

STUDY OF DEMAND AND SUPPLY PATTERN OF HOUSING (DSPH)
IN CMA FOR CHENNAI THIRD MASTER PLAN - 2046

1. Background and Introduction

Chennai Metropolitan Development Authority (CMDA or ‘Authority’) was constituted as an ad-hoc body in 1972 and became a statutory body in 1974 via the Tamil Nadu Town and Country Planning Act 1971. The Chennai Metropolitan Area (CMA), until November 2022, comprised the city of Chennai covering Greater Chennai Corporation, corporations of Tambaram and Avadi, 5 Municipalities, 3 Town Panchayats, and 179 Village Panchayats in 10 Panchayat Unions and falls within four districts and covers an area of 1,189 Sq.km. The CMA area was increased to 5,904 sq.km comprising of, the city of Chennai covering Greater Chennai Corporation, corporations of Tambaram, Avadi and Kancheepuram, 12 Municipalities, 14 Town Panchayats, and 1321 Village Panchayats in 22 Panchayat Unions and falls within five districts. The Chennai Metropolitan Development Authority (CMDA) has decided to prepare the Third Master Plan for the 1,189 sq.km. and a Strategic Regional Plan for the expanded area of 5,904 sq.km.

To inform future policies and plans, especially the Third Master Plan (1,189 Sq.km.) for the organised growth of the Chennai City, The CMDA has called for a comprehensive study to assess the housing demand and supply patterns in CMA (status quo) and to make projections for the year 2046 (i.e., the plan period). The study shall aid devising strategies and interventions that will foster healthy growth of housing stock (both quantity and quality) in response to real and diverse needs and to effective demands (inter alia, limited by affordability). The study shall further support the design of appropriate policies that can be supported through the Third Master Plan and will guide the Authority to enable and facilitate public and private players to achieve the vision of sustainable and inclusive “Housing for All”.

Across CMA, the growing demand for affordable housing has brought a sense of urgency to address shelter needs across the housing spectrum, especially for low- and middle-income households. Further, mixed-housing (inter alia, catering to a diverse range of

affordability levels, tenure arrangements, and sizes) is essential to plan for an inclusionary and equitable metropolis. A diverse and affordable housing stock is an important foundation for supporting growth and responding to changes in the economy, population and housing trends.

CMDA wishes to engage a reputed consultancy to develop an overall, long-term, strategic plan that provides a comprehensive framework for meeting the projected housing requirements over the plan period. It should facilitate both improvements in the existing housing stock as well as the planning and realization of diverse new housing solutions (affordable housing, student housing, etc) through regeneration of existing areas and planned development of green-field sites. It also addresses the challenges and specific requirements of unplanned areas in the city.

2. Objectives of the study

The main objectives of this study on the Demand and Supply Pattern of Housing (DSPH) in CMA for Chennai Third Master plan 2046 can be classified into the following broad categories:

- i. **To identify, capture, analyse, and illustrate the overall housing NEED AND DEMAND** (quantitative magnitude & qualitative attributes) by various socioeconomic groups.¹
- ii. **To identify, capture, analyse, and illustrate overall SUPPLY of housing options.**²
- iii. **To analyse and illustrate the MARKET BALANCE**, through an Affordable Housing Matrix (AHM) that cross-tabulates demand and supply.³

¹ Housing options may be described by unit size, tenure, urban form, and location, amongst others. Socioeconomic groups may be described by household size, livelihood, income categories (e.g., defined in per-capita household income or expenditure deciles), and varied access to financing arrangements (e.g., rent, mortgages, microcredit), amongst others.

² This may be done by graphing various housing solutions / market segments on an Alonso curve (i.e., a gradient of land values subject to location relative to CBD and other centres). Housing types/solutions may be described by supplier, stock and flow, vacancy rates, price, size, tenure, urban form, and location, amongst others. To determine the resource footprint, it should also determine (net private) land consumption per capita, and (if applicable) the level of fiscal subsidies required to bring in various population segments. (With this information, it is later possible to project land needs and fiscal needs for a specific prototype mix, and to determine policy trade-offs.)

³ The AHM is more than just a simple calculation of affordable cost by household income level (as one measure of housing demand) but cross-tabulates demand (rows) and supply (columns) and lists the availability,

- iv. **To project HOUSING NEED and DEMAND by geographic area from today till the horizon year** (e.g., 5-year intervals from today to 2046), based on (1) other works undertaken for the Third Master Plan, including demographic studies, economic development plans, land value and density studies; and (2) learnings from i through iii.⁴
- v. **To make recommendations** that can be taken up through the Third Master Plan preparation regarding a feasible **Housing and Land Use Mix Strategy** for addressing the projected need and demand, specific to each geographic area.⁵

3. Level of Analyses

It is for the prospective Consultant to propose, based on their best professional judgement and given the data and resources (money and time) available – and given the objectives of the study outlined above and the specificities of the deliverables described below. For example, urban street blocks in GCC area and rural lot/village level in CMA area might be the appropriate level of analysis to infer spatial policies related to urban housing and land development patterns and their transformations over time, but this level of detail may not be required for many other analyses (e.g., demographic parameters such as population growth, household size, etc). [Here, ‘blocks’ mean real estate clusters surrounded by public streets, but

accessibility, and affordability for each product (i.e., specific matrix cell): who are the suppliers, what is the respective magnitude of supply (units per year) vs the need, what is the price point vs who can afford it, what is the vacancy rate, and what is the preferred location.

⁴Regarding housing need, the study may reflect on minimum standards that are pragmatically feasible, given the households economic means as well as the state’s fiscal means relative to the magnitude of people who may require state support. [E.g., Indonesia’s Million Housing Programme determined the minimum adequate size of a dwelling to be 9m² p.c. as the ultimate goal, while the minimum initial unit size (to enable households to progressively realize their human right to adequate housing) was 12m², only. The government as an enabler then supports households to reach the initial 12m², while the progressive realization of the 9m² p.c. is the responsibility of the households themselves. Similarly, Ahmedabad’s Parivartan Slum Networking Scheme provided a minimum enabling habitat with tenure security (no eviction guarantee) and access to basic services (highly subsidized with 10% co-payment), while home improvement is the responsibility of the households who, thanks to enabling tenure security and basic services, can tap into microfinance.]

The study may consider economic principles of ‘fiscal responsibility’ and ‘state as an enabler’ of the initial habitat to enable further development (through markets, investment, financial access) for progressively realizing the Human Right to Adequate Housing. If so, the study may consider a strategy for addressing housing need and demand across time, and project various housing types (e.g., single family versus walk ups) across geography (e.g., central versus peripheral wards).

⁵ A feasible strategy will balance land consumption, development costs, affordability/inclusivity, and fiscal resources required, inter alia. To arrive at a feasible strategy, the study will explore various housing prototype and land use mix scenarios, identify policy trade-offs and the potentially preferred mix. The study may further recommend potential zoning changes, considering international best practices for tackling risks and obstacles and for realizing opportunities identified.

not any administrative unit (like taluka).] Thus, it is for the Consultant to determine and propose pragmatic approaches, and to budget accordingly.

4. Scope of the study

The following are the scope of the study:

Phase 1: Inception – Framing, literature review, and global case studies

4.1.1. Sub-step 1. Develop the research framework and outline the report, considering the study objectives. Through this part the consultant will lay out the overall framework for the study, methodology to be used, and the outputs envisioned. The consultant shall submit an outline (i.e., table of contents *and* brief description for each section) of the envisaged final product.

4.1.2. Sub-step 2. Pursue a literature review to inform/enrich the research framework, particularly regarding demand and supply studies for practical (non-academic) purposes with a focus on providing practical information for framing the Third Master Plan.

4.1.3. Sub-step 3. Conduct a review of relevant National and State policies, development rules and regulations, programmes, schemes, projects, guidelines and other instruments that affect housing development. The review should also cover all relevant instruments/interventions by CMDA, other government agencies, non-governmental agencies, academic institutions and other stakeholders.

4.1.4. Sub-step 4. Conduct a comparative study of different development rules and regulations, with at least eight different national, regional, and global practices (focusing on metropolitan cities) enabling functional (e.g., affordable, liveable, sustainable, and profitable) land and housing markets. The consultant should assess and review research studies such as but not limited to the following, (a broad perspective of the below topics should be shared during inception stage and a detailed report to be furnished in deliverable IV).

- Current land use plan and government housing programs.
- Dedicated affordable housing zones (e.g., overlay zones near transit hubs)

- Dedicated minimum reservation for affordable housing in each local area
- FSI, TDR and TOD -related incentives.
- Possible changes by reviewing from housing perspective onTNCDBR 2019 study and T&CP Act 1972 amendment study, which is currently under study process and the same will be shared to consultant once the report is finalized.
- Integrated developments and market-responsive zoning practice (e.g., promoting mixed-use, mixed-income, mixed-housing settlements) for a compact and walkable residential neighbourhood.

Deliverable 1: Inception Report

In addition to the traditional contents of an inception report (i.e., research framework, literature review/initial study, outline for the final product), the report shall discuss in details the methodology of study (incl. research questions, secondary and primary data needed, both qualitative and quantitative). If primary data collection is needed (surveys, FGDs, interviews, etc.), the Consultant shall articulate the purpose, scope and timeline for these undertaking in order to achieve the project objectives as mentioned above. If applicable, for primary household surveys, careful consideration need to be given to sampling strategy to ensure statistically robust analyses.

4.2. Phase 2: Housing Market Drivers and Housing Stock.

The consultant will identify the key market drivers/factors in CMA for the overall housing market (large developer vs SME developer/builder vs household-led; formal and informal). This phase is critical for understanding the current housing market: i.e. housing need and demand (Objective I), and supply (Objective II), and their interactions (Objective III: which prototypes get built where, how many, by whom, at which cost, etc.)

The consultant should identify the key demographics, socio-economic, real estate market trends, market drivers and profile of existing & future (e.g., 5-year intervals from today to 2046) housing stock of CMA area that will impact on the local housing market. This study should also give complete qualitative understanding of market drivers, particularly

economic ones, such as employment location, mobility patterns, household income and financial access.

It is important that the study reports aggregated numbers at the lowest level which is statistically robust given the data collected. Moreover, the consultant will develop quantitative-spatial visual representations, like graphs and maps of population, household density, housing stock, income distribution, physical and tenure type of housing stock for existing housing scenarios.

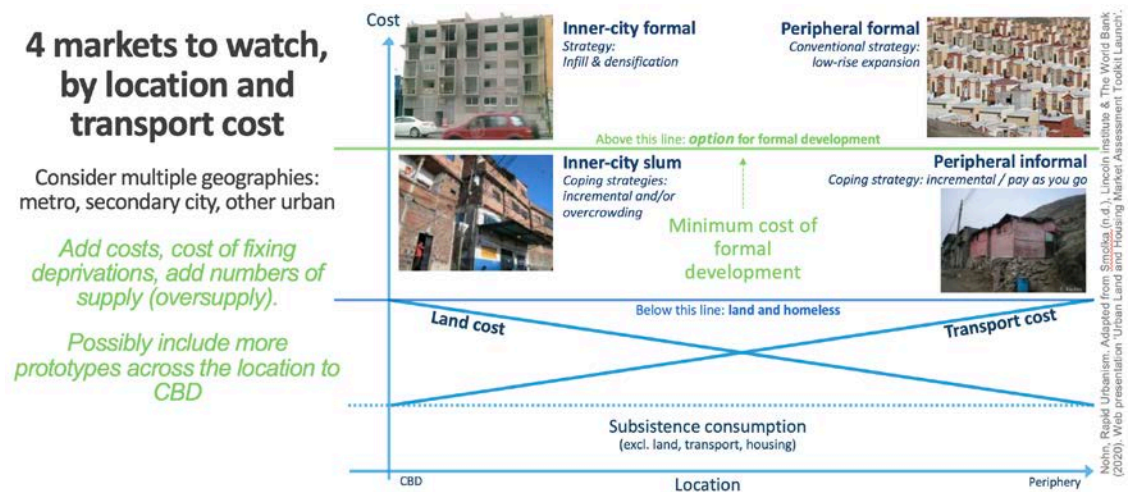
4.2.1. **Sub-step 5. Determine the housing need.** Housing need arises from (a) existing backlog (e.g., slums), (b) natural depreciation of existing buildings (e.g., renewal), and (c) change in the number of urban households (which is a combined effect of natural population growth, net migration, and change in average household size).

Nota bene: housing need also has varied qualities, regarding the enabling habitat (basic services, location/employment access, investment security, starter home) to be supported by the State versus the final objective (fully adequate housing) to be the responsibility of the market.

Sub-step 6. Determine effective housing demand, based on affordability. This task will determine (a) the per-capita household income distribution (by deciles, with poorest decile at the bottom), (b) affordable ranges of housing expenditures for owners (using the market's 30-percent rule of thumb as well as the softer residual income method) and renters (using somewhat lower expenditure shares, as renters are not saving up equity), and (c) varied financial access (e.g. mortgages at the top versus microfinance at the bottom; e.g. market-based vs subsidized).

4.2.2. Sub-step 7. Documenthousing supply prototypes, varied by geographic area. To do so, the consultant will identify at least 20 key housing solutions (e.g., chosen amongst high-rise vs mid-rise vs low-rise; apartments vs multi-story townhouses vs rowhouses, residential only vs mixed-use buildings; complete provision versus incremental construction). Each housing solution will be described as outlined under Objective II (footnote); the following is an illustrative figure with four housing solutions: central vs peripheral, formal vs informal; the study is tasked to develop a more detailed representation for GCC and high density area in CMA and describe further details.

Eventually, a detailed supply analysis incorporating market trends, ongoing projects, proposed projects, their supply pattern (market value, number and size of units, location), and reason for the supply pattern will provide further evidence and details to the above prototypes.



4.2.3. **Sub-step 8. Carry out necessary spatial analysis of Housing Quality Determinants (HQD)**⁶ at select priority locations (with identified maximum demand)⁷ and deliver spatial representations of preferred housing nodes based on the study result, as illustration for other areas with similar characteristics.

4.2.4. **Sub-step 9. Develop an Affordable Housing Matrix (AHM).** Cross-tabulate identified demand (by income level* in rows) and identified supply (by prototypes/housing solutions in columns) and then describe each matrix cell: the AHM will provide practical insights on which prototype is affordable to which socioeconomic group (e.g., affordable price by income group), whether it is available (output volume), and whether it is wanted (i.e., no high vacancy rate). With the larger set of information on prototypes (sub-step 6) and locational nodes (sub-step 7), one may also infer land consumption, market size, fiscal footprint, etc across.

* This analysis requires household income at a spatially disaggregated level. Consultants are encouraged to think through the most practical yet relatively robust way of arriving at them. The need for primary data collection from surveys (Primary questioner survey need prior approval from CMDA) needs to be assessed critically, given existing data sources and other studies being carried out in parallel (such as the study on Spatial distribution of employment and income categories and agglomeration economies in CMA).

Deliverable 2: Existing Situation Assessment (ESA) of the Housing Sector in CMA area.

The Consultant shall prepare an ESA Report summarizing the process and reporting the results of the various analyses and consultations conducted by the Consultant. The consultant has to submit the prepared outputs along with the above-mentioned tables, matrices, figures, Data and maps.

⁶Housing Quality Determinants: The perception of housing quality depends on factors including job location/employment, proximity to institutions & public transits, preferred typology (villa/x-BHK/apartment/gated community), proximity to city centre/core city and perceived quality of society.

⁷ Preferred location of housing: AHP to be performed on areas (on authority approval) identified with maximum demand in CMA through DSPH profile demand mapping.

4.3. Phase 3: Geographic and temporal projections for CMA

In this phase, the consultant will assess the existing & future (e.g., 5-year intervals from today to 2046) housing demand in the CMA area arising due to the affordable housing cost of CMA populations and other key factors from the result of Phase 2.

4.3.1. Sub-step 10. Compute the land need. The consultant will determine the need for supplying various categories of land parcels (to hold respective housing prototypes/land uses) across geography and time in CMA.

The Consultant will consider the identified magnitude of various needs and the housing prototype mix and the spatial distribution (e.g., across wards) projected, considering: (i) the quantity of net residential land needed, and (ii) the quantity of gross land needed after including other land uses (to nudge with/support net residential land).

4.3.2. Sub-step 11. Overlay critical data. The consultant will overlay the land need information with other relevant data:

- Integrating critical information from other studies, including demographic studies, economic development plans, land value and density studies, Spatial Distribution of Employment and Income Categories, among others, for an iterative analysis for DSPH purposes.
- Coordinating with another ongoing study such as mapping of flood zones⁸, to determine overlaps between risk areas and pressure for development. CMDA will facilitate the data on studies undertaken by CMDA.

⁸ JICA (Japan International Cooperation Agency) is currently preparing “Comprehensive Flood control Master Plan for Chennai River basin” under Commissionerate of Revenue Administration and Disaster Management.

4.3.3. Sub-step 12. Translate land need/demand into useful allocations.

Considering both need/demand and the overlay of critical data, the consultant will make land use allocations, as may be necessary/suitable to adjust the projections to avoid undue cost/risk or to harness opportunities. The consultant has to provide a detailed breakdown of the allocation of total housing demand over the projected timeframe in the identified housing nodes (in sub-step 7) along with various infrastructure facilities & services. The breakdown should consider the varied housing needs and affordability across the socioeconomic distribution, as well as possibly reflect on differentiated standards of the enabling habitat (state-supported) vs the minimum objective (adequate housing).

4.3.4. Sub-step 13. Conclude with rationale and justification. The consultants are tasked with providing an integrated and standardized evidence base for CMDA to estimate overall housing demand, prototype mix, land need, and allocations: i.e., describing the here outlined sub-steps, related data sources, methods, key findings, etc, as well as any adjustments that may have become necessary.

Deliverable 3: Projected Housing Demand for CMA

The Consultant shall prepare the projected demand across time and space, describing the process/methodology/input data and report the results of the various analyses and spatial allocation of housing demand, net and gross land need, and zoning implications in CMA in text, quantitative tables and charts and spatial information (e.g., maps). The consultant shall submit all (e.g., socioeconomic, spatial) data used as input and output with the report in a format acceptable to the Authority.

4.4. Phase 4: Opportunities and Risks, Recommendations for Third Master Plan towards Feasible Housing Strategies

This phase will respond to objective V, by formulating a feasible set of recommendations on housing & land use mix strategy across the CMA for addressing the projected housing need and demand, specific to each geographic area. A feasible strategy will balance land consumption, development costs, affordability/inclusivity, and

fiscal resources required, inter alia. To arrive at a feasible strategy, the study will explore various housing prototype and land use mix scenarios, identify policy trade-offs and the potentially preferred mix. The study may further recommend potential zoning changes, considering international best practices for tackling risks and obstacles and realizing opportunities identified throughout.

4.4.1. Sub-step 14. Identify key findings, opportunities and risks. Based on all earlier findings, the Consultant will conclude on key findings, opportunities and risks.

4.4.2. Sub-step 15. Conduct in-depth international case studies. To inform the various aspects of a feasible strategy (also see below), the Consultant will further detail not less than 4 international case studies (a subset of from the global review during phase 1 and/or new cases) with those cases that are most relevant for addressing the identified need and related opportunities and risks/threats.

4.4.3. Sub-step 16. Formulate practical forward-looking recommendations that will inform the preparation of the Third Master Plan for CMA. Considering local conditions and international experiences, activities under this sub-step will inform policy and strategy, inter alia by:

- **The Consultant shall propose a Housing Strategy** to include measures that address the housing needs of the existing and future (e.g., 5-year intervals from today to 2046) population of the CMA area with respect to the possible changes to key rules/regulations (T&CP Act and TNCDBR).
- **The Consultant shall propose a Land Strategy** to cater to the need across different sectors to locate spatially and to integrate various urban housing prototypes towards mixed-use, mixed-income, mixed-density, mixed-housing settlements, with cross-subsidies between financially stronger and weaker elements. It should provide for more sustainable patterns of development by ensuring that as far as possible housing development is designed and located so

as to make full use of public transport and to give access to education, employment, health and other services. The consultant has to provide key provisions for the integration of housing with social, economic and environmental opportunities based on housing need, location & types of an implementation mechanisms.

Here, the consultant has to frame the strategy that must set out the target needs identified by the DSPH which is to be met by the horizon period of the Chennai Third Master Plan: moreover, the consultant shall consider various larger objectives and principles – such as climate-smart and inclusive development or market making for local economic development; suitable location given disaster risks and given employment location and mobility, connectivity, accessibility, as well as Transit-Oriented Development (TOD); prior availability of and ease of providing infrastructure & services, etc. Finally, the consultant will conclude with recommendations for zoning (density and land use mix) to address these needs and outline priority locations for phasing these land uses over time (e.g., 5-year intervals from today to 2046).

- **The Consultant shall propose potential pilot projects.** Considering the larger pattern proposed and risks and opportunities identified above, the consultant shall indicate potential pilot projects, regarding enhanced land supply and housing based on adequate location & feasible land use mix given predominant land ownership patterns (public, private, others), and the need for adequate infrastructure & services. Some potential pilots could include Land Pooling & Land Readjustment, affordable housing PPP, and rent-to-own schemes.
- **Finally, the Consultant shall outline an enabling policy for realizing the strategies.** The consultant has to set out policies (which are within CMDA's mandate) that include specific objectives in the study, reflecting the need of different areas assessed in the strategy to ensure that the necessary social and affordable housing will be provided, including inclusive planning/zoning and

policy interventions, such as encouraging the development of mixed and balanced communities, to counteract undue social segregation.

Deliverable 4: Policies and strategies and final reports.

The Consultant shall submit the combined final report on DSPH, including a forward-looking conclusion with pragmatically feasible (non-academic) strategy and policies for consideration by the Authority.

5. Deliverables and payment schedule

Deliverables*	Timeline**	Payment (% of value)
Inception Report	T + 0.75 months	15 %
Existing situation assessment of the Housing sector in CMA area.	T + 5 months	30 %
Projected Housing Demand for CMA.	T + 7 months	30 %
Policies and strategies and final reports.	T + 8 months	25 %

Note*: As part of each deliverable, the consultant has to submit all the collected data, analysis, Maps, GIS

files, etc., for DSPH study for further payment process.

** ‘T’ = date of issue of work order

6. Key Personnel

S. No	Position	Qualifications and Experience	Man Months
1.	Program Director and An international expert as an advisor for developing housing strategies and guide the team to deliver at a strategic	Recognized master’s degree in Urban Planning/ Urban Design/ Urban Management or equivalent Minimum 15 years of professional experience with senior roles across core elements of Project Planning / Project Supervision / Program Management. Should have experience of managing at least one long term program/project (project duration of 8 months or more) in a leadership capacity with	8

S. No	Position	Qualifications and Experience	Man Months
	level	<p>accountability and responsibility for performance including quality, budget, schedule, client and stakeholder management.</p> <p>Should have experience in working on/ managing projects related to urban agglomeration development/ land and housing/ economic development strategy / socio-economic planning</p> <p>Should have related international experience</p>	
2.	Urban Planning expert	<p>Recognized master's degree in urban planning or equivalent</p> <p>Minimum 10 years of professional experience</p> <p>Should have done at least 3 programs related to affordable housing/ real estate valuation/ land assessment/ value capture/ socio-economic planning</p>	8
3.	Housing expert / Specialist	<p>Recognized master's degree in Housing or real estate or equivalent</p> <p>Minimum 10 years of professional experience</p> <p>Should have done at least 3 projects related to affordable housing/ real estate valuation/ land assessment/ value capture/socio-economic planning</p>	8
4.	Statistics expert	<p>Recognized master's degree in statistics or equivalent (e.g., public policy with quantitative concentration), with minimum of 10 years of work experience in surveying, sampling, and quantitative data processing, including experience with urban / spatial analysis.</p>	4
5.	Urban Economics expert	<p>Recognized master's degree in economics/urban economics or equivalent, with minimum 10 years of work experience in housing or real-estate assessment.</p> <p>OR</p> <p>Recognized doctorate in Economics or equivalent with minimum 2 years of work experience in housing or real estate assessment.</p>	4
6.	Financial expert	<p>Recognized MBA(Finance) or equivalent</p> <p>Minimum 10 years of professional experience</p> <p>Should have worked on at least three projects related to public finance and policy, finance models including PPP.</p>	4

S. No	Position	Qualifications and Experience	Man Months
7.	GIS expert	Recognized master's degree in GIS/ Remote sensing & GIS/Geo-informatics or equivalent Minimum 5 years of professional experience. Should have worked with at least 2 projects related to the Housing sector.	8
8.	Community Development Specialist/Sociologist	Recognized master's degree in Sociology or equivalent Minimum 5 years of work experience in community development projects in the housing sector.	4
9.	Architect	Recognized master's degree in Architecture/Environmental Architecture/ Housing/ Habitat Design/real estate or equivalent Minimum 5 years of work experience in green buildings/Sustainable building development Should preferably have one or more of the following accreditations: LEED, GRIHA, IGBC, ECBC.	6

Nota bene: the Consultant does not need to fill each expert position with different individuals, but one expert with multiple experiences may cover more than 1 position; however, any team composition needs to balance the workload across individuals so to not slow down the work process. Also any 1 position may be split between experts with complementary experiences.

A. Annexure I: On-going Studies for the preparation of the TMP

S.NO.,	Name of the Study	objective/expected outputs	Timeline
1.	Spatial distribution of employment and income categories and agglomeration economies in CMA.	This project will study the spatial distribution of employment and income patterns in the Chennai Metropolitan Area to support the Third Master Planning efforts at CMDA and analyse its connection to geographical spread of economic activity, as well as the demand for housing, transport and basic urban infrastructure/services in Chennai.	
	Land value and density distribution in the CMA.	Collect information on the spatial distribution and temporal trend of land value and density across the CMA and use such information to make inferences on urban development hotpots and urban investment needs	
	Integrating Blue-green infrastructure for flood disaster and risk reduction in Urban Planning and management in CMA.	Prepare a Blue Green Infrastructure Master Plan for Climate Change Adaptation and Mitigation in CMA	
	Study on Urban heat islands effect in Chennai.	Analysis of surface urban heat island effect and its change over Chennai Metropolitan Area (CMA) using a geospatial approach”.	
	Open Space guidelines for CMA.	<ol style="list-style-type: none"> 1. To establish the need for OSR in the city including the developed/core areas of the city. 2. To analyze supply & demand, identify deficiencies and to secure new provisions for open spaces at Community, neighborhood town and city level. 3. To understand the types of open spaces with respect to location. (parks, playgrounds, greenfields, etc) 	
	Climate action plan for CMA	<ol style="list-style-type: none"> 1. Develop a complete greenhouse gas emission inventory for CMA operations. 2. To assess the net land use, land use change and forestry emissions in CMA. 	

		<p>3. To develop comprehensive strategies to create natural systems resilience, transportation, building energy management and waste reduction.</p> <p>4. Develop framework for risk informed decentralization of governance in CMA</p> <p>5. To develop policy guidelines for the introduction of Carbon credits, pricing and ensure public infrastructure projects take account of climate impacts.</p> <p>6. Develop strategies for a carbon neutral economy in CMA by 2050.</p>	
	Regional Planning strategy	<p>1. To establish a 'spatial' vision and strategy specific to the region</p> <p>2. To formulate the region specific policies for the Economic growth and social development.</p> <p>3. To formulate strategy for regional growth and to bring out the development of the region in a systematic and planned manner.</p> <p>4. To formulate strategy to reduce the economic imbalances in the region.</p> <p>5. To conceptualize strategy for economic growth, social development and while protecting the environment of the region.</p> <p>6. To identify the different growth centres and different order of settlements functioning within the Extended CMA and formulate a comprehensive strategy for inclusive development for all level of settlements.</p> <p>7. To establish the visions across sectors pertaining to the region.</p>	
9.	Public space master plan for CMA	<p>1. Preparation of Citywide Public space inventory on a parcel-by-parcel basis to review the status of existing public spaces specifically the network, distribution, accessibility, quantity, and</p>	

		<p>quality.</p> <p>2. Identify the issues, deficiencies and Opportunities for the existing Public spaces through a specific site assessment framework.</p> <p>3. Review the current standards by comparing with national and international benchmarks and propose appropriate standards for Public spaces based on a contextual approach to achieve the target level of service.</p> <p>4. Detailed assessment of existing public spaces by comparing with proposed standards and determine the current demand & future requirements of public spaces to address the needs of diverse range of user groups.</p> <p>5. Prepare a plan showing the various typologies of proposed public spaces that are essential at each neighborhood, zonal & city level in terms of spatial balance, quantity, and quality.</p> <p>6. Propose an Implementation plan with monitoring and evaluation framework for Short term, Medium Term, and Long Term.</p> <p>7. Propose Planning and Design guidelines for public spaces and outdoor facilities with the goal of achieving safe, accessible, and inclusive spaces for everyone.</p>	
10.	Study on Neighbourhood planning for CMA	The objective of this study is to develop resilient neighbourhoods that are adaptive and diverse by developing a hierarchy of planning instruments, such as development plans, urban design framework, integrated visions, quality programmes, design codes and site briefs. The neighbourhood plans will have unique visions that unifies with the comprehensive master plan but are also flexible enough to accommodate changes.	
11.	Digital Twinning of Cities	1. To study and ascertain suitable level of detail of Digital twinning for Chennai by performing cost-benefit analysis, feasibility of data collection, quality	

		of data available, and frequency of data updation required. 2. To demonstrate a pilot digital twin for Chennai and handhold for a period of 2 years	
12.	Gender Inclusive planning and Safety and Security Plan (Zone wise) for CMA	Assess the current status of gender equity and develop a plan for equitable participation in urban life with special emphasize to safety, security and mobility of women.	
13.	Social Facilities plan for CMA	To understand the status quo of Social Infrastructures in CMA and develop a spatial plan for balanced distribution of facilities.	

Relevant studies with the expected outputs and the timeline is given in the table to help the consultant to prepare the technical proposal and to decide on the input days required by the team. Actual study reports to be shared with the contracted consultant after the onboarding.