Reinventing Smart Cities as an Extended Eneterprise Model for Inclusive Growth

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Transformative Cities : No more a Business As Usual Scenario

- Cities have outgrown model: ie self-contain industries.
- Offers employment and finical independencies; access to better service delivery-energy, water, health, education etc
- Climate change mitigation, disaster management, circularity, resource efficiency, innovation type of issues require city centric approach for smart solutions.
- Local economic development: core for cities and per-urban areas, driver for global value chains
- Engines not only for large capital/manufacturing centers, from poverty to inequality.
- Creative expression in the context of simultaneous urbanization by migrants who are usually young and ageing population -offering potential transformation of individual governance roles

What is a smart city?

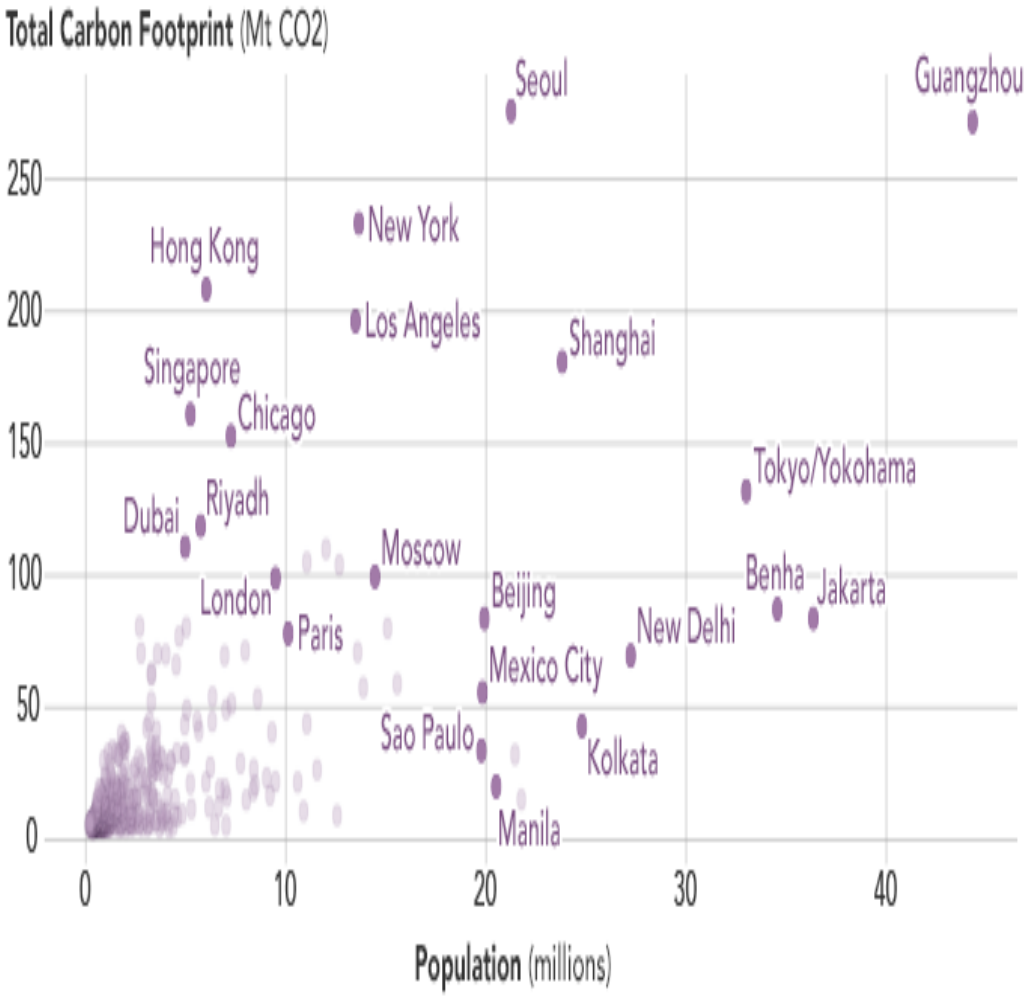
- Adopting ICT in order to enhance livability, workability and sustainability *(Smart Cities Council, 2013).*
- A city where the conditions of all its critical infrastructures are monitored and integrated . *(US Office of Scientific and Technical Information, 2014).*
- An instrumented, interconnected and intelligent city *(IBM, 2010).*
- A city seeking to address public issues via ICT-based solutions on the basis of multi-stakeholder and municipality-based partnership *(European Parliament, 2014).*
- A city that links physical capitals with social one in order to enhance the quality of services *(Corriea and Wunstel, 2011).*
- Integrating the physical, IT, social and business infrastructures into a single framework so as to leverage the collective intelligence of a city *(Harrison et al., 2016).*
- A innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects *(UNECE, 2017*)
- Automating routine functions as well as monitoring and planning the city to improve the efficiency, equity and quality of life for its citizens *(Batty et al., 2018).*
- Smart city is not about technology. It is really about how we apply ICT to enhance the quality of life of our citizens, to create greater opportunities for every one to prosper and thrive in this new world where economic restructuring is occurring and technology diffusion is occurring at an unprecedented pace and , to also strengthen community cohesion, quality of life. Opportunities and communities. Technology is a means to that end *(Vivian Balakrishnanan, Singapore Minister, 2018*).

SC as an Extended Enterprise Model

- Concept that an entity does not operate in isolation because its success depends on networks of partner relationships
- ICT plays an important role in an extend enterprise, facilitating communication and relationship building and providing each member and the network a common view of data in real or near real time.
- An extended enterprise model not only emphasise the need to share data, but also by ICT consumerization, the burring of lines between personal and work related use of technology
- SC ->System of System (SoS) viewing of multiple, dispersed, independent system in the context as a part of larger more complex system. The goal of smart city is get a maximum value of larger system by understanding how each small system works, interface and used. Such a design require thinking –a wholistic approach to analyze that way constitute parts interpolate, work over time and function within the context of larger evolving systems.

Sustainability Challenges of ASEAN Cities

- BAU could result in annual resource requirements (energy, water, materials) of cities growing from 40 billion tonnes in 2010 to nearly 90 billion tonnes by 2050 (ERIA, 2018). Resource use and CO2 emissions from energy use will be a well recognized concern.
- Long term historic sprawl of ASEAN cities by 2% year threaten to increase urban land use, putting land and food supplies at risk (IRP, 2015).
- Cities that create compact urban growth and become more resource efficient in transport, buildings, could achieve reductions of between 36 to 54% in energy use and carbon emissions. (MGI, 2018)



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Inclusive Growth Challenges of Today' Cities

Increasing Inequalities

City	Year	Gini Co-efficient
Chiangmai	2014	0.58
Ho-chi Minh City	2011	0.53
Bangkok	2012	0.53
Davo	2009	0.44
Kula Lumphur	2009	0.41
Nonthaburi	2006	0.41
Manila	2006	0.40

Reduced Urban Poverty

Country	Year	% of urban population	Year	% urban population
Indonesia	1996	13.6	2015	8.8
Malaysia	1994	21.8	2015	6.7
Thailand	1990	20.5	2011	9
Viet Nam	1995	25.1	2014	6

Source: UN, ADB and ASEAN data base

Cities as a part of Global Challenge and Smart Solutions

By 2020 more than 60% of the population will be living in cities

70% of global GDP is generated by Cities

Global Challenges of Cities

- Pollution
- Climate change
- Traffic congestion
- Affordable housing
- Rising cost of services
- Inequality
- Crimes/security
- Urban sprawl

It is crucial to manage cities in such a way that they support and drive economic growth and competitiveness while achieving social cohesion and environmental sustainability

Priority Action Areas

Energy and Environment
Transport and mobility
Urban development and planning

Smart City Concept

Socio-Economic Benefits

Integrated social and Economic Development
Inster-sectoral ICT
Public Service and Utilities

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ASEAN Smart City Initiative – An Enhanced Service Delivery Approach

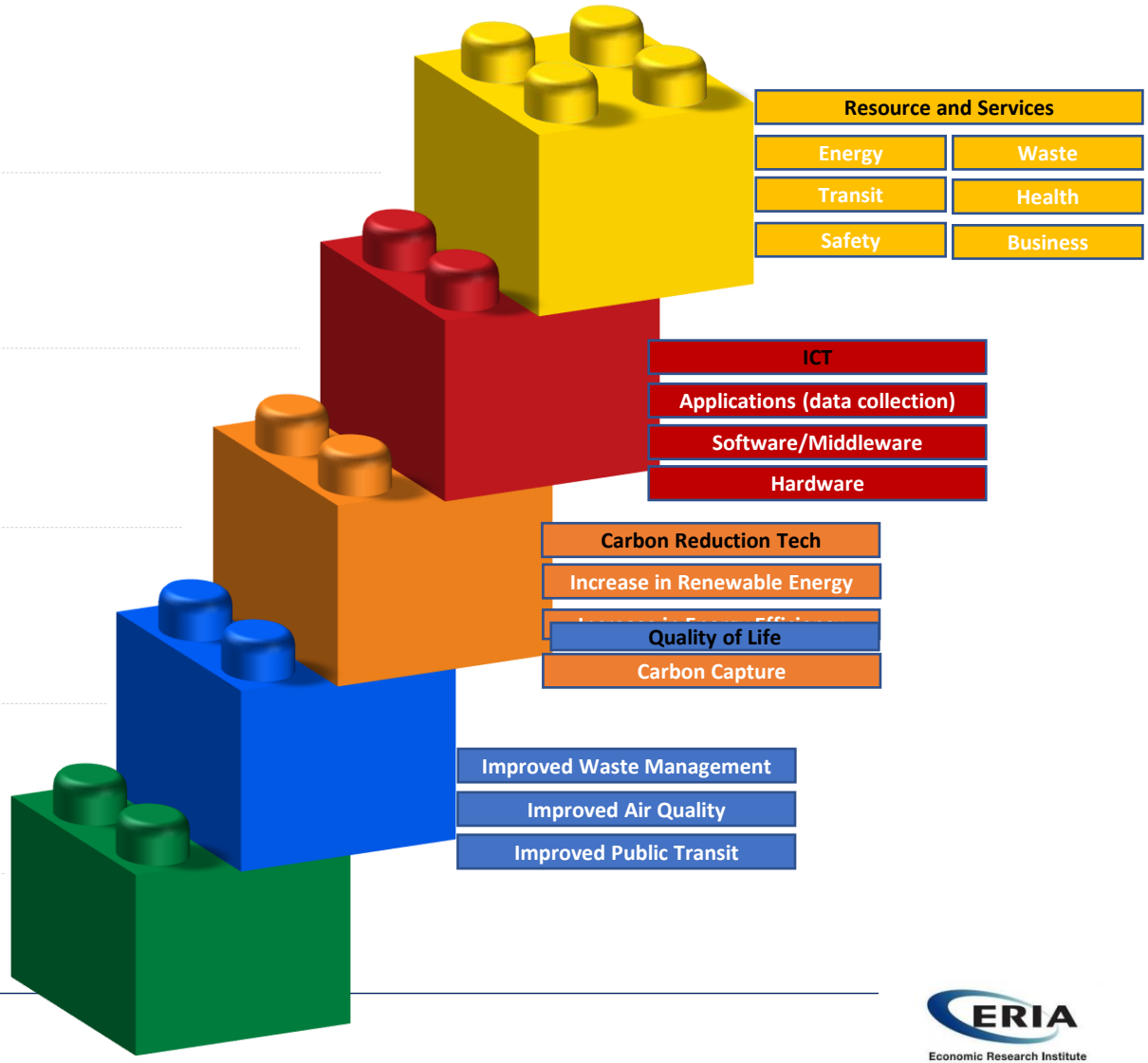
SMART SERVICE CITY
The implementation and usage of ICT to improve city services and to ensure suitable and equitable growth

SMART CITY
Development of Information Communication Technologies (ICT) amongst urban infrastructure

LOW-CARBON CITY
A climate change oriented urban center implementing technologies to reduce carbon impacts

SUSTAINABLE CITY
Economic, environmental, and socially sustainable policies that preserve resources and limit human impact

CITY
Agglomeration of individuals in one collective location creating a dynamic and centralized society



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ASEAN SMART CITIES NETWORK

Pilot Cities

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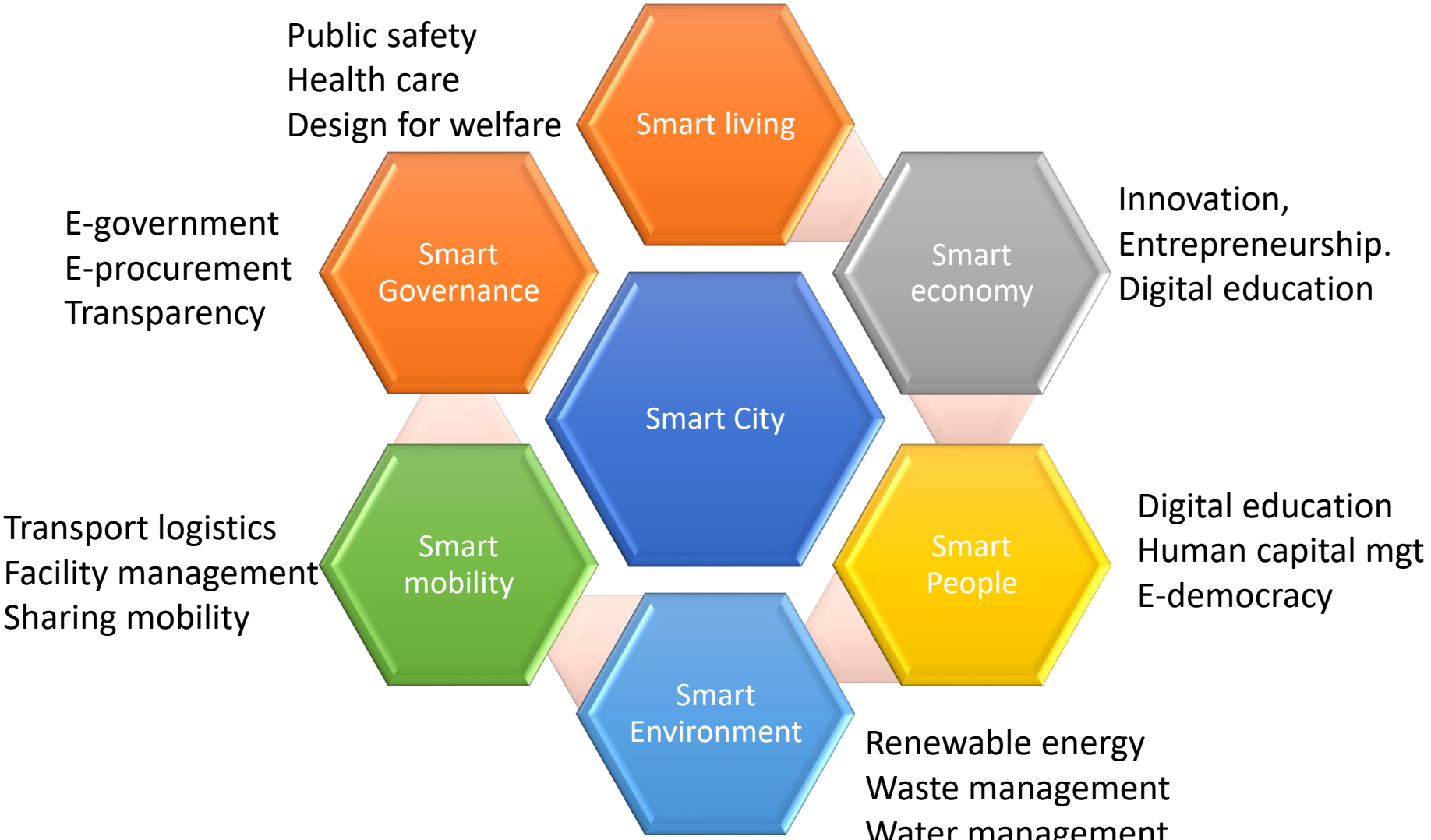
ASEAN smart cities are integrating digital technologies into government services

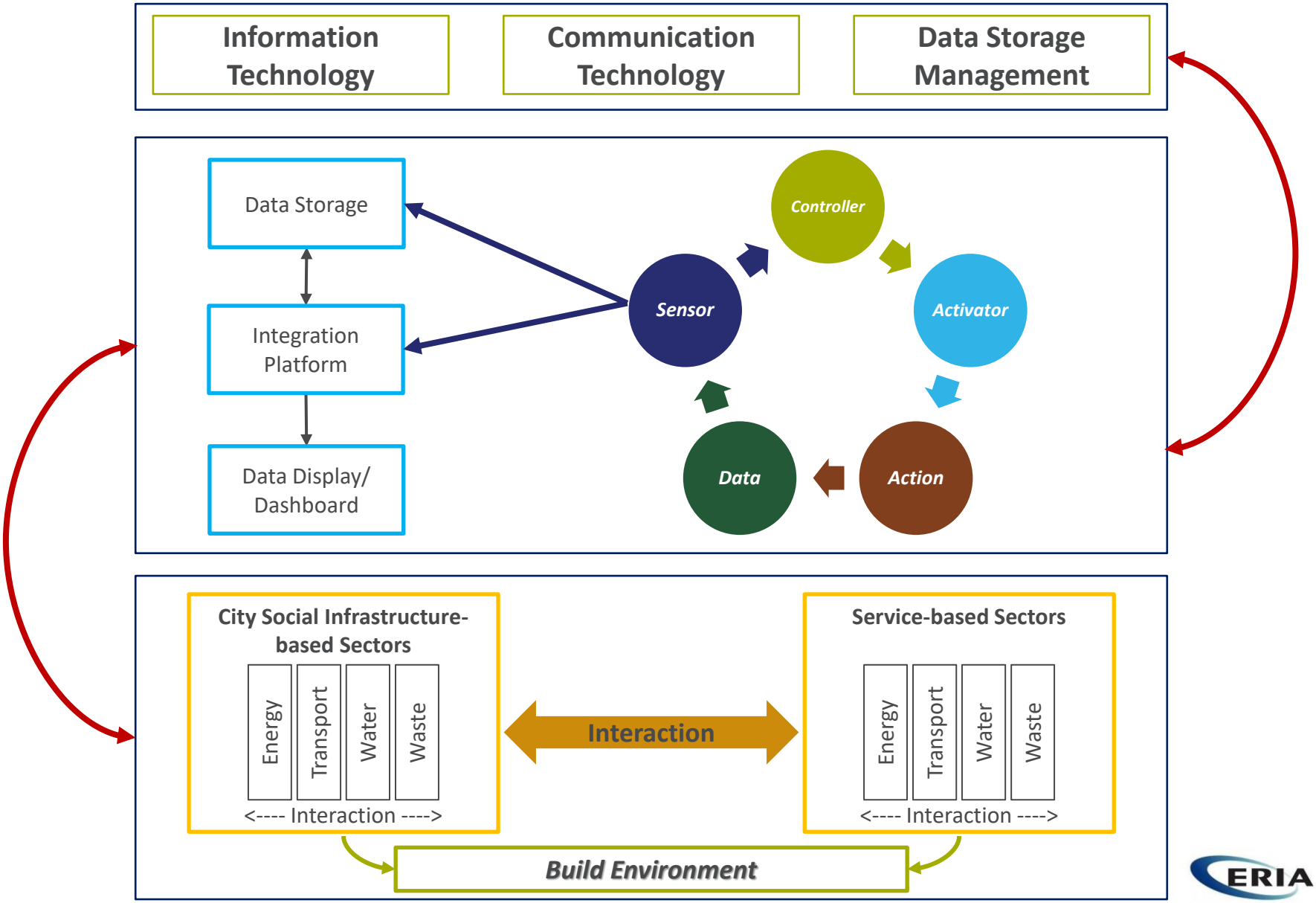
Country	City	City level action
Brunei	Bandar Sei Begawan	Working with Ericsson to pilot 5G and IOT with full deployment expected by 2021
Cambodia	Phenom Penh	Smart city will make use of ICT to boost service delivery, performance, optimize resource consumption, and connect citizens
Indonesia	Jakarta	More transparent and livable city ; GLUE to receive and process complaints and monitor the civil services
Lao PDR	Luong Prabang	Introduced connected CCTV system and household electricity meter
Malaysia	Kuala Lumpur	Promoted IOT through partnership with LoRa Alliance to improve traffic through WAN
Myanmar	Yangon	Introduce digital payment and e-card to ensure better transport services
Philippines	Clark city	Spatial planning and IoT for disaster resilience
Singapore	Singapore	National digital identity, e-payments, smart urban mobility, big data operation center, smart nation platform
Thailand	Phuket	Smart transport and surveillance and big data operation centre
Vietnam	Da Nang	Collobarted with IBM to develop IOT infrastructure to address issues such as air control, water management, waste management , energy and disaster warning with full deployment expected by 2025

ASEAN Smart City- SoS - Will it be a best option to Resolve New and Multiple Challenges of Service delivery ?



Source: ASCN – e-book
https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf

A common Minimum IOT Architecture & SOS for a Model Smart City



Smart Cities : From Data to Intelligence

Instrumentation

Collect a lot of data using sensors, satellites, society etc

Integration

Connect and bring these data from across the city

Intelligence

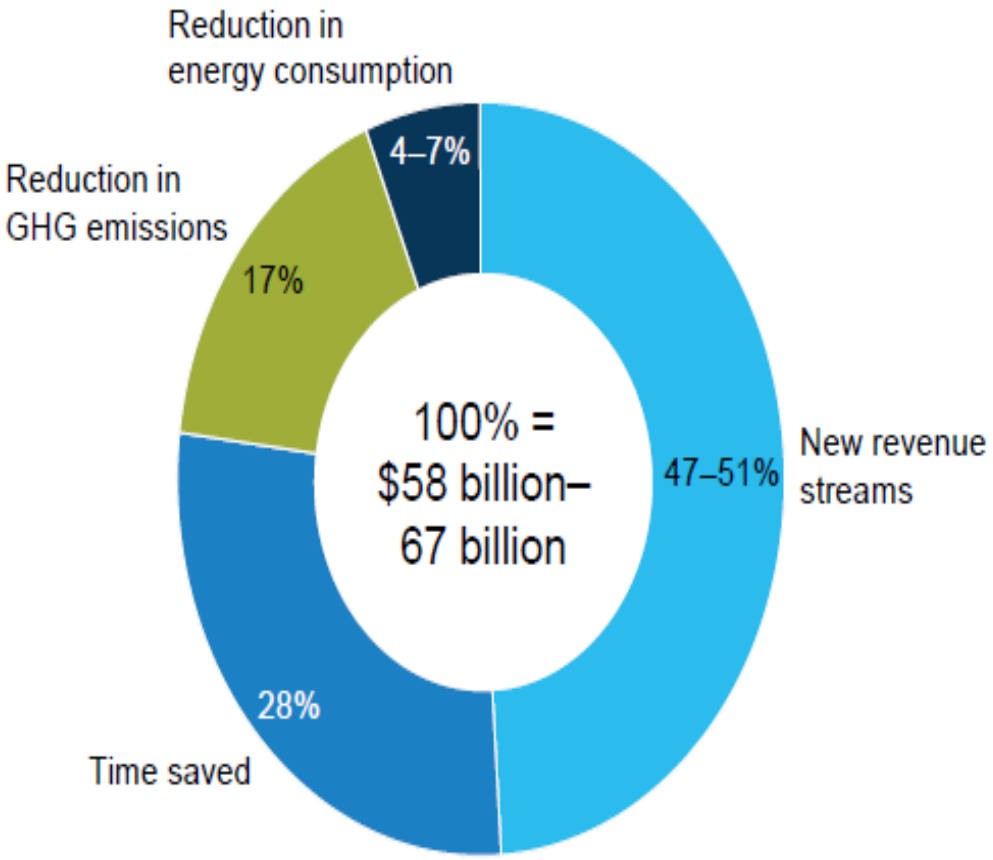
Analyze Integrate data for insights and trends to make smarter decisions

Efficiency, Innovation and Inclusion

To do more with less, through collaboration at scale, to ensure every one benefits

What could be the Benefits of an Externed Enterprise Model Application?

Mobility applications can create almost $70 billion in value across Southeast Asia.



Examples

Singapore

- Implemented dynamic congestion pricing through the Electronic Road Pricing system
- Traffic congestion is down by 15% since its introduction in 1990
- Public transit has gone from 45% to 65% of the city's commutes

Malaysia

- Grab acquired Uber's Southeast Asia business in 2018. It provides up to 2.5 million rides daily

Indonesia

- Ride-hailing company Go-Jek currently has a fleet of more than a million cars and motorcycles

Source: MGI, 2017

Smart Cities in ASEAN : Not Just a Trend but a Transformational Race for Investment and Talents

Political Goal

Significant contribution to AEC and ASCC Blueprint by 2025

A Headline Target

Significant no of smart city solutions , highly transferrable, that enable city to preform on multiple challenges

Operational Focus

Transferable solutions where ICT, energy, transport, water and waste amenities overlap in an urban development context

Urban context

Integrated Infrastructure planning, Business models and common data standards

Operational Goal

Achieving highly completive, innovative and sustainable city development

- How to get cities and the private sector to commit together to advancing the smart city agenda?
- What are the Innovative financing models for pilot projects (via existing and new instruments)
- How to formulate a regional action plan on key technological and barriers?

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Key Actors in the Extended Enterprise System in Japan

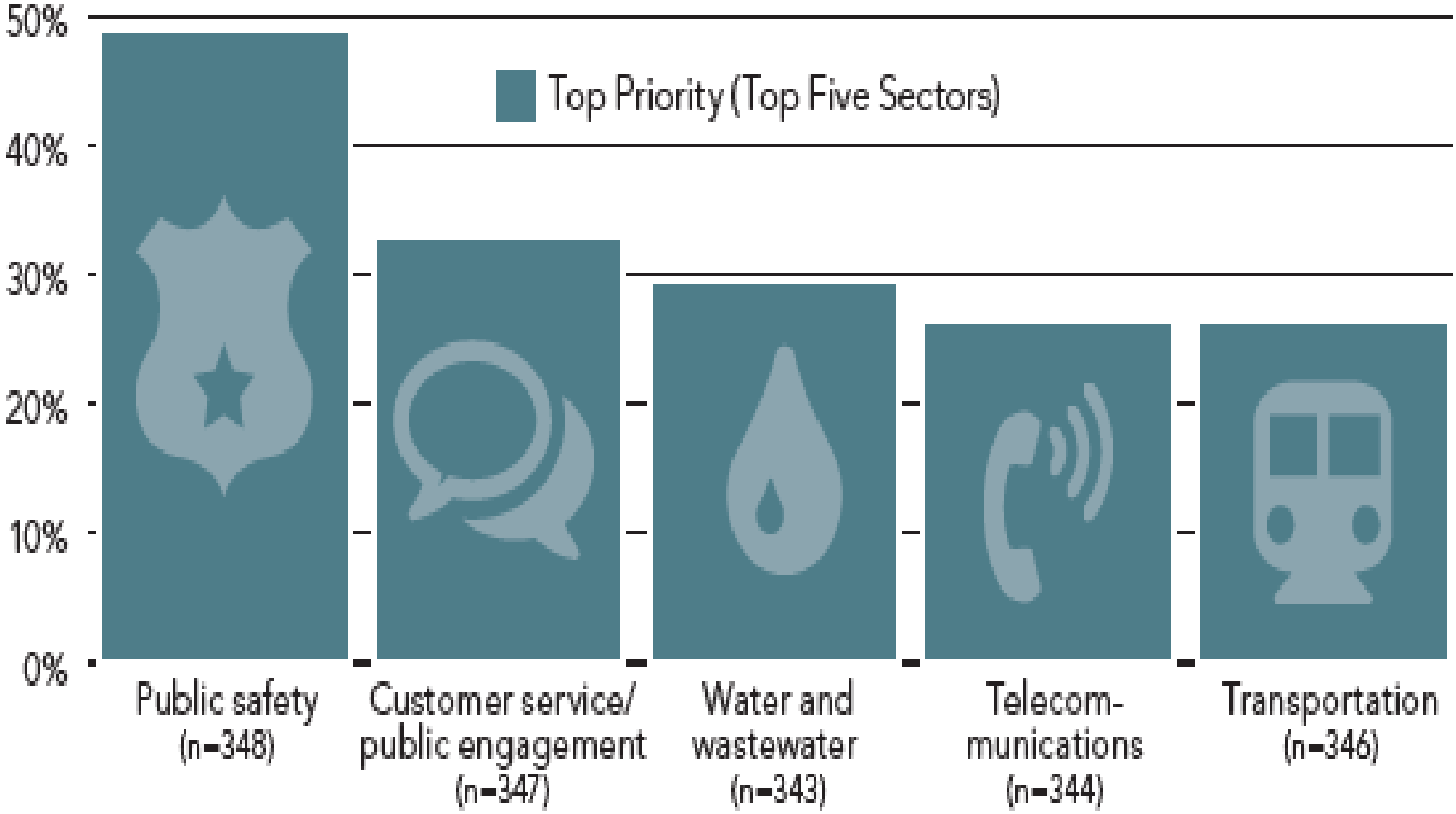
Firm	Sector	Betweenness Centrality	Degree Centrality
Hitachi	Electronics	5212.7	74
Toshiba	Electronics	3735.6	64
Mitsubishi	Trading	2908.3	67
NEDO	Public Funding	2735.7	28
Sharp	Consumer electronics	1603.5	91
Denso	Automobile	1567.2	55
Fuji Electronic	Infrastructure provider	1516.7	53
Nippon Oil & Energy	Petroleum	1481.1	55
Panasonic	Electronics	1276.7	35
Furukawa Electric	Infrastructure	1187.1	47
University of Tokyo	Academic	1154.3	13
Urban Renaissance Agency	Infrastructure	1123.1	55
IBM	Software provider	917.4	47

Source: Yarime, 2018

How impt the location of firm for other firms

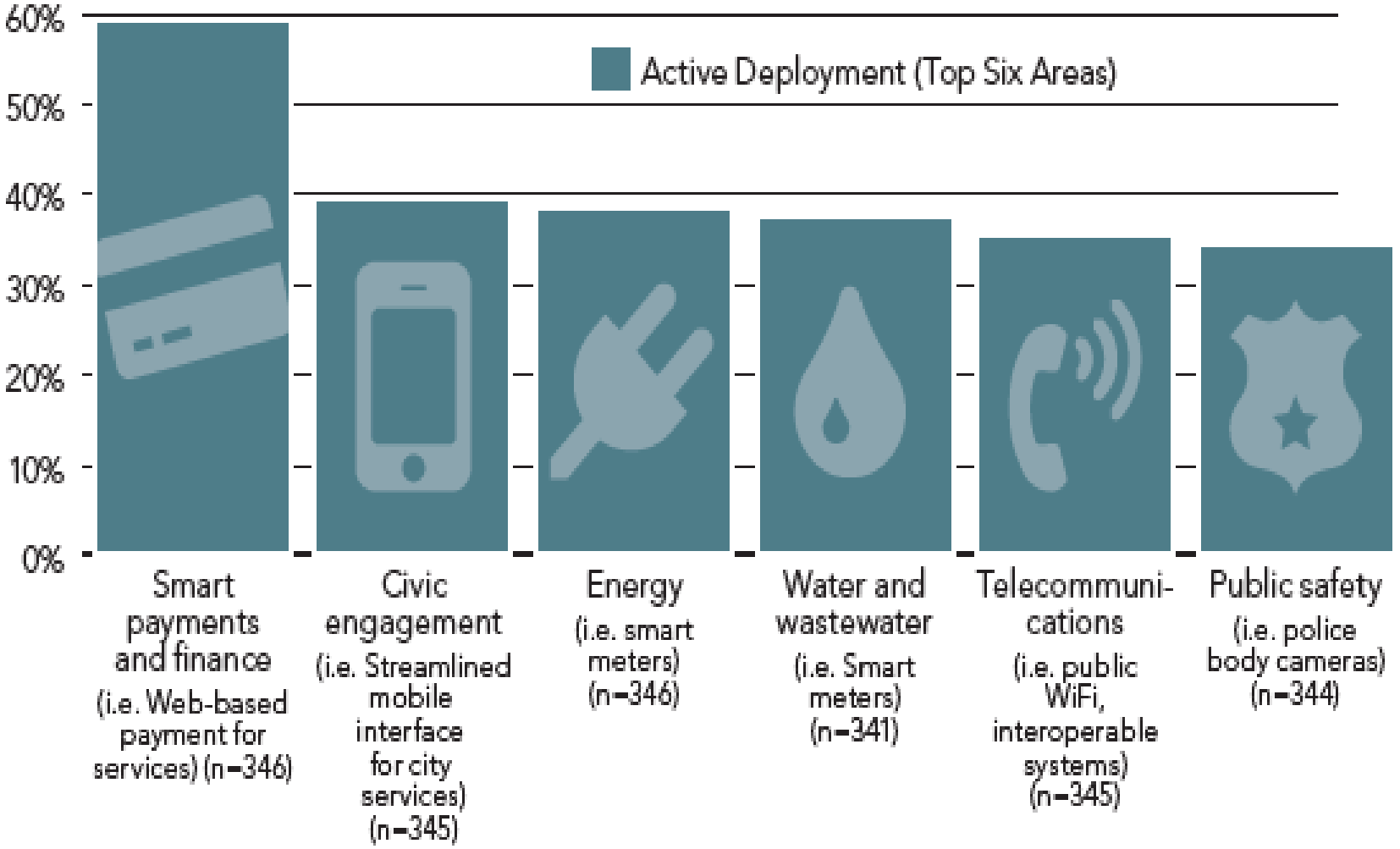
No of connections

For each of the following sectors, what level of priority do smart city technologies represent for your community?



Smart city technologies Represents the Highest Priority for Public Safety

What is your community's current level of engagement with smart city technologies?



Communities are more active with Smart city Technologies on Smart city Payments and Finance

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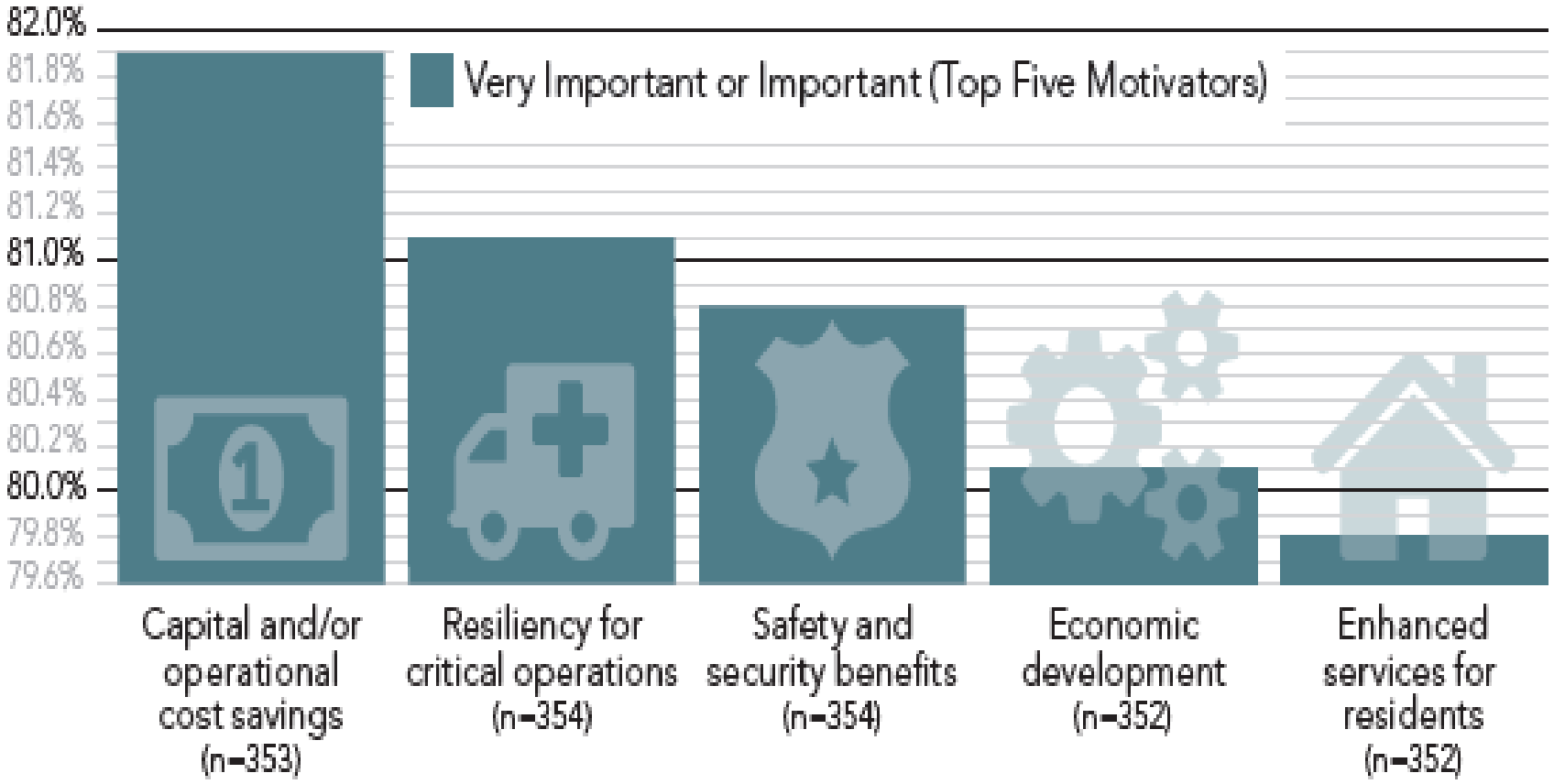
How important are each of the following benefits in motivating your local government to implement or expand the use of smart city technologies?



Capital and/or Operational Cost savings is Identified as the Most important Motivator for Implementing smart city Technologies

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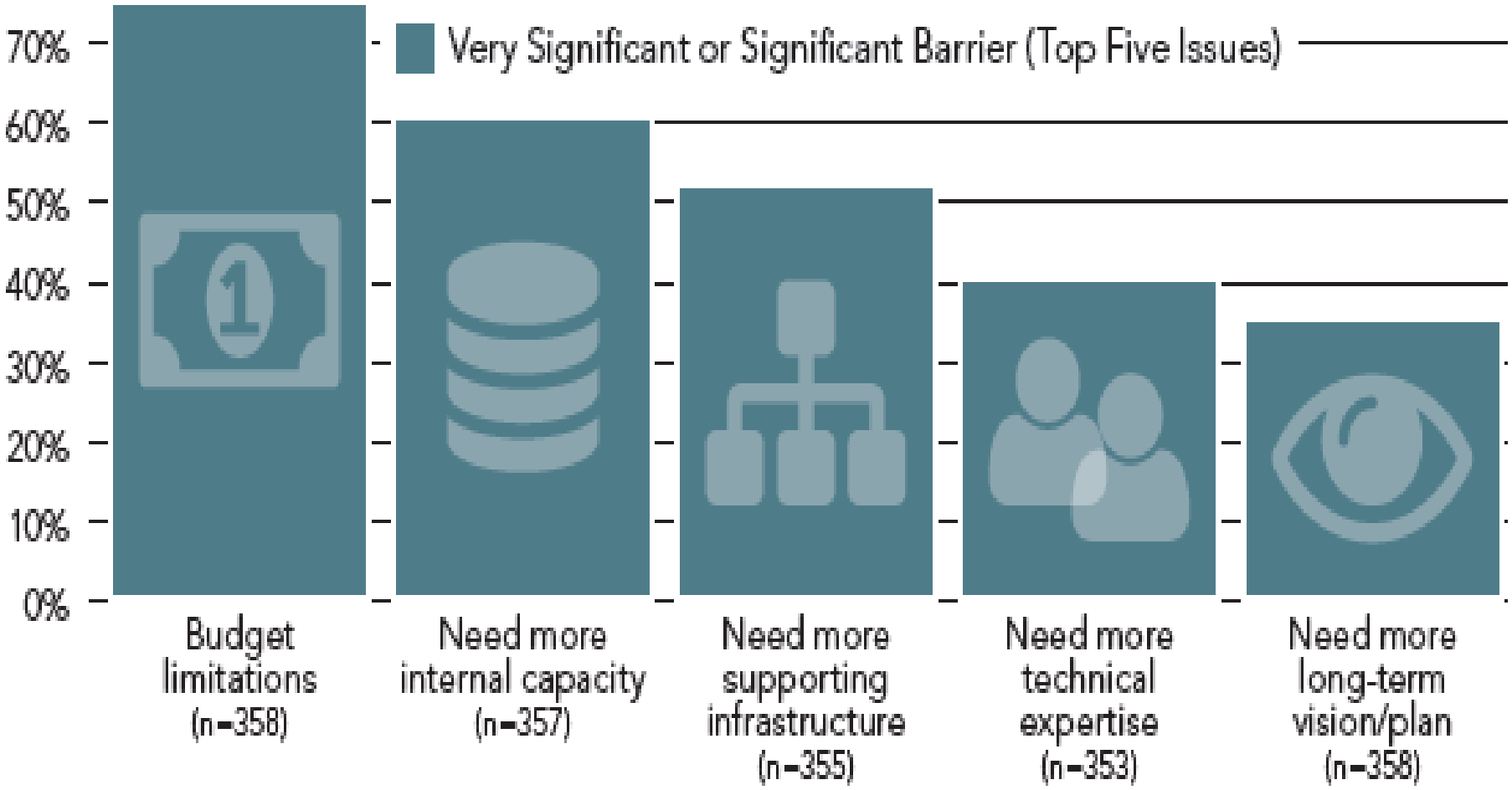
To what extent do each of the following issues represent barriers for your community to implement smart city technologies?



Budget Limitations Represent a Significant barrier to Implement Smart City Program

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Five Difficulties in ASEAN Smart City Policy Governance

1. Privacy Protection Vs Social Intelligence Securement.
2. Formulations of Government-Citizen-Private sector Holistic Governance
3. Harmonization of City –Service Publicity and Private Investment.
4. Political Rationality: Difficult of Structural Innovation Rather than technological Innovation.
5. Future Investment: High Risk, High Return.

Conclusion

- As of now, many smart city models in ASEAN often see themselves as part of long term, comprehensive national sustainable and inclusive transformation plans. Their smart city strategies represents very important Extended Enterprise Model/SOS thinking.
- The defining characteristic of ASEAN smart city model is the promotion of technological infrastructure development. ICT, Big Data and AI are indispensable dimension for an inclusive smart city. ASEAN SC cities opt for quick result yielding technological solutions in the key domains of energy, water transport and waste management.
- Strategic planning ASEAN SC models need to capitalize on both technological advancement –digital intelligence and on the development of knowledge and innovation networks for digital inclusion.