

# Accelerating city transformation using frontier technologies

A U4SSC deliverable







# Key report features

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- Frontier Technologies
- Connecting Cities of the Future with the SDGs
- City of the Future = Smart Sustainable City
- Artificial Intelligence
- The Internet of Things
- Digital Twin
- Unmanned Aerial Vehicles/Drones
- Wearable Technology
- Virtual Reality/Augmented Reality
- City Data from Frontier Technologies
- The Role of Standardization
- ITU Standards for Frontier Technologies
- Conclusions



# Frontier Technologies

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Frontier technologies are leading to a new technological age characterized through:



a digitalization wave



heavy predication on data



associated analytics





# Connecting cities of the future with SDGs

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Cities of the future are urban agglomerations that harness the power of frontier technologies to improve the quality of public services and promote long-term sustainability in accordance with:



SDG 11: Sustainability



The New Urban Agenda





# Artificial Intelligence

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LONDON,  
UNITED KINGDOM

deploying intelligent sensors that use AI to detect road users and recognize the mode of transport they are using



SARASOTA, FLORIDA,  
USA

training robots to recognize recyclable materials in order to be able to sort them into recycling bins or to recover these materials

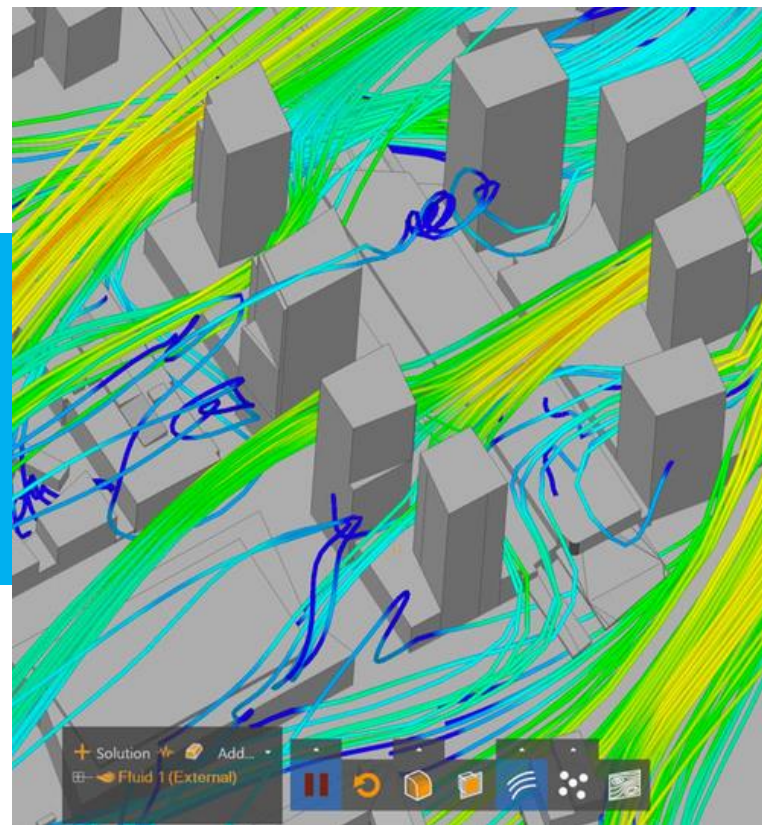


SHANDONG PROVINCE,  
CHINA

implementing an AI-based system, LSTM, to identify the characteristics of water pollutants and trace industrial point sources



# Digital Twin



## HELSINKI, FINLAND

using its digital twin to develop a creative virtual tour of the city to support tourism



## SINGAPORE

using Virtual Singapore, a dynamic 3-D city model and collaborative data platform to support city stakeholders in driving innovations



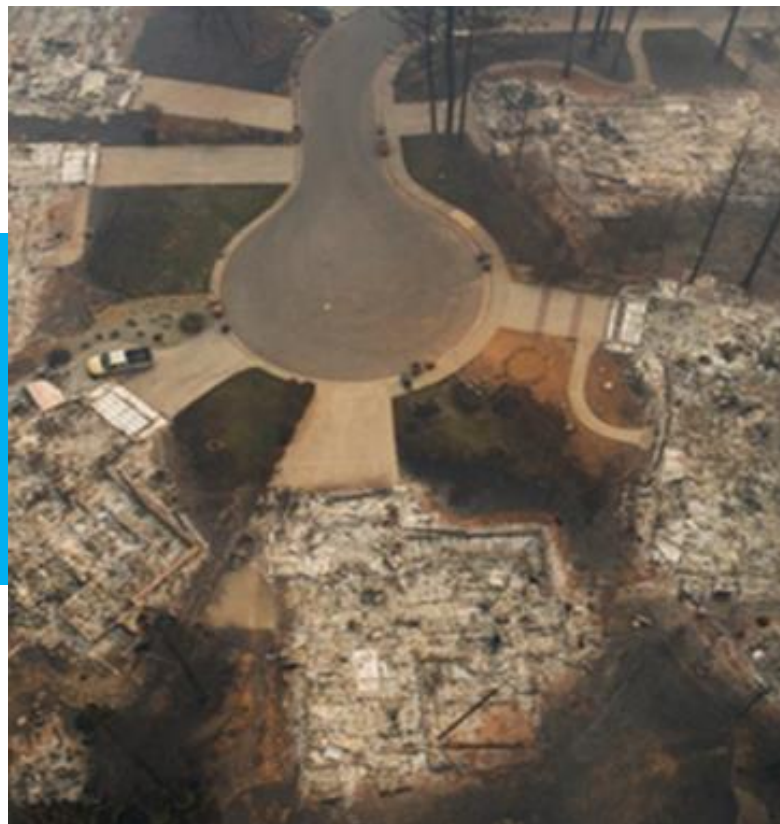
## AMARAVATI, INDIA

utilizing the digital twin to monitor the city's construction process in real-time; carry out climate change-related simulations and analysis; and create digital twin user IDs



# Unmanned Aerial Vehicles/Drones

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## CALIFORNIA

using UAVs to obtain aerial images to map the destruction in order to aid the recovery process after wildfires



## BOSNIA

launching humanitarian drones to assist search and rescue operations during the Balkan flood in 2014



## HAITI

deploying UAVs to assess collapsed houses and flood risks, and capture aerial images to identify areas where epidemics could occur following Hurricane Sandy



# Wearable Technology

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## LYON, FRANCE

utilizing smart LED wristbands and smart glasses to enhance attendees' overall experience at the Fête des Lumières as part of the MONICA pilot project



## EVERYWHERE

wearing fitness trackers to monitor heart rate, estimate calorie burn and measure other biometrics



## EVERYWHERE

using hearables to enable voice assistants such as Siri



# Virtual Reality/Augmented Reality

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## LONDON, CANADA

using a VR experience to look at the buildings under development in a city, based on different proposed scenarios and even experience how the light levels would change



## ANYWHERE

using VR to create immersive scenarios that support cities in their education, urban planning and water management



## ANYWHERE

allowing use of VR by students to interact with key elements as in the physical world

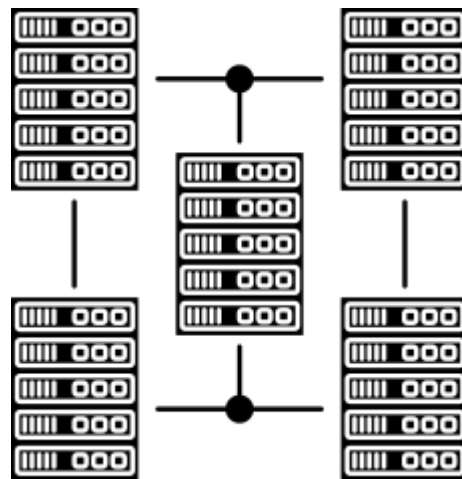


# City data and frontier technologies

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## Technical challenge

City data is:



Diverse and vast

City data should be:



Identifiable and  
high quality

City data needs to be:



Integrable and analyzable



# The role of standardization

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## Need for interoperability

One of the most common challenges in deploying IoT in cities is the issue of interoperability. Legacy systems and the latest IoT infrastructure are often not compatible with one another. The ability of IoT nodes & systems to communicate with each other is crucial for integrating IoT into city services. Delivering effective city services or verticals requires different layers of architectures, platforms and third-party applications to interact with one another.

## Importance of international standards

International standards can play a significant role in defining the technical and environmental requirements needed to scale frontier tech solutions. They are crucial for harmonizing the requirements of IoT systems and architecture.





# An example: ITU standards

## RECOMMENDATION ITU-T Y. 4201

'High-level requirements and reference framework of smart city platforms' defines the framework of smart city platforms (SCPs).

## RECOMMENDATION ITU-T Y. 4200

'Requirements of the interoperability of smart city platform' provides the specifications of reference points of SCPs.

## RECOMMENDATION ITU-T Y. 4402

'Requirements and functional architecture for the open ubiquitous sensor network (USN) service platform' provides guidance for setting the requirements of an open USN service platform.

Some examples of key ITU standards that are vital in this context



# Conclusions for Cities of the Future

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DATA TRAFFIC's ROLE

3

THE IMPORTANCE OF PLANNING

2

AI, IoT AND BIG DATA's IMPACT

4

THE NEED FOR  
INTERNATIONAL STANDARDS



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Access the report and other U4SSC publications  
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# Thank you!

