

# Smart Cities and Telecommunications Service Providers (TSPs) Value Propositions

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# Agenda

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1. Definition of "Smart City"
2. Drivers for Smart Cities
3. Smart City Use Cases
4. Smart Cities Components
5. Challenges for Smart Cities
6. TSPs Value Propositions
7. Conclusions

# Definition of "Smart City"

There is still no agreement among academics and practitioners about a clear-cut definition of "smart city".



However, in common for most definitions, "Smart City" refers to a city that uses the latest ICT and other new technologies to improve:

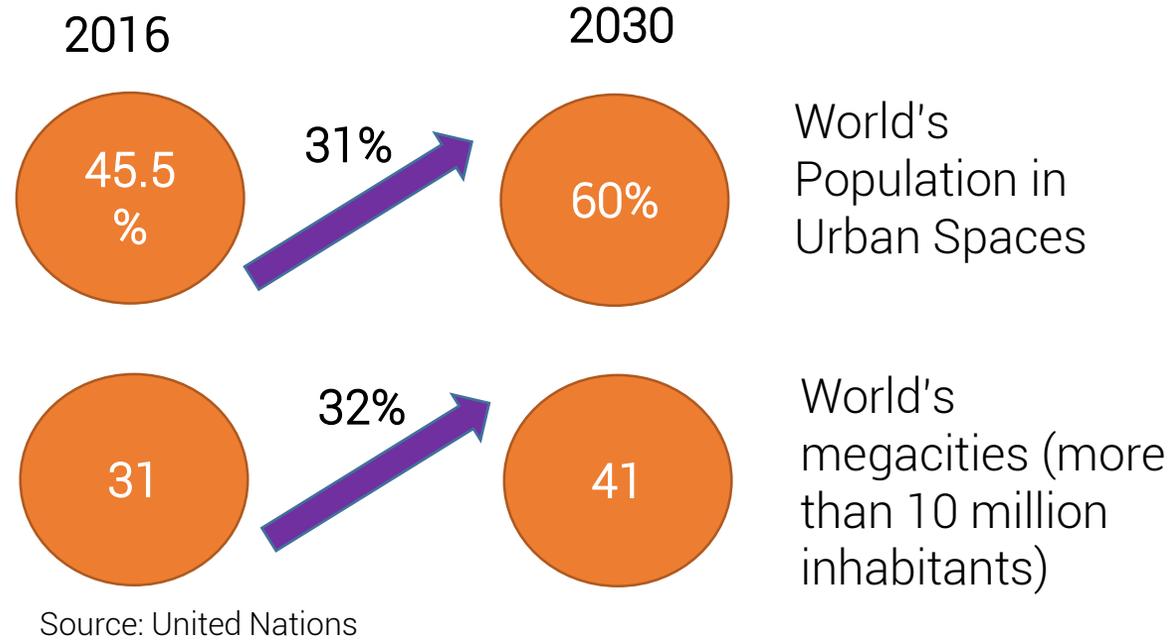
- Efficiency,
- Sustainability,
- Quality of public services,
- Standard of living for residents.

A close-up, slightly blurred photograph of a spiral-bound notebook with a pen resting on it, set against a warm, golden light background. The notebook is on the left side of the slide, and the pen is positioned diagonally across the bottom right of the notebook's pages.

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# Mass Urbanization



## Challenges to Cities:

- Infrastructure (e.g., roads, utilities, communications, etc)
- Social services (e.g., education, health care, housing, etc)
- Emergency services
- Public safety and security
- Environmental protection

# Advances in ICT

## Communications Infrastructure



Copper, fiber, base stations, gateways, routers & switches, core network, etc.

## Sensors



A wide range of sensors are available at reasonable prices

## Broadband Connectivity



Mobile and Fixed broadband connectivity are available at affordable prices

# Advances in ICT (continued)

## Mobile Devices & App.



Instant Access to  
whatever information we desire

## Cloud Computing



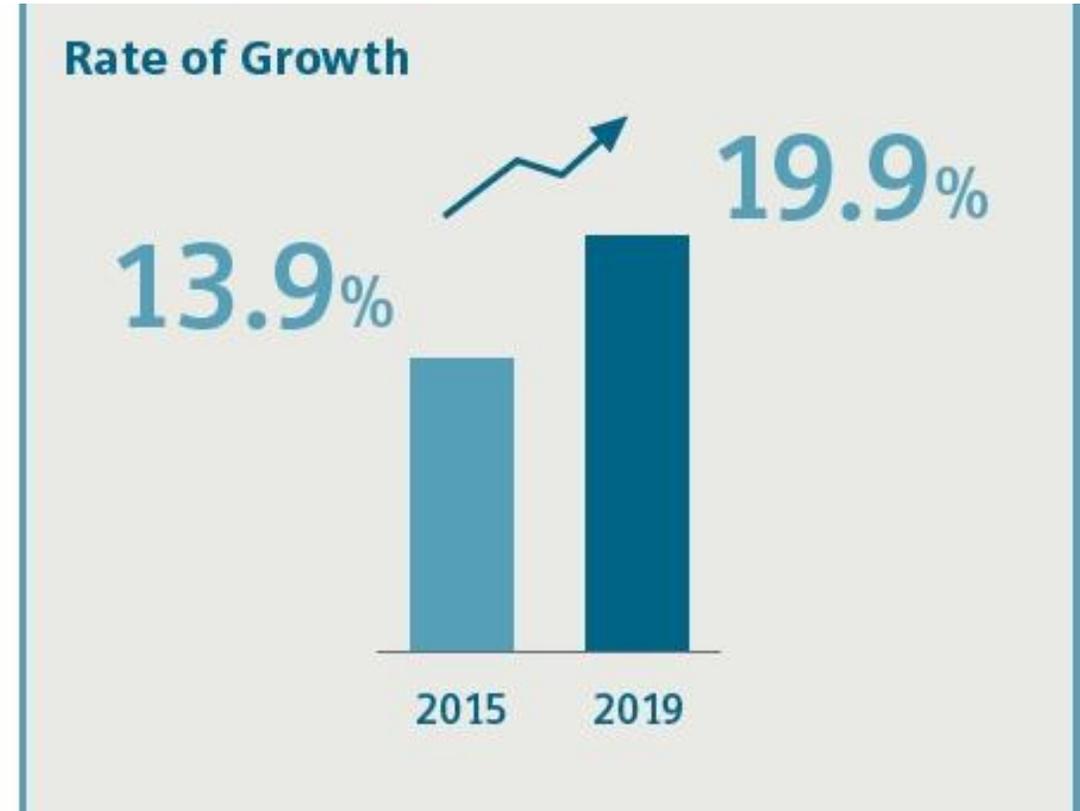
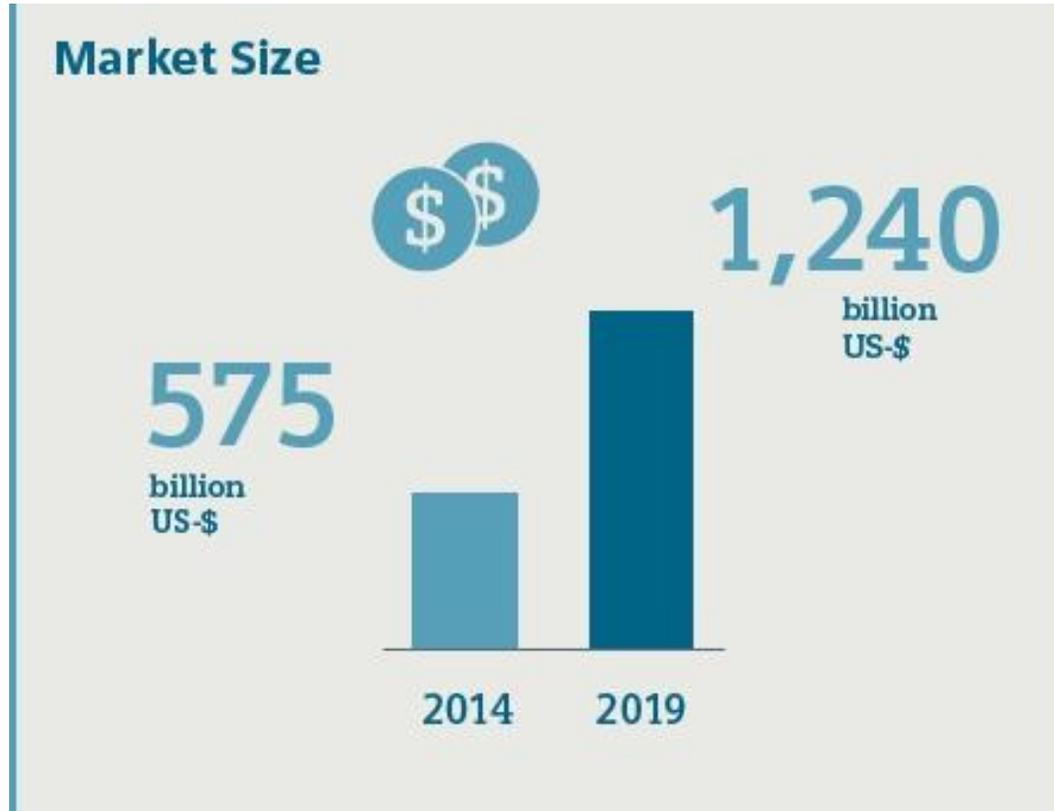
Agility, scalability, security &  
efficiency at a reasonable cost

## Big Data and Data Analytics



Faster and better decision making, data  
monetization, and cost reduction

# A Growing Market Opportunity



Source: SIEMENS

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# Smart City Use Cases



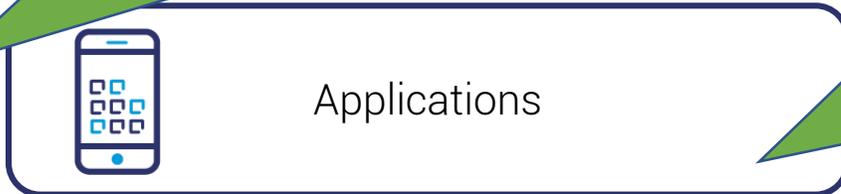
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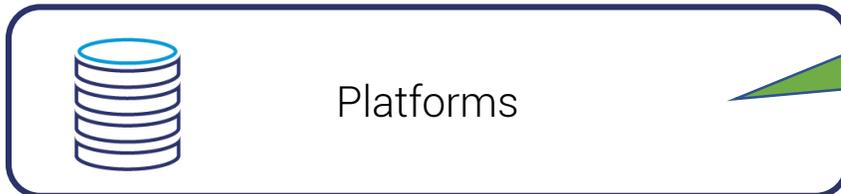
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# Smart Cities Components

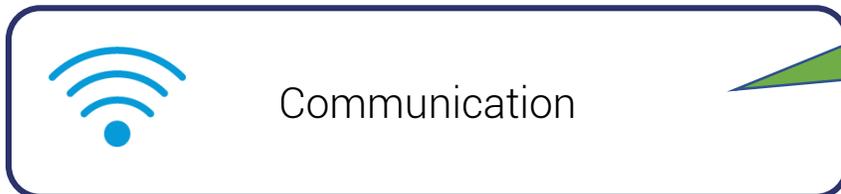
Consists of technical mechanisms and policies to protect, sensors, communication network, data, and application from unauthorized outside access and manipulation



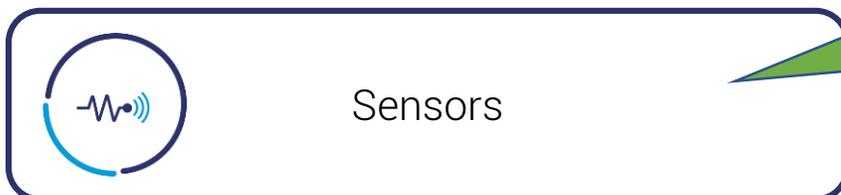
A user interface and the associated software (e.g., web application or a mobile application) that connect to the platforms layer and provide information to customers in well-defined formats such as tables, graphs, and reports



Receive, store, process, and expose information to the applications layer



Responsible for receiving and sending data from and to sensors



Consists of sensors that collect data that were previously too complex or time-consuming to collect

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# Lack of Funding



Huge Cost

Creation of a smart city :

- Requires a **committed leader**
- **Takes time** due to **complexity of implementation**
- Requires special **management skills** (e.g., risk assessment, dealing with a diverse set of stakeholders, cross-departmental coordination and alignment)
- Requires special **technical skills** (e.g., communications infrastructure, cyber security, cloud environments, data analytics and visualization, programming languages)

# Organizational, System, and Data Silos



- Each Dept. is focused on its own Products, Budgets, Analytics, etc.
- Teams from Different Deps. are **unwilling to collaborate and share information**
- **Siloed solutions** are deployed for **each vertical**
- **Siloed Data Sets** prevent informed, strategic, and smart decisions

# Inadequate Communications Infrastructure



- Lack of reliable fixed and mobile connectivity that covers all cities
- Lack of state of the art technology that facilitates the adoption of smart cities



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# Multi-network Approach

## Fixed Network



- **Broadband connectivity** through **copper** and optical **fibre** cables
- Can easily deploy **free public WiFi sites** throughout urban areas

## Mobile Network



- **Good coverage** across most cities through: 2G, 3G, and 4G
- Often **enough spectrum** to handle a wide range of smart cities verticals
- **Broadband connectivity** through LTE advanced carrier aggregation, higher-order QAM, and MIMO techniques

## Mission-critical Network



- **Dedicated Network** for Mission-critical Communications
- “Push-to-Talk” and “Data Transfer” services

### Multi-network approach:

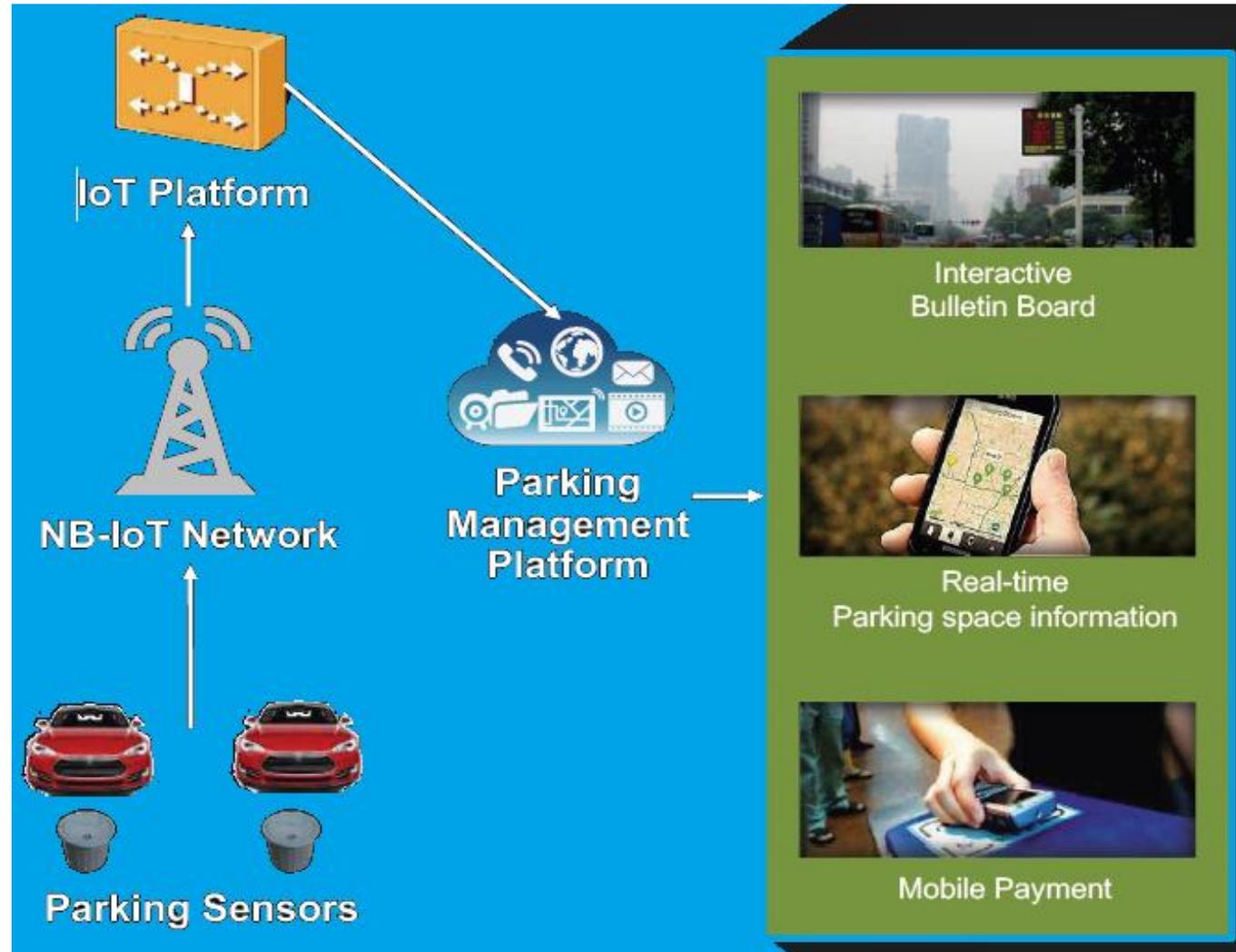
- Allows for pairing of each vertical with the most suitable network technology
- Provides the flexibility and agility required to accelerate the development of smart cities

# Cloud Capacity



- A number of **certified data centers** spread across major cities
- **Virtual Machines (VMs)** on Linux or Windows operating system
- Network **bandwidth**
- **block storage & object storage**
- Backup as a service (**BaaS**),
- Disaster recovery as a service (**DRaaS**),
- **Analytics** tools
- **Encryption** tools
- And more

# Narrowband Internet of Things (NB-IoT)

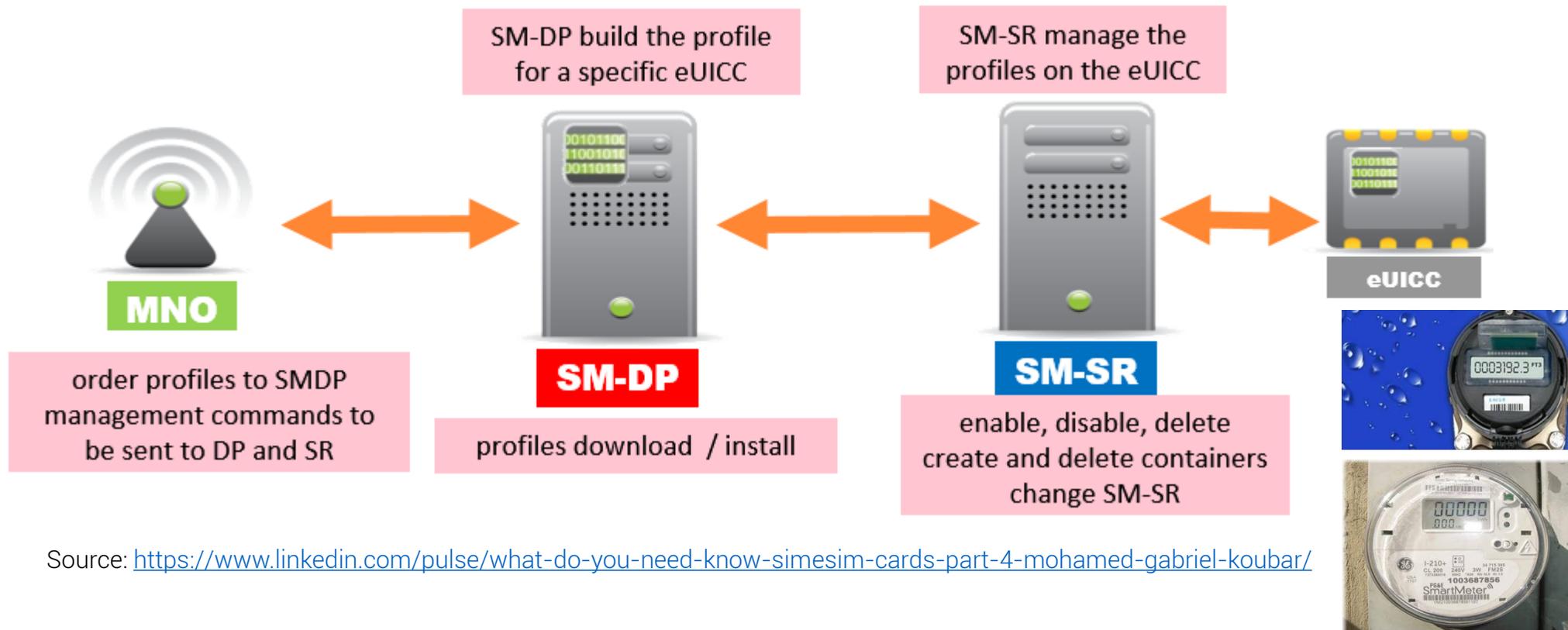


Source: Huawei

- NB-IoT is a **secure, reliable, and efficient** technology
- It was standardized by **3GPP in Release 13** (LTE Advanced Pro) [13]
- It uses **licensed spectrum**

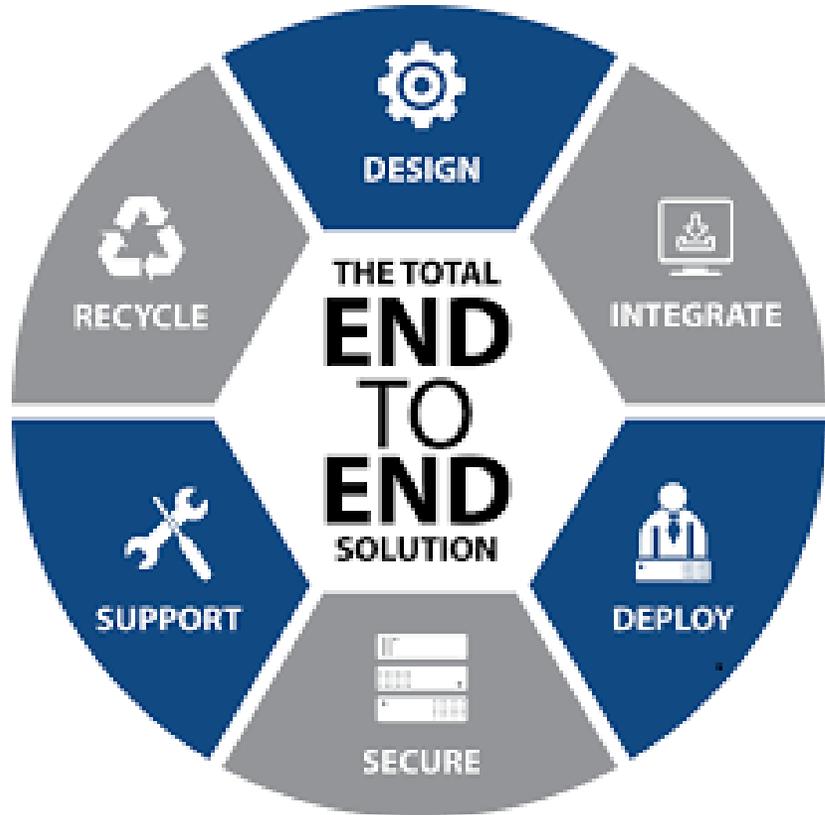
# embedded SIM (eSIM)/eUICC

eSIM Technology allows the download and activation of eSIM profiles over the air in a seamless, secure, and convenient way



Source: <https://www.linkedin.com/pulse/what-do-you-need-know-simesim-cards-part-4-mohamed-gabriel-koubar/>

# End-to-end Approach



- State of the art network infrastructure
- A large number of talented professionals with in-depth expertise in technology selection and implementation
- A good network of partners

TSPs can take an end-to-end approach including sensors, network, applications, analytics, and management to deliver smart cities solutions.



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# Conclusions

- Smart Cities are Driven by:
  - ✓ Mass Urbanization
  - ✓ Advances in ICT
  - ✓ A Growing Market Opportunity
- Main Challenges for Smart Cities Are:
  - ✓ Lack of Funding
  - ✓ Organizational, System, and Data Silos
  - ✓ Inadequate Communications Infrastructure
- TSPs Value Propositions Include:
  - ✓ Multi-network Approach
  - ✓ Cloud Capacity
  - ✓ Latest Technologies (NB-IoT and eSIM)
  - ✓ End-to-end Approach



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