Metadata on SDGs Indicator 11.7.1

Indicator category: Tier II

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable.

Target 11.7: Providing universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

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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1. Definition and method of Computation

This indicator aims to monitor successfully the amount of land that is dedicated by cities for public space (open spaces and streets). Cities vary considerably in size, history, development patterns, designs, shapes and citizen's attitudes towards public spaces. Measuring how much public space a city has is only one part of measuring whether residents actually benefit from the space.

The following definitions are required:

Built-up area of a city is the contiguous area occupied by **buildings and other impervious surfaces including the urban vacant areas in and around them** but excluding rural areas beyond the urban fringe.

Public space all places of public use, accessible by all comprises open public space and streets. The elements, which can be considered as open public space, are:

• Parks: Open space inside an urban territory that provide free air recreation and contact with nature. Their principal characteristic is the significant proportion of green area.
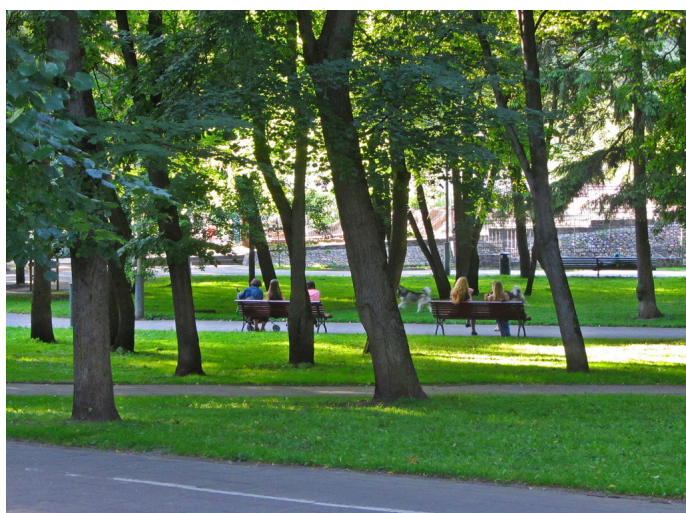
A park © Flickr/Tery14

• Recreational areas: public areas that contribute to environmental preservation. Their main functions can be both ornamental and passive recreation. These includes areas such as playground, riverfronts, waterfronts, public beaches etc.
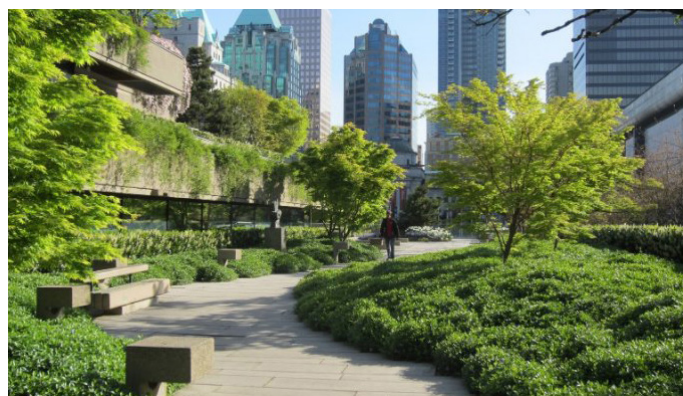
Recreational area © Flickr /Ramerk_de

• Civic parks: Open space created as a result of building agglomeration around an open area, which was later transformed into a representative civic area. They are characterized by considerable nature, specifically gardens and a good place for cultural events and passive recreation.

Palm Desert civic center © tripadvisor.com

• Squares: Open spaces created because of building agglomeration around an open area. Its main characteristics are the significant architectonic elements and interaction among buildings and the open area. Squares are usually public spaces relevant to the city due to their location, territorial development, or cultural importance.

Streets are defined as the space used by pedestrian or vehicles in order to go from one place to another in the city. The following elements are considered as streets space: *Carriageways, One car park line on each side of the road, sidewalks, bike paths, traffic islands, roundabouts, median strips and green areas in the center of boulevards and tramways.*

Borehamwood, England © Street View Screenshot.

Elements excluded from street space include plots (either built-up), open space blocks, railways, paved space within parking lots and airports and individual industries.

Brooklyn New York © GoogleMap Screenshot.

Trafalgar Square, London © Wikipedia Commons

2. Methods for Computing the Proposed Indicator:

The method to estimate the area of public space is based on three steps: a) spatial analysis to delimit the built-up area of the city; b) estimation of the total open public space and; c) estimation of the total area allocated to streets.

a). Spatial analysis to delimit the built-up area.

Delimit the built-up area of the urban agglomeration and calculate the total area (in square kilometers). To compute this component of the indicator, follow these steps:

   i). Acquire satellite imagery (Imagery is freely available on the internet).

   ii). Classify the satellite imagery into built-up area, open space, or water.

   iii). Sub-classify, the built-up area pixels into three types i.e. urban, suburban and rural based on the built-up density

   iv). Sub classify, open space pixels into three types i.e. fringe open space, captured open space and rural open space .

   v). Run Cluster analysis-using sub-classification of built-up area and open space into a unified extent (built-up area).

   vi). Calculate the total area in square kilometers.

b). Computation of total area of open public space.

Mapping and calculation of the total areas of open public space within the defined urban boundaries based on the built-up area. To compute this component of the indicator, follow these steps:

   i). An inventory on Open Public Spaces should be the initial source of information, additional legal documents, land use plans and other sources of information complement the information

   ii). Alternatively, since this inventory is often not available, using satellite imagery/data identify Potential Open public spaces,

   iii). Digitize Potential Open public spaces

   iv). Field work to verify the identified spaces and assess quality based on the definition above to create an inventory of open public spaces

   v). Calculate the total area of open public space.

c). Computation of land allocated to streets.

Calculation of the total area allocated to streets based on sampling techniques as a proportion of the total surface of the built-up area. To compute this component of the indicator, follow these steps:

   i). Using the built-up area boundary

   ii). Generate Halton sequence of sample points (Halton sequence refers to quasi-random sequence used to generate points in space that are ex-post evenly spread (i.e. equidistant))

   iii). Buffer the points to get sample areas with an area of 10 hectares each.

   iv). For each of the sample area: check the completeness of the street network, define and delimit streets as per definition.

   v). Calculate the land allocated to street for each sample area using the formula;

$$Land\ allocated\ to\ streets\ =\ \frac{Total\ street\ area}{Circle\ area}$$

The final computation of the indicator is calculated using the formula:

$$\begin{aligned}&Share\ of\ the\ built\text{-}up\ area\ of\ the\ city\ that\ is\ open\ space\ in\ public\ use\ (\%)\\&=\left[\frac{(Total\ surface\ of\ open\ public\ space + Total\ surface\ of\ land\ allocated\ to\ sreets)}{(Total\ surface\ of\ built\ up\ area\ of\ the\ urban\ agglomeration)}\right]\times 100\end{aligned}$$

Plaza de Mayo, Buenos Aires, Argentina © 10mosttoday.com

3. Rationale and interpretation

In order for cities to be vibrant and safe places, we need to think of them as systems of interdependent parts and complex connections, as interactive and social spaces. However, many public areas have been gradually forgotten-they are no longer safe living spaces that people enjoy. Reclaiming urban spaces for people is part of how we can humanize our cities and make our streets and public areas more communal. Public spaces are often more than anonymous places that can be replaced with one another: the meetings and exchanges that occur there affect our relationships with each other, giving meaning to our communities and urban landscapes.

This indicator provides information about the amount of open public areas in a city. Cities that improve and sustain the use of public space, including streets, enhance community cohesion, civic identity, and quality of life. Having access to open public spaces does not only improve the quality of life: it is also a first step toward civic empowerment and greater access to institutional and political spaces.

Cities function in an efficient, equitable, and sustainable manner only when private and public spaces work in a symbiotic relationship to enhance each other. In optimal conditions, they need to be secured and laid out in advance of urbanization to ensure orderly urban expansion. In existing cities, there is a need to revise and expand the ratio of public space in cities to make them more efficient, prosperous and sustainable and are needed in adequate amounts. Uncontrolled rapid urbanization creates disorderly settlement patterns with dangerously low shares of public space. Many cities in developed countries are also experiencing a dramatic reduce of public space.

The road network is the integrative tissue that binds cities together. It organizes the geographic space of cities, integrates them both as job markets and as local political spaces. Cities that are walkable and transit-friendly require a highly connected network of paths and streets around small, permeable blocks. A tight network of paths and streets offering multiple routes to many destinations that also make walking and cycling trips varied and enjoyable. This has clear implications in making cities more energy efficient. Adequate public spaces in cities contribute to the achievement of other targets of Goal 11

Multi-functional street, Seattle © parklets.files.wordpress.com

4. Disaggregation

- Disaggregation by location (intra-urban)
- Disaggregation by qualities of the open public space (safe, inclusive, accessible, green)
- The share of built-up area is **green** open space in public use
- The share of built-up area is **universally accessible** open space in public use, particularly for disable persons.
- Disaggregation by type of human settlements.
- Disaggregation by typology of public space.

5. Sources and data collection processes

Satellite imagery (open sources), documentation outlining publicly owned land; community-based maps are the main sources of data.

- **For estimating the total Surface of Built-up area**. Satellite imagery: Use of existing layers of satellite imagery ranging from open sources such as Google Earth and US Geological Survey/NASA imagery Landsat to more sophisticated and higher resolution land cover data sets. Images are to be analyzed for the latest available year.

- **For the Inventory of open public space**. Information can be obtained from legal documents outlining publicly owned land and well-defined land use plans. In some cases, where this information is lacking, incomplete or outdated, open sources, informants in the city and community-based maps, which are increasingly recognized as a valid source of information, can be a viable alternative.

- The share of land in public open spaces cannot be obtained directly from the use of high-resolution satellite imagery, because **it is not possible to determine the ownership or use of open spaces by remote sensing.** However, fieldwork to validate and verify the open spaces derived from satellite imagery helps to map out land that is for public and non-public use.

6. Comments and limitations

Gaps in the currently available data for monitoring target 11.7 along with some recommendations of upcoming opportunities for filling such gaps are provided below. Many cities are now creating an inventory of public space or have one that is not up-to date. UN-Habitat has developed tools, programmes and guidelines to assist cities in measuring, and expanding the availability of public space in cities.

McLane Stadium © Waco, TX amphitheater and public open space

Types of open public space vary across cities; however, the types listed in this indicator are usually the most accepted ones and are now fully defined in the country guides we developed. The indicator quantifies the amount of open space in public use in cities but does not capture the quality of the space that may impede its proper use. As a result, the tools developed for surveys have been designed to collect additional data that is very useful for building the context of public space profiles.

7. Current data availability/ indicator tier

Data for this indicator is already available for over 450 cities, which are part of the UN-Habitat's city prosperity initiative.

8. Responsible entities

UN-Habitat is the lead in global reporting which will follow efforts of directly working with national statistical agencies for reporting at national levels. UN-Habitat and other partners including other private and regional commissions are working together on efforts of building national capacities to monitor and report on this indicator.

9. Data collection and data release calendar

The monitoring of the indicator is at intervals of 5 years, allowing for three reporting points until the year 2030. **Monitoring in 5-years intervals** allows cities to determine whether the shares of open public space in the built-up areas of cities is increasing significantly over time, as well as deriving the share of the global urban population living in cities where the open public space is below the acceptable minimum.

10. Treatment of missing values

All countries are expected to fully report on this indicator more consistently following implementation of several technical workshops where the methodological guide and tools will be introduced. In majority of the cases, missing values are available to reflect a non-measurement of the indicator for the city. However, because national statistical agencies are reporting national figures from all cities or

a sample of cities, we expect fewer missing values at the national level over the years. Global figures will be derived from nationally reported estimates.

11. Sources of differences between global and national figures

Most cities lack a clear protocol or standard guide for how they might measure public spaces, let alone an existing inventory or understanding of the public agencies involved in public space (e.g. cities can have both city-owned parks and national parks). Google maps are helping to fill the gaps in inventory of a city's public space. These differences in knowledge and understanding are expected to create some inconsistencies in reporting.

12. Regional and global estimates and data collection for global monitoring

Regional and global estimates are derived from national figures with an appropriate disaggregation level. Specialized tools were developed and agreed upon with local and international stakeholders. For example, UN-Habitat proposed the use of the national sample of cities in order to obtain and get the national estimates for countries with many cities.

13. References

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- UN-Habitat (2015) Global Public Space Toolkit From Global Principles to Local Policies and Practice