



How standards can help your city become smarter

**1st Southeast Europe
Smart Society
Conference**

Ljubljana
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Standards include both products and processes



Standards are clear descriptions of agreed best practice

They describe all the essential aspects of a product or service

- What it does

- What input it needs

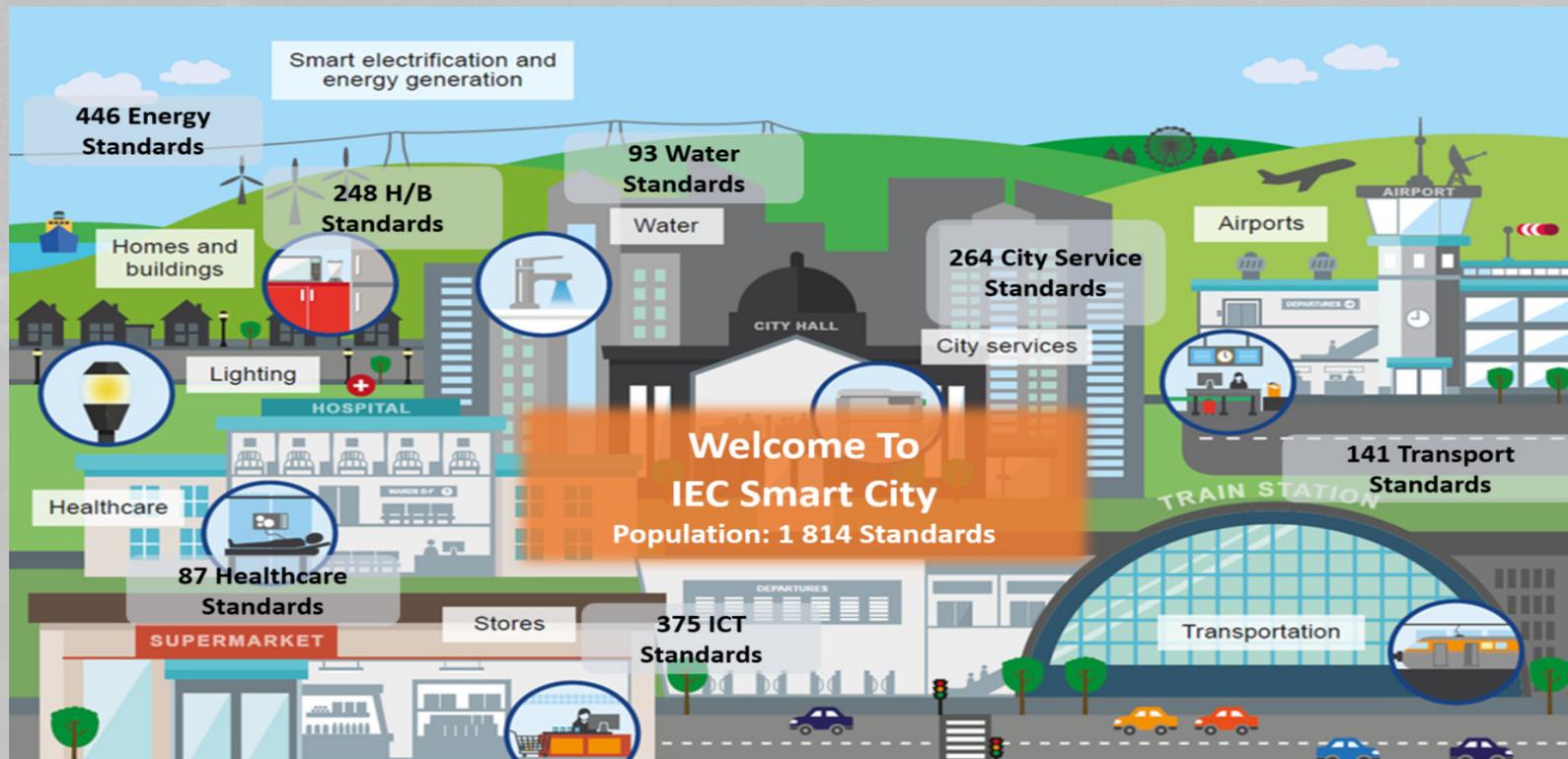
- The environmental requirements

- The safety requirements

- And so on ...

They also provide a clear description of what it “looks like” to all the other products and services that need to link to it - the interface requirements

There are already many standards vital to cities



“Smart cities” tackles problems to do with ...



where density and size make it difficult to manage all the services and infrastructures in a coherent way

What is a smart city?

Smart city: city where improvements in quality of life, services, sustainability and resilience are accelerated by the integration of physical, digital and social systems and the transformative use of data and technology

IEC Smart Cities SyC



Smart City standards

Speed up the move to smarter cities because:

- Help cities to learn from each other and follow best practice
- Build scale – many cities implementing the same things – cheaper, better products
- Make things easy to procure – and easy to design for procurement
- Make sure things “fit together”

What kinds of city standards are needed

Helping cities work

The basic plumbing

These may need to be updated from time to time to reflect smart city changes

Helping cities improve

Incremental improvements

Using digital initiatives to help existing services work better
Eg Open 311
These are low risk and quick return, but need to be designed so that they can interoperate with incremental improvements in other city areas

Helping cities transform

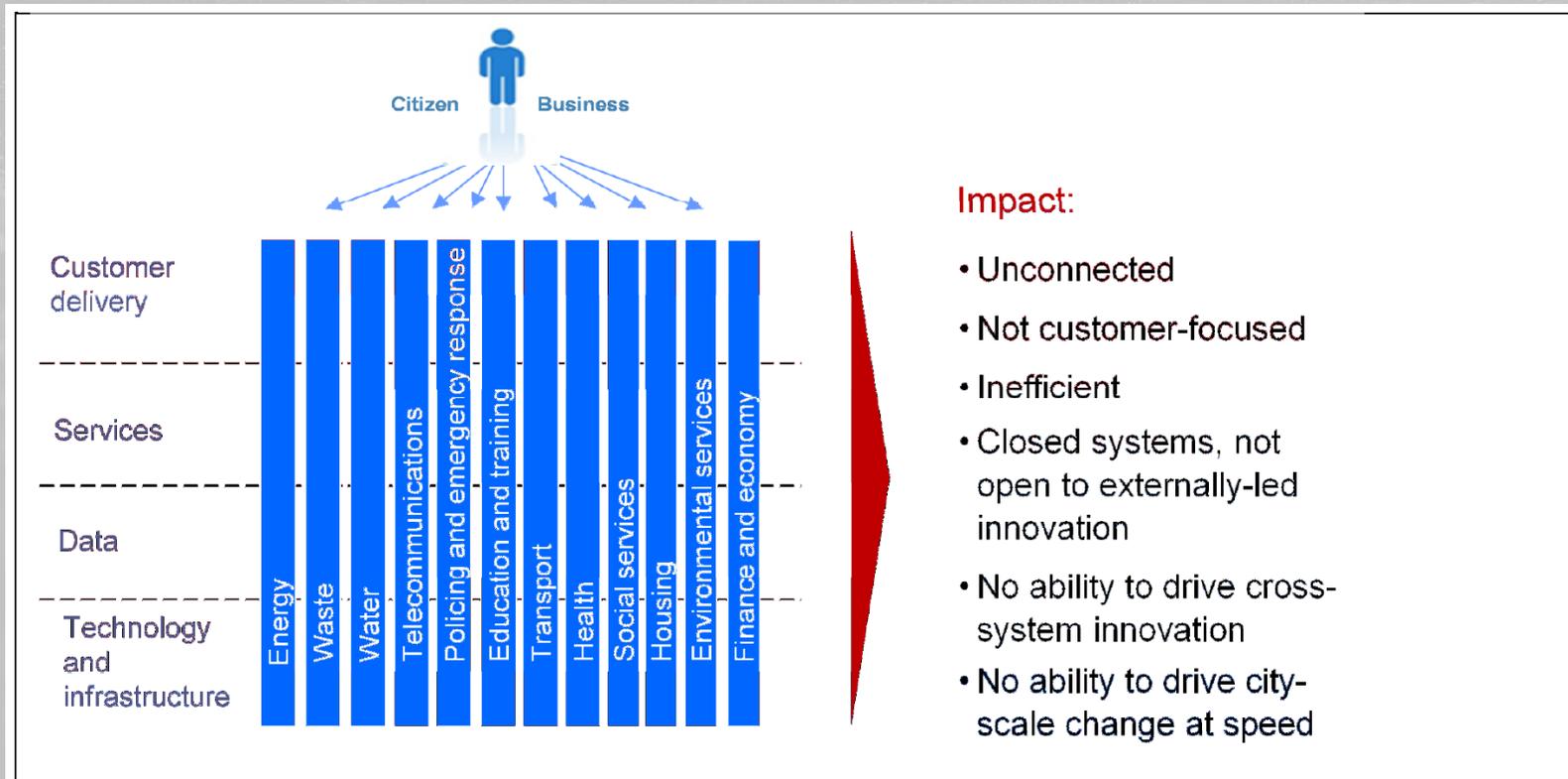
City-wide impact

Using data and technology to change the way a city works. These can be city-wide guidance standards, or packages of standards to enable a step change in how the city works

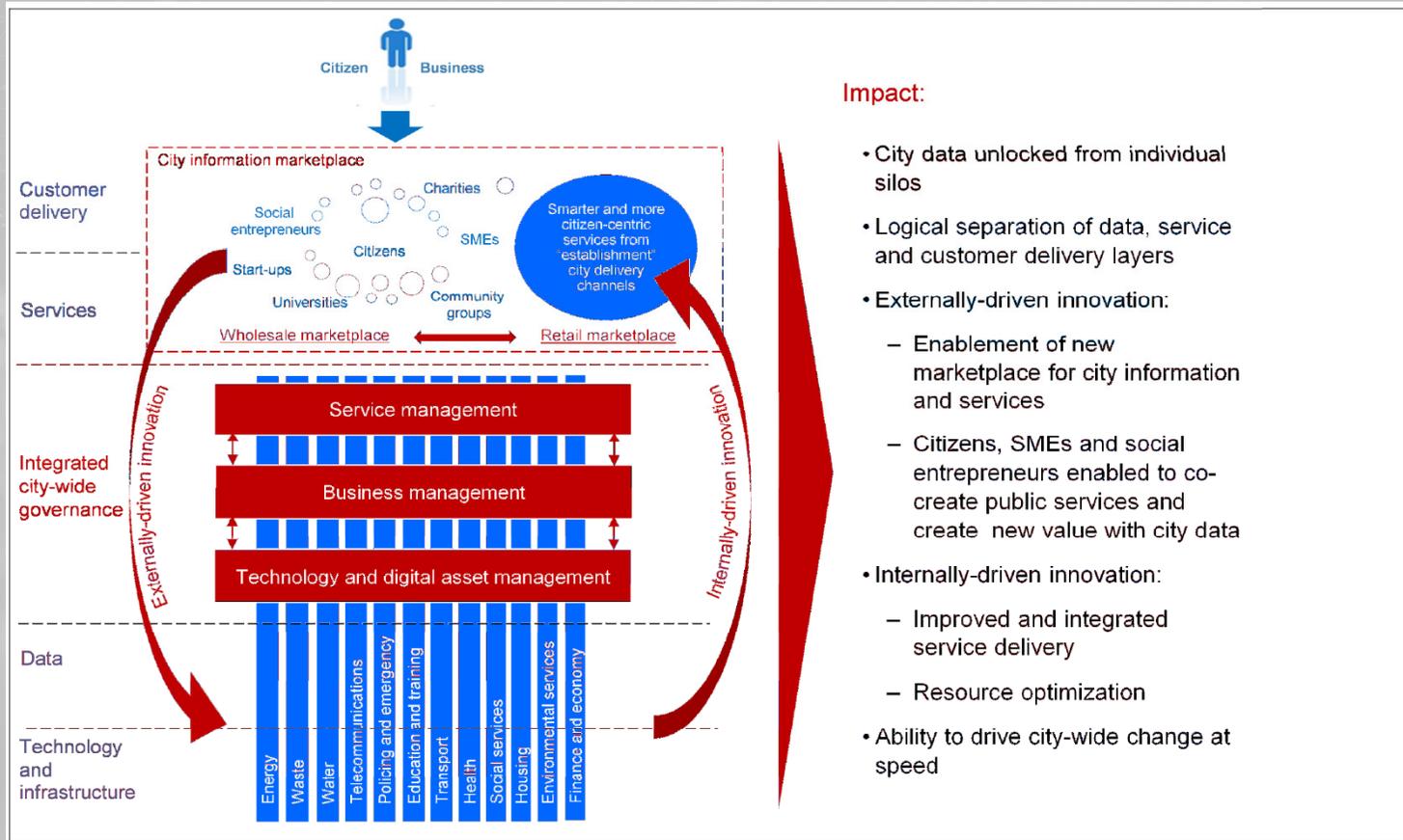
Let's look at a few city-wide guidance standards

Guidance on smart city operations

ISO 37106 - joining up the silos



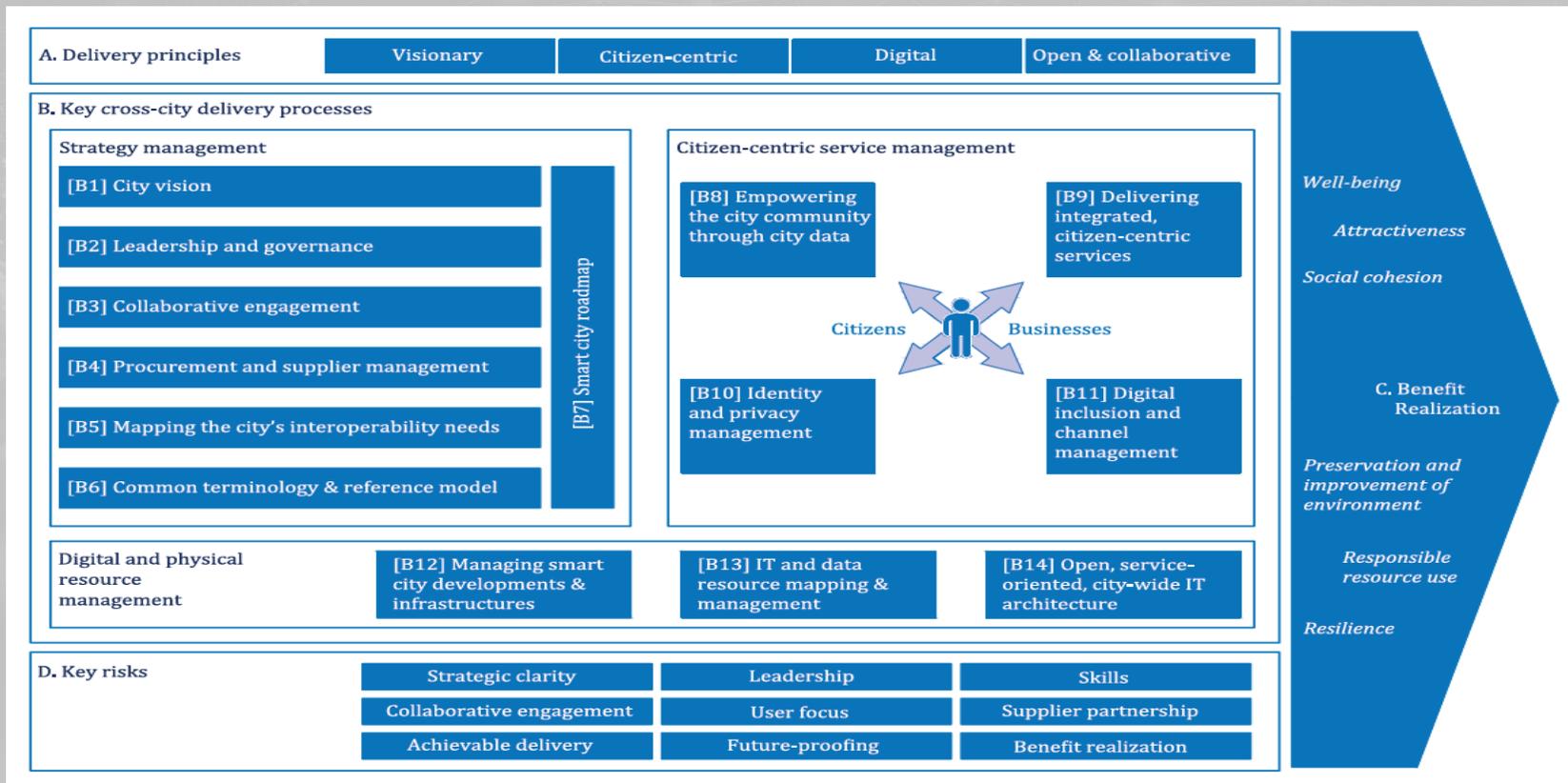
The smart city



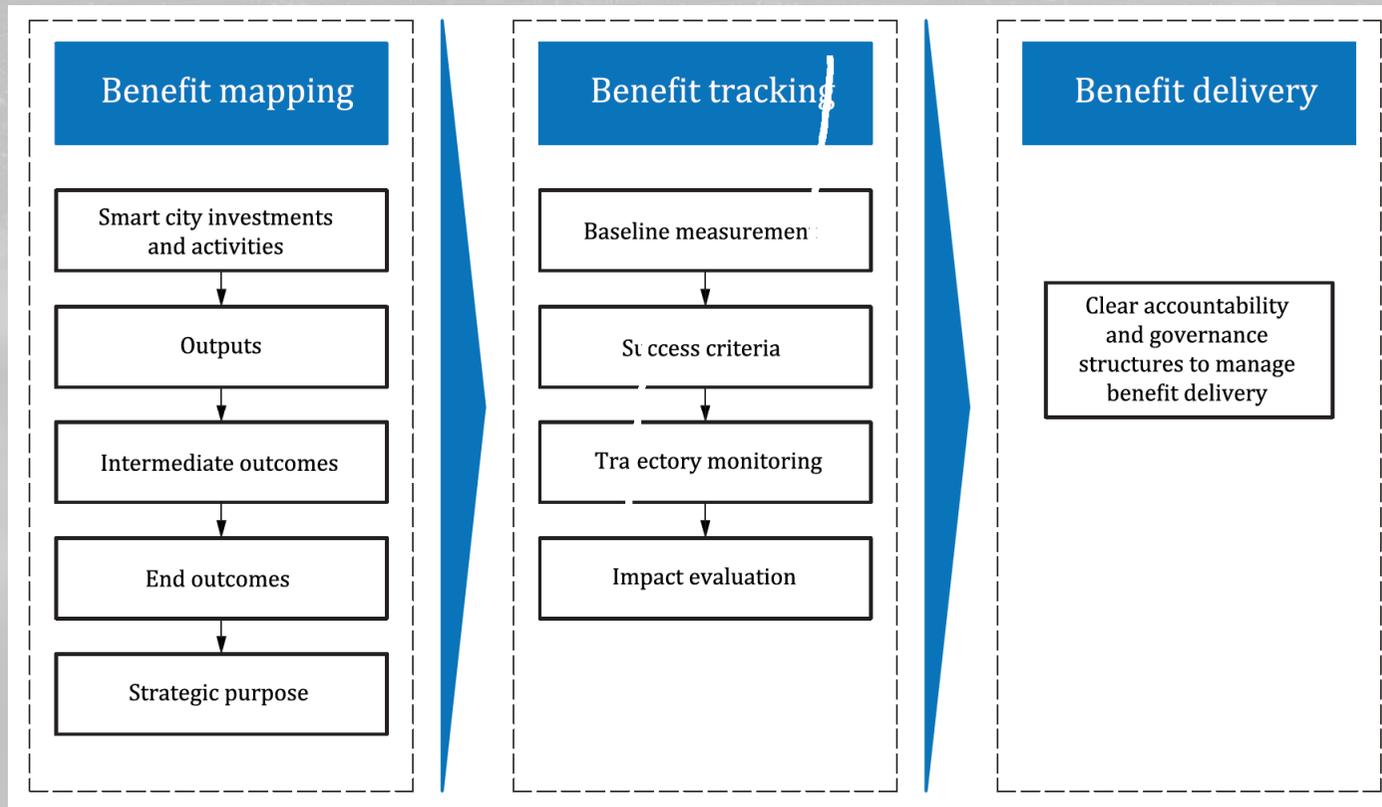
Impact:

- City data unlocked from individual silos
- Logical separation of data, service and customer delivery layers
- Externally-driven innovation:
 - Enablement of new marketplace for city information and services
 - Citizens, SMEs and social entrepreneurs enabled to co-create public services and create new value with city data
- Internally-driven innovation:
 - Improved and integrated service delivery
 - Resource optimization
- Ability to drive city-wide change at speed

What ISO 37106 covers



ISO 37106 Benefit Realisation Framework



Measuring and guiding progress

Two assessment methods

1. Indicators/KPIs

- These do not necessarily provide indications of what “good” looks like, but rather give robust and precise measures against which a city can assess progress

2. Maturity Models

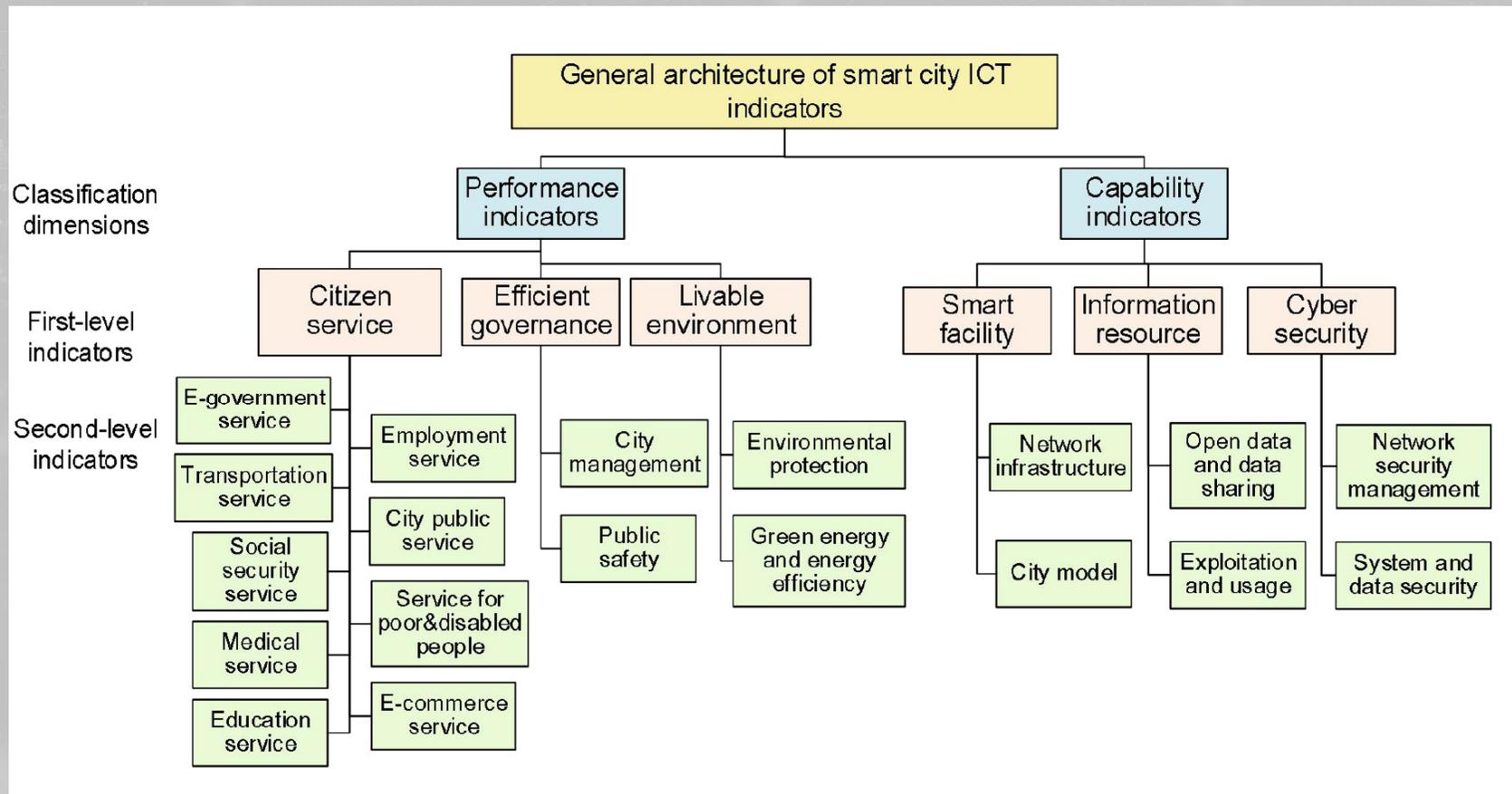
- These do provide indications of what “good” looks like
- Can be tailored to an individual city or nation
- Often they are not quite as precise as KPIs

ISO IEC 30146 Smart city ICT Indicators

Scope

This document defines a comprehensive set of evaluation indicators specially related to information and communication technologies (ICT) adoption and usage in smart cities. Firstly, this document establishes an overall framework for all the indicators. Then, this document specifies the name, description, classification and measure method for each indicator.

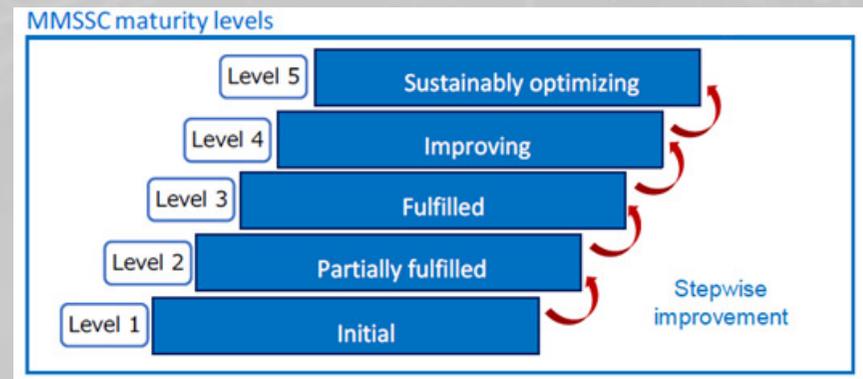
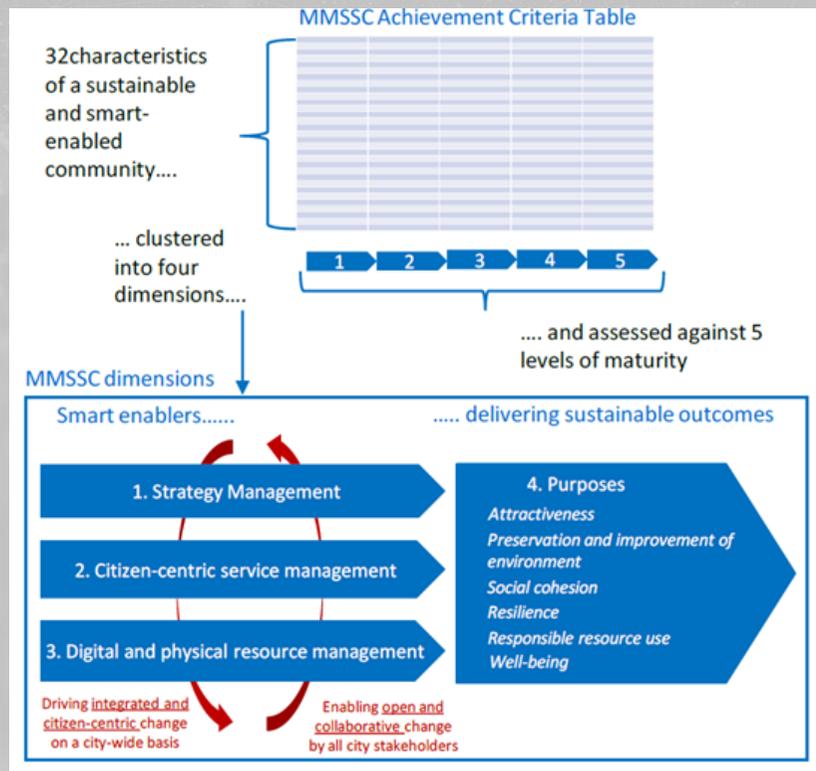
Structure of indicator system



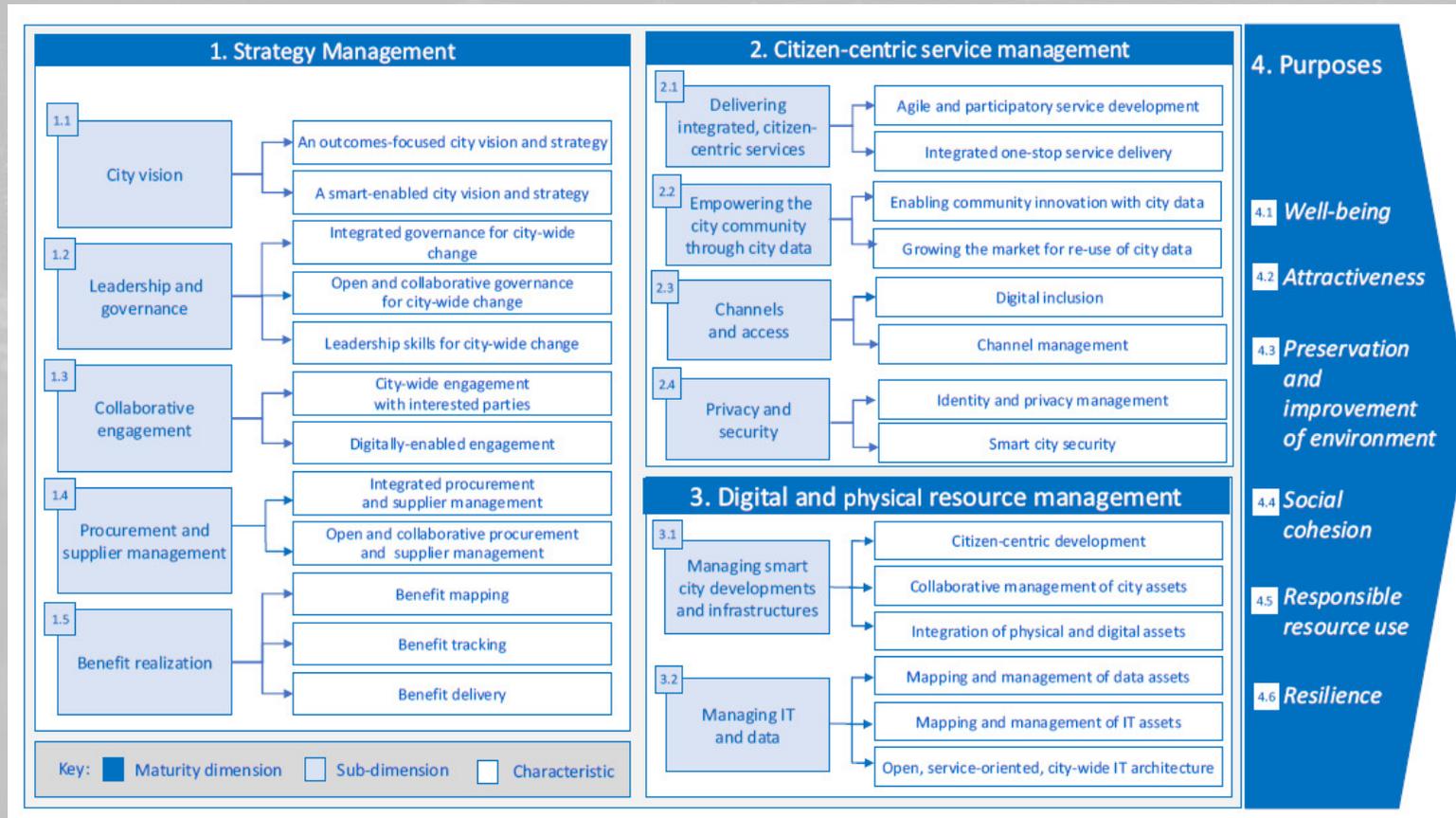
Structure of each indicator

Number	Indicator Name	Description	Method
L1.1.1	Percentage of one-stop government services	Physical convenience evaluation of government services, that all required procedures can be processed at one physical location.	$(\text{number of one-stop government services} / \text{total number of government services}) * 100$
L1.1.2	Percentage of government services which can be solved via single sign in	Online convenience evaluation of government services	$(\text{number of government services which can be accessed via single web portal} / \text{total number of government services}) * 100$
L1.1.3	Implementation of electronic or digital signature	Effectiveness of implementation of electronic/digital signatures	$(\text{number of governmental services or departments using digital signatures} / \text{total number of governmental services in the city}) * 100$

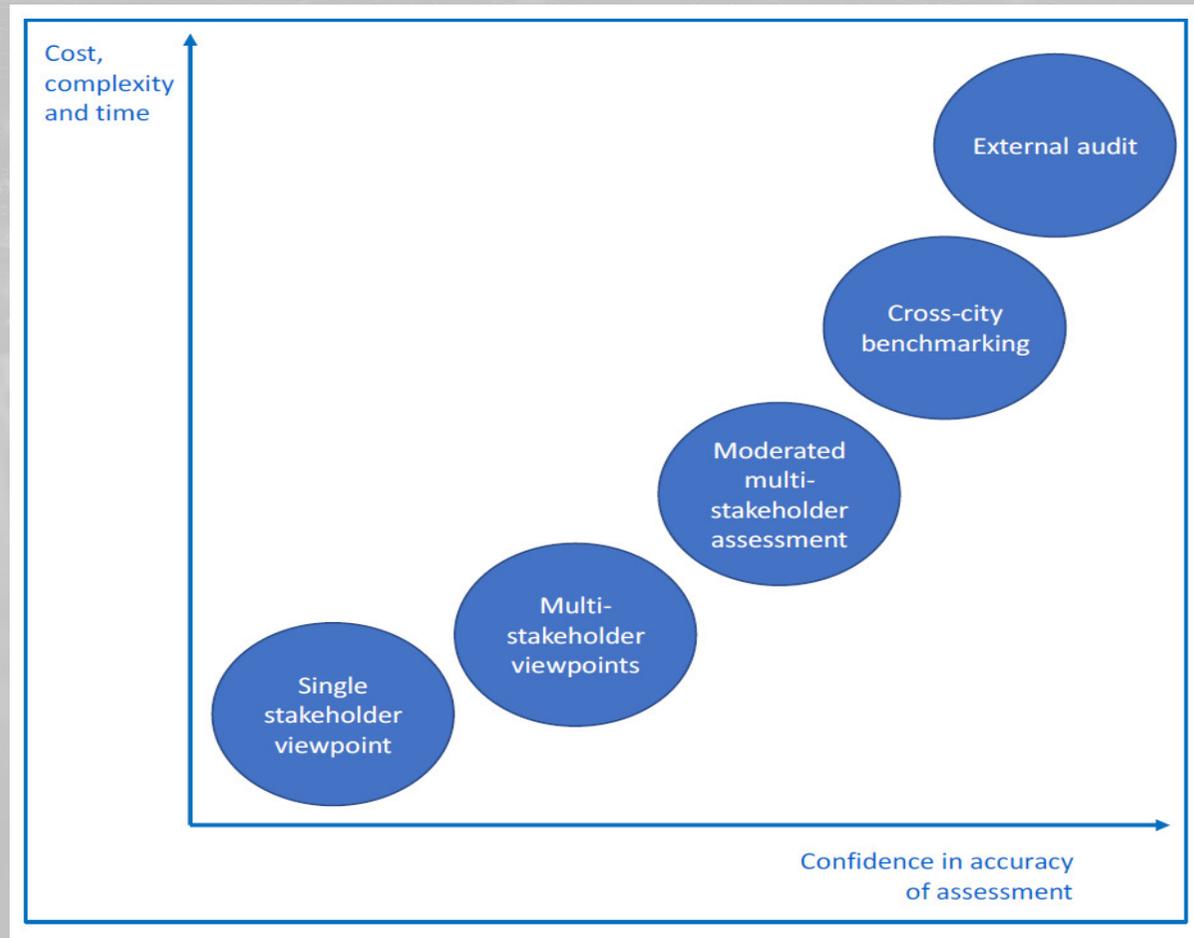
ISO 37107: Maturity model for smart sustainable communities



The 32 Characteristics and 6 purposes



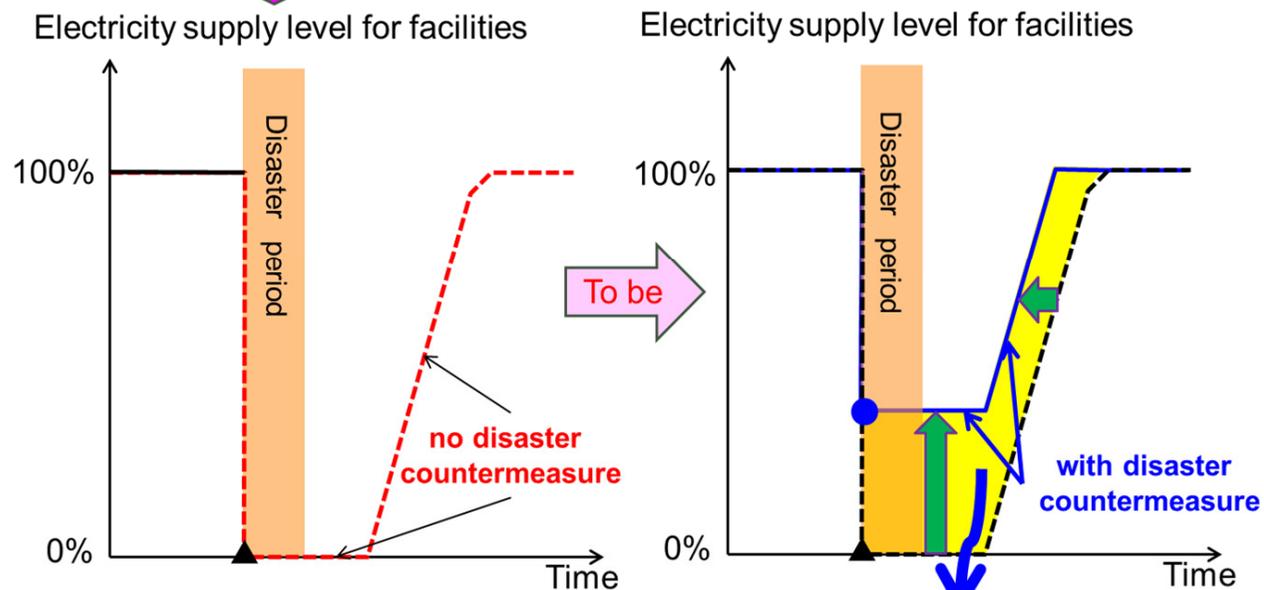
Different ways to use the Maturity Model



Providing Good Practice

IEC 63152 City Service Continuity

Discontinuity of electricity supply due to disaster causes all facilities for city services to stop functioning



Establish ECP and implement ECS

Developing effective plans and systems

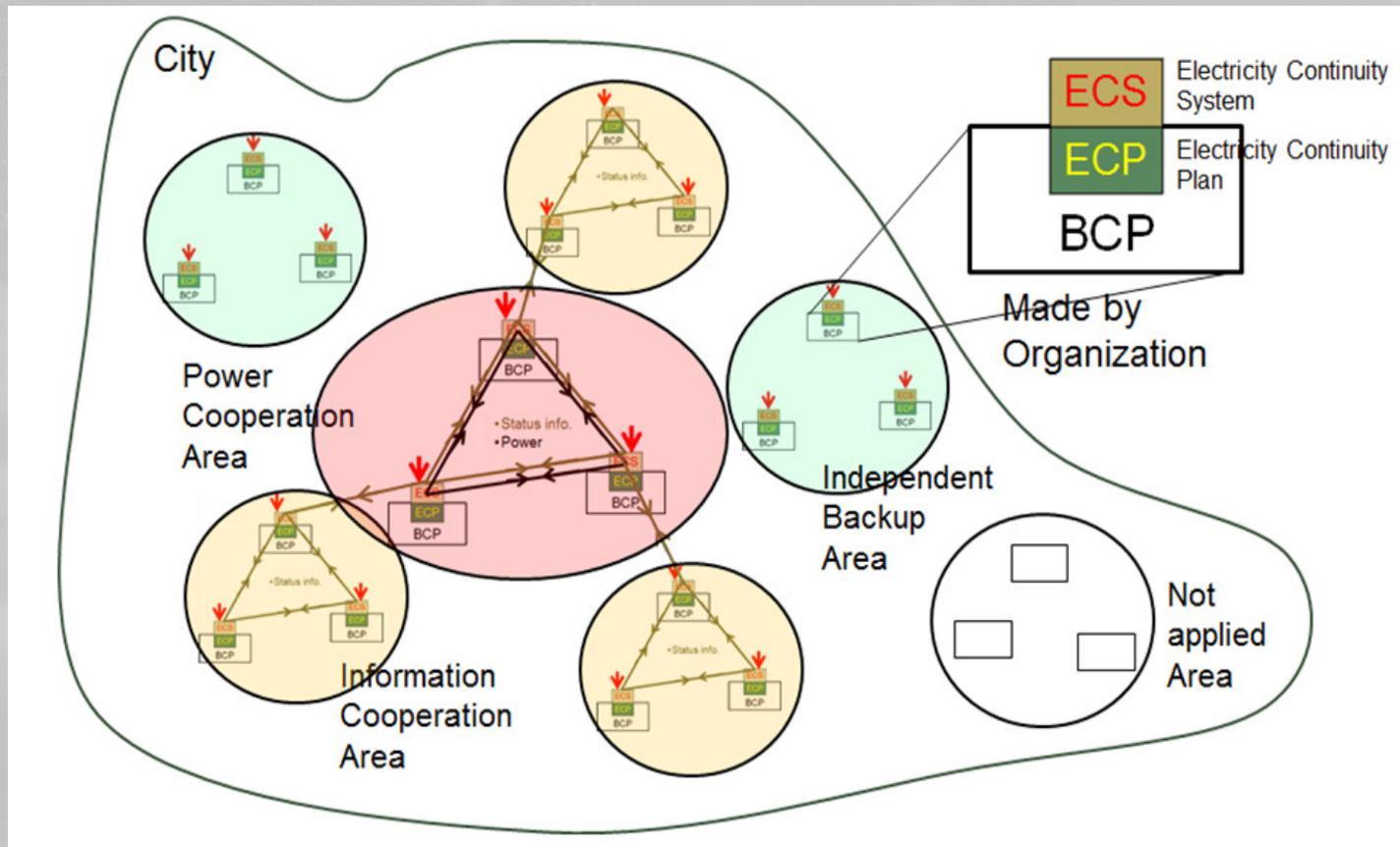
Electricity Continuity Plan (ECP)

plan to address continuity of the electricity supply to maintain city services in a business continuity plan that addresses disruption caused by a critical event.

Electricity Continuity System (ECS)

system required to ensure reliable and effective implementation of functions which are necessary for ECP.

How it might look in a city



Standards package example: City data platform

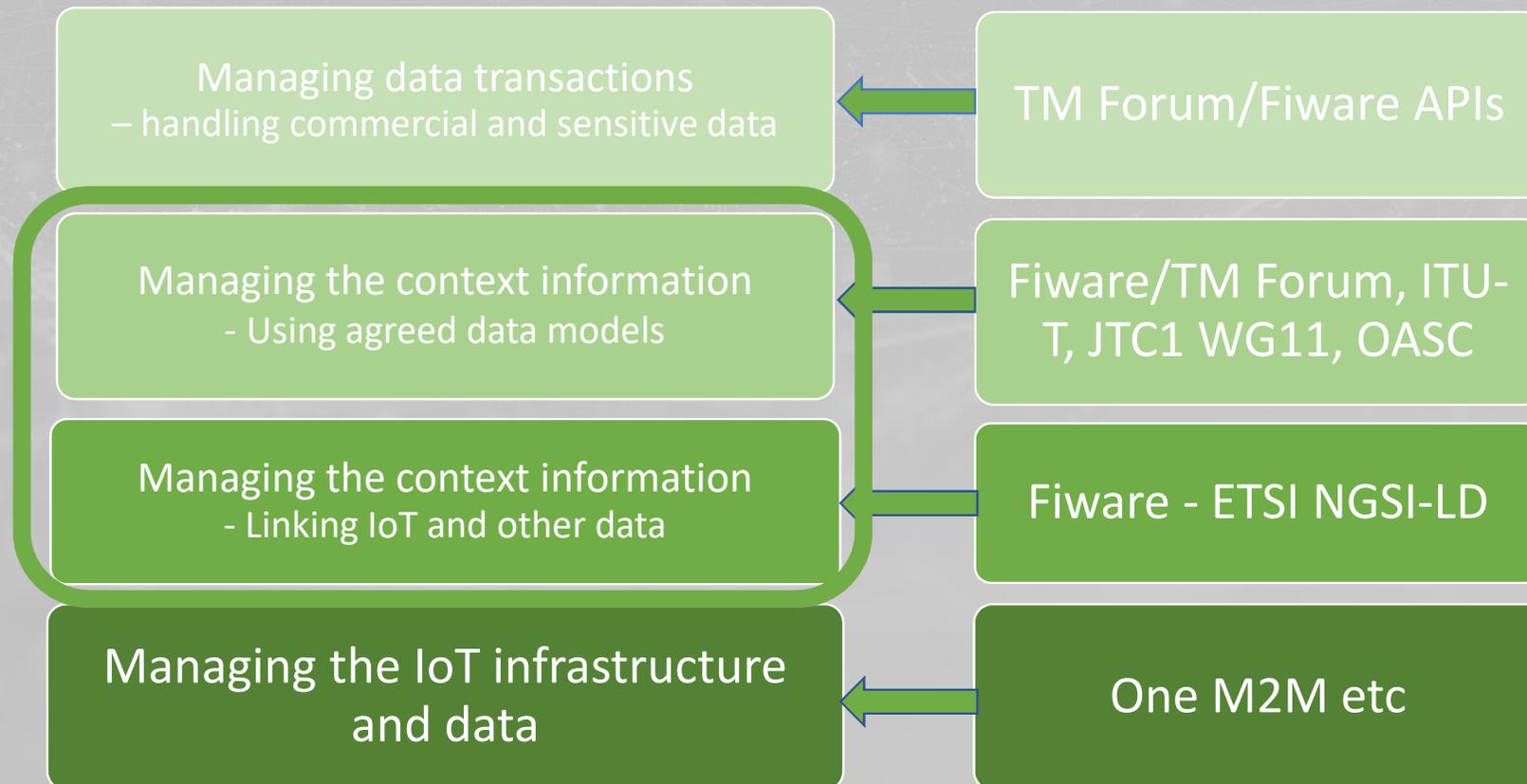
The city data platform brings together agencies that need data about the city with those who can help them get it

It provides a platform for:

- agencies that can provide useful data about the city; and
- agencies that can add value to that data - bringing it closer to being knowledge

And makes it easy for their data / knowledge to be acquired and used appropriately

The role of different SDOs



JTC1 WG11 Facilitation

- JTC1 WG 11 is helping to facilitate consensus on City Data Models
- Held three online workshops to allow various experts to share what they are doing
- Developing a wiki site to help build consensus that can then underpin standards work in individual SDOs

Many other standards needed to manage data

- Cyber security
- Privacy
- Cloud
- Big Data
- Data analytics
- Artificial Intelligence
- Building Information Modeling
-

Smart City Standards – How are they made?

Many types of Standards bodies

- **Industry consortia** – developing open standards that meet industry concerns and **Professional member organisations** – developing standards for their members to use
- **National standards bodies** – recognised by all local and national stakeholders
- **International standards bodies** – recognised by all international stakeholders

Industry and professional member organisations

3GPP

W3C

Fiware

OGC

OASC

IEEE

One
M2M

TM
Forum

National Standards Development Organisations

BSI

DIN

BIS

STAMEQ

INN

ANSI

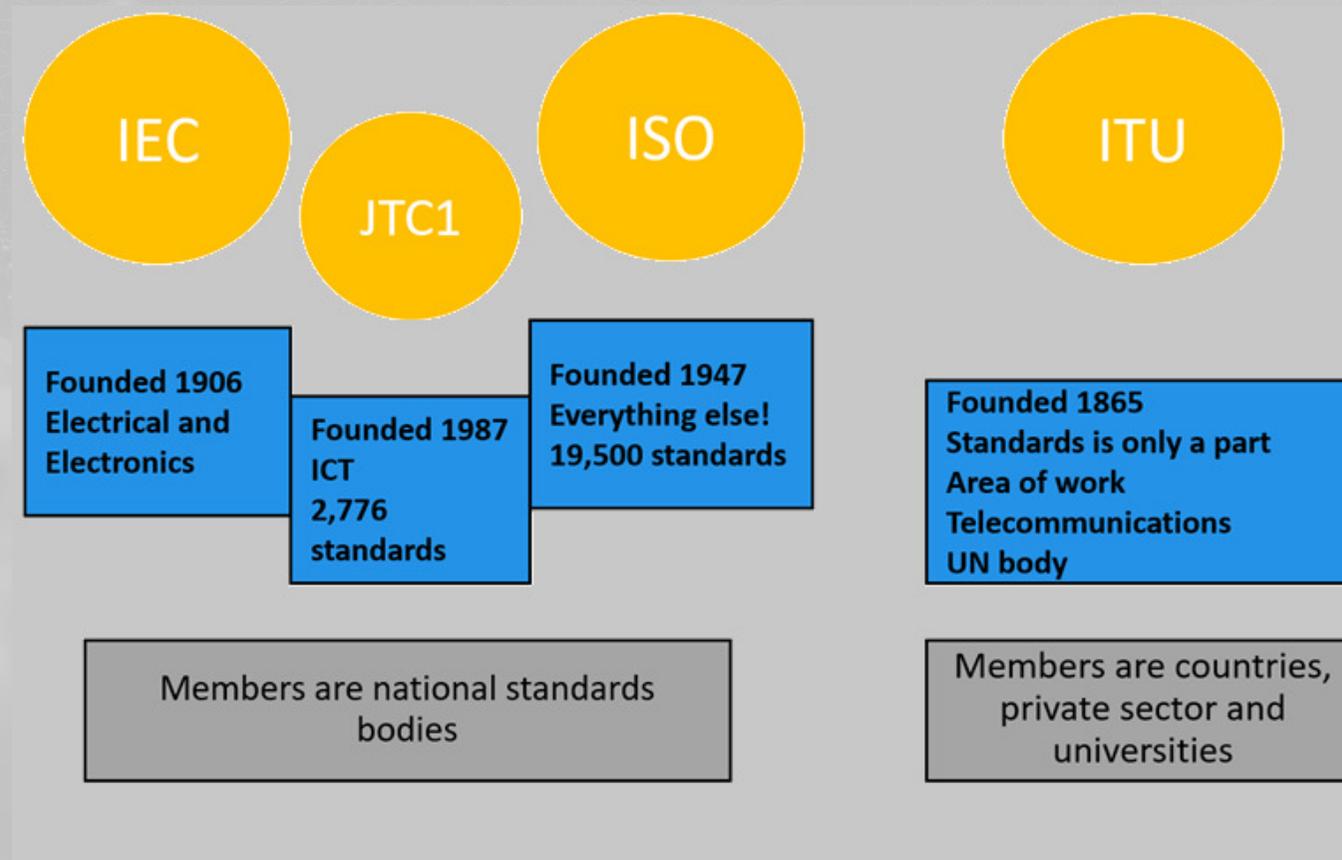
SPRING

Standards
Australia

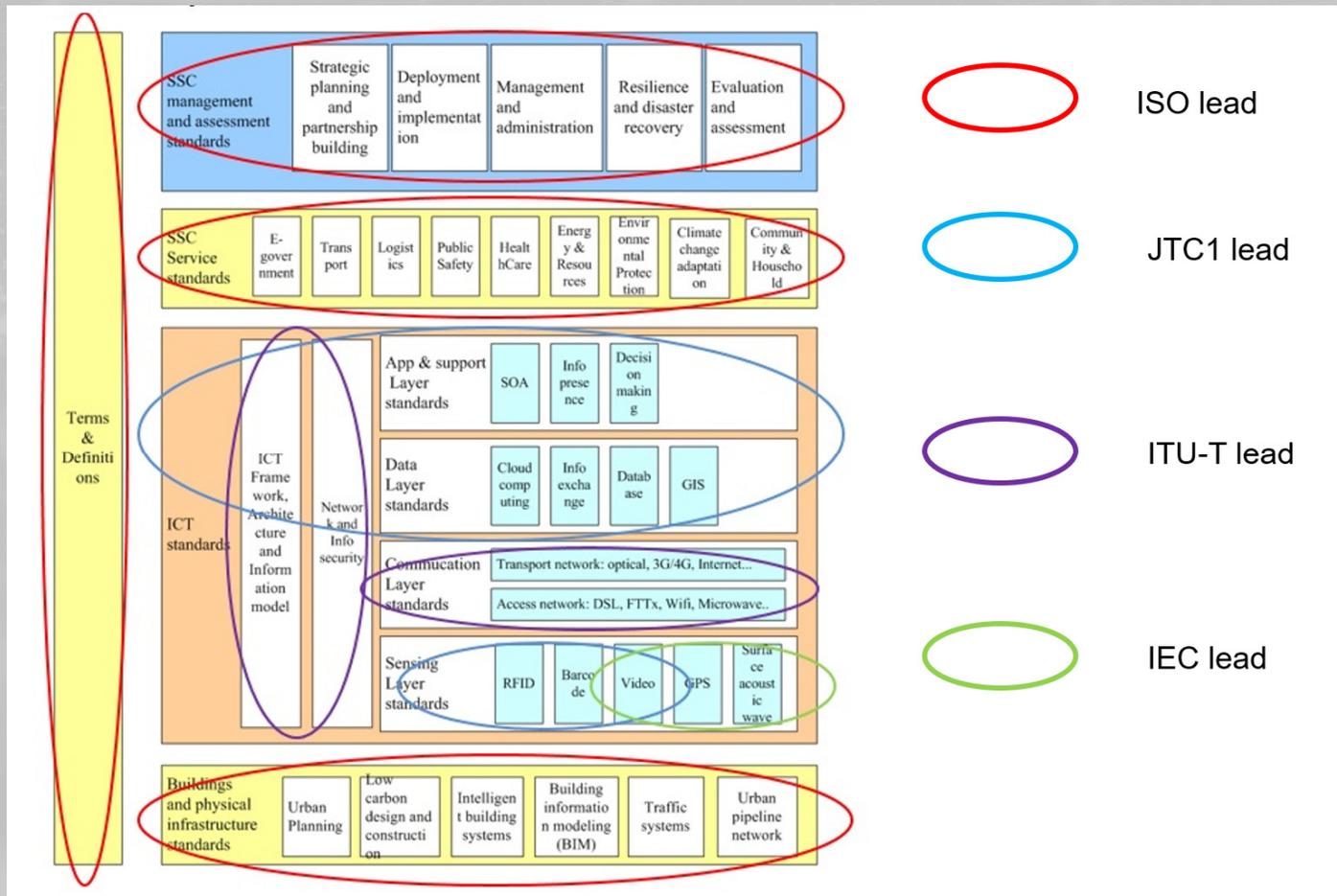
KATS

DGN

International Standards Development Organisations



Potential roles re smart city standards



International standards work on smart cities

- **ISO TC268** is developing standards for sustainable cities and communities and smart community infrastructures
- **IEC** has a Systems Committee on smart cities
- **JTC1** established a Smart Cities Study Group that reported in 2015, and on the basis of that, set up Working Group 11 on Smart Cities
- **ITU-T** established a focus group on smart and sustainable cities, that developed a number of technical reports and then set up Study Group 20: *IoT and its applications including smart cities and communities*

Some other relevant standards work

ISO

- TC 59 *Buildings and civil engineering works*
- TC 204 *Intelligent Transport Systems*
- TC 211 *Geographi information/Geomatics*
- TC 292 *Security and Resilience*

JTC1

- AG 6 *Autonomous and Data Rich Vehicles*
- AG 11 *Digital Twin*
- SC 27 *IT Security Techniques*

- SC 41 *Internet of things and related technologies*
- SC 42 *Artificial Intelligence*

IEC

- TC 124 *Wearable electronic devices and technologies*
- TC 125 *Personal e-Transporters (PeTs)*
- SyC LVDC *Low Voltage Direct Current and Low Voltage Direct Current for Electricity Access*
- SEG 10 *Ethics in Autonomous and Artificial Intelligence Applications*
- SEG 11 *Future Sustainable Transportation*

Industrial Consortia and International SDOs

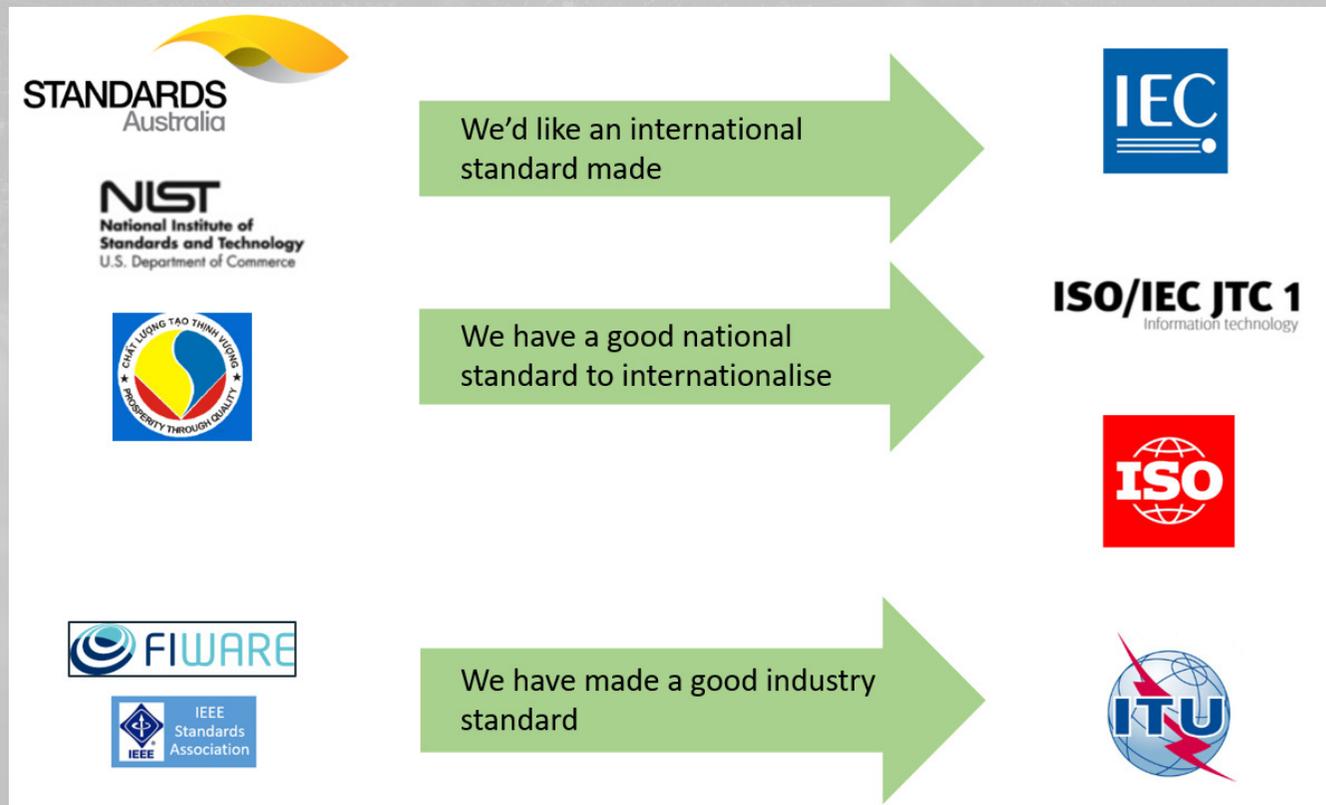
Industrial Consortia

- Quick and easy to develop
- Quick and easy to test
- Opportunity to learn what is useful
- Credible only for Consortia members

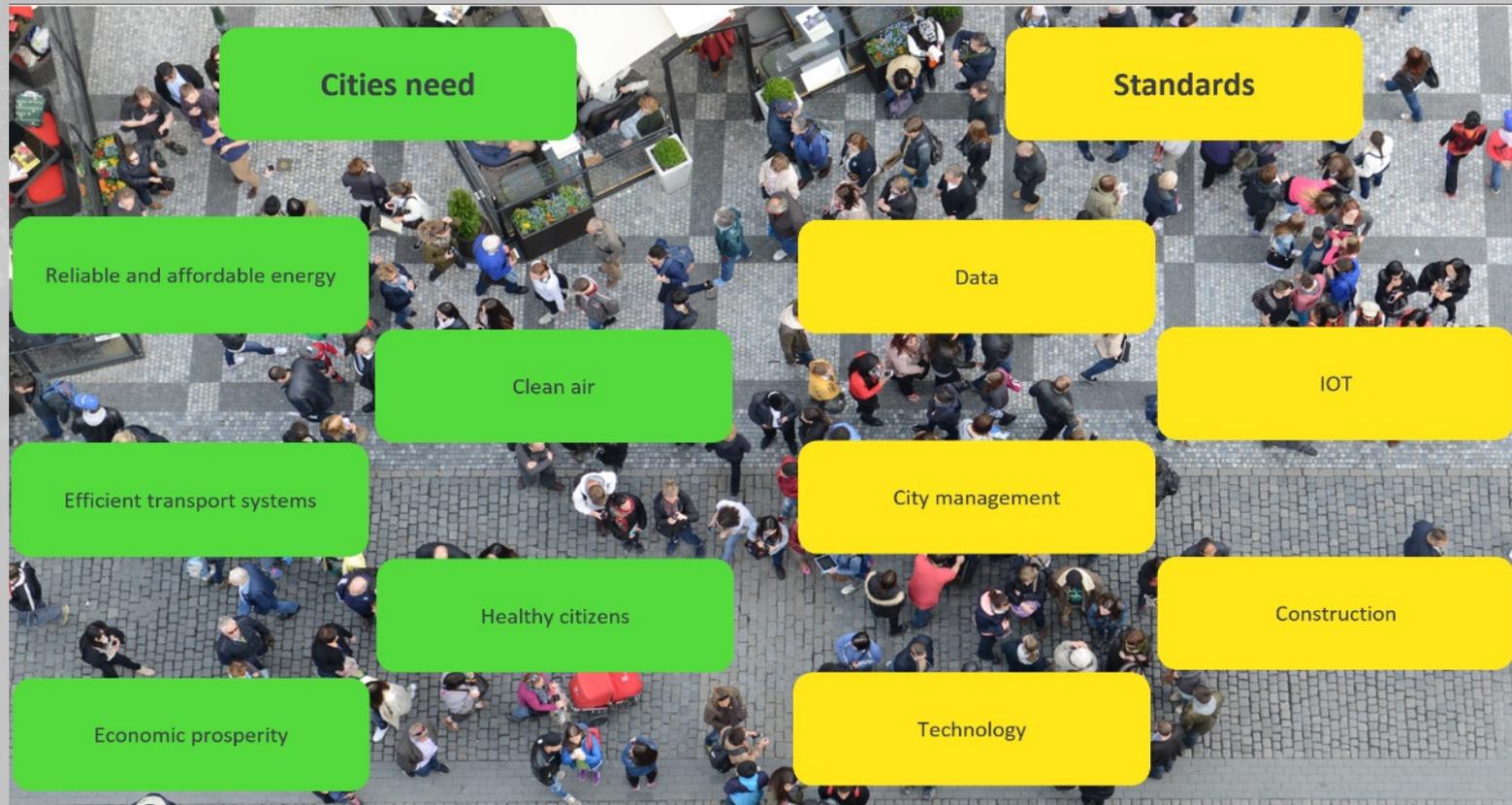
International SDOs

- Slow and careful (painful?)
- Transparent
- Involves all parties
- Builds consensus
- Credible with all players

How international standards are made



How to find the standards you need



SYNCHRONICITY

Standards Library

Initial Basic Design

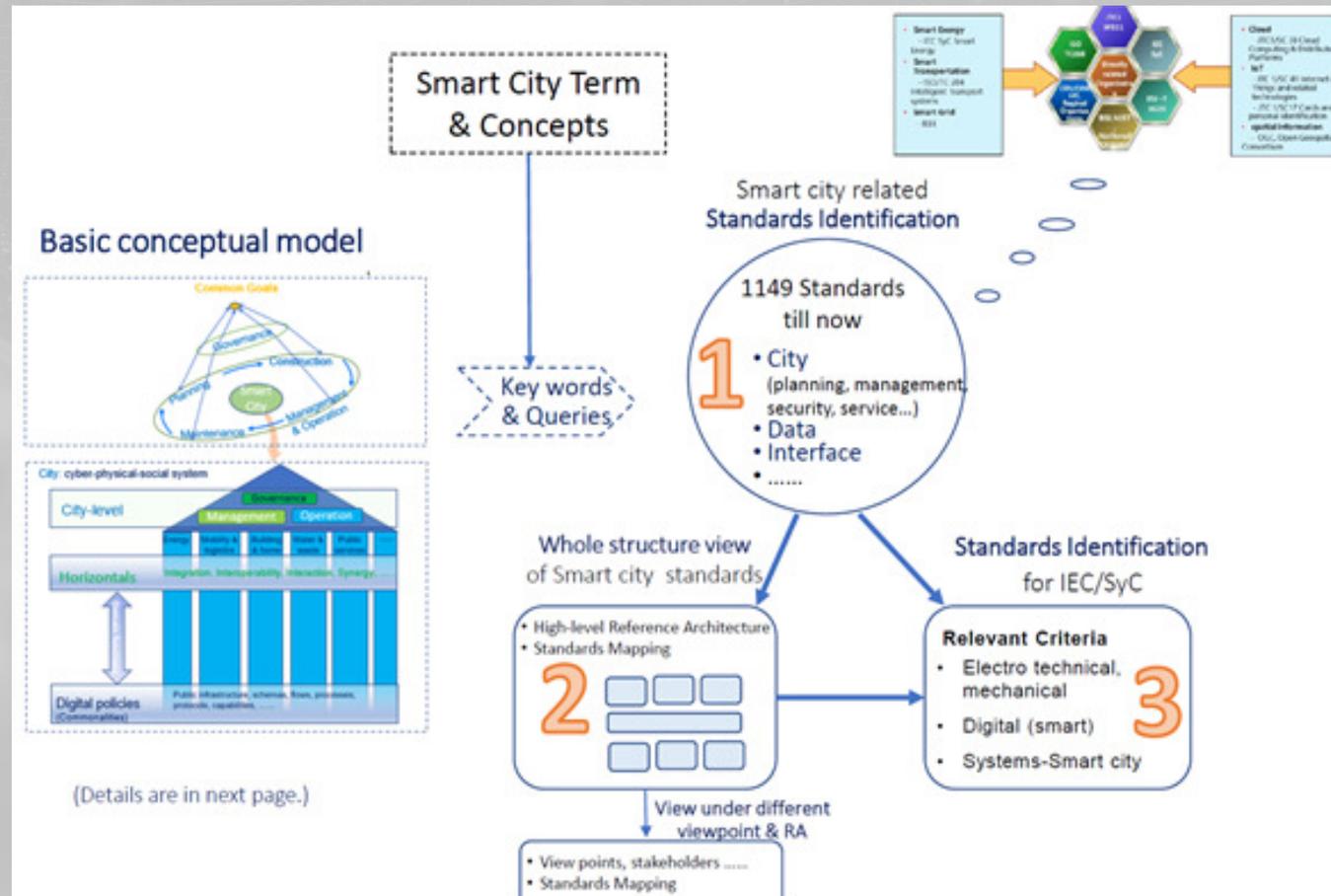
Standards Categories – horizontal sectors

Smart City Governance	Data Management & AI	Citizen Centric Services	Smart City ICT	Internet of Things	MIMs
Guidance	Data Governance	Inclusivity & Accessibility	Reference Architecture	Guidance	Data Models
Use Cases	Big Data Guidance	Human Factors	Platforms	Use Cases	Context Information Management
Reference Architecture	Big Data Terminology	Citizen Engagement	Applications	Reference Architecture	Marketplace
Terminology	Big Data Reference Architecture	Other	Interoperability	Terminology	Storage
Strategy	Big Data Use Cases		Service Oriented Architectures	Ontology	Security
Management systems	AI Guidance		Indicators	Interoperability General	Other
Sustainable Development	AI Terminology		Cloud	Interoperability Frameworks	
Resilience	AI Reference Architecture		Other	M2M	
Procurement	AI Use cases			Discovery	
Project Management	AI Governance			APIs	
Privacy	AI Trustworthiness			Data Models	
Security	AI Ethics			Devices	
Evaluation	Analytics			Applications	
Indicators	Other			Sensors	
Other				Security	
				Privacy	
				IoT Management	
				Edge	
				Cloud	
				Other	

Standards categories – vertical sectors

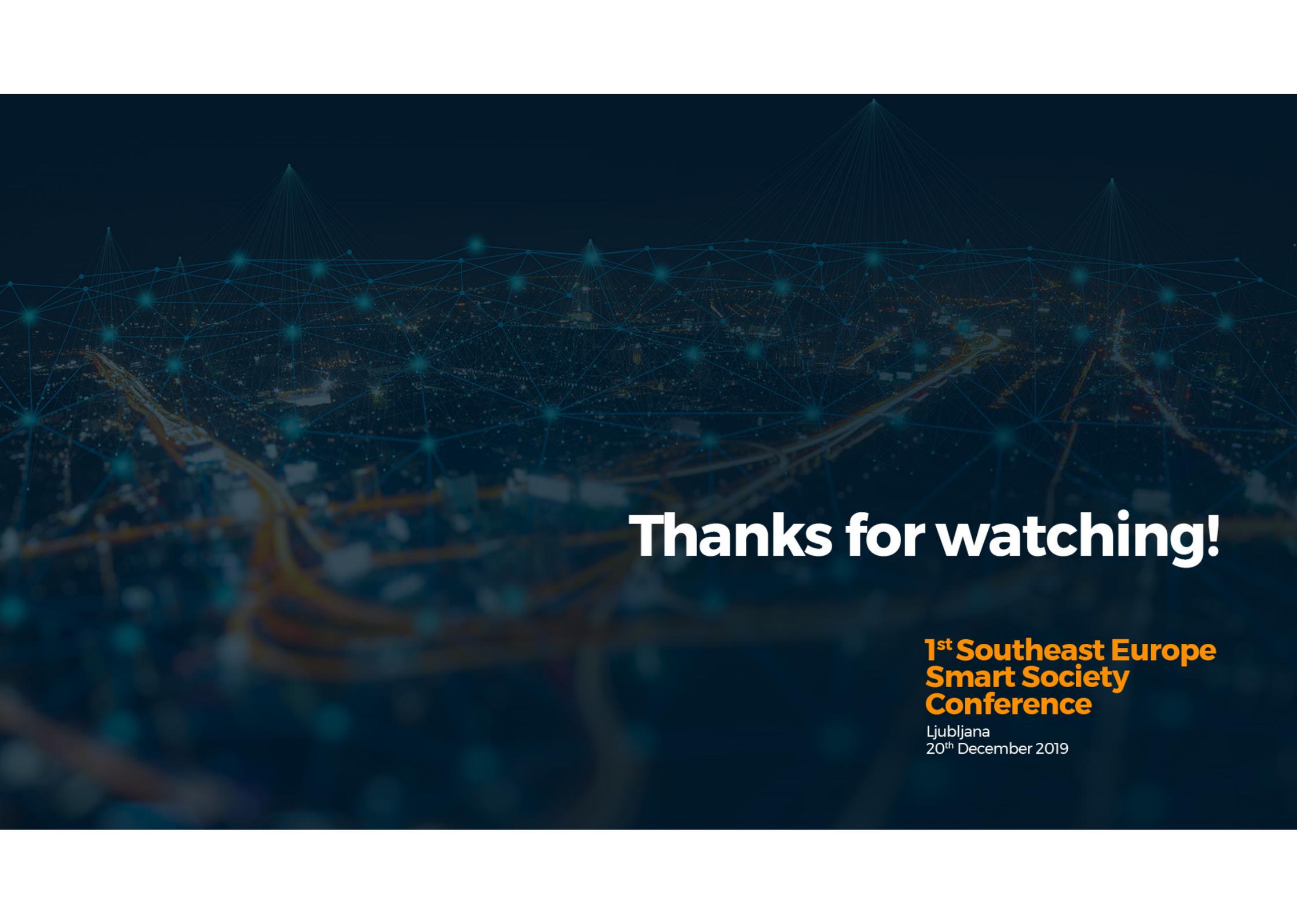
Environment	Mobility	Utilities	Buildings	Health	Public Realm
Air Quality	EV Charging Infrastructure	Energy production	Terminology	Applications	Street Lighting
Noise	EV Data Communication	Energy management	Sustainability	Devices	Street Furniture
Light	Parking	Energy distribution	Connectivity	Data Management	CCTV
Temperature	Traffic Management	Energy transmission	Building Management Systems	Device management	Totems
Waste	Mobility Data	Energy data	Information Management	Platforms	Advertising
Biodiversity	Micro Mobility	Energy metering	Health	Wearables	Wayfinding
Water consumption	Mobility As A Service	Water Management	Energy	Other	Other
Pollution	Intelligent Transport Systems	Water distribution	Water		
Flooding	Rail	Water data	Air Quality		
Carbon	Buses	Water metering	Waste		
Other	Drones	Telecommunications	Materials		
	Logistics	5 G	Accessibility		
	Active Travel	Other mobile and cellular	Security		
	Other	LoRa	Other		
		LPWAN			
		WiFi			
		Mesh Protocols			
		Other			
		Waste Management			
		Other			

IEC Smart City Standards mapping



Overall Recommendations

1. Use standards wherever possible
2. No one standards body has all the answers – so review the work of all credible standards bodies
3. In all tenders, specify the use of non-proprietary systems and open and interoperable interfaces – and require vendors to refer to the standards they will use

The background of the slide is a dark blue aerial night view of a city, likely Ljubljana, with its lights visible. Overlaid on this is a complex network of glowing blue lines and dots, representing a smart city or data network. The lines connect various points across the city, creating a web-like structure.

Thanks for watching!

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