BUILDING GEOSPATIAL INDICATORS TO MONITOR PROGRESS IN REGIONS AND CITIES TOWARDS SUSTAINABLE DEVELOPMENT AND CIRCULAR ECONOMY

21 October 2021

Rudiger Ahrend, Head of the Economic Analysis, Data and Statistics Division
Outline

- How the OECD helps governments in their localised data work?
- Using geospatial data to define cities
- Geospatial tools to bridge data gaps
- Measuring the distance to the SDGs in regions and cities
- The OECD Laboratory for Geospatial Analysis
Using geospatial data for monitoring progress with SDGs and the circular economy

To adequately inform policy making, data need to:

1. Capture the scale of people’s everyday lives

2. Help to assess results of policies and monitor progress across places and over time

3. Support an evidence-based dialogue across levels of government and sectors of society
How the OECD helps governments in their localised data work?

Networks and Communities (WPTI, Geospatial Lab)

Visualisation tools (e.g. Atlas, SDGs, Well-being)

Geographical definitions (e.g. regions and cities)

Reports and Frameworks (e.g. Regions and cities at a Glance)

Databases (Regional and Metropolitan)
What is a city? Using geospatial data to define cities

Administrative boundaries vs. Functional urban areas

Many cities do not match their respective administrative boundaries.

[Image of maps showing urban areas and administrative boundaries for Paris and Rome]
One-fifth of metropolitan areas in the world are shrinking

Currently 20% decline since 2005

Looking forward 30% decline by 2050

Geospatial sources to bridge data gaps

Examples of modelled indicators

• **Global Burden of Disease (GBD):**
  Exposure to air pollution, PM2.5

• **Global Human Settlement Layer (GHSL grids):**
  Built-up area growth relative to population growth

• **Climate Change Initiative Land Cover (CCI-LC):**
  Change in tree cover

• **Global Database of Power Plants (geo-localised data):**
  Percent of electricity that comes from coal

• **Emission Database for Global Atmospheric Research (EDGAR grid):**
  GHG emissions by sector
Despite improvements in the last decade, air pollution in cities remains high

World trends in air pollution, 2010-19:

- In 30 OECD countries at least one city with air pollution above WHO recommended levels
- Air pollution levels have decreased since 2010, except in low- and lower-middle income countries
- Highest concentration of PM2.5 in lower-middle income countries’ cities (66 µ/m3 of PM2.5)

Recommended WHO limit: 10 µ/m3 of PM2.5
In one-third of cities with high levels of built-up area per capita, land consumption keeps increasing faster than population.

Land consumption relative to population growth in FUAs

Growth rate of built-up area minus growth rate of population, 2000-15

- Minimum
- Average of Metropolitan areas
- Maximum
Large metropolitan areas are experiencing higher tree cover loss than other areas, particularly in North America and Australia.

- Tree cover area has declined in more than half of functional urban areas between 1992 and 2018 (3pp reduction on average).
- Decline in tree cover happened for almost three quarters of the metropolitan areas over one million inhabitants.
Emissions per capita vary significantly across cities

Estimated GHG emissions per capita by metropolitan area size
Tonnes of CO2-equivalent emissions per capita, functional urban areas, 2018

- Large metropolitan areas tend to have lower production-based emissions per capita than other cities, mainly due to efficiency gains in the transport sector.
OECD Visualisation tool to measure the distance to the SDGs in regions and cities

oecd-local-sdgs.org
The OECD Laboratory for Geospatial Analysis (aka Geospatial Lab) is a platform that proposes to connect people from different organisations, including academia, government agencies, the private sector, and Statistical Offices to develop and disseminate policy-relevant analyses based on geospatial information.

Thank you!

Rudiger.AHREND@oecd.org

Twitter: @OECD_local
LinkedIn: www.linkedin.com/company/oecd-local
Website: www.oecd.org/cfe

Visit the OECD Statistical Atlas for Regions and Cities
https://regions-cities-atlas.oecd.org/

Website: www.oecd.org/regional/rural-development/rural-service-delivery.htm
Leveraging open data from Ookla

Users send billions of requests for tests

Send data

Receive data

How many seconds?

14000 Ookla servers

Users conduct speed tests automatically or deliberately (speedtest.com)

- Aggregated to web Mercator tiles at zoom level 16 (approximately 610 by 610 meters at the equator).
- GHS Settlement Model grids (1 by 1 km cells) according to the degree of urbanisation.
Rural areas consistently lag behind in terms of download speed, though urban-rural gap different across countries

Gaps in fixed download speeds experienced by users, by degree of urbanization (2020)

Deviation from the national average (in percentage points)
Fine-granular data allows zooming-in within countries (at different scales)

Ookla tests on fixed download speed, 2020, Q4

- Hamburg and Bremen 15% higher speed than national average
- Thuringia and Saxony-Anhalt more than 30% lower speed than national average
Download speeds are higher in denser places

OECD calculations based on Speedtest® by Ookla® Global Fixed and Mobile Network Performance Maps. Based on analysis by Ookla of Speedtest Intelligence® data for 2020Q4.
How do we feed our databases?

The Regional and Metropolitan databases

Indicators are compiled primarily from official statistics. In cases where the information is not available, the indicators are modelled using a variety of techniques:

- **Official Statistics**
  - Obtained from National Statistical Agencies

- **Modelling techniques**
  - Estimated based on unconventional sources (e.g. GIS techniques, big data, satellite imagery, raster files, etc.)

**Categories**

- Demographic
- Labour market
- Economic
- Territorial organisation
- Innovation
- Social / Environment