Guidebook for adoption of Form Based Codes

SOP-I
Preparation of Character Based Area Layout Plan

National Institute of Urban Affairs
Guidebook
for adoption of
Form Based Codes

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Preparation of
Character Based Area Layout Plan

Kindly send your valuable feedback on
info@formbasedcodes.in

October 2023
Quotes from Honorable Prime Minister’s Post Budget-2023 speech
Dated: 02.03.23

“Well-planned cities are going to be the need of the hour in the fast-paced environment of India in the 21st century”

“Development of new cities and the modernization of services in the existing ones are the two main aspects of urban development”

“Urban planning will determine the fate of our cities in Amritkal and it is only well-planned cities that will determine the fate of India”

“India has overtaken several countries in terms of metro network connectivity”

“75 percent of waste is being processed today when compared to only 14-15 percent in 2014”

“Our new cities must be garbage-free, water secure, and climate-resilient”

“The plans and policies that the government is making should not only make life easier for the people of the cities but also help in their own development”

Foreword

Urbanisation is a hallmark of development for any nation. The Modi government has leveraged India’s rapid urbanisation to propel economic growth and build a path towards meeting the goals of sustainable development. As India undertakes the largest planned urbanisation programmes in the world, the government is also cognisant of its responsibilities of balancing development needs with ecological harmony.

Successful programmes such as the Smart Cities Mission, Pradhan Mantri Awas Yojana – Urban and AMRUT have not only shown the need for in-situ upgradation but demonstrated the preparedness of our city administrators and planners to steer the process. By strengthening area-based planning, improving last-mile access to services, and integrating digital technology, these missions have led to a greater appreciation of sustainable urban form in our cities. The government is further incentivising a shift in our urban morphology by prioritising reforms such as modernisation of building bye-laws, transit-oriented development and adoption of Transferable Development Rights, among other measures.

I am pleased that this ‘Guidebook on Form Based Codes’ is being released to ensure that this objective is met. Within the ambit of applicable laws and regulations, this Guidebook and its Standard Operating Protocols demonstrate that achieving sustainable urban form is possible through a Form Based Codes approach. Combined with a digital interface, the tools proposed in this guidebook have the potential to increase efficiencies in city planning and management.

I look forward to seeing this guidebook being adopted by city planners and managers across India. It will be a useful resource in improving the urban form of our cities, thereby optimising urban services, streamlining development efforts, and reducing carbon emissions.

New Delhi,
06 October, 2023

[Signature]

Hardeep S. Puri
Minister of Housing and Urban Affairs; and Petroleum and Natural Gas
Government of India
Foreword by Director NIUA

The rapid and unprecedented growth of Indian cities, characterized by chaotic urbanization, severe congestion, and escalating environmental degradation, has taken urban planners by surprise. Conventional urban planning methods have given rise to a multitude of challenges, including inflexible and unyielding plans, a disconnection from investment planning, resulting in poor implementation, and a failure to comprehensively address the intricate interplay between spatial and functional aspects. It is now imperative that the field of urban planning undergoes a fundamental shift towards a people-centric development paradigm that takes into account the diverse needs of all residents, with a particular focus on the underprivileged segments of society.

In his recent post-budget speech, the Hon’ble Prime Minister not only emphasized the pivotal role of planning and governance in urban development but also stressed the urgent need to direct our efforts towards spatial planning, transport planning, and urban infrastructure. To fulfill the Prime Minister’s vision, it is imperative that we foster a climate of innovation, develop a versatile array of planning tools, fortify our human resources with efficiency, and augment the capabilities of urban local bodies to create a plethora of opportunities.

In line with the vision of the Hon’ble Prime Minister, the National Institute of Urban Affairs is nudging the urban eco-system through its seven-pronged approach: (1) Data for Action; (2) Evidence-Based Integrated Planning; (3) Demonstrate to Scale, (4) Equip to Institutionalize and Empower, (5) Innovate and Co-create, (6) Foster Collaborations and Alliances; and (7) Invest in cities of tomorrow; has developed a Guidebooks for the adoption of Form-Based Codes and its Standard Operating Procedures.

These Guidebooks offer practical tools for managing brownfield sites of varying scales at the city level. They outline a step-by-step process to transition towards adopting Form-Based Codes in India, streamlining the development process for all stakeholders and facilitating business operations.

Moreover, in addition to the Guidebooks, the NIUA is poised to launch a comprehensive training program. This program is specifically designed to provide guidance and support to practitioners, professionals, and students, enabling them to embrace and refine this innovative approach. Through these concerted efforts, we are paving the way for a new era of urban development in India, one that is in harmony with the vision of our Hon’ble Prime Minister and focused on sustainable growth and inclusive prosperity.
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<tr>
<td>AAI</td>
<td>Airports Authority of India</td>
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<td>ABD</td>
<td>Area Based Development</td>
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<td>AF</td>
<td>Active Frontage</td>
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<td>AI</td>
<td>Artificial Intelligence</td>
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<tr>
<td>AMRUT</td>
<td>Atal Mission for Rejuvenation and Urban Transformation</td>
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<tr>
<td>AR</td>
<td>Artificial Reality</td>
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<tr>
<td>BBL</td>
<td>Building Bye-Laws</td>
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<tr>
<td>BTL</td>
<td>Build-To-Line</td>
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<tr>
<td>BUA</td>
<td>Built-Up Area</td>
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<tr>
<td>CBALP</td>
<td>Character Based Area Layout Plans</td>
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<tr>
<td>CBP</td>
<td>Community Building Program</td>
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<tr>
<td>DCR</td>
<td>Development Control Regulations</td>
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<tr>
<td>EoDB</td>
<td>Ease of Doing Business</td>
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<td>EWS</td>
<td>Economically Weaker Section</td>
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<td>FAR</td>
<td>Floor Area Ratio</td>
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<tr>
<td>FBC</td>
<td>Form Based Codes</td>
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<td>FC</td>
<td>Facade Controls</td>
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<td>FSI</td>
<td>Floor Space Index</td>
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<td>GC</td>
<td>Ground Coverage</td>
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<td>GDA</td>
<td>Green Development Area</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>GPR</td>
<td>Ground Penetrating Radar</td>
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<td>HRIDAY</td>
<td>Heritage City Development and Augmentation Yojana</td>
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<td>IoT</td>
<td>Internet of Things</td>
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<td>IPT</td>
<td>Intermediate Para Transit/ Public Transport</td>
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<td>IRP</td>
<td>Interface Regulation Plan</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>LAP</td>
<td>Local Area Plan</td>
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<td>LCMP</td>
<td>Low Carbon Mobility Plan</td>
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<td>LDS</td>
<td>Low-Emissions Development Strategy</td>
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<td>LP</td>
<td>Layout Plans</td>
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<tr>
<td>MUZ/ MFZ</td>
<td>Multi-Utility Zone</td>
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<td>NMT/ NMV</td>
<td>Non-Motorized Transport/ Vehicles</td>
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<td>NUTP</td>
<td>National Urban Transport Policy</td>
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<td>OSP</td>
<td>Outdoor Space Plan</td>
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<td>PDC</td>
<td>Property Development Cards</td>
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<td>PDP</td>
<td>Property Development Plan</td>
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<tr>
<td>PHPDT</td>
<td>Peak Hour Peak Direction Traffic</td>
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<td>PT</td>
<td>Public Transport</td>
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<tr>
<td>PW</td>
<td>Pedestrian Way</td>
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<td>ROP</td>
<td>(Re)generation Opportunity Plan</td>
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<td>RoW</td>
<td>Right of Way</td>
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<td>SAP</td>
<td>Special Area Plan</td>
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<tr>
<td>SOP</td>
<td>Standard Operating Procedures</td>
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<td>TDR</td>
<td>Transferable Development Rights</td>
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<td>TOD</td>
<td>Transit Oriented Development</td>
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<tr>
<td>UFR</td>
<td>Urban Form Regulations</td>
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<tr>
<td>UNFCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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<tr>
<td>URA</td>
<td>Urban Redevelopment Authority</td>
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<td>URDPFI</td>
<td>Urban and Regional Development Plans Formulation and Implementation Guidelines</td>
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<tr>
<td>VW</td>
<td>Vehicular Way</td>
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<td>w.r.t.</td>
<td>with respect to</td>
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List of Definitions

Form Based Codes
Form Based Codes (FBC) is an area-based regulatory tool to facilitate incremental development or transformation of Urban Built Form (and Public Realm) to enhance, inherent or acquire a desired character. It is a performance-oriented, bottom-up approach, and applicable to brownfield and greenfield areas.

Character Based Area
An area that is distinct by the virtue of identity defining feature is called a Character Based Area (CBA). The Character thus identified may generate from its functionality, visual quality of built form and/or landscaping et al enabling the urban realm to impart a collective experience. Such areas are often contiguous to an anchor, like railway, metro or bus stations/terminals, water bodies, heritage building/precinct, university, business district, wholesale market, industrial park, etc. Areas without an anchor with a uniform identity defining features like urban villages, plotted residential neighborhoods, farmhouse zones, slums, organically developed areas, etc. can also be referred as CBAs. CBAs are usually bound by physical features like roads, green areas, water bodies, railway lines, etc.

Character Based Area Layout Plan
Each CBA will require a Layout Plan to regulate its urban form. Such Layout Plans will be referred as Character Based Area Layout Plans (CBALP). These will be a set of plans to regulate the development of public realm and its adjoining urban forms.

Urban Form Regulations
Urban Form Regulations (UFR) are tools which originate from CBALPs and can be used to regulate the design of urban form (building and open spaces). These regulate the qualities of public realm created by plot/building frontages. These, when applied to brownfield sites, may require removal, amendment or at least rationalization of some conventional clauses in Development Control Regulations and Building Bye-Laws.

(Re)generation Opportunity Plan
(Re)generation Opportunity Plan (ROP) provides assessment of areas where:
1. Market demand and Infrastructure capacities are suitable for mix of uses and growth
2. Infrastructure augmentation is required for future growth
3. Introduction of design measures and activities can induce market demand.

Low Carbon Mobility Plan (LCMP)
Low Carbon Mobility Plan (LCMP) would consider existing transport network, augmentation required to sustain future growth and also provide the street widths, location of shared parking and interchange facilities.

Outdoor Space Plan (OSP)
Outdoor Space Plan (OSP) proposes the Blue and Green infrastructure network by augmenting and adding to existing types of spaces like:
1. Natural green space
2. Natural water body and its Right of Way
3. Man-made green spaces (Private, Public, Paid, Unpaid)
4. Man-made water bodies and their Right of Way (Private, Public, Paid, Unpaid)
5. Plazas and Terraces (Private, Public, Paid, Unpaid)
The above spaces shall also include private properties, plazas and public terraces.

Property Development Plan
Property Development Plan (PDP) governs development of plot and its resultant form through below-mentioned components:
- Size and shape of plot
- Character of development
- Suitable approach of Heritage Response
- Public Passages through plots
- Public spaces within plots
- Plots with marker elements
- Prohibited and regulated areas of protected monuments

Interface Regulation Plan
Interface Regulation Plan (IRP) provides various types of interfaces (i.e., Build-To-Line) including response to heritage.

Community Building Program
Community Building Program (CBP) is a plan with all existing and future activities, spillover that defines the Character and function of an area.
Preface

SOP I - Preparation of Character Based Area Plan

Executive Summary

This Guidebook is an instrument to achieve the urban transformation agenda initiated by the Government of India. It provides tools to implement the Form Based Codes (FBC) approach for Indian cities – the Character Based Area Layout Plan (CBALP), Urban Form Regulation (UFR) unique to corresponding CBALP and Property Development Cards (PDC) for improving public realm by meeting the demands of live-work-recreate, safety, sustainability and resilience, including brownfield areas.

Urban form in India is heterogeneous, and layered. Its planning is increasingly gravitating to address qualitative aspects of incremental growth, from the earlier quantitative approaches. This is evident in the emergence of approaches like Local Area Planning, Layout Planning, Special Area Planning, Area Based Development, Smart City Project, Transit Oriented Development et al. to upgrade public realm. Addressing this need, Character Based Area (CBA) has been introduced as a physical planning area defined through its existing or desired quality of public realm. Improvements in the latter, boosts outdoor activities that increases social interaction, community building, business potentials and has environmental benefits. And, the resultant incremental improvement of living condition, infrastructure and mobility, makes it a viable format of development.

This Guidebook details out a process to adopt FBC in India. It also comprises the Standard Operating Procedures (SOPs) for preparing CBALP and its corresponding UFRs. The plot specific DCRs and UFRs shall be compiled in PDCs to streamline the development process for all end-users, thereby enabling Ease-of-Doing Business (EoDB).

The CBALP enrols overlays of Layout Plans for (re)generation opportunities, mobility network, outdoor space network, interface regulation and property development. This would inform the generation of UFRs (of CBALP) that enable functional design regulations of -
1. Public realm, through organization and utilization of streets, open-spaces, waterfronts
2. Plots, through buildable envelope, pedestrian way, public place within plots, projection across Public Right of Ways, etc
3. Interface of Plots with Public Realm, through Build-to-line, Active Frontages, Colonnades, etc

The Guidebook also provides tools for cities to regulate aesthetics of the facades through establishing proportions, material, colour etc.

The recommended FBC approach is performance-oriented and prioritizes on optimum utilization of resources (trunk infrastructure, road network, environmental assets etc) where the CBALP conforms with the capacity of infrastructure. The emerging UFRs will regulate the design of public realm. Execution of the latter will be contextual, and demand-driven, hence flexible to factor specifics such as land restructuring, use, articulation of frontages, open-spaces, building facades et al.

To leverage from the FBC approach, a dynamic portal with the above outputs is recommended.
Introduction

This chapter explains the process of CBA planning and comprises the following section:
(i) CBA and CBALP definitions
(ii) CBA delineation process and
(iii) CBALP preparation process
(iv) CBALP and UFR linkages
Character Based Area (CBA) is defined as:

"An area that is distinct by the virtue of identity defining feature is called a Character Based Area. The Character thus identified may generate from its functionality, visual quality of built form and/or landscaping et al enabling the urban realm to impart a collective experience. Such areas are often contiguous to an anchor, like railway, metro or bus stations/terminals, water bodies, heritage building/precinct, university, business district, wholesale market, industrial park, etc. Areas without an anchor with a uniform identity defining features like urban villages, plotted residential neighborhoods, farmhouse zones, slums, organically developed areas, etc. can also be referred as CBAs. CBAs are usually bound by physical features like roads, green areas, water bodies, railway lines, etc."

The Character can be a function of either of the following, or their combination:
1. Activities - Formal and Informal
2. Density - Population density, Built density, Spatial density
3. Heritage - Climatic character of the area
4. Natural and Built
5. Collective experience
6. Administrative area proposed for a type of development or use

Identification of predominant activities
Ex. Areas for administrative functions, recreation, habitat and residences, workplaces, etc.

Delineation of areas with similar density
(Population or Built-up area)

Identify areas with Heritage Assets
Ex. Areas with built or natural environmental heritage
• Whether continuous/discontinuous, across different CBALP

Organize public consultation to assess the perception/image of the area through Collective Experiences
Ex. Ghats of Banaras and Rishikesh, Suraj Kund Mela ground, Area around Baba Kharag Singh Marg

Areas with Special Planning Norms
Ex. Railway Station Area / Transit Oriented Development / Green Development Area / Low Density Residential Areas, Special Areas, Redevelopment Areas etc.

Identification of CBAs should be led by Town Planning department in consultation with stakeholders. Its boundaries have to be marked onto the local Master/Development Plans. Boundaries of Area Based Development Policies like Transit Oriented Development, Green Development, Low Density Residential Areas, Special Areas, Redevelopment Areas etc. may also be considered as a CBA.

The step-by-step process of delineating a CBA is shown in Figure 2 below.
Following figure demonstrates identification of Character Based Areas.

**CBA - Central Business District**
1. Activities - Office and retail commercial
2. Density - High job density
3. Heritage - None
4. Collective Experience - CBD
5. Administrative Unit - District Center

**CBA - Hill settlement**
1. Activities - Mostly mixed use
2. Density - Similar built density
3. Heritage - Environmental zone
4. Collective Experience - Tourism destination
5. Administrative Unit - Ward boundary

**CBA - Transit Oriented Development**
1. Activities - Mostly mixed use
2. Density - High residential density
3. Heritage - None
4. Collective Experience - Transit interchange
5. Administrative Unit - TOD planning area

**CBA - Urban village**
1. Activities - Informal mixed use
2. Density - High Residential Density
3. Heritage - Built and natural
4. Collective Experience - Heritage Precinct
5. Administrative Unit - Urban village boundary

Fig. 3: Sample CBA Delineation

1.3 CBALP Preparation Process

Each CBA will require a Layout Plan and shall be referred to as Character Based Area Layout Plans (CBALP) in this document.

**Data Collection**

CBALP is to be prepared using updated data and on GIS platform.

For brownfield areas, CBALP can follow Public Consultation and engagement with existing and future stakeholders (See process in Table 1).

Following data are required and be mapped on a GIS platform to draft CBALP-

1. Land Use
2. Built / Unbuilt / Encroachment
3. Public / Private Ownership - includes information like plot boundaries, existing buildings, greens and trees et.al.
4. Mobility and Street network - includes data related to streets, transport systems and parking et al.
5. Blue Green network - includes data related to water bodies, green areas, like natural characteristics, activities, use, per capita availability, at. al.
6. Circle and Market real estate rates for land, unit built-up areas, etc.
7. Activities and spillover - includes all data like duration, spread/ distribution, footfall, dependencies, utilities consumed, et. al.
8. Heritage structures - includes property boundaries, view corridors, view cones and volumetric control, proportions et. al.
9. Social Infrastructure including Community facilities - includes details of spaces occupied, catchment, nature of activity, et. al.
10. Climate change and disaster mitigation data, including -
   - Sun path and wind rose diagrams showing built edges receiving direct sunlight, indicating need for climate control.
   - Heat island effect and area with trapped heat.
   - Earthquake, floods and other disaster prone areas.
11. Existing and future Demographic profile

CBALP comprises a set of plans to regulate Urban Form while developing the Public Realm and its adjoining Urban Forms.

**Analysis and Proposals**

1. Real Estate Demand and Supply dynamics, including product mix, and projected affordability of existing and future stakeholders.
2. The capacity of existing Infrastructure, its current consumption and capacity for future growth. This shall inform limiting factors, requirement and feasibility for future augmentation as well as integrate sustainable infrastructure solutions. Based on this, the maximum built up area in different parts within a CBA shall be determined.
3. The existing street and transportation networks are to be analyzed in keeping with projected future growth. Strategies for augmentation of Public Transport, Intermediate Para Transit (IPT) and Non Motorized Transport (NMT) including walking and cycling desire lines are to be discussed with concerned stakeholders.
4. Properties in the CBA are to be classified based on types of Building Characters and desirable approaches of Heritage response. View Corridors, view cones etc. are to be taken into consideration.
5. Map showing existing condition and nature of edge of the Blue-green infrastructure is to be prepared and compatible activities in it to be identified.
6. All Formal and Informal outdoor activities and their corresponding spillover are to be identified and their impact on community building and potentials for revenue generation to be projected.
7. Models of Value Capture Financing to be tested, deliberated with stakeholders and quantified to determine upfront and life cycle revenues. Design and planning measures required to enhance the revenue potential to also be identified.
1.4 Application and Benefits

1. OUTDOOR SPACE PLAN (OSP)
The OSP would provide opportunity(ies) for:
1. Preserving and augmenting the blue-green network.
2. Creating multi-use public outdoor spaces.
3. Providing refuge spaces during disaster and for emergency use.
4. Creating mechanisms for land value creation, its maximization and revenue generation.

2. (RE)GENERATION OPPORTUNITY PLAN (ROP)
The assessment of regeneration opportunity to ascertain demand for purchase therefore, the feasible product mix in the real estate market. This information shall be mapped to project the maximum feasible global FSI conforming to infrastructure capacity. This would help identify:
1. Zones with sufficient infrastructure and Real Estate market demand.
2. Zones where market demand is high and to capitalize on the demand, infrastructure upgradation is required.
3. Zones with excess infrastructure and where market demand needs to be generated to enhance property values. This may be achieved through promotion / introduction of park-facing areas, plaza-facing areas et. al.

3. LOW CARBON MOBILITY PLAN (LCMP)
The LCMP will provide solutions for mobility improvements by making the area transit-friendly, walkable and cyclable. The area should minimize dependence on private motor vehicles through demand reduction measures.

4. PROPERTY DEVELOPMENT PLAN (PDP)
This will provide Urban Form Regulations mapped on plot profiles and influence cluster of properties. This will make plot owners aware of and respond to surrounding development.

5. INTERFACE REGULATION PLAN (IRP)
IRP will provide various types of Build-To-Line:
1. Build-To-Line (BTL) with Active Frontage (AF)
2. Build-To-Line (BTL) with Active Frontage (AF) and Colonnade
3. Build-To-Line (BTL) with Active Frontage, Facade Control (FC) and Colonnade
4. Build-To-Line (BTL) with Active Frontage (AF) and Facade Control (FC)
This will encourage safe and climate responsive urban development and enhance potential of revenue generation.

6. COMMUNITY BUILDING PROGRAM (CBP)
Existence of activities and spillovers is a unique property of a brownfield site. This program acknowledge, identifies and to leverage from opportunities like revenue generation, community building, social interaction, disaster mitigation, etc. This makes cities resilient.
For greenfield sites, this program would humanize the settlements with future activities and spillovers.
1.5 Consultation Process

<table>
<thead>
<tr>
<th>Preparatory Actions</th>
<th>Program</th>
<th>Follow-up Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Outline key questions, choices on offer (segregate negotiable from non-negotiable options) and identify priorities based on CBALP</td>
<td>1. Constitution of CBALP Steering Committee; Groups must represent the actual usage of spaces and to avoid token representation.</td>
<td>1. Interpretation and analysis of inputs from charrettes to form CBALP.</td>
</tr>
<tr>
<td>2. Formation of focused groups of owner, stakeholder and users, marginalized sections for equitable participation.</td>
<td>2. Conduct surveys, polls and petitions, across the plan preparation process.</td>
<td>2. Formulation and finalization of CBALP.</td>
</tr>
<tr>
<td>3. Create / Develop:</td>
<td>3. Implement pilots in the form of tactical interventions and assess impact and receipt of proposal.</td>
<td>3. Conduct impact analysis to inform CBALP like:</td>
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<tr>
<td>i. Program with timeline, deployment of resources, funds and venues; ii. Standards to assess progress made in consultation; iii. On and off-line communication and outreach program; iv. Feedback system; v. System of visualization</td>
<td>4. Celebrate milestones and achievement. Events shall also be used to prevent dissent, give voice to marginalized group, collect unstructured feedback and introduce innovation.</td>
<td>i. Lowering crime rate and cases of violation, ii. Higher investment from businesses, iii. Growth of local businesses, iv. Increase in property value and v. Improvement of image of the area among non-residents/ users.</td>
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<tr>
<td>4. Enlist roles and responsibilities of different departments/ agencies mandated to provide resolution</td>
<td>5. Process documentation and dissemination of outcomes of meetings.</td>
<td>4. For respective CBALP, formulate the Urban Form Regulations.</td>
</tr>
<tr>
<td>5. Identify Expert(s) to assist in programming and conducting public consultation: The expert(s) would study community profile, underlaying power structure, representativeness and ascertain whether community own assets to offer or require assistance.</td>
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Meeting Agenda

Meeting 1: Ice-breaker - for groups to familiarize with each other over bonding exercise. Towards its end, the objective of the consultation program to be introduced.

Meeting 2: Listen to stakeholders - the agenda of the consultation program is introduced for stakeholders to absorb and respond freely.

Meeting 3: Orientation - the agenda and details are introduced to the stakeholders in a manner that reflect resolution of matters identified in meeting 2.

Meeting 4: Workshop - design charrettes to be conducted to identify solutions and tactical interventions to test proposals.

Meeting 5: Concluding charrette - finalize output and present to stakeholders.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizens, Community Building Organizations (CBOs), Urban Local Bodies (ULBs), Resident Welfare Association (RWAs), Municipalities, Elected Ward Representatives, Town Planning Organizations, Development Authorities, Concerned Government Bodies, Housing Corporations, Utility and service providers, Developers, etc.</td>
<td>2-6 months based on scale.</td>
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</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>2-4 months</th>
<th>1-2 months</th>
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Table 1: Public Consultation Process for preparation of CBALP
CBALP Overlays

This chapter provides the recommendatory steps to draft CBALP in the form of:
(i) explanation of the overlays
(ii) generic steps to prepare overlays.

Experts/institutions undertaking the task of preparing overlays may also devise their own methodology.
2.1 Outdoor Space Plan (OSP)

Definition

OSP proposes the Blue and Green infrastructure network by augmenting and adding to existing types of spaces like:
1. Natural green space
2. Natural water body and its Right of Way
3. Man-made green spaces (Private, Public, Paid, Unpaid)
4. Man-made water bodies and their Right of Way (Private, Public, Paid, Unpaid)
5. Plazas and Terraces (Private, Public, Paid, Unpaid)

The above spaces shall also include private properties, plazas and public terraces.

Objective

To provide public spaces suitable for existing activity pattern of the areas thereby making CBAs people-centric.

Benefits

1. Create multi-activity outdoor spaces
2. Preserve natural water bodies and green areas
3. Create provisions of alternatives of green areas in dense brown field areas.

Typical Benchmarks (Indicative)

1. 20% of land to be allocated for recreational open spaces within CBALP of greenfield land parcels.
2. Public spaces to be planned to meet at least two of the following four functions:
   • Recreation
   • Organized play / sport
   • Nature
   • Revenue / Utility
3. Minimum dimension of open space on ground shall not be less than 10m.

Points to keep in mind

1. In developed areas, identify ways through which green/ open space may be created by reclaiming some land or by building such facilities within private properties or terraces in lieu of Green TDR benefits.
2. Ensure all green areas perform the function of managing storm water and have space for public utilities like waste composting, district cooling, etc. shared by neighbouring properties (Sponge City).
3. Parking shall not be allowed at green open spaces, flood plains, wetlands, etc.
4. Existing natural water bodies, floodplains and wetlands should be preserved, while the ones encroached shall be reclaimed through Green TDR.

Performance Indicators

1. Atleast 20% of CBA is recreational open areas. (In brownfield sites it can also include public open spaces within plots or on terraces)
2. All natural blue and green areas are preserved with suitable use.
3. All outdoor open spaces provide opportunity of more than two functions.

Step 1: Prepare a base map with following information:
1. Demarcate all natural zones like Urban Forest, river, stream, lakes, wetlands, springs, aquifers, etc. Also demarcate their Flood Control Zones and Right of Way.
2. Demarcate all existing man-made green areas, water bodies like parks, tot-lots, sports facility, pond, swimming pool, canals, etc.
3. Demarcate all existing green verges.
4. Demarcate all activities that can be accommodated in such spaces.

Step 2: Analyze the existing scenario and build proposals:
1. Analyze all types of activities and existing spaces where such activities take place. Identify zones where spaces for new/ future activities are required.
2. Conduct stakeholder and public consultation to identify private and public plots where spaces for such activities can be provided. Identify areas suitable for disaster and emergency response.

Step 3: Designate public plazas and public open spaces within plots:
1. On the map of all outdoor spaces, indicate all plots where public plazas and public space on terraces are feasible. Provide FAR incentives or Green TDR to encourage creating such spaces for public activities in public / private plots.

Checklist

1. GIS map of all blue and green areas, including all activities performed in them
2. GIS map of property boundaries including ownerships

Fig. 10: Natural Blue Green Open Space Network Map (Sample)

Fig. 11: Man-made Blue Green Open Space Network Map (Sample)

Fig. 12: Public Plazas and Terraced Open Space Map (Sample)
2.2 Low Carbon Mobility Plan (LCMP)

Definition
LCMP is a plan to augment (existing) transport network, and provide the street widths, location of shared parking and interchange facilities, to sustain future growth.

Objective
To encourage use of sustainable modes of transport through demand management measures.

Benefits of Sustainable mobility
1. Decreases dependence on private vehicles by providing multiple mobility options
2. Dense street grid would:
   • Ensure high trip carrying capacity of the network.
   • Encourage walking, cycling and use of public transport.

Points to keep in mind
Provide FAR or TDR incentives to plot owners who provide following in their plots-
1. Shared parking facility
2. Pedestrian Ways or Vehicular Ways
3. Space for Bus Shelter, IPT or Bicycle Parking

Typical Benchmarks (Indicative)
- Public Transport (PT), Intermediate Para Transit (IPT) and Non-Motorized Transport (NMT) Interchange facilities to be provided.
- Vehicular roads (including NMT) to be provided at 200-250m from center-to-center.
- NMT only streets to be provided at 100-150m from center-to-center.
- Shared parking facilities through demand management measures to be planned. For plots constructing such facilities, FAR or TDR benefits to be provided.
- Street Density of 18 per sq km to be planned.
- Intersection density of 80-100 per sq km to be provided.

Performance Indicators
1. Modal split in favor of Public Transport, walking and cycling
2. Reduction in parking demand
3. Every house to have at least i. One bus stop within 500m
   ii. One public bicycle sharing dock or Intermediate Para Transit Stand within 200m
4. Atleast 70% of the recommended street and junction density

Checklist
- GIS database with Street Grid layout
- Existing and proposed PT, IPT, NMT network, Shared parking
- NMT provisions on all streets
- Street Density as per benchmark

Fig. 13: Street Hierarchy, Junction Type and Shared Parking Map (Sample)

Fig. 14: Mobility Network Plan (Sample)

Step 1: Conduct a Traffic Impact Assessment (TIA) to create LCMP:
1. Show Road Right of Ways (RoW) for existing roads
   - Show carriageway widths separately
2. Map existing transport network
   - Public Transport
   - Intermediate Para Transit
   - NMT (footpath, cycle tracks)
3. Map the Per Hour Peak Direction Trips (PHPTD) of each road

Step 2: Map Proposals on the Mobility Map
1. Pedestrian and Vehicular Ways through plots
2. New transport systems proposed by the city or required for future growth of the area.

Step 3: Identify all junctions and categorize them into:
1. Roundabouts
2. Regular junction which are-
   • Signalized
   • Signal free
3. Mid-block NMT crossing
4. Road Geometry Improvements

Step 4: Identify all streets and adjoining spaces for:
1. Transport Interchange locations and types
2. Shared Parking Facility

Step 5: Analyze and build proposals-
1. Gap analysis by comparing performance of existing transportation system against the typical benchmarks.
2. Develop proposals to fill the gaps and meet the performance indicators.
3. Categorize proposals as those for-
   i. Public streets, junctions, mid-block crossings, interchanges and mobility systems
   ii. Pedestrian and Vehicular Ways through plots
4. Integrate proposals for Pedestrian and Vehicular Ways through Plots into the Plot Development Plan.

Step 6: Create mechanism for implementation-
1. Proposed public facilities and create action plans for implementation and budget allocation, following a discussion with road owning agency, transport service providers etc.
2. Proposed public facilities that may require land acquisition or barter, mechanism need to be devised in consultation with plot owners to identify acceptable monetary or TDR incentives enabling -
   i. Land acquisition
   ii. Land sharing without ownership transfer
2.3 (Re)generation Opportunity Plan (ROP)

Definition
ROP provides assessment of areas where:
1. Market demand and Infrastructure capacities are suitable for mix of uses and growth
2. Infrastructure augmentation is required for future growth
3. Introduction of design measures and activities can induce market demand

Objective
To encourage mix of uses by overlaying market demand with infrastructure capacity and identifying areas to be improved.

Benefits of Mix of Uses
1. Decrease trips by converging work, stay and recreation within walking distances (500 m).
2. Enhances saleability of Real Estate Assets as amenities, facilities and (land) use can be conveniently accessed.
3. Encourages development that readily transform in response to economic changes.

Points to keep in mind
1. Allow asset owners to choose from mix of uses within defined limits of safety and functionality.
2. Simplify the process of conversion of use.

Performance Indicators
1. Mix of uses in CBALPs, except those producing hazardous waste - at least 50%
2. Increase in supply of EWS and Affordable Housing - at least 30% of all residential
3. Negligible increase in load on infrastructure and resources
4. Increase in Real Estate transactions as a result of improved quality (and efficiency) of public realm and infrastructure.

Typical Benchmarks (Indicative)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Build Use Category</th>
<th>Minimum %age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Commercial use and social infrastructure in all land parcels of &gt; 1 Acre area</td>
<td>10%</td>
</tr>
<tr>
<td>2.</td>
<td>Commercial use in all land parcels of &lt; 1 Acre area</td>
<td>5%</td>
</tr>
<tr>
<td>3.</td>
<td>Residential in all land parcels</td>
<td>20%</td>
</tr>
<tr>
<td>4.</td>
<td>Provide EWS units and affordable housing as per government rules following the above criteria.</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 2: Typical benchmarks for ROP

Step 1: Prepare a map of Existing use (Built or Un-Built) in brownfield areas and proposed use premises in greenfield areas.

Step 2: Assessment of Market Demand for various use types, w.r.t. parameters as below:
1. Map the zones of impact of the following on real estate values
   - Connectivity
   - Access to transit facility
   - Place making and Urban Aesthetics (Blue, Green, Heritage)
   - Existing and planned Utility
   - Plot size and Geometry
   - Consultation/ Survey for demand
   - Any other suitable parameter
2. For all zones created based on abovementioned, the Built Up Area Demand is to be deduced and converted into volumetric map.

Step 3: Conduct the Infrastructure Holding Capacity -
1. At Master Plan/ Zonal Plan level the Infrastructure Holding Capacity available in the trunk infrastructure that could be utilized for the CBALP is to be assessed considering:
   - Power Supply
   - Water Supply
   - Sewer
   - PHPDT on roads considering all modes of transport like private vehicles, PT / IPT / NMT
   - For Solid Waste, the city should have a policy, regulations and space for decentralized Waste Management.
2. Mapping infrastructure capacities to reflect additional floor space that can be accommodated.
3. Using limiting BUA to generate a value of global FAR.
Step 4: Overlaying the values generated from Market Demand in Step 2 and Infrastructure Capacity in Step 3.

The intersecting areas would provide:
1. Zone 1 which have sufficient infrastructure and Real Estate market demand, thereby making it suitable for mixed use.
2. Zone 2 have high market demand and require infrastructure augmentation to capitalize it and encourage mixed use by:
   a) Augmenting Infrastructure
   b) Adoption of decentralized infrastructure and sustainable mobility.
3. Zones with excess infrastructure and where market demand needs to be generated to enhance property values. This may be achieved through promotion / introduction of park-facing areas, plaza-facing areas et al. which enhance property values.

Methodology for generating projected volumes from infrastructure and market assessments.

Generating volumes from Infrastructure assessment-

1. For each land use type, water and power consumption for every square meter of built up area is to be calculated. For this, the benchmarks and occupancy loads from concerned Development Plan, URDPFI Guidelines and National Building Code may be used. Additional water and power requirement for fire safety, landscaping, and other special uses is also be factored. Sewage generation for every square meter of built up area is to be calculated.

2. Based on the above, the commutative water consumption, power consumption and sewage generation for the CBA, is to be calculated considering maximum applicable FAR/FSI. The same is to be discussed with service providers. Where a limit applies, it should be recorded to determine the cut-off FAR/FSI. The future possibility of infrastructure augmentation is to be discussed with service providers and recorded.

3. The limiting factor for road capacity w.r.t. trip generation per square meter of Built Up Area can be done through a TIA.

4. The total consolidated buildable envelope as per limiting infrastructure capacity is to be modeled either at gross level of the CBA or at net level for each plot.
2.4 Property Development Plan (PDP)

**Definition**

PDP governs development of plot and its resultant form through below-mentioned components:

1. Size and shape of plot
2. Character of development
3. Suitable approach of Heritage Response
4. Public Passages through plots
5. Public spaces within plots
6. Plots with marker elements
7. Prohibited and regulated areas of protected monuments

**Objective**

To regulate market responsive property development by applying components of Urban Form to create land value.

**Benefits**

1. Creates development opportunities for land parcels.
2. Leverages presence of heritage and environment as a strength to enhance property value and return of revenue.
3. Creates land parcels in brownfield sites for property development to enhance potential of the CBALP.

**Typical Benchmarks (Indicative)**

All benchmarks of respective UFRs are provided in SOP-II- Preparation of Urban Form Regulations.

**Points to keep in mind**

1. Transformation of brownfield sites are critical to ensure its livability and vitality. Dynamic plans like CBALP and its UFR are ideal to enable incremental growth compliant with changing regulations.
2. Besides classified heritage, properties may also become so in the future. This makes it essential to institutionalize certain norms of response to heritage as a part of regular building sanction. This will alleviate the general quality of architecture through practice and involve experts for specialised studies, design responses and to establish standards.
3. Compensation through FAR/ TDR incentives encourages public participation in transforming cities and augments quality of life. Steps such as plot amalgamation and sub-division to form new public streets and open spaces, creation of Public Spaces (like pedestrian way, greens, plazas) in private plots et. al.; enhance functionality and reflects in increased value of the plot and surrounding areas.
4. Expansion of Built Up Areas from one property to another across public spaces enhance functionality and value of assets created. Such expansion which conform to all safety requirements should be encouraged.

**Checklist**

- GIS map of all plot profiles and ownerships
- GIS map of following CBALP overlays - ROP, LCMP and OSP
- GIS map of all public areas where expansion above or below them are restricted

**Step 1:** Collate all overlays prepared earlier and demarcate mandatory development actions applicable to each plot. For example:

1. From (Re)Generation Opportunity Map plots requiring infrastructure augmentation or value addition through design, like insertion of open spaces, plazas, etc.
2. From Mobility network Plan, all Pedestrian Way and Vehicular Way passing through plots to be mapped.
3. From Outdoor Space Network plan, all public spaces required within plots to be mapped.

**Step 2:** Response to Heritage to be mapped:

1. Locate Natural and Built Heritage
2. Classify plots that fall under:
   a) Prohibited Area
   b) Regulated Area
   c) Any other applicable regulations

**Step 3:** Location of high-rises and marker elements to be mapped to ensure that its shadows allows least two hours of solar access on shortest day of the year.

**Step 4:** Zones where expansion under and above public roads, green areas and water bodies are restricted, are to be mapped. In all other areas, where such expansions are allowed, shall be subject to controls mentioned in SOP-II. Following three types of zones are possible:

1. Zones where expansions are prohibited above or under it. For example - defense land, environmentally sensitive area, in and around Protected monuments, etc.
2. Zones where expansions are only prohibited above ground.
3. Zones where expansions are only prohibited below ground.

**Fig. 20:** Heritage Regulations Map (Sample)

**Fig. 21:** Marker Elements within CBALP (Sample)

**Fig. 22:** Construction Restriction Zone Map (Sample)
2.5 Interface Regulation Plan (IRP)

**Definition**

IRP provides various types of interfaces (ie, Build-To-Line) including response to heritage.

**Points to keep in mind**

1. All plot frontages along primary, secondary roads, green areas, water bodies to be planned with active frontages.
2. All plot frontages facing harsh sun rays to be provided with climate controlled features like colonnades footpaths.
3. Indicating all frontage around a heritage asset where Facade Controls is mandatory.
4. Overlay for areas where BTL may not apply, need not be generated. Reasons for the same may arise from requirements for security, heritage preservation, securing view corridors et al.

**Objective**

1. Demarcate plot interfaces where Active Frontages (AF), Colonnades (C) and Facade Controls (FC) either independently or in combination are mandatory.
2. The demarcated plot interface conditions will regulate the permissible character of the CBA through Built to Line

**Benefits**

1. Creates people centric and climate responsive Urban Environment
2. Creates and enhances land value
3. Encourages sustainable and compact cities.
4. Creates frontage which have lower heat island affect.
5. Reduces heat gain in buildings.

**Types of interfaces to be mapped**

1. BTL with Active Frontage (AF).
2. BTL with Active Frontage (AF) and Colonnade (where climate controlled footpaths are required).
3. BTL with Active Frontage and Facade Controls essential where Heritage Response apply and climate controlled footpaths are not necessary.
4. BTL with Active Frontage, Colonnade and Facade Control, essential where Heritage Response and climate controlled footpaths are required.

**Checklist**

- GIS map of all existing and proposed property frontage conditions
- GIS map of property boundaries including ownerships

**Performance Indicators**

1. Encourage active frontages along all public spaces.
2. Encourage solar heat gain in winters and solar heat resistance in summers through facade controls and colonnades wherever possible.
2.6 Community Building Program (CBP)

Definition

CBP is a plan with all existing and future activities, spillover that defines the Character and function of an area.

Objective

All existing settlements have a pattern of activities and spillover. Future developments may add new flavor to it. The purpose of this plan is to acknowledge all such activities and spillovers which allow social interactions and generate a sense of community. A lot of such activities and spillovers have immense potential to enhance “eyeballs” and “footfalls” in public spaces, thereby opening up new possibilities of revenue generation and pushing market demands.

Points to keep in mind

1. While this plan is the basis, spirit and the outcome of regeneration of brownfield areas, these can make green field planning people centric.
2. People centric and market responsive planning have to complement each other. As such, a balance between paid-unpaid activities, revenue generation etc have to be achieved.
3. Activities and spillovers reflect how urban areas affect human behaviour and how human actions articulate spaces. As such, focus should be on leveraging from existing social activities and mitigating anti-social activities through proposed design interventions.
4. All public spaces need to be universally accessible.

Benefits

1. Leverage social infrastructure, public spaces, spillovers and activities to create real estate value.
2. Ensure that urban areas and assets are people centric, thereby enhancing outdoor activities, time and money spent in outdoor activities.
3. Create opportunities of digital place making, through application of IoMT, AR and AI.
4. Create beneficial relationships between urban assets of past, present and future.

Performance Indicators

1. Increase in spillover of activities on streets and other public spaces.
2. Increase in outdoor activities by residents and visitors of all genders, age groups and physical condition.
3. Increase in community engagement activities in outdoor spaces.
4. Increase in demand for commercial use of outdoor spaces and hence revenues.

Checklist

- GIS map of all plot profiles and ownerships
- GIS map of all social infrastructure, community facilities, public spaces etc.
- GIS map of all activities and spillovers

Step 1: Create base map of all community facilities and spaces like schools, hospitals, formal and informal markets, community halls, etc.

Step 2: Map desired spillover of all facilities in outdoor spaces after consulting the facility owners/managers. For example - map the zones where the spillover of school activities take place, zones where spillover of markets, hospitals, etc. take place. Also mark the character and types of spillovers. For time bound spillover, mark the period of spillover too.

Step 3: Map activities which require special attention;

1. Identify all zones which are frequented by children and require specific design measures.
2. Identify all areas, especially interchange points, crossing facilities, public spaces where geriatric friendly design need special attention.
3. Identify zones where traditional art, craft, skills, etc. exist and need to be preserved / promoted.
3.1 Relationship between CBALP and UFR

Table below reflects how each CBALP overlay regulates various Urban Form Regulations. These regulations may apply as per need established for respective CBAs.

<table>
<thead>
<tr>
<th>CBALP Overlays</th>
<th>Corresponding UFRs</th>
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<tbody>
<tr>
<td>Outdoor Space Plan (OSP)</td>
<td>Open Space Regulations-</td>
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<tr>
<td></td>
<td>• Waterfronts- Natural and Man-made</td>
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<td>• Green space- Natural and Man-made</td>
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<td></td>
<td>• Public space within plots- Public Plaza and Public Terrace</td>
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<tr>
<td>Low Carbon Mobility Plan (LCMP)</td>
<td>Street Design Regulations-</td>
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<td>• Street Hierarchy</td>
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<td>• Street Design</td>
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<td>• Junctions and Mid-Block Crossings</td>
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<td>(Re) generation Opportunity Plan (ROP)</td>
<td>Plot and Building Regulations-</td>
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<thead>
<tr>
<th>CBALP Overlays</th>
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<td>Property Development Plan (PDP)</td>
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<td>• Vehicular Way</td>
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<td>• Marker Elements</td>
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<td>• Prohibited Area</td>
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<td>• Regulated Area</td>
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<td>• Heritage Regulations</td>
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<td>- View Corridor</td>
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<td>• Pedestrian Colonnade</td>
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<td>• Facade Controls-</td>
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<td>- Colour Palette</td>
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<td>- Material Palette</td>
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<td>Community Building Program (CBP)</td>
<td>Community Building Regulations to apply along with Open Space Regulations and will focus on-</td>
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<tr>
<td></td>
<td>• Activities and Spillovers</td>
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<td></td>
<td>• Public Art</td>
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</tbody>
</table>

Table 3: Relationship between CBALP and UFR
3.2 Way Forward

Once the CBALP is prepared through public consultation, the following actions are important:

1. UFRs and CBALP are to be prepared and notified together.
2. CBALP and UFR to be published on the dynamic online portal.
3. Dynamic portal to demonstrate the proposed transformation, necessary convergences and impact of proposals to property owners.
4. Regular public consultation to be conducted and CBALP to be updated on a real-time basis.

Recommendations for CBALP approvals

The approval of CBALP and its UFR is similar to that of other Area Based Plans, like Layout Plan, Influence Zone Plans, LAPs, etc. However, to facilitate public participation and necessary negotiations similar to those done under TP-Schemes, an online portal is beneficial. This makes the process efficient, transparent, increases public participation and awareness. This results in enhancing the buildability of areas, hence revenue maximization. The recommended mechanism for online portal has also been proposed in the guidebook.
Other Documents

For more details also see the other parts of this Guidebook.

Guidebook

This guidebook explains all tools and processes to adopt Form Based Codes and its component parts, like CBALP, UFR, PDC.

SOP II

SOP-II provides tools and processes for formulating Urban Form Regulations (UFRs) applicable to various CBALP.

Background studies

This document contains all background studies and references for Form Based Codes (FBC).

Manuals for Station Redevelopment including Commercial Development

These Manuals and Guidebooks were prepared by IRSDC Ltd. through testing on ongoing projects and adopted in 2021 after an India-wide consultative process involving key sector experts. The manuals have been applied to plan for Indian station redevelopment projects at Nagpur, Bijwasan (New Delhi), Chandigarh, Amritsar, etc.

Source:
https://smartnet.niua.org/content/ce38f242-d616-454f-83f6-6e9c4d7b4443
https://shaktifoundation.in/impact-stories/indian-railways-adopts-form-based-codes-for-station-redevelopment/
Testimonials

“The Standard Operating Procedures I and II viz., Preparation of Character Based Area Layout Plan and Preparation of Urban Form Regulations along with Guidebook for adoption of Form Based Codes – Case Studies have assumed much significance especially as Ministry of housing and Urban Affairs have been advocating area based strategies through Special Assistance to States to implement Urban Planning Reforms as formulation of Local Area Plans and Town Planning Scheme have been identified as one of the reforms. Both the SOPs and Guidebook are comprehensible and Town Planners working in State Town and Country Planning Department, Urban Development Authorities and Urban Local Bodies can use these documents while taking up area based strategies.”

R.Srinivas,
Consultant (Urban Planner) M/o Housing and Urban Affairs, Govt. of India. Former Town and Country Planner, TCPO, MoHUA. Director (Ahmedabad Smart City Development Limited)

“The effort put in to develop the FBC Guidebook and the SOPs is commendable, the documents are well written and illustrated with simple graphics. Integration of FBCs in the Planning Process is indicated clearly, and as understood from the guidebook, its implementation may be done in a phased manner over a period of time. Using performance oriented and area based approach for FBCs with a dynamic portal offering flexibility is good and will ensure that the regulations are neither too prescriptive nor rigid. FBCs lays emphasis on climate responsiveness and addresses resilience while integrating natural and built resources, which is good. PDCs are in an easy to understand format, which may make it useful for wide range of users. Additional regulations for heritage and high density areas is much needed and is welcomed.”

Dr. Sujata Govada
Founding and Managing Director, UDP International
Adjunct Associate Professor at CUHK
Vice President (International Relations) and Founding Member of Hong Kong Institute of Urban Design (HKIUD)
Vice President of AIA HK
Global Trustee of the Urban Land Institute and ExCo member of ULI North Asia

“Very good piece of work done and relevant considering. This is a non-prescriptive and handholding tool to streamline the processes for brownfield transformation and aligns with the new vision for Indian cities, being promoted by the Government of India, MoHUA and other allied bodies/missions like NIUA, GATI and JAL Shakti. While individual agency/ Mission focus on isolated mandates, the Guidebook and SOPs are providing an integrated framework and have enlisted actions to achieve necessary outcomes. The idea of Property Development Cards and dynamic portal would facilitate implementation of Real estate bonds, green bonds and even carbon markets. With this we can also imagine exploring tools like these to increase participation/ interest of participants in improving the public and green spaces when you are sequestering carbon. Improving the quality of life for people in the urban spaces if made tradeable, benefits real estate development and boosts revenue capture. When quality and feasibility is converted into real estate shareable bonds, it becomes easier to incentivize everyone to participate.”

Dr. Sumana Bhattacharya
Senior Advisor, Climate Change at Iora Ecological Solutions
Expert in review, development, management and implementation of programmes and projects in the areas of Climate Change, GHG inventory, Ecosystem Assessment, and Low Carbon Development.
She is a key member for engagements on climate change policy development, finance and governance issues at a national and state level.

“It is good to note that the Guidebook and SOPs integrate Green Building parameters as part of area planning and regulation. The integration of Green Building Guidelines into Property Development Cards lay the ground for cities to adopt Green Building Passports.”

SMH Adil
Built Environment Simulation Specialist, CEO, GEED
Licensed ECBC Master Trainer,
Certified Energy Manager, Bureau of Energy Efficiency, M/o Power Govt. of India

“The proposition in the documents (Form Based Codes) – i.e. to streamline the process of transformation of brownfield sites can be a useful tool for upgrading areas in and around monuments and historic cities in general. As the regulations are contextually driven, the layers in historic towns, which impart its characteristics can be included and responded suitably. Which means, one evolves a format of development where heritage is synonymous to upgradation/ better quality of development. The Property Development Card – is of great help to those with property in Prohibited and Regulated Areas. As the PDCs are applicable even at plot level, it will very clearly articulate options of development at the very onset. This will prevent the issues arising from ambiguity and tentativeness due to complications in the norms and even how monuments were notified originally. In fact – this is the essence of EoDB. As a reviewer, I have understood the immense value of these regulations and guidelines, and I would look forward to further Consultation and adoption processes.”

Prof. Ajay Khare,
Professor (HAG) and Dean Research & Head GHCR
School of Planning and Architecture, Bhopal, India. (M/o Education, Govt. of India)
Former Member, National Monuments Authority, (M/o Culture, Govt. of India).
Former Director, (Founder) SPA Bhopal, (2009-2014)
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