SDG indicator metadata

(Harmonized metadata template - format version 1.1)

0. Indicator information (SDG_INDICATOR_INFO)

0.a. Goal (SDG_GOAL)

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

0.b. Target (SDG_TARGET)

Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

0.c. Indicator (SDG_INDICATOR)

Indicator 11.2.1: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

0.d. Series (SDG_SERIES_DESCR)

SP_TRN_PUBL - Proportion of population that has convenient access to public transport [11.2.1]

0.e. Metadata update (META_LAST_UPDATE)

2025-04-23

0.f. Related indicators (SDG_RELATED_INDICATORS)

11.3.1, 11.7.1, 9.1.1

0.g. International organisations(s) responsible for global monitoring (SDG_CUSTODIAN_AGENCIES)

United Nations Human Settlements Programme (UN-Habitat)

1. Data reporter (CONTACT)

1.a. Organisation (CONTACT_ORGANISATION)

United Nations Human Settlements Programme (UN-Habitat)

2. Definition, concepts, and classifications (IND_DEF_CON_CLASS)

2.a. Definition and concepts (STAT_CONC_DEF)

This indicator will be monitored by the proportion of the population that has convenient access to public transport. Because most public transport users walk from their trip origins to public transport stops and from public transport stops to their trip destination, local spatial availability and accessibility is sometimes evaluated in terms of pedestrian (walk) access, as opposed to park and ride or transfers.

Hence, the access to public transport is considered convenient when an officially recognized stop is accessible within a walking distance along the street network of 500 m from a reference point such as a home, school, work place, market, etc. to a low-capacity public transport system (e.g. bus, Bus Rapid Transit) and/or 1 km to a high-capacity system (e.g. rail, metro, ferry). Additional criteria for defining public transport that is convenient include:

   a. Public transport accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, as well as those with temporary disabilities, the elderly, children and other people in vulnerable situations.

    b.   Public transport with frequent service during peak travel times.

    c.   Stops present a safe and comfortable station environment.

The following definitions are required to define and measure convenient access to public transport.

City or urban area: Since 2016 UN-Habitat and partners organized global consultations and discussions to narrow down the set of meaningful definitions that would be helpful for the global monitoring and reporting process. Following consultations with 86 member states, the United Nations Statistical Commission (UNSC), in its 51st Session (March 2020) endorsed the Degree of Urbanisation (DEGURBA) as a workable method to delineate cities, urban and rural areas for international statistical comparisons.[1] This definition combines population size and population density thresholds to classify the entire territory of a country along the urban-rural continuum, and captures the full extent of a city, including the dense neighbourhoods beyond the boundary of the central municipality. DEGURBA is applied in a two-step process: First, 1 km^2 grid cells are classified based on population density, contiguity and population size. Subsequently, local units are classified as urban or rural based on the type of grid cells in which the majority of their population resides. For the computation of indicator 11.2.1, countries are encouraged to adopt the DEGURBA to define the analysis area (city or urban area).

Public transport is defined as a shared passenger transport service that is available to the public and is provided for the public good. It includes cars, buses, trolleys, trams, trains, subways, and ferries that are shared by strangers without prior arrangement. It may also include informal modes of transport (e.g. community transport, paratransit, unregulated public transport) – but it is noted that these are often lacking in designated routes or stops.

For a city to understand the nature of its transport system and in turn make the necessary planning and investment decisions, it is recommended to do an inventory of its public transport modes including major characteristics. For cities where a mix of formal and informal transport systems exist, it is also recommended to disaggregate the indicator findings by the share of population with access to each type of transport system, which is critical for decision-making processes. Recent data has shown that many cities in developing regions may lack a formal public transport system, but residents still enjoy a high level of access to public transport driven by a comprehensive informal public transport network (e.g. community transport, paratransit, unregulated public transport etc) which does not necessarily have designated stops. A mapping of the transport routes where these informal public transport networks can stop is thus recommended, and countries are encouraged to document each type of transport mode.

Street Network is defined as a system of interconnected lines that represent a system of streets or roads for a given area. A street network provides the foundation for network analysis that will help to measure the pedestrian access/walking distance of 500 m and/or 1 km to a public transport stop; or the network along which random informal transport modes can be accessed. Some cities have detailed data on their street network, type, street design (e.g. availability of a safe walking path) or topological structure of the network. However, if such data is not available, it is proposed to use OpenStreetMap as a baseline and fill missing gaps through digitizing of missing lines from satellite imagery (e.g. Google Earth). The major assumption in the use of these data sources is that all streets are walkable and on the same elevation level.

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[1] A recommendation on the method to delineate cities, urban and rural areas for international statistical comparisons. https://unstats.un.org/unsd/statcom/51st-session/documents/BG-Item3j-Recommendation-E.pdf.

Service Area, in the context of indicator 11.2.1 is defined as the area served by public transport within 500 m walking distance to a low capacity-system and/or 1 km to a high-capacity system based on the street network.

Low-capacity public transport system, in the context of indicator 11.2.1 includes systems such as buses, trams, and Bus Rapid Transit (BRT), which largely run along the street network (including on dedicated lanes or tracks that follow the street network). These low-capacity public transport carriers are smaller in size and require less space for stopping-dropping-picking passengers (compared to high-capacity carriers such as metros), meaning their stops can be provided within shorter distances to each other and along majority of the city streets. In countries where informal public transport systems are common, most of the services/carriers will fall under this category of public transport system.

High-capacity public transport system, in the context of indicator 11.2.1 includes systems such as trains, metros and ferries. The carriers in this category of public transport system are large and require significantly large terminus infrastructure (e.g. metro stations) which makes it impossible to provide their stopping-dropping-picking stations (stops) within short distances. Majority of the carriers in this category also operate along dedicated infrastructure (e.g. metro-lines, waterways) and reach higher speeds than low-capacity carriers. Several surveys have indicated that passengers are more likely to walk longer distances to access high-capacity than they would walk to access low-capacity public transport systems.

Built up area within the context of indicator 11.2.1 is defined as all areas occupied by buildings.

2.b. Unit of measure (UNIT_MEASURE)

Percent (%)

2.c. Classifications (CLASS_SYSTEM)

The indicator depends on international classifications on boundaries of countries and regions and city boundaries. Guidance on the city definitions is provided based on a harmonized global city definition, see: https://unstats.un.org/unsd/statcom/51st-session/documents/BG-Item3j-Recommendation-E.pdf.

3. Data source type and data collection method (SRC_TYPE_COLL_METHOD)

3.a. Data sources (SOURCE_TYPE)

- **Location of public transport stops:** Typically available from city administration or transport service providers, General Transit Feed Specification (GTFS) feeds, OpenStreetMap, Google (if not available at all, for instance in cities with informal public transport services, innovative technologies/apps and stakeholder consultations could assist the cities to map out the routes and stops).
- **Street Network:** Ideally available from city administration but could also come from OpenStreetMap, the Global Roads Open Access Data Set (gROADS) and other open-source streets data providers.
- **Population data:** Available from censuses or other demographic surveys at individual dwelling units or enumeration zones, which can be further disaggregated to uniform grids through population modelling approaches.
- **Number of residents per dwelling unit:** Available from census/household surveys.

- **Demographic data for disaggregation:** Typically available from household surveys that collect information both on household/individual characteristics and travel patterns. Must also provide information on the location of the respondent. These surveys could also be used to collect information about the perceived quality of the service, such as time to reach a station considering obstacles, typical wait times, safety, etc. Note that such household surveys are often not easily available and rarely updated on a frequent (e.g. every 2-3 years) basis.

3.b. Data collection method (COLL_METHOD)

Data collection is supposed to be done at the local city/urban level, with national aggregates made from all cities in the country, or from a sample of representative cities (selected using the National Sample of Cities Approach developed by UN-Habitat). At the Global level, data will be assembled and compiled for international consumption and comparison by UN-Habitat and other partners. UN-Habitat and partners will explore several capacity building options to ensure that uniform standards for generation, reporting and analysing data for this indicator are applied by all countries and regions.

3.c. Data collection calendar (FREQ_COLL)

The monitoring of the indicator can be repeated at an annual interval, allowing several reporting points until the year 2030. Monitoring at annual intervals will help in determining whether the proportion of the population with convenient public transport is increasing significantly over time, as well as monitor what is the share of the global urban population living in cities where the convenient access to public transport is below the acceptable minimum. Indicator 11.2.1 has the potential to measure improvement within short term intervals. Moreover, the disaggregated monitoring for this indicator will provide increasing attention on the access to transport especially among the vulnerable populations such as women, children, persons with disabilities and older persons. It will also help to track a modal shift towards more sustainable modes of transport including public transport integrated with walking and cycling.

UN-Habitat has developed a simple reporting template appended to this metadata to collect city level data. The template, which is sent to countries on an annual basis is expected to be used until 2030, but slight changes may be effected as data on more aspects becomes available. The template is appended to this metadata and can also be accessed [here](#).

3.d. Data release calendar (REL_CAL_POLICY)

Data for indicator 11.2.1 will be released on an annual basis, to cater for an anticipated increase in the number of cities/urban areas and countries reporting on the indicator. Changes in trends within individual cities and/or countries are likely to happen in spans of about 3-5 years, so a three-year window will be applied for comprehensive review of all data, with updates made based on availability of new data.

3.e. Data providers (DATA_SOURCE)

National focal points as designated by respective governments underpins the governance framework for monitoring the transport target. Such focal points could be the ministries themselves, National Statistical Offices (NSOs), academic or research institutions, Civil Society Organisations (CSOs), transport operators or a combination of these working under an agreement facilitated by the national government. UN-Habitat will be working with its partner organizations to support countries in the data collection efforts,

by providing capacity building and quality assurance support. UN-Habitat and partners will also ensure the exchange of knowledge and experience between participating countries. Specific agreements will be drawn up with respective countries and cities for collaboration in the monitoring – as well as with partner organizations involved in transport data collection including the International Association of Public Transport (UITP), the Institute for Transport and Development Policy (ITDP), the World Bank, the International Transport Forum (ITF), the Partnership on Sustainable, Low Carbon Transport (SLoCaT), the Wuppertal Institute of Climate, Energy and Environment, the German Aerospace Center (DLR) and others. Comprehensive reporting will be undertaken on a biennial basis. Reports will be published in the public domain with data available in the UN-Habitat global databases.

3.f. Data compilers (COMPILING_ORG)

United Nations Human Settlements Programme (UN-Habitat)

3.g. Institutional mandate (INST_MANDATE)

The United Nations Human Settlements Programme (UN-Habitat is the specialized agency for sustainable urbanization and human settlements in the United Nations. The mandate derives from the priorities established in relevant General Assembly resolutions and decisions, including General Assembly resolution 3327 (XXIX), by which the General Assembly established the United Nations Habitat and Human Settlements Foundation, and resolution 32/162 by which the Assembly established the United Nations Center for Human Settlements (Habitat). In 2001, by its Resolution 56/206, the General Assembly transformed the Habitat into the secretariat of the UN-Habitat, with a mandate to coordinate human settlements activities within the United Nations System. As such, UN-Habitat has been designated the overall coordinator of SDG 11 and specifically as a custodian agency for 9 of the 15 indicators under SDG 11 including indicator 11.2.1. UN-Habitat also supports the monitoring and reporting of 4 urban specific indicators in other goals.

4. Other methodological considerations (OTHER_METHOD)

4.a. Rationale (RATIONALE)

This indicator aims to successfully monitor the use of and access to the public transportation system and the move towards easing the reliance on the private means of transportation, improving the access to areas with a high proportion of transport disadvantaged groups such as elderly citizens, physically challenged individuals, and low-income earners or areas with specific dwelling types such as high occupancy buildings or public housing and reducing the need for mobility by decreasing the number of trips and the distances travelled. The accessibility based urban mobility paradigm also critically needs good, high-capacity public transport systems that are well integrated in a multimodal arrangement with public transport access points located within comfortable walking or cycling distances from homes and jobs for all.

The ability of residents including persons with disabilities and businesses to access markets, employment opportunities, and service centers such as schools and hospitals is critical to urban economic development. The transport system provides access to resources and employment opportunity. Moreover, accessibility allows planners to measure the effects of changes in transport and land use systems. The accessibility of jobs, services and markets also allows policymakers, citizens and businesses to discuss the state of the transport system in a comprehensible way. The transportation system is a critical enabler of economic activities and social inclusion. The access to transport SDG indicator

addresses a significant gap that was never addressed by the Millennium Development Goals (MDGs), i.e. directly addressing transport as a critical enabler of economic activities and social inclusion. Already, the "externalities" associated with transport in terms of greenhouse gas emissions, traffic congestion and road traffic accidents have been increasing. Emissions from transport are now (2022) responsible for 23% of global greenhouse gas emissions[2] and are increasing faster than any other source; outdoor air pollution alone, a major source of which is transport, is responsible for 4.2 million[3] premature deaths annually, road traffic accidents kill more than 1.3 million[4] people every year and severe traffic congestion is choking cities and impacting gross domestic product (GDP). Achieving SDG 11 requires a fundamental shift in the thinking on transport with the focus on the goal of transport rather than on its means. With accessibility to services, goods and opportunities for all as the ultimate goal, priority is given to making cities more compact and walkable through better planning and the integration of land-use planning with transport planning. The means of transport are also important but the SDG's imperative to make the city more inclusive means that cities will have to move away from car-based travel to public transport and active modes of transport such as walking and cycling with good inter-modal connectivity.

The rising traffic congestion levels and the resulting negative air quality in many metropolitan areas have elevated the need for a successful public transportation system to ease the reliance on the private means of transportation. Cities that choose to invest in effective public transportation options stand out to gain in the long run. Cities that have convenient access to public transport, including access by persons with disabilities are more preferred as these are more likely to offer lower transportation costs while improving on the environment, congestion and travel times within the city. At the same time, improving the access to areas with a high proportion of transport disadvantaged groups such as elderly citizens, physically challenged individuals, and low-income earners or areas with specific dwelling types such as high occupancy buildings or public housing also helps increase the efficiency and the sustainability of the public transport system. Public transport is a very important equalizer of income, consumption and spatial inequalities. This indicator is empirically proven that public transport makes cities more inclusive, safe and sustainable. Effective and low-cost transportation is critical for reducing urban poverty and inequalities and enhancing economic development because it provides access to jobs, health care, education services and other public goods.

Clean public transport is a very efficient mean for the reduction of CO_2 emissions and therefore it contributes to reduction of climate change impacts and lower levels of energy consumption. Most importantly public transport needs to be easily accessible to the elderly and disabled citizens.

4.b. Comment and limitations (REC_USE_LIM)

Experts in the transport sector, during different Expert Group Meetings held in 2016, 2017 and 2019 established that measuring accessibility to public transport using the distance to stop metric (spatial access of 500 m or 1 km walking distance to a public transport stop) provides a good measurement of the indicator. They however also pointed out that this distance computation is not enough to properly measure "convenient access" to public transport. At a minimum, they recommended that additional features of quality be taken into account, as described in the recommended secondary indicators section. Eventually, a complete shift to a measure of access of destinations and opportunities would be ideal, if

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[2] IEA, Global energy-related CO2 emissions by sector, IEA, Paris https://www.iea.org/data-and-statistics/charts/global-energy-related-co2-emissions-by-sector, IEA. Licence: CC BY 4.0.

[3] https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health.

[4] https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries.

data systems can be developed to support this, and applied in a consistent manner in cities around the world.

4.c. Method of computation (DATA_COMP)

The method to estimate the proportion of the population that has convenient access to public transport is based on **five** steps (core indicator):

a) Delimitation of the urban area/city which will act as the spatial analysis scope,
b) Inventory of the public transport stops in the city or the service area,
c) Network analysis based on street network to measure walkable distance of 500 m and/or 1 km to nearest transport stop ("service area"),
d) Estimation of population living within the walkable distance to public transport, and
e) Estimation of the proportion of the population with convenient access out of the total population of the city.

a. Delimitation of the urban area/city which will act as the spatial analysis scope: Following consultations with 86 member states, the United Nations Statistical Commission in its 51st session (March 2020) endorsed the Degree of Urbanisation (DEGURBA) as a workable method to delineate cities, urban and rural areas for international statistical comparisons. Countries are thus encouraged to adopt this approach for delimitation of the urban area/city within which indicator 11.2.1 is measured, which will help them produce data that is comparable across urban areas within their territories, as well as with urban areas and cities in other countries. More details on DEGURBA and its application are available here: https://unstats.un.org/unsd/statcom/51st-session/documents/BG-Item3j-Recommendation-E.pdf.

b. Inventory of public transport stops: Data and information on types of public transport available in each urban area/city, as well as the location of public transport stops can be obtained from city administration or transport service providers. In many cases, however, this information is lacking, incomplete, outdated, or difficult to access (especially where strong inter-agency collaboration is lacking). In these cases, alternative sources which have proven to be useful include open data sources (e.g. OpenStreetMap, Google and the General Transit Feed Specification - GTFS feeds), volunteered geospatial data, community transport /paratransit mapping, community-based maps, and point mapping using global positioning systems (GPS) or from high to very high resolution satellite imagery (e.g. Google Earth). When information is available, characteristics of the quality, universal accessibility for people with disabilities, safety, and frequency of the service can be 'assigned' to the public transport stops' inventory for detailed analysis and further disaggregation according to the statistical capacities of countries and cities.

c. Network analysis based on street network to measure walkable distance of 500 m and/or 1 km to nearest transport stop ("service area"): To calculate the walking distance to each stop, data on a well-defined street network (by city authorities or from open sources such as OpenStreetMap) is required. Network analyst tools (Geographic Information System, GIS) can be used to identify service areas around any location on a network. A network service area is a region that encompasses all accessible areas via the streets network within a specified impedance/distance. The distance in each direction (and in turn the shape of the surface area) varies depending on, among other things, existence of streets, presence of barriers along each route (e.g. lack of footbridges and turns) or availability of pedestrian walkways along each street section. In the absence of detailed information on barriers and walkability along each street

network, the major assumption in creating the service areas is that all streets are walkable. Since the analysis is done at the city and national level, local knowledge can be used to exclude streets which are not walkable. The recommendation is to run the service area analysis for each public transport stop per applicable walking distance thresholds (500 m or 1 km), and then merge all individual service areas to create a merged service area polygon.

In urban areas where informal services are the main mode of public transport, the use of street networks along which the carriers stop should be used in place of the designated stops. Cities and countries are encouraged to provide notes on their type of public transport system (whether formal, informal or a mix).

d. Estimation of population within the walkable distance to public transport: The combined service area of 500 m walking distance to the low-capacity stops and/or 1 km to the high-capacity stops generated in (c) above is overlaid in GIS with high resolution demographic data. The best source of population data for the analysis is individual dwelling or block level total population which is collected by National Statistical Offices through censuses and other surveys. Where this level of population data is not available, or where data is released at large population units, countries are encouraged to create population grids, which can help disaggregate the data from large and different sized census/population data release units to smaller uniform sized grids. For more details on the available methods for creation of population grids, explore the links provided under the references section on "Some population gridding approaches". A generic description of the different sources of population data for the indicator computation is also provided in the detailed indicator 11.2.1 training module (see link in references section). Once the appropriate source of population data is acquired, the total population with convenient access to public transport in the city will be equal to the population encompassed within the combined service area for all public transport modes.

e. Estimation of the proportion of the population with convenient access to public transport out of the total population of the city or urban area. Estimate the proportion of population with access to public transport within 500 m and/or 1 km walking distance out of the total population of the city or urban area.

$$\text{Share of population with convenient access to Public transport (\%)} = \frac{\text{Total population living within the merged service areas for low and (or) high capacity public transport stops}}{\text{City Population}}$$

Countries and cities are encouraged to disaggregate the data on access to public transport by the capacity of the carriers – that is between low-capacity and high-capacity systems. Where applicable, countries and cities are also encouraged to disaggregate the data by type of carrier – whether formal or informal . The disaggregation is directly relevant in understanding the entire public transport system and also identifying the weaknesses and opportunities in the system which are relevant in making policy and investment decisions.

Recommended secondary indicators
While the core indicator provides a good measurement that will help cities and urban areas identify their public transport situation, it does not cover the entire spectrum of information required to comprehensively analyse "convenient access" to public transport and to in turn inform policy and investments. Here, we recommend some secondary indicators which can be used to measure "convenient access" to public transport, and which may provide a useful complement to the core indicator of spatial distance to stops. Several are identified here, but there may be others. It should

however be noted that these secondary indicators may require more data inputs and sometimes field-based surveys, and that their collection may vary significantly across jurisdictions making comparisons difficult. Despite this, these indicators provide critical information that can help cities and urban areas improve their public transport systems and ensure the needs of all urban dwellers are catered for. The suggested secondary indicators include:

- **Transit system performance:** The methodology described above for monitoring the core indicator covers public transport service solely based on spatial access to stops and does not address the performance of the system, such as frequency of service, capacity, comfort, etc. We note that performance aspects of public transport are important because a service within walking distance is not necessarily considered as accessible if waiting times are long, frequency of service is low or if conditions are unsafe/insecure. The system cannot also be considered as accessible and reliable when passengers spend many hours from their trip origin to destination. These are not included in the core indicator, but countries are encouraged to collect and report this information as a secondary indicator. Transport stakeholders participating in Expert Group Meeting held in Berlin on 19 -20 October 2017 recommended the use of 20 minutes average waiting time during peak hours (from 5 am to 9 pm) to assess the frequency of the service. This data can be acquired from public transport timetables for some cities, from public transport service providers or through surveys. This measurement may however be limited in cities where informal public transport modes are prevalent since they often do not operate according to fixed schedules.
- **Affordability:** This can be used to further explain the indicator since access is only convenient for those who can afford the transport services. Affordability is often measured as the percentage of household income spent on transport of the poorest quintile of the population. Data can be obtained from surveys. The recommended indicator for affordability is that the poorest quintile should not spend more than 5% of their net household income on transport.
- **Safety/security:** This parameter may be difficult to measure but could be quantitatively captured in part from accident and crime statistics near stations and on the transit systems themselves. For example, safety of the public transport can be measured by the share or number of crimes within the public transport system to the total crimes in the city. In addition, it is recommended to include a question on the perception of safety of public transport in the national crime surveys, or in transport user surveys.
- **Comfort and access to information:** An additional feature of "convenient access" may be the presence of information systems such as real-time electronic schedule displays or other user information systems (e.g. apps), while comfort may also relate to features on the system and typical crowding or load factor levels.
- **Modal shift to sustainable transport:** It is important to continuously monitor the modal share (percentage of travellers using a particular type of transportation incl. private cars, taxis, non-motorised transport, Public transport, etc.), as well as passenger-km travelled on electric vehicles as percentage of total passenger-km travelled in the urban area from city mobility surveys. This parameter is important to understand the city's overall mobility mix, monitor the modal shift towards more sustainable transport over time, and provide actionable recommendations to move towards low carbon, shared, high-capacity mobility systems in the future. The data on this secondary indicator is largely available for many cities. UN-Habitat thus requests for such information in the country reporting template every year to understand the transitions in the modal share.

Other measurement considerations which can be considered in the indicator measurement, and which can further improve understanding of prevailing public transport trends in cities include:

- **Alternative metrics of "spatial access":** In some cities, alternative modes to reach a public transport stop exist -– such as safe cycling lanes, bike share systems or other forms of micro-mobility. In these contexts, experts in the transport sector have suggested that a cycling distance of 2 km can be included in the creation of service areas to each public transport stop.
- **Obstacles to reaching stations:** Distance to stations may be adjusted by considering factors that create obstacles and make accessing the station difficult, at least for some travelers. An obvious example is the presence of walkways along the street network and the need to take stairs or steep ramps to reach a station, making it difficult for elderly or people with disabilities. Alternative routes would need to be identified, or stations indicated as not providing convenient access for some population groups. To identify the prevailing limitations, field observations will be required, which should capture, among other information, availability of safe walkways along the street network and existence of ramps or elevators ("universal access"), and special seating areas for the elderly and disabled.

Achieving a higher level of "convenient access" – Access to opportunities
Beyond the secondary indicators for measuring convenient access to public transport lies another approach that understands *Transportation* as a *means*, *not an end.* This is based on the purpose of 'transportation' to gain access to destinations, activities, services and goods. Ultimately, people do not wish to access transit stations, they wish to access destinations, and even access non-physical objectives such as "opportunities".

Operationally, access to "opportunities" means the ability of individuals to reach desired final destinations in a reasonable amount of time, for a reasonable cost, with adequate safety/security/ comfort, etc. For example, this may be measured as a maximum one-hour travel time between any origins and destinations (O-Ds) within a city, or at least those O-D combinations used (or desired to be used) by individuals.

While measuring "access to opportunities" has more analytical and policy value to measuring "access to transit stations", it is more difficult and data intensive, so it is not proposed as the core indicator. Though, as data systems improve and cities become more able to collect the needed data, it may eventually make sense to shift to this as a core indicator. We note here that there are three basic types of data needed to construct this indicator:

- Data on the residential locations of individuals,
- Data on the desired destinations of individuals (such as job, shopping, school, hospital locations),
- Data on the available travel options and travel times linking the origins to the destinations.

In fact, the first and third of these are very similar to what is needed to construct the core indicator, since residential locations and transit data are needed. The main additional data requirement is on the destinations, and there may be some additional complexities in putting the three types of data together. Efforts are ongoing to try to operationalize this approach and help cities beginning to collect the needed data.

4.d. Validation (DATA_VALIDATION)

As part of the validation process, UN-Habitat developed a template to compile data generated by countries through the National Statistics Offices as well as other government agencies responsible for official statistics (see: https://data.unhabitat.org/datasets/template-for-compilation-of-sdg-indicator-11-2-1). Data compiled is then checked against several criteria including the data sources used, the application of internationally agreed definitions, classification and methodologies to the data from that source, etc. Once reviewed, appropriate feedback is then provided to individual countries for further discussion.

4.e. Adjustments (ADJUSTMENT)

Any adjustments to the data is jointly agreed after consultations with the relevant national agencies that share the data points for reporting.

4.f. Treatment of missing values (i) at country level and (ii) at regional level (IMPUTATION)

- **At country level**

This indicator is measured at city level, and aggregations from available cities made to represent national averages. UN-Habitat has proposed use of the National Sample of Cities approach to identify cities/urban areas for which data can be calculated in a manner that is nationally representative. Noting gaps in the availability of public transport data in many countries, particularly on smaller cities/urban areas which may impact negatively on the production of national aggregates, countries are requested to report on the individual city values without creating national aggregates. The data reporting template provided by UN-Habitat requests for both city and national values, allowing countries to report incrementally on the available data points.

- **At regional and global levels**

This indicator is measured at city level, and population weighted aggregates from available cities are undertaken to represent national, regional and global averages. Currently, there is adequate representative data on the indicator to undertake population weighted regional and global averages. The continued production of data on the indicator is also enhancing the accuracy of regional and global estimates and has eliminated the risk of missing data at this level.

4.g. Regional aggregations (REG_AGG)

Data at the global/regional levels will be estimated from national figures derived from an aggregation of performance for all cities/urban areas or a sample of nationally representative cities (selected using the national sample of cities approach developed by UN-Habitat). Regional estimates will incorporate national representations using a weighting by population sizes. Global monitoring will be led by UN-Habitat with the support of other partners and regional commissions.

4.h. Methods and guidance available to countries for the compilation of the data at the national level (DOC_METHOD)

Data for indicator 11.2.1 is to be collected at the city/urban level and aggregates made to the national level. For countries which have adequate capacity (personnel, systems, resources) and baseline data, the indicator can be computed for all cities/urban areas then averages used to report on national

performances. For countries which do not have the capacity to collect data and undertake computations for all their cities/urban areas, UN-Habitat has proposed the use of the National Sample of Cities Approach, which allows them to select a representative sample from where weighted national aggregates can be undertaken.

The guidance on implementation of the National Sample of Cities Approach is available here: https://unhabitat.org/sites/default/files/2020/06/national_sample_of_cities_english.pdf. UN-Habitat will continuously undertake capacity building on the sampling approach, and directly support countries to develop a national sample of cities where needed.

UN-Habitat has developed a step-by-step data compilation and computation methodological document, which is applicable at the city and national level. The document is available here: https://data.unhabitat.org/pages/guidance . The agency also provides on-the-task training to countries on a need basis, as well as continuous technical support throughout the data compilation process to ensure alignment of national processes with the globally adopted methodology.

4.i. Quality management (QUALITY_MGMNT)

To ensure consistency in data production across countries, UN-Habitat has developed detailed step-by-step tutorials on the computation of indicator 11.2.1, which further explain the steps presented in this metadata. The detailed tutorials, which will be continuously updated are available at https://unhabitat.org/knowledge/data-and-analytics, https://www.urbanagendaplatform.org/learning, and https://data.unhabitat.org/.

Within its Data and Analytics Unit which is responsible for the indicator data compilation, UN-Habitat has a team of spatial data experts who check all submitted data and provide direct support to countries in the indicator computation.

As part of its global custodianship of indicator 11.2.1, UN-Habitat has also established partnerships with major institutions and organizations involved in production of baseline data relevant for the indicator computation. The main aim of this is to create a common understanding on the approach for the indicator computation, and to encourage continuous production of high-quality global data that responds to the indicator computation needs. Examples of some ongoing initiatives with partners to manage quality of products and processes include, among others providing support to apply the Degree of Urbanisation at the local level for the indicator computation (in partnership with the European Commission), development of an Earth Observation Toolkit for SDG 11 (in partnership with EO4SDG and GEO), and continuous feedback to global products produced by partners such as ITDP, UITP, the German Aerospace Center (DLR) and the European Commission, among others.

4.j Quality assurance (QUALITY_ASSURE)

UN-Habitat maintains the global urban indicators database that is used for monitoring of the urban metrics drawn from SDGs, New Urban Agenda (NUA), flagship reports (e.g. World Cities Report) and other official reporting. In general, for all new data, a thorough review is done to check for consistency and overall data quality by technical staff in the Data and Analytics unit before publication in the urban indicators database. This ensures that only the most accurate and reliable information are included in the database. Key elements considered in the review include: proper documentation of data sources; representativeness of data at national level, use of appropriate methodology for data collection and

analysis (e.g. appropriate sampling process, values based on valid sample sizes), use of appropriate concepts and definitions, consistency of data trends with previously published/reported estimates for the indicator.

4.k Quality assessment (QUALITY_ASSMNT)

Once data is received from member states, UN-Habitat uses a checklist specific to each indicator to a) assess whether the data production process followed the metadata provisions, and b) confirm the accuracy of the data sources used for the indicator computation. Both components are captured in the reporting template shared with National Statistical Offices, which helps to assess whether computation was done using the proposed indicator inputs or proxies. The reporting template also requests for information that helps understand whether national data for the indicator was produced from a representative sample of the country's urban systems, or if estimates were done for only select cities/urban areas where data is easily available.

In addition, the received data is also checked for other qualities such as data disaggregation, reporting period and consistency with other previously reported trends, which ensures reliable regional estimates. For indicator 11.2.1, one extra assessment that is done is to check the completeness of open-source data (such as OpenStreetMap and General Transit Feeds Specification, GTFS) for the specific country/city, where such is used for the indicator estimation.

5. Data availability and disaggregation (COVERAGE)

Data availability:
In 2024, data on indicator 11.2.1 is available for more than 2,000 cities from 190 countries. Some countries have also produced national averages based on the city level data. UN-Habitat has calculated populated weighted regional aggregates based on the M49 categories, as well as the UN regional commissions. UN-Habitat and partners are continuously supporting national statistical systems to increase data availability on the indicator, including disaggregation by gender and persons with disability.
Time series:
Annual based on data availability. Regional and global aggregates to be produced for 2020, 2025 and 2030.

Disaggregation:
The core indicator of access to public transport stations, and the proposed secondary indicators can in principle be disaggregated by various characteristics of groups within the population, to track whether all such groups have good access. Information can be disaggregated as shown below, including potential disadvantages such as disability, and by various other characteristics. Obtaining such data typically requires major efforts (mainly surveys) and often changes in mainstream mechanisms of data collection.

Typical types of disaggregation include:
- Disaggregation by location (intra-urban)
- Disaggregation by income group
- Disaggregation by sex (female-headed household)
- Disaggregation by age group
- Disaggregation by type of public transport system (low-capacity vs. high-capacity systems)
- Disaggregation by formality of public transport carrier (formal vs. informal transport modes/ services)

- Disaggregation by mode to reach public transport (walking vs. cycling)

Quantifiable Derivatives:
- Proportion of urban area that is served by convenient public transport systems
- Proportion of population/urban area that has convenient access to public transport stop with universal accessibility for people with disabilities
- Proportion of population/urban area that has frequent access to public transport during peak hours
- Proportion of population/urban area that has frequent access to public transport during off-peak hours
- Proportion of population with access to low-capacity systems (e.g. bus) and high-capacity systems (e.g. metros), access by **walking vs. biking**, etc.
- Proportion of population with access to **formal vs. informal** transport modes/services
- Share of population using different transport modes (modal share)

6. Comparability / deviation from international standards (COMPARABILITY)

Sources of discrepancies:

For this indicator, national data built up from a "national sample of cities approach", complemented with internationally available spatial data sources will be used to derive final estimates for reporting at national and global figures. As national agencies are responsible for data collection, no differences between country produced data and international estimated data on the indicator are expected to arise. Where such discrepancies exist, these will be resolved through planned technical meetings and capacity development workshops.

7. References and Documentation (OTHER_DOC)

URL:

[1] http://unhabitat.org/knowledge/data-and-analytics

https://data.unhabitat.org/

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- National Sample of Cities:
  https://unhabitat.org/sites/default/files/2020/06/national_sample_of_cities_english.pdf

- Access to Opportunities (World Bank):
  http://www.worldbank.org/en/topic/transport/brief/connections-note-25
- Global Mobility Report 2017 (SUM4All):
  https://openknowledge.worldbank.org/bitstream/handle/10986/28542/120500.pdf?sequence=4
- Coverage Areas for Public Transport:
  https://www.witpress.com/Secure/elibrary/papers/UT08/UT08017FU1.pdf
- Detailed Indicator 11.2.1 training module: https://data.unhabitat.org/pages/guidance
- Some population gridding approaches:
  https://sedac.ciesin.columbia.edu/data/collection/usgrid/methods;
  https://www.ciesin.columbia.edu/data/hrsl/; https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_grids; https://www.worldpop.org/methods
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