INTERNATIONAL STANDARDS FOR SMARTER & MORE SUSTAINABLE CITIES

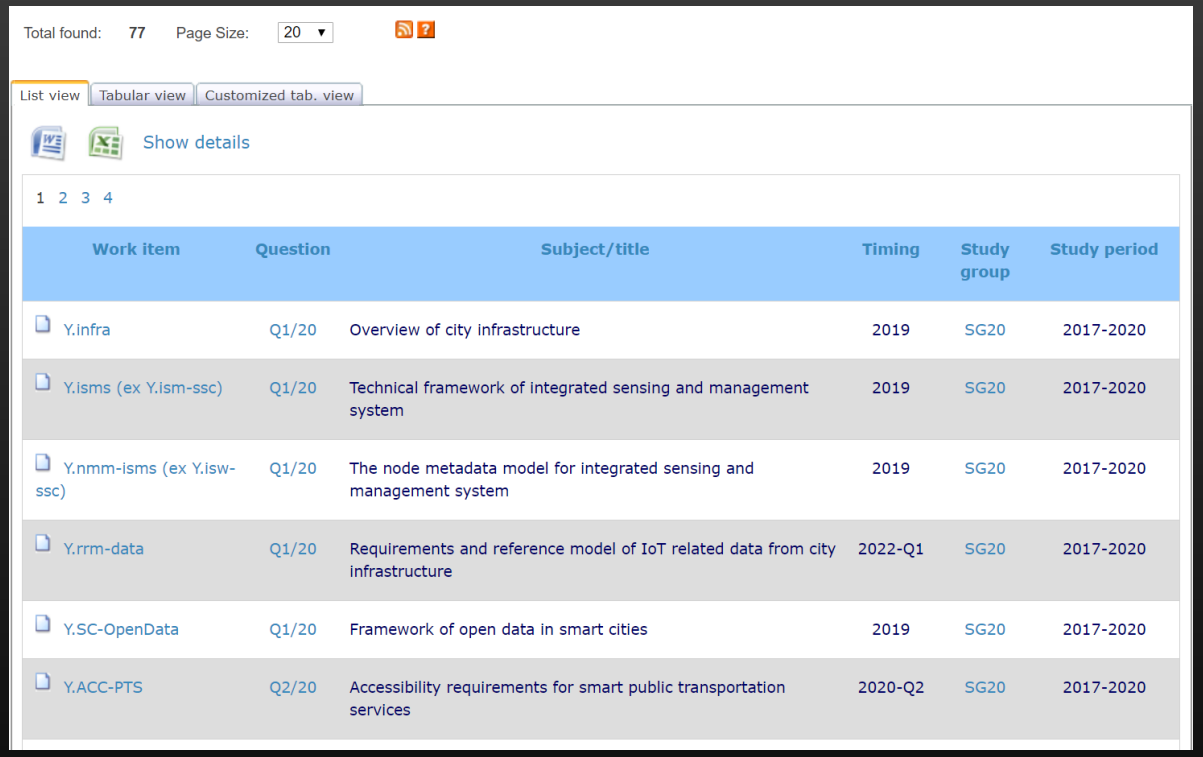
Dr. Okan Geray, Smart Dubai Office, UAE, U4SSC Management Team, ITU SG20 Rapporteur

WHY STANDARDS

- Commonly agreed unified documents
- Expedites implementations and decisions (efficiency in innovation)
- Anticipates requirements
- Facilitates participation and incorporates diverse perspectives
- Formulation of standards enables knowledge exchange
- Enables interoperability
- Cost reduction

ITU SG20

Under Study – 77 Work Items



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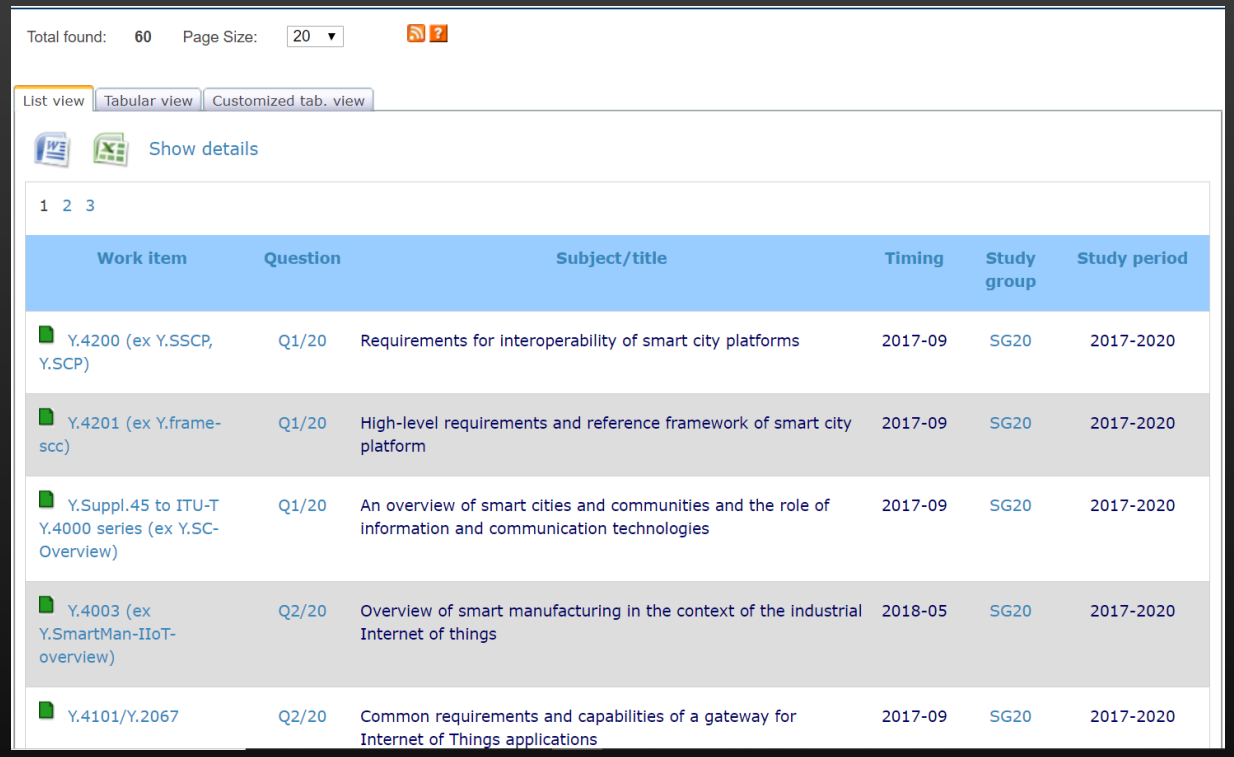
Work item	Question	Subject/title	Timing	Study group	Study period
Y.infra	Q1/20	Overview of city infrastructure	2019	SG20	2017-2020
Y.isms (ex Y.ism-ssc)	Q1/20	Technical framework of integrated sensing and management system	2019	SG20	2017-2020
Y.nmm-isms (ex Y.isw-ssc)	Q1/20	The node metadata model for integrated sensing and management system	2019	SG20	2017-2020
Y.rrm-data	Q1/20	Requirements and reference model of IoT related data from city infrastructure	2022-Q1	SG20	2017-2020
Y.SC-OpenData	Q1/20	Framework of open data in smart cities	2019	SG20	2017-2020
Y.ACC-PTS	Q2/20	Accessibility requirements for smart public transportation services	2020-Q2	SG20	2017-2020

Approved – 60 Recommendations



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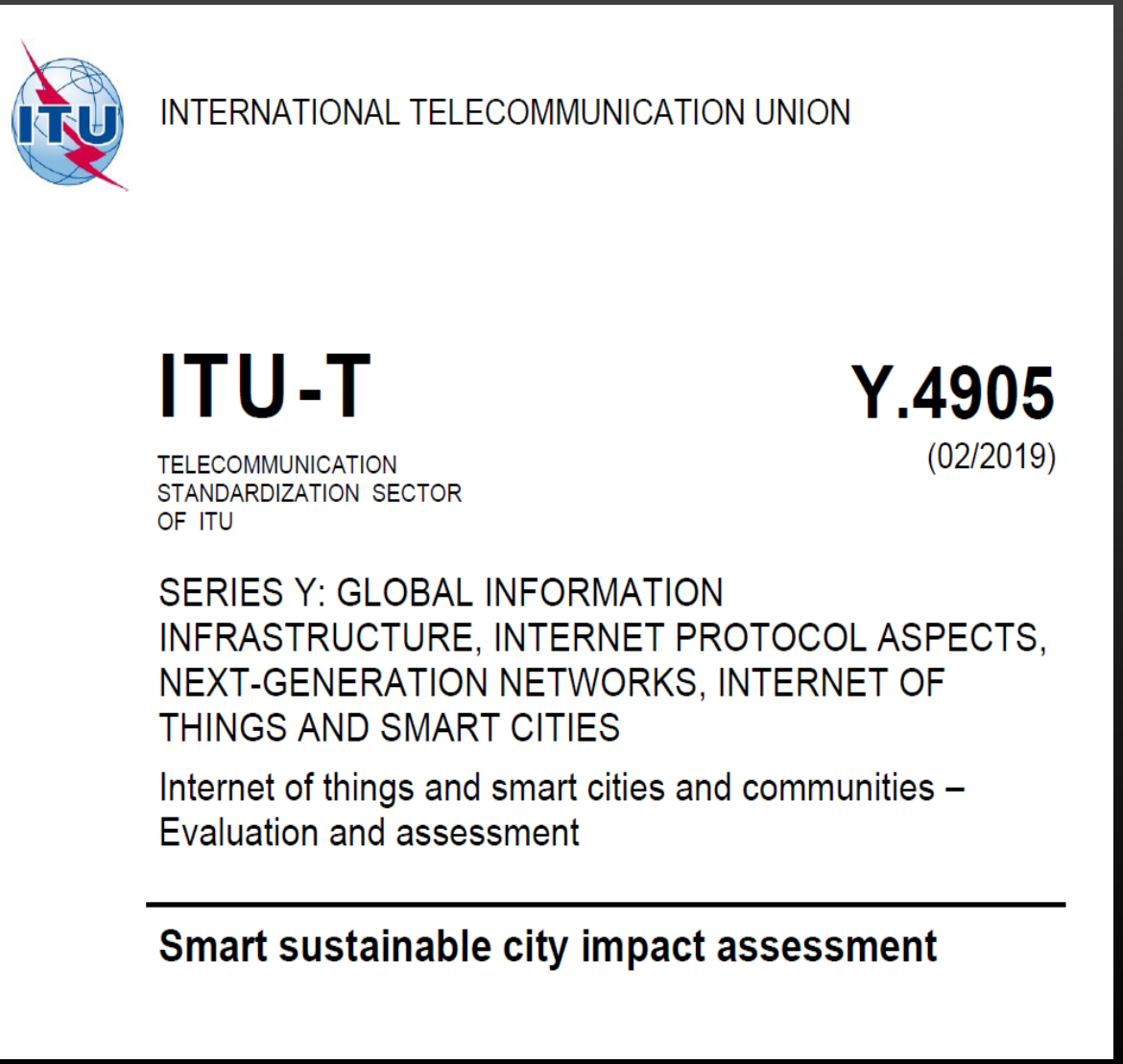
Work item	Question	Subject/title	Timing	Study group	Study period
Y.4200 (ex Y.SSCP, Y.SCP)	Q1/20	Requirements for interoperability of smart city platforms	2017-09	SG20	2017-2020
Y.4201 (ex Y.frame-scc)	Q1/20	High-level requirements and reference framework of smart city platform	2017-09	SG20	2017-2020
Y.Suppl.45 to ITU-T Y.4000 series (ex Y.SC-Overview)	Q1/20	An overview of smart cities and communities and the role of information and communication technologies	2017-09	SG20	2017-2020
Y.4003 (ex Y.SmartMan-IIoT-overview)	Q2/20	Overview of smart manufacturing in the context of the industrial Internet of things	2018-05	SG20	2017-2020
Y.4101/Y.2067	Q2/20	Common requirements and capabilities of a gateway for Internet of Things applications	2017-09	SG20	2017-2020

Source: ITU SG20 Website

ITU SG20 Q7 - EVALUATION AND ASSESSMENT OF SMART SUSTAINABLE CITIES AND COMMUNITIES

Work item	Question	Subject/title	Timing	Study group	Study period
Y.4903rev	Q7/20	Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals	2019-Q4	SG20	2017-2020
Y.4904 (ex Y.SSC-MM)	Q7/20	Smart sustainable cities maturity model	2018-12	SG20	2017-2020
Y.4905 (ex Y.SSC-IA)	Q7/20	Smart sustainable city impact assessment	2018-12	SG20	2017-2020
Y.4906 (ex Y.AFDTS)	Q7/20	Assessment framework for digital transformation of sectors in smart cities	2019-04	SG20	2017-2020
Y.IoT-EH-PFE	Q7/20	Performance evaluation frameworks of e-health systems in the IoT	2019-Q4	SG20	2017-2020
Y.SSC-BKDMS-arc	Q7/20	Reference architecture of blockchain-based unified KPI data management for smart sustainable cities	2020-Q4	SG20	2017-2020
Y.Stra-SSC	Q7/20	Standards mapping assessment for smart sustainable city (SSC) strategy"	2020-Q4	SG20	2017-2020
Y.Sup.digi-inc	Q7/20	Guidelines for digital inclusion in the development of digital urban technology and smart cities	2020-Q4	SG20	2017-2020



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

Y.4905

(02/2019)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

Internet of things and smart cities and communities – Evaluation and assessment

Smart sustainable city impact assessment

Source: ITU SG20 Website

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

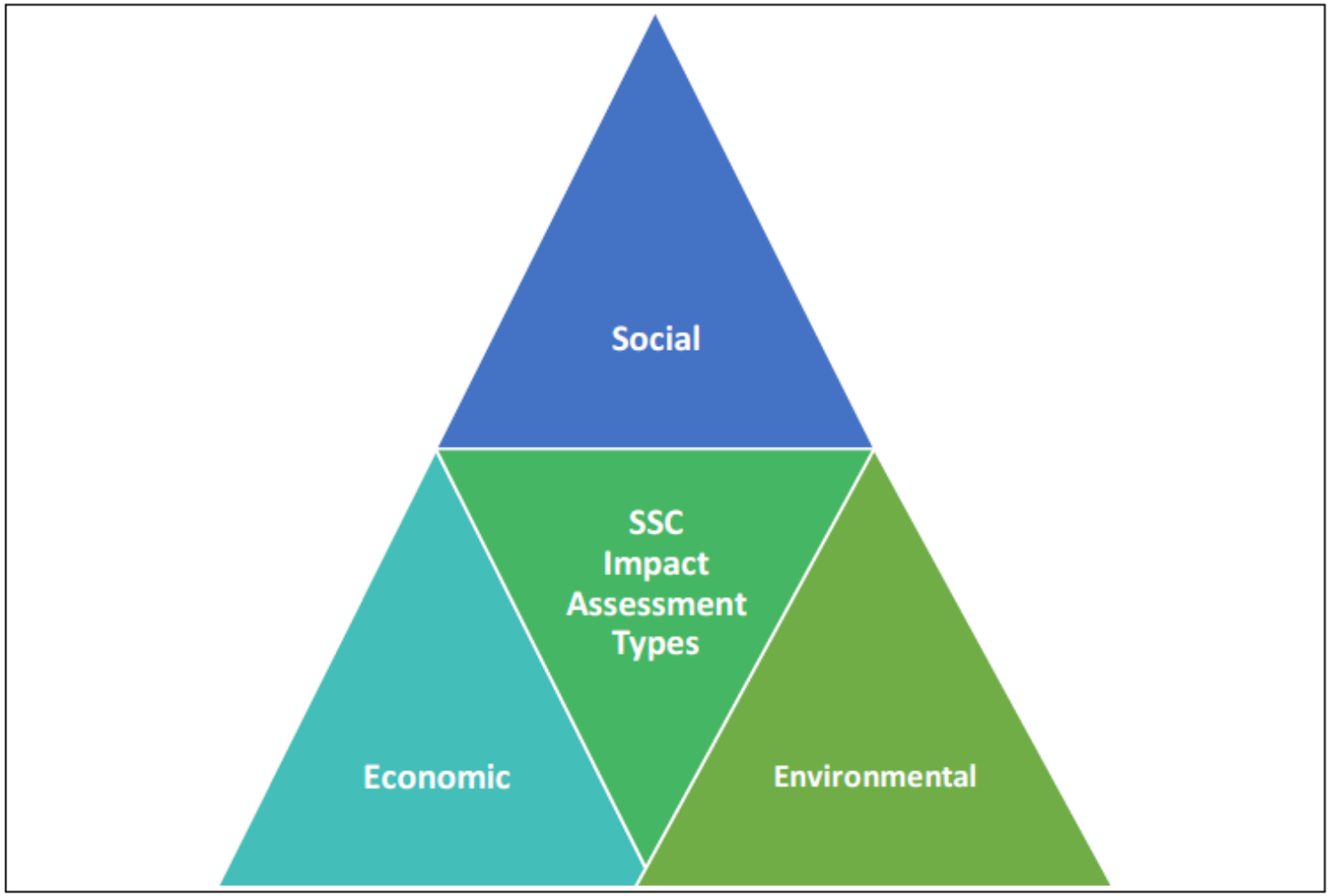


Figure 1 – Smart Sustainable City Impact Assessment Types

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

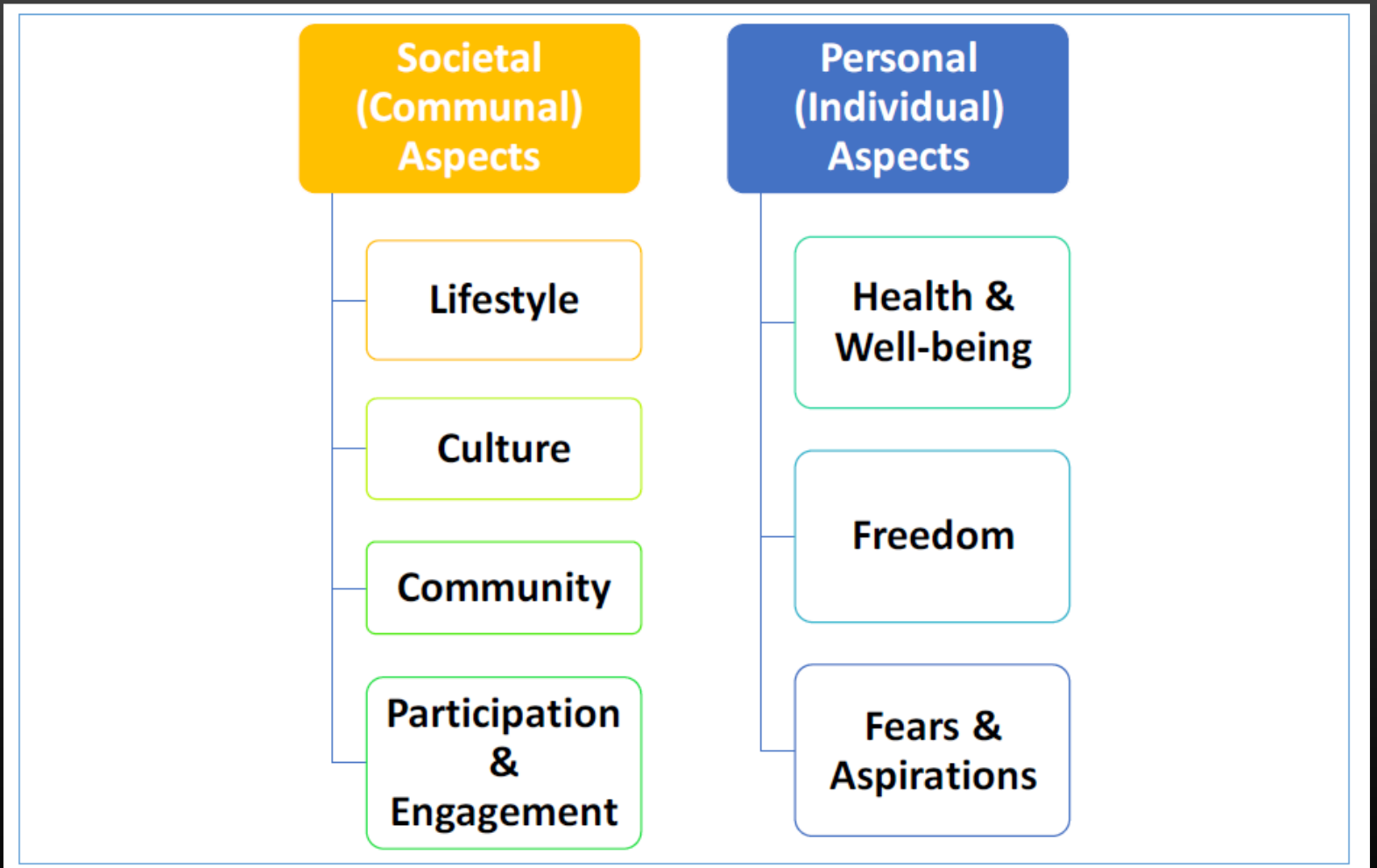


Figure 2 – Potential Social Impact Areas

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

Economic Impact

Cities are recommended to use financial and economic data as part of the economic impact assessment to estimate one or more of the following potential economic impact measures:

- business or economic output,
- value added or city GDP,
- wages and salaries,
- jobs and labor force, and
- tax revenues among others.

- **Leontief Input Output Model**
- **Top down Econometric Model**

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

Environmental Impact

Clauses 7.3.1 to 7.3.5 deliberate potential environmental impact areas resulting from SSC strategic action items. Five main potential environmental impact areas have been identified in this Recommendation; namely:

- Water
- Energy
- Waste
- GHG emissions, and
- Others.

- **IoT and smart city solutions**
- **Adverse impacts**

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

Scoping Boundaries for Impact Assessment

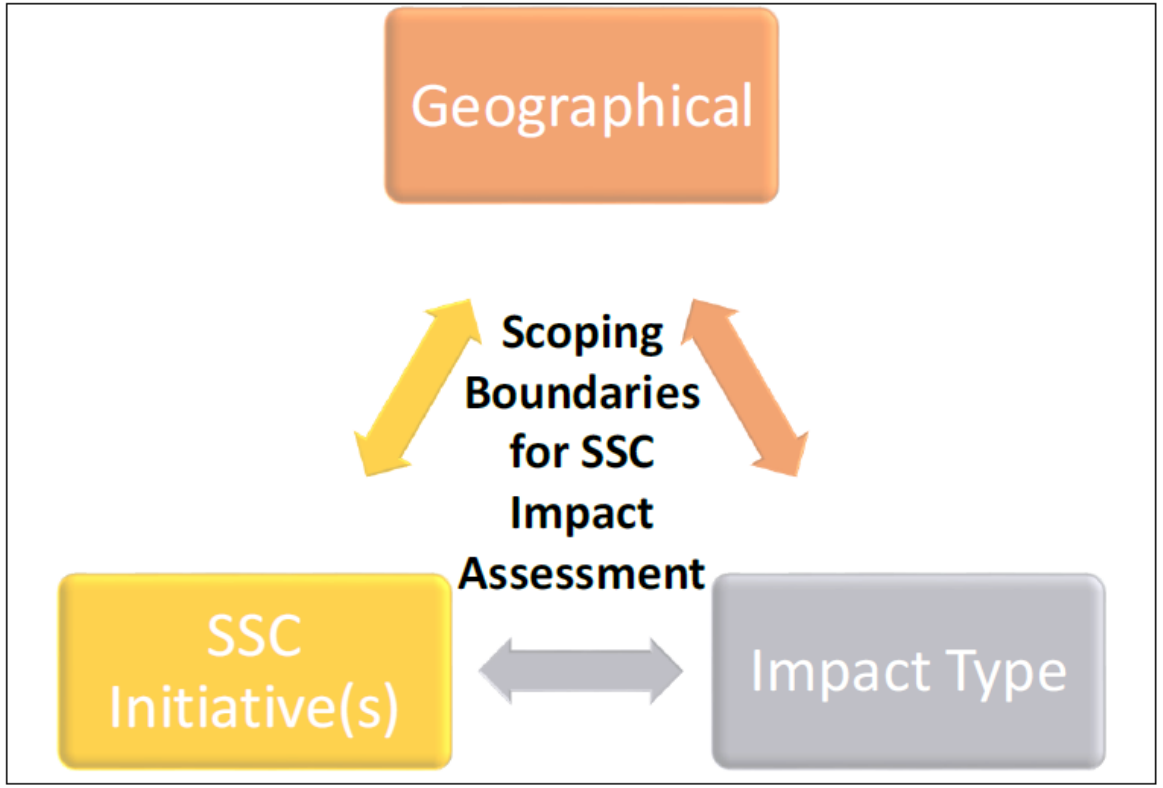


Figure 4 – Scoping Boundary Types for SSC Impact Assessment

Y.4905 SMART SUSTAINABLE CITY IMPACT ASSESSMENT

Impact Evaluation and Mitigation

The purpose of mitigation measures is to avoid, accept, reduce or minimize adverse and unwanted potential impacts while maintaining and enhancing positive and beneficial potential impacts. Cities should determine one of the following mitigation measures:

i. ***Accept potential impacts:*** Cities can accept and assume the potential impacts identified during the assessment process and implement the SSC initiative(s) identified during the SSC initiative(s) boundary step.

ii. ***Reduce adverse impacts where feasible***: Alternatively, cities can in some cases reduce the adverse potential impacts identified during the assessment process. For example, concerns of people or society in particular cases may be addressed through better communication and explanation of benefits. Similarly, policy and regulatory tools can be used to address certain concerns. Particular elements of the SSC initiative(s) may be eliminated, rectified, redesigned, relocated, etc. to address adverse potential impacts and to develop enhanced alternatives, if deemed feasible and applicable.

iii. ***Monitor impacts:*** Cities can accept but also monitor potential impacts during the implementation of SSC initiative(s) to ensure they materialize as predicted during the assessment process. Unforeseen impacts might require interventions and corrective actions to ensure adverse impacts remain within acceptable levels.

iv. ***Avoid impacts:*** Cities can in rare circumstances decide not to implement the SSC initiative(s) as a result of the potential impacts. Adverse impacts identified during the impact assessment may impede cities to undertake the SSC initiative(s) as defined part of SSC initiative(s) boundary.

Y.4904 SMART SUSTAINABLE CITIES MATURITY MODEL

The objectives of SSC-MM include:

- Describe general smart sustainable city goals, recognizing that these will vary from city to city.
- Assess the current situation in developing SSCs.
- Assist in formulating a development strategy and outline the necessary milestones.
- Learn the challenges and global best practices in developing SSCs.
- Help cities to do self- evaluation and enable them to share the results with other cities.

Y.4904 SMART SUSTAINABLE CITIES MATURITY MODEL

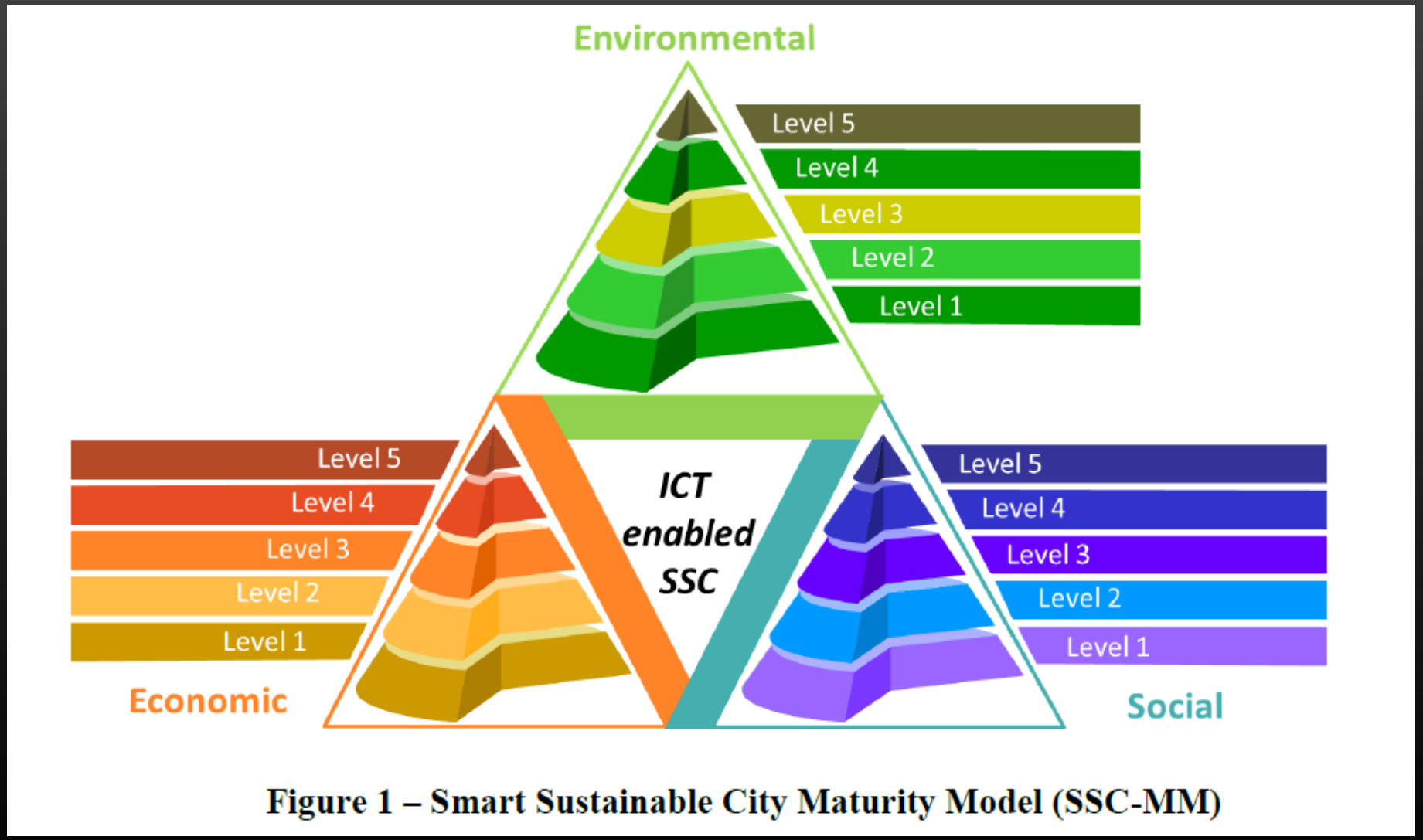


Figure 1 – Smart Sustainable City Maturity Model (SSC-MM)

Y.4904 SMART SUSTAINABLE CITIES MATURITY MODEL

Table 1 – Recommended achievements for each maturity level

	Strategy	Infrastructure	Data	Services and applications	Assessment	KPIs performance
Maturity Level 1	The overall strategy is developed	Key ICT infrastructures are identified in the strategy	Key aspects on data are identified in the strategy.	Strategy and priorities for services and applications on city level are identified.	Assessment plan is ready.	Long term targets for KPIs are set in city SSC strategy and baseline values for KPIs are collected.
Maturity Level 2	SSC initiatives are aligned with the strategy	ICT Infrastructures are operated independently	Ontology and methodology to identify, capture, organize and utilise data are agreed	Domain services and applications are operated by particular systems.	Self-assessment on ICT infrastructure development and services are carried out	Interim KPI targets for maturity level 2 are achieved.
Maturity Level 3	Evaluation on SSC initiatives is carried out	Accessibility of ICT infrastructures is improved	Data is properly stored, processed and managed in systems and platforms.	Services and applications are delivered to the public. Application and service operation is monitored and analysed to improve service performance and quality.	User satisfaction assessments are carried out.	Interim KPI targets for maturity level 3 are achieved.
Maturity Level 4	Strategy is developed on improving integration and cooperation	Cross-domain ICT infrastructures are provided with interoperability capabilities	Open data is accessible to the public	Cross-domain services and applications are available to the public	Stakeholders' satisfaction assessments are carried out	Interim KPI targets for maturity level 4 are achieved.
Maturity Level 5	Improvement and optimization potential is explored	Continual developments on infrastructure are carried out	Improvements on data sharing, utilization and exchange, etc. are made	Continuous improvements of services and applications are made by applying advanced state of the art technologies	Systematic assessment process is established with corresponding actions.	Long term targets for KPIs are achieved.

Y.4904 SMART SUSTAINABLE CITIES MATURITY MODEL

Annex A

Sample template for performance matrix to set the target values of KPIs

(This annex forms an integral part of this Recommendation.)

Table A.1 – Sample template for performance matrix of SSC-MM in economic dimension

Dimension	Topic	KPIs	Current KPI value for maturity level 1	Interim target KPI value for maturity level 2	Interim target KPI value for maturity level 3	Interim Target KPI value for maturity level 4	Long-term target KPI value for maturity level 5
Economic	ICT infrastructure	KPI 1	Current value	Interim target value	Interim target value	Interim target value	Target value
		KPI 2					
		…					
	Innovation	KPI 1					
		KPI 2					
		…					
	Employment	KPI 1					
		KPI 2					
		…					
	Trade	KPI 1					
		KPI 2					
		…					
	Productivity	KPI 1					
		KPI 2					
		…					
		KPI 1					

THANK YOU