created for heritage conservation of listed heritage buildings or listed heritage precincts by the Heritage Conservation Committee. Where applicable under the provisions of the General Development Control Regulations of the revised development plan for PKDA or special regulations may include Transfer of development rights, the creation of a repair fund, tax incentive, etc. The specific provisions for these incentives, where applicable, may be framed by Heritage Conservation Committee.
- Within the vicinity of heritage buildings hazardous materials, chemicals, bonfires and any such things that may affect the heritage buildings or precincts should be avoided.

5.5.2.4 Urban Design Guidelines for Heritage Zone

The objectives of the urban design guidelines for heritage zone must be to integrate unprotected heritage and sites into daily social life by balancing their needs so that neither overshadows the other. These are certain guidelines that may be implemented for the identified Heritage area of Puri

- Delineating the boundaries of the heritage zone through signages and the Heritage Conservation Committee may document the delineated area for their records and subsequent planning. Signages may also include detail description of the monument / area, architecture significance (if any), information of built form and mythology attached (if any)
- All the new or widening of road proposals should be sanctioned by the Heritage Conservation Committee / heritage cell (as proposed in Puri Municipality and PKDA). The proposed road project should be carried out in a manner such that it may affect the Heritage buildings and precincts in the least possible manner.
- Improvement and additional services (pipelines, electricity, sewerage, etc.) these should be planned and aligned with the existing built heritage.
- These areas should be made pedestrian friendly to increase walkability within the Heritage zone.
- Special attention to be given to the building heights and typology of new development granted in the vicinity of the Heritage zone.
- The proposed public utilities (such as bus stops, public toilets, waste bins) should not obstruct the visual character of the buildings. They should be designed in such a way that they merge with the surroundings and do not overpower the existing heritage buildings.



- Buildings in the Heritage zone shall maintain the existing skyline and follow the prevalent architectural styles so as not to destroy the, value and beauty of or the view of the heritage buildings or precincts from public street or alley. The heights of new buildings should be in context with its concerned location and surroundings.
- Before any modifications or additions to the building, owner or owners should consult the Heritage Conservation Committee for the best possible solution with less visual alteration to the building.
- The buildings that have commercial area or offices should not completely modify and change the character of the building. Eg: Addition of large hoardings over a building would only be the visual focus.
- All the external facades (that are visible from street or alley) should follow the prevalent colours and finishes in the heritage zone.
- The specific element that relates to the character of the buildings should be maintained in its original form. (list of visual Characters is mentioned below)
- If renovating, modifying or rebuilding a structure in heritage zone all the architectural and visual characters of the previous building should be retained. These include height, FSI, ornate features, colour and texture. This new building should merge with the existing buildings and not conflict with the surroundings. The owners can consult a conservation architect, ASI, field specialist for better view and solution pertaining to the renovation, modification or rebuilding activity.

Identification of visual characters in Heritage zone: Every building built more than 100 years old, which is unique, with its own identity and its own distinctive character is a part of heritage. Character refers to all those visual aspects, building layout and physical features that comprise the appearance of every historic building or property. Character-defining elements include the overall shape of the building, its materials, craftsmanship, decorative details, interior spaces and features, as well as the various aspects of its site and environment. There are many facets of an historic building its function, type, its materials or construction or style that contribute to its historic qualities or significance. Some of these qualities are conveyed by the sense of time and place or in buildings associated with events or people. A complete understanding of any property requires documenting its style, construction, function, its furnishings or contents; knowledge about the original builder, owners, and later occupants; and knowledge about the evolutionary history of the building. Some of the visual characters seen in the Heritage zone of Puri are listed below

- Setting and overall layout
- Recessed entry
- Arches
- Balustrades
- Stucco detail



- Public spaces
- Roofing
- Sculptures
- Interior spaces
- Surface materials and finishes
- Important indoor or outdoor spaces

5.5.2.5 Other initiatives for Conservation of Heritage Buildings

Apart from Urban Design guidelines there are certain measures for better maintenance of Heritage areas that are mentioned below:

- A thorough shared understanding of the property by all stakeholders
- A cycle of planning, implementation, monitoring, evaluation and feedback
- The involvement of partners and stakeholders
- The allocation of necessary resources
- Capacity-building
- An accountable, transparent description of how the management system functions
- Publicity and awareness
- Media initiatives

DISCLAIMER

This report has been prepared based on information, maps and drawings collected from various primary and secondary sources. As far as possible, care has been taken to correct and update all information as of January 2012. CEPT shall have no responsibilities, whatsoever, due to any errors, omissions and printing mistakes in such information or database