



The U4SSC KPIs

Enabling Smart Sustainable Cities



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"A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects."

Recommendation ITU-T Y.4900





U4SSC is a UN initiative coordinated by the ITU, UNECE and UN-Habitat along with several other UN bodies that advocates for public policy to encourage the use of ICTs and digital technologies to facilitate the transition to smart sustainable cities and meet SDG 11.

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U4SSC Key Performance Indicators for Smart Sustainable Cities



The U4SSC KPIs provide cities a way to quantify, measure, report and monitor progress along their smartness and sustainability pathways to achieving SDG 11: "Make cities and human settlements inclusive, safe, resilient and sustainable".



Aims

- To support cities in the implementation and use of the U4SSC KPIs
- To provide cities with a standardized method to measure performance and progress regarding:
 - Achieving the SDGs;
 - Becoming a smarter city; and
 - Becoming a sustainable city.

U4SSC KPIs Principles

Comprehensiveness

The set of indicators should cover all the aspects of SSC. The indicators of evaluation should be aligned to the measured subject, i.e., ICT and its impact on the sustainability of cities.

Comparability

The KPIs should be defined so that data can be compared scientifically between different cities according to the phases of urban development, which means the KPIs must be comparable over time and space.

Availability

The KPIs should be quantitative and the historic and current data should be either available or easy to collect.

Independence

The KPIs in the same dimension should be independent or almost-orthogonal i.e., overlap of the KPIs should be avoided as much as possible.

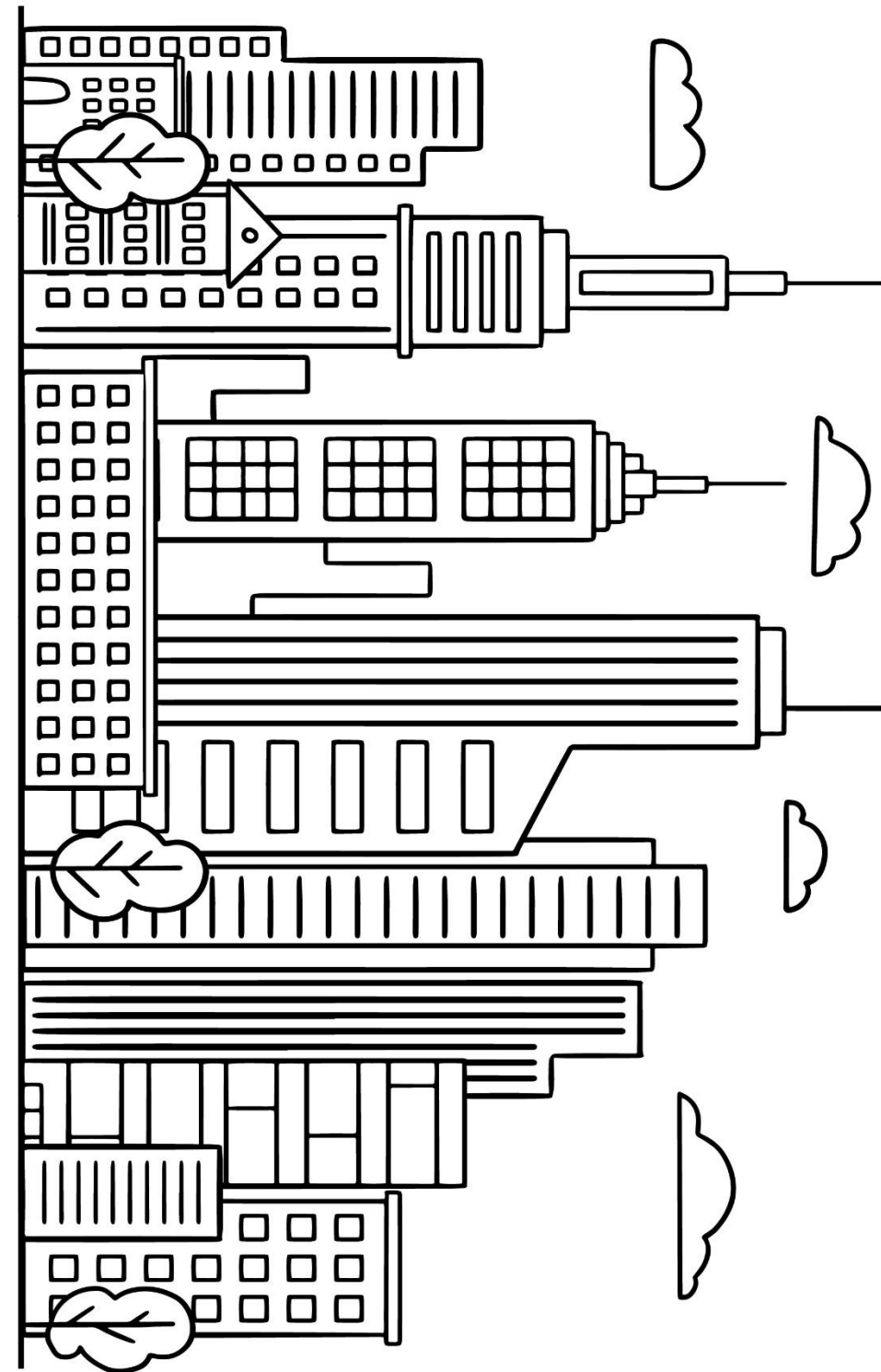
Simplicity

The concept of each indicator should be simple and easy to understand for the urban stakeholders. The calculation of the associated data should also be kept intuitive and simple.

Timeliness

This refers to the ability to produce KPIs with respect to emerging issues in SSC construction.

U4SSC KPIs Structure



Dimensions

Economy	Environment	Society and Culture
<ul style="list-style-type: none"> • ICT Infrastructure • Water & Sanitation • Drainage • Electricity Supply • Transport • Public Sector • Innovation • Employment • Waste • Buildings • Urban Planning 	<ul style="list-style-type: none"> • Air Quality • Water and Sanitation • Waste • Environmental Quality • Public Space and Nature • Energy 	<ul style="list-style-type: none"> • Education • Health • Culture • Housing • Social Inclusion • Safety • Food Security

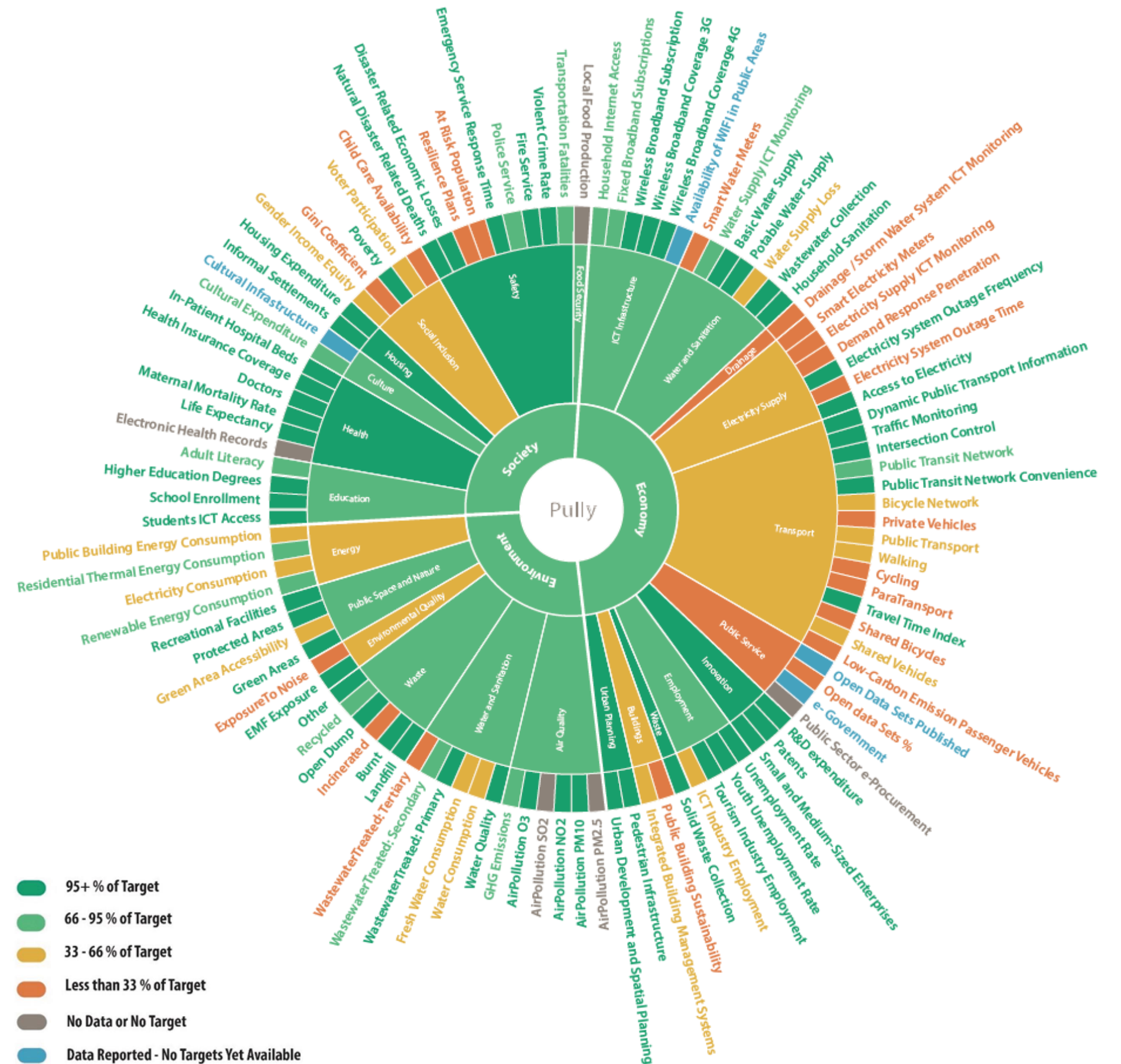
Categories

55 Core Indicators + 36 Advanced Indicators

- 20 Smart + 32 Structural + 39 Sustainable
- 132 Data Collection Points

U4SSC KPIs Applications

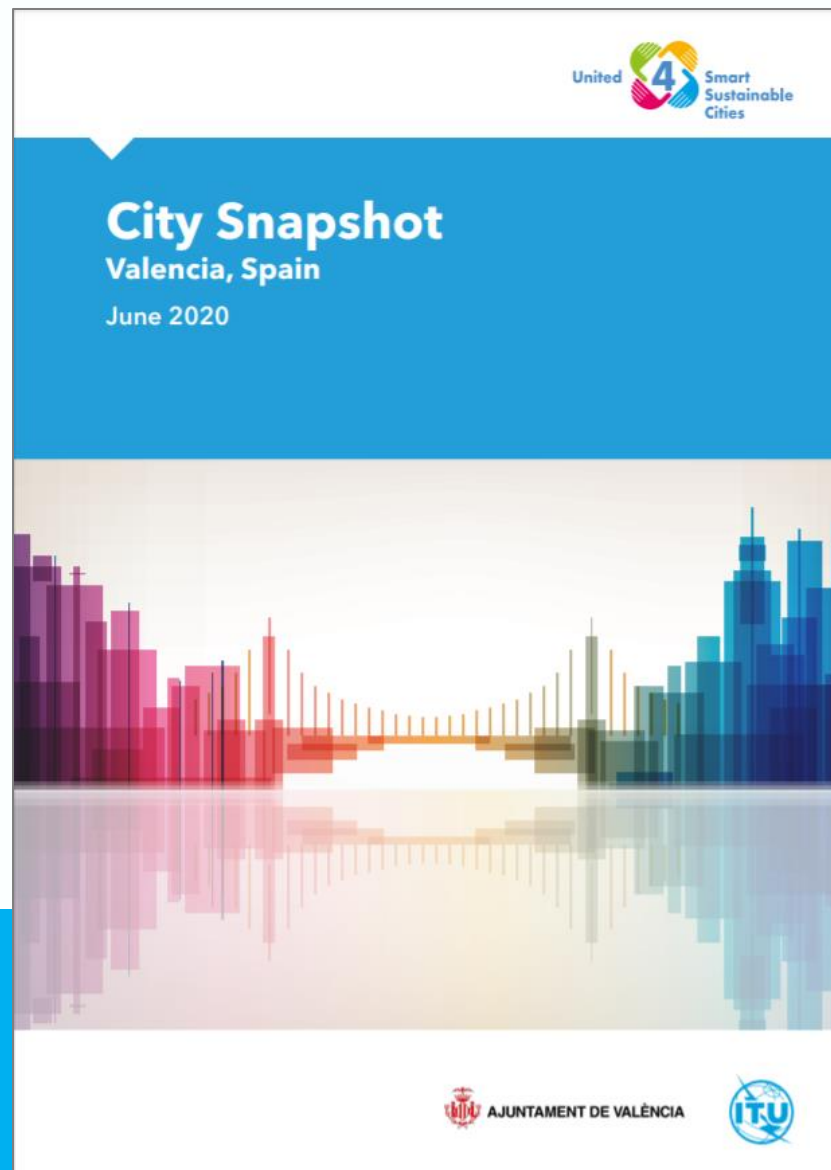
- Trend analysis
- Benchmarking and policy guidance



ITU's implementation of the U4SSC KPIs

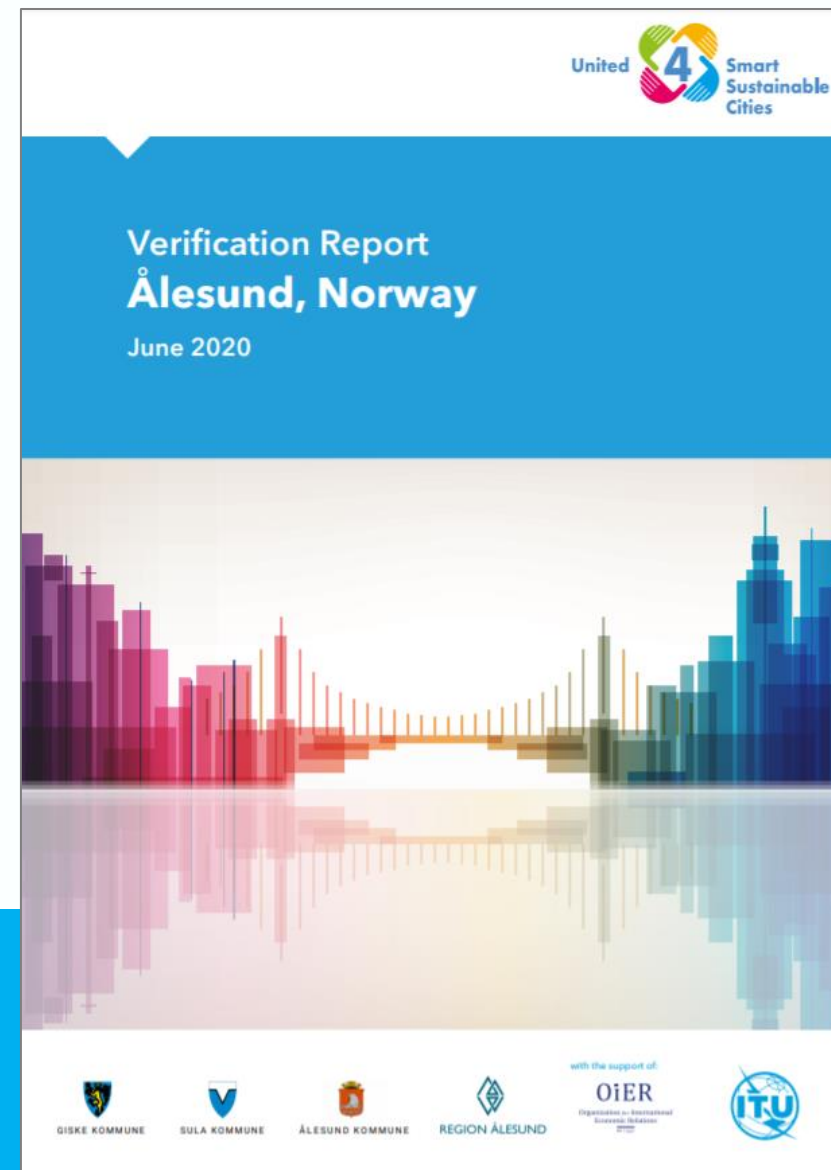
Available in the library of free resources at:

<https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx>



Snapshots

Provide a visual overview of a city's U4SSC KPIs performance based on global benchmarks.



Verification Reports

Summarize the conclusions of a city's U4SSC KPIs for SSC project.



Factsheets

Elaborate and analyze the results of a city's U4SSC KPIs for SSC project.

Case Studies

Detail a city's journey towards becoming a smart sustainable city (SSC).

ITU-T

Search...
"Smart Dubai, the happiest city on Earth"
Search engine.

Implementing ITU-T International Standards to Shape Smart Sustainable Cities:
The Case of Dubai

دبي الذكية
SMART DUBAI
الهيئة العامة لتنظيم قطاع الاتصالات

1956 2016
CCITT / ITU-T

ITU

The cover features a top-down view of several people's hands and arms gathered around a dark table, appearing to be in a collaborative meeting. A white banner with the text "Search..." and "Smart Dubai, the happiest city on Earth" is held across the table. The ITU-T logo is in the top right corner.

ITU-T

Implementing ITU-T International Standards to Shape Smart Sustainable Cities:
The Case of Singapore

IMM
INFOCOMM MEDIA DEVELOPMENT AUTHORITY

ITU

The cover features a night-time photograph of the Singapore skyline, with illuminated skyscrapers reflected in the water of a bay. The ITU-T logo is in the top right corner.

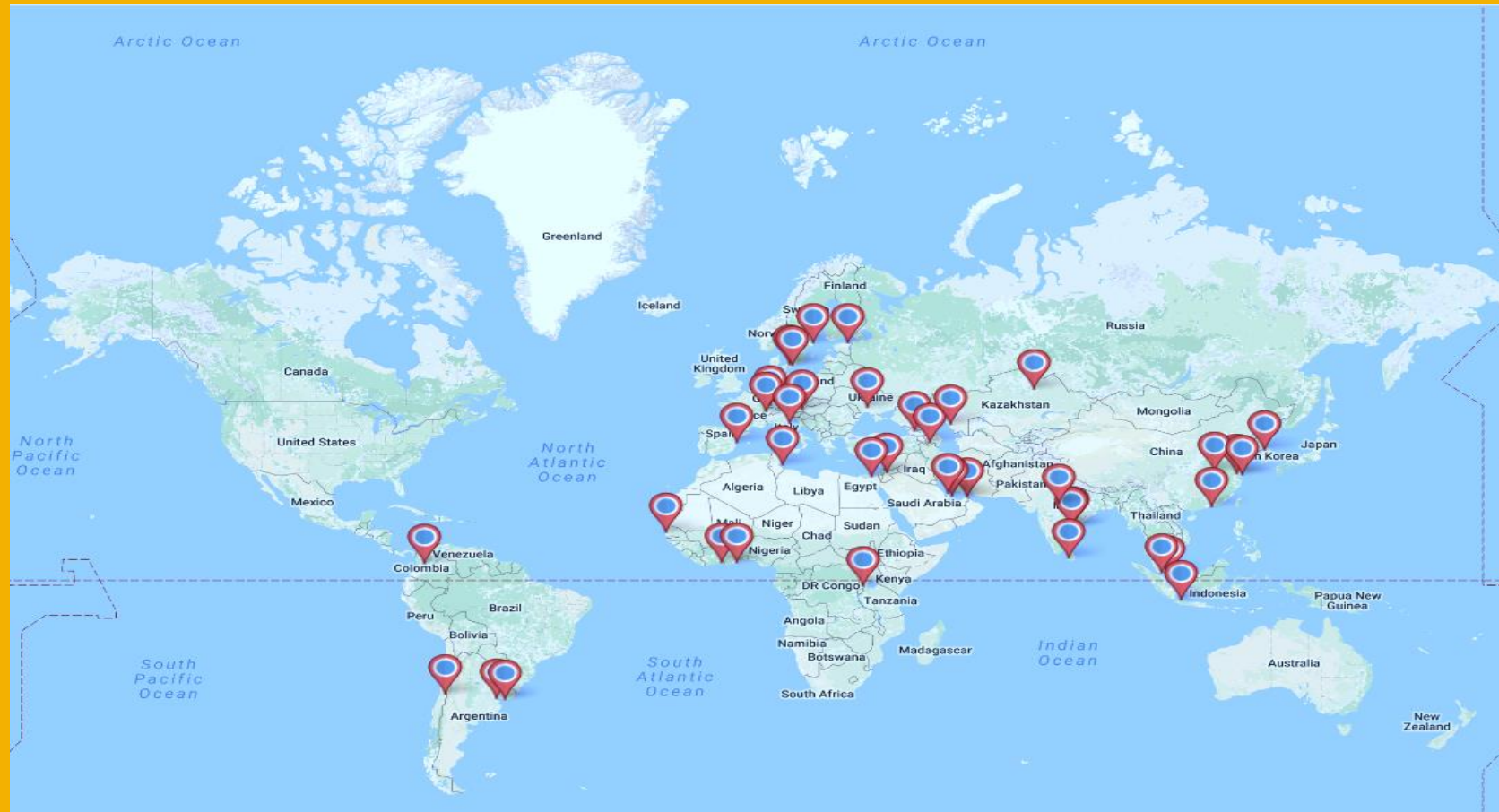
ITU-T

Implementing ITU-T International Standards to Shape Smart Sustainable Cities:
The Case of Moscow

mos.ru

USSC ITU







The cover features an aerial photograph of a city with a river and a bridge, likely Moscow. The ITU-T logo is in the top right corner.



TRULY GLOBAL REACH

More than 100 cities worldwide are already participating in the U4SSC KPIs Project, with more signing on every year!

U4SSC Cities:

-  Dubai
-  Singapore
-  Moscow
-  Bizerte
-  Ålesund
-  and 100+ more!

U4SSC welcomes
all cities to start their
SSC journey!

For more information, contact:

u4ssc@itu.int

Website:

www.itu.int/en/ITU-T/ssc/

More information on the U4SSC KPIs and the KPIs methodology and other publications can be found [HERE](#).

Thank you!



Additional information

U4SSC KPIs by Dimension

Collection Methodology available in the library of free resources at:

www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx

ECONOMY

ICT – Core Indicators

Household Internet Access
Percentage of households with Internet access.

Fixed Broadband Subscriptions
Percentage of households with fixed (wired) broadband.

Wireless Broadband Subscriptions
Wireless broadband subscriptions per 100 000 inhabitants.

Wireless Broadband Coverage
Percentage of the city served by wireless broadband (3G and 4G).

Dynamic Public Transport Information
Percentage of urban public transport stops for which traveller information is dynamically available to the public in real time.

Traffic Monitoring
Percentage of major streets monitored by ICT.

Smart Water Meters
Percentage implementation of smart water meters.

Smart Electricity Meters
Percentage implementation of smart electricity meters.

ECONOMY

ICT – Advanced Indicators

Availability of WIFI in Public Areas

Number of public WIFI hotspots
in the city.

Open Data

Percentage and number of
inventoried open datasets that
are published.

e-Government

Number of public services
delivered through electronic
means.

Public Sector e-Procurement

Percentage of public sector
procurement activities that are
conducted electronically.

Intersection Control

Percentage of road
intersections using adaptive
traffic control or prioritization
measures.

Water Supply ICT Monitoring

Percentage of the water
distribution system monitored
by ICT.

Drainage / Storm Water System ICT Monitoring

Percentage of drainage / storm
water system monitored by ICT.

Electricity Supply ICT Monitoring

Percentage of electricity supply
system monitored by ICT.

Demand Response Penetration

Percentage of electricity
customers with demand
response capabilities.

ECONOMY

Productivity – Core Indicators

R&D Expenditure

Research and Development expenditure as a percentage of city GDP.

Unemployment Rate

Percentage of the total city labour force that is unemployed.

Patents

Number of new patents granted per 100 000 inhabitants per year.

Youth Unemployment Rate

Percentage of the city youth labour force that is unemployed.

ECONOMY

Productivity – Advanced Indicators

Small and Medium-Sized Enterprises

Percentage of small and medium-sized enterprises (SMEs).

Tourism Sector Employment

Percentage of the city labour force working in the tourism sector.

ICT Sector Employment

Percentage of the city labour force working in the ICT sector.

ECONOMY

Infrastructure – Core Indicators

Basic Water Supply

Percentage of households with access to basic water supply.

Electricity System Outage Frequency

Average number of electrical interruptions per customer per year.

Public Transport Network

Length of public transport network per 100 000 inhabitants.

Wastewater Collection

Percentage of households served by wastewater collection.

Potable Water Supply

Percentage of households with a safely managed drinking water service.

Electricity System Outage Time

Average length of electrical interruptions.

Bicycle Network

Length of bicycle paths and lanes per 100 000 population.

Household Sanitation

Percentage of households with access to basic sanitation facilities.

Water Supply Loss

Percentage of water loss in the water distribution system.

Access to Electricity

Percentage of households with authorized access to electricity.

Solid Waste Collection

Percentage of households with regular solid waste collection.

ECONOMY

Infrastructure – Advanced Indicators

Public Transport Network Convenience

Percentage of city population with convenient access to public transport.

Shared Bicycles

Number of shared bicycles per 100 000 inhabitants.

Public Building Sustainability

Percentage area of public buildings with recognized sustainability certifications for ongoing operations.

Pedestrian Infrastructure

Percentage of the city designated as a pedestrian / car free zone.

Transportation Mode Share

Percentage of people using forms of transportation to travel to work

Shared Vehicles

Number of shared vehicles per 100 000 inhabitants.

Integrated Building Management Systems in Public Buildings

Percentage area of public buildings using integrated ICT systems to automate building management.

Urban Development and Spatial Planning

Existence of urban development and spatial at the city level.

Travel Time Index

Ratio of the travel time during the peak periods to travel time at free flow periods.

Low-Carbon Emission Passenger Vehicles

Percentage of low-carbon emission passenger vehicles.

ENVIRONMENT

Environment – Core Indicators

Air Pollution

Air Quality Index based on reported value for: PM2.5; PM10; NO2; SO2; and, O3.

Drinking Water Quality

Percentage of households covered by an audited Water Safety Plan.

Wastewater Treatment

Percentage of wastewater receiving treatment.

Green Areas

Green areas per 100 000 inhabitants.

GHG Emissions

Greenhouse gas (GHG) emissions per capita.

Water Consumption

Water consumption per capita.

Solid Waste Treatment

Percentage of solid waste.

EMF Exposure

Percentage of mobile network antenna sites in compliance with EMF exposure guidelines.

Freshwater Consumption

Freshwater consumption.

ENVIRONMENT

Environment – Advanced Indicators

Noise Exposure

Percentage of inhabitants exposed to excessive noise levels.

Green Area Accessibility

Percentage of inhabitants with accessibility to green areas.

Protected Natural Areas

Percentage of city area protected as natural sites.

Recreational Facilities

Area of total public recreational facilities per 100 000 inhabitants.

ENVIRONMENT

Energy – Core Indicators

Renewable Energy Consumption

Percentage of renewable
energy consumed in the city.

Electricity Consumption

Electricity consumption per
capita.

Residential Thermal Energy Consumption

Residential thermal energy
consumption per capita.

Public Building Energy Consumption

Energy consumption of public
buildings.

SOCIETY AND CULTURE

Education, Health and Culture – Core Indicators

Student ICT Access

Percentage of students with classroom access to ICT facilities.

School Enrollment

Percentage of school-aged population enrolled in schools.

Higher Education Degrees

Higher level education degrees per 100 000 inhabitants.

Adult Literacy

Adult literacy rate.

Life Expectancy

Average life expectancy.

Maternal Mortality Rate

Maternal deaths per 100 000 live births.

Physicians

Number of physicians per 100 000 inhabitants.

Cultural Expenditure

Percentage expenditure on cultural heritage.

SOCIETY AND CULTURE

Education, Health and Culture – Advanced Indicators

Electronic Health Records

Percentage of city inhabitants with electronic health records.

In-Patient Hospital Beds

Number of in-patient public hospital beds per 100 000 inhabitants.

Health Insurance/Public Health Coverage

Percentage of inhabitants covered by basic health insurance or a public health system.

Cultural Infrastructure

Number of the cultural institutions per 100 000 inhabitants.

SOCIETY AND CULTURE

Safety, Housing and Social Inclusion – Core Indicators

Informal Settlements

Percentage of inhabitants living in slums, informal settlements or inadequate housing.

Gender Income Equity

Ratio of average hourly earnings of female to male workers.

Natural Disaster Related Deaths

Number of natural disaster related deaths per 100 000 inhabitants.

Police Service

Number of police officers per 100 000 inhabitants.

Gini Coefficient

Income distribution in accordance with Gini coefficient.

Disaster Related Economic Losses

Natural disaster related economic losses as a percentage of the city's GDP.

Fire Service

Number of firefighters per 100 000 inhabitants.

Poverty

Percentage of inhabitants living in poverty.

Emergency Service Response Time

Average response time for Emergency Services.

Violent Crime Rate

Violent crime rate per 100 000 inhabitants.

Voter Participation

Percentage of the eligible population that voted during the last municipal election.

Traffic Fatalities

Traffic fatalities per 100 000 inhabitants.

SOCIETY AND CULTURE

Safety, Housing and Social Inclusion – Advanced Indicators

Housing Expenditure

Percentage expenditure of income for housing.

Resilience Plans

Implementation of risk and vulnerability assessments for disaster mitigation.

Local Food Production

Percentage of local food supplied from within 100 km of the urban area.

Child Care Availability

Percentage of pre-school age children (0-3) covered by (public and private) day-care centres.

Population Living in Disaster Prone Areas

Percentage of inhabitants living in a zone subject to natural hazards.