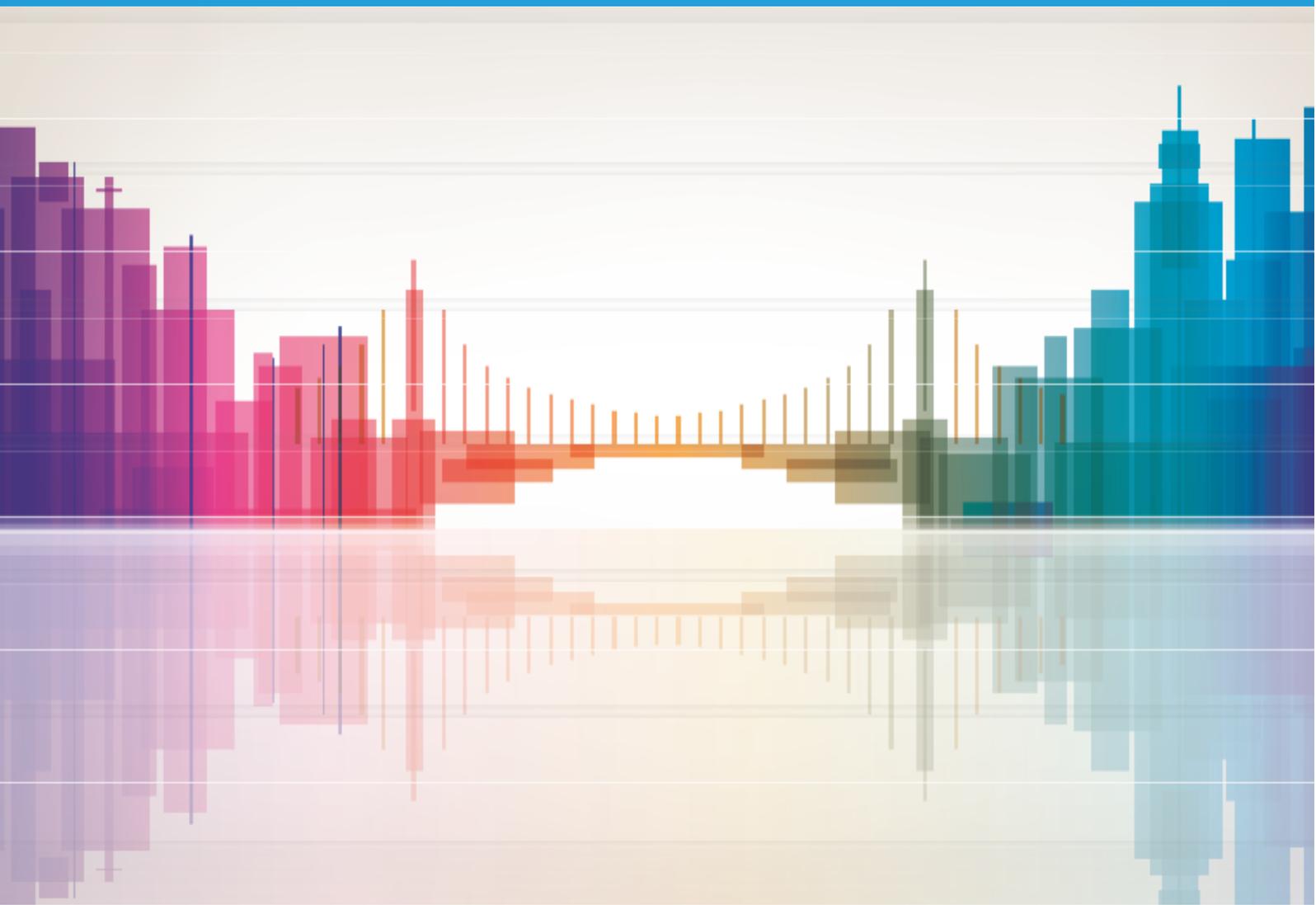


Verification Report Tromsø

January 2022



GLOBAL GOALS



Verification Report

Tromsø, Norway

**11 SUSTAINABLE CITIES
AND COMMUNITIES**



Foreword

This publication has been developed by ITU within the framework of the United for Smart Sustainable Cities (U4SSC) initiative. It provides an overview of the reporting and implementation of key performance indicators (KPIs) for smart sustainable cities (SSC) in the City of Tromsø, Norway. The U4SSC KPIs are based on [Recommendation ITU-T Y.4903](#). This set of KPIs for SSC was developed to establish the criteria to evaluate ICTs' contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments.

Disclaimer

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1. Introduction and Verification Background

This report contains the verification results for the KPI submission by Tromsø to the requirements of the United for Smart Sustainable Cities (U4SSC) Key Performance Indicators (KPIs) as described within the 'Collection Methodology for Key Performance Indicators for Smart Sustainable Cities'.

John Smiciklas, who is certified as a U4SSC Key Performance Indicators for Smart Sustainable Cities Verifier, completed the verification in January 2022.

The verification assessment activities included:

- collecting and reviewing KPI data;
- interviewing city stakeholders;
- verifying that the data submitted are in conformance with the requirements of the Collection Methodology for Key Performance Indicators for Smart Sustainable Cities; and
- preparing the Verification Report.

The verification was conducted using the information made available by the city and the information presented during follow-up activities. It was planned and performed in order to obtain limited assurance with respect to the information examined.

There were no limitations that impacted the completion of this verification.

2. KPI Reporting and Verification Summary

	Total	Reported	Verified	% KPIs Verified
Economy				
Core KPIs	23	21	21	91 %
Advanced KPIs	22	18	18	82 %
Environment				
Core KPIs	12	11	11	92 %
Advanced KPIs	5	2	2	40 %
Society & Culture				
Core KPIs	19	18	18	95 %
Advanced KPIs	10	8	8	80 %
Overall				
Core KPIs	54	50	50	93 %
Advanced KPIs	37	28	28	76 %
Total	91	78	78	86 %

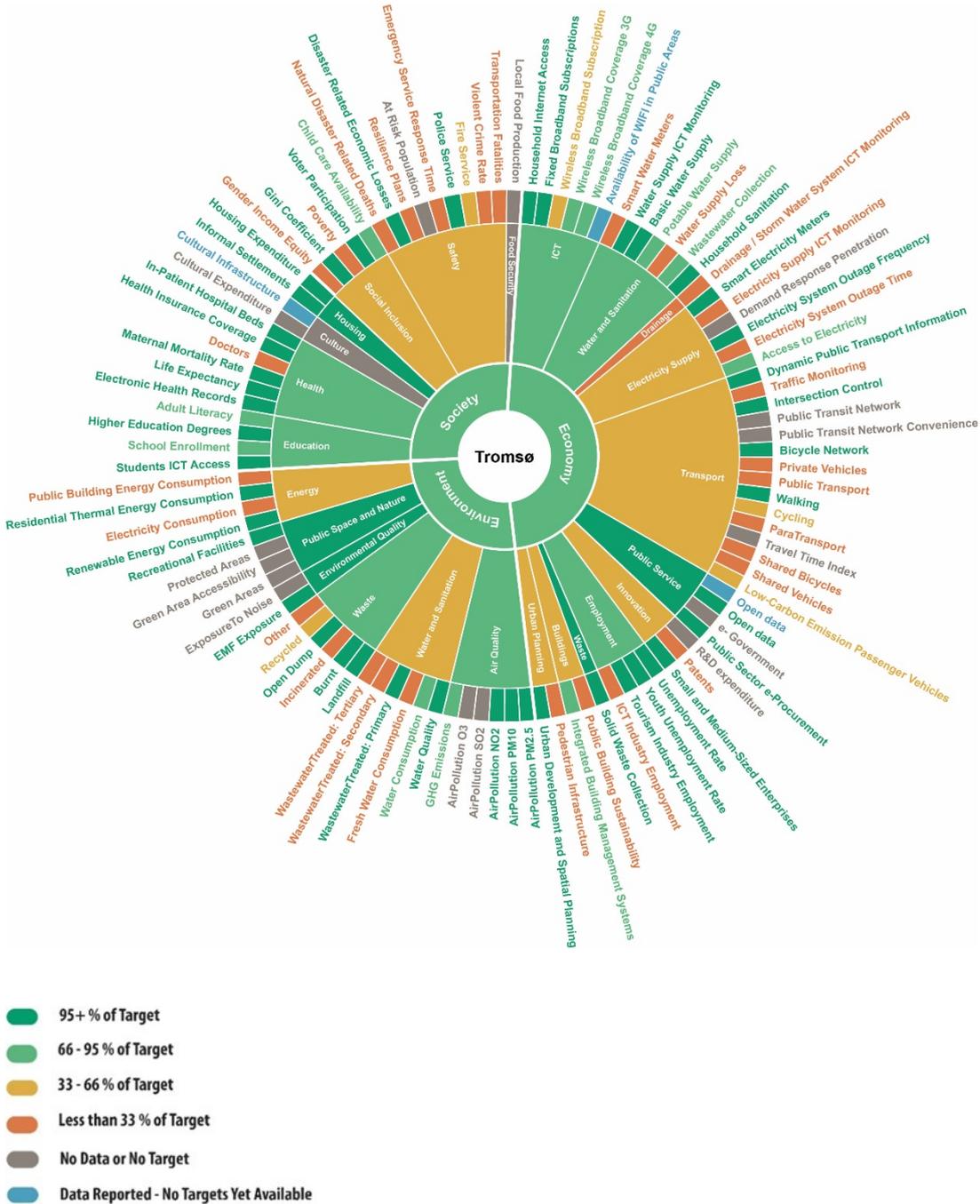
3. KPI Data Points Reporting and Verification Summary

Certain KPIs are composed of more than one data point.

Below is a summary of the verification results of those data points.

	Total	Reported	Verified	% Data Points Verified
Economy				
Core Data Points	24	22	22	92 %
Advanced Data Points	31	27	27	87 %
Environment				
Core Data Points	23	20	20	87 %
Advanced Data Points	5	2	2	40 %
Society & Culture				
Core Data Points	19	18	18	95 %
Advanced Data Points	10	8	8	80 %
Overall				
Core Data Points	66	60	60	91 %
Advanced Data Points	46	37	37	80 %
Total	112	97	97	87 %

4. City Performance Benchmark



Note: Performance Benchmark Targets apply to all sections of the graphic. Starting from the centre: Dimensions, Categories and KPIs.

5. Benchmarks and Scoring Methodology

As part of the U4SSC KPIs project, benchmarks were developed for most KPIs in order to develop a reporting framework with which to demonstrate to cities how their performance could be reported.

The benchmarks were set based on several factors:

- fully meeting the aligned SDG(s);
- performance compared with other international and transnational targets (e.g. OECD, European Commission);
- performance against a UN agency's goals (e.g. International Telecommunication Union);
- evaluation of city performance using UN and other international statistical data; and
- performance measured versus leading city performance globally.

Performance to benchmarks were then scored in four ranges for every KPI and data point reported:

- 0 – 33 % of target – 1 pt;
- 33 – 66 % of target – 2 pts;
- 66 – 95 % of target – 3 pts; and
- 95+ % of target – 4 pts.

The scores for each reported KPI and data point were added to give a percentage score for categories, sub-dimensions and dimensions and were reported based on the above target scores. KPIs or data points that are not reported or have no benchmarks yet defined were excluded.

Example: Education 4 KPIs

- If all 4 are reported and the scores are 1 pt, 3 pts, 4 pts and 1 pt;

Total score 9 pts out of 16 = 56.25 % reported as 33 – 66 % of target.

- If only 3 are reported and the scores are 3 pts, 4 pts and 2 pts;

Total score 9 pts out of 12 = 75 % reported as 66 – 95 % of target.

Targets and scoring are meant to provide additional context to KPI data and should be used in context with city goals and comparisons with other similar cities to determine future actions.

6. Verification Results

This section contains the data and results of the verification for the City of Tromsø's reporting for each of the U4SSC KPIs within the three dimensions:

- Economy
- Environment
- Society and Culture

and the twenty-two categories of the dimensions:

- | | |
|------------------------|---------------------------|
| • ICT Infrastructure | • Air Quality |
| • Water and Sanitation | • Environmental Quality |
| • Drainage | • Public Space and Nature |
| • Electricity Supply | • Energy |
| • Transport | • Education |
| • Public Sector | • Health |
| • Innovation | • Culture |
| • Employment | • Housing |
| • Waste | • Social Inclusion |
| • Buildings | • Safety |
| • Urban Planning | • Food Security |

Note: The following categories are reported under the Economy and the Environment dimensions.

- Water and Sanitation
- Waste

Note: For the results on following pages.

- **Core KPIs are highlighted in bold.**
- *Advanced KPIs are in italics.*

Dimension: Economy

CATEGORY	KPI / Data Point	Results	Benchmark
 ICT INFRASTRUCTURE	Household Internet Access	99.00 %	
	Fixed Broadband Subscriptions	79.00 %	
	Wireless Broadband Subscriptions	36 746 / 100 000 inhabitants	
	Wireless Broadband Coverage: 3G	86.86 %	
	Wireless Broadband Coverage: 4G	86.86 %	
	<i>Availability of Wi-Fi in Public Areas</i>	47	N/A
 WATER AND SANITATION	Smart Water Meters	17.15 %	
	<i>Water Supply ICT Monitoring</i>	100.00 %	
	Basic Water Supply	100.00 %	
	Potable Water Supply	82.28 %	
	Water Supply Loss	41.10 %	
	Wastewater Collection	84.50 %	
 DRAINAGE	<i>Drainage/Storm Water System ICT Monitoring</i>	0.00 %	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 ELECTRICITY SUPPLY	Smart Electricity Meters	97.47 %	
	<i>Electricity Supply ICT Monitoring</i>	<i>0.00 %</i>	
	<i>Demand Response Penetration</i>	<i>Not Reported</i>	
	Electricity System Outage Frequency	0.05	
	Electricity System Outage Time	250.67 Minutes	
	Access to Electricity	92.78 %	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 TRANSPORT	Dynamic Public Transport Information	100.00 %	
	Traffic Monitoring	1.07 %	
	<i>Intersection Control</i>	<i>100.00 %</i>	
	Public Transport Network	Not Reported	
	<i>Public Transport Network Convenience</i>	<i>Not Reported</i>	
	Bicycle Network	42.80 km / 100 000 inhabitants	
	<i>Transportation Mode Share: Private Vehicles</i>	<i>49.00 %</i>	
	<i>Transportation Mode Share: Public Transport</i>	<i>11.00 %</i>	
	<i>Transportation Mode Share: Walking</i>	<i>25.00 %</i>	
	<i>Transportation Mode Share: Cycling</i>	<i>4.00 %</i>	
	<i>Transportation Mode Share: Para Transport</i>	<i>0.53 %</i>	
	<i>Travel Time Index</i>	<i>Not Reported</i>	
	<i>Shared Bicycles</i>	<i>36.31 / 100 000 inhabitants</i>	
	<i>Shared Vehicles</i>	<i>0.00 / 100 000 inhabitants</i>	
	<i>Low-Carbon Emission Passenger Vehicles</i>	<i>4.38 %</i>	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 PUBLIC SECTOR	<i>Open Data Sets Published</i>	463	N/A
	<i>Open Data Sets % Availability</i>	100.00 %	
	<i>e-Government</i>	Not Reported	N/A
	<i>Public Sector e-Procurement</i>	100.00 %	
 INNOVATION	R&D Expenditure	Not Reported	
	Patents	3.76 / 100 000 inhabitants	
	<i>Small and Medium-Sized Enterprises</i>	99.86 %	
 EMPLOYMENT	Unemployment Rate	1.07 %	
	Youth Unemployment Rate	4.30 %	
	<i>Tourism Sector Employment</i>	2.98 %	
	<i>ICT Sector Employment</i>	1.15 %	
 WASTE	Solid Waste Collection	100.00 %	
 BUILDINGS	<i>Public Building Sustainability</i>	0.31 %	
	<i>Integrated Building Management Systems in Public Buildings</i>	88.32 %	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 URBAN PLANNING	<i>Pedestrian Infrastructure</i>	< 0.01 %	   
	<i>Urban Development and Spatial Planning: Compact</i>	YES	   
	<i>Urban Development and Spatial Planning: Connected</i>	YES	
	<i>Urban Development and Spatial Planning: Integrated</i>	YES	
	<i>Urban Development and Spatial Planning: Inclusive</i>	YES	
	<i>Urban Development and Spatial Planning: Resilient</i>	YES	

Dimension: Environment

CATEGORY	KPI / Data Point	Results	Benchmark
 <p>AIR QUALITY</p>	Particulate Matter (PM 2.5)	5.50 µg / m ³	
	Particulate Matter (PM 10)	16.40 µg / m ³	
	Nitrogen Dioxide (NO ₂)	30.00 µg / m ³	
	Sulphur Dioxide (SO ₂)	Not Reported	
	Ozone (O ₃)	Not Reported	
	GHG Emissions	3.26 µg / m ³	
 <p>WATER AND SANITATION</p>	Drinking Water Quality	100.00 %	
	Water Consumption	150.00 ℓ / day / capita	
	Freshwater Consumption	99.86 %	
	Wastewater Treatment: Primary	100.00 %	
	Wastewater Treatment: Secondary	0.00 %	
	Wastewater Treatment: Tertiary	0.00 %	

Dimension: Environment

CATEGORY	KPI / Data Point	Results	Benchmark
 WASTE	Solid Waste: Landfill	3.90 %	
	Solid Waste: Burnt	0.00 %	
	Solid Waste: Incinerated	51.80 %	
	Solid Waste: Open Dump	0.00 %	
	Solid Waste: Recycled	41.21%	
	Solid Waste: Other	3.24 %	
 ENVIRONMENTAL QUALITY	EMF Exposure	100.00 %	
	Noise Exposure	Not Reported	
 PUBLIC SPACE AND NATURE	Green Areas	Not Reported	
	Green Area Accessibility	Not Reported	
	Protected Natural Areas	Not Reported	
	Recreational Facilities	3 655 216 m ² / 100 000 inhabitants	
 ENERGY	Renewable Energy Consumption	98.00 %	
	Electricity Consumption	16 496 kWh / yr / capita	
	Residential Thermal Energy Consumption	< 0.01 GJ / yr / capita	
	Public Building Energy Consumption	248.56 ekWh / m ² / yr	

Dimension: Society and Culture

CATEGORY	KPI / Data Point	Results	Benchmark
 EDUCATION	Student ICT Access	100.00 %	
	School Enrolment	90.31 %	
	Higher Education Degrees	38 112 / 100 000 inhabitants	
	Adult Literacy	94.80 %	
 HEALTH	<i>Electronic Health Records</i>	100.00 %	
	Life Expectancy	82.00 Years	
	Maternal Mortality Rate	0.00 / 100 000 live births	
	Physicians	126.97 / 100 000 inhabitants	
	<i>In-Patient Hospital Beds</i>	601.77 / 100 000 inhabitants	
	<i>Health insurance/ Public Health Coverage</i>	100.00 %	
 CULTURE	Cultural Expenditure	Not Reported	
	<i>Cultural Infrastructure</i>	132.29 / 100 000 inhabitants	N/A
 HOUSING	Informal Settlements	0.07 %	
	<i>Housing Expenditure</i>	13.62 %	

Dimension: Society and Culture (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 SOCIAL INCLUSION	Gender Income Equity	0.78	
	Gini Coefficient	0.23	
	Poverty Rate	12.12 %	
	Voter Participation	63.61 %	
	<i>Childcare Availability</i>	<i>68.86 %</i>	
 SAFETY	Natural Disaster-Related Deaths	2.59/ 100 000 inhabitants	
	Disaster-Related Economic Losses	< 0.01 %/City GDP	
	<i>Resilience Plans</i>	<i>NO</i>	
	<i>Population Living in Disaster-Prone Areas</i>	<i>Not Reported</i>	
	<i>Emergency Service Response Time</i>	<i>13.00 Minutes</i>	
	Police Service	416.31 FTE / 100 000 inhabitants	
	Fire Service	59.66 FTE / 100 000 inhabitants	
	Violent Crime Rate	833.92 / 100 000 inhabitants	
	Traffic Fatalities	2.59 / 100 000 inhabitants	
 FOOD SECURITY	<i>Local Food Production</i>	<i>Not Reported</i>	

7. KPIs Not Reported

KPI Number	Description
EC: ICT: ES: 3A	Demand Response Penetration
EC: I: T: 1C	Public Transit Network
EC: I: T: 2A	Public Transit Network Convenience
EC: I: T: 5A	Travel Time Index
EC: ICT: PS: 2A	e- Government
EC: P: IN: 1C	R&D expenditure
EN: EN: AQ: 1C	Air Pollution SO ₂
EN: EN: AQ: 1C	Air Pollution O ₃
EN: EN: EQ: 2A	Noise Exposure
EN: EN: PSN: 1C	Green Areas
EN: EN: PSN: 2A	Green Area Accessibility
EN: EN: PSN: 3A	Protected Areas
SA: EH: C: 1C	Cultural Expenditure
SC: SH: SA: 4A	At Risk Population
SC: SH: FS: 1A	Local Food Production

8. KPIs Not Verified

All reported KPIs were verified.

9. Next Steps

Tromsø is encouraged to focus on KPIs that have been reported as falling within the benchmarks of 0 – 33 % and 33 – 66 % of targets, determine which of these KPIs indicates critical issues for the city and develop plans for improvement.

Tromsø is encouraged to review the KPIs for which no data were reported and determine plans for future data collection and reporting.

Tromsø is encouraged to continue ongoing data collection to determine trends in performance against benchmarks over time.

Tromsø is encouraged to stay engaged within the U4SSC process and continue to provide feedback on KPIs and benchmarks.

10. Using KPIs for SSC to Reach the SDGs

The **United for Smart Sustainable Cities (U4SSC)** initiative has developed the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) to support cities worldwide in evaluating the role and contribution of ICTs in smart sustainable cities, and to provide cities with the tools for self-assessments in order to achieve the United Nations Sustainable Development Goals (SDGs).

United for Smart Sustainable Cities (U4SSC)



U4SSC is a UN initiative coordinated by the International Telecommunication Union (ITU), UN-Habitat and UNECE, and supported by 14 other UN Agencies and Programmes, including CBD, ECLAC, FAO, UNESCO, UNDP, UNECA, UN-Women, UNEP, UNEP-FI, UNFCCC, UNIDO, UNU-EGOV, UNOP and WMO.

U4SSC is the global platform to advocate for public policies to encourage the use of ICTs to facilitate and ease the transition to smart sustainable cities. [Find out more...](#)

These indicators are developed based on an international standard – Recommendation ITU-T Y.4903/L.1603 ‘Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals’.

These indicators have been developed to provide cities with a consistent and standardized method to collect the necessary data to measure performance and progress with regard to:

- achieving the Sustainable Development Goals (SDGs);
- becoming a smarter city; and
- becoming a more sustainable city.

The U4SSC KPIs consist of 91 indicators. Each indicator forms part of a holistic view of a city’s performance in three dimensions: **Economy**, **Environment** and **Society and Culture**. Each of these dimensions provides a separate view of progress, and when reported together they provide a holistic view of a smart sustainable city.

By providing a common set of metrics to benchmark a city's performance, the indicators will also enable cities to compare their performance to other cities, allowing for the dissemination of best practices and setting the standards for progression in meeting the Sustainable Development Goals (SDGs) at the city level.

The list of all the U4SSC KPIs for SSC, along with its collection methodology, are contained in:

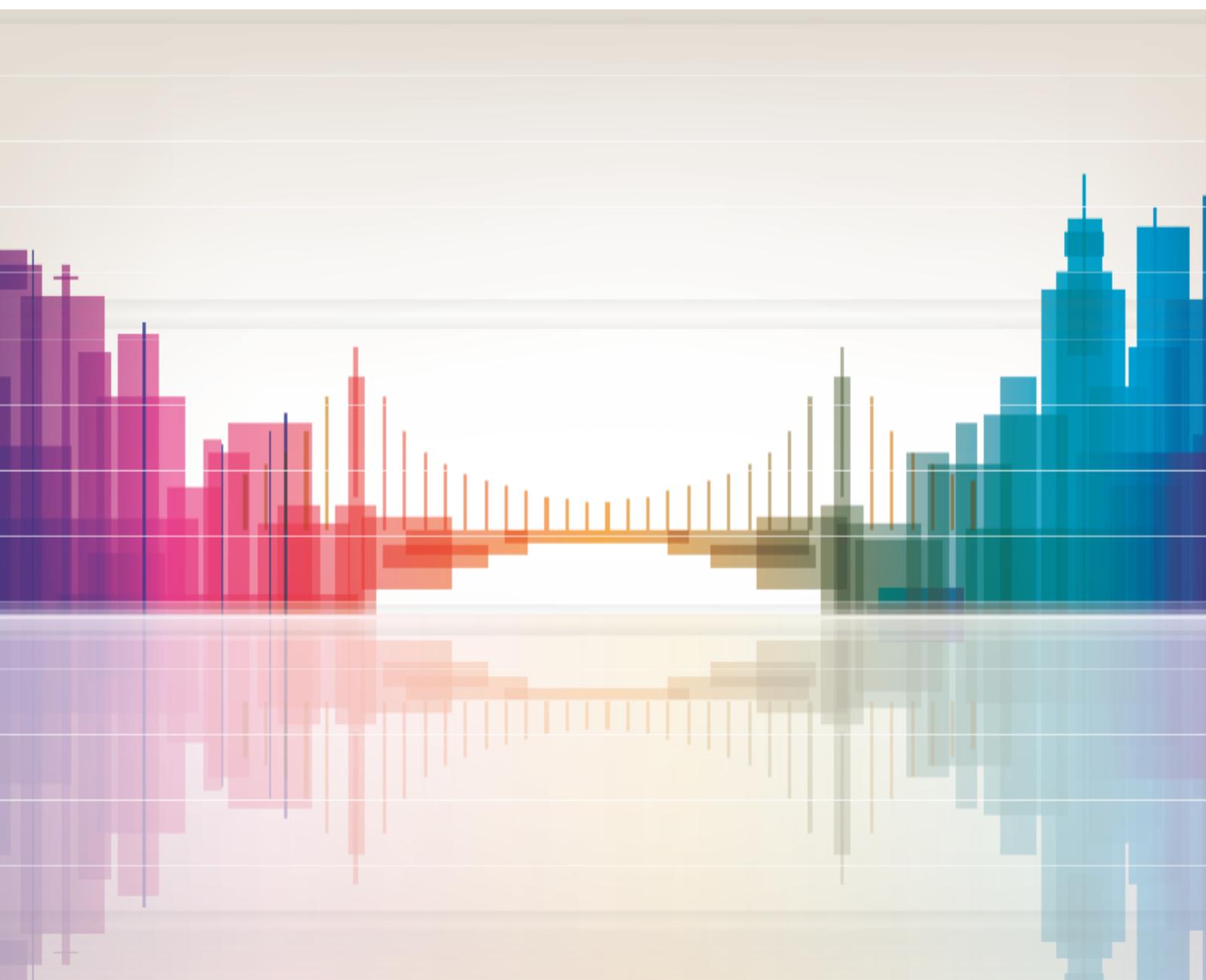
- the Flipbook on the 'Collection Methodology for Key Performance Indicators for Smart Sustainable Cities'.

Over 100 cities worldwide are already implementing these KPIs. All cities are invited to participate in this project and employ these KPIs.

To find out more, contact the U4SSC Secretariat at: u4ssc@itu.int.







For more information,
please contact: u4ssc@itu.int
Website: itu.int/go/u4SSC

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