

TRANSFORMING DAVAO DE ORO THROUGH SMART INITIATIVES

Governance and Leadership Development (GOLD)

Training for the Provincial Government of Compostela Valley

Understanding the 'Smart City' Concept in the Philippine Context

Mark Anthony Mesina Gamboa

12 February 2020



Session Objectives

- **Give a better understanding on what constitutes a ‘smart city’ based on existing models and best practices**
- **Highlight the important role of smart cities in making the future more liveable, inclusive, and sustainable**
- **Describe the state of urban planning in the Philippines, as well as the gains and gaps in existing policies related to urbanization and development**
- **Discuss how all these concepts can be applied in a provincial setting**

What constitutes a ‘smart city’?





« It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair... »

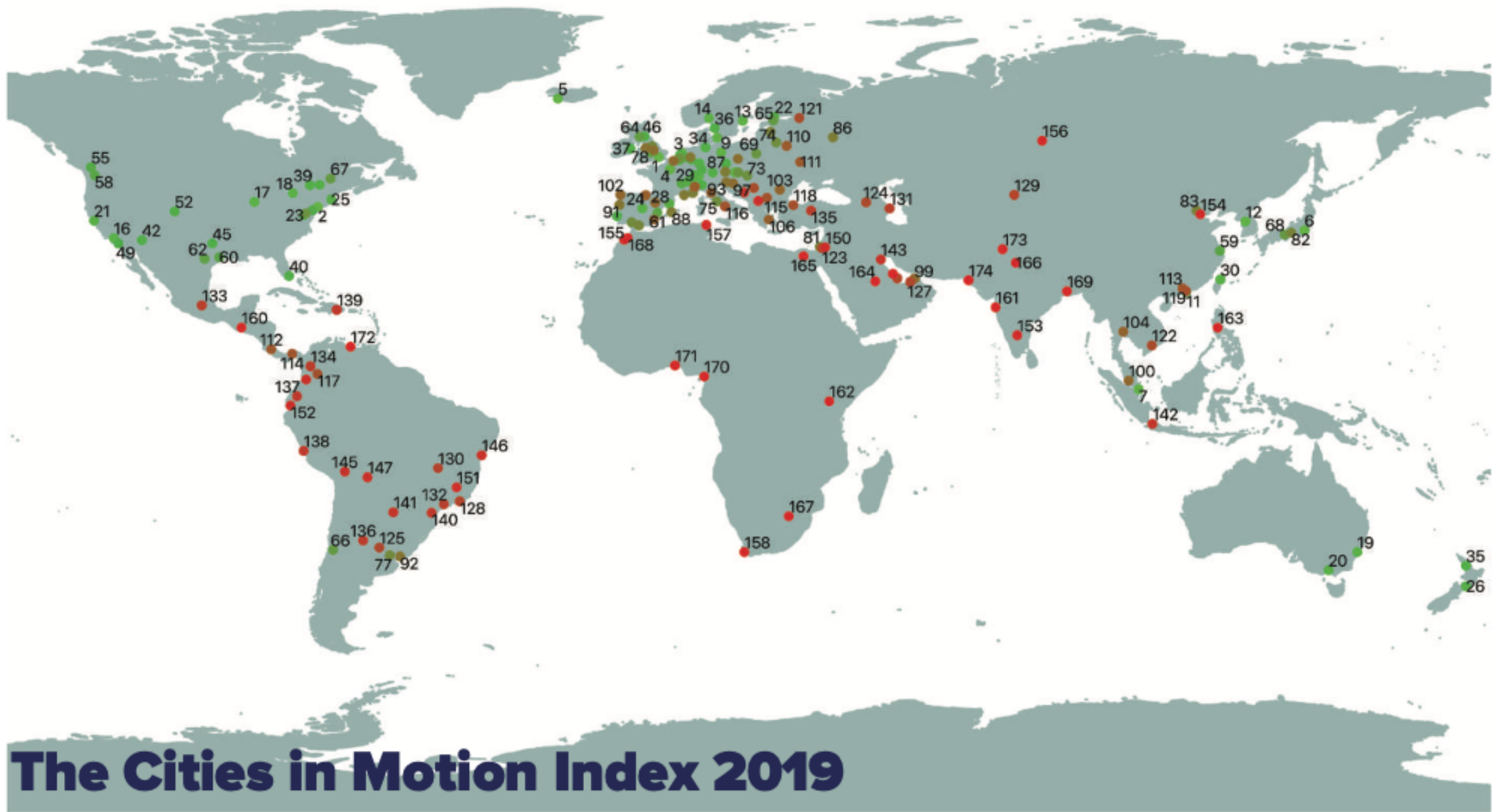
A Tale of Two Cities - Charles Dickens, 1859

Overall ranking	City	Overall rating
1	Singapore	A A A
2	Zurich	A A A
3	Oslo	A A
4	Geneva	A A
5	Copenhagen	A A
6	Auckland	A
7	Taipei City	A
8	Helsinki	A
9	Bilbao	A
10	Dusseldorf	A
11	Amsterdam	A
12	San Francisco	A
13	Vancouver	A
14	Sydney	A
15	Toronto	A
16	Montreal	A
17	Vienna	B B B
18	Bologna	B B B
19	Prague	B B B
20	London	B B B
21	Madrid	B B B
22	Milan	B B B
23	Lyon	B B B
24	Melbourne	B B B
25	Stockholm	B B B
26	Hanover	B B B

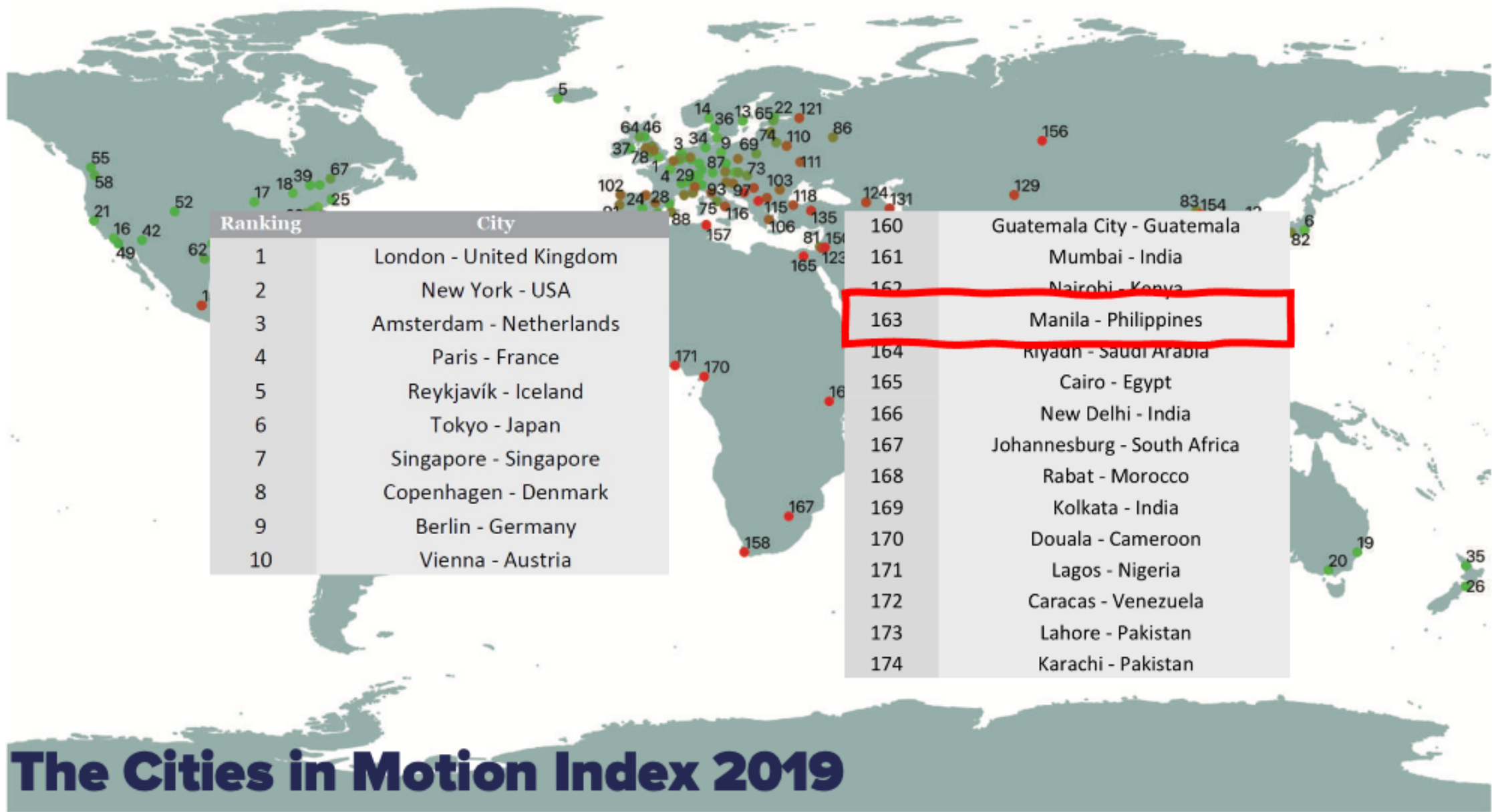
Overall ranking	City	Overall rating
27	Brisbane	B B B
28	Gothenburg	B B B
29	The Hague	B B B
30	Dublin	B B B
31	Washington D.C.	B B B
32	Boston	B B B
33	Denver	B B B
34	Seattle	B B B
35	Los Angeles	B B B
36	Rotterdam	B B B
37	Hong Kong	B B B
38	New York	B B B
39	Berlin	B B B
40	Zhuhai	B B
41	Tianjin	B B
42	Chongqing	B B
43	Shenzhen	B B
44	Hangzhou	B B
45	Dubai	B B
46	Tel Aviv	B B
47	Seoul	B B
48	Barcelona	B B
49	Zaragoza	B B
50	Busan	B B
51	Paris	B B
52	Birmingham	B B

Overall ranking	City	Overall rating
53	Chicago	B B
54	Philadelphia	B B
55	Nanjing	B
56	Abu Dhabi	B
57	Guangzhou	B
58	Chengdu	B
59	Shanghai	B
60	Beijing	B
61	Warsaw	B
62	Tokyo	B
63	Osaka	B
64	Brussels	B
65	Ho Chi Minh City	C C C
66	Hanoi	C C C
67	Hyderabad	C C C
68	New Delhi	C C C
69	Krakow	C C C
70	Kuala Lumpur	C C C
71	Riyadh	C C C
72	Moscow	C C C
73	St. Petersburg	C C C
74	Ankara	C C C
75	Bangkok	C C C
76	Lisbon	C C C
77	Rome	C C C
78	Mumbai	C C

Overall ranking	City	Overall rating
79	Bengaluru	C C
80	Makassar	C C
81	Jakarta	C C
82	Medan	C C
83	Budapest	C C
84	Bratislava	C C
85	Bucharest	C C
86	Santiago	C C
87	Buenos Aires	C C
88	Mexico City	C C
89	Sofia	C C
90	São Paulo	C C
91	Medellin	C
92	Kiev	C
93	Cape Town	C
94	Manila	C
95	Athens	C
96	Rio de Janeiro	C
97	Abuja	D
98	Bogota	D
99	Cairo	D
100	Nairobi	D
101	Rabat	D
102	Lagos	D



The Cities in Motion Index 2019



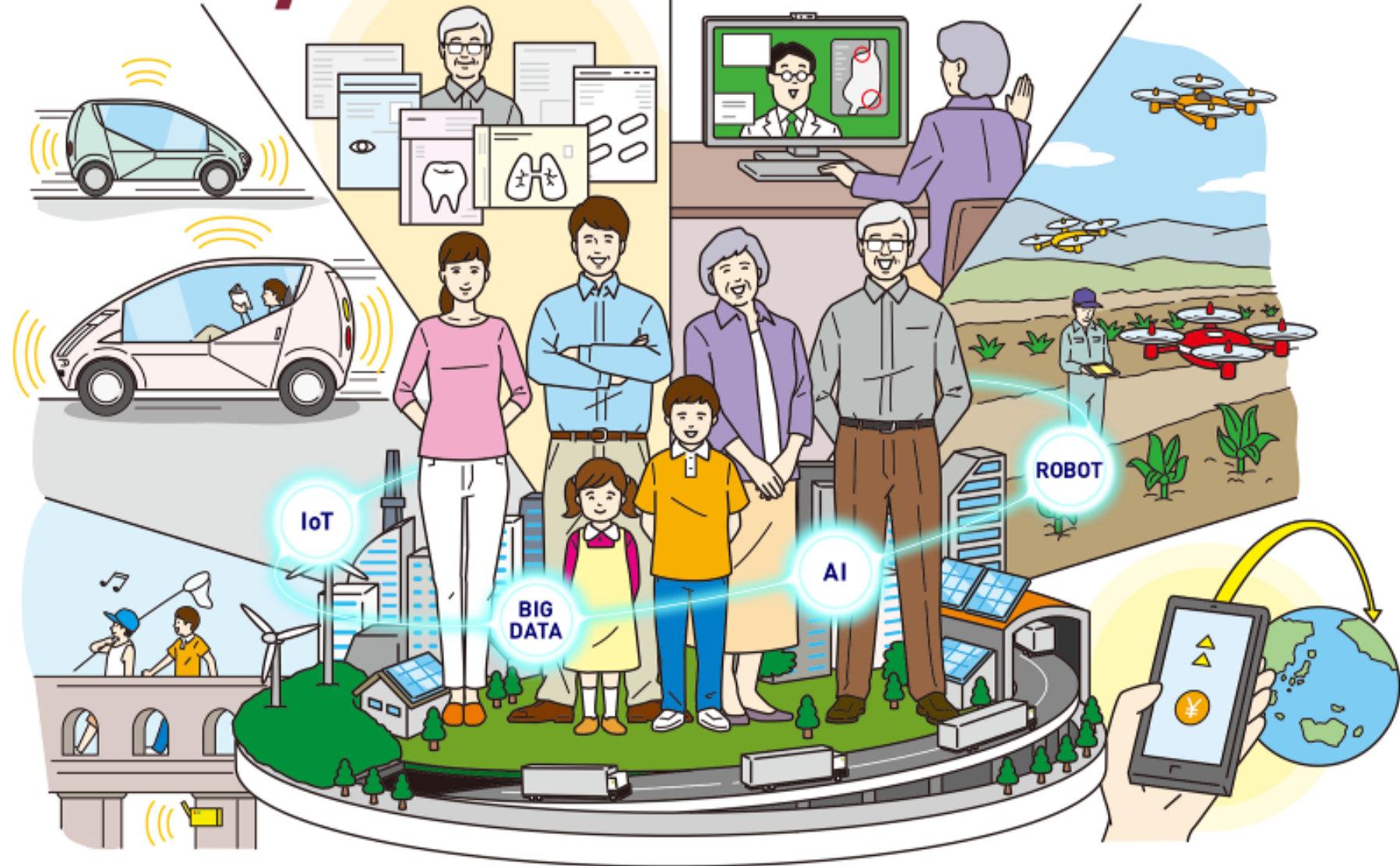
RANKING

163 • Manila (Philippines)

Category	Ranking
Governance	162
Urban planning	160
Technology	158
Environment	149
International outreach	105
Social cohesion	161
Mobility and Transportation	170
Human capital	148
Economy	133



Japan's Society 5.0: Solutions for Better Human Life



Japan's Prime Minister, *Shinzo Abe*
published this commercial
created by the Japanese government
about their new advanced
"Society 5.0"
controlled by AI in 2017.

But what really is 'smart city'?

a generally accepted definition of smart city still lacks



Most cited definitions of ‘smart city’

- **A Smart City is a city well performing built on the ‘smart’ combination of endowments and activities of self-decisive, independent and aware citizen** (Giffinger)
- **A smart community is a community that has made a conscious effort to use information technology to transform life and work within its region in significant and fundamental rather than incremental ways** (California Institute)
- **A city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance** (Caragliu et al.)



Most cited definitions of 'smart city'

- Smart city is defined as the use of information and communication technology to sense, analyze and integrate the key information of core systems in running cities (IBM)
- Smart City is the product of Digital City combined with the Internet of Things (Su et al.)
- Concept of a Smart City where citizens, objects, utilities, etc., connect in a seamless manner using ubiquitous technologies, so as to significantly enhance the living experience in 21st century urban environments (Northstream)



Most cited definitions of ‘smart city’

- **A city that monitors and integrates conditions of all of its critical infrastructures, including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings, can better optimize its resources, plan its preventive maintenance activities, and monitor security aspects while maximizing services to its citizens (Hall)**
- **A smart city is a well-defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of well-being, inclusion and participation, environmental quality, intelligent development; it is governed by a well-defined pool of subjects, able to state the rules and policy for the city government and development (Dameri)**

What makes a city smart?



What do we mean by smartness?



EFFECTIVE



**ENVIRONMENT
CONSIDERATIONS**



INNOVATION

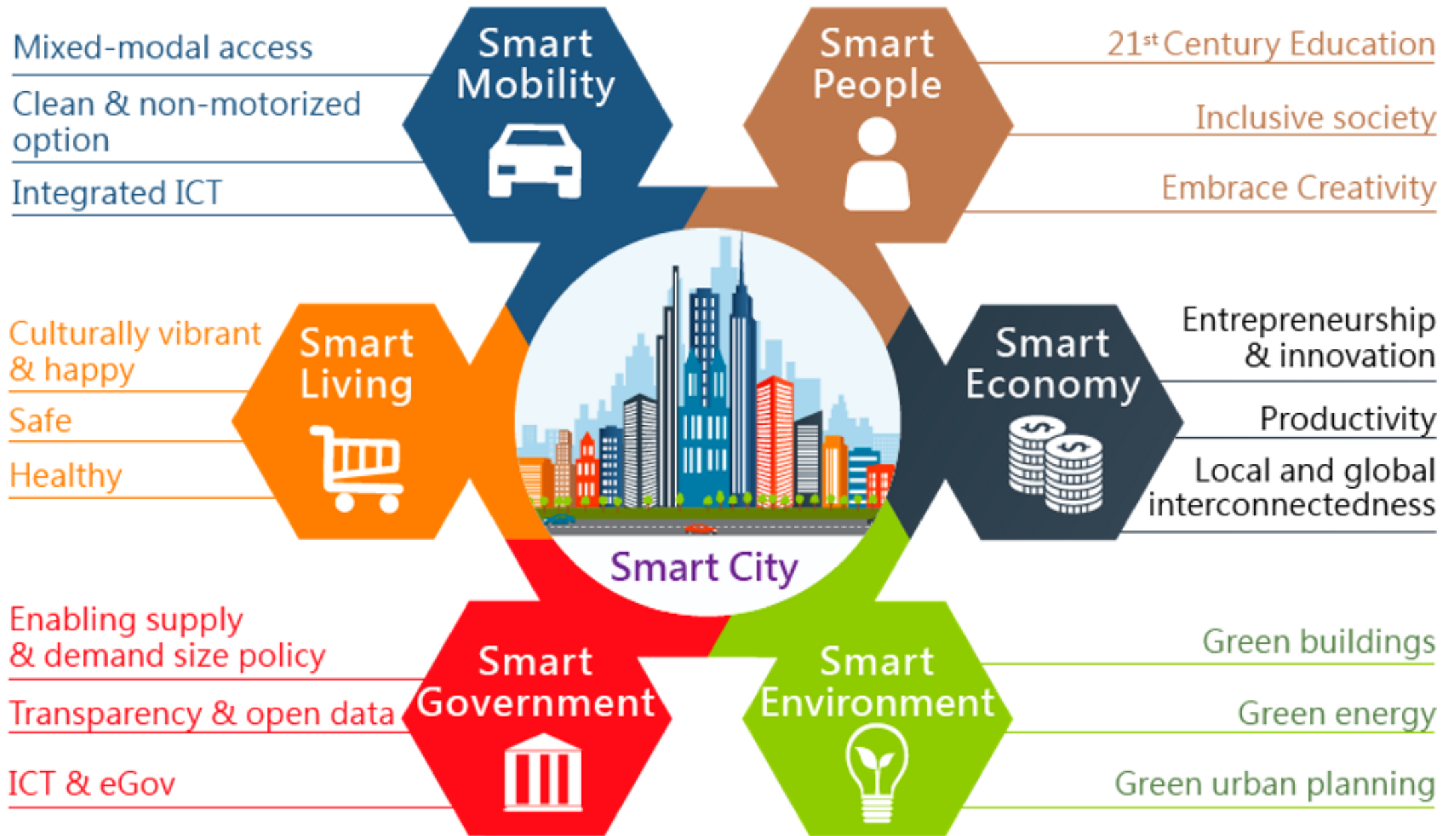
Aims of a smart city



Use of technology and data to deliver

Quality of life in the city

Quality of the city



Smart Economy
(Competitiveness)

- Innovative Spirit
- Productivity
- Flexibility of labour market

Smart People
(Social/Human Capital)

- Affinity for life-long learning
- Participation in public life
- Creativity and flexibility

Smart Governance
(Participation)

- Participation in Decision-making
- Transparent Governance

Smart Mobility
(Transportation and ICT)

- Local Accessibility
- ICT infrastructure
- Sustainable, innovative and safe transport systems

Smart Environment
(Natural Resources)

- Attractiveness of natural conditions
- Environmental protection
- Sustainable resource mgmt

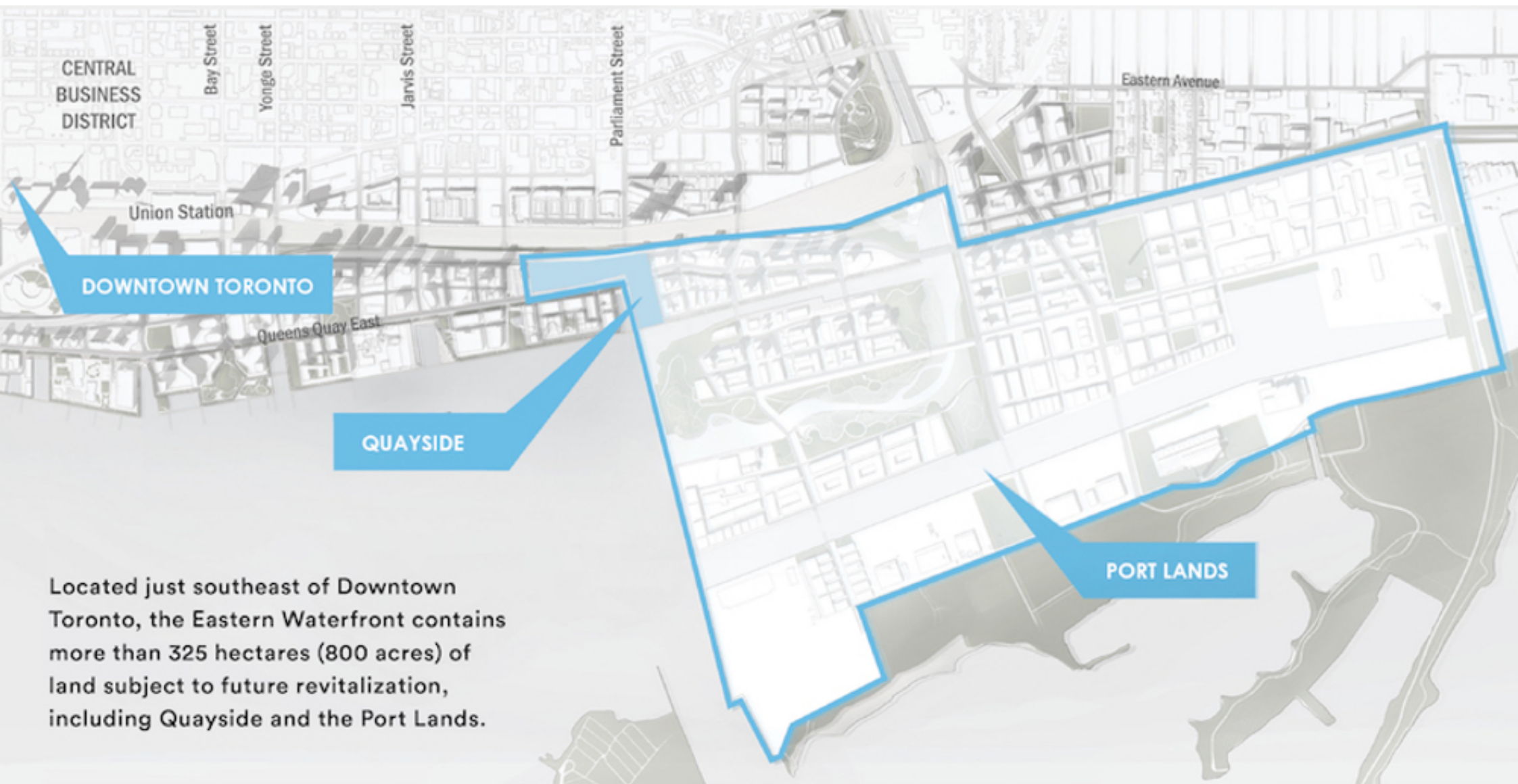
Smart Living
(Quality of Life)

- Cultural Facilities
- Health Conditions
- Housing Quality
- Social Cohesion

Six Characteristics of the Smart City Model

Smart City 1.0: Top-Down, Technologically Driver





Located just southeast of Downtown Toronto, the Eastern Waterfront contains more than 325 hectares (800 acres) of land subject to future revitalization, including Quayside and the Port Lands.

Smart City 2.0- City-driven, Technology-enabled



Smart 3.0: Citizen Co- creation



Smart city and big data

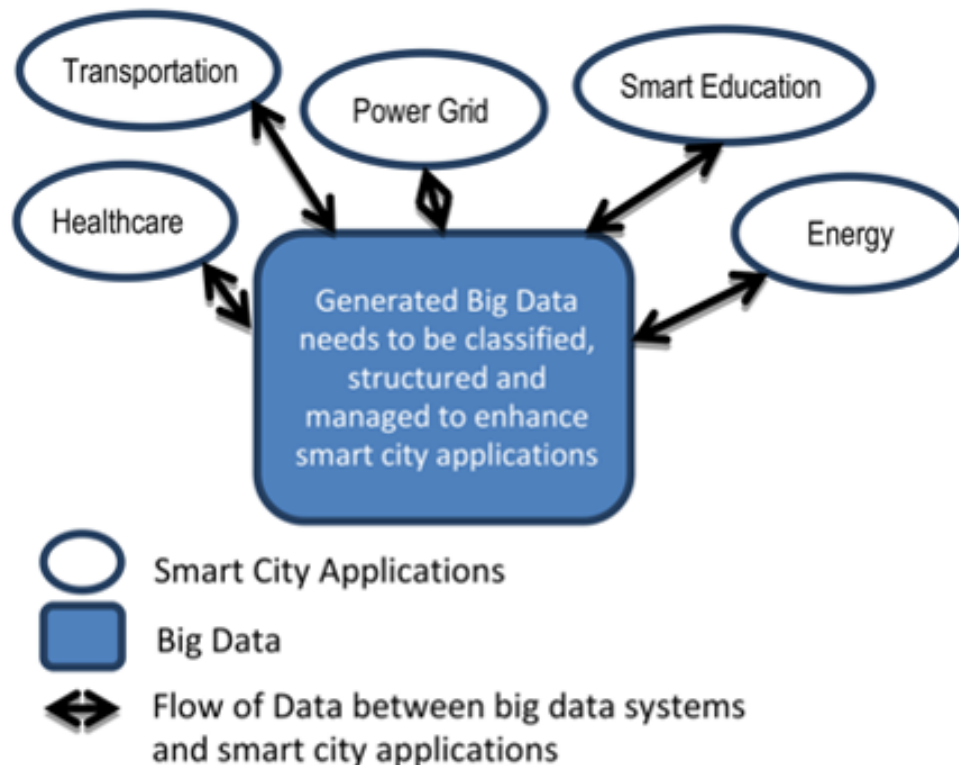
- **Big data lies at the heart of smart city innovation**
 - Big data is a popular term used to describe the exponential growth, availability, and use of information, both structured and unstructured (Michalik, et al.)
 - Data, coming from everywhere; sensors used to gather climate information, posts to social media sites, digital pictures and videos, purchase transaction record, and cell phone GPS signal to name a few (Michalik, et al.)
 - Big Data is defined as large set of data that is very unstructured and disorganized (Khan, et al)
 - Big data is a form of data that exceeds the processing capabilities of traditional database infrastructure or engines (Khan, et al)



The Vs of big data management

- **Volume**
 - *refers to the size of data that has been created from all the sources.*
- **Velocity**
 - *refers to the speed at which data is generated, stored, analyzed and processed. An emphasis is being put recently on supporting real-time big data analysis.*
- **Variety**
 - *refers to the different types of data being generated. It is common now that most data is unstructured and cannot be easily categorized or tabulated.*
- **Variability**
 - *refers to how the structure and meaning of data constantly changes especially when dealing with data generated from natural language analysis for example.*
- **Value**
 - *refers to the possible advantage big data can offer a business based on good big data collection, management and analysis*

Smart city and big data relationship



Smart city applications generate huge amounts of data while big data systems utilize this data to provide information to enhance smart cities applications

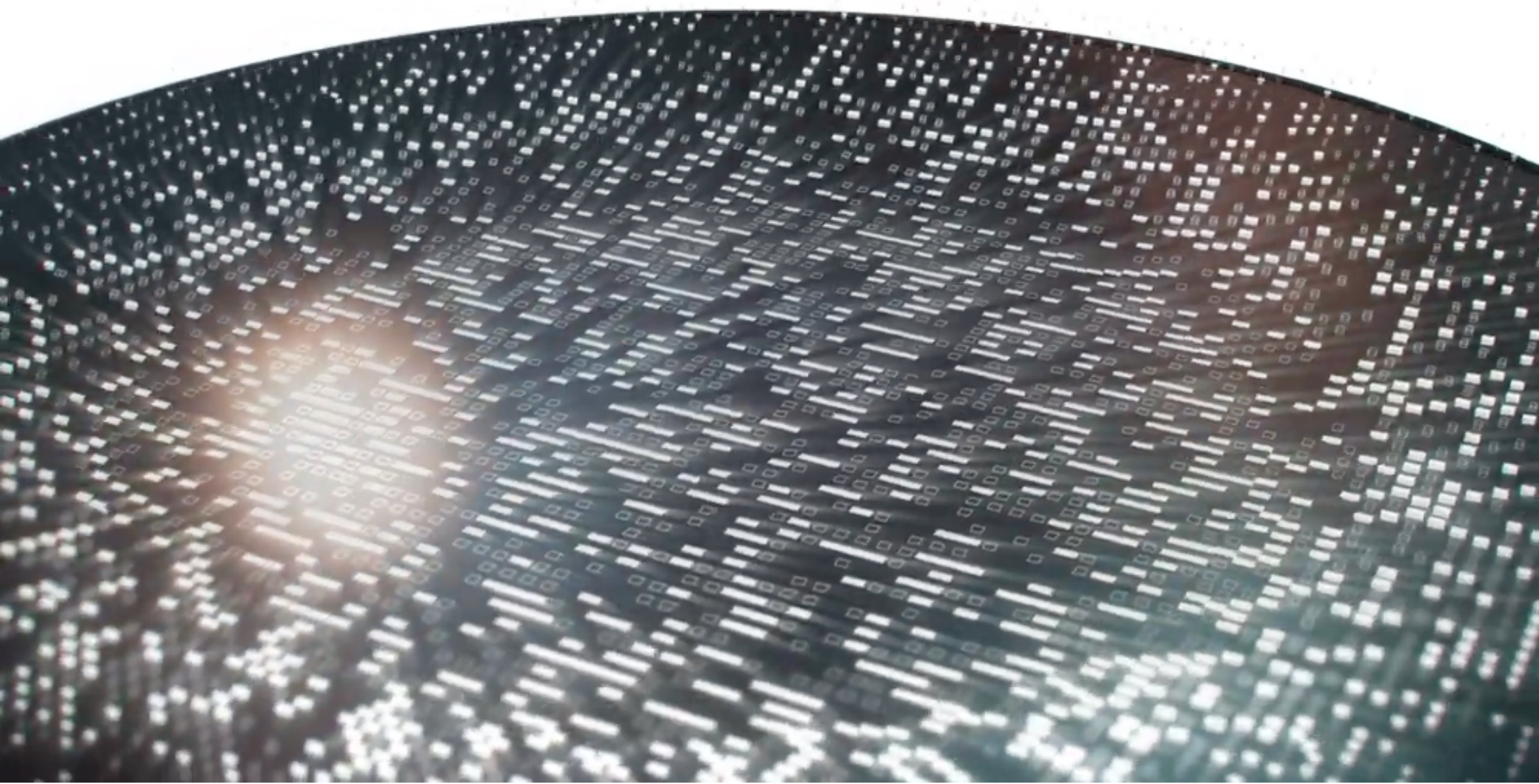
Open Data

- refers to information that can be freely used, modified, & shared by anyone for any purpose
- must be available under an open license & provided in a convenient and modifiable form that is machine readable
- “boots economy to grow by leaps and bounds”



Source : “Creating Value through Open Data” By the Publications Office of the European Union , November 2015

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APPS

Purposeful web apps built with Open Data to answer questions and solve problems.



MAPS

Browse Brampton's gallery of cartographic products that are built with Open Data.



STORIES

A platform to share stories with residents relating to the City's current initiatives.



OPEN DATA

Analyze it. Visualize it. Download it. This is Open Data with a purpose.



CITY DASHBOARD

Monitoring service performance and community measures helps to drive continuous improvement.



BUDGET 2019

The 2019-2021 Proposed Operating and Capital Budgets. We are building a future ready Brampton.



ONLINE SERVICES

Submit and track your service requests, and browse the City's Online Service Offerings.




FEEDBACK

Take this quick survey to let us know how we're doing, and how you use, or plan to use Brampton's Open Data.

The Brampton GeoHub is a platform that features initiative driven tools that help grow transparency and foster innovation everywhere. Combine datasets and perform analysis through the use of maps and charts, or simply download the data to tell your own story.



 **Finance & Assets**


Responsible and accountable organizational practices.



 **Customer Service**


Providing quality service that meets needs and expectations.



 **Community Well-Being**

Caring for the health, safety and well-being of our residents.



 **Livability**


Connecting people and places through live, work and play.



 **Economy**

Encouraging investment to grow our global success.

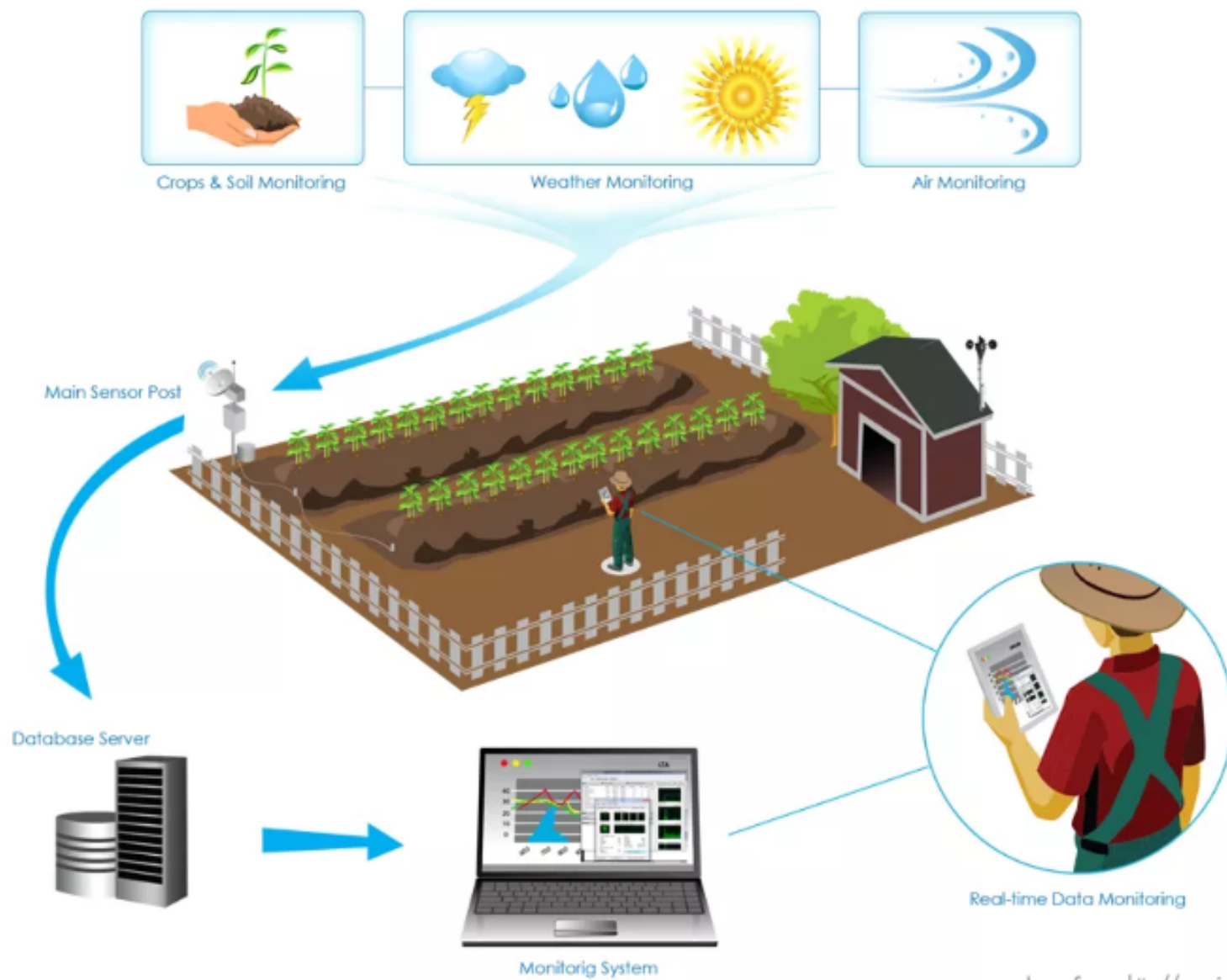


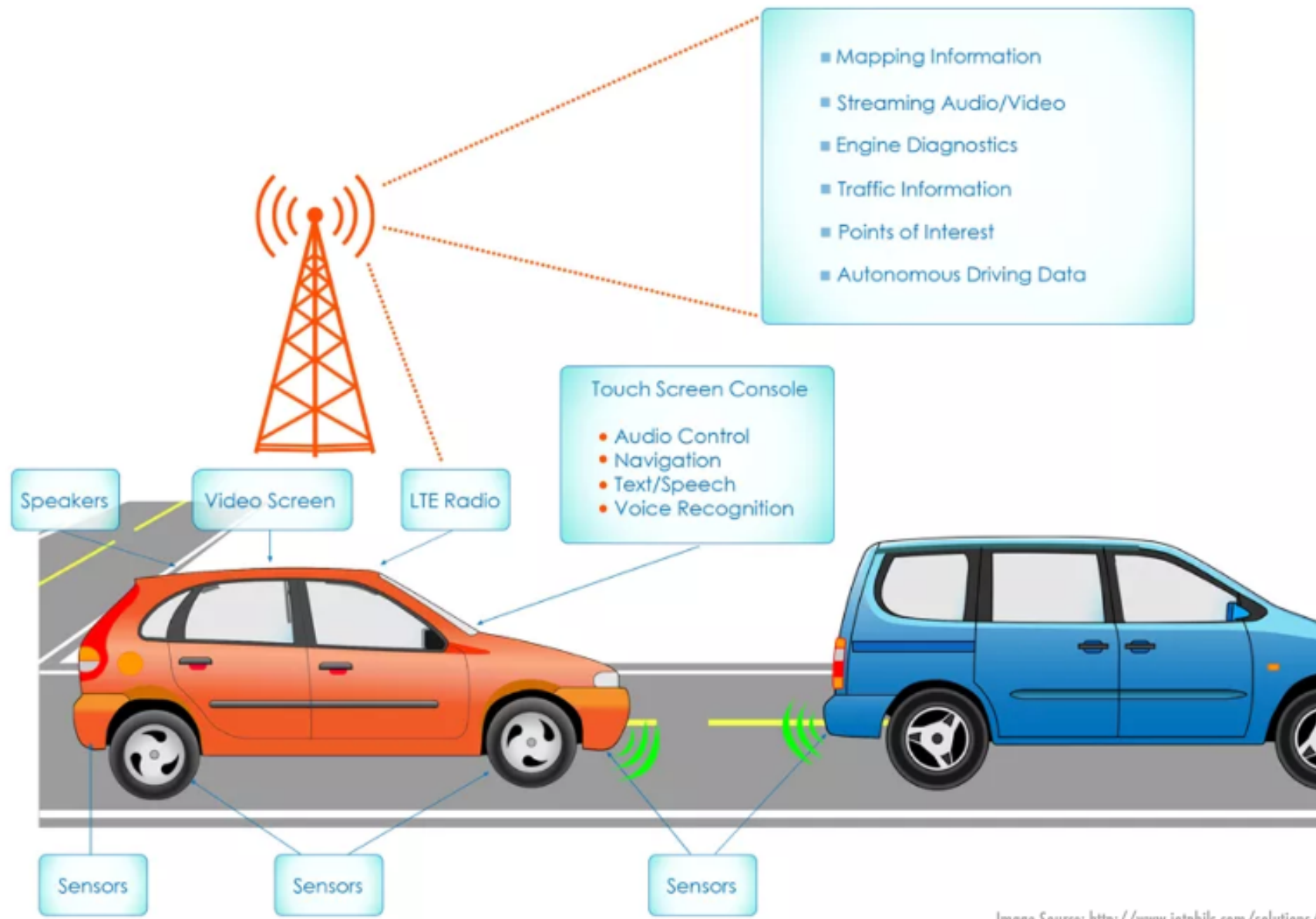
 **Urban Form**

Managing growth and building complete communities.

Internet of Things







- Mapping Information
- Streaming Audio/Video
- Engine Diagnostics
- Traffic Information
- Points of Interest
- Autonomous Driving Data

- Touch Screen Console
- Audio Control
 - Navigation
 - Text/Speech
 - Voice Recognition

Speakers

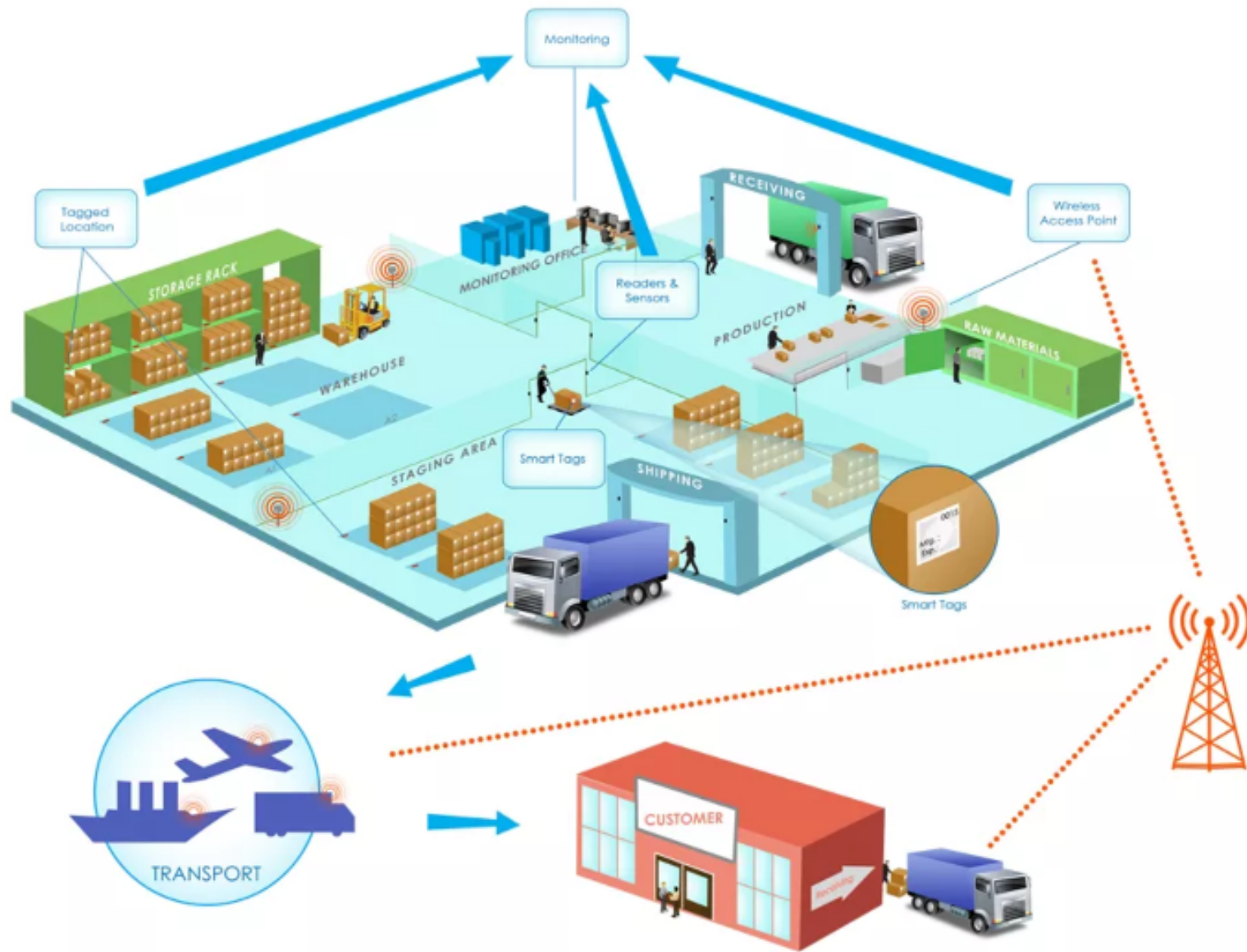
Video Screen

LTE Radio

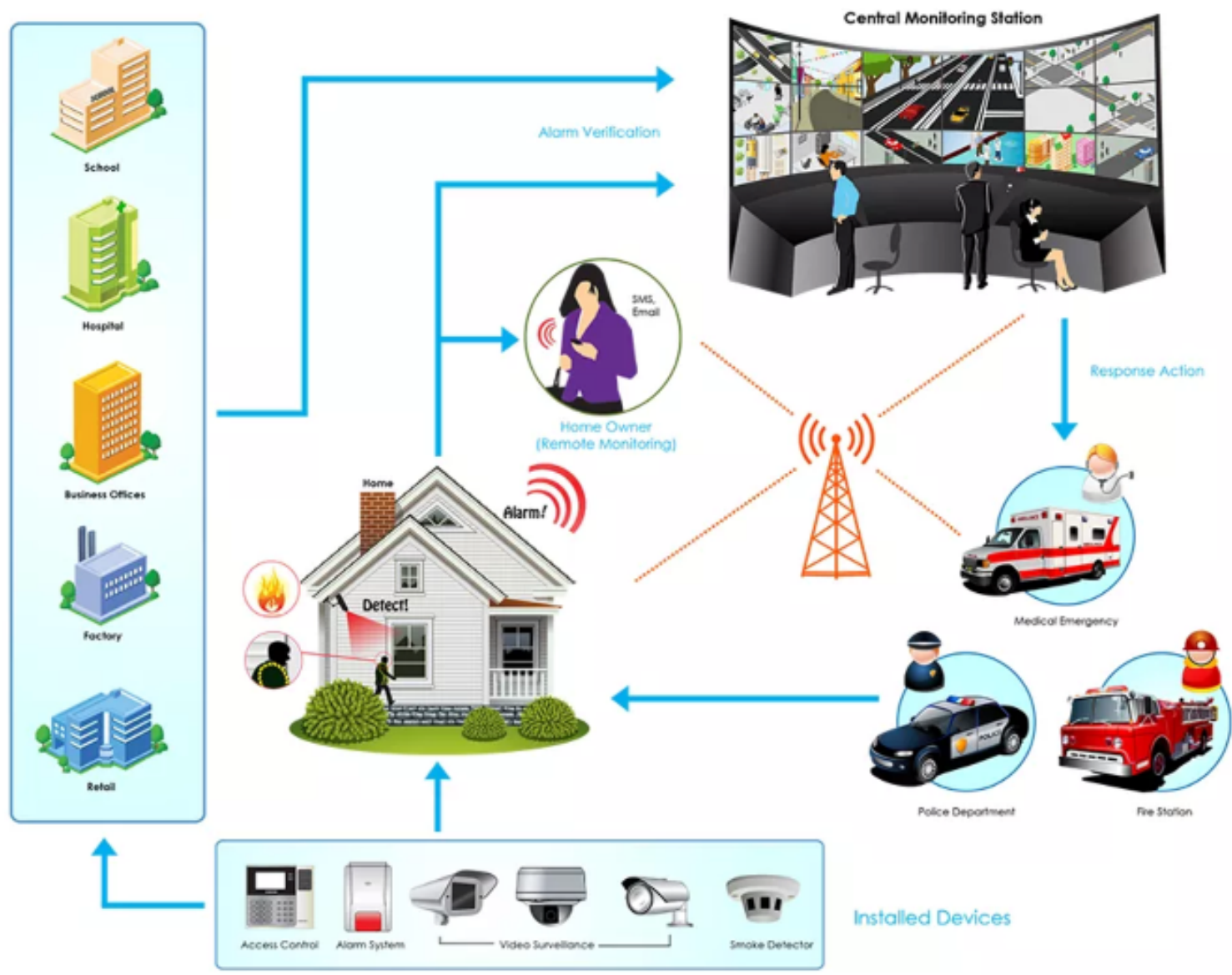
Sensors

Sensors

Sensors







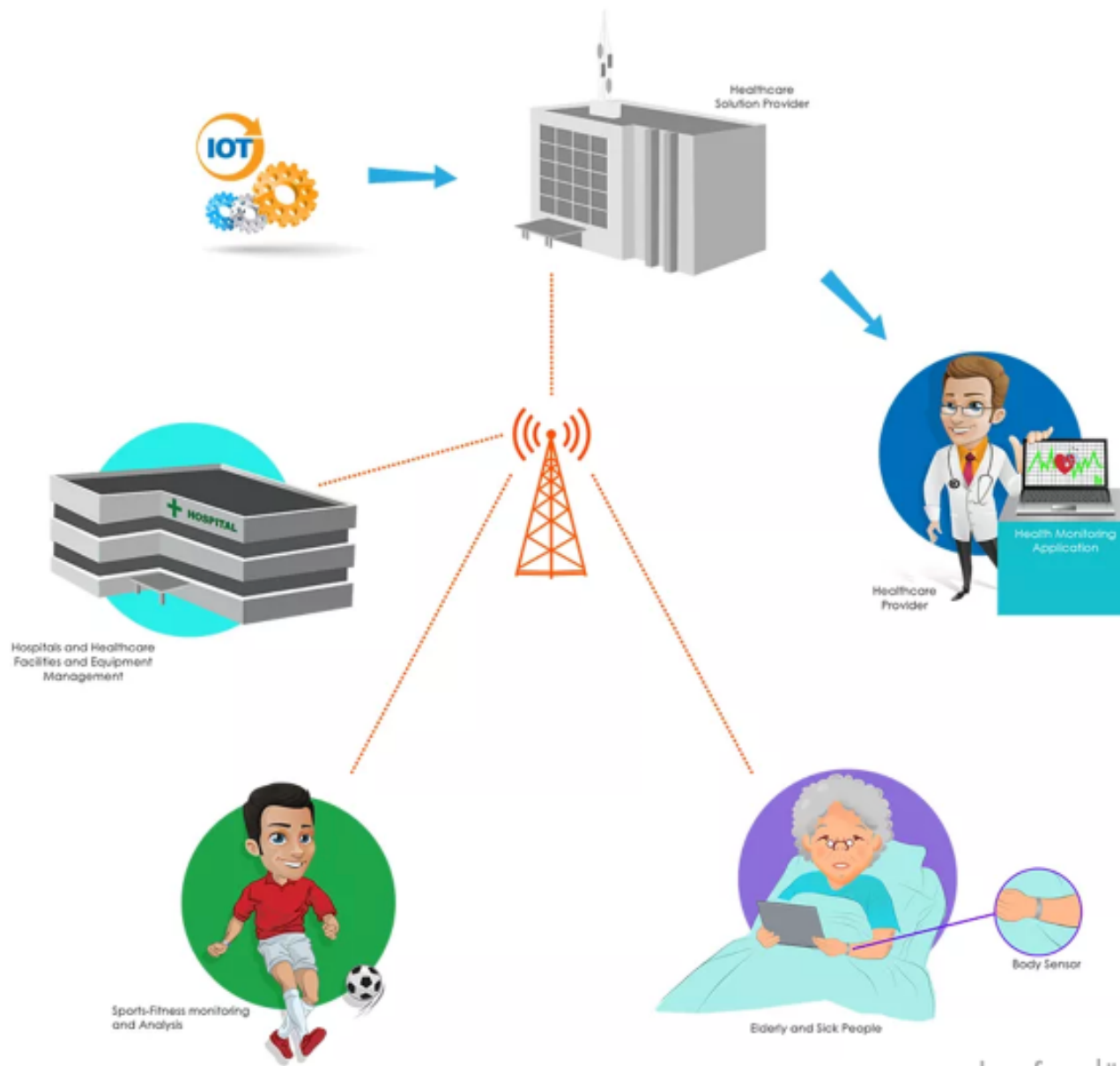
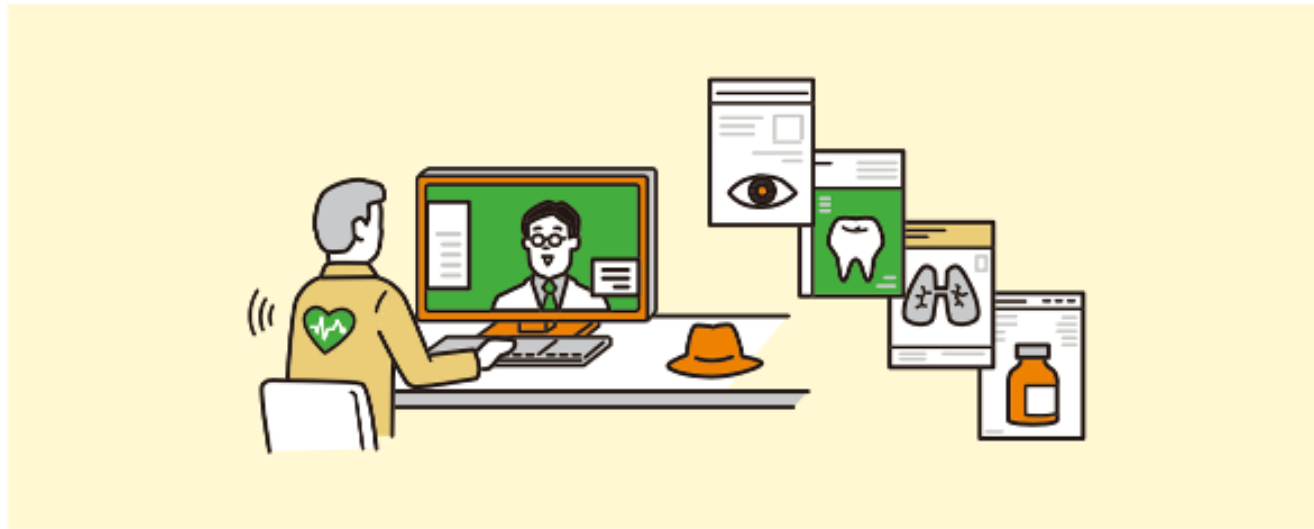


Image Source: <http://www.iotphils.com/solutions/health-and-wellness/>

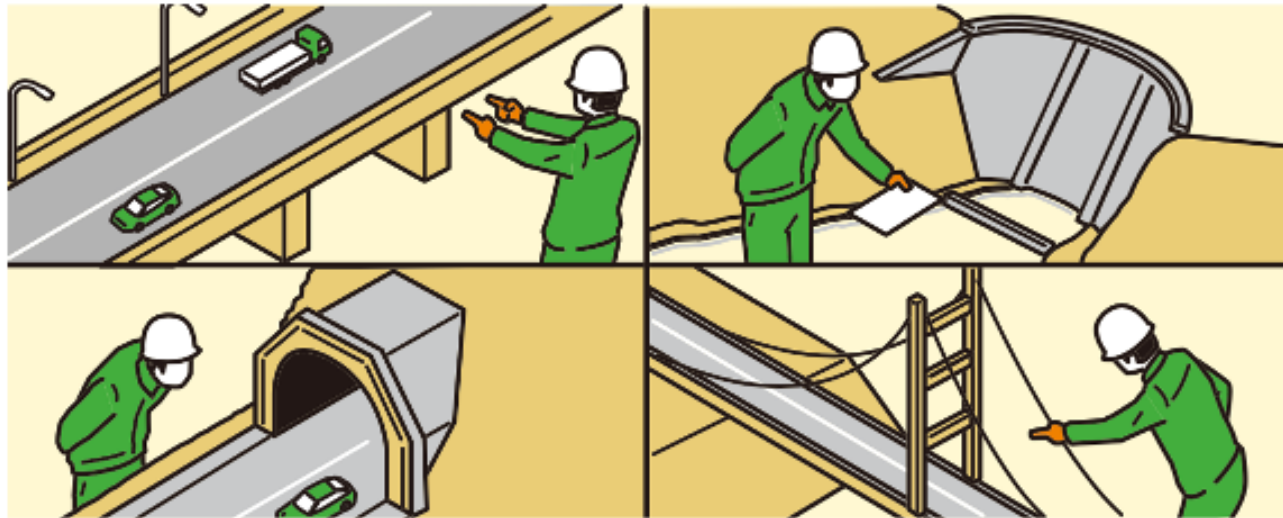
Before



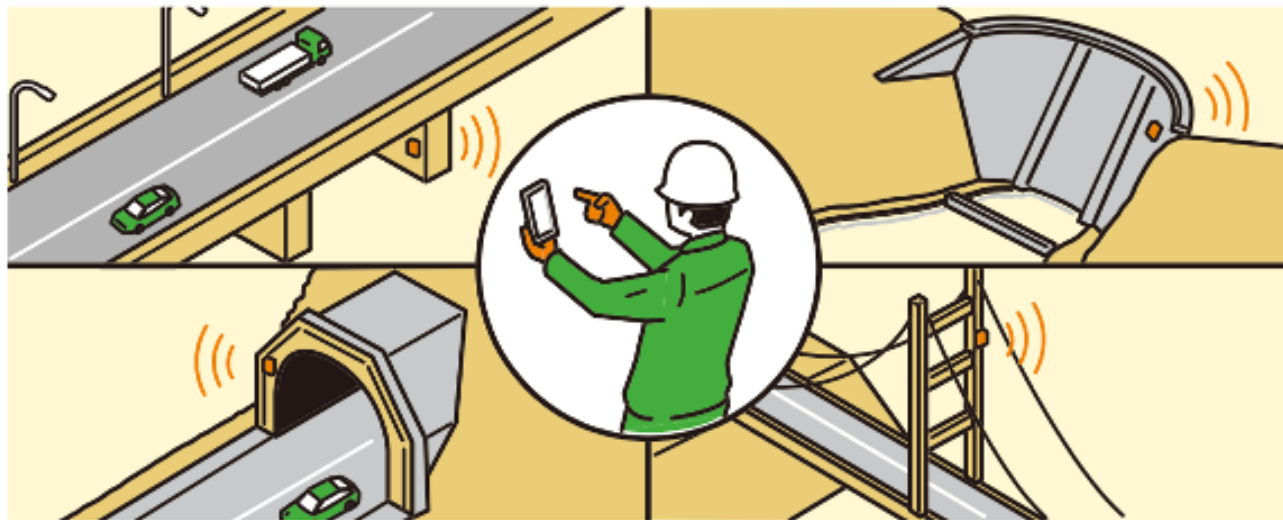
After



Before



After



Transforming cities into smart cities

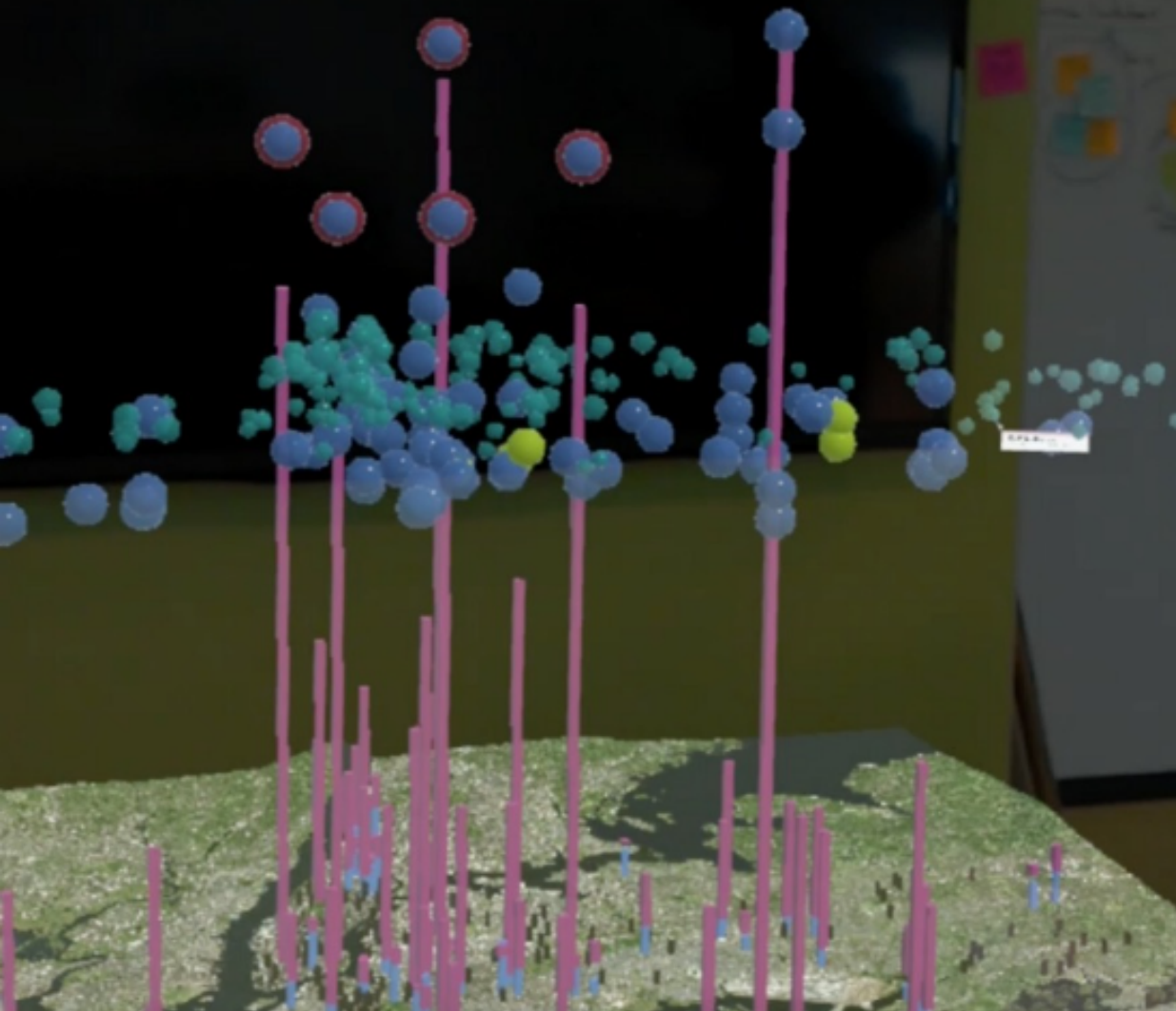


Image: Gowling WLG



Immersive Virtual Reality (© STIPO)

Visualization of big data



Understand impacts of proposed development

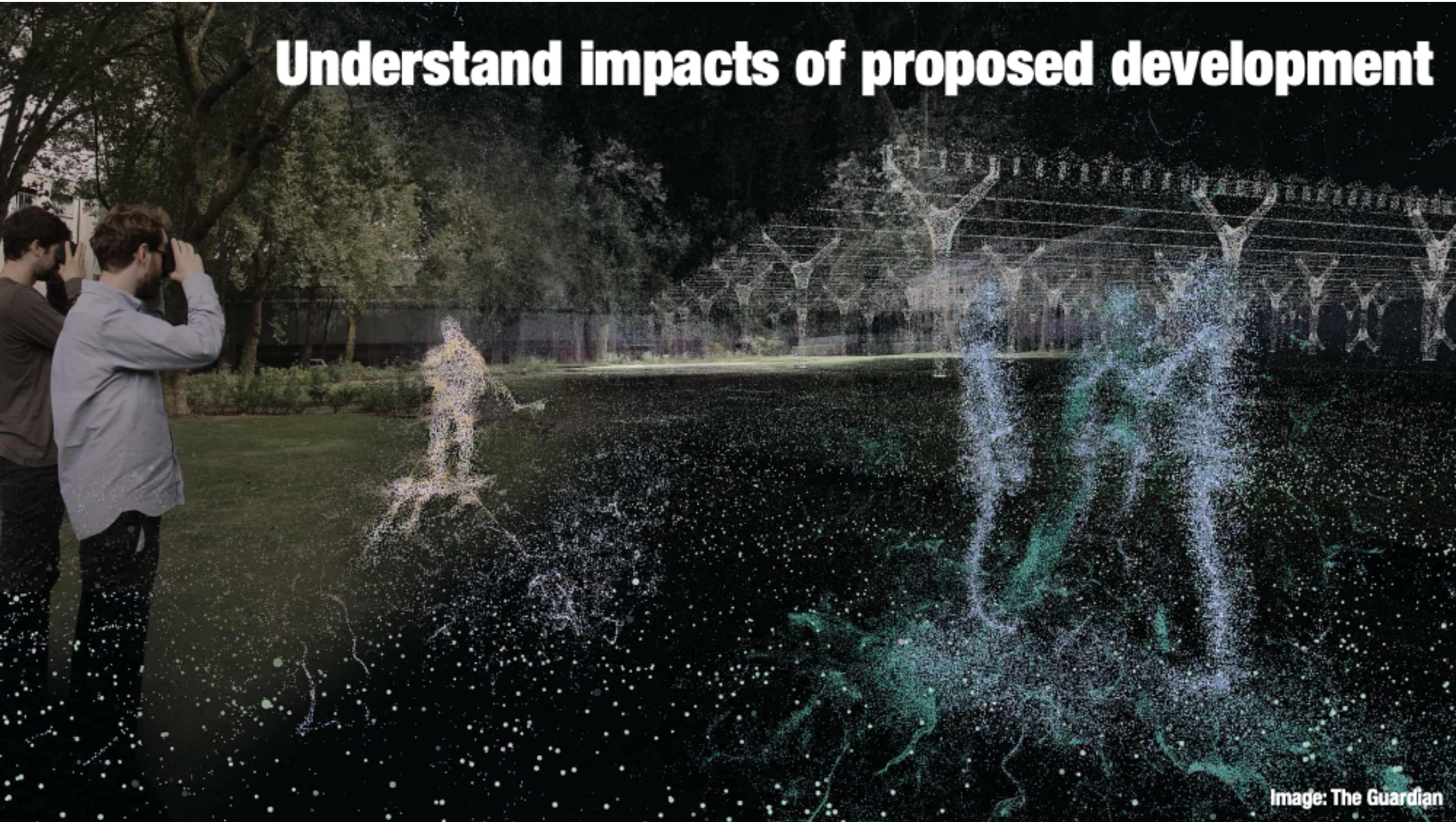


Image: The Guardian



Encourage citizens to participate in urban planning and governance

Image: REUTERS/Albert Gea



An augmented reality view of a city being used as an urban planning tool from MIT Media Lab. // Ariel Noyman/MIT Media Lab



Mixed Reality in Urban Planning



Augmented reality associated with a ground-plan (© Artikel)

Image in an immersive room (© IRISA)



Urban

A virtual Paris, Archivideo (© Archivideo)





VIRTUAL SINGAPORE





The Privacy/Transparency Balance



Brief Country Urbanization Profile

Urbanization in the Philippines

The Philippines	1960	1970	1980	1990	2000	2010	2016
Total Population	26,273,025	35,804,729	47,396,968	61,947,348	77,991,569	93,726,624	103,320,222
<i>Population Growth</i>	-	36%	32%	31%	26%	20%	10%
GDP per capita (sus)	\$254.43	\$186.77	\$684.65	\$715.31	\$1,038.91	\$2,129.50	\$2,951.07
<i>Rank in Southeast Asia</i>	-	-	-	-	5th out of 11	6th out of 11	6th out of 11
Total Urban Population	7,959,938	11,808,042	17,764,858	30,100,216	37,400,857	42,415,984	45,759,493
<i>Rank in Southeast Asia</i>	2nd out of 11	2nd out of 11	2nd out of 11	2nd out of 11	2nd out of 11	2nd out of 11	2nd out of 11
<i>Urban Population %</i>	30%	33%	37%	49%	48.0%	45.26%	44.29%
<i>Rank in Southeast Asia</i>	3rd out of 11	3rd out of 11	4th out of 11	4th out of 11	4th out of 11	5th out of 11	6th out of 11
Urbanization Rate (Decade)	-	8.9%	13.7%	29.6%	-1.3%	-5.6%	-2.1%
<i>Rank in Southeast Asia</i>	-	9th out of 11	6th out of 11	3rd out of 11	11th out of 11	11th out of 11	11th out of 11

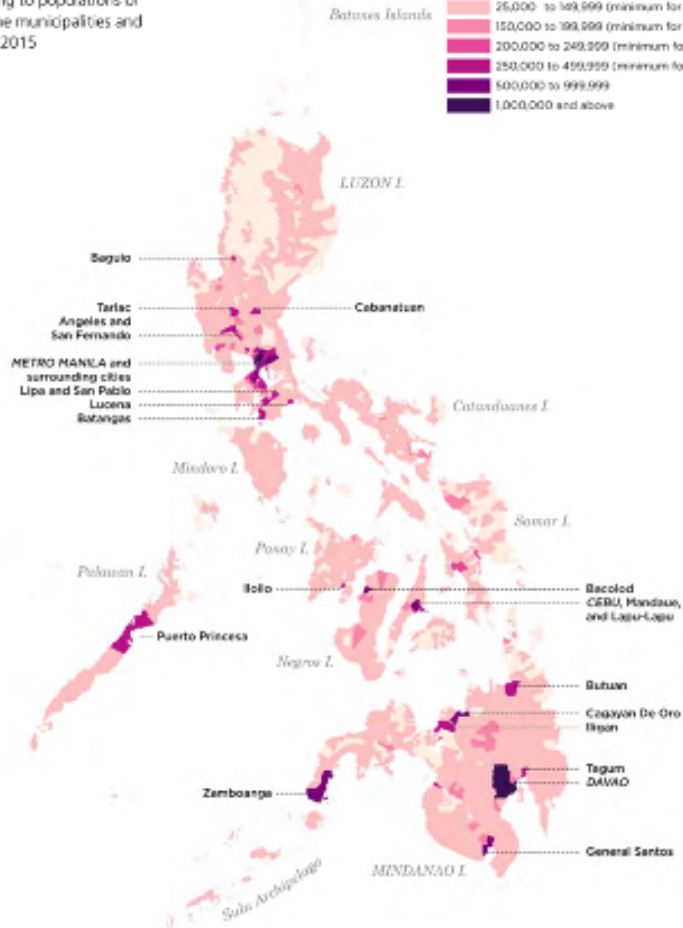
13th most populated country in the world

Area: 342,353 km.²

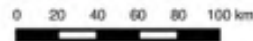
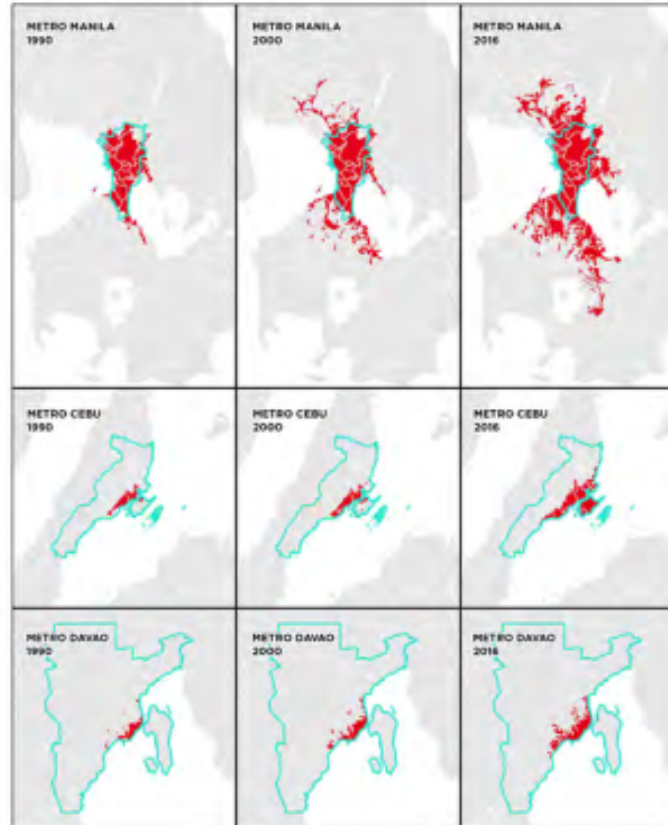
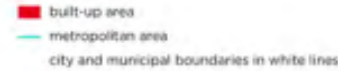
HIERARCHY OF SETTLEMENTS

According to populations of Philippine municipalities and cities in 2015

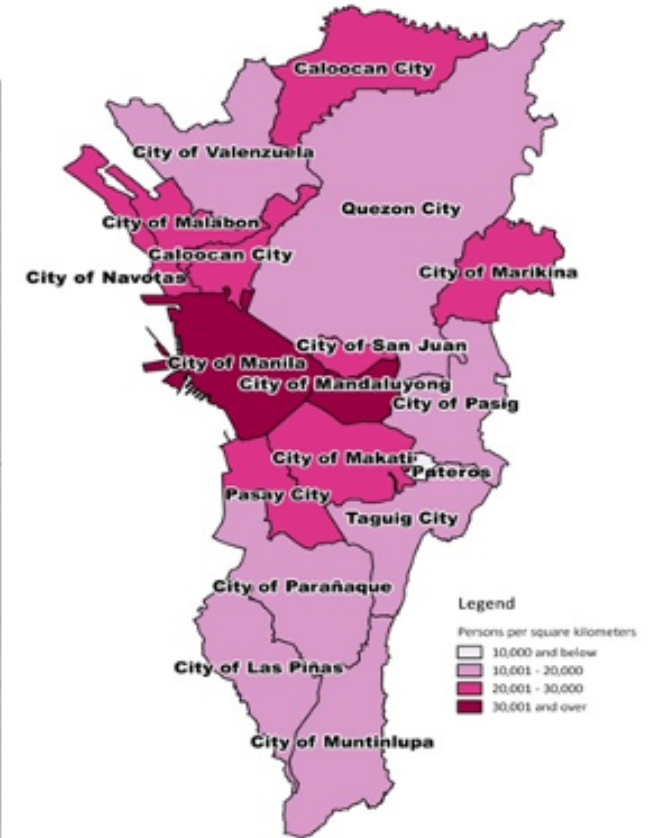
LEGEND



Change in Built-up Areas 1990, 2000, and 2016



SOURCES
 Administrative Boundaries From: NSO/PSA, PH 1990
 Built-up areas traced from Google Earth

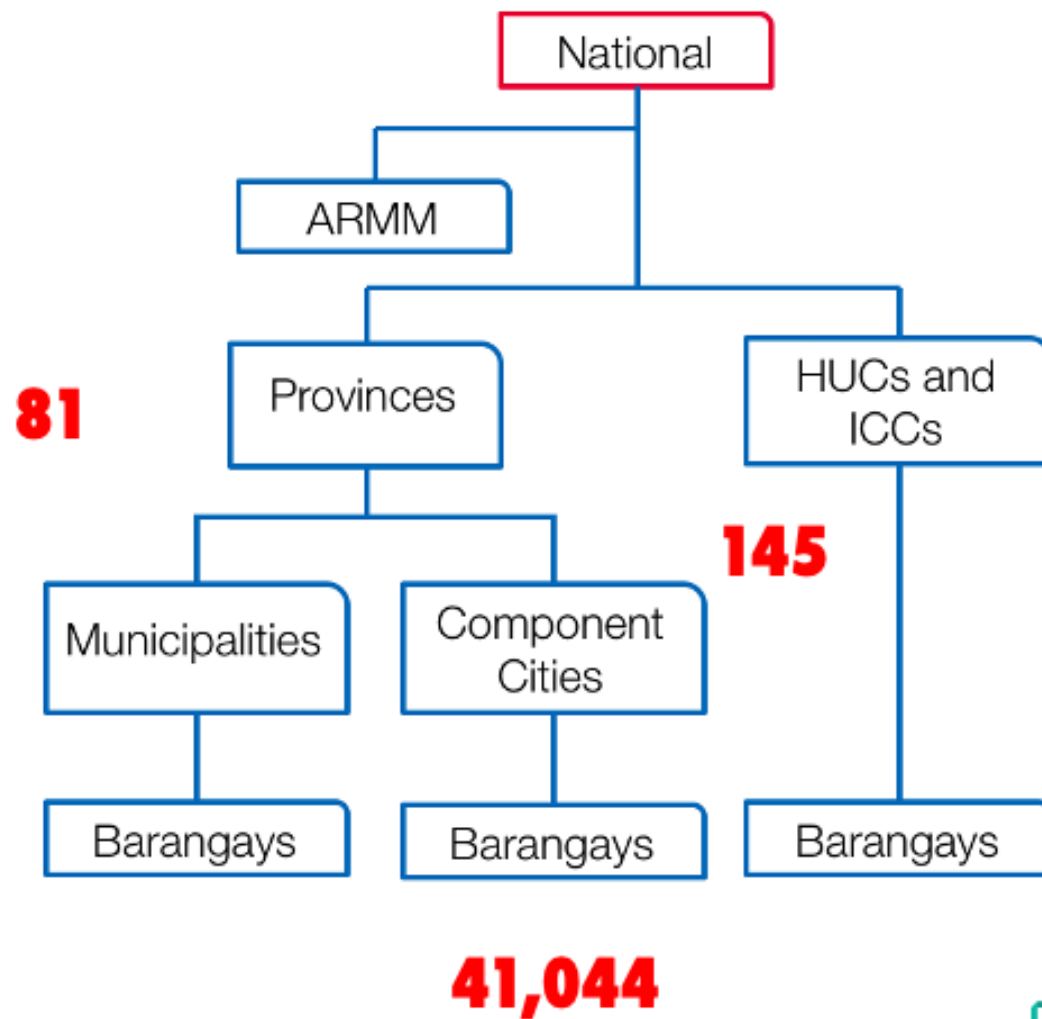


619.57 km² (239.22 mi²)

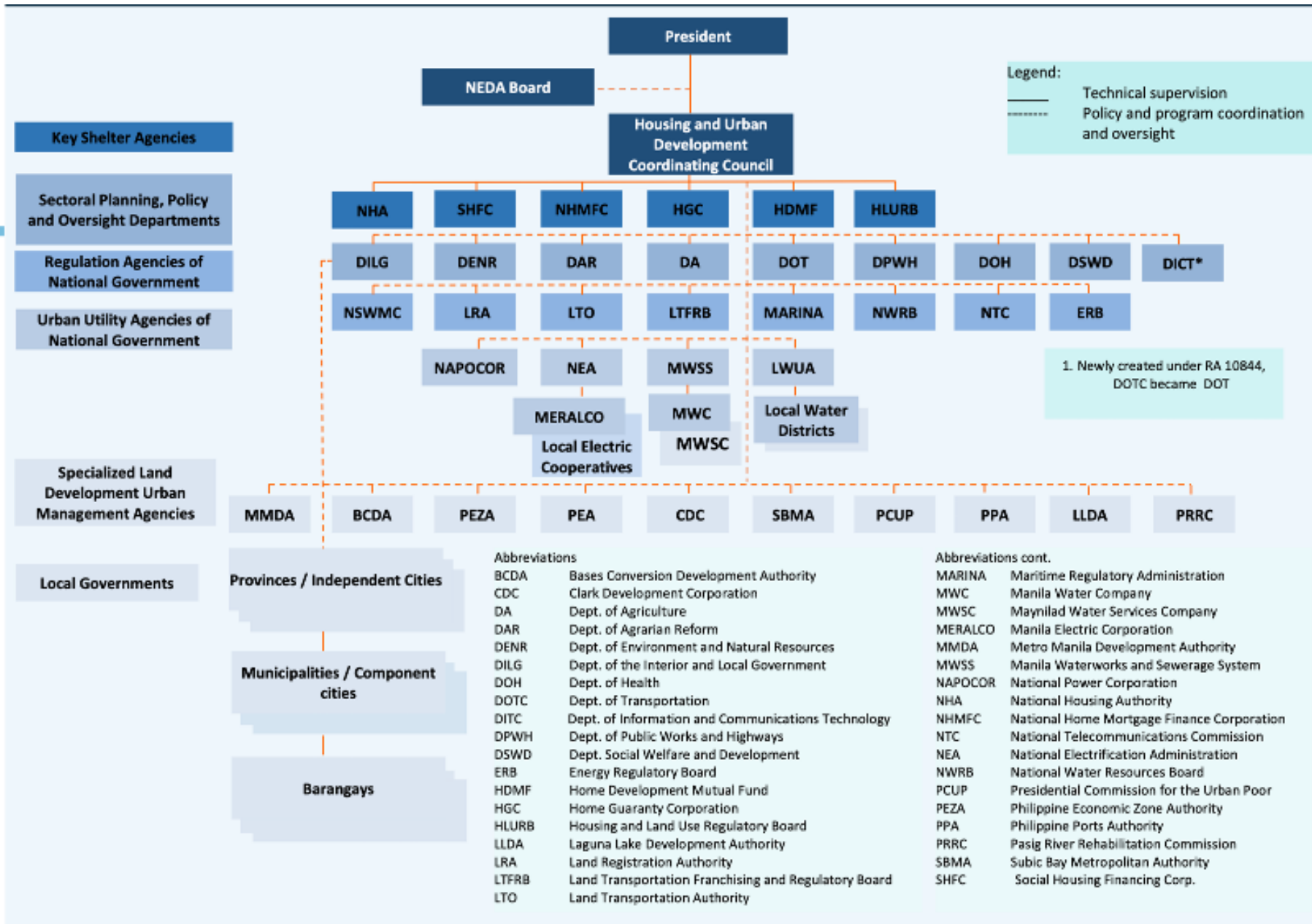
5,617 persons per km²

Institutional Arrangements for Delivering Urban Services

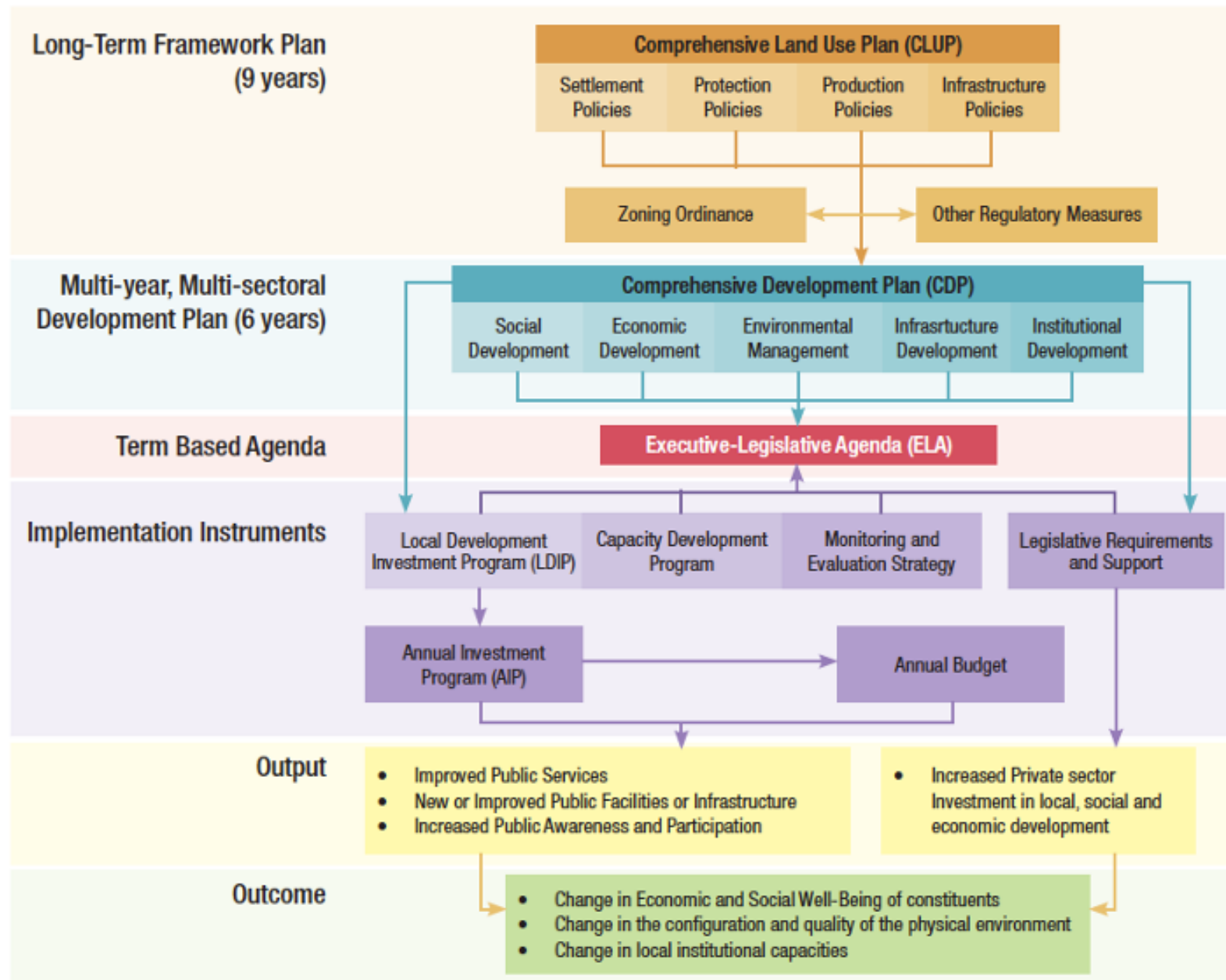
1,489



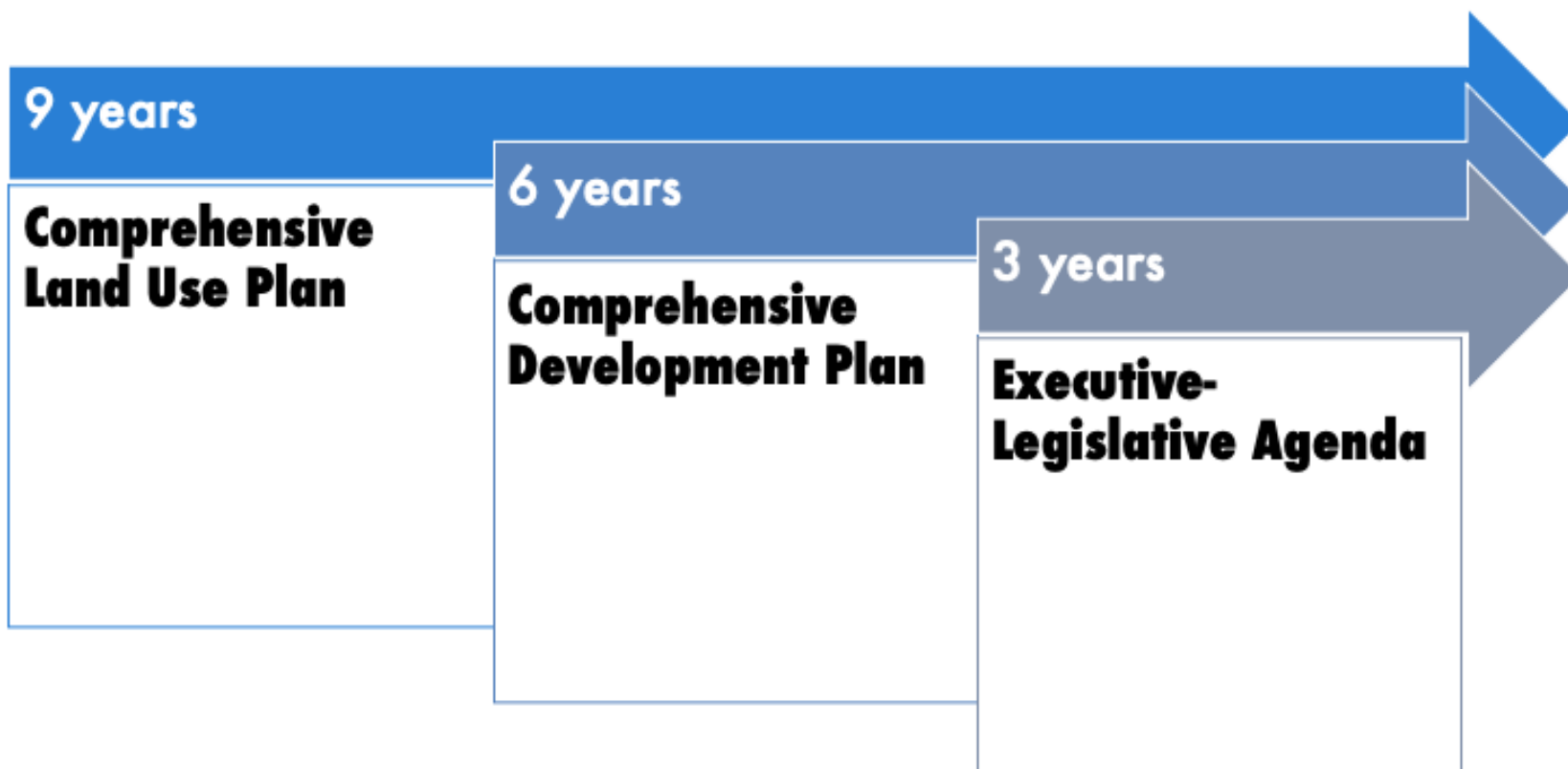
Legal and Policy Framework



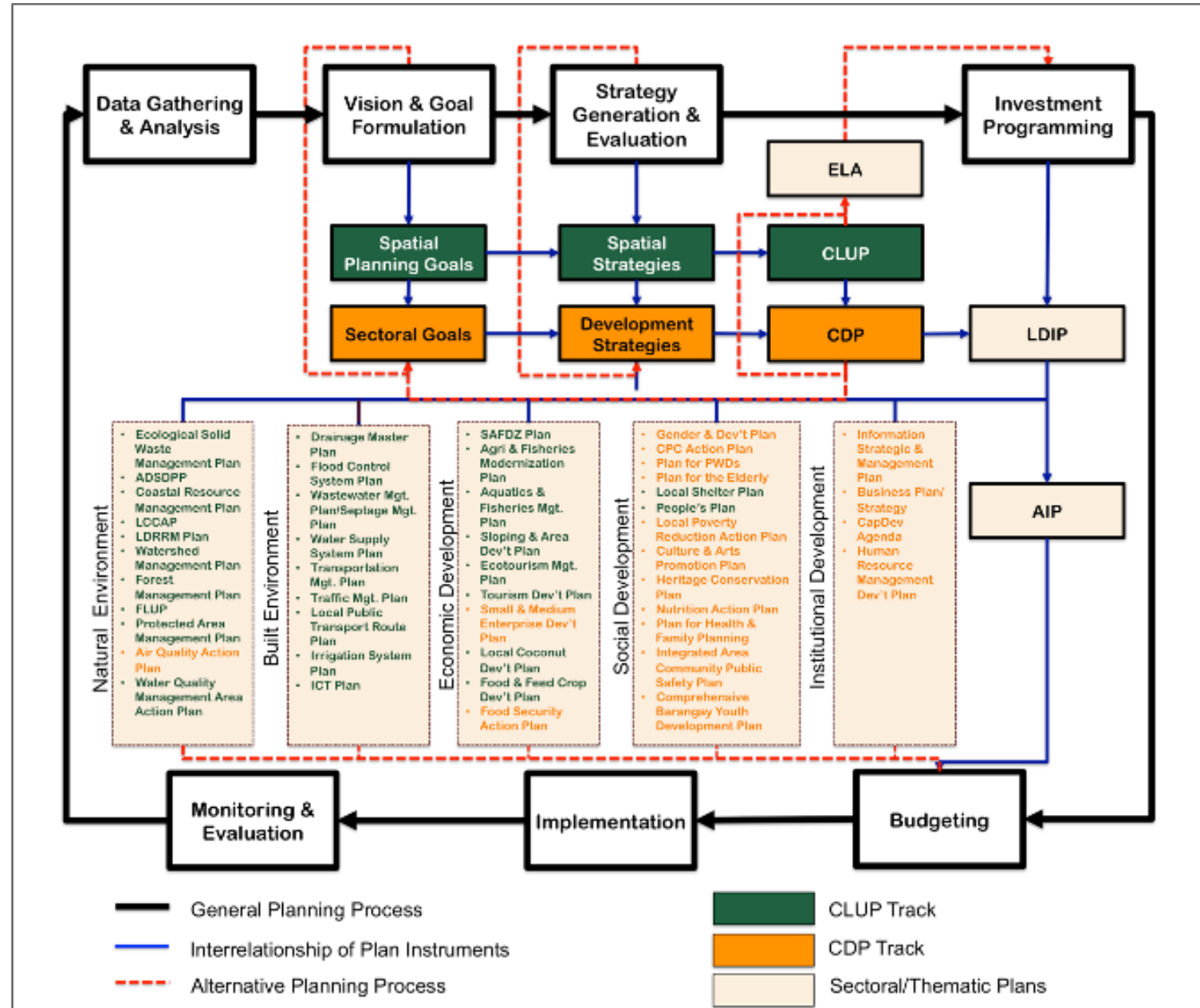
The Logic of LGU Plans



Temporal Coverage of Local Plans



LGU- Mandated Plans





DEPARTMENT OF THE INTERIOR AND LOCAL GOVERNMENT
 DILG-NAPOLCOM Center, EDSA corner Quezon Avenue, II
 http://www.dilg.gov.ph

MEMORANDUM CIRCULAR
No. 2019- 172

17 OCT 2019

MEMORANDUM CIRCULAR
 No. 2019- 172

TO : ALL CITY AND MUNICIPAL MAYORS, DILG FIELD OFFICERS, AND ALL OTHERS CONCERNED

SUBJECT : COMPLIANCE OF LOCAL GOVERNMENT UNITS (LGUs) ON THE PREPARATION/UPDATING OF COMPREHENSIVE LAND USE PLANS (CLUPs) AND COMPREHENSIVE DEVELOPMENT PLANS (CDPs)

**TO : ALL CITY AND MUNICIPAL MAYORS
 OTHERS CONCERNED**

SUBJECT : COMPLIANCE OF LOCAL GOVERNMENT UNITS (LGUs) ON THE PREPARATION/UPDATING OF COMPREHENSIVE LAND USE PLANS (CLUPs) AND COMPREHENSIVE DEVELOPMENT PLANS (CDPs)

Section 106 of Republic Act No. 7160 (Local Government Code of 1991) mandates LGUs to prepare a comprehensive multi-sectoral development plan to be initiated by its local development council and approved by its respective Sanggunian. The six (6)-year planning timeframe of the CDP should coincide with the planning period of the prevailing Philippine Development Plan (PDP) as it provides guidance to subnational plans. The importance of the CDP is underscored as the investment program serves as basis for budgets of LGUs as provided in DILG-NEDA-DBM-DOF Joint Memorandum Circular No. 001 S. 2016: *Harmonization of Local Planning, Investment Programming, Resource Mobilization, Budgeting, Expenditure Management, and Performance Monitoring and Coordination in Fiscal Oversight.*

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Section 20 (c) of the 1991 LGC mandates LGUs to prepare a comprehensive multi-sectoral development plan to be initiated by its local development council and approved by its respective Sanggunian. The six (6)-year planning timeframe of the CDP should coincide with the planning period of the prevailing Philippine Development Plan (PDP) as it provides guidance to subnational plans. The importance of the CDP is underscored as the investment program serves as basis for budgets of LGUs as provided in DILG-NEDA-DBM-DOF Joint Memorandum Circular No. 001 S. 2016: *Harmonization of Local Planning, Investment Programming, Resource Mobilization, Budgeting, Expenditure Management, and Performance Monitoring and Coordination in Fiscal Oversight.*

Pursuant thereto, all LGUs are hereby reminded of the importance of the CDP as it provides guidance to subnational plans. The importance of the CDP is underscored as the investment program serves as basis for budgets of LGUs as provided in DILG-NEDA-DBM-DOF Joint Memorandum Circular No. 001 S. 2016: *Harmonization of Local Planning, Investment Programming, Resource Mobilization, Budgeting, Expenditure Management, and Performance Monitoring and Coordination in Fiscal Oversight.*

To support the development/updating of the CDP, LGUs should adhere to the requirements for the preparation issued by the then Housing and Land Use Regulatory Department (HLURD) in its Memorandum Circular No. 2008-156 which provides a guide that puts into effect the provisions of the Rationalized Planning System and other planning laws.

For the formulation of the CLUP, LGUs should adhere to the requirements for the preparation issued by the then Housing and Land Use Regulatory Department (HLURD) in its Memorandum Circular No. 2008-156 which provides a guide that puts into effect the provisions of the Rationalized Planning System and other planning laws.

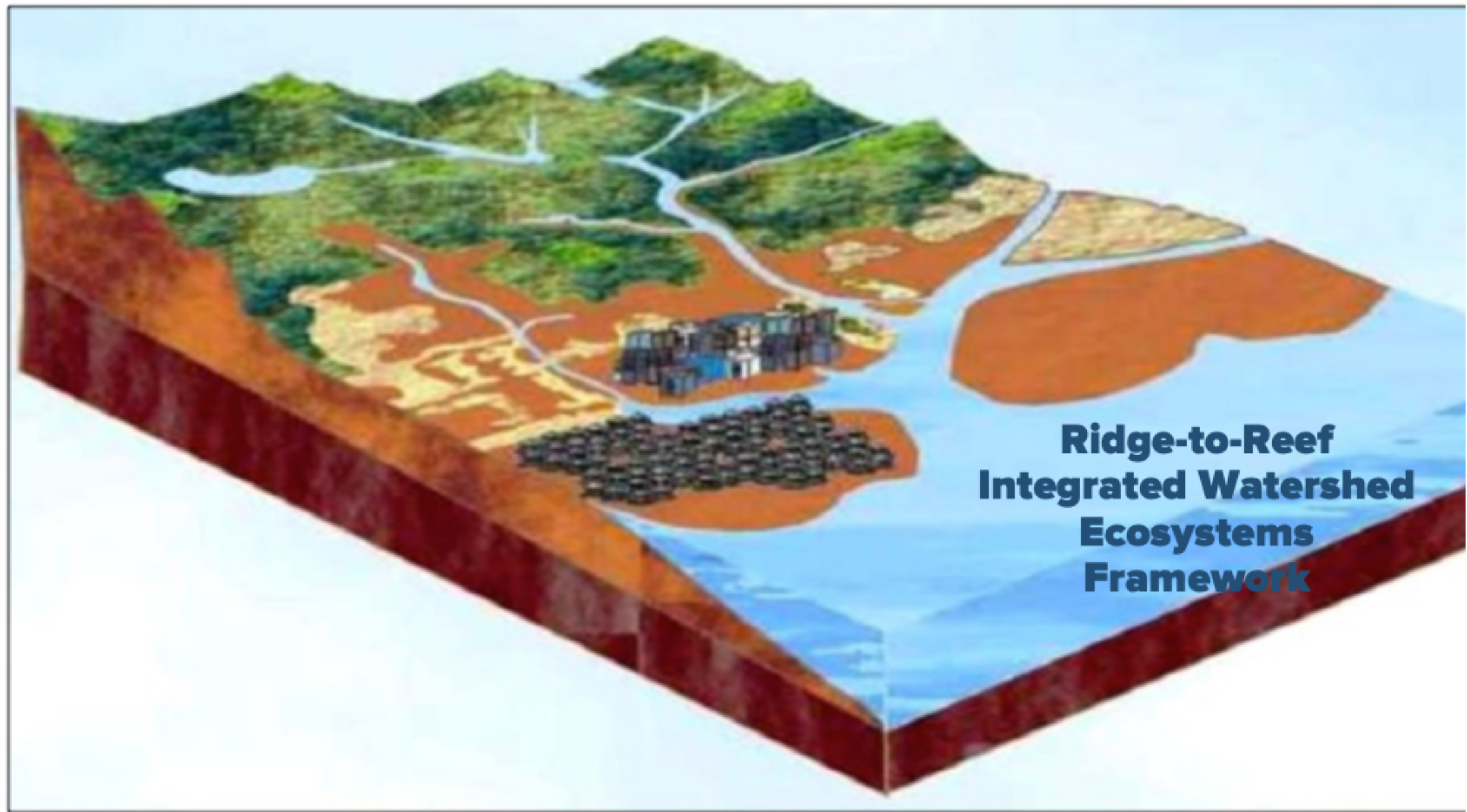
LGUs that fail to comply with the requirements for the preparation of the CDP by June of 2020 will be subjected to an appropriate administrative case filed against them pursuant to Section 60 of the Local Government Code.

LGUs that fail to comply with the requirements for the preparation/updating of CDPs and CLUPs by June of 2020 will be subjected to an appropriate administrative case filed against them pursuant to Section 60 of the Local Government Code.

For information and guidance of all concerned.

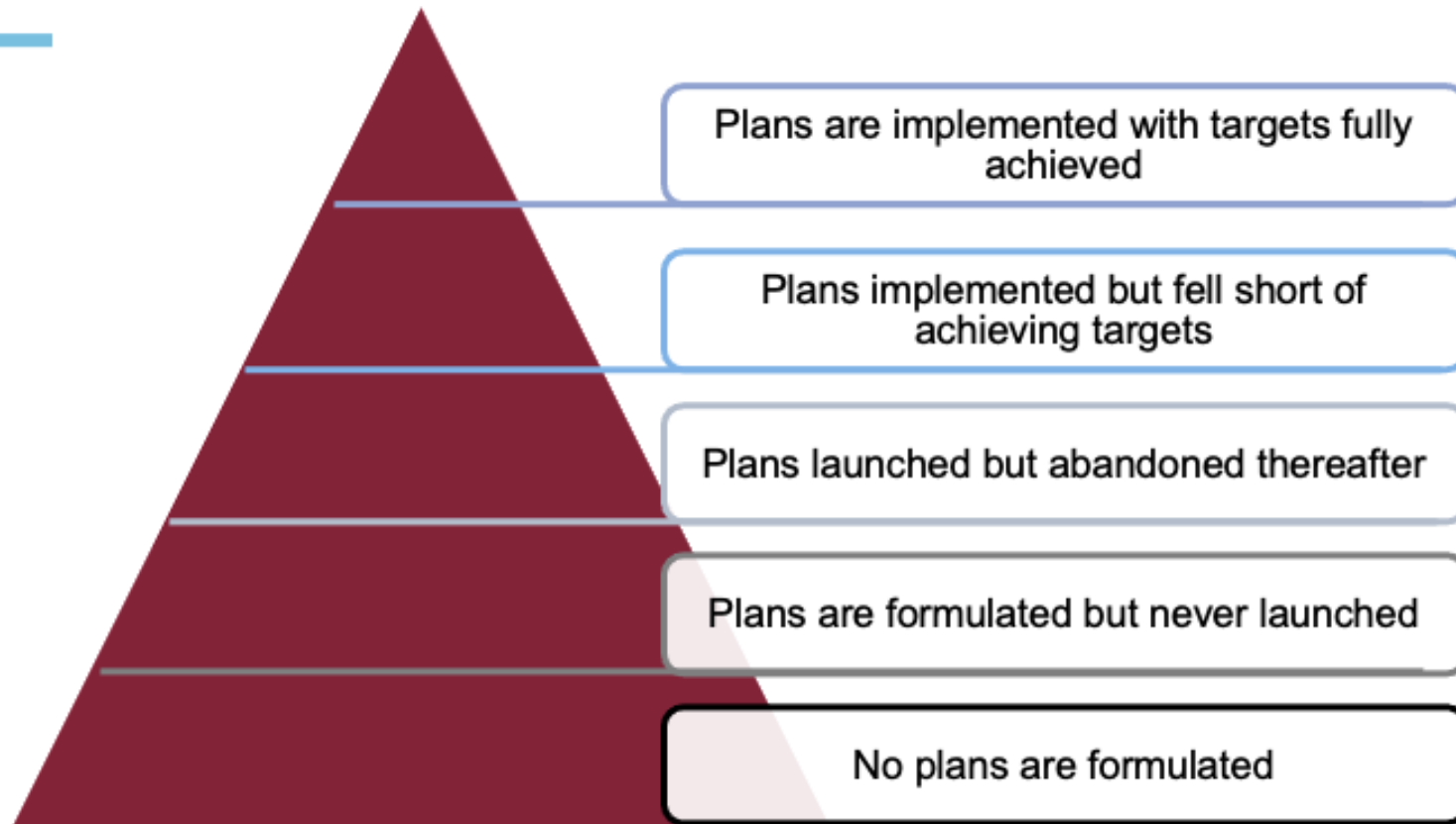
EDUARDO M. AÑO
 Secretary



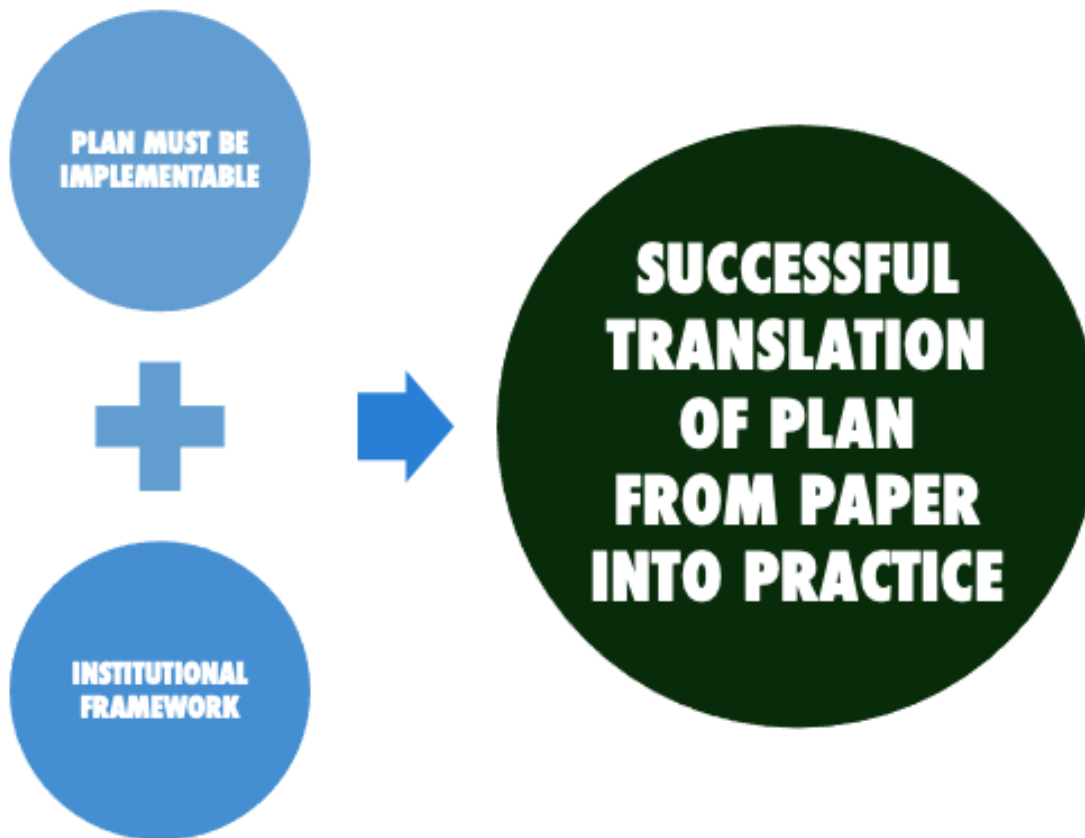


**Ridge-to-Reef
Integrated Watershed
Ecosystems
Framework**

From Promises to Performance?



From Paper to Practice





**Current Initiatives
and Status of
Developing
Standards for Smart
Cities**



SMARTER Philippines



Department of Science and Technology



Smarter Cities

iGovPhil
Smarter LGUs
iTalentDev.PH
Global Leadership in IT-BPO
iCreativePhil
e-Business
Filipinnovation
Smarter SMEs
e-Business Permit Lic. System

Industry-driven curriculum
Transformative Learning Technologies
National Information Infrastructure
Smarter Traffic Management

Internet for All Community e-Centers

new Government CIO Training
DOST Scholarships
Smart Farming
MAKIBAYAN

High Value Electronics
UP Monorail
electric Jeepney
Smart Grids
Renewable Energy
Project NOAH
EWS



Smarter Countryside

Ensuring Universal Access to ICT

Developing Human Capital

e-Governance

Strategic Business Development

Legal and Policy Agenda



LEGEND	
	ENABLING & SUSTAINABLE ICT ENVIRONMENT
	IMPROVED PUBLIC LINKS & CONNECTIVITY
	INDUSTRY AND COUNTRYSIDE DEV'T
	ICT USER PROTECTION AND INFORMATION SECURITY
	RESOURCE SHARING & CAPACITY BUILDING THROUGH ICT
	PARTICIPATORY E-GOVERNANCE



The Metro Manila Greenprint 2030: **Building a Vision**

“Metro Manila for all; green, connected, resilient; offering talent and opportunity; processing knowledge and delivering services at home and abroad.”



Leveraging Opportunities for IT-BPO

Unleashing Tourism Potential and attracting newly-rich neighbors

Reclaiming High-Value Services and Promoting High-Potential Economic Clusters

Connecting Metro Manila

Making Metro Manila Inclusive

Developing a Resilient Metropolis

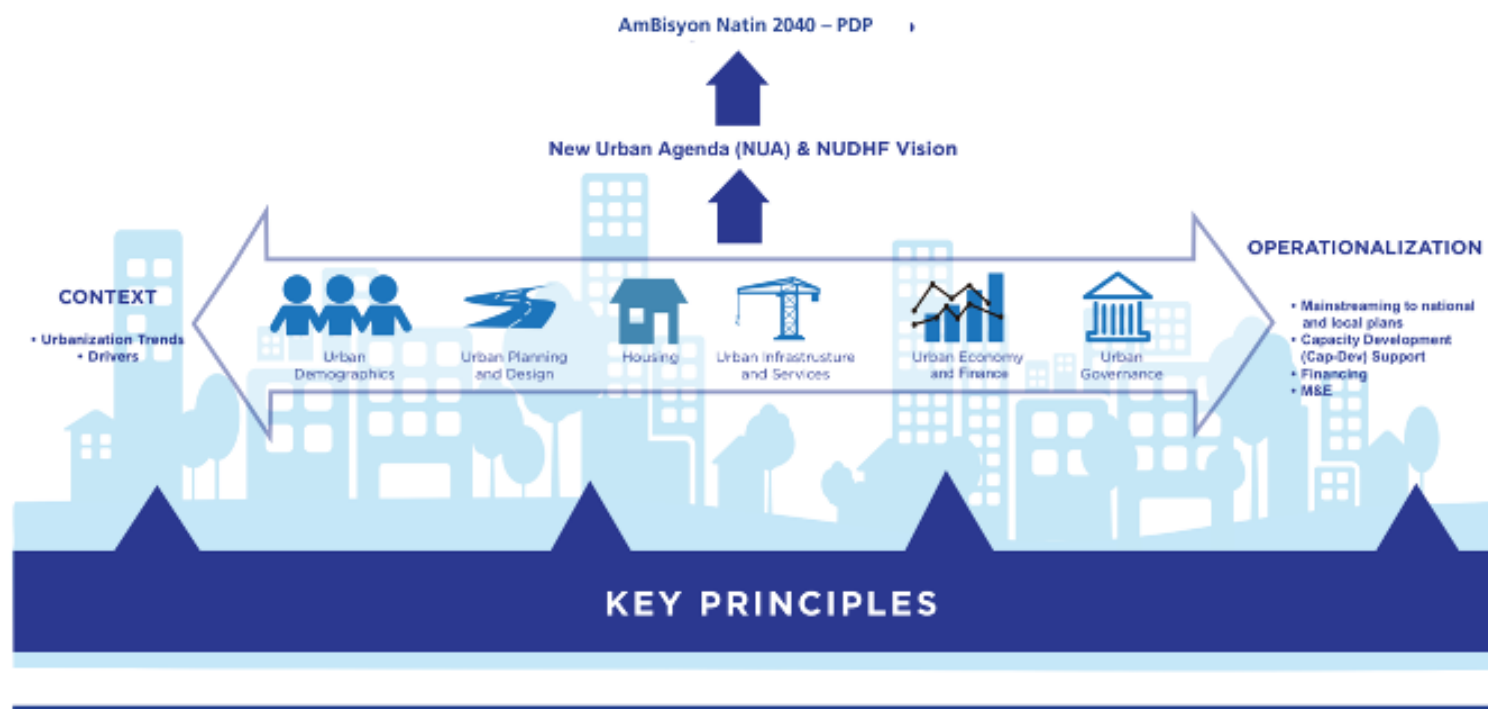
The life of all Filipinos in 2040: *Matatag, Maginhawa at Panatag na Buhay*

By 2040, Filipinos enjoy a strongly rooted, comfortable, and secure life.

In 2040, we will all enjoy a stable and comfortable lifestyle, secure in the knowledge that we have enough for our daily needs and unexpected expenses, that we can plan and prepare for our own and our children's future. Our family lives together in a place of our own, and we have the freedom to go where we desire, protected and enabled by a clean, efficient, and fair government.



The National Urban Policy Framework





NUDHF 2017-2022

Adopted Vision	Better, greener, smarter urban systems in a more inclusive Philippines
Key Framework Principles	Urbanization as catalyst for inclusive growth
	Climate change resilience as a base for spatial structuring and sectoral development
	Spatially and thematically integrated settlements within coherent and efficient urban systems and forms across scales
	Urban areas as accessible platforms for social and economic opportunity, cultural expression, and innovation
	People's participation and empowerment as foundations of urban governance, facilitating sustainable resource use, planning, management, and finance
	Sustainable urban environment

Source: 2017-2022 NUDHF, Housing and Land Use Regulatory Board

NUDHF 2017-2022



MOBILITY



PEOPLE



GOVERNANCE



ENVIRONMENT



PEOPLE



ECONOMY



Philippine Smart City Summit 2018

Advocating for Smart Sustainable Cities through Innovation and Collaboration

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STUDIES



Key Challenges



On Science, Technology and Innovation

- **Weak science, technology, and innovation (STI) culture**
- **Low government spending on STI**
- **Inadequate S&T human resources engaged in STI R&D**
- **Weak linkages among players in the STI ecosystem**
- **Restrictive regulations that hamper the implementation of R&D programs and projects**
- **Inadequate STI infrastructure**

Source: Philippine Development Plan 2017-2022



On ICT



Low access to ICT



**Unconsolidated
network
operations**



**Unsecured data
storage and data
facility**



**High operation
costs**



Key challenges



Critical role of local government units in achieving sustainability



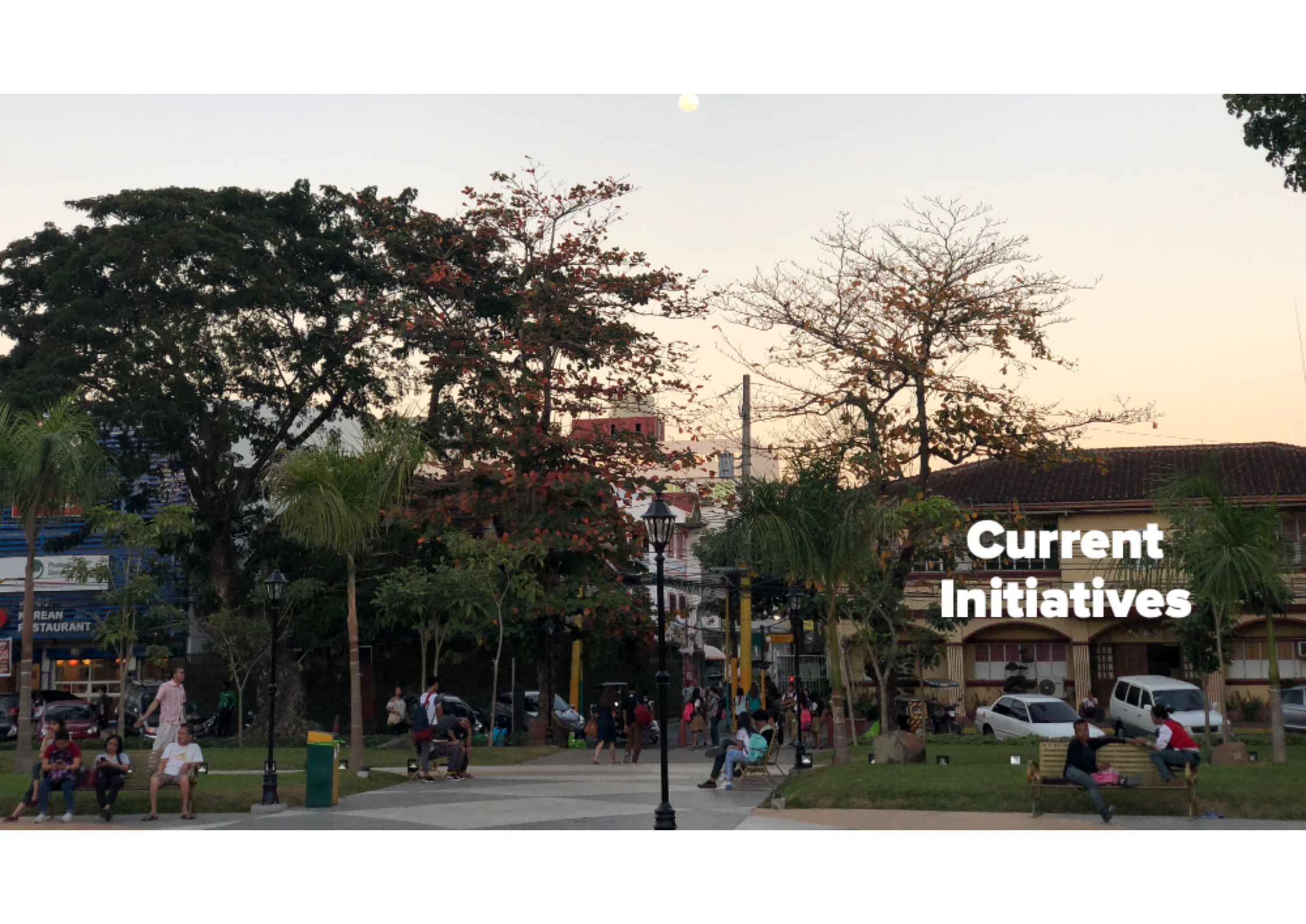
Continuing challenge of horizontal and vertical integration of plans and interventions



Planning-programming-budgeting disconnects



Scale of governance relevant to smart city initiatives



Current Initiatives

Smart News

HOME / SMART NEWS / NEWS / WORLD'S BIGGEST SMART CITY TO RISE IN THE PHILIPPINES

World's biggest smart city to rise in the Philippines



MANILA, Philippines - With the sustained growth of the Philippine economy, the local property market continues to attract massive investments, and foreign players are not passing up on the opportunities the country has to offer.

But with the availability of developable land in Metro Manila becoming limited, reclamation is starting to be a feasible option for developers to acquire land in the country's capital

. The Manila Bay area has had its share of reclaimed projects in the past, such as the ongoing Aseana City development, but reclaiming land as a landbanking option is still gaining attention from developers.

One promising reclamation project about to rise in the coming years is New Manila Bay City of Pearl.

The 407.42-hectare reclamation project will be funded and developed by a consortium led by local company UAA Kinming Group Development Corp., along with a global mix of partners from Hong Kong, China, Southeast Asia, Europe and other regions.

With a global roster undertaking the project as a "self-sufficient" city, Hong Kong -based architectural firm Ho & Partners Architects, Engineers & Development Consultants Ltd. (HPA), the architect of the New Manila Bay development, said the project

will be an international destination.

KEY POINTS

- The Philippines wants to build its own version of the city of the future
- Called New Clark City, the urban project is planned to be smart, sustainable and resilient to disasters.



Clark: The Modern City (CNN)

<https://youtu.be/3ejNpKz6kGk>

New Clark City: The Next Big Metropolis

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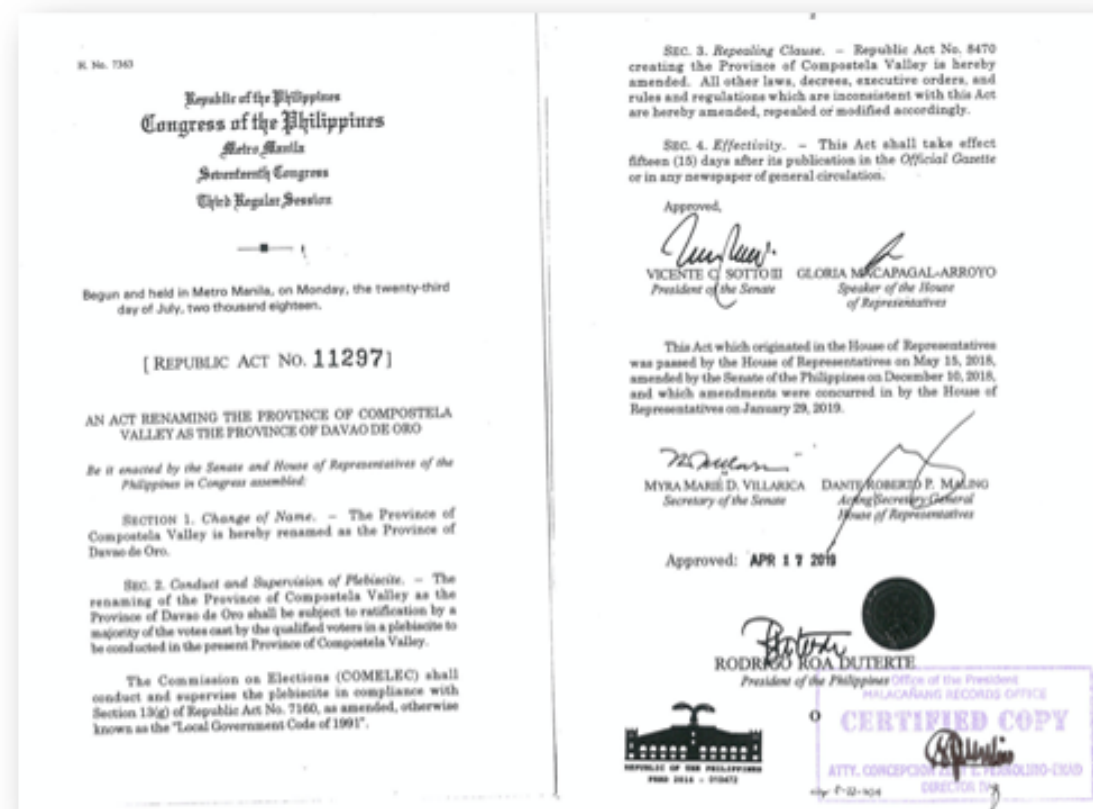


Smart city application in the provincial setting



The province

- The province, composed of a cluster of municipalities, or municipalities and component cities, and as a political and corporate unit of government, serves as dynamic mechanism for developmental processes and effective governance of local government units within its territorial jurisdiction (§459, Rep. Act No. 7160)





Role of provinces in fostering collaboration

Commitment

Connectivity and contents

Collaboration platform

Co-creation



A province can

- **Provide data sensing, information processing, and networking technologies enabling the use of smart and innovative solutions addressing metropolitan and urban challenges brought about by rapid urbanization**
- **Act as a support system for strategic decision-making for local, metropolitan, regional, and national policy-makers relevant to the management and governance of Metropolitan Iloilo**
- **Provide avenue for democratic participation of key stakeholders and beneficiaries of the programs and projects to be formulated, designed, and implemented**
- **Serve as the mechanism by which the local governments will be able to effectively and efficiently coordinate metropolitan and urban actions and processes**

Questions???






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As Environmental Planners, we strive for honor, excellence, and compassion because we have a profession to evolve, rights to protect, a community to empower, a town to collaborate with, and a nation to serve...

