SMARTNET
Solutions Exchange for Urban Transformation of India

सत्यमेव जयते
Ministry of Housing and Urban Affairs
Government of India

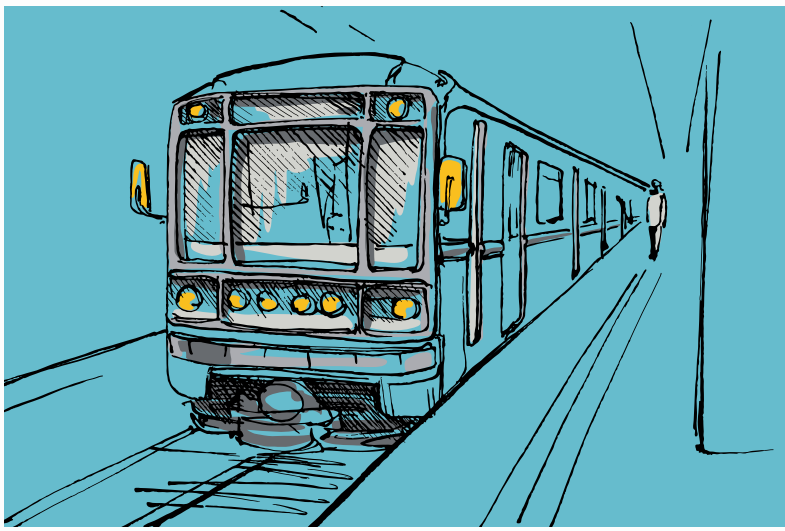
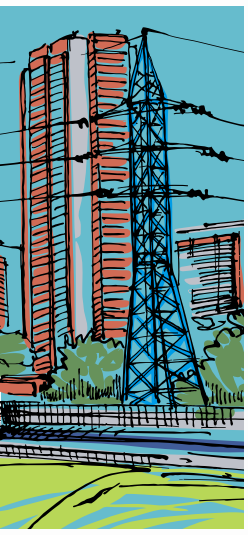
स्वच्छ भारत
एक कदम स्वच्छता की ओर

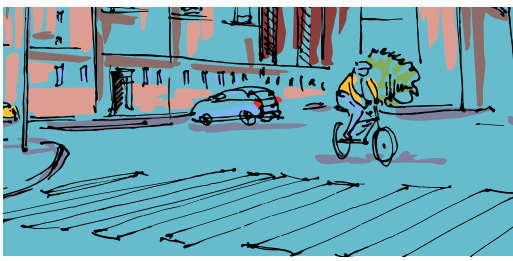






EASE OF LIVING INDEX 2018


Smart City MISSION TRANSFORM NATION
DAY-NULM Deendayal Antyodaya Yojana-National Urban Livelihoods Mission
HRIDAY Rejuvenating the Soul of Urban India
प्रधान मंत्री आवास योजना-शहरी Pradhan Mantri Awas Yojana-Urban
अमृत Atal Mission for Rejuvenation and Urban Transformation
Urban Transport

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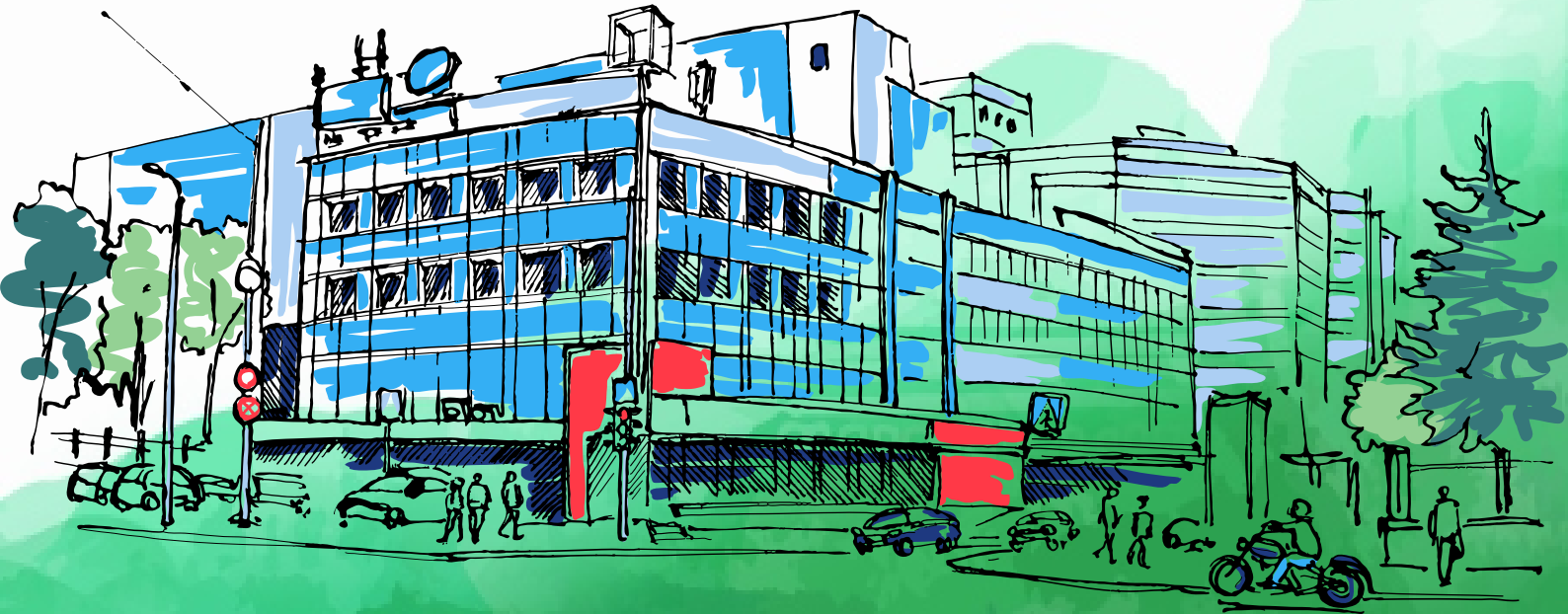


Hardeep S. Puri
MoS (I/C), MoHUA

My Ministry takes great pride in presenting India's first-ever 'Ease of Living' Index. It is an effort to assess the Ease of Living standards of 111 Indian cities, which includes cities identified under the Smart Cities Mission, capital cities and a few more cities with a population of over 1 million. This assessment is first of its kind globally in terms of scale and coverage. The Index covers 111 cities inhabited by approximately 134 million people.

The framework on 'Ease of Living' Index for cities was launched in June 2017. The indicators used have been adapted from various national/international indicator sets and service level benchmarks, and finalised after extensive consultations with state/city governments and citizens through the MyGov portal, and peer review by sector experts. The ranking of the cities marks a shift to a data driven approach to urban planning and management and promotes healthy competition among cities.

Another highlight of the Ease of Living framework is its strong link to the Sustainable Development Goals (SDGs). The assessment covers several metrics critical to track progress towards the SDGs in an urban environment.

Besides collecting data on a range of metrics to evaluate performance of the city administration, the exercise spread over four months also collected feedback from over 60,000 citizens to measure satisfaction on urban services. Urban planners, practitioners and city managers may use the learnings from this exercise to benchmark their cities against other peers and track performance over time.

I congratulate the team at the Ministry and the consultants for completing this exercise with a high level of engagement with the city authorities and successfully establishing this baseline, which marks a major milestone in India's goal to promote evidence-based planning and action towards sustainable urbanisation.

(Hardeep S. Puri)

Preface

Durga Shanker Mishra, Secretary, MoHUA

The cities in India have experienced a rapid and dramatic transformation. Out of the total population of 1210.2 million, in 2011, about 380 million persons lived in urban areas. The proportion of urban population has since increased from 27.8% in 2001 to 31.16% in the year 2011, as per 2011 census.

While this rapid urbanisation offers India an incredible window for further transforming the economy and fuelling growth, it is also likely to accentuate several of the existing challenges that cities already face such as overcrowding, increased pollution, and inequity. Addressing these challenges demands deeper engagement, complex program design, robust and agile implementation mechanisms and a rigorous evaluation and monitoring framework.

To tackle the challenges and make the best out of the opportunities in the cities, the Ministry of Housing and Urban Affairs has launched several initiatives such as the Swachh Bharat Mission, Smart Cities Mission, AMRUT, Pradhan Mantri Awas Yojana, Deen Dayal Antyodaya Yojana-National Urban Livelihood Mission and HRIDAY. These missions collectively seek to foster a better quality of life for India's urban citizens through improving urban governance, city planning and availability and quality of urban infrastructure.

The 'Ease of Living' Index launched by the Ministry serves as a litmus test to help assess the progress made in urban environments through these various initiatives and empower cities to use evidence to plan, implement and monitor their performance. In the first round of the assessment, the exercise covers 111 Indian cities, which includes selected smart cities, capital cities and a few more cities with a population of over 1 million. With more than 134 million people residing in these 111 cities, this initiative is the first of its kind globally, in terms of scale and coverage.

The framework developed to measure 'Ease of Living' is very comprehensive and covers all the critical pillars of urban development (Physical, Institutional, Social and Economic) and uses 78 indicators across 15 categories (governance, identity and culture, education, health, safety and security, economy, affordable housing, land use planning, public open spaces, transportation and mobility, assured water supply, waste-water management, solid waste management, power, and quality of environment). The indicators used have been designed by adapting global best practices through extensive consultations with state and city governments, and sector experts and citizen feedback using the MyGov portal.

In addition to enabling systematic evaluation of cities' progress

towards the Sustainable Development Goals (SDGs), the 'Ease of Living' Index seeks to assist cities in undertaking a 360-degree assessment of their strengths, weaknesses, opportunities, and threats. They can leverage this knowledge to formulate plans and prioritise investments.

The work on the Ease of Living Index in all 111 cities commenced in January 2018. In order to enable cities to effectively participate in the assessment, a user-friendly online data entry portal was created. Over 30 state-level capacity building workshops and 111 city reconnaissance missions were conducted to engage with city and state nodal agencies for their effective participation in the assessment. Over 60,000 data points were collected of which several were physically audited.

It gives me immense pride to present the outcomes of this exercise for which several missions coordinated seamlessly. An exercise of this scale would not have been possible in such a short time frame if not for the enthusiasm and support showcased by the states and cities. This report details the approach for formulation of the Ease of Living Index and calculation of city scorecards (refer Section 1). Section 1.2 presents our current thinking about Ease of Living from a conceptual point of view and details out the indicators used in the creation of the Index. Section 2 presents the 2018 Ease of Living Index results. It presents the overall performance of 111 cities as well as the ranks under each sub-index (Institutional, Social, Economic and Physical). Section 3 summarises the way forward.

Foremost, I would like to express my sincere gratitude to the Hon'ble Minister of States (I/C), Hardeep S. Puri, Ministry for Housing and Urban Affairs for his leadership in launching the 'Ease of Living' Index. I thank Shiv Das Meena (Joint Secretary, AMRUT), Kunal Kumar (Mission Director, Smart Cities Mission) and Sanjay Kumar (Joint Secretary, DAY-NULM) for ensuring that the assessment was conducted in a manner consistent with the Ministry's vision and goals.

I thank Dr. Sameer Sharma (Director General, Indian Institute of Corporate Affairs) for playing an instrumental role in designing the methodology framework for the Ease of Living Index in his capacity as Additional Secretary and Mission Director, Smart Cities Mission.

I would also like to place my appreciation on record for Sajeesh Kumar Nair (Director, Smart Cities Mission) for his hands-on approach and Reema Jain (Deputy Director, AMRUT) for seamlessly coordinating across various missions and facilitating effective participation from state and city nodal officials.

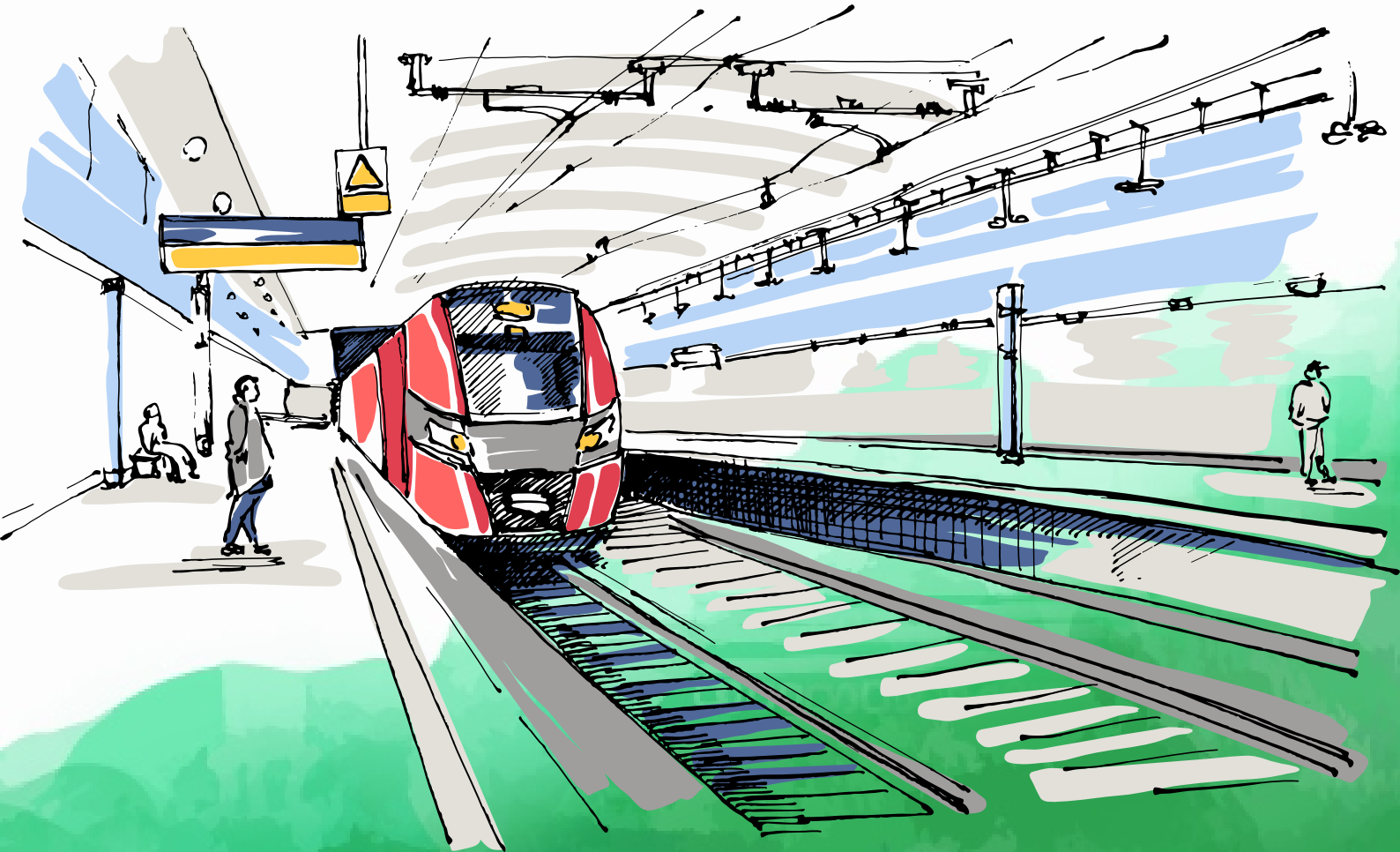
I would also like to commend State Principal Secretaries, City Commissioners and Smart City CEOs for their extraordinary support in this process. The participation of other government departments and parastatal agencies has also been exemplary. Their engagement and ownership has truly enriched the process.

I thank the World Bank and the CBUD team for their support. I congratulate the consultants - Ipsos and Athena Infonomics for completing this exercise with high level of engagement with the cities and successfully establishing this baseline. I would also like to acknowledge the advisory support provided by the Economist Intelligence Unit towards developing a framework for estimating city-level GDP for Indian cities.

I am extremely pleased to present the outcomes of this exercise in this report. The 'Ease of Living' Index marks an important milestone in India's journey towards evidence-based planning and I hope city officials will leverage this to make their cities more sustainable and liveable. This will assist cities in moving towards the Hon'ble Prime Minister's vision of a New India by 2022.

(Durga Shanker Mishra)

Executive Summary



By 2050 India is projected to add 416 million urban dwellers to the world's urban population and will be home to about 58% of the total global population[1]. This trend brings with it several opportunities, challenges and intensified competition among cities to attract talent and resources to create healthy and liveable cities. The Government of India, through its various missions such as the Smart Cities Mission, AMRUT, HRIDAY, Swachh Bharat Mission, and PMAY, among others, is committed to making Indian cities healthy, attractive and sustainable, and to improving its residents' quality of life.

The Ministry of Housing and Urban Affairs (MoHUA) launched the 'Ease of Living' Index in January 2018 to help cities systematically assess themselves against global and national benchmarks and encourage them to shift towards an 'outcome-based' approach to urban planning and management.

The key objective of the Ease of Living Index is to:

- Generate information to assist evidence-based planning;
- Catalyse actions to achieve broader development outcomes including the Sustainable Development Goals;
- Assess outcomes achieved from various urban policies and schemes; and
- Serve as a basis for dialogue between citizens and urban decision makers.

Calculating the Ease of Living Index

The Ease of Living Index captures the breadth of the quality of life in cities across 4 pillars and 15 categories using 78 indicators, of which 56 are core indicators and 22 are supporting indicators. The core indicators measure those aspects of ease of living which are considered 'essential' urban services. The supporting indicators are used to measure adoption of innovative practices which are considered desirable for enhancing ease of living.

4 Pillars

15 Categories

[1]UN Department of Economic and Social Affairs (2018). 2018 Revision of World Urbanization Prospects.

Each city is given a score between 0 and 100. The Index construction follows the Dimensional Index Methodology. This method computes the scores for each indicator with reference to 'maximum within the comparison group' or 'absolute benchmarks'. These absolute benchmarks were derived from national or international standards. Where neither international nor national benchmarks exist, the city with the best performance in its group (relevant population range) is treated as a benchmark and the marks awarded to other cities (within the relevant population group) are calculated proportionately.

The score that a city receives is based on its performance on each indicator under that pillar, and the level of importance i.e., the weight assigned to each pillar and indicator. The pillar weights, are as follows: Institutional (25 points), Social (25 points), Economy and Employment (5 points), and Physical (45 points). A core indicator carries 70% weightage while a supporting indicator carries 30% weightage. For more information on the index methodology, please refer to the Methodology for Collection and Computation of Ease of Living Standards published on **smartcities.gov.in.**

2018 Ease of Living Index Results

The 2018 Ease of Living Index assessed 111 cities[2] in India and the key insights from the exercise are presented below:

Top 10 Cities

1 Pune

Navi Mumbai 2

[2]Cities included in this round are smart cities/capital cities/ population hubs (having 1 million plus population). Green field cities like Naya Raipur and Amaravati have been excluded in this round.

3 Greater Mumbai

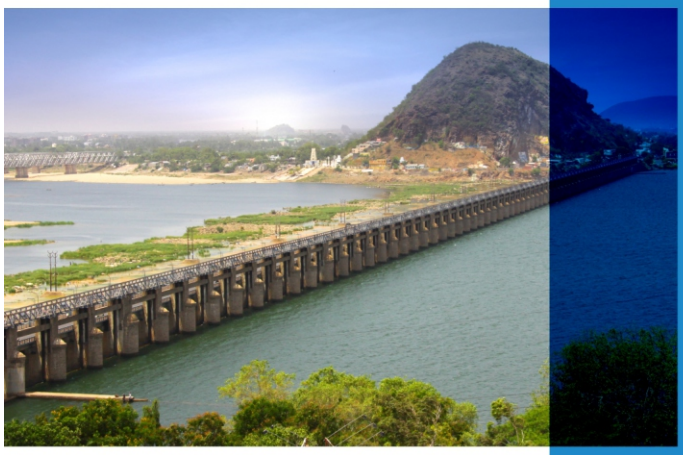
Tirupati 4

5 Chandigarh

Thane 6

7 Raipur

Indore 8



9 Vijayawada

Bhopal 10

The top cities on the Ease of Living Index show mixed representation across population groups. The top 20 cities comprise of 3 cities with population under the 0.5 million band, 4 cities between 0.5 - 1 million, 10 cities between 1 - 4 million and 3 cities over 4 million population. This mixed representation is true of the pillar level ranks as well.

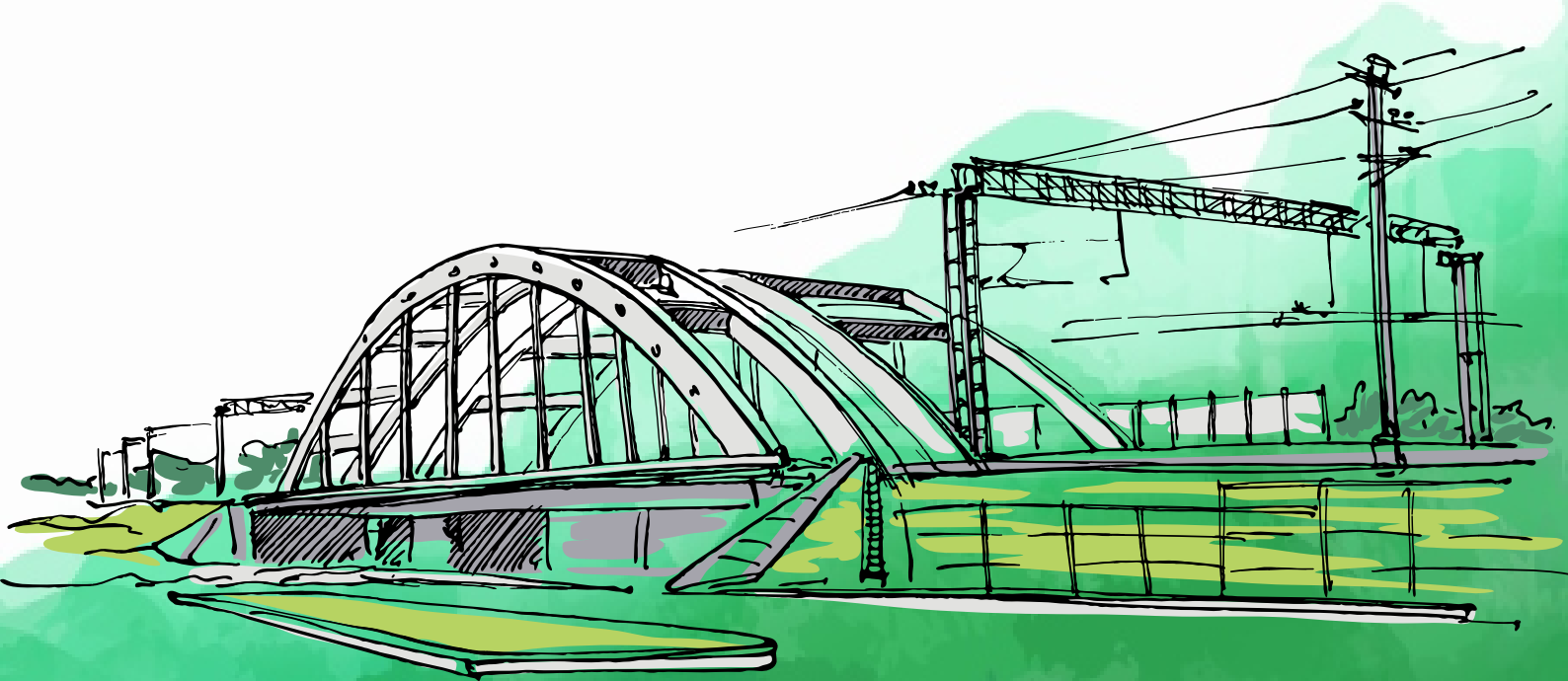
The scores themselves show an interesting distribution, with the four quartiles separated by 12, 5, 8 and 15 points respectively, showing appreciable clustering in the middle ranks (the maximum difference in the score between cities in the top 25 percentile is 15 marks, while it is 8 marks in the 25th to 50th percentile). However, overall the scores are quite close, indicating that cities are getting increasingly competitive in improving their urban quality of life (refer Annexure C for detailed scores of the cities).

Apart from being a tool for comparative benchmarking and assessment, the Ease of Living Index could potentially trigger actions at various levels, some of which are outlined below:

1. Enhance the quality and comparability of data collection;
2. Improve cities' decision making and ensure efficient allocation of resources based on gap areas;
3. Identify best models for achieving the desired transformation in ease of living, by enabling learnings across cities over time; and
4. Improve the quality of electoral discourse and improve accountability of elected representatives at the city level.

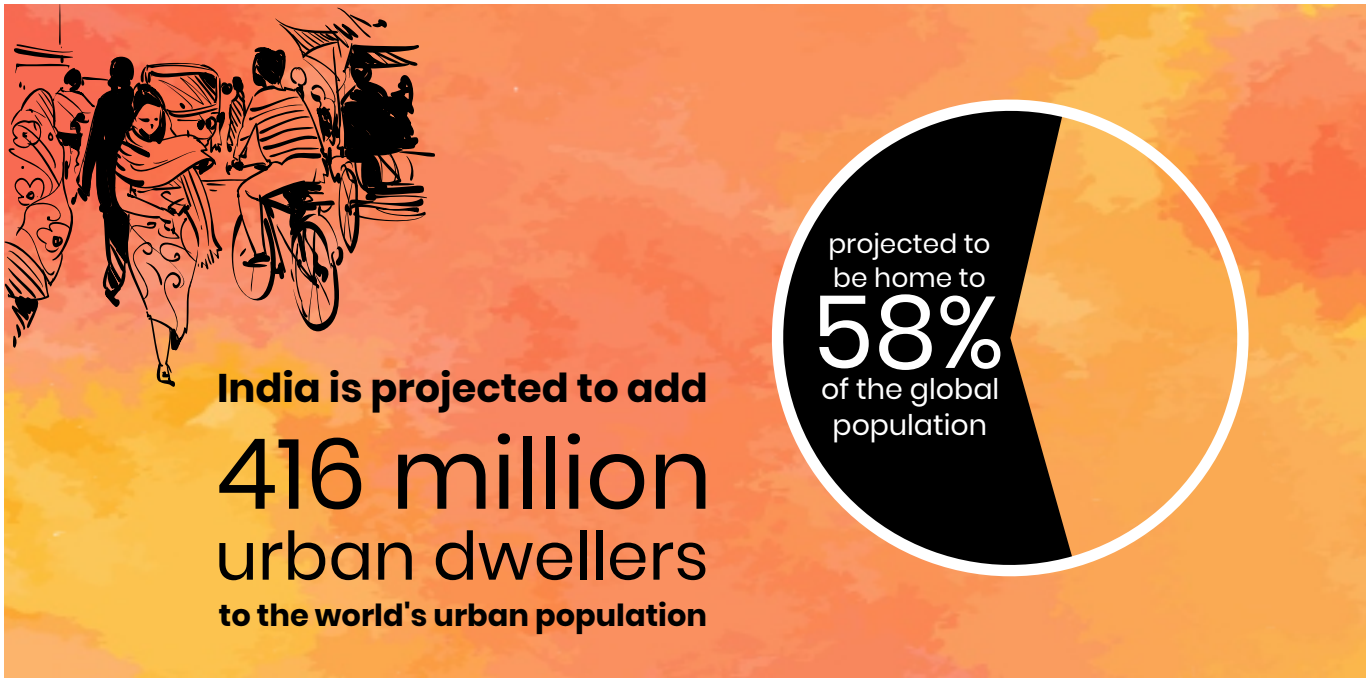
01

Ease of Living Index



1.1 What do we mean by Ease of Living Index?

By 2050 India is projected to add 416 million urban dwellers to the world's urban population and will be home to about 58% of the total global population[3].



Structurally, urbanisation is advantageous to India on several fronts. Urban areas contribute to approximately 62-63% of India's Gross Domestic Product (GDP)[4], which is estimated to reach 75% by 2030[5]. McKinsey research estimates that cities could generate 70% net of all new jobs by 2030[6]. It presents an opportunity to reduce social inequities which are much less pronounced in urban agglomerations compared with rural areas, since hierarchies are driven more by economic (rather than social) standing in cities. It also serves as a natural focal point for the adoption of new technologies and innovation en-masse. Additionally, it creates large markets with critical mass for a variety of goods and services, catalysing the overall economy.

However, the rapid pace of urbanisation and the increased number of urban dwellers could exacerbate existing challenges like pollution, overcrowding, rising crime levels, poor access to water supply and sanitation facilities, and congestion, among others. This warrants a greater focus on improving the governance and the quality of urban infrastructure and service delivery, which have a direct bearing on the quality of life offered by the cities to its citizens. This puts 'Ease of Living' at the heart of India's urban agenda.

[3] UN Department of Economic and Social Affairs (2018). 2018 Revision of World Urbanization Prospects..
[4] Planning Commission (2008). Eleventh Year Plan (2007-2012).
[5] MOUD (2011). Estimating the investment requirements for urban infrastructure services – Report of the High Powered Expert Committee
[6] Mckinsey Global Institute (2010). India's Urban Awakening: Building inclusive cities, sustaining economic growth

Enhancing ease of living in cities needs evidence-based growth strategies that are inclusive and put the aspirations and well-being of all citizens first. To this end, city managers need to be equipped with information that will help them understand the characteristics of their city along the various dimensions of ease of living, which provides a starting point for designing interventions.

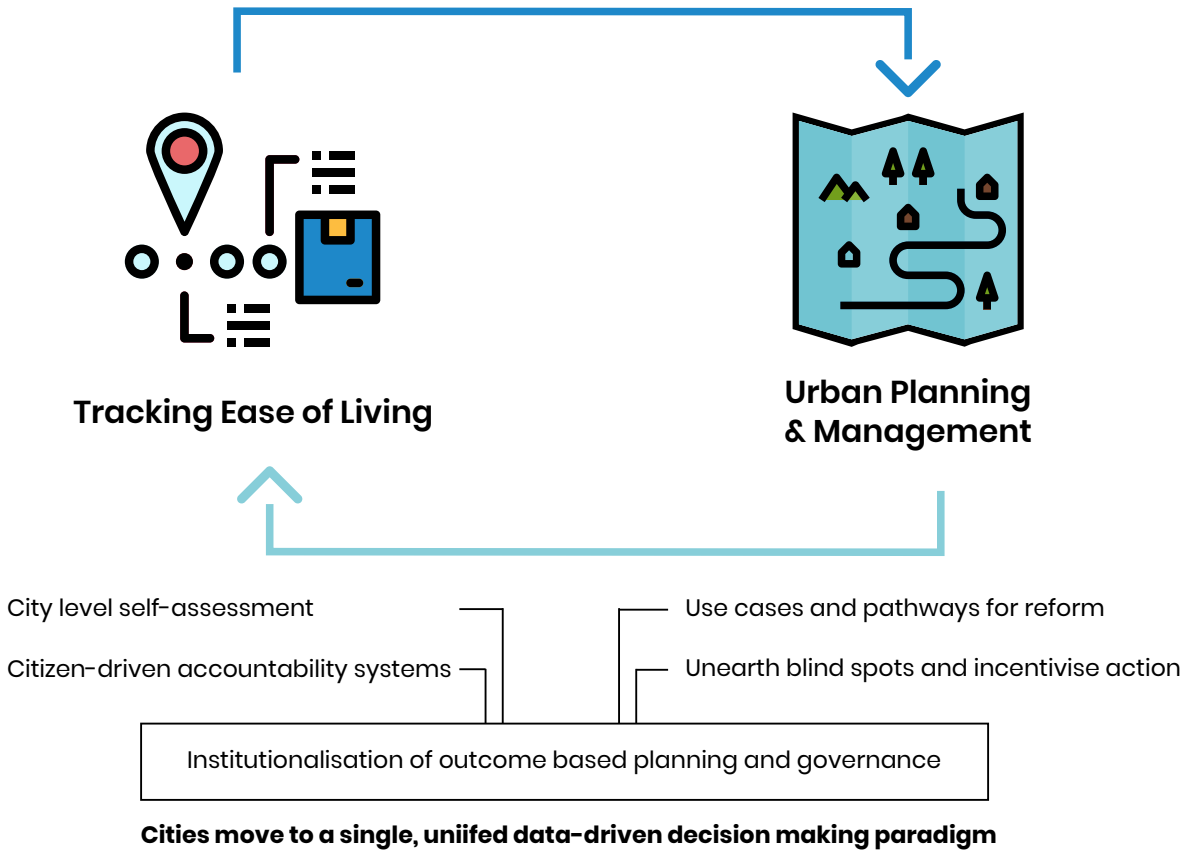
Against this backdrop, the Ministry of Housing and Urban Affairs (MoHUA) has created a tool to measure the 'Ease of Living' in cities. This tool known as the Ease of Living Index was accompanied by a framework that helps to conceptualise 'Ease of Living' and identify critical factors that support and improve the quality of life of urban citizens in the country.

The tool serve as an annual tracker to help generate data and establish systems for assisting cities with city specific data on a range of indicators that feed into 'Ease of Living' Index for ranking cities.

The Ease of Living Index seeks to achieve the following objectives:

1) Generate information to assist evidence-based planning

The 'Ease of Living' Index is envisaged to be a 360-degree tool for tracking, planning and transforming Indian cities. It will help to systematically quantify the challenges urban citizens face and serve as an instrument for policy reform, resource mobilisation, investment prioritisation and management of services. This Index will enable city managers and other decision makers understand the city's baseline and compare its performance across key measures. By bringing together critical information, the Index will also help to establish a common evidence base for Indian cities.



2) Catalyse actions to achieve broader development outcomes including the Sustainable Development Goals

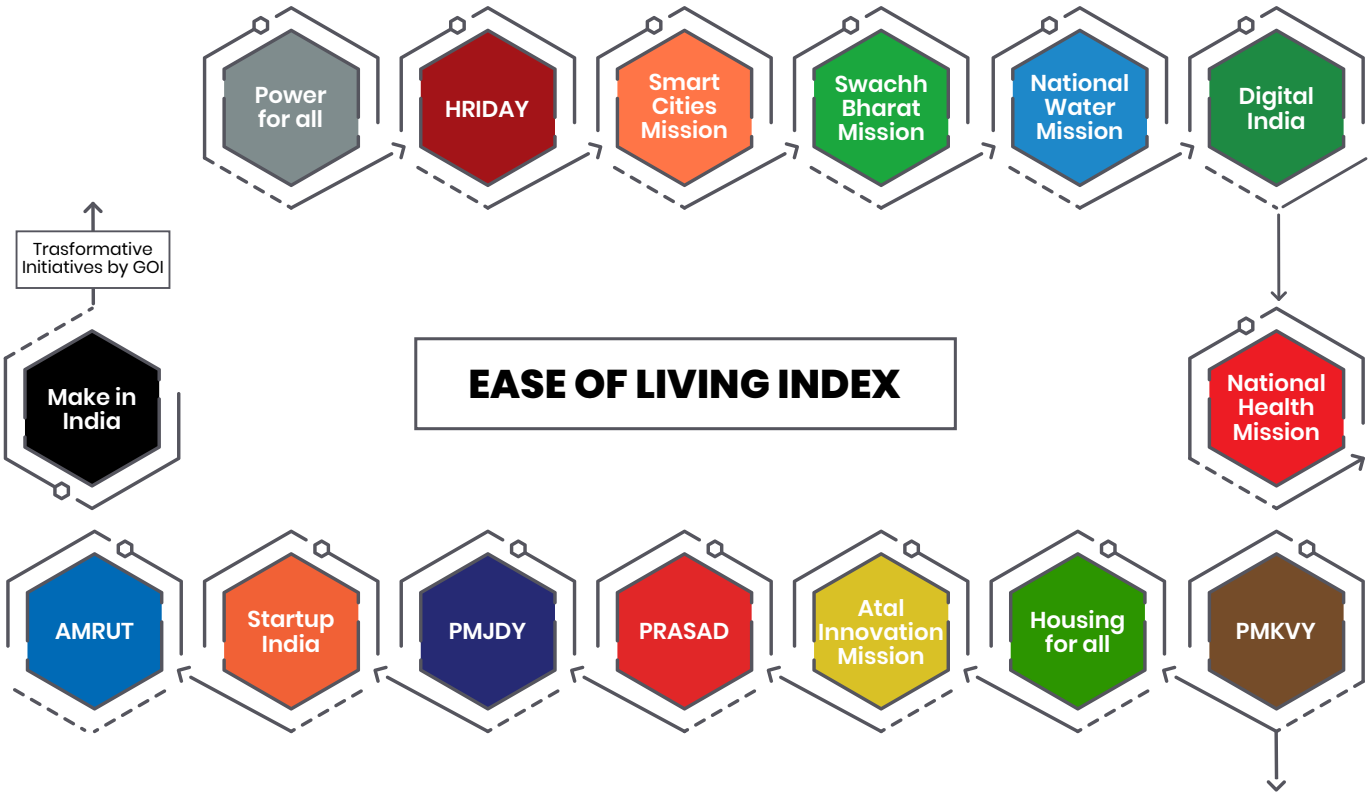
The assessment standards are linked to the Sustainable Development Goals (SDGs) and will provide a strong impetus to India's effort to systematically track the progress of SDGs in urban areas. In its very first year, the assessment will help collate data on metrics related to SDGs for approximately 134 million citizens, that in a large measure, represents a rapidly growing urban India. While all 17 SDGs represent key considerations in achieving ease of living, 8 goals in particular stand out under the proposed Ease of Living assessment framework:

- **Goal 3:** Ensure healthy lives and promote well-being for all at all ages.
- **Goal 4:** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- **Goal 6:** Ensure availability and sustainable management of water and sanitation for all.
- **Goal 7:** Ensure access to affordable, reliable, sustainable and modern energy for all.

- **Goal 8:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- **Goal 11:** Make cities and human settlements inclusive, safe, resilient and sustainable.
- **Goal 16:** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
- **Goal 17:** Strengthen the means of implementation and revitalize the global partnership for sustainable development.

3) Assess outcomes achieved from various urban policies and schemes

The Government of India is implementing a multitude of programmes to meet the needs of the urban areas of the country: AMRUT (Atal Mission for Rejuvenation and Urban Transformation) with a focus on water, sewerage, storm water drainage, public transport and amenities; Smart Cities Mission with components of retrofitting, redevelopment, green-field developments and pan-city application of smart solutions; HRIDAY (National Heritage City Development and Augmentation Yojana) with a focus on holistic development of heritage cities; Pradhan Mantri Awas Yojana, envisioning 'Housing for All' by 2022; and Swachh Bharat Mission for better sanitation, the elimination of open defecation, and the promotion of household and community toilets. The Ease of Living Index seeks to serve as a barometer to track improvements across these various facets covered by the different missions and programmes.



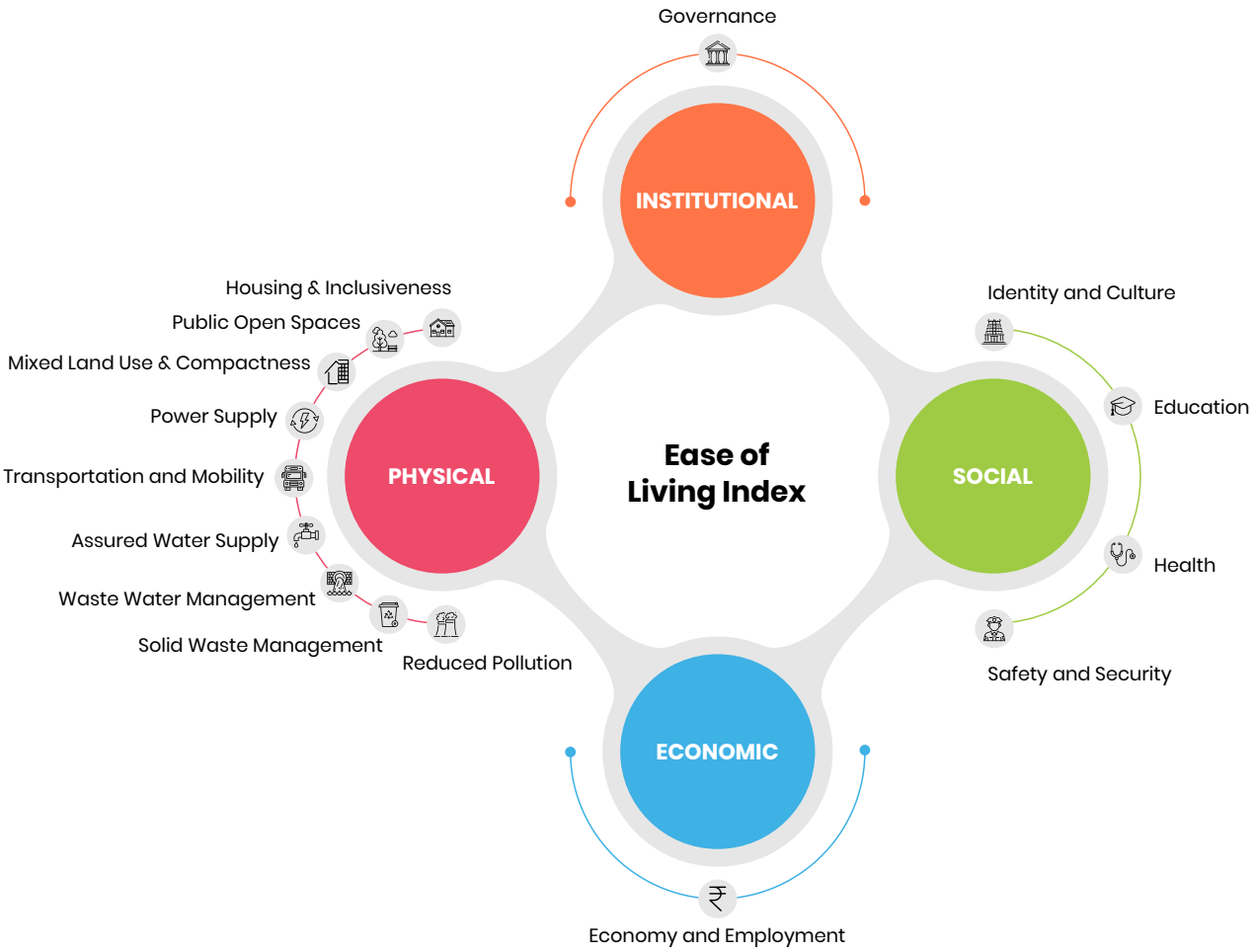
4) Serve as a basis for dialogue between citizens and urban decision makers

The 'Ease of Living' Index will provide citizens with useful and practical information about how their city performs on the various parameters included in the index, such as municipal finances, education, health, transportation, crime prevention, water supply, housing etc. Having access to this information will enable citizens to understand how 'liveable' their city is and will allow them to compare its performance vis-à-vis other cities of the same region. This could provide the basis for constructive dialogue between citizens and decisions makers on areas demanding greater attention.

1.2 Overview of the Assessment Framework

MoHUA has developed a conceptual framework that defines ease of living as well as its key elements. 'Ease of Living', as defined by the Ministry, is underpinned by concepts of healthy communities, economic development, environmental sustainability, and social capital and cohesion. It is intrinsically linked to physical amenities such as water supply, solid waste management, and presence of parks and green spaces etc., and socio-economic and cultural aspects such as cultural offerings, career opportunities for citizens, economic dynamism, and safety and security.

The 'Ease of Living' Index has 78 indicators classified across 15 categories and organised under 4 pillars.



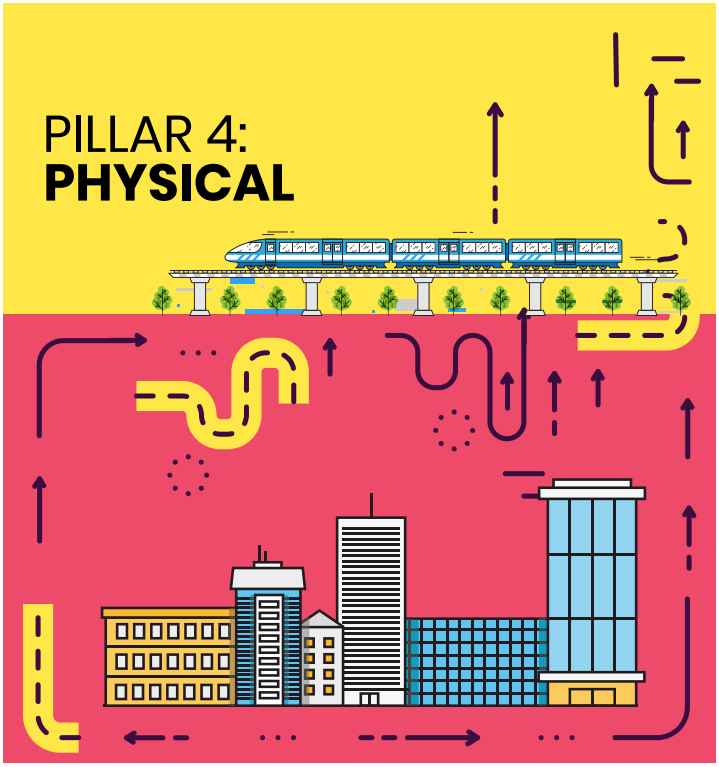
A. Pillars

The Ease of Living Index is structured according to 4 pillars- Institutional, Social, Economic and Physical that represent the broad conceptual elements that define ease of living.

In order to provide better living conditions for their citizens, cities require efficient and effective institutions that will help them to deliver improved services and manage urban infrastructure in a sustainable manner. By leveraging technology, including ICT-enabled solutions, cities can foster economic growth, improve urban quality of life, and create opportunities for participatory urban development.

Tracking progress of the categories under this pillar will enable cities to monitor the availability and accessibility of education and healthcare facilities for its citizens. It will also allow them to ensure that the city has a safe and secure environment in addition to fostering the existing culture and strengthening the identity and sense of belonging to the city among its residents.

For a city to achieve inclusive growth, it should focus on enhancing the economic prospects of all businesses and improve the revenue bouyancy of the urban local bodies. This is an essential ingredient for enhancing the quality of life of its citizen.



The physical pillar, which is representative of the city infrastructure and urban service delivery, is the one that has the largest direct impact on the ease of living in a city. The pillar encompasses categories related to housing, access to open spaces, the supply of water and electricity, sanitation and pollution. It aims to measure the actual service delivery performance of the city and also the extent to which cities are implementing policies that work towards making them more sustainable.

B. Categories

A total of 15 categories constitute the above 4 pillars. All categories together aim to provide a holistic picture of the living standards in a city.

Category 1: **Governance**

Governance is an important part of the measure of ease of living in a city since the quality and efficacy of governance in a city influences all the other categories and indicators. The indicators within this category are a reflection of the performance of the city in terms of efficient service delivery, optimal allocation and utilisation of resources, and creating opportunities for citizens to participate in matters of governance and development of the city (possibilities for participatory growth).

Category 2: **Identity & Culture**

This category captures the degree to which a city embraces and maintains its cultural and natural heritage, and promotes sustainable tourism. It is a strong indicator of the vibrancy of a city, which has a bearing on the quality of urban life. It is also a reflection of a city's performance in the upkeep of the business environment for tourism (hotel infrastructure) and the availability of opportunities to explore local identity and culture (restoration of historical and ecological sites).

Category 3: **Education**

Education is one of the most important aspects of human development and therefore, the degree of access and quality of education is critical to building inclusive cities. The indicators under this category reflect, both the ease of access to educational institutions for the children and also the quality of education in the same. The category also places emphasis on measuring progress with respect to eliminating gender disparities in access to education.

Category 4: **Health**

Healthy cities lead to happy and productive residents. This category includes indicators that measure the capability and capacity of health care infrastructure and services in cities e.g., number of hospital beds, number of healthcare professionals, response time of medical emergencies. Other indicators reflect the incidence of communicable diseases in cities which is not only a reflection of the health of their residents but is also closely linked to pollution levels in cities and the state of sanitation services.

Category 5: **Safety & Security**

Safety and security have a tremendous impact on the ease of living in a city as people highly value feeling safe inside and outside of their homes. The level of safety in a city can be captured quantitatively by

examining at the number of crimes recorded in the city, especially against vulnerable groups (women, children, and elderly people). The number of streets and public places in a city that are covered by surveillance systems is a way to assess the efforts of the city to prevent all forms of violence.

Category 6: **Economy & Employment**

The ease of living in a city is influenced in part by its economic performance. Indicators in this category aim to capture growth in trade and services in a city, in the organised sector and also in the real-estate sector. Since economic growth is largely beneficial to the residents of a city when it is inclusive, the indicator pertaining to street vendors under this category aims to understand the extent to which the cities have implemented inclusive strategies to protect livelihoods.

Category 7: **Housing & Inclusiveness**

Ensuring access to affordable housing is connected to inclusive development. When cities are unable to keep pace with the increased demand for affordable housing, slums form and grow, contributing to economic, social and health issues. This category has indicators that reflect the progress that a city has made in terms of offering formal and/or affordable housing to all its residents and are also indicative of the coverage and efficiency of service delivery of basic services such as toilets, water supply, and solid waste management in the slums.

Category 8: **Public Open Spaces**

Liveable cities have access to green and public open spaces such as parks, playgrounds and beaches. Better access to green and open spaces helps promote physical activity, which has a positive effect on the mental and physical health of citizens. The indicators in this category therefore reflect the per capita availability of green space and public and recreational places in the city.

Category 9: **Mixed Land Use & Compactness**

As the population of a city grows, the optimal utilisation of space becomes an important consideration for city planning. A compact city promotes relatively high residential density (measured through net density) and integrated land use - residential, commercial and retail, public open spaces are seamlessly blended within the same area. It subscribes strongly to the concept of sustainability by supporting conservation of lands and increased non-motorised and multi-modal transportation options which results in low transport related energy consumption and reduced pollution. Mixed land use development can potentially reduce infrastructure costs, lower service costs, and enhance the efficiency of service delivery.

Category 10: **Power Supply**

Availability of good quality (low voltage fluctuations) and reliable power is a basic necessity for the industries and services in a city to function well. This category includes indicators related to the number of electrical connections and power interruptions as a reflection of the quality of power supply. Indicators related to the percentage of energy derived from non-conventional sources, and energy consumption by other services such as water supply, sewerage, and street lighting aim to track the progress of a city in terms of sustainably managing its natural resources and increasing the use of renewable sources of energy.

Category 11: **Transportation & Mobility**

The presence of safe, convenient, affordable and accessible alternatives to driving in a city has a huge impact on a city's development and hence, ease of living. This category includes indicators that reflect on how cities encourage the use of public transport and non-motorised transport, by assessing the existing infrastructure in a city on the basis of availability and safety. Measures taken to improve facilities for pedestrians are also assessed. Inclusiveness of public infrastructure is examined by the extent to which new and redeveloped government buildings, malls, public toilets, footpaths, subways and foot-over-bridges are built as per universal design principles.

Category 12: **Assured Water Supply**

Continued access to clean and safe water is one of the most basic human needs and the foundation for urban ease of living. Improved water supply and better management of water resources can significantly affect the ease of living in a city. Indicators under this category aim to assess the quantity and quality of water supplied in the city, including the level of non-revenue water. The extent of smart meter connection coverage allows the city to better monitor the consumption and supply of water and reduce its losses.

Category 13: **Waste Water Management**

The availability of sanitation facilities and effective waste-water and storm-water services are extremely important to build liveable, sustainable and resilient cities. The indicators in this category capture the effort made by the city to provide its citizens with toilets and also how efficiently the city manages to treat and reuse and/or safely dispose of the waste-water that is generated. Over time this has become an important aspect of development and the safe management of waste-water is important for both the health of humans and the ecosystem.

Category 14: **Solid Waste Management**

Rising population levels and increasing urbanisation leads to an increase in the amount of solid waste that is generated in a city. This category aims to assess the efficiency and the manner in which a city manages its solid waste generated in a city. It also captures the efficiency of a city's solid waste collection and disposal system. In order to monitor the adverse environmental impact that waste generation can have, cities are also assessed on its level of recycling and reuse of municipal solid waste.

Category 15: **Reduced Pollution**

Air pollution, noise pollution, and water pollution all adversely affect the quality of urban life. High pollution level can negatively impact the health of its citizens as well as the natural and cultural ecosystem of the city. It can damage ecological sites and cultural heritage in the city which determines the ease of living of the city.

C. Ease of Living Indicators

At the most granular level, the Ease of Living Index framework identifies independent outcome measures in the form of indicators that are relevant to each category. Indicators enable the categories of Ease of Living Index to be benchmarked and monitored over time. In this round, there are a set of 78 indicators, of which 56 are core indicators and 22 are supporting indicators, measuring the different dimensions of ease of living. While the core indicators are those which are considered essential for assessing the performance management of city services and quality of life, the supporting indicators are those that promote best practices.

The set of 78 indicators with their associated categories are presented in the table below:

CATEGORY	INDICATORS
1. GOVERNANCE	1.1 Percentage of citizen services available online
	1.2 Percentage of services integrated through a Command and Control Centre
	1.3 Percentage of citizens using online services
	1.4 Average delay in grievance redressal
	1.5 Tax collected as percentage of tax billed
	1.6 Extent of cost recovery (O&M) in water supply services
	1.7 Capital spending as percentage of total expenditure
	1.8 Percentage of population covered under Ward Committees/Area Sabhas

CATEGORY	INDICATORS
 2. Identity &Culture	2.1 Restoration and reuse of historic buildings
	2.2 Percentage of ecologically important areas covered through projects for restoration
	2.3 Hotel occupancy
	2.4 Percentage of budget allocated towards cultural/sports activities
	2.5 Number of cultural/sports events hosted by the city
 3. Education	3.1 Percentage of school-aged population enrolled in schools
	3.2 Percentage of female school-aged population enrolled in schools
	3.3 Primary education student-teacher ratio
	3.4 Percentage of schools with access to digital education
	3.5 Percentage of students completing primary education
	3.6 Percentage of students completing secondary education
 4. Health	4.1 Number of in-patient hospital beds per 10,000 population
	4.2 Healthcare professionals per 10,000 population
	4.3 Average response time in case of health emergencies
	4.4 Period prevalence of water borne diseases
	4.5 Period prevalence of vector borne diseases
 5. Safety & Security	5.1 Number of CCTV cameras installed in the city per unit of road length
	5.2 Number of recorded crimes per lakh population
	5.3 Extent of crimes recorded against women, children and elderly per year
	5.4 Transport-related fatality per lakh population
 6. Economy & Employment	6.1 Increase in VAT collection
	6.2 Increase in collection of Professional Tax
	6.3 Increase in issuance of construction permits
	6.4 Percentage of vendors registered and provided formal spaces

CATEGORY	INDICATORS
 **7. Housing & Inclusiveness**	7.1 Percentage of slum/EWS households covered through formal/affordable housing
	7.2 Percentage of slum households covered through basic services
 **8. Public Open Spaces**	8.1 Per capita availability of green spaces
	8.2 Per capita availability of public and recreational places
 **9. Mixed Land Use & Compactness**	9.1 Share of mixed land use area in overall city land use
	9.2 Net density
 **10. Power Supply**	10.1 Percentage of city population with authorised electrical services
	10.2 Percentage of electrical connections covered through smart meters
	10.3 Average number of electrical interruptions per customer per year
	10.4 Average length of electrical interruptions per customer per year
	10.5 Percentage of total energy derived from renewable sources
	10.6 Energy consumption per unit - water supply and sewerage
	10.7 Energy consumption per unit - street lighting
	10.8 Percentage of new and redeveloped buildings following green building norms
	10.9 Total energy consumption per capita
 **11. Transportation & Mobility**	11.1 Geographical coverage of public transport
	11.2 Availability of public transport
	11.3 Mode share of public transport
	11.4 Percentage of road network with dedicated bicycle tracks
	11.5 Percentage of interchanges with bicycle parking facilities
	11.6 Mode share of non-motorised transport

CATEGORY	INDICATORS
 **11. Transportation & Mobility**	11.7 Availability of Passenger Information System
	11.8 Extent of signal synchronisation
	11.9 Availability of paid parking spaces
	11.10 Percentage coverage of footpaths – wider than 1.2 m
	11.11 Percentage of traffic intersections with pedestrian crossing facilities
	11.12 Extent to which universal accessibility is incorporated in public rights-of-way
 **12. Assured Water Supply**	12.1 Household level coverage of direct water supply connections
	12.2 Per capita supply of water
	12.3 Quality of water supplied
	12.4 Level of Non-Revenue Water (NRW)
	12.5 Percentage of water connections covered through meters
	12.6 Percentage of plots with rainwater harvesting facility
 **13. Waste Water Management**	13.1 Coverage of toilets
	13.2 Coverage of sewerage network and/or septage
	13.3 Collection efficiency of sewerage network
	13.4 Extent of reuse and recycling of waste water
	13.5 Coverage of storm water drains
 **14. Solid Waste Management**	14.1 Household level coverage of municipal solid waste collection
	14.2 Efficiency of collection of municipal solid waste
	14.3 Extent of municipal solid waste recovered through reuse
 **15. Reduced Pollution**	15.1 Concentration of SO_2- air pollution
	15.2 Concentration of NO_2- air pollution
	15.3 Concentration of PM_{10} - air pollution
	15.4 Level of noise pollution
	15.5 Quality of water in public surface water bodies

1.3 Creating the Ease of Living Index

Implementation of the Ease of Living Index involved the following key steps:

Indicator Development and Refinement

Indicator development . Final list of indictors (with details on collection protocols)

In order to objectively measure Ease of Living, MoHUA developed a set of 78 indicators, based on the 15 categories as outlined in Section 1.2. The selection of indicators followed an extensive research and development process wherein MoHUA has drawn on a range of global and national indicator sets; service level benchmarks; research literature; and consulted leading city policy, sector and data experts.

The Ease of Living indicators and categories were further refined via consultations with city governments for various considerations such as theoretical robustness, efficiency of the metric to capture the objective of the indicator, availability and accessibility of data.

State and City Level Engagement

Training and deployment of the state and city-coordinators . Organising National/State Level Workshops
City Level Reconnaissance Meetings

To prepare and equip states and cities to participate in the data collection exercise, a series of state level orientation workshops and city reconnaissance missions were undertaken. The goal of the workshops was to acquaint all the key relevant stakeholders from urban local bodies (ULBs) and relevant state departments on expectations from the assessment and discuss in detail the Ease of Living assessment questionnaire, the Ease of Living online data entry tool and the data collation and submission protocols. A total of 33 state workshops were conducted.

Furthermore, dedicated city coordinators were deployed in every city as part of the city reconnaissance missions to support the cities and assist them in data collation and submission.

Data Collection

Creation of online tools to collect data . Data Collection . Citizen Surveys
Creation of data collection protocols for primary data collection

The assessment involved aggregating data across the 78 listed indicators for the quantitative Ease of Living Index, including government data or primary data collected through dipstick surveys. The main source of data for the computation of the Index involved secondary data, which was collated by city governments from various sources, including reports, surveys and government statistical reports and submitted through an online data portal (https://smartnet.niua.org/).

For three indicators, the existing datasets were found to be inadequate. For these indicators, dipstick studies were conducted, and the data was collected directly from the source using a standardised approach. The survey instruments were developed based on nationally prescribed survey formats.

11.3 Mode share of public transport

12.3 Quality of water supplied

15.4 Level of noise pollution

Additionally, to complement the Ease of Living assessment exercise, citizen perception surveys were also conducted to capture 'Citizen Pulse' with over 60,000 citizens representing various socio-economic profiles. The objective of the citizen interviews was to understand ease of living from the citizens' point of view, namely the aspects that are most important for those living in the city and their current levels of satisfaction on these parameters. However, it is important to note that in the current round of the Ease of Living Index assessment, indicator calculation and ranking is based only on 78 indicators and no weightage was provided for the citizen perception component. City wise insights from the citizen survey is included as part of the independent city assessment reports.

STEP 4

Data Verification

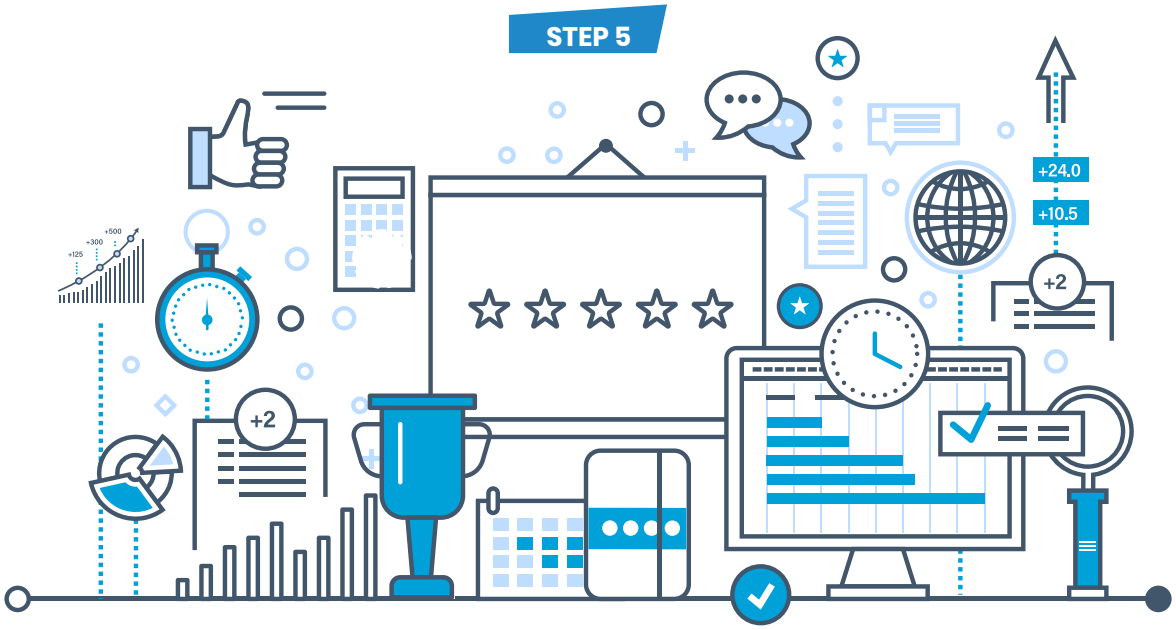
Formulation of secondary and physical audit protocols
Audit of secondary data provided by cities . Finalisation of datasets

The assessment involved three rounds of data quality checks to establish data accuracy, validity, and reliability. The types of quality control procedures and validation checks applied included consistency checks, identification of outliers, missing data and sector specific fact checks.

Furthermore, a combination of secondary evidence-based reviews and primary audits were deployed to evaluate the reliability of the data provided by the cities. A thorough review of supporting documents such as internal records, DPRs, log books etc. provided by cities against the data submitted on the Ease of Living online data entry portal was undertaken for ensuring data consistency.

For eight select indicators, random audits and site visits were conducted to validate the submission of data by the cities.

- 1.2 Percentage of services integrated through Command and Control Centre
- 2.3 Hotel occupancy
- 3.4 Percentage of schools with access to digital education
- 5.1 Number of streets, public places, junctions covered through surveillance systems
- 6.4 Percentage of vendors registered and provided formal spaces
- 11.7 Availability of Passenger Information System
- 11.11 Percentage of traffic intersections with pedestrian crossing facilities
- 11.12 Extent to which universal accessibility is incorporated in public rights-of-way



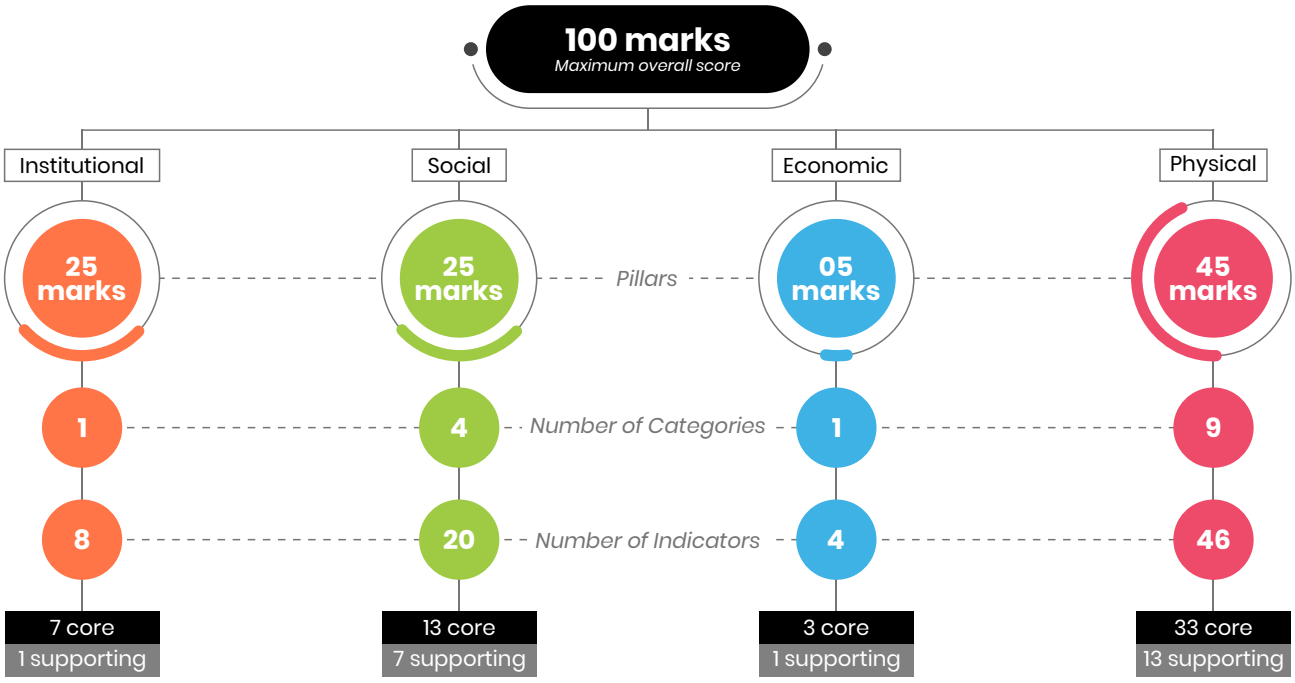
Scoring and Ranking of the Cities

Indices development and visualisation . Preparation of assessment report

The Ease of Living Index measures cities on indicators across 4 pillars, which were further sub-divided into 15 categories and rates the overall ease of living of the selected city on a scale of 0 to 100. Each city receives an overall index rank which is a cumulative score across the 15 categories and a separate rank for each individual pillar (Institutional sub-index, Social sub-index, Economic sub-index and Physical sub-index).

The scoring methodology can be summarised in the following five steps:

1. The pillar weights, as prescribed in the Ease of Living methodology document, are as follows: Institutional (25 points), Social (25 points), Economic (5 points) and Physical (45 points). Within each pillar, the scores are equally divided across the categories under it. For example, the overall score for the "Social" pillar is 25, and it has four categories (Identity and Culture, Education, Health and Safety and Security) under it. Hence, each category gets a total score of 6.25 (i.e., 25/4).



2. Within each category, the weights are divided across the core and supporting indicators. A core indicator carries 70% weightage, while a supporting indicator carries 30% weightage. This establishes scores for each indicator across the categories and pillars.

No	Category	Pillar	No. of Indicators			Weights		Category Wise Maximum Scores		
			Core	Supporting	Total	Core	Supporting	Core	Supporting	Total
1	Governance	Institutional	7	1	8	3.37	1.44	23.56	1.44	25
2	Identity & Culture	Social	3	2	5	1.62	0.69	4.86	1.39	6.25
3	Education	Social	4	2	6	1.29	0.55	5.15	1.10	6.25
4	Health	Social	3	2	5	1.62	0.69	4.86	1.39	6.25
5	Safety & Security	Social	3	1	4	1.82	0.78	5.47	0.78	6.25
6	Economy & Employment	Economic	3	1	4	1.13	0.48	4.52	0.48	5
7	Housing & Inclusiveness	Physical	2	0	2	2.50		5.00	0.00	5
8	Public Open Space	Physical	2	0	2	2.50		5.00	0.00	5
9	Mixed Land Use & Compactness	Physical	2	0	2	2.50	0.35	5.00	0.00	5
10	Power Supply	Physical	4	5	9	0.81	0.25	3.26	1.74	5
11	Transportation & Mobility	Physical	6	6	12	0.58	0.44	3.50	1.50	5
12	Assured Water Supply	Physical	4	2	6	1.03		4.12	0.88	5
13	Waste Water Management	Physical	5	0	5	1.00		5.00	0.00	5
14	Solid Waste Management	Physical	3	0	3	1.67		5.00	0.00	5
15	Reduced Pollution	Physical	5	0	5	1.00		5.00	0.00	5
			56	**22**	**78**			**89.29**	**10.71**	**100**

3. For some cities, certain indicators are not - applicable (e.g., some cities are not mandated to collect professional taxes, meaning that the indicator on the efficiency of professional tax collection does not apply to that city). In such cases, the indicator is excluded from the list for that city, and step (2) above is re-calculated. Effectively, this means that the same overall score for the category is spread across a fewer set of indicators (excluding those non-applicable). Due diligence measures in the form of secondary data audits and consultations with the city managers were undertaken to ensure that only those indicators that are verifiable for a non-applicable category are excluded on a city to city basis. The list of non-applicable indicators is presented in Annexure A.

4. Dimensional Index Methodology has been used to compute scores for each indicator with reference to 'maximum within the comparison group' or 'absolute benchmarks'. This implies that to score cities on the indicators, one of two approaches are employed depending upon the indicator. Where there are absolute national or international benchmarks available for an indicator (e.g., water provision per capita), the benchmark is used as the upper limit for scoring. In other words, any city which performs at or above the benchmark gets the same score, which is the maximum score possible for that indicator. The list of indicators and the absolute benchmarks are provided in Annexure B.

Type 1 - National benchmark available			
Example indicator - Percapita supply of water			
City	**Population**	**Supply** (Benchmark value - 135 lpcd)	**Score** (Max 1.5)
A	5 million	135 lpcd	1.5
B	6 million	110 lpcd	1.11
C	2 million	100 lpcd	0.95
D	3 million	150 lpcd	1.5
E	2.5 million	40 lpcd	0

Score of City (i) = 1.5*(lpcd of city i - 40)/(135-40)

- Since 135 is the benchmark performance, any city which is performing at 135 lpcd or greater gets full marks (1.5 marks)
- The lowest performing city (City E) is given the score of zero for the indicator
- Other cities are given proportionate scores, irrespective of the population classification they belong to

In cases where absolute benchmarks are not available, the best performing city is treated as the benchmark, and other cities are given marks proportionately. To ensure comparability, best performing cities are identified by relevant population group, so that cities are compared only with those cities in a similar population range (for indicators where a population effect is relevant). The city classifications, which is based on 2011 census population, are given in the table below:

Classification	Population Range
Classification 1	Population ≥ 4 million
Classification 2	1 million ≤ Population < 4 million
Classification 3	0.5 million ≤ Population < 1 million
Classification 4	Population < 0.5 million

Since this relative approach is sensitive to outliers, the city data was tested for outliers before scoring.

Type 2 - No national benchmark available			
Example indicator - Number of cultural/ sports events hosted by the city			
City	**Population**	**No of events**	**Score** (Max 0.75)
A	5 million	150 *(max. in its population classification)*	0.75
B	6 million	120 *(min. in its population classification)*	0
C	2 million	40 *(min. in its population classification)*	0
D	3 million	45	0.375
E	2.5 million	50 *(least in its population classification)*	0.75

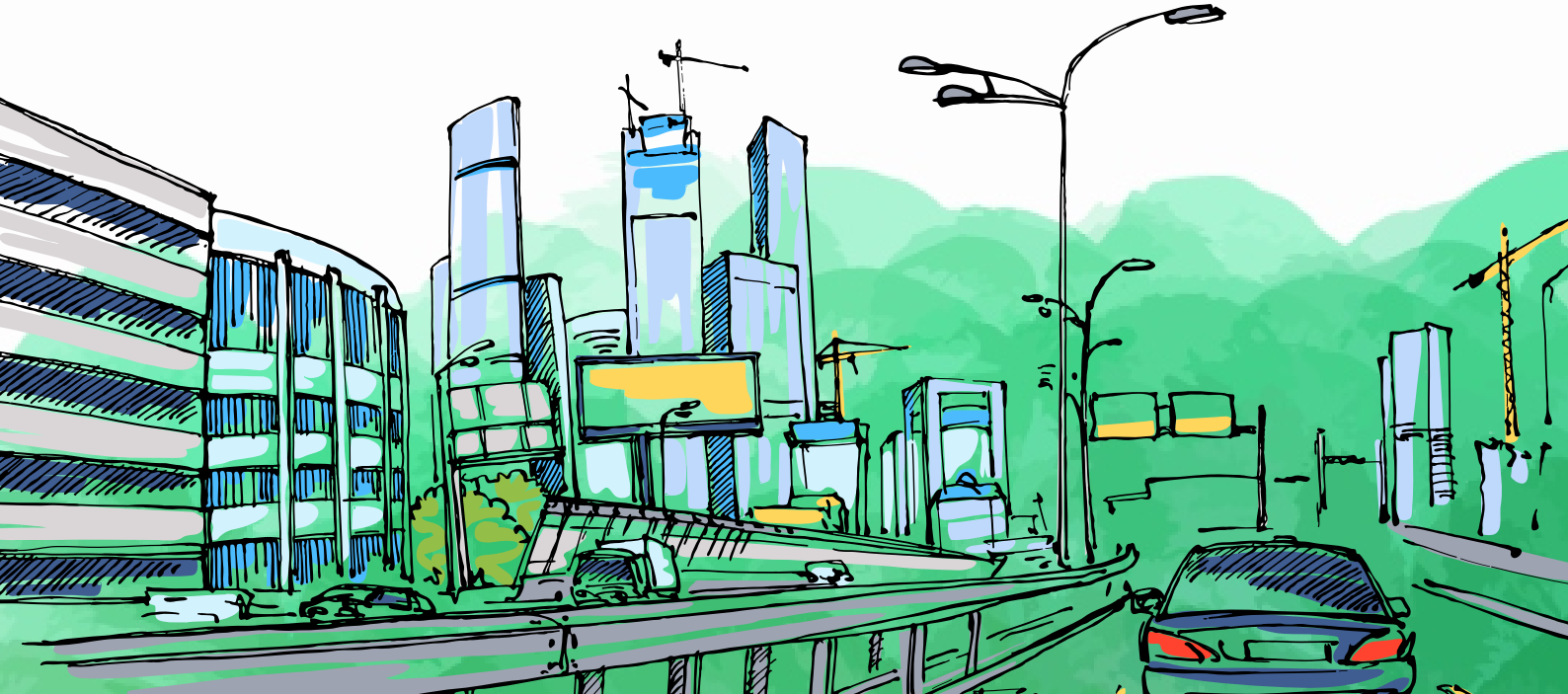
Score of city (i) in population classification 1 = 0.75*(no. events in city i - lowest no. events in population classification 1)/(highest no. events in population classification 1 - lowest no. events in population classification 1)

Since there is no benchmark, we calculate scores on a relative basis. This happens at the level of each population classification. Within each population classification, the best performing city is given full marks (0.75), the lowest performing city is given the score of zero, and all other cities are given proportionate scores.

5. Finally, the scores on each indicators are adjusted for the quality of data. Since indicators are calculated based on the data provided by the cities, it is important that the quality of data is also reflected in the scores. The data provided by cities is categorised into one of three groups: (a) data which is backed up by secondary documentation (e.g., Detailed Project Reports, MIS reports, SLIP, Comprehensive Mobility Plan, Smart City Proposal etc.), (b) data which comes with a specific letter of undertaking from the city manager and/or head of departments, and (c) data which is entered into the portal without the above substantiation. Discounts are given to scores calculated based on data types (b) and (c).

02

Mapping Ease of Living in India



2.1 Overall Rankings

INDIA'S MOST LIVEABLE CITIES IN 2018

The Ease of Living Index was formulated with the ultimate goal of being able to rank the cities on the quality of lives led by their citizens.

Ease of Living Index 2018 — National Average : 35.64/100

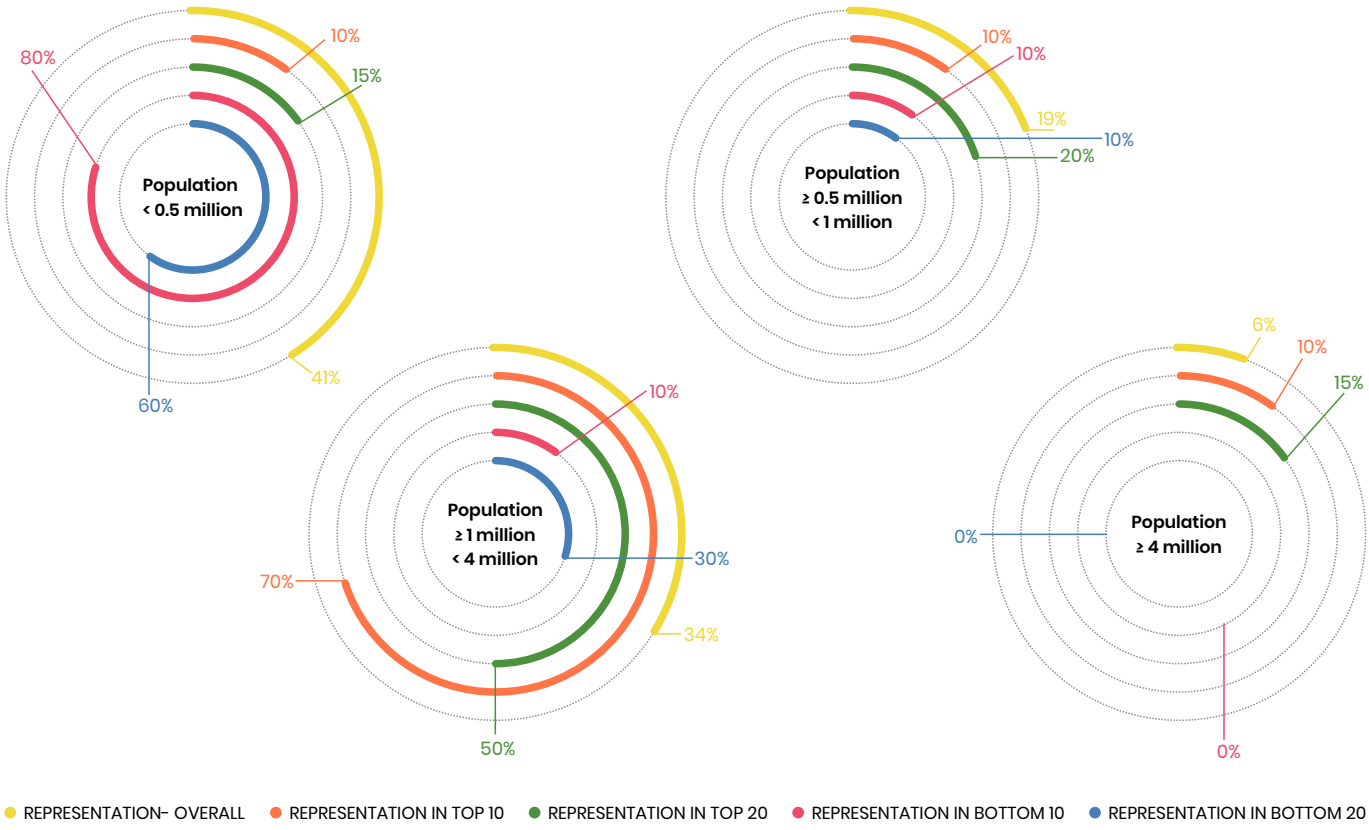
Top 10 Performers			Bottom 10 Performers		
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Pune	58.11	102	Silvassa	22.71
2	Navi Mumbai	58.02	103	Saharanpur	22.21
3	Greater Mumbai	57.78	104	Kavaratti	21.04
4	Tirupati	57.52	105	Pasighat	20.83
5	Chandigarh	53.16	106	Itanagar	20.81
6	Thane	52.27	107	Bhagalpur	20.40
7	Raipur	50.58	108	Bihar Sharif	18.84
8	Indore	50.16	109	Patna	18.67
9	Vijayawada	49.27	110	Kohima	18.13
10	Bhopal	49.11	111	Rampur	17.00

Out of the 111 cities that were assessed in the premier Ease of Living Index, Pune (Maharashtra) has topped the rankings, with Navi Mumbai (Maharashtra) coming in the 2nd place followed by Greater Mumbai (Maharashtra) in the 3rd. The remaining cities in the top 10 (in order), include: Tirupati (Andhra Pradesh), Chandigarh (Chandigarh), Thane (Maharashtra), Raipur (Chhattisgarh), Indore (Madhya Pradesh), Vijayawada (Andhra Pradesh) and Bhopal (Madhya Pradesh).

The top positions in each of the sub-indices are occupied by the top 5 cities in the overall rankings: Navi Mumbai scores the highest in the Institutional sub-index, Tirupati in Social sub-index, Chandigarh in Economic and Greater Mumbai in Physical sub -index. Due to its high weightage, the Physical sub-index, influences the overall ranks the most (correlation coefficient[7] of 0.94).

As the highest ranking city in the Ease of Living Index, Pune is also amongst the most consistent overall performing city across all pillars - it is among the top 10 cities in all of the four sub-indices. Navi Mumbai appears among the top 10 cities in 3 of the 4 sub-indices, while Greater Mumbai is present among the top 10 in 2 of the 4 sub-indices.

Mid-size cities with population in the range of 1-4 million perform the best overall, with significant over-representation in the top 10 and top 20 ranks. Conversely, smaller cities (with population less than 0.5 million) underperform on an aggregate basis. This trend could be attributed towards a combination of factors-critical size for attracting investments, economic activity, large infrastructure spending, as well as a fundamental gap in effective data collection and management.



[7]Correlation Co-efficient is a measure of the strength and direction of the linear relationship between two variables

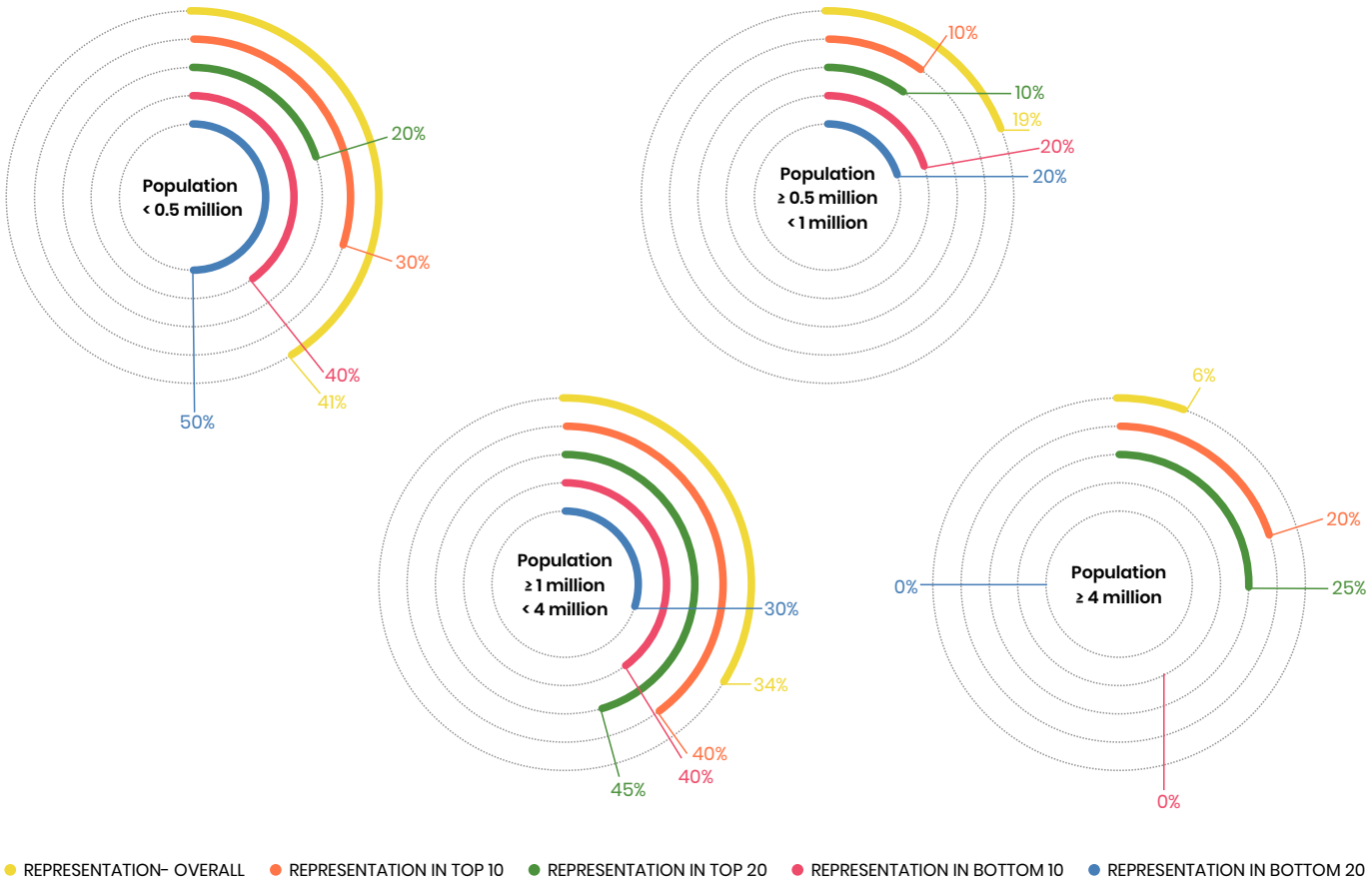
2.2 Institutional Sub-Index

A well governed city is better prepared to overcome the challenges associated with urban service delivery and is able to offer quality urban living to its citizens. Navi Mumbai (Maharashtra) is the best performer on the Institutional sub-index, followed by Tirupati (Andhra Pradesh), Karim Nagar (Telangana), Hyderabad (Telangana) and Bilaspur (Chhattisgarh). These cities are known for their responsive city governments and innovative governance models, including digital governance, high tax collection efficiency and opportunities for participatory growth. At other end of the table, the cities that scored the least under this sub-index are Saharanpur (Uttar Pradesh), Kohima (Nagaland), Srinagar (Jammu and Kashmir), Jammu (Jammu and Kashmir) and Shillong (Meghalaya).

Institutional Sub Index 2018 — National Average: 9.15/25

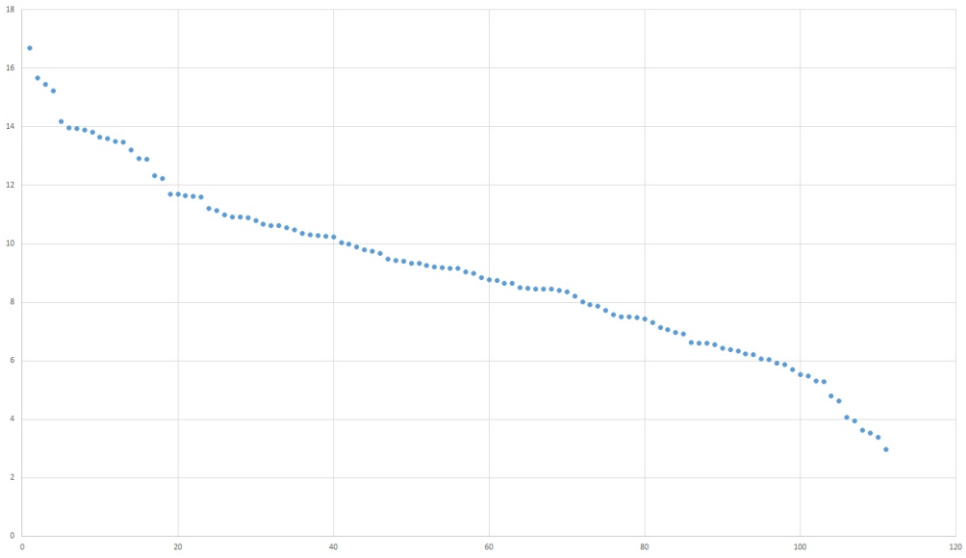
Top 10 Performers			Bottom 10 Performers		
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Navi Mumbai	16.70	102	Port Blair	5.32
2	Tirupati	15.68	103	Aurangabad	5.28
3	Karim Nagar	15.46	104	Kanpur	4.80
4	Hyderabad	15.23	105	Rampur	4.63
5	Bilaspur	14.17	106	Patna	4.05
6	Kochi	13.96	107	Saharanpur	3.94
7	Ahmedabad	13.93	108	Kohima	3.62
8	Pune	13.88	109	Srinagar	3.54
9	Vijayawada	13.81	110	Jammu	3.39
10	Visakhapatnam	13.63	111	Shillong	2.96

A comparative assessment of representation of cities by population group shows that larger cities (having population in the range of 1-4 million and over 4 million) have significant representation among the top performers. Especially, very large cities (with population greater than 4 million) do well on this sub-index, perhaps due to availability of scale to implement e-governance, and efficient systems to focus on cost recovery and tax collection.



Analysis of the score distribution shows that with the exception of the top 5 cities, the score transition is gradual, till the bottom 10 cities, where differences are again more pronounced.

Distribution of Scores - Institutional sub-index



2.3 Social Sub-Index

Social infrastructure, such as hospitals and public health services; primary and secondary schools; supporting cultural events; sporting events and emergency services create the conditions needed to promote the health and well-being of all city residents. The access to, and the reliability and quality of services available in the cities are key components for ease of living.

In the Social sub-index, Tirupati (Andhra Pradesh) tops the list. Tiruchirappalli (Tamil Nadu), which is ranked 12th overall in the Ease of Living Index, is positioned as the 2nd best city in this sub-index followed by Navi Mumbai (Maharashtra), Chandigarh (Chandigarh) and Pune (Maharashtra).

Social Sub Index 2018 — National Average: 10.92/25

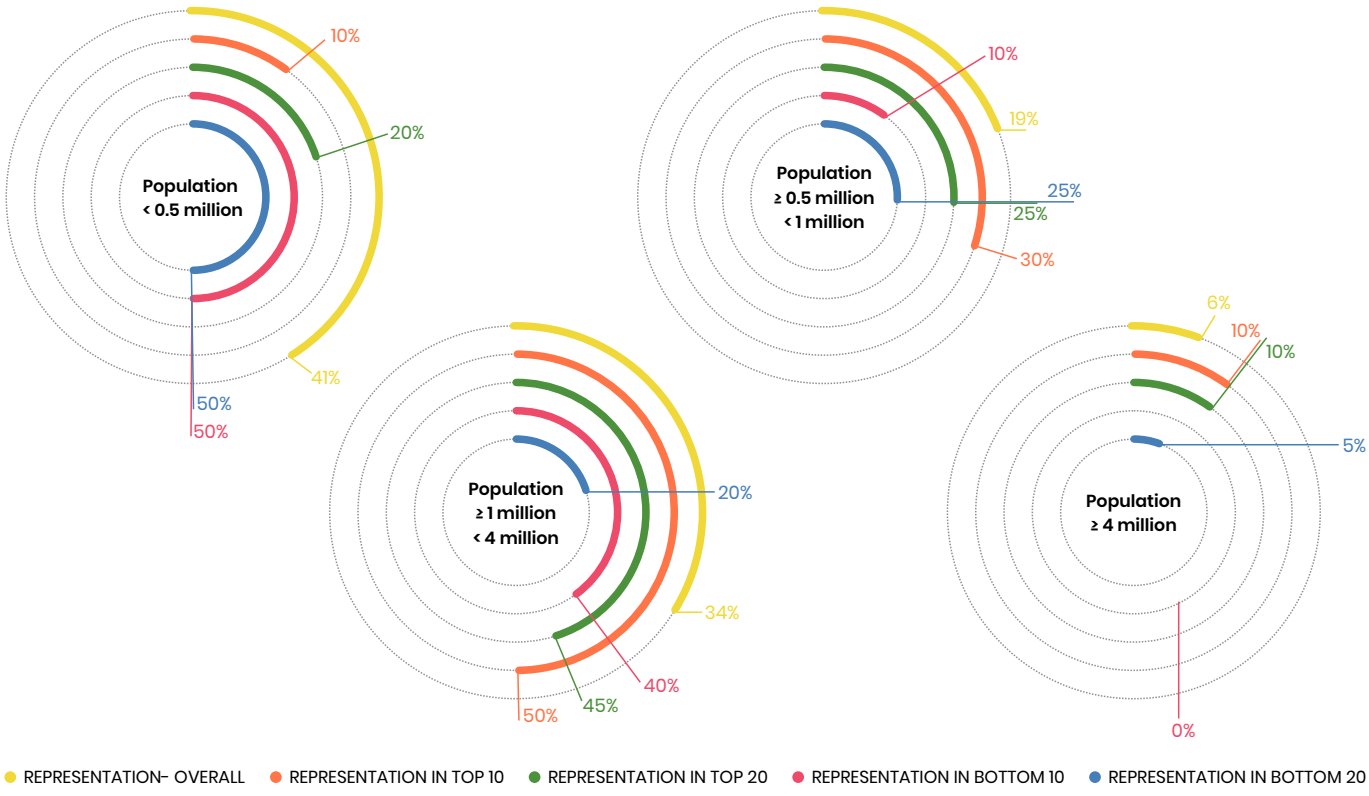
Top 10 Performers			Bottom 10 Performers		
Rank	City Name	Score	Rank	City Name	Score
1	Tirupati	18.90	102	Lucknow	7.45
2	Tiruchirappalli	18.57	103	Aligarh	7.40
3	Navi Mumbai	17.92	104	Meerut	7.28
4	Chandigarh	17.91	105	Raebareli	7.24
5	Pune	16.82	106	Kavaratti*	6.89
6	Greater Mumbai	15.60	107	Ghaziabad*	6.89
7	Amravati	15.28	108	Bihar Sharif	6.74
8	Vijayawada	15.18	109	Itanagar	5.98
9	Indore	15.16	110	Patna	5.91
10	Vasai-Virar	15.10	111	Rampur	5.58

* Rounded off to the nearest decimal

The category of education influences the Social sub-index the most (correlation coefficient of 0.79) followed by health (0.71) and identity and culture (0.70). The category of safety and security has the least influence on the rankings (correlation coefficient of 0.49) for the Social sub-index. However, examining the performance of the top 10 cities reveals that the scores of the cities are mainly influenced by their

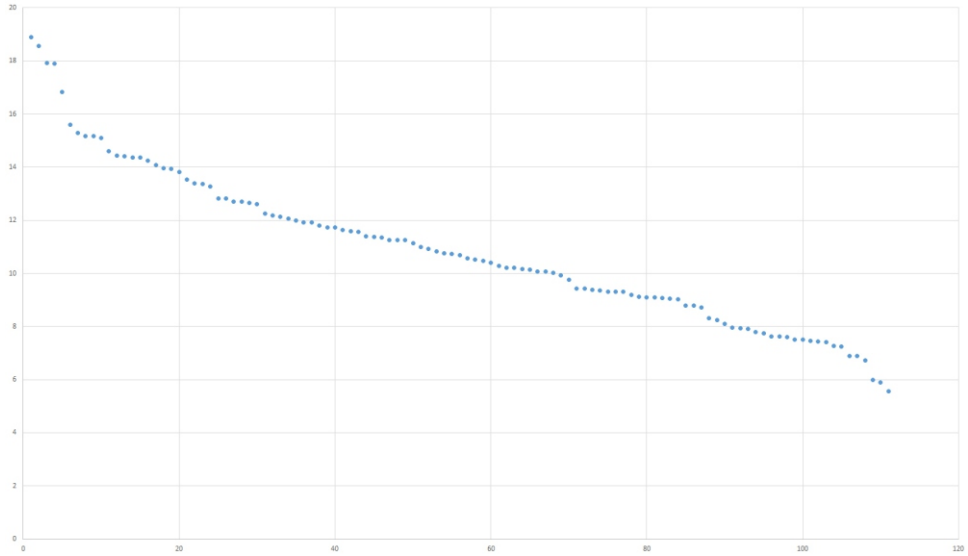
performance in the category of safety and security followed by identity and culture and health. Safety and security has a correlation coefficient of 0.86, while education and health has 0.79 and 0.71, respectively. This could indicate that the best performing cities are able to differentiate themselves through technology enabled innovative initiatives in safety and security, compared to other areas (education and health) where intervention models have more or less stabilised.

Analysis of the representation of cities based on the population classification reveals a trend that is almost similar to overall Index, indicating that population does not play a significant role in determining performance on this sub-index. Mid-size cities with a population of 1-4 million have the highest representation among the top 10 and top 20 cities.



Analysis of the score distribution shows a gradual transition. Notable outlier to this are Tirupati, Tiruchirappalli, Navi Mumbai, Chandigarh and Pune among the top performing cities.

Distribution of Scores - Social sub-index



2.4 Economic Sub-Index

For a city to be liveable, it needs to fulfil several basic conditions, the most important of which are related to the economy. The economic aspects of the Ease of Living Index include consumer markets, human capital and resources, and real-estate activities. A city's development is also influenced in a large measure by its informal economy. Chandigarh (Chandigarh) scores the highest in the Economic sub-index, followed by Ajmer (Rajasthan), Kota (Rajasthan), Indore (Madhya Pradesh) and Tiruppur (Tamil Nadu). There is no significant variance in the scores of the top 10 cities- Chandigarh, ranked 1st , scores only 0.62 more than Vijayawada (Andhra Pradesh), ranked 10th. The cities that are rated low in this Index are Kohima (Nagaland), Kavaratti (Lakshadweep) and Delhi[8] (National Capital Territory of Delhi).

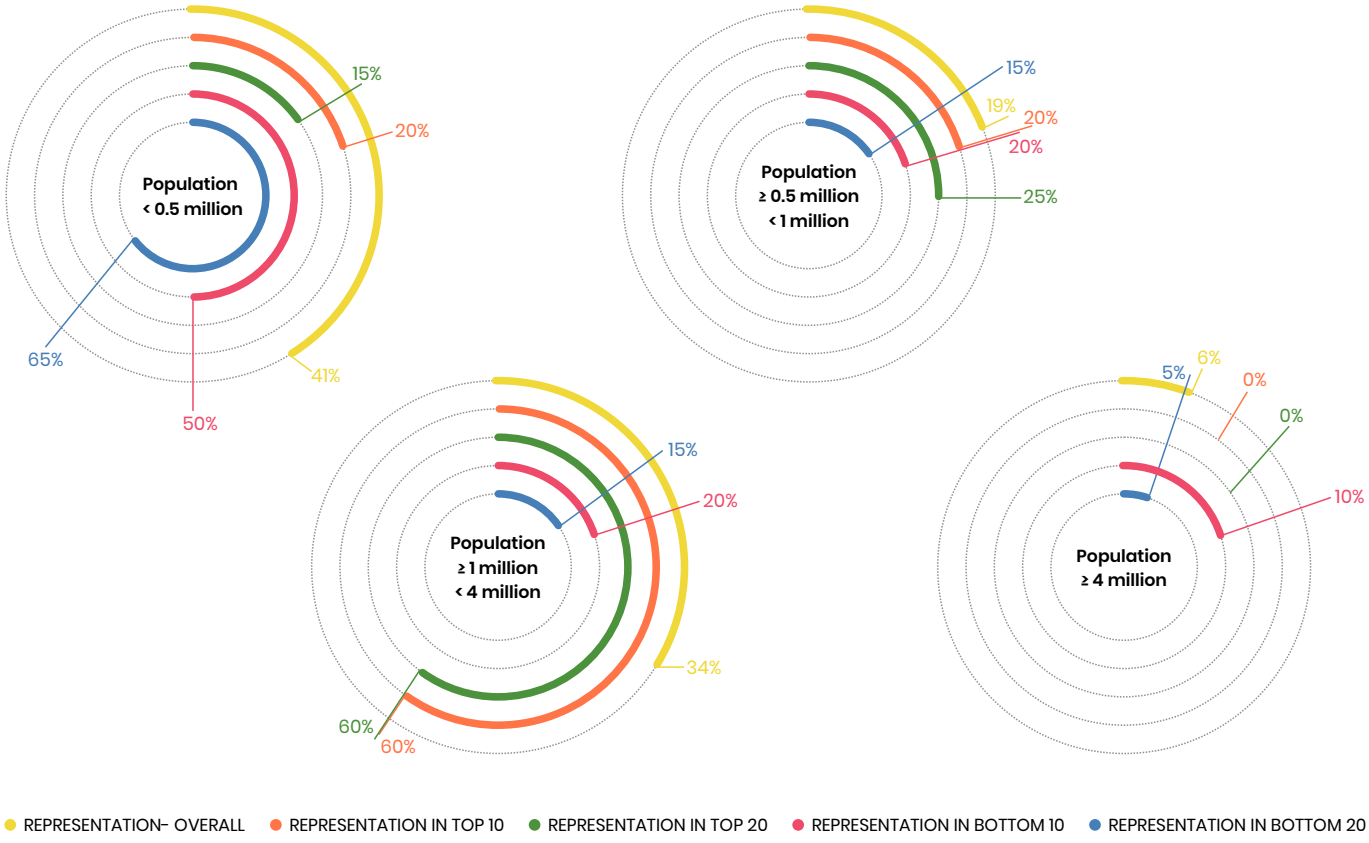
₹ Economic Sub-Index 2018 — **National Average: 2.17/5**

Top 10 Performers			Bottom 10 Performers		
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Chandigarh	3.78	102	Port Blair	1.41
2	Ajmer	3.73	103	Pasighat	1.29
3	Kota	3.71	104	Saharanpur	1.28
4	Indore	3.60	105	Jammu	1.04
5	Tiruppur	3.56	106	Faridabad	0.94
6	Itanagar	3.44	107	Gandhinagar	0.91
7	Pune	3.44	108	Patna	0.71
8	Ludhiana	3.39	109	Delhi	0.12
9	Thane	3.22	110	Kohima	0.00
10	Vijayawada	3.16	111	Kavaratti	0.00

The performance of the cities under this sub-index depends more on their ability to enable economic development (construction permits, VAT and Professional Tax collection and provision of formal spaces to vendors). It is also important to note that 3 of the 4 indicators under this category measure growth and therefore provide an advantage to smaller cities which are witnessing faster growth on these indicators. The high scores of the top 10 cities can be explained by the fact that these cities have taken steps to create an enabling environment for this kind of growth and development.

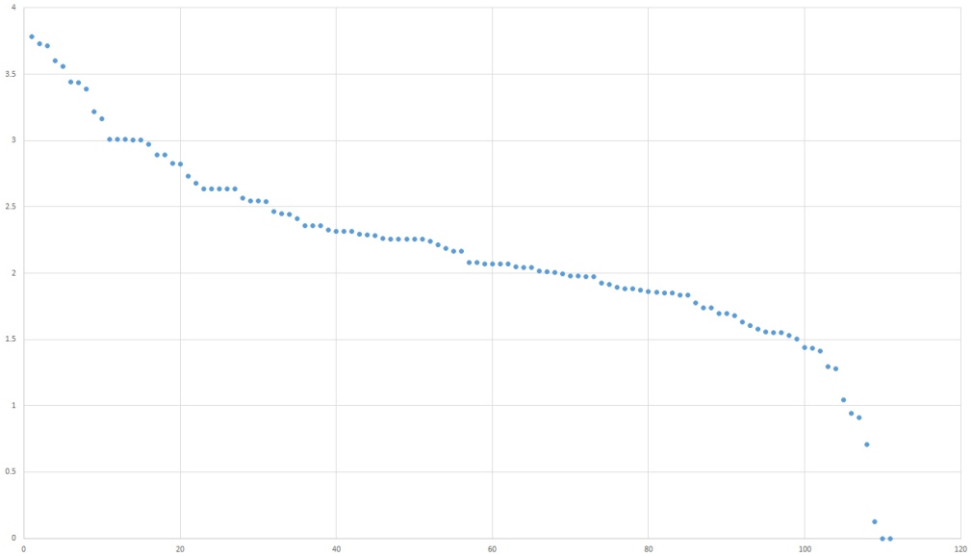
[8]City of Delhi includes the following municipal corporations: New Delhi Municipal Corporation, South Delhi Municipal Corporation, North Delhi Municipal Corporation and East Delhi Municipal Corporation.

Mid-size cities having a population in the range of 1-4 million perform the strongest while large cities (population greater than 4 million) appear to underperform in this sub-index.



Scores of cities under this sub-index show large variation at the either extremes -the top 10 and bottom 10 cities have significant differential score with the median. Addressing this variation and improving the overall performance of the city portfolio requires customisation and replication of good practices implemented by the best performing cities.

Distribution of Scores - Economic sub-index



2.5 Physical Sub-Index

A city that is easy to live in is able to provide its citizens with high quality and sustainable urban infrastructure including housing; basic services (such as water and waste water management, solid waste management; transportation and pedestrian facilities), and adequate power among others. The Ease of Living Index defines 9 distinct categories under this pillar: housing, open spaces, mixed land use, power supply, transportation and mobility, assured water supply, waste water management, solid waste management and reduced pollution.

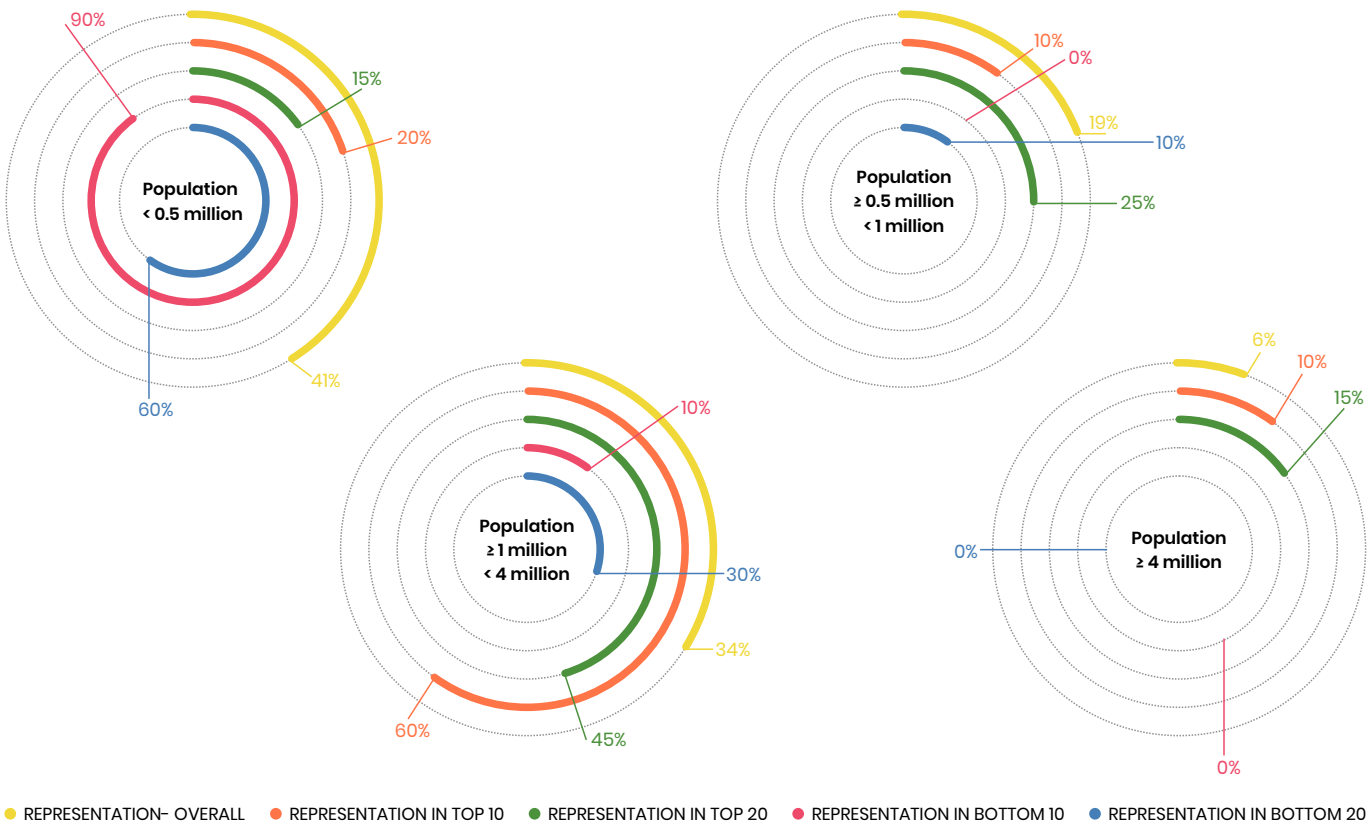
Greater Mumbai (Maharashtra), Pune (Maharashtra) and Thane (Maharashtra) top this sub-index. Larger cities having population greater than 1 million account for 7 out of the top 10 rankings, with Chandigarh (Chandigarh), Tirupati (Andhra Pradesh) and Bilaspur (Chhattisgarh) being the outliers. The cities that fare poorly under this sub-index are Bhagalpur (Bihar), Rampur (Uttar Pradesh) and Itanagar (Arunachal Pradesh).

The category of assured water supply (correlation coefficient of 0.82) influences the Physical sub-index score the most followed by waste-water management (0.76) and solid waste management (0.75). Among the top 10 cities, however, the category of mixed land-use and compactness (correlation coefficient of 0.86) influences the Physical sub-index most.

Physical Sub-Index 2018 — **National Average: 19.758/45**

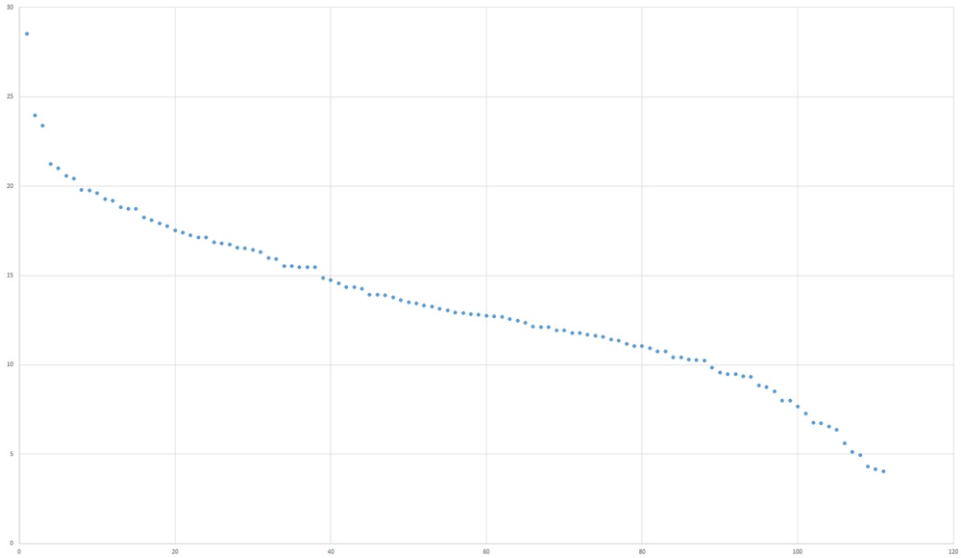
Top 10 Performers			Bottom 10 Performers		
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Greater Mumbai	28.53	102	Kohima	6.76
2	Pune	23.97	103	Kavaratti	6.73
3	Thane	23.40	104	Imphal	6.55
4	Chandigarh	21.24	105	Pasighat	6.37
5	Raipur	21.00	106	Silvassa	5.60
6	Tirupati	20.58	107	Aurangabad	5.14
7	Navi Mumbai	20.43	108	Bihar Sharif	4.96
8	Bhopal	19.81	109	Itanagar	4.32
9	Bilaspur	19.76	110	Rampur	4.16
10	Visakhapatnam	19.61	111	Bhagalpur	4.03

It is observed that cities with population over 1 million generally perform better than average on this sub-index, possibly implying economies of scale in creation of physical infrastructure, as well as pointing out to greater attention these cities garner in both direct devolution to cities as well as project allocation.



Based on the distribution of scores, it is evident that the top three cities – Greater Mumbai, Pune and Thane are clear outliers vis-à-vis the rest of the cities. It is also interesting to note that these cities have reported high level of own revenue and this could be positively linked to greater availability of physical infrastructure.

Distribution of Scores - Physical sub-index



2.6 Peer City Comparison

When considering city development strategies, it is helpful to examine the performance of a city relative to that of peer cities that embody similar characteristics. The Ease of Living Index considers four distinct city classifications based on demographic characteristics for comparison and also presents ranking of cities within each classification. Out of the 78 indicators, 22 are relative in nature, where cities are compared against cities in the same population classification groups. This levels the playing field for all cities and is also reflected in the rankings, which have a diverse representation of cities across population groups - especially among the top and bottom ranking cities.

Ease of Living Index 2018

Population ≥ 4 million

	Overall Rank	City	Score
Top 3 cities	3	Greater Mumbai	57.78
	14	Chennai	47.24
	19	Surat	45.44
Bottom 3 cities	27	Hyderabad	43.13
	58	Bengaluru	34.38
	65	Delhi	33.18

Population ≥ 1 million < 4 million

	Overall Rank	City	Score
Top 3 cities	1	Pune	58.11
	2	Navi Mumbai	58.02
	6	Thane	52.27
Bottom 3 cities	100	Srinagar	22.71
	101	Meerut	22.71
	109	Patna	18.67

Population ≥ 0.5 million < 1 million

	Overall Rank	City	Score
Top 3 cities	5	Chandigarh	53.16
	12	Tiruchirappalli	48.82
	16	Amravati	46.57
Bottom 3 cities	89	Moradabad	28.19
	95	Jammu	25.71
	103	Saharanpur	22.21

Population < 0.5 million

	Overall Rank	City	Score
Top 3 cities	4	Tirupati	57.52
	11	Karim Nagar	48.90
	13	Bilaspur	48.26
Bottom 3 cities	108	Bihar Sharif	18.84
	110	Kohima	18.13
	111	Rampur	17.00

Institutional Sub-Index

Population ≥ 4 million			
	Institutional Rank	City	Score
Top 3 cities	4	Hyderabad	15.23
	7	Ahmedabad	13.93
	11	Surat	13.60
Bottom 3 cities	20	Chennai	11.69
	21	Bengaluru	11.64
	23	Greater Mumbai	11.60

Population ≥ 1 million < 4 million			
	Institutional Rank	City	Score
Top 3 cities	1	Navi Mumbai	16.70
	8	Pune	13.88
	9	Vijayawada	13.81
Bottom 3 cities	107	Kanpur	4.80
	108	Patna	4.05
	109	Srinagar	3.54

Population ≥ 0.5 million < 1 million			
	Institutional Rank	City	Score
Top 3 cities	6	Kochi	13.96
	15	Ujjain	12.91
	25	Bhubaneswar	11.12
Bottom 3 cities	98	Jalandhar	5.87
	107	Saharanpur	3.94
	110	Jammu	3.39

Population < 0.5 million			
	Institutional Rank	City	Score
Top 3 cities	2	Tirupati	15.68
	3	Karim Nagar	15.46
	5	Bilaspur	14.17
Bottom 3 cities	105	Rampur	4.63
	108	Kohima	3.62
	111	Shillong	2.96

Social Sub-Index

Population ≥ 4 million			
	Social Rank	**City**	**Score**
Top 3 cities	6	Greater Mumbai	15.60
	14	Chennai	14.38
	43	Hyderabad	11.56
Bottom 3 cities	57	Surat	10.58
	71	Delhi	9.43
	97	Bengaluru	7.62

Population ≥ 1 million < 4 million			
	Social Rank	**City**	**Score**
Top 3 cities	3	Navi Mumbai	17.92
	5	Pune	16.82
	8	Vijayawada	15.18
Bottom 3 cities	104	Meerut	7.28
	107	Ghaziabad	6.89
	110	Patna	5.91

Population ≥ 0.5 million < 1 million			
	Social Rank	**City**	**Score**
Top 3 cities	2	Tiruchirappalli	18.57
	4	Chandigarh	17.91
	7	Amravati	15.28
Bottom 3 cities	99	Kochi	7.52
	100	Saharanpur	7.51
	103	Aligarh	7.40

Population < 0.5 million			
	Social Rank	**City**	**Score**
Top 3 cities	1	Tirupati	18.90
	15	Karim Nagar	14.35
	16	Tiruppur	14.24
Bottom 3 cities	108	Bihar Sharif	6.74
	109	Itanagar	5.98
	111	Rampur	5.58

Economic Sub-Index

Population ≥ 4 million			
	Economic Rank	City	Score
Top 3 cities	45	Ahmedabad	2.28
	59	Hyderabad	2.07
	63	Greater Mumbai	2.05
Bottom 3 cities	70	Chennai	1.98
	71	Bengaluru	1.98
	109	Delhi	0.12

Population ≥ 1 million < 4 million			
	Economic Rank	City	Score
Top 3 cities	3	Kota	3.71
	4	Indore	3.60
	7	Pune	3.44
Bottom 3 cities	95	Dhanbad	1.56
	106	Faridabad	0.94
	108	Patna	0.71

Population ≥ 0.5 million < 1 million			
	Economic Rank	City	Score
Top 3 cities	1	Chandigarh	3.78
	2	Ajmer	3.73
	11	Jhansi	3.01
Bottom 3 cities	94	Thiruvanan-thapuram	1.58
	104	Saharanpur	1.28
	105	Jammu	1.04

Population < 0.5 million			
	Economic Rank	City	Score
Top 3 cities	5	Tiruppur	3.56
	6	Itanagar	3.44
	14	Udaipur	3.00
Bottom 3 cities	107	Gandhinagar	0.91
	110	Kohima	0.00
	111	Kavaratti	0.00

Physical Sub-Index

Population ≥ 4 million			
	Physical Rank	City	Score
Top 3 cities	1	Greater Mumbai	28.53
	11	Surat	19.27
	12	Chennai	19.19
Bottom 3 cities	44	Hyderabad	14.26
	54	Bengaluru	13.14
	70	Delhi	11.92

Population ≥ 1 million < 4 million			
	Physical Rank	City	Score
Top 3 cities	2	Pune	23.97
	3	Thane	23.40
	5	Raipur	21.00
Bottom 3 cities	99	Allahabad	7.99
	100	Meerut	7.66
	107	Aurangabad	5.14

Population ≥ 0.5 million < 1 million			
	Physical Rank	City	Score
Top 3 cities	4	Chandigarh	21.24
	16	Amravati	18.26
	17	Tiruchirappalli	18.09
Bottom 3 cities	91	Guwahati	9.48
	92	Saharanpur	9.48
	94	Dehradun	9.33

Population < 0.5 million			
	Physical Rank	City	Score
Top 3 cities	6	Tirupati	20.58
	9	Bilaspur	19.76
	15	Erode	18.73
Bottom 3 cities	109	Itanagar	4.32
	110	Rampur	4.16
	111	Bhagalpur	4.03

03

From Index to Action

While the 'Ease of Living' Index is a diagnostic tool that evaluates the quality of living in cities, it also defines new agendas and action plans. Decision makers can use this tool across various aspects of planning, implementation and evaluation to increase value for money for resource allocation and budgetary support, and to drive city ecosystems to improve equilibria. Some of the key actions that could lead from the assessment process are explored below:

A. Addressing data gaps

The Ease of Living Index is composed of a comprehensive set of indicators with varying degrees of complexity in data collection. While efforts have been made to collect the data across cities through a homogenous approach, the exercise highlights the need to develop protocols for a) collection of new datasets and b) homogenising standards for existing datasets.

A city's GDP is a prime candidate for development of protocols for collection of new datasets. Given that the key driver of population convergence to cities is economic growth, measurement of city GDP is vital to recalibrate and plan interventions, enhance ease of doing business at a local level, and set expectations for revenue realisation for city governments. Currently in India, GDP is measured at the national and state level, and there are no cogent approaches for measurement at the city level. The study has identified a shortlist of approaches for measuring city GDP, considering the current datasets available with national and local (administrative) statistical organisations. Piloting city GDP calculation in a subset of cities, and rolling out a stabilised protocol can break new ground in this space. The Ministry intends to come out with operational guidelines on the methodology for city GDP calculation, and this would ideally be included in the next round of the Ease of Living assessment.

There are many indicators which can benefit from improved data collection protocols. New technologies offer an opportunity to strengthen the measurement and collection techniques. Some examples include: using drones for spatial mapping (e.g., updating city cadastres and property registers through drones, which are being done in some cities already), using crowdsourcing data platforms to get demand side experience from citizens (e.g., mobile based applications for monitoring road quality and mobility), and use connected devices to automatically monitor performance (e.g., automatic air and water quality monitors, flow meters, power quality and disruption trackers). Many of these technologies (in pilots) have proven to be cost effective, improve data accuracy, and can serve as recipes for more effective planning and implementation.

Finally, improvements in homogenising data reporting and interoperability can yield high returns in the short term with respect to high quality of data. Data (indicators) definitions and reporting standards are understandably diverse, especially given that ease of living is a function of conjoint service provision by city authorities, para-statal agencies and state departments. The Ministry will seek to empower cities on such standardised data collection and reporting by building capacities at city and state department levels through its SmartNet Portal.

B. Enhance city-level decision making

A second area of action that theIndex triggers is enhancing city-level decision making. The Ease of Living Index can guide actions of city governments at portfolio, project and administrative levels.

At a portfolio level, the Index can help cities prioritise on avenues for expenditure. Since the Index is granular at the category and indicator level, cities can accordingly balance resource allocation (e.g., for infrastructure development) in areas which require the most improvement. While most cities have already identified a portfolio of citywide projects in their Smart City Proposals or AMRUT Service Level Improvement Plans (SLIPs), the Index can help validate these and if required, revisit the expenditure and sequencing.

Tactically, the Index can be used to develop strategies for better integration of projects and help in acquainting city officials to good practices on administrative convergence (e.g., integrated command and control centres, grievance redressal, participatory planning through ward committees, and data sharing across departments).

C. Improve access to resources

Transparently linking resourcing to performance and need gaps is increasingly demanded by funders, and the Ease of Living Index can serve as an objective and authoritative source of insight for this. Performance based funding approaches can be applied across devolved finance (from state and centre), external funding (debt and equity) and internal funding (city's own revenues).

Central and State Finance Commissions have identified and mainstreamed performance grants as a key tool to incentivise better use of resources. The Ease of Living Index can, for example, serve as the measurement criteria for allocation of funds by either the central government or state governments, either on a performance basis or preferably a combination of the two.

Given that service level improvement is the core objective of most of the projects (in Smart Cities Mission AMRUT, HRIDAY etc.), the Ease of Living Index becomes a tool to shape procurement and contracts from the private sector as well. Exploring alternative finance options such as impact funding requires a neutral and authoritative measurement of outcomes as a prerequisite. This enables city governments to award outcome-based projects and test 'pay for outcome' models which can significantly increase value for money of public spending.

Finally, the Ease of Living Index provides cities a gauge to assess potential for value capture to feedback into internal resourcing. Property tax revisions and service charge revisions should ideally be linked to ease of living and levels of actual service delivery to be justifiable to citizens. Transparently showcasing improvements in ease of living can be a powerful argument to substantiate appropriate levels of value capture.

D. Facilitate learning and capacity building

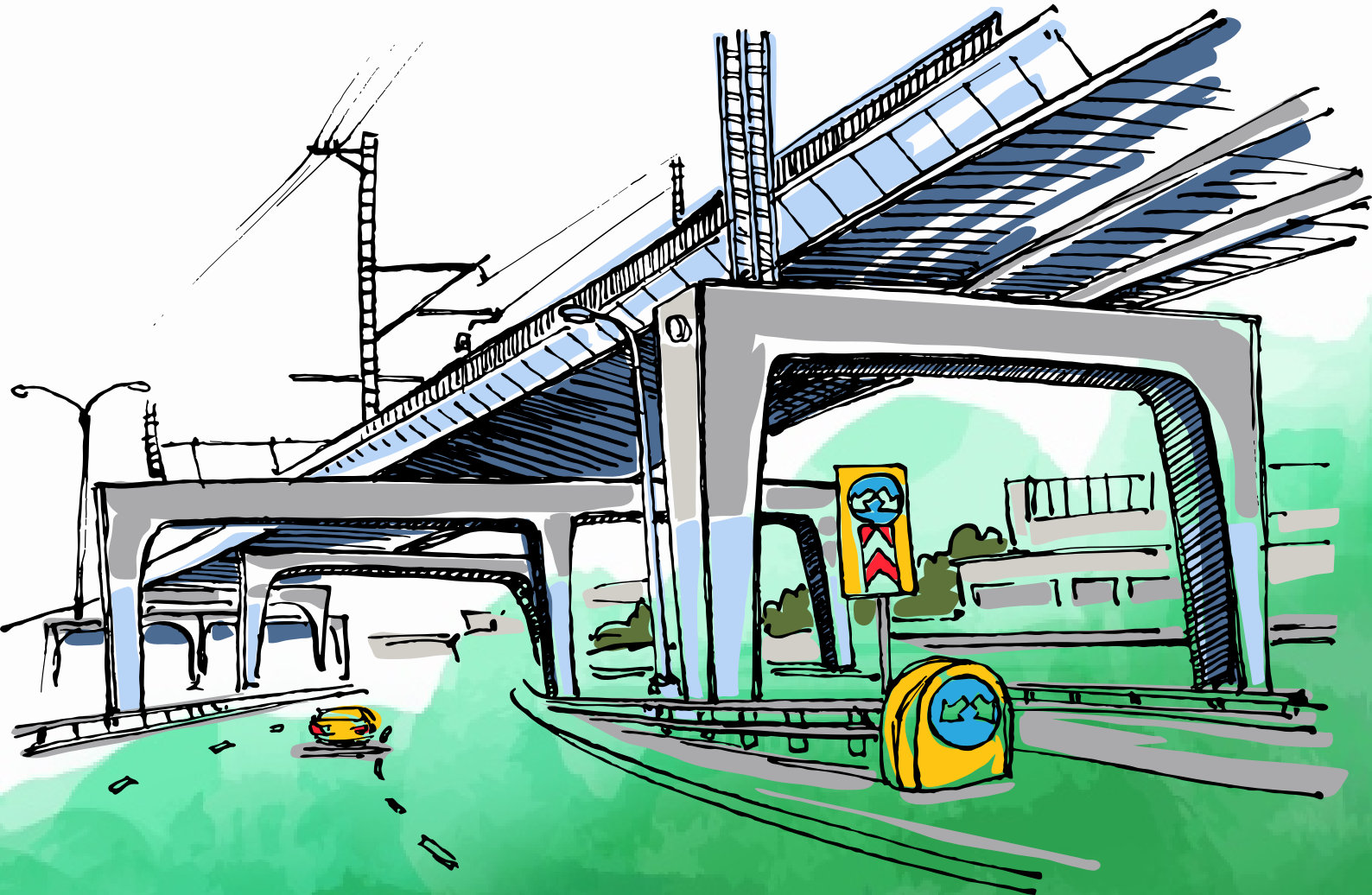
One of the most powerful use-cases of such an index is its potential to aggregate experiences across cities and flatten the learning curve. Over time, the Index will enable identification of cities which have witnessed the highest improvements by thematic area. Close investigation of these cities can help uncover models of successful intervention (e.g., type of project, governance structure, citizen behavior, financing, project management, stakeholder management) which is best suited to addressing

contextual challenges for different types of cities. Normative influences can have a powerful effect in federal contexts like India, in large part due to greater acceptance of approaches which have been 'tried and tested' in similar settings. The Ministry proposes to facilitate such peer learnings through its SmartNet Portal.

E. Shaping local electoral discourse

Finally, the transparency which the Ease of Living Index brings to citizens can potentially become a powerful tool to shape the principal – agent compact via the local electoral discourse. While city managers and officials are in charge of day-to-day service delivery, elected representatives play a key role in garnering and deploying resources for the city's improvement. Data driven scorecards of performance can help increase the quality of interface between citizens and elected representatives, and expand citizen interest at the third level of governance.

Glossary



Atal Innovation Mission (AIM), launched by the NITI Aayog, is Government of India's endeavour to promote a culture of innovation and entrepreneurship. Its objective is to serve as a platform for promotion of world-class innovation hubs, grand challenges, start-up businesses and other self-employment activities, particularly in technology oriented areas.

The Government of India launched the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015 with the focus on providing basic civic amenities like water supply, sewerage, urban transport, parks. The emphasis of the mission is on infrastructure creation that has a direct link to quality of urban life.

Launched in 2015, Digital India focuses on improving the digital infrastructure and internet connectivity to deliver e-governance services to the citizens of India.

National Heritage City Development and Augmentation Yojana (HRIDAY) seeks to preserve and rejuvenate the rich cultural heritage of the country by promoting an integrated, inclusive and sustainable development of heritage sites, focusing not just on the maintenance of monuments, but also on the advancement of the entire ecosystem including its citizens, tourists and local businesses.

"Housing for All by 2022" Mission – National Mission for Urban Housing was launched in 2015 with the following components:

a) Slum rehabilitation of slum dwellers with participation of private developers using land as a resource;

b) Promotion of affordable housing for weaker section through credit linked subsidy;

c) Affordable housing in partnership with public and private sectors; and

d) Subsidy for beneficiary-led individual house construction or enhancement.

Credit linked subsidy component will be implemented as a Central Sector Scheme while other three components will be implemented as Centrally Sponsored Scheme (CSS).

The Make in India programme is a Government of India initiative that aims to facilitate investment and build world-class manufacturing infrastructure in the country. Launched in 2014, the programme focuses on 25 key sectors.

The National Health Mission (NHM) encompasses two sub-missions, the National Rural Health Mission (NRHM) and the National Urban Health Mission (NUHM). It was launched by the government in 2013. The main programmatic components include health system strengthening in rural and urban areas: Reproductive-Maternal-Neonatal-Child and Adolescent Health (RMNCH+A), and communicable and non-communicable diseases. The NHM envisages achievement of universal access to equitable, affordable and quality health care services that are accountable and responsive to people's needs.

The National Water Mission is one of the eight missions in the National Action Plan on Climate Change launched in 2014 to tackle the threats of global warming and environmental degradation. The objective of National Water Mission is the "conservation of water, minimising wastage and ensuring its equitable distribution both across and within states through integrated water resources development and management".

Pradhan Mantri Jan-Dhan Yojana (PMJDY) is the national mission for financial inclusion encompassing an integrated approach to bring about comprehensive financial inclusion of all the households in the country. The schemes envisages universal access to banking services namely, banking/savings and deposit accounts, remittance, credit, insurance, pension in an affordable manner. The plan also envisages channelling all government benefits (from centre/state/local body) to the beneficiaries' accounts and pushing the Direct Benefits Transfer (DBT) scheme of the union government.

Pradhan Mantri Kaushal Vikas Yojana (PMKVY) is a skill certification scheme of the Ministry of Skill Development and Entrepreneurship (MSDE). The objective of this programme is to enable a large number of Indian youth to take up industry-relevant skill training that will help them in securing a better livelihood. Individuals with prior learning experience or skills will also be assessed and certified under Recognition of Prior Learning (RPL). The scheme was launched on 15 July, 2015, on the occasion of World Youth Skills Day.

The Power for All scheme aims to achieve 24x7 power and electrification for all by 2019 through last mile connectivity and electricity connections to all remaining un-electrified households in rural as well as urban areas.

The Pilgrimage Rejuvenation and Spirituality Augmentation Drive (PRASAD) was launched by the Ministry of Tourism. It seeks to identify and develop pilgrimage tourist destinations on the principles of high tourist visits, competitiveness and sustainability in an integrated manner by synergizing efforts to focus on needs and concerns of all stakeholders to enrich religious/spiritual tourist experience and enhance employment opportunities.

Launched in 2015, the Smart Cities Mission's main objective is to promote sustainable and inclusive cities that provide core infrastructure: adequate water supply, assured electricity supply, sanitation, efficient urban mobility and public transport, affordable housing, robust IT connectivity, a clean and sustainable environment, safety and security of citizens and application of 'smart' solutions. The strategic components of the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) plus a pan-city initiative in which smart solutions are applied covering larger parts of the city

Start Up India is an initiative of the Government of India, intended to build a strong entrepreneurial eco-system for nurturing innovation and start-up businesses in the country that will drive sustainable economic growth and generate large scale employment opportunities.

The Swachh Bharat Mission (Urban) was launched in 2014. The key components are:

1) Elimination of open defecation;

2) Eradication of manual scavenging;

3) Modern and scientific municipal solid waste management;

4) To effect behavioural change regarding healthy sanitation practices;

5) Awareness generation about sanitation and its linkage with public health; and

6) Capacity augmentation for ULBs to create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance).

Annexure

A. List of Non-Applicable Indicators

Pillar	Category	Indicator
Economic	Economy and Employment	6.1 Increase in VAT/GST collection
Economic	Economy and Employment	6.2 Increase in Professional Tax
Physical	Housing and Inclusiveness	7.2 Percentage of slum households covered through basic services
Physical	Transportation and Mobility	11.4 Percentage of road network with dedicated bicycle tracks
Physical	Transportation and Mobility	11.5 Percentage of interchanges with bicycle parking facilities
Physical	Transportation and Mobility	11.6 Mode share of non-motorised transport

B. List of Indicators with External Benchmark

Indicator	Benchmark	Source
1.1 Percentage of citizen services available online	100%	
1.2 Percentage of services integrated through command centre	100%	
1.3 Percentage of citizens using online services	100%	
1.4 Average delay in grievance redressal	<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
1.5 Tax collected as percentage of tax billed	90%	AMRUT, MoUD
1.6 Extent of cost recovery (O&M) in water supply services	100%	
2.1 Restoration and reuse of historic buildings	100% of listed buildings/sites should be restored/preserved and/or brought under adaptive reuse	
2.2 Percentage of ecologically important areas covered through projects for restoration	100%	
3.1 Percentage of school-aged population enrolled in schools	100%	Right of Children to Free and Compulsory Education Act, 2009
3.2 Percentage of female school-aged population enrolled in schools	100%	Right of Children to Free and Compulsory Education Act, 2009
3.3 Primary education student-teacher ratio	1 teacher for every 30 students	Right of Children to Free and Compulsory Education Act, 2009

Indicator	Benchmark	Source
3.4 Percentage of schools with access to digital education	100%	
3.5 Percentage of students completing primary education	100%	
3.6 Percentage of students completing secondary education	100%	
4.1 Number of in-patient hospital beds per 10,000 population	25 beds per 10,000 population	Service Availability and Readiness Assessment, SARA, Reference Manual 2015, World Health Organization
4.2 Healthcare professionals per 10,000 population	23 per 10,000 population	Service Availability and Readiness Assessment, SARA, Reference Manual 2015, World Health Organization
4.3 Average response time in case of health emergencies	8 minutes	Report of the Working Group on Emergency Care in India, Ministry of Road Transport and Highways
5.4 Transport-related fatality per lakh population	<=2 persons per lakh	Service Level Benchmarks for Urban Transport, Ministry of Urban Development
6.4 Percentage of vendors registered and provided formal spaces	100%	
7.1 Percentage of slum/EWS households covered through formal/ affordable housing	100%	
7.2 Percentage of slum areas covered through basic services	100%	

Indicator	Benchmark	Source
8.1 Per capita availability of green spaces	10-12 sq.m. per capita	Urban and Regional Development Plans Formulation and Implementation Guidelines, 2014
10.2 Percentage of electrical connections covered through smart meters	100%	
10.5 Percentage of total energy derived from renewable sources	10%	Smart Cities Mission, MoUD
10.8 Percentage of new and redeveloped buildings following green building norms	80%	Smart Cities Mission, MoUD
11.1 Geographical coverage of public transport	>=1	Service Level Benchmarks for Urban Transport, MoUD
11.2 Availability of public transport	>=0.6	Service Level Benchmarks for Urban Transport, MoUD
11.3 Mode share of public transport	Less than 50,000 Population: 12% Population ≥ 50,000 < 1 lakh: 12% Population ≥ 1 lakh < 5 lakh: 15% Population ≥ 5 lakh < 1 million: 15% Population ≥ 1 million < 2 million: 20% Population ≥ 2 million < 5 million: 33% Population ≥ 5 million: 38%	National Transport Development Policy Committee, 2013
11.5 Percentage of interchanges with bicycle parking facilities	>=75	Service Level Benchmarks for Urban Transport, MoUD
11.6 Mode share of non-motorised transport	Less than 50,000 Population: 67% Population ≥ 50,000 < 1 lakh: 67% Population ≥ 1 lakh < 5 lakh: 60% Population ≥ 5 lakh < 1 million: 53% Population ≥ 1 million < 2 million: 48% Population ≥ 2 million < 5 million: 36% Population ≥ 5 million: 36%	National Transport Development Policy Committee, 2013

Indicator	Benchmark	Source
11.7 Availability of Passenger information system	>=75	Service Level Benchmarks for Urban Transport, MoUD
11.8 Extent of signal synchronisation	>=75	Service Level Benchmarks for Urban Transport, MoUD
11.9 Availability of paid parking spaces	>=75	Service Level Benchmarks for Urban Transport, MoUD
11.10 Percentage coverage of footpaths – wider than 1.2m	>=75	Service Level Benchmarks for Urban Transport, MoUD
11.11 Percentage of traffic intersections with pedestrian crossing facilities	100%	
11.12 extent to which universal accessibility is incorporated in public rights-ofway	100%	
12.1 Household level coverage of direct water supply connections	100%	Service Level Benchmarks, MoUD
12.2 Per capita supply of water	135 lpcd	Service Level Benchmarks, MoUD
12.3 Quality of water supplied	100%	Service Level Benchmarks, MoUD
12.4 Level of non-revenue water – NRW	Less than 15%	Service Level Benchmarks, MoUD
12.5 Percentage of water connections covered through meters	100%	Service Level Benchmarks, MoUD

Indicator	Benchmark	Source
12.6 Percentage of plots with rainwater harvesting facility	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
13.1 Coverage of toilets	100%	Service Level Benchmarks for Urban Transport, MoUD
13.2 Coverage of sewerage network and/or septage	100%	Service Level Benchmarks for Urban Transport, MoUD
13.3 Collection efficiency of sewerage network	100%	Service Level Benchmarks for Urban Transport, MoUD
13.4 Extent of reuse and recycling of waste water	20% or more	Service Level Benchmarks for Urban Transport, MoUD
13.5 Coverage of storm water drains	100%	Service Level Benchmarks for Urban Transport, MoUD
14.1 Household level coverage of municipal solid waste collection	100% door to door collection	Service Level Benchmarks for Urban Transport, MoUD
14.2 Efficiency of collection of municipal solid waste	100%	Service Level Benchmarks for Urban Transport, MoUD
14.3 Extent of municipal solid waste recovered through reuse	80% or more	Service Level Benchmarks for Urban Transport, MoUD
15.1 Concentration of SO_2 - air pollution	Annual mean concentration of 50 µg/m^3 OR Mean concentration over 24 hours of 80 µg/m^3	Central Pollution Control Board

<table>
<tr><th>Indicator</th><th>Benchmark</th><th>Source</th></tr>
<tr><td>15.2 Concentration of NO^2 - air pollution</td><td>Annual mean concentration of 40 µg/m^3 OR
Mean concentration over 24 hours of 80 µg/m^3</td><td>Central Pollution Control Board</td></tr>
<tr><td>15.3 Concentration of PM_{10} - air pollution</td><td>Annual mean concentration of 60 µg/m^3 OR
Mean concentration over 24 hours of 100 µg/m^3</td><td>Central Pollution Control Board</td></tr>
<tr><td>15.4 Level of noise pollution</td><td>
<table>
<tr><th rowspan="2">Category</th><th colspan="2">Limits</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>Industrial area</td><td>55</td><td>45</td></tr>
<tr><td>Industrial area (silence zone)</td><td>50</td><td>40</td></tr>
</table>
</td><td>Noise Pollution (Regulation and Control) Rules, 2000</td></tr>
<tr><td>15.5 Quality of water in public surface water bodies</td><td>
<table>
<tr><th>Designated best use</th><th>Quality Class</th><th>Primary quality criteria</th></tr>
<tr><td>Drinking water source without conventional treatment but with chlorination</td><td>A</td><td>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</td></tr>
</table>
</td><td>CPCB, Guidelines for Water Quality Management, 2008</td></tr>
</table>

<table>
<tr><th>Indicator</th><th>Benchmark</th><th>Source</th></tr>
<tr>
<td>15.5 Quality of water in public surface water bodies</td>
<td>
<table>
<tr><th>Designated best use</th><th>Quality Class</th><th>Primary quality criteria</th></tr>
<tr><td>Outdoor bathing (organized)</td><td>B</td><td>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</td></tr>
<tr><td>Drinking water source with conventional treatment</td><td>C</td><td>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</td></tr>
<tr><td>Propagation of wildlife and fisheries</td><td>D</td><td>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</td></tr>
<tr><td>Irrigation, industrial cooling, and controlled disposal</td><td>E</td><td>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.</td></tr>
</table>
</td>
<td>CPCB, Guidelines for Water Quality Management, 2008</td>
</tr>
</table>

Overall Rankings

Ease of Living Index 2018					
Rank		Score	Rank	City Name	Score
1	Pune	58.11	15	Jabalpur	46.78
2	Navi Mumbai	58.02	16	Amravati	46.57
3	Greater Mumbai	57.78	17	Visakhapatnam	46.52
4	Tirupati	57.52	18	Bhubaneswar	46.19
5	Chandigarh	53.16	19	Surat	45.44
6	Thane	52.27	20	Vasai-Virar	44.99
7	Raipur	50.58	21	Nashik	44.79
8	Indore	50.16	22	Solapur	44.48
9	Vijayawada	49.27	23	Ahmedabad	44.28
10	Bhopal	49.11	24	Ujjain	43.97
11	Karim Nagar	48.90	25	Coimbatore	43.61
12	Tiruchirappalli	48.82	26	Erode	43.55
13	Bilaspur	48.26	27	Hyderabad	43.13
14	Chennai	47.24	28	Madurai	43.05

Ease of Living Index 2018

Rank	City Name	Score	Rank	City Name	Score
29	Tiruppur	42.94	43	Thanjavur	37.14
30	Jaipur	40.64	44	Thoothukudi	36.44
31	Nagpur	40.01	45	Kochi	36.43
32	Gwalior	39.88	46	Ghaziabad	36.42
33	Varanasi	39.86	47	Diu	36.09
34	Jhansi	39.55	48	Vellore	36.06
35	Ludhiana	39.29	49	Raebareli	36.02
36	Vadodara	39.25	50	Kalyan-Dombivli	35.80
37	Tirunelveli	38.86	51	Ajmer	35.67
38	Rajkot	38.65	52	Belagavi	35.48
39	Gandhinagar	38.18	53	Jodhpur	35.22
40	Dindigul	38.14	54	Udaipur	35.06
41	Mangaluru	37.90	55	Agra	34.60
42	Salem	37.32	56	Dharamshala	34.57

Ease of Living Index 2018					
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
57	Hubli-Dharwad	34.44	71	Thiruvananthapuram	32.11
58	Bengaluru	34.38	72	Faridabad	31.94
59	Kota	34.30	73	Lucknow	31.76
60	Puducherry	34.23	74	Gangtok	31.73
61	Warangal	34.14	75	Kanpur	31.65
62	Satna	33.92	76	Amritsar	31.52
63	Muzaffarpur	33.91	77	Jalandhar	31.05
64	Kakinada	33.63	78	Port Blair	30.73
65	Delhi	33.18	79	Dahod	30.72
66	Sagar	32.97	80	Dehradun	30.49
67	Shimoga	32.78	81	Bareilly	30.35
68	Ranchi	32.45	82	Karnal	29.95
69	Pimpri Chinchwad	32.20	83	Davanagere	29.28
70	Tumakuru	32.17	84	Aizawl	29.25

Ease of Living Index 2018

Rank	City Name	Score	Rank	City Name	Score
85	Guwahati	29.03	99	Namchi	23.33
86	Aligarh	28.87	100	Srinagar	22.71*
87	Rourkela	28.84	101	Meerut	22.71*
88	Gurugram	28.32	102	Silvassa	22.71*
89	Moradabad	28.19	103	Saharanpur	22.21
90	Panaji	27.84	104	Kavaratti	21.04
91	Imphal	27.78	105	Pasighat	20.83
92	Shimla	27.32	106	Itanagar	20.81
93	Agartala	26.56	107	Bhagalpur	20.40
94	Dhanbad	26.24	108	Bihar Sharif	18.84
95	Jammu	25.71	109	Patna	18.67
96	Allahabad	25.50	110	Kohima	18.13
97	Aurangabad	24.20	111	Rampur	17.00
98	Shillong	23.46			

*Rounded off to the nearest decimal point

Institutional Sub-Index

Institutional Sub-Index					
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Navi Mumbai	16.70	15	Ujjain	12.91
2	Tirupati	15.68	16	Bhopal	12.89
3	Karim Nagar	15.46	17	Raebareli	12.33
4	Hyderabad	15.23	18	Nashik	12.23
5	Bilaspur	14.17	19	Delhi	11.70
6	Kochi	13.96	20	Chennai	11.69
7	Ahmedabad	13.93	21	Bengaluru	11.64
8	Pune	13.88	22	Muzaffarpur	11.61
9	Vijayawada	13.81	23	Greater Mumbai	11.60
10	Visakhapatnam	13.63	24	Thane	11.22
11	Surat	13.60	25	Bhubaneswar	11.12
12	Raipur	13.49	26	Solapur	11.00
13	Indore	13.47	27	Thiruvananthapuram	10.91*
14	Jabalpur	13.22	28	Madurai	10.91*

*Rounded off to the nearest decimal point

Institutional Sub-Index

Rank	City Name	Score	Rank	City Name	Score
29	Thoothukudi	10.90	43	Lucknow	9.89
30	Ghaziabad	10.79	44	Nagpur	9.79
31	Vadodara	10.66	45	Agra	9.73
32	Vasai-Virar	10.62*	46	Varanasi	9.68
33	Hubli-Dharwad	10.62*	47	Vellore	9.48
34	Salem	10.54	48	Aligarh	9.43
35	Amravati	10.48	49	Gandhinagar	9.40
36	Kalyan-Dombivli	10.35	50	Faridabad	9.34
37	Tiruppur	10.29*	51	Tiruchirappalli	9.33
38	Jodhpur	10.29*	52	Jhansi	9.25
39	Mangaluru	10.25	53	Tirunelveli	9.20
40	Chandigarh	10.22	54	Thanjavur	9.17
41	Coimbatore	10.03	55	Rajkot	9.16
42	Gwalior	10.00	56	Ranchi	9.15

*Rounded off to the nearest decimal point

Institutional Sub-Index

Rank	City Name	Score	Rank	City Name	Score
57	Aizawl	9.05	71	Dhanbad	8.21
58	Shimoga	9.00	72	Dahod	8.01
59	Warangal	8.83	73	Gangtok	7.91
60	Dharamshala	8.76	74	Bareilly	7.86
61	Dehradun	8.74	75	Kota	7.72
62	Satna	8.65	76	Agartala	7.58
63	Erode	8.64	77	Sagar	7.51*
64	Jaipur	8.51	78	Amritsar	7.51*
65	Kakinada	8.47	79	Moradabad	7.47
66	Guwahati	8.46	80	Kavaratti	7.42
67	Imphal	8.45	81	Diu	7.31
68	Ludhiana	8.44	82	Davanagere	7.13
69	Tumakuru	8.40	83	Itanagar	7.06
70	Belagavi	8.35	84	Panaji	6.97

*Rounded off to the nearest decimal point

Institutional Sub-Index

Rank	City Name	Score	Rank	City Name	Score
85	Udaipur	6.93	99	Pasighat	5.69
86	Puducherry	6.63	100	Bihar Sharif	5.54
87	Dindigul	6.61	101	Meerut	5.48
88	Bhagalpur	6.60	102	Port Blair	5.32
89	Allahabad	6.54	103	Aurangabad	5.28
90	Silvassa	6.44	104	Kanpur	4.80
91	Gurugram	6.39	105	Rampur	4.63
92	Pimpri Chinchwad	6.33	106	Patna	4.05
93	Namchi	6.24	107	Saharanpur	3.94
94	Ajmer	6.20	108	Kohima	3.62
95	Rourkela	6.07	109	Srinagar	3.54
96	Shimla	6.04	110	Jammu	3.39
97	Karnal	5.91	111	Shillong	2.96
98	Jalandhar	5.87			

Social Sub-Index

Social Sub-Index					
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Tirupati	18.90	15	Karim Nagar	14.35
2	Tiruchirappalli	18.57	16	Tiruppur	14.24
3	Navi Mumbai	17.92	17	Bhopal	14.09
4	Chandigarh	17.91	18	Solapur	13.97
5	Pune	16.82	19	Coimbatore	13.94
6	Greater Mumbai	15.60	20	Erode	13.82
7	Amravati	15.28	21	Raipur	13.54
8	Vijayawada	15.18	22	Jhansi	13.39
9	Indore	15.16	23	Dindigul	13.37
10	Vasai-Virar	15.10	24	Diu	13.28
11	Jabalpur	14.59	25	Nashik	12.83
12	Thane	14.44	26	Belagavi	12.81
13	Bhubaneswar	14.40	27	Madurai	12.71*
14	Chennai	14.38	28	Puducherry	12.71*

*Rounded off to the nearest decimal point

Social Sub-Index

Rank	City Name	Score	Rank	City Name	Score
29	Jaipur	12.67	43	Hyderabad	11.56
30	Ujjain	12.62	44	Dahod	11.40
31	Mangaluru	12.24	45	Jalandhar	11.36*
32	Salem	12.18	46	Visakhapatnam	11.36*
33	Rajkot	12.14	47	Thanjavur	11.26*
34	Bilaspur	12.07	48	Agra	11.26*
35	Ludhiana	12.00	49	Faridabad	11.25
36	Aurangabad	11.93	50	Imphal	11.14
37	Karnal	11.92	51	Kakinada	11.01
38	Kalyan-Dombivli	11.80	52	Tirunelveli	10.92
39	Kanpur	11.73	53	Ahmedabad	10.82
40	Gwalior	11.72	54	Vadodara	10.76
41	Udaipur	11.64	55	Gandhinagar	10.73
42	Sagar	11.58	56	Shimoga	10.69

*Rounded off to the nearest decimal point

Social Sub-Index

Rank	City Name	Score	Rank	City Name	Score
57	Surat	10.58	71	Delhi	9.43
58	Warangal	10.52	72	Gangtok	9.42
59	Thoothukudi	10.47	73	Satna	9.38
60	Pimpri Chinchwad	10.39	74	Muzaffarpur	9.37
61	Ajmer	10.29	75	Thiruvanan-thapuram	9.32
62	Dehradun	10.21*	76	Shimla	9.31
63	Dharamshala	10.21*	77	Tumakuru	9.31
64	Amritsar	10.18	78	Nagpur	9.20
65	Rourkela	10.13	79	Guwahati	9.11
66	Port Blair	10.08	80	Ranchi	9.10*
67	Kota	10.07	81	Varanasi	9.10*
68	Hubli-Dharwad	10.02	82	Davanagere	9.07
69	Jammu	9.92	83	Panaji	9.06
70	Vellore	9.77	84	Jodhpur	9.04

*Rounded off to the nearest decimal point

Social Sub-Index

Rank	City Name	Score	Rank	City Name	Score
85	Silvassa	8.80	99	Kochi	7.52
86	Agartala	8.79	100	Saharanpur	7.51
87	Allahabad	8.71	101	Pasighat	7.47
88	Shillong	8.31	102	Lucknow	7.45
89	Moradabad	8.26	103	Aligarh	7.40
90	Srinagar	8.11	104	Meerut	7.28
91	Dhanbad	7.97	105	Raebareli	7.24
92	Bhagalpur	7.94	106	Kavaratti	6.89*
93	Namchi	7.92	107	Ghaziabad	6.89*
94	Gurugram	7.78	108	Bihar Sharif	6.74
95	Kohima	7.75	109	Itanagar	5.98
96	Aizawl	7.62	110	Patna	5.91
97	Bengaluru	7.62	111	Rampur	5.58
98	Bareilly	7.60			

*Rounded off to the nearest decimal point

Economic Sub-Index

₹ Economic Sub-Index					
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Chandigarh	3.78	15	Rajkot	3.00*
2	Ajmer	3.73	16	Navi Mumbai	2.97*
3	Kota	3.71	17	Coimbatore	2.89*
4	Indore	3.60	18	Bhubaneswar	2.89*
5	Tiruppur	3.56	19	Tiruchirappalli	2.83
6	Itanagar	3.44*	20	Ghaziabad	2.82
7	Pune	3.44*	21	Vasai-Virar	2.73
8	Ludhiana	3.39	22	Gwalior	2.68
9	Thane	3.22	23	Dindigul	2.64
10	Vijayawada	3.16	24	Jalandhar	2.63*
11	Jhansi	3.01*	25	Moradabad	2.63*
12	Jaipur	3.01*	26	Rampur	2.63*
13	Kanpur	3.01*	27	Jodhpur	2.63*
14	Udaipur	3.00*	28	Madurai	2.57

*Rounded off to the nearest decimal point

₹ Economic Sub-Index

Rank	City Name	Score	Rank	City Name	Score
29	Raipur	2.55*	43	Nagpur	2.29*
30	Amravati	2.55*	44	Meerut	2.29*
31	Karim Nagar	2.54	45	Ahmedabad	2.28
32	Dahod	2.46	46	Amritsar	2.26*
33	Ujjain	2.45*	47	Bilaspur	2.26*
34	Aligarh	2.45*	48	Varanasi	2.26*
35	Tirunelveli	2.41	49	Gangtok	2.26*
36	Thanjavur	2.36*	50	Ranchi	2.26*
37	Erode	2.36*	51	Allahabad	2.26*
38	Tirupati	2.36*	52	Sagar	2.24
39	Bhopal	2.33	53	Dehradun	2.21
40	Nashik	2.32*	54	Jabalpur	2.19
41	Davanagere	2.32*	55	Puducherry	2.17
42	Vadodara	2.31	56	Thoothukudi	2.16

*Rounded off to the nearest decimal point

₹ Economic Sub-Index

Rank	City Name	Score	Rank	City Name	Score
57	Mangaluru	2.08*	71	Bengaluru	1.98*
58	Lucknow	2.08*	72	Guwahati	1.98*
59	Hyderabad	2.07*	73	Satna	1.98*
60	Vellore	2.07*	74	Visakhapatnam	1.93
61	Diu	2.07*	75	Agra	1.92
62	Bareilly	2.07*	76	Namchi	1.89
63	Greater Mumbai	2.05	77	Raebareli	1.88*
64	Shimoga	2.04*	78	Karnal	1.88*
65	Gurugram	2.04*	79	Silvassa	1.87
66	Hubli-Dharwad	2.01*	80	Pimpri Chinchwad	1.86*
67	Kochi	2.01*	81	Kalyan-Dombivli	1.86*
68	Solapur	2.00	82	Salem	1.85*
69	Surat	1.99	83	Aurangabad	1.85*
70	Chennai	1.98*	84	Dharamshala	1.83

*Rounded off to the nearest decimal point

₹ Economic Sub-Index

Rank	City Name	Score	Rank	City Name	Score
85	Bhagalpur	1.83	99	Muzaffarpur	1.50
86	Tumakuru	1.78	100	Shillong	1.44
87	Warangal	1.74*	101	Agartala	1.43
88	Belagavi	1.74*	102	Port Blair	1.41
89	Rourkela	1.69*	103	Pasighat	1.29
90	Srinagar	1.69*	104	Saharanpur	1.28
91	Kakinada	1.68	105	Jammu	1.04
92	Imphal	1.63	106	Faridabad	0.94
93	Bihar Sharif	1.61	107	Gandhinagar	0.91
94	Thiruvana-nthapuram	1.58	108	Patna	0.71
95	Dhanbad	1.56	109	Delhi	0.12
96	Panaji	1.55*	110	Kohima	0.00
97	Shimla	1.55*	111	Kavaratti	0.00
98	Aizawl	1.53			

*Rounded off to the nearest decimal point

Physical Sub-Index

Physical Sub-Index					
Rank	**City Name**	**Score**	**Rank**	**City Name**	**Score**
1	Greater Mumbai	28.53	15	Erode	18.73
2	Pune	23.97	16	Amravati	18.26
3	Thane	23.40	17	Tiruchirappalli	18.09
4	Chandigarh	21.24	18	Indore	17.93
5	Raipur	21.00	19	Bhubaneswar	17.78
6	Tirupati	20.58	20	Solapur	17.51
7	Navi Mumbai	20.43	21	Nashik	17.41
8	Bhopal	19.81	22	Ahmedabad	17.24
9	Bilaspur	19.76	23	Gandhinagar	17.13
10	Visakhapatnam	19.61	24	Vijayawada	17.12
11	Surat	19.27	25	Madurai	16.86
12	Chennai	19.19	26	Jabalpur	16.79
13	Varanasi	18.83	27	Coimbatore	16.74
14	Nagpur	18.73	28	Karim Nagar	16.54

Physical Sub-Index

Rank	City Name	Score	Rank	City Name	Score
29	Vasai-Virar	16.54	43	Thanjavur	14.34
30	Jaipur	16.45	44	Hyderabad	14.26
31	Tirunelveli	16.32	45	Port Blair	13.92*
32	Ujjain	15.99	46	Satna	13.92*
33	Ghaziabad	15.92	47	Jhansi	13.89
34	Dindigul	15.52*	48	Dharamshala	13.77
35	Vadodara	15.52*	49	Pimpri Chinchwad	13.62
36	Gwalior	15.48	50	Udaipur	13.49
37	Ludhiana	15.47	51	Diu	13.43
38	Ajmer	15.46	52	Mangaluru	13.32
39	Tiruppur	14.85	53	Jodhpur	13.26
40	Vellore	14.75	54	Bengaluru	13.14
41	Raebareli	14.57	55	Warangal	13.05
42	Rajkot	14.35	56	Kochi	12.94

*Rounded off to the nearest decimal point

Physical Sub-Index

Rank	City Name	Score	Rank	City Name	Score
57	Thoothukudi	12.91	71	Kalyan-Dombivli	11.79*
58	Bareilly	12.83	72	Hubli-Dharwad	11.79*
59	Kota	12.80	73	Agra	11.69
60	Salem	12.75	74	Sagar	11.64
61	Puducherry	12.72	75	Amritsar	11.57
62	Tumakuru	12.69	76	Muzaffarpur	11.43
63	Belagavi	12.58	77	Jammu	11.36
64	Kakinada	12.48	78	Jalandhar	11.19
65	Lucknow	12.35	79	Shimoga	11.05*
66	Gangtok	12.15	80	Aizawl	11.05*
67	Gurugram	12.11*	81	Rourkela	10.94
68	Kanpur	12.11*	82	Davanagere	10.76
69	Ranchi	11.93	83	Shillong	10.75
70	Delhi	11.92	84	Faridabad	10.41

*Rounded off to the nearest decimal point

Physical Sub-Index

Rank	City Name	Score	Rank	City Name	Score
85	Shimla	10.41	99	Allahabad	7.99
86	Thiruvanan-thapuram	10.31	100	Meerut	7.66
87	Panaji	10.26	101	Namchi	7.28
88	Karnal	10.24	102	Kohima	6.76
89	Moradabad	9.83	103	Kavaratti	6.73
90	Aligarh	9.59	104	Imphal	6.55
91	Guwahati	9.48*	105	Pasighat	6.37
92	Saharanpur	9.48*	106	Silvassa	5.60
93	Srinagar	9.37	107	Aurangabad	5.14
94	Dehradun	9.33	108	Bihar Sharif	4.96
95	Dahod	8.86	109	Itanagar	4.32
96	Agartala	8.75	110	Rampur	4.16
97	Dhanbad	8.51	111	Bhagalpur	4.03
98	Patna	8.01			

*Rounded off to the nearest decimal point