

READINESS OF PHILIPPINE CITIES TO SMART CITY DEVELOPMENT

RAMOS, T., LORENZO, P.J., ANCHETA, J., & BALLESTEROS, M.



Philippine Institute for Development Studies
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

POLICY QUESTIONS



WHAT DRIVES
PHILIPPINE LGUS
TOWARDS THE
IMPLEMENTATION
OF SMART CITY
INITIATIVES?



WHAT IS THE
EXTENT OF SMART
CITY
DEVELOPMENT
AMONG PHILIPPINE
CITIES?

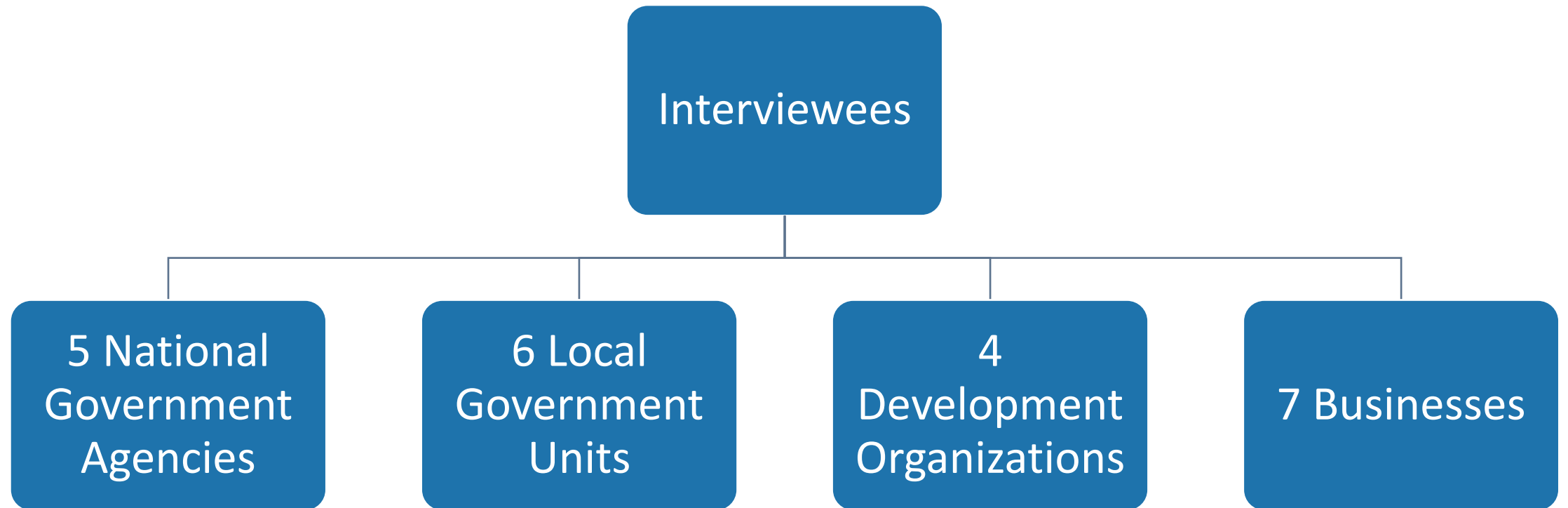


HOW CAN THE
PHILIPPINE
GOVERNMENT
FACILITATE THE
DEVELOPMENT OF
SMART CITIES?

METHODOLOGY

Desk Review
Smart City Concept
Discussions on Enablers, Barriers, and Pathways
International Cases
Overview of Smart City Initiatives in the Philippines
Philippine Cases

METHODOLOGY



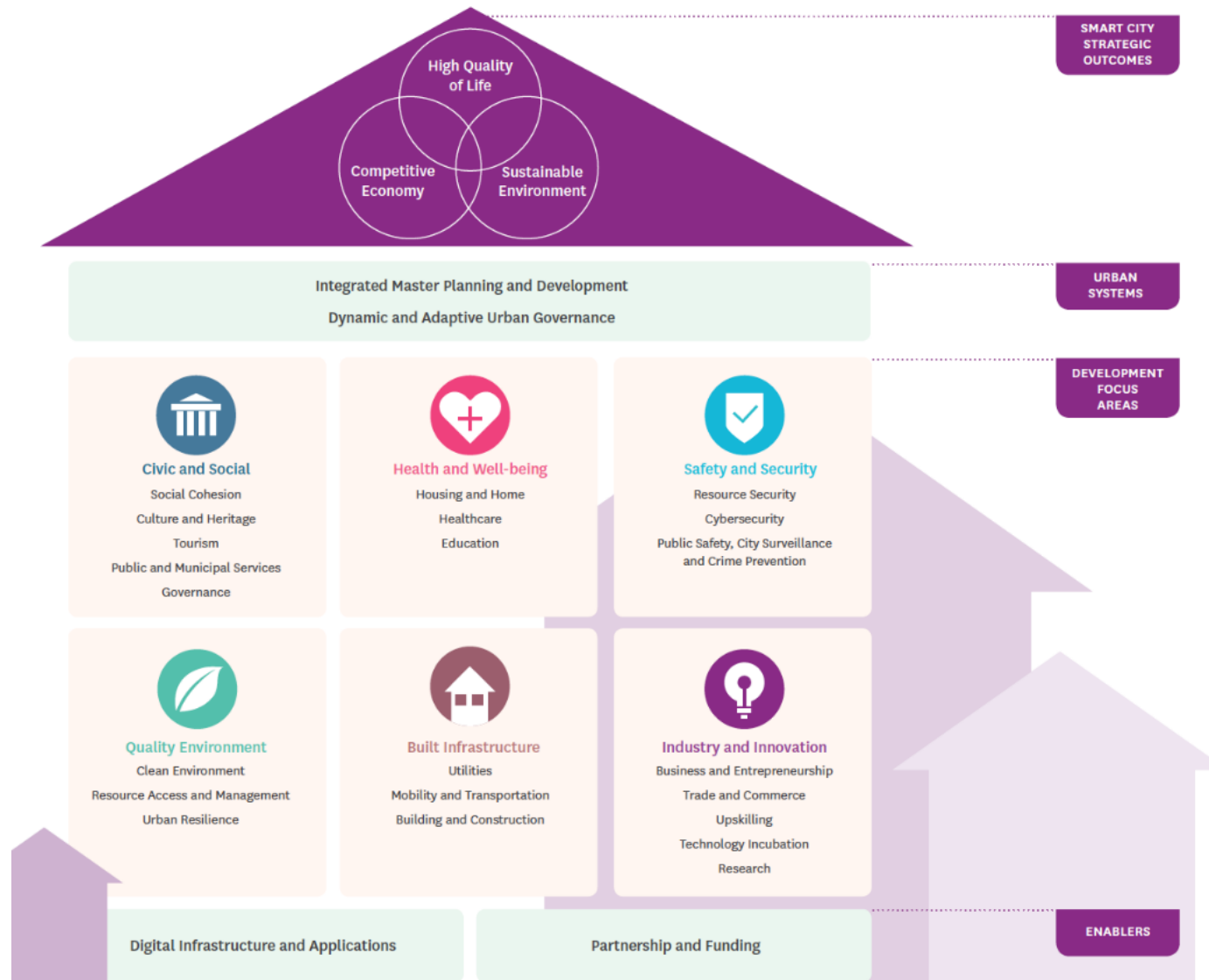
METHODOLOGY

City	Highly Urbanized City	Income Class	Population
Mandaue City	Yes	1st	364,116
Malabon City	Yes	1st	380,522
San Fernando City	No	1st	354,666
Tagum City	No	1st	296,202
Cauayan City	No	3rd	143,403
Tuguegarao City	No	3rd	166,334

WHAT IS A “SMART CITY”?

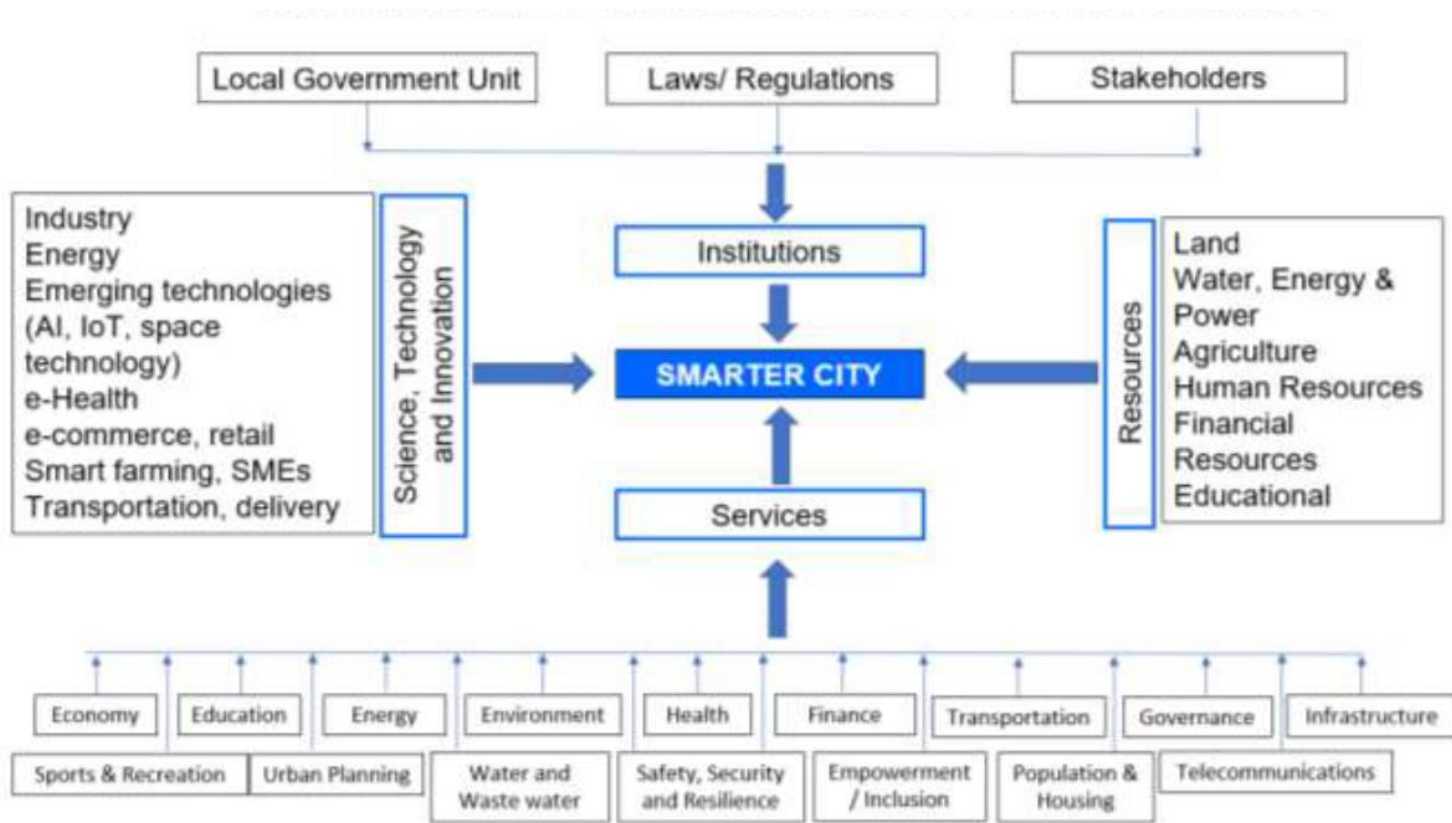


ASEAN SMART CITIES FRAMEWORK



“A smart city in ASEAN harnesses technological and digital solutions as well as innovative non-technological means to address urban challenges, continuously improving people’s lives and creating new opportunities.”

DOST FRAMEWORK FOR SMART SUSTAINABLE COMMUNITIES AND CITIES



“Smart city – is an ecosystem comprised of people, organizations and businesses, policies, laws and processes integrated together to create desired outcomes... The city is adaptive, responsive, relevant, and integrates technology to accelerate, facilitate, and transform this ecosystem.”

PNS ISO 37122: 2020

Smart city – “city that increases the pace at which it provides social, economic and environmental sustainability outcomes and responds to challenges such as climate change, rapid population growth, and political and economic instability by fundamentally improving how it engages society, applies collaborative leadership methods, works across disciplines and city systems, and uses data information and modern technologies to deliver better services and quality of life to those in the city (residents, businesses, visitors), now and for the foreseeable future, without unfair disadvantage of others or degradation of the natural environment”



WORKING DEFINITION

SMART



Structure	Functions	Focus	Semiotics	Stakeholders	Outcomes
Technology and innovation-powered system	to sense monitor process translate communicate	+ civic and social health and well-being safety and security quality environment built infrastructure industry and innovation	+ data information knowledge	by/from/to people institutions	for high quality of life competitive economy sustainable environment



CITY

INTERVIEWEES' UNDERSTANDING OF SMART CITY



MANDAUE CITY

Initiative	Description
Guardian Emergency Response System	Mobile application for reporting of incidents or requesting assistance; Software for dispatch and deployment
Traffic Management System	Traffic lights; Digital clocks; CCTV and high-definition cameras; LED streetlights
Internet	Fiber broadband connection
Electronic Business Permit and Licensing System	Online processing of business permits with QR code and a security sticker
Purok Database System	Database per purok
Low carbon city	Green Building Program; Solid waste management technologies; Geospatial Assessment and Modelling of Urban Heat Islands in Philippine Cities (Project GUHeat); Urban gardening; Biodegradable waste shredder; Rotary drum composter

SAN FERNANDO CITY, PAMPANGA

Initiative	Description
Command and Control Center	Telemetry for flood monitoring; LED Information Board; Communication tower; 360-degree thermal camera; Video analytics; License plate recognition; Facial recognition; Body cameras; Public Address System
Free WiFi in City Hall and Old Public Market	Fiber-powered WiFi in City Hall and Old Public Market
Free WiFi in public schools	WiFi for selected public schools
Smart City Phase II Program	Integration of CCTV features; Fiber optic cabling
Solar panels	Renewable energy source
Online business transactions	Online platform for business permit transactions and payment of business taxes
Integrated/centralized systems for inter-office transactions	Development of applications and integrated/centralized systems to expand linkage of inter-office transactions

CAUAYAN CITY

Initiative	Description
E-Tricycles and Charging in Minutes station	E-Tricycles (some models with solar panel on roof); Charging station
Hybrid Electric Road Train	4 air-conditioned interlinked cabins for maximum of 200 passengers
E-Scooter Project	E-Scooters with app for control and Global Positioning System for tracking
Platform for Assessment and Tracking of Urbanization - Related Opportunities	Data hub; Smart Index; Sandbox
WiFi routers	WiFi routers for free
Fiber optics	Installation of fiber optics
Cellsites and cellular network system	Installation of cell sites and/or expansion of cellular network system; 4G / LTE
WiFi	Obtainment of WiFi services

CAUAYAN CITY

Initiative	Description
Barangay Centralized WiFi Network	Enables messaging and file sharing via 5GHz radio signal and high sector antenna; Extranet; LAN Messenger
QR Code for Barangay Constituents	Intended for household profiling
Cauayan City App	Enables electronic transactions
Cauayan City Identification Card	Version 1 (simple ID); Version 2 (ATM-enabled); Version 3 (Mastercard-enabled)
Juan Time Campaign	Synchronization of time across devices; Providing weather updates
Kiosk machines	Payment of bills at kiosk machines
Police drones	To keep constituents safe, capture criminals, and implement lockdown restrictions
Digital Twin	From drone photos to 3D map of the landscape; AI for damage estimation

CAUAYAN CITY

Initiative	Description
Waste-to-energy plant	Generation of energy using waste products from Cagayan Valley
Aquaponics	IoT-Based Aquaponics with integrated sensors
Investment Website	Presents investment opportunities and incentive package
Water Quality Testing Laboratory	Tests the quality of water
No QR Code, No Entry Policy	Requirement to register for unique QR Code to facilitate contact tracing
RxBox	Measures heart rate, oxygen saturation, temperature, etc.
Cauayan City Care COVID-19 Consult	Telemedicine
Smarter Dengue Early Warning System	Dengue Vector Surveillance; Smarter Dengue Early Warning System App; Disease Mapping on 3D Model Using AI; Dengue Information Mapping

MALABON CITY

Initiative	Description
CCTV Cameras	CCTV Cameras for emergency monitoring and response
Mobile connectivity	4G
Free WiFi	Fiber infrastructure
Contact Tracing App	Application with QR code technology integrated into City Health Monitoring System
Computerization of tax collection data and transactions	Computerization in revenue-generating departments; GIS
Online Payment Services System	Online payment services for government transactions

TAGUM CITY

Initiative	Description
Revenue Administration and Mobilization Program	Automated and integrated management system; GIS
ISDN and PABX for City Trunkline Services	IP telephones and a centralized trunkline
Use of quad media	Television; Radio; Print media; Social media
LED Walls	LED walls for information dissemination
Traffic Signalization System and No Contact Apprehension	Installation of traffic lights in priority junctions; Traffic surveillance cameras; Monitoring of Traffic Violations using figures and summaries of traffic violations in various areas
Smart street lighting	Solar-powered streetlights along Barangay roads
Internet	P2P Internet Tower
EURO 4-compliant heavy equipment and vehicles	Equipment and vehicles for reduced greenhouse gas emissions
Tagum City Waste-to-Energy Plant Project	Transformation of waste to energy
E-Center	Computers; Internet service

TUGUEGARAO CITY

Initiative	Description
Digital twin	Conversion of drone photos to 3D model
Command Center	Real-time monitoring center; CCTV
Free Direct Internet	Direct Internet enabling connection between offices
Free WiFi	Free WiFi in some public areas through fiber optic wide area network
Tuguegarao Government Portal	Online government services
MyCure System	Online medical consultations

INTERVIEW FINDINGS: MOTIVATIONS

High Quality of Life, Competitive Economy, and Sustainable Environment

LGUs

- ✓ Address needs of constituents
- ✓ Uphold policy on ease of doing business

Businesses

- ✓ CSR
- ✓ Opportunity to maintain good relationship with city and clients
- ✓ “...good for the people or city, good for the business...”

Development Organizations

- ✓ Alignment with organization’s objectives

NGAs

- ✓ Alignment with mandates

INTERVIEW FINDINGS: ENABLERS

Partnerships, Policies, Smart City Champions, ICT Personnel, and Digitized Data

LGUs

- ✓ Smart city champions
- ✓ Designated ICT personnel
- ✓ Basic ICT infrastructure
- ✓ Technical and funding support
- ✓ Partnerships
- ✓ Policies

Private Sector

- ✓ Smart city champions
- ✓ Partnerships
- ✓ Digitized data

NGAs

- ✓ Partnerships
- ✓ Digitized data
- ✓ Designated ICT personnel

INTERVIEW FINDINGS: CHALLENGES

Lack of Infrastructure, Funding, Smart City Champions, Policies/Standards, Interoperability, and Social Acceptance; and Change in Local Leadership

LGUs

- ✓ Lack of funding
- ✓ COVID-19 Pandemic
- ✓ Lack of policies
- ✓ Lack of interoperability
- ✓ Low public uptake

Private Sector

- ✓ Lack of infrastructure
- ✓ COVID-19 Pandemic
- ✓ Issues on data cleaning and merging
- ✓ Low public uptake
- ✓ Change in local leadership

NGAs

- ✓ Issues on data cleaning and merging
- ✓ Low public uptake
- ✓ Lack of policies

INTERVIEW FINDINGS: PATHWAYS

Partnerships, Pilot Projects, Information Dissemination, Capacity Building, and Provision of Incentives

LGUs

- ✓ Partnerships with formalized agreements
- ✓ Pilot projects
- ✓ Capacity building
- ✓ Incentives
- ✓ Regional/innovation hubs

Private Sector

- ✓ Partnerships with formalized agreements
- ✓ Pilot projects

NGAs

- ✓ Capacity building
- ✓ Incentives

CONCLUSION: WHAT DRIVES PHILIPPINE LGUS TOWARDS THE IMPLEMENTATION OF SMART CITY INITIATIVES?

- Motivations consistent with three outcomes, *i.e.*, high quality of life, competitive economy, and sustainable environment
- Presence of smart city champions, ICT personnel and infrastructure, and digitized data facilitate the adoption of smart city initiatives in cities
- Government policies and stakeholder engagement are also regarded as enablers to smart city development

CONCLUSION: WHAT IS THE EXTENT OF SMART CITY DEVELOPMENT AMONG PHILIPPINE CITIES?

- More initiatives in the Infrastructure Phase
- Focus is on Built Infrastructure, and Civic and Social Domains
- Generally more initiatives involving institutions, and data and information, while people and knowledge fall short in their respective categories of stakeholders and semiotics
- Smart city initiatives being supported by some national government efforts
- Still with numerous challenges including those related to funding, interoperability of data systems, public uptake, and sustainability
- Solutions would be best carried out with the help of the national government
- LGUs cannot be left paddling their own canoe towards smart city development

RECOMMENDATIONS

HOW CAN THE PHILIPPINE GOVERNMENT
FACILITATE THE DEVELOPMENT OF
SMART CITIES?



BRANDING TECHNOLOGY AND INNOVATION-POWERED PHILIPPINE CITIES

NATIONAL	LOCAL
DOST-PCIEERD can become lead agency and can explore assessing LGUs to be engaged in terms of potential indicators of readiness	LGUs can also consider monitoring readiness based on suggested indicators: <ul style="list-style-type: none">○ Presence of smart city champions○ Presence of ICT personnel○ Number of completed projects supported by ordinances, resolutions, and/or MOAs involving businesses, development organizations, and/or NGAs○ Number of constituents with Internet access○ Availability of digitized data
DILG can support in the promotion of references at local level	PNS ISO 37122:2020 and DOST Framework for Smart Sustainable Communities and Cities can be used as references
PPP Center can provide guidance in the conduct of feasibility studies involving smart city-related PPP projects	Conduct of PPP smart city projects can be explored more

DEVELOPMENT OF POLICIES AND STANDARDS TO IMPROVE DATA FLOW

NATIONAL	LOCAL
DICT and NPC can issue policies and standards on development of data repositories and application programming interfaces	LGUs can designate ICT personnel that would focus on interoperability and security of data systems

TRANSPARENCY AND ACCOUNTABILITY MEASURES IN IMPLEMENTATION OF INITIATIVES

NATIONAL	LOCAL
DOST-PCIEERD can enhance DOST Framework for Smart Sustainable Communities and Cities by emphasizing accountability principle	LGUs can further explore data sharing to the public
DILG can monitor adoption of framework and assess development based on indicators from PNS, and implement accreditation system accordingly	LGUs can monitor relevant efforts using framework and PNS

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