GRIHA FOR CITIES

CIvic bodies governing **T**owns, **I**ndustries, **E**xisting and new **S**ettlements

VERSION 1

ABRIDGED MANUAL

A GRIHA Council Publication

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Tel. 2468 2100 or 4150 4900
Fax 2468 2144 or 2468 2145
India +91 • Delhi (0) 11
Email teripress@teri.res.in
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MESSAGE

President, GRIHA Council

Census data reveals that population living in urban regions contributes 63% to the country's Gross Domestic Product (GDP) and it is predicted that, by the year 2030 this share will increase to 75% mainly due to continuing urbanization. Many Indian cities are weighed down with various environmental, social, and economic issues, such as resource scarcity, congestion, pollution, poverty, lack of affordable housing, proliferation of informal dwelling, as well as sewerage and sanitation problems.

Addressing these issues is a matter of urgency for the cities, which is highlighted by the objective of the Ministry of Housing and Urban Affairs (Government of India) to promote cities that provide basic infrastructure, give a decent quality of life to its citizens, a clean and sustainable environment and at the same time demonstrate application of 'Smart' solutions.

I am delighted that GRIHA is now launching a new rating variant called, 'GRIHA for CITIES' aligned to the Government of India's target of providing better living conditions for existing and future generations. This rating variant is specifically developed for **CI**vic bodies governing **T**owns, **I**ndustries, **E**xisting and new **S**ettlements to be designed or re-engineered by adopting a holistic and smart approach with a focus on sustainability of the ever-growing infrastructure.

I acknowledge the contribution of the technical team and industry experts, who shared their valuable insights throughout the development process. I hope 'GRIHA for CITIES' will serve as a benchmark for all the upcoming cities and equally help in the refurbishment of the existing ones.

Ajay Mathur

FOREWORD

CEO, GRIHA Council

The rapid increase in Indian population and growth of Gross Domestic Product (GDP) has given rise to an enormous demand for buildings with a subsequent pressure on availability of resources. The GRIHA rating system helps people assess the performance of their building against certain nationally acceptable benchmarks. It evaluates the environmental performance of a building holistically over its entire life cycle right from the design to the post-occupancy phase of the buildings. GRIHA rating system attempts to quantify aspects, such as energy consumption, waste management, renewable energy adoption, etc., so as to manage, control, and reduce the same to the best possible extent.

We, at the GRIHA Council are pleased to introduce the new rating variant 'GRIHA for CITIES' which has been structured as a benchmarking framework such that the 'greenness' of new as well as existing cities can be measured. It is a dedicated assessment cum rating tool to evaluate performance and provide solutions for improved governance, enhanced energy and water efficiencies, better management of waste, and sustainable mobility while ensuring enriched quality of life through qualitative and quantitative criteria covering diverse aspects of sustainable development. The rating system is in sync with the work being done to achieve the Sustainable Development Goals, UNFCCC, and specifically to the livability index, ease of living index and smart city initiatives of the Ministry of Housing and Urban Affairs (Government of India).

The rating system 'GRIHA for CITIES' has been developed through a consultative process across all stakeholders, ranging from policymakers, urban planners, architects, engineers, and experts from academia. I gratefully appreciate the support of all those who were associated with the development of this rating and look forward to their continued guidance for its enhancement in the future.

Sanjay Seth

TECHNICAL ADVISORY COMMITTEE

Chair Person

Mr Sanjay Seth, CEO, GRIHA Council

Members of the Committee

Mr K K Joadder, Former Chief Town Planner, Town and Country Planning Organization

Mr Hitesh Vaidya, Country Manager, UN-Habitat

Mr A K Jain, Former Commissioner (Planning), DDA

Prof. Shovan K Saha, Professor Emeritus and Dean, Sharda University

Mr Ashok B Lall, Principal Architect, Ashok B Lall Architects

Dr Vinod Gupta, Partner, Space Design Consultants

Prof. (Dr) Arun Kansal, Head of Department, Regional Water Studies, TERI School of Advanced Studies

Prof. Chitra Chidambaram, Sharda University

Ms Shabnam Bassi, Secretary, GRIHA Council

DEVELOPMENT TEAM

GRIHA Council

Ms Ashu Dehadani, Manager, Technical and Publications

Ms Gaura Saxena, Deputy Manager

Mr Ravi Prakash Kurkiya, Deputy Manager

Ms Prathama Dolas, Project Officer

Ms Aakriti Sachdeva, Project Officer

TERI

Ms Raina Singh, Fellow, Centre for Urban Planning and Governance

Ms Amrita Chakraborty, Associate Fellow, Centre for Urban Planning and Governance

Mr Puduchari Yashwanth Kumar, Research Associate, Centre for Urban Planning and Governance

Mr Narendra Singh Verma, Research Associate, Centre for Sustainable Mobility

Ms Rhea Srivastava, Intern, Centre for Urban Planning and Governance

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The completion of GRIHA for CITIES rating manual is an outcome of the hard work and dedication of the members of the development team along with several other specialists in the field. GRIHA Council would like to extend sincere gratitude to all the experts for taking out time from their busy schedules and providing their valuable insights.

We would like to thank Mr K K Joadder, Former Chief Town Planner, Town and Country Planning Organization; Mr Hitesh Vaidya, Country Manager, UN-Habitat; Mr A K Jain, Former Commissioner Planning, DDA; Prof. Shovan K Saha, Professor Emeritus and Dean, Sharda University; Mr Ashok B Lall, Principal Architect, Ashok B Lall Architects; Dr Vinod Gupta, Partner, Space Design Consultants; Prof. (Dr) Arun Kansal, Head of Department, Regional Water Studies, TERI School of Advanced Studies, for their productive inputs that helped in the development of this manual.

In addition, we would like to appreciate the support extended to us by all the colleagues from the various divisions of TERI. We gratefully note the inputs provided to us by Ms Sonia Grover, Water Resources Policy & Management Division, TERI; and Mr Alekhya Datta and Mr Abhinav Jain, Electricity & Fuels Division, TERI.

Point weightage of the entire rating system has been developed based on Analytic Hierarchy Process (AHP), which was conducted to define thresholds. GRIHA Council would like to thank all the participants for taking out time to fill and submit the survey.

Lastly, we also extend our sincere gratitude to Dr Ajay Mathur, President, GRIHA Council, for his leadership without which the development of this rating would not have been possible.

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ABBREVIATIONS

AMC	Annual Maintenance Contract
AT&C loss	Aggregate Technical and Commercial loss
CAA	Constitutional Amendment Act
CBULB	Capacity Building Schemes for Urban Local Bodies
CGWB	Central Ground Water Board
CITIES	**CI**vic bodies governing **T**owns, **I**ndustries, **E**xisting and new **S**ettlements
CNG	Compressed Natural Gas
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organisation
dB	Decibel
DCR	Development Control Regulations
DSM	Demand Side Management
EOI	Expression of Interest
EWS	Economically Weaker Section
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GNH	Gross National Happiness
GRIHA	Green Rating for Integrated Habitat Assessment
ICT	Information and Communication Technology
IoT	Internet of Things
kWh	kilowatt hour
LED	Light Emitting Diode
LIG	Lower Income Group
MoHUA	Ministry of Housing and Urban Affairs
MSW	Municipal Solid Waste
MT	Metric Tonnes
NAAQS	National Ambient Air Quality Standards
NABL	National Accreditation Board for Testing and Calibration Laboratories

NMEEE	National Mission for Enhanced Energy Efficiency
NMT	Non-Motorized Transport
NO_2	Nitrogen Dioxide
NTDPC	National Transport Development Policy Committee
PM	Particulate Matter
PMAY	Pradhan Mantri Awas Yojana
PPA	Power Purchase Agreement
REC	Renewable Energy Certificate
SBM	Swachh Bharat Mission
SMART	Simple, Moral, Accountable, Responsive, and Transparent
SO_2	Sulphur Dioxide
SPV	Solar Photovoltaics
SPVs	Special Purpose Vehicles
SWM	Solid Waste Management
T&D	Transmission & Distribution
UHIE	Urban Heat Island Effect
ULB	Urban Local Body
UNFCCC	United Nations Framework Convention on Climate Change
URDPFI	Urban and Regional Development Plans Formulation and Implementation

INTRODUCTION

India's population had already crossed the 1 billion mark in 2001 and it has been assessed that the urban population may reach 50% of the total population by the middle of the century, as against about 28% in 2001. In the coming decades, the urban sector will play a critical role in the structural transformation of the Indian economy and in sustaining the high rates of economic growth. Ensuring high quality public services for all in the cities and towns of India is a task in itself, but it will also facilitate the full realization of India's economic potential. A fundamental shift is crucial to maintain the momentum of economic development through proper facilitation of urban development.

Urbanization in India is characterized by skewed urban growth between cities by large population influx creating distinct variation in the core and periphery of cities in terms of urban form and services. The key challenges include growth of slums, inadequate management of solid waste, decrease in per capita water availability and unreliable water quality, inadequate sewage coverage, and deteriorating ambient air. Cities and towns of India are visibly deficient in the quality of services they provide, even to the existing population. Current service levels are too low compared to the needs of the urban households and considering that India is one of the fastest growing economies in the world.

The country's urbanization presents a unique opportunity of ecologically and economically sustainable development. Since the launch of the Smart Cities Mission in 2015, sustainable, improved, and inclusive infrastructure has come to a focus. Building on the smart city elements, that is, housing, walkable communities, developing open spaces, citizen-friendly governance; the Liveability Index was developed by the Ministry of Housing and Urban Affairs (MoHUA).

The GRIHA for CITIES rating has been structured as a framework for sustainable development of a city, to be achieved by measuring 'greenness' of existing as well as proposed cities. Benchmarking is the process of measuring the performances of various elements against a set standard or target. The rating sets out precepts for planning to achieve holistic sustainability in a city. Qualitative and quantitative criteria have been integrated in the rating to cover diverse aspects of sustainable development. The rating sets performance benchmarks for key resources, such as energy, water, and waste; and evaluates the project's performance in areas, such as smart governance, social well-being, and transportation. The rating is in synchronization with the work being done to achieve targets of Sustainable Development Goals, UNFCCC and is in line with the work being done in the country through MoHUA's Liveability Index, Ease of Living Index and Smart Cities initiatives.

Advantages of achieving GRIHA for CITIES rating

Judicious use of resources is becoming more crucial with time. GRIHA for CITIES rating aims to provide a single platform with a set of predefined parameters to compare the performance of various cities/municipalities within the country thereby providing a sustainability accreditation. It helps to increase the marketability of municipalities for investors and enhances their Credit rating. It also aids the civic bodies in becoming torchbearers for the upcoming towns and cities.

Scope of the rating

The rating targets all cities, towns with civic/local bodies, such as municipal corporation and municipal council. Urban agglomerations having more than one civic body can go for rating in phases as well. The municipal limits of the urban area shall be considered as the boundary for rating purposes. The civic bodies for the rating can be classified as urban local bodies (ULBs) with population less than 1 lakh and ULBs with population greater than 1 lakh.

Any city which is undergoing land acquisition or is in the planning phase shall be considered as new. If the implementation has not started, the civic body can submit policies/plans/calculations/drawings or other relevant documents. The implementation status shall be verified during the course of the project certification.

Rating process

1. **Online registration**: The project proponent can initiate the registration process by filling the expression of interest (EOI) form available on the GRIHA website. The registration is complete after the feasibility checklist is successfully completed by the project proponent. Once the project is registered, the project proponent shall be provided with username and password for documentation on online panel.
2. **Orientation workshop:** The registration is followed by an orientation workshop conducted by the GRIHA Council,[1] which intends to provide detailed information of the rating, all criteria, and to address specific queries of the project team.
3. **Submission of documents:** The project team will upload documents for all criteria on the online panel with the username and password provided during registration.
4. **Preliminary evaluation:** After online submission of documents, the preliminary evaluation is carried out by a team of professionals and experts from the GRIHA Council. The documentation must be complete in all aspects for all attempted criteria. Any attempted criteria with incomplete documentation shall not be evaluated. Online calculators provided for specific criteria need to be filled in and submitted. The GRIHA Council professionals shall first review compliance of all criteria and establish compliance with mandatory criteria; followed by estimation of the total number of achievable points. A preliminary evaluation report shall be submitted within 25 working days after document submission.
5. **Review workshop:** A meeting with the entire project team will be organized after preliminary evaluation. This meeting will be a platform for discussing any concerns and/or queries with the preliminary evaluation.
6. **Final evaluation:** GRIHA Council shall evaluate submitted documentation and final site visit report in response to the preliminary evaluation. On the basis of this evaluation, GRIHA Council shall prepare a final scorecard within 20 working days after the project team furnishes requisite information sought during preliminary evaluation and review workshop. Final rating will be awarded based on the final evaluation.
7. **Review meetings:** After the final rating has been awarded to the project based on the submitted documentation, a review meeting shall be organized for the project team to discuss its progress as per the set targets. This meeting shall be organized once in two years and will give the projects an opportunity to improve their rating.
8. **Rating renewal**: The rating must be renewed every 5 years by submitting updated documentation in the standard format as per the rating.

Rating threshold	Achievable stars as per GRIHA for CITIES rating
25-40	★
41-55	★★
56-70	★★★
71-85	★★★★
86 and above	★★★★★

[1] To be organized at the project proponent's office to ensure participation from all concerned professionals.

Criteria and their weightages

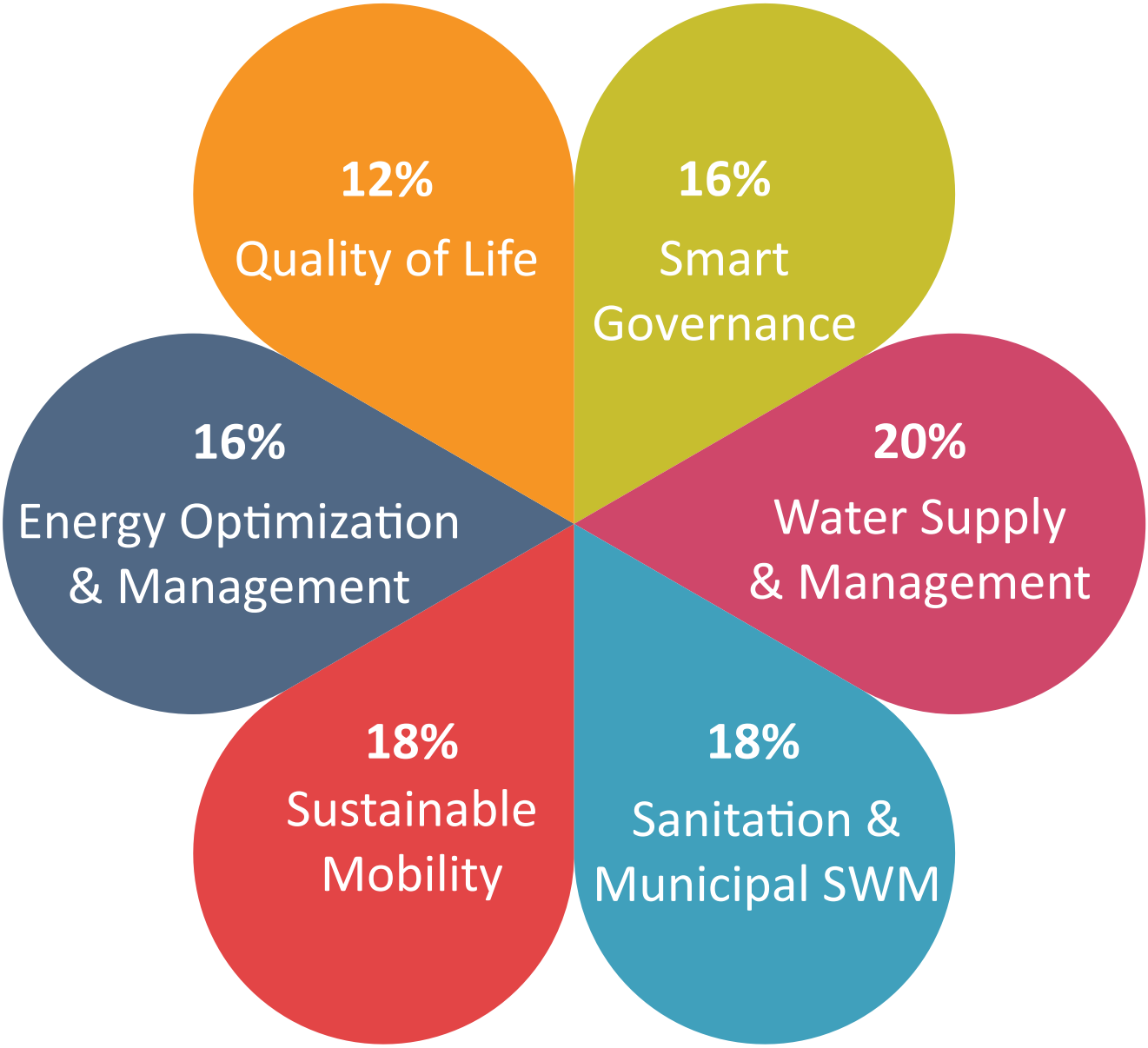

Table 1: Criteria Listing and Their Weightages

Criterion No.	Criterion Name	Points
Section 1	**Smart Governance**	**16**
1	Public Participation in Decision Making Processes	6
2	Intelligent Building Processes	4
3	Municipal Finance	4
4	Capacity Building	2
Section 2	**Water Supply and Management**	**20**
5	Water Sufficiency	8
6	Water Quality and Charge Collection Efficiency	6
7	Stormwater Management	6
Section 3	**Sanitation and Municipal Solid Waste Management**	**18**
8	Sanitation and Wastewater	10
9	Extent of Waste Collection and Management	6
10	Waste Recycling/Treatment	2
Section 4	**Sustainable Mobility**	**18**
11	Public Transport Facilities	5
12	Non-Motorized Facilities	5
13	Road Safety Measures	3
14	Low Carbon Interventions	2
15	Policy Measures	3
Section 5	**Energy Optimization and Management**	**16**
16	Demand Side Management	2
17	Managing Household Electricity Consumption	4
18	Promoting Energy Efficient Street Lights	3
19	Enhancing Power Quality	3
20	Promoting Use of Renewable Energy	4
Section 6	**Quality of Life**	**12**
21	Universal Accessibility	3
22	Availability of Public Spaces and Green Areas	2
23	Levels of Ambient Air Quality and Noise Quality	4
24	Provision of Affordable Housing	3
25	**Bonus Points**	**4**

SMART GOVERNANCE

Presently, India's urban population is around 410 million and is estimated to reach a staggering 814 million by 2050.[2] The urban sector has emerged as a key stimulant for India's economic growth and future prosperity contributing around 60% to the national economic output and 80% of the total tax revenue.[3] However, the present condition of the cities, with respect to maintenance of urban infrastructure and public services delivery is highly unsatisfactory. In order to cater to the challenges faced due to rapid urbanization, the government has encouraged the development of Smart Cities, that is, cities integrated with technology. Technological interventions in governance are paramount to improve the democratic processes and to revolutionize the way public services are delivered. Smart Governance is a strategy to aid in better planning and decision making, thereby providing effective, efficient citizen-centric services. It has been found that good and smart governance helps in enhancing the Gross National Happiness (GNH)[4] index which ultimately gets reflected in the city's economic and social health.

The word SMART captures the vital attributes of governance, that is, Simple, Moral, Accountable, Responsive, and Transparent. If all the civic bodies abide by these, then the management of the various cities and towns could be upscaled at a much higher pace and the challenges faced by them could be reduced to a great extent. The various criteria discussed in this section have been designed in alignment with the several policies and guidelines adopted/ developed by the Government of India.

This section focuses on involving the citizens of the city to put forth their concerns and opinions regarding the public services, incorporation of ICT and GIS-based mapping systems to improve the efficiency and accountability of the services provided, aiding the revenue and expenditure decisions of the municipal body to help in better governance and periodic knowledge enhancement of the municipal body to keep a track of the latest service management strategies.

This section consists of four criteria as mentioned in the table below:

Table 2: Criteria under Smart Governance

Criterion Number	Criterion Name	Maximum Points
Criterion 1	Public Participation in Decision Making Processes	6
Criterion 2	Intelligent Building Processes	4
Criterion 3	Municipal Finance	4
Criterion 4	Capacity Building	2

[2] World Economic Forum (WEF). 2016. 'Reforms to Accelerate the Development of India's Smart Cities: Shaping the Future of Urban Development & Services'. Geneva: WEF.

[3] Praharaj, S, et al. 2018. 'Towards the Right Model of Smart City Governance in India', *Int J Sus Dev Plann* 13 (2): 171–186. Available at: https://www.witpress.com/Secure/ejournals/papers/SDP130201f.pdf; last accessed on November 6, 2018.

[4] Gross National Happiness or GNH, is a holistic and sustainable approach to development, which balances material and non-material values with the conviction that humans want to search for happiness.

CRITERION 1 PUBLIC PARTICIPATION IN DECISION MAKING PROCESSES

Intent: Open (i.e., transparent), accountable, collaborative (i.e., involving all stakeholders), and participatory (i.e., citizens' participation) principles are the foundation of good governance. Public participation in the city's management activities is an important element of what makes a city smart, by incorporating the needs and requirements of citizens. Further, with the citizens' inputs, potential problems can be addressed at an early stage, thus, preventing the risk of failure. This criterion focusses on transparency, efficiency in complaint redressal, and urban decentralization and intends to provide an effective, efficient, citizen-centric service system in cities.

Maximum Points: 6

1.1 Appraisals:

1.1.1 Ensure that the civic body complies with the 74th Constitutional Amendment Act (CAA) such that the area has a governing urban local body (for new as well as existing cities) and the provision of core municipal services[5] (for existing cities).

2 Points

1.1.2 Ensure access to online citizen services as listed in the liveability standards[6] for all the citizens of the area under the purview of the civic body.

2 Points

Methodology for calculating the online citizen services access
Online citizen services accessibility = (A/B)*100
Where,
A = Number of citizen services available online
B = Total number of citizen services provided by the civic body

1.1.3 Ensure efficiency in redressal of customer complaints for all the services as listed in the liveability standards[5]:

2 Points

[5] As mentioned in the Model Municipal Law and modified State Municipal Law that encompasses water supply; drainage and sewerage, solid waste management; economic and social development plans; transportation systems including construction and maintenance of roads, bridges, ferries and other inland water transport systems; community health and protection of environment; and markets and slaughterhouses.

[6] Methodology for Collection and Computation of Liveability Standards in Cities, MoUD, GoI. Available at: http://smartcities.gov.in/upload/uploadfiles/files/MethodologicalReportFinal.pdf; last accessed on November 12, 2018.

Methodology for calculating the efficiency in redressal of customer complaints

C = A-B

Where,

A = Average redressal period for a service

B = Committed redressal period for the service

C = Number of days (these should be <7 for all the services listed in the liveability standards[5] and for other services should be < 1 month)

1.2 Compliance:

1.2.1 Submit duly signed (by competent authority) narrative to demonstrate implementation of the 74th Constitutional Amendment Act.

1.2.2 Submit narrative and calculations highlighting the number of citizen services available online along with the working links of the services portal.

1.2.3 Submit details of the redressed complaints over the past 12 months and calculations demonstrating compliance with 1.1.3

1.2.4 Submit detailed narrative listing the mechanism to manage the complaints and expedite resolution.

CRITERION 2 INTELLIGENT BUILDING PROCESSES

Intent: The use of Information and Communication Technologies (ICTs) is a defining element associated with smart governance. Single window clearance aims to facilitate businesses in the State by providing a single point (online) interface and a time-bound clearance system by acting as a one-stop information/registration/approval/tracking centre for clearances/approvals/payments. Furthermore, GIS mapping of the municipal area can improve decision mapping, ensure precise management of the resources, and increase transparency and efficiency in the public procedures. This criterion intends to facilitate citizen accountability, transparency, and efficiency in the procedures by developing a framework to provide better services to the citizens in an integrated manner.

Maximum Points: 4

2.1 Appraisals:

2.1.1 Ensure provision of single window clearances for the citizens.

- At least 25% of the online services have a provision for single window clearance.

1 Point

- At least 50% of the online services have a provision for single window clearance.

2 Points

Methodology for calculating the percentage of single window clearance services

Percentage of services having single window clearance facilities = (A/B)*100

Where,

A = Number of services which have single window clearance

B = Total number of citizen services provided online by the civic body

2.1.2 Ensure provision/development of GIS-based municipal information systems within the area under the purview of the civic body.

2 Points

2.2 Compliance:

2.2.1 Submit narrative, date stamped photographs showcasing the provision of single window clearances for the citizens along with active web link of the portal.

2.2.2 Submit the link of the portal with GIS map for the notified area under the purview of civic body.

CRITERION 3 MUNICIPAL FINANCE

Intent: Municipal finance consists of earnings and expenditures of the municipalities in an urban area. They derive their finances from state revenues, government grant, market borrowings besides their own earnings. Studies in the past highlight that the Indian cities are far behind in revenue generation and contribute only about 1% to the nation's GDP; on the contrary, a country like Brazil contributes more than 6%.[7] The intent of this criterion is to bring about the ability of the civic bodies in efficient tax collection and at the same time invest adequately in capital expenditure like creating infrastructure and, thereby, improving the quality of life in the city.

Maximum Points: 4

3.1 Appraisals:

3.1.1 Ensure that the municipal tax (property tax and professional tax) is being collected efficiently within the area under the purview of the civic body.

2 Points

Methodology for calculating the percentage of property tax collected

Percentage of property tax collected = (A/B)*100

Where,

A = Total tax collected in a year

B = Total demand raised for the year

Methodology for calculating the percentage of professional tax collected

Percentage of professional tax collected = ({A-B}/B)*100

Where,

A = Total professional tax collection during the year

B = Total professional tax collection during the preceding year

3.1.2 Ensure that there exists double accrual accounting systems with the civic body to manage the financial transactions.

2 Points

3.2 Compliance:

3.2.1 Submit calculations demonstrating compliance with Appraisal 3.1.1 along with duly signed (by competent authority) document stating the reference of the values considered.

3.2.2 Submit relevant documents duly signed (by competent authority) to demonstrate that double accrual accounting system is being used by the civic body for managing their financial transactions.

7 Retrieved from http://www.janaagraha.org/files/Event_Report_NITI_Aayog.pdf; last accessed on November 12, 2018.

CRITERION 4 CAPACITY BUILDING

Intent: Capacity building is one of the key strategies to strengthen the civic bodies and set them towards better financial management. It is important to develop capacities in all areas at all the levels of Governance—Centre, State, and Local Bodies, for the successful implementation of any e-governance projects. Capacities can be built in the areas, such as inclusion of non-conventional fuels—waste to energy technology for power generation, use of IoT, implementation of smart metering, etc., for the benefit of the civic bodies by the use of all relevant tools, such as the Internet, cable TV, community/FM radio, conducting training programmes and the vernacular press to create awareness. This criterion focuses on use of all such modes/tools to reinforce and strengthen the civic body through capacity building.

Maximum Points: 2

4.1 Appraisal:

4.1.1 Ensure that the civic bodies are implementing Capacity Building Schemes for Urban Local Bodies (CBULBs) by the Ministry of Housing and Urban Affairs.

2 Points

4.2 Compliance:

4.2.1 Submit a list of the capacity building schemes being implemented.

4.2.2 Submit event reports of the respective programmes conducted, the key learnings, and the action plans for future implementation.

4.2.3 Submit photographs of the various capacity building programmes being conducted.

WATER SUPPLY AND MANAGEMENT

Availability of fresh water has become critical with the onset of urbanization and vast industrialization. India is suffering from the worst water crisis in its history with about 600 million people facing high to extreme water stress and about two lakh people dying every year due to inadequate access to safe drinking water.[8] In addition, climate change, early onset of summers, rainfall deficit, depleting water level, increasing population, and lack of water management policy are making it difficult for the urban local bodies to meet the increasing demand of water. As a result, many of the Indian cities are moving towards acute water shortage.

With the depleting water resources, the quality of water is degrading further. According to Census 2011, out of the total 24 crore households, only 7 crore households are getting treated tap water, that is, 70% households are getting contaminated water. India currently ranks 120 amongst 122 countries in the water quality index. Civic bodies along with policymakers should trigger joint actions for mitigating the future climate, urban, and demographic trends and the pressure they are exerting on the water resources. Various parameters mentioned in this section are in alignment with the several policies and guidelines followed and devised by the Government of India over the years, such as the Service Level Benchmarks for Water and Sanitation, National Mission on Sustainable Habitat, Sustainable Development Goals, etc.

The section encourages the civic bodies to ensure adequate provision of water supply to the area and its metering, monitoring the quality of water and taking measures to improve it, adopting efficient charge collection mechanisms, and drafting and implementing appropriate rainwater harvesting policies along with managing the stormwater drainage network.

This section consists of three criteria as mentioned in the table below:

Table 3: Criteria under Water Supply and Management

Criterion Number	Criterion Name	Maximum Points
Criterion 5	Water Sufficiency	8
Criterion 6	Water Quality and Charge Collection Efficiency	6
Criterion 7	Stormwater Management	6

[8] Composite Water Management Index (CWMI) Report by NITI Aayog. Available at: http://niti.gov.in/writereaddata/files/new_initiatives/presentation-on-CWMI.pdf; last accessed on November 12, 2018.

CRITERION 5 WATER SUFFICIENCY

Intent: Water is crucial for the existence of any living species and is a basic right. With the increase in the level of urbanization, the sources of water are stressed and thus the water demand remains unmet. Additionally, the lack of data or adequate source metering adds on to the gap in supply. This criterion focuses on ensuring that households receive adequate water supply by enabling the provision of metered water connections across the city and decreasing the extent of water loss during supply.

Maximum Points: 8

5.1 Appraisals:

5.1.1 Provide water consumption data for the area under the purview of civic body obtained from various sources (such as springs, rivers, lakes, ground, tankers, etc.) to meet the area's water requirement.

Mandatory

5.1.2 Ensure that basic water supply connections are provided in households across the city:

- **At least 50% of the households have basic water supply connections** — **Mandatory**
- At least 70% of the households have basic water supply connections — **2 Points**
- At least 80% of the households have basic water supply connections — **4 Points**

5.1.3 Ensure that the per capita supply of water is as per nationally acceptable benchmark OR as per the local government body's benchmark.

Mandatory

5.1.4 Ensure that the water connections are metered:

- At least 20% of the households have metered water connections — **1 Point**
- At least 50% of the households have metered water connections — **2 Points**
- At least 70% of the households have metered water connections — **4 Points**

5.2 Compliance:

5.2.1 Submit city plan showing water supply network highlighting basic supply to households.

5.2.2 Copy of the latest census data to support the number of households with water connections.

5.2.3 Submit duly signed (by the competent authority) water consumption data from respective sources to demonstrate compliance with Appraisal 5.1.1.

5.2.3 Submit water supply reports demonstrating supply meets the per capita demand as per national benchmark or local body standards.

5.2.4 Submit duly signed (by competent authority) documents listing the number of metered connections in the city.

5.2.5 Submit calculations demonstrating compliance with Appraisals 5.1.2 and 5.1.4.

CRITERION 6 WATER QUALITY AND CHARGE COLLECTION EFFICIENCY

Intent: Majority of the Indian cities are located adjacent to rivers which are the major sources of water. Other cities rely either on the nearby lakes, ponds, or groundwater. All of these sources over the period of time are getting polluted due to the discharge of untreated sewage, industrial effluents as well as leachate from waste disposed in landfills. The water supplied by municipalities comes at a cost, both for the supplier as well as the consumer. Even though the municipalities charge a meagre amount, that too is not being paid by the consumers. As a result, the wastage of water continues in water-rich areas. The criteria thus focuses on the necessity to ensure provision of appropriate quality of water by periodic monitoring. It also intends to encourage the municipal corporations to improve the efficiency of charge collection for better services.

Maximum Points: 6

6.1 Appraisals:

6.1.1 Ensure that the quality of 100% of the water supplied meets the CPHEEO (Central Public Health and Environmental Engineering Organisation) standards.

Mandatory

6.1.2 Ensure the following with respect to the water quality monitoring and maintenance:

- Adequate measures have been taken for periodic maintenance of the water treatment plants installed within the area under the purview of the civic body — **1 Point**
- The frequency of sampling for water quality testing should be at least every 6 months — **1 Point**
- An efficient zoning plan to ensure delivery of quality water within the area — **2 Points**

6.1.3 Ensure that the city has developed a charge collection mechanism for water supply:

- **At least 50% of the charges have been recovered** — **Mandatory**
- At least 70% of the charges have been recovered — **1 Point**
- At least 90% of the charges have been recovered — **2 Points**

6.2 Compliance:

6.2.1 Submit potable and non-potable water quality reports for various sources—from an NABL-accredited laboratory on the quality of water.

6.2.2 Submit a location map demarcating the location of water monitoring stations within each zone (zoning plan).

6.2.3 Submit duly signed (by competent authority) narrative describing the measures adopted for periodic maintenance of water treatment plants installed within the area.

6.2.4 Submit AMC (Annual Maintenance Contract) document signed with the third party.

6.2.5 Submit duly signed (by competent authority) log records of the water sampling frequency for one year for all zones.

6.2.6 Submit duly signed (by competent authority) documents providing details of the estimated annual budget and annual revenue of water supply in the previous year.

6.2.7 Calculations demonstrating the collection efficiency achieved by the project for the respective year.

CRITERION 7 STORMWATER MANAGEMENT

Intent: India has been developing at a rapid pace due to which there has been an upturn in the hard paved areas across the various cities and towns. These hard paved areas increase the imperviousness of the ground, thereby causing the stormwater to accumulate and clog the entire city just a few hours after the rainfall. The criterion focuses to motivate the civic bodies to devise measures to cater to the stormwater generated and channelize it to replenish the groundwater table thereby reducing the burden on the municipal supply lines.

Maximum Points: 6

7.1 Appraisals:

7.1.1 Ensure that the civic body provides an efficient stormwater drainage network:

- 45% of road length covered by stormwater drainage network **1 Point**
- 70% of road length covered by stormwater drainage network **2 Points**
- 100% of road length covered by stormwater drainage network **4 Points**

7.1.2 Ensure that the civic body: **2 Points**

- has provision of receiving water logging complaints
- maintains a record of the total number of water logging complaints received in a year
- has marked the water logging points in the area that falls under its purview

7.1.3 Ensure that the area under the purview of the civic body has a policy mandating the construction of rainwater harvesting/recharging structures in building plans.

Mandatory

7.2 Compliance:

7.2.1 Submit city plans/drawings displaying stormwater drainage network.

7.2.2 Submit calculations demonstrating compliance with Appraisal 7.1.1.

7.2.3 Submit duly signed (by competent authority) document listing the methods adopted for allowing the residents to log waterlogging complaints and maintaining a record of the complaint.

7.2.4 Submit logs of waterlogging/flooding incidents that have occurred in the area under the purview of the civic body.

7.2.5 Submit location map demarcating the waterlogging points within the area under the purview of the civic body.

7.2.6 Submit copy of the policy mandating the construction of rainwater harvesting structures in building plans.

SANITATION AND MUNICIPAL SOLID WASTE MANAGEMENT

According to the 2011 census data, the percentage of households having access to television and telephones in rural India is much higher than the percentage of households with access to toilet facilities. This data portrays how well technology and media have carved their way into the rural households, however, basic sanitation is still a dream for many. Out of the estimated billion people around the world who defecate in the open, half of them reside in India. The lack of spread of sewage networks and sufficient technological knowledge of sewage and sludge recycling processes are found to be the major hindrances towards suitable sanitation. In addition, the rapid scale of urbanization and industrialization have worsened the sanitation provisions in India due to the added burden on the existing system and resources.

Municipal solid waste management in India follows a similar path as the problem is not only limited to environment and aesthetics, but the exorbitant quantity of waste that keeps on accruing daily. The waste management process should focus on efficient collection and segregation of waste from each sector and adopting measures to treat it. The Swachh Bharat Mission (SBM) of the government is a step towards tackling the burning issue of sanitation and waste management in India; results of which seem promising. The various parameters mentioned in this section are in alignment with several policies and guidelines followed and devised by the Government of India over the years such as SBM, Swachh Sarvekshan Survey, Service Level Benchmarks for Water and Sanitation, National Mission on Sustainable Habitat, Sustainable Development Goals, etc.

The section aims to encourage the civic bodies for providing adequate public toilets, sewage service network and its effective collection, and recycling and reuse of wastewater. In addition, it pushes the civic bodies to participate in the Swachh Sarvekshan Survey, enhancing their waste collection efficiency as well as waste treatment services.

This section consists of three criteria as mentioned in the table below:

Table 4: Criteria under Sanitation and Municipal Solid Waste Management

Criterion Number	Criterion Name	Maximum Points
Criterion 8	Sanitation and Wastewater	10
Criterion 9	Extent of Waste Collection and Management	6
Criterion 10	Waste Recycling/Treatment	2

CRITERION 8 SANITATION AND WASTEWATER

Intent: Nearly 10 million households still defecate in the open.[9] This has been a cause of rapid spread of various kinds of microbes affecting the community as well as the environment. Many places that have toilets lack the appropriate sewerage system to channelize and treat the wastewater that is generated. The Swachh Bharat Mission (SBM) initiative is a step to improve the plight of the people. The intent of this criterion is to ensure that the municipalities enable access to basic sanitation through the provision of public toilets and sewage services, and also efficiently collect and manage sewage by means of recycling/reusing.

Maximum Points: 10

8.1 Appraisals:

8.1.1 Ensure that all the public areas have accessibility to public toilets as per the table below and are maintained by the local civic body.

Mandatory

Table 5: Norms for Toilets as per CPHEEO 2013

Types	Norms for Toilets
Public Toilet	On roads and for open areas: @every 1 km, including in parks, plaza, open air theatre, swimming area, car parks, and fuel stations. Toilets shall be disabled-friendly and in 50-50 ratio (M/F). Provision may be made as for public rooms.
Signage	Signboards on main streets shall give directions and mention the distance to reach the nearest public convenience of visitors. Helpline number shall be pasted on all toilets for complaints/queries.
Modes	Pay and use or free. In pay and use toilets entry is allowed on payment to the attendant or by inserting coin and user gets 15–20 minutes.
Maintenance/Cleaning	The toilet should have both men and women attendants. Alternatively automatic cleaning cycle covering flush, toilet bowl, seat, hand wash basin, disinfecting the floor and complete drying after each use can be adopted, which takes 40 seconds. Public toilets shall be open 24 hours.

Source: Draft manual on Sewage and Sewage Treatment Systems, CPHEEO 2013.

Methodology for calculating density of public toilets

Density of Public Toilets = T/R

Where,

T = toilets in the urban built-up area (in numbers)

R = road length (in km)

[9] Urban Water Supply & Sanitation in India. Kavita Wankhade, Krishnachandran Balakrishnan, Vishnu M J. Available at: http://iihs.co.in/knowledge-gateway/wp-content/uploads/2015/08/RF-WATSAN_reduced_sized.pdf; last accessed on November 14, 2018.

8.1.2 Ensure that the area under the purview of the civic body has a wide network of sewage services across all properties (residential, commercial, industrial, and institutional):

- Upto 40% of the properties have access to sewage services **1 Point**
- Upto 70% of the properties have access to sewage services **2 Points**
- Upto 100% of the properties have access to sewage services **4 Points**

8.1.3 Ensure that the area under the purview of the civic body has a sewage network with an effective collection and treatment system:

- **At least 10% of the total sewage has been collected and treated** **Mandatory**
- At least 40% of the total sewage has been collected and treated **1 Point**
- At least 70% of the total sewage has been collected and treated **2 Points**

Methodology for calculating wastewater collection efficiency

Wastewater collection efficiency (%)= [C/((A+B)*0.8)]*100

Where,

A = Total water supplied to the distribution system minus the T&D losses through leakages

B = Estimated water use from other sources, such as private borewells

C = Wastewater collected (ignore the quantum of untreated sewage at outfalls, leading into rivers, lakes or other water bodies)

8.1.4 Demonstrate the extent of water reuse and recycling of sewage[10] in the area under the civic bodies' purview:

- Upto10% of the area's total wastewater is recycled and/or reused **1 Point**
- Upto 20% of the area's total wastewater is recycled and/or reused **2 Points**
- More than 20% of the area's total wastewater is recycled and/or reused **4 Points**

8.2 Compliance:

8.2.1 Submit a duly signed (by competent authority) narrative and supporting documents demonstrating that the area under the purview of the civic body provides public toilets in different areas across the city in compliance with Appraisal 8.1.1.

8.2.2 Submit plan displaying sewage network across the city.

8.2.3 Submit calculations demonstrating compliance with Appraisal 8.1.1–8.1.4 with duly signed (by competent authority) documents stating the values considered in the calculations.

8.2.4 Submit specifications as well as capacity of sewage treatment plants across the area under the civic body's purview for treatment of the sewage.

8.2.5 Submit documents demonstrating quantity of sewage produced.

8.2.6 Submit plans demarcating the location of sewage treatment plants in the area.

8.2.7 Upload photographs, with description of the measures implemented to demonstrate compliance.

8.2.8 Submit transport network plan demonstrating compliance with Appraisal 8.1.1.

[10] Water which is discharged in the water bodies and subsequently used for various purposes should not be considered in this quantum of recycled/reused water.

CRITERION 9 EXTENT OF WASTE COLLECTION AND MANAGEMENT

Intent: The management of solid waste is considered a vast challenge by many of the civic bodies where increased urbanization, industrialization, and growth rate have led to a tremendous increase in the per capita waste generation. The present systems of waste collection and management are unable to cope with the increased chunk of waste that is being added. The priority is thus to move from dumping of waste that provides no environmental protection to waste management systems which provide useful resources within the economy. This criterion focuses on acknowledging the efforts that some civic bodies are making via the Swachh Sarvekshan Survey and motivating others to perform better. Also, the criterion intends to improvise the collection efficiency of the waste that is being generated within the area.

Maximum Points: 6

9.1 Appraisals:

9.1.1 Demonstrate that the area under the civic body's purview is conforming to the requirements of Swachh Sarvekshan Survey and is being ranked[11] (according to the latest survey):

- Ranks between 50–100 **1 Point**
- Ranks between 1–50 **2 Points**

9.1.2 Ensure that the civic body collects the municipal solid waste (MSW) generated within the area in the most efficient way possible:

- 70%–90% of the total municipal solid waste generated is collected **1 Point**
- More than 90% of total municipal solid waste generated is collected **2 Points**
- 100% of total municipal solid waste generated is collected **4 Points**

Methodology for calculating collection efficiency of MSW

Collection efficiency of MSW = [(B/A)*100]

Where,

A = Total waste that is generated[12] and is required to be collected

B = Total quantum of waste that is collected by the civic body or authorized service providers

9.2 Compliance:

9.2.1 Submit master plan demonstrating that the city provides solid waste management services across households.

9.2.2 Submit copy of the Swachh Sarvekshan Survey results.

9.2.3 Calculations demonstrating the collection efficiency of MSW with duly signed (by competent authority) documents stating the values considered in the calculations.

[11] Ranks are for both the categories: Civic bodies governing areas with >1 lakh population and <1 lakh population.

[12] Excludes the waste that is processed or recycled at the generation point.

9.2.4 Submit contracts with details of number of trucks employed for solid waste collection services along with their waste collection capacities.

9.2.5 Submit details of the number of bins provided and the number of *safai karamcharis* appointed to help in the management of the municipal solid waste in the area under the purview of the civic body.

9.2.6 Upload photographs, with description of the measures implemented.

CRITERION 10 WASTE RECYCLING/ TREATMENT

Intent: The amount of waste generated is directly linked with the growth rate of a nation. Thus, as the nation or a city progresses towards development, it is producing a higher quantum of waste which is dumped into the landfill sites and eventually contaminates the air and the environment in the near vicinity giving rise to various health and sanitation issues. Hence, the need of the hour is to push the municipalities to divert the waste from the landfill site and treat it as a resource. The criterion focuses on ensuring that the MSW is effectively managed in the area under the purview of the civic body by employing efficient treatment strategies for enhanced resource recovery.

Maximum Points: 2

10.1 Appraisals:

10.1.1 Ensure that the civic body adopts waste disposal strategies (with capacities of at least 10 tonnes/day) for resource recovery and to manage the quantity and quality of total MSW generated.

- **At least 1 strategy is adopted to manage MSW of the area** — **Mandatory**
- At least 2 strategies are adopted to manage MSW of the area — **1 Point**
- More than 4 strategies are adopted to manage MSW of the area — **2 Points**

10.2 Compliance:

10.2.1 Submit the capacities and detailed description of the technologies or strategies employed for resource recovery of solid waste.

10.2.2 Submit data demonstrating the quantity of solid waste dumped on the landfill sites.

10.2.3 Upload photographs of the various technologies implemented within the area.

SUSTAINABLE MOBILITY

Mobility is one of the greatest environmental challenges faced in sustainable cities. Mankind needs a seemingly infinite network of automobiles and transportation systems for the vital flow of societies and economies. Sustainable mobility solutions are one of the greatest challenges as well as a great opportunity for development of low carbon cities. It requires a mind shift where transport in private cars gives way to different modes of transportation.

A sustainable transport system enables individuals and societies to satisfy their needs for access to activity areas in complete safety, in a way that is compatible with the health of mankind and ecosystems, and which is also balanced fairly between different generations.[13] The various parameters mentioned in this section are in alignment with several policies and guidelines issued by the Government of India over the years, such as the National Urban Transport Policy, Service Level Benchmarks for Urban Transport, National Mission on Sustainable Habitat, Unified Traffic and Transportation Infrastructure Guidelines, Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, etc.

The section targets to ensure affordable, accessible transport modes to the citizens, improved efficiency and cost-effective public transport, safe pedestrian movement, dedicated cycle infrastructure, reduced environmental impact, and financial incentives.

This section consists of five criteria as mentioned in the table below:

Table 6: Criteria under Sustainable Mobility

Criterion Number	Criterion Name	Maximum Points
Criterion 11	Public Transport Facilities	5
Criterion 12	Non-Motorized Transport Facilities	5
Criterion 13	Road Safety Measures	3
Criterion 14	Low Carbon Interventions	2
Criterion 15	Policy Measures	3

[13] Catherine Morency (2013, 12th of February), 'Sustainable Mobility: definitions, concepts and indicators', Mobile Lives Forum. Available at: http://en.forumviesmobiles.org/video/2013/02/12/sustainable-mobility-definitions-concepts-and-indicators-622; last accessed on November 16, 2018.


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CRITERION 11 PUBLIC TRANSPORT FACILITIES

Intent: Mass transit facilities ensure reliable, safe, comfortable, fast, and affordable journey for the citizens. Additionally, it ensures reduced carbon emissions, less crowded roads, and acts as a catalyst to walkable communities. This criterion intends to encourage the city authorities to promote investments in planning, designing, and implementation of mass transit systems and ensure the extent and availability of public transport services across the city.

Maximum Points: 5

11.1 Appraisals:

11.1.1 Ensure that modal share of public transport meets the desirable modal share requirements as per NTDPC (National Transport Development Policy Committee).

1 Point

Table 7: Modal Share of Public Transport as per NTDPC

City Population (in lakhs)	Modal Share (Public Transport) (%)
0.5–1	12
1–5	15
5–10	15
10–20	20
20–50	33
>50	38

11.1.2 Ensure that availability of public transport fleet meets the service level benchmarks established by the Ministry of Urban Development (MoUD), Government of India.

- **If ratio as per MoUD calculator is less than 0.2** **Mandatory**
- If ratio as per MoUD calculator is between 0.2 and 0.6 **1 Point**

Methodology for calculating the Public Transport Fleet

Availability of Public Transport/1,000 population = (A/B)*100

Where,

A = No. of buses (1 train coach ≈ 3 buses) available in the city on any day

In case of other public transport modes, the following conversion factors can be used:

1 Train Coach ≈ 3 Buses

1 Bus ≈ 18 Auto Rickshaws or 9 Tempos/Vikrams

B = Total population of the city

- If ratio as per MoUD calculator is above 0.6 **2 Points**

11.1.3 Ensure that service coverage of public transport across the city meets service level benchmarks established by the MoUD.

- **If ratio as per MoUD calculator is less than 0.3** **Mandatory**
- If ratio as per MoUD calculator is between 0.3 and 1.0 **1 Point**
- If ratio as per MoUD calculator is above 1.0 **2 Points**

Methodology for calculating the service coverage of Public Transport

Service coverage ratio of public transport system = (A/B)

Where,

A = Total length of the public transport corridor within the urban limits (km)

B = Area of the urban limits (sq. km)

11.2 Compliance:

11.2.1 Submit the latest modal share data (duly signed by competent authority) along with reference document to demonstrate compliance with 11.1.1.

11.2.2 Submit calculations as per Appraisals 11.1.2, 11.1.3, and duly signed supporting documents (by a competent authority) for the values considered.

11.2.3 Submit network map demarcating public transport routes and their respective corridor lengths.

Or

Submit documents verifying length of public transport routes under operation in the area under the purview of the civic body.

CRITERION 12 NON-MOTORIZED TRANSPORT FACILITIES

Intent: Non-motorized transport (NMT), which includes walking, cycling, and cycle rickshaws, etc., are green modes of transport with low carbon footprint, and minimal energy consumption. Dedicated pedestrian and cycle infrastructure in any city ensures last mile connectivity, increased equity, and inclusion of all citizens thereby reducing dependence on the carbon-fuelled infrastructure. This criterion intends to ensure extent and availability of NMT facilities across the city.

Maximum Points: 5

12.1 Appraisals:

12.1.1 Ensure that percentage share of non-motorized trips (walk + cycle) meets the desired modal share as recommended by NTDPC (National Transport Development Policy Committee)

1 Point

Table 8: Modal Share of Non-motorized as Recommended by NTDPC

City Population (in lakhs)	Modal Share (Walk Trips) (%)	Modal Share (Cycle Trips) (%)
0.5–1	30	25
1–5	30	20
5–10	30	15
10–20	30	12
20–50	25	10
>50	25	10

12.1.2 Ensure that network length of footpath meets service level benchmarks established by the Ministry of Urban Development (MoUD), Government of India.

- **If network coverage is less than 25%** — **Mandatory**
- If network coverage is between 25% and 75% — **1 Point**
- If network coverage is above 75% — **2 Points**

Methodology for calculating the network coverage of footpaths

Network Coverage (%) = (B/A)*100

Where,

A = Total length of road network

B = Total length of footpath (Min. footpath width = 1.2 m) in the city

12.1.3 Ensure that network length of cycle track meets service level benchmarks established by the MoUD.

- **If network coverage is less than 15%** **Mandatory**
- If network coverage is between 15% and 50% **1 Point**
- If network coverage is above 50% **2 Points**

Methodology for calculating the network coverage of cycle tracks

Network Coverage (%) = **(B/A)*100**

Where,

A = Total length of road network

B = Total length of cycle tracks (minimum track width = 2.5 m) in the city

12.2 Compliance:

12.2.1 Submit the latest modal share data along with reference document to demonstrate compliance with 12.1.1.

12.2.2 Submit calculations as per Appraisals 12.1.2, 12.1.3, and duly signed supporting documents (by a competent authority) for the values considered.

12.2.3 Submit road network map demarcating the availability and length of footpaths and cycle tracks for demonstrating compliance with Appraisals 12.1.2 and 12.1.3, respectively

Or

Submit documents verifying length of footpath and cycle tracks available in the area under the purview of the civic body.

CRITERION 13 ROAD SAFETY MEASURES

Intent: Every day, nearly 400 road deaths occur on Indian roads and several thousands are hospitalized due to road crashes.[14] With the economic surge, the vehicle population has increased tremendously, creating pressure on the already overburdened road infrastructure thereby leading to critical accidents. Thus, there is a need for stringent policies and regulations to further improve the road safety issues in cities. This criterion aims to ensure that cities are implementing appropriate road safety measures to minimize road accidents.

Maximum Points: 3

Appraisals:

13.1.1 Ensure that total number of fatalities due to road accidents within the area under the purview of the civic body are minimized as per service level benchmarks established by the Ministry of Urban Development (MoUD)

- If fatality rate is between 2 and 6 persons **1 Point**
- If fatality rate is less than or equal to 2 persons **3 Points**

Methodology for calculating the fatality rate

Fatality rate per 100,000 population = (B/A)*100,000

Where,

A = Total no. of fatalities in road accidents within urban area limits in a year

B = Total urban population

13.2 Compliance:

13.2.1 Submit calculations as per Appraisal 13.1.1 and duly signed supporting documents (by a competent authority) for the values considered.

[14] Gururaj G and Gautham M S. Advancing Road Safety in India-Implementation is the Key, Bengaluru, 2017. National Institute of Mental Health & Neuro Sciences; 2017. Publication Number: 136.

CRITERION 14 LOW CARBON INTERVENTIONS

Intent: The transportation-related carbon dioxide emissions have increased more rapidly than the total global emissions in the past two decades.[15] Thus, to contain our emissions and to contribute towards our national targets, transformative changes are needed. The focus needs to shift from personal transit means to public transit, e-vehicles, and enhanced vehicle energy efficiency amongst others. This section intends to encourage the civic bodies to take appropriate measures to reduce emissions from the transport sector.

Maximum Points: 2

14.1 Appraisals:

14.1.1 Initiatives taken in an effort towards reducing Transport Sector Emissions **(Choose any two)**

2 Points

- Initiatives to promote 'e-vehicles' or other clean transport fuels, such as inclusion of electric vehicles in public transport fleet, etc.
- Initiatives to promote NMT-based schemes, such as dedicated cycle tracks, bike sharing schemes, etc.
- Initiatives regarding pollution prevention and fitness of aging vehicles
- Initiatives taken to reduce congestion issues, such as congestion pricing schemes, park and ride schemes, etc.

14.2 Compliance:

14.2.1 Strategy 1: Submit policies/strategies and interventions undertaken to promote clean fuel vehicles (electric/ hybrid/CNG, etc.) in the area under the purview of the civic body.

14.2.2 Strategy 2: Submit policies/strategies and interventions undertaken to promote NMT- based schemes in the area under the purview of the civic body.

14.2.3 Strategy 3: Submit policies/strategies and interventions undertaken regarding pollution prevention and fitness of aging vehicles in the area under the purview of the civic body.

14.2.4 Strategy 4: Submit policies/strategies and interventions undertaken to reduce congestion issues in the area under the purview of the civic body.

[15] International Energy Agency. 2011. World Energy Outlook 2011.

CRITERION 15 POLICY MEASURES

Intent: Sustainability in the context of urban transport can be brought about by ensuring safe, affordable, quick, comfortable, reliable access to jobs, education, recreation, and such other needs to all the city residents. Amidst the general lack of transport planning, at present, most of cities do not have any dedicated agency responsible for urban transport at city level. This criterion intends to develop financial and fiscal mechanisms to raise funds for urban transport activities and specific institutional arrangements focussing on capacity building and other appropriate measures to promote sustainable transport.

Maximum Points: 3

15.1 Appraisals:

15.1.1 Financial and Fiscal Mechanisms:

2 Points

- Creation of exclusive funds for supporting urban transport activities (e.g., Urban Transport Fund).

15.1.2 Institutional Mechanisms:

1 Point

- Efforts taken regarding setting up specific institutional arrangements or SPVs (Special Purpose Vehicle) (e.g., Urban Mass Transit Authorities, Road Safety Cell, etc.).
- Capacity building within government bodies to address issues related to urban transport by creating dedicated institutions (e.g., knowledge management and research centre).

15.2 Compliance:

15.2.1 Submit relevant documents, such as government notifications, circulars, etc., demonstrating compliance with Appraisal 15.1.1.

15.2.2 Submit relevant documents supporting establishment of SPVs, and respective institutional structures as per Appraisal 15.1.2.

15.2.3 Submit relevant documents supporting collaboration with research organizations for capacity building as per Appraisal 15.1.2.

15.2.4 Submit photographs of the trainings/workshops conducted (if any) under such capacity building programmes along with a brief description as per Appraisal 15.1.2.

ENERGY OPTIMIZATION AND MANAGEMENT

With a share of 18% in the world population, India consumes only 6% of the world's primary energy derived from conventional as well as non-conventional sources of fuel.[16] The present trend of overall energy consumption of the nation is expected to nearly double by the end of next decade. It is also seen that energy sector has been on the topmost priority in all the five-year plans of the government till date and also the outlay of the plan in terms of share in the budget was the highest for this sector.

This section caters to the data assimilation from the various sectors followed by managing the electricity consumption. It further impels the need for implementation of energy efficiency measures and also ascertaining better power quality in the area under the purview of the civic bodies. The section also encourages the use of renewable energy to offset the dependency on the conventional sources of fuel. It becomes evident through this section that there is a huge scope for optimizing energy usage and implementing energy management practices.

This section consists of five criteria as mentioned in the table below:

Table 9: Criteria under Energy Optimization and Management

Criterion Number	Criterion Name	Maximum Points
Criterion 16	Demand Side Management	2
Criterion 17	Managing Household Electricity Consumption	4
Criterion 18	Promoting Energy Efficient Street Lights	3
Criterion 19	Enhancing Power Quality	3
Criterion 20	Promoting Use of Renewable Energy	4

[16] Retrieved from https://www.iea.org/publications/freepublications/publication/IndiaEnergyOutlook_WEO2015.pdf; last accessed on November 15, 2018.

CRITERION 16 DEMAND SIDE MANAGEMENT

Intent: Demand side management (DSM) brings about the reduction or shift in the customer's energy demand thereby giving an opportunity to avoid or delay building additional generating capacity. For customers, DSM offers the opportunity to reduce their energy bill through efficiency and conservation measures. This criterion focusses on establishing a database for the energy scenario in the area under the purview of civic bodies and enumerating the steps taken towards energy efficiency.

Maximum Points: 2

16.1 Appraisals:

16.1.1 Assimilate and share sector-wise data of electricity consumption for the sectors mentioned below:

Mandatory

- Commercial
- Residential
- Water pumping
- Industrial
- Street lighting
- Traction and non-traction load
- Others

16.1.2 Provide action plans and policies envisioned in alignment with National Mission for Enhanced Energy Efficiency (NMEEE).

1 Point

16.1.3 Ensure that there exists an energy efficiency cell to promote and implement policies of central and state government related to energy efficiency within the area under the purview of the civic body.

1 Point

16.2 Compliance:

16.2.1 Submit duly signed (by the competent authority) sector-wise electricity consumption data to demonstrate compliance with appraisal 16.1.1.

16.2.2 Submit policies and strategies demonstrating implementation of energy efficiency measures drafted for the area under the purview of civic bodies in compliance with NMEEE.

16.2.3 Submit details of the energy efficiency cell highlighting the members, their role, and responsibilities along with the organization chart/responsibility matrix.

CRITERION 17 MANAGING HOUSEHOLD ELECTRICITY CONSUMPTION

Intent: Household electricity consumption is projected to increase seven times by the year 2030.[17] Hence, it becomes imperative to assess the actual demand of electricity in this sector. This can be done by ensuring that all the households in the area under the purview of civic bodies have authorized electricity connection. Based on this, the capacity of the grid can be planned and enhanced in future.

With the nation moving towards digitalization and to align to the various policies of the government, it becomes indispensable to use smart meters for metering the electricity consumption. So, this criterion intends to ensure that the households have authorized electricity connection and promote use of smart meters.

Maximum Points: 4

17.1 Appraisals:

17.1.1 Ensure that more than 90% of households in the area have authorized electricity connections.

2 Points

Methodology for calculating percentage of authorized electricity connection -

$$\text{Percentage of authorized electricity consumption} = \frac{\text{Number of authorized electrical connections at household level}}{\text{Total no. of household in area}} \times 100$$

17.1.2 Ensure that within a time span of 5 years the desired number of consumers will be connected to smart meters.

2 Points

Consumers with monthly electricity consumption above 200 kWh but less than 500 kWh	More than 10% of them have smart meters installed
Consumers with monthly electricity consumption above 500 kWh	More than 25% of them have smart meters installed

17.2 Compliance:

17.2.1 Submit duly signed documents (by competent authority) clearly mentioning the number of households in the area under the purview of local bodies and authorized electrical connections.

17.2.2 Submit calculations as per the appraisal 17.1.1.

17.2.3 Submit a policy for the area under the purview of civic bodies to demonstrate that as per the appraisal 17.1.2 smart meters will be installed within 5 years.

17.2.4 Upload photographs, with description of the measures implemented.

[17] Prayas (Energy Group), Residential Electricity Consumption in India: What do we know? December 2016

CRITERION 18 PROMOTING ENERGY EFFICIENT STREET LIGHTS

Intent: Street lighting has the highest share of energy consumption in an urban settlement along with water and sewage pumping the buildings.[18] Once installed, the street lighting systems stay functional for nearly 15–20 years and thus have immense potential in terms of energy efficiency. Considering the urban local bodies (ULBs), street lighting has either inadequate or poor infrastructure and incurs high maintenance costs, often amounting to 10%–15% of a typical municipal budget.[19] Thus, this criterion focuses on installation of energy efficient street lights to ensure energy savings, and consequently reducing the greenhouse gas (GHG) emissions.

Maximum Points: 3

18.1 Appraisals:

18.1.1 Ensure that 100% street lighting within the area will be based on LEDs or other more efficient technologies within the next 5 years.

1 Point

18.1.2 Demonstrate that the reduction in the energy demand of the city due to the use of LEDs or other more efficient technologies in street lighting:

- **Reduction in energy demand upto 15%** — **Mandatory**
- Reduction in energy demand upto 30% — **1 Point**
- Reduction in energy demand upto 45% — **2 Points**

18.2 Compliance:

18.2.1 Submit a policy and implementation plan ensuring that the street lighting within the area will be based on LEDs or other more efficient technologies within the next 5 years.

18.2.2 Submit detailed calculations and actual case studies indicating the energy saving due to installation of energy efficient street lighting with duly signed (by competent authority) documents supporting the values used in the calculations.

18.2.3 Submit street lighting plan at the area for the existing and design case along with the type of lighting fixtures installed.

18.2.4 Upload photographs, with description of the measures implemented.

[18] The World Bank, *India: Energy-Efficient Street Lighting—Implementation and Financing Solutions*. 2015. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/22275/India000Energy0Financing0Solutions.pdf?sequence=1&isAllowed=y; last accessed on November 16, 2018.

[19] Refer to Footnote 14

CRITERION 19 ENHANCING POWER QUALITY

Intent: The widened gap between demand and supply in case of developing countries, such as India, has always been a major reason behind the poor power quality. Power cuts, breakdowns, interruptions and their prolonged duration, power theft, besides others, are responsible for loss, maloperation and in worst cases, may also cause damage to the consumer's equipment. This criterion caters to the improvement of power quality in the households thereby ensuring reduction in losses, power theft, number of interruptions and their duration, etc.

Maximum Points: 3

19.1 Appraisals:

19.1.1 Provide policies at the area level to ensure that the losses (due to theft and aggregate technical & commercial loss) will be reduced as per the current five-year plan of the government.

1 Point

19.1.2 Provide monthly data for the number of interruptions and duration of interruptions in the power supply for the city.

1 Point

19.1.3 Ensure that there exists a policy to reduce the number and duration of interruptions annually.

1 Point

19.2 Compliance:

19.2.1 Submit a city level policy ensuring that the losses are minimized.

19.2.2 Submit monthly data for number of interruptions and duration of interruptions for at least last 12 months.

19.2.3 Submit a policy listing out strategies to be adopted to reduce the number and duration of interruptions annually.

19.2.4 Submit a chart along with roles and responsibility matrix of the dedicated team members involved in the development of policy as mentioned in Appraisals 19.1.1 and 19.1.3.

CRITERION 20 PROMOTING USE OF RENEWABLE ENERGY

Intent: No two cities, towns or settlements are alike in terms of their natural resources. Thus, the availability of the non-conventional sources of fuel varies from place to place and time to time. Some areas have abundant solar energy while in others, harnessing the wind power may be more feasible and easier. This criterion thrusts upon increasing the dependency on greener sources of power thereby offsetting the consumption of power derived from conventional sources of fuel.

Maximum Points: 4

20.1 Appraisals:

20.1.1 Demonstrate that the capacity of renewable energy (RE) system in the area under the purview of local bodies caters:

- Upto 10% of area's electricity demand **1 Point**
- Upto 15% of area's electricity demand **2 Points**
- Upto 20% of area's electricity demand **4 Points**

20.2 Compliance:

20.2.1 Submit duly signed (by competent authority) documents demonstrating the overall annual energy consumption of the area under the purview of the civic body or estimated energy consumption in case of newly developed areas.

20.2.2 Submit calculations/simulations for the renewable energy system sizing demonstrating annual energy generation potential.

20.2.3 Submit technical specification sheets and purchase orders of the RE system highlighting the performance of the same when tested under standard testing conditions.

20.2.4 Submit a plan at area level highlighting the already existing installations and/or proposed area for new installations of renewable energy systems.

20.2.5 Renewable Energy Certificates (RECs) for at least 2 years along with a declaration that the RECs are not being used for any obligatory requirements and will be purchased every year or Power Purchase Agreement (PPA) for purchase of green power.

20.2.6 Upload photographs, with description of the measures implemented, if installed.

QUALITY OF LIFE

Majority of the civic bodies today are facing challenges in providing a minimum desired quality of life to the occupants of the area under its purview. The cities are affected severely by traffic congestion, poor quality of air, excessive noise, lack of sufficient green areas, and inadequate accessibility to the public spaces. Thus, while designing any city, the social, economic, and environmental impact on the people should be duly taken into consideration.

India is a rapidly urbanizing country facing development challenges associated with rapid growth. One of the key challenges for a developing country such as India is urban migration, which is further exacerbated by limited resources to meet increasing housing demands. At the national level, the government estimated a shortage of more than 18.78 million homes at the beginning of 2012, of which 95% were in the Economically Weaker Sections (EWS) and Low Income Group (LIG) segments. Even though the urban housing shortage is primarily driven by EWS and LIG segments in India, the majority of the capacity addition has been going on in the segments beyond the reach of EWS and LIG group. To successfully build India's affordable housing, collaboration between the central government ministries, state governments, urban local bodies, civil society, private sector, and financial institutions is essential.

This section shall cater to making a city universally accessible, enhancing the green areas to allow social interaction as well as interaction with nature, monitoring and managing the level of air, noise, and water pollution, and encouraging the adoption of affordable housing within the area.

This section consists of four criteria as mentioned in the table below:

Table 10: Criteria under Quality of Life

Criterion Number	Criterion Name	Maximum Points
Criterion 21	Universal Accessibility	3
Criterion 22	Availability of Public Spaces and Green Areas	2
Criterion 23	Levels of Ambient Air Quality and Noise Quality	4
Criterion 24	Provision of Affordable Housing	3

CRITERION 21 UNIVERSAL ACCESSIBILITY

Intent: Barrier-free design, essential to inclusive development, influences the country's growth by enabling equal participation from people of all ages, and disabilities. The 'Accessible India Campaign' (Sugamya Bharat Abhiyan) is a nation-wide flagship campaign of the Ministry of Social Justice & Empowerment, Government of India, targeting the enhancement of accessibility of built environment, transport system, and Information & communication ecosystem. This criterion focusses on the steps being taken for the accessibility of facilities and services open to the public in the built environment and transportation system at city level in line with the national campaign for all people regardless of age, disability or other factors.

Maximum Points: 3

21.1 Appraisals:

21.1.1 Ensure universal accessibility in the area under the purview of civic body through compliance with Accessible India Campaign by incorporating the following design measures for persons with disability and elderly persons:

2 Points

- Provision of ramps in public buildings and health care centres.
- Provision of dedicated universally accessible toilets.
- Provision of Braille symbols and auditory signals in elevators or lifts.
- Provision of auditory signals at red lights in public roads, curb cuts and slopes in pavements, engraving on the surface at zebra crossing, etc.

21.1.2 Ensure universal accessibility in the transportation system (airways, railways, roadways) in the area under the purview of civic body through compliance with Accessible India Campaign for barrier-free built environment for persons with disability and elderly persons.

1 Point

21.2 Compliance:

21.2.1 Demonstrate that the city has incorporated design measures for universal accessibility as per the national standards by submitting city-level schematic with typical details that have been implemented. A copy of building byelaws/notified document highlighting universal accessibility as per the design measures mentioned under Appraisal 21.1.1.

21.2.2 Submit strategies and policy measures being proposed/undertaken under the built environment in the area under the purview of the civic body.

21.2.3 Submit strategies and policy measures being proposed/undertaken under the transportation system in the area under the purview of the civic body.

21.2.4 Upload photographs, with description of the measures implemented.

21.2.5 Submit declaration stating that the development of the city is in alignment with the abovementioned Appraisals (21.1.1–21.1.2)

CRITERION 22 AVAILABILITY OF PUBLIC SPACES AND GREEN AREAS

Intent: Cities are comprised of more than just buildings and people. Public spaces are the living rooms, gardens, and corridors of urban areas. They serve as the area for social interaction and economic activities, which improves the development and desirability of a community. It helps to cool the environment as well as increases productivity by reducing the human stress level. Despite their importance, public spaces and green areas are often poorly integrated or neglected in planning and urban development. This criterion intends to encourage the civic bodies to provide urban, green, and open areas for an enhanced urban environment.

Maximum Points: 2

22.1 Appraisals:

22.1.1 The city is meeting the URDPFI Standards for per capita green spaces/ Recreational Space.[20]

Or

The city would be implementing the URDPFI guidelines in the next 5 years.

Mandatory

22.1.2 Provision of action plans and policies envisioned by the civic body for green or public spaces development.[20]

2 Points

22.2 Compliance:

22.2.1 Submit strategies and policy measures being proposed/undertaken in the area under the purview of the civic body.

22.2.2 Upload photographs, with description of the measures implemented.

22.2.3 Submit signed declaration stating that the development of the area is in alignment with the abovementioned appraisals (22.1.1–22.1.2)

22.2.4 Submit city-level schematics demonstrating the per capita green space provided/proposed to be provided in the area under the purview of civic body.

[20] Green/public space development includes play areas, provision of landscape, sitting/resting area, drinking water facilities, paved pathways, water bodies, etc.

CRITERION 23 LEVELS OF AMBIENT AIR QUALITY AND NOISE QUALITY

Intent: The brunt of the changing environment, particularly the deteriorating quality of air and the noise levels due to the increase in traffic congestion, is being borne in various cities. Pollution refers to the contamination of the Earth's environment with materials that interfere with human health, quality of life or the natural functioning of the ecosystems. It has become a major concern of new civilized world, which has a serious toxicological impact on human health and the environment. Noise is an underestimated threat which can cause a number of short- and long-term health problems and hence noise standards should be a part of any city development. This criterion thus focuses on measuring the concentrations of the primary pollutants in the air and the noise levels within the area under the purview of the city and their compliance with the recommended standards.

Maximum Points: 4

23.1 Appraisals:

23.1.1 Ensure that the concentration of SO_2, NO_2, and PM emissions are as per the Central Pollution Control Board (CPCB) norms.

2 Points

Table 11: Concentration of Pollutants in Ambient Air

Pollutant (µg/m³)	Time Weighted Average	Industrial, Residential, Rural, and Other Areas	Ecologically Sensitive Area (notified by Central Government)
Sulphur Dioxide (SO_2)	Annual*	50	20
	24 hours**	80	80
NO_2	Annual*	40	30
	24 hours**	80	80
PM_{10}	Annual*	60	60
	24 hours**	100	100
$PM_{2.5}$	Annual*	40	40
	24 hours**	60	60

Source: Ambient Air Quality Standards in India

23.1.2 Ensure that the level of noise pollution is as per the nationally applicable standards as listed below:

2 Points

Table 12: Ambient Noise Standards for Different Land Use Categories

Code	Category of Area	Day Time (Limits in dB(A), Leq)	Night Time (Limits in dB(A), Leq)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6 a.m. and 9 p.m.
2. Night time is reckoned in between 9 p.m. and 6 a.m.
3. Silence zone is referred as areas upto 100 m around such premises as hospitals, educational institutions, and courts. The silence zones are to be declared by the competent authority. Use of vehicular horns, loudspeakers, and bursting of crackers shall be banned in these zones.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the competent authority and the corresponding standards shall apply.

Noise standards for automobiles, domestic appliances, and construction equipment have been notified in Part 'E', Schedule-VI of Environment (Protection) Rules, 1986, as amended on 19th May, 1993.

Source: The Noise Pollution (Regulation and Control) Rules, 2000

Table 13: Ambient Noise Standards for Different Categories of Vehicles

Category of Vehicles	Noise limit in dB(A)
Motorcycles, scooters, and three-wheelers	80
Passenger cars	82
Passenger or commercial vehicles upto 4 MT	85
Passenger or commercial vehicles above 4 MT and upto 12 MT	89
Passenger or commercial vehicles exceeding 12 MT	91

Source: The Noise Pollution (Regulation and Control) Rules, 2000

Table 14: Ambient Noise Standards of Domestic Appliances/Construction Equipment

Category of domestic appliances/construction equipment	Noise limit in dB(A)
Window air conditioners of 1 tonne to 1.5 tonne	68
Air coolers	60
Refrigerators	46
Diesel generator for domestic purposes	85–90
Compactors (rollers), Front loaders, Concrete mixers, Cranes (movable), vibrators, and saws	75 (industrial area), 65 (other areas)

Source: The Noise Pollution (Regulation and Control) Rules, 2000

Table 15: Acceptable Noise Levels for Different Types of Building

Location/Types of Buildings	Noise limit in dB(A)
Auditoria and concert halls	20–25
Radio and television studios	20–25
Music rooms	25–30
Hospitals and cinema theatres	35–40
Apartments, hotels, and homes	35–40
Conference rooms, small offices, and libraries	35–40

Location/ Types of Buildings	Noise limit in dB(A)
Courtrooms and classrooms	40–45
Large public offices, banks, and stores	45–50
Restaurants	50–55
Other Noise Standards: 1. The noise level at the boundary of the public place, where loudspeaker or public address system shall not exceed 10 dB (A) above the ambient noise standards for the area or 75 dB (A), whichever is lower (Noise Rules, 2000). 2. The peripheral noise level of a privately-owned sound system or a sound-producing instrument shall not, at the boundary of the private place, exceed by more than 5 dB (A) the ambient noise standards specified for the area in which it is used (Noise Rules, 2009).	

Source: National Building Code, 2005 (BIS, 2005a)

23.2 Compliance:

23.2.1 Submit strategies and policy measures being proposed/undertaken at the city level to control air pollution and noise pollution.

23.2.2 Upload photographs, with description of the measures implemented.

23.2.3 Submit signed declaration stating that the development of the city is in alignment with the above mentioned Appraisals (23.1.1-23.1.2)

23.2.4 Submit ambient air quality reports from the monitoring stations of various areas under the purview of the civic body to demonstrate compliance.

23.2.5 Submit noise test reports from the monitoring stations of various areas under the purview of the civic body to demonstrate compliance.

CRITERION 24 PROVISION OF AFFORDABLE HOUSING

Intent: The demand for residential space is expected to increase tremendously in order to meet the urban shortage. Thus, it is vital to cater to this demand in a sustainable manner to reduce the impact of this massive construction on the community, economy, and the environment. The government's Pradhan Mantri Awas Yojana (PMAY) is a step in this direction which envisions to provide Housing for All by 2022. The intent of this criterion is to inspire and reward the civic bodies making provisions for improving the living conditions of the economically-weaker sections.

Maximum Points: 3

24.1 Appraisals:

24.1.1 Ensure that a policy is framed and implemented for redevelopment of slums towards formal/affordable housing.

1 Point

24.1.2 Ensure that houses should be reserved for EWS and LIG category.

- At least 20%–30% of the houses should be reserved for EWS and LIG category. **1 Point**
- At least 30%–35% of the houses should be reserved for EWS and LIG category. **2 Points**

24.2 Compliance:

24.2.1 Submit strategies and policy measures being proposed/undertaken at the city level towards the redevelopment of slums.

24.2.2 Upload photographs, with description of the measures implemented.

24.2.3 Submit declaration stating that the development of the city is in alignment with the abovementioned appraisals (24.1.1–24.1.2)

24.2.4 Submit calculations demonstrating compliance with appraisal 24.1.2.

24.2.5 Submit duly signed (by competent authority) declaration supporting the values considered in the calculations.

BONUS

The intent of a rating is to establish a benchmark to evaluate a certain case on definite parameters. Considering the uniqueness and priorities of each project, the bonus section rewards attempts towards enhancing sustainability, other than the parameters mentioned in the rating. This section provides an opportunity to push the boundaries and strive to integrate climate change mitigation, disaster preparedness, greenhouse gas (GHG) inventorying, urban farming, strategies to mitigate urban heat island effect (UHIE), protection of ecologically sensitive areas, heritage conservation practices, and provision of spaces for street markets to name a few. The section provides flexibility to the projects to choose strategy in alignment with their plans and goals.

This section consists of one criterion as mentioned in the table below:

Table 16: Criterion under Bonus

Criterion Number	Criterion Name	Maximum Points
Criterion 25	Bonus Points	4

CRITERION 25 BONUS POINTS

Intent: The intent of awarding points for innovation is to reward additional measures adopted by the project which have not been covered in the previous 24 criteria.

Maximum Points: 4

25.1 Appraisal:

25.1.1 Adopt Strategies (Maximum 4), independent of the previous 24 criteria, to make the project more sustainable.

4 Points

25.2 Compliance:

25.2.1 Submit documents, calculations, and narrative highlighting the measures adopted.

Suggested strategies: The following strategies are indicative to inspire/guide the project. Any other strategy towards enhancing sustainability may also be chosen.

Strategy 01: The consequences of climate change are impacting the world, especially the developing countries. Adoption and implementation of climate-resilient strategies and encouraging low-carbon growth is a necessity which cannot be ignored anymore. This strategy shall appraise climate resilience plans with set timelines and strategies developed by the project. The plan must highlight the hazards faced, assessment of vulnerability and risks, investigation of options, prioritizing, and planning to take actions.

Strategy 02: India has pledged under the Paris Agreement to reduce the carbon intensity of its economy by 33%–35% by 2030. GHG inventorying provides estimates of all emissions and removal of GHGs from given sources or sinks from a defined region in a specific period of time. It is a step towards quantification and control of GHG emissions. This strategy shall appraise development of a GHG inventory and mitigation plan for low carbon growth.

Strategy 03: With increasing population in the urban areas, basic necessities, such as vegetables and fruits, are transported from long distances. Integration of farming in the urban areas will decrease the pressure on hinterland for supplying fresh produce, decrease emissions, and inculcate self-sufficiency. This strategy evaluates initiatives taken to encourage urban farming/forestry/agriculture in the project.

Strategy 04: Urbanization has led to degradation and deterioration of the urban environment and biodiversity. The natural features, such as lakes, hills, and plantations are negatively affected and have detrimental effect on the residents. This strategy evaluates proposals/strategies in place for protection of Ecologically Sensitive Areas.

Strategy 05: The temperatures in urban areas are found to be significantly higher than the surrounding green areas or peri-urban areas. This is due to increased paved surfaces, which results in the UHIE. This strategy evaluates steps taken by the project to mitigate UHIE through tree plantation in dense areas, lighter finish for roads, pathways, shaded walkways, and less hard paved surfaces.

Strategy 06: Green practices in buildings are being encouraged around the country. This strategy appraises promotion of GRIHA ratings in the region.

Strategy 07: Cultural heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions, and values. This strategy promotes cultural heritage as a means to improve the touristic product of the city and preserve its historic core. The project will be appraised on conservation of heritage structures, and planning being done in compliance with the local city development control regulations (DCR) for heritage in the city.

Strategy 08: Informal sector is an integral part of the cities in developing countries. Solutions seeking integration of informal sector in urban planning and not stigmatizing to create productive and equitable spaces should be encouraged. This strategy appraised provision of formal spaces for street vendors and other sections of the informal sector by ensuring that the Masterplan and Development Control Regulations have assigned allocated spaces for vendors and other informal sectors while designing public spaces.

A GRIHA Council - TERI initiative

GRIHA Council
A-260, Bhishma Pitamah Marg,
Defence Colony, New Delhi – 110024
Tel. 011-46444500/24339606
info@grihaindia.org • www.grihaindia.org