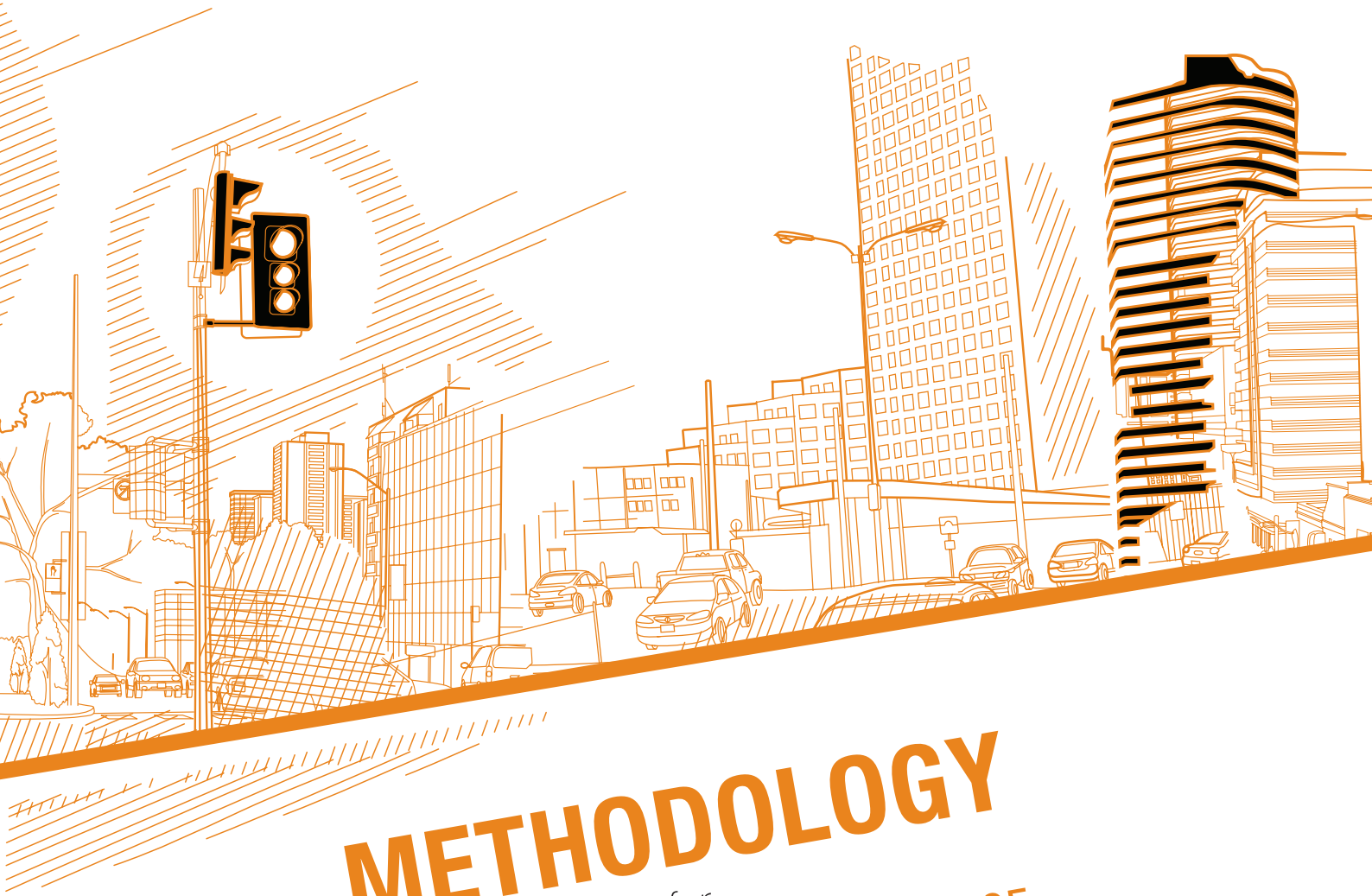
सत्यमेव जयते

Ministry of Urban Development
Government of India



METHODOLOGY

for

COLLECTION AND COMPUTATION OF LIVEABILITY STANDARDS IN CITIES

Table of Contents

OVERVIEW OF PROCESS	**2**
Stage 1: Study and documentation of Liveability Standards in cities	**3**
Stage 2: Scoring of indicators and calculation of indexes	**4**
~ Scoring and Computing Category Indexes of Liveability	4
~ Computing City Liveability Index	7
~ Ranking of Cities	7
ANNEX 1	**8**
LIST OF INDICATORS	9
ANNEX 2	**12**
DETAILS OF INDICATORS	12

OVERVIEW OF PROCESS

The Ministry of Urban Development has developed a set of 'Liveability Standards in Cities' to generate a Liveability Index and rate cities. A total of 79 indicators (57 Core Indicators and 22 Supporting Indicators) have been prescribed in the document (given at Annex 1). These have been grouped under 15 thematic categories, which in turn are part of the four pillars of comprehensive development of cities, namely institutional, social, economic and physical. Based on the performance of cities against the various core and supporting indicators, various 'Category Sub-Indexes' and a composite 'City Liveability Index' will be developed for each city.

This 'Methodology for Collection and Computation of Liveability Standards in Cities' is intended as a companion document, and provides guidance on data capture, sources of data, and the process to be followed for calculating the various indexes. Two key stages are involved in the process as given in Figure 1.

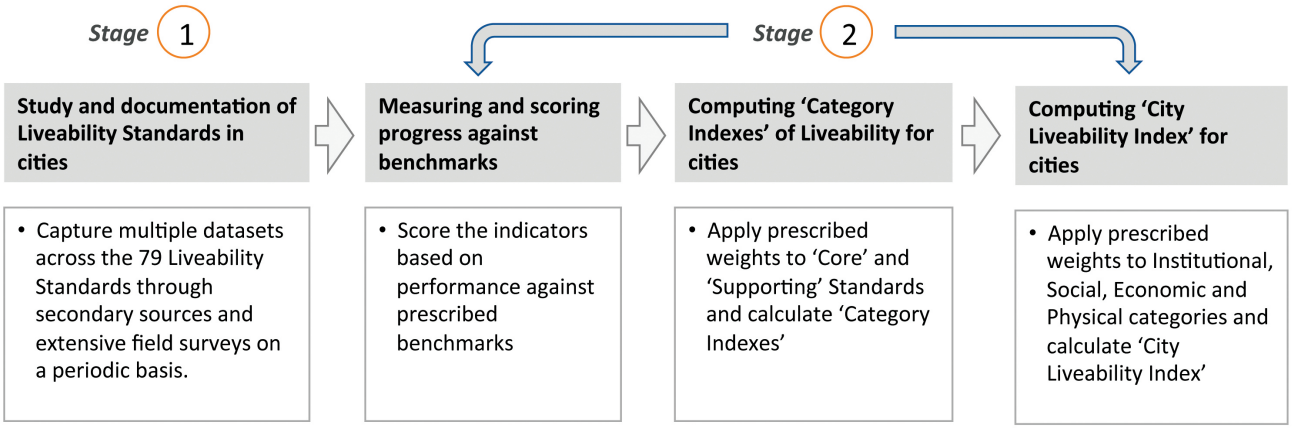


Figure 1: Key stages for calculating Liveability indexes

Stage 1:
Study and Documentation of Liveability Standards in cities

Calculation of the 79 different Liveability indicators prescribed in the 'Liveability Standards in Cities' requires data on a large number of aspects of urban infrastructure, governance, municipal finances, social infrastructure, economic aspects etc. Wherever such data is regularly compiled by the ULBs or other service providers such as DISCOMS, Water and Sewerage Utilities etc. it should be sourced from the records of such providers. In some cases the data may require on-field corroboration through physical surveys. For certain indicators such as pollution, water quality, modal split of urban transport etc. data will have to be obtained from physical surveys as per standards and prescribed survey and sampling techniques. Some indicators such as per capita availability of open spaces will require map-based analysis, and necessary base maps may need to be prepared for cities where such information or maps are not readily available.

Broad guidance (indicator-wise) on data collection methods, likely sources of secondary data, and sampling size and regimen to be followed for physical surveys is given in Annex 2. Such data collection should be a periodic exercise and should be executed through a robust framework for ensuring reliable and high quality data collection for all cities. The raw data collected as part of this exercise should be aggregated through an MIS database allowing year-on-year comparisons and city-wise documentation of progress.

Stage 2:
Scoring of Indicators and Calculation of Indexes

The overall model for computing the indexes in given in Figure 2.

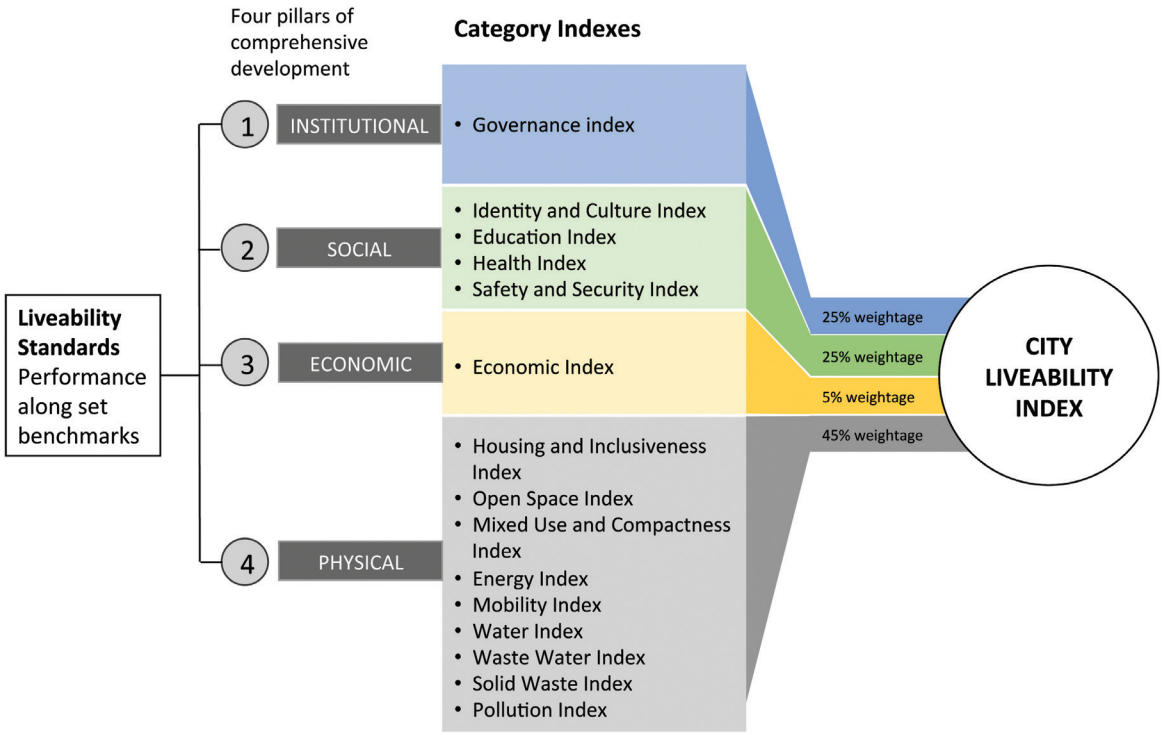


Figure 2: Model to compute the Liveability Index

Scoring and Computing Category Indexes of Liveability

The performance achieved by cities against 79 indicators, will be assessed against given benchmarks. Where no international/national norms are available, city with the best performance in its Group will be treated as a benchmark. The Groups are given in Table 1.

Table 1: Classification of cities based on population

Classification*	Population range
Small Towns	Less than 50,000 population
Medium Towns	Population ≥ 50,000 < 5 lakh
Large Towns	Population ≥ 5 lakh < 1 million
Metropolitan Cities	Population ≥ 1 million < 5 million
Megapolis	Population ≥ 5 million

Category indexes will be calculated for the Core and Supporting Liveability Standards as per the following weights

Core Indicator	Supporting Standard
70%	30%

Thus,

Category Index = (Average score for core indicators * 0.7) + (Average score for supporting standards * 0.3)

Three alternative methods can be used to score the cities based on their performance on the 79 indicators, calculate 'Category Sub-Indexes' and the 'City Liveability Index'.

1. Dimensional Index Methodology

Indicators are expressed in different units and one way of aggregating them is by normalisation of each indicator using the equations (1) and (2).

$$I^{+}_{N,ijt} = \frac{I^{+}_{A,ijt} - I^{+}_{\min.jt}}{I^{+}_{\max.jt} - I^{+}_{\min.jt}} \quad \text{---------- (1)}$$

$$I^{-}_{N,ijt} = 1 - \frac{I^{-}_{A,ijt} - I^{-}_{\min.jt}}{I^{-}_{\max.jt} - I^{-}_{\min.jt}} \quad \text{---------- (2)}$$

Where IN,ijt+ is the normalized indicator i of type "more is better" for group of indicators j (economic, environmental or social), for time (year) t and IN,ijt– is the normalized indicator i of type "less is better" for group of indicators j for the same time (year) t and IA is the average value of an indicator. The indicators with positive and negative effect are taken into consideration, for example,

- a rise of the air pollutant emissions per unit of product has obviously a negative impact,
- while a bigger operational profit has a positive effect on the economic performance of the company

Min-Max normalises indicators to have an identical range [0, 1] by subtracting the minimum value and dividing by the range of the indicator values. However, extreme values/ outliers could distort the transformed indicator. On the other hand, Min-Max normalisation could widen the range of indicators lying within a small interval, increasing the effect on the composite indicator more than the z-score transformation.

Example 1:

Open spaces – Max: 50%, Min: 5% Example of a city where Open Space is 30%: (30-5)/(50-5)=25/45=0.55

Example 2:

Pollutants – Min: 40 ppm; Max: 250 ppm. Example of a city where pollutant is 100 ppm:

1-(100-40)/(250-40) = 1-60/210 = 1-0.428=0.572

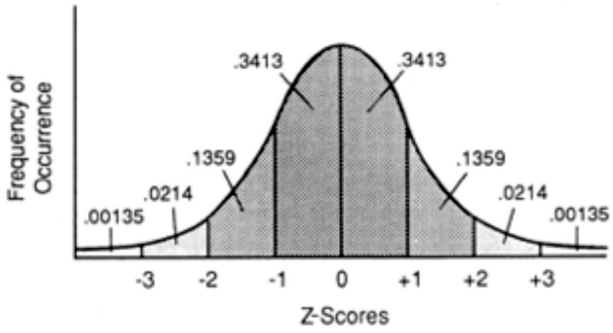
2. Method using Z-Score

The absolute value of Z represents the distance between the raw score and the mean in units of the standard deviation. Z is negative when the raw score is below the mean, positive when above.

The standard Z-score is calculated as follows:

$Z = (X-\mu)/\sigma$ where:

μ is the mean and σ is the standard deviation.



Standardisation (or z-scores) converts indicators to a common scale with a mean of zero and standard deviation of one. In this method, indicators with extreme values have a greater effect on the composite indicator. This effect can be corrected in the aggregation methodology, e.g. by excluding the best and worst individual indicator scores from inclusion in the index or by assigning differential weights based on the "desirability" of the individual indicator scores.

3. Methodology using Deciles

- The range of values on each of the indicators is divided into 10 equal deciles from the highest to the lowest values. Extreme outliers are dropped or transformed using standard statistical techniques.
- For the indicator with a desirable higher value (i.e., higher the better, example GDP), cities that fall in the highest decile are given a score of 10, those in the next decile get a score of 9 and so on till the cities in the lowest decile get a score of 1. For the Indicators with a desirable lower value (i.e., lower the better, example: unemployment rate, homelessness), the opposite is done. Cities that fall in the highest decile are given a score of 1, those in the next decile get a score of 2 and so on till the cities in the lowest decile get a score of 10.
- For the missing data point the average of the other Indicators within the same factor can be used as a proxy.
- Once marks are available for each Indicator in a city, these are added up and divided by the number of Indicators to generate category specific indexes and the composite index.

Computing City Liveability Index

INSTITUTIONAL	SOCIAL	ECONOMIC	PHYSICAL
25% weightage	25% weightage	5% weightage	45% weightage

These weights will be applied to the 15 Category sub-indexes to derive a composite 'City Liveability Index'. The methodology is given in Table 2.

Table 2: Methodology for computing 'City Liveability Index'

Pillar of Comprehensive Development	Category Index	Average value for each pillar	Weight Adjustment	City Liveability Index
Institutional (25% weight)	Governance Index (A)	A	T=A*0.25	City Liveability Index = T+U+V+W
Social (25% weight)	Identity and Culture Index (B)	R= B+C+D+E 4	U=R*0.25	
	Education Index (C)			
	Health Index (D)			
	Safety and Security Index (E)			
Economic (5% weight)	Economic Index (F)	F	V=F*0.05	
Physical (45% weight)	Housing and Inclusiveness Index (G)	S= G+H+J+K+L+M+N+P+Q 9	W=S*0.45	
	Open Space Index (H)			
	Mixed Use and Compactness Index (J)			
	Energy Index (K)			
	Mobility Index (L)			
	Water Index (M)			
	Waste Water Index (N)			
	Solid Waste Index (P)			
	Pollution Index (Q)			

Ranking of Cities

Based on the City Liveability Index computed, cities can be ranked in descending order. Similarly, cities can also be ranked on Category sub-indexes

ANNEX 1
LIST OF INDICATORS

PILLAR OF COMPREHENSIVE DEVELOPMENT	CATEGORY	INDICATOR	TYPE
INSTITUTIONAL	1. Governance	1.1 Percentage of citizen services available online	Core
		1.2 Percentage of services integrated through Command Centre	Supporting
		1.3 Percentage of citizens using online services	Core
		1.4 Average delay in grievance redressal	Core
		1.5 Tax collected as percentage of tax billed	Core
		1.6 Extent of cost recovery (O&M) in water supply services	Core
		1.7 Capital spending as percentage of total expenditure	Core
		1.8 Percentage of population covered under Ward Committees/ Area Sabhas	Core
SOCIAL SOCIAL	2. Identity and Culture	2.1 Restoration and reuse of historic buildings	Core
		2.2 Percentage of ecologically important areas covered through projects for restoration	Core
		2.3 Hotel occupancy	Core
		2.4 Percentage of budget allocated towards cultural/sports activities	Supporting
		2.5 Number of cultural/sports events hosted by city	Supporting
	3. Education	3.1 Percentage of school-aged population enrolled in schools	Core
		3.2 Percentage of female school-aged population enrolled in schools	Core
		3.3 Primary education student-teacher ratio	Core
		3.4 Percentage of schools with access to digital education	Supporting
		3.5 Percentage of students completing primary education	Core
		3.6 Percentage of students completing secondary education	Supporting
	4. Health	4.1 Number of in-patient hospital beds per 10,000 population	Core
		4.2 Healthcare professionals per 10,000 population	Supporting
		4.3 Average response time in case of health emergencies	Supporting
		4.4 Period prevalence of water borne diseases	Core
		4.5 Period prevalence of vector borne diseases	Core
	5. Safety and Security	5.1 Number of streets, public places, junctions covered through surveillance systems	Core
		5.2 Number of recorded crimes per lakh population	Core
		5.3 Extent of crimes recorded against women, children and elderly per year	Core
		5.4 Transport-related fatality per lakh population	Supporting

ECONOMIC	6. Economy and Employment	6.1 Increase in VAT/GST collection	Core
		6.2 Increase in collection of Professional Tax	Core
		6.3 Increase in issuance of Construction permits	Core
		6.4 Unemployment rate	Core
		6.5 Percentage of vendors registered and provided formal spaces	Supporting
PHYSICAL	7. Housing and Inclusiveness	7.1 Percentage of Slum/EWS households covered through formal/affordable housing	Core
		7.2 Percentage of slum areas covered through basic services	Core
	8. Public Open Spaces	8.1 Per capita availability of green spaces	Core
		8.2 Per capita availability of public and recreational places	Core
	9. Mixed Land Use and Compactness	9.1 Share of mixed land use area in overall city land use	Core
		9.2 Net Density	Core
	10. Power Supply	10.1 Percentage of city population with authorized electrical service	Core
		10.2 Percentage of electrical connections covered through smart meters	Supporting
		10.3 Average number of electrical interruptions per customer per year	Core
		10.4 Average length of electrical interruptions per customer per year	Supporting
		10.5 Percentage of total energy derived from renewable sources	Core
		10.6 Energy consumption per unit - water supply and sewerage	Supporting
		10.7 Energy consumption per unit - street lighting	Supporting
		10.8 Percentage of new and redeveloped buildings following green building norms	Supporting
		10.9 Total energy consumption per capita	Core
	11. Transportation and Mobility	11.1 Geographical coverage of public transport	Core
		11.2 Availability of public transport	Supporting
		11.3 Mode share of public transport	Core
		11.4 Percentage of road network with dedicated bicycle tracks	Core
		11.5 Percentage of interchanges with bicycle parking facilities	Supporting
		11.6 Mode share of non-motorized transport	Core
		11.7 Availability of Passenger Information System	Supporting

PHYSICAL		11.8 Extent of signal synchronization	Supporting
		11.9 Availability of paid parking spaces	Core
		11.10 Percentage coverage of footpaths – wider than 1.2 m	Core
		11.11 Percentage of traffic intersections with pedestrian crossing facilities	Supporting
		11.12 Extent to which universal accessibility is incorporated in public rights-of-way	Supporting
	12. Assured Water Supply	12.1 Household level coverage of direct water supply connections	Core
		12.2 Per capita supply of water	Core
		12.3 Quality of water supplied	Core
		12.4 Level of non-revenue water - NRW	Core
		12.5 Percentage of water connections covered through meters	Supporting
		12.6 Percentage of plots with rainwater harvesting facility	Supporting
	13. Waste Water Management	13.1 Coverage of toilets	Core
		13.2 Coverage of sewerage network and/or septage	Core
		13.3 Collection efficiency of sewerage network	Core
		13.4 Extent of reuse and recycling of waste water	Core
		13.5 Coverage of storm water drains	Core
	14. Solid Waste Management	14.1 Household level coverage of municipal solid waste collection	Core
		14.2 Efficiency of collection of municipal solid waste	Core
		14.3 Extent of municipal solid waste recovered through reuse	Core
	15. Reduced Pollution	15.1 Concentration of SO_2 - air pollution	Core
		15.2 Concentration of NO_2 - air pollution	Core
		15.3 Concentration of PM_{10} - air pollution	Core
		15.4 Level of noise pollution	Core
		15.5 Quality of water in public surface water bodies	Core

ANNEX 2
DETAILS OF INDICATORS

Indicator No. and Name	**1.1 Percentage of citizen services available online**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**CORE**
Description	The extent to which, various citizen services can be accessed by citizens remotely, through online portals, phone applications, e-kiosks etc. Citizen services will include various online payments of taxes and charges, applications and approvals, grievance management, issue of documents like birth and death certificates etc.				
Expressed as	Number of citizen services available online ---------- X 100 = _____% Total number of citizen services provided by the ULB				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Mapping of various citizen services (amenable to online provision) that are being provided to citizens by each ULB/SPV should be done in following categories: ~ Taxes (e.g. property tax, professional tax), ~ User Charges (e.g. water charges), ~ Challans and fines (e.g. traffic violations), ~ Service connections (e.g. water supply connection) ~ Certificates/ Licenses (e.g. birth and death certificates) ~ Approvals (e.g. building plan sanctions), ~ Tenders (for various works) across various departments/ utilities ~ Grievance management (tracking of complaints), ~ Tickets and passes (e.g. public transport, cultural events), and ~ Disclosure of documents (e.g. budgets, plans, RTI requests). • A matrix should be prepared to map each of these citizen services in terms of aspects such as online registration, availability of online information, bill generation, payment, application for various services, tracking of progress, online delivery of certificates etc. • Example, Property Tax portal should include aspects like (i) process related information (ii) user registration (iii) self-assessment tool (iv) bill generation (v) payment. A city should provide all 5 aspects to score 100% • Example, Water Supply portal should include aspects like (i) process related information (ii) user registration (iii) application for connection (iv) grievance (v) tracking of progress (vi) bill generation (vii) payment. A city should provide all 7 aspects to score 100% • The final score should be an average percentage of the number of aspects available online for each type of citizen service. • Record of ULB/ public utilities and other service providers (like DISCOMs), and from the operator/systems integrator responsible for online systems				
Benchmark	100%				
SDG Reference(s)	• 16.6 Develop effective, accountable and transparent institutions at all levels				

Indicator No. and Name	**1.2 Percentage of services integrated through Command Centre**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**SUPPORTING**
Description	The extent to which, various city services like water supply, sewerage, waste management, e-governance, urban transport etc. have been integrated through Singular Operations or Command and Control Centres. Such integration can facilitate better data management and horizontal integration across various services, leading to overall efficiency in service provision and optimal use of resources.				
Expressed as	Number of services integrated through singular operations centre ---------- X 100 = _____ Total number of services provided by the ULB				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Mapping of various city services being provided in the city by the ULB and other service providers should be done in the following categories: ~ Water Supply, ~ Sewerage and/or Septage, ~ Storm Water Drainage, ~ City Transport, ~ Solid Waste Management, ~ E-governance (including permissions, e-payments etc.), ~ Surveillance Systems, ~ Lighting of streets and public places, ~ Disaster and Emergency Response Management, ~ Pollution Data Management, ~ Health and Education, ~ Smart Homes and Buildings, ~ Entertainment and city events, ~ Wired/Wireless Connectivity. • Such a list must also include sub-services. For example, City Transport should include public transport, intermediate public transport (IPT) or para-transit, traffic management, parking management etc. and Waste Management should include collection, transportation, disposal and recovery. • Data on actual number of such city services being integrated through Command Centre should be mapped to form the numerator. • Data on various services can be obtained from ULB/ public utilities and other service providers (like DISCOMs), and from operator/ systems integrator responsible for the Singular Operations Centre or Command and Control Centre				
Benchmark	100%				
SDG Reference(s)	• 16.6 Develop effective, accountable and transparent institutions at all levels				

Indicator No. and Name	**1.3 Percentage of citizens using online services**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**CORE**
Description	The extent to which citizens have started using the online portals and phone-based smart applications for accessing various citizen services that are being provided online.				
Expressed as	Average for all citizen services Number of registered users using online services in a month ---------- X 100 = _____ Total number of households				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Average should be taken for usage records available for various citizen services (as defined in Indicator 1.1) being provided online • Data should be collected across different media such as ULB website, websites of other providers like DISCOMs and various phone-based apps for accessing citizen services • An instance of login from a unique ID during a month should be counted only once for the month, irrespective of the number of times that ID is used during the month. Similarly, if a unique ID has logged in from more than one media i.e. website, phone app, e-kiosks etc. the same should be counted only once for the month. • Data on instances of login by registered users can be obtained from operator/ systems integrator responsible for website/app backend management • Data for households should be based on the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population				
Benchmark	100%				
SDG Reference(s)	• 16.6 Develop effective, accountable and transparent institutions at all levels				

Indicator No. and Name	**1.4 Average delay in grievance redressal**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**CORE**
Description	This denotes the efficiency achieved in addressing complaints/issues raised by citizens regarding the various services being provided by the ULB. Most cities have committed grievance redressal timelines as part of their Citizen Charters. The Guidelines on National Mission Mode Project on e-Governance in Municipalities of the MoUD provide the guidelines and benchmarks for grievance acknowledgement and redressal.				
Expressed as	Average of all services [Average redressal period for a service - Committed redressal period for the service] = _____				
Unit	Number of days				

Methodology/ Interpretation and Sources of Data	• Committed grievance redressal timelines for the following services will be mapped: ~ water supply, ~ solid waste management, ~ drainage, ~ sewerage/septage, ~ roads, ~ street lights, ~ open spaces, ~ public transport services like ticketing, ~ power supply, ~ taxes and user charges, and ~ various other online services. • Where such commitments are not available, the benchmark given below will be treated as committed period for grievance redressal. • Average time taken for successful redressal, identified separately for each service, should be calculated on the basis of historical data available for a reasonable period of time (separately for each service) • Average redressal time can be obtained from the records of ULB/ public utilities and other service providers (like DISCOMs), or logs maintained by agencies responsible for online systems (wherever applicable) • The final score on the indicator will be the average of values mapped for each type of service
Benchmark	<7 days for all, other than specified for which it would < 1 month (Guidelines on National Mission Mode Project on e-Governance in Municipalities, MoUD)
SDG Reference(s)	• 16.6 Develop effective, accountable and transparent institutions at all levels

Indicator No. and Name	**1.5 Tax collected as percentage of tax billed**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**CORE**
Description	This denotes the efficiency achieved by a city in collecting property taxes against the tax demand raised in a given year. Implementation of smart solutions in cities will be expected to improve systemic efficiencies in issuance of regular and timely demand notices, and facilitate ease of payment (online, m-applications etc.), thereby leading to improvement in collection of taxes and ULB revenues.				
Expressed as	Total tax collected in a year ---------- X 100 = _____ Total demand raised for the year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data for tax demand raised by the ULB and collection efficiency against demand, should be collected for previous financial year. For example, if data is being collected in June 2017, data on total property tax demand and collection for 2016-17 must be obtained. • Data can be obtained from the revenue departments of ULBs				
Benchmark	90% (AMRUT, MoUD)				
SDG Reference(s)	SDG Target 17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection				

Indicator No. and Name	1.6 Extent of cost recovery (O&M) in water supply services				
Pillar	INSTITUTIONAL	Category	GOVERNANCE	Type	CORE
Description	The extent to which O&M expenditure on provision of water supply services is being recovered by city administrations through user charges. O&M cost can be reduced through the implementation of monitoring systems like SCADA, installation of smart meters and reduction in NRW. This coupled with adoption of telescopic and volume based tariffs, and efficient billing and collection systems can result in better recovery of costs.				
Expressed as	Total collection of user charges in water supply in a year ---------- X 100 = _____ Total O&M cost for providing water supply services during the year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data for water charges collected by the ULB and O&M costs for providing water supply services, should be obtained for previous financial year. For example, if data is being collected in June 2017, data on water charges and O&M costs for 2016-17 must be obtained. • Data can be obtained from the records of the ULB/ Water Utility				
Benchmark	100%				
SDG Reference(s)	• SDG Target 17.1: Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection				

Indicator No. and Name	1.7 Capital spending as percentage of total expenditure				
Pillar	INSTITUTIONAL	Category	GOVERNANCE	Type	CORE
Description	The extent to which, a ULB is able to re-invest its revenues into creation of capital (infrastructure and assets), after taking care of annual establishment and O&M costs. This is a strong measure of the financial health of cities and a higher percentage indicates that the city is proactively improving its services and facilities.				
Expressed as	Total capital expenditure during a year ---------- X 100 = _____ Total expenditure (revenue and capital accounts) in the same year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data should be collected for previous financial year. For example, if data is being collected in June 2017, data on capital expenditure and total expenditure for 2016-17 must be obtained. • Data can be obtained from the Accounts department of the ULB				
Benchmark	City with the highest performance (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• 16.6 Develop effective, accountable and transparent institutions at all levels				

Indicator No. and Name	**1.8 Percentage of population covered under Ward Committees/ Area Sabhas**				
Pillar	**INSTITUTIONAL**	**Category**	**GOVERNANCE**	**Type**	**CORE**
Description	The participation of citizens in matters of governance, planning and development is critical for ensuring inclusive and participatory growth of cities. This indicator determines the extent of institutionalization of citizen participation, through implementation of the provisions of the Community Participation Law.				
Expressed as	Population covered under ward committees/ area sabhas ---------- X 100 = _____ Total population of the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data should be calculated as the sum of population covered under operational ward committees/ area sabhas. • Operational ward committees/ area sabhas will mean those that hold meetings regularly, and participate actively in ward-level budgeting and prioritization of works. • Data on formation of ward committees/ area sabhas and the meetings conducted by such committees will be available from the records maintained by the ULB • Data for city population should be based on the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population				
Benchmark	City with the highest performance (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries ~ SDG Indicator 11.3.2: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically				

Indicator No. and Name	**2.1 Restoration and reuse of historic buildings**				
Pillar	**SOCIAL**	**Category**	**IDENTITY AND CULTURE**	**Type**	**CORE**
Description	The extent to which planning and development in the city respects historic buildings/sites and the existing cultural landscape, through projects for preservation/restoration and adaptive reuse. Heritage assets are listed by the Archaeological Survey of India (ASI) and various State ASIs. City governments may also undertake listing of buildings, sites, precincts considered historically significant locally due to their cultural importance. The guidelines for local listing and grading of heritage assets are provided by the Town and Country Planning Organization (TCPO), MoUD (Model Heritage Regulations, 2011).				
Expressed as	Average for buildings listed by ASI, State ASI and Local Authority Number of historic buildings/sites restored/preserved/brought under adaptive reuse ---------- X 100 = _____ Total number of historic buildings/sites identified				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Historic buildings will include buildings and areas notified by the Archaeological Survey of India (ASI), State ASI, as well as those listed as part of city/municipal lists. • Data should be obtained separately for all three lists i.e. ASI, State ASI and local list. • Projects can include conservation, preservation, repair, restoration, adaptive reuse, retrofitting etc. as defined in the National Policy for Conservation of Ancient Monuments, Archaeological Sites and Remains, 2014 developed by the Archaeological Survey of India. • Records of ASI, State ASI and ULB/ Planning Authority can be used to get data on listing and completed conservation projects.
Benchmark	100% of listed buildings/sites should be restored/preserved and/or brought under adaptive reuse
SDG Reference(s)	• SDG Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage ~ SDG Indicator 11.4.1: Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/ investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)

Indicator No. and Name	**2.2 Percentage of ecologically important areas covered through projects for restoration**				
Pillar	SOCIAL	Category	IDENTITY AND CULTURE	Type	CORE
Description	The extent to which the city has taken ecologically sensitive areas (natural heritage) into consideration during the process of planning and development. Ecologically sensitive sites will include surface water bodies, urban watershed (natural drainage lines), coastlines, riverfronts, wetlands and urban forests. Such sites are often ignored in the process of urban development and suffer from invasive development along the edges, deterioration due to dumping of wastes and waste water, pollution, silting and narrowing etc. Restoration of such sites can lead to better urban environment and sustainable development.				
Expressed as	Ecologically important sites covered through projects for restoration ---------- X 100 = _____ Total number of ecologically important sites identified in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Ecologically sensitive sites will include surface water bodies, urban watershed (natural drainage lines), coastlines, riverfronts, wetlands and urban forests. • Such sites of ecological importance will need to be identified and plotted on a map in discussion with the ULB/ Planning officials. • Only completed projects should be included. Records of ULB/ Development Authority regarding completed projects must be corroborated through site visits.				
Benchmark	100%				
SDG Reference(s)	• SDG Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes • SDG Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage ~ SDG Indicator 11.4.1: Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship) • SDG Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.				

Indicator No. and Name	**2.3 Hotel Occupancy**				
Pillar	SOCIAL	Category	IDENTITY AND CULTURE	Type	CORE
Description	This indicates the extent to which the city is frequented by tourists/visitors coming to the city for various purposes such as tourism, business or other work related activities. High average hotel occupancy rates across different times of the year indicate a flourishing inflow of visitors, fuelled by improvements in economic productivity and business environment, concerted efforts towards upkeep and marketing of local heritage and ecological assets (eco-tourism), and availability of adequate opportunities for exploring local identity and culture				
Expressed as	Average of various categories of hotels Total number of hotel rooms occupied ---------- X 100 = _____ Total number of hotel rooms available				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data must be collected separately for different categories of hotels. Data can be collected from Hotel Associations. • Key categories of hotels are given as per 'Guidelines for Classification of Hotels' and 'Guidelines for Classification of Heritage Hotels' published by the Ministry of Tourism, and include Star Category Hotels – 5 star deluxe, 5 star, 4 star, 3 star, 2 star and 1 star, and Heritage Category Hotels – Heritage Grand, Heritage Classic and Heritage Basic • Where such data is not available sample surveys will have to be conducted across various categories of hotels • The final indicator value will be calculated as an average of occupancy rates in the various hotel categories				
Benchmark	City with the highest performance (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products				

Indicator No. and Name	**2.4 Percentage of budget allocated towards cultural/sports activities**				
Pillar	SOCIAL	Category	IDENTITY AND CULTURE	Type	SUPPORTING
Description	This indicates the focus of the City Government on encouraging cultural and sports activities in the city. Active budgeting and expenditure by city governments on such cultural/sports activities can facilitate a vibrant socio-cultural environment within cities				
Expressed as	Budget allocated for cultural/sports activities ---------- X 100 = _____ Total budget of the ULB (capital and revenue)				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Cultural activities will include various music and dance performances, art exhibitions, expositions and exhibitions, literary events, film screenings and festivals etc. • Sports activities will include local/state/national tournaments, short duration training camps, promotional events etc. • Data should be collected for previous financial year. For example, if data is being collected in June 2017, data on budget allocated for 2016-17 must be obtained • Data on total budget of the ULB (capital and revenue) should also be collected for the same financial year. • All data can be obtained from Accounts department of the ULB
Benchmark	City with the highest budgetary allocation (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark
SDG Reference(s)	SDG Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage

Indicator No. and Name	**2.5 Number of cultural/sports events hosted by city**				
Pillar	**SOCIAL**	**Category**	**IDENTITY AND CULTURE**	**Type**	**SUPPORTING**
Description	This along with the previous Indicator 2.4 indicates the focus of the City Government on encouraging cultural and sports activities in the city. While some of the activities may be actively funded through ULB funds, others may be supported by the city administration through facilitation of permissions and provision of land/facilities				
Expressed as	Number of cultural/sports events hosted by the city authority in the preceding year				
Unit	Number of events				
Methodology/ Interpretation and Sources of Data	• Cultural activities will include various music and dance performances, art exhibitions, expositions and exhibitions, literary events, film screenings and festivals etc. • Sports activities will include local/state/national tournaments, short duration training camps, promotional events etc. • Data should be collected for previous financial year. For example, if data is being collected in June 2017, number of events in 2016-17 must be captured. • Data can be obtained from the Accounts department of ULBs				
Benchmark	City with the highest number of events (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage				

Indicator No. and Name	3.1 Percentage of school-aged population enrolled in schools				
Pillar	SOCIAL	Category	EDUCATION	Type	CORE
Description	Education is one of the most important aspects of human development. This indicator denotes educational opportunity, and determines the coverage of formal education among school-aged population in the city. The Right of Children to Free and Compulsory Education Act (RTE Act) of 2009 provides for children below the age of 14 to be provided free and compulsory education				
Expressed as	Total enrolment in primary and secondary schools (public and private) ---------- X 100 = _____ Total population in the age group of 6-14 years				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Enrolment is given as the number of students who are enrolled in a particular grade as on 30th September of the School Year. It shall include new entrants, promotees and repeaters • Data on school enrolment is compiled by every state, district and city, under the Unified District Information System of Education (U-DISE) Programme of the Ministry of Human Resources Development (MHRD). • Under U-DISE, school data is updated annually with 30th September as the reference date. • Data should include both public and private schools. • Data for population in age group of 6-14 years (eligible under RTE 2009) can be obtained from Education Department. In the absence of such data population Census may be used as base, and annual growth rate may be applied to arrive at current population.				
Benchmark	100% (Right of Children to Free and Compulsory Education Act, 2009)				
SDG Reference(s)	SDG Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes				

Indicator No. and Name	3.2 Percentage of female school-aged population enrolled in schools				
Pillar	SOCIAL	Category	EDUCATION	Type	CORE
Description	This indicator determines the availability of educational opportunity for girls. Reporting on differential enrolment by gender is also consistent with the Sustainable Development Goals. The RTE Act 2009 provides for children below the age of 14 to be provided free and compulsory education				
Expressed as	Total female enrolment in primary and secondary schools (public and private) ---------- X 100 = _____ Total female population in the age group of 6-14 years				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Enrolment is given as the number of students who are enrolled in a particular grade as on 30th September of the School Year. It shall include new entrants, promotees and repeaters • Data on school enrolment is compiled by every state, district and city, under the Unified District Information System of Education (U-DISE) Programme of the Ministry of Human Resources Development (MHRD). • Under U-DISE, school data is updated annually with 30th September as the reference date. • Data should include both public and private schools. • Data for female population in age group of 6-14 years (eligible under RTE 2009) can be obtained from Education Department. In the absence of such data population Census may be used as base, and annual growth rate may be applied to arrive at current population
Benchmark	100% (Right of Children to Free and Compulsory Education Act, 2009)
SDG Reference(s)	• SDG Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes • SDG Target 4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

Indicator No. and Name	**3.3 Primary education student-teacher ratio**				
Pillar	**SOCIAL**	**Category**	**EDUCATION**	**Type**	**CORE**
Description	This denotes the availability of adequate number of teachers in schools for providing primary education. A lower ratio indicates better individual attention and support for students in the primary grades. The norms for an acceptable student-teacher ratio are set out under the RTE Act 2009				
Expressed as	Total number of students in primary grades (public and private) ---------- = _____ Total number of teachers available for primary grades (public and private schools)				
Unit	Ratio				
Methodology/ Interpretation and Sources of Data	• The number of classroom teachers and other instructional staff (e.g. teachers' aides, guidance counsellors), shall not include administrators or other non-teaching staff. • Kindergarten or pre-school teachers and staff shall not be included. • Enrolment in schools is given as the number of students who are enrolled in a particular grade as on 30th September of the School Year. It shall include new entrants, promotees and repeaters • Data on school enrolment is compiled by every state, district and city, under the Unified District Information System of Education (U-DISE) Programme of the Ministry of Human Resources Development (MHRD). • Under U-DISE, school data is updated annually with 30th September as the reference date. • Data should include both public and private schools.				
Benchmark	1 teacher for every 30 students (Right of Children to Free and Compulsory Education Act, 2009)				
SDG Reference(s)	• SDG Target 4.C: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States ~ SDG Indicator 4.C.1: Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country				

Indicator No. and Name	**3.4 Percentage of schools with access to digital education**				
Pillar	**SOCIAL**	**Category**	**EDUCATION**	**Type**	**SUPPORTING**
Description	The extent to which government schools have facilities for accessing digital educational content, thereby reducing the complete dependence on the quality of teachers as well as improving learning outcomes through use of innovative audio-visual pedagogy and providing access to vast online knowledge repositories. It is important for schools to not only focus on procuring digital infrastructure but also focus on connecting to robust digital learning networks such as the National Knowledge Network (NKN) developed by the Government of India.				
Expressed as	Number of schools (public and private) with facilities for using digital educational content (availability of necessary infrastructure and connection to digital resources such as NKN) ---------- X 100 = _____ Total number of schools				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Schools with necessary infrastructure and connection to digital resources such as the National Knowledge Network (NKN) developed by the Government of India shall be counted. • Data (including for total number of schools) should include both public and private schools and can be obtained from the Education Department. • Where such data is not available the same may be obtained through ward-level surveys of sample schools.				
Benchmark	100%				
SDG Reference(s)	• SDG Indicator 4.A: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all ~ SDG Indicator 4.A.1: Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)				

Indicator No. and Name	**3.5 Percentage of students completing primary education**				
Pillar	**SOCIAL**	**Category**	**EDUCATION**	**Type**	**CORE**
Description	The ability of the primary education system in the city to hold enrolled students until the completion of primary education (survival rate). It is the percentage of students belonging to a school-cohort who have reached each successive grade of primary education without failing or moving to another jurisdiction. Survival rate, particularly at the primary level, is considered a pre-requisite for sustainable literacy, and indicates the holding power and efficiency of the primary education system.				
Expressed as	Average for all school cohorts enrolled in base year Number of students from a school cohort completing primary education ---------- X 100 = _____ Total number of students belonging to the school cohort				

Unit	Percentage
Methodology/ Interpretation and Sources of Data	• School cohort is the number of students who have enrolled in the first grade of primary education in a given year • Number of students from a school cohort completing primary education, are the number of students who have reached each successive grade of primary education without failing or moving to another jurisdiction • If the city reporting year is 2016 and primary education lasts five years, report the percentage of students that entered primary education in 2010 and reached the final grade of primary education in 2015 • The year 2010 will be considered the base year and enrolment will be given as the number of students who enrolled in the first grade as on 30th September of the base year • Data should be an average of all school cohorts from public and private schools as per records available with the Education Department
Benchmark	100%
SDG Reference(s)	• SDG Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

Indicator No. and Name	**3.6 Percentage of students completing secondary education**				
Pillar	**SOCIAL**	**Category**	**EDUCATION**	**Type**	**SUPPORTING**
Description	The ability of the secondary education system to hold enrolled students until the completion of secondary education (survival rate). It is the percentage of students belonging to a school-cohort i.e. those originally enrolled in the first grade of secondary education, who have reached each successive grade of secondary education without failing or moving to another jurisdiction.				
Expressed as	Average for all school cohorts enrolled in base year Number of students from a school cohort completing secondary education ---------- X 100 = _____ Total number of students belonging to the school cohort				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• School cohort is the number of students who have enrolled in the first grade of secondary education at a school in a given year • Number of students from a school cohort completing secondary education are the number of students who have reached each successive grade of secondary education without failing or moving to another jurisdiction • If the city reporting year is 2016 and secondary education lasts seven years, report the percentage of students that entered secondary education in 2008 and reached the final grade of secondary education in 2015. • The year 2008 will be considered the base year and enrolment will be given as the number of students who enrolled in the first grade of secondary education as on 30th September of the base year • Data should be an average of all school cohorts from public and private schools as per records available with the Education Department				
Benchmark	100%				
SDG Reference(s)	• SDG Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes				

Indicator No. and Name	**4.1 Number of in-patient hospital beds per 10,000 population**				
Pillar	**SOCIAL**	**Category**	**HEALTH**	**Type**	**CORE**
Description	This denotes the adequacy of in-patient medical infrastructure measured in the form of availability of in-patient beds in hospitals (public and private) in the city. The World Health Organization (WHO) provides the benchmarks for health services as part of its Service Availability and Readiness Assessment initiative (SARA Reference Manual 2015).				
Expressed as	Number of in-patient hospital beds in public and private hospitals ---------- X 10,000 = _____ Total population of the city				
Unit	Number per 10,000 population				
Methodology/ Interpretation and Sources of Data	• Data on hospital beds should include both public and private hospitals and should be sourced from the Health Department. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	25 beds per 10,000 population (Service Availability and Readiness Assessment, SARA, Reference Manual 2015, World Health Organization)				
SDG Reference(s)	• SDG Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all				

Indicator No. and Name	**4.2 Healthcare professionals per 10,000 population**				
Pillar	**SOCIAL**	**Category**	**HEALTH**	**Type**	**SUPPORTING**
Description	This denotes the availability of health workers in the city (health worker density) that cater to the health needs of citizens. This includes various qualified human resources for healthcare including doctors, nurses, mid-wives etc. The World Health Organization (WHO) provides the benchmarks for health services as part of its Service Availability and Readiness Assessment initiative (SARA Reference Manual 2015)				
Expressed as	Total number of qualified healthcare professionals ---------- X 10,000 = _____ Total population of the city				
Unit	Number per 10,000 population				
Methodology/ Interpretation and Sources of Data	• Qualified healthcare professionals will include Doctors (Allopathic), Doctors (AYUSH), Trained Nurses, Dentists, Pharmacists, and Auxiliary Nurse Midwives (ANMs). • Data can be obtained from the records available with the Health Department.				
Benchmark	23 per 10,000 population (Service Availability and Readiness Assessment, SARA, Reference Manual 2015, World Health Organization)				
SDG Reference(s)	• SDG Target 3.C: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States ~ SDG Indicator 3.C.1: Health worker density and distribution				

Indicator No. and Name	**4.3 Average response time in case of health emergencies**				
Pillar	**SOCIAL**	**Category**	**HEALTH**	**Type**	**SUPPORTING**
Description	The average response time taken by Emergency Medical Services (EMS) to respond to an initial distress call. Response time is the time elapsed from receiving the initial call to arrival on-site of emergency personnel and equipment. Lower response times indicate better preparedness and response to emergency calls, resulting in effective and timely medical attention				
Expressed as	Sum of all response times for distress calls received during the year ---------- =_____ Total number of emergency responses in the same year				
Unit	Minutes and seconds				
Methodology/ Interpretation and Sources of Data	• Response time is the time elapsed from receiving the initial call to arrival on-site of emergency personnel and equipment. • Data on response times for all emergency responses in one year should be obtained from sample hospitals and leading emergency service providers. • Records maintained by government services such as 108/102 National Ambulance Service operated under the National Health Mission can also be used. • The final value of the indicator should be calculated as an average of response times across various sample hospitals/ service providers.				
Benchmark	8 minutes (Report of the Working Group on Emergency Care in India, Ministry of Road Transport and Highways)				
SDG Reference(s)	• SDG Target 3.D: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks. ~ SDG Indicator 3.D.1: International Health Regulations (IHR) capacity and health emergency preparedness				

Indicator No. and Name	**4.4 Period prevalence of water borne diseases**				
Pillar	**SOCIAL**	**Category**	**HEALTH**	**Type**	**CORE**
Description	This denotes the prevalence of water borne diseases such as cholera, typhoid, dysentery etc. in the city during a particular time period. It is an indicator of the quality of water used for drinking, washing, bathing etc. in the city				
Expressed as	Number of cases of persons affected by water borne diseases in a year ---------- X100 = _____ Total population of the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Only instances of water borne diseases like cholera, typhoid, dysentery etc. should be captured. Data can be obtained from the records maintained by the Health Department for the measurement period. • Alternatively data available with government hospitals can be used as a basis to estimate the number of cases in the city. Data for remaining hospitals (non-government) can be proportionate to the number of private beds as compared to government hospitals. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.
Benchmark	City with the lowest prevalence of water-borne diseases (amongst cities in the same city-size classification as given in the Liveability Standards document) will be treated as a benchmark
SDG Reference(s)	• SDG Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases

Indicator No. and Name	**4.5 Period prevalence of vector borne diseases**				
Pillar	**SOCIAL**	**Category**	**HEALTH**	**Type**	**CORE**
Description	This denotes the prevalence of vector borne diseases such as malaria, dengue, chikungunya etc. in the city during a particular time period. It is an indicator of the measures taken by city administrations to control the growth of mosquitoes and other organisms that spread such diseases, and the general level of hygiene and sanitation in the city				
Expressed as	Number of cases of persons affected by vector borne diseases in a year ---------- X100 = _____% Total population of the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Only instances of vector borne diseases like malaria, dengue, chikungunya etc. should be captured. Data can be obtained from the records maintained by the Health Department for the measurement period. • Alternatively data available with government hospitals can be used as a basis to estimate the number of cases in the city. Data for remaining hospitals (non-government) can be proportionate to the number of private beds as compared to government hospitals. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	City with the lowest prevalence of vector borne diseases (amongst cities in the same city-size classification as given in the Liveability Standards document) will be treated as a benchmark				
SDG Reference(s)	SDG Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases SDG Indicator 3.3.3: Malaria incidence per 1,000 population				

Indicator No. and Name	**5.1 Number of streets, public places, junctions covered through surveillance systems**				
Pillar	**SOCIAL**	**Category**	**SAFETY AND SECURITY**	**Type**	**CORE**
Description	The extent to which public areas such as streets, public places like transport interchanges, government buildings, recreational spaces etc. and major traffic junctions in the city are covered through Closed-circuit Television (CCTV) surveillance cameras. This can facilitate real time monitoring of instances of crime or accident and quicker responses in emergency situations. Such surveillance systems can result in improved security and incidence management, and in the specific case of traffic junctions, also help in obtaining real time information regarding pedestrian and vehicular flow for monitoring road accidents.				
Expressed as	Number of streets, public places and major traffic junctions covered through CCTV cameras ---------- X 100 = _____ Total number of streets, public places and major traffic junctions in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• The following sites shall be included for calculating the metric. ~ All streets with ROW equal to or more than of 10 metres (minimum width for local roads IRC:86-1983); ~ Traffic junctions along all roads with ROW equal to or more than 20 metres (minimum width for collector roads IRC:86-1983); ~ Major transport interchanges including bus depots/stations, metro or suburban rail stations and water transport terminals (e.g. ferry terminal); ~ Public interface areas in government buildings, municipal markets, pedestrian subway crossings, and stadiums; ~ Recreational open spaces such as playgrounds, city and district parks, neighbourhood parks and tot lots, zoological/botanical gardens, bird sanctuary, and multi-open spaces and maidans for cultural events, public gatherings etc. ~ Other public spaces like publicly accessible beaches and waterfronts, promenades and public squares, and spaces of gathering/social interaction at neighbourhood-level. • Only those sites where CCTV cameras have been installed (and operationalized) will be included in the numerator. Data can be obtained from ULB, Transportation department and Police Department. • Total number of public areas can be calculated on the basis of existing land use and/or GIS maps. Where such maps are not available the survey teams will have to develop a working GIS map for calculation.				
Benchmark	100%				
SDG Reference(s)	SDG Target 16.1: Significantly reduce all forms of violence and related death rates everywhere				

Indicator No. and Name	5.2 Number of recorded crimes per lakh population				
Pillar	SOCIAL	Category	SAFETY AND SECURITY	Type	CORE
Description	This denotes the prevalent crime rate in a city. Lower crime rates are indicative of higher levels of safety and security in a city, due to effective surveillance in public spaces, better SOS and crime registration systems, and police response mechanisms. Better planning and programming of public spaces, illumination of streets, compact and active neighbourhoods can also contribute to safer cities				
Expressed as	Total number of crimes recorded in a year ---------- X 1,00,000 = _____ Total population of the city				
Unit	Crimes per lakh				
Methodology/ Interpretation and Sources of Data	• Total number of cases should be based on the total number of cases registered with the Police department • Crime data can be obtained from the Police Department. Latest reports published by the National Crime Research Bureau (NCRB) can also be used for obtaining crime data. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	City with the lowest crime rate (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 16.1: Significantly reduce all forms of violence and related death rates everywhere				

Indicator No. and Name	5.3 Extent of crimes recorded against women, children and elderly per year				
Pillar	SOCIAL	Category	SAFETY AND SECURITY	Type	CORE
Description	This denotes the proportion of crimes committed against vulnerable groups such as women, children and elderly.				
Expressed as	Number of crimes recorded against vulnerable groups (women, children and elderly) in a year ---------- X 100 = _____ Total crimes recorded in the same year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Total number of cases should be based on the total number of cases registered with the Police department • Crime data can be obtained from the Police Department. Latest reports published by the National Crime Research Bureau (NCRB) can also be used for obtaining crime data.				
Benchmark	City with the lowest proportion of crimes against vulnerable groups (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				

SDG Reference(s)	• SDG Target 5.2: Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation • SDG Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities ~ SDG Indicator 11.7.2: Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months • SDG Target 16.2: End abuse, exploitation, trafficking and all forms of violence against and torture of children

Indicator No. and Name	**5.4 Transport-related fatality per lakh population**				
Pillar	**SOCIAL**	**Category**	**SAFETY AND SECURITY**	**Type**	**SUPPORTING**
Description	This denotes the level of safety of transport networks in the city. Better managed transport systems will tend to be safer and record lower transport related fatalities. Service Level Benchmarks (SLBs) for Urban Transport developed by the MoUD provide guidance on the service levels for transport				
Expressed as	Total number of fatalities recorded in road accidents in a year ---------- X 1,00,000 = _____ Total population of the city				
Unit	Fatality per lakh				
Methodology/ Interpretation and Sources of Data	• Only fatalities related to roads, railways, water transport should be included in the numerator • Data on transport-related fatalities can be obtained from the Police department or Traffic department. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	<=2 persons per lakh (Service Level Benchmarks for Urban Transport, Ministry of Urban Development)				
SDG Reference(s)	• SDG Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents ~ SDG Indicator 3.6.1: Death rate due to road traffic injuries				

Indicator No. and Name	6.1 Increase in VAT/GST collection				
Pillar	ECONOMIC	Category	ECONOMY AND EMPLOYMENT	Type	CORE
Description	This is one of the important indicators of economic productivity and competitiveness of a city, along with Indicators 6.2 and 6.3. Increase in collection of Value-added Tax (VAT) or Good and Services Tax (GST) is a proxy for improvements in trade and services in the city				
Expressed as	(Total VAT/GST collection during the year – Total VAT/GST collection during preceding year) ---------- X 100 = _____ Total VAT/GST collection during preceding year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data on VAT/GST collection must be collected for 2 consecutive years i.e. year for which indicator is being calculated and the preceding year. • Data can be obtained from the Department of Sales Tax, Trade and Taxes Department or similar department.				
Benchmark	City with the highest increase in collection (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors				

Indicator No. and Name	6.2 Increase in collection of Professional Tax				
Pillar	ECONOMIC	Category	ECONOMY AND EMPLOYMENT	Type	CORE
Description	This is one of the important indicators of economic productivity and competitiveness of a city, along with Indicators 6.1 and 6.3. Increase in collection of Professional Tax is a proxy for improvements in organized sector employment in the city.				
Expressed as	(Total Professional Tax collection during the year – Total collection during preceding year) ---------- X 100 = _____ Total Professional Tax collection during preceding year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data on Professional tax collection must be collected for 2 consecutive years i.e. year for which indicator is being calculated and the preceding year. • Data can be obtained from the Revenue Department of ULBs				
Benchmark	City with the highest increase in collection (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors				

Indicator No. and Name	**6.3 Increase in issuance of Construction Permits**				
Pillar	**ECONOMIC**	**Category**	**ECONOMY AND EMPLOYMENT**	**Type**	**CORE**
Description	This is one of the important indicators of economic productivity and competitiveness of a city, along with Indicators 6.1 and 6.2. Increases in issuance of construction permits indicates improvements in the construction/real estate sector in the city.				
Expressed as	(Number of permits issued during the year – Number of permits during preceding year) ---------- X 100 = _____ Number of construction permits during preceding year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data on Construction permits must be collected for 2 consecutive years i.e. year for which indicator is being calculated and the preceding year. • Data can be obtained from the Building Permissions Department of the ULB				
Benchmark	City with the highest increase in permits (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors				

Indicator No. and Name	**6.4 Unemployment Rate**				
Pillar	**ECONOMIC**	**Category**	**ECONOMY AND EMPLOYMENT**	**Type**	**CORE**
Description	Employment generation is one of the key channels through which economic growth translates into prosperity for the population. Unemployment rate of a city denotes the proportion of work force in a city that is not engaged in gainful employment or economic activity, and is given as persons unemployed per 1000 persons in the labour force (employed and unemployed).				
Expressed as	Number of unemployed persons (seeking or available for work) ---------- X 1000 = _____ Total labour force in the city				
Unit	Per 1000 persons				
Methodology/ Interpretation and Sources of Data	• Numerator should include data on number of unemployed persons from the labour force who are seeking or available for work. • Labour force estimates will be for persons aged 15 years and above only • State level data on labour force and unemployment for urban areas as a whole can be obtained from the Annual Employment-Unemployment Survey conducted by the Labour Bureau, Ministry of Labour and Employment. City specific figures can be derived from the State-level data on the basis of share of urban population.				

Benchmark	City with the lowest unemployment rate (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark
SDG Reference(s)	• SDG Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value ~ SDG Indicator 8.5.2: Unemployment rate, by sex, age and persons with disabilities • SDG Target 8.6: By 2020, substantially reduce the proportion of youth not in employment, education or training

Indicator No. and Name	**6.5 Percentage of vendors registered and provided formal spaces**				
Pillar	**ECONOMIC**	**Category**	**ECONOMY AND EMPLOYMENT**	**Type**	**SUPPORTING**
Description	The extent to which the city has implemented inclusive strategies for protecting livelihoods of street vendors, by integrating such activities with public places (including streets) in line with the Street Vendors Act of 2014.				
Expressed as	Number of street vendors registered and provided formal spaces ---------- X 100 = _____ Total number of vendors in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Actual provision of spaces must be documented on the records of the ULB and should be corroborated through sample surveys • Data on total number of vendors can be obtained from the records of the ULB				
Benchmark	100%				
SDG Reference(s)	• SDG Target 8.3: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services				

Indicator No. and Name	**7.1 Percentage of Slum/EWS households covered through formal/ affordable housing**				
Pillar	**PHYSICAL**	**Category**	**HOUSING AND INCLUSIVENESS**	**Type**	**CORE**
Description	The extent to which slum households have been provided formal housing through redevelopment projects, and EWS (economically weaker section) households have been covered through various affordable housing projects and schemes. Improved housing supply to the poorer sections can to lead to overall improvement in the living conditions of the poor				
Expressed as	Total number of slum and EWS households covered through formal/affordable housing ---------- X 100 = _____ Total number of slum and EWS households in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Data on slum and EWS households who have been provided housing under slum redevelopment or subsidy/interest subvention schemes will be the cumulative data for the city at the time of reporting. • EWS category will be defined as prescribed in the PMAY scheme of the Government of India, or as redefined by the various State Governments in consultation with the Centre. Slum households will be as per the last notified list of the ULB or as per Census (in case such listing is not available). • Data on allotment of mandatory EWS housing component constructed by private developers (in cities where such policies have been implemented), as well as redevelopment of slum sites under PPP schemes such as the SRA scheme in Mumbai shall also be included in the calculation. • Data on EWS component constructed by private developers can be obtained from the records of the ULB. Data on slum redevelopment schemes, PMAY or other state can also be obtained from the ULB. • Data on total number of slum and EWS households in the city can be obtained from the records of the ULB.
Benchmark	100%
SDG Reference(s)	• SDG Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance ~ SDG Indicator 1.4.2: Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure • SDG Target 11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

Indicator No. and Name	**7.2 Percentage of slum areas covered through basic services**				
Pillar	**PHYSICAL**	**Category**	**HOUSING AND INCLUSIVENESS**	**Type**	**CORE**
Description	This denotes the extent to which basic services of water supply, waste water management and solid waste management (SWM) are available in slum areas of the city				
Expressed as	Slum areas covered through basic services ---------- X 100 = _____ Total area under slums in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Basic services will include water supply, waste water management and solid waste management (SWM) • Only those slum areas where all three basic services are fully met shall be counted. • Water supply shall mean supply of potable water through household level direct water supply connections. Slum areas where supply of water is through stand posts shall not be included. • Waste water management shall mean provision of individual/ community toilets (connected to septic tanks or sewerage) or other low cost sanitation solutions, and storm water drainage. • SWM will include daily collection from doorstep or common collection points. • Data can be obtained from the records of the ULB and corroborated through sample physical surveys. • Data on total area under slums in the city can be obtained from the records of the ULB.				
Benchmark	100%				
SDG Reference(s)	• SDG Target 1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance ~ SDG Indicator 1.4.1: Proportion of population living in households with access to basic services • SDG Target 11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums				

Indicator No. and Name	**8.1 Per capita availability of green spaces**				
Pillar	**PHYSICAL**	**Category**	**PUBLIC OPEN SPACES**	**Type**	**CORE**
Description	The extent to which urban greens and open spaces such as recreational spaces, organized greens and common spaces like flood plains, forest cover, vacant lands etc. are available in the city leading to a better urban environment. The Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines, 2014 prescribe benchmarks for open spaces in cities				
Expressed as	Total area of green space (sq.m.) ---------- = _____ Total population of the city				
Unit	Square metres (sq.m.)				
Methodology/ Interpretation and Sources of Data	• Total area under urban greens will include recreational spaces, organized greens and common spaces such as flood plains, forest cover, vacant lands etc. as per URDPFI guidelines. • Data on area of urban greens can be obtained from the land use plan available with the ULB/ Planning Authority or Development Authority. Where an updated GIS database is available the same can be used. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	10-12 sq.m. per capita (Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014)				
SDG Reference(s)	• SDG Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities				

Indicator No. and Name	**8.2 Per capita availability of public and recreational places**				
Pillar	**PHYSICAL**	**Category**	**PUBLIC OPEN SPACES**	**Type**	**CORE**
Description	This indicator denotes the extent to which recreational and public spaces are available in the city for recreation, social interaction and active physical activities. Such spaces can include playgrounds, stadiums and sports complexes, city and district parks, neighbourhood parks and tot lots, zoological/botanical gardens, multi-use open spaces and maidans for cultural events, publicly accessible waterfront areas, promenades, public squares etc.				
Expressed as	Total area of public and recreational places (sq.m.) ---------- = _____ Total population of the city				
Unit	Square metres (sq.m.)				

Methodology/ Interpretation and Sources of Data	• Recreational spaces will include (i) Playgrounds, Stadiums (indoor and outdoor), sports complexes, clubs and swimming pools; (ii) City and district parks, neighbourhood parks and tot lots, zoological/botanical gardens, bird sanctuary; and (iii) Multi-open spaces and maidans for cultural events, public gatherings etc. • Public spaces like publicly accessible beaches and waterfronts, promenades and public squares, and spaces of gathering/social interaction at neighbourhood-level shall be included. Neighbourhood spaces must be at least 1/6 acre (0.067 hectare) in area as per LEEDS standards for neighbourhoods. Further, spaces less than 1 acre (0.4 hectare) must have a proportion no narrower than 1 unit of width to 4 units of length. • Data can be obtained from land use/ GIS plans and records available with the ULB/ Development Authority and corroborated through physical surveys. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population
Benchmark	City with the highest per capita availability (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark
SDG Reference(s)	• SDG Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

Indicator No. and Name	**9.1 Share of mixed land use area in overall city land use**				
Pillar	**PHYSICAL**	**Category**	**MIXED LAND USE AND COMPACTNESS**	**Type**	**CORE**
Description	This indicates the proportion of areas in the city which have been developed as multi-functional zones, i.e. areas where residential, commercial and non-polluting industrial activity/ service industry are planned in close proximity to one another as an integrated mix. This is an important departure from the emphasis of modern planning on functional separation leading to unsustainable land use patterns (large mono-functional land uses, longer trip distances, overt reliance on motorized transport etc.). The URDPFI guidelines, 2014 provide the guidelines for planning of mixed land use areas				
Expressed as	Total area under mixed land use ---------- X 100 = _____ Total area of the city (total area of all land uses)				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Three kinds of mixed land use zones have been identified under the URDPFI Guidelines. Areas of the city that exhibit either of these characteristics shall be identified as mixed land use areas: ~ Mixed Industrial Use (M1 zone): Activities falling within non-polluting industry/ service industry (dominant land use) categories can coexist with maximum up to 20-30% of commercial, institutional, recreational and residential land use; ~ Mixed Residential Use (M2 zone): All activities falling within permitted residential land use (dominant land use) shall be minimum 60% and to coexist with commercial, institutional, recreational; ~ Mixed Commercial Use (M3 zone): All activities falling within permitted commercial, institutional land use (dominant land use) shall be minimum 60% and to coexist with residential, recreational and non- polluting and household industry. • Data can be obtained from the land use plan available with the ULB/ Planning Authority or Development Authority. Where an updated GIS database is available the same can be used				
Benchmark	City with the highest percentage of mixed use (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries				

Indicator No. and Name	**9.2 Net Density**				
Pillar	**PHYSICAL**	**Category**	**MIXED LAND USE AND COMPACTNESS**	**Type**	**CORE**
Description	This denotes the intensity of development in the city. Higher net densities coupled with mixed land use areas can result in a compact development pattern, potentially forming walkable and inviting activity centres and neighbourhoods				
Expressed as	Total population of the city ---------- = _____ Area allocated for residential land use (in hectares)				
Unit	Persons per hectare				
Methodology/ Interpretation and Sources of Data	• This is net residential density and will only include residential land uses (including residential pockets within mixed use areas). All other land uses including roads and green spaces must be removed for the calculation. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population • Data on area under residential land use can be obtained from the land use map available with the ULB and/or Development Authority. Where an updated GIS spatial database is available the same can be used to determine the land uses				
Benchmark	City with the highest net density (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries				

Indicator No. and Name	**10.1 Percentage of city population with authorized electrical service**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**CORE**
Description	This denotes the extent to which households in the city are being served through authorized electrical connections, and enjoy associated services such as complaint registration and timely grievance redressal.				
Expressed as	Number of authorized electrical connections at household level ---------- X 100 = _____ Total number of households in the city				
Unit	100%				
Methodology/ Interpretation and Sources of Data	• Only household connections (residential consumers) shall be counted for the indicator. • Data can be obtained from local electricity distribution companies (DISCOMs). • Data on households can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	City with the highest per capita availability (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services ~ SDG Indicator 7.1.1: Proportion of population with access to electricity				

Indicator No. and Name	**10.2 Percentage of electrical connections covered through smart meters**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which electrical connections in the city are covered through smart meters, leading to better monitoring and reduction in losses. Smart metering is an essential component of a smart grid, and supplies the required meter data and events' information to the utility's various IT systems, including its outage management system. This allows better management of power outages and restoration, and can improve reliability of supply in the long run				
Expressed as	Number of electrical connections (residential and commercial) with smart meters ---------- X 100 = _____ Total number of electricity connections in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• The calculation should include all types of consumers – residential, commercial and industrial covered through smart meters. • Data on total connections and those with smart meters can be obtained from local electricity distribution companies (DISCOMs).				
Benchmark	100%				
SDG Reference(s)	• SDG Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services				

Indicator No. and Name	**10.3 Average number of electrical interruptions per customer per year**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**CORE**
Description	This denotes the reliability of electric supply for both residential and commercial users, in terms of frequency of electrical interruptions causing inconvenience to users. This indicator is also known as the System Average Interruption Frequency Index (SAIFI), defined as the average number of sustained interruptions (outages that last more than 5 minutes) per consumer during the year. This is one of the critical reliability indicators prescribed under the IEEE Standard 1366, 2012				
Expressed as	Total number of sustained electrical interruptions in a year ---------- = _____ Total number of consumers (residential and commercial) served in the same year				
Unit	Number per consumer				
Methodology/ Interpretation and Sources of Data	• The calculation should include all types of consumers – residential, commercial and industrial. • Only instances of sustained power outages that last longer than 5 minutes (as defined by the North American Electric Reliability Corporation, NERC 1996) shall be included in the calculation • Capturing data over the period of an entire year allows the indicator to capture seasonal variations in efficiency of power distribution • Data can be obtained from local electricity distribution companies (DISCOMs)				
Benchmark	City with the lowest number of outages (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services				

Indicator No. and Name	**10.4 Average length of electrical interruptions per customer per year**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**CORE**
Description	In combination with Indicator 10.3 this denotes the reliability of electrical supply for both residential and commercial users, in terms of average duration of unscheduled electrical interruptions causing inconvenience to users. This indicator is also known as the System Average Interruption Duration Index (SAIDI), defined as the average duration of sustained interruptions (outages that last more than 5 minutes) per consumer during the year. This is one of the critical reliability indicators prescribed under the IEEE Standard 1366, 2012				
Expressed as	Sum of duration of all sustained electrical interruptions in a year (in hours) ---------- = _____ Total number of consumers (residential and commercial) served in the same year				
Unit	Hours per consumer				
Methodology/ Interpretation and Sources of Data	• The calculation should include all types of consumers – residential, commercial and industrial. • Only instances of sustained power outages that last longer than 5 minutes (as defined by the North American Electric Reliability Corporation, NERC 1996) shall be included in the calculation • Capturing data over the period of an entire year allows the indicator to capture seasonal variations in efficiency of power distribution • Data can be obtained from local electricity distribution companies (DISCOMs)				
Benchmark	City with the lowest average length of outages (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services				

Indicator No. and Name	**10.5 Percentage of total energy derived from renewable sources**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**CORE**
Description	The extent to which energy demand is met from non-conventional energy sources such as solar energy, wind energy etc. thereby reducing the dependence on energy produced through non-renewable sources. Cities can actively promote installation of renewable energy systems both in public buildings and public spaces, as well as individual households and community facilities				
Expressed as	Total installed capacity for generation of renewable energy in the city ---------- X 100 = _____ Total energy consumption from all sources				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Data for renewable energy installations in Government buildings (including ULB buildings) as well as households who have sought subsidy under schemes should be captured. • Data can be obtained from the various state nodal agencies for renewable energy. Data can also be obtained from the Ministry of New and Renewable Energy. • Data on total energy consumption can be obtained from local electricity distribution companies (DISCOMs)
Benchmark	10% (Smart Cities Mission, MoUD)
SDG Reference(s)	• SDG Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix ~ SDG Indicator 7.2.1: Renewable energy share in the total final energy consumption • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator No. and Name	**10.6 Energy consumption per unit - water supply and sewerage**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which ULB has adopted energy saving options to reduce the energy consumption on water supply and sewerage services through interventions such as use of energy efficient pumps for water and wastewater systems				
Expressed as	Energy consumption on water supply and sewerage services ---------- = _____ Total quantum of water and waste water handled during the period				
Unit	kWh per million litres				
Methodology/ Interpretation and Sources of Data	• Energy consumption data for a period of a month on water supply and sewerage services should be captured • Average of energy consumption data for different months should be used, in order to capture periodic variations. • Data can be obtained from local electricity distribution companies (DISCOMs). • Total quantum of water supplied during the period can be obtained from the records of the ULB/ Water and Sewerage Utility or PHED, as applicable. This can also be estimated based on the average quantum of treated water supplied into the distribution system on a daily basis (million litres per day), as given by the providing agency.				
Benchmark	City with the lowest per unit consumption (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.3: By 2030, double the global rate of improvement in energy efficiency • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources				

Indicator No. and Name	**10.7 Energy consumption per unit – street lighting**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which ULB has adopted energy saving options to reduce the energy consumption on street lighting through interventions such as installation of energy saving LED lights and/or solar panels in street lights, and general lighting in public places such as plazas, squares, parks etc.				
Expressed as	Energy consumption on street lighting ---------- = _____ Total number of street light installations				
Unit	kWh per light installation				
Methodology/ Interpretation and Sources of Data	• Energy consumption data for a period of a month on street lighting and lighting in plazas, squares, parks etc. should be captured • Average of energy consumption data for different months should be used, in order to capture periodic variations. • Data can be obtained from local electricity distribution companies (DISCOMs). Total number of light installations/poles can be obtained from the records of the ULB/ Development Authority.				
Benchmark	City with the lowest per unit consumption (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.3: By 2030, double the global rate of improvement in energy efficiency • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources				

Indicator No. and Name	**10.8 Percentage of new and redeveloped buildings following green building norms**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which new developments and redevelopments have adopted green building norms and have received GRIHA, LEEDS or equivalent green ratings, leading to reduction in overall energy consumption				
Expressed as	Built up area of new/redeveloped buildings completed that have received green ratings ---------- X 100 = _____ Total built up area of all new/redeveloped buildings completed during the same year				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• The current year should be the reference year, and only those buildings completed during the year should be used for computation. • Buildings that have received a GRIHA, LEEDS or equivalent green rating should be included for calculating the numerator. • Data can be obtained from the ULB or Development Authority. Data may also be available with the MoNRE regarding certification provided to buildings in various cities, or with rating agencies like GRIHA and LEEDS				

Benchmark	80% (Smart Cities Mission, MoUD)
SDG Reference(s)	• SDG Target 7.3: By 2030, double the global rate of improvement in energy efficiency • SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator No. and Name	**10.9 Total energy consumption per capita**				
Pillar	**PHYSICAL**	**Category**	**POWER SUPPLY**	**Type**	**CORE**
Description	This denotes the per capita energy consumption by residential, commercial and industrial users in the city. This is an important indicator that can be used by cities to plan various conservation and efficiency-related interventions for optimizing energy use.				
Expressed as	Total energy consumption (for all uses) in the city ---------- = _____ Total population of the city				
Unit	kWh per capita				
Methodology/ Interpretation and Sources of Data	• Energy consumption data for a period of a month should be captured • Average of energy consumption data for different months should be used, in order to capture periodic variations. • Data can be obtained from local electricity distribution companies (DISCOMs). • Data on population can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	City with the lowest per capita consumption (amongst cities in the same city-size classification as given in this document) will be treated as a benchmark				
SDG Reference(s)	• SDG Target 7.3: By 2030, double the global rate of improvement in energy efficiency • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources				

Indicator No. and Name	**11.1 Geographical coverage of public transport**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**CORE**
Description	This denotes the geographical coverage of public transport services (road, rail or water based) in the city, and along with Indicator 11.2 is indicative of the overall availability of public transport facilities in the city. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport				
Expressed as	Total length of public transport network (road km) ---------- = _____ Total area of the city (sq.km)				
Unit	Road kms per square km				
Methodology/ Interpretation and Sources of Data	• Total length of the public transport corridor within the urban limits should be considered. Public transport systems will include suburban and metro rails, buses, public water transport, and can include public or private transport service providers. • Corridors along which the service frequency is one hour or less should only be considered. • Data on service coverage can be obtained from the records of the relevant Transport Authority, Development Authority or ULB, as applicable. Route and frequency data can also be obtained from major private providers. • Data on area of the city can be obtained from ULB or Development Authority.				
Benchmark	>=1 (Service Level Benchmarks for Urban Transport, MoUD)				
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons				

Indicator No. and Name	**11.2 Availability of public transport**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	This denotes the availability of public bus or rail transport in the city, in proportion to the population of the city. Along with Indicator 11.1 it is indicative of the overall availability of public transport facilities in the city. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport				
Expressed as	Average number of public transport vehicles available per day ---------- X 1,000 = _____ Total population of the city				
Unit	Number per 1000 persons				

Methodology/ Interpretation and Sources of Data	• 'Public transport' shall include both buses and rail coaches. Each rail coach will be considered equivalent to 3 buses for computation. • Number of public transport vehicles operating in the city should be the actual buses/ rail coaches in operation and as such the number can be lower than the number of vehicles/rolling stock owned by the public utility or major private operators. • Daily average values over a specific time period (e.g. a month) can be considered • Data on public transport can be obtained from the logs maintained by the Transport Authority or major Private Operators, and Suburban Rail/ Metro Rail authorities. • Population data can be sourced from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.
Benchmark	>=0.6 (Service Level Benchmarks for Urban Transport, MoUD)
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Indicator No. and Name	**11.3 Mode share of public transport**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**CORE**
Description	This is a critical indicator that denotes the extent to which people use public transport for moving within the city. Higher modal share in favour of public transport or non-motorized transport is desirable. The National Transport Development Policy Committee (NTDPC), 2013 provides the benchmarks for the level of service in a city.				
Expressed as	Total public transport trips ---------- X 100 = _____ Total trips through all modes in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• 'Public transport' shall include buses, suburban and metro rail, water transport (e.g. ferries) etc. • A household survey (or other alternative transportation survey technique) can be undertaken for capturing the modal split in the city as per the sample size prescribed for different size-classes of towns in the URDPFI Guidelines. • Wherever recent studies (current year) have been undertaken for planning purposes, the same may be used for obtaining data. Such studies may be available with local Transport Authorities or ULBs.				

<table>
<tr><td>Benchmark</td><td>
<table>
<tr><th>Classification of City/town</th><th>Population</th><th>Mode share of public transport</th></tr>
<tr><td>Small town</td><td>Less than 50,000 population</td><td>12%</td></tr>
<tr><td>Medium town</td><td>Population ≥ 50,000 < 1 lakh</td><td>12%</td></tr>
<tr><td></td><td>Population ≥ 1 lakh < 5 lakh</td><td>15%</td></tr>
<tr><td>Large town</td><td>Population ≥ 5 lakh < 1 million</td><td>15%</td></tr>
<tr><td>Metropolitan City</td><td>Population ≥ 1 million < 2 million</td><td>20%</td></tr>
<tr><td></td><td>Population ≥ 2 million < 5 million</td><td>33%</td></tr>
<tr><td>Megapolis</td><td>Population ≥ 5 million</td><td>38%</td></tr>
<tr><td colspan="3">(National Transport Development Policy Committee, 2013)</td></tr>
</table>
</td></tr>
<tr><td>SDG Reference(s)</td><td>• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
• SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources</td></tr>
</table>

<table>
<tr><td>Indicator No. and Name</td><td colspan="5">11.4 Percentage of road network with dedicated bicycle tracks</td></tr>
<tr><td>Pillar</td><td>PHYSICAL</td><td>Category</td><td>TRANSPORTATION AND MOBILITY</td><td>Type</td><td>CORE</td></tr>
<tr><td>Description</td><td colspan="5">This denotes the availability of dedicated Right of Way (ROW) for bicycles in the city, thereby encouraging the use of such non-polluting transport options. Higher percentage would indicate a better non-motorised transport (NMT) network in the city. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.</td></tr>
<tr><td>Expressed as</td><td colspan="5">Total length of bicycle network
---------- X 100 = _____
Total length of road network in the city</td></tr>
<tr><td>Unit</td><td colspan="5">Percentage</td></tr>
<tr><td>Methodology/ Interpretation and Sources of Data</td><td colspan="5">• The total length of cycle tracks shall be calculated only once, even where tracks are available on both sides.
• Data can be obtained from relevant Transport Authority, Development Authority or Planning department of the ULB.</td></tr>
<tr><td>Benchmark</td><td colspan="5">>=50
(Service Level Benchmarks for Urban Transport, MoUD)</td></tr>
<tr><td>SDG Reference(s)</td><td colspan="5">• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</td></tr>
</table>

Indicator No. and Name	**11.5 Percentage of interchanges with bicycle parking facilities**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	The extent to which use of bicycles is encouraged in a city by providing adequate parking facilities at the major transport interchanges – bus depots/stations, metro or suburban rail stations and water transport terminals (e.g. ferry terminal). This is thus an indicator of the extent to which NMT has been integrated with the public transport network in the city. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.				
Expressed as	Total number of major transport interchanges with bicycle parking facility (within 250m radius) ---------- X 100 = _____ Total number of major transport interchanges in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Major transport interchanges will include bus depots/stations, metro or suburban rail stations and water transport terminals (e.g. ferry terminal) • An interchange can be considered to have bicycle parking facility if such facility is available within a radius of 250 metres • Data can be obtained from the relevant Transport Authority, Development Authority or Planning department of the ULB. Where such data is not available, the same can be obtained through physical surveys of major interchange sites.				
Benchmark	>=75 (Service Level Benchmarks for Urban Transport, MoUD)				
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons				

Indicator No. and Name	**11.6 Mode share of non-motorised transport**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**CORE**
Description	This denotes the extent to which people walk or use bicycles and cycle rickshaws for moving within the city. Higher number of trips indicate better infrastructure available for pedestrian movement and cycling as well as higher acceptability of NMT as a transport option. The National Transport Development Policy Committee, 2013 provides the benchmarks for the level of service in a city				
Expressed as	Total NMT (pedestrian, cycling and cycle rickshaws) trips ---------- X 100 = _____ Total trips through all modes in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• 'Non-motorised transport' shall include pedestrian, cycling and cycle rickshaws trips. • A household survey (or other alternative transportation survey technique) can be undertaken for capturing the modal split in the city as per the sample size prescribed for different size-classes of towns in the URDPFI Guidelines. • Wherever recent studies (current year) have been undertaken for planning purposes, the same may be used for obtaining data. Such studies may be available with local Transport Authorities or ULBs.
Benchmark	

Classification of City/town	Population	Mode share of NMT
Small town	Less than 50,000 population	67%
Medium town	Population ≥ 50,000 < 1 lakh	67%
	Population ≥ 1 lakh < 5 lakh	60%
Large town	Population ≥ 5 lakh < 1 million	53%
Metropolitan City	Population ≥ 1 million < 2 million	48%
	Population ≥ 2 million < 5 million	36%
Megapolis	Population ≥ 5 million	36%
(National Transport Development Policy Committee, 2013)		

SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons • SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator No. and Name	**11.7 Availability of Passenger Information System**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	Passenger Information Systems (PIS) are the key communication link between transportation operators and the travelling passengers. They provide accurate information regarding arrival and departure times, gates etc. Such information is provided in the form of digital displays as well as through loud speakers installed at appropriate locations. This indicator denotes the extent to which such PIS are installed at all major transport interchanges, such as major bus stops and bus depots, suburban rail stations, metro stations and water transport terminals. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.				
Expressed as	Total number of major interchanges with PIS ---------- X 100 = _____ Total number of major interchanges in the city				

Unit	Percentage
Methodology/ Interpretation and Sources of Data	• Major transport interchanges will include bus depots/stations, metro or suburban rail stations and water transport terminals (e.g. ferry terminal) • Only those interchanges with operational PIS systems shall be included in the numerator • Data can be obtained from the records of the relevant Transport Authority, Development Authority or Planning department of the ULB and corroborated through sample physical surveys.
Benchmark	>=75 (Service Level Benchmarks for Urban Transport, MoUD)
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Indicator No. and Name	**11.8 Extent of signal synchronisation**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	The extent to which signals installed at traffic junctions on major roads in the city are inter-connected and synchronised, so as to facilitate smooth traffic flow along the road networks. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.				
Expressed as	Total number of signalised intersections that are synchronised ---------- X 100 = _____ Total number of signalised intersections in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Synchronisation will mean that the phasing of the signal at any specific intersection is in tune with the phasing of the intersection before and after it so as to provide a continuous green phase for the traffic stream, resulting in reduced congestion and stopping time at each intersection. • Only those signals that are synchronized should be included in the numerator • Data can be obtained from the records of the relevant Transport Authority/ Department responsible for signal management in the city and corroborated through sample physical surveys				
Benchmark	>=75 (Service Level Benchmarks for Urban Transport, MoUD)				
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons				

Indicator No. and Name	**11.9 Availability of paid parking spaces**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**CORE**
Description	This is indicative of the restriction on free parking spaces for all vehicles in a city and measures the availability of paid public on-street parking spaces in the city, particularly along major arterial and sub-arterial roads. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.				
Expressed as	Total available on-street paid parking spaces in the city ---------- X 100 = _____ Total available on-street parking spaces in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Number of parking spaces (paid or unpaid) should be stated in terms of Equivalent Car Spaces (ECS) allotted for all vehicles. Total available on-street parking spaces = (Number of parking spaces for cars X 1) + (Number of parking spaces for two wheelers X 0.25) • All arterial, sub-arterial roads with ROW equal to or more than 30 metres (minimum width for sub-arterial roads IRC:86-1983) should be taken into account, including service roads (if any) along these roads. • Data can be obtained from the records of relevant Transport Authority, Development Authority or Planning department of the ULB and verified through sample physical surveys				
Benchmark	>=75 (Service Level Benchmarks for Urban Transport, MoUD)				
SDG Reference(s)	• SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries				

Indicator No. and Name	**11.10 Percentage coverage of footpaths – wider than 1.2m**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**CORE**
Description	This denotes the availability of pedestrian facilities (footpaths wider than 1.2 metres) along the road network in the city. SLBs for Urban Transport developed by the MoUD provide guidance on the service levels for transport.				
Expressed as	Total length of footpaths (wider than 1.2 m) available in the city ---------- X 100 = _____ Total length of road network in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• The total length of footpaths having minimum width of 1.2 metres shall be counted and shall also be multiplied by 2 for roads where footpaths are available on both sides. • The total length of road network available in the city shall be multiplied by 2 (since footpaths should be provided on either side of the roads). • Data can be obtained from the records of relevant Transport Authority, Development Authority or Planning department of the ULB and verified through sample physical surveys
Benchmark	>=75 (Service Level Benchmarks for Urban Transport, MoUD)
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons • SDG Target 11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

Indicator No. and Name	**11.11 Percentage of traffic intersections with pedestrian crossing facilities**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	The extent to which pedestrian crossing facilities such as zebra crossing, pedestrian signals, grade separators etc. are available at all traffic junctions on major roads in the city.				
Expressed as	Total number of intersections with pedestrian crossing facilities on major roads ---------- X 100 = _____ Total number of junctions/ intersections on major roads in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• The Traffic junctions along all roads with ROW equal to or more than 20 metres (minimum width for collector roads IRC:86-1983) should be taken into account. • Sample physical surveys can be conducted (ward-wise) to assess the availability of pedestrian facilities at junctions and an average can be used. Wherever available, data can also be obtained from the relevant Transport Authority, Development Authority or Planning department of the ULB. • Data on total number of junctions can be obtained from the relevant Transport Authority, Development Authority or Planning department of the ULB on the basis of available maps showing road network.				
Benchmark	100%				
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons				

Indicator No. and Name	**11.12 Extent to which universal accessibility is incorporated in public rights-of-way**				
Pillar	**PHYSICAL**	**Category**	**TRANSPORTATION AND MOBILITY**	**Type**	**SUPPORTING**
Description	The extent to which public right-of-way areas have been designed in accordance with universal design principles (including design of appropriate signage) so as to facilitate use and access by all, including the differently abled. Guidelines have been provided by the MoUD for barrier-free environment (Harmonized Guidelines and Space Standards for Barrier Free Built Environment for Persons with Disability and Elderly persons, 2016)				
Expressed as	Number of public right-of-way areas designed as per universal design principles ---------- X 100 = _____ Total number of public right-of-way areas in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Public right-of-way areas will include areas such as Government buildings, sidewalks/ footpaths, subways and foot-over-bridges (FOB) • Data can be obtained from the relevant Transport Authority, Development Authority or Planning department of the ULB and corroborated through sample physical inspections. • Data on total number of government buildings, sidewalks, subways and FOBs can be obtained from the relevant Transport Authority, Development Authority or Planning department of the ULB.				
Benchmark	100%				
SDG Reference(s)	• SDG Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons				

Indicator No. and Name	**12.1 Household level coverage of direct water supply connections**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**CORE**
Description	The extent to which households in the city are connected to the water supply network with a direct service connection, as percentage of total number of households. Household level water supply connection i.e. direct piped connection, is the minimum acceptable standard for water supply service. Water provision through public stand posts or tankers is not considered as an acceptable long-term service provision standard. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for water supply.				
Expressed as	Total number of households with direct water supply connection ---------- X 100 = _____ Total number of households in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• This will include households which receive municipal water supply at one common point, from where it is stored and distributed for all households (for e.g. as in apartment complexes). • Households supplied water through public stand posts or tankers should be excluded. Households completely dependent on other water sources such as bore wells, open wells, etc. should not be included. • Data on number of connections can be obtained from the records available with ULB/ Water Utility or Public Health and Engineering Department (PHED), as applicable. • Data on households can be obtained from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.
Benchmark	100% (Service Level Benchmarks, MoUD)
SDG Reference(s)	• SDG Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all • SDG Indicator 6.1.1: Proportion of population using safely managed drinking water services

Indicator No. and Name	**12.2 Per capita supply of water**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**CORE**
Description	Per capita water supplied, indicates the adequacy of the municipal water supply system to source adequate raw water, treat water to potable standards and supply the same into the distribution system. This denotes the overall sufficiency of water supplied into the municipal network to meet the needs of the population. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for water supply.				
Expressed as	Total quantity of water supplied into the distribution system ---------- = _____ Total population of the city				
Unit	Litres per capita per day (lpcd)				
Methodology/ Interpretation and Sources of Data	• Data on average quantum of treated water supplied into the distribution system on a daily basis, obtained on the basis of measurement by bulk flow meters at the outlet of treatment plants and/or bulk production points, can be obtained from the records of ULB/ Water Utility or PHED, as applicable. • If water is distributed from multiple points, aggregate of that quantity should be considered as total quantity of water supplied into the distribution system. However, the quantum should exclude all bulk transmission losses, as measured through water audit data available with ULBs • Population data can be obtained from the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population.				
Benchmark	135 lpcd (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all				

Indicator No. and Name	**12.3 Quality of water supplied**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**CORE**
Description	This denotes the quality of water supplied to citizens, as per specified potable water standards. This is an important aspect, since poor water quality can pose serious public health hazards. Quality standards for potable water are laid down by the Central Public Health and Environmental Engineering Organization (CPHEEO) as part of the Manual on Water Supply and Treatment, 1999.				
Expressed as	Number of samples meeting or exceeding specified potable water standards ---------- X 100 = _____ Total number of samples tested for water quality				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Potable water standards for measurement and sampling regimen should be as per standards and norms laid down by CPHEEO (Manual on Water Supply and Treatment, 1999). • Samples should be drawn both at the treatment plant outlet as well as at the consumer end. • Sample survey as per sampling regimen prescribed by CPHEEO (Manual on Water Supply and Treatment, 1999) • All parameters of the quality standards should be met. Even if one standard is not met, the sample cannot be assumed to have met the standards				
Benchmark	100% (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all ~ SDG Indicator 6.1.1: Proportion of population using safely managed drinking water services				

Indicator No. and Name	**12.4 Level of non-revenue water – NRW**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**CORE**
Description	This denotes the quantity of water produced and supplied by the ULB that does not earn the utility any revenue. NRW comprises of - a) consumption which is authorized but not billed, such as public stand posts; b) apparent losses such as illegal water connections, water theft and metering inaccuracies; and c) real losses due to leakages in the transmission and distribution networks. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for water supply.				
Expressed as	Quantum of water put into distribution system (mld) - Quantum of water sold (mld) ---------- X 100 = _____ Quantum of water put into the distribution system (mld)				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Data on average quantum of treated water supplied into the distribution system on a daily basis obtained on the basis of measurement by bulk flow meters at the outlet of treatment plants and/or bulk production points, can be obtained from the records of ULB/ Water Utility or PHED, as applicable. • If water is distributed from multiple points, aggregate of that quantity should be considered. However, the quantum should exclude all bulk transmission losses, as measured through water audit data available with ULBs • Data on quantum of water sold can be obtained from the records of the ULB/ Water Utility or PHED, as applicable • Where full metering has been achieved the actual aggregate volume of water consumed based on which consumers have been billed should be considered for computation. • In the absence of metered connections and flat water charges, the volume of water supplied to such consumers can be calculated on the basis of average consumption per consumer and the total number of such consumers.
Benchmark	Less than 15% (Service Level Benchmarks, MoUD)
SDG Reference(s)	• SDG Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity ~ SDG Indicator 6.4.1: Change in water-use efficiency over time • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator No. and Name	**12.5 Percentage of water connections covered through meters**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which water supply connections in the city are covered through functional meters (including smart meters), thereby facilitating better monitoring, volumetric billing and reduction in losses. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for water supply.				
Expressed as	Number of metered water connections ---------- X 100 = _____ Total number of water connections in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Total number of metered connections will include metered direct service connections, as well as metered public stand posts. • The total number of water connections in the city will include all direct service connections and total number of public stand posts. • Households and establishments which receive municipal water supply at one common point, from where it can be stored and distributed for all households (for e.g. as in apartment complexes), should be included. • Households that are completely dependent on other water sources such as bore wells, open wells, tankers etc. should not be included. • Data can be obtained from the records of the ULB/ Water Utility or PHED, as applicable.				
Benchmark	100% (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity				

Indicator No. and Name	**12.6 Percentage of plots with rainwater harvesting facility**				
Pillar	**PHYSICAL**	**Category**	**ASSURED WATER SUPPLY**	**Type**	**SUPPORTING**
Description	The extent to which individual plots within a city have the ability to retain storm water within the site through rain water harvesting (RWH) structures. The MoUD under the AMRUT Mission has recommended that all new developments/ redevelopments with minimum plot size of 300 sq.m., and all commercial and public buildings should have rainwater harvesting facilities.				
Expressed as	Number of new developments/redevelopments (of designated plot size), commercial and public buildings with RWH facility ---------- X 100 = ____ Total number of new developments/redevelopments (of designated plot size), commercial and public buildings in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Only those buildings where ULB has a record that such facilities have been constructed should be considered. • Data can be obtained from the records of planning or building sanctions department of the ULB.				
Benchmark	100% of all new developments/ redevelopments with minimum plot size of 300 sq.m., and all commercial and public buildings should have rainwater harvesting facilities (AMRUT Mission, MoUD)				
SDG Reference(s)	• SDG Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources				

Indicator No. and Name	**13.1 Coverage of toilets**				
Pillar	**PHYSICAL**	**Category**	**WASTE WATER MANAGEMENT**	**Type**	**CORE**
Description	The extent to which citizens have access to individual or community toilets in the city. These would include toilets in the category of residential, commercial, industrial and institutional properties. This should be computed for the number of properties recorded in municipal records and not households. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for waste water management.				
Expressed as	Total number of properties with access to individual and/or community toilets ---------- X 100 = _____ Total number of properties in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Total number of properties as per municipal records (not households) should be considered for the computation. A property may have multiple tenants/ households occupying it. • Data on number of properties with access to toilets can be obtained from the records available with the ULB. Where such data is unavailable sample field surveys may need to be conducted (random stratified sample) to estimate the proportion of properties (ward wise) without access to individual/community toilets. • Data on total properties can be obtained from the records of the ULB.
Benchmark	100% (Service Level Benchmarks, MoUD)
SDG Reference(s)	• SDG Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations ~ SDG Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

Indicator No. and Name	**13.2 Coverage of sewerage network and/or septage**				
Pillar	**PHYSICAL**	**Category**	**WASTE WATER MANAGEMENT**	**Type**	**CORE**
Description	Denotes the extent to which waste water management facilities are available to individual properties across the city, whether through centralized underground sewerage, decentralized systems or on-site systems such as septic tanks. This should be computed for the number of properties recorded in municipal records and not households, and should include all residential, commercial, industrial and institutional properties. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for waste water management.				
Expressed as	Total number of properties with connection to waste water management systems ---------- X 100 = _____ Total number of properties in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Total number of properties as per municipal records (not households) should be considered for the computation. A property may have multiple tenants/ households occupying it. • Only properties with access connection to centralised underground sewerage network, or decentralised sewerage or onsite systems such as septic tanks should be included. • Properties that connect their waste water outlets to storm water drains or open drainage systems should not be included. • Data can be obtained from the records available with the ULB/ Water and Sewerage Utility.				
Benchmark	100% (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations ~ SDG Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water • SDG Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally				

Indicator No. and Name	13.3 Collection efficiency of sewerage network				
Pillar	PHYSICAL	Category	WASTE WATER MANAGEMENT	Type	CORE
Description	This indicator denotes the actual proportion of waste water generated in the city that is collected by the available sewerage network. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for waste water management.				
Expressed as	Total waste water collected per day ---------- X 100 = _____ Total waste water generated in the city per day				
Unit	Percentage				
Methodology/ Interpretation	• Waste water generated in a city is assumed to be 80% of the total water consumed in mld. This data should be based on the water supplied to the distribution system after treatment, less physical losses of water due to transmission and distribution losses as available with the ULB/ Water and Sewerage Utility. • Where other sources are also used such as sourcing water from deep bore wells or tanker supply, the same should be included. • Waste water collected should be estimated on the basis of measurements taken at the inlet of centralised sewage treatment plants and decentralised waste water treatment systems (DEWATS). Data on quantum of wastewater collected can be obtained from ULB/ Water and Sewerage Utility.				
Benchmark	100% (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally • SDG Indicator 6.3.1: Proportion of wastewater safely treated				

Indicator No. and Name	13.4 Extent of reuse and recycling of waste water				
Pillar	PHYSICAL	Category	WASTE WATER MANAGEMENT	Type	CORE
Description	This denotes the proportion of waste water received at the treatment plant that is recycled or reused for various purposes. Treated waste water can be used for horticultural purposes in parks and gardens, irrigation of farmlands on city periphery, and/or supplied to power plants and industries. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for waste water management.				
Expressed as	Quantum of waste water recycled or reused per day ---------- X 100 = _____ Total waste water received at treatment plants per day				
Unit	Percentage				

Methodology/ Interpretation	• The quantum of wastewater recycled or reused per day should be estimated on the basis of data on actual flow measurement by functional flow meters at the outlets of recycled water (i.e. points of supply of recycled water) and inlets (for quantum of waste water received for treatment) of treatment plants • Both centralised and decentralised treatment plants should be considered. • Data regarding the waste water received at treatment plants and supplied for reuse can be obtained from the records of the ULB/ Water and Sewerage Utility, as applicable.
Benchmark	20% or more (Service Level Benchmarks, MoUD)
SDG Reference(s)	• SDG Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally ~ SDG Indicator 6.3.1: Proportion of wastewater safely treated • SDG Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

Indicator No. and Name	**13.5 Coverage of storm water drains**				
Pillar	**PHYSICAL**	**Category**	**WASTE WATER MANAGEMENT**	**Type**	**CORE**
Description	The extent to which the road network in the city is covered through a storm water drainage network (pucca covered drains). SLBs for Urban Services developed by the MoUD provide guidance on the service levels for storm water drainage.				
Expressed as	Total length of covered primary, secondary and tertiary drains (of pucca construction) ---------- X 100 = _____ Total length of road network in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• For the numerator only drains that are of pucca construction and are covered should be considered. • For the denominator only roads that have a carriageway of 3.5 metres or more should eb considered. • Data can be obtained from the ULB or estimated on the basis of maps available with the ULB.				
Benchmark	100% (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations				

Indicator No. and Name	**14.1 Household level coverage of municipal solid waste collection**				
Pillar	**PHYSICAL**	**Category**	**SOLID WASTE MANAGEMENT**	**Type**	**CORE**
Description	The extent to which households and establishments in the city are covered through door-to-door collection of municipal solid wastes on a daily basis. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for solid waste management.				
Expressed as	Total number of households and establishments covered through doorstep collection ---------- X 100 = _____ Total number of households and establishments in the city				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data on coverage of doorstep collection can be obtained from the records of the ULB or private operators employed by the ULB, as applicable. This data can be further verified from available records for user charges (if any) collected by the service providers for doorstep collection. • In addition to services provided by the ULB or designated service providers, households and establishments covered through Resident Welfare Associations or Traders' Associations should also be included. • Total number of households should be calculated on the basis of the decennial Census of India. Past census figures should be used as base, and annual growth rate should then be used to arrive at current population. • Total number of establishments can be obtained from the records of the ULB. Wherever available, data on total number of households/ establishments can be obtained from updated GIS spatial data of the city.				
Benchmark	100% door to door collection (Service Level Benchmarks, MoUD)				
SDG Reference(s)	• SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management ~ SDG Indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities				

Indicator No. and Name	**14.2 Efficiency of collection of municipal solid waste**				
Pillar	**PHYSICAL**	**Category**	**SOLID WASTE MANAGEMENT**	**Type**	**CORE**
Description	The extent to which the quantum of municipal solid waste (MSW) generated in the city is collected by the ULB or its authorised service providers (private operators). SLBs for Urban Services developed by the MoUD provide guidance on the service levels for solid waste management.				
Expressed as	Total quantum of MSW collected by the ULB or private operator ---------- X 100 = _____ Total quantum of MSW generated in the city				
Unit	Percentage				

Methodology/ Interpretation and Sources of Data	• Data on waste collected from households, commercial establishments and common collection points based on actual weighment, can be obtained from the records of ULBs and/or designated service providers. • Waste generation estimates can be based on a sample survey of a statistically relevant proportion of households and establishments. Where such a survey has been carried out earlier, the per capita generation data from such studies can be used. • Alternatively, waste generation can be calculated on the basis of empirical standards per capita available for different city sizes. Central Pollution Control Board (CPCB) indicates that the per capita generation of wastes in Class I cities is 0.376 kg/person/day, and in Class II cities it is 0.152 kg/person/day • The total generation figure should exclude any waste recycled or processed at source, and which does not require to be collected.
Benchmark	100% (Service Level Benchmarks, MoUD)
SDG Reference(s)	• SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management ~ SDG Indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

Indicator No. and Name	**14.3 Extent of municipal solid waste recovered through reuse**				
Pillar	**PHYSICAL**	**Category**	**SOLID WASTE MANAGEMENT**	**Type**	**CORE**
Description	The extent to which municipal solid waste generated in the city is either recycled or processed through centralised and decentralised recycling processes. SLBs for Urban Services developed by the MoUD provide guidance on the service levels for solid waste management.				
Expressed as	Average quantum of MSW that is processed or recycled (tons per month) ---------- X 100 = _____ Average MSW generated in the city (tons per month)				
Unit	Percentage				
Methodology/ Interpretation and Sources of Data	• Data on quantum of wastes recycled per month at organised large waste processing facilities, such as composting yards and waste-to-energy facilities, can be obtained from the records of the ULB or recycling partners designated by the ULB. Aggregates of unorganized recycled waste can be obtained at wholesaler level. • Unorganized recycling through community level composting facilities and reuse through the chain of waste recyclers should be added to organized recycling through the ULB or its service providers. • Waste generation estimates can be based on a sample survey of a statistically relevant proportion of households and establishments. Where such a survey has been carried out earlier, the per capita generation data from such studies can be used. • Alternatively, waste generation can be calculated on the basis of empirical standards per capita available for different city sizes. Central Pollution Control Board (CPCB) indicates that the per capita generation of wastes in Class I cities is 0.376 kg/person/day, and in Class II cities it is 0.152 kg/person/day • The total generation figure should exclude any waste recycled or processed at source, and which does not require to be collected				
Benchmark	80% or more (Service Level Benchmarks, MoUD)				

SDG Reference(s)	• SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management ~ SDG Indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities • SDG Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse ~ SDG Indicator 12.5.1: National recycling rate, tons of material recycled

Indicator No. and Name	**15.1 Concentration of SO_2 - air pollution**				
Pillar	**PHYSICAL**	**Category**	**REDUCED POLLUTION**	**Type**	**CORE**
Description	This indicator along with 15.2 and 15.3 denotes the acceptable levels of air pollutants in the city. Sulphur Dioxide (SO_2) is considered one of the critical urban air pollutants, monitored on a regular basis by the Central Pollution Control Board (CPCB) through a nation-wide programme for ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). High levels of SO_2 can potentially affect the health of citizens, particularly those suffering from asthma and chronic lung diseases, and exacerbate respiratory symptoms.				
Expressed as	Annual mean concentration OR Mean concentration over 24 hours of SO_2				
Unit	$\mu g/m^3$				
Interpretation/ Methodology and Sources of Data	• The standards for acceptable level of air pollutants (including SO_2) have been prescribed as part of the National Air Quality Standards (2009) by the CPCB. • As per the guidelines, annual mean concentration range ($\mu g/m^3$) of SO_2 is calculated as an annual arithmetic mean of minimum 104 measurements in a year taken twice a week. • Air samples should be tested at various points in the city. Measurements may be carried out as per the guidelines for manual sampling and analysis provided by the CPCB (Guidelines for the Measurement of Ambient Air Pollutants Volume-I, 2011). Guidelines on choosing monitoring locations is also given by CPCB (Guidelines for Ambient Air Quality Monitoring, 2003). • Previous data collected by CPCB or respective State Pollution Control Boards (SPCBs) during the same year can be used to additionally obtain information for different times of the year.				
Benchmark	Annual mean concentration of 50 $\mu g/m^3$ OR Mean concentration over 24 hours of 80 $\mu g/m^3$ (Central Pollution Control Board)				
SDG Reference(s)	• SDG Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination • SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management				

Indicator No. and Name	**15.2 Concentration of NO_2 - air pollution**				
Pillar	**PHYSICAL**	**Category**	**REDUCED POLLUTION**	**Type**	**CORE**
Description	This indicator along with 15.1 and 15.3 denotes the acceptable levels of air pollutants in the city. Nitrogen Dioxide (NO_2) is considered one of the critical urban air pollutants, monitored on a regular basis by the CPCB through a nation-wide programme for ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). Continued and frequent exposure to high levels of NO_2 can cause irritation of lungs and acute respiratory illnesses.				
Expressed as	Annual mean concentration OR Mean concentration over 24 hours of NO_2				
Unit	$\mu g/m^3$				
Interpretation/ Methodology and Sources of Data	• The standards for acceptable level of air pollutants (including NO_2) have been prescribed as part of the National Air Quality Standards (2009) by the CPCB. • As per the guidelines, annual mean concentration range ($\mu g/m^3$) of NO_2 is calculated as an annual arithmetic mean of minimum 104 measurements in a year taken twice a week. • Air samples should be tested at various points in the city. Measurements may be carried out as per the guidelines for manual sampling and analysis provided by the CPCB (Guidelines for the Measurement of Ambient Air Pollutants Volume-I, 2011). Guidelines on choosing monitoring locations is also given by CPCB (Guidelines for Ambient Air Quality Monitoring, 2003). • Previous data collected by CPCB or respective State Pollution Control Boards (SPCBs) during the same year can be used to additionally obtain information for different times of the year.				
Benchmark	Annual mean concentration of 40 $\mu g/m^3$ OR Mean concentration over 24 hours of 80 $\mu g/m^3$ (Central Pollution Control Board)				
SDG Reference(s)	• SDG Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination • SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management				

Indicator No. and Name	**15.3 Concentration of PM_{10} - air pollution**				
Pillar	**PHYSICAL**	**Category**	**REDUCED POLLUTION**	**Type**	**CORE**
Description	This indicator along with 15.1 and 15.2 denotes the acceptable levels of air pollutants in the city. Respirable Suspended Particulate Matter (size less than 10µm) or PM_{10} is considered one of the critical urban air pollutants, monitored on a regular basis by the CPCB through a nation-wide programme for ambient air quality monitoring known as National Air Quality Monitoring Programme (NAMP). Exposure to high levels of PM_{10} can cause respiratory and cardiovascular diseases.				
Expressed as	Annual mean concentration OR Mean concentration over 24 hours of PM_{10}				
Unit	$\mu g/m^3$				

Interpretation/ Methodology and Sources of Data	• The standards for acceptable level of air pollutants (including PM_{10}) have been prescribed as part of the National Air Quality Standards (2009) by the CPCB. • As per the guidelines, annual mean concentration range (µg/m³) of PM_{10} is calculated as an annual arithmetic mean of minimum 104 measurements in a year taken twice a week. • Air samples should be tested at various points in the city. Measurements may be carried out as per the guidelines for manual sampling and analysis provided by the CPCB (Guidelines for the Measurement of Ambient Air Pollutants Volume-I, 2011). Guidelines on choosing monitoring locations is also given by CPCB (Guidelines for Ambient Air Quality Monitoring, 2003). • Previous data collected by CPCB or respective State Pollution Control Boards (SPCBs) during the same year can be used to additionally obtain information for different times of the year.
Benchmark	Annual mean concentration of 60 µg/m³ OR Mean concentration over 24 hours of 100 µg/m³ (Central Pollution Control Board)
SDG Reference(s)	• SDG Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination • SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management ~ SDG Indicator 11.6.2: Annual mean levels of fine particulate matter (e.g. $PM_{2.5}$ and PM_{10}) in cities (population weighted)

Indicator No. and Name	**15.4 Level of noise pollution**				
Pillar	**PHYSICAL**	**Category**	**REDUCED POLLUTION**	**Type**	**CORE**
Description	This denotes the level of noise pollution in a city. Prolonged exposure to ambient noise from industrial activity, construction, vehicles, loud speakers, generator sets etc. can have negative health effects on citizens, in addition to causing annoyance and sleep deprivation. Cities can implement various measures to regulate noise pollution as per the provisions of the Noise Pollution (Regulation and Control) Rules, 2000. The rules also provide benchmarks for acceptable noise levels in industrial, commercial, residential and sensitive (silence) zones such as hospitals, nursing homes, educational institutions and courts.				
Expressed as	Number of noise samples meeting acceptable noise levels ---------- X 100 = _____ Total number of noise samples				
Unit	Percentage				
Interpretation/ Methodology and Sources of Data	• Sound samples should be tested at various points in the city and at different times of the day. • The procedure for monitoring of noise levels is given by CPCB (Protocol for Ambient Level Noise Monitoring, 2015). Measurements should be conducted in various categories of areas (industrial/ commercial, residential and sensitive areas), both during day and night. • Where cities have installed sensors for mapping noise levels at various public places, light poles etc., such data can be obtained to enable taking an average value over a longer period. Such data will be available from the ULB department, or operator responsible for data management and reporting.				

<table>
<tr><td>Benchmark</td><td>
<table>
<tr><th rowspan="2">Category of area/ zone</th><th colspan="2">Limits in dB/A L_{eq}*</th></tr>
<tr><th>Day time</th><th>Night time</th></tr>
<tr><td>Industrial area</td><td>75</td><td>70</td></tr>
<tr><td>Commercial area</td><td>65</td><td>55</td></tr>
<tr><td>Residential area</td><td>55</td><td>45</td></tr>
<tr><td>Sensitive area (silence zone)</td><td>50</td><td>40</td></tr>
</table>
*dB/A Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. Benchmark as per Noise Pollution (Regulation and Control) Rules, 2000
</td></tr>
<tr><td>SDG Reference(s)</td><td>• SDG Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</td></tr>
</table>

<table>
<tr><td>Indicator No. and Name</td><td colspan="5">15.5 Quality of water in public surface water bodies</td></tr>
<tr><td>Pillar</td><td>PHYSICAL</td><td>Category</td><td>REDUCED POLLUTION</td><td>Type</td><td>CORE</td></tr>
<tr><td>Description</td><td colspan="5">This denotes the quality of water in public surface water bodies such as rivers, lakes and ponds in the city, which is critical for maintaining the health of the overall water ecology associated with these surface water bodies.</td></tr>
<tr><td>Expressed as</td><td colspan="5">Number of tested samples meeting prescribed standards
---------- X 100 = _____
Total number of samples tested</td></tr>
<tr><td>Unit</td><td colspan="5">Percentage</td></tr>
<tr><td>Interpretation/ Methodology and Sources of Data</td><td colspan="5">• The CPCB has classified water bodies into 5 categories based on the designated best use of the water bodies and prescribed water quality standards in terms of chemical requirements for each of the categories (Guidelines for Water Quality Management, 2008).
• An inventory of surface water bodies in the city should be developed with the assistance of a base map, in discussion with ULB/ Planning Authority
• Water samples from the various water bodies should be tested as per the Guidelines for Water Quality Monitoring, 2007 developed by the CPCB
• Previous data collected by CPCB or respective State Pollution Control Boards (SPCBs) during the same year can be used to additionally obtain information for different times of the year.</td></tr>
</table>

Benchmark

Designated best use	Quality class	Primary quality criteria
Drinking water source without conventional treatment but with chlorination	A	Total coliform organisms (MPN/100 ml) shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6 mg/l or more, and Biochemical Oxygen Demand 5 days - 2 mg/l or less
Outdoor bathing (organized)	B	Total coliform organisms (MPN/100 ml) shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5 mg/l or more, and Biochemical Oxygen Demand 5 days - 3 mg/l or less
Drinking water source with conventional treatment	C	Total coliform organisms (MPN/100 ml) shall be 5000 or less pH between 6 and 9 Dissolved Oxygen 4 mg/l or more, and Biochemical Oxygen Demand 5 days - 3 mg/l or less
Propagation of wildlife and fisheries	D	pH between 6.5 and 8.5 Dissolved Oxygen 4 mg/l or more, and Free ammonia (as N) 1.2 mg/l or less
Irrigation, industrial cooling, and controlled disposal	E	pH between 6.0 and 8.5 Electrical conductivity less than 2250 micro mhos/cm, Sodium Absorption Ratio less than 26, and Boron less than 2 mg/l.

(CPCB, Guidelines for Water Quality Management, 2008)

SDG Reference(s)

- SDG Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
- SDG Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

~ SDG Indicator 6.3.2: Proportion of bodies of water with good ambient water quality

- SDG Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

Notes

Notes

Ministry of Urban Development
Government of India