Smart Sustainable Cities

In order to deal with increasing urbanization trends, smarter and more sustainable means of **managing urban complexities**, **reducing urban expenditure**, **increasing energy efficiency** and **improving the quality of life for urban residents**, must be developed.

In this regard, the concept of Smart Sustainable Cites (SSC) is used to discuss the utilization of modern technologies for everyday urban life. In SSC, information and communication technologies (ICTs) are merged with traditional infrastructures. ICTs have a crucial role in SSC as it acts as the platform for the aggregation of information and data to help enable an improved understanding of how the city is functioning in terms of resource consumption and services. ICT based services in SSC include intelligent transport systems, which can significantly improve urban mobility.

Integration of ICTs into existing urban services in SSC can also assist in:

- Improving the energy efficiency
- Operation and transparency of the urban infrastructure
- Resilience of road networks
- Efficiency of water distribution systems
- Wastewater management
- Security
- Other services

Urban sensors in SSC have the potential to provide city stakeholders with access to real-time spatial, economic and environmental information about their cities.

Thus, ICTs in SSC are not only capable of establishing defined urban functions but also promote the essential degree of engagement among citizens, governments, private stakeholders, and other interested parties, in the designing and planning process for cities. This helps ensure informed participation to create shared knowledge for urban governance along with providing the platform for urban simulation which inform future designs for economic, social and environmental development.

Additionally, the infrastructure of SSC in terms of its operational functioning and planning through management, aims for equity, fairness and the realization of a better quality of urban life.

International Telecommunication Union (ITU) Liaison Office to the United Nations. Two United Nations Plaza, DC2-2524.
Tel: +1-212-963-6121 or 1-917-214-5584; wynhoven@un.org or ursula.wynhoven@itu.int

Transitioning to SSC is a gradual process. While guiding urban stakeholders through the process, ITU-T Focus Group on Smart Sustainable Cities (FG-SSC) elaborated on a series of steps, which can be adopted by urban stakeholders at any stage. Based on the work of the FG-SSC, key desirable features for SSC along with defined key performance indicators to monitor smart city transitions, have been elaborated in the flipbook on "Shaping smarter and more sustainable cities: Striving for sustainable development goals".

The work on SSC is being continued by the new ITU-T Study Group 20 on "Internet of things (IoT) and smart cities and communities (SC&C)", which provides a unique platform to influence the development of international IoT standards and their application as part of urban-development master plans. This Study Group provides IoT standards developers, the opportunity to target their standardizations efforts towards specific applications and various urban parameters, thereby responding to the requirements of standards implementers including city administrations, energy and water utilities, healthcare providers, and transportation authorities.

Additional resources:

· Building tomorrow's Smart Sustainable Cities

- Flipbook on "Connecting cities and communities with the SDGs" http://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Deliverable-Connecting-Cities/index.html

- Flipbook on "Enhancing innovation and participation in smart sustainable cities" http://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Enhancing-innovation/index.html

- Flipbook on "Implementing SDG11 by connecting sustainability policies and urban planning practices through ICTs"http://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Implementing-sustainable-devt/index.html

- Flipbook on "Collection Methodology for Key Performance Indicators for Smart Sustainable Cities"http://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Collection-Methodology/index.html

- Flipbook: Unleashing the potential of the Internet of Things

Case Studies

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

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

- Flipbook: Sustainable management of waste electrical and electronic equipment in Latin America

Emergency Telecommunications

When disasters strike they have devastating effects on people's lives, and on the economy. The latest data show that in 2016 more than 445 million people were affected by disasters. Twenty-six million people were forced into poverty. The impact is even worse for those living in remote and isolated areas with no access to basic information and communication facilities. Emergency telecommunications play a critical role in disaster risk reduction and management. ICTs are critical to deliver early warnings and in the immediate aftermath of disasters by ensuring timely flow of vital information.

· Resources:

· BDT Study Group Question 5/2: Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response (2017). This report focuses on the use of Information and Communication Technologies (ICTs) for disaster communications management, approaches and systems available to increase **redundancy and resiliency of ICTs.** It provides a review and analysis of a range of technology **and policy case studies presented** by Administrations and organizations regarding implementation of ICTs during all disaster phases. An Emergency Communications Checklist, outlining the types of activities and expected decision points that could be considered for inclusion in a National Disaster Communications Plan, is also provided.

- Emergency Telecommunication - Saving Lives (2016). The brochure gives an overview of ITU interventions on emergency situations from 2005 until 2015.

Big Data for development: preventing the spread of epidemics

"The use of Information and Communication Technologies (ICTs) plays an important role to break the chain of health-related emergencies such as Ebola virus transmission" (Resolution 202, PP-2014).

Big data derived from the use of ICTs holds great promises to help address global development challenges. Digital footprints left through the use of online services, phones and other digital transactions, can be gathered, analyzed and used to develop better policies, and provide more individualized services and critical information. Because of the near ubiquity of the mobile-cellular network and since a growing number of people are using mobile phones, data from mobile phone operators are particularly valuable, including in the case of emergencies.

As part of ITU's efforts to support its Members States in the area of emergency telecommunications, a big data project was launched in 2015. The project showcased the potential of big data to facilitate the timely exchange of information to combat the Ebola epidemic - which had gripped West Africa in 2014 - and future health crises. The project used Call Detail Record (CRD) data, which includes information on the use of the mobile phone, including the location, from mobile network operators in Liberia, Guinea and Sierra Leone. The project demonstrated how analyzed CDR data can provide information on human mobility, including cross-border movement, and the spatiotemporal distribution of people, while safeguarding individual privacy. In the case of the outbreak of a disease this information is critical for governments as well as for humanitarian aid agencies, for effective intervention, and to tackle the disease. It can further be used to build models of population flow patterns over time, and at specific

events, and to combine these data with other information.

Three separate country case studies for Guinea, Liberia, and Sierra Leone were published as a result of the project. The case studies include detailed information on the CDR datasets, analysis and results, as well as the anonymization process and limitations and challenges.

Case Studies:

- Call Detail Record (CDR) Analysis - Guinea. Available for download in PDF (en) (fr), ePUB (en) (fr), MOBI (en) (fr)

- Call Detail Record (CDR) Analysis - Liberia. Available for download in PDF (en), ePUB (en), MOBI (en)

- Call Detail Record (CDR) Analysis - Sierra Leone. Available for download in PDF (en), ePUB (en), MOBI (en)

Cybersecurity

With ICTs increasingly underpinning a broad range of human activities, modern societies have developed a growing dependency on ICTs in their daily operations and management of critical infrastructure. However, this creates risks that need to be managed at all levels – national, regional and international.

In the Post-2015 era, ICTs are expected to have an enabling role in all aspects of socioeconomic development, as it was also made clear with the adoption of Goal 9.c "Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020". However such development cannot be sustainable without ensuring confidence and security in the use of ICTs, as lack of trust could hinder the adoption of ICTs and minimize their positive impact in countries' development process.

ITU as the facilitator of WSIS Action Line C5 on "Building confidence and security in the use of ICTs" contributed to the WSIS-SDG Matrix, which elaborates on areas of the SDG framework, where security in the use of ICTs could foster and accelerate implementation. These include inter alia access to electronic financial services (1.4), access to online information as part of education (4.1, 4.3, 4.5), empowerment of women through ICTs (5b), development of resilient infrastructure and sustainable economic growth (7.1, 7a, 7b, 8.1, 9.1, 17.8), transition to Smart Cities (11.3, 11b), and end of child violence and exploitation, especially in the online world (16.2).

Increasing ICT access alone should therefore not be the end-goal. Ensuring that ICT access can be sustainable and secure should further be one of the key priorities of all actors involved. Based on ITU's Global Cybersecurity Agenda (GCA) launched in 2007 a holistic approach is necessary for promoting ICT security, building on five strategic pillars: Legal Measures, Technical & Procedural Measures, Organizational Structures, Capacity Building and International Cooperation.

The GCA put forward an international framework for collaboration, which has been guiding ITU's Cybersecurity work since its launch. The following are some *examples* from ITU's work:

· **Child Online Protection (COP) Initiative:** ITU launched the Child Online Protection (COP) Initiative in November 2008 as a multi- stakeholder effort within the Global Cybersecurity Agenda (GCA) framework. The initiative brings together partners from all sectors of the global community to create a safe and empowering online experience for children around the world. In cooperation with diverse stakeholders, ITU has been providing guidance and building capacity in various countries - involving policy makers, parents, educators and children.

· **National CIRT Programme:** ITU's National CIRT Programme is helping countries build their national capacity in responding to cyber-attacks and protecting their national critical infrastructure from cyber-threats. ITU provides assistance to its Member States in four phases: a) Assessment phase of cybersecurity readiness, b) Design phase: identifying services, resource requirements etc., c) CIRT establishment phase; d) CIRT Improvement/Enhancement phase. ITU further organizes regular regional Cyber-exercises (Cyber-drills) in order to strengthen the collaboration of National CIRTs within the same region.

· **Global Cybersecurity Index:** The Global Cybersecurity Index (GCI) is a multi- stakeholder initiative to measure the commitment of countries to cybersecurity within five categories: Legal Measures, Technical Measures, Organizational Measures, Capacity Building and Cooperation. So far two index iterations have been published in 2014 and 2017.

· **National Cybersecurity Strategy (NCS) Initiative:** ITU has partnered with some 15 entities who have been active in implementing cybersecurity strategies and devising models, to produce a reference guide on devising a national cybersecurity strategy. The reference guide, currently under finalization, will represent a single resource for any country to gain a clear understanding of the purpose, content and development of a national cybersecurity strategy.

· **Technical Standards:** The ITU Standardization Sector through its Study Group 17 "Security" has produced over 330 Recommendations (Standards) in the area of cybersecurity, anti-spam, identity management, X.509 certificates, information security management, ubiquitous sensors networks, telebiometrics, IPTV security, virtualization security towards cloud computing security, and security architecture and application security, often in cooperation with external SDOs and Consortia.