

WELCOME!

INCOSE Enchantment Chapter Monthly Meeting



We're glad you're here.

We respectfully request:



ComputerHope.com

- Mute your audio when you are not speaking
- *6 toggle or in GlobalMeet left-side, your name

Discussion and questions are encouraged!

Put questions in the chat box or unmute yourself to speak up.



Meeting Materials

Slide presentations can be downloaded prior to start of the meeting from the Meeting Materials page of our website:

<https://www.incose.org/incose-member-resources/chapters-groups/ChapterSites/enchantment/resources/meeting-materials>

If recording is authorized by speaker, the video will be posted at the link above within 24 hours.



SEP Training

CSEP Courses by *Certification Training International*:

CTI currently is offering online course offerings, see

<https://certificationtraining-int.com/incose-sep-exam-prep-course/>

Our chapter has two SEP mentors:

Ann Hodges alhodge@sandia.gov

Heidi Hahn drsquirt@outlook.com



Upcoming meetings

- December 8, 2021: Zane Scott – “Soft Yet Crucial Skills for SEs: Conflict Management, Persuasion and Negotiation”
- January 12, 2022: David Long – “6 Vs and 3 Ts”

Introductions

- Please type your name, position, and organization in the Chat window





Survey

The link for the online survey for this meeting is

- www.surveymonkey.com/r/2021_11_MeetingEval

Your feedback is important!

Enchantment Chapter Monthly Meeting



Smart Cities Initiative

- **Abstract:** As cities around the world are unevenly waking up after a pandemic coma, cities are seeking opportunities to continue evolving toward being 'smart.' Cities may wish to take a new approach to provide services that meet the goals of the city and needs of the residents in new and innovative ways. The implementation of such approaches will define the new "smart city." We propose a human-centric model to help city authorities to make decisions with human needs in mind. Such a human-centric model will help identify and classify technological investments with the greatest positive impact for their residents. This presentation will introduce this human-centric model, the INCOSE-TUS Smart Cities Reference Model.

Download recording from the Library at www.incose.org/enchantment

NOTE: This meeting will be recorded

Speaker Bio



Jennifer Russell, EISE, CSEP is the Program and Management Support Leader on Garver's Water team. Over the past 25 years, she honed her West Point leadership motto of being a "Leader of Character." From strategic planning to tactical logistics, Jennifer has invested in public service and infrastructure. The domains of her experience are a testament to the portability of her skill set and include water systems, software systems, high-speed rail, transit systems, highway systems, and multi-modal connectivity. Jennifer holds a B.S. in Engineering Psychology from the United States Military Academy and an M.S. (2003) and Engineer Degree (2007) in Industrial and Systems Engineering from the University of Southern California.



Smart Cities Initiative Chair
Jennifer Russell, EISE, CSEP

Introduction and Overview

November 10, 2021

INCOSE Enchantment Chapter

Smart Cities are a Moving Target

Other technologists aren't nearly as subtle.

Videos



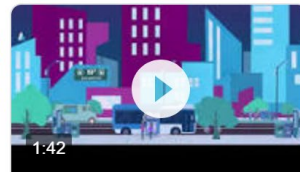
What is a smart city? | CNBC Explains

CNBC International
YouTube - Feb 9, 2017



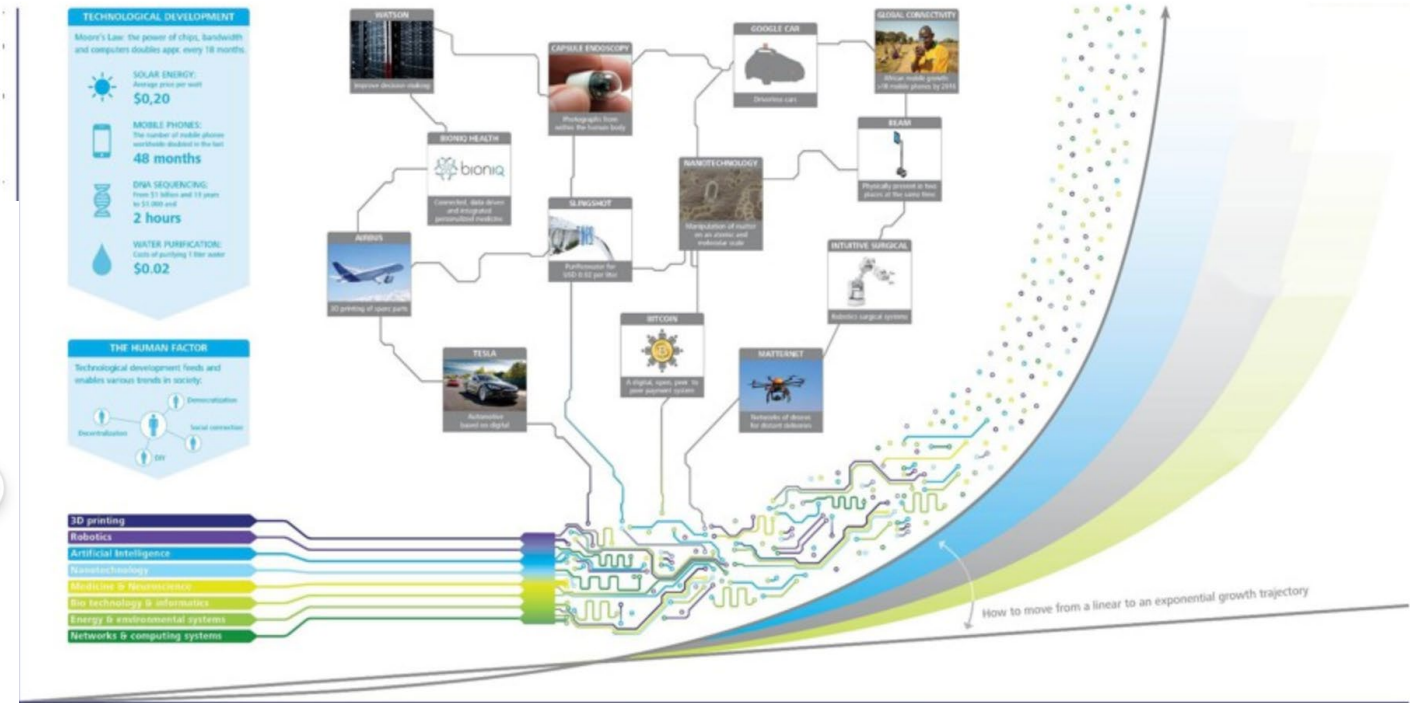
What is a smart city

VINCI Energies
YouTube - Aug 24, 2015



Smart Cities Explained In 101 Seconds

Qualcomm
YouTube - Jun 14, 2016





Smart Cities Initiative

The time is right

Success

Learning

Agenda



Smart Cities Overview

INCOSE Role

Definition, Framework, and Metrics

Next Steps and Outreach

Smart Cities applied

TOP 10 SMARTEST CITIES IN 2019

-
- | | |
|-------------------------------|--------------------------------|
| 1 Singapore, Singapore | 6 Auckland, New Zealand |
| 2 Zurich, Switzerland | 7 Taipei, Taiwan |
| 3 Oslo, Norway | 8 Helsinki, Finland |
| 4 Geneva, Switzerland | 9 Bilbao, Spain |
| 5 Copenhagen, Denmark | 10 Dusseldorf, Germany |
| 75 Bangkok, Thailand | |

Source: IMD Smart City Index 2019 (102 cities worldwide)

BKPgraphics

15 smartest cities around the world



Source Roland Berger, SCSi 2019

Roland Berger

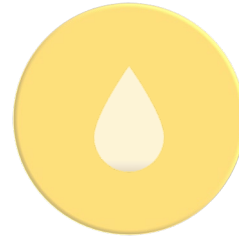
Smart Cities applied



TRANSPORTATION



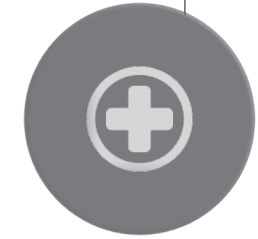
WASTE MANAGEMENT



WATER SYSTEMS



UTILITY



HEALTHCARE

TOP 10 SMARTEST CITIES IN 2019

- 
- | | |
|-------------------------------|--------------------------------|
| 1 Singapore, Singapore | 6 Auckland, New Zealand |
| 2 Zurich, Switzerland | 7 Taipei, Taiwan |
| 3 Oslo, Norway | 8 Helsinki, Finland |
| 4 Geneva, Switzerland | 9 Bilbao, Spain |
| 5 Copenhagen, Denmark | 10 Dusseldorf, Germany |
| 75 Bangkok, Thailand | |

Source: IMD Smart City Index 2019 (102 cities worldwide)

BKPgraphics

15 smartest cities around the world



Source Roland Berger, SCS1 2019



Technology focused smart cities are rethinking their approach



Electronics

'Frankenstein' lunges to new life for Cisco and smart Carlsbad, California

by Matt Hamblen | Feb 5, 2021 5:12pm



Carlsbad, California's Chief Innovation Officer described turning a "Frankenstein" network of disparate parts into a fast and intelligent resource, even as Cisco has created a new approach to its smart city legacy. (Getty Images)

Success in a smart city “has nothing to do with technology and has to do with people. We need to invite the public into co-creating these experiences with high degree of civic engagement. Cities need to be engaged with the public around connecting communities.”

- David Graham, Chief Innovator Officer for the City of Carlsbad, California.

We need a common definition for a smart city

Guiding the evolution of smart cities

By [Calil Queiroz](#) June 01, 2021

The idea of the “Smart City” is a fashionable one. However, there is no common definition of what a smart city should look like.



(Image credit: Image source: Shutterstock/ jamesteohart)

Agenda

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Smart Cities Initiative

Purpose

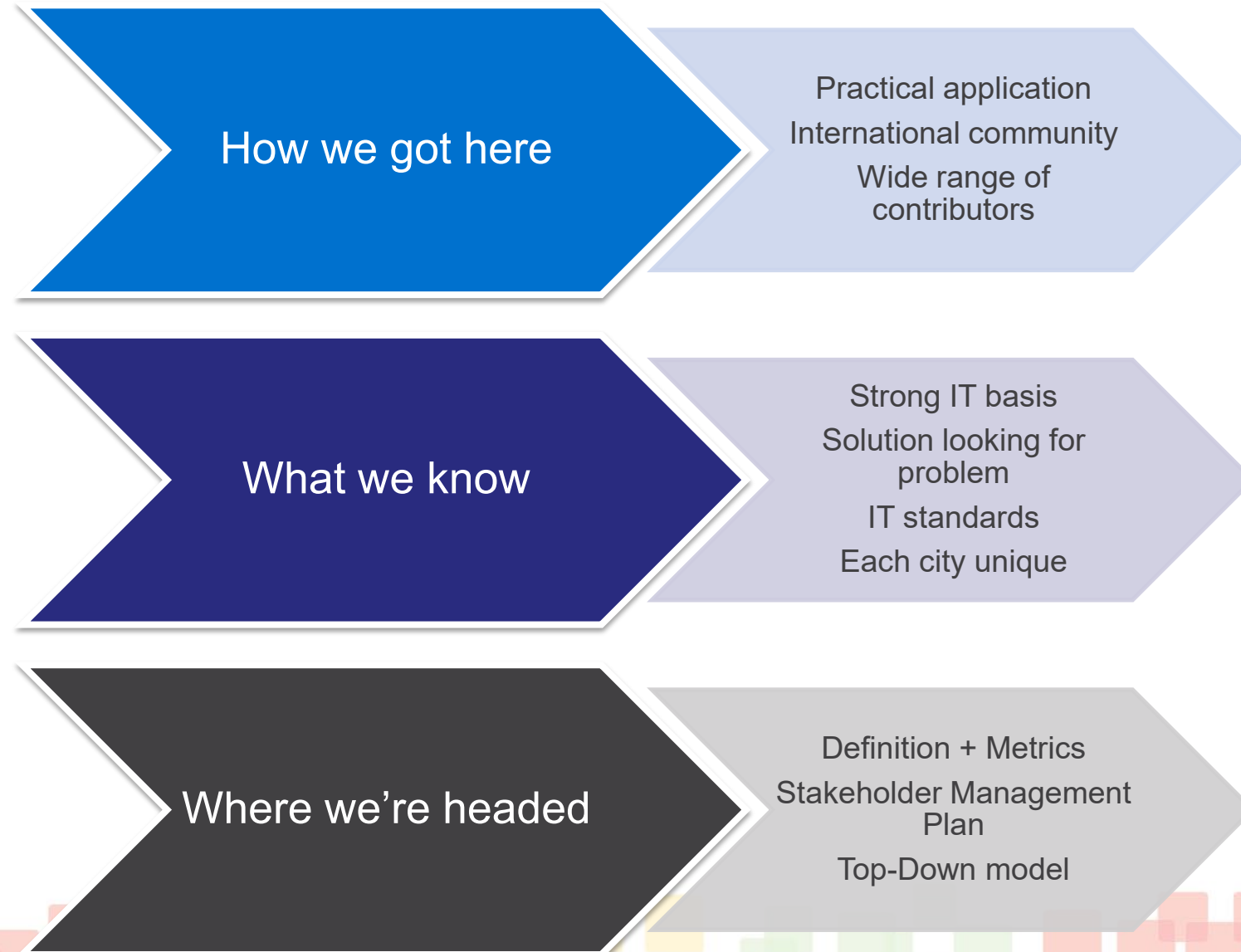
- Support communities
 - Concepts
 - Applications
 - Technology
 - Services (CATS)by leveraging systems engineering tools and principles



Goal

- Create a model that illustrates the resources
- Enabling
 - interconnectivity
 - reuse
 - consistency

Our Path

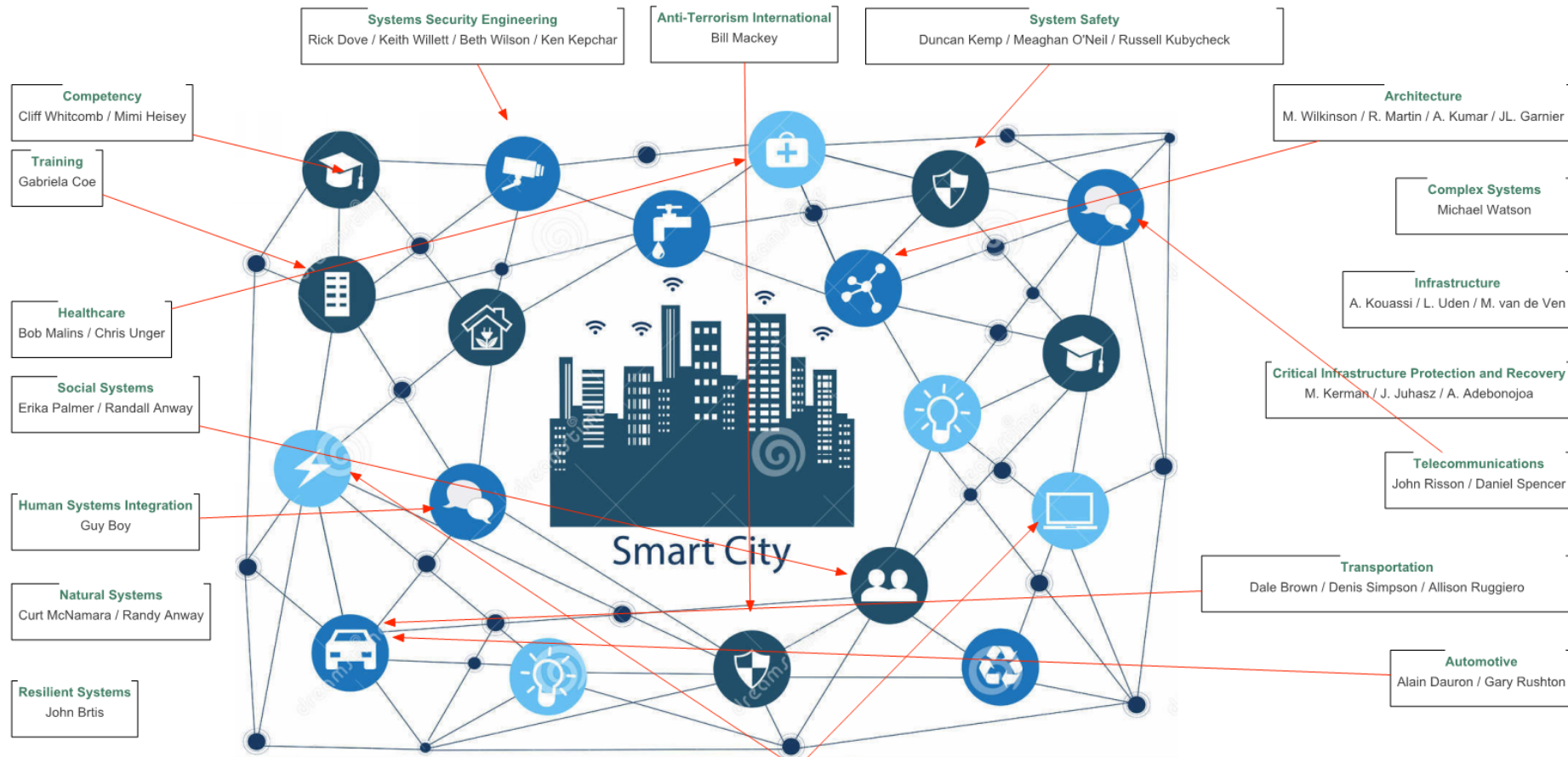


INCOSE Products Plan



- Definition of Smart City
- Metrics
- Case Studies
- Stakeholder List + Management Plan
- Input on other Smart Cities publications
- Architecture template for Smart Cities ~ MBSE model
- Executive Sales Kit Package
- Architecture
- Context Diagram
- Tailored Systems Engineering Management Plan (SEMP)
- Demonstrated interface template for Smart Cities CATS (N2 diagram)
- Smart Cities Concept of Operations Template

INCOSE Working Groups



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Collaboration



IEEE



IEC



Municipalities (in progress)



Smart Cities organizations (in progress)

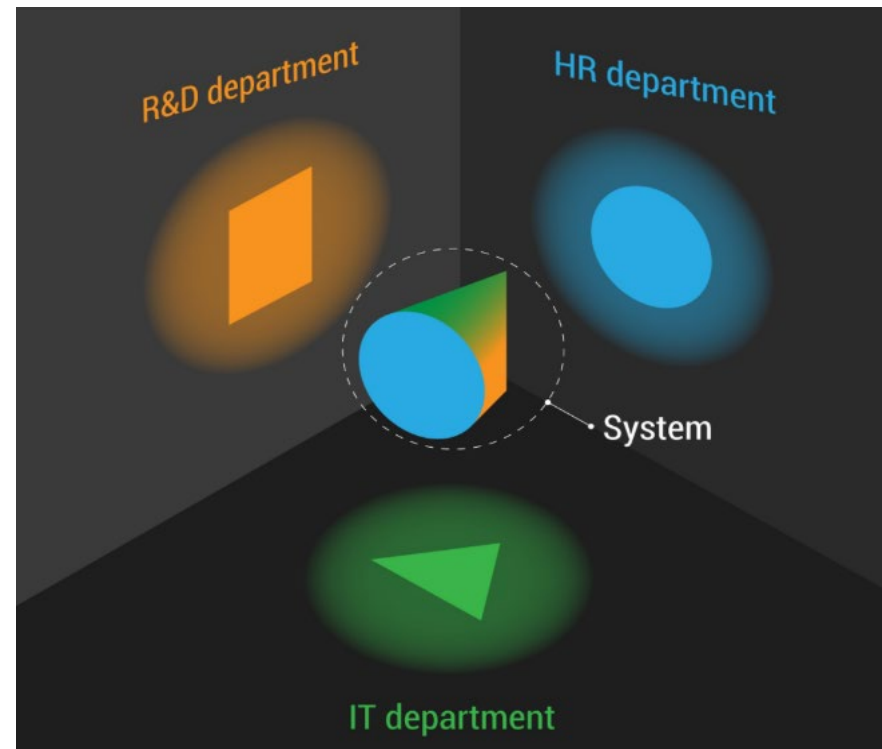
How do we build a smart city more closely aligned with the needs of the residents?

1) Humans belong at the center of the smart city

2) Objectives are dynamic and adjust over time

3) Effectively link digital data solutions to human needs with a feedback loop

Should we change our thinking style and try a new approach?



A new paradigm is needed to re-imagine our future cities



No	Legacy Paradigms	INCOSE-TUS Proposed Paradigms
1	A smart city is a city with all problems solved.	A smart city is a city capable of promptly identifying its problems and the root causes and mitigating the root causes.
2	Humans are beneficiaries of a smart city.	Humans are designers, inventors, developers, and beneficiaries by generating knowledge for Smart cities.
3	Technologies make Smart cities.	Humans build Smart cities.
		Humans develop technologies that support human activities aimed at building smart cities.
4	Big data is critically important for every decision making for Smart cities.	Big data is important, but it is not enough. To make fast and accurate decisions, the city needs engineered quality data.
5	A city has its own goal	A city doesn't have its own goal, but it has a goal-reflecting the common needs of the humans in the city.
6	The city government guarantees rights of city residents.	The rights of city residents are guaranteed by services provided (or duties performed) by the stakeholders within the city government.
7	A city must satisfy the needs of its residents.	A city must create an environment enabling its residents to satisfy their own needs.

Agenda



Smart Cities Overview

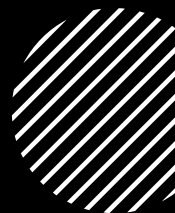
INCOSE Role

Definition, Framework, and Metrics

Next Steps and Outreach



INCOSE Smart City Definition provides evaluation and comparison



A smart city is capable of



identifying its problems and



mitigating root causes



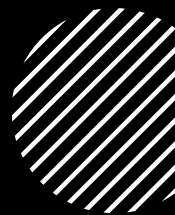
by generating and processing



engineered quality data in a continuous and inclusive manner.



Other
definitions
provide
formalized
consistency



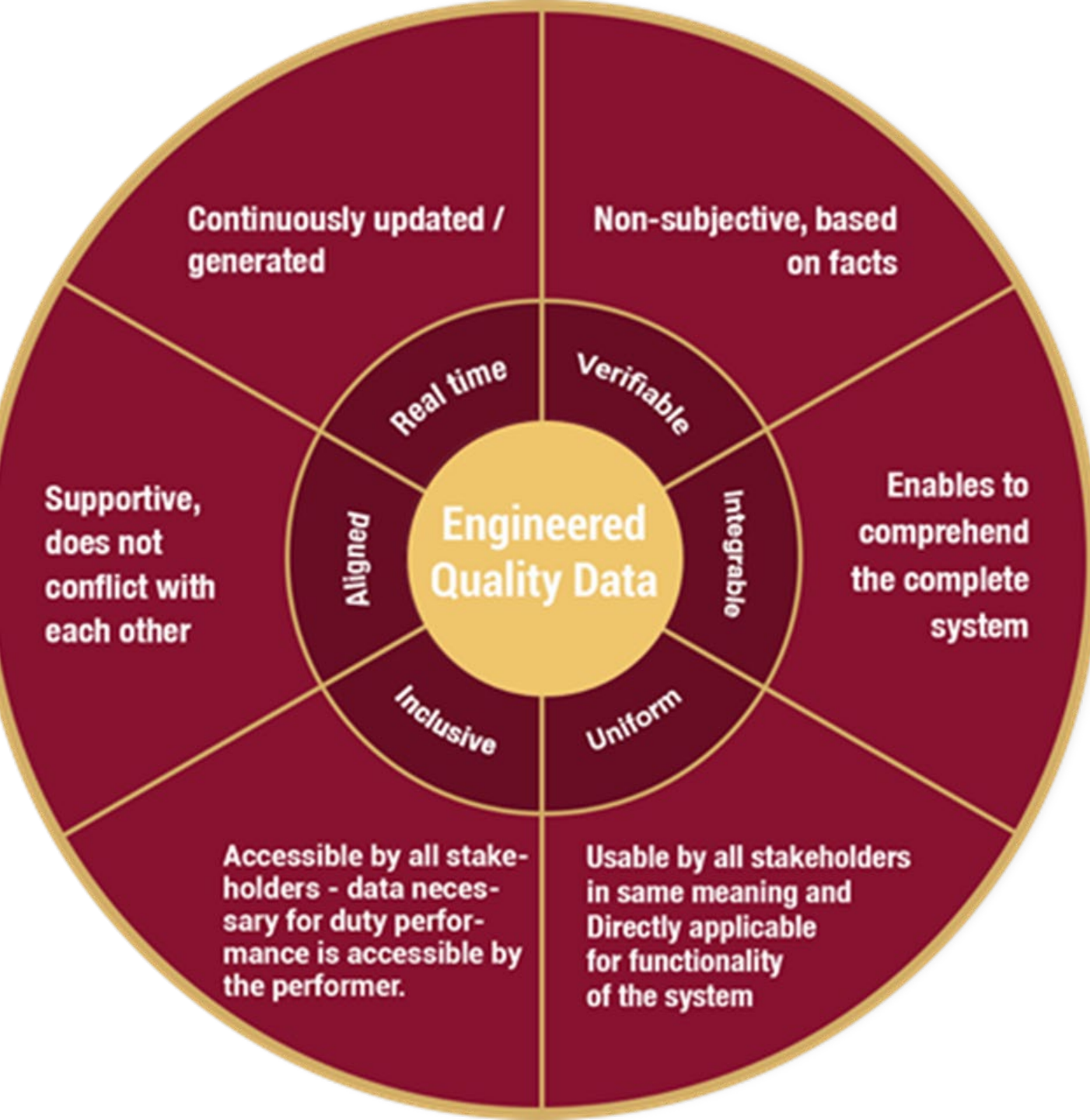
Being Smart

Social System

City

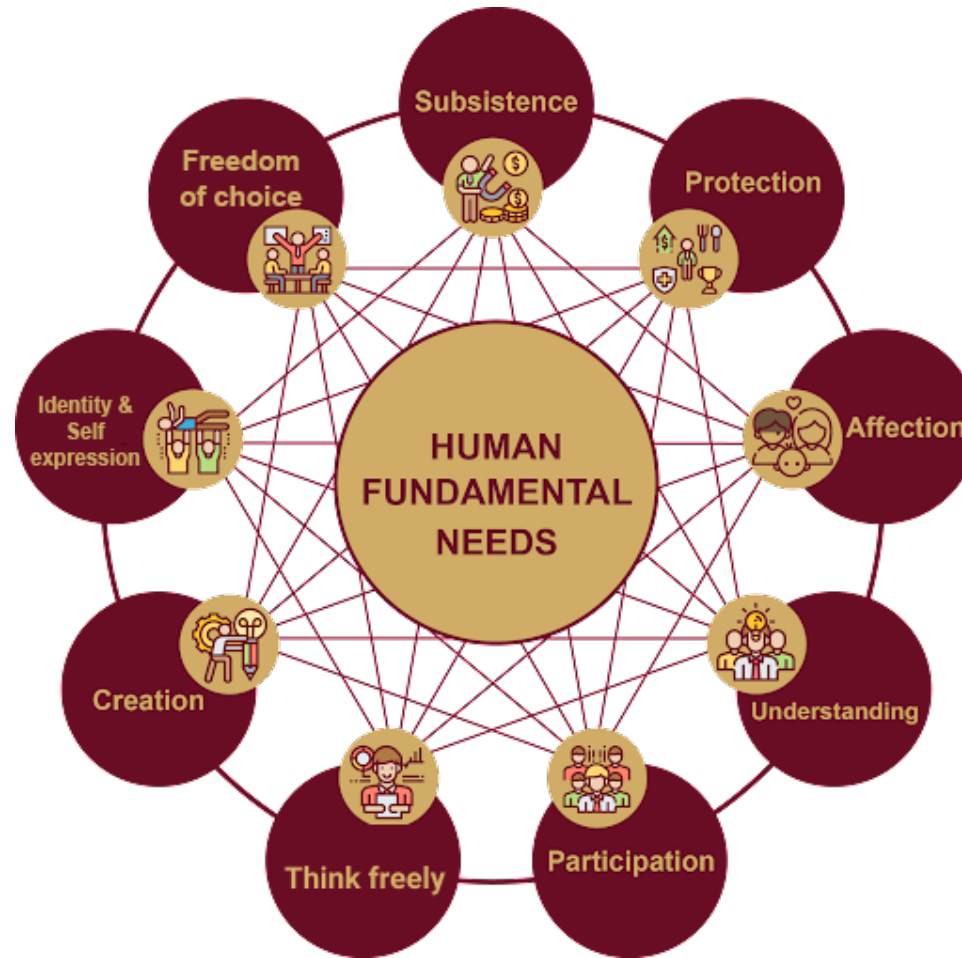
Model

Engineered Quality Data



Engineered Quality
Data is used to
identify and mitigate
root causes

Human Fundamental needs are the basis for a Smart City's goal



The Goal of a
Smart City
guides decision
making for
new
technology

The purpose of a smart city is to

create and maintain an environment that

enables its residents to

satisfy their fundamental needs by

interacting in fair, mutually beneficial, and
sustainable ways.

A single set of holistic metrics provide a consistent benchmark for evaluation and comparison



The Well-Being Index was developed based on ISO standards



Indicators for City Services & Quality of life (ISO 37120:2019)

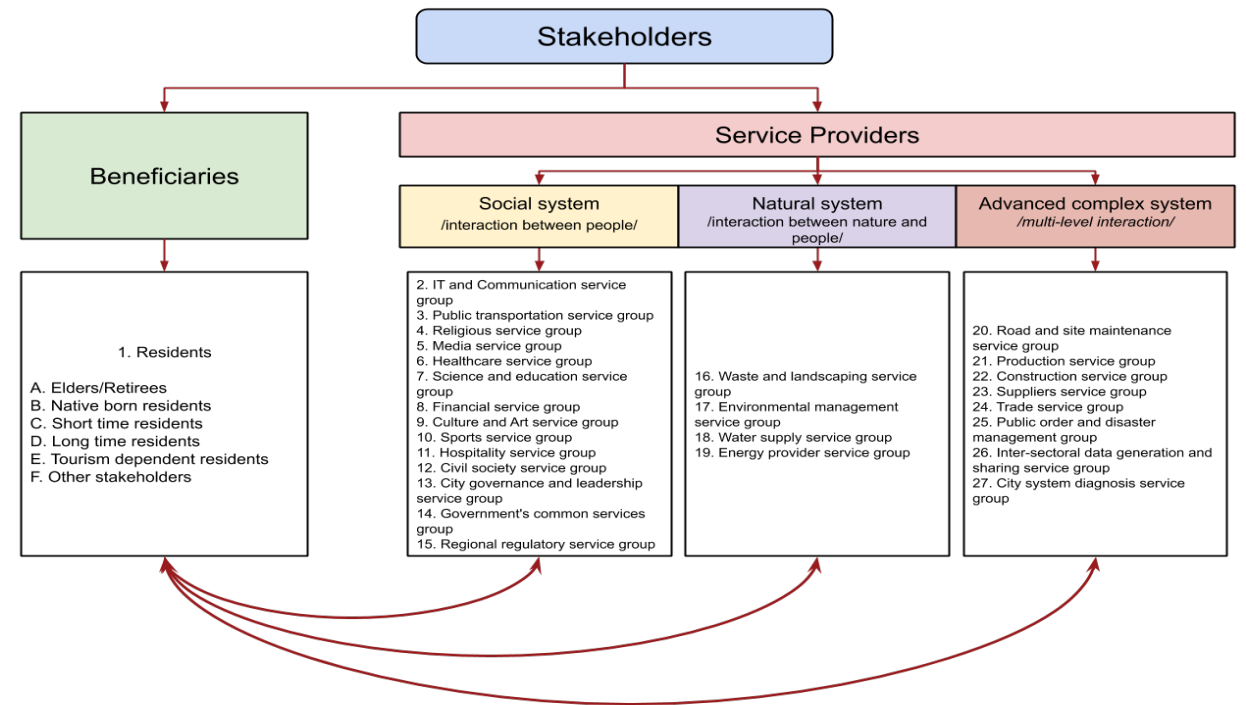
Indicators for Small Cities (ISO 37122:2019)

Indicators for Resilient Cities (ISO 37123:2019)

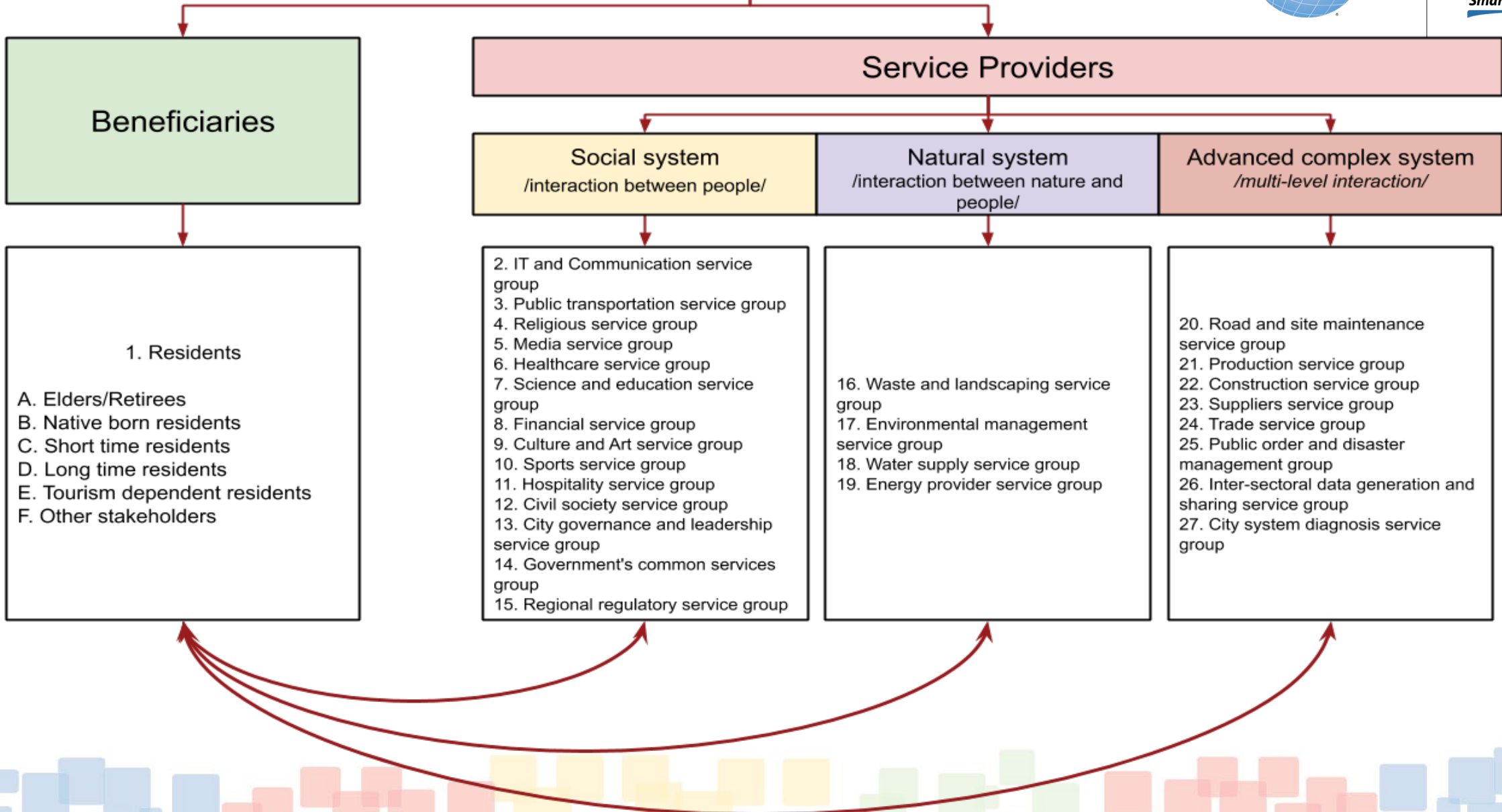
Social Responsibility index has a direct connection to the 17 United Nations' Sustainable Development goals



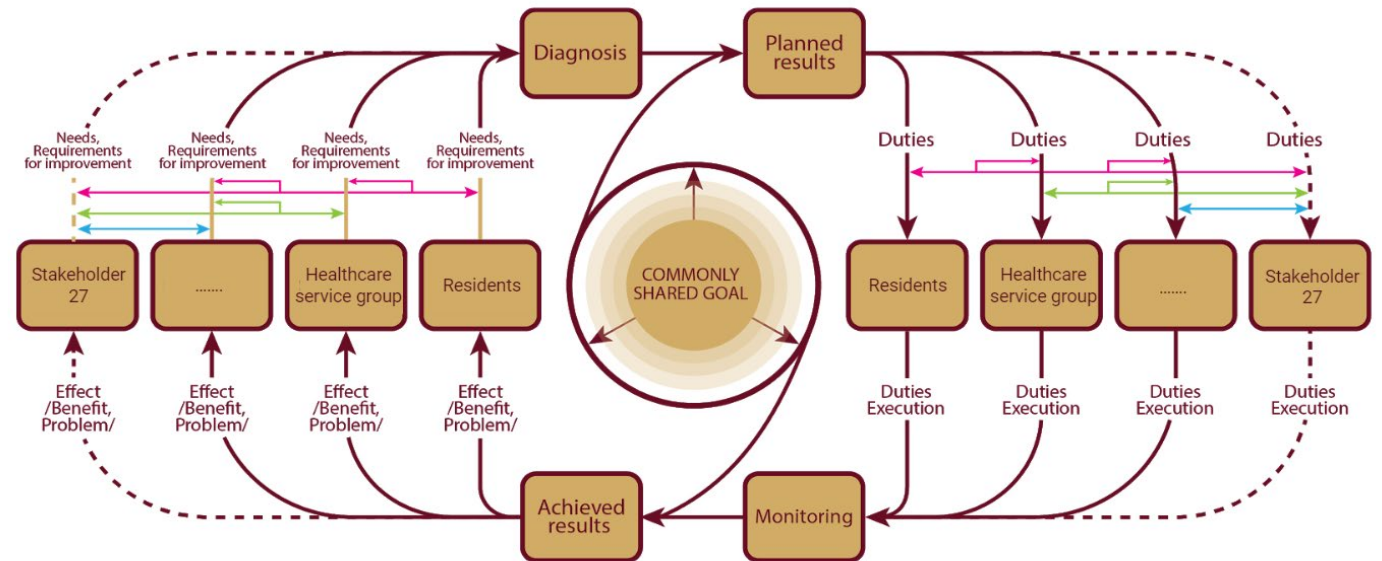
Engaging those who deliver the smart city results can improve the likelihood of a realistic and achievable implementation

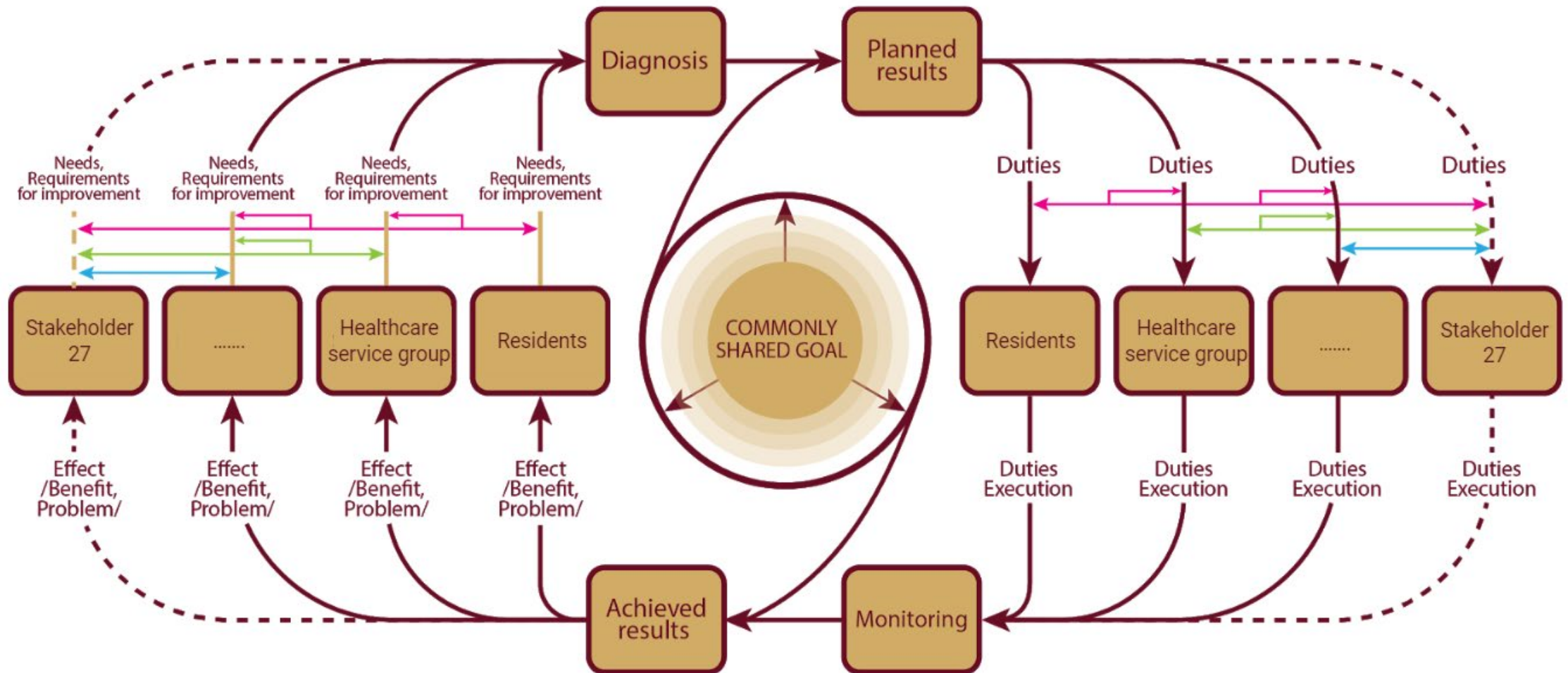


Stakeholders



The INCOSE-TUS Reference Model is a robust, tailorable, and systematic way to view and evaluate a smart city as an integrated complex social system





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Demonstration
applications


City of Ulaanbaatar,
Mongolia

City of Monterey, CA,
USA (??)

Kansas City, MO,
USA (??)

Initiating collaboration with Ulaanbaatar city government and Business community






TUSS
Tailored Unified System Solution

System ID / Ухаар

СИСТЕМИЙН ЛОГИК ЗУРАГЛАЛ



аг хотын зориулалт зориулалт:
үүдийг бүрэн, тасралтгүй цуглуулан, чамартай өгөгдлийн сан
р тулгарсан асуудлуудынхаа суурь шалтгаануудыг тухай бүр

Системийн тулхуур хэв шинж	
№	Хэв шинж
1	Системийн нэр
2	Системийн төрөл
3	Оролдогч тал/элементүүдийн
4	Үүсгэх синергистик хэв шинж
5	Системийн код

Model
Development

IEC Collaboration

- ISO
- IEEE

SysML basis?



Questions and Discussion



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