

## Indicator 11.7.1

“Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities”

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# Background and international standards



Cities that improve and sustain the use of public space, including streets, enhance community cohesion, civic identity, and quality of life which is also a first step towards civic empowerment and greater access to institutional and political spaces.

- **Methodological refinements** and piloting activities are concluded :
  - EGMs with diverse and inclusive partners – including NSOs and city managers
  - Detailed documentation on methodology and concepts
  - Pilot testing of the indicator methodology in various cities,
  - Development of capacity development guides, partnership agreements and database development ongoing.
- **City definitions:** UN-Habitat and partners have worked on these definitions as a cross-cutting issue for all spatial indicators.





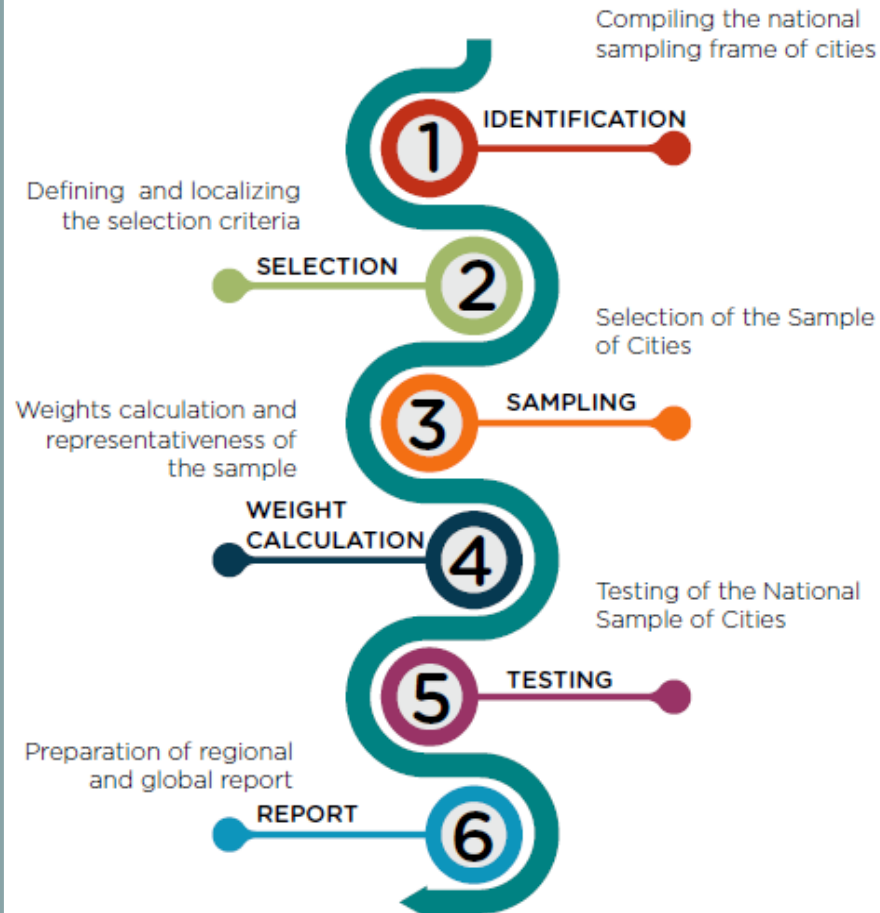
# National sample of cities for systematic monitoring

**?** HOW is the sample of cities selected?

## About the NSC

- NSC is modelled after the global sample of cities
- It is recommended for countries with many cities (**20 or more**), and/or those with limited resources (financial, systems, technical)
- Sampling offers :
  - A **low-cost** option for monitoring progress in cities
  - An Integrated approach to **systematically** monitor cities with diverse characteristics
  - **Representative and inclusive** data across cities, countries and regions

## The Sampling process



## Sampling is based on:

- Population size
- City size
- Geographic location
- City function
- Economic and political importance
- etc

Sample size is based on number of cities and heterogeneity of urban characteristics in a country

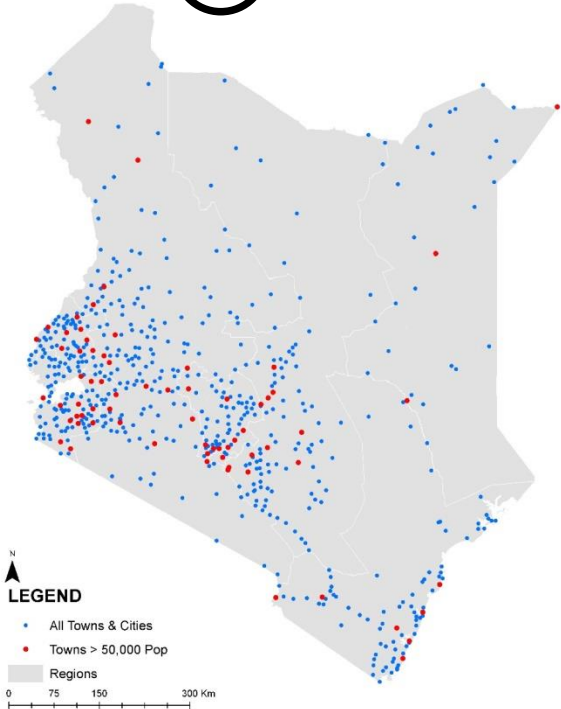
$$\sum_{i=1}^N S_i$$



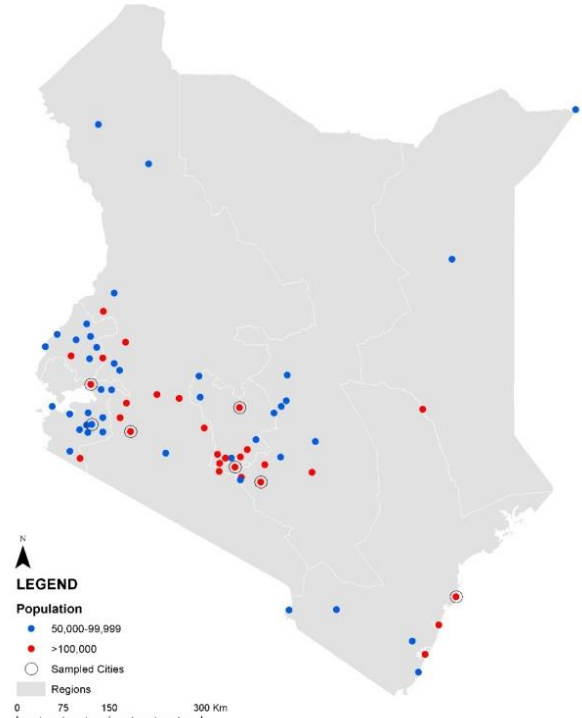
# Determination of Sample Size: Example of Kenya



WHAT method does Un-habitat propose for selection of the cities to obtain a representative sample and define a minimum size of this sample



City	Population size	Economic activity
Limuru	100,000+	Agriculture
Karuri	100,000+	Agriculture
Webuye	50,000 - 99,999	Agriculture
Bungoma	50,000 - 99,999	Agriculture
Kimilili	50,000 - 99,999	Agriculture
Burnt Forest	Less 50,000	Agriculture
Luanda	Less 50,000	Agriculture



Final City Sample = 7

- Identify all cities and their spatial location
- Create database with attributes such as:
  - Population,
  - Economic activity,
  - City area
  - Regional distribution
  - Etc
- Apply Sample of Cities Selection Matrix



## NEXT STEPS

- Collect data at city level
- Compute Indicator at city level
- Aggregate to National level



# Method of computation

Indicator 11.7.1 is composed of four parts:

1. Spatial analysis to delimit the **built-up area of the urban agglomeration**
2. Computation of **total area of open public space**.
3. Estimation of **land allocated to streets**.
4. Estimation of share of population with **access to open public spaces**

**Share of the built up area of the city that is open space in public use %**

$$\left( \frac{\text{Total surface of open public space} + \text{Total surface of land allocated to streets}}{\text{Total surface of built up area of the urban agglomeration}} \right) \times 100$$





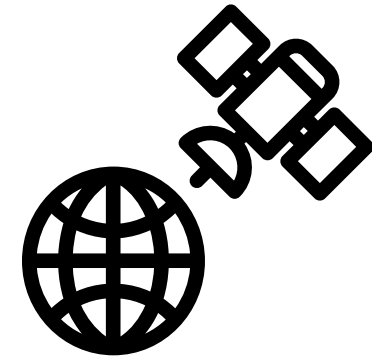
# Method of computation



The method could prove to be cumbersome and expensive to implement because of the field studies.

We could work easier by exclusively analyzing satellite images or aerial photos. Methodological developments, in terms of image analysis, should be provided

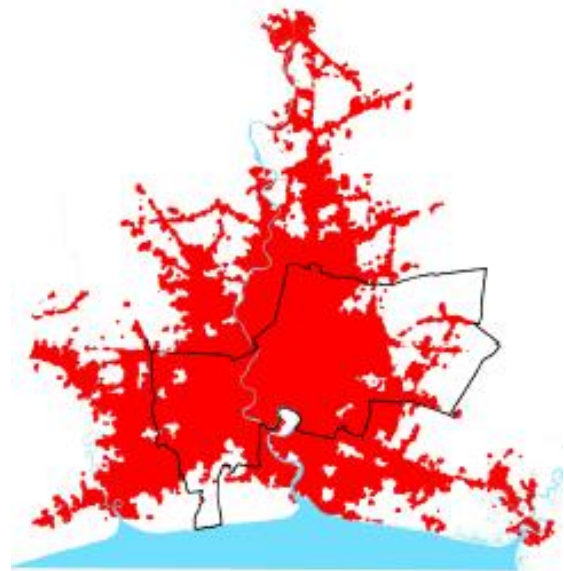
1. The proposed method **fully depends on spatial analysis techniques** from satellite images and aerial photos to extract potential open public spaces based on character of space – shape, land cover type, space size, location
  - Acquire imagery, extract open spaces and streets within city area, overlay extracted spaces with official / open data,
2. **Pre-validation to eliminate private land, commercial land**, etc is done using existing city records and open source/ crowd sourced data – e.g from openstreetmap
  - Enhanced accuracy can be achieved through sharing of extracted open spaces with city and community leaders, civil society groups, experts, or ground truthing etc
3. **Create service areas** from each open space based on the street networks
4. **Overlay service areas with population data** from city and estimate number of people served



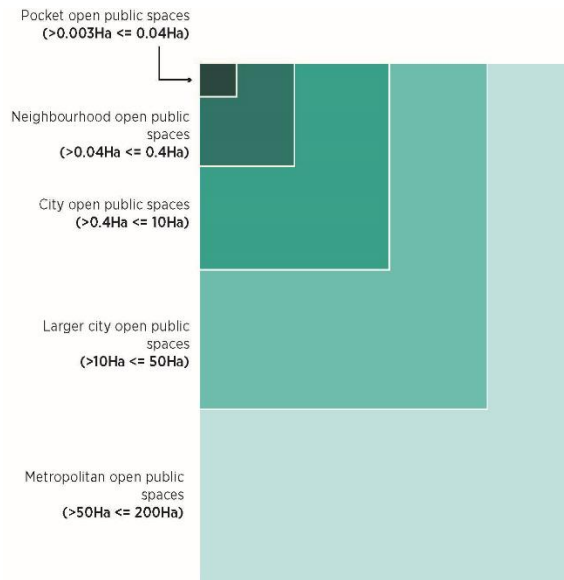


# Definition of terms for indicator computation

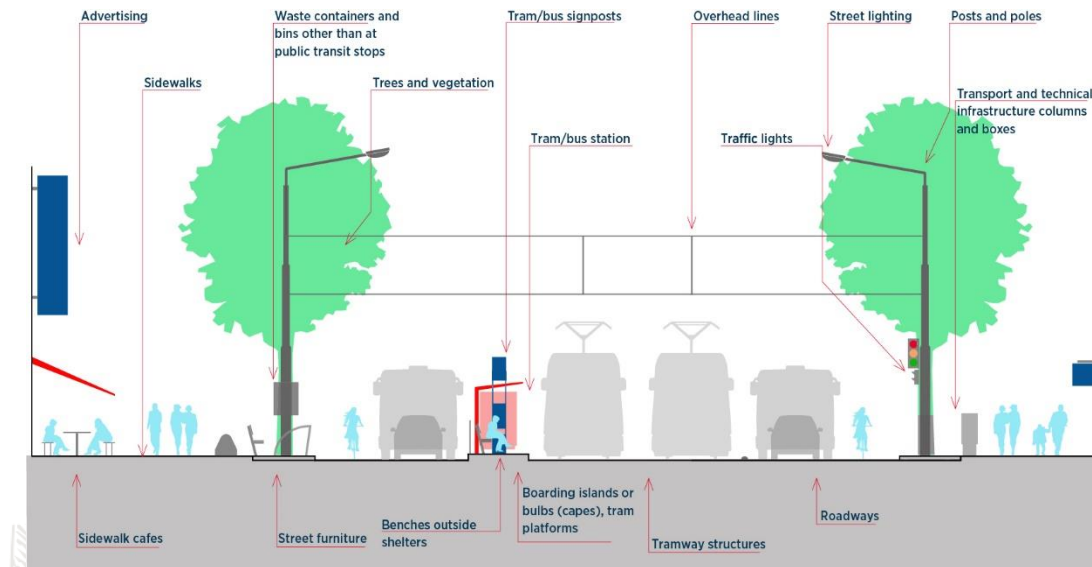
**Urban extent** is defined as the total area occupied by the built-up area and the urbanized open space. The built-up area is defined as the contiguous area occupied by buildings and other impervious surfaces.



**Open public spaces** are those areas within the urban environment that are freely accessible to the public for use, regardless of ownership, and are intended primarily for outdoor recreation and informal activities irrespective of size, design or physical feature.



**Streets** are defined thoroughfares that are based inside towns, cities and neighbourhoods most commonly lined with houses or buildings used by pedestrians or vehicles in order to go from one place to another in the city, interact and to earn a livelihood.





# NSO and Expert Consultations

## The 1st EGM in Oct 2016

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Focused on **methodological refinements and concretizing the institutional partnerships** for the indicator development and data collection

- Participants included NSOs, Urban Observatories, EU, World Resources Institute, UCLG, Arab Urban Development Institute, WHO, ESRI, NYU, among others

## The 2<sup>nd</sup> EGM held in Feb 2017

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Focused on **challenges of data collection and review of preliminary data** made available through efforts of collecting city-based monitoring the human settlements data at local levels.

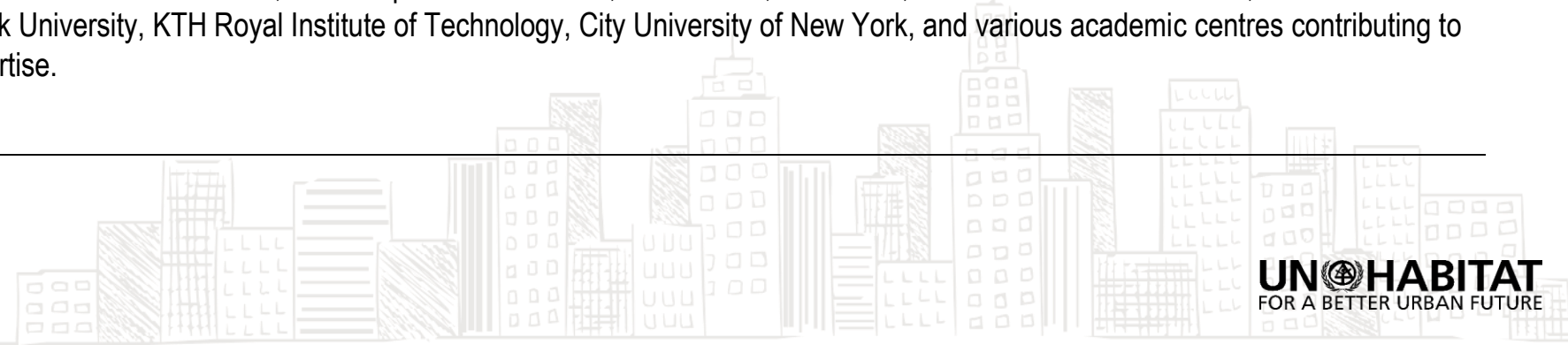
- The meeting was attended by representatives from NSOs, Urban Observatories, European Union, World Resources Institute, United Cities and Local Governments, ESRI, Arab Urban Development Institute UNESCO, Women in Cities (WICI), Universities and private planning firms, senior statisticians from governments, academic institutions, urban planners, etc.

## The 3<sup>rd</sup> consultative in July 2018

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A Meeting was held as a side event of the HLPF in New York and review accuracy of available data and methodology.

- Participants included representatives of UN-Habitat, the European Commission, World Bank, ISOCARP, the Future of Places forum\*, stakeholders from various cities, New York University, KTH Royal Institute of Technology, City University of New York, and various academic centres contributing to technical and research expertise.







# Feedback from consultations and activities

## Outcomes of consultations:

### The 1<sup>st</sup> EGM

resulted in agreement on key conceptual parameters of the indicator, the metadata content, approach for data collection, and identification of country specific needs and areas of support from experts and agencies

### The 2<sup>nd</sup> EGM

agreed on the technical aspects of computing the indicator and the proposed methodology. It also identified the challenges and opportunities of improving the methodology as well as strategies for scaling up and capacity building for National Statistics Offices (NSOs).

### The 3<sup>rd</sup> consultative meeting

concluded that, available data and the proposed methodology combining remote sensing with statistical sampling and social surveys is an effective and practical approach for the indicator computation across countries/ cities

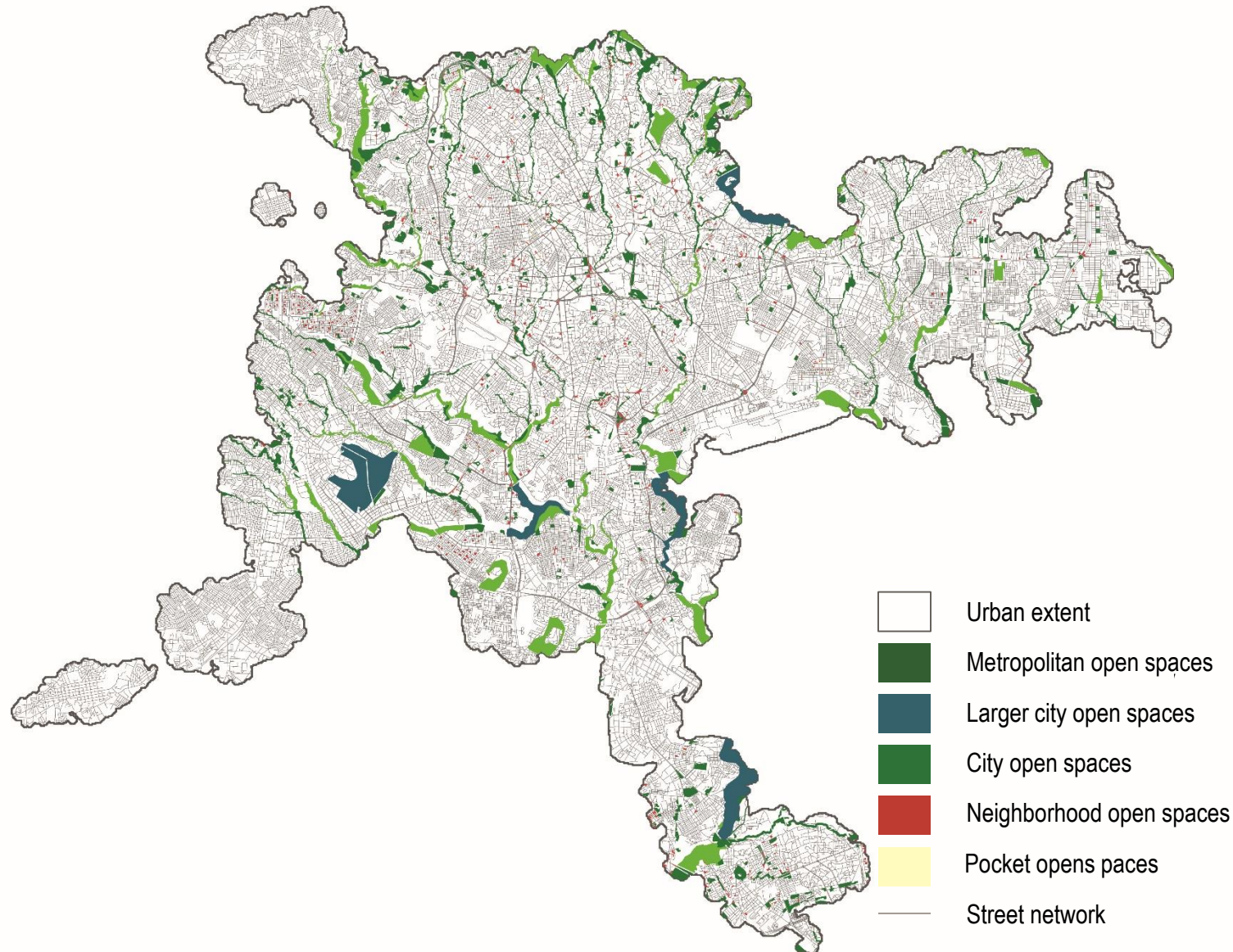
## As a result of consultations:

- Data for the indicator is now available for **289 cities in 94 countries** and other data collection initiatives are on-going.
  - UN-Habitat's City Prosperity Initiative (CPI) has collected data on the indicator in various cities distributed across Latin America & Caribbean, Africa, Asia and Europe.
  - UN-Habitat's Global Public Spaces Programme has conducted city-wide public space assessments in 9 cities in close collaboration with cities and local governments, NSOs and urban observatories. The process helped to refine the methodology for city wide data verification and disaggregation
  - UN-Habitat worked with New York University to conduct a worldwide mapping of amount of land occupied by open spaces covering a global sample of 200 cities using the agreed upon methodology. This data has been shared with countries for validation
  - Additional data from EC is under review
  - A database compiling available data on the indicator is available ([SDG 11.7.1 Database](#))
  - Tools for data collection on the indicator have been developed and pilot tested in several countries/ cities ([SDG 11.7.1 data collection form](#)).
- A **multi-country capacity assessment** for several cities on the ability and preparedness to report on 11.7.1 was conducted by UN-Habitat and regional partners.





# Computation Methodology: Addis Ababa, Ethiopia Snapshot



1. Start with satellite imagery

2. Extract Urban extent

3. Extract open spaces and streets within urban extent

4. Correlate the extracted data with data from local authority and other open sources (e.g openstreetmap)

5. Classify open spaces by 5 categories: Pocket spaces, Neighbourhood spaces, City spaces, Larger city space and Metropolitan spaces

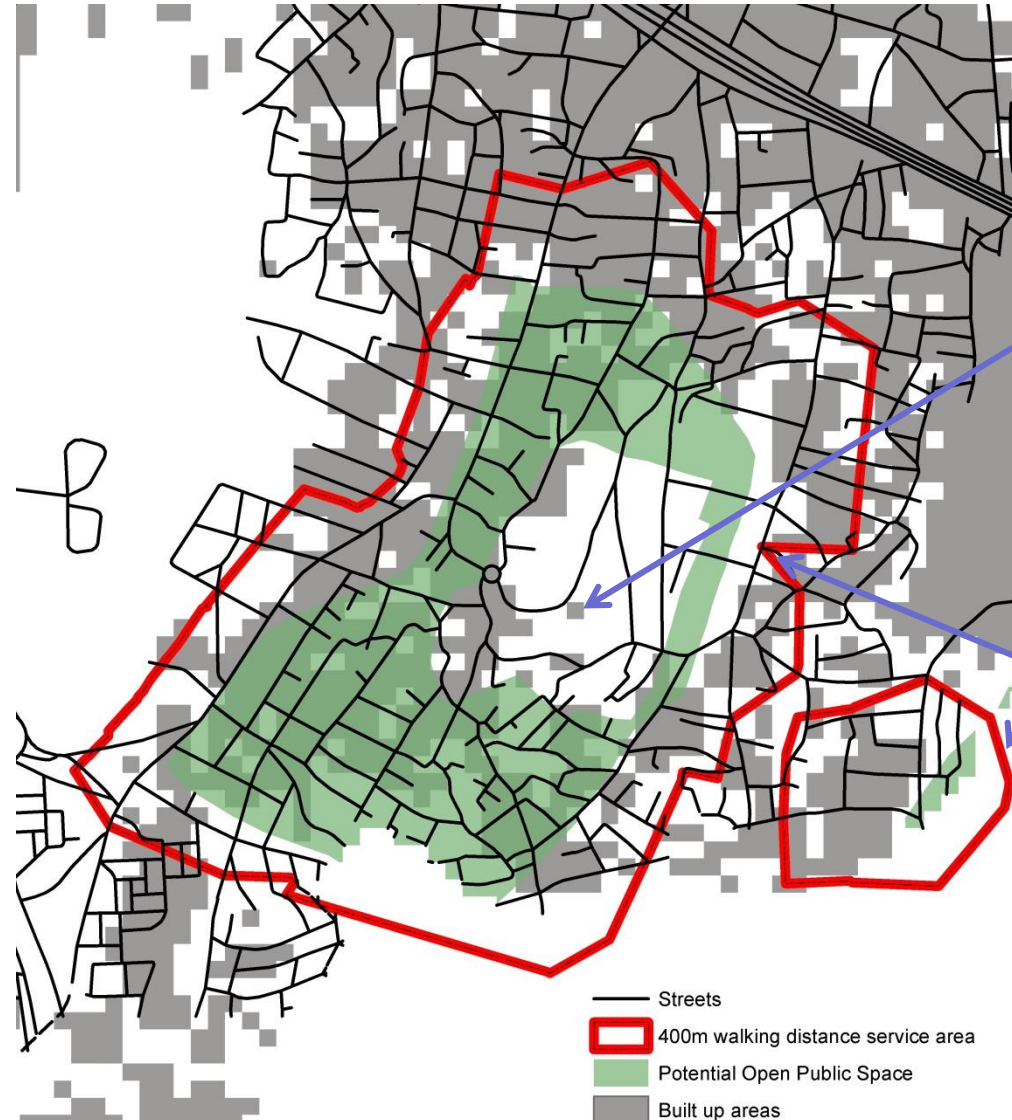
6. Calculate amount of land allocated to streets by adding up areas of individual streets in the urban extent

7. Calculate amount of land allocated for public use



# Computation Methodology, population with access to OPSs

- Define service area for each space using 400m walking distance\*
- Estimate number of people living within the service area from population data
  - High resolution population data from NSOs is best data source
  - Alternatives include density based measures or population grids
  - Population grids can offer reliable estimates where high resolution data is unavailable
- Disaggregate results per indicator request



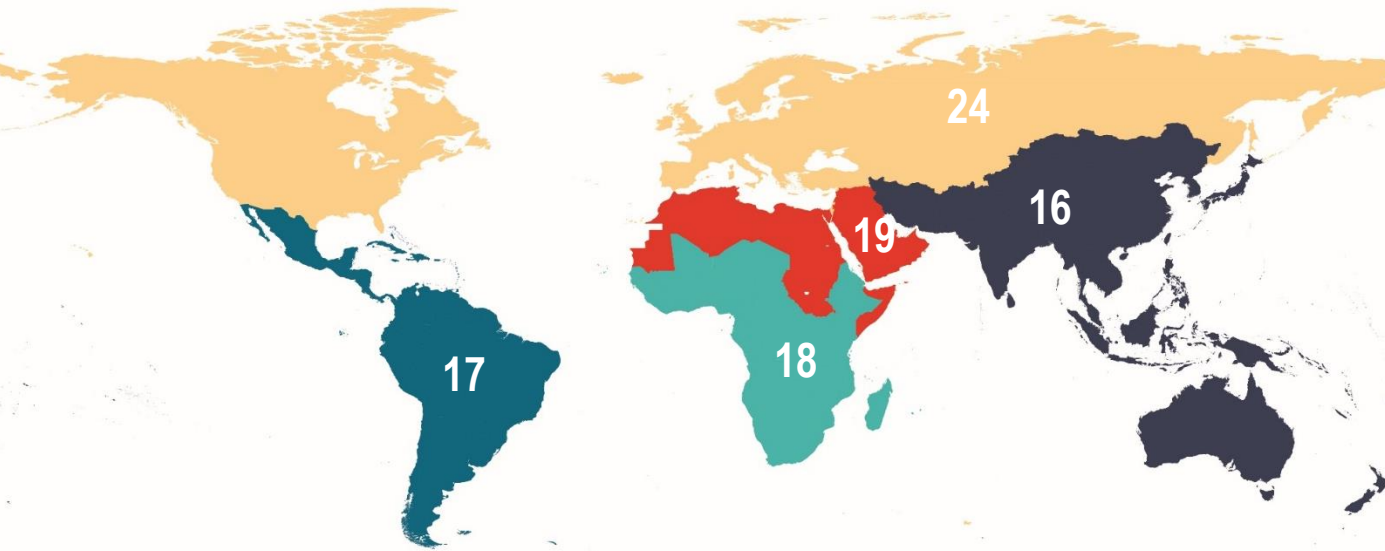
Number of people per single building =  $x$   
People aged  $< 15 = y$   
Women in building =  $z$   
Persons with disabilities =  $d$

Total population with access to OPS = total no. of people in all buildings within serviced area  
Share of age  $x = \frac{\text{total population of age } x \text{ within service areas}}{\text{total population of age } x \text{ within urban area}}$



# Summary of data availability on indicator 11.7.1

## Countries with data available on the indicator



Region	Cities covered as of December 2017	Countries covered as of December 2017
Asia and the Pacific	91	16
Europe and North America	66	24
Latin America and the Caribbean	55	17
North Africa and Arab States	47	19
Sub-Saharan Africa	30	18
<b>Total</b>	<b>289</b>	<b>94</b>

City	Country	Region	DATA AVAILABILITY		
			Share of Built-up Area Occupied by Streets	Share of Built-up Area Occupied by Open Space	Share of Built-up Area Occupied by potential public space
Melborne	Australia	Asia and the Pacific	19.5	0.09	19.59
Dhaka	Bangladesh	Asia and the Pacific	12%	32%	44%
Leshan, Sichuan	China	Asia and the Pacific	18%	40%	58%
Vinh Long	Vietnam	Asia and the Pacific	10%	41%	51%
Vienna	Austria	Europe and North America	18%	31%	49%
Gomel	Belarus	Europe and North America	16%	30%	46%
Antwerp	Belgium	Europe and North America	13%	43%	56%
Montreal	Canada	Europe and North America	19%	21%	40%
Astrakhan	Russia	Europe and North America	20%	33%	53%
Madrid	Spain	Europe and North America	29%	34%	63%
Chicago	United States	Europe and North America	25%	27%	52%
Buenos Aires	Argentina	Latin America and the Caribbean	15%	24%	39%
Cordoba	Argentina	Latin America and the Caribbean	21%	31%	52%
Cochabamba	Bolivia	Latin America and the Caribbean	19%	36%	55%
Curitiba	Brazil	Latin America and the Caribbean	16%	30%	46%
Santiago	Chile	Latin America and the Caribbean	18%	21%	39%
Kabul	Afghanistan	North Africa and Arab States	20%	34%	54%
Algiers	Algeria	North Africa and Arab States	25%	38%	63%
Baku	Azerbaijan	North Africa and Arab States	18%	27%	45%
Cairo	Egypt	North Africa and Arab States	24%	32%	56%
Ahvaz	Iran	North Africa and Arab States	23%	32%	55%
Tel Aviv	Israel	North Africa and Arab States	22%	39%	61%
Shymkent	Kazakhstan	North Africa and Arab States	17%	35%	52%
Luanda	Angola	Sub-Saharan Africa	17%	28%	45%
Kinshasa	Congo Dem. Rep.	Sub-Saharan Africa	13%	26%	39%
Ndola	Zambia	Sub-Saharan Africa	13%	39%	52%

\*Link to full database: [SDG 11.7.1 Database](#)



# Conclusions

- With our partners (EC, KTH university, NYU, Local governments, NSOs, ESRI, urban observatories, ESA, NASA, etc ) we have demonstrated both in principle and in practice that **cities and NSOs are accurately collecting data for this indicator** i.e. using a generally agreed upon methodology, and data has been gathered in several cities with relevant disaggregation's.
- **A complete set of all latest data** by countries/cities and disaggregation is available at [SDG 11.7.1 Database](#)
- **A data collection form** for the indicator has been developed and pilot tested in several countries/cities and is available at [SDG 11.7.1 data collection form](#).
- Global guides for NSOs and city teams are available
- Also **a complete guide on public spaces** is available at [Global Public Space Toolkit](#)
- The body of evidence provided linked alongside the criteria for reclassification is the basis for seeking a Tier II for this indicator.





Thank You