

**ITU**Webinars

# Accelerating cities' transformation through standards

*Outcome Document*

**25 June 2020**  
**12:00 - 14:00, Geneva**





## Cities and standards

There is a growing list of challenges that cities must face. These range from growing social inequalities, traffic congestion, water contamination and their associated health issues, to the growing impacts of climate change. Many of these challenges further exacerbate one another, leading to self-reinforcing cycles of issues.

With over 80 per cent of the world's population expected to live in cities by 2050, cities need to re-imagine the way in which resources and services are managed and delivered, in order to improve the sustainability and efficiency of city services, mitigate against climate and environmental risks, and

safeguard the well-being of every citizen.

Accelerating phenomena like urbanization and climate change need innovative solutions that accelerate cities' response. Cities can deploy information and communication technologies (ICTs) and digital technologies to build smarter and more sustainable cities for their citizens.

The technologies that are required to connect smart urban systems and services must be interoperable, accessible, scalable and energy efficient. Standardization is key to ensuring these outcomes.



## **Accelerating cities' transformation through Standards**

To this end, International Telecommunication Union (ITU) organized a webinar on "Accelerating cities' transformation through standards" on 25 June 2020.

The webinar was open to all and brought together over 120 participants such as policy makers, industry experts, representatives from standardization organizations, international organizations, the academia

and other key stakeholders.

These participants explored the role of international standards in providing the necessary guidance to make cities smarter and more sustainable.

International standards can provide vital guidance, and technical and policy recommendations that cities can use to set their priorities, navigate global challenges and implement innovative solutions to accelerate digital transformation.



## Opening remarks

*Presenter*

**Chaesub Lee** | Director |  
Telecommunication Standardization  
Bureau, ITU

To start, I want to thank all of you for joining us here in these extraordinary times. We understand that the COVID-19 situation has presented many uncertainties and challenges for all of us.

But we also realize that, more than ever, cities need to be prepared for emergency situations like COVID-19.

Digital technologies have great potential to transform cities to become smarter, more sustainable, and better equipped to manage these situations.

We have seen cities around the world using artificial intelligence and other digital technologies to enhance city emergency management. They boost their ability to monitor progress, disseminate critical information, coordinate appropriate responses and so much more.

However, digital transformation in cities is still facing many obstacles, from the scalability of digital solutions to a wide range of inter-operability issues.



International standards play an important role in overcoming these obstacles.

As the United Nations' specialized agency for information and communication technologies, ITU has been working closely with its membership to develop international standards that support digital transformation in cities.

For example, ITU-T Study Group 20 is the leading study group on "Internet of Things and smart cities and communities".

Study Group 20 has been working on international standards that facilitate interoperability between digital infrastructures and Internet of Things (IoT) applications.

ITU has also created a dedicated Focus Group on "Environmental efficiency for artificial intelligence and other emerging technologies". This Focus group is dedicated to studying standardization needs to deploy AI and other digital solutions in an effective and sustainable manner.

This webinar provided a platform to learn more about how international standards can be used to provide guidance to cities to set their priorities, navigate through different global challenges and harmonize the development of digital solutions.

We were very excited to have speakers from different standard development organizations to share their expertise and insights with us.



*Presenter*

**Nasser Saleh Al Marzouqi |**  
Chairman | ITU-T Study Group 20:  
Internet of Things, Smart Cities and  
Communities

It was my pleasure to welcome everyone to the ITU Webinar on “Accelerating cities’ transformation through standards”.

Standards are crucial for accelerating the deployment of internet of things and other digital applications in cities. They provide the necessary tools to build a trusted infrastructure capable of supporting a large amount of digital applications, overcome digital silos in cities and align technologies

with global commitments such as the Sustainable Development Goals (SDGs).

That is why one of the key objectives of ITU-T Study Group 20 is to develop international standards that enable the coordinated development of Internet of Things (IoT) technologies, including machine-to-machine (M2M) communications and ubiquitous sensor networks.

A central part of the work of ITU-T SG20 is to support the development of end-to-end architectures for IoT, mechanisms for the interoperability of IoT applications, and datasets employed by vertically oriented industry sectors.



ITU-T SG20 uses standards to support cities in leveraging IoT to address urban development challenges. It constantly looks for opportunities to collaborate with other global stakeholders and standards organizations to enrich its work.

This webinar had two sessions.

The first session looked more closely at how ITU-T standards are accelerating the digital transformation in cities. In the second session, speakers from other leading standard development organizations shared their insights and expertise with us.

As we discuss the future of our cities, we must remind ourselves that the future itself is cities; and our major challenge is how do we

build our future in the cities of the future!

Artificial intelligence, advanced robotics, Internet of Things, Blockchain and distributed ledgers, 3D printing, self-driving vehicles, drones - and the list goes on - are not only part of our vocabulary today but a reality of our daily lives.

Smart cities do not rise by themselves; they must be planned, designed, implemented, and managed effectively and, thus, require strategic policies and standards.

I firmly believe that with our collective wisdom and by working together and learning from each other, we can build smarter and more sustainable cities that will make citizens happier worldwide.



## Keynote

*Presenter*

**Harsha Madiraju** | Associate Director,  
Member Recruitments and Marketing |  
World Geospatial Industry Council

**"Accelerating cities - reliable data and  
insights: can Standards help?"**

When it comes to smart cities, the aspect of smart governance supported by transparency and open data becomes the key. Citizens, the beneficiaries of smart cities, will be consuming information on facets such as weather, pollution, traffic and transportation, disasters, etc.

So, it becomes essential to take care of the four objectives of open data - availability, integrity, confidentiality, and accountability by governments and commercial companies providing such data services.





Further, as we move into the era of the Fourth Industrial Revolution (4IR) and the aspect of data becomes critical to everyone, the element of reliability of Data platforms, Information services, and automated models that drive these services becomes pivotal.

The absence of authoritative data sources in developing countries has always been a challenge, which leads to citizens relying on services from commercial enterprises that are popular.

So, the debate of authoritative and non-authoritative data sources has been a topic of contention for a long-time. However, with numerous such services available through multiple apps, providing various realities is not going to solve the problem, but create a challenge in the future.

So, it is pivotal that we discuss how we should encourage these commercial services to consider standards on aspects such as semantics, reliability of data, information, and models.



## **Session 1: ITU's activities on smart sustainable cities (SSC)**

*Moderator*

**Javier García Díaz |**  
Director General | UNE

International standards are vital to accelerating cities' progress in reaching smartness and sustainability and progressing toward achieving the United Nations Sustainable Development Goals (SDGs).

This session looked at ITU's activities in facilitating the development and adoption of international standards. In particular, the work of ITU-T Study Group 20 on "Internet of Things, Smart Cities and Communities" was explored, along with the comprehensive collaboration with a number of UN bodies in the form of the "United for Smart Sustainable Cities" initiative.



*Presenter*

**Hyoung Jun Kim** | Vice Chairman |  
ITU-T Study Group 20: Internet of  
Things, Smart Cities and Communities  
(Co-convener of The JCA-IoT and  
SC&C)

**“ITU-T SG20: actualizing smart cities and  
communities”**

ITU-T Study Group 20: 'Internet of things  
(IoT) and smart cities and communities  
(SC&C)' works to address the requirements  
of Internet of Things (IoT) technologies, with  
a focus on IoT applications in smart cities  
and communities to address important  
urban-development challenges.

It provides specialized IoT standardization  
platform necessary for cross-sector converg-  
ence. It looks to address issues regarding  
interoperability and compatibility.

Indeed, IoT is a key enabler of the smart  
society and offers an opportunity to  
transform city infrastructures, benefiting  
from efficiencies of intelligent buildings and  
transportation systems, and smart energy  
and water networks.

ITU-T SG20 is assisting many governments  
and industry in capitalizing on this  
opportunity, providing a unique platform to  
influence the development of international  
IoT standards and their application as part of  
urban-development master plans.



11 SUSTAINABLE CITIES  
AND COMMUNITIES



*Presenter*

**Cristina Bueti** | Counsellor |  
International Telecommunication Union

**“U4SSC: enabling a smart sustainable  
future for all cities”**

United for Smart Sustainable Cities (U4SSC) is a UN initiative coordinated by ITU, UNECE and UN-Habitat, and supported by CBD, ECLAC, FAO, UNDP, UNECA, UNESCO, UNEP, UNEP-FI, UNFCCC, UNIDO, UNOP, UNU-EGOV, UN-Women and WMO to achieve Sustainable Development Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable".

U4SSC serves as the global platform to advocate for public policy and to encourage the use of ICTs and digital technologies to facilitate and ease the transition to smart sustainable cities.



Focusing on various Thematic Groups, the U4SSC initiative's Implementation Programme (U4SSC-IP) supports the implementation of projects and builds partnerships, which aim to build smart and sustainable cities worldwide.

Furthermore, U4SSC helps enable cities to measure their performance through the U4SSC Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC). 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"](#).

This set of KPIs for SSC was developed to establish the criteria for assessing the smartness and sustainability of a city within the three dimensions of Economy, Environment and Society & Culture, and to provide cities with the means for self-assessments, while simultaneously achieving the SDGs. A U4SSC KPIs for SSC [Collection Methodology](#) helps cities on how to collect the data or information linked to the U4SSC KPIs. Cities are encouraged to periodically check their performances against the recommended indicators. Over 100 cities are participating in the U4SSC KPIs Project at present, with many more in the pipeline to join this year and next.



## **Session 2: The role of international standards in accelerating SSC outcomes**

*Moderator*

**Bilel Jamoussi** | Chief |  
Study Groups Department, ITU

ITU believes that collaboration is the key to ensuring effective international standards and their adoption. It is particularly proud to be collaborating with some of the organizations represented today and looks forward to expanding its joint activities with others.

An example of such a joint venture is the IEC-ISO-ITU Joint Smart City Taskforce. It is already building synergies on ongoing work in ITU-T, IEC and ISO related to smart cities and communities; maximizing efforts in order to identify new areas of cooperation related to smart cities and communities; and developing a holistic view on smart cities and communities taking into consideration the scope, areas of work and expertise of ITU-T, IEC and ISO to support smart cities and communities development.



*Presenter*

**Michael Mulquin |**

Chair, Smart Cities Systems Committee |  
International Electrotechnical Commission

**“The role of international standards in  
accelerating SSC outcomes”**

Cities are each wonderfully unique and are justly proud of all the attributes that set them apart from other cities - the skills and character of their people, their history, their beautiful setting, their influence on the world, their success commercially.

And yet all cities have many things in common. They must manage the challenges and opportunities that come from bringing many people with different lifestyles and aspirations to live and work together in one place. They need to manage all the infrastructures and services that support this and to build a good and sustainable future for coming generations.



It is around these commonalities that smart and sustainable city standards can have a vital contribution. The challenge is that cities are very complex, and to solve city needs in a smart and sustainable way, whole packages of new products and services are needed, and new processes must be put in place to manage them.

The good news is that the International Standards Development Community has brought together many thousands of world class experts in many hundreds of Study Groups, Technical Committees and Working Groups to identify best practice and develop interoperable products, services and processes, and to provide guidance as to how cities can put together the most appropriate families of standards to meet their needs.

The IEC Smart Cities Systems Committee supports this vital work by providing tools to help the experts within the different SDOs to develop the standards needed.

This presentation covers 4 key activities:

- Facilitating the development of common definitions of key terms
- Developing Smart City reference architecture
- Collecting and analyzing use cases to help scope out the requirements of families of standards to underpin systems solutions
- Categorizing and mapping standards related to smart and sustainable cities.





*Presenter*

**Bernard Gindroz** | Chairman,  
ISO TC 268 | International Organization  
for Standardization

**“ISO TC 268 'Sustainable Cities and  
Communities' in support of accelerating  
cities' transformation”**

The challenges facing cities around the world are very complex and often very specific. We always need to consider the local and cultural context as cities are all unique and need to retain their character. That said, feedback we have received has been consistent in that all cities want an overarching framework that they can all use.

This has been reached with international consensus on what best practice means and how to apply it. It also needs to match up with the United Nations' Sustainable Development Goals. The standards need to ensure these issues, such as energy management, road safety, transport, cyber security, water management, health and governance, climate change mitigation and adaptation, citizens well-being including ageing population.



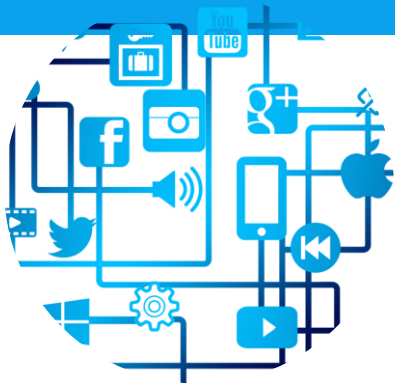
ISO TC 268 collects expression of needs from cities and communities, to help them in their journey towards sustainable development. Their own needs are driving our TC 268 activities and new work items. We base our strategy in developing standards that support cities in that sense, and thus, we permanently collect feedbacks from their implementation, with the aim to improve our existing standards and develop new ones to fulfil cities and communities' expectations.

To start the process, ISO 37101 'Sustainable development in communities – Management system for sustainable development' is the standard we first recommend. It provides quality management systems that clearly set out the basic requirements that help cities determine their sustainable development needs and strategies.

ISO 37101 is supported by the other standards in the 'ISO 371xx family' that add more specific information, structures and measures that:

- are open and transparent for decision makers, government, and citizens;
- are market-driven for economic prosperity;
- represent all interested parties and stakeholders;
- have technical coherence that is achievable and measurable;
- are reached through consensus by all stakeholders; and
- achieve national commitment for consistency and comparison.

Thanks to the implementation of these standards, cities and communities have an efficient and robust set of tools to accelerate their transformation.



*Presenter*

**Dave Raggett |**

Lead, Data Activity and Web of Things  
Activity | World Wide Web Consortium

**“Healing the fragmentation to realize the  
full potential of the IoT”**

The IoT remains fragmented with myriad standards and incompatible solutions. Some of the complexity reflects varying requirements at the network edge, but the rest is an accidental consequence of development in isolated communities.

W3C is approaching this in two ways. First, the Web of Things is an abstraction layer for digital twins that decouples services from the underlying protocols. Second, a uniform framework for data and metadata that enables incremental integration of services. New work is addressing the integration of statistics to mimic human cognition, and business opportunities based upon data sovereignty and delegated trust.



*Presenter*

**Nadine Alameh | CEO |**  
Open Geospatial Consortium

Smart cities provide a rich and challenging environment for the integration and analysis of heterogeneous information available via complex distributed platforms and provided by multiple stakeholders.

From the Open Geospatial Consortium (OGC) perspective, location information interoper-

ability is a critical connecting aspect for the integration of this information and for the success of Smart Cities. With the rise of smart cities, OGC members have been working to apply geospatial and other standards to inform interoperable architectures for smart cities.

In this session, we shared the findings of a recent pilot, funded by the US Department of Homeland Security (DHS), describing how interoperability can be established in Smart City Interoperability Reference Architecture (SCIRA) to integrate information, based on location, to support informed decision making.



## Key highlights

As we have globally experienced during the isolation brought on by the COVID-19 pandemic, there should be an equal opportunity for everyone to lead a connected personal and work life. This is where standards are of the utmost importance. They are critical to offering reliable mechanisms and tools to accelerate the adoption of digital technologies, include IoT, in cities to achieve today's needed connectivity.

The 2030 Agenda for Sustainable Development recognizes the importance of digital technologies for cities, especially

toward fostering city sustainability.

Collaborative initiatives like United for Smart Sustainable Cities (U4SSC) at the UN are helping cities overcome key technology issues such as interoperability, and address various policy challenges, especially those that are emerging in light of frontier technologies such as AI, IoT, and more.

Many cities are implementing its deliverables, such as its comprehensive reports, frameworks and guidelines. And in turn, cities are actively contributing to these deliverables as well, both to learn from the findings and enact the lessons learned in their policies, as well as to share their experiences for the benefit of other cities.



While cities are not homogenous and can be vastly different from one other, they do face many of the same kind of challenges and complexities - which they need to manage effectively, in order to provide services to the best extent possible and to ensure their citizens' quality of life. This, again, is why cities need and increasingly rely on international standards.

Standards are, essentially, the language for innovation. In cities, they ensure citizen engagement, help benchmark progress, help ensure adoption of best practices, support the emphasis on quality, and - importantly - help bridge the vision and priorities of the decision makers and investors that lead the transformation process.

The information commodity, in particular, has a crucial role to play in smart cities. Accessibility, openness and transparency of data are required and expected in today's smart sustainable cities. Reliability of data platforms and solutions is very important, as we move to a state of ever-increasing digitalization in cities.

Since cities are such complex systems, a systems approach is needed to understand a whole city as well as all its parts (including their unique characteristics, interactions and constraints), so that city standards are developed in a way that can best facilitate integration, interoperability and buildability of architectures and solutions, and engender consistent credibility and trust in city data.



## Way forward

Standards developing organizations (SDOs) should continue to collaborate and synergize their capabilities and expertise to provide the best implementable products and standards to cities, industries and all other stakeholders. An annual dialogue dedicated to bringing all SDOs and their work together for this shared aim should be furthered.

It is imperative that cities and communities have a clear view on what kinds of standards are available, and which ones would best serve their unique needs. SDOs, therefore, must continue to work on understanding these needs well and to transform them into standards that are implementable.

SDOs should consider the needs of cities while developing data, processes, infrastructures, interfaces and requirements, using common terminology in order to convey the guidance and best practices that cities need in their digital transformation journeys. Describing the specific 'types' of cities could be helpful. High-level use cases of city services, systems and scenarios can also help develop more contextualized standards.

Lastly, but importantly, there is need to lower the technical complexity and deployment risk and cost for IoT development projects, and to learn from the experiences and successes of early adopters. These must be reflected in IoT standards, as well as in those of related frontier technologies.

# Biographies



**Chaesub Lee | Director |**

Telecommunication Standardization Bureau, ITU

Dr. Chaesub Lee was elected Director of the ITU Telecommunication Standardization Bureau at the ITU Plenipotentiary Conference 2014 in Busan, Republic of Korea, and re-elected to this post for a second four-year term at the ITU Plenipotentiary Conference 2018 in Dubai, United Arab Emirates. Dr Lee has contributed ICT standardization for over 30 years, specializing in areas such as integrated services digital networks (ISDN), global information infrastructure (GII), Internet protocol, next-generation networks (NGN), Internet protocol television (IPTV) and cloud computing.



**Nasser Saleh Al Marzouqi | Chairman |**

ITU-T Study Group 20: IoT, Smart Cities and Communities

Mr. Nasser Al Marzouqi is the Chairman of the ITU-T Study Group 20 “Internet of things and smart cities and communities” which provides the specialized IoT standardization platform necessary for the convergence to rest on a cohesive set of international standards. The focus of the research conducted by ITU-T Study Group 20 is on identifying and analyzing emerging applications and global solutions for IoT and smart cities, which will contribute to improving the interoperability of various IoT-based technologies, a key factor in ensuring end-user and market acceptance of IoT solutions.





**Bilel Jamoussi** | Chief of Study Groups Department |  
International Telecommunication Union

Dr. Bilel Jamoussi has been Chief of the Study Groups Department of the ITU Standardization Bureau (TSB) in Geneva, Switzerland since 2010. He has led the coordination of the bureau's standards moving activities into a new era of digital transformation with increased collaboration with vertical sectors such as healthcare, transportation, utility, and banking. Dr. Jamoussi's innovative approach has served as a catalyst to launch new standards initiatives related to emerging technologies such as IoT, Blockchain, AI and Quantum. He has also been credited with bringing the telco and financial sectors together to develop digital payments guidelines and standards with the aim of advancing financial inclusion globally.



**Javier García Díaz** | Director General | UNE

Mr. Javier Garcia Diaz is General Director of UNE, the Spanish Association for Standardization. He is a member of ISO Council and member of the Administrative Boards of CEN and CENELEC. He also chairs the CEN Strategic Advisory Group on Services. Previously he was Pre-Accession Advisor of the European Commission to Bulgaria in the field of Free Movement of Goods and member of the CEN and the CENELEC Technical Boards (BT). From 2008 to 2013 he acted as Chairman of the Technical Committee Management Group of the CEN/BT. Mr Garcia Diaz has also served from 2012 to 2017 as a member of the IEC Standardization Management Board.



**Hyoung Jun Kim** | Vice Chairman | ITU-T Study Group 20: IoT, Smart Cities and Communities (Co-convener Of JCA-IoT & SC&C)

Dr. Hyoung Jun Kim joined the Electronics and Telecommunications Research Institute (ETRI) in 1988, and he is currently working as its Managing Director of the Protocol Engineering Centre. He has had 28-year research experiences in various divisions of ETRI including Info-Communications Technology Division, IT Strategy Research Division, and the Information & Telecommunications Technology Division. Dr. Kim is currently serving as Vice-Chairmen of ITU-T SG20 and Chairman of WP1 (Internet of Things) under ITU-T SG20, Convener of the JCA-IoT in ITU-T SG20. He also has been serving as vice-Chairmen of ITU-T SG13 and Chairmen of WP3 (SDN and Networks of Future) in SG13.



**Cristina Bueti** | Counsellor |  
International Telecommunication Union

Ms. Cristina Bueti is the ITU Focal Point on Environment and Smart Sustainable Cities. She is also the Counsellor of ITU-T Study Group 20 "Internet of things (IoT) and smart cities and communities (SC&C)" at the International Telecommunication Union (ITU). She also serves as TSB/ITU focal point for Latin America. As part of the International Women's Day 2016, Ms. Bueti was named as one of the twenty Geneva-based inspirational women working to protect the environment. She has authored over 40 reports on telecommunication issues.



**Harsha Vardhan Madiraju** | Associate Director, Member Recruitments & Marketing | World Geospatial Industry Council

Mr. Madiraju is a geospatial technology evangelist with 15+ years of experience in the geospatial industry in the areas of marketing, business development, and pre-sales. As part of his current and previous roles, he brings an understanding of the latest happening in the geospatial market, technology trends, and innovative applications. An alumnus of UCLA Anderson School of Management and the University of Salzburg, his professional interests are in the areas of leadership, marketing and communications, and strategy.



**Michael Mulquin** | Chair, Smart Cities Systems Committee | International Electrotechnical Commission

Mr. Mulquin has spent 25 years partnering with cities, rural areas, and industry on how technology can help neighbourhoods and cities work better. He has been focusing on the development and implementation of smart and sustainable city standards. He is technical author of two British Standards Institution publications: PD8100 Smart cities overview - Guide, and PD8101 Smart cities - Guide to the role of the planning and development process. He is Chair of the IEC Smart Cities Systems Committee and is an active member of ISO TC 268 and JTC1 Working Group 11. He was a member of the ITU-T Smart and Sustainable Cities Focus Group. He is Principal Architect of the TM Forum's Smart City Maturity Model and is helping lead their work on Smart City standards.



**Bernard Gindroz** | Chairman, ISO TC 268 |  
International Organization for Standardization

Dr. Bernard Gindroz is an independent consultant on Energy, Environment, Climate Change, Smart Cities and Communities and Transport, with a special focus on innovation, policies and standardization. Dr. Gindroz is also Chairman of the ISO TC 268 (Sustainable Development of Communities), Chairman of the CEN/CENELEC Joint TC 6 (Hydrogen in Energy Systems), Chairman of the CEN/CENELEC/ETSI Sector Forum on Smart and Sustainable Cities & Communities, and Chairman of the CEN/CENELEC Sector Forum Energy Management-Energy Transition (SFEM). He is an EU expert in Adaptation to Climate Change and has been involved in innovation, policy and competitiveness issues for more than 30 years.



**Dave Raggett** | Lead, Data Activity and Web of Things Activity |  
World Wide Web Consortium

Dr. Dave Raggett is a member of the W3C's European staff and a visiting professor at the University of the West of England. He was closely involved with early work on web standards especially HTML and HTTP. He has been involved in many European projects, and currently focuses on the Web of Things and Cognitive AI. He was educated at the University of Oxford, followed by assignments at the University of Edinburgh, Imperial College and MIT, along with industry experience at HP, Canon, Openwave, Volantis and JustSystems.



**Nadine Alameh | CEO |**

Open Geospatial Consortium

Dr. Nadine Alameh is the recently appointed CEO of the Open Geospatial Consortium (OGC), an international organization dedicated to making Location information Findable, Accessible, Interoperable and Reusable (FAIR) via a process that combines consensus-based standards, collaborative agile development, and targeted domain, regional and technology partnerships. Dr. Alameh is a recognized leader in the field of Geospatial Information Systems (GIS), having built a career out of her dedication to interoperability, innovation and information sharing in a multitude of domains including Aviation, Earth Observations, Public Safety and Defense.



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## Further links:

For more information on smart sustainable cities, please visit:

[www.itu.int/en/ITU-T/ssc/Pages/default.aspx](http://www.itu.int/en/ITU-T/ssc/Pages/default.aspx)

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