

HUBLI-DHARWAD 2030 CITY DEVELOPMENT FRAMEWORK

PROJECT: PREPARATION OF A CITY PLAN FOR HUBLI-DHARWAD, KARNATAKA



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Prepared for Hubli Dharwad BRTS Co.
By IBI Consultancy India Pvt. Ltd.

REPORT 6

Final City Plan / Urban Development Framework
& Final BRT Corridor Urban Design Guidelines

CITY DEVELOPMENT FRAMEWORK

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ACRONYMS

ABD	:	Area Based Development
AHP	:	Analytical Hierarchical Process
AMASR	:	Ancient Monuments and Archaeological Sites and Remains Act
APMC	:	Agricultural Produce Market Committee
ASI	:	Archaeological Survey of India
BRT	:	Bus Rapid Transit
BRTS	:	Bus Rapid Transit System
BT	:	Bio-Technology
BVB	:	Bhoomaraddi College of Engineering and Technology
CAA	:	Constitutional Amendment Act.
CBT	:	City Bus Terminal
CDF	:	City Development Framework
CEDOK	:	Centre for Entrepreneurship Development of Karnataka
DCR	:	Development Control Regulation
DE	:	Developer Entity
DIC	:	District Industries Centre
DPC	:	District Planning Committee
DU	:	Dwelling Unit
ECS	:	Equivalent Car Space
EESL	:	Energy Efficiency Services Limited
EWS	:	Economically Weaker Section
FAR	:	Floor Area Ratio
FSI	:	Floor Space Index
GF	:	Ground Floor
GIDP	:	Green Industrial Development Program
GIS	:	Geographic Information System
GOK	:	Government of Karnataka
GP	:	Gram Panchayet
GPS	:	Global Positioning System
HA	:	Hectre
HDBRTS	:	Hubli-Dharwad Bus Rapid Transit System
HDMC	:	Hubli-Dharwad Municipal Corporation
HDUDA	:	Hubli-Dharwad Urban Development Authority
HESCOM	:	Hubli Electricity Supply Company Limited
HFA	:	Housing for All
HIG	:	High Income Group
HUDCO	:	Housing and Urban Development Corporation Limited
IDH	:	International Development Association
IGBC	:	Indian Green Building Council

ACRONYMS (CONTD..)

IIIT	:	Indian Institutes of Information Technology
IIT	:	Indian Institute of Technology
IT	:	Information Technology
KHB	:	Karnataka Housing Board
KIADB	:	Karnataka Industrial Areas Development Board
KIMS	:	Karnataka Institute of Medical Sciences
KREDL	:	Karnataka Renewable Energy Developement Ltd
KSCA	:	Karnataka State Cricket Association
KSDB	:	Karnataka Slum Development Board
KSR SAC	:	Karnataka State Remote Sensing and Application Centre
KSSIDC	:	Karnataka Small Scale Industries Development Corporation
KTCP	:	Karnataka Town and Country Planning
LIG	:	Low Income Group
LMS	:	Land Management System
LPA	:	Local Planning Area
MHADA	:	Maharashtra Housing and Area Development Authority
MIG	:	Middle Income Group
MPC	:	Metropolitan Planning Committee
MSA	:	Mufaddal Shopping Arcade
NGT	:	National Green Tribunal
NH	:	National Highway
NKSSIA	:	North Karnataka Small Scale Industries Association
NMT	:	Non-Motorised Transport
NOC	:	No Objection Certificate
NWKRTC	:	North - Western Karnataka Road Transport Corporation
PACE	:	Property Assessed Clean Energy Financing
PBS	:	Public Bike Sharing
PMAY	:	Pradhan Mantri Awas Yojana
PPP	:	Public Private Partnership
PU	:	Public Utilities
PV	:	Photovoltaic
SBUT	:	Saifee Burhani Upliftment Trust
SEMC	:	Sustainable Energy Management Cell
TDR	:	Transfer of Development Rights
TOD	:	Transit Oriented Development
TSD	:	Transit Supportive Development
UGB	:	Urban Growth Boundary
URA	:	Urban Redevelopment Authority
URDPFI	:	Urban and Regional Development Policy Formulation and Implementation
ZR	:	Zonal Regulation

1

INTRODUCTION

Introduction

The Learning City - Hubli Dharwad 2030 presents the strategic directions Hubli-Dharwad will aim to pursue for the 12 year period from 2018 to 2030. This Plan underscores our commitment to contribute positively to the health and well-being of the People and restore balance and resource efficiency to our Environment. The central theme of this commitment is expressed through our adoption and endorsement of The Learning City vision – ***“a new kind of city vision that emphasizes the importance of learning from previous experiences rather than merely building.”***

This City Plan looks at the city not only as an economic entity or a physical entity, but also as a learning entity- the city itself learns over time, as do its managers, residents and visitors. The total knowledge they develop, share and accumulate becomes the human and institutional capital of the city, and the greater the sharing of this knowledge, the greater the capital and hence the potential for the city, whether in manufacturing, the arts, commerce, or education. The plan also assesses the ecological capital of the area – the services which the land, the flora, the fauna and the systems which connect them provide to ensure that these too are taken into account.

The City Plan seeks to assess the existing capital, and then suggests actions and strategies by which the city can consciously foster further development of its human potential, especially where this concerns the quality of life within the city - the provision of housing, employment, commercial development, infrastructure, feeding itself, the quality of the physical environment and the functioning of the ecosystems on which the city depends, further education and civic life. Within these, the City Plan will look at the interactions among the people from a systemic perspective- how improvements or problems in one area affect the other areas as well.

A primary resource is the youth of the region. These are the people who will inherit the city, and for whom the decisions made today will have the greatest impact. The City Plan principles encompass the institutions of formal education, but add to them layers of informal, life-long learning. Citizens who have the tools to understand their situation are the best source of the ideas and energy that will be needed to address them. In this model, government becomes a partner and a mechanism whereby citizens direct their own concerns and resources toward addressing shared concerns. Working together in this way builds community solidarity, and reduces or eliminates the conflicts that have led to wasteful and destructive behaviors in the past.

The City Plan does not foresee an “end state” for Hubli-Dharwad at some date in the future, but rather a process that will permit the city to continue to evolve over the coming decades, conscious of its progress and its failings, but able to use the knowledge gained to address each new challenge in a constructive manner, guided by the principles of sustainability.

2

GUIDING PRINCIPLES

Guiding Principles

Urbanization in the 21st century is expected to be largely focused in the developing world. To deal with the rapid rate of urbanization in a scenario where resource consumption and environmental quality are reaching their limits is a massive challenge. Cities in India must be ready to address this challenge quickly before population pressures force irreparable deterioration of the environment. Status quo is unacceptable. Traditional planning methods only focus on two-dimensional land use issues. The planning process for the City Plan is based on three-dimensional planning principles ranging from socio-economic issues and wealth generation to the environment and preservation of cultural resources.

Given the growing concern about sustainable futures at the global level, the City Plan has attempted to lay out a sustainable path at the city level focusing on people and guided by the Sustainable Development Goals (SDGs) set forth by the United Nations. As shown in Figure 1 the SDGs are a set of 17 Goals covering a broad range of sustainable development issues. Guided by the SDGs, the City Plan is based on seven planning principles given below.

1. **Equitable access to affordable housing, health & education:** Hubli Dharwad is a regional institutional hub for learning and health care. However, there is a need assess if all income groups have access to essential services including affordable housing, health care and education proximate to their place of residence. Similar assessments will be carried out for housing.
2. **Healthy, safe and attractive city for better quality of life:** The City Plan seeks to incorporate considerations of health and safety in planning practices. Integrated transportation and land use planning will enable active lifestyles and promote environments that are safe for women, seniors and children. Creating an attractive public realm will be one of most important priorities and will be critical in improving quality of life.
3. **Growth of climate-friendly economic opportunities:** Economic growth driven by industrialization forms a key priority for the city and state officials. The City Plan seeks to ensure that all residents reap the benefits from economic growth within a city structure that is resilient to climate change and its impacts on life and livelihood.



Figure 1: Principles of Sustainable Development Goals (SDGs) by the United Nations

4. **Resilient, sustainable & productive landscape:** Agriculture and agro-based industries sustain the Hubli Dharwad city region by providing food and employment. The City Plan seeks to introduce landscape as a form of urban infrastructure and promote practices that can help the growth and sustenance of the region by making farming sustainable, productive and resilient to climate change and urbanization.
5. **Protect, conserve and promote natural, physical & cultural heritage:** Hubli Dharwad is a cultural center for music and literature. It is proximate to important world heritage sites like Hampi and has unique natural features and lakes. The City Plan seeks to protect, conserve and promote the natural, physical and cultural heritage of the region, as well as improve access to regional assets, thereby promoting the growth of tourism.
6. **Equitable access to clean air, water & energy:** Basic necessities like clean water, air and energy are at risk of depletion due to climate change and industrialization. The City Plan seeks to conserve these resources as well provide universal access to these basic necessities.
7. **Smart, innovative, technology-driven management of urban systems:** Management of urban infrastructure such as water and sewage is a massive undertaking, especially for small cities with limited municipal budgets. Innovation in technology has increased the reach of the government and eased citizen access to services. The City Plan seeks to build on ongoing processes and innovate ways to enable efficient management of urban systems.

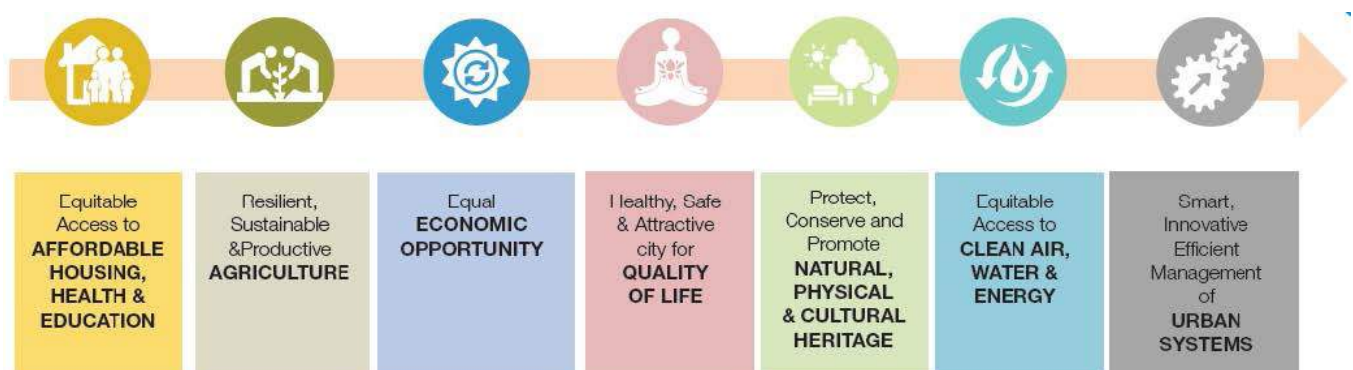
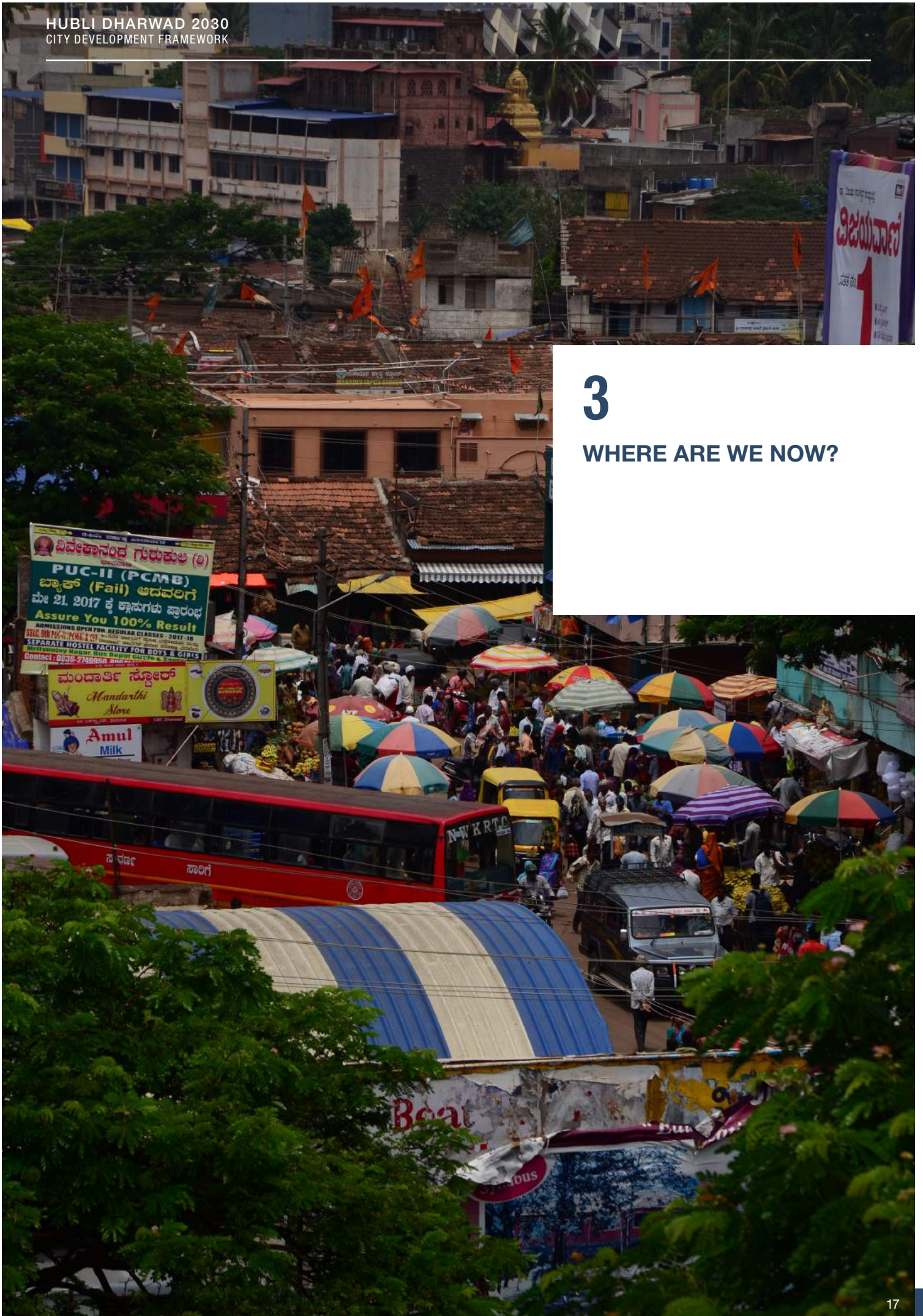


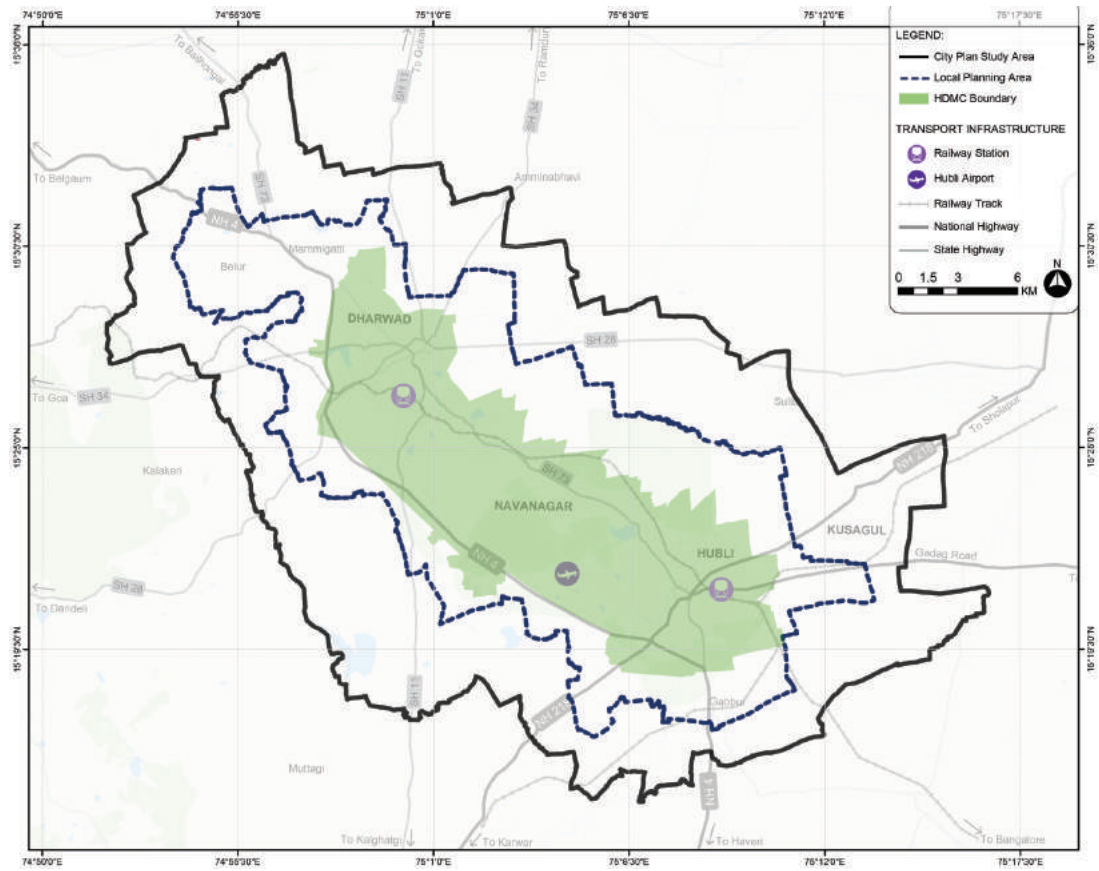
Figure 2: Seven Planning principles for Hubli Dharwad

3

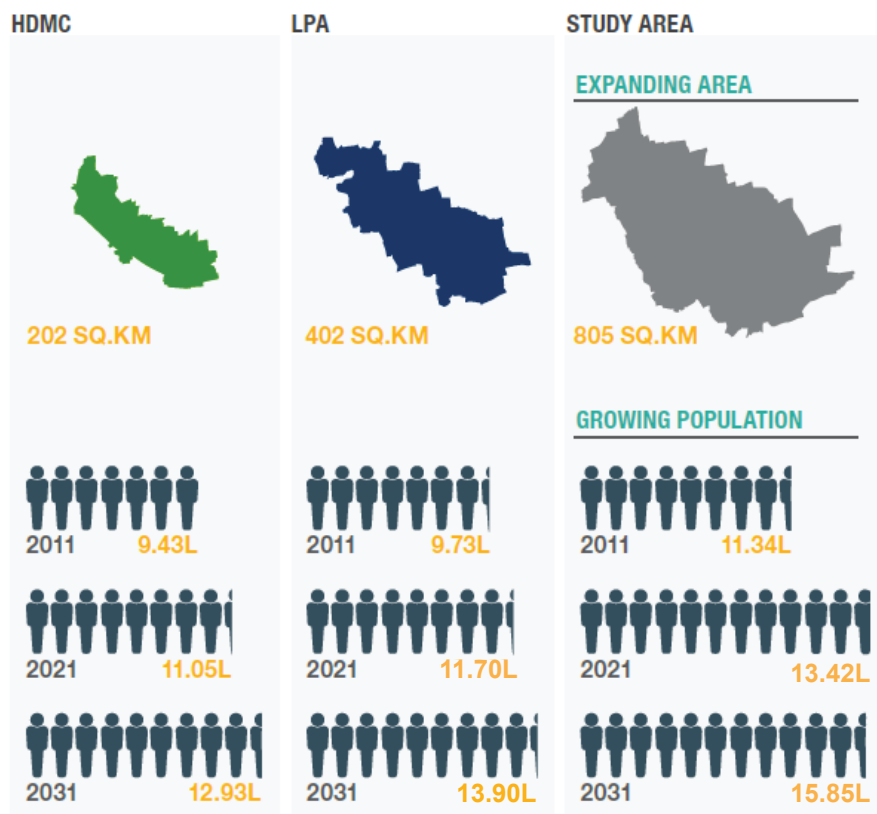
WHERE ARE WE NOW?



3.1 City



STUDY AREA AT A GLANCE



Source: Census 2011, Hubli Dharwad City Plan Projections by average of Arithmetic, Geometric, and Incremental Methods.

3.2 Population

POPULATION & SEX RATIO



POPULATION DENSITY

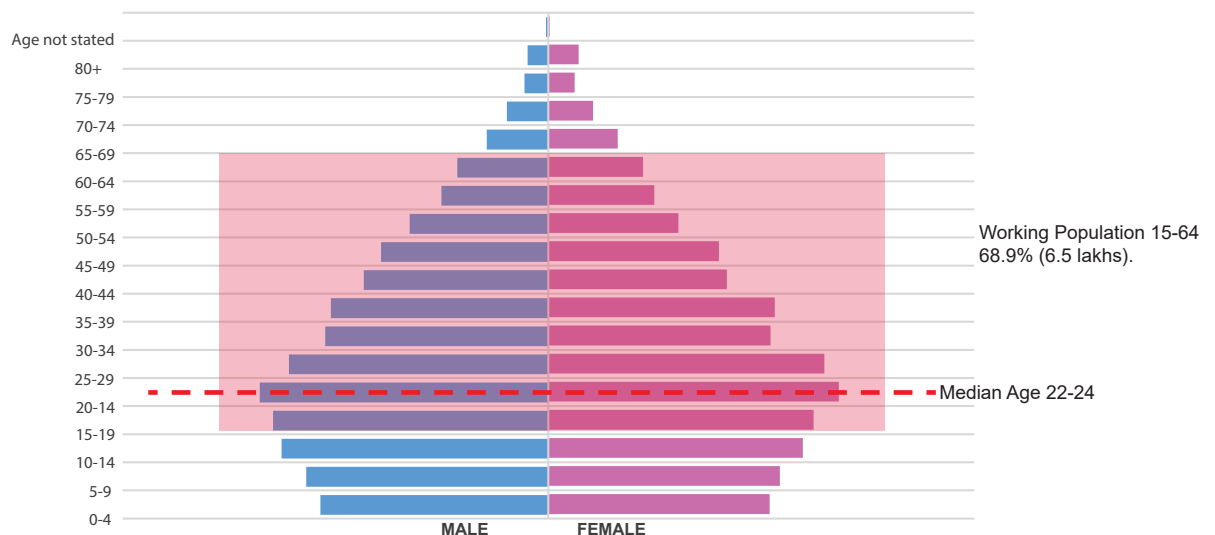
46.6
Persons Per Hectare

HDMC AREA

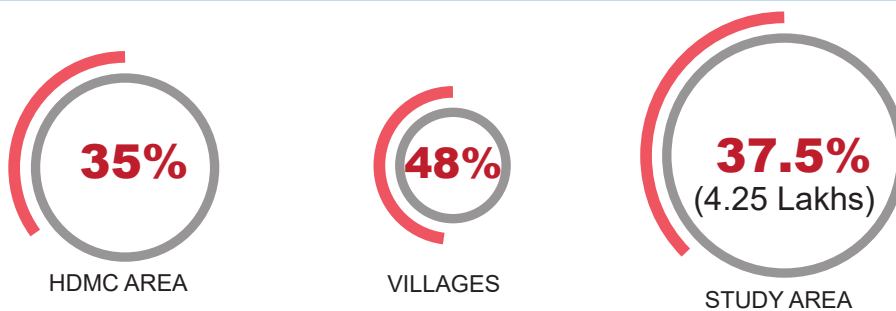
14.0
Persons Per Hectare

STUDY AREA

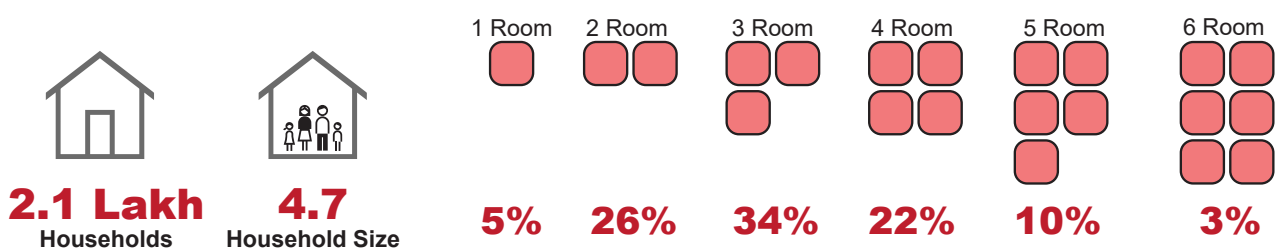
AGE PYRAMID



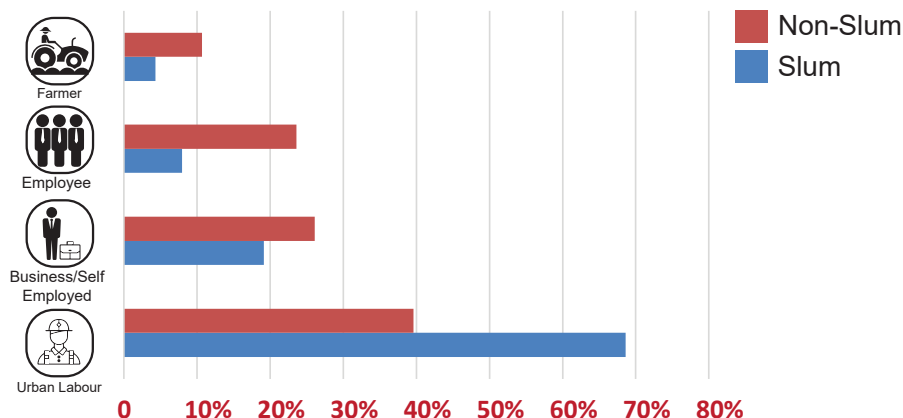
WORKFORCE PARTICIPATION RATE



HOUSING



EMPLOYMENT DISTRIBUTION



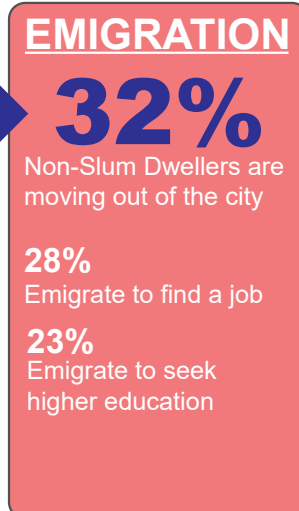
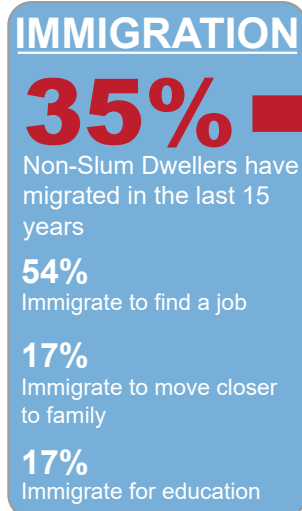
INCOME

95.2% Slum Households earn less than Rs.15,000/Month

66% Non- Slum Households earn less than Rs.15,000/Month

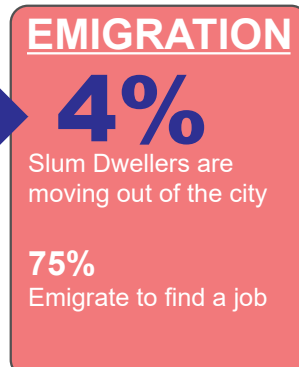
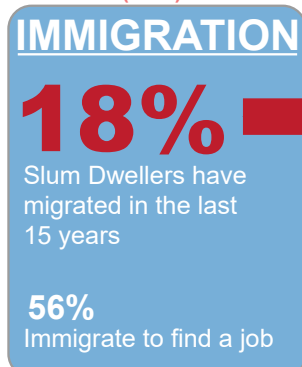
MIGRATION

Non-Slum Population



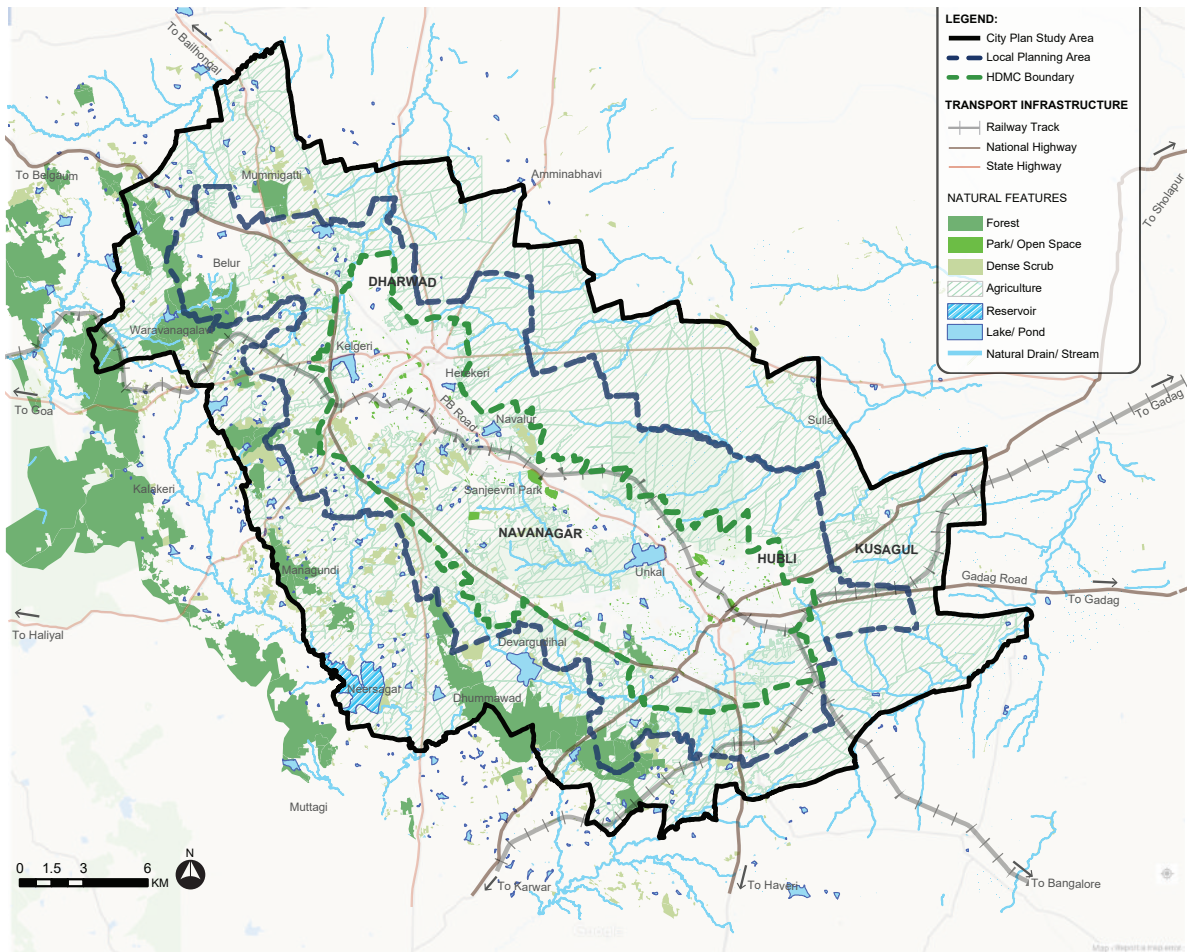
Slum Population

1.4 Lakhs (20%)



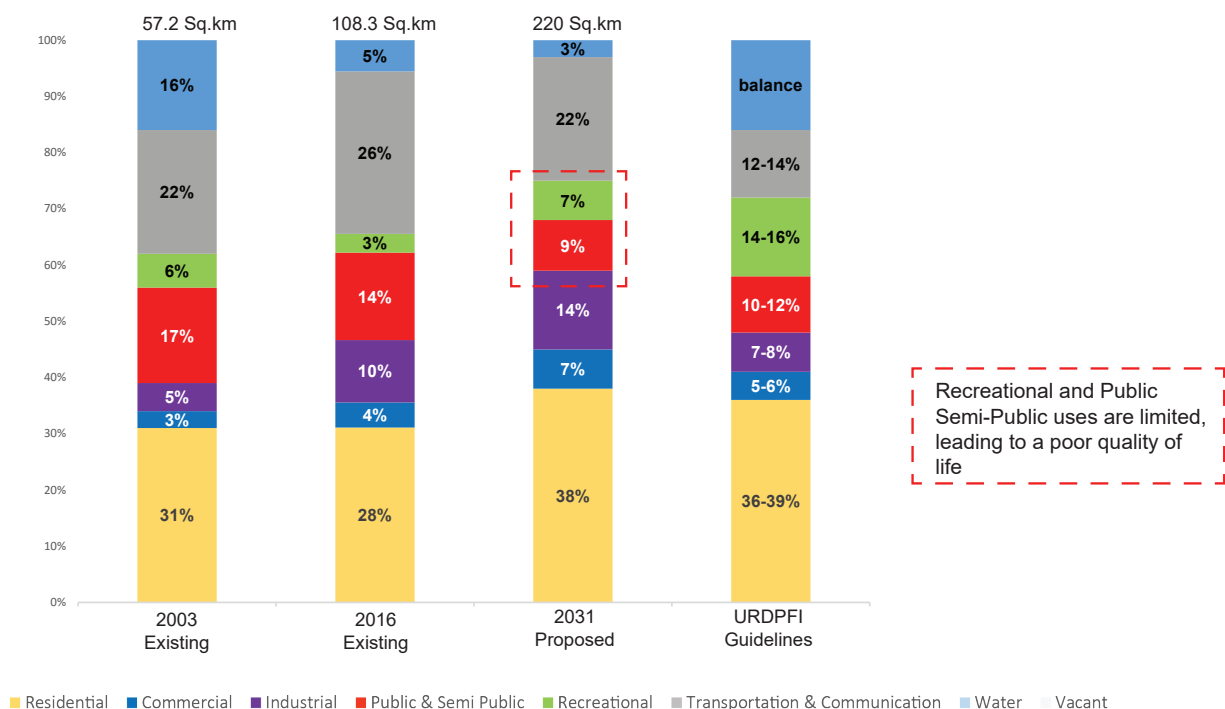
81%
Migrate from nearby villages
Major Factor - Jobs

3.3 Environment & Infrastructure



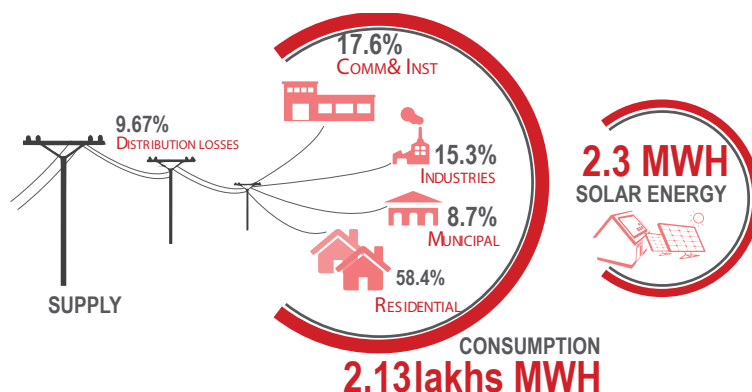
Source: Hubli Dharwad City Plan

LAND USE COMPARISON

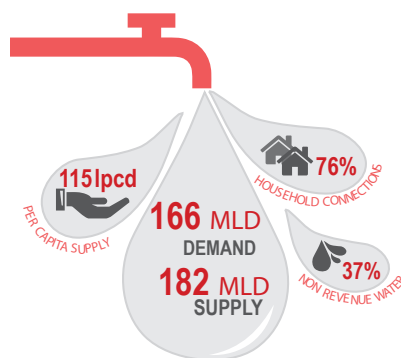


Source: Hubli Dharwad City Plan (Base Data: Master Plan)

ENERGY



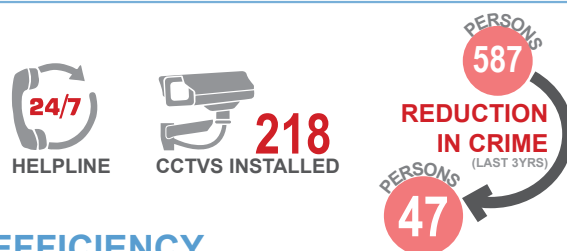
WATER



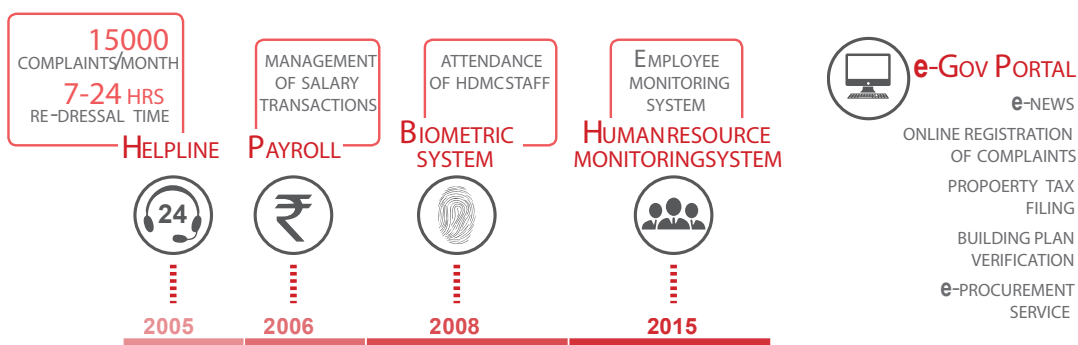
WASTE



SECURITY



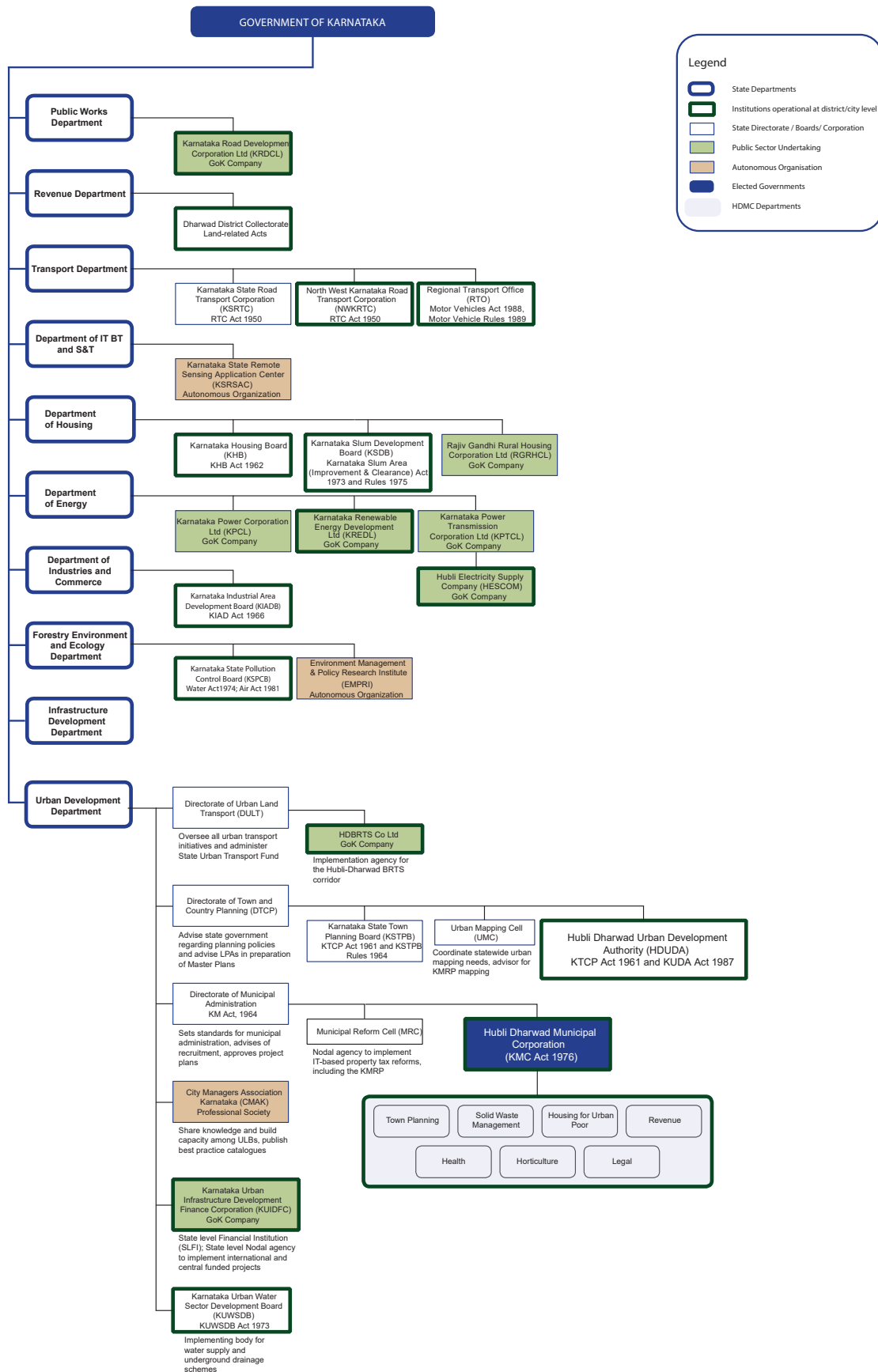
ADMINISTRATIVE EFFICIENCY



Source: Hubli Dharwad Smart City Proposal

3.4 Institutions

INSTITUTIONAL STRUCTURE



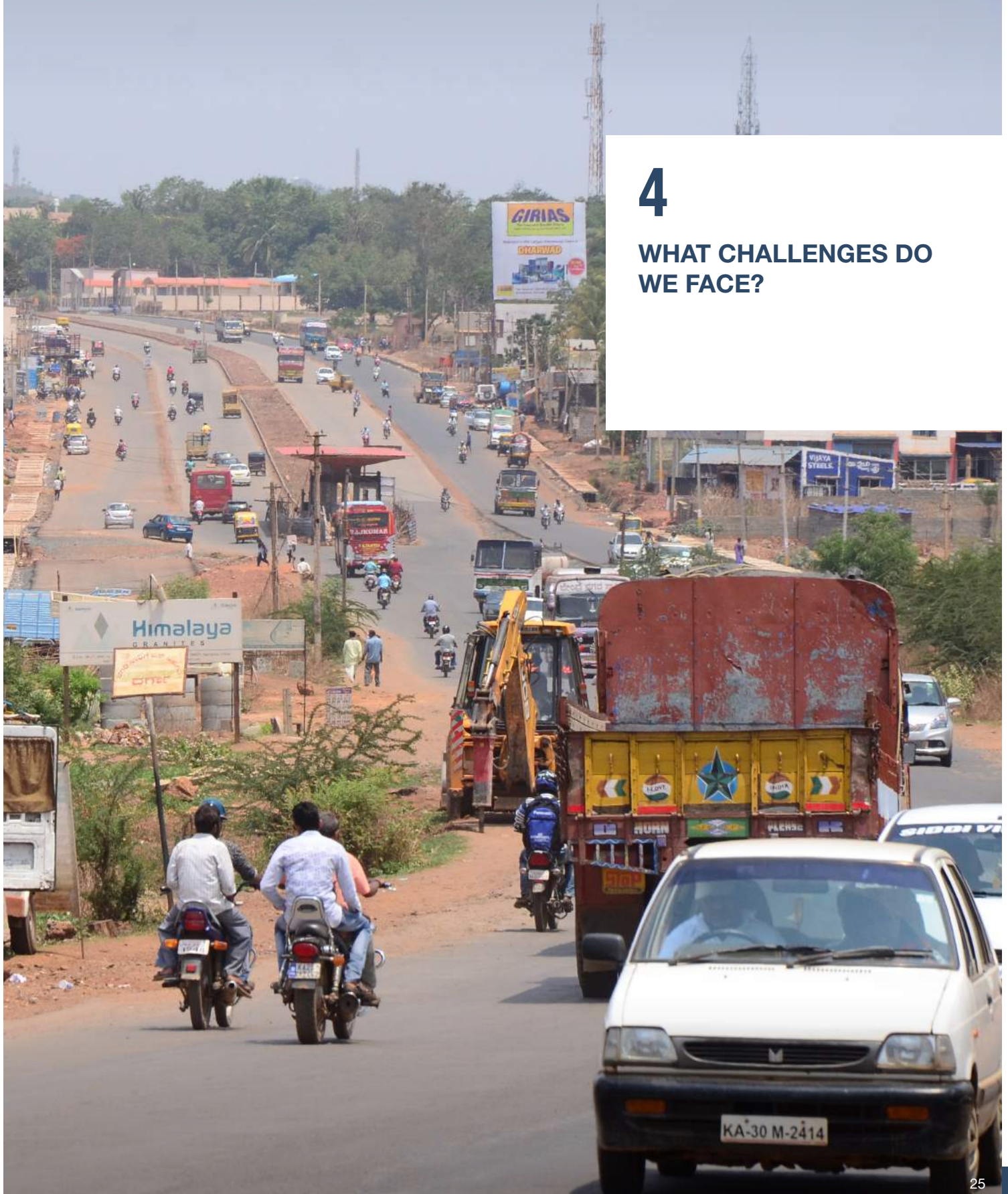
Source: Hubli Dharwad City Plan

HUBLI DHARWAD DEPARTMENT ROLES

DEPARTMENT	ACTIVITIES
Hubbali-Dharwad Urban Development Authority City Municipal Council Hubbali-Dharwad	<ul style="list-style-type: none"> • Improvement schemes • City extension schemes • Formation of roads, • Development of land for commercial use • Civic amenities and traffic improvement schemes
Karnataka Industrial Area Development Board	Development of land for Industrial use
Karnataka Housing Board	Development of land for Residential use
Public Works Department & National Highways Department	<ul style="list-style-type: none"> • Formation of Highways, roads • Construction of quarters for Govt. employees, • Construction of buildings for various departments • Traffic improvement schemes
Karnataka Urban Water Supply & Drainage Board & Zilla Panchayat	Formulation and implementation of drinking water supply and underground drainage schemes
Karnataka Power Transmission Corporation Limited	Electricity supply and maintenance
Education Department	Construction of schools and educational institutions
Horticulture and Social Forestry	Plantation of trees & maintenance of greenery.
Taluka Panchayat & Gram Panchayat	Implementation of various schemes in villages coming under local planning area

4

WHAT CHALLENGES DO WE FACE?



4.1 The City

- **Disjointed City Form:** Hubli Dharwad grew organically as two different cities, which were amalgamated in 1964 into a single municipal corporation. Even though their economies are interdependent, structurally these cities have remained disjointed connected only by the present-day BRT corridor. Most development between the 2 cities is sprawling in nature, which physically divides the 2 cities and forces intense urban development outwards and away from the primary corridor.
- **Urban Sprawl:** Availability of large tracts of urbanisable land with very little demand has led to proliferating urban sprawl. Sprawl poses a threat to the forested and agricultural lands around the city cores. With the increasing pressures of urbanization, vast residential layouts are emerging in the once fertile agricultural lands. These processes poses an opportunity to test integration of urban agriculture into the city form to address the depleting



Disconnected development along PB road



Difference in housing and settlement characteristics



Unregulated development and loss of natural resources



Construction of residential units outside the HDMC boundary

Figure 3: Challenges Faced by the City

4.2 People

- **Unemployment in the City:** The median population in the HDMC area is 20-24 years. The estimated unemployment rate for Dharwad district is 8%. A preliminary glance at the Census 2011 and Economic Census 2013 reveal as that the rate of unemployment is higher for post graduates. In order to make the most of the demographic dividend in Hubli Dharwad and boost economic growth, the region must produce employment for people at different skill levels.
- **Loss of Agricultural Productivity in the Hinterlands:** Agriculture is facing extremely weak economic growth due to its vulnerability to climate change. Water shortage in drought situations is one of key reasons for failure of crops. Further, changes in seasonal occurrences due to climate change have led to early maturing of crops and consequent crop failure. Other reasons include lack of skills for adapting to changes, reduction in plot sizes, and misuse of pesticides. Organic farming is practiced at a small scale, but has shown positive growth.



Loss of green and open spaces and their misuse



Construction activities and loss of agriculture fields

Figure 4: Loss of Agricultural Productivity in the Hinterlands

4.3 Environment

- **Loss of Natural Environment:** Lack of protective mandates in the Master Plan has led to conversion of many forest lands and critical lake catchments to urban areas. In many cases, the natural drainage system is fragmented resulting in decreasing ground water recharge and increase in surface water run-off. This has led to drying up of lakes and retention ponds while also increasing the risk of flash floods. The loss of tree cover due to sprawled developments and infrastructure projects is also leading to reductions in carbon sequestration capabilities, which result in an adverse impact on temperatures.
- **Water:** Water as a resource is under severe strain in Hubli Dharwad. Even though the water that can be harnessed in the LPA in an average year of rainfall is twice as much the current demand, water scarcity is prevalent due to unsustainable consumption patterns. In the core areas of Hubli and Dharwad, ground water levels have reduced while areas outside the Local Planning Area have higher water levels. Over-extraction for irrigation and the higher elevation in the north western portions of the study area has led to lowering of the groundwater table and turned groundwater brackish. Lack of appropriate sewage treatment is also cause for pollution of water bodies in the City.
- **Energy:** Electricity supply in the city is sporadic due to absence of a reliable system with necessary infrastructure such as energy storage for back up and underground cabling. Reliable electricity supply is a core prerequisite for economic growth. Solar energy potential has not been tapped.



Unkal Lake: Contamination and waste disposal



Raypura Lake: Encroachment and construction

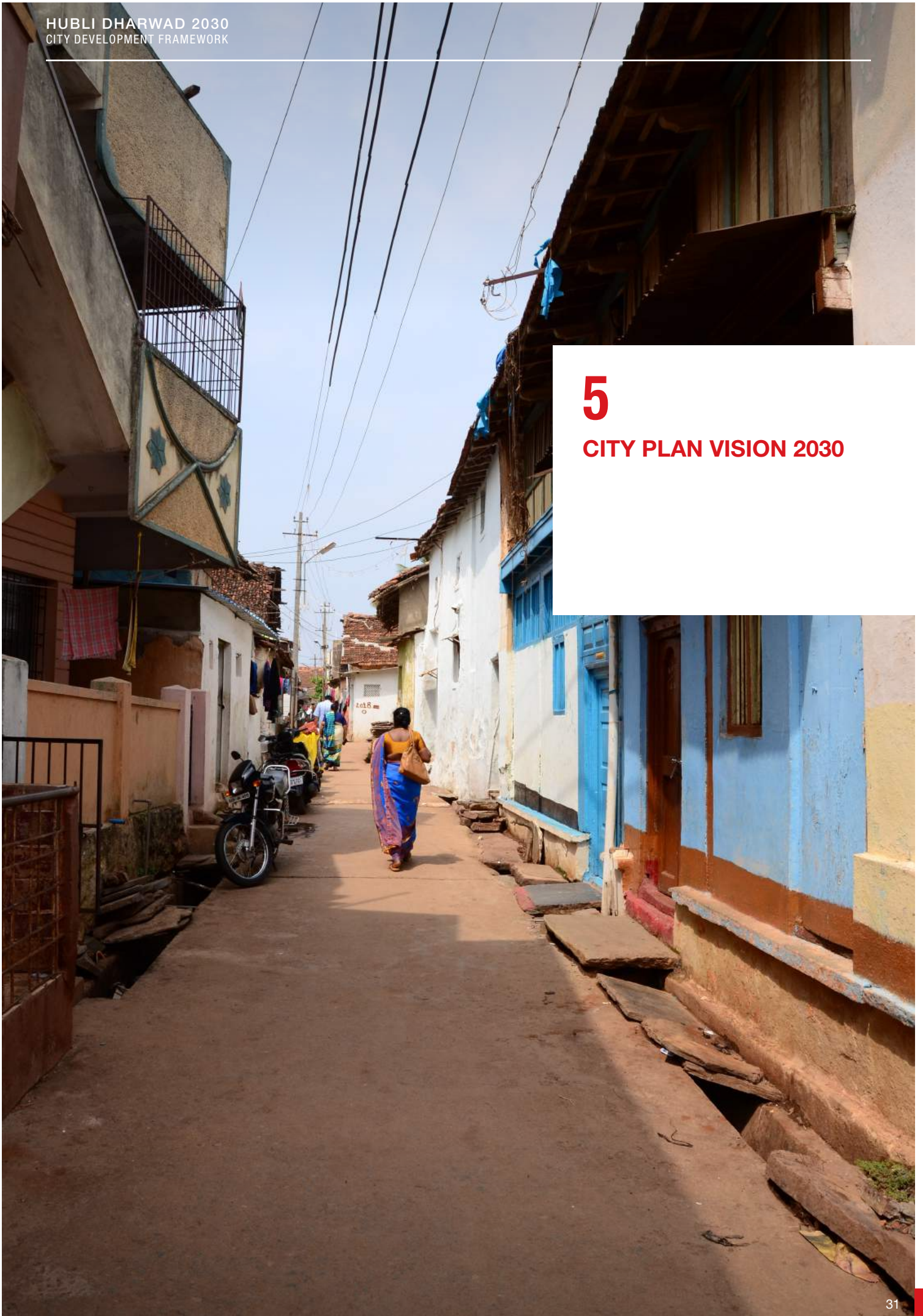
Figure 5: Loss of Natural Environment

4.4 Institutions

- **Lack of Coordination between Multiple Stakeholders with Overlapping Jurisdictions:** Non- coordinated plans from multiple stakeholders with overlapping and multiple jurisdictions for a given geography results in several independent projects (and programmes) managed through the various arms of the state. While the Master Plan evolution rests with the HDUDA, the implementation is divided and rests largely with the HDMC and with a host of other arms of the GoK. Challenges in implementation occur due to non-participation of the various implementing arms of GoK (line agencies) in the process of master plan preparation.
- **Lack of Participatory Planning:** A top down non participatory and non-consultative planning process confined within the offices of the urban planning authority. In addition, citizens as well as the larger civil society have little or no say in the plan preparation process.

5

CITY PLAN VISION 2030



City Plan Vision 2030

Hubli-Dharwad stands on the brink of a reformation in urban development. This reformation is a process, which at its base, consists of using technology to empower citizens and their government to learn from each other, share their knowledge more effectively and gain a measure of confidence in shaping the future for themselves and their children. It is not predetermined in form, but the process is the key element through which form will develop over time.

The Learning City concept is based on the understanding that one core function of any city is to enhance communications among all segments and participants. The quantity and content of communication is a strong measure of the success of any urban area, with the general recognition that the greater quantity and the greater openness and transparency of the communication process in urban management are the measures of success. One of the key elements in the learning city is the development of new methods of monitoring and evaluating the performance of key aspects of the operation of the city, not only physically, but in its social, governance, environmental and economic functions as well.

This ideal is based on what the project team has heard through the project planning period from the people, government authorities and economic influencers. These comments, correlated to the teams knowledge and experience incorporating lessons from many different situations which are appropriate to the present situation.

Hubli-Dharwad is already an important center of formal learning with its many colleges and universities. The learning city concept seeks to supplement the formal sector with the informal learning that takes place through day to day interactions between authorities, institutions, employers and citizens, as well as among citizens themselves. The learning city does not seek to control these so much as to ensure that the content of such communications has the opportunity to fully address all the important urban issues and that there are open channels which encourage constructive participation by all – not only those currently aware of possibilities, but also those for whom these constitute new challenges and opportunities.

Development in this context is not only economic development, but individual, social, environmental and institutional development as well, linked strongly to the physical environment and to environmental sustainability.

The City Plan envisions a participatory society that contributes to the enrichment of their physical environment by engaging with and responding to their natural surroundings; building industries and institutions that enhance opportunities for healthy and comfortable lives for everyone; and progressing together in liberal, livable and inclusive communities.

The City Plan is structured around 7 Strategic Pillars that are aimed at enabling a comprehensive approach to planning. These themes allow detailed examination of critical issues that remain a bottleneck to effecting planning and implementation. The City Plan aims to consistently tie the observations under each of these planning themes to the spatial form of the city and their impact on liveability.



5.1 Diverse Economic and Social Growth

The City Plan promotes economic viability through factors such as diversified employment, skilled workforce, competitiveness, investment, and affordability. Social growth is also an important determinant of healthy communities and as such, strategies aim to achieve social equity, social well-being and citizen engagement.



GOALS

TARGETS 2030

Achieve Equitable and All-round Development for All Children and Youth in Hubli Dharwad

- 80% of population should have secondary school education
- 100% children and youth should have access to age-appropriate play facilities

Diversify Economic Activity and Educational Programs for Better Matching of Skills and Job Opportunities

- Set up of industry-led skill building institutions in partnership with education institutes
- Reduce out-migration of post graduates by 20%

Enable Thriving, Adaptable, Inclusive and Competitive Local Business Environment

- Increase local businesses by 20%

Ensure Sustainable Consumption, Production, and Pollution Patterns

- Reuse / Recycle 50% of waste generated by existing industries within Hubli Dharwad

5.2 Manage Environment and Climate Resilience

The City Plan is committed to the creation of more resilient infrastructure to reduce greenhouse gas emissions and the enhancement of existing policies on the natural environment to consider ecosystems, water, natural habitats and biodiversity.



GOALS

TARGETS 2030

Preserve and Enhance City's Natural Assets

- 30% Mature Tree Cover allowing 25 lakh tonnes of carbon sequestration

Protect Critical Ecosystems to Reduce Vulnerability to Droughts and Floods

- Harness 50% of the total harnessable water capacity within the study area (200 billion litres in a year with average rainfall)
- Develop bio-engineered buffers around all streams within identified watersheds

Ensure Food Security Through Resilient & Productive Agriculture

- Generate 100% of Hubli Dharwad Nutrition Demand within the Study Area

Empower Institutions with Data to Help Build Resilience for Communities and Citizens

- GIS Information Portal for Development and Management of Landscape Infrastructure

5.3 Effective Land Management and Transportation

The City Plan promotes land use that supports transit. All plans and policies must enable an urban structure and transport system that affords maximum accessibility and affordability to its citizens, safe and efficient mobility to all users and contributes to a sustainable and resilient environment.



GOALS

TARGETS 2030

Healthy live-work-play balance in a compact walkable environment

- 10% of urbanized areas shall be compact mixed use with at least 15% land within the mixed use area dedicated to recreational and open spaces and minimum 45 street intersection density

Inclusive and affordable development within transit catchment

- Minimum 20% of new development within transit catchment to be banked or reserved for affordable housing and informal commerce

Reduced land speculation in unsuitable areas

- No new development outside of the proposed conurbation (urban growth) boundary

Reduced peak hour congestion in city cores

- Peak hour traffic volumes across critical intersections to reduce by 10%

Improved Traffic Safety

- Zero traffic accident fatalities

Reduction in citywide VKT

- Citywide VKT to be reduced to 35,00,000kms or less

5.4 A Range of Housing and Community Facilities

Creating and maintaining a full range of housing types and community facilities is a key City Plan priority. We need to invest in existing communities while making wise development choices that make our communities great places to live.



GOALS

TARGETS 2030

Make Housing Affordable

- Total number of homes to be created by 2030 = 3.62 lakh; 20% of total supply in TOD Zone; 30% of total supply in EWS and LID segment

Make Housing Adequate

- All slums should have tenure and come under redevelopment or upgradation scheme
- All buildings older than 20 years should be submitting structural audits

Make Housing Plural

- 50% of temporary workers shall be housed within company quarters
- Government-driven rental homes should be implemented

Make Housing Sustainable

- All EWS and LIG Housing must have access to Public Transport
- All projects larger than 1 acre should have rain water harvesting, decentralised organic composting, and solar energy supply.

Make Housing Resilient

- All slums within flood zone should be redeveloped
- Transit housing shall be notified for disaster victims from the region.

Create Long Term Provisions for Housing

- Notify land banks for HFA housing

5.5 Celebrate Heritage

The City Plan is committed to the creation of more resilient infrastructure to reduce greenhouse gas emissions and the enhancement of existing policies on the natural environment to consider ecosystems, water, natural habitats and biodiversity.



GOALS

TARGETS 2030

Protection and Preservation of Historic Urban Landscapes of the region

- Built Heritage Asset Inventories Prepared and 2-3 hotspots rejuvenated
- Heritage Conservation Committee and Heritage Bye-laws for the protection of Built Heritage Assets under implementation

Creating a Sustainable Heritage District

- Adaptive re-use of Built Assets within one Historic cluster implemented to showcase best practices of Restoration

Creating a platform for Intangible Heritage

- A corpus fund created under a committee to fund ongoing and regular promotional initiatives

Better Public outreach and Awareness

- Minimum 50% of Hubli Dharwad Citizens should show awareness of the City's Tangible and Intangible Heritage

5.6 Green Infrastructure and Services

Green Infrastructure is a critical focus in our City Plan, with particular attention on preparing ecosystems, water resources, and other natural systems for sustainable distributive services and public awareness on global best practices.

Because water management is largely addressed in the Environment and Climate Resilience, the focus is primarily on Energy Efficiency and Solid Waste Management.



GOALS

TARGETS 2030

REDUCE Electricity Consumption and Waste Being Carried to Landfills

- 20% energy efficiency savings (Projected consumption 2029-30)
- 20% reduction in waste being carried to landfills

INCREASE Supply of Renewable Energy and Decentralized Management of Organic and Recyclable Waste

- 50% of Hubli- Dharwad Electric Energy Consumption from Renewable Sources.
- 50% of Total Waste to be Managed at Local Waste Management Centers

INCREASE proportion of Green Buildings

- 100% of all newly constructed buildings follow green building standards for energy consumption and waste management

PROVIDE a resilient and robust energy supply and distribution system with smart-grid readiness.

- 100% of citizens have 24 x 7 electrical service connections with smart meters.

PROVIDE a resilient and robust waste management system with centralized operations management

- 100% door-to-door collection of waste by GPS-enabled vehicles with regular operations monitoring.

ENSURE active participation of all residents and public and private organisations.

- 10% of institutions, industries and commercial entities signed voluntary sustainable energy and zero waste agreements.

5.7 Efficient Implementation and Governance

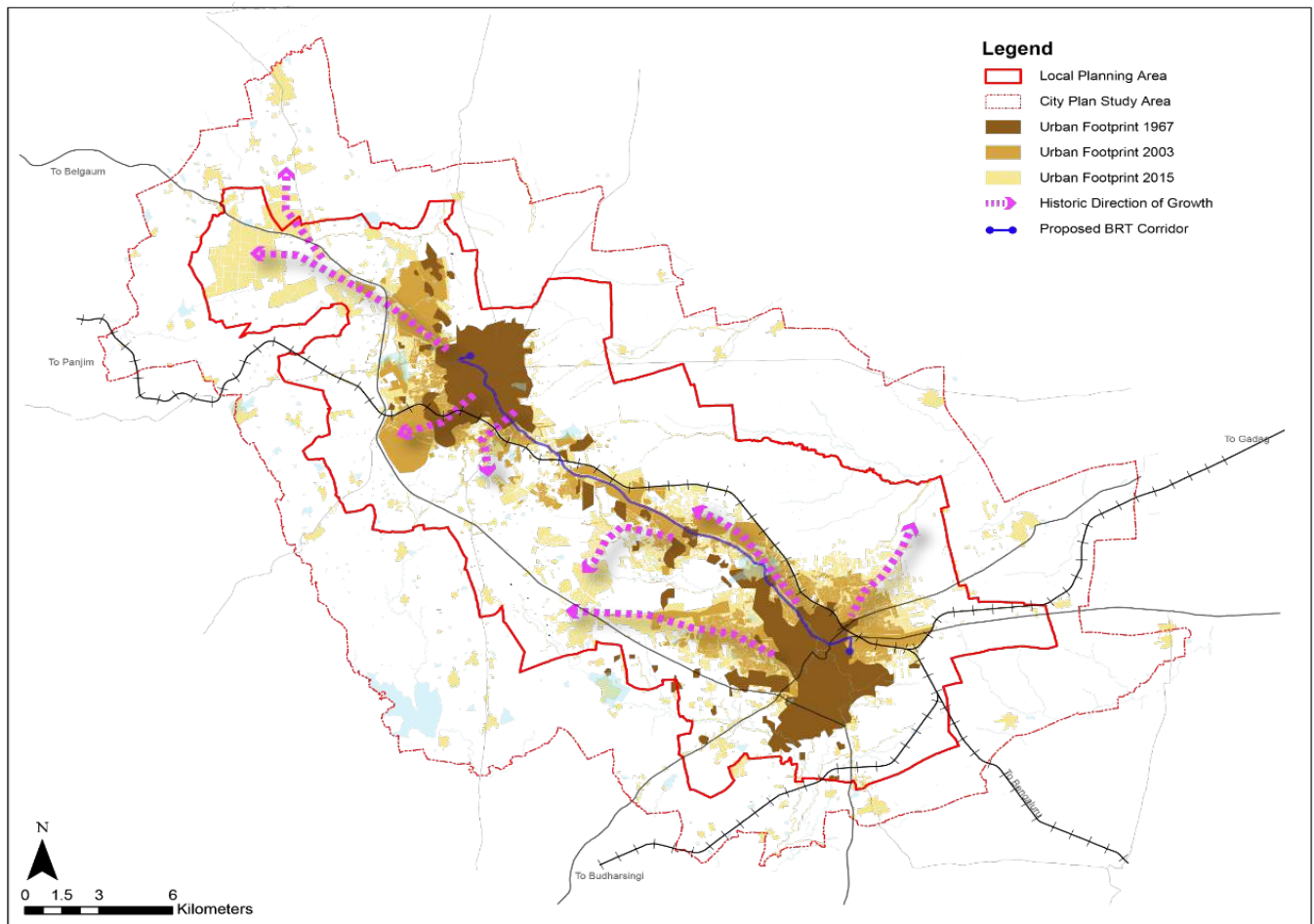
This City Plan will outline an approach to implement the Strategic Directions, including the guidelines to support participatory planning in Hubli-Dharwad. Government agencies should work more closely together with communities to co-ordinate investments and improve access to information, becoming more accountable to residents. This City Plan will play a significant role in facilitating collaboration between stakeholders and creating a communications and outreach strategy.





6

STRATEGIC GROWTH PLAN



Map 2: Natural features in Hubli-Dharwad

The spatial structure that currently defines the twin-cities of Hubli-Dharwad can be summarized in terms of the following dominant elements:

- Primary activity nodes present in the city cores of Hubli and Dharwad functioning as significant economic focuses since colonial period. These nodes are connected with a dominant development corridor- PB Road that links the city-region. Industrial areas scattered on the north, south-west and along the PB road formed the basis of the city's growth in the last few decades. A series of minor activity nodes of varying intensities and functional characteristics have emerged around institutions and smaller villages surrounding the city cores.
- The growth of Hubli has primarily occurred in the north-western, northern and north-eastern direction. It has also grown irregularly towards Dharwad city. The growth of Hubli across the east-west axes has largely been steady, the clear axes of growth being towards Kusugal in the east and towards Tarihal in the west.
- Dharwad has grown towards the north and west directions. Interestingly the growth of Dharwad towards Hubli has been limited, demonstrating a stronger pull northwards towards the Pune-Mumbai corridor. The westwards expansion of Dharwad in the direction of Karnataka University has been stagnant. Instead most of the growth in the last 2 decades has been northwards towards Belur, specifically due to the establishment of the industrial estate and Karnataka High Court, Dharwad Bench.
- The lack of development along the road connecting Hubli and Dharwad has not allowed the city to become unified. The establishment of Navanagar, a residential layout between the twin cities has started the amalgamation process. Higher intensity development, including key destinations between the two cities will help in bridging the distance and increase access and mobility between the two centers.

- There are also two major spatial discontinuities in the city structure that are barriers to opportunity: (1) the Unkal Lake - Airport belt: which restricts the spatial growth of Hubli towards the north-west direction, and (2) the vacant tracts between Hubli and Dharwad. The land along the PB road is occupied more than 95% by developments including government offices, shops, workshops and other commercial activities.

Hubli-Dharwad has a road network which is dense but with constrained right-of-ways in the city cores. The two city cores are connected by PB Road, the only arterial road in the twin cities, which was also formerly a national highway. National Highway, radiating from Hubli centre, including NH4, which is recently developed to bypass the traffic passing through these city cores. The constraints in road ROWs in the employment centers limits densification potential and results in congestion.

Beyond the traditional neighbourhoods in Hubli and Dharwad cities, growth of housing developments is also observed in areas such as Navanagar, Amargol, Kusugal, etc. The real estate scenario in the twin-cities can be summarized as follows:

- The current market assessment shows areas such as JC Nagar, Deshpande Nagar, Vidya Nagar, Sampige Nagar, Shiradi Nagar, Mangalwar Pet and Old Hubli are high demand areas.
- Speculative buying is prevalent in areas with low market value. Land values in areas such as Kusugal and Amargol is low as compared to areas near to city cores. It is also observed that the coverage of necessary infrastructure is poor in such areas. Speculative land purchase and construction of buildings is creating sprawl.
- Housing development agencies such as KHB has developed layouts at outskirts on lands having low market value and poor road connectivity.
- Navanagar residential neighbourhood, developed along PB Rd is primarily low density, and is only recently drawing residential demand. This neighbourhood has poor provision of civic amenities and public transport reach. Most residents of Navanagar are largely reliant on private modes of transport.
- Apartment style housing is only observed in the periphery of Hubli core, where the rental market is thriving. Most temporary residents in the city, including temporary workers and students live in such rental premises.
- Slums are scattered in both Hubli and Dharwad, with very different conditions.
- Many villages are located within the city limits and still exhibit a rural structure.

What is evident is that meeting development demand only through unchecked proliferation of purely residential layout developments not only exacerbates existing socio-economic disparities and spatial inequality in the city, but also places significant pressure on the natural environment, reduces the efficiency of land, and increases the cost of infrastructure provision and maintenance.

The Spatial Development Framework thus seeks to address five major issues in Hubli-Dharwad's spatial and social landscape:

- Lack of spatial vision for cohesive development of the city.
- Urban sprawl and fragmentation.
- Increasing pressure on the natural environment infrastructure.
- Spatial inequalities and the job-housing mismatch.
- Exclusion and disconnection emanating from:
- High potential underused areas
- Disconnected street networks
- Inefficient residential densities and land use diversity

6.2 Spatial Vision

Using the land capacity and suitability analysis (Chapter 4) as the base, it was possible to evaluate the structural viability of theoretical spatial growth concepts for Hubli-Dharwad. The first concept considers a 'business-as-usual' scenario assuming that the twin-cities continue to grow radially outwards from the two cores without any physical or strategic intervention. The second considers a 'Nodal Ring Corridors' scenario, which suggests development of nodal rings around each primary growth node, with several secondary growth nodes that distribute the activity. The third scenario is a 'Ringed City' concept which enables development to be contained within a ring, and focused along the defined axes to discourage any unplanned and unlimited growth outside.

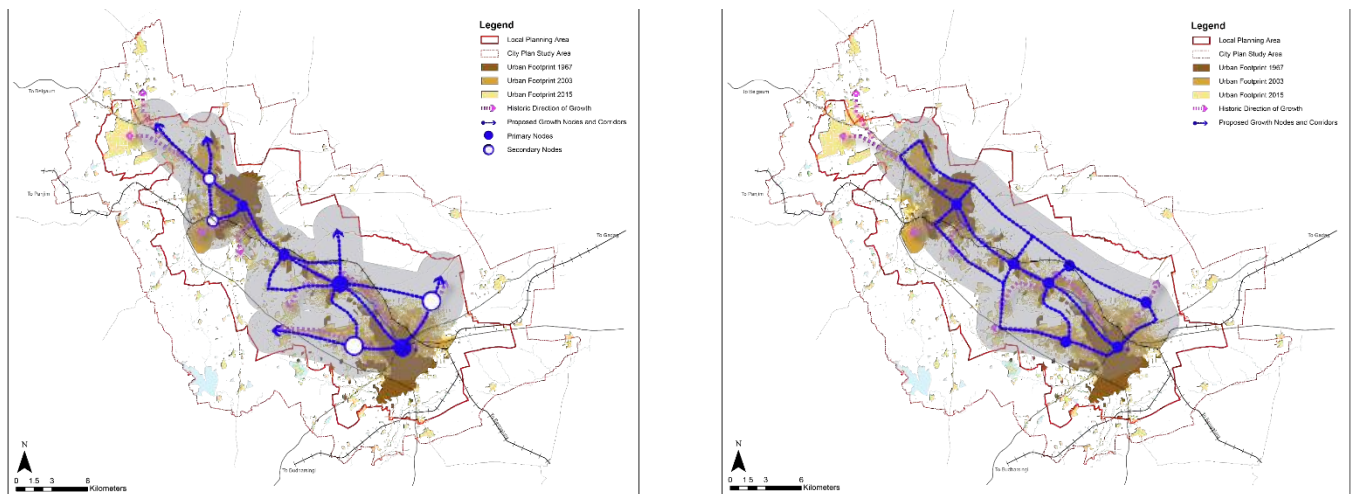


Figure 6: Nodal Ring Concept (Left) and Ringed City Concept (Right)

As per the spatial analysis and deliberations carried out during the exercise, a combination of Nodal ring corridors and Ringed city concepts suits the present spatial structure and aligns with the strategies as identified through strategic pillars.

The selected growth concept draws from the traditional 'Compact polycentric model' which concentrates growth in a compact urban core and around priority spatial economy nodes and transit oriented development corridors. Figure 7 illustrates the traditional compact polycentric model of spatial urban growth.

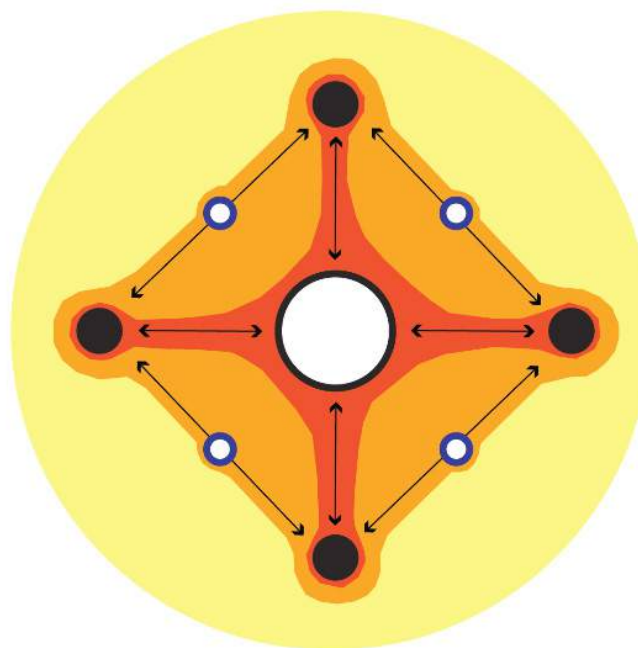


Figure 7: Traditional Compact polycentric model

The spatial vision envisaged by the CDF 2030 is a compact polycentric city with dense urban cores linked by efficient public transport networks to mixed use, complimentary sub-centres, situated within a protected and integrated natural environment.

The twin-cities of Hubli-Dharwad presently displays the inverse of this compact polycentric urban model with separated land uses and people living far from work opportunities. Because of the linear pattern of the spatial growth of twin-cities, the residential areas are separated from urban economic centres and movement structures of the city Figure 8. This pattern of development results in high social, economic and environmental costs. The CDF thus proposes a shift to a more efficient and inclusive urban logic of compact polycentric urban structure. Focusing on the Hubli and Dharwad cores as the core nodes, mixed use nodes of various intensities surrounding the city cores and BRT corridor, connected by effective public transport.

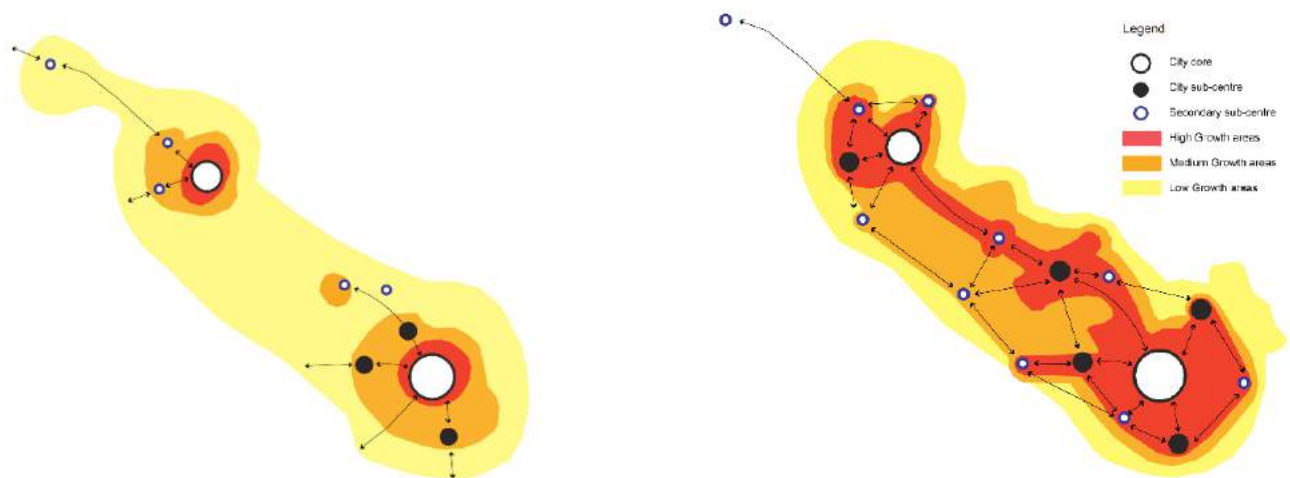
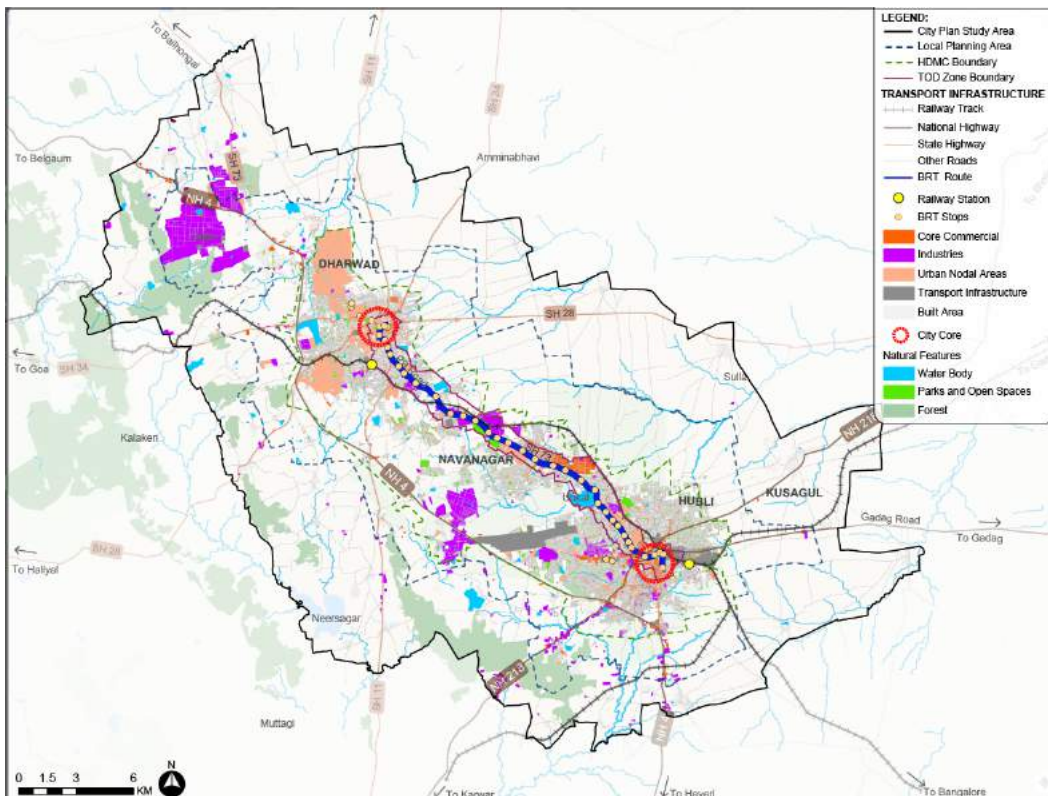


Figure 8: Existing (Left) and Proposed (Right) spatial structure of Hubli-Dharwad

The commercial areas operate in the city cores. The city core of Hubli can be defined as a hub of commercial activities, having mix of commerce and residences. The area is called as Old Town of Hubli and has markets and narrow streets. Dharwad core has commercial as well as institutional activities.



Map 3: Spatial distribution of activities in Hubli-Dharwad

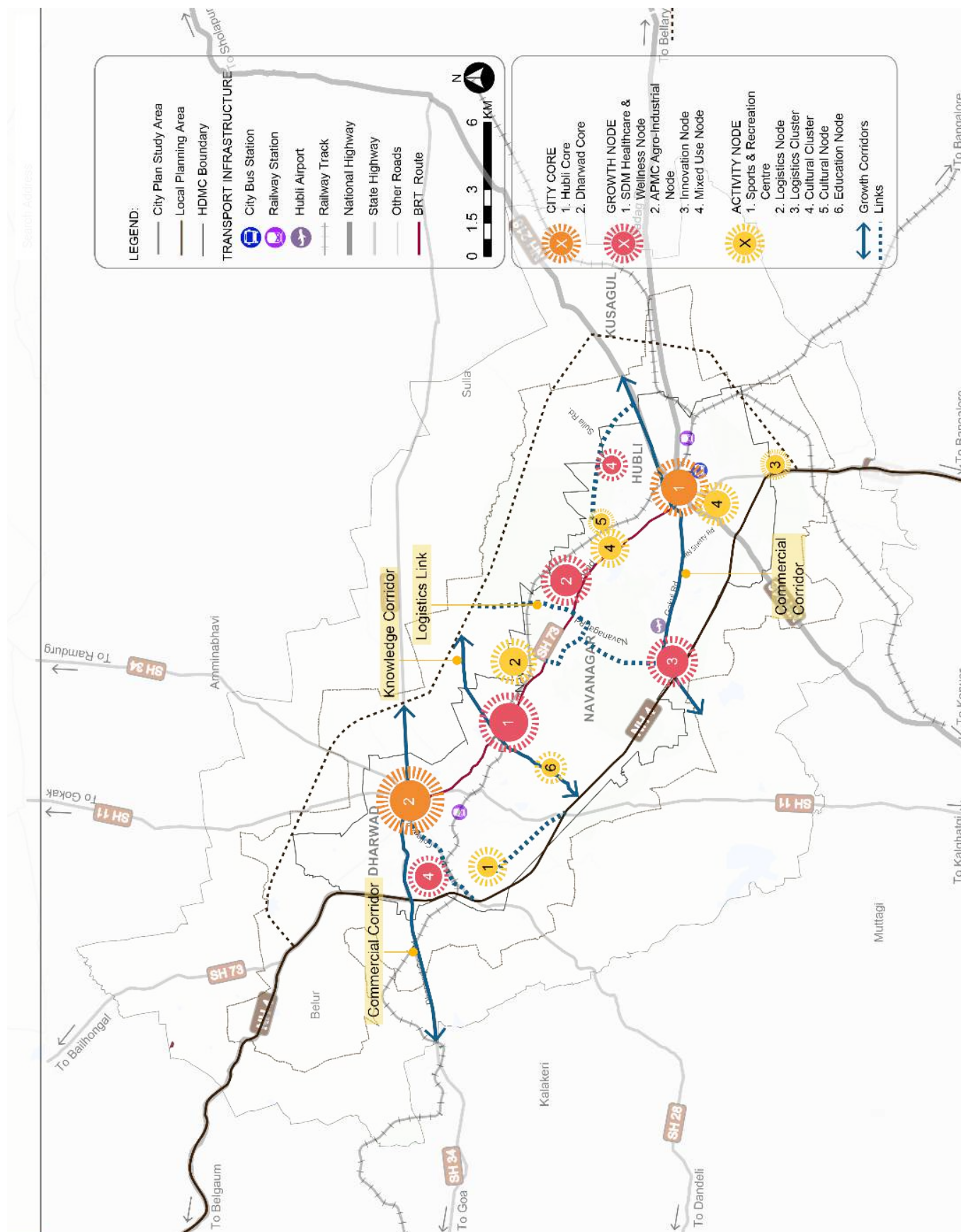
As illustrated on Map 3, industries are located outside the city cores in areas such as Belur, Gamangatti and Sattur. They are linked with road networks but shows a discontinuous spatial growth.

The spatial concept for Hubli-Dharwad builds on the spatial vision for the City Plan as a Compact polycentric city illustrated below. The spatial concept envisions Hubli-Dharwad as a hierarchy of mixed use areas, corridors and nodes, that integrate the natural ecological system, and that are connected by an efficient public transit system as shown in Figure 8.

The resulting Spatial Growth Concept in Map 4 acknowledges environmental constraints and leverages economic opportunities born out of emerging industries and land-based opportunities. Illustrated below is the Growth Concept, expressed through Growth Nodes and Corridors, and Activity Nodes. This Growth Concept makes the following proposals:

- **Develop Secondary Mixed Use Growth Nodes** surrounding the city cores and along the PB Road Growth Axis. Higher density mixed use development should be incentivised in these nodes to promote growth of employment centres within such nodes. The growth node near SDM College and Hospital is envisioned to develop into a wellness cluster offering multi-facility services ranging from temporary housing and research labs to ancillary medical facilities. The areas around APMC and the Infosys Campus are envisioned to develop as centres of innovation. Further, mixed use nodes are proposed in residential areas to bridge the housing-job gap.
- **Develop Commercial Corridors** along Gokul Road and Sholapur Rd in Hubli and Goa Road in Dharwad to disperse mixed use and commercial activity along key road links.
- **Develop Activity Nodes** at key locations to leverage locational advantages. For example, Logistics Nodes and Clusters are proposed beyond Navalur Station and near the Gabbur Truck Terminal to leverage the rail and road connectivity. Logistics links are proposed to interconnect transport nodes and cause minimum hindrance to passenger movement corridors. Cultural clusters are proposed in Old Hubli and near Unkal Village, which are locations of several of the city's intangible assets.

Figure 9: Compact polycentric model



6.3 Spatial Framework

The spatial framework for Hubli Dharwad intends to recommend areas to grow intensively and areas to preserve, such that they can be implemented within the mandate of the HDUDA Master Plan. The Spatial Framework is defined through the following layers:

- The Integrated Natural Structure – this defines the natural land structure, specifically identifying areas that should be conserved through available regulatory means. This spatial layer encompasses the entire region including the LPA and the villages surrounding it.
- The Development Density Framework – this defines the areas that should be intensely developed based on the existing growth trends and emerging opportunities.
- Transportation Framework – the transportation framework is a key component intended to support the growth strategy by ensuring smooth flow of people and resources for an efficient economy.
- Village Cluster Framework – the villages are clustered in concurrence with administrative groupings, to establish a unit of planning. Detailed Master Plans should be developed for these village clusters to allow for more inclusive and efficient synergies between the city and its peripheries.

The growth strategy defined here is based on the findings of GIS based analysis (Land suitability analysis) and priorities of the Strategic Pillars. As per the data study and current spatial structure of the twin-cities, the spatial development of Hubli-Dharwad is recommended to be guided as a compact city with multiple growth centers. To guide the spatial growth, it is important to consider and identify characteristic of different zones and districts in the city. For this purpose, zones/areas such as Natural Zone, Differential Density Zones and an integrated transportation network are identified which will help guiding the spatial growth as per the vision of the spatial framework.

For the purpose of implementing the spatial framework, it requires certain key elements to prepare a plan and lay down the strategies to ground. The key elements of Spatial Framework are summarized below:

6.3.1. Integrated Natural Structure

Natural features and environmentally sensitive areas refers to the conservation areas defined in the briefing paper. Applying development controls and supporting mechanisms in conservation areas is important to protect and enhance these valuable city assets.

The Integrated Natural Structure is proposed based on the findings of the environmental analysis. Two kinds of layers are proposed to be added into the Master Plan. Within the conurbation boundary, conservation areas or No Development Zones (NDZ) should be proposed, where no urban development shall be permitted. Low or Regulated Growth Areas, on the other hand are areas outside of the conurbation boundary, which need to be preserved in the future through restricted development allowances.

NO DEVELOPMENT ZONE

The NDZ areas marked in the map below should be preserved from any kind of building development. These areas shall be protected through development control regulations. Developments around conservation areas must be scrutinized to ensure that no pollutants enter these zones.

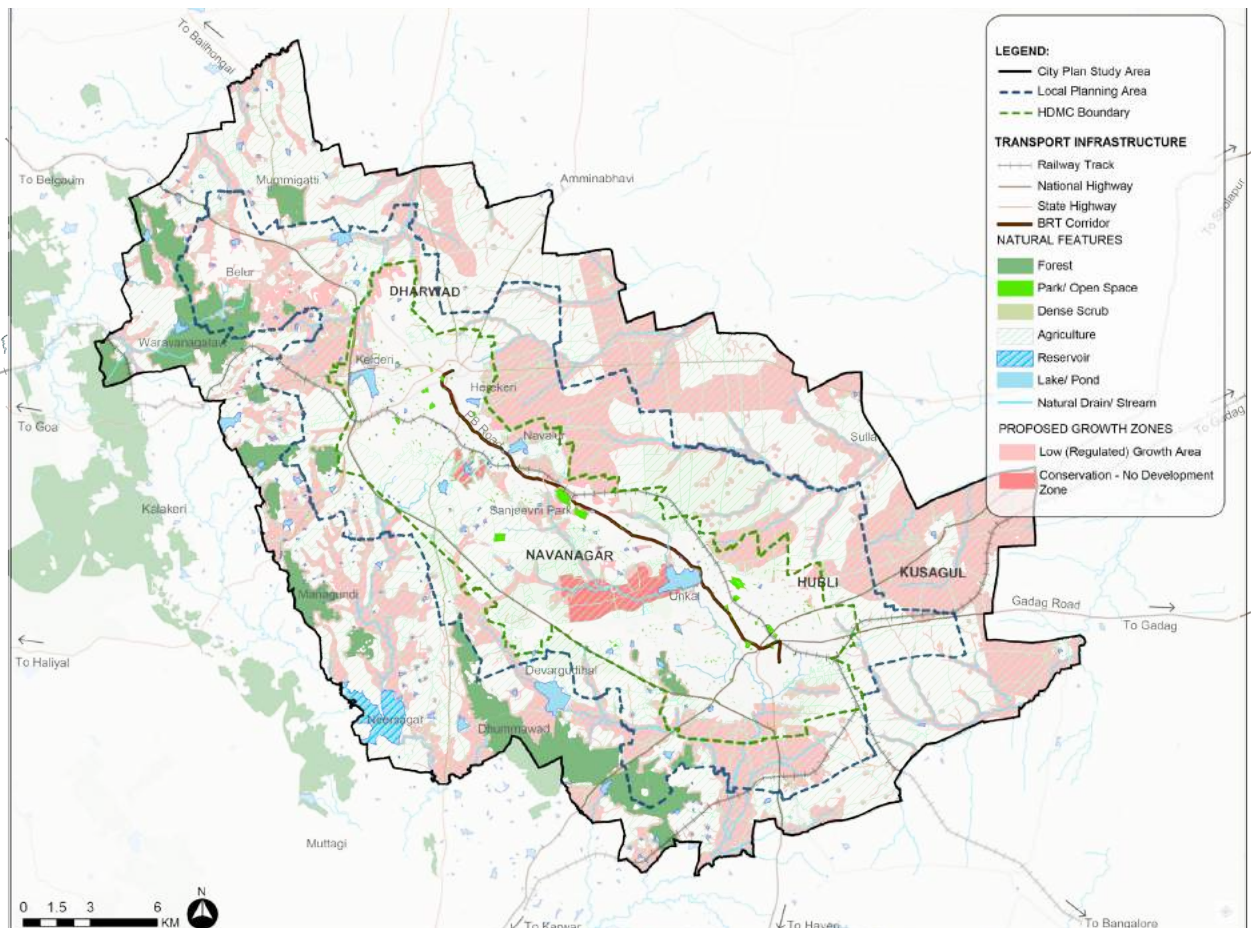
The only types of uses that may be permitted within these areas include:

- Farming and plantation,
- Bio-filtration processes, and
- Open spaces and parks.
- Not more than 5% of these areas shall be permitted to be used for building of ancillary facilities such as caretaker housing or toilet blocks.

REGULATED GROWTH AREAS:

The Regulated Growth Areas are those that add value to the ecosystem and are significant in maintaining natural resource availability for urban functions. These must be preserved and should form part of the public realm, adding value and structuring elements to the urban system and provide agricultural, tourism, social and spiritual services. Within the conurbation area, the Regulated Growth Areas primarily include the local and river stream buffers. Outside of the conurbation area, they include larger agricultural areas in the north and forested areas in the south.

In the Regulated Growth Areas, even those outside of the LPA, the HDUDA must enforce a maximum FAR of 0.5, and a maximum ground coverage of 20%. Surface water run-off must be minimized from these zones by limited hard surfaces to not more than 30% of the plot area.



Map 5: Proposed Natural Structure Hubli-Dharwad

6.3.2. Development Density Framework

The Development Density Framework suggests a differential density paradigm for the city. It proposes higher densities and FAR allowances for areas with higher amenities and higher accessibility to jobs and city services. Primarily, the framework is defined with the conurbation boundary as the base.

- **The Conurbation Boundary** - Reimagining the Conurbation Boundary as a potential Urban Growth Boundary (UGB) allows to enforce limitations to new development outside of it. This area measures 220 sq km.

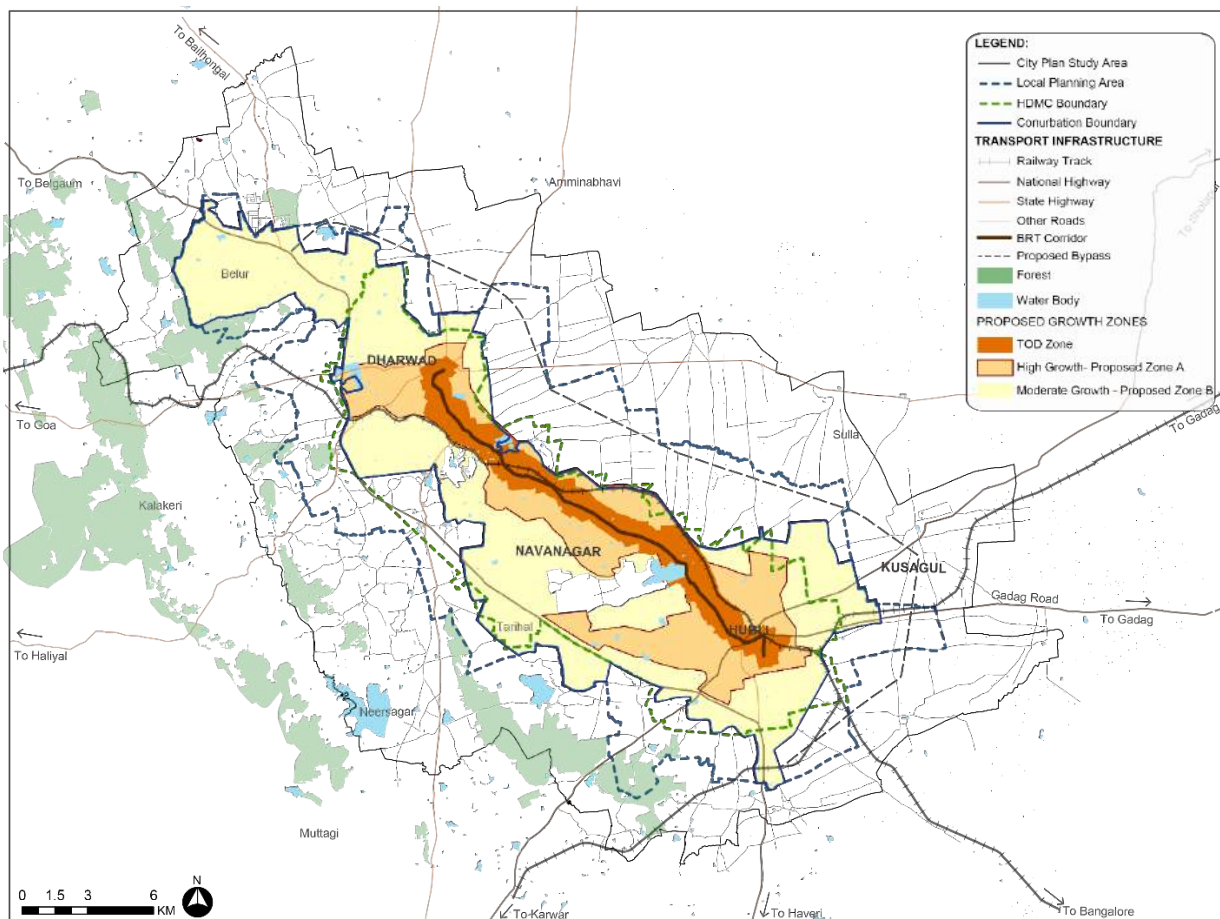
However, developing the entire conurbation area with the same density of development will lead to spread out and sprawled development. As per the Land Use assessment (Chapter 2), less than 100 sq km is required to accommodate a compact city with an average density of 150 pph. Accordingly, the next layer of density is defined, a high growth Zone measuring 83 sq km.

- **High Growth Zone** – Proposed Zone A – This zone includes all high demand and high opportunity areas as well as future strategic areas of growth. Within this zone, larger mix of uses and higher FAR should be proposed to enable compact and mixed use development. The HDUDA Master Plan already recommends more intensive uses in “Zone A”. It is proposed therefore that the High Growth Zone be considered for inclusion in the Master Plan as Zone A. However, unlike the Master Plan, this zone must be allowed higher FARs to accommodate the market demand.

The final layer of the differential density is the TOD Zone, the areas within walking distance of the new BRT corridor connecting Hubli and Dharwad.

- **TOD Zone** - This zone has the advantage of access to a high capacity, high frequency public transport system, which is expected to catalyse compact, mixed use, and inclusive development.

The Map 10 shows the conurbation area as per the Master Plan 2031, and differential density zoning.



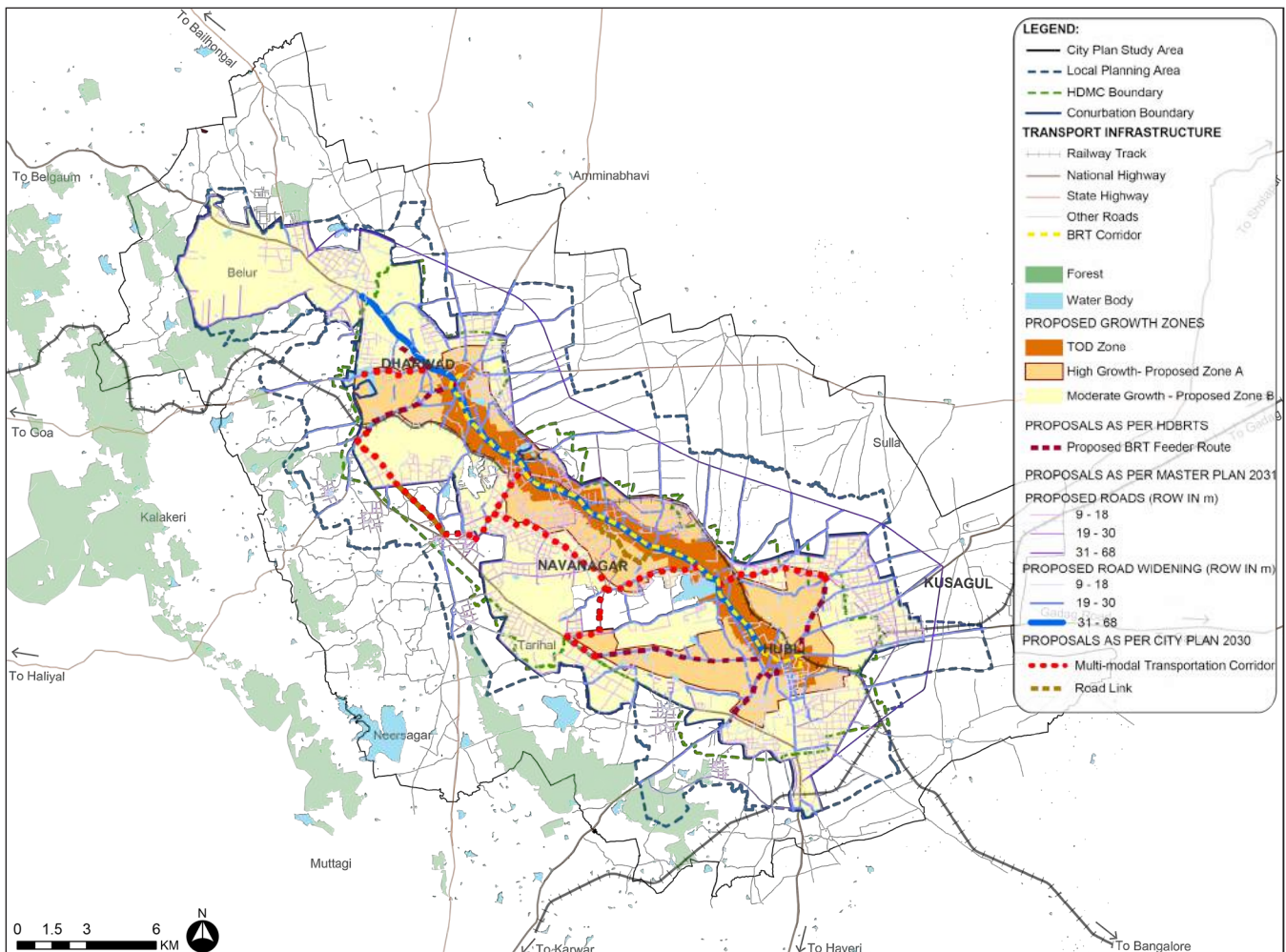
Map 6: Proposed Density Framework in the LPA

6.3.3. Transportation Framework

The development structure of a city must be imagined in parallel with a transportation network that can support its growth and ensure equitable accessibility at all stages of growth. In addition to the BRT Corridor and the Proposed Bypass Road, a network of priority roads and corridors are identified, that contribute to the spatial strategy of growth. Primarily, these include:

- **Multi-modal corridors** – Transforming PB Road from a freight corridor to an urban multi-modal corridor will enable far-reaching developmental changes as envisioned by the HDBRTS project. The advantages of public transportation grow manifold when the services are provided across a network instead of a single corridor + feeders. Building on this principle, a secondary network of multi-modal corridors is also proposed that will supplement the PB Road BRT Corridor. This network will serve to decongest existing corridors by offering alternative routes and also support and catalyze new development in growth areas and activity areas between and around the core cities.
- **Road Links** – New road links are proposed to improve freight connectivity to and from Navalur Station Goods Terminal directly connecting the NH4 at Tarihal Toll Naka in the west, and the proposed Bypass road in the east. The objective of

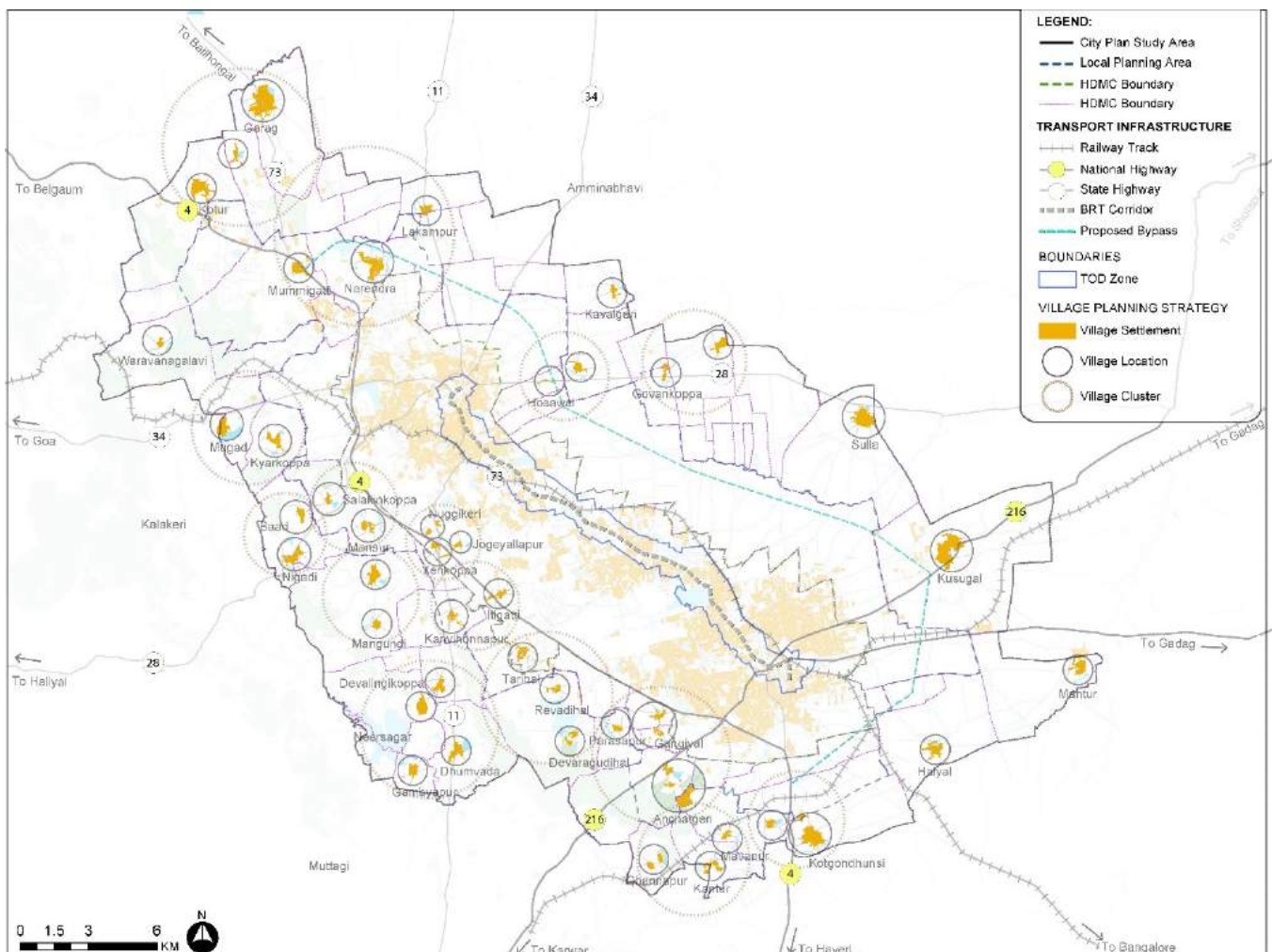
creating these east west freight links is to divert truck traffic from existing and proposed transit corridors. The freight road links must preferably be grade separated to ensure minimum conflicts with passenger traffic. This will improve safety across the PB Road BRT corridor and other proposed multimodal corridors.



Map 7: Proposed Transportation Framework in the LPA

6.3.4. Village Cluster Framework

Villages are an integral part of the planning framework of the larger region. A village clustering framework is proposed to be developed under Village Planning as per the provisions of the 73rd and 74th Constitutional Amendment Act. The administrative framework already clusters villages within Gram Panchayat and Zilla Panchayat units. Villages are further proposed to be clustered for the purpose of planning and implementation of schemes. It is recommended that the planning and development of these village clusters shall be done as per the provision of 73rd CAA. Map 8 shows the villages within the Study Area and proposed clusters.



Map 8: Proposed Village Cluster Framework

6.3.5. Proposed Recommendations to Land Use Plan

Detailed recommendations or modifications to the HDUDA Land Use Plan are suggested here based on the spatial vision and strategic interventions proposed through the City Development Action Plan. These are intended to support the Master Plan and provide detailed direction on spatial distribution of public and private investments.

6.3.5.1. Community Needs Proposals

As per the Land Use Assessment, recreation and public amenities are the least in proportion compared to URDPFI norms. The following is a summary assessment of the Community Needs in each HDMC Zone, the estimated gaps in each zone and the area availability as per the Proposed Land Use Plan 2031.

	Additional Area Available for Public-Semi Public Uses as per MP 2031 (sq.m.)	Area needs as per 2031 population projections				Land Reservation Gap for Public Semi Public Uses (sq.m.)	Additional Area Available for Open spaces as per MP 2031 (sq.m.)	Land Reservation Gap for Open Space Facilities (sq.m.)
		Proposed Area Needs for Primary Education Facilities (sq.m.)	Proposed Area Needs for Healthcare (sq.m.)	Proposed Area Needs for Social Amenities (sq.m.)	Proposed Area Needs for Other Recreational facilities like malls, theatres, etc. (sq.m.)			
Zone 1	0	-	-	13136	5913	19050	1010192	0
Zone 2	0	63234	28976	29809	22356	144375	785043	0
Zone 3	260000	39860		15236	9724	0	626176	0
Zone 4	110000	22144	1206	7275	7902	0	1244248	0
Zone 5	230000	-	-	11264	414	0	1808419	0
Zone 6	70000	-	-	9824	6869	0	286770	0
Zone 7	300000	29950	-	18488	4866	0	2109930	0
Zone 8	20000	17618	-	10461	7053	15132	172442	37839
Zone 9	0	16886	-	8888	-	25773	12565	67244
Zone 10	10000	-	-	953	99	0	228790	0
Zone 11	40000	192533	52721	53955	40600	299809	1384767	0
Zone 12	80000	108479	-	45632	31590	105701	3781125	0

As per this assessment (See Annexure A), Zones 1, 2, and 12 in Dharwad and Zones 8, 9, and 11 in Hubli City continue to be deficient in civic amenities. Zones 8 and 9, in particular, lack civic amenities and sufficient open spaces apropos to the population and residential density. However, these are smaller zones with adequate access to PSP facilities in surrounding zones.

It is proposed that existing PSP areas in Zones 1, 2, 11, 12 should be considered for redevelopment and intensification, such that they cater to larger needs of the area. In addition, in these zones commercial and/or industrial use zones may need to be diverted for accommodating civic amenities.

6.3.5.2. Green Infrastructure Proposals

Typically infrastructure needs in the city for water, energy and/or solid waste management, include provision of centralized units for production, processing or storage, and an adequate distribution or collection system. Green infrastructure aims to improve efficiency of infrastructure services by introduction of decentralized and natural technologies that can reduce the load on existing distribution or collection systems and on centralized and mechanized infrastructure. With such intent, the Plan proposes locations and areas for establishment of the following decentralized and natural infrastructure technologies: (See Annexure A)

- Solar Farms – aimed to augment energy supply to the city through renewable solar energy, are proposed on potential land areas with non-productive soil and good solar exposure.
- Decentralised Recyclable Waste Collection and Composting facilities in every ward – One open space of minimum 2.4 acre size per ward is identified for integrating recyclable waste collection and composting facilities.
- Bio-filtration Sites – lake catchment areas are proposed to be developed into natural bio-filtration sites. This will ensure that pollutants mixed into storm water from natural streams and drainage channels is filtered out before water enters the lakes. Treated sewage can also be disposed into lakes once it has gone through bio-filtration processes.

6.3.5.3. Slum Management Proposals

There are a total of 135 slums in Hubli Dharwad. Providing adequate and livable housing to all slum dwellers is a substantial obligation for the Housing Board. It is thus proposed that slums that are in livable condition should be supported through lighter upgradation program, instead of a redevelopment program. Slum redevelopment incentives must only be offered to slums that needs intervention on a priority.

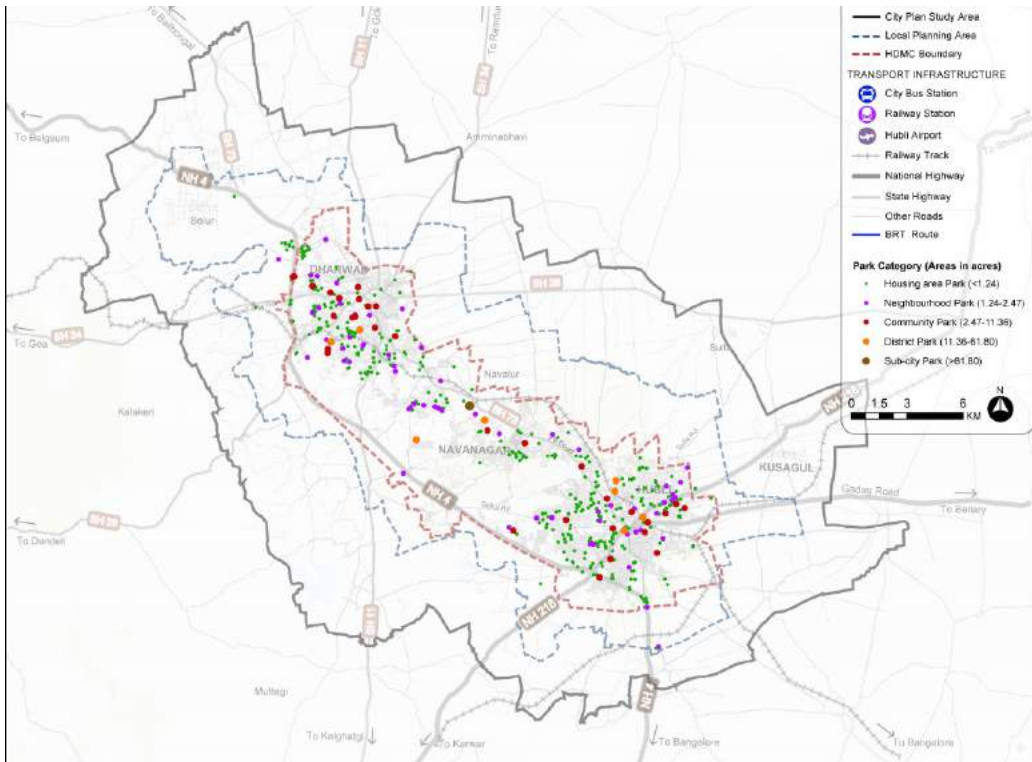
Slums were prioritized for redevelopment based on three key parameters (See Annexure 2):

- Hazardous Environment – slums that were located in areas which can be considered hazardous were prioritized for redevelopment
- Housing Condition – slums with poor housing condition were also prioritized for redevelopment
- Water Supply Connectivity – most slums were connected to a water source, partially or fully.
- Slums that were evaluated as good in all three of the above conditions are proposed to be provided with the option of in-situ upgradation. Slum upgradation DCRs are proposed in the recommendations to regulate such activity.

6.3.5.4. Public Realm Proposals

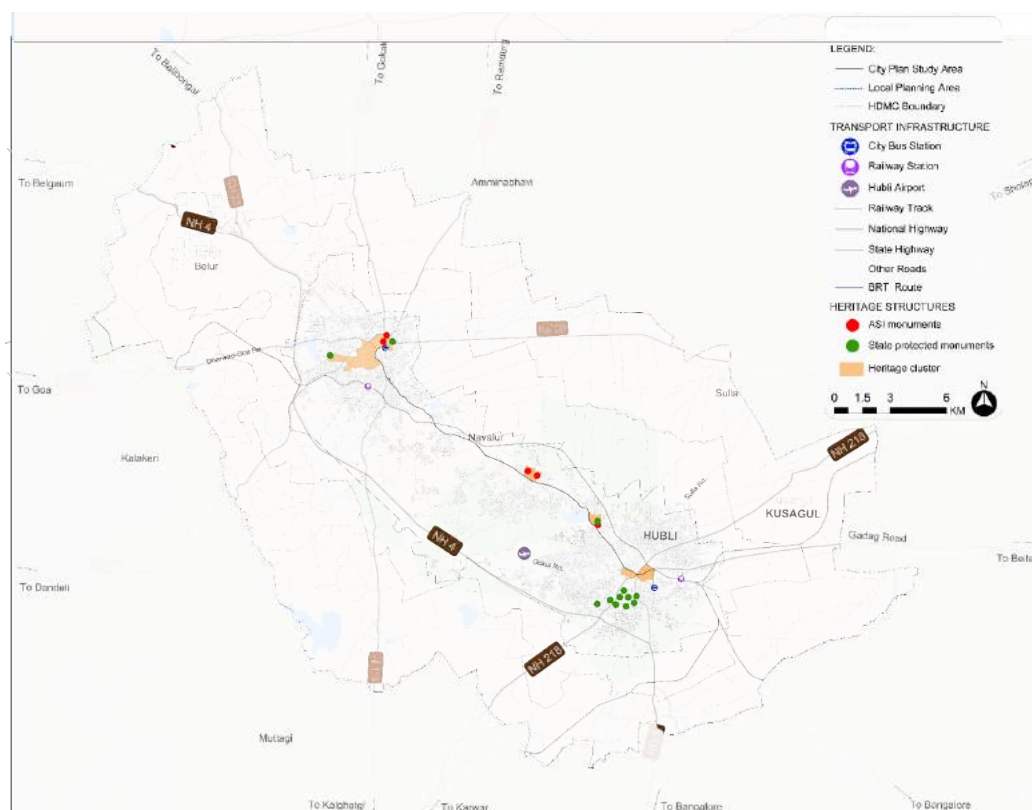
The Public Realm Plan (Annexure A) proposes three key additions to the Master Plan:

Open Space Program - The Proposed Land Use Plan 2030 adds approximately 2900 acres of recreation area (parks and playgrounds) spread across the city. These are proposed to be categorized as per URDPFI standards ranging from housing area parks (area up to 1.24 acre) to Sub City parks (area more than 61.8 acre). The Plan proposes programs for city level recreation facilities such as zoological gardens, botanical gardens, museums, science park adventure parks, bird sanctuary, and agricultural/botany research areas in buffer areas of natural features.



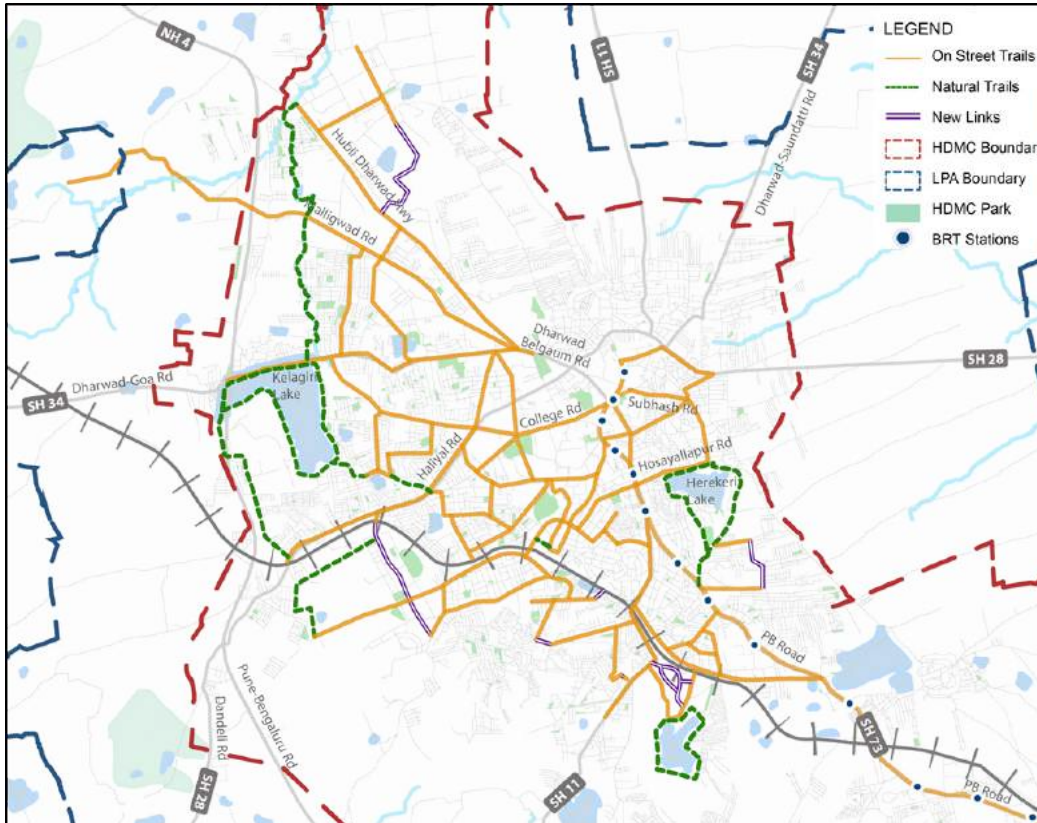
Map 9: Recreational Areas of Hubli Dharwad

Heritage Precincts – Precinct areas with large concentration of built heritage are proposed to be identified as part of the Public Realm Plan. These areas should be prioritized for streetscape construction and wayfinding systems. All development in these areas must be subject to heritage guidelines.

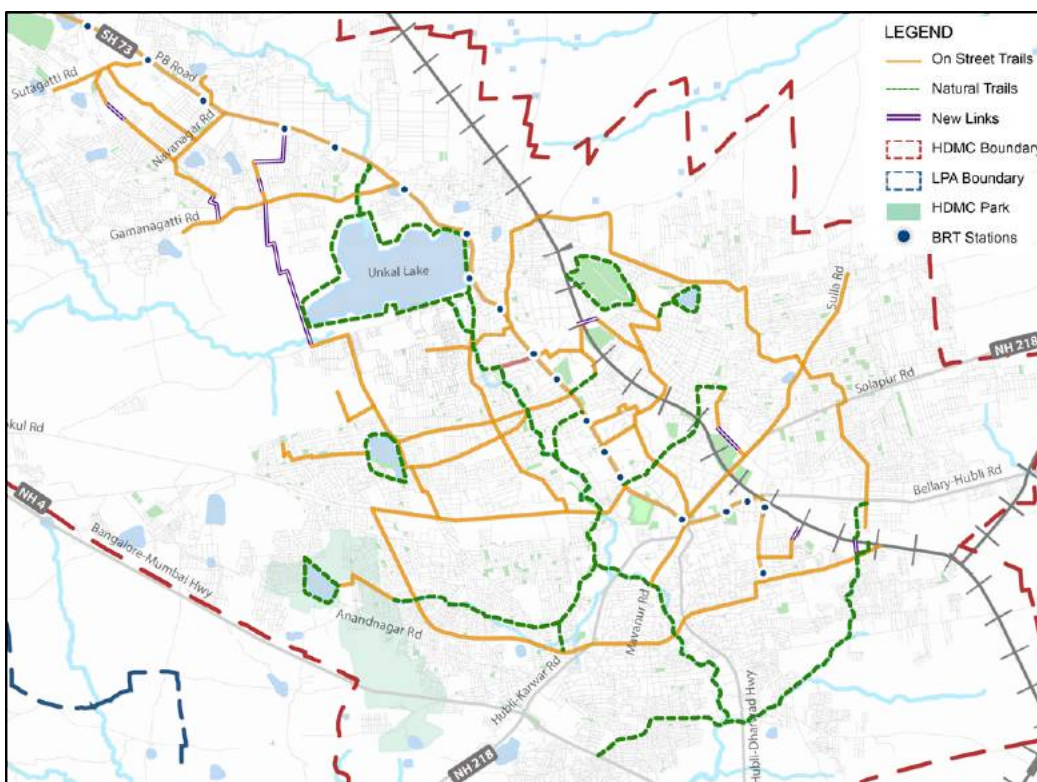


Map 10: Heritage Areas of Hubli Dharwad

Eco-Mobility Corridors – Green corridors for pedestrian and cyclist movement connecting major existing and proposed open spaces in the city and integrated with place of interest such as popular tourist destinations and heritage monuments. Ecomobility corridors will encourage NMT trips and use of bicycle.



Map 11: : Eco-Mobility Corridors in Dharwad



Map 12: Eco-Mobility Corridors in Hubli

7

STRATEGIC OBJECTIVES



The Hubli Dharwad 2030 Plan proposes four key objectives as imperatives to ensure cohesive and sustainable growth through the 12 year period until 2030. These objectives are expressed through 20 strategies that will guide us toward the Learning City Vision and key targets.

	<p>CONNECT AND STRENGTHEN</p> <p><i>Creating Links within Hubli Dharwad to reconnect the city with assets is a core objective. The strategies suggested under this objective primarily focus on drawing links within the planning framework to better connect the overlapping jurisdictions; reconnecting citizens with the city's natural assets; creating links between economic and educational activities; and creating a unifying brand for the City for competitive advantage among the cities of the region.</i></p> <ol style="list-style-type: none"> 1. Formalize a Bottom-up and Integrated Planning Framework 2. Rethink Urban Parks to Maximize Value 3. Build Partnerships to Link Education, Research and Development 4. Develop a Hubli-Dharwad City Brand
	<p>PRESERVE AND MANAGE</p> <p><i>Hubli Dharwad brings together natural resources, places, and institutions that are historically significant. As the second largest City in Karnataka, Hubli Dharwad is at the cusp of growing into a center of considerable regional influence. Preserving the City's assets and improving management capabilities within the City is a core objective of this Plan.</i></p> <ol style="list-style-type: none"> 5. Manage Regional Water Resources 6. Reimagine Built Heritage and Maximize Value 7. Build Complimentary Institutions for Key Functions 8. Improve Institutional Capacities within City Administration
	<p>UPGRADE AND TRANSFORM</p> <p><i>As Hubli Dharwad grows, the pressure of formal urbanization will force older city areas to deteriorate. It is a core objective of the Plan to ensure that existing settlements upgrade and transform to be ready for future growth.</i></p> <ol style="list-style-type: none"> 9. Enable Housing Plurality 10. Make Villages Independent 11. Create a Tourist-ready District 12. Upgrade Neighbourhoods 13. Encourage Compact Intensification through Regulations
	<p>GROW AND INNOVATE</p> <p><i>Looking towards the Future, it is imperative for the City to promote innovation and grow as a Knowledge Economy with high standards of living.</i></p> <ol style="list-style-type: none"> 14. Capitalize on City Strengths to Build Economic Clusters 15. Green the Hubli Dharwad Economy 16. Remodel Public Infrastructure to Contribute to the Green Infrastructure 17. Create Sustainable Land Development Opportunities for the Future 18. Promote High Density Compact Mixed-Use Development in TOD Zone and Growth Nodes 19. Capitalize on the Sharing Economy for augmentation of Transport Services 20. Tap on Smart Trends

7.1 Connect and Strengthen Strategies



1.0 FORMALIZE A BOTTOM-UP AND INTEGRATED PLANNING PROCESS

For any given geography there are multiple plans over multiple jurisdictions by multiple stakeholders and very often these plans are not coordinated. What this results in is the conception and implementation of several independent projects (and programmes) managed through the various arms of the state. The Development Plan prepared within the framework of the regional plan and as an aggregate of the Local Area Plans should emerge as the apex document with all programmes and projects aiming to deliver services and infrastructure aligning to this apex plan.

OPPORTUNITIES

1. Ongoing City Plan to address the gap of regional planning aspects and inform the master plan
2. Possibility of inclusion of the city plan recommendations and establish a bottom up approach in the ongoing Master Plan revision process
3. Absence of existing LAPs create opportunity to make it in the right way

ACTION PLANS

1. Build Planning Capacity in HDMC to promote micro-level planning

The Smart City and AMRUT Missions have enabled capacity building in HDMC. The municipal corporation is currently in the process of creating Ward Committees. These Ward Committees must include at a minimum:

- a. One Local Elected Official
- b. One member from HDMC Planning Division
- c. One HDMC Zonal Officer
- d. One member of the Academic Community
- e. One member of an Environmental NGO
- f. 3-4 Resident members from the Ward

These Committees should be required to host quarterly town-hall meetings to present their work and hear from the public-at-large.

These Committees should be consulted in creating municipal budgets. They should also have the authority to provide suggestions and prioritize infrastructure investments in their ward.

2. Set up City Transformation Cell in a local University or the new IIT Dharwad for technical assistance to Government Agencies

The existence of top-ranking universities in the city including the new IIT Dharwad can play a significant role in improving local capacities in urban planning, infrastructure building, and technologies. Institutions such as IIT Delhi and CEPT Ahmedabad have been able to place their host cities as frontrunners in the evolving planning practice of the country. A City Transformation Cell should be set up in a local University or IIT to provide technical assistance to city authorities for key transformational plans and projects. Such a Cell should also be made responsible for the regular updation and monitoring of the City Plan.

RELATED STRATEGIC PILLARS



- Effective Implementation and Governance

APPLICABILITY

- City I Institutions

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATORS

- % of Wards for which Ward Committees Formed
- % of Residents Participating in TownHall meetings
- % of Local Academic Faculty engaged in City Projects

CHALLENGES

1. The Master Planning exercise ignores the mixed-use morphology common to most Indian cities.
2. Non-coordinated plans from multiple stakeholders with overlapping and multiple jurisdictions for a given geography. This result in several independent projects (and programmes) managed through the various arms of the state.
3. A top down non-participatory and non-consultative planning process confined within the offices of the urban planning authority. In addition, citizens as well as the larger civil society have little or no say in the plan preparation process.
4. While plan evolution rests with the HDUDA, the implementation is divided and rests largely with the HDMC and with a host of other arms of the GoK. Non-participation of the various implementing arms of GoK (line agencies) in the process of master plan preparation.

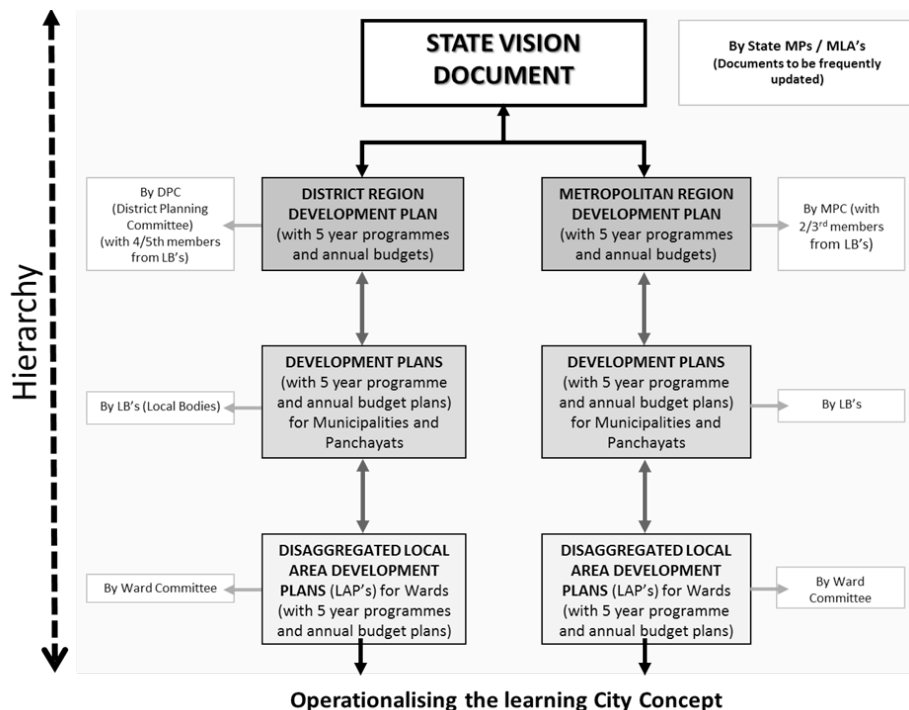


Figure 10: Current planning approach in Hubli Dharwad

SCALE	PLANNING HIERARCHY	GOVERNANCE ARRANGEMENT		
City - Region	REGIONAL / STRUCTURE PLAN Resource plan & a policy framework	DPC or a MPC as and when H-D is declared a metropolis	District /Metropolitan Region (none) Spatial Data Infrastructure and Planning and management Cell	GoK Line agencies • KWSSB • KEB • DULT • KLCDA
			Municipalisation Cell District / Metropolitan Transport Authority	
Municipal + Cluster of Villages (GPs)	DEVELOPMENT PLANS	HDMC 22 Gram Panchayats	Land mobilisation Cell Development plan implementation & Finance Cell: Planning Permissions/change of land-use, layout approvals, DP approvals City (non) Spatial Data Infrastructure mgnt & planning Cell Transit Oriented Development Cell	• Fire & Services • Karnataka Slum Improvement Board • Karnataka Housing Board • Traffic police
Wards + Villages	LOCAL AREA PLAN	Ward Committees + Village Gram Sabhas		

Figure 11: Recommended Planning Approach



CASE STUDY

PLANNING FRAMEWORK OF SINGAPORE

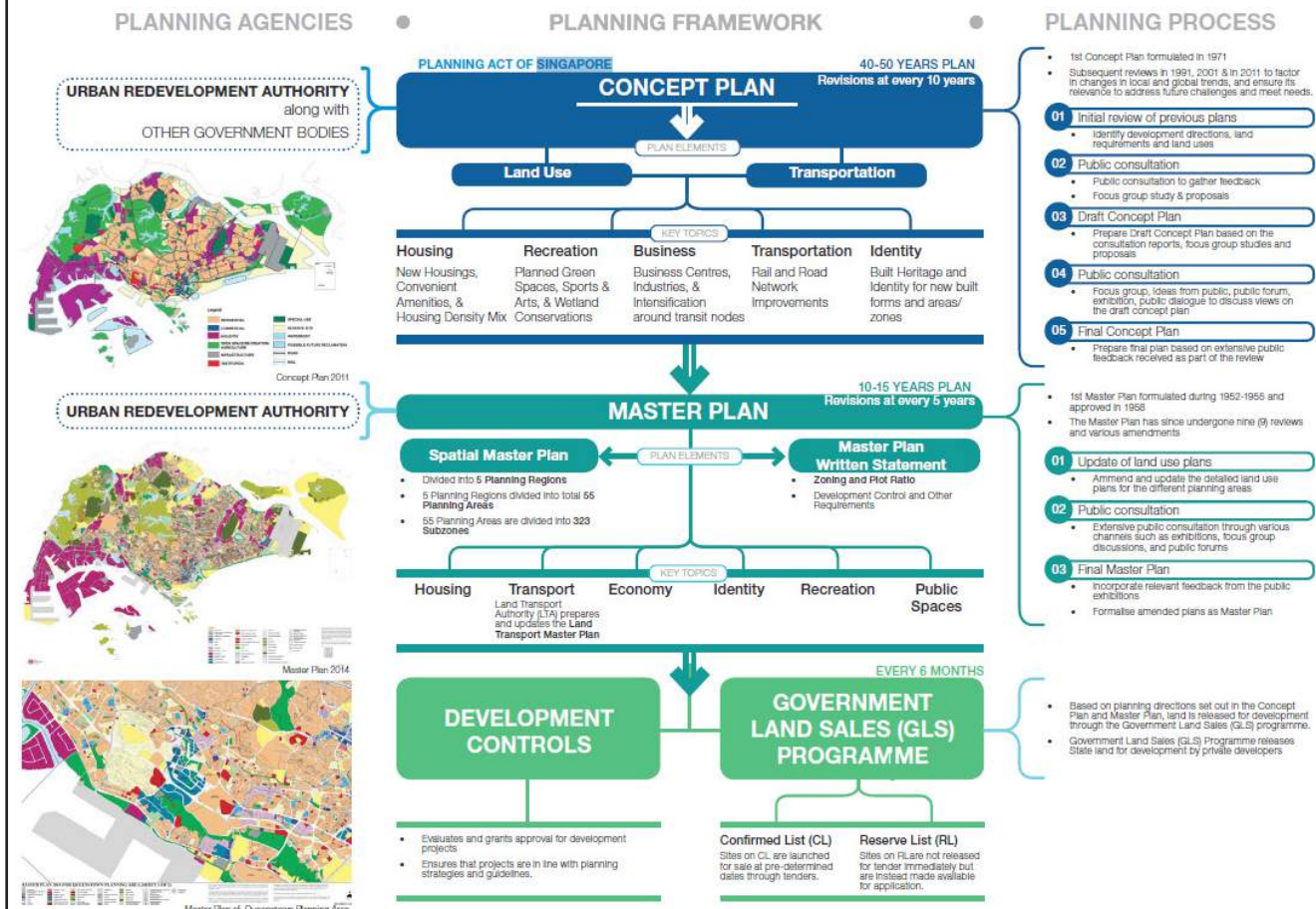
The Urban Redevelopment Authority (URA) is the primary agency responsible for administering the Planning Act which, together with its subsidiary legislation, lays down the general rules governing the urban planning process and the development control system. URA along with other government authorities such as the Housing and Development Board and the Corporation prepares both the concept plan and the master plan, the two most influential plans that guide the physical development of Singapore.

Concept Plan:

The Concept Plan is a strategic land use and transportation plan that guides Singapore's development over the next 40- 50 years. Reviewed every ten years, the Concept Plan outlines the strategies to provide the physical capacity to sustain a high quality living environment.

Master Plan:

The Master Plan is a statutory plan that guides the development over 10 to 15 years. It translates the broad, long-term strategies of the Concept Plan into detailed plans for implementation by specifying the permissible land uses and densities. It is reviewed once every five years. Public consultations in the form of focus groups, public forums, Draft Concept Plan exhibitions, and public dialogue are important components of the Master Plan process. By incorporating relevant feedbacks from the public consultations, final master plan is formalized. The planning strategies to achieve the vision for Master Plan are presented through six key focuses: Housing, Transport, Economy, Recreation, Identity, and Public Spaces. Finally, the Development Control evaluates and grants approval for development projects and ensures they are in line with planning strategies and guidelines.





CASE STUDY

PLANNING FRAMEWORK OF LONDON

The spatial planning framework for London mandates a three tier planning process as published in the National Planning Policy Framework. The framework makes it clear that local and neighbourhood plans are central to the operation of planning system, with the regional strategic plan as a guidance document to achieve long-term goals.

London Plan

The Mayor of London is responsible for producing a strategic plan for the capital region that includes the London city corporation limits and 32 boroughs. This strategic plan document, termed as "London Plan", summarizes the vision statement of the Mayor and highlights the regional strategies to guide the development over a period of 20 years. It no longer has a statutory role, but in principle guides the formulation of Local Plan and Neighbourhood Plans.

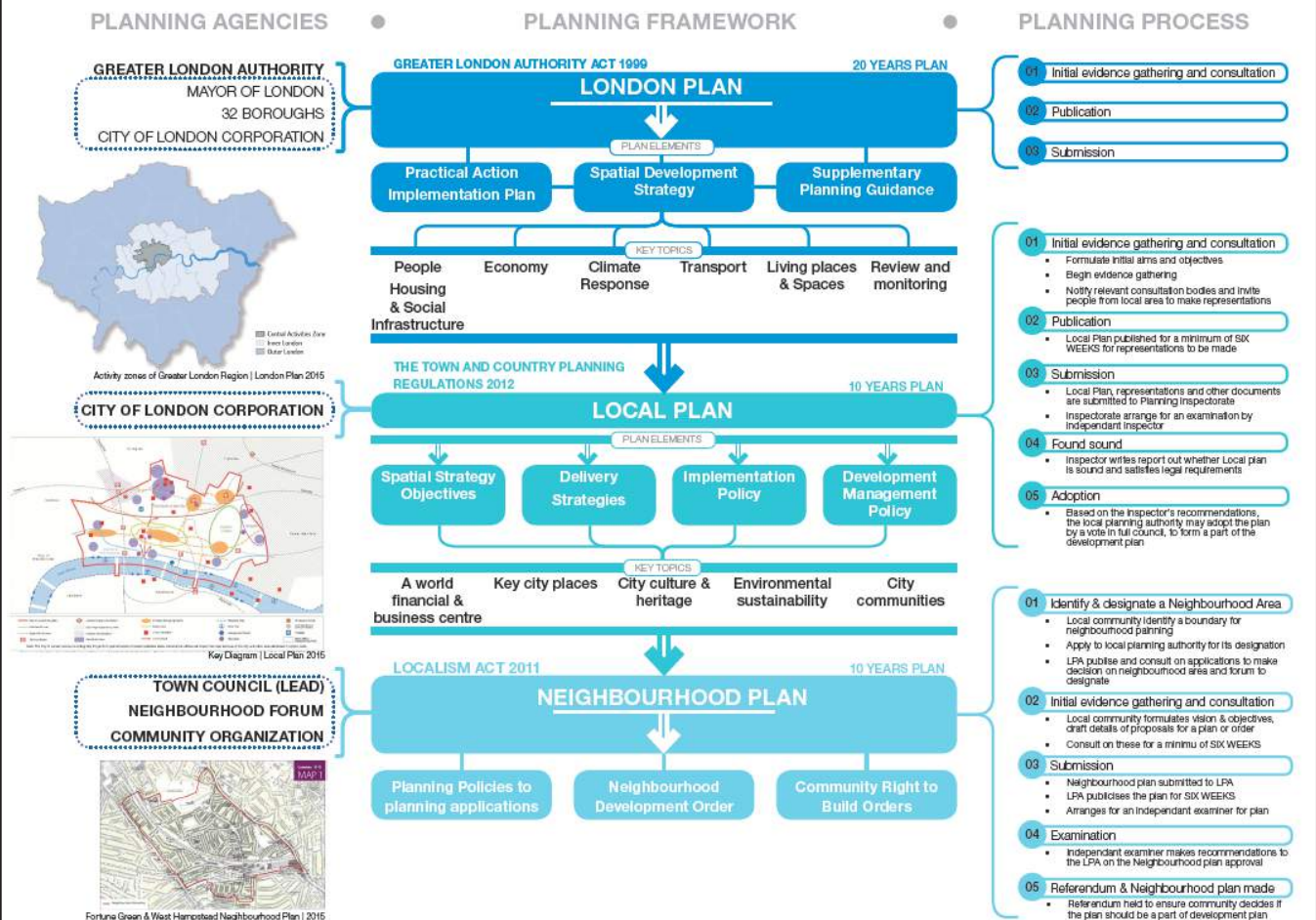
Local Plans

Local Plans are the key statutory documents that the local planning authorities can set out a vision and framework for the future development of their respective

local areas under the Localism Act 2011. Local plans are a shared endeavour led by the local authorities, communities, developers and other interested parties. This plan prepared for a duration of 10 years cover diverse aspects of plan-ning and implementation including, delivery strategies, implementation & development manage-ment policy.

Neighbourhood Plans

In its endeavour to provide new rights for the communities that gives them direct power to develop a shared vision for their neighbourhoods, Neighbourhood Plans provide an opportunity to prepare legal plans, development orders or right to build orders. In accordance with the Localism Act 2011 and in compliance with the Local Plan, this plan could be prepared by any approved neighbourhood that has a 21 member forum of resident or working people along with the local authority. The plan needs to pass the examination of an independent planning inspector to get integrated into the de-velopment plan of the area attaining a statutory status.





2.0 RETHINK URBAN PARKS TO MAXIMIZE VALUE

Urban parks in all its forms – from large natural areas to neighbourhood parks, street trees and green buffer areas – is vital to healthy and resilient communities. Urban parks and green buffers can purify air and water, support wildlife, provide food, increase our physical and mental health, add beauty to our communities, and bring people together. Faced with the increased population and declining quality of common green spaces, it is time to rethink parks and urban green spaces as an integrated system, which maximizes community wellbeing and protection of our local ecosystems

OPPORTUNITIES

1. Underutilized existing parks and playgrounds
2. Proposed land use 2030 adds approximately 2900 acres of recreation area (parks and playgrounds) spread across the city, ranging from housing area parks (area up to 1.24 acre) to Sub City parks (area more than 61.8 acre). These demarcated recreation & green spaces are potential spots for city level community level recreation facilities (Map 13)
3. Absence of city level recreational amenities such as sports complexes, museums, adventure parks, science parks, zoological parks and botanical gardens.
4. Significant number of youth and student population in the twin city as potential target population for sports related activities

ACTION PLANS

1. **Revive urban parks as core of community facilities –**
 - a. Develop urban parks to allow maximum utilization and universal access to all. Install play equipment for different age groups, open air gym, plant nurseries, seating and lights.
 - b. Locate community level facilities and amenities such as day care centers/ anganwadis, community shops, gyms, senior citizens clubs, sports clubs, eateries and sanitation facilities to make it a social hubs
 - c. Encourage NMT friendly infrastructure, plant trees and install lights to make the area safe.
2. **Introduce city level recreation facilities at strategic locations** such as zoological gardens, botanical gar-dens, museums, science park adventure parks, Dharwad haat in large plots and en-courage urban farming areas; bird sanctuary, and agricultural/botany research areas in buffer areas of natural features.
3. **Upgrade existing and invest in new sports facilities –**
 - a. Develop international standard specialized sports facility and sports com-plexes, which can host national and international level sports events.
 - b. Establish multi-sport training academies to encourage sports as a career.
 - c. Approach Sports Authority of India, State sports department, etc. for devel-oping specialized sports facility and training academy
 - d. Promote sports as a catalyst for economic development
 - e. Develop facilities that cater to non-traditional sports (skating) and adventure sports (rock climbing)

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Manage Environment and Climate Resilience
	<ul style="list-style-type: none"> Green Infrastructure and Services
	<ul style="list-style-type: none"> A Range of Housing and Community Facilities

APPLICABILITY

- City | People | Environment

IMPLEMENTATION TIMEFRAME

- 5 – 10 years

INDICATOR

<ul style="list-style-type: none"> % of Open Spaces being used as Active Parks % of population that live within 500m distance of Active Parks
<ul style="list-style-type: none"> No. of City-level Recreation Attractions per 1,00,000 population
<ul style="list-style-type: none"> No. of Sports Facilities per 100000 population
<ul style="list-style-type: none"> % of Road Network with NMT infrastructure Length of Cycling Infrastructure
<ul style="list-style-type: none"> % of Waste that is Composted or Recycled % of Energy Requirement met by Renewable Sources

4. **Develop Ecomobility Corridors to link Parks** - Green corridors for pedestrian and cyclist move-ment connecting major existing and proposed open spaces in the city and integrated with place of interest such as popular tourist destinations and heritage monuments. Ecomobility corridors will encourage NMT trips and use of bicycle.
5. **Provide decentralized infrastructure facilities in open spaces** - Decentralised waste management can be facilitated by participation of neighbourhood and resident organisations and use of areas within parks. HDMC should direct local park managers to allocate atleast one Neighbourhood Park in each ward where a 8' x 8' area is identified to be used as composting pits and where recycle and e-waste bins should be installed. HDMC should also provide guidelines to neighbourhood organisations for management of such pits. The HDMC SWM Department should provide weekly waste collection and compost management services for these parks. All shelters designed within Parks should have solar panels to serve energy needs for the lighting and water pumps in parks. HDMC should also identify some parks for installation of larger solar panels to fill the current gap in energy supply in the city.

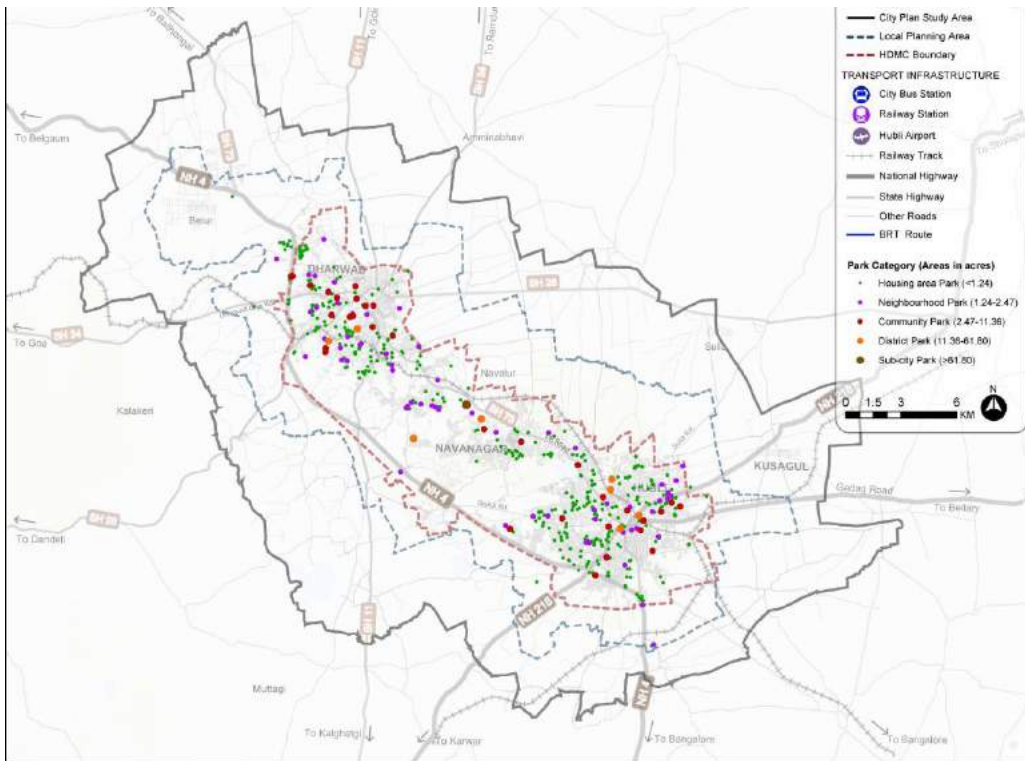
Table 1: List of proposed improvement of recreation facilities

S.N.	EXISTING FACILITIES	PROPOSALS
Up gradation of Existing Sports Facilities		
1	Nehru Stadium, Hubli	Develop as multipurpose ground
2	Hubli Sports Ground	Athletics, sports ground for school / colleges
3	KSCA Cricket Stadium	Cricket
4	RN Shetty Stadium	Athletics, Hockey and Football
Share Existing Facilities		
1	BVB College Ground	Inter school / colleges tournaments
2	Karnataka Science College, Dharwad	Inter school / colleges tournaments
3	Railway Sports Ground, Hub-li	Allow for state & national level sports events
Proposed City Level Recreational Destinations		
1	Unkal Lake and its buffer areas	Parks, Gardens, Plant Nurseries, Organic Farming,
2	Topalgatti Lake	Lake rejuvenation, parks, Cycle trail with connection to Gokul Road PBS proposal in smart city ABD Area.
3	Herekeri Lake	Conservation of buffer areas by developing gardens / plantations, Converting the existing landfill site into a proposed amusement/ adventure park ¹
4	Kelageri Lake	Conserving the lake and its buffer, plantation to facilitate it as a bird sanctuary
5	Nuptatunga Hills	Adventure parks, rock climbing, trekking
6	Belur Biodiversity Reserve	Nature trails, camping, bird watching
7	Karnataka University	Botanical Garden upgradation and open it to public. Build Museum of Natural History

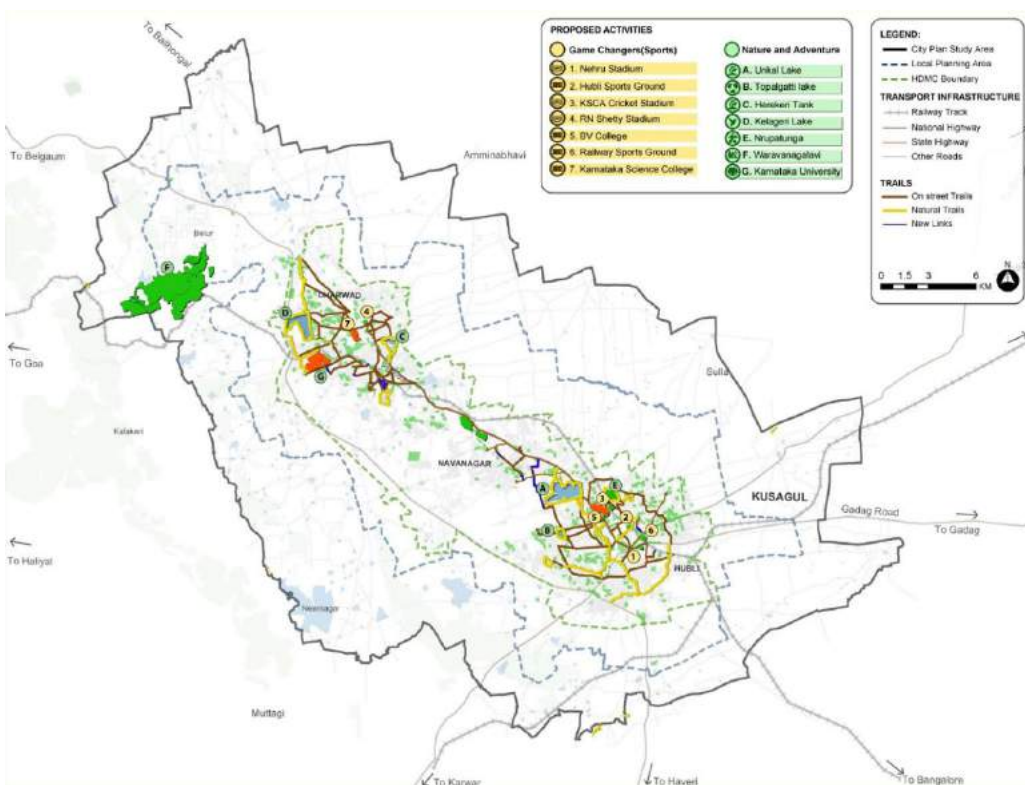
¹ Similar to the Indraprastha Park, which is created over an area of 34 ha., stretching 2.7 km along the Ring Road of Delhi, transforming sanitary landfill site into living, breathing and verdant landscapes.

CHALLENGES

1. Involvement of huge cost and time
2. Limited funding opportunities



Map 13: Recreational Areas of Hubli Dharwad



Map 14: Proposed improvement of recreation facilities



3.0 BUILD PARTNERSHIPS TO LINK EDUCATION, RESEARCH AND DEVELOPMENT

Collaboration between universities and industries is critical for skills development (education and training), the generation, acquisition, and adoption of knowledge (innovation and technology transfer), and the promotion of entrepreneurship (start-ups and spin-offs). The benefits of university-industry linkages are wide-reaching: they can help coordinate R&D agendas and avoid duplications, stimulate additional private R&D investment, and exploit synergies and complementarities of scientific and technological capabilities. University-industry collaboration can also expand the relevance of research carried out in public institutions, foster the commercialization of public R&D outcomes, and increase the mobility of labor between public and private sectors.²

OPPORTUNITIES

1. Hubli Dharwad is a regional institutional hub for learning with 10+ educational institutes and medical colleges. (Some prominent institutions include the DIET College, Agricultural University, Karnataka University, 4 Engineering Colleges, 3 Medical related colleges)
2. Presence of large number of industries starting from small and medium scale industries to large scale industries (Some of the other substantial economic centres include, BDK, Telcon, Murdeshwar Ceramics, TATA Marcopolo manufacturing units)
3. The Software Technology Park on Pune-Bangalore highway and Aryabhata Tech Park in Navanagar are emerging as prominent economic magnets that are expected to induce a rapid urbanization process.
4. Education institutes can tie up with social entrepreneurs and social development organizations such as Deshpande Foundation, Sandbox and TiE to promote economic activities, skill development and generate employment

RELATED STRATEGIC PILLARS	
	<ul style="list-style-type: none">• Diverse Economic and Social Growth
	<ul style="list-style-type: none">• Effective Implementation and Governance

APPLICABILITY
<ul style="list-style-type: none">• City People Environment

IMPLEMENTATION TIMEFRAME
<ul style="list-style-type: none">• 5 – 10 years

² Marotta, Blom, and Thorn 2007

(source: http://innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/PromotingUniversityIndustryCollaborationInDevelopingCountries.pdf)

ACTION PLANS

1. **Create funding channels to set up R&D facilities in educational institutes by industries** - Education institutes and industries can come together to collaborate and start joint industrial training and skill development programs. Industries should be encouraged to set up research and development (R&D) facilities and incubation centers in educational institutions and universities or utilize university labs and equipment by industries to leverage the technical knowledge pool existing in the institutions. A typical approach to stimulating university-industry collaboration is to design R&D research grants, tax-incentives with a requisite of a consortium of industries and universities for project eligibility, performance-based funding of universities and reward systems for researchers.
2. **Start joint industrial training and skill development programs** – One of prime goal of university-industry collaboration is to focus on training and skill development. The human resource training and knowledge transfer will help in innovation in industries, training of industry employees, internship programs, postgraduate training in industry, and strengthening practical knowledge of students, researchers and faculty.
3. **Encourage local recruitment by Hubli Dharwad Industries** -
 - a. District Industries Centre to create policy incentives for industries to employ local graduates to increase job opportunity and stop brain drain.
 - b. Organize city wide career expo or recruitment fair for a range of students - those starting their degree and looking for work experience opportunities, as well as recent graduates looking for full-time employment or a graduate scheme and large companies to advertise themselves and recruit new people from the local region.

INDICATOR

- No. of R&D facilities as a percentage of No. of Universities
- No. of skill development programs as a percentage of No. of Universities
- % of new graduates/post-graduates who find jobs in Hubli-Dharwad

CHALLENGES

1. Lack of attractive infrastructure and facilities to stop brain-drain and emigration of young population
2. Absence of incentive and policy environment for investors and industrialists
3. Lack of skilled workforce corresponding to the existing industries



4.0 DEVELOP A HUBLI-DHARWAD CITY BRAND

The idea of branding Hubli Dharwad is to give an image of the city to its people so that it turns from a location to a destination. City branding should not be perceived simply as branding or marketing, it is the art of creating an image of a city in peoples mind so that they are attracted towards it; the unique character of the city is what makes it different from other cities. As Hubli Dharwad focuses on building capacities and enhancing growth across various sectors, city branding will help in enhancing the pace. Apart from the city's physical traits, history, heritage, culture, people, innovation, ideas generated and experiences of the city will contribute towards its image.

OPPORTUNITIES

1. Largest commercial and business hub of North Karnataka
2. Strategic location of Hubli-Dharwad between Mumbai and Bangalore, near Goa. It lies on the Golden Quadrilateral and is located on NH4- Mumbai Bangalore Economic corridor
3. Rich history and heritage – both tangible and intangible assets
4. Emerging hub of IT Industries such as Software Technology Park of India and Infosys
5. Presence of premier education institutes providing education in the fields of Engineering, Medical Science, Law, Music such as IIT, IIIT, University of Agriculture Science, Karnataka University, Karnataka Institute of Medical Sciences, The District Institute of Education and Training (DIET)

RELATED STRATEGIC PILLARS	
	<ul style="list-style-type: none"> Effective Implementation and Governance
	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Celebrate Heritage

APPLICABILITY
<ul style="list-style-type: none"> City Institutions

IMPLEMENTATION TIMEFRAME
<ul style="list-style-type: none"> 2 – 5 years

ACTION PLANS

1. **Market hospitality and tourist services to put Hubli Dharwad at the center of the regional tourist map** – Hubli serves as a halt station as well as transfer stop for tourists coming via air to visit many tourist destinations in the region. Marketing the available hospitality and tourist services that will add to the image of the city as a tourist node.
 - a. Create an Event Calendar for weekly/monthly/annual music, dance and art festivals as well as other events of the city including sports, trade fairs, ca-reer fairs, etc.
 - b. Create attractive, informative, and multilingual brochure /flyers/ hand-outs of tourist interest places in and around Hubli Dharwad. Collaborate with private tour operators and agencies for funding, design & printing as well as distribution. (Figure 12)
2. **Develop branding of available healthcare facilities** – Hubli Dharwad has 20+ healthcare facilities and some premier medical colleges and research institutes catering to the twin city as well as the North Karnataka Region. Creating a common marketing and branding framework for the healthcare facilities that will help Hubli Dharwad to capitalize the potential to advance as a Medical Tourism Node.
3. **Develop an online portal and city app for all facilities that Hubli Dharwad has to offer:** Educational institutions and universities, the emerging IT Sector, and robust small and medium scale industries contribute to the economy of Hubli Dharwad. Building an online portal for city services and amenities, primarily targeting new migrants or visitors to the city, will help in building the image of the city as one with an excellent quality of life.
 - a. Create a city app for Hubli Dharwad for two-way communication between citizens and HDMC for grievance redressal, information sharing and incident reporting
 - b. Integrate 'Hubli-DharwadOne' portal with the city portal and the city app for easy payment (Figure 14)
4. **GIS based interactive land management system:** A Land Management System (LMS) portal for sale, lease, and management of industrial lands will help to expand the visibility of the city and its offerings for industry establishment. The database if updated on a continuous basis, will allow the availability of industrial lands to be known to a potential investor at the click of a button.
 - a. Upgrade the Hubli Dharwad City Plan portal (Figure 15).

INDICATOR
<ul style="list-style-type: none"> Quality of Hubli-Dharwad Tourist Information available online Quality of Healthcare Information available online City Apps available % of land records digitized



Figure 12: City Branding by Bhubaneswar Development Authority

CHALLENGES

1. Limited no of quality hotels, restaurants and transport options
2. Limited air connectivity from metro cities. Only direct connectivity from Banga-lore and Mumbai
3. Poor rail connectivity from Mumbai/Pune. The lack of a direct rail link between Belugum and Dharwad hampers smooth rail travel to Mumbai and Pune.
4. Cultural assets are not economized to its potential
5. Dilapidated heritage structures, poor maintenance of ASI and State listed monuments, lack of proper connectivity and signage, lack of awareness and public interest

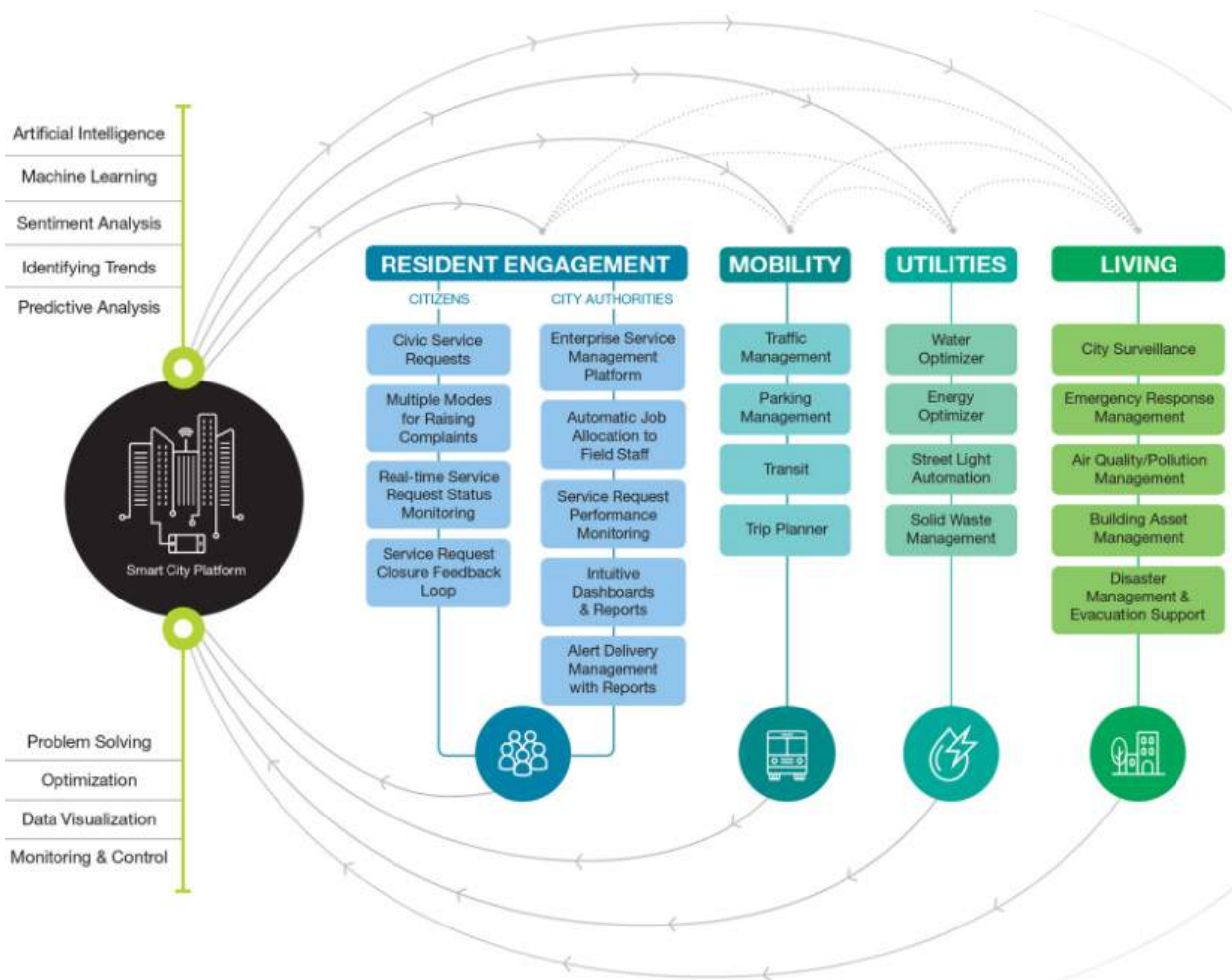


Figure 13: Smart City Platform by IBI, online city portal for seamless integration of city services and citizen connect.

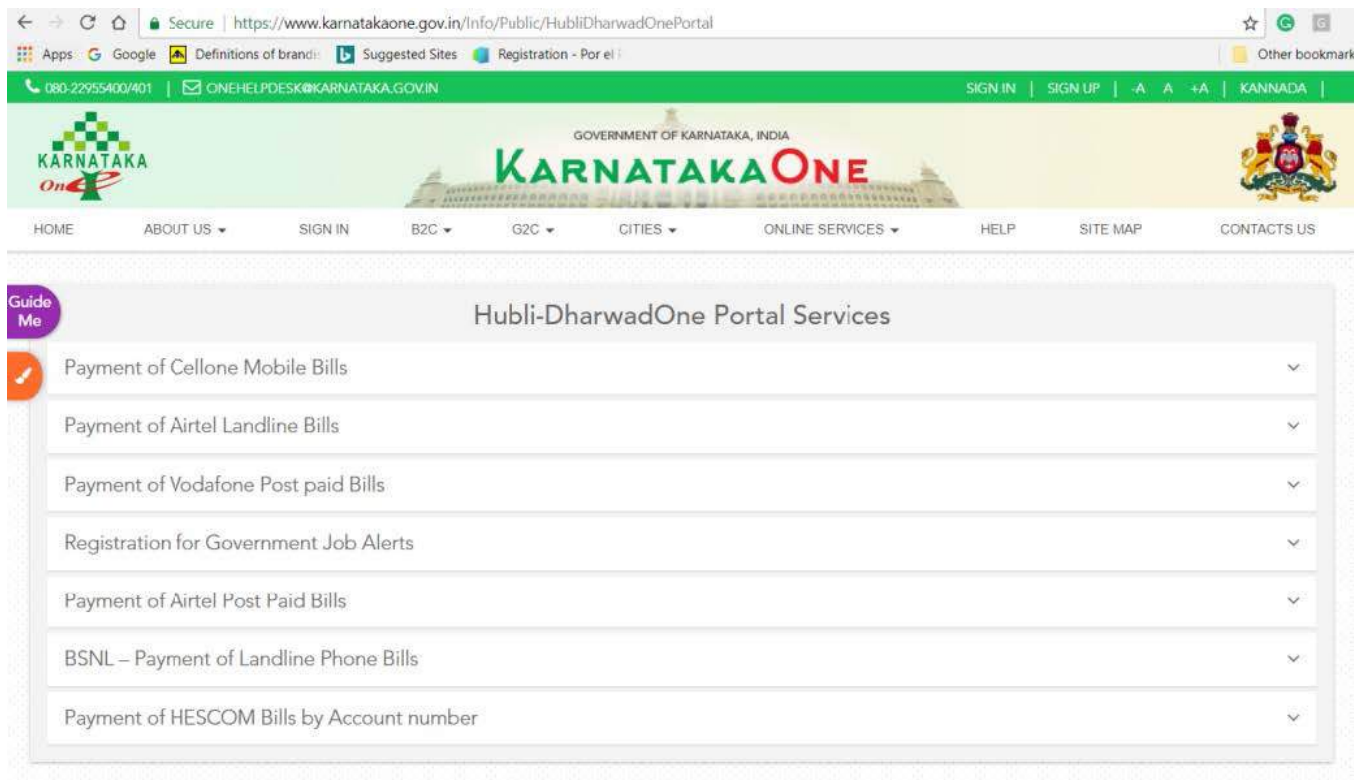


Figure 14: Hubli-DharwadOne portal for online utility bill payments

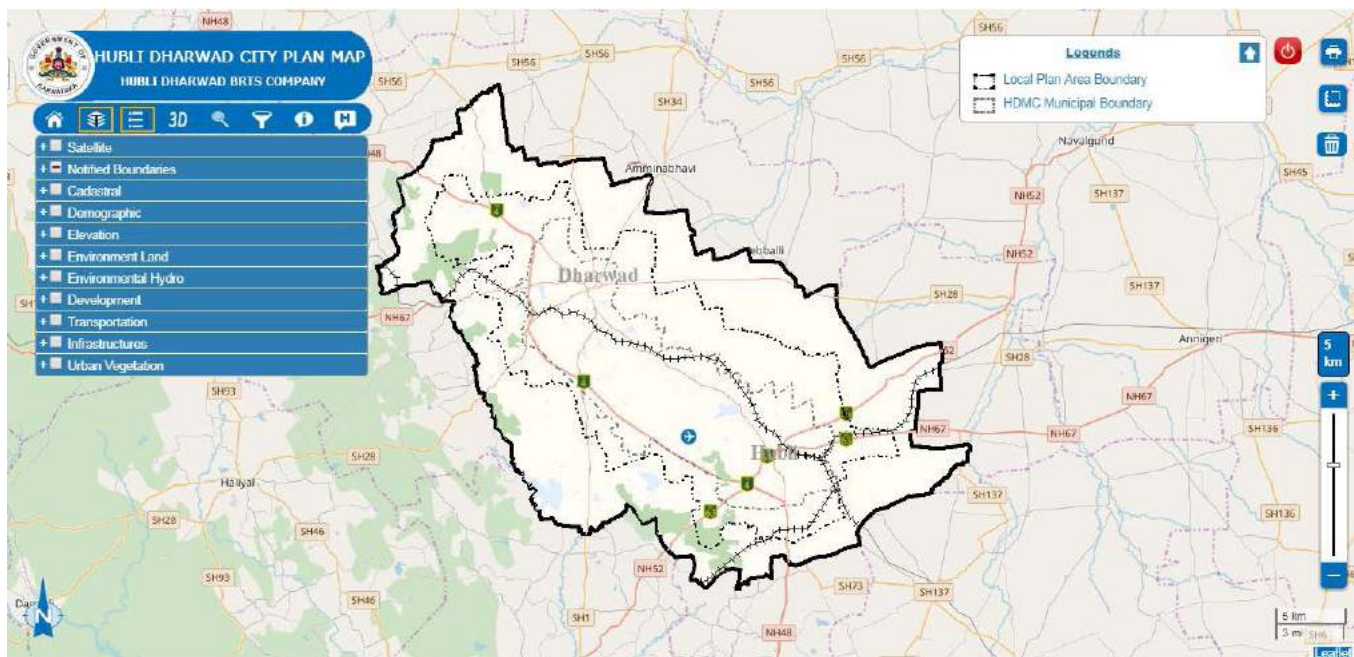


Figure 15: GIS based city plan portal

7.2 Preserve and Manage



5.0 MANAGE REGIONAL WATER RESOURCES

An integrated watershed management approach is multi-sectoral and recognizes the correlation between land management, waste management, health of ecosystems, water quality, water availability and accessibility along with livelihood and economic benefits. It would include; slope stabilization through land management interventions such as contouring, bench terracing, mixed cropping etc. Watersheds are natural systems and these have to be delineated and recognized in development plans and should be anchored on the regional level landscape infrastructure development framework. Watershed Management is continuous and needs a multi-disciplinary approach (land use, irrigation practices, cultivation practices, water consumption practices, water infrastructure resources (landscape infrastructure)). Micro watersheds are base unit for management and inventory of demand, resource capacity data and spatial assessment mapping are essential.

For Hubli Dharwad there are two aspects for prioritizing watersheds:

- Watersheds falling in the lower most areas of the larger catchment (in Hubli) are criti-cal as these watersheds carry the water from the upper catchments.
- The micro watersheds along the central BRTS axis that connects the twin cities. Even though on the upper most reaches is important due to the high density urbanization, this stretch can have considerable impact on the all water resources downstream.

OPPORTUNITIES

1. As Hubli Dharwad not being fully developed, watersheds are not fully destroyed
2. Availability of vacant / underutilized lands to create buffers around watershed areas
3. Recent draught and flooding in some area instigate the need for watershed management

ACTION PLANS

1. **Manage natural streams through integrated watershed approach**
 - The integrated watershed approach aims at augmentation of ground water reservoir by modifying the natural movement of surface water utilizing suitable techniques. The basic approach is characterized by implementation of ground water recharge techniques that help to restore supply of aquifers. The recharge techniques vary as per the variations in hydrogeological framework. Some common techniques include:
 - a. Excavate basins in the existing terrains where the soil is highly permeable
 - b. Make recharge pits/ shafts / recharge wells in case of presence of low permeable soil between land surface and water table (Figure 16)
 - c. Create farm ponds / check dams for retaining excess runoff water (Figure 17)
 - d. Make gully plugging, bench terracing or contour trenching for slowing down surface runoff and thereby causing more infiltration in area with steep slope (more than 1:10) (Figure 18)
 - e. Encourage softscaping of setback areas of plots to allow water infiltration into the ground
 - f. Enforce buffer areas surrounding the water bodies as proposed in the zonal regulation and master plan (Map 15)

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> • Manage Environment and Climate Resilience
	<ul style="list-style-type: none"> • Green Infrastructure and Services

APPLICABILITY

- City | People | Environment

IMPLEMENTATION TIMEFRAME

- 10 - 15 years

INDICATOR

- Height of Ground Water Table Citywide average
- Height of Ground Water Table in Unkal Catchment
- Quality of Water in all Lakes
- % of properties of 1 acre or more with rainwater harvesting
- No. of education programs launched for stakeholders

2. **Create Comprehensive Landscape Infrastructure Development Plan for Unkal Catchment** - Recommendations may include interventions like rejuvenation of lakes, retrofitting the existing land use and activities for ecological functions, bioengineered storm water drainage retrofits, suggestive alterations and additions to development control regulations, recommendations for sewage management, guidelines for cultivation practices, design guidelines for drainage management of road and other transport infrastructures etc. specifically for the delineated Landscape Infrastructure of Unkal catchment.
3. **Encourage natural water treatment system near inlets bringing in untreated wastewater, stormwater, or treated sewage into lakes** - Natural low-rate biological treatment systems are available for the treatment of organic wastewaters and tend to be lower in cost and less sophisticated in operation and maintenance. Follow widely used natural biological treatment systems available, such as:
 - a. Water stabilization ponds / oxidation ponds and land treatment
 - b. Use interactions of microorganisms, aquatic plants and aquatic animals for pollutant removals
 - c. Creation of marshlands / constructed wetlands
 - d. Ensure sewage passes through a primary sewage treatment facility before allowing untreated sewage into the natural treatment systems.
4. **Implement Mandated rain water harvesting norms** – the provisional Zonal Regulation provides regulations for rain water harvesting for all developments. A task force within HDMC (water supply department) need to be created for implementation of the DCR norms as well as for monitoring, evaluation and capacity building.
5. **Create knowledgebase and educate stakeholders** – capacity building of stakeholder including the students are essential to ensure future water availability in the region. The following steps may be followed:
 - a. Develop information centers in HDMC for broadening awareness, build capacity and educate stakeholders,
 - b. Curate awareness and education programs based on target users
 - c. Establish joint research cell in collaboration with universities to create GIS based database, conduct site level detailed assessments of vulnerable and fragmented areas, and suggest case specific interventions
 - d. Develop flag-ship projects with the help of research cell for demonstration

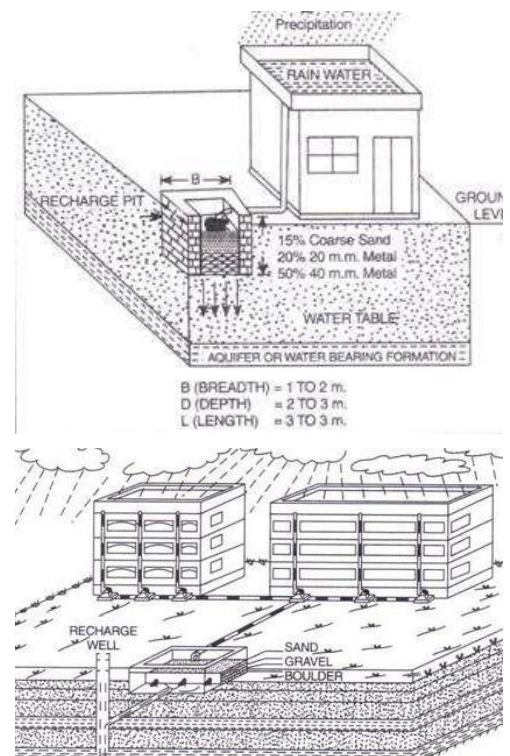


Figure 16: Rooftop rain water harvesting through recharge pit and tubewells
 Source: <http://www.yourarticlelibrary.com/water/rain-water-harvesting-in-india-need-methods-and-other-details/20917>

CHALLENGES

1. Lack of awareness, knowledge and interest of both users and competent authorities
2. Absence of guideline / toolkits for managing watersheds
3. Absence of pilot demonstration projects

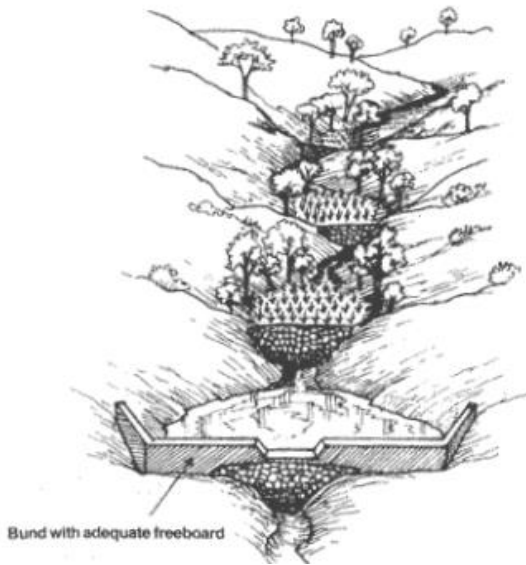


Figure 17: Check dams/cement plugs/nala bunds

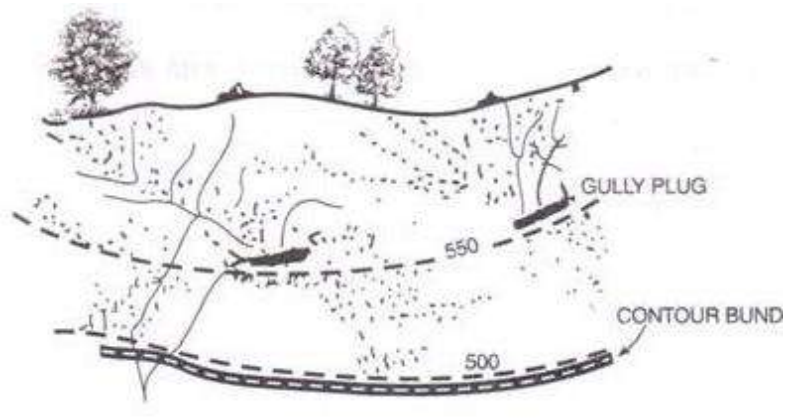
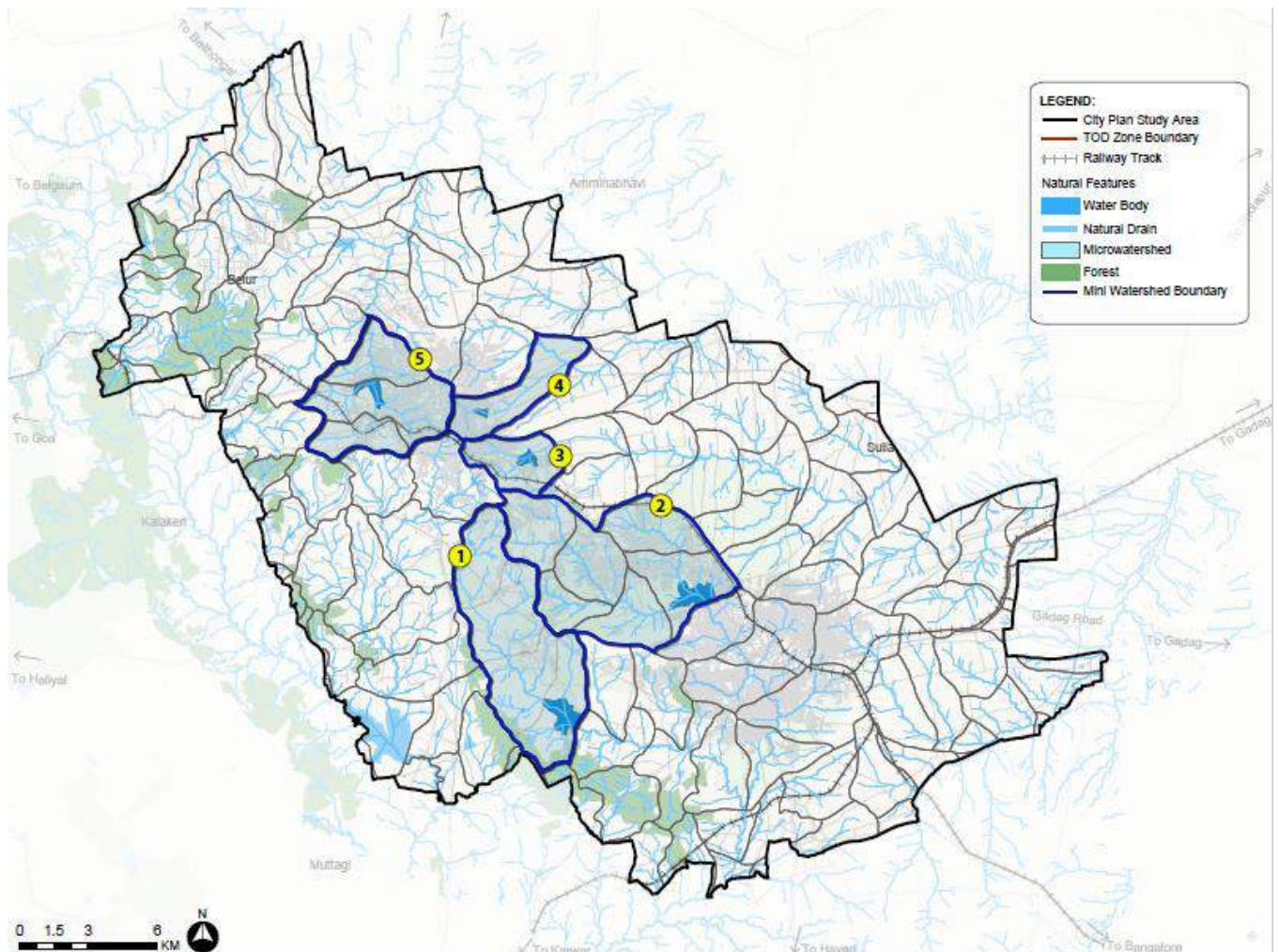


Figure 18: Rain water harvesting through gully plug and contour bund
Source: <http://www.yourarticlelibrary.com/water/rain-water-harvesting-in-india-need-methods-and-other-details/20917>



Map 15: Critical areas for watershed management



PILOT DEMONSTRATION

WATERSHED MANAGEMENT FOR UNKAL

The status and factors within the catchment of Unkal Lake will determine the health of the lake. This is because the water that the Unkal lake holds is that which falls in the entire area of the catchment and not merely that which falls on the lake during rainfall. Hence the water draining in Unkal will reflect the qualities of the entire catchment. These factors include; % area under permeable surfaces, run-off rates, time of concentration in the higher order drains and then further the time of concentration in the Lake from the various higher order streams/ drains falling into it. The greater the convergence between time of concentration of different drains the greater the probability of flooding in Unkal especially if the outflow rates of water exiting Unkal is not enough to prevent overflow of Unkal.

Steps to undertake for Unkal Lakes Pilot Project:

1. Identifying the watershed of influence to the Unkal Lake

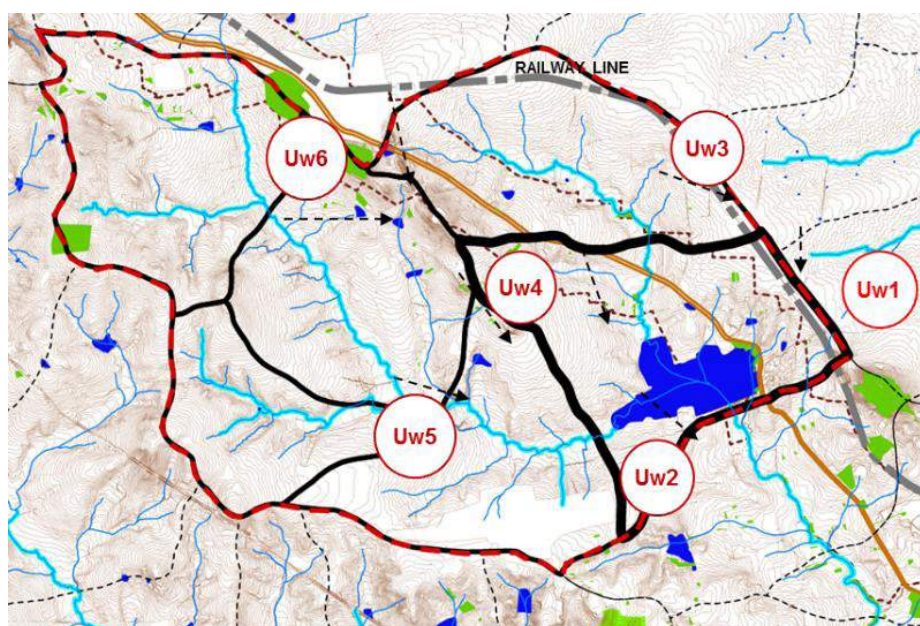
The micro watershed having influence is not only the immediate micro watershed but also all micro watersheds that host the drainage networks draining into Unkal Lake. The highlighted micro watersheds together form the catchment of Unkal Lake. Uw1 being the immediate micro watershed to the lake makes it most vulnerable to any overflow or inundation from Unkal. The inundation will follow the terrain of the immediate precincts along with backflow into the channel which brings water especially if the rate of outflow from Unkal beyond its catchment is affected or blocked.

2. Overlay the existing and proposed land use master plan to identify the land uses and infrastructure developments that are falling on the natural drainage and water bodies
3. **Diagnosis and Remediating fragmented and damaged drainage networks**

In this step, a detailed diagnostic study of the ground conditions is done to measure possible impacts for various rainfall and development scenarios. Based on the impact assessment, site level interventions to mitigate and ameliorate the impacts are suggested.

For eg., BRTS corridor divides and Unkal catchment, Uw3 micro watershed almost completely and Uw1 micro watershed partially. This would mean catchment diversion and increased water logging and flooding risk in Uw3 and Uw1. This can be dealt through:

- a. retrofit on BRTS or
 - b. by creating detention grounds and or
 - c. by creating alternate connectivity of this separated area to the larger system downstream.
4. Feasibility of suggested intervention measures



5. Delineate buffer

Buffer for various orders of streams as per National Green Tribunal:

WATER SYSTEM COMPONENT	BUFFER SUGGESTED
Tertiary Drains	25m from edge on either sides
Secondary Drains	35m from edge on either sides
Primary Drains	50m from edge on either sides
Lake	75m

The drains of various orders and lakes should be delineated and recognized in the master plan and land use plans of the city. The width and extent of each of these perennial and non-perennial streams has to be earmarked in the legal land use plan and development control regulations.

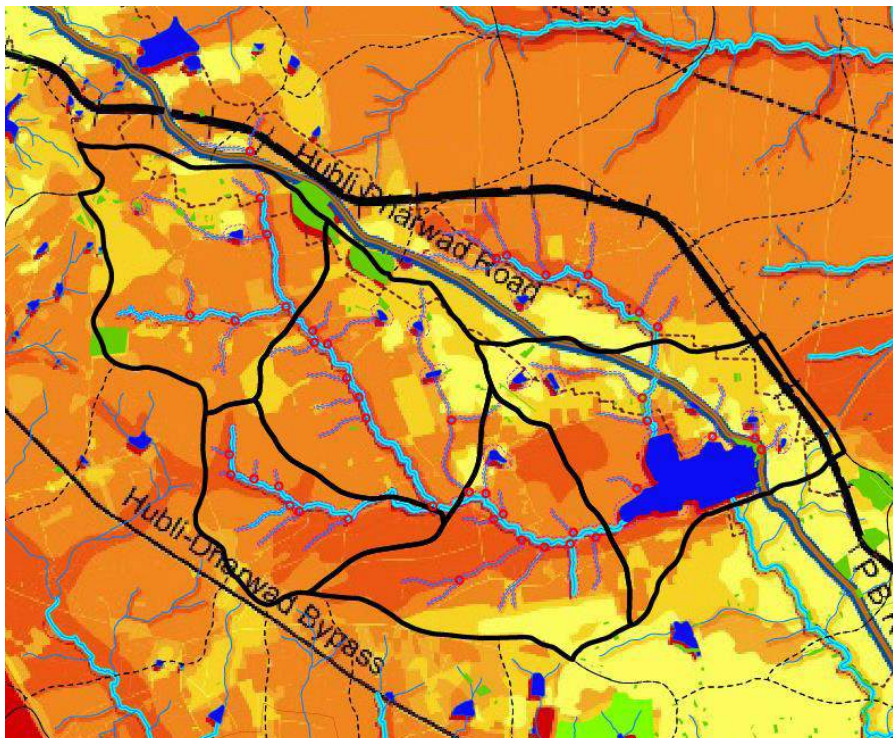
6. Initiate Landscape Infrastructure development for the catchment as a pilot

This Comprehensive Landscape Infrastructure Development Plan recommendations may include interventions like rejuvenation of the Unkal lake, retrofitting the existing land use and activities for ecological functions, bio-engineered storm water drainage retrofits, suggestive alterations and additions to development control regulations, recommendations for sewage management,

guidelines for cultivation practices, design guidelines for drainage management of road and other transport infrastructures etc. specifically for the delineated Landscape Infrastructure of Unkal catchment.

7. Initiate Implementation

Constitute a cell with active representatives from all concerned departments and stakeholders as well as decision makers to organize manage and implement the pilot.





6.0 REIMAGINE BUILT HERITAGE AND MAXIMIZE VALUE

Identifying and preserving the region's heritage assets will be an important tool to ensure that the unique identity and "sense of place" for the twin cities is kept intact. With increased development pressures, historic structures are most vulnerable to changes that often lead to demolition and loss of a city's heritage. Tourism and heritage are often used synonymously in planning studies; however, financial constraints and lack of awareness often results in underutilization of these assets.

OPPORTUNITIES

1. High concentration of heritage buildings and monuments
2. Precedents of adaptive use of heritage buildings in Hubli Dharwad such as, Karnataka Arts College (Southern Maratha Railways Head office) and HDMC offices at Hubli and Dharwad

ACTION PLANS

1. **Create listing and grading for heritage management-** The primary objective of listing & grading is to record existing architectural heritage and sites. This process must be undertaken in a rigorous and transparent manner by a multidisciplinary team of experts as the results will determine subsequent conservation decisions. Create a list consisting of grade I, II and III structures. This list will be the foundation for heritage policy and legislation. The overall process includes the following steps (Figure 19):

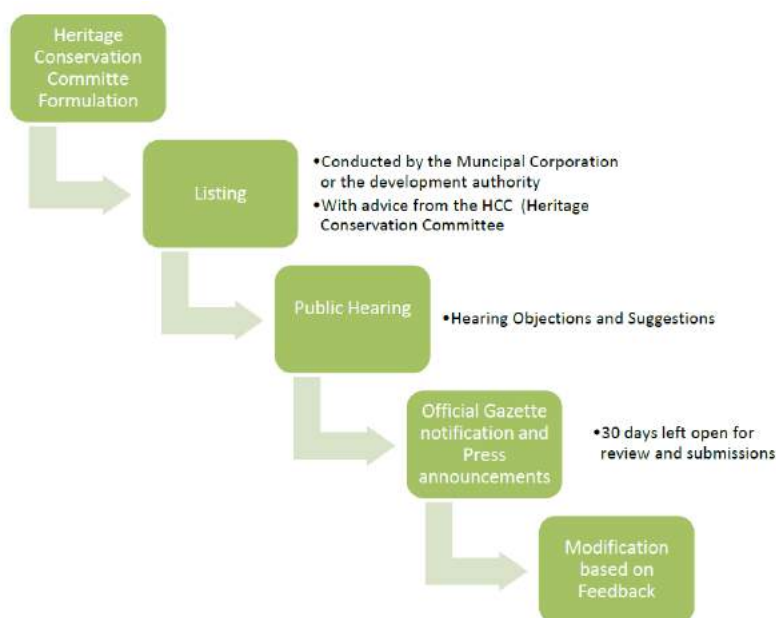


Figure 19: Process flow of creation of Heritage Policy and Legislation in a city

2. **Preserve Grade - I structures** – Heritage Grade-I comprises buildings and precincts of national or historic importance, embodying excellence in architectural style, design, technology and material usage and/or aesthetics; they may be associated with a great historic event, personality, movement or institution. They have been and are the prime landmarks of the region. All natural sites shall fall within Grade-I. Heritage Grade-I richly deserves careful preservation by ASI (for ASI monuments) and state government (for state protected monuments and others).

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> • Celebrate Heritage
	<ul style="list-style-type: none"> • Effective Implementation and Governance

APPLICABILITY

- City I Institutions

IMPLEMENTATION TIMEFRAME

- 10-15 years

INDICATOR

- Presence of Heritage Listing and Grading
- % of Grade-1 structures preserved
- % of Grade-II structures in use
- Availability of Notified Manual
- Heritage Project Status

3. **Identify Grade - II heritage assets that are potential for retrofit and adaptive reuse** - Heritage Grade-II comprises of buildings and precincts of regional or local importance possessing special architectural or aesthetic merit, or cultural or historical significance though of a lower scale than Heritage Grade-I and deserves intelligent conservation approach such as retrofitting / adaptive reuse.
4. **Identify partner organization and funding opportunities** – Collaborate with organizations such as INTACH to
 - a. Develop heritage policies and regulations, and make legal interventions to protect Hubli Dharwad's heritage
 - b. Get expertise in the field of conservation, restoration and preservation of specific works of art
 - c. Explore funding opportunities
 - d. Foster collaborations, Memoranda of Understanding (MoU) and partnerships with government and other national and international agencies
 - e. Capacity-building by developing skills through training programmes
 - f. Generate sponsorships for conservation and educational projects
5. **Develop Manuals /Toolkit / Guideline** - Create manuals, that will be the go-to guide for all professionals – architects, planners, engineers etc. for any interventions on heritage buildings. Separate Manuals (Technical Manual with specifications on material specification, graphical representation, types and styles) need to be prepared for restoration and repair of buildings under each typology/type
6. **Create pilot demonstration project** – Creating a pilot project in PPP mode will help to demonstrate best practices of restoration, improve understanding of relevant bye –laws, encourage innovations in retrofitting / adaptive reuse, unlock implementation challenges, explore financial mechanisms and ensure availability of funds for routine maintenance.

CHALLENGES

1. Absence of guidelines for adaptive use and retrofit.
2. Lack of proper understanding about the bylaws in both user and institutional level, leading to implementation challenges
3. Absence of “Heritage Conservation Committee”
4. Privately owned heritage buildings
5. Lack of public awareness and interest



7.0 BUILD COMPLIMENTARY INSTITUTIONS FOR KEY FUNCTIONS

OPPORTUNITIES

1. HDMC is an established municipal corporation with an annual budget of xxx
2. Dharwad city is the head quarter of Dharwad district making it a center for all administrative activities

ACTION PLANS

1. **Set up Heritage Cell within HDMC** - with the objective of initiating strategic intervention to conserve and promote the rich heritage of the city. This will act as a catalyst to preserve the cultural heritage, both tangible & intangible heritage aspects of the city. It will undertake programs and projects such as heritage awareness creation and educational programs, identification and listing of heritage resources, conduction of heritage walk, organizing promotional programs, and heritage based lectures, seminars, conferences, competitions, exhibitions, besides physical conservation and restoration of heritage buildings and structures located in the twin cities.²
2. **Institute a Parking Cell in HDMC Road Department**– An independent Parking Authority should be formed under the aegis of HDBRTS and HDMC to develop parking management plans, oversee enforcement of public parking rules, collect revenues and manage the Parking Budget. The Parking Authority should largely be self-financed through parking revenues. Excess revenues should be directed to public transport improvements.
3. **Establish the Landscape Infrastructure (LI) Management cell in HDMC Horticulture Department** as an extended mandate under the integrated watershed management programme or mandated as per powers vested with the municipality by the 73rd and 74th constitutional amendments. Development authority, state and central level land resources and water resources departments to handhold municipality in establishing smaller ward level or area level or micro watershed level units of management
4. **Form the Sustainable Energy Management Cell (SEMC) to be formed within HDMC** for:
 - a. Conduct energy efficiency audits and renewable energy assessments
 - b. Close collaboration with KREDL, HESCOM, EESL and energy service providers
 - c. Advocating for conducive policy frameworks at state and central government level
 - d. Developing innovative financing mechanisms
 - e. Implement or facilitate the implementation of sustainable energy programs; Progress monitoring and reporting
 - f. Capacity building programs

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Effective Implementation and Governance
	<ul style="list-style-type: none"> Celebrate Heritage
	<ul style="list-style-type: none"> Effective Land use and Transportation
	<ul style="list-style-type: none"> Manage Environment and Climate Resilience
	<ul style="list-style-type: none"> Green Infrastructure and Services

APPLICABILITY

- City | Institutions | People | Environment

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATOR

- Notification of Heritage Cell
- Formation of Parking Cell
Status of Parking Policy and Parking Plan for the City
- Formation of LI Management Cell
- Formation of SEMC Cell
- Set up of Center of Industries Partnership
- Notification of TOD Cell;
No. of proposals reviewed by the TOD Cell;
- % of neighbourhoods for which TOD Plan made as per Urban Design Guidelines

² Heritage Cell within Amravati Municipal Corporation (AMC) was established in collaboration with CRUTA Foundation, an NGO, in July 1996. As the result of various Heritage initiatives undertaken during the last two decades, the AMC has become a national leader in urban heritage conservation. Many Indian cities are now replicating Ahmedabad model to conserve their heritage. The heritage cell has now been upgraded and transformed into a full-fledged Heritage Department

5. **Form Center for Industries partnership in the District Industries Centre** to facilitate university-industry collaboration, create policy mandate for industries to ensure local employment, conduct training and skill development program, organize career expo/ recruitment fairs, involve social development organizations such as Deshpande Foundation to facilitate the process.
6. **Set up a TOD Implementation Cell in HDMC** - A TOD Implementation Cell should be formed within the HDMC, with a specific mandate to provide approval to all developments within the TOD Zone. The TOD Cell should determine if the type of development proposed will be eligible for higher FARs as per the TOD norms. The TOD Cell would also be responsible for evaluating land development proposals on properties larger than 12,000 sqm, using the TOD Urban Design Guidelines Checklist. Developers interested in building within the TOD Zone would be able to seek all approvals directly from the TOD Implementation committee, easing out the approval process. The TOD Cell would need to collaborate with the Ward Committees to identify public realm improvements within existing neighbourhoods in the TOD Zone.

CHALLENGES

1. Lack of precedents
2. Time intensive interventions
3. Lack of manpower and institutional capacity



8.0 IMPROVE INSTITUTIONAL CAPACITIES

Capacity building refers to building technical and political know-how about issues and appropriate solutions related to common and specific urban issues. This is currently one of the leading issues identified in government departments and organizations of Hubli Dharwad. Departments need to upgrade and expand beyond their work mandates. As for eg, the District Disaster Management Cell need to take the lead role in disaster management and climate resilience in the region and work closely with the other nodal agencies to bring synergy among programs and channelize funds and efforts.

OPPORTUNITIES

1. Periodic capacity building programs hosted by national and state govt.
2. Assistance of International Development agencies such as World Bank

ACTION PLANS

1. **Conduct Institutional needs assessment** - Carefully performed needs assessments are critical to priority setting and programme design. Assess already existing capacity to identify the gap, areas for improvement, appropriate capacity building programs and institutions and local experts that could be involved to design and implementation of the activities. This requires a careful insight into previous work done in an organization, existing structures and institutional settings. Encourage local institutions and professionals take the lead in the delivery of capacity building activities.
2. **Promoting Capacity Building through exposure visits and workshop**
 - a. Create tie-ups with training institutes to conduct capacity building programs for creating skilled manpower in the sector
 - b. Encourage employees to participate in national level capacity building programs, workshops and exposure visits
 - c. Formalize and support each staff member's professional development and job training through employee development plans.
 - d. Partner with international organizations for city projects that offer technical expertise.
3. Conduct urban lecture series periodically in collaboration with local as well as national/ international institutions, organizations and professionals to explore and experience demonstration of tactical urbanism projects and measure impacts of ongoing planning.

CHALLENGES

1. Lack of awareness and interest among employees and institutions
2. Limited fund availability for training and capacity building programs

RELATED STRATEGIC PILLARS



- Effective Implementation and Governance

APPLICABILITY

- City I Institutions

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATOR

- No. of Urban Planners and Transport Planners in HDUDA
- No. of Urban Planners, Urban Designers and Landscape Architects in HDMC
- % of Employees of Executive Engineer level who have participated in atleast two out-of-town capacity building workshops or site visits
- % of capacity building workshops hosted in Hubli Dharwad



7.3 Upgrade and Transform

9.0 ENABLE HOUSING PLURALITY

Hubli Dharwad being a major hub for education, health care, industries and growing IT destination in north Karnataka, attracts industrial worker, students, medical tourists and the new service oriented middle class. Over the years Dharwad has also become a favorite location for retirees to settle down. Clearly, the housing needs are diversified in terms of typology and tenure. Along with the different needs, the twin city requires housing strategies to cope with floating population during disaster and seasonal migration.



OPPORTUNITIES

1. Ever increasing diverse housing demand by increased native residents, students, medical tourists, industrial workers, retirees, migrants and floating population
2. Availability of vacant land within HDMC boundary and cheaper lands in the outskirts Under-utilized government land, which can be redeveloped/ readapted/ in-filled to provide affordable housings
3. Availability of active government land development agencies, which are creating diverse housing stocks (both plotted and flatted) for EWS, LIG, MIG and HIG
4. Existing government agencies (KSDB) and government supported housing schemes for urban poor and slum dwellers such as Pradhan Mantri Awas Yojana – Housing for All (PMAY_HFA)
5. Presence of private developers to explore PPP opportunities.

ACTION PLANS

1. **Facilitate the creation of affordable, denser housing stock along the TOD corridor and employment nodes:**
 - a. Prioritize public sector loans for developers building affordable housing for the EWS and LIG sector in TOD areas or close to employment hubs
 - b. Prioritize approvals for smaller unit sizes along TOD corridor
 - c. Reduce the requirement for parking in the TOD corridor and allow builders to provide shared, unbundled parking. Eventually when the HDBRTs corridor is functional and attracts higher built up density, this move will allow builders to build more housing units than give space for parking.
2. **Create rental housing stock** – Traditionally government have preferred ownership models of public housing to rental and rental housing is in the domain of market. However there is great need for cheap, and well-equipped rental housing as a large section of the population cannot afford formal ownership. Steps that need to be followed include:
 - a. Conduct a study on market responsiveness to rental / seasonal housing needs in the region
 - b. Develop rental-ownership models autonomously or through PPP with developers and test it on a pilot project
 - c. Depending on the market response, develop alternative models / produce more housing stocks
3. **Mandate creation of housing for special needs -**
 - a. Mandate universities to reserve land and build hostels for students
 - b. Mandate hospitals to provide dorm areas for care takers of patients
 - c. Mandate employers of construction workers to provide well-serviced transitory housing options close to or at the construction site.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> • A Range of Housing and Community Facilities
	<ul style="list-style-type: none"> • Effective Land use and Transportation

APPLICABILITY

- City I People

IMPLEMENTATION TIMEFRAME

- 2-5 years

INDICATOR

- % of affordable housing in new developments in TOD Zone
- % of rental stock in Zone A
- % of Students living in hostels or dorms
- % of industrial labour living in formal housing
- Presence of Relief Centers

- d. Mandate KIADB to reserve land for housing industrial labour that works on their estates.
 - e. Create night shelters close to places where homeless families can avail of other amenities, for example religious centres that provide food.
 - f. Reserve housing for people with special needs within the mandatory inclusionary housing that is extracted from government and private housing projects.
4. **Create relief centres** that provide food and housing for distressed citizens and migrants during droughts or other emergencies
 5. **Incentivize creation of affordable housing for special needs** - Extend any concessions granted to affordable housing developers for special needs housing

CHALLENGES

1. Land banks² created by developers within HDMC area pushes existing housing development further away into the suburbs
2. Development of housing stock in sprawled manner by government land developers such as HDUDA, KIADB & KHB.
3. Absence of government agency is producing rental housing in Hubli Dharwad.
4. Minimal / no real estate data availability and market demand assessment

² Source: CREDAI



10.0 MAKE VILLAGES RESILIENT

Hubli-Dharwad makes a large urban conurbation influencing surrounding villages and activities. There are 35 villages in LPA housing 1.9 lakh people. The villages are dependent on Hubli Dharwad for economic activities, education, health care, amenities and employment. On the other hand, the twin cities also get benefitted by the agricultural produces and cheap labour. It has also been observed that some of the villages are experiencing negative population growth in last few decades due to migration to the twin cities mainly for jobs. Development of village areas and improving socio economic conditions of the village populace have become priority for inclusive growth of the region.

OPPORTUNITIES

1. Availability of fertile agricultural lands in the region. Agricultural activity can be boosted if proper funding opportunity, education, awareness programs and natural resource management trainings can be made available to the villages. This will also ensure food security and trigger socio economic development
2. HDMC and LPA area has a capacity of 17,155 MWh/ Day and 1,20,840 MWh/ Day solar generation capacity

ACTION PLANS

1. **Create Village development Plan** – Identify clusters² of villages within the LPA and prepare cluster development plans under the mandate of HDUDA. Each Gram Panchayat will then prepare local area plans for each villages and implement it.
 - a. **Follow Rurban mission as reference for village development** – Rurban envisage to stimulate local economic development, enhance basic services, and create well planned Rurban clusters. Villages within the Hubli Dharwad LPA boundary are not identified under the Rurban Mission by the Ministry of Rural Development, GOK³. However, similar process and framework can be adopted for easy implementation.
2. **Facilitate Sustainable Farming Practices** - Sustainable farming benefits the environment by maintaining soil quality, reducing soil degradation and erosion, and saving water. The crops grown through this process are healthier, natural and gives better economic returns.
 - a. Collaborate with Agricultural University to develop and promote sustainable farming guidelines
 - b. Promote organic farming using the Capital Investment Subsidy Scheme for Commercial Production Units for organic/ biological Inputs.
 - c. Conduct capacity building and awareness programs for farmers
3. **Conduct skill development training linked to economic activities** –
 - a. **Skill building agricultural practices** - tie up with Deshpande Foundation for capacity building of the villagers through their existing programs such as Agriculture programs and Farm Pond Programs which provides education, upgrade skill, assist to develop infrastructure, introduce to a series of innovations.

RELATED STRATEGIC PILLARS	
	• Diverse Economic and Social Growth
	• Effective Implementation and Governance
	• Manage Environment and Climate Resilience
	• A Range of Housing and Community Facilities

APPLICABILITY

- City | People | Institutions

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATOR

- % of Villages for which micro-level Cluster Plans are made
- % of Farms that have adopted sustainable farming practices
- % of Villages that have access to Skill Development Programs
- Total solar capacity installed and revenue generated for villages in the study area.
- % of agricultural connections with solar pumps
- % of rural residents who have attended sustainable energy awareness program

² Clusters as defined in the Shyama Prasad Mukherjee Rurban Mission by GOI (<http://rurban.gov.in/download/FOI.pdf>):

- A 'Rurban cluster', would be a cluster of geographically contiguous villages with a population of about 25000 to 50000 in plain and coastal areas and with a population of 5000 to 15000 in desert, hilly or tribal areas.
- As far as practicable, clusters of villages would follow administrative convergence units of Gram Panchayats and shall be within a single block/tehsil for administrative convenience.

³ http://rurban.gov.in/download/State_Presentations-Southern_Region_Workshop-Status.pdf

- b. **Skill building in cottage and village industries** - provide technical and managerial capacity building and assistance to promote cottage and village industries through government agencies such as Karnataka Small Scale Industries Development Corporation (KSSIDC), District Industries Centre (DIC), North Karnataka Small Scale Industries Association (NKSSIA), Centre for Entrepreneurship Development of Karnataka (CEDOK) in collaboration with facilitators such as Deshpande Foundation.
- 4. **Sustainable Energy Programs for villages** – Electricity is used not only for lighting and household purposes, but it also allows for mechanization of farming operations, well-pumping and small scale household industries. Alternative sustainable energy sources need to be explored to reduce demand and dependency on conventional electricity sources. Solar is one of the potential alternatives for rural electrification and the following programs can be adopted for Hubli Dharwad villages:
 - a. **Solar Village Program** - Facilitate a co-operation between commercial entities and Panchayats in the wider region of Hubli-Dharwad for setting up solar energy systems at village level that have a co-ownership model (village and private partners), avail of wheeling or third-party sales mechanisms.
 - b. **Agricultural Solar Pump Program** – Expand collaboration with Energy Efficiency Services Limited (EESL) for providing solar pumps for the agricultural and horticultural sector.
 - c. **Sustainable Energy Awareness Program** - Run citywide awareness campaigns about the social, economic, environmental and technical benefits of energy efficiency and renewable energy systems

CHALLENGES

1. Villages within the Hubli Dharwad LPA boundary are not identified under the Rurban Mission by the Ministry of Rural Development, GOK⁴.
2. Out migration of workforce population from the villages
3. Poor access to agricultural knowledge and innovation about sustainable farming practices

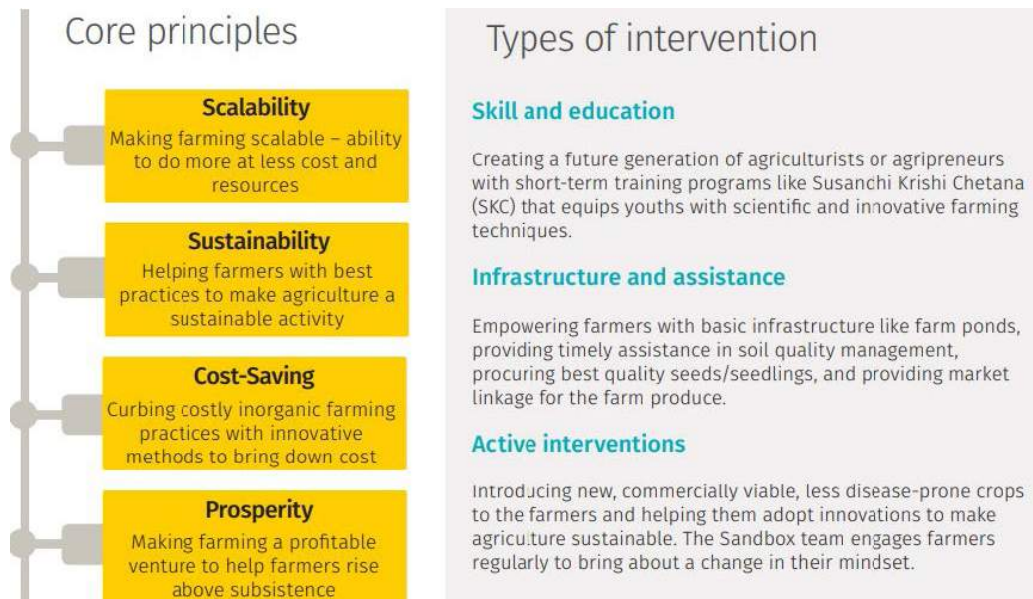
⁴ http://rurban.gov.in/download/State_Presentations-Southern_Region_Workshop-Status.pdf



CASE STUDY

AGRICULTURE PROGRAM BY DESHPANDE FOUNDATION

The Agriculture program actively engages more than 15,000 farmers like Praveen and provides them end-to-end support to make agriculture a sustainable and scalable economic activity. With an integrated approach and constant handholding, it helps traditional farmers with initiatives that lead to cost-saving and efficient farming techniques. The increase in farm income through these initiatives is positively impacting the rural community.



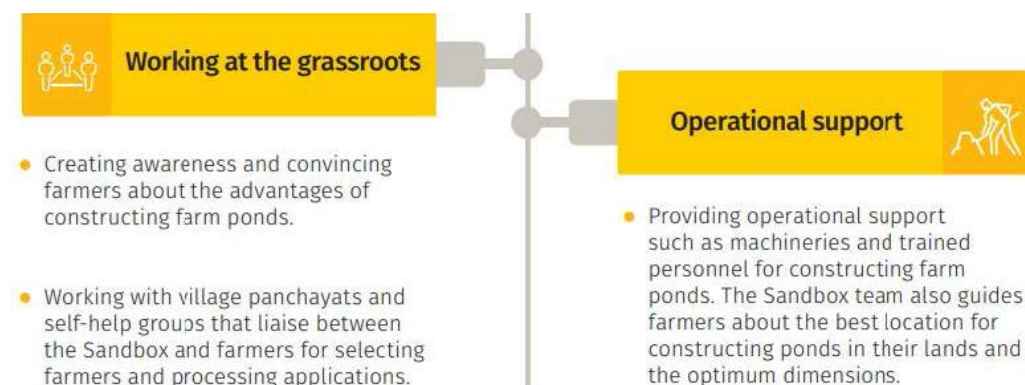
1. FARM POND PROGRAM

With direct engagement and by supporting organizations that are promoting the initiative, the Sandbox team has facilitated the construction of over 1,700 ponds, impacting a similar number of farmer families and irrigating about 6,384 acres of land.

Program Highlights:

- Speed and scale to construction** - The Sandbox's operational support allows multiple simultaneous locations to excavate ponds in less than 48 hours
- Cost Savings for farmers** - Machines and trained operators provided by the Sandbox reduce the cost of construction by an assured 30% to 50%, making it affordable for farmers
- Long-term sustainability** - As farmers share the cost of construction, the program has moved away from the traditional grant based model to become a self-sustainable model.

How it works?



2. PAPAYA & BAMBOO CULTIVATION

Papaya cultivation is a pilot project implemented by Hubli Sandbox with the support of Tata Trusts. In the initial phase, more than 30 farmers in Shiggaon taluk (Haveri district) and Navalgund taluk (Dharwad district) are supported under the project, covering about 50 acres of farmland. With an average per-acre profit of INR 1 lakh per annum, papaya cultivation has provided a viable and alternative means of income for the farmers.

The Sandbox is promoting bamboo cultivation in Navalgund, Belagavi and Shiggaon taluks in North Karnataka. About 50 farmers have taken up bamboo cultivation covering more than 120 acres. Similar to papaya, bamboo requires water. After a 3-year initial growth phase, the crop produces yield for 40-50 years, providing a steady per-acre income of above INR 50,000 every year.

Support for new crops:

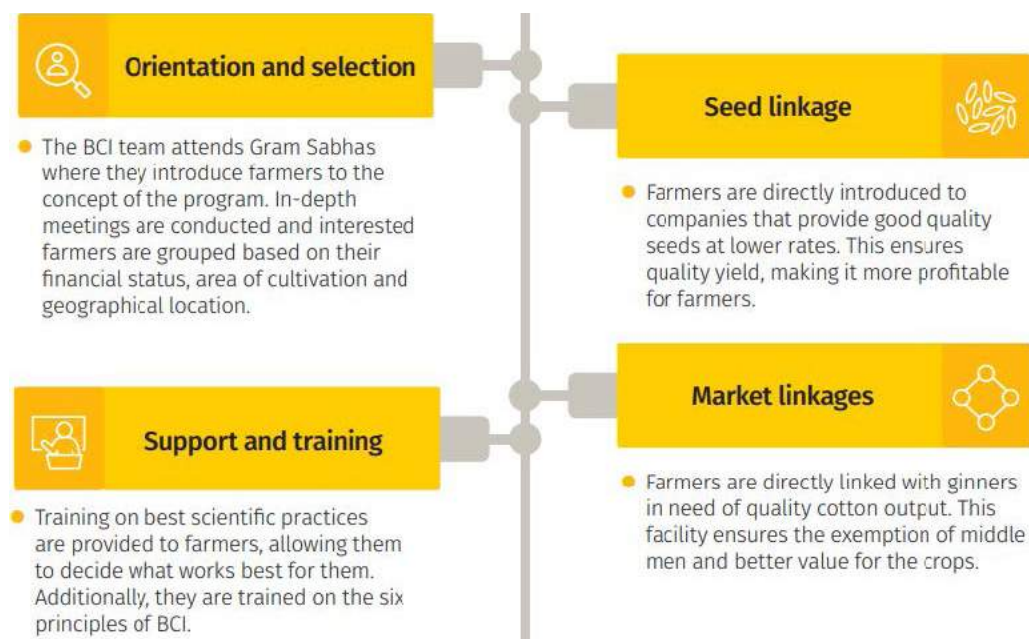
1. **Land Preparation** - Providing help in preparing land and managing water for growing newly introduced crops such as papaya and bamboo about which farmers lack adequate knowledge.
2. **Guidance and Follow up** - Regular guidance and follow-up with farmers on the condition of crops builds confidence among the farmers. The Sandbox team intervenes to help farmers whenever they need help.

Seedlings and Market Linkages - Providing quality seedlings processed at the Sandbox's agricultural innovation center to farmers, and connecting them with buyers for their papaya and bamboo crops.

3. BETTER COTTON INITIATIVE

In partnership with IDH Sustainable Trade Initiative, the Sandbox works with cotton farmers to improve productivity by exposing them to scientific practices. Though cotton is not an irrigation dependent crop, its yield can be substantially better if water is provided at crucial stages of the crop like blooming. Water availability from farm ponds puts cotton farmers in a better position.

How it works?



**CASE STUDY****AGRICULTURAL SOLAR PUMPS BY EESL**

Energy Efficiency Services Limited (EESL) is already present in Karnataka and has replaced around 2000 agricultural pump sets in Hubli and Mysore. The project has already achieved savings of 37%.

How the model works?

- No upfront costs to farmers and utility companies
- EESL recovers investments from DISCOMs through annual energy savings
- Reduction in power purchase costs, peak load and load shedding to DISCOMs

Benefits to farmers:

- Free energy efficient pump set
- Less maintenance and pump failure
- Workshop on irrigation practices
- Better agricultural resource and input management
- Free repair and maintenance till project duration

Benefits to DISCOMs/ State Government:

- Reduction in power purchase cost
- Monetary benefits because of sharing of energy saving
- Lower load shedding
- Reduction in peak demand
- Lower subsidy burden
- Reduction in T&D losses
- Reduced transformer burnout



11.0 CREATE TOURIST READY CIRCUIT

Hubli-Dharwad is a transit city for tourists. Upgradation of various natural and historic sites could help transform the twin city into what could be a unique Heritage City with a strong sense of historic character and sense of place.



OPPORTUNITIES

1. A wide variety of tangible heritage including ASI protected sites, vernacular architecture, sprawling colonial architecture and natural sites like hills and lakes
2. Strong intangible heritage - Hubli-Dharwad is famous for its Hindustani classical musicians, poets, artists, activists and was the home to the movement to unify Kannada speaking areas
3. Hubli Dharwad is known for celebrating Festivals and Food
4. Good connectivity at a macro level– local airport and railway junction
5. High concentration of heritage clusters
6. Bus Rapid Transport System – creates a main axis of connectivity

ACTION PLANS

1. **Upgrade Tourism Infrastructure** – Focus on the following key sectors for improving tourism infrastructure and services of Hubli Dharwad:
 - a. Attract and facilitate in setting up of quality hotels (3 star and above) and restaurants
 - b. Create one day trip to heritage district of Hubli and Dharwad to make tourists stay for a day and start hop on-hop off tourist bus services connecting these destinations.
 - c. Create Tourist information/interpretation centres
 - d. Create a GPS enabled Hubli Dharwad tourist app with audio tours in the heritage district
2. **Develop a Tourist Gateway at Hubli Railway Station** – A TOD Development outside the Hubli Railway Station where the Railways owns a large parcel of land offers immense opportunities to be developed as a Tourist Gateway. Redevelop land for mixed use developments including hotels and tourist interpretations centers, while also creating opportunities for direct pedestrian links from Hubli Station to the Historic Hubli Commercial Core and catalyzing the revival of Durgadbail Market. Develop intermodal transit hub, create travel and tourist related facilities such as travel agencies, tourist information and interpretation centers, banks and foreign exchanges, healthcare and other services to make it a vibrant tourism gateway. The following Figure 20 illustrates the functions and activities needed for the tourism cluster.
3. **Promote local heritage assets as key destinations within tourist clusters** – Hubli Dharwad has high concentration of historically and culturally relevant structure and large pool of architectural styles.
 - a. Create uniform signage and way finding strategy
 - b. Improve accessibility to local heritage assets
 - c. Create heritage trails and conduct heritage walks
 - d. Organize dance and music programs (Map 16)

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> • Celebrate Heritage
	<ul style="list-style-type: none"> • Effective Implementation and Governance

APPLICABILITY

- City | Institutions

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATOR

- Per capita expenditure by Tourists in Hubli Dharwad
- No. of Tourist Facilities within 5 minute walking distance of Hubli Railway Station
- No. of tourists visiting local destinations as a percentage of no. of tourist arriving in the city
- No. of tourists attending Art and Culture Events in Hubli Dharwad

- Host Regional Art & Culture Events** – Hubli Dharwad is renowned for their contribution towards the socio-cultural assets of the region including, classical music, poetry and folklore. Annual cultural events and festivals similar to Kala Ghoda Festival of Mumbai or PAGo (Public Arts in Gopalpur) of Gopalpur, Odisha will add to the brand of Hubli Dharwad as a cultural node of the region.

CHALLENGES

- Low connectivity and poor way finding
- Lack of Public Interest in Heritage
- Lack of Collaboration Between local bodies

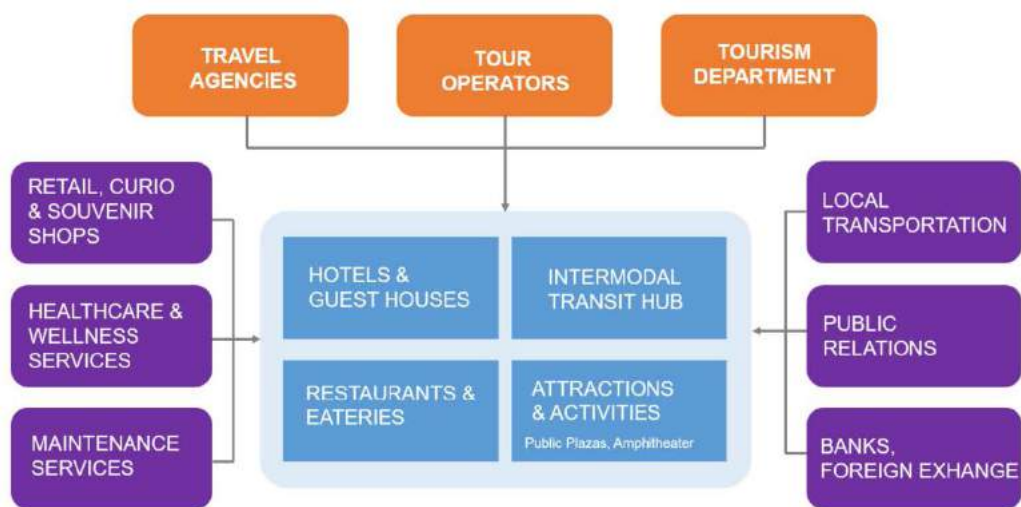
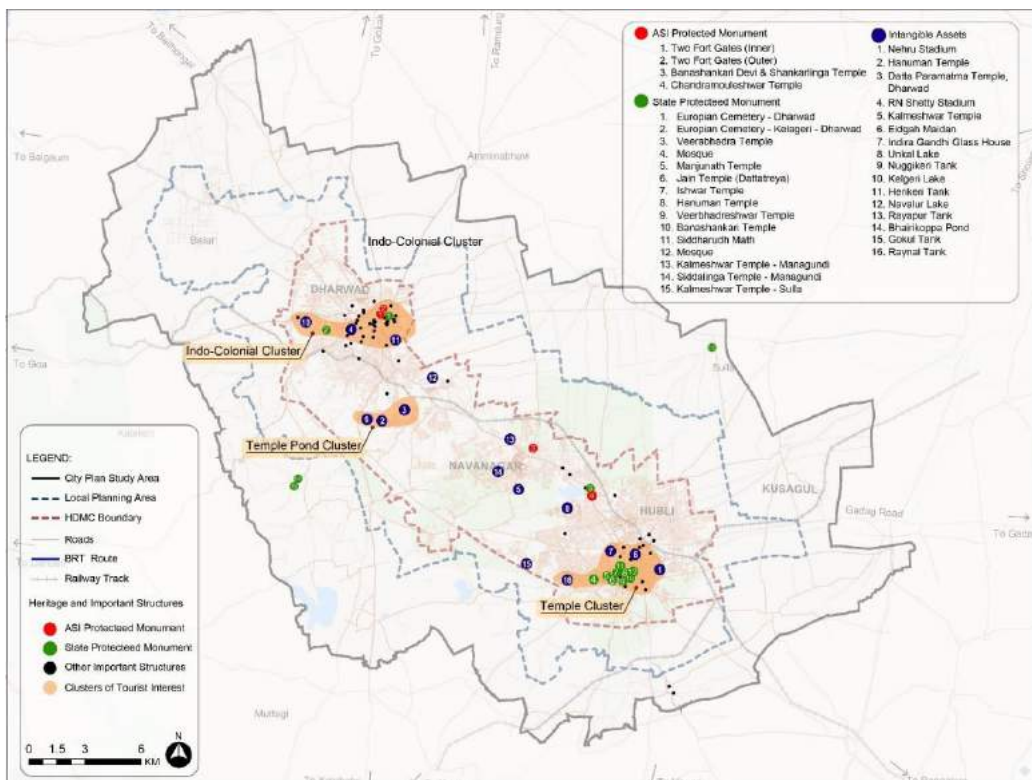


Figure 20: Components of tourism cluster



Map 16: Places of tourist interests in Hubli Dharwad



CASE STUDY

1. KALA GHORA FESTIVAL, MUMBAI

The Kala Ghoda Arts Festival is annual festival, nine days long, commencing always on the first Saturday of February and closing always on the second Sunday in February, in the Kala Ghoda area of South Mumbai. Kala Ghoda Association, was formed on 30th October 1998 with the object of maintaining and preserving the heritage and art district of South Mumbai.

The festival sections are visual arts, dance, music, theatre, cinema, literature including children's literature as a sub section, workshops, heritage walks, urban design and architecture, food, a dedicated section for children, and a vibrant street section including stalls selling eco friendly, hand made arts and crafts wares. Entry to all events is free to all (only restricted by the size of the venues) and costs are met through corporate sponsorship. Rampart Row is closed off to vehicular traffic for the duration of the festival, with the entire area becoming a street mela, with food stalls, artisans selling their creations, artists who sketch instant portraits, street art installations and the like. In recent years, the Festival has expanded beyond the Kala Ghoda crescent, with events being held in Cross Madian and Horniman Circle as well.

The success of the Kala Ghoda Arts Festival has, arguably, encouraged the setting up of several other arts and cultural festivals at that time of the year



Source: <http://www.kalaghodaassociation.com/> and https://en.wikipedia.org/wiki/Kala_Ghoda_Arts_Festival

2. PAGO FESTIVAL, GOPALPUR, ODISHA

PAGo (Public Arts in Gopalpur): PAGo is the stepping stone to the aspiration of transforming Gopalpur into an Art Town. In view of improving the tourism infrastructure and beach activities, the authority conducted the festival, which had enthused and attracted people from diverse age groups from all walks of life through activities like clean beach drive, sand art, cyclothon, kite flying completion, beach sports and cultural shows. The PAGO festival put Gopalpur in the limelight and help it receive the first runner-up award for the Best Beach category award in the India Today Tourism Awards 2017 supported by Incredible India in view of the efforts put in by the Brahmapur Development Authority.





12.0 UPGRADE NEIGHBOURHOODS

Neighborhoods in Hubli Dharwad are no different from other cities and face similar issues of urban sprawl, poor housing conditions, lack of adequate infrastructure, vanishing green spaces and slums.

As per census, there are 127 slum clusters within HDMC (93 are notified by Karnataka Slum Clearance Board) catering to 19% households of Hubli Dharwad. 20% of the housing stock in Hubli Dharwad requires up gradation. Similarly, formal neighborhoods lack safe and inclusive public open spaces and streets. Constant efforts are being made to improve the current situation. However, there is still need for interventions to improve the overall living conditions and quality of life.

OPPORTUNITIES

1. HDBRTS and TOD as catalyst for neighbourhood upgradations
2. Presence of Government schemes and grants (e.g. Pradhan Mantri Awas Yojana – Housing for all (PMAY-HFA)) for upgradation of slums

ACTION PLANS

1. **Upgrade and /or Redevelop Existing Slums** – notify all slums within HDMC and implement government plans and schemes related to infrastructure, housing and socio - economic development. Some of the other innovative approaches for slum up gradation may include:
 - a. Provide Tenure Security
 - b. Facilitate credit for upgradation of slum homes.
 - c. Continue slum improvement and networking programs for slums that cannot be redeveloped. (As per Map 14, Slums that are in bad and worst condition need immediate interventions. The assessment has been made based on housing and infrastructure condition.)
 - d. Create regulations to guide redevelopment to ensure minimum housing size, provision of community level facilities and supporting infrastructure. (Map 17)
2. **Redevelop existing housing stock in the Inner City** to create opportunity for creation of new housing stocks:
 - a. Conduct a structural audit of all buildings in the inner city over 30 years of age and notify owners about the housing conditions and possible funding options / joint development opportunity for redevelopments.
 - b. Collaborate with Nirmithi Kendra and Karnataka State Building Centre (KARNIK)² and entrust them with the responsibility of developing retrofitting/ upgradation design, construction and material technologies for owner led upgradation
 - c. Develop byelaws to mandate mixed use and inclusion of affordable housing / smaller housing units for redevelopment and encourage and amalgamation.
3. **Upgrade neighbourhoods to add community facilities:**
 - a. Investing in pedestrian and NMT infrastructure such as wide footpaths and cycle lanes, pedestrian thoroughfares and complete streets design
 - b. Creation of mixed use developments to ensure round the clock activity, active street frontages and shop lines

RELATED STRATEGIC PILLARS	
	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> A Range of Housing and Community Facilities
	<ul style="list-style-type: none"> Effective Land Management and Transportation

APPLICABILITY

- City | People | Institutions

IMPLEMENTATION TIMEFRAME

- 10 - 15 years

INDICATOR

- % of Slums for which upgradation or redevelopment process is initiated
- % of total building stock that is older than 50 years
- % of population within 5 minute walking distance of markets and shopping
- % of private housing developments registered with GRIHA or LEED

² Government of India has established Building Centres or Nirmithi Kendras in each district under the National Network of "Building Centres" in India. These are technology transfer centers. These centres will promote and propagate the proven technologies from the R&D Institutes to the field on "Lab to Land" principles. Government of Karnataka took a leading initiative in order to Promote, Monitor, Oversee, Guide the Nirmithi Kendras and Rural Nirmithi Kendras in the state and established an apex centre called "Karnataka Rajya Nirmana Kendra [KARNIK]".

- c. Allow accommodation reservation regulations to add amenities and facilities for shared community use –

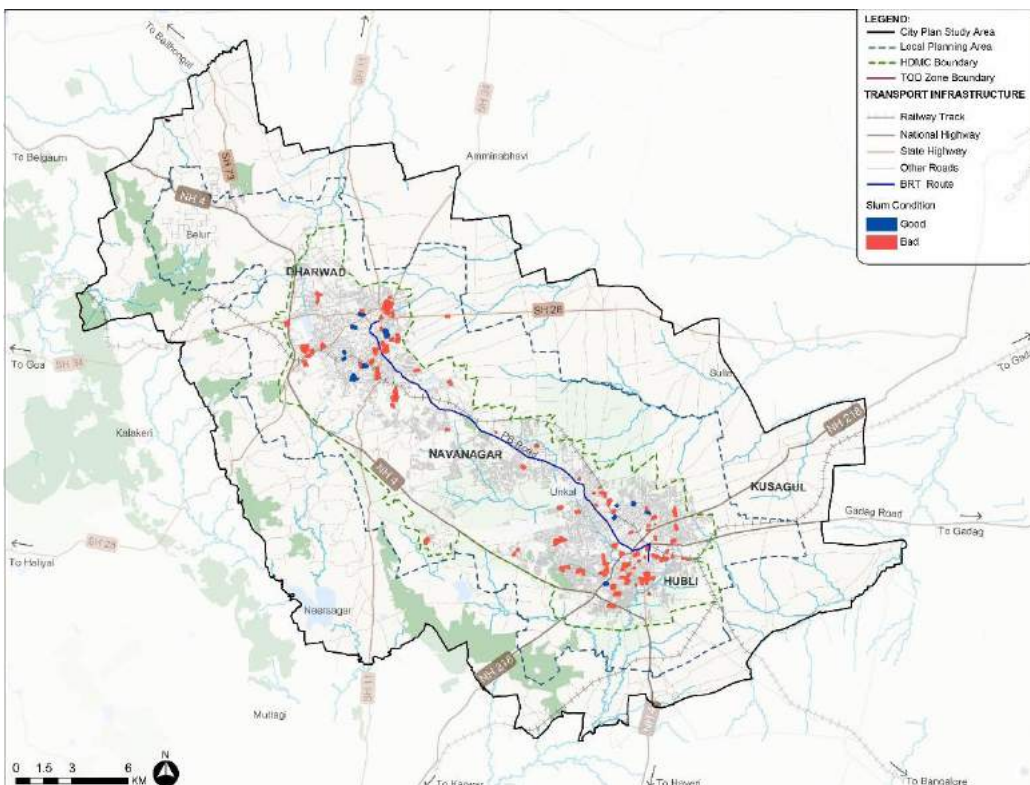
It is an urban planning tool for the development of public reservations without land acquisition. In Nashik, reservations such as recreation, commercial, health and transportation have been categorised in the rules, and construction can be done in gardens, parks, playgrounds, open spaces and children's parks among other places. Either the Municipality or the land owner can develop these up to 15% of the area reserved. Ten per cent of the construction will be on the land, while the rest will be above this construction. The owner would have to develop this for free for the Municipality. According to the rules, the owner will have to give 70% of his land to the Municipality and can avail of the entire floor space index (FSI) permissible on a plot reserved for public amenities and transfer of development rights for the remaining 30%.

Different categories of reservation for public amenities has various specifications, for eg., in some cases the land the owner will have to give 40% of the plot to the Municipality, while in some cases the owner will have to give 50% of the land. However, the owner will have to develop 50% or 40% land that it gives to the Municipality for free. He can acquire TDR for the remaining 60% or 50%, respectively,

- d. Developing neighbourhood level facilities such as shopping areas, community halls, parks, jogging trails and gardens considering universal accessibility.
 - e. Making parking shared and unbundled
4. **Enforce regulations for sustainable building and living practices** such as rain water harvesting, use of sustainable building materials and systems to conserve water and electricity on private and public plots.

CHALLENGES

1. Lack of finance for upgradation and redevelopments
2. Presence of non-notified slums, which are not getting PMAY-HFA funds for slum upgradation





13.0 ENCOURAGE COMPACT INTENSIFICATION THROUGH REGULATIONS

Development in Hubli Dharwad is characterized by low rise low density development. Sprawl development in the outskirts of the city is also very common. Government land development agencies are also following the same trend. Sprawl development increase travel distances, reliance on private vehicles, demand for quality infrastructure, infrastructure investments cost. Compact mixed use development helps in development of quality infrastructure in a planned manner, create space for public amenities and community facilities, reduce the pressure of natural resources (ground water extraction) as well safe, walkable neighbourhoods.

OPPORTUNITIES

1. Areas outside the core city are characterized by larger land holdings that can be advantageous in redevelopment.
2. Many areas within the identified high growth areas are in high demand and open to intensification
3. Revision of the zonal regulation is undergoing to enable higher FAR and high density in the TOD zone.
4. The BRT, once functional, will trigger more activity and development especially near the transit stops as well as areas with large land holdings.

ACTION PLANS

1. **Provide regulatory mandates for compact development -** developments to become compact, walkable, allows mixed use, creates more housing stocks, and provide good connectivity to BRT and public transit. The mandates may include:
 - a. Higher base FAR with option for premium FAR
 - b. Mandatory inclusion of affordable housing (EWS/LIG, smaller housing units such as 1RK /1BHK, rental housings)
 - c. Reduce block sizes to maximum 150m/200m, create NMT thoroughfares in larger blocks, and design complete streets to increase walkability
 - d. Mandatory mixed of land uses and creation of shopline
 - e. Reducing setbacks, promoting build to line
 - f. Creation of public plaza and public realm improvements
 - g. Relaxing parking norms and discouraging standalone parking facilities
2. **Create incentives for developers to pool land** to encourage them to pool land for compact developments such as:
 - a. Additional/ premium FAR in lieu of creation of affordable housing and public amenities
 - b. Single window clearance for ease of project approval
3. **Create directives to facilitate land assembly of Government properties in TOD Zone -**
 - a. Implement Special Land Assembly Regulations for conversion of underutilized government properties to enable optimum land utilization, support transit service, create land value capture opportunities in TOD Zone, support economic plan and fulfill community needs
 - b. Create directives for land consolidation and land swap between multiple government departments.

CHALLENGES

1. Existing private land banks located beyond the TOD zone leading to sprawled development
2. Creation of new land banks in the peri-urban areas by converting cheap agricultural lands which will ultimately lead to investment and development far off from TOD zone
3. Enforcement of regulations because of lack of reliable data and resources.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Effective Implementation and Governance
	<ul style="list-style-type: none"> Effective Land use and Transportation
	<ul style="list-style-type: none"> A Range of Housing and Community Facilities

APPLICABILITY

- City I Institutions

IMPLEMENTATION TIMEFRAME

- 10 - 15 years

INDICATORS

- % of developments consuming allowable FARs
- % of Development in Core Cities that are pooling land
- No. of land assembly or land swap deals initiated between Government organizations in TOD Zone



PILOT DEMONSTRATION

BHENDI BAZAAR REDEVELOPMENT PROJECT IN SOUTH MUMBAI

The Bhendi Bazaar redevelopment project in South Mumbai has emerged as a model for large scale redevelopment in other cities across India and abroad. It is a prominent case study for urban renewal. In 1889, Bhendi Bazaar formed part of the inner-city areas that housed labourers working in the harbour of Old Bombay.

Existing Condition

More than 80 of the 250 buildings are worn-out and have been declared dilapidated, unfit for living according to Maharashtra Area and Housing Development Authority (MHADA). Over 70 per cent of the inhabitants are living as tenants in an area of less than 350 sq feet. The now 150-year-old infrastructure is deprived of footpaths or roads navigable by cars and doesn't have a system for waste disposal. The project is a brainchild of the late Dr Syedna Mohammed Burhanuddin, the 52nd Dai Al-Mutlaq of the Dawoodi Bohra community, and is now being carried forward by his son Syedna Mufaddal Saifuddin. The Saifee Burhani Upliftment Trust (SBUT) is implementing the project, while the Maharashtra Housing and Area Development Authority (MHADA) is the planning authority. Inputs were taken from various stakeholders, including residents, commercial tenants and expert consultants to shape the master plan and design the project. The project entails an investment of Rs. 4,000 crore, which is being largely funded through donations by businessmen from the Dawoodi Bohra community. There is no equity or loans involved in the whole project

Transit Housing and Commercial Facilities

In order to avoid the inconvenience to the residential tenants, a housing complex of 950 units providing temporary accommodation has been built at Anjeerwadi (Mazgaon). Besides, the Trust has availed 1,100 transit units from the state-run MHADA in Sewri and another 450 transit homes in Sion. Each room is furnished with a kitchen, attached toilet, carpet, cupboard, curtains, hot water geysers and a washing machine. The SBUT also provides Logistics Support such as services from movers and packers, etc. to ease the transition, Professional Housekeeping service and engages in sustainable practices with the use of sewage treatment and water recycling plants, solar panels and air water heater. To house the commercial establishments that have moved, the Trust set up Mufaddal Shopping Arcade (MSA) in Bhendi Bazaar. Businessmen can either opt to move their businesses in one of the commercial transit camps built by the trust or even move to a rented place. The rent will be reimbursed by the trust until they get possession of their own properties.



Source: <https://www.thehindubusinessline.com/specials/india-file/bhendi-bazaar-urban-indias-largest-ever-makeover/article9046482.ece>
http://www.business-standard.com/article/economy-policy/bhendi-bazaar-redevelopment-kicks-off-116051700679_1.html

7.4 Grow and Innovate



14.0 CAPITALIZE ON CITY STRENGTHS TO BUILD ECONOMIC CLUSTERS

A cluster is a geographic concentration of related companies, organizations, and institutions in a particular field that can be present in a region, state, or nation. Clusters arise because they raise a company's productivity, which is influenced by local assets and the presence of like firms, institutions, and infrastructure that surround it. Economic Clusters in Hubli Dharwad will increase productivity and operational efficiency of existing industries and allied services. Furthermore clusters stimulate and enable innovation, while also facilitating creation of new local businesses.

RELATED STRATEGIC PILLARS

	• Diverse Economic and Social Growth
	• Effective Implementation and Governance

OPPORTUNITIES

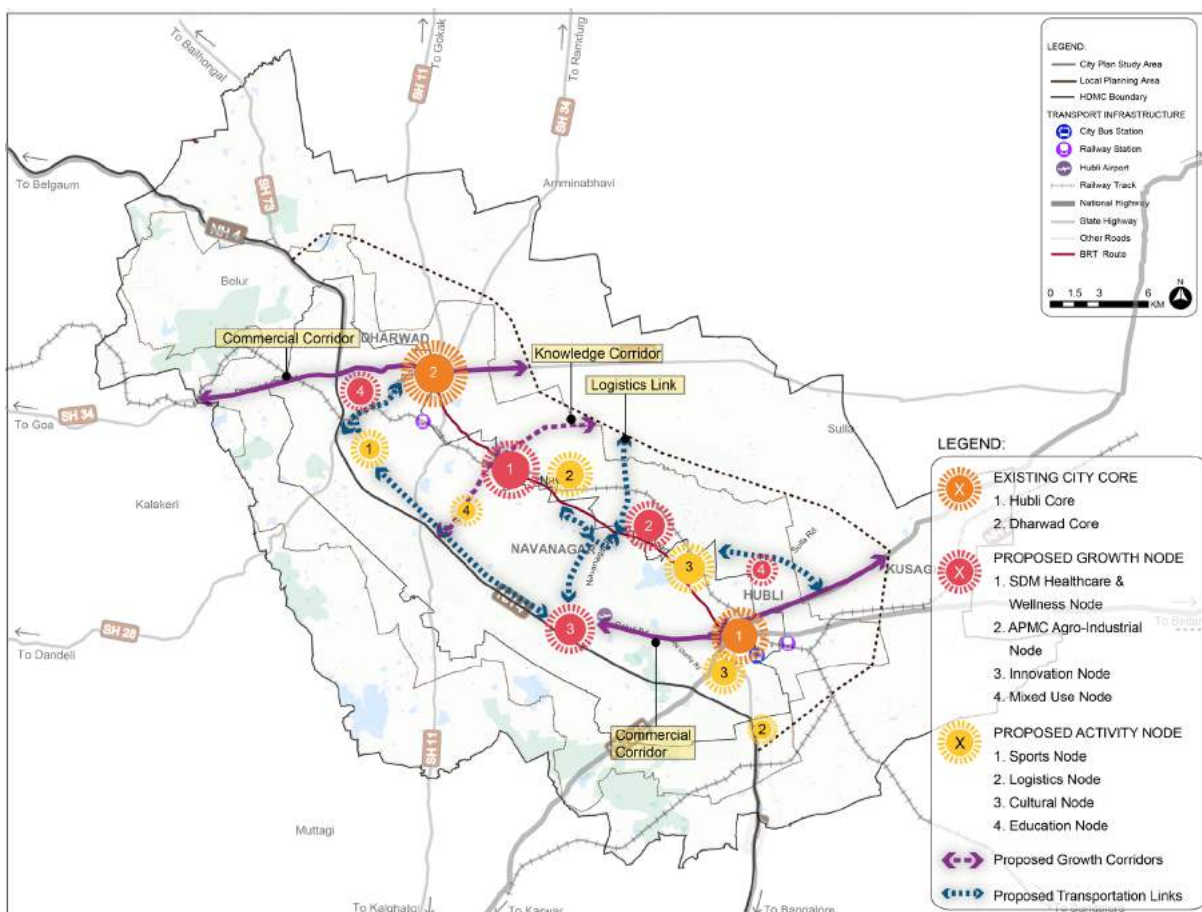
1. Hubli Dharwad is known for the presence of highly acclaimed educational institutions such as IIIT-Hubli, University of Agriculture Science, Karnataka University, KLE Institute, the District Institute of Education and Training (DIET) and the recent IIT-Dharwad. Reputable healthcare institutions such as Karnataka Institute of Medical Sciences and SDM College of Medical Science.
2. Hubli-Dharwad is located strategically along the NH4- Bangalore Mumbai Economic Corridor with immediate access to an airport and key railway junction as well as several regional roads providing east-west connectivity to surrounding regions.
3. The availability of land in and around the city is an opportunity to create clusters. (Map 18)

APPLICABILITY

- City | People | Institutions

IMPLEMENTATION TIMEFRAME

- 10 - 15 years



Map 18: Location of proposed Spatial Economy Nodes

ACTION PLANS

- Create Healthcare and Wellness Cluster around SDM Hospital** – Allocate land surrounding SDM Hospital to create a multi-specialty Healthcare Cluster. Healthcare clusters are agglomerations of health-related facilities including Hospitals, Medical and Nursing Colleges, Alternative Medicine Centers, Residential Care Facilities, Specialty Diagnostic Centers, Special Research Laboratories, Veterinary Facilities. Ancillary industries such as medical equipment and instrument manufacturing industries and bio-pharmaceutical industries would also find it beneficial to set up in close proximity to a healthcare cluster. The easy connectivity to Karnataka Cancer Therapy & Research Institute in Navanagar and KIMS Hospital in Hubli via BRT will also add value to a Healthcare Cluster located near SDM.
- Leverage Proximity to Primary Freight Corridors to Create Logistics Clusters** – Create Logistics Clusters at key locations along NH4 identified near Karwar Rd and Gabbur. Logistics clusters are agglomerations of different types of firms and operations including primarily: (i) firms providing logistics services, such as third party logistics, transportation, warehousing and forwarders, (ii) the logistics operations of industrial firms, such as the distribution operations of retailers, manufacturers and distributors and (iii) the operations of companies for whom logistics is a large part of their business. Such logistics clusters also include firms that service logistics companies, such as truck maintenance operations, software providers, specialized law firms, international financial services providers, etc. The proximity of Hubli Airport and the proposed Karwar Rail Link is expected to add value to the location of the logistics clusters.
- Create Knowledge Clusters to Expand Contributions to the City** – An existing knowledge cluster has emerged in the vicinity of KLE College, where the new Infosys Campus and Deshpande Foundation have come up. This Knowledge Cluster should be expanded northwards to promote technological entrepreneurship and provide incubation centers and skill-building centers. The second knowledge cluster is proposed in the vicinity of Gangubai Hangal Music Academy, primarily focusing on classical and cultural arts. This knowledge cluster will build on the music heritage of the city to take advantage of the growing interest in classical Indian music and arts. Programs like yoga institutes, dance academies, performance auditoriums and exhibition grounds can be developed in this cluster.
- Promote Manufacturing Industries in the outskirts** – Belur and Tarihal industries are aptly suited to house manufacturing industries because of easy access to freight corridors for transporting raw materials as well as distributing products. Belur should be positioned as a prime automotive manufacturing location because of its location.

INDICATORS

- Healthcare and ancillary industries setting up in Hubli Dharwad
- No. of Logistics Industries setting up in Hubli Dharwad
- No. of Incubation Centres in Hubli Dharwad
- % of land utilization in Belur and Tarihal

CHALLENGES

The Master Plan as per the KTCP rules only allocates land for commercial or public-semi-public uses. Detailed uses such as healthcare or ancillary uses are not a part of the Master Plan. This does not allow for specific land regulations. This challenge will need to be addressed through the implementation plan.²

² The Greater Mumbai Development Plan 2034 proposes land use categorization in detail. This allows for special allocation of land for special services and facilities and clustering of facilities as suggested in the strategies.





15.0 GREEN THE HUBLI DHARWAD ECONOMY

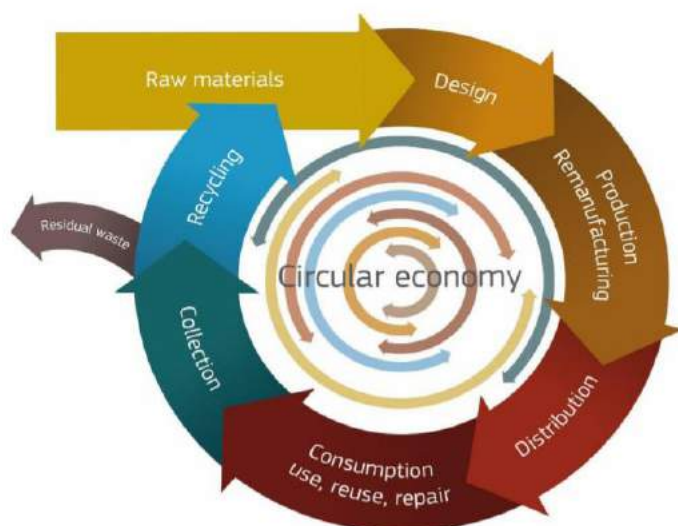
Economic activities have a large role to play in exacerbating or mitigating risks associated with climate change. Building a resilient economy requires adoption of practices that disassociate economic growth with increasing consumption of non-renewables and increasing production of pollutants. Because the Hubli Dharwad economy is only beginning to grow, it is well placed to impose far-reaching implementation of green practices in the industrial sector, which can ensure rapid economic growth without corresponding negative impacts on the environment.

OPPORTUNITIES

1. Besides automotive manufacturing and logistics, most Hubli Dharwad industries are at a nascent stage of growth and may be more willing to convert to greener practices.
2. Numerous educational institutions in Hubli Dharwad increase the potential of innovation in management of resources and pollutants.
3. Large spans of underutilized land can be repurposed to set up green practices.

ACTION POINTS

1. **Facilitate Plastic Recycling through a Circular Economy** – A circular economy allows for the waste of one industry to be used as raw material for another industry, resulting in lower industrial waste generation. The City must establish rigorous mandates and directives for industries using plastic packaging and/or creating plastic residual waste. MSMEs that collect, segregate, and reuse plastic waste should be promoted and financed. Incubation Centers should be set up that provide financial and professional mentoring for green entrepreneurs working towards circular solutions.



2. **Set up a Green Industrial Development Program (GIDP)** - Promote the development of Green Industrial Parks in the City –specifically in Gokul and Gamangatti Industrial Estates. *Low Impact Sustainable Industries* should be prioritized for allotment of land in these industrial estates. All new buildings to follow the IGBC (Indian Green Building Council) Green Factory Rating System (or relevant rating system as of date of application).

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Effective Implementation and Governance
	<ul style="list-style-type: none"> Manage Environment and Climate Resilience
	<ul style="list-style-type: none"> Green Infrastructure and Services

APPLICABILITY

- City | People | Environment

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATORS

- % of industries that are plastic-free
- % of industries adopting green building standards
- Capacity of renewable energy installed as a part of the PACE loan program.
- Total number of electricity units wheeled. (38% of the targeted total installed renewable energy for municipal facilities)
- % of industries who have signed voluntary green agreements
- % of industries managing waste sustainably

3. **Set up Property Assessed Clean Energy Financing (PACE)** for the Institutional and Commercial Sector to accelerate investments into green energy efficiency and renewable energy programs (local, distributed generation).
4. **Enable Wheeling of Renewable Energy for Municipal Facilities**
 - Utility scale renewable energy systems (solar) present an attractive investment opportunity for municipal services and will act as a hedging against future electricity cost increase. HDMC city (municipality) may invest into utility scale renewable energy generators in neighboring districts and make use of wheeling mechanism.
5. **Facilitate Voluntary Green Agreements** - Initiate voluntary agreements with Institutes, Commerce and Industry on Reduced Waste Creation, Pollution Mitigation, Waste Water Recycling, Energy Savings and Renewal Energy Programs.
6. **Train and Prepare Businesses to Reduce Waste Generation** – the City must take a methodical approach to ensure all existing and new businesses in the City are committed to sending minimum waste to landfills.
 - a. **Partner with Agriculture University to Transform Management of Commercial Organic Waste** – The Dharwad Agriculture University can lead a decentralized commercial organic waste composting program for the benefit of hospitality, food and beverage, and event management industries. This will include conducting training programs and hand-holding programs to help commercial enterprises convert their organic waste to compost, either individually or through co-operative groups.
 - b. **Encourage Businesses to identify Recycling interventions specific to their businesses** – All existing and new businesses should be required to submit a waste management checklist, indicating how they propose to recycle the waste generated because of their business.
 - c. After the initial training period, the HDMC must pass a **Compulsory Business Recycling and Composting Rule**, fining businesses that send organic and recyclable waste to municipal landfills.

CHALLENGES

1. Industries are largely not willing to partake in green activities due to lack of incentives or lack of significant consequences. Without impacts that affect business bottom lines, the change to a greener economy will be difficult to implement.
2. The removal of plastic waste from circulation at all levels of industrial production is a huge challenge due to ineffective central and state policies.
3. Lack of expertise and exposure among traditional industries lead to continuing mismanagement of critical resources and pollutants.



16.0 REMODEL PUBLIC INFRASTRUCTURE TO ACCOMMODATE GREEN INFRASTRUCTURE

Green Infrastructure is a set of solutions aimed at mitigating urban and climatic challenges by building with nature. The main components of this approach include stormwater management, sustainable energy production, clean water and healthy soils. Green infrastructure also serves to provide an ecological framework for social, economic and environmental health of the surroundings. Retrofitting existing development to accommodate green infrastructure can help achieve environment and infrastructure goals for the city.

OPPORTUNITIES

A large proportion of the current built land in the city is utilized for public infrastructure, including Railway's lands, lands owned by HDBRTS and NWKRTC for bus transport operations, Airport, and Government office buildings. All of these should incorporate green infrastructure practices.

ACTION POINTS

- Retrofit BRT Stations to incorporate Green Infrastructure** – Install grid-connected solar energy systems on all BRTS stations and depot facilities. Create Electric Vehicle Charging Stations near key BRTS stations to enable electric rickshaws to serve the feeder areas.
- Install Eco Composting Public Toilets at BRTS Stations and Corridor** – Install eco-composting public toilets at key locations throughout the BRTS corridor and at key stations and depots.
- Mandate Rainwater Harvesting and Wastewater Recycling Infrastructure within Government-owned properties** – All Government-owned properties, individually or in clusters should install rainwater harvesting infrastructure. This includes installation of passive harvesting such as permeable pavements, bio-swales or rain gardens (small catchment pits), which can be implemented on plots of all sizes. Plots larger than 1 acre should have active harvesting infrastructure such as recharge pits or trenches, tubewells, or recharge wells. (Figure 21 and Figure 22)
- Make Municipal Facilities Green** – Municipal facilities including street lighting, water pumps, and sewage treatment plants should be migrated to solar energy. Convert all existing street lights into LED street lights with dimming function. Street light clusters should be powered by grid-interactive solar PV systems, energy storage (lithium-iron technology) will be added to guarantee a few hours of autonomy of the street light clusters. City must mandate energy audit, energy efficiency interventions and solar PV for municipal pumps and sewage treatment systems. A smart pumping operation system can be deployed in order to minimize pumping hours during peak hours. The system should include electricity storage.

CHALLENGES

Retrofit costs are not accounted for in current budgets. These should be included in future budgets in a concerted effort to turn Hubli Dharwad green, one building at a time.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Effective Implementation and Governance
	<ul style="list-style-type: none"> Manage Environment and Climate Resilience
	<ul style="list-style-type: none"> Green Infrastructure and Services

APPLICABILITY

- City | People | Environment

IMPLEMENTATION TIMEFRAME

- 5-10 years

INDICATORS

- % of BRT Stations with Green Infrastructure
- No. of E-Toilets along BRT Corridor
- % of Government properties that have incorporated RWH or Waste water recycling
- % of street lights converted to energy efficient lighting
- % of municipal pumps and STPs converted to energy efficient systems



How does a rain garden work?

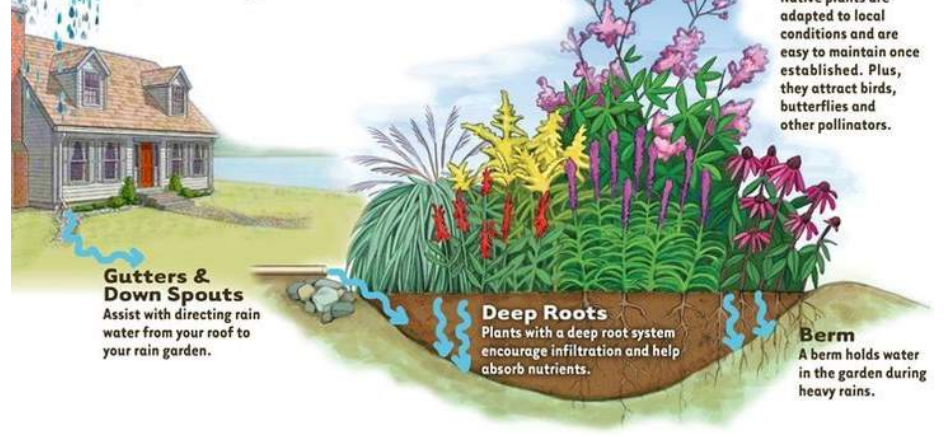


Figure 21: Passive Rainwater Harvesting Methods: Permeable paving and Rain Gardens
Source: <https://www.thebetterindia.com/57856/rain-harvesting-tips-india/>

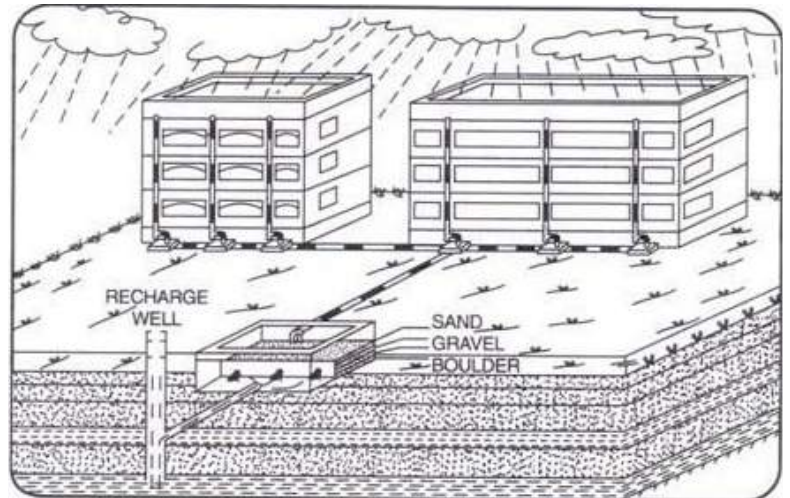
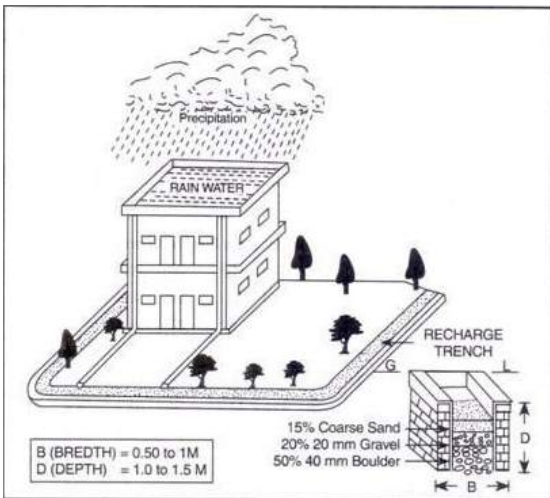


Figure 22: Active Rainwater Harvesting through a gravity-fed system
Source: Rain Water Harvesting in India: Need, Methods and other Details – Puja Mondal



17.0 CREATE SUSTAINABLE LAND DEVELOPMENT OPPORTUNITIES FOR THE FUTURE

Long term growth planning requires land in strategic areas inside and outside the urban growth boundary.

OPPORTUNITIES

1. Large swathes of under-productive agricultural lands exist in the immediate vicinity of the city that can be urbanized and consolidated within the city boundary.
2. Greenfield development opportunities offer the ability to plan for sustainable transportation and other green infrastructure in advance before settlements grow.

ACTION POINTS

1. **Acquire land banks in moderate growth areas** - This strategy proposes that the HDUDA hold a list of recommended land from the moderate growth areas for acquisition by government authorities to maintain as land banks. A long-term growth plan should be developed, building on the City Development Framework Proposals, to identify attractive areas to acquire land banks that can be later linked through a strategic multi-modal transit network. This will provide land value capture opportunities for government authorities that can be utilized for investments in transportation infrastructure.
2. **Exact affordable housing through land reservations in greenfield areas** - High affordable housing and public amenity reservations should be mandated in greenfield development coming up in moderate growth areas. This will dis-incentivize speculative buying of properties in far-flung areas, while also creating land banks for the Government and for future affordable housing.
3. **Designate land for renewable energy generation** - Approximately 65% of the renewable energy generation will be through independent power suppliers. The total land required for renewable energy generation is 761 acres. The following actions may be taken:
 - a. **Encourage co-location** of agriculture and renewable energy generation through financial incentives to farmers. This in turn will also enable farmers to become more self-sufficient and less vulnerable to droughts.
 - b. **Reserve** 10% of land in SEZ's and industrial estates for development of renewable energy as per 2041 Draft City Development Plan.

CHALLENGES

The acquisition of land and reservation of land for future growth requires vigilant monitoring. Limited capacities within planning organization will make this a challenging task.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Green Infrastructure and Services
	<ul style="list-style-type: none"> A Range of Housing and Community Facilities
	<ul style="list-style-type: none"> Effective Land use and Transportation

APPLICABILITY

- City I Institutions

IMPLEMENTATION TIMEFRAME

- 10 -15 Years | Long Term

INDICATORS

- % of developable land owned by Government agencies
- % of developable residential area reserved for affordable housing
- No. of renewable energy farms set up in study area



18.0 PROMOTE HIGH DENSITY COMPACT MIXED USE DEVELOPMENT IN TOD ZONES AND GROWTH NODES

Land use planning influences the travel behaviour of people. The spatial distribution of housing, working, shopping, leisure, and other activities determine the average trip distances in urban transport. By providing local facilities and jobs - mixing together living accommodation, shops, services and jobs, the need for travel can be reduced

High population density, as well as a mixture of land uses for various social and economic activities maintain low distances between origins and destinations of urban trips.

OPPORTUNITIES

1. Compact city cores connected by a high capacity BRTS system offers the opportunity to create more well-connected compact cores.
2. There exists large potential for intensification of many underutilized areas, without spreading to natural areas.

ACTION POINTS

1. **Create Statutory Regulations that encourage compact development** – Decreased setback requirements and parking requirements will enable compact development in the TOD Zone. In addition FAR and other incentives should be offered for high density mixed use developments in the TOD, the follow the urban design guidelines.
2. **Institute a Land Taxation Scheme that incentivizes compact development**
 - a. **Vacant Land Tax in High Growth Areas** - Vacant land tax is proposed for all land parcels that are left undeveloped for a period of 5 years after implementation of the HDUDA Master Plan 2031 and the special TOD Zone regulations. Vacant Land Tax places a higher emphasis on taxing the land itself rather than on its improvements. This system will intend to incentivize compact development in areas identified for high-intensity growth, and discourage land purchase and development in low growth areas.²
 - b. **Higher Registration Fees in Moderate Growth Areas** – high registration fees are proposed to discourage sale of land in moderate growth areas to discourage speculative buying. Instead Government authorities should be encouraged to purchase and bank lands near future growth nodes in moderate growth areas.

CHALLENGES

The lack of existing market demand in the TOD Zone will make it difficult to attract developments that are high density and mixed use. In this respect, specific areas which see a high population of temporary residents, such as students and trainees should be prioritized.

RELATED STRATEGIC PILLARS	
	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Effective Land use and Transportation
	<ul style="list-style-type: none"> Effective Implementation and Governance

APPLICABILITY
<ul style="list-style-type: none"> City I Institutions

IMPLEMENTATION TIMEFRAME
<ul style="list-style-type: none"> Long term

INDICATORS
<ul style="list-style-type: none"> % of New Development in TOD Zone that is mixed use and high density

² Vacant Land Tax is common practice in many cities around the world. Local governments not only tax land, but often set higher rates for vacant land in urban areas on the basis that, aside from increasing revenue, it may have further benefits such as reducing speculation, incentivizing land transactions to ensure an overall more efficient usage of a scarce resource. - Astrid R.N. Haas and Mihaly Kopanyi, July 2017, *Taxation of Vacant Urban Land: From Theory to Practice*.



19.0 CAPITALIZE ON THE SHARING ECONOMY FOR AUGMENTATION OF TRANSPORT SERVICES

The sharing economy, or collaborative consumption, is a way of “renting” resources owned by one individual to be accessed by many other individuals. It is a system built around the utilization of unused or under-used resources. The sharing economy can lead to more sustainable consumption while remaining compatible with economic growth.

OPPORTUNITIES

1. A large youth population for whom sharing is cheaper and easier than owning goods and services
2. Presence of Ride Sharing Companies
3. A lack of options for short trips and first and last mile trips provides the opportunity for demand-response services to be introduced through government-led programs

ACTION POINTS

1. **Incentivize demand-response feeder transport services for first/ last mile connectivity from BRT stations**
 - a. **Shared Vans/ shuttle services at key destinations** – such services are already operated by private operators to serve transport demand. The Government must introduce permit-based shared van services, where service areas would be defined by the authority and the operations would be run by private operators at a minimum permit fee. Service level agreements would ensure high level of service by participating operators.
 - b. **Cab-aggregators** – Ola and Uber are running in many cities independently. The Government should promote shared Ola and Uber services at specific locations in the city through permit-related incentives.
2. **Invite operators for PBS in Dharwad city and surrounding education campuses** Public Bike Sharing (PBS) is a growing mobility alternative in many Indian cities. A number of private PBS operators currently operate in the country. Such independent operators should be invited to operate PBS services within Dharwad City, particularly around the educational hubs within the center. Even though PBS is proposed for implementation in Hubli City as part of the Smart City investment, because Dharwad City performs better in pedestrian and cyclist safety and traffic conflict situations, this paper recommends the service to be first piloted in Dharwad. It is recommended that at a minimum the pilot launch should include 100 PBS stations and 1500 bicycles.

CHALLENGES

Regulation and service level maintenance is a challenge for privately operated services.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Effective Land use and Transportation
	<ul style="list-style-type: none"> Effective Implementation and Governance

APPLICABILITY

- City I Institutions | People

IMPLEMENTATION TIMEFRAME

- 2-5 years

INDICATORS

- % of BRT commuters using alternative (non-private) modes for first-last mile connectivity
- Set up of PBS in City



20.0 TAP ON SMART TRENDS

The Smart Cities program has introduced a number of technological solutions that can increase the effectiveness and efficiency of urban systems and governance. Digital solutions have made it possible for communities to know and learn more about the conditions of their physical environments and closely monitor delivery of public services. Such innovations present an unprecedented opportunity to build a consistent and transparent medium of communication between the city institutions, people, and investors.

OPPORTUNITIES

Hubli Dharwad is one of the cities selected to receive Smart Cities Funding, which can be utilized to strengthen institutions through data-driven planning and transparency in communication.

ACTION POINTS

1. **Create a coordinated and reliable database for all City Data** – a single point for data storage and management for the entire city will help several agencies in planning projects for implementation. It will eliminate redundancies and help compile historic data, which will be useful for creating future projections. The guidelines prepared and mandated by state-run KRSAC and IT/BT Department should be followed for all data collection and assimilation.
2. **Create a Control Centre for monitoring and operations or key Government Services** – A single Control Centre should be built in the city where the following functions can be performed, for eg. traffic management, parking management, utilities management, e-governance, incident management, and security. Specific components can be added in a phase-wise manner as per availability of funding. However, the Control Center should be well-equipped to handle additional services in the future.
3. **Use digital communication tools to enhance community participation** – Community engagement has become the cornerstone of planning within the democratic framework. To achieve the Learning City Vision, it is imperative that the city uses digital media to create wider interest in participation on city issues.
4. **Share real-time data to private developers to encourage innovation** – Real-time information can be used to create dynamically modeled prediction systems for consumer information like availability of transit service, parking spaces, traffic speeds, accidents and incidents, weather incidents, etc. Private developers have been able to develop many innovative applications that improve customer perception of the city and its services.
5. **Encourage use of sustainable technologies to increase resource efficiency** – Some of these technologies include light sensors on streetlights to conserve electricity, water overflow and leakage sensors to prevent excessive loss of water during distribution, and others.

CHALLENGES

Affordability of technologies can be a limiting factor. Phased procurement and intelligent use smart city funding can help to implement most of these actions.

RELATED STRATEGIC PILLARS

	<ul style="list-style-type: none"> Diverse Economic and Social Growth
	<ul style="list-style-type: none"> Effective Implementation and Governance

APPLICABILITY

- City | Institutions | People

IMPLEMENTATION TIMEFRAME

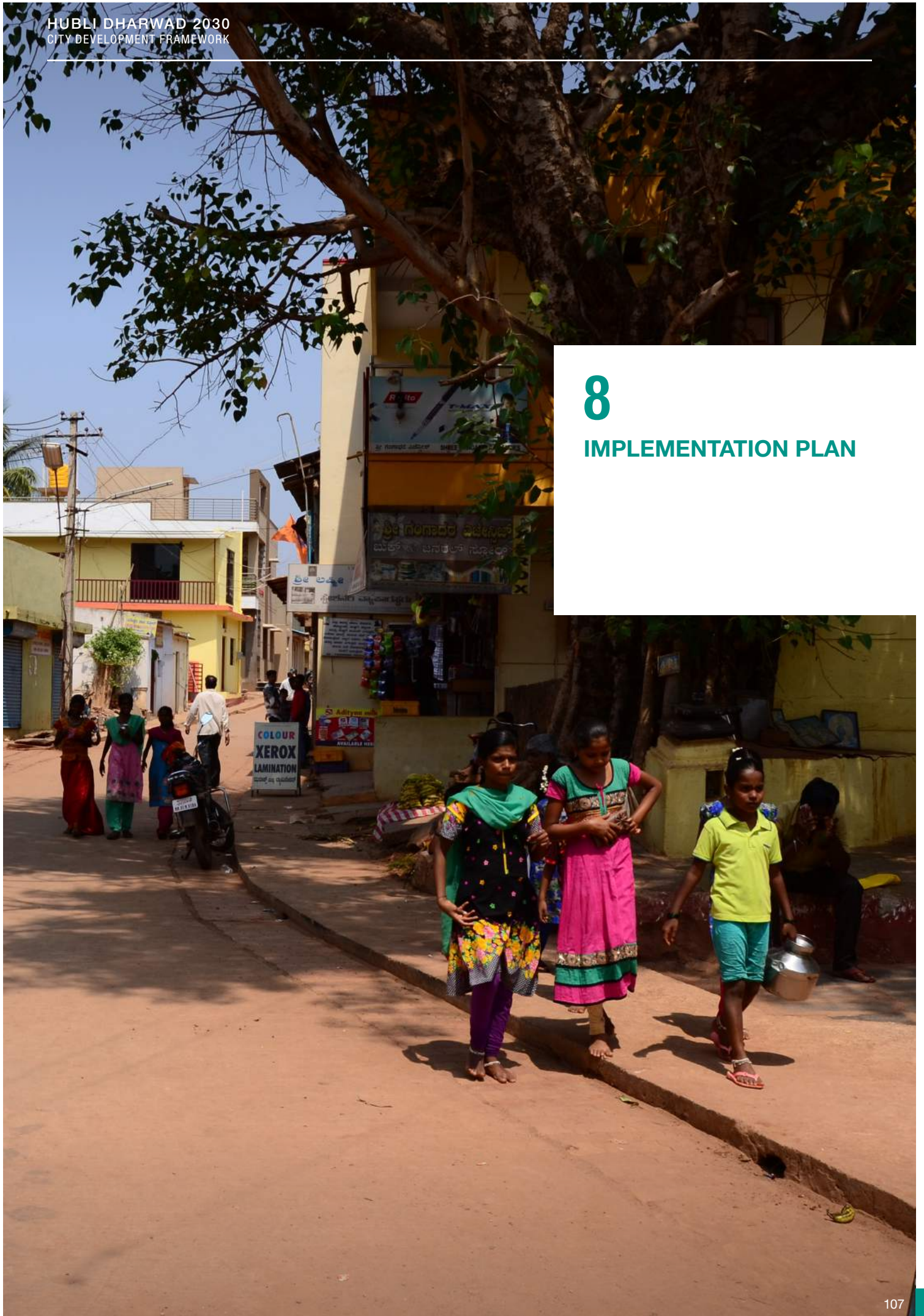
- 2-5 years

INDICATORS

- % of utility services integrated into ICC
- Ease of information availability on different city sectors
- Ease of community participation through digital tools
- Availability of real-time data to public

8

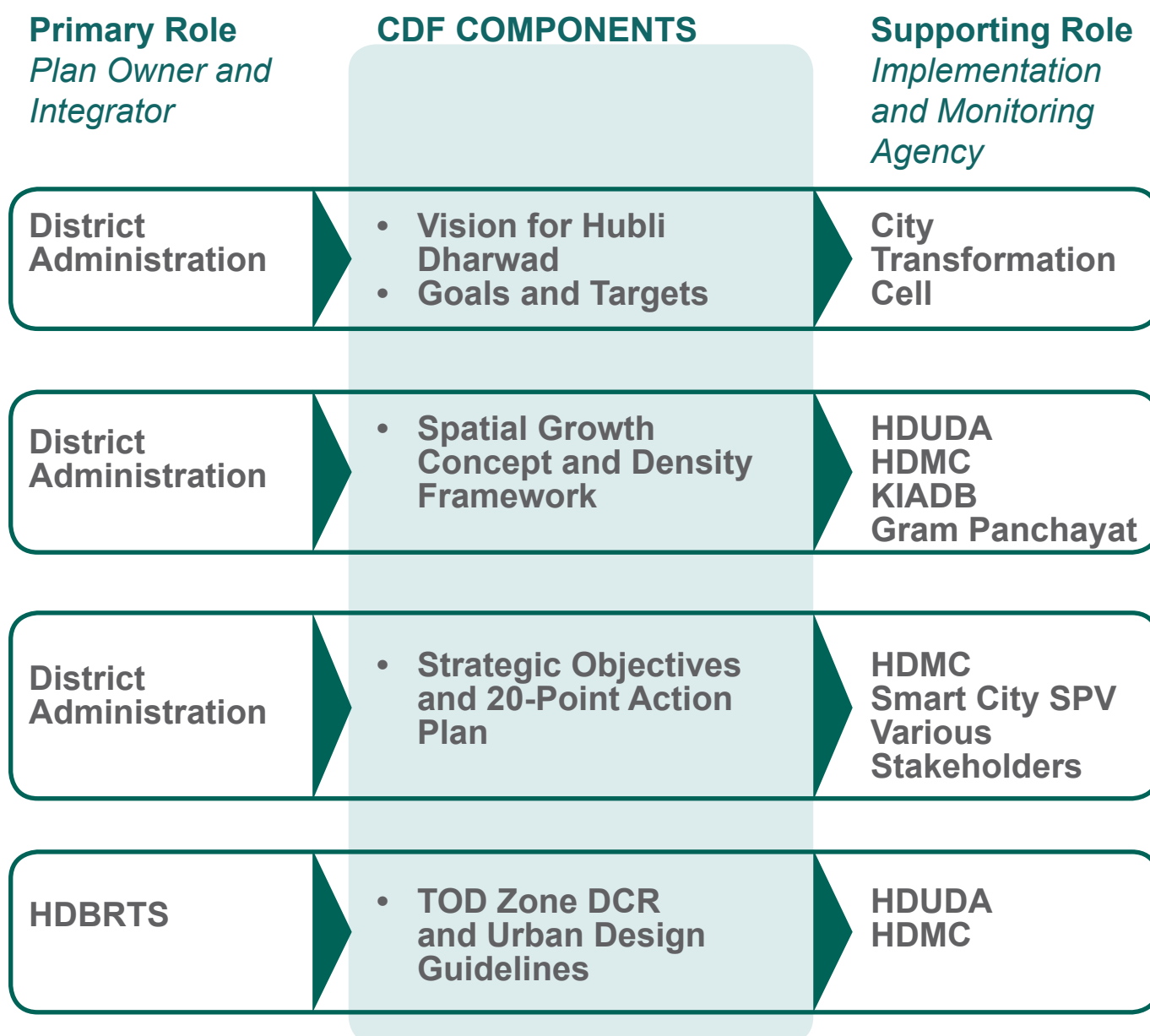
IMPLEMENTATION PLAN



8.1 Implementation Roles

Urban Plan Making in most of India today is guided by availability of financing schemes introduced by the State and the Central Governments. The Hubli Dharwad 2030 City Development Framework (CDF), as the first of its kind in India, is set up to prepare Hubli Dharwad for the future by creating a vision and path for the future even before new programs at the State and Central level are introduced. All potential opportunities for funding and financing can now be streamlined to achieve the vision set forth in this Framework.

Along with providing a larger Vision, the CDF also proposes immediate actions that the city agencies can adopt using existing sources of funds. A break-up of the CDF components and relevant implementation roles is illustrated below.



8.1.1. City Development Framework

The Dharwad District Administration is envisioned as the Authority that will own the first three components of the Framework and be responsible for integration across sectors and jurisdictions. The implementation and monitoring of the Framework shall be within the scope and mandate of sector-specific and jurisdiction specific agencies.

The Primary Vision and Goals and Targets shall be monitored by a City Transformation Cell to be established at a Local University. This Cell shall be equipped to carry out regular surveys and enquiries to monitor the status across the defined Goals. The City Transformation Cell shall establish a continuous medium of interaction with the city and rural residents to enable resident inputs to inform the Framework.

The DA will use these monitoring reports to evaluate the performance of various agencies and projects. The Framework shall be revised and updated every 10 years. The results of the monitoring and evaluation should inform the proposed modifications and revisions of the Framework.

While the DA shall be the Nodal Agency for the Spatial Growth Concept and Density Framework, as this will allow an integrated city-rural approach to guide economic growth in the study area, the HDUDA, HDMC, KIADB, and Gram Panchayats will be responsible to implement the proposals for setting up of growth nodes and growth corridors within their jurisdictions. Similarly, implementation of the Strategic 20-point Action Plan will also lie with individual organisations, utilizing funding through various central and state-led programmes.

FINANCING

As a Vision Document that will guide all finance allocations to Hubli Dharwad City, it is proposed that funding for the management and update of the City Development Framework shall be provided through budgetary allocations from the State and Municipal Corporation. The financing for the Action Points shall be derived through ongoing central and state-level schemes such as Smart City Mission, AMRUT, and Swaccha Bharat.

8.1.2. TOD Zone Guidelines

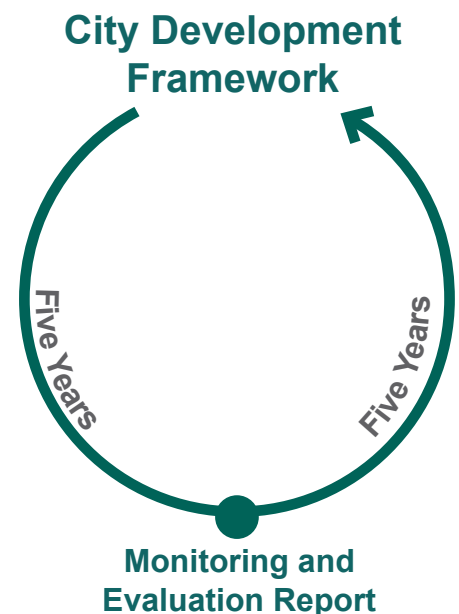
The HDBRTS, under the aegis of DULT shall be the Primary Nodal Agency for the TOD Zone DCR and Urban Design Guidelines. The HDUDA shall incorporate the TOD Zone DCRs into the Master Plan, while the implementation of the DCRs and Urban Design Guidelines shall be done by a TOD Implementation Committee set up within the HDMC.

FINANCING

TOD Incentives provide an opportunity to earn increased revenues through:

- Sale of Premium FAR
- Increased revenue through property taxes levied on higher built up areas

The revenues earned through the tools listed above shall be shared between the HDBRTS and HDMC as per mutual agreement. This source of revenue shall be used by HDBRTS for operations and maintenance of the BRTS system, and shall be used by the HDMC to implement crucial public realm improvements.



8.2 Action Points - Implementation Plan

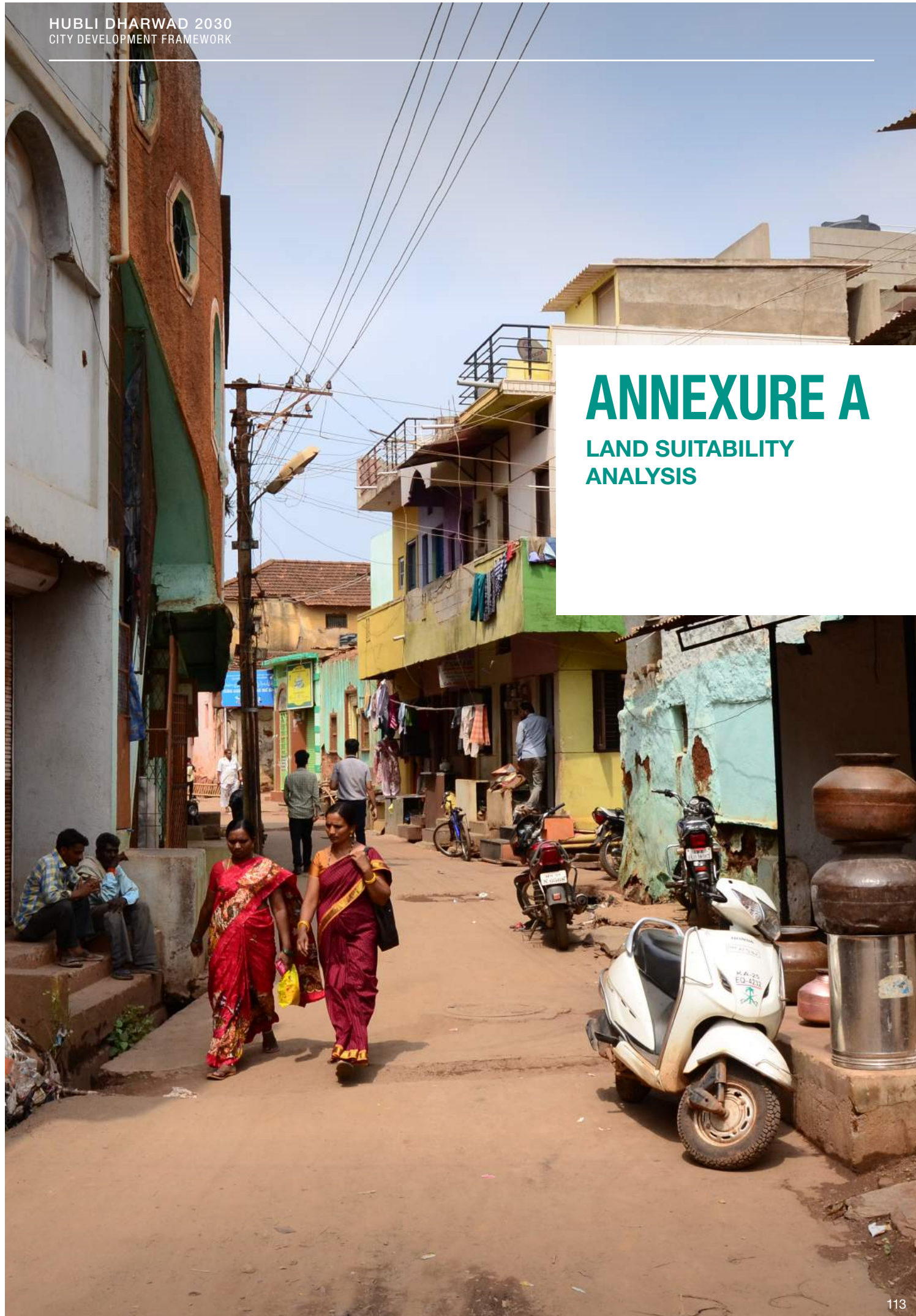
The tables shown below summarizes details on the implementation roles and timelines for the Action Points. It lists the different organization that shall be responsible for the different strategies. It also provides the strategic pillars, whose targets shall be used to measure the performance of the action points. Specifically, indicators that will measure the success of each individual action are also suggested to ensure that the strategy produces individual and collective benefits. This provides a basis for the development of 5-years monitoring reports and the eventual CDF Update in 2028.

Strategic Objectives		Strategies	Action Points	Applicability	Timeframe	Related Strategic Pillars	Roles and Responsibilities	Indicators
Connect and Strengthen Strategies	1	Formalize a Bottom-Up and Integrated Planning Process	1. Build Planning Capacity in HDMC to promote micro-level planning 2. Set up City Transformation Cell in a local University or the new IIT Dharwad for technical assistance to Government Agencies	City, Institutions	5-10 years	Effective Implementation and Governance	HDMC HDMC, Academic Institutions	% of Wards for which Ward Committees Formed % of Residents Participating in TownHall meetings % of Local Academic Faculty engaged in City Projects
	2	Rethink Urban Parks to Maximize Value	1. Revive urban parks as core of community facilities 2. Introduce city level recreation facilities at strategic locations 3. Upgrade existing and invest in new sports facilities 4. Develop Ecomobility Corridors to link Parks 5. Provide decentralized infrastructure facilities in open spaces	City, People, Environment	5-10 years	Diverse Economic and Social Growth Manage Environment and Climate Resilience Green Infrastructure and Services A Range of Housing and Community Facilities	HDMC HDMC, Private Partnership HDMC, Private Partnership HDMC, PWD, KRDSL HDMC	% of Open Spaces being used as Active Parks % of population that live within 500m distance of Active Parks No. of City-level Recreation Attractions per 100000 population No. of Sports Facilities per 100000 population % of Road Network with NMT infrastructure Length of Cycling Infrastructure % of Waste that is Composted or Recycled % of Energy Requirement met by Renewable Sources
	3	Build Partnerships to Link Education, Research and Development	1. Create funding channels to set up R&D facilities in educational institutes by industries 2. Start joint industrial training and skill development programs 3. Encourage local recruitment by Hubli Dharwad Industries	City, People, Institutions	2-5 Years	Diverse Economic and Social Growth Effective Implementation and Governance	DIC, Academic Institutions, Private Industries	No. of R&D facilities as a percentage of No. of Universities No. of skill development programs as a percentage of No. of Universities % of new graduates/post-graduates who find jobs in Hubli-Dharwad
	4	Develop a Hubli-Dharwad City Brand	1. Market hospitality and tourist services to put Hubli Dharwad at the center of the regional tourist map 2. Develop integrated branding of available healthcare facilities 3. Develop an online portal and city app for all facilities that Hubli Dharwad has to offer 4. GIS based interactive land management system	City, Institutions	2-5 Years	Effective Implementation and Governance Diverse Economic and Social Growth Celebrate Heritage	HDMC, Dept. Tourism HDMC, DIC HDMC HDMC, DIC	Quality of Hubli-Dharwad Tourist Information available online Quality of Healthcare Information available online City Apps available % of land records digitized
Preserve and Manage	5	Manage Regional Water Resources	1. Manage natural streams through integrated watershed approach 2. Create Comprehensive Landscape Infrastructure Development Plan for Unkal Catchment 3. Encourage natural water treatment system near inlets bringing in untreated wastewater, stormwater, or treated sewage into lakes 4. Implement Mandated rain water harvesting norms 5. Create knowledgebase and educate stakeholders	City , People , Environment	10-15 years	Manage Environment and Climate Resilience Green Infrastructure and Services	HDMC, Ground Water Board, WDD Karnataka HDMC HDMC, Ground Water Board, WDD Karnataka HDMC HDMC, Ground Water Board	Height of Ground Water Table Citywide average Height of Ground Water Table in Unkal Catchment Quality of Water in all Lakes % of properties of 1 acre or more with rainwater harvesting No. of education programs launched for stakeholders
	6	Reimagine Built Heritage and Maximize Value	1. Create listing and grading for heritage management 2. Preserve Grade - I structures 3. Identify Grade - II heritage assets that are potential for retrofit and adaptive reuse 4. Identify partner organization and funding opportunities 5. Develop Manuals / Toolkit / Guideline 6. Create pilot demonstration project	City , Institutions	10-15 years	Celebrate Heritage Effective Implementation and Governance	HDMC ASI, HDMC HDMC HDMC HDMC	Presence of Heritage Listing and Grading % of Grade-1 structures preserved % of Grade-II structures in use Availability of Notified Manual Heritage Project Status
	7	Build Complimentary Institutions for Key Functions	1. Set up Heritage Cell within HDMC 2. Institute a Parking Cell in HDMC Road Department 3. Establish the Landscape Infrastructure (LI) Management cell in HDMC Horticulture Department 4. Form the Sustainable Energy Management Cell (SEMC) to be formed within HDMC 5. Form Center for Industries partnership in the District Industries Centre 6. Set up a TOD Implementation Cell in HDMC	City , Institutions , People , Environment	5-10 years	Effective Implementation and Governance Celebrate Heritage Effective Land Management and Transportation Manage Environment and Climate Resilience Green Infrastructure and Services	HDMC HDMC HDMC DIC HDMC	Notification of Heritage Cell Formation of Parking Cell Status of Parking Policy and Parking Plan for the City Formation of LI Management Cell Formation of SEMC Cell Set up of Center of Industries Partnership Notification of TOD Cell; No. of proposals reviewed by the TOD Cell; % of neighbourhoods for which TOD Plan made as per Urban Design Guidelines
	8	Improve Institutional Capacities	1. Conduct Institutional needs assessment 2. Promoting Capacity Building through exposure visits and workshop 3. Conduct urban lecture series periodically	City , Institutions	5-10 years	Effective Implementation and Governance	District Administration, HDUDA, HDMC DA, HDUDA, HDMC DA, HDUDA, HDMC	No. of Urban Planners, Transport Planners, Urban Designers and Landscape Architects in HDUDA and HDMC % of Employees of Executive Engineer level who have participated in atleast two out-of-town capacity building workshops or site visits % of capacity building workshops hosted in Hubli Dharwad

Strategic Objectives		Strategies	Action Points	Applicability	Timeframe	Related Strategic Pillars	Roles and Responsibilities	Indicators
Upgrade and Transform	9	Enable Housing Plurality	1. Facilitate the creation of affordable, denser housing stock along the TOD corridor and employment nodes	City , People	2-5 years	A Range of Housing and Community Facilities	KHB	% of affordable housing in new developments in TOD Zone
			2. Create rental housing stock			Effective Land use and Transportation	KHB	% of rental stock in Zone A
			3. Mandate creation of housing for special needs			KHB	% of Students living in hostels or dorms	
			4. Create relief centres			KHB	% of industrial labour living in formal housing	
			5. Incentivize creation of affordable housing for special needs			KHB, HDUDA	Presence of Relief Centers	
	10	Make Villages Resilient	1. Create Village development Plan	City , People , Institutions	5-10 years	Diverse Economic and Social Growth	DA, Gram Panchayat	% of Villages for which micro-level Cluster Plans are made
			2. Facilitate Sustainable Farming Practices			Effective Implementation and Governance	Gram Panchayat, University of Agriculture Sciences	% of Farms that have adopted sustainable farming practices
			3. Conduct skill development training linked to economic activities			Manage Environment and Climate Resilience	Gram Panchayat, Deshpande Foundation	% of Villages that have access to Skill Development Programs
			4. Sustainable Energy Programs for villages			A Range of Housing and Community Facilities	Gram Panchayat, DA, HESCOM	Total solar capacity installed and revenue generated for villages in the study area. % of agricultural connections with solar pumps % of rural residents who have attended sustainable energy awareness program
11	Create Tourist Ready Circuit	1. Upgrade Tourism Infrastructure	City , Institutions	5-10 years	Celebrate Heritage	DIC, Tourism Department	Per capita expenditure by Tourists in Hubli Dharwad	
		2. Develop a Tourist Gateway at Hubli Railway Station			Effective Implementation and Governance	SE Railways, HDMC, Tourism Department	No. of Tourist Facilities within 5 minute walking distance of Hubli Railway Station	
		3. Promote local heritage assets as key destinations within tourist clusters			HDMC, Tourism Department	No. of tourists visiting local destinations as a percentage of no. of tourist arriving in the city		
		4. Host Regional Art & Culture Events			HDMC, Tourism Department	No. of tourists attending Art and Culture Events in Hubli Dharwad		
12	Upgrade Neighbourhoods	1. Upgrade and /or Redevelop Existing Slums	City , People , Institutions	10-15 years	Diverse Economic and Social Growth	KSDB	% of Slums for which upgradation or redevelopment process is initiated	
		2. Redevelop existing housing stock in the Inner City			A Range of Housing and Community Facilities	KHB	% of total building stock that is older than 50 years	
		3. Upgrade neighbourhoods to add community facilities			Effective Land Management and Transportation	KHB, HDMC	% of population within 5 minute walking distance of markets and shopping	
		4. Enforce regulations for sustainable building and living practices			HDMC	% of private housing developments registered with GRIHA or LEED		
13	Encourage Compact Intensification through Regulations	1. Provide regulatory mandates for compact development	City , Institutions	10-15 years	Effective Implementation and Governance	HDUDA, HDMC	% of developments consuming allowable FARs	
		2. Create incentives for developers to pool land			Effective Land use and Transportation	HDUDA, HDMC	% of Development in Core Cities that are pooling land	
		3. Create directives to facilitate land assembly of Government properties in TOD Zone			A Range of Housing and Community Facilities	DA, HDUDA, HDMC	No. of land assembly or land swap deals initiated between Government organizations in TOD Zone	
Grow and Innovate	14	Capitalize on City Strengths to Build Economic Clusters	1. Create Healthcare and Wellness Cluster around SDM Hospital	City , People , Institutions	10-15 years	Diverse Economic and Social Growth	DIC, KIADB, HDMC	Healthcare and ancillary industries setting up in Hubli Dharwad
			2. Leverage Proximity to Primary Freight Corridors to Create Logistics Clusters			Effective Implementation and Governance	DIC, KIADB, HDMC	No. of Logistics Industries setting up in Hubli Dharwad
			3. Create Knowledge Clusters to Expand Contributions to the City			DIC, Higher Education Dept, KIADB, HDMC	No. of Incubation Centres in Hubli Dharwad	
			4. Promote Manufacturing Industries in the outskirts			DIC, KIADB	% of land utilization in Belur and Tarihal	
	15	Green the Hubli Dharwad Economy	1. Facilitate Plastic Recycling through a Circular Economy	City , People , Environment	5-10 years	Diverse Economic and Social Growth	DIC, KIADB, HDMC	% of industries that are plastic-free
			2. Set up a Green Industrial Development Program (GIDP)			Effective Implementation and Governance	DIC, KIADB, HDMC	% of industries adopting green building standards
			3. Set up Property Assessed Clean Energy Financing (PACE)			Manage Environment and Climate Resilience	DIC, KIADB, HDMC	Capacity of renewable energy installed as a part of the PACE loan program.
			4. Enable Wheeling of Renewable Energy for Municipal Facilities			Green Infrastructure and Services	HDMC	Total number of electricity units wheeled.
			5. Facilitate Voluntary Green Agreements			DIC, KIADB, HDMC	% of industries who have signed voluntary green agreements	
6. Train and Prepare Businesses to Reduce Waste Generation			HDMC			% of industries managing waste sustainably		
16	Remodel Public Infrastructure to Accommodate Green Infrastructure	1. Retrofit BRT Stations to incorporate Green Infrastructure	City , People , Environment	5-10 years	Effective Implementation and Governance	HDBRTS	% of BRT Stations with Green Infrastructure	
		2. Install Eco Composting Public Toilets at BRTS Stations and Corridor			Manage Environment and Climate Resilience	HDBRTS	No. of E-Toilets along BRT Corridor	
		3. Mandate Rainwater Harvesting and Wastewater Recycling Infrastructure within Government-owned properties			Green Infrastructure and Services	HDMC	% of Government properties that have incorporated RWH or Waste water recycling	
		4. Make Municipal Facilities Green			HDMC	% of street lights converted to energy efficient lighting % of municipal pumps and STPs converted to energy efficient systems		
17	Create Sustainable Land Development Opportunities for the Future	1. Acquire land banks in moderate growth areas	City , Institutions	5- 10 Years , Long Term	Green Infrastructure and Services	HDUDA	% of developable land owned by Government agencies	
		2. Extract affordable housing through land reservations in greenfield areas			A Range of Housing and Community Facilities	HDUDA	% of developable residential area reserved for affordable housing	
		3. Designate land for renewable energy generation			Effective Land use and Transportation	HDUDA	No. of renewable energy farms set up in study area	
18	Promote High Density Compact Mixed Use Development in TOD Zones and Growth Nodes	1. Create Statutory Regulations that encourage compact development	City , Institutions	10-15 years	Diverse Economic and Social Growth	HDMC	% of New Development in TOD Zone that is mixed use and high density	
		2. Institute a Land Taxation Scheme that incentivizes compact development			Effective Land use and Transportation; Effective Implementation and Governance	HDMC		
19	Capitalize on the Sharing Economy for augmentation of Transport Services	1. Incentivize demand-response feeder transport services for first/last mile connectivity from BRT stations	City , Institutions , People	2-5 years	Diverse Economic and Social Growth; Effective Land use and Transportation	HDBRTS	% of BRT commuters using alternative (non-private) modes for first-last mile connectivity	
		2. Invite operators for PBS in Dharwad city and surrounding education campuses			Effective Implementation and Governance	HDMC, DULT	Set up of PBS in City	
20	Tap on Smart Trends	1. Create a coordinated and reliable database for all City Data	City , Institutions , People	2-5 years	Diverse Economic and Social Growth	DA, HDMC, Smart City	% of utility services integrated into ICC	
		2. Create a Control Centre for monitoring and operations or key Government Services			Effective Implementation and Governance	DA, HDMC, Smart City	Ease of information availability on different city sectors	
		3. Use digital communication tools to enhance community participation			DA, HDMC, Smart City	Ease of community participation through digital tools		
		4. Share real-time data to private developers to encourage innovation			DA, HDMC, Smart City	Availability of real-time data to public		
		5. Encourage use of sustainable technologies to increase resource efficiency			DA, HDMC, Smart City			

ANNEXURE A

LAND SUITABILITY ANALYSIS



1 Land Use and Density Assessment

1.1 Urban Growth

The cities of Hubli and Dharwad grew individually as independent economic centers, the former as a center of trade and commerce, and the latter as a center of culture and education. The extents of both cities until the Indian Independence in 1947 measured approximately 14 sq km each. Immediately after Independence, thirty major industries were set up to the west of Hubli expanding the city westwards. The establishment of Karnataka University pushed the Dharwad boundaries towards the southwest.

The two cities were combined in 1962 to form the Hubli-Dharwad Municipal Corporation, which was to administer a conurbation covering 2 villages and measuring 202 sq km. Post 1962, the growth of the urban footprint of the twin cities can be seen below. The urban footprint measured 57.8 sqkm in 2003, and has grown to 108.3 sqkm in 2016.

The growth of Hubli has primarily occurred in the north-western, northern and north-eastern direction. It has also grown irregularly towards Dharwad city. The growth of Hubli across the east-west axes has largely been steady, the clear axes of growth being towards Kusugal in the east and towards Tarihal in the west.

Dharwad has grown towards the north and west directions. Interestingly the growth of Dharwad towards Hubli has been limited, demonstrating a stronger pull northwards towards the Pune-Mumbai corridor. The westwards expansion of Dharwad in the direction of Karnataka University has been stagnant. Instead most of the growth in the last 2 decades has been northwards towards Belur, specifically due to the establishment of the industrial estate and Karnataka High Court, Dharwad Bench.

The lack of development along the road connecting Hubli and Dharwad has not allowed the city to become unified. The establishment of Navanagar, a residential layout between the twin cities has started the amalgamation process. Higher intensity development, including key destinations between the two cities will help in bridging the distance and increase access and mobility between the two centers.

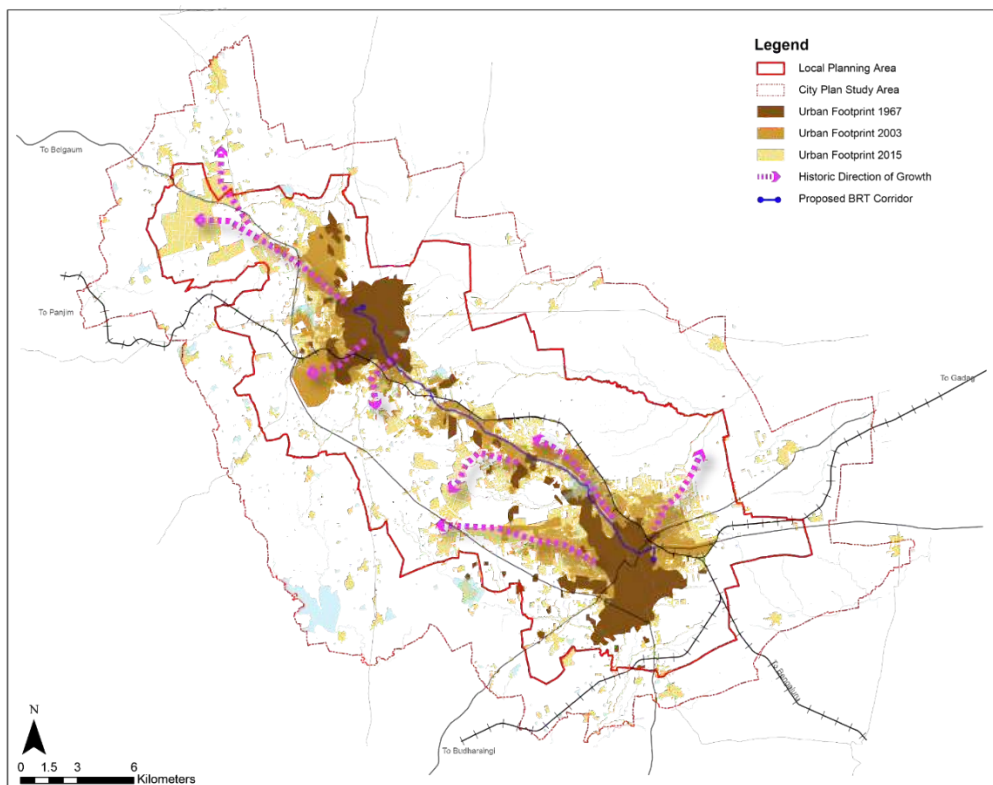


Figure 1: Hubli-Dharwad Historic Evolution (Source: derived from HDUDA land use data)

1.2 Urbanization and Development Density

The rate of urbanization in Hubli Dharwad in the last 15 years has been rapid not essentially because of increase in population, but rather because of development sprawl. This is evident in the chart below. Between 2003 and 2016, population grew at an annual rate of 1.76%, whereas urbanization grew at an annual rate of 6.7%. Effectively the population density of the urbanized areas reduced from 141 pph to 90 pph in 2016. The URDPFI suggests an optimum population density of 175 for Large Cities with population ranging from 5 – 10 lakhs.

The 2031 Master Plan is developed for a projected population of 22 lakh, accommodating for excess migration due to economic growth, using an average population density of 100 pph. However, if all the urbanizable land is open to development and the population increases at the same pace as projected earlier, the resultant population density in 2031 could drop as low as 65.

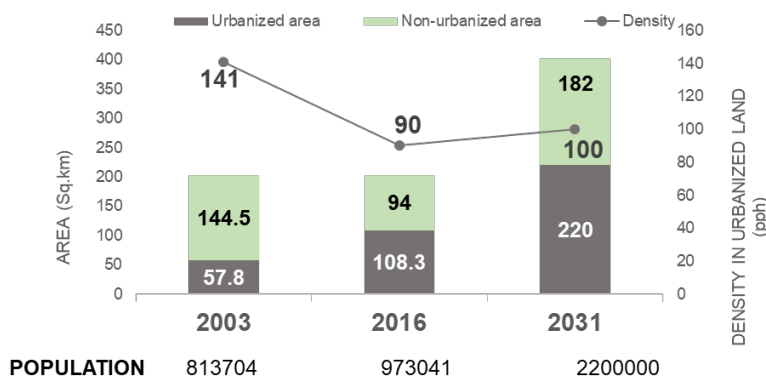


Figure 2: Urbanization and Population Density

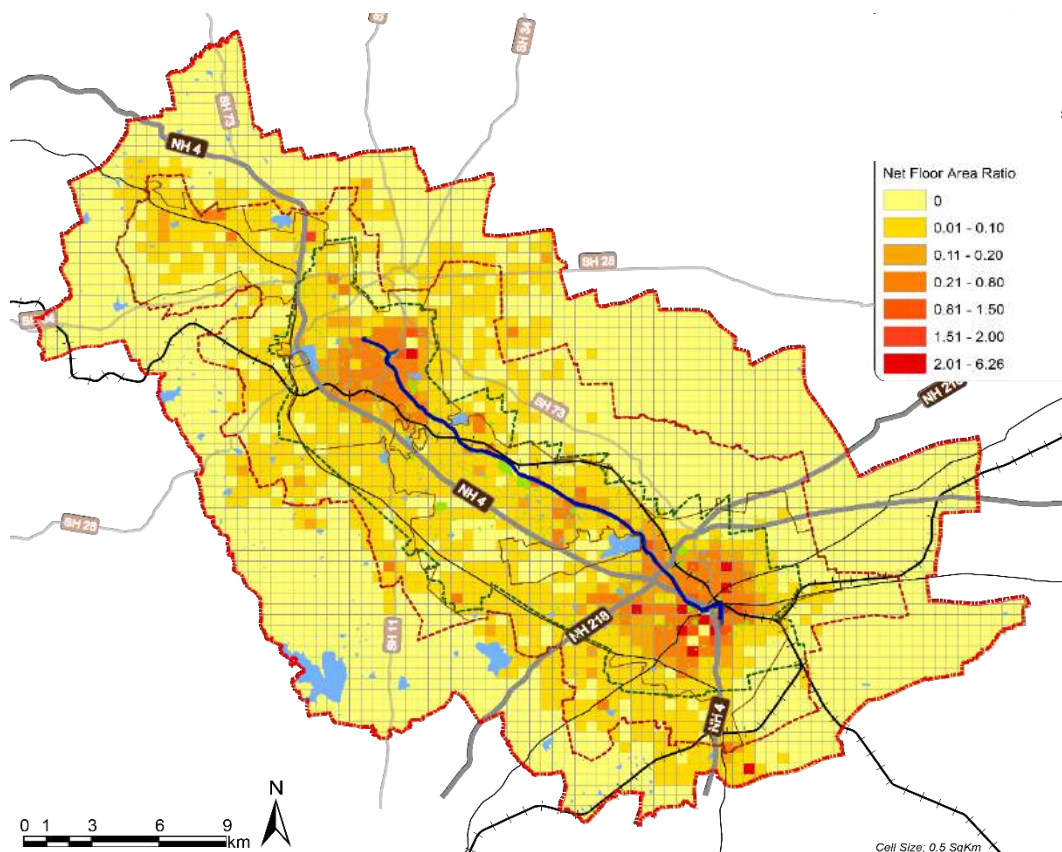


Figure 3: Net Floor Area Ratio (FAR) Distribution Map

Looking at density spatially, as seen in the Net Floor Area Distribution Map¹ shown above, it is seen that the Hubli and Dharwad city cores are much denser than the surrounding areas. As per the current built form, the average FAR of the areas urbanized before 2003 is 0.15, whereas the average FAR of all the areas urbanized after 2003 is 0.06. This clearly indicates a growing trend of sprawling developments.

All upcoming development outside of the Hubli and Dharwad city areas are in the form of layouts, where plots are sub-divided into smaller plots and sold as single-use residential lots. This lack of prioritization has led to sub-optimal utilization of land along the BRT corridor, and creates challenges for TOD in the near future. The TOD regulations will need to focus on creating compact high density nodes that counter this trend and catalyze higher demand and higher densities around transit stations.



Figure 4: KHB Layouts in peri-urban areas

1.3 Changes in Land Use

1.3.1 Spatial Variations

For the purpose of planning, the proposed Master Plan divides the Local Planning Area (LPA) into 3 main planning divisions: Hubballi – incorporating 52.96 sq. km of built up area, Dharwad – incorporating 47.19 sq. km of built up area, and Navanagar – incorporating 19.28 sq. km of the built up area. Overall, residential land use is the predominant form of land use, followed by transportation, public-semi-public, and industrial. Parks and open spaces only comprise 4.25% of the built-up land in the LPA.

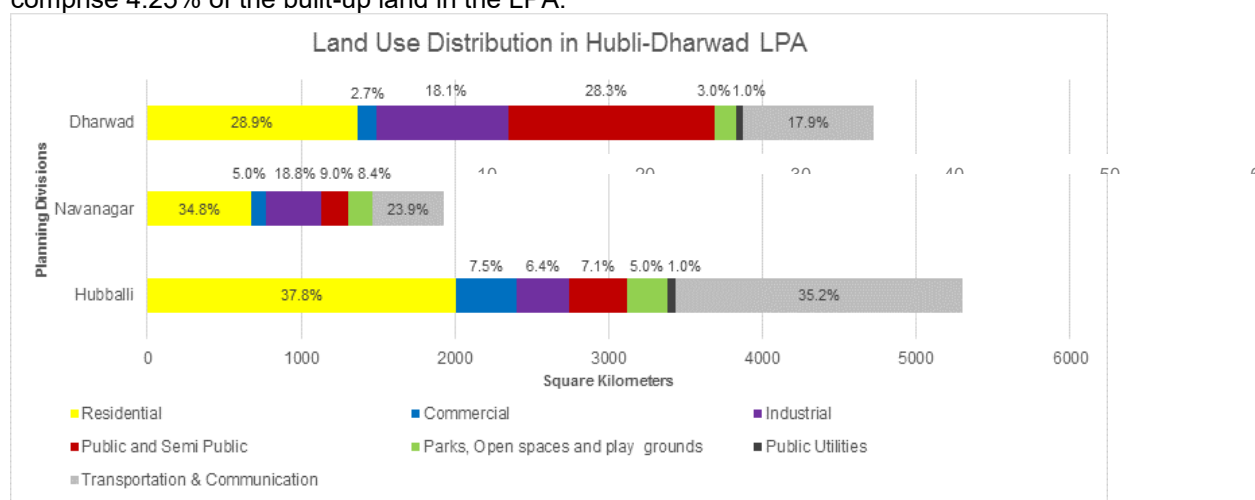


Figure 5 Land Use Distribution in HDMC (Hubli Navanagar and Dharwad) Source: Master Plan 2031

¹ The Net Floor Area Distribution Map is created through a fishnet analysis, dividing the total net built up area in a 0.25 sqm block, excluding roads and natural areas, by the available land area.

The Hubli division is primarily residential, with 38% of the built up land being of residential land use. This division also includes Chennamma Circle, where three major regional roadways converge. This explains the high land use share of transportation (35%).

The Dharwad division comprises largely of public and semi-public uses, which primarily includes institutions and government offices. The division also incorporates the Belur industrial area, which brings the share of industrial land use to 18% of the total built up area. The distribution of commercial uses and parks / open spaces in Dharwad is even lower than the city-wide distribution of these uses. Compared to Hubli, the proportion of land dedicated to transportation uses is half (18%).

The Navanagar division spans the smallest area in the LPA and consists of primarily residential, industrial and transportation uses.

1.3.2 Changes over Time

The land uses mapped in 2003 and 2016 demonstrate the growth of the city across separate land use sectors. In general it is observed that transportation and industrial land uses have seen the maximum growth at 4% and 5% respectively. When compared to the 2016 URDPFI Guidelines, it is observed that the decreasing proportion of land uses for public/semi-public uses and urban green is a significant gap. This is also reflected in the ward level analysis performed in the Data Gathering Report. The Proposed Master Plan 2031 continues to decrease the proportion of land allotted to PSP and urban greens in favour of residential and industrial uses. In particular, the proposed land uses on currently undeveloped or agricultural land is proportioned as follows: 38% for residential, 14% for industrial, 7% for commercial, 9% for PSP, 22% for transportation, and 7% for open spaces.

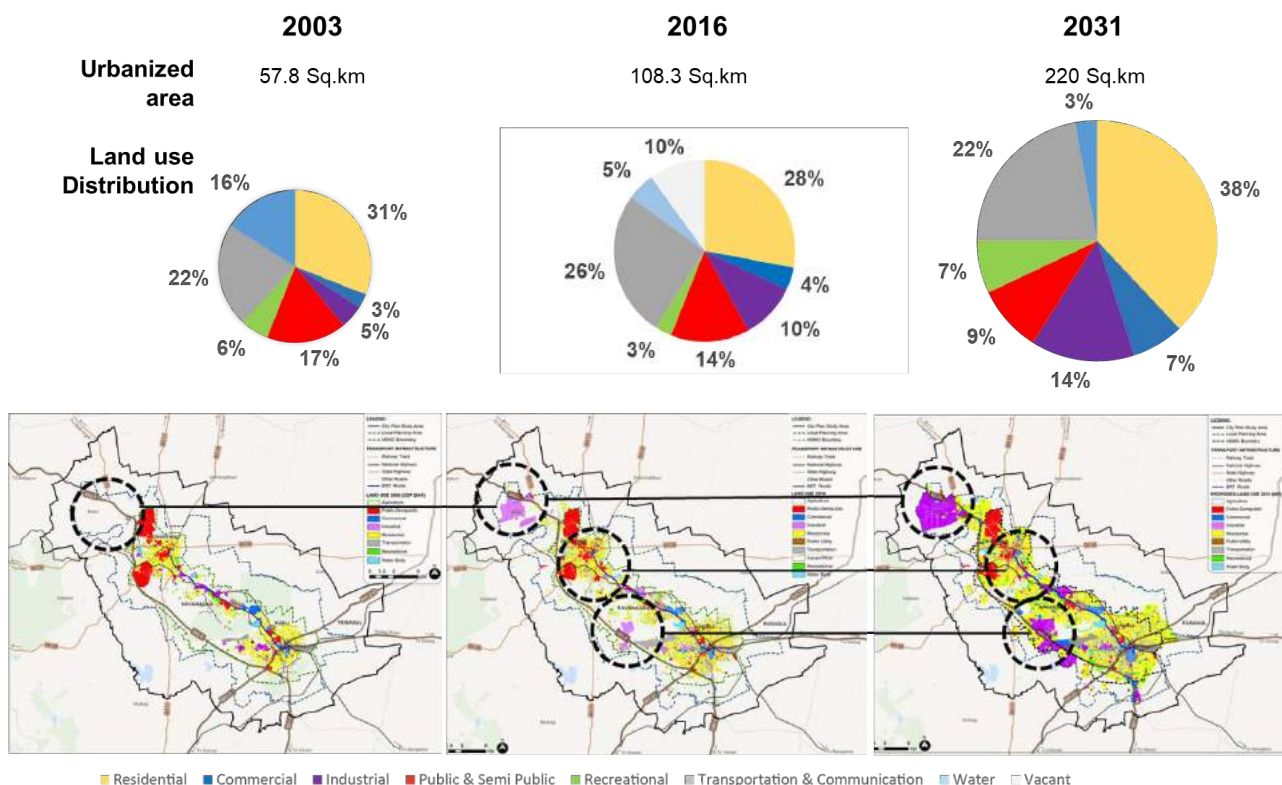


Figure 6: Land Use Changes from 2003 to 2016, and proposed changes in 2031

The land use allotted in the Proposed Master Plan 2031 for PSP and Recreational Uses is far short of URDPFI guidelines as seen below. It will therefore be essential to manage the need for essential amenities such as schools and open spaces through regulatory mechanisms.

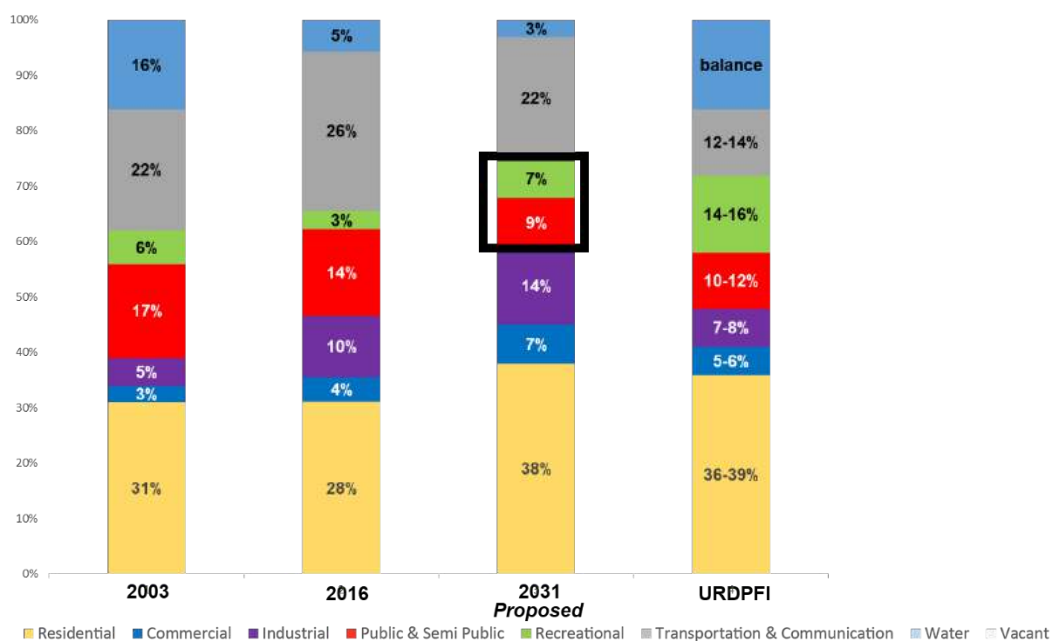


Figure 7: Land Use Distribution Comparison to URDPFI

Benefits of Land Use Compactness and Higher Density

A city that is easy to manage through adequate provision of physical infrastructure and essential amenities is one that is balanced in terms of compactness of land uses and density. Land uses that are mixed and within close proximity allow users to conduct maximum daily activities in short times. Higher densities create economic viability for a larger mix of uses within short distances, encouraging more activities in a smaller footprint of land.

The cost that city bears for infrastructure is directly dependent on density. A sparsely dense city, where infrastructure has to be distributed through large networks with very few beneficiaries is not economically viable. Conversely, in an overly dense city, the burden on infrastructure distribution systems may become prohibitive for adequate supply.

Overall the lesser land we urbanize, the more we leave open for natural processes that provide us essential resources such as food and water. However, finding the optimal land area is essential such that citizens may also maintain comfortable living standards.

1.4 Land Use and Density Scenarios

To define the optimal land area required for comfortable urban growth in Hubli Dharwad, 3 scenarios were considered:

- Scenario 1: This Scenario is adapted from the 2031 Master Plan assumptions. The assumed population density is maintained at 100 pph. Assuming that the residential area is 35% of the total urbanized area, the residential density works out to 63 du/ha.
- Scenario 2: The assumed population density in this scenario is considered 150 pph, which is closer to the URDPFI standard of 175 pph. In this scenario, residential area is 30% and mixed use is 10%, bringing the overall land available for residences to 40%, with a residential density of 83 du/ha.
- Scenario 3: The assumed population density in this scenario is considered 200 pph, which is higher than the URDPFI requirement. In this scenario, residential area is 25% and mixed used is 15%, bringing the overall land available for residences to 40%, with a residential density of 111 du/ha.

A summary comparison of the scenarios is seen below:

	As per HDUDA Master Plan (referred from UDPFI Guidelines)	Ideal scenario (from URDPFI guidelines for large cities ranging 5-10 lakh population)	Scenario 1	Scenario 2	Scenario 3
	2031	2031	2031	2031	2031
Mixed use (%)				10%	15%
Residential (%)	38.94%	36-39%	35%	30%	25%
Commercial (%)	7.47%	5-6%	10%	8%	8%
Industrial (%)	14.58%	7-8%	10%	10%	10%
Public/ Semi Public (%)	8.85%	10-12%	15%	12%	12%
Recreational (%)	7.52%	14-16%	10%	10%	10%
Transportation and Communication (%)	22.25%	12-14%	20%	20%	20%
Population as per MP 2031	2200000				
Population (as per City Plan)	1390048				
Density on urbanized land (pph)	100	175	100	150	200
Min. area req. (sq.km.)	139 (as per City Plan projection)	79.43	139	92.67	69.50
Max. Developed area req. (sq.km.)	220 (as proposed by Master Plan)	125.71	220	146.66	110
Developed Residential area (sq.km.)	85.67	30.98	48.65	37.07	27.80
Gross Residential Area Density (pph)	257	449	286	375	500
Dwelling Unit Density DUs/ Ha	57	100	63	83	111

Based on the above scenarios and considering the low demand and acceptance for high density living in Hubli-Dharwad, the recommended density for the city is 150 PPH. As per such density, the maximum area of development should be 146.66 sq km.

Because the HDUDA Master Plan 2031 is already provisionally approved, the opportunity to modify the conurbation extents is limited. However, land development can be prioritized through effective incentives and property taxation structures, such that only the 146.66 sq km is promoted for development. Failure in implementing such programs could lead to speculative and leap frog development, with higher infrastructure provision costs.

A summary of findings from the Land Use and Density Assessment is provided below:

Issues	Impacts
Limited reservation for PSP or open spaces	Can lead to very low quality of life
Large amount of land reserved for transportation infrastructure	Increase in impervious surface leading to heat island effect and increased surface water run-off
Low development density leading to poor utilization of land	Sprawling development patterns in peripheral areas leading to increasing trip lengths and use of personal mobility
Lack of prioritization of land development in the future	May lead to speculative and leapfrog development with higher infrastructure provision costs.

2 Review of Land Suitability based Conservation Needs and Market Demand

2.1 Land Suitability

The natural environment becomes an increasingly important element in the structuring of the future city. The critical biodiversity layer should be seen as a city asset that provides valuable environmental services and not merely as unused land available for development. Protecting these areas is not for the sake of conservation alone, but to make surrounding developed parts of the city more sustainable, livable and valuable. They should also be protected to maximize their intrinsic value in providing ecosystem services as green infrastructure, including supporting, provisioning, regulating and cultural services. Defining a conservation areas layer is done towards:

- Protecting high value areas beyond existing areas of settlement.
- Integrating natural ecological systems with urban development through green corridors and the extension of an urban open space network.
- Ensuring new development and redevelopment is cognizant of current environmental rules and regulations.
- Extending the role of the public environment, through streets and public spaces, in a broader, integrated, open space network.
- Maximizing the value of ecosystem services.

The natural and environmentally sensitive areas in Hubli-Dharwad are identified using measurable grades for the environmental values listed below:

- **Nutrient Management Services**-This parameter focuses on the nutrient resource capacity to nurture ecological services and natural cover. Identifying these areas would help to preserve them for forests and ecological uses, that aid in preserving water and food resources as well as promotes carbon sequestration
- **Water Resource Capability** - This parameter focuses on water resources. It is intended to help identify areas with the highest potential to store and preserve water to allow meeting future needs.
- **Agricultural Productivity**- The areas which are highly fertile and suitable for agriculture are considered for conservation from an urbanization perspective, where future urban growth should not be promoted. These areas need to be preserved for future food security.
- **Flood Vulnerability**- This parameter includes the study of various environmental features that impact floods, primarily including like slopes, soil, and drainage patterns. This is to understand the susceptibility of a region to degradation including soil erosion, waterlogging, soil contamination etc. as it has a direct impact on the development potential of the site and cost of construction.

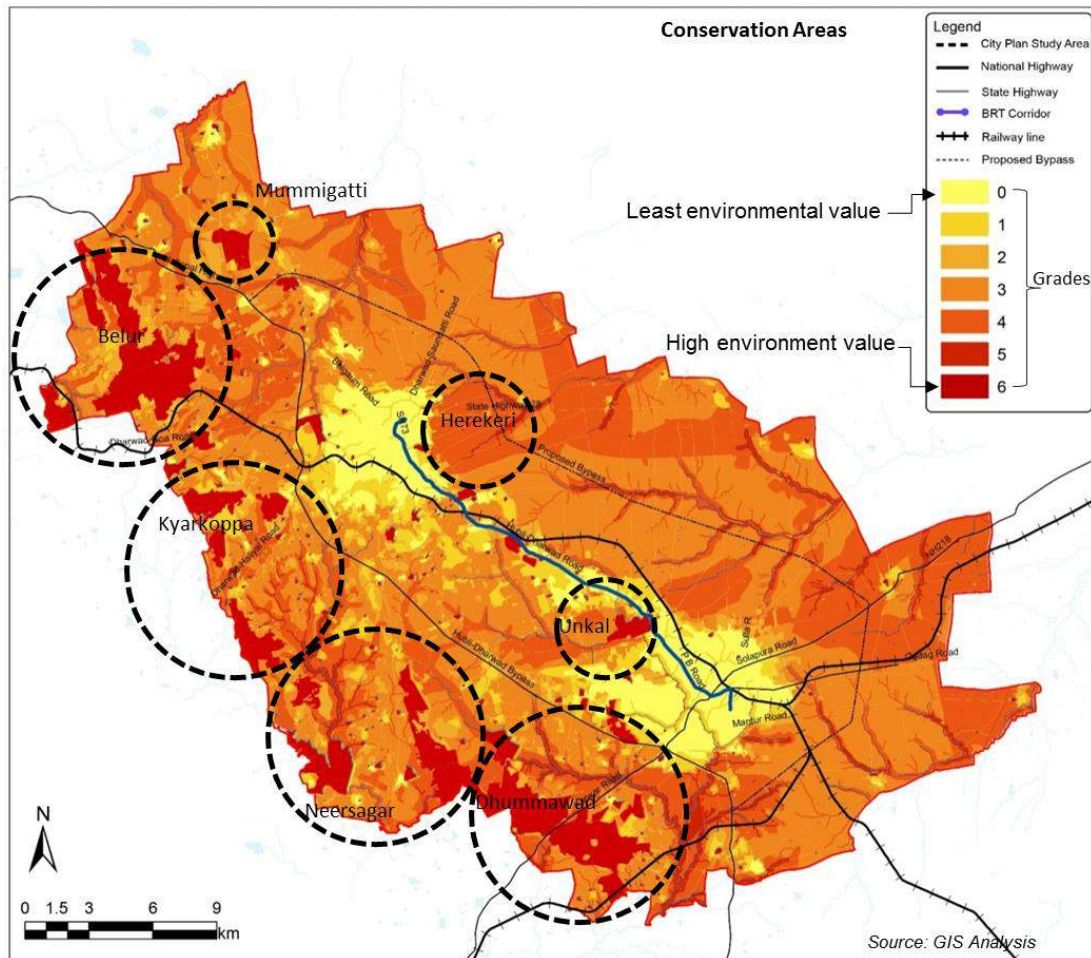
The table below lists all the conservation parameters, Criteria and their weightages based on the Analytical hierarchical process (AHP). Each parameter, the defined buffers or area of influence, scores and weightage is described in further detail in the following section.

Table 1: List of Conservation Parameters

PARAMETER	CRITERIA	SUB-CRITERIA	THRESHOLDS	CALCULATED WEIGHT (AHP)
Nutrient Management Services	Soil Type	Soil Fertility	High to low	35%
		Soil Depth	Deep to shallow	

PARAMETER	CRITERIA	SUB-CRITERIA	THRESHOLDS	CALCULATED WEIGHT (AHP)
	Land cover	Settlements and open scrub land	Low capacity	
		Forest plantation and farm lands	Moderate capacity	
		Forest cover and water bodies	High capacity	
	Forest area buffers	Buffers around reserved forests	100m buffers	
Water Resource Capability	Watershed capacity	Watershed area capacity	High to low volume of water holding capacity	35%
		Drainage density	High to low length of drain per sq.km.	
		Contours	Low elevation = more potential	
		Green cover	% of green cover within watershed	
	Water System Capacity	Soil depth	Deep to shallow	
		Soil porosity	Clayey - high; gravel - low	
		Streams	Low order – 30m buffer High order- 100m buffer	
		Land cover	Forest and water bodies – highest capacity Settlements have lowest capacity	
Agriculture	Soil	Soil fertility	High to low	19%
	Irrigation potential	Canal	1 km buffer	
		Ground water level	<10 m depth	
	Land cover	Areas under cultivation		
Vulnerability to floods	Flooding streams and impact area		100m buffer	11%
	Contours		Low elevation = more vulnerable	

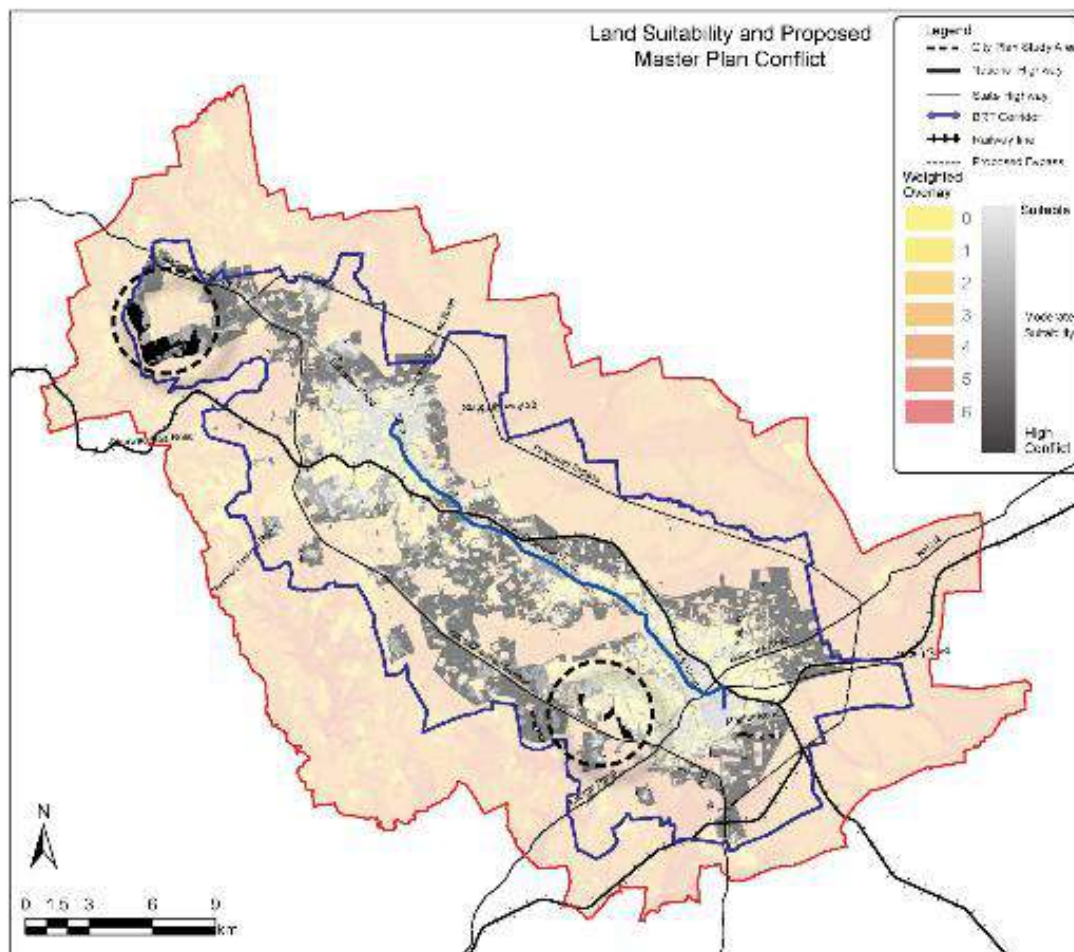
Map 1 illustrates the conservation areas in Hubli Dharwad. The colour coding used to depict the sensitivity of these conservation areas ranges from yellow to dark red. The colour codes are based on the grades calculated from land suitability analysis.



Map 1: Identification of conservation areas

As shown on Map 1 areas falling in the categories beyond grade 3 are critical areas in terms of their environmental sensitivity and have high environmental values. Areas shown as grade 6 are no development areas because they possess high environmental sensitivity. These areas are identified based on the land suitability analysis.

The map below shows the result of overlaying the conservation suitability map over the proposed land use. Most proposed areas are seen to be in moderately suitable areas, with few exceptions that are highlighted. These maps will also form the basis of the spatial framework that guides the city and its planners on the direction for growth.

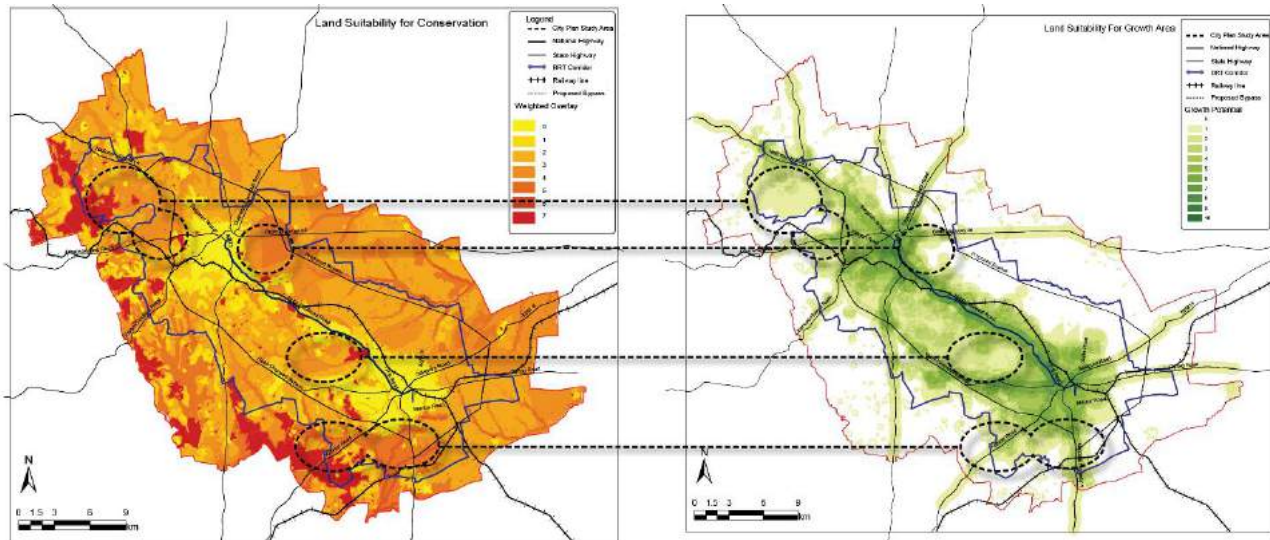


Map 2: Land Suitability and Proposed Master Plan Conflict

Building off the land capability (conservation) analysis, the growth opportunities for the city were also mapped, primarily considering the following parameters:

PARAMETER	CRITERIA
Accessibility	BRT corridor, arterial road, major transport nodes
Employment nodes	Industrial nodes, commercial nodes, institutional nodes
Infill Potential	Existing built up buffer, FAR intensification potential
Physical infrastructure availability	Municipal infrastructure availability, access to water supply

In many areas land suitable for conservation also conflicted with land suitable for growth. The presence of transportation networks near natural areas is the main reason for such conflicts. It is imperative, therefore to not consider all and any land that lies along a highway or rail corridor as developable land. **A conservation layer thus needs to be defined that supersedes all other zoning regulations for the larger area.**

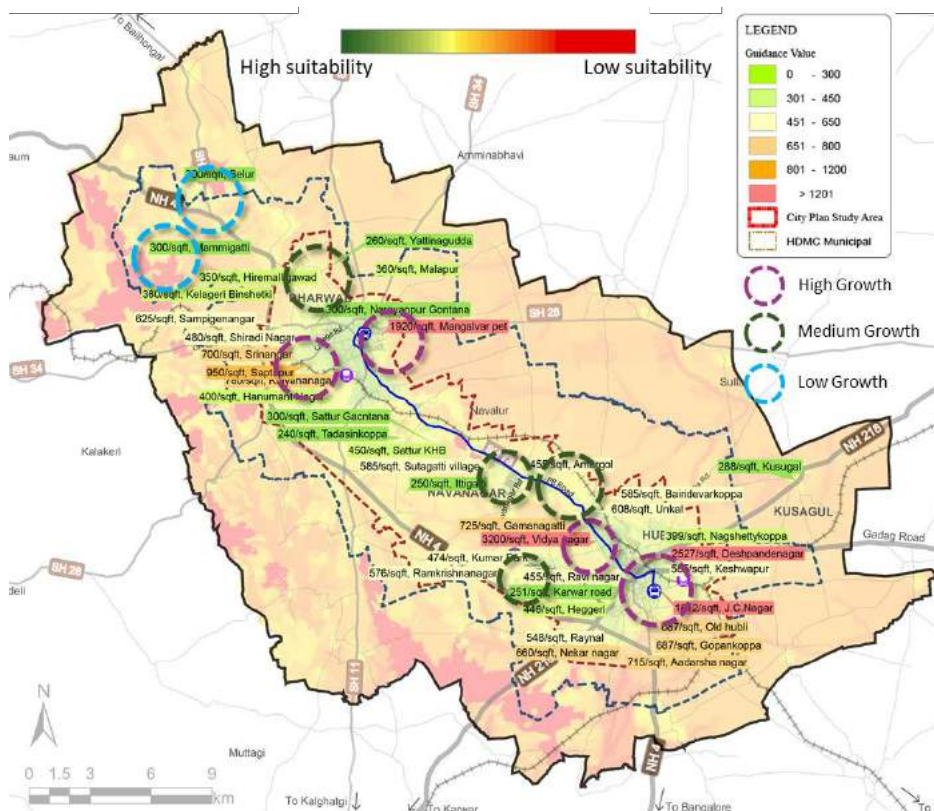


Map 3: Land Suitability Comparison of Conservation and Growth Areas

2.2 Land Demand

In areas where conservation needs conflict with growth needs, there is a need to look at the demand for land from the perspective of the real estate market. The comparative market valuation of land helps to identify areas with existing economic demand. This helps prioritize growth areas further, whereas the availability of vacant land and government-owned land allows to prioritize land based on realistic development potential.

The guidance values of land as received from the Deputy Director of Land Records, Dharwad are mapped and overlaid over the land suitability map in the map below. Guidance values are used as an indicator of market demand due to potentially higher economic opportunities or access to better facilities and infrastructure.



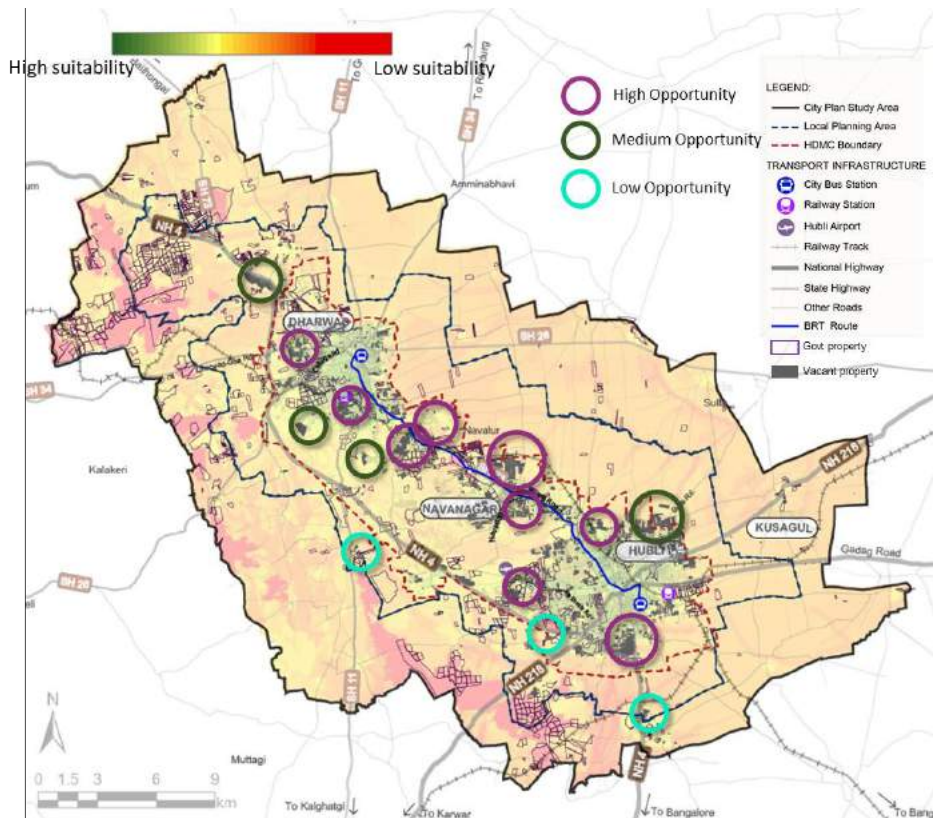
Map 4: Guidance Values across the City (Source: DDLR 2017)

The following high, medium, and low demand areas are derived from this overlay analysis.

High Demand	Medium Demand	Low Demand
J.C Nagar	Yattinagudda	Belur
Deshpandenagar	Bairidevarkoppa	Mammigatti
Mangalvar pet	Unkal	Satur KHB
Saptapur	Amargol	
Vidya nagar	Ramkrishnanagar	
Old Hubli	Sutagatti village	
Kanwar road	Yattinagudda	
Heggeri	Hiremalligawad	
Sampigenangar		
Saptapur		
Kalyananagar		
Srinangar		
Shiradi Nagar		
Mangalvar pet		

2.3 Development Opportunities

Land development opportunities are mapped based on the availability of vacant lands and availability of Government-owned land. It is assumed that land that is vacant at present or is currently held by a Government body will be easy to acquire and plan in a comprehensive manner. Vacant or government owned lands in higher suitability areas are considered to have higher opportunities.



Map 5: Land Development Opportunities

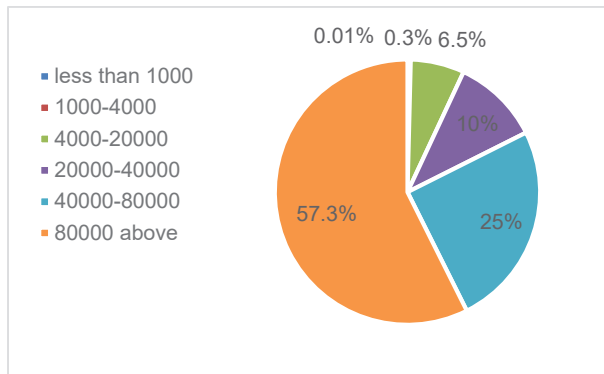


Figure 8: Plot Size distribution of Opportunity Plots

The distribution of available plots as per their sizes is seen above. This indicates that a large number of opportunity lands are larger than 80,000 sq km, which is conducive for development.

Overlaying the land suitability analysis with a mapping of opportunities driven by economic opportunities, market demand and land availability, a spatial understanding of what may be considered as high growth potential and what may be considered as low growth potential emerges. This is illustrated in the map below. This map forms the basis of the Spatial Vision described in Chapter 7. **The Spatial Vision helps to identify the preferred areas suggested as Zone A and Zone B, as per the Master Plan definition.**

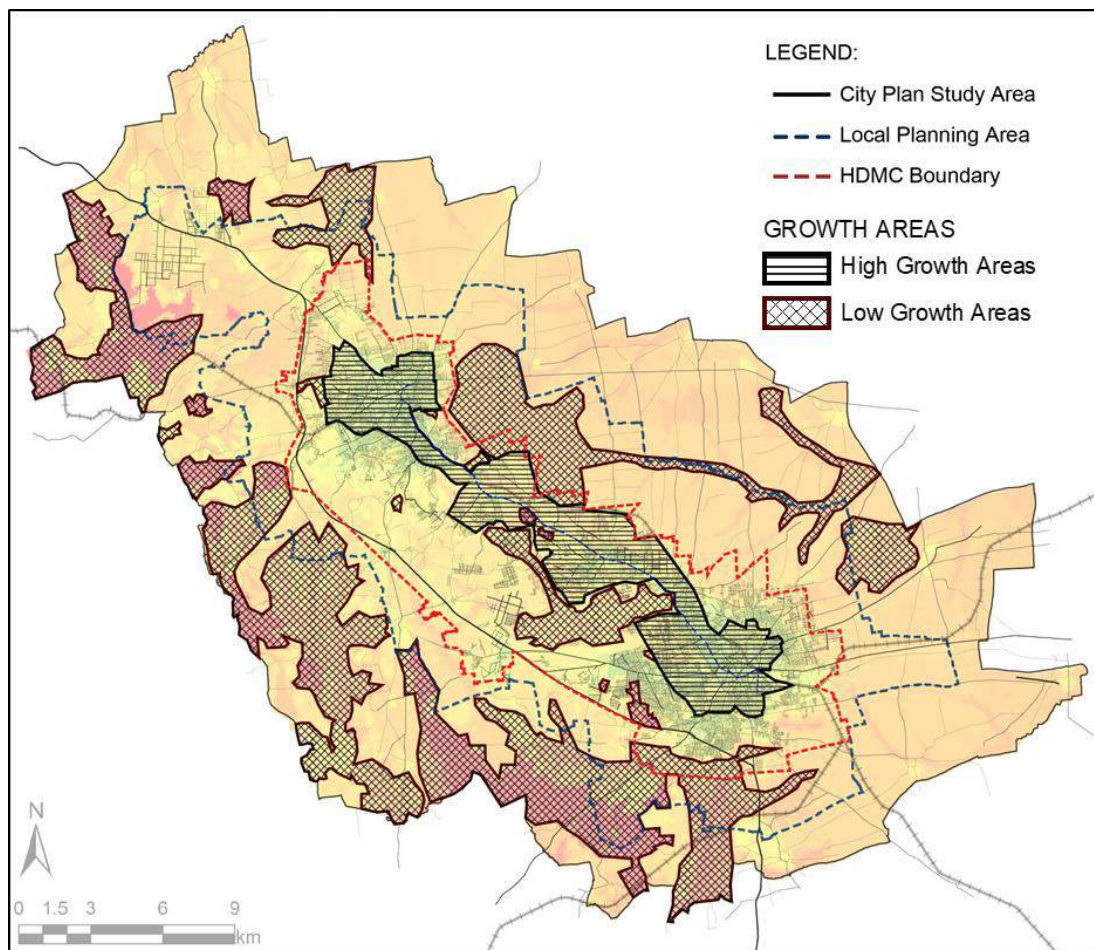
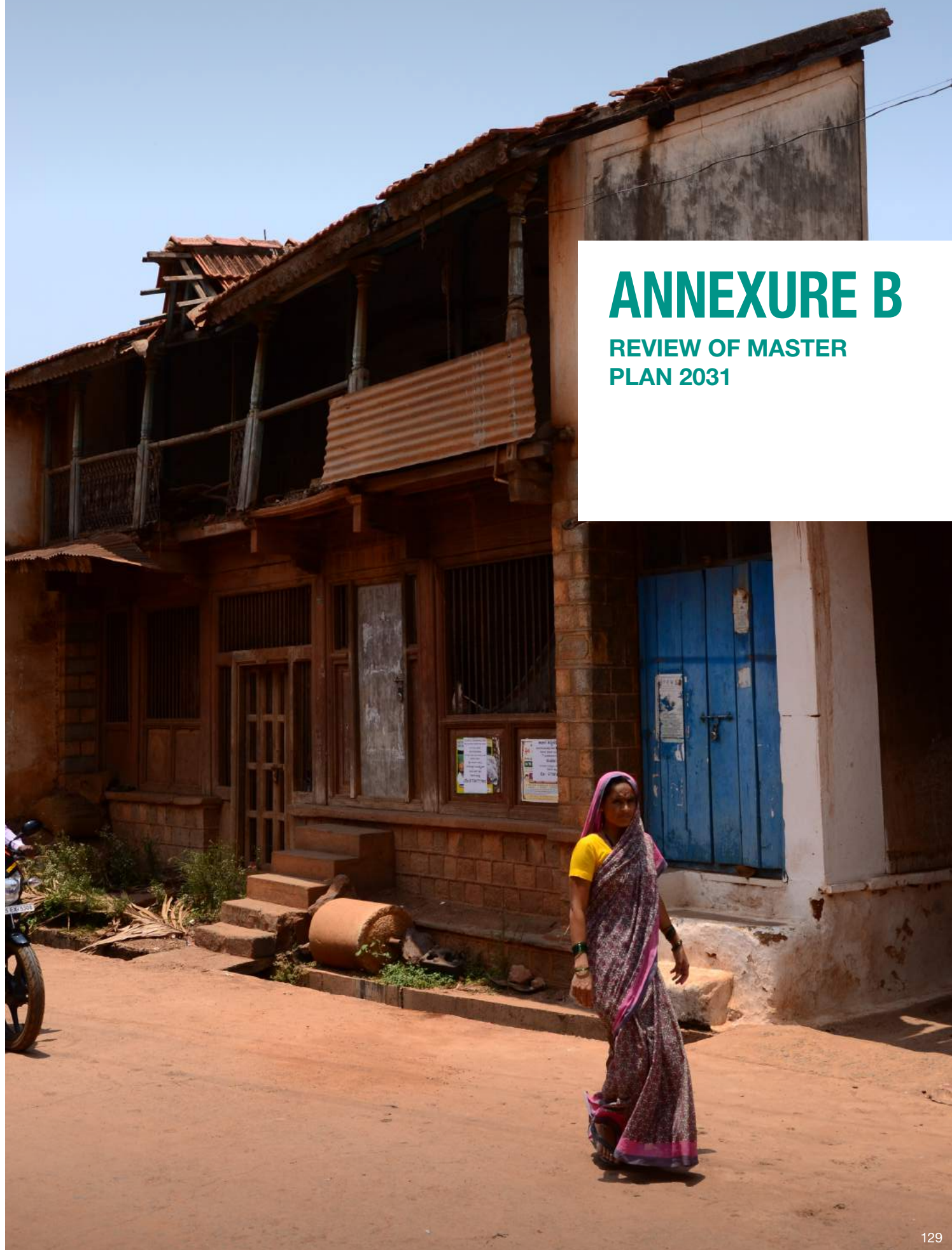


Figure 9: High Growth and Low Growth Potential Areas

ANNEXURE B

REVIEW OF MASTER PLAN 2031



1 Inconsistencies between Land Use Plan and Zonal Regulations

There are inconsistencies evident between the spatial demarcation of land uses in the Proposed Land Use Plan, 2031 and the Zonal Regulations (ZR). This can lead to ambiguity and cause confusion in on-ground enforcement of these regulations. To ensure that formulated plans are followed, it must be made mandate that the zonal regulations be consistent with the Master Plan 2031.

1.1 Proposed Land Use

Section 11 of the Zonal Regulations provides differential regulations for different types of land use zones including:

- Residential (Main)
- Residential (Mixed)
- Commercial (Central)
- Commercial (Business)
- Industrial – (General)
- Public and Semi-Public (P&SP)
- Transportation and Communication (T&C)
- Public Utilities (PU)
- Parks and Open Space

However, the land use zones marked spatially in the Proposed Land Use Plan, 2031 can be seen in Figure 1 below.


















PROPOSED LANDUSE - 2031				
EXISTING	PROPOSED	LANDUSE	AREA (IN HECT.)	PERCENTAGE %
		RESIDENTIAL	8573.54	38.94
		COMMERCIAL	1645.30	7.47
		INDUSTRIAL	3210.75	14.58
		PUBLIC & SEMI PUBLIC	1949.57	8.85
		PARK, OPEN SPACE & BURIAL GROUND	1654.96	7.52
		PUBLIC UTILITIES	85.49	0.39
		TRANSPORTATION & COMMUNICATION	4899.35	22.25
CONURBATION AREA			22018.96	100.00
		EXISTING DEVELOPMENT AREA OF VILLAGES & RURAL POCKETS	360.37	
		WATER SHEET	734.59	
		AGRICULTURE	17094.08	

Figure 1: HDUDA Proposed Land Use Plan Legend

1.2 Lack of Spatial Demarcation of Zone A & B

The local planning area (LPA) is conceptually organized into two rings i.e. Zone A, and Zone B, for the purpose of regulating building form. Section 1.5 of the document describes Zone A as *an Intensely Developed Area*, whereas other areas fall under Zone B category. However, Zone A is not spatially demarcated in the Proposed Land use Plan, 2031, leading to ambiguity on allowable building form in the city.

1.3 Existing Land Use Plan does not show Forest Land

The HDUDA Master Plan 2031 shows all land outside of the Conurbation Boundary as Agriculture Zone. However, as per the Forest Department Working Plans, many forested areas, including reserved forest areas exist within the LPA. These are not shown in the HDUDA Land Use Plan. As per the Forest (Conservation) Act 1980, the primary objective of forest reservation is to enable judicial protection of these areas and not allow revenue generating activities. The potential of human-animal conflict also exacerbates if development is allowed within close proximity of forest areas. It is thus essential to mark these lands separately in the Master Plan as inhabitable areas, to protect them from deforestation and future urbanisation.

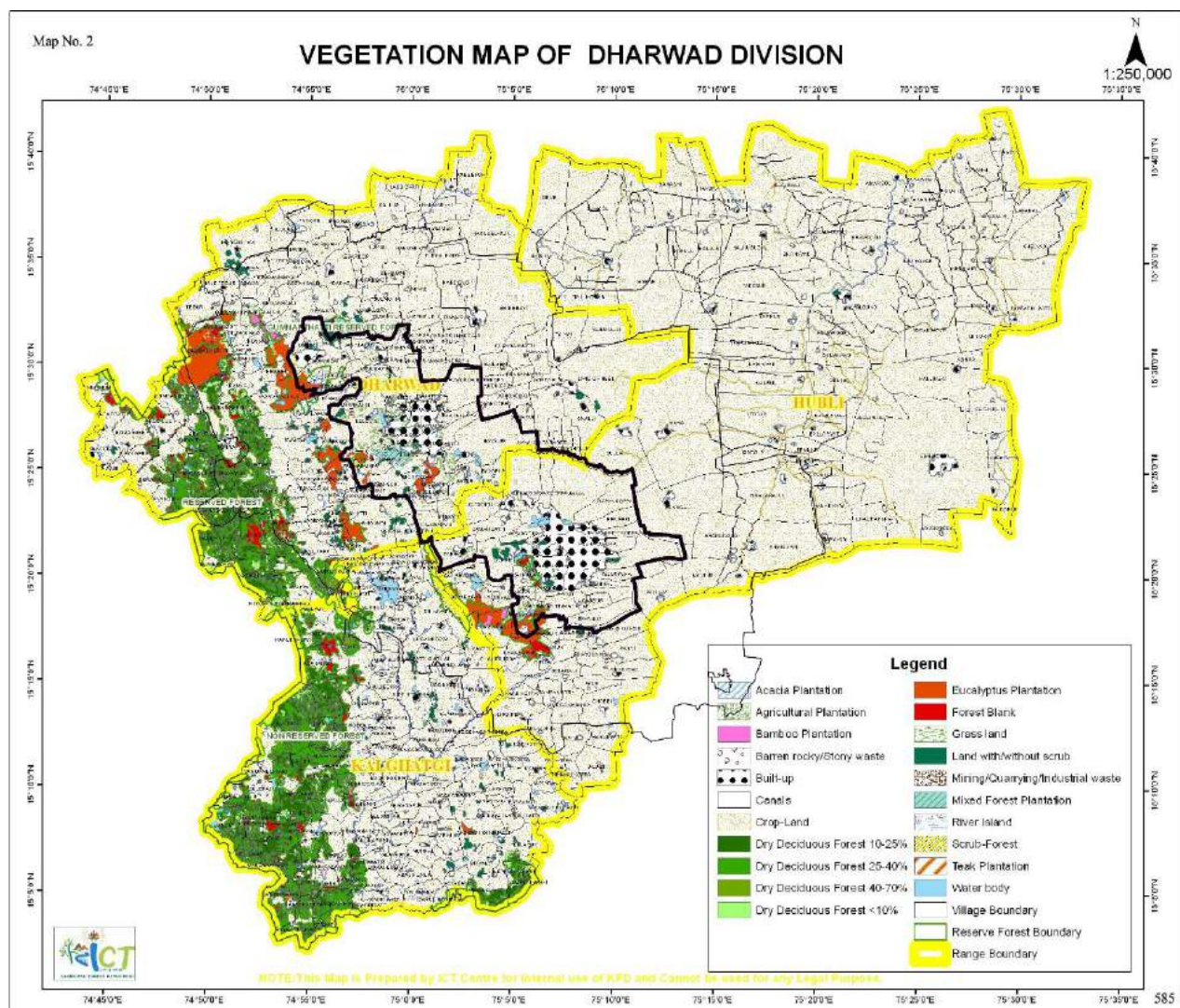


Figure 2: Forest Department Dharwad Division Forest Vegetation Map overlapped with LPA boundary

1.4 Gaps in Regulations for Areas of Special Control

The *HDUDA Master Plan 2031* suggests areas of 'Special control' to be established to allow for the context responsive development. It suggests the following zones to be marked as 'Areas of Special Control' which includes:

- **Heritage control area-** It provides regulations for any development/redevelopment of buildings within the area surrounding the heritage monuments.
- In addition to this, the *HDUDA Master Plan 2031* also specifies regulations for other zones such as **No Development Zone, Air Funnel Zone, and Housing for All Areas.**
- **TOD zone-** It states the permissible and prohibited land uses for the areas within this zone. It also provides special regulations with respect to plot coverage, permissible FAR, and road width for different plots area within the TOD zone.

The Special Control Regulations are reviewed below.

1.5 Heritage Area Regulations

Section 5 of the *HDUDA Provisional Master Plan 2031 Zonal Regulations* defines “*ancient monuments and structures of heritage value, religious artifacts, as declared by the govt., as protected monuments or heritage monuments, under Ancient monuments and Archaeological Sites and Remains Act or Heritage Regulation Act.*” In addition, the Zonal Regulations defines the 'Prohibited' and the 'Regulated zones' around the protected/heritage monuments. It states that the development/ redevelopment in these zones should be in accordance with the “**Ancient and Historical Monument and Heritage Sites and Remains Act, 1961**”. The following gaps are identified in the Heritage Regulations:

1. Heritage Buildings, including ASI Monuments and State Protected Monuments are not defined in *Section 3: Technical Terms and Definitions of the HDUDA Master Plan 2031 Zonal Regulations*. In addition to the state protected monuments, Hubli-Dharwad also has three ASI protected monuments, which are not identified in the Proposed Land Use Plan 2031.
2. Though the ZR define the 'Prohibited' and 'Regulated zones' around the protected monuments, these “zones” are not delineated in the Proposed Land Use Plan 2031.
3. The ZR suggests development or redevelopment to follow detailed guide lines/ regulations provided by the Archaeological department according to ancient and historical monument and heritage sites and remains Act 1961, which is not in accordance with the Ancient Monuments and Archaeological Sites and Remains Act (or AMASR Act) 2010.
4. The ZR also suggests that all development or redevelopment are subject to NOC by the competent authority, but it fails to provide clear guidance on the competent authority.

1.6 Environment Specific Regulations

The *HDUDA Master Plan 2031 – Land Use Plan and Zonal Regulations* provides considerations or regulations for environment-related controls around natural features like lakes and water streams, but not for forests. The buffer regulations also vary between ZR and the land use plan. Many city master plans provide for no development zones (Greater Mumbai Development Plan) or conservation areas (Bangalore Metropolitan Region Development Authority Structure Plan) to ensure conservation of eco-sensitive areas.

Some key areas of concern include:

1. Lakes and Streams:

Unkal Lake, Navalur Lake, Kelagiri Lake, Nuggikeri Lake, Herekeri Tank are some of the existing lakes within the twin cities. Dharwad was once known for its lakes, however some of these, such as Navalur Lake, are drying out, leading to concern over hydrological conditions of the city.

Development around lakes need to be either prohibited or regulated so as not to pollute/ negatively affect the watershed and dependent areas. The 'Karnataka State Action Plan on Climate Change, 2012' specifically calls out the need to develop plans and strategies for lake conservation and prevention of overexploitation of water, in accordance with objectives of the 'National Water Mission' and 'National Lake Conservation Programme'. MoUD's Advisory on Conservation and Restoration of Water Bodies in Urban Areas, 2013 also states that the land around the lake at a certain distance from its shore-perimeter should be declared as eco-sensitive area, and dumping of any solid waste into these areas should be considered as a punishable offence. Master Plan 2031 (ZR and the land use plan) provides buffer regulations around water bodies. However some ambiguity are observed, as discussed below:

- a. Multiplicity of norms for buffer dimensions in ZR (varying in Section 3.70, Section 6.3 and Section 11.9) and land use plan as provided in the following table.

	ZONAL REGULATION	LAND USE PLAN	NGT, BANGALORE																
Lakes / Tanks	b. 30-50m from the edge of water bodies (Section 6.3) c. Section 11.9: <div> <p>Table No. 11-8: Categories of tanks/lakes.</p> <table> <tr> <th>Sl. No</th><th>Tank/lake area</th><th>Category</th><th>Buffer all round (in m)</th></tr> <tr> <td>1</td><td>Up to 4 Ha</td><td>A</td><td>10 m</td></tr> <tr> <td>2</td><td>Above 4 Ha up to 20 Ha</td><td>B</td><td>20 m</td></tr> <tr> <td>3</td><td>Above 20 Ha</td><td>C</td><td>30 m</td></tr> </table> </div>	Sl. No	Tank/lake area	Category	Buffer all round (in m)	1	Up to 4 Ha	A	10 m	2	Above 4 Ha up to 20 Ha	B	20 m	3	Above 20 Ha	C	30 m	50m from the edge of water body as shown in the land use plan	75m from the edge of water bodies (Clause 1.i., page 4)
Sl. No	Tank/lake area	Category	Buffer all round (in m)																
1	Up to 4 Ha	A	10 m																
2	Above 4 Ha up to 20 Ha	B	20 m																
3	Above 20 Ha	C	30 m																
Water Stream / storm	d. 6m (Section 6.3) e. 3m, 6m and 9m for primary, secondary, and tertiary drains / valleys (Section 3.70)	3m, 6m and 9m for primary, secondary, and	50m, 35m and 25m for primary, secondary, and																

	ZONAL REGULATION	LAND USE PLAN	NGT, BANGALORE
drains / nullah	f. 5m, 8m and 10m for primary, secondary, and tertiary natural valleys (Section 11.9)	tertiary drains / valleys as shown in the land use plan	tertiary rajkalewas (Clause 1.i., page 4)

2. **Forests:** *The Environmental Protection Act, 1986* sets out objectives to protect and improve the ecological environment. It empowers the Central Government to establish authorities charged with the mandate of preventing environmental pollution. The *Karnataka State Forest Department* also sets out policy objectives for preservation of forests in the state. As per information from the Forest Department - Dharwad Division, there is land earmarked under Reserved Forests in Mommigatti, Kedennath, Rayanal and Anchateri villages. Following are key concerns:
- These forest areas are not marked in the HDUDA Master Plan 2031 - Existing or Proposed Land Use Maps. Such dereservation of these forests allows for development in forest areas.
 - There are no provisions to regulate the development around the forest ecosystem so as to prevent further degradation of these forests. Such potential conflicts between land use allocation within the LPA and impact on the forest areas bordering the LPA boundary are not given due consideration in the Master Plan.

1.7 Air Funnel Zone Regulations

The HDUDA Master Plan Zonal Regulations provides height restrictions near “aerodrome” area for International Civil Airports and Other Civil Airports. It also provides land use restrictions within 10 km radius of the Aerodrome reference point. However, following are the key concerns:

- The aerodrome area or reference point are not identified on the Land Use Plan.
- Also, more context-specific information is needed to determine the height restrictions around Hubli Airport, in accordance with the Gazette Notification of Ministry of Civil Aviation (Height Restrictions for Safeguarding of Aircraft Operations) Rules, 2015.

1.8 Housing Regulations

The following ambiguities were observed in housing regulations in the HDUDA Master Plan 2031:

- The HDUDA Master Plan 2031 Land Use Plan proposes areas for ‘Housing for All’ (HFA). However, no information or regulations related to the HFA Program is provided in the Zonal Regulations. The correlation between HFA and Slum Redevelopment is also ambiguous, and it is not evident if slum redevelopment can be accommodated in HFA areas.

2. The HDUDA Master Plan 2031 Zonal Regulation include regulations for the development/re-development of slums in terms of setbacks, plot coverage, allowable FAR as well as permissible land uses. A standard FAR of 3.00 is allowable, irrespective of existing FAR, location, plot size and road width. This may lead to the following situations:
 - a. Slum Redevelopment near the HDBRTS Corridor will not be able to reap the incentives available to other plots along the corridor.
 - b. All slum dwelling units may not be able to be accommodated within the allowable FAR of 3 in otherwise dense areas.
 - c. With less incentive to develop larger plots, there will be less opportunity to design well-laid out street network or integrated communities with provision of anganwadis and other essential amenities.
3. Slum regulations do not provide details on the minimum percentage of slum dwellers that would need to be accommodated within the existing slum plot or within a given distance of the original location. Such protections would allow private developer entities (DE) to also participate in Slum Redevelopment.

2 Issues in TOD Zone Demarcation

The special regulations for Transit Oriented Development are intended to be provided to areas within walking distance of the corridor to incentivize high density growth that can take advantage of transit and reduce reliance on private vehicles. The HDUDA Provisional Master Plan 2031 identifies a **special BRT impact area which is 500m on either side of the BRT corridor**, and is earmarked as the TOD zone. Some issues with the current delineation are identified below:

- The core areas of Hubli and Dharwad in the vicinity of the respective CBTs are not included in the TOD Zone.
- Lake areas such as Unkal Lake and Navalur Lake are being cut by the current TOD Zone boundary.
- The presence of existing railway stations in close proximity is not considered in the current delineation.
 - the areas between Unkal Lake and Bairidevarakoppa BRT stations and Unkal Railway station, and
 - Areas between Vidyagiri, Toll Naka, and Bagalkot Petrol Pump and Dharwad Railway Station.
- In some cases the TOD Zone boundary is not following any physical feature such as road network or property boundary and cuts across property.
- Large land parcels under single ownerships and vacant / agricultural lands are partially included, such as:
 - APMC land between the current boundary and the railway line
 - Industrial land near Navalur Station
 - Agricultural lands located south of Navalur Village.

These issues and recommendations in the TOD Zone boundary are shown in the below figure.

3 Review of Urban Form Regulations

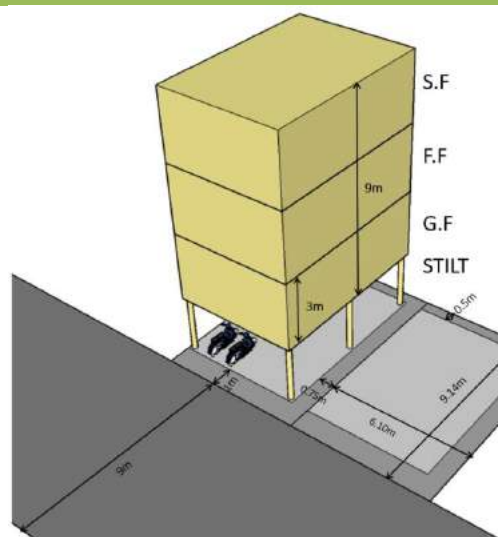
The Urban Form Regulations proposed in the HDUDA Master Plan 2031, including FARs, Setbacks, and Ground Coverage are reviewed in this section. A comparative volumetric study is carried out to enable a better understanding of the differences in the existing and proposed urban form corresponding to relevant FAR and setback norms. The conclusions will help in suggesting changes to the FAR and setback norms in the Master Plan. The volumetric analysis is carried out separately for residential and commercial properties for different types of plot sizes up to 4,000 sqm area.

For the TOD Zone, the analysis is based on potential recommendation that emerge from the analysis of the residential and commercial regulations.

3.1 Residential DCR Evaluation

3.1.1 Plot Size Range: Up to 250sqm

CASE 1: PLOT SIZE = 55 SQM (EQUIVALENT TO HOUSING BOARD LIG PLOT = 20'X30')



Resultant Building Form

A. PLOT DETAILS

Plot size	55 sqm (6.10m X 9.14m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	1.0m
Setback- Back (8% or min 1m)	0.5m
Setback- Side 1 (8% or min 1m)	0.0m
Setback- Side 2 (8% or min 1m)	0.75m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

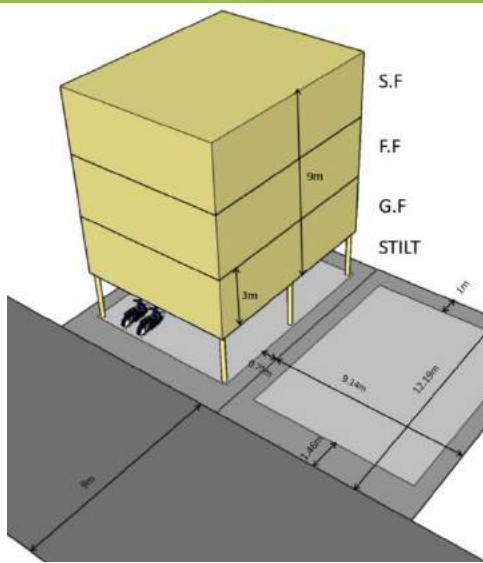
C. ANALYSIS

Net Plot Area Available (leaving setback)	40.87 sqm
No of Floors Built	3
Area of Each Floor Plate	40.87 sqm
Total Built up used	122.62 sqm
Ground coverage used	73%
Total FAR used	2.20

D. CONCLUSION

Maximum FAR for this plot	2.20
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 2: PLOT SIZE = 111 SQM (EQUIVALENT TO HOUSING BOARD MIG PLOT = 30'X40')



Resultant Building Form

A. PLOT DETAILS

Plot size	111 sqm (9.14m X12.19m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

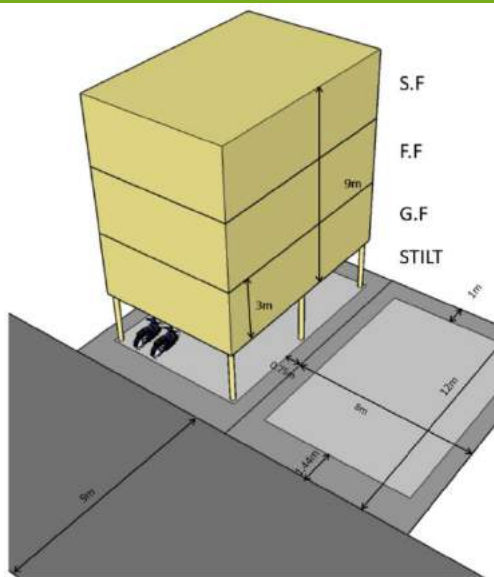
Setback- Front (12%)	1.46m
Setback- Back (8% or min 1m)	1.0m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

C. ANALYSIS

Net Plot Area Available (leaving setback)	71.88 sqm
No of Floors Built	3
Area of Each Floor Plate	71.88 sqm
Total Built up used	215.65 sqm
Ground coverage used	65%
Total FAR used	1.94

D. CONCLUSION

Maximum FAR for this plot	1.94
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 3: PLOT SIZE = 222 SQM (EQUIVALENT TO HOUSING BOARD HIG PLOT = 40'X60')


Resultant Building Form

A. PLOT DETAILS

Plot size	222 sqm (12.19m X18.29m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.19m
Setback- Back (8% or min 1m)	1.46m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

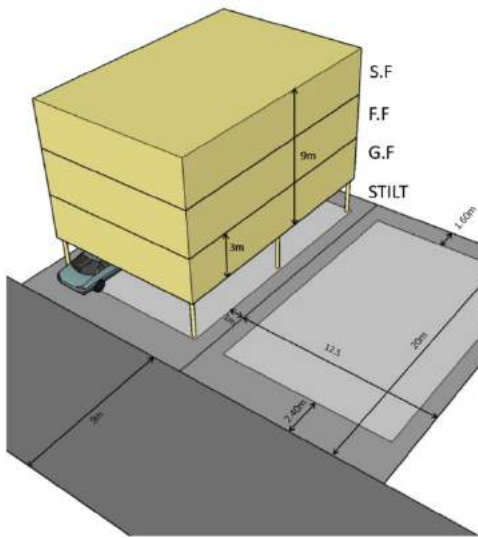
C. ANALYSIS

Net Plot Area Available (leaving setback)	149.10 sqm
No of Floors Built	3
Area of Each Floor Plate	149.10 sqm
Total Built up used	447.30 sqm
Ground coverage used	67%
Total FAR used	2.01

D. CONCLUSION

Maximum FAR for this plot	2.01
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 4: PLOT SIZE = 250 SQM



Resultant Building Form

A. PLOT DETAILS

Plot size	250 sqm (12.5m X20.0m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.46m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

C. ANALYSIS

Net Plot Area Available (leaving setback)	168 sqm
No of Floors Built	3
Area of Each Floor Plate	168sqm
Total Built up used	504sqm
Ground coverage used	67%
Total FAR used	2.02

D. CONCLUSION

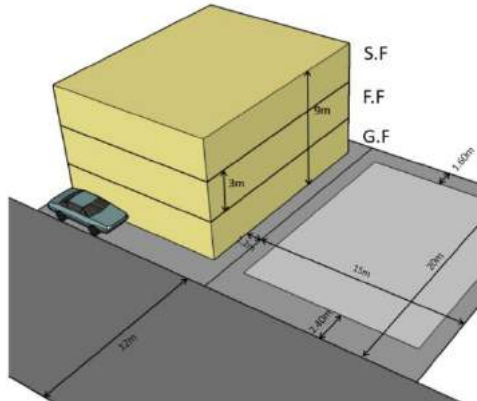
Maximum FAR for this plot	2.02
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

Inferences for plot sizes up to 250 sqm

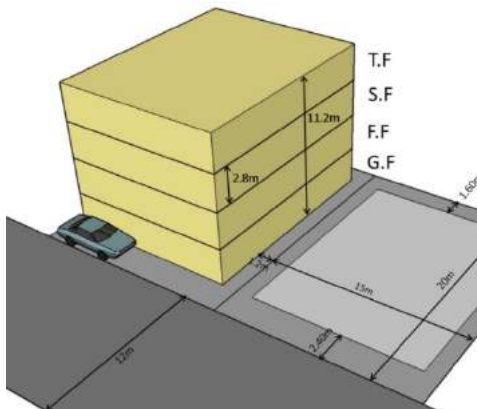
- DCR Limitations for these plots:
 - Building height = 11.5m or Stilt+GF+2 floors (whichever is less)
 - Maximum DU to be accommodated = 1.00
- Ground Coverage:
 - Due to set back regulations, 75% ground coverage is not achievable.
- FAR Utilization:
 - Maximum FAR that can be absorbed = 2.20
 - Premium FAR not advisable for this category.

3.1.2 Plot Size Range: 250sqm to 500sqm

CASE 1A: PLOT SIZE = 300 SQM (TOTAL HEIGHT = 11.5M)



Resultant Building Form of C1 Analysis



Resultant Building Form of C2 Analysis

A. PLOT DETAILS

Plot size	300 sqm (12m X 15m)
Abutting Street	12m

B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.6m
Setback- Side 1 (8% or min 1m)	1.2m
Setback- Side 2 (8% or min 1m)	1.2m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.5
Building Height	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

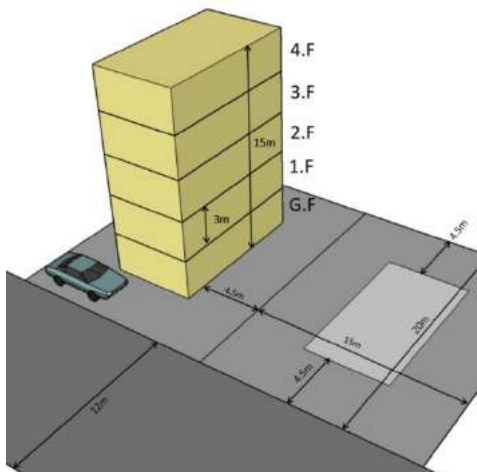
C1. ANALYSIS

Net Plot Area Available (leaving setback)	201.6 sqm
No of Floors Built	3
Area of Each Floor Plate	195sqm
Total Built up used	585sqm
Ground coverage used	65%
Total FAR used	1.95

C2. ANALYSIS

Net Plot Area Available (leaving setback)	201.6 sqm
No of Floors Built (Considering floor to floor height 2.8m, as setback increases beyond 11.5m height)	4
Area of Each Floor Plate	195sqm
Total Built up used	780sqm
Ground coverage used	65%
Total FAR used	2.6

CASE 1B: PLOT SIZE = 300 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form of C3 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5m and above up to 15.0m)	4.5m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.5
Building Height	15.0m

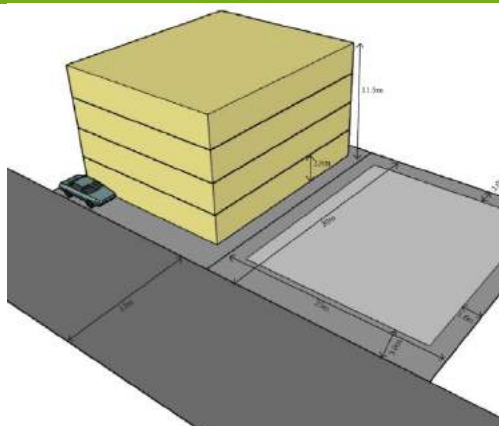
C3. ANALYSIS

Net Plot Area Available (leaving setback)	66.0 sqm
No of Floors Built	5
Area of Each Floor Plate	66.0sqm
Total Built up used	330.0sqm
Ground coverage used	22%
Total FAR used	1.10

D. CONCLUSION

Maximum FAR for this plot	2.6
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 2A: PLOT SIZE = 500 SQM (TOTAL HEIGHT = 11.5M)



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	500 sqm (20m X25m)
Abutting Street	12m

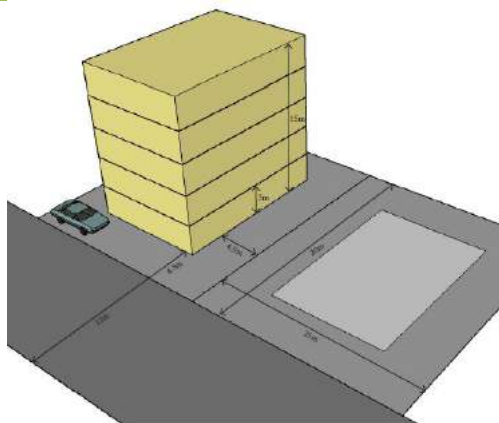
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	3.0m
Setback- Back (8% or min 1m)	2.0m
Setback- Side 1 (8% or min 1m)	1.6m
Setback- Side 2 (8% or min 1m)	1.6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.5
Building Height	11.5m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

C1. ANALYSIS

Net Plot Area Available (leaving setback)	336.0sqm
No of Floors Built	4
Area of Each Floor Plate	325.0sqm
Total Built up used	1300.0sqm
Ground coverage used	65%
Total FAR used	2.60

CASE 2B: PLOT SIZE = 500 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5m and above up to 15.0m)	4.5m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.5
Building Height	15.0m
Multi dwelling units (Apartments) shall be allowed only on plot sizes of above 500 sqm with road width of 12.00 m and above.	1 DU

C2. ANALYSIS

Net Plot Area Available (leaving setback)	176 sqm
No of Floors Built	5
Area of Each Floor Plate	176sqm
Total Built up used	880sqm
Ground coverage used	35%
Total FAR used	1.76

D. CONCLUSION

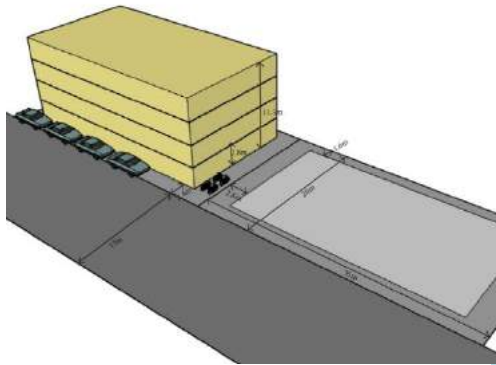
Maximum FAR for this plot	2.60
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

Inferences for plot sizes 250sqm – 500sqm

- DCR Limitations for these plots:
 - Building height = 11.5m is optimum as setback requirement is higher beyond 11.5m (e.g. for 15.0m building height, setback = 5.0 m)
 - Maximum DU to be accommodated = 1.00
- FAR Utilization:
 - Maximum FAR that can be absorbed = 2.60 and Premium FAR not advisable for this category.

3.1.3 Plot Size Range: 500sqm to 4000sqm

CASE 1A: PLOT SIZE = 700 SQM (TOTAL HEIGHT = 11.5M)



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	700 sqm (35m X20m)
Abutting Street	15m

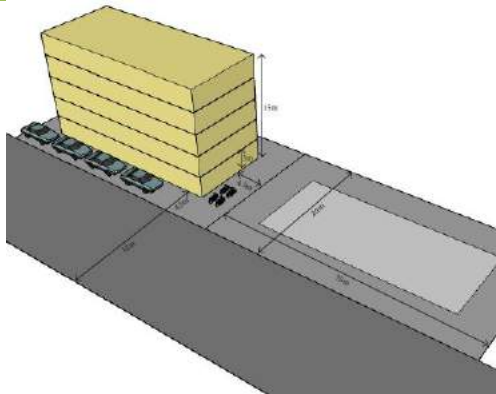
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.6m
Setback- Side 1 (8% or min 1m)	2.8m
Setback- Side 2 (8% or min 1m)	2.8m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	470.4 sqm
No of Floors Built	4
Area of Each Floor Plate	385 sqm
Total Built up used	1,540 sqm
Ground coverage used	55%
Total FAR used	2.20

CASE 1B: PLOT SIZE = 700 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5m and above up to 15.0m)	4.5m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	15.0m

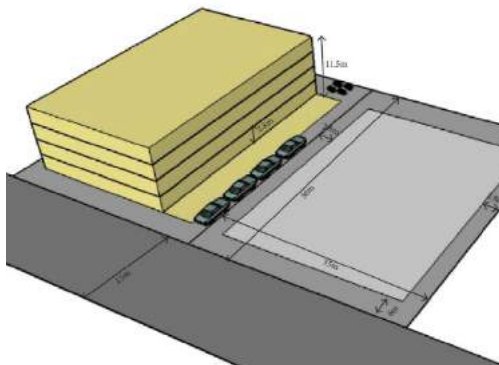
C2. ANALYSIS

Net Plot Area Available (leaving setback)	286 sqm
No of Floors Built	5
Area of Each Floor Plate	286 sqm
Total Built up used	1,430 sqm
Ground coverage used	41%
Total FAR used	2.04

D. CONCLUSION

Maximum FAR for this plot	2.20
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CASE 2A: PLOT SIZE = 1750 SQM (TOTAL HEIGHT = 11.5M)



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	1750 sqm (35m X50m)
Abutting Street	15m

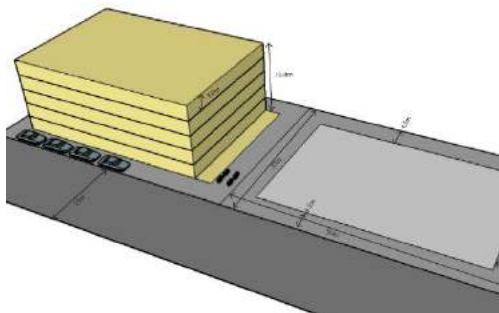
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	6.0m
Setback- Back (8% or min 1m)	4.0m
Setback- Side 1 (8% or min 1m)	2.8m
Setback- Side 2 (8% or min 1m)	2.8m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	1,176 sqm
No of Floors Built	4
Area of Each Floor Plate	962.5 sqm
Total Built up used	3,850 sqm
Ground coverage used	55%
Total FAR used	2.20

CASE 2B: PLOT SIZE = 1750 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form of C2 Analysis

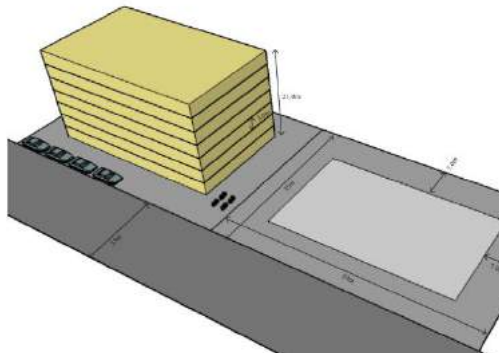
B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5m and above up to 15.0m)	4.5m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	15.0m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	1,066 sqm
No of Floors Built	5
Area of Each Floor Plate	962.5 sqm
Total Built up used	4,812.5 sqm
Ground coverage used	55%
Total FAR used	2.75

CASE 2C: PLOT SIZE = 1750 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form of C3 Analysis

B3. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

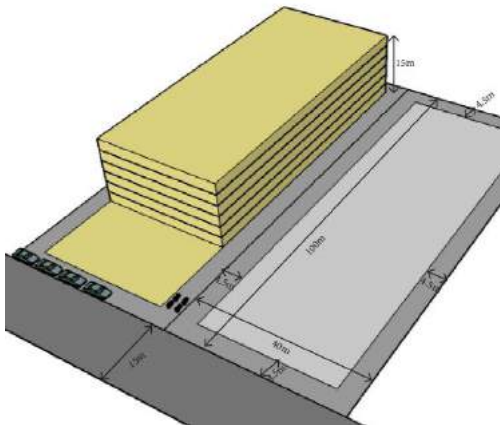
Setback for all sides – (18.0m and above up to 21.0m)	7.0m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	21.0m

C3. ANALYSIS

Net Plot Area Available (leaving setback)	756 sqm
No of Floors Built	7
Area of Each Floor Plate	756 sqm
Total Built up used	5292 sqm
Ground coverage used	43%
Total FAR used	3.02

D. CONCLUSION

Maximum FAR for this plot	3.02
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CASE 3A: PLOT SIZE = 4000 SQM (TOTAL HEIGHT = 15M)


Resultant Building Form of C1 Analysis

A. PLOT DETAILS

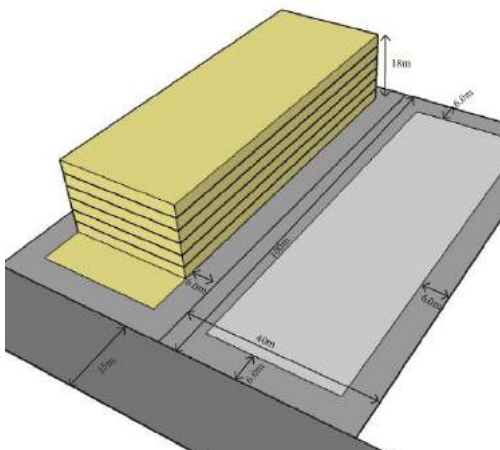
Plot size	4000 sqm (40m X100m)
Abutting Street	15m

B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5m and above up to 15.0m)	4.5m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	15.0m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	2,821sqm
No of Floors Built	5
Area of Each Floor Plate	2200 sqm
Total Built up used	11,000 sqm
Ground coverage used	55%
Total FAR used	2.75

CASE 2B: PLOT SIZE = 4000 SQM (TOTAL HEIGHT = 18M)


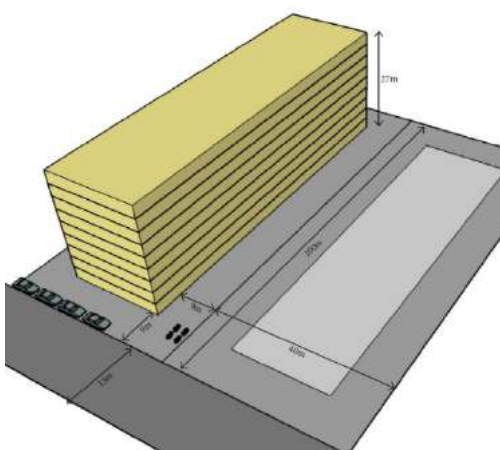
Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (15.0m and above up to 10.0m)	6.0m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	18.0m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	2464 sqm
No of Floors Built	6
Area of Each Floor Plate	2200 sqm
Total Built up used	13,200 sqm
Ground coverage used	55%
Total FAR used	3.30

CASE 2C: PLOT SIZE = 4000 SQM (TOTAL HEIGHT = 24M)


Resultant Building Form of C3 Analysis

B3. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (24.0m and above up to 27.0m)	9.0m
Permissible Ground Coverage	55%
Maximum Permissible FAR	2.75
Building Height	27.0m

C3. ANALYSIS

Net Plot Area Available (leaving setback)	1,804 sqm
No of Floors Built	9
Area of Each Floor Plate	1,804 sqm
Total Built up used	16,236 sqm
Ground coverage used	45%
Total FAR used	4.06

D. CONCLUSION

Maximum FAR for this plot	4.06
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Inferences for plot sizes 500sqm – 4000sqm:

1. DCR Limitations for these plots: Nil
2. FAR Utilization:
 - a. Smaller plots, such as Case 1A & 1B, are not able to consume permissible FAR fully and also can't accommodate the Premium FAR
 - b. Larger plot sizes, such as Case 2B, 2C, 3A, 3B & 3C can fully utilize the permissible FAR and also able to utilise Premium FAR
 - c. Premium or Incentive FAR are advisable in lieu of eligible amenity contributions.

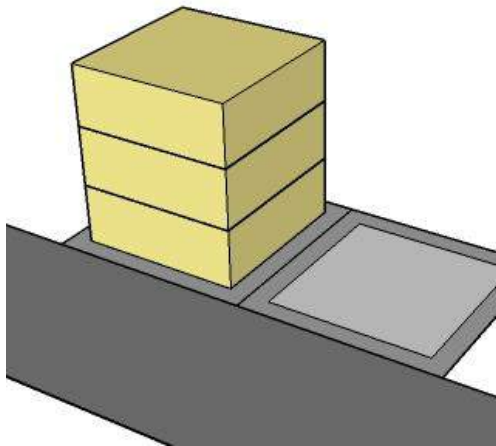
3.1.4 Observations for Residential DCR

1. Plots under 500 sqm in size are not able to utilise full FAR due to Height Restriction of 11.5m
2. Plots of ranges 500 – 1000 sqm and 1000 – 4000 sqm should not be clubbed under the same category, because they have different capacities of consuming FAR.
3. For plot sizes in the higher range of 2000 - 4000 sqm, larger variations in FAR are required to enable differential densities. FAR up to 2 will ensure dwelling unit densities up to 100 DU/HA. For zones where higher densities are desired, FAR up to 3.5 can be provided.
4. Only single dwelling units are allowed in plots less than 500 sqm in size. A higher FAR for this plot size may encourage development of larger unit sizes, which could lead to speculative rise in market prices; or alternatively it could encourage cramped living conditions, as is evident in many intensely developed areas of Hubli. To maintain comfortable densities, it is recommended to allow multi dwelling unit beyond 250sqm plot size with abutting street width of more than 9m.

3.2 Commercial DCR Evaluation

3.2.1 Plot Size Range: Up to 250sqm

CASE 1: PLOT SIZE = 100 SQM



Resultant Building Form

A. PLOT DETAILS

Plot size	100 sqm (10m X 10m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	1.2m
Setback- Back (8% or min 1m)	1.0m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	80%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m

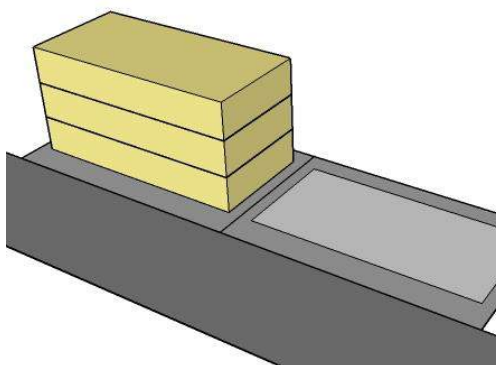
C. ANALYSIS

Net Plot Area Available (leaving setback)	66.0 sqm
No of Floors Built	3
Area of Each Floor Plate	66.0 sqm
Total Built up used	198.0 sqm
Ground coverage used	66%
Total FAR used	1.94

D. CONCLUSION

Maximum FAR for this plot	1.94
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CASE 2: PLOT SIZE = 250 SQM



Resultant Building Form

A. PLOT DETAILS

Plot size	250 sqm (10.5m X 16.0m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.6m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	80%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	11.5m

C. ANALYSIS

Net Plot Area Available (leaving setback)	168.0 sqm
No of Floors Built	3
Area of Each Floor Plate	168 sqm
Total Built up used	504 sqm
Ground coverage used	67%
Total FAR used	2.02

D. CONCLUSION

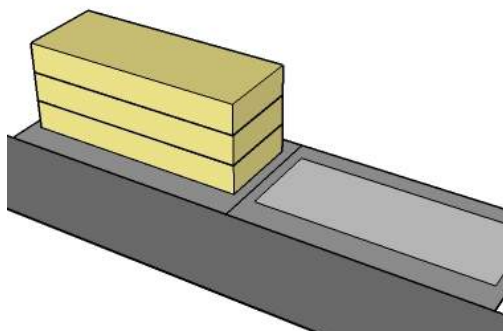
Maximum FAR for this plot	2.02
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Inferences for plot sizes up to 250sqm:

1. FAR Utilization: 100%
2. Ground Coverage: due to set back regulations, 80% ground coverage is not achievable and limited to 67%

3.2.2 Plot Size Range: 250sqm to 500sqm

CASE 1A: PLOT SIZE = 312 SQM



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	312 sqm (13m X 24m)
Abutting Street	12m

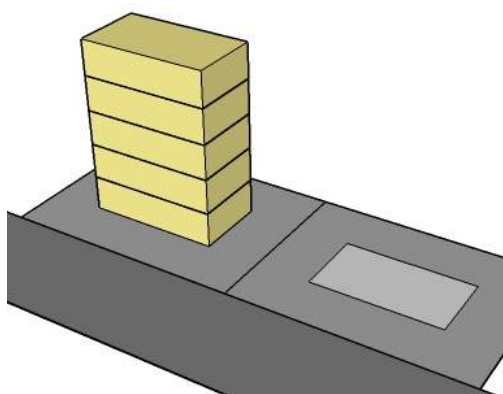
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.88m
Setback- Back (8% or min 1m)	1.92m
Setback- Side 1 (8% or min 1m)	1.04m
Setback- Side 2 (8% or min 1m)	1.04m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.5
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	209.66 sqm
No of Floors Built	4
Area of Each Floor Plate	209.66 sqm
Total Built up used	838.66 sqm
Ground coverage used	67%
Total FAR used	2.69

CASE 1B: PLOT SIZE = 312 SQM



Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5 and above up to 15.0)	4.5m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.5
Building Height	15m

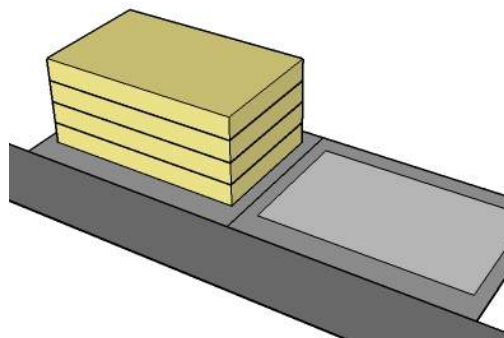
C2. ANALYSIS

Net Plot Area Available (leaving setback)	66 sqm
No of Floors Built	5
Area of Each Floor Plate	66 sqm
Total Built up used	330 sqm
Ground coverage used	21%
Total FAR used	1.10

D. CONCLUSION

Maximum FAR for this plot	2.69
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CASE 2A: PLOT SIZE = 500 SQM



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	500 sqm (20m X 25m)
Abutting Street	12m

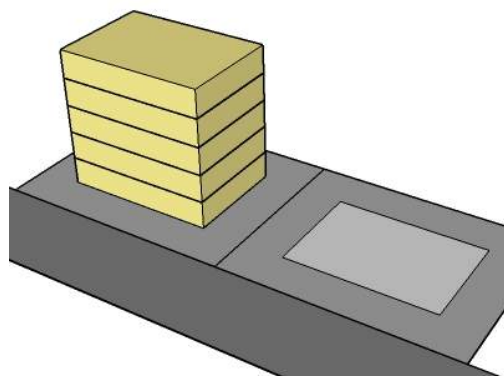
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	3.0m
Setback- Back (8% or min 1m)	2.0m
Setback- Side 1 (8% or min 1m)	1.6m
Setback- Side 2 (8% or min 1m)	1.6m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.5
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	336.0 sqm
No of Floors Built	4
Area of Each Floor Plate	336.0 sqm
Total Built up used	1344 sqm
Ground coverage used	67%
Total FAR used	2.69

CASE 2B: PLOT SIZE = 500 SQM



Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5 and above up to 15.0)	4.5m
Permissible Ground Coverage	75%
Maximum Permissible FAR	2.5
Building Height	15m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	176 sqm
No of Floors Built	5
Area of Each Floor Plate	176 sqm
Total Built up used	880 sqm
Ground coverage used	35%
Total FAR used	1.76

D. CONCLUSION

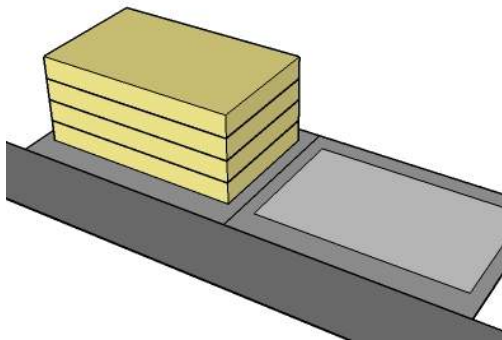
Maximum FAR for this plot	2.69
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Inferences for plot sizes 250sqm – 500sqm:

- DCR Limitations for these plots:
 - 11.5m height restrict development till 3 floors. Building 4 floors will reduce the floor to floor height, i.e. 2.8m.
- FAR Utilization:
 - Full FAR can be consumed, only if 4 floors are built.
- Ground Coverage: due to set back regulations, 75% ground coverage is not achievable.

3.2.3 Plot Size Range: 500sqm to 4000sqm

CASE 1A: PLOT SIZE = 660 SQM



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	660 sqm (23m X 30m)
Abutting Street	18m

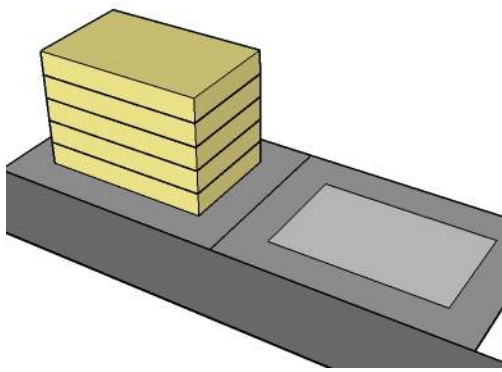
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	3.6m
Setback- Back (8% or min 1m)	2.4m
Setback- Side 1 (8% or min 1m)	1.76m
Setback- Side 2 (8% or min 1m)	1.76m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	443.52 sqm
No of Floors Built	4
Area of Each Floor Plate	429.0 sqm
Total Built up used	1716 sqm
Ground coverage used	65%
Total FAR used	2.60

CASE 1B: PLOT SIZE = 660 SQM



Resultant Building Form of C2 Analysis

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5 and above up to 15.0)	4.5m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	15m

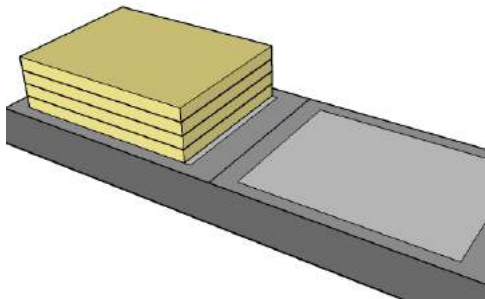
C2. ANALYSIS

Net Plot Area Available (leaving setback)	286 sqm
No of Floors Built	5
Area of Each Floor Plate	286 sqm
Total Built up used	1430 sqm
Ground coverage used	43%
Total FAR used	2.04

D. CONCLUSION

Maximum FAR for this plot	2.60
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CASE 2A: PLOT SIZE = 1750 SQM



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	1750 sqm (35m X 50m)
Abutting Street	18m

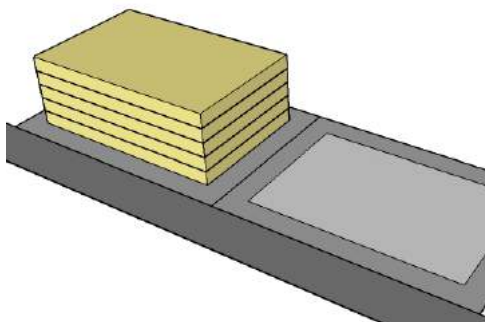
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	6m
Setback- Back (8% or min 1m)	4m
Setback- Side 1 (8% or min 1m)	2.8m
Setback- Side 2 (8% or min 1m)	2.8m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	11.5m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	1176 sqm
No of Floors Built	4
Area of Each Floor Plate	1137.5 sqm
Total Built up used	4550 sqm
Ground coverage used	65%
Total FAR used	2.60

CASE 2B: PLOT SIZE = 1750 SQM



Resultant Building Form of C2 Analysis

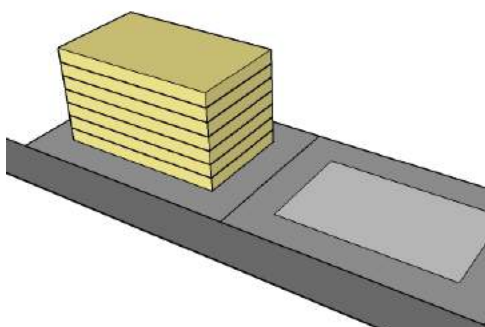
B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5 and above up to 15.0)	4.5m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	15m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	1066 sqm
No of Floors Built	5
Area of Each Floor Plate	1066 sqm
Total Built up used	5330 sqm
Ground coverage used	61%
Total FAR used	3.05

CASE 2C: PLOT SIZE = 1750 SQM



Resultant Building Form of C3 Analysis

B3. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (18.0 and above up to 21.0)	7m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	21m

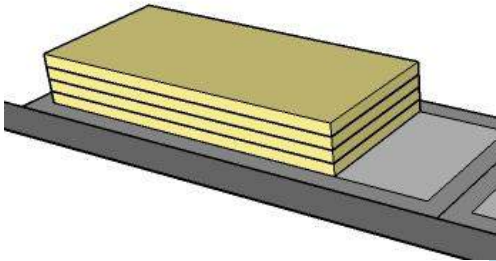
C3. ANALYSIS

Net Plot Area Available (leaving setback)	756 sqm
No of Floors Built	7
Area of Each Floor Plate	756 sqm
Total Built up used	5292 sqm
Ground coverage used	43%
Total FAR used	3.02

D. CONCLUSION

Maximum FAR for this plot	3.05
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CASE 3A: PLOT SIZE = 4000SQM



Resultant Building Form of C1 Analysis

A. PLOT DETAILS

Plot size	4000 sqm (40m X 100m)
Abutting Street	18m

B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (11.5 and above up to 15.0)	4.5m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	15m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	2,821 sqm
No of Floors Built	5
Area of Each Floor Plate	2,200 sqm
Total Built up used	11,000 sqm
Ground coverage used	55%
Total FAR used	2.75

CASE 3B: PLOT SIZE = 4000 SQM

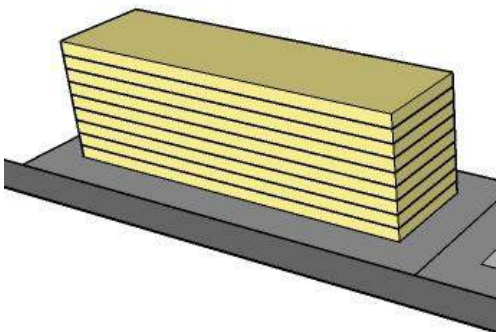
B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (15.0 and above up to 18.0)	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	18m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	2464 sqm
No of Floors Built	6
Area of Each Floor Plate	2200 sqm
Total Built up used	13,200 sqm
Ground coverage used	55%
Total FAR used	3.30

CASE 3C: PLOT SIZE = 4000 SQM



Resultant Building Form of C3 Analysis

B3. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback for all sides – (24.0 and above up to 27.0)	9m
Permissible Ground Coverage	65%
Maximum Permissible FAR	2.75
Building Height	27m

C3. ANALYSIS

Net Plot Area Available (leaving setback)	1804 sqm
No of Floors Built	1
Area of Each Floor Plate	1804sqm
Total Built up used	16,236 sqm
Ground coverage used	45%
Total FAR used	4.06

D. CONCLUSION

Maximum FAR for this plot	4.06
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Inferences for plot sizes 500sqm – 4000sqm:

1. FAR Utilization:
 - a. Smaller plots, such as case 1 & 2, are not able to fully consume permissible FAR
 - b. Larger plots, such as Case 3, will be able to consume permissible as well as premium FAR beyond 5 floors of development.

3.2.4 Observations for Commercial DCR

- i. Smaller plots below 500sqm are not able to consume:
 - a. Full permissible FAR due to height restriction of 11.5m (3 floors) and
 - b. Ground coverage due to set back norms
- ii. Plots above 500sqm are able to consume permissible and premium FARs within current setback and ground coverage norms.

3.3 TOD DCR Evaluation

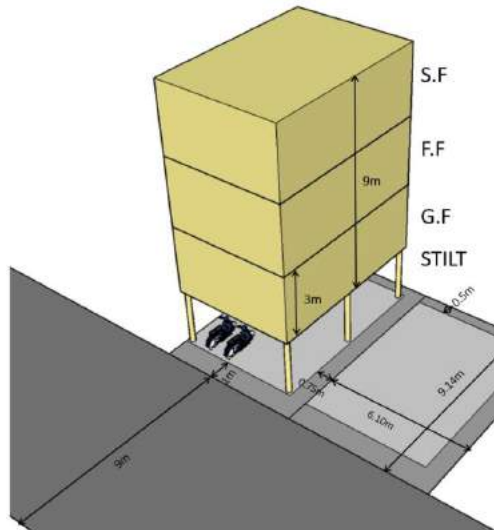
It is evident from the analysis above that within the existing ground coverage and setback conditions, it is not possible on plots of most sizes to consume the full allowable FAR. Identifying the constraints is the first step towards defining alternations such that the TOD Zone is able to consume more FAR and utilize the incentives of building along a transit corridor.

For the analysis, the Residential and Commercial DCRs are considered as the base. However the following assumptions were made to identify the maximum possible FAR.

- Minimum setback requirements of 12% for front setback and 8% for back and side setbacks was allowed for building up to 15m height
- Setback requirements for buildings higher than 15m but up to 24m were capped at 1.5m from front setback and 6m for side and back setbacks
- Ground coverage for plots up to 4000 sqm was capped at 65%, and plots above 4000 sqm was capped at 60%.
- Parking requirements were reduced to half of those prescribed in the Master Plan Zoning Regulations.

3.3.1 Plot Size Range: Up to 250sqm

CASE 1: PLOT SIZE = 55 SQM (EQUIVALENT TO HOUSING BOARD LIG PLOT = 20'X30')



Resultant Building Form

A. PLOT DETAILS

Plot size	55 sqm (6.10m X 9.14m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	1.0m
Setback- Back (8% or min 1m)	0.5m
Setback- Side 1 (8% or min 1m)	0.0m
Setback- Side 2 (8% or min 1m)	0.75m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	15m

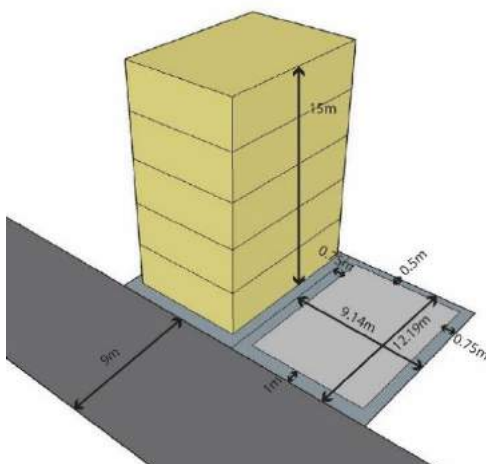
C. ANALYSIS

Net Plot Area Available (leaving setback)	43.5 sqm
No of Floors Built	5
Area of Each Floor Plate	39.03 sqm
Total Built up used	195.14 sqm
Ground coverage used	70%
Total FAR used	3.5

D. CONCLUSION

Maximum FAR for this plot	3.5
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 2: PLOT SIZE = 111 SQM (EQUIVALENT TO HOUSING BOARD MIG PLOT = 30'X40')



Resultant Building Form

A. PLOT DETAILS

Plot size	111 sqm (9.14m X 12.19m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	1.0m
Setback- Back (8% or min 1m)	0.5m
Setback- Side 1 (8% or min 1m)	0.75m
Setback- Side 2 (8% or min 1m)	0.75m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	15m

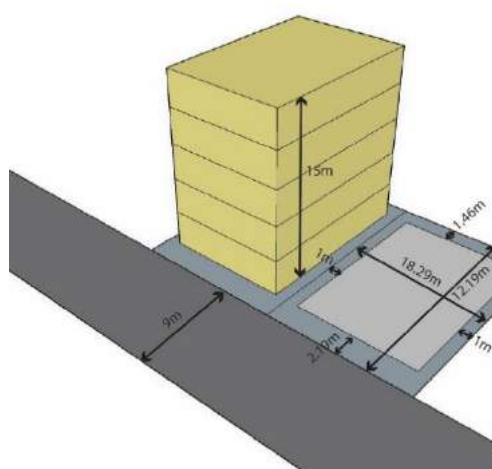
C. ANALYSIS

Net Plot Area Available (leaving setback)	81.67 sqm
No of Floors Built	5
Area of Each Floor Plate	78 sqm
Total Built up used	390 sqm
Ground coverage used	70%
Total FAR used	3.5

D. CONCLUSION

Maximum FAR for this plot	3.5
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 3: PLOT SIZE = 222 SQM (EQUIVALENT TO HOUSING BOARD HIGH PLOT = 40'X60')



Resultant Building Form

A. PLOT DETAILS

Plot size	222 sqm (12.19m X18.29m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.19m
Setback- Back (8% or min 1m)	1.46m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	15m

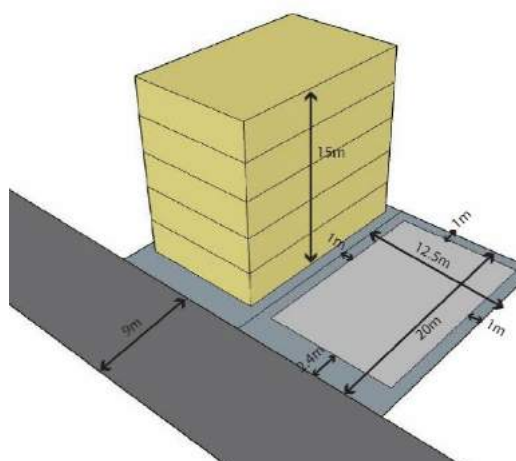
C. ANALYSIS

Net Plot Area Available (leaving setback)	149.10 sqm
No of Floors Built	5
Area of Each Floor Plate	149.10 sqm
Total Built up used	745.5 sqm
Ground coverage used	67%
Total FAR used	3.34

D. CONCLUSION

Maximum FAR for this plot	3.34
No of DU accommodated	1
Parking Requirements (ECS)	1.10 ECS

CASE 4: PLOT SIZE = 250 SQM



Resultant Building Form

A. PLOT DETAILS

Plot size	250 sqm (12.5m X20.0m)
Abutting Street	9m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.0m
Setback- Side 1 (8% or min 1m)	1.0m
Setback- Side 2 (8% or min 1m)	1.0m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.0
Building Height (11.5m or Stilt+GF+2 Floors, whichever is less)	15m

C. ANALYSIS

Net Plot Area Available (leaving setback)	168 sqm
No of Floors Built	5
Area of Each Floor Plate	168sqm
Total Built up used	840sqm
Ground coverage used	67%
Total FAR used	3.36

D. CONCLUSION

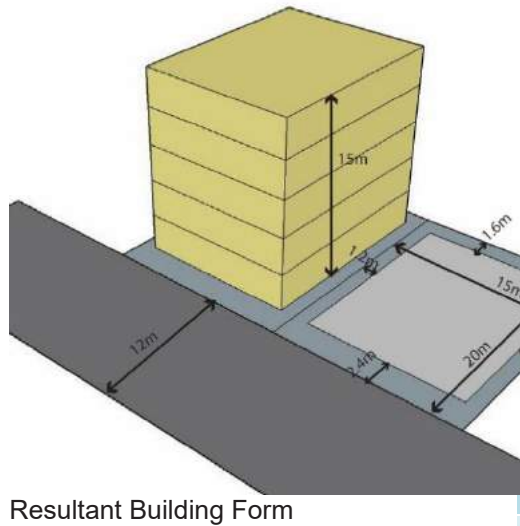
Maximum FAR for this plot	3.36
No of DU accommodated	2
Parking Requirements (ECS)	1.10 ECS

Inferences for plot sizes up to 250 sqm

1. Maximum achievable FAR for all plots of size less than 250 sqm is 3.3.
2. With Base FAR of 2.0, these plots will be able to consume additional FAR of 1.3.
3. Ground Coverage, when reduced to 70% is in conformance with due setback norms for small plots.
4. Minimum FAR Requirement is proposed to be removed for these plots.

3.3.2 Plot Size Range: 250sqm to 500sqm

CASE 1A: PLOT SIZE = 300 SQM (TOTAL HEIGHT = 15M)



A. PLOT DETAILS

Plot size	300 sqm (15m X 20m)
Abutting Street	12m

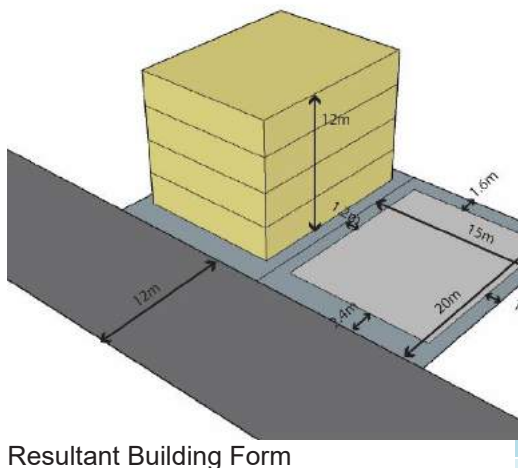
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.6m
Setback- Side 1 (8% or min 1m)	1.2m
Setback- Side 2 (8% or min 1m)	1.2m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.5
Building Height	15m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	201.6 sqm
No of Floors Built	5
Area of Each Floor Plate	201.6sqm
Total Built up used	1008sqm
Ground coverage used	67%
Total FAR used	3.36

CASE 1B: PLOT SIZE = 300 SQM (TOTAL HEIGHT = 12M)



B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.4m
Setback- Back (8% or min 1m)	1.6m
Setback- Side 1 (8% or min 1m)	1.2m
Setback- Side 2 (8% or min 1m)	1.2m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.5
Building Height	12.0m

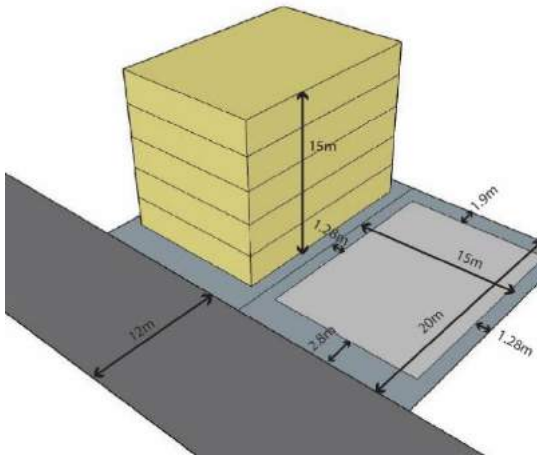
C2. ANALYSIS

Net Plot Area Available (leaving setback)	201.60 sqm
No of Floors Built	4
Area of Each Floor Plate	187.5sqm
Total Built up used	750sqm
Ground coverage used	63%
Total FAR used	2.5

D. CONCLUSION

Maximum FAR for this plot	3.36
No of DU accommodated	2
Parking Requirements (ECS)	1.10 ECS

CASE 2: PLOT SIZE = 384 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form

A. PLOT DETAILS

Plot size	384 sqm (20m X25m)
Abutting Street	12m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.8m
Setback- Back (8% or min 1m)	1.92m
Setback- Side 1, Side 2 (8% or min 1m)	1.28m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.5
Building Height	15m

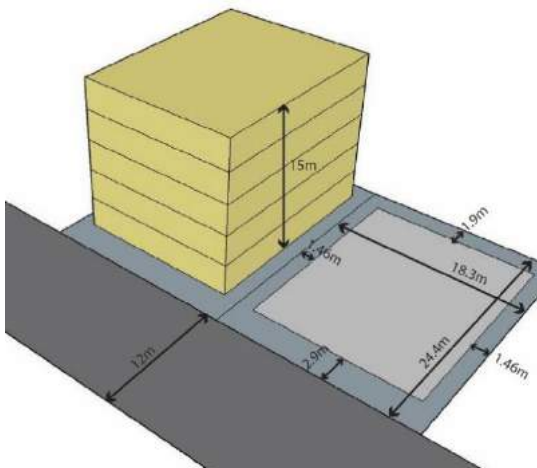
C. ANALYSIS

Net Plot Area Available (leaving setback)	258sqm
No of Floors Built	5
Area of Each Floor Plate	258sqm
Total Built up used	1290sqm
Ground coverage used	67%
Total FAR used	3.36

D. CONCLUSION

Maximum FAR for this plot	3.36
No of DU accommodated	3
Parking Requirements (ECS)	1.10 ECS

CASE 3: PLOT SIZE = 446 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form

A. PLOT DETAILS

Plot size	446 sqm 18.3m X24.4m)
Abutting Street	12m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	2.93m
Setback- Back (8% or min 1m)	1.95m
Setback- Side 1, Side 2 (8% or min 1m)	1.46m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.5
Building Height	15m

C. ANALYSIS

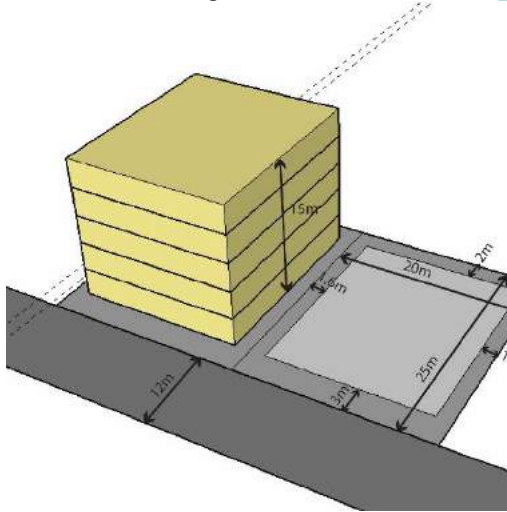
Net Plot Area Available (leaving setback)	300sqm
No of Floors Built	5
Area of Each Floor Plate	300sqm
Total Built up used	1500sqm
Ground coverage used	67%
Total FAR used	3.36

D. CONCLUSION

Maximum FAR for this plot	3.36
No of DU accommodated	3
Parking Requirements (ECS)	1.10 ECS

CASE 4: PLOT SIZE = 500 SQM (TOTAL HEIGHT = 15M)

Resultant Building Form



A. PLOT DETAILS

Plot size	500 sqm (20m X25m)
Abutting Street	12m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	3.0m
Setback- Back (8% or min 1m)	2.0m
Setback- Side 1 (8% or min 1m)	1.6m
Setback- Side 2 (8% or min 1m)	1.6m
Permissible Ground Coverage	70%
Maximum Permissible FAR	2.5
Building Height	15m

C. ANALYSIS

Net Plot Area Available (leaving setback)	336.0sqm
No of Floors Built	5
Area of Each Floor Plate	336.0sqm
Total Built up used	1680.0sqm
Ground coverage used	67%
Total FAR used	3.36

D. CONCLUSION

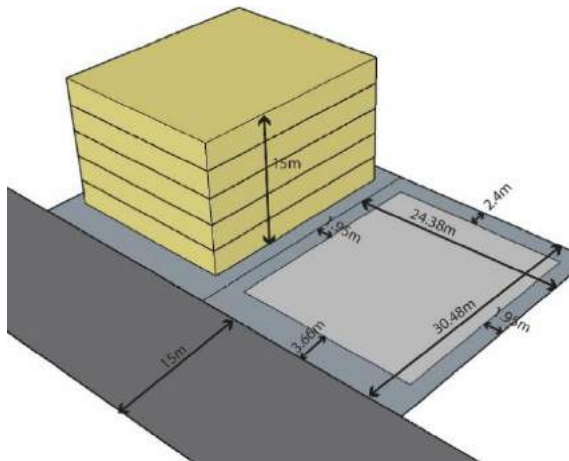
Maximum FAR for this plot	3.36
No of DU accommodated	3
Parking Requirements (ECS)	1.10 ECS

Inferences for plot sizes 250sqm – 500sqm

1. Maximum achievable FAR for all plots of size 250 – 500 sqm is **3.3**
2. With Base FAR of 2.5, these plots will be able to consume additional FAR of 0.8
3. The minimum DU requirement should be removed for plots in TOD Zone.
4. Ground Coverage, when reduced to 70% is in conformance with due setback norms for small plots.
5. Minimum FAR Requirement is proposed to be reduced to 1 for these plots.

3.3.3 Plot Size Range: 500sqm to 1250sqm

CASE 1A: PLOT SIZE = 743 SQM (TOTAL HEIGHT = 15M)



Resultant Building Form

A. PLOT DETAILS

Plot size	743 sqm (24.38m X30.48m)
Abutting Street	15m

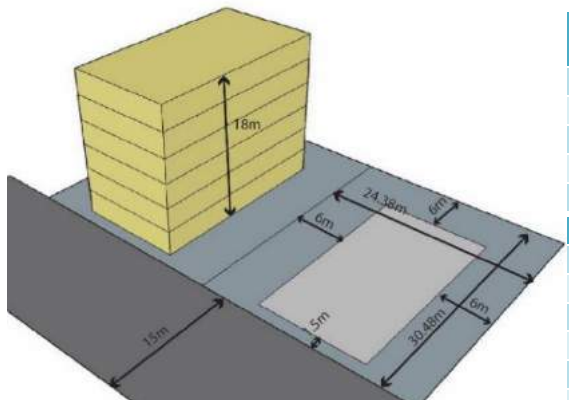
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	3.66m
Setback- Back (8% or min 1m)	2.44m
Setback- Side 1, Side 2 (8% or min 1m)	1.95m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3
Building Height	15m

C1. ANALYSIS

Net Plot Area Available	499.36 sqm
No of Floors Built	5
Area of Each Floor Plate	499.36 sqm
Total Built up used	2496 sqm
Ground coverage used	67%
Total FAR used	3.36

CASE 1B: PLOT SIZE = 743 SQM (TOTAL HEIGHT = 18M)



Resultant Building Form

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

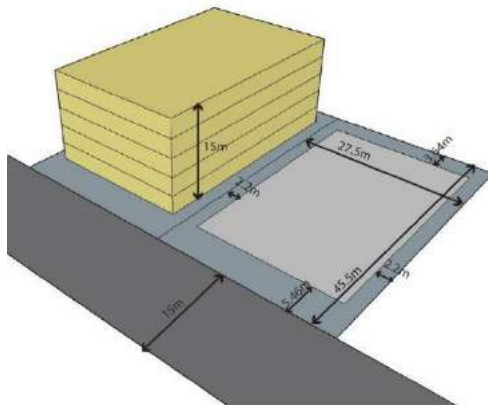
Setback-Front	1.5m
Setback-Back, Side 1,Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3
Building Height	18.0m

C2. ANALYSIS

Net Plot Area Available	284 sqm
No of Floors Built	6
Area of Each Floor Plate	284 sqm
Total Built up used	1,706 sqm
Ground coverage used	38%
Total FAR used	2.30

D. CONCLUSION

Maximum FAR for this plot	3.36
No of DU accommodated	5
Parking Requirements (ECS)	2.75 ECS

CASE 2A: PLOT SIZE = 1250 SQM (TOTAL HEIGHT = 15M)

Resultant Building Form

A. PLOT DETAILS

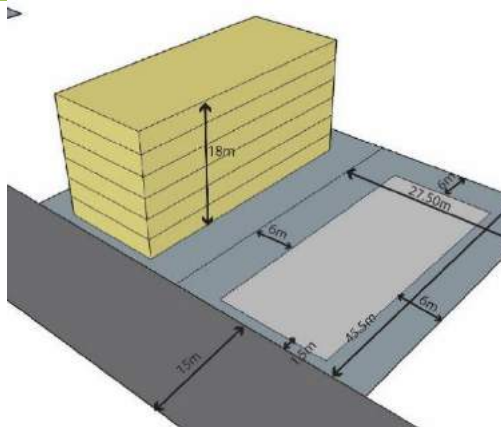
Plot size	1250 sqm (45.50m X27.50m)
Abutting Street	15m

B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback- Front (12%)	5.46m
Setback- Back (8% or min 1m)	3.64m
Setback- Side 1, Side 2 (8% or min 1m)	2.20m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3
Building Height	15m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	840.8 sqm
No of Floors Built	5
Area of Each Floor Plate	813.3 sqm
Total Built up used	4066 sqm
Ground coverage used	65%
Total FAR used	3.25

CASE 2B: PLOT SIZE = 1250 SQM (TOTAL HEIGHT = 18M)

Resultant Building Form

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3
Building Height	18.0m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	589 sqm
No of Floors Built	6
Area of Each Floor Plate	589 sqm
Total Built up used	3534 sqm
Ground coverage used	47%
Total FAR used	2.82

D. CONCLUSION

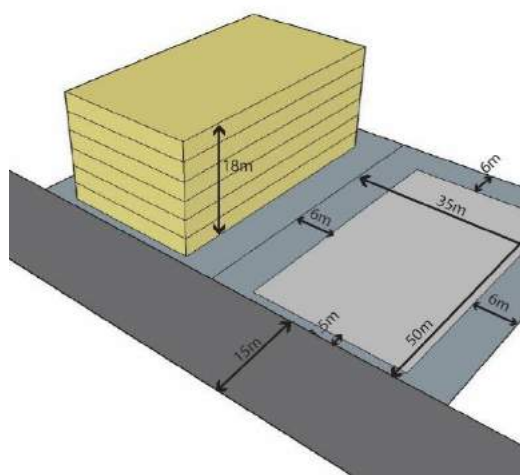
Maximum FAR for this plot	3.25
No of DU accommodated	8
Parking Requirements (ECS)	4.40 ECS

Inferences for plot sizes 500 – 1250 sqm

1. Maximum achievable FAR for plots from 500 to 1250 sqm is 3.25.
2. With Base FAR of 3.0, these plots will be able to consume additional FAR of 0.25.
3. Optimum Ground Coverage for these plots is 65%.
4. 4 – 8 dwelling units can be accommodated, for which parking requirement can be accommodated in a half stilt area.

3.3.4 Plot Size Range: 1250sqm to 2000sqm

CASE 1A: PLOT SIZE = 1750 SQM (TOTAL HEIGHT = 18M)



Resultant Building Form

A. PLOT DETAILS

Plot size	1750 sqm (35m X50m)
Abutting Street	15m

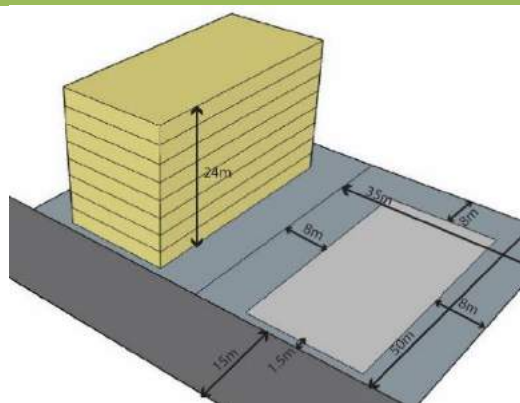
B1. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3.25
Building Height	18.0m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	977.5 sqm
No of Floors Built	6
Area of Each Floor Plate	977.5 sqm
Total Built up used	5865 sqm
Ground coverage used	56%
Total FAR used	3.35

CASE 1B: PLOT SIZE = 1750 SQM (TOTAL HEIGHT = 21M)



Resultant Building Form

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3.25
Building Height	24.0m

C2. ANALYSIS

Net Plot Area Available (leaving setback)	977.5 sqm
No of Floors Built	8
Area of Each Floor Plate	977 sqm
Total Built up used	7816 sqm
Ground coverage used	56%
Total FAR used	4.4

D. CONCLUSION

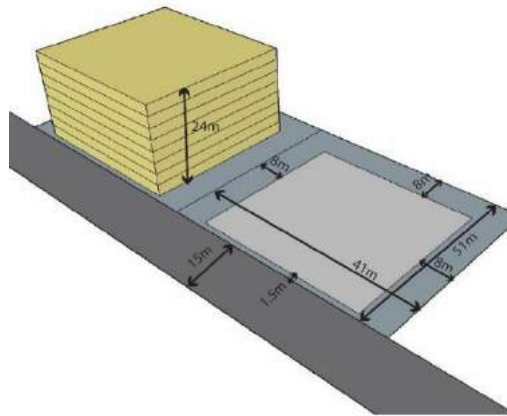
Maximum FAR for this plot	4.4
No of DU accommodated	8
Parking Requirements (ECS)	4.40 ECS

Inferences for plot sizes 1250 – 2000 sqm

1. Maximum achievable FAR for plots from 1250 to 2000 is more than 4.
2. With Base FAR of 3.25, these plots will be able to consume additional FAR as desired.
3. Optimum Ground Coverage for these plots is 55%.
4. More than 8 dwelling units can be accommodated, for which parking requirement can be accommodated in a half still area.

3.3.5 Plot Size Range: 2000sqm to 4000sqm

CASE 1A: PLOT SIZE = 3000 SQM (TOTAL HEIGHT = 24M)



Resultant Building Form

A. PLOT DETAILS

Plot size	3000 sqm (50m X60m)
Abutting Street	15m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3.5
Building Height	24.0m

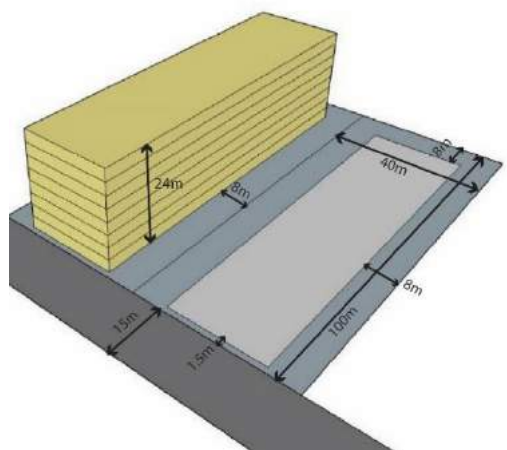
C. ANALYSIS

Net Plot Area Available (leaving setback)	2040 sqm
No of Floors Built	8
Area of Each Floor Plate	1950 sqm
Total Built up used	15600 sqm
Ground coverage used	65%
Total FAR used	5.2

D. CONCLUSION

Maximum FAR for this plot	5.2
No of DU accommodated	17
Parking Requirements (ECS)	9.35 ECS

CASE 2: PLOT SIZE = 4000 SQM (TOTAL HEIGHT = 24M)



Resultant Building Form

A. PLOT DETAILS

Plot size	4000 sqm 100m X40m)
Abutting Street	15m

B2. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	6m
Permissible Ground Coverage	65%
Maximum Permissible FAR	3.5
Building Height	24.0m

C1. ANALYSIS

Net Plot Area Available (leaving setback)	2860 sqm
No of Floors Built	8
Area of Each Floor Plate	2600 sqm
Total Built up used	20800 sqm
Ground coverage used	65%
Total FAR used	5.2

D. CONCLUSION

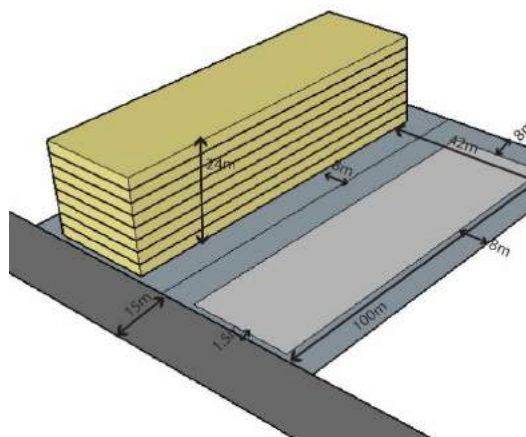
Maximum FAR for this plot	5.2
No of DU accommodated	22
Parking Requirements (ECS)	12.10 ECS

Inferences for plot sizes 2000 – 4000 sqm

1. Maximum achievable FAR for plots from 2000 to 4000 sqm is more than 4.
2. Optimum Ground Coverage for these plots is 55%.
3. More than 15 dwelling units can be accommodated, which increases the parking requirement.

3.3.6 Plot Size Range: 4000sqm and above

CASE 1B: PLOT SIZE = 4200 SQM (TOTAL HEIGHT = 24M)



Resultant Building Form

A. PLOT DETAILS

Plot size	4200 sqm 42X100m)
Abutting Street	15m

B. APPLICABLE DEVELOPMENT CONTROL REGULATIONS

Setback-Front	1.5m
Setback-Back, Side 1, Side 2	8m
Permissible Ground Coverage	60%
Maximum Permissible FAR	3.75
Building Height	24.0m

C. ANALYSIS

Net Plot Area Available (leaving setback)	3036 sqm
No of Floors Built	8
Area of Each Floor Plate	2520 sqm
Total Built up used	20160 sqm
Ground coverage used	60%
Total FAR used	4.71

D. CONCLUSION

Maximum FAR for this plot	4.8
No of DU accommodated	24
Parking Requirements (ECS)	13.20 ECS

Inferences for plot sizes 4000 sqm and above

1. Maximum achievable FAR for plots more than 4000 sqm is more than 4.
2. Optimum Ground Coverage for these plots is 55%.
3. More than 20 dwelling units can be accommodated, which increases the parking requirement.

3.4 Conclusion

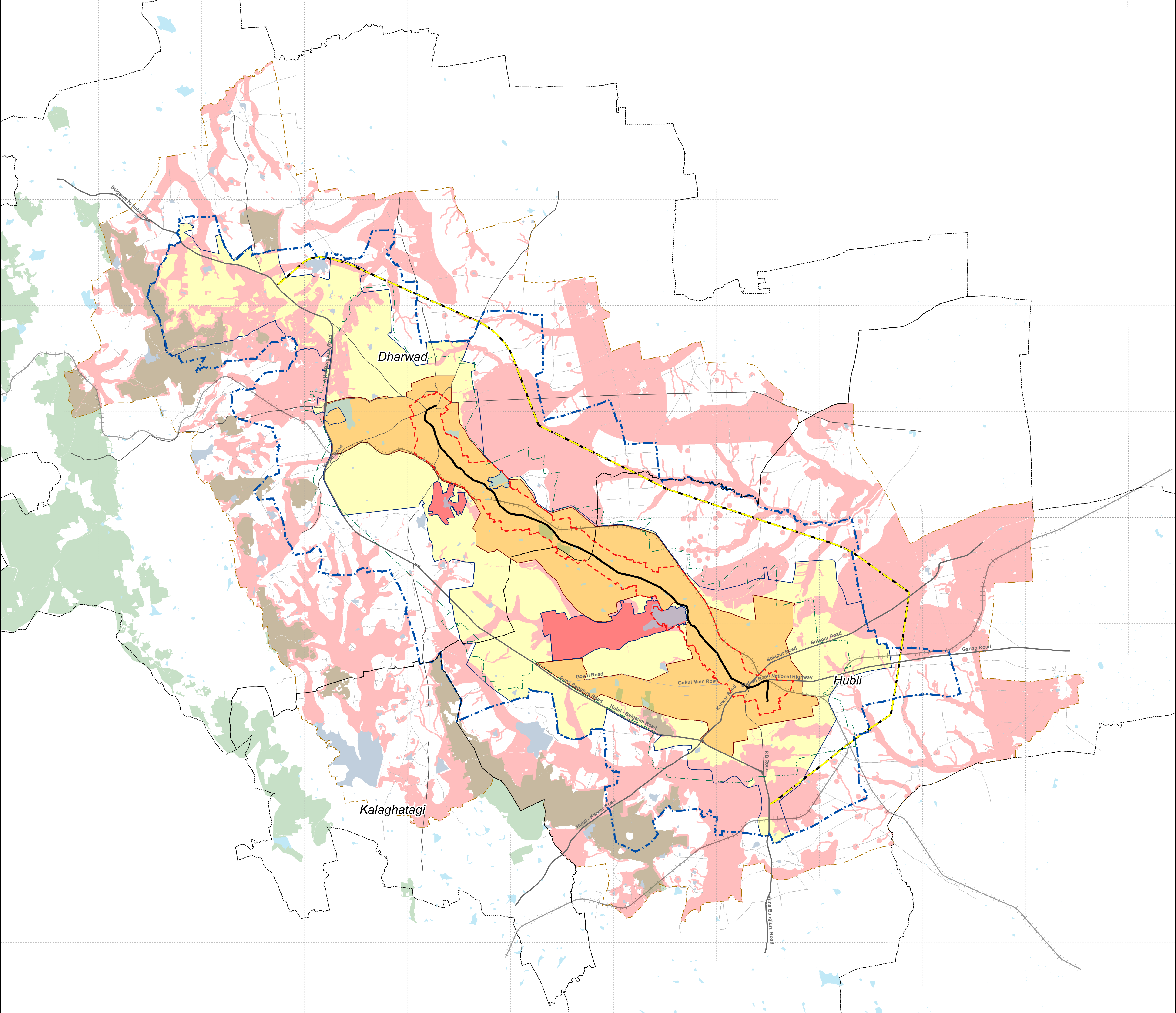
Based on the review of urban form regulations, and considering the assumptions stated for TOD Regulations in section 6.3, the following modifications are suggested in the FAR and Ground Coverage Regulations. The cells highlighted in blue are the proposed regulations compared to existing regulations in white.

Table 1: Existing and Proposed FAR Regulations

Plot Area (sqm)	Plot Coverage				Permissible FAR				Minimum FAR		Premium FAR		Min. Road width (m)
	Existing		Proposed		Existing		Proposed		Existing (TOD Zone)	Proposed (TOD Zone)	Existing	Proposed	
	Max	Min	Max	Min	Zone A	Zone B	Zone A	Zone B					
Upto 250	80%	50%	70%	-	1.75	2	2	1.75	2	1	-	0.25	Up to 9.0
Above 250 & upto 500	75%	50%	70%	-	2.25	2.5	2.5	2.25	2.5	1.5	1	0.25	> 9.0 up to 12.0
Above 500 & upto 1250	65%	50%	65%	50%	2.5	2.75	2.75	2.5	3	1.75	1.25	0.25	> 12.0 up to 18.0
Above 1250 & upto 2000												0.25	
Above 2000 & upto 4000												0.25	
Above 4000 & upto 12000	50%	50%	60%	50%	2.75	3	3	2.75	3.75	2	1.5	0.5	>18.0
Above 12000	55%	-	55%	40%	2.25	2.25		3		-	1	0.5	>12.0 up to 15.0
	50%	-	55%	40%	2.5	2.5		3.25		-	1.25	0.5	>15.0 up to 18.0
	50%	-	55%	40%	2.75	2.75		3.5		-	1.5	0.5	>18.0 up to 24.0
	45%	-	55%	40%	3	3	3	3	3.75	-	1.75	0.5	Above 24.0

ANNEXURE C

MAPPING ATLAS

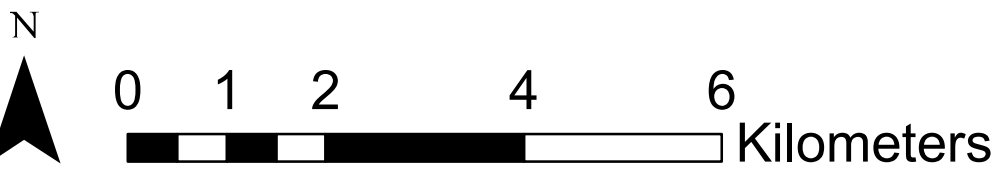


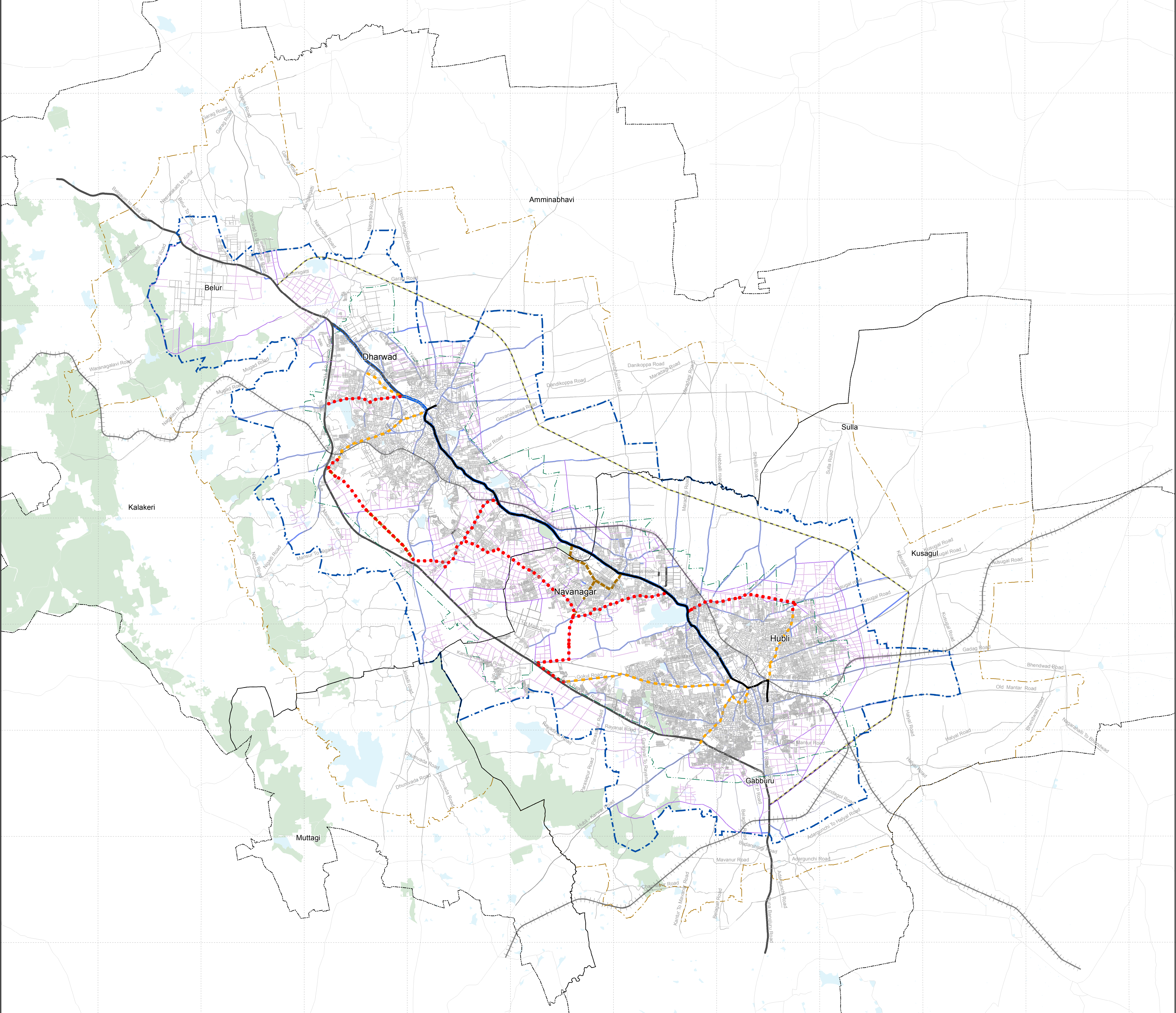
Growth Areas and Density Distribution

Legend

- Taluka Boundary
- HDMC Boundary
- Local Planning Area
- City Plan Study Area
- Conurbation Boundary
- National Highway
- State Highway
- City Road Major
- Village Road
- BRT Corridor
- Proposed Bypass
- Railway Track
- Water Body
- Forest
- Proposed Growth Zones
 - High Growth Area - Proposed Zone A
 - Moderate Growth - Proposed Zone B
 - Low (Regulated) Growth Area
 - Conservation - No Development Zone
 - Proposed TOD Zone

Hubli Dharwad City Plan





Proposed Transportation Map

- Legend**
 - Taluka Boundary
 - HDMC Boundary
 - Local Planning Area
 - City Plan Study Area
- Existing Roads (RoW in m)**
 - 2.0 - 18.0
 - 18.1 - 30.0
 - 30.1 - 60.0
- Railway Track
 - Water Body
 - Forest
- Proposals as per HDBRTS**
 - BRT Corridor
 - Proposed BRT Feeder Route
- Proposals as per Master Plan 2031**

Proposed Roads (RoW in m)

 - 9 - 18
 - 19 - 30
 - 31 - 68

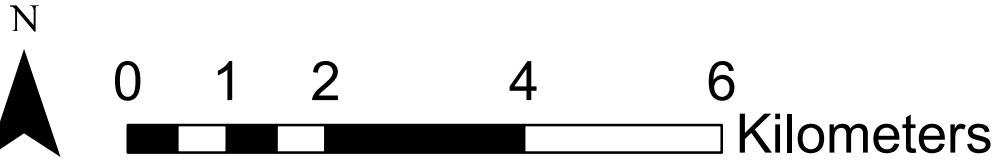
Proposed Road Widening (RoW in m)

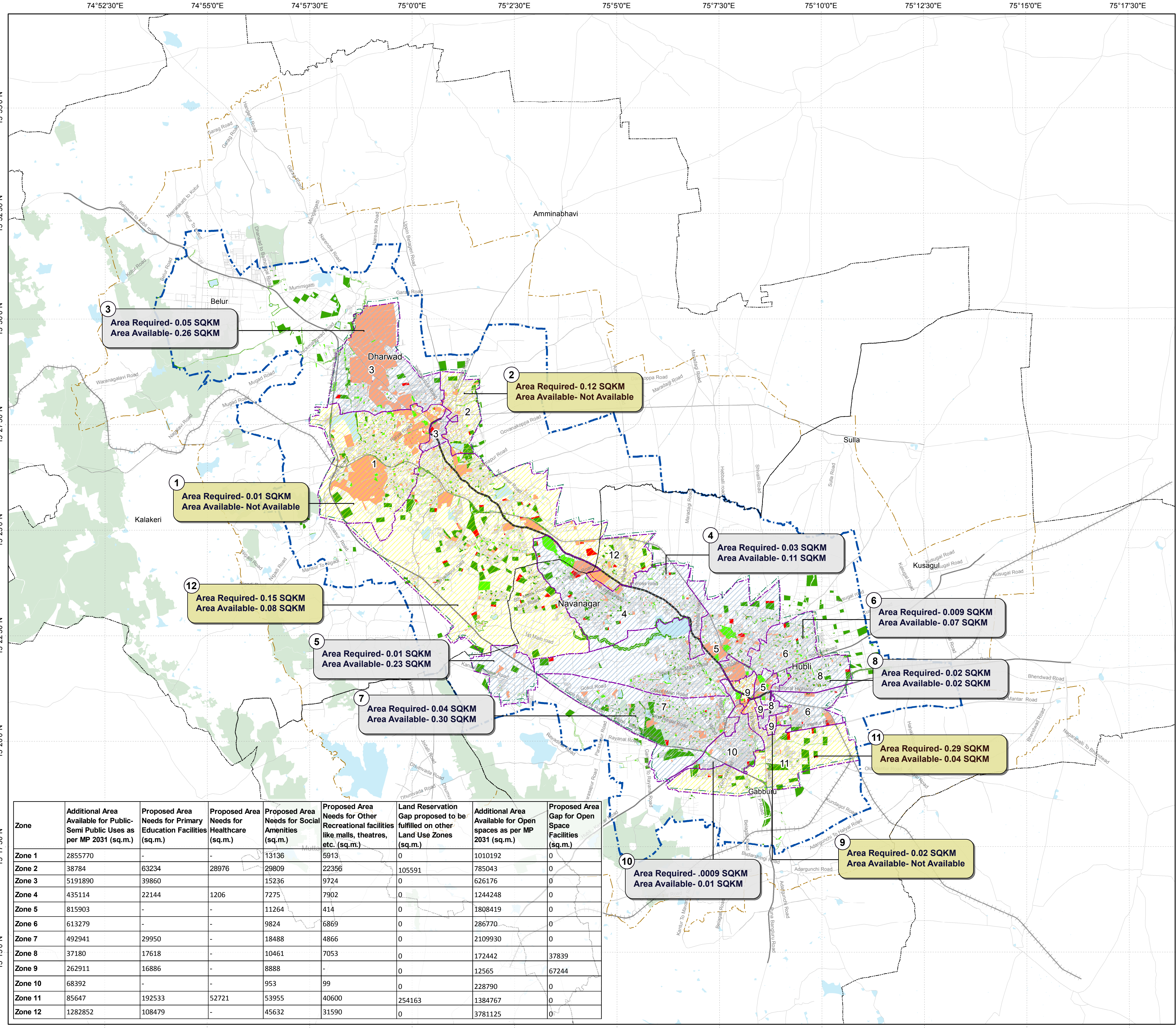
 - 9 - 18
 - 19 - 30
 - 31 - 68

Proposed Bypass

 - Proposed Bypass
- Proposals as per City Plan 2030**
 - Multi-modal Transportation Corridor
 - Road Link

Hubli Dharwad City Plan





Provision of Community Needs

Legend

- Taluka Boundary
- Local Planning Area
- City Plan Study Area
- HDMC Administrative Zone

Transportation

- National Highway
- State Highway
- City Road
- BRT Corridor
- Railway Track
- Proposed Road in Master Plan 2031

Recreational

- Existing
- Proposed in Master Plan 2031

Public & Semi-public

- Existing
- Proposed in Master Plan 2031

Area availability for P & SP

- Insufficient
- Sufficient
- HDMC Zone Number

Note:

Area available for Public and Semi-public uses as per existing land use and Master Plan 2031 proposed land use in Zones 1, 2, 9, 11 and 12 is less than the required area as per the demand gap analysis.

**P&SP- Public and Semi-public*

Insufficient Area for PSP

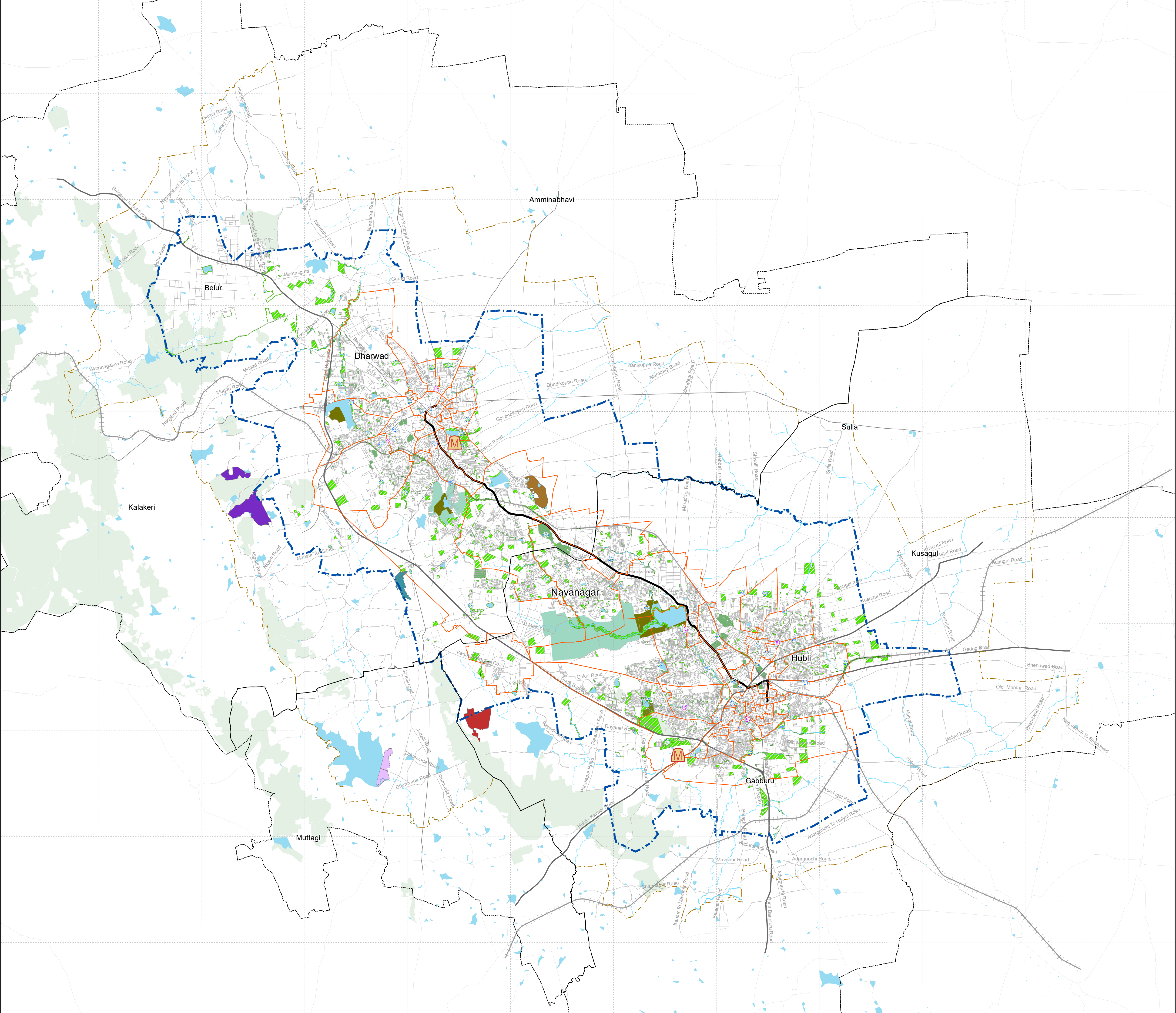
Hubli Dharwad City Plan

IB

CHIGARI

N

0 1 2 4 6 Kilometers



Green Infrastructure Plan

Legend

- Taluka Boundary
- Local Planning Area
- HDMC Ward
- City Plan Study Area

Transportation

- National Highway
- State Highway
- City Road
- Railway Track
- BRT Corridor

Proposed Road

- Proposed Road

Potential Solar Energy Farm

- Dasanur (218 ac)
- Kyarkoppa (393 ac)
- Navalur (163 ac)
- Neersagar (126 ac)
- Yerikoppa (92 ac)

Recreational

- Recreational
- Master Plan Proposed Recreational
- Regulated Growth Area

Existing Solid waste Management



Municipal Landfill

City Plan Waste Management Plan

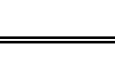


Waste Recycle and Composting



Decentralised Composting Facility

Bio-filtration Site



Bio-filtration Site

Hubli Dharwad City Plan



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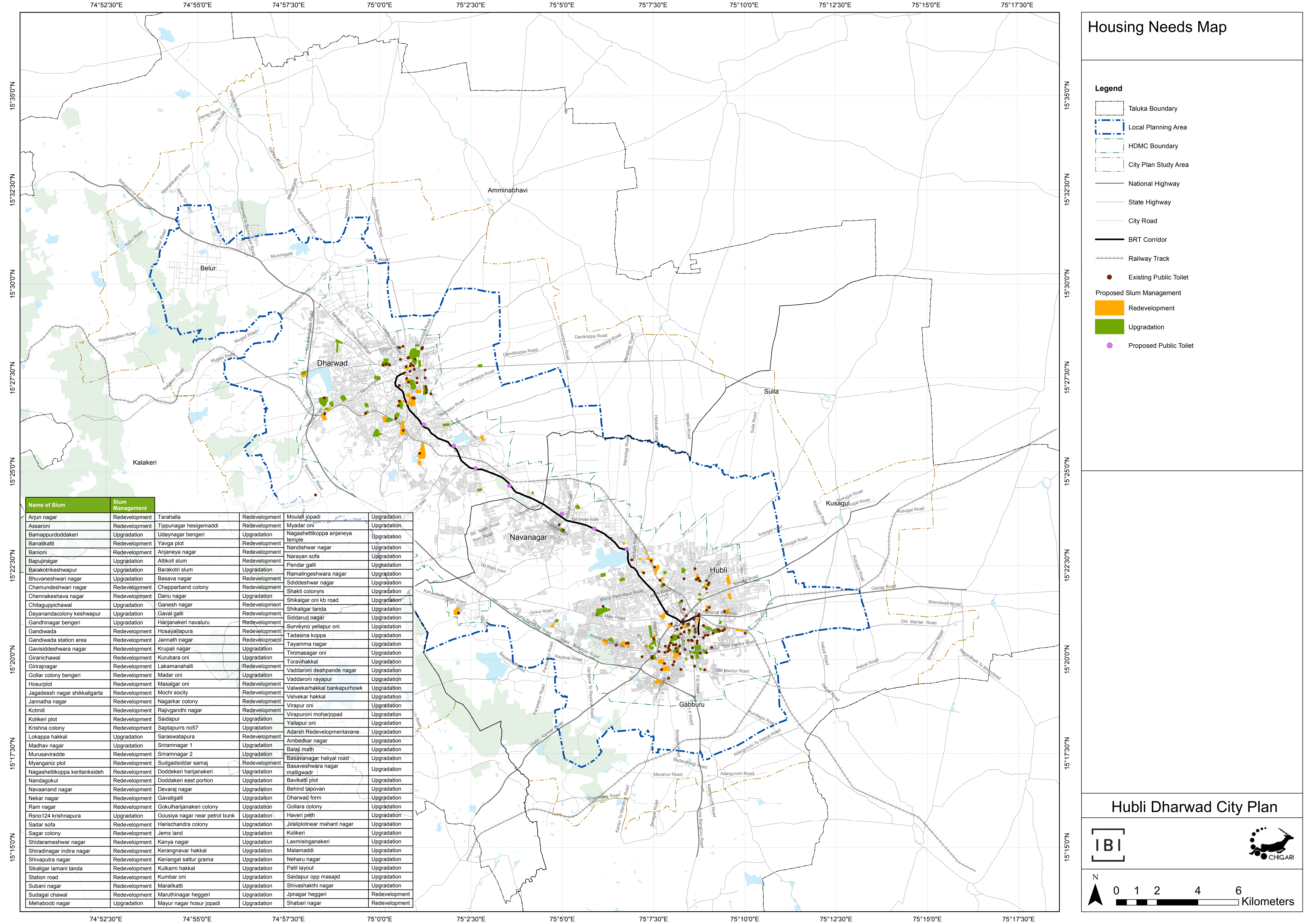
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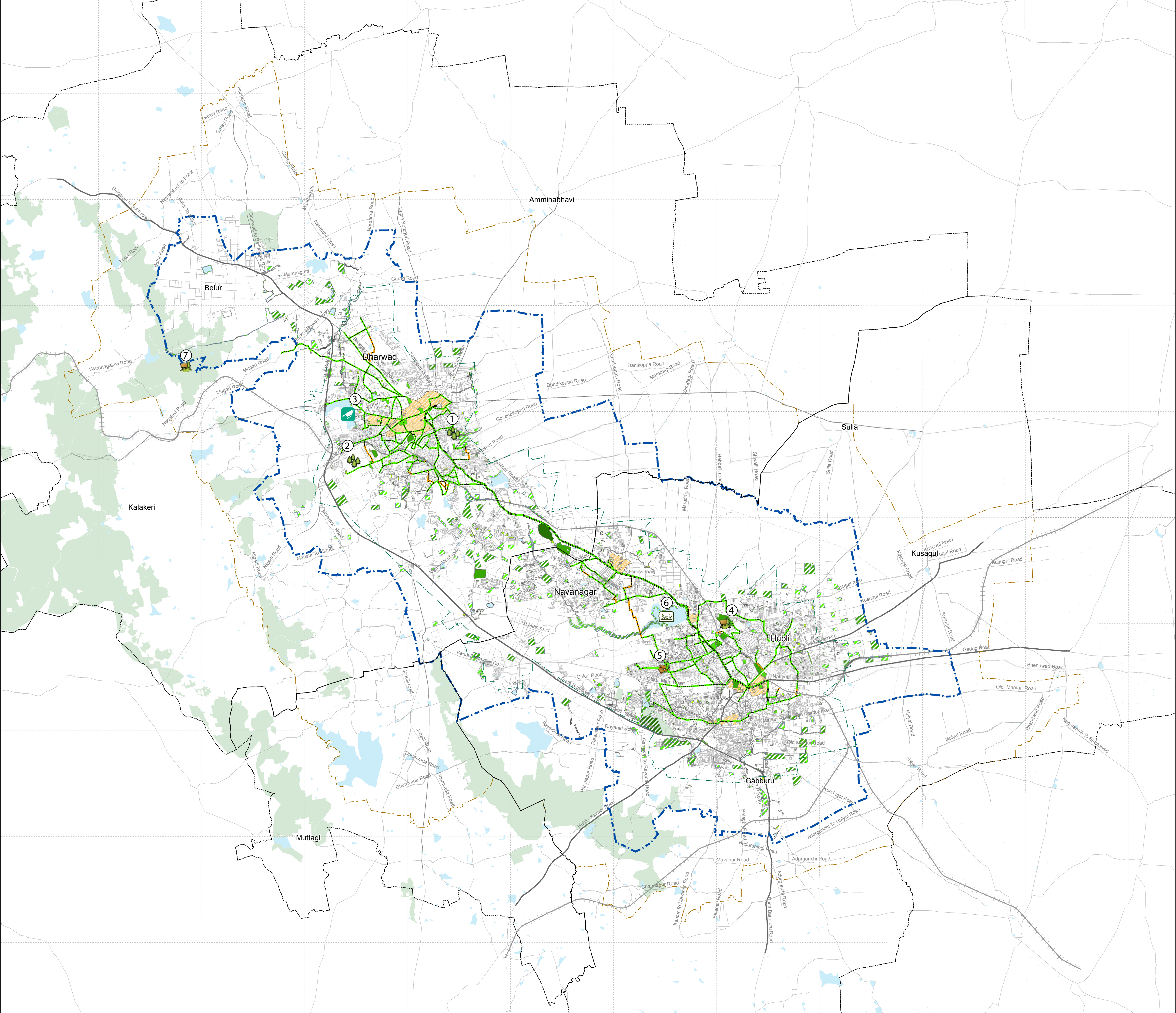
2

4

6

Kilometers





Public Realm Plan

Legend

- Taluka Boundary
- HDMC Boundary
- Local Planning Area
- City Plan Study Area
- Transportation
- National Highway
- State Highway
- City Road
- BRT Corridor
- Railway Track
- Proposed Road as per Master Plan 2031
- Water Body
- Forest
- Existing Park Category
- Housing Area Park (<= 1.24 ac)
- Neighbourhood Park (1.25 - 2.47 ac)
- Community Park (2.48 - 11.36 ac)
- District Park (11.37 - 61.80 ac)
- Sub-City Park (> 61.80 ac)
- Parks Category- Master Plan 2031
- Housing Area Park (<= 1.24 ac)
- Neighbourhood Park (1.25 - 2.47 ac)
- Community Park (2.48 - 11.36 ac)
- District Park (11.37 - 61.80 ac)
- Sub-City Park (> 61.80 ac)
- City Plan Proposed Activities
- ① Herekeri Lake Garden
- ② Karnataka University Gardens
- ③ Kelgeri Lake Garden
- ④ Nrupatunga Adventure Park
- ⑤ Topalgatti Lake and Park
- ⑥ Unkal Lake Nursery
- ⑦ Waravanagalavi Bio-reserve
- Proposed Corridors and Trails
- Eco-mobility Corridor
- New Link
- Heritage District

Hubli Dharwad City Plan



N



0 1 2 4 6

Kilometers



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