SMART CITIES

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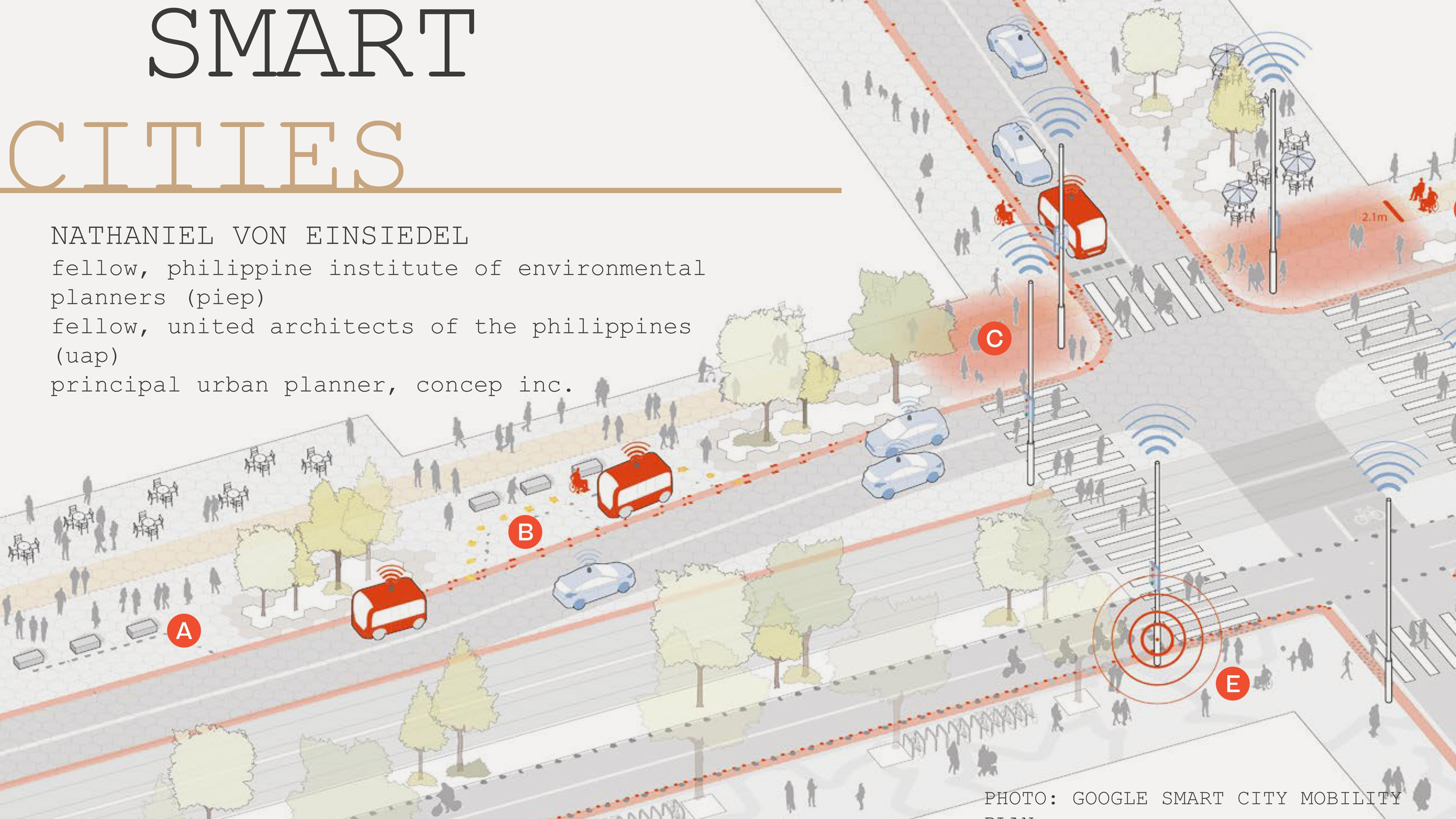


PHOTO: GOOGLE SMART CITY MOBILITY

PRESENTATION OUTLINE

- What does “smart city” mean?
- Smart City Opportunities: The biggest drivers for smart cities
- Smart City Challenges: Do we really need all these smart city technologies?
- Examples of Smart Cities
- Conclusions and Way Forward

What does “smart city” mean?

A smart city is a territory (town, city, province, region) that uses information and communication technology (ICT) to collect data and then use the insight gained from that data to plan and manage it’s resources, assets and services efficiently.

Smart city technology allows government officials to interact directly with both the community and infrastructure, and to monitor what is happening to the city and how the city is evolving.



A truly smart city has an overarching strategy and infrastructure in place that integrates various public services, and positions citizens and businesses as central

PHOTO: OSAKA CITY

KEY ASPECTS THAT DEFINE A SMART CITY

- Smart governance
- Smart energy
- Smart buildings
- Smart mobility
- Smart infrastructure
- Smart technology
- Smart healthcare
- Smart citizens

Smart City Opportunities

BIGGEST DRIVERS FOR SMART CITIES

01

Improving mobility and reducing congestion (connectivity and public broadband)

02

Citizens' demand for better digital services (improving public services through ICT)

03

Need for cities to compete for funding, talent and investment (competitiveness)

04

Improvement of citizens' safety (video surveillance, predictive policing, high-tech streetlighting)



SMART CITY PRIORITIES

- City-wide Connectivity
- Transportation / Mobility
- Lighting
- Waste
- Energy
- City Administration
- Public Safety
- Disaster Risk Management
- Emergency Services
- Water
- Climate Change Adaptation

PHOTO: 5G SMART CITY TECHNOLOGY

Smart cities make two fundamental promises:
lots of data, and automated decision-making based
on that data.

The ultimate smart city will require a wide range
of existing as well as still-to-be-invented technologies,
from sensors to robots to artificial intelligence

For many, this promises a more efficient, equitable city;
for others, it raises questions about privacy,
algorithmic bias, and costs.

Smart City Challenges

MAJOR CHALLENGES

01

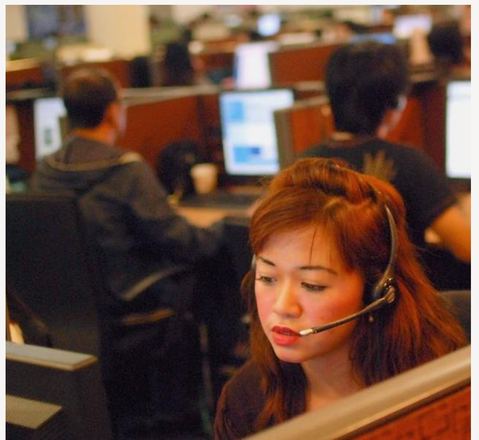
Constantly moving targets in realizing its objectives

02

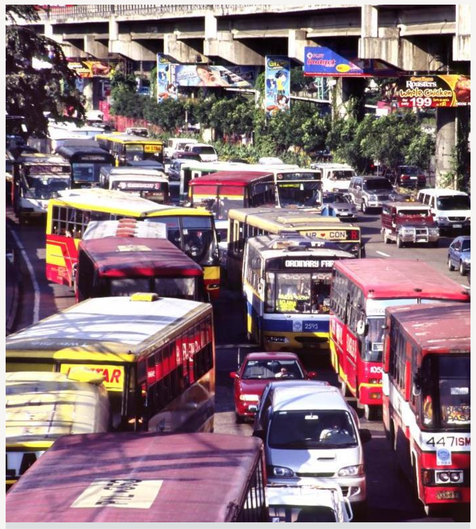
Huge structural change (funding, finding the right partner, technology glitches, data management issues, organizational fragmentation, skills and knowledge requirements)













Examples of Smart Cities

EXAMPLES OF SMART CITIES

- Singapore
- Osaka, Japan
- Austin, Texas, USA
- San Diego, California, USA
- London, United Kingdom
- Barcelona, Spain
- Paris, France
- Melbourne, Australia
- Sydney, Australia
- Amsterdam, The Netherlands
- Stockholm, Sweden
- Copenhagen, Denmark
- Frieburg, Germany
- Toronto, Canada
- Vancouver, Canada
- Cascals, Portugal
- Helsinki, Finland
- Vienna, Austria



ISO 37120: INDICATORS FOR CITY SERVICES AND QUALITY OF LIFE

THEME

ECONOMY

CORE INDICATOR

- City's unemployment rate
- Assessed value of commercial and industrial properties as a % of total assess value of all properties
- % of city population living in poverty

SUPPORT INDICATOR

- % of persons in full-time employment
- Youth unemployment rate
- Number of businesses per 100,000 population
- Number of new patents per 100,000 population

THEME

EDUCATION

CORE INDICATOR

- % of female school-age population enrolled in schools
- SURVIVAL RATE: % of students completing primary education
- SURVIVAL RATE: % of students completing secondary education
- Primary education student - teacher ratio

SUPPORT INDICATOR

- % of male school-age population enrolled in schools
- % of school-age population enrolled in schools
- Number of higher education degrees per 100,000 population

THEME

ENERGY

CORE INDICATOR

- Total residential electrical energy use per capita (kWh/year)
- % of city population with authorized electrical service
- Energy consumption of public buildings per year (kWh/m2)
- % of total energy derived from renewable sources, as a share of the city's total energy consumption

SUPPORT INDICATOR

- Total electrical energy use per capita (kWh/year)
- Average number of electrical interruptions per customer per year
- Average length of electrical interruptions

THEME

ENVIRONMENT

CORE INDICATOR

- Fine particulate matter (PM2.5) concentration
- Particulate matter (PM10) concentration
- Greenhouse gas emissions measured in tonnes per capita

SUPPORT INDICATOR

- Nitrogen dioxide (NO2) concentration
- Sulphur dioxide (SO2) concentration
- Ozone (O3) concentration
- Noise pollution
- % change in number of native species

THEME

FINANCE

CORE INDICATOR

- Debt service ratio (debt service expense as a % of city's own-source revenue)

SUPPORT INDICATOR

- Capital spending as a % of total revenues
- Own-source revenue as a % of total revenues
- Taxes collected as a % of tax billed

THEME

FIRE & EMERGENCY RESPOSE

CORE INDICATOR

- Number of firefighters/emergency responders per 100,000 population
- Number of fire related deaths per 100,000 population
- Number of disaster related deaths per 100,000 population

SUPPORT INDICATOR

- Number of volunteer and part-time firefighters/ emergency responders per 100,000 population
- Response time for emergency response services from initial call
- Response time for fire department from initial call

THEME

GOVERNANCE

CORE INDICATOR

- Voter participation in last municipal election as % of eligible voters
- Women as a % of total elected to city-level office

SUPPORT INDICATOR

- % of women employed in city government
- Number of convictions for corruption and/or bribery by officials per 100,000 population
- Citizens' representation: number of local officials elected to office per 100,000 population

THEME

HEALTH

CORE INDICATOR

- Average life expectancy
- Number of hospitals beds per 100,000 population
- Number of doctors per 100,000 population
- Under age five mortality per 100,000 live births

THEME

RECREATION

CORE INDICATOR

- Square meters of public indoor recreation space per capita
- Square meters of public outdoor recreation space per capita

THEME

SAFETY

CORE INDICATOR

- Number of police officers per 100,000 population
- Number of homicides per 100,000 population

SUPPORT INDICATOR

- Crimes against property per 100,000 population
- Response time from police department from initial call
- Violent crime rate per 100,000 population

THEME

SHELTER

CORE INDICATOR

- % of city population living in slums

SUPPORT INDICATOR

- Number of homeless per 100,000 population
- % of households in the city without registered legal land titles

THEME

SOLID WASTE

CORE INDICATOR

- % of city population with regular waste collection (Residential)
- Total collected municipal solid waste per capita per year
- % of city's solid waste that is recycled

SUPPORT INDICATOR

- % of city's solid waste disposed in a sanitary landfill
- % of city's solid waste disposed in an incinerator
- % of city's solid waste that is burned openly
- % of city's solid waste that is disposed in an open dump
- Hazardous waste generation per capita (tonnes)
- % of city's hazardous waste that is recycled

THEME

TELECOMMUNICATION AND INNOVATION

CORE INDICATOR

- Number of Internet connections per 100,000 population
- Number of cell phone connections

SUPPORT INDICATOR

- Number of landline phone connections per 100,000 population

THEME

TRANSPORTATION

CORE INDICATOR

- Km of light passenger public transportation system per 100,000 population
- Annual number of public transportation trips per capita
- Number of personal automobiles per capita

SUPPORT INDICATOR

- Number of two-wheeled motorized vehicles per capita
- Km of bike paths and lanes per 100,000 population
- Transportation fatalities per 100,000 population
- Commercial air connectivity (number of non-stop commercial air destinations)

THEME

URBAN PLANNING

CORE INDICATOR

- Green open space (hectares) per 100,000 population

SUPPORT INDICATOR

- Annual number of trees planted
- Number of hectares of informal settlements as a % of city land area
- Jobs / housing ratio

THEME

WASTEWATER

CORE INDICATOR

- % of city population served by wastewater collection
- % of the city's wastewater that has received no treatment
- % of the wastewater receiving primary treatment
- % of the wastewater receiving secondary treatment
- % of the wastewater receiving tertiary treatment

THEME

WATER AND SANITATION

CORE INDICATOR

- % of city population with potable water supply
- % of city population with sustainable access to an improved water source
- % of population with access to improved sanitation
- Total domestic water consumption per capita (liters/day)

SUPPORT INDICATOR

- Total water consumption per capita (liters/day)
- Average annual hours of water service interruption per household
- % of water loss (unaccounted for water)

CASE STUDIES

CASE STUDIES

RIO DE JANEIRO OPERATIONS CENTER

Established in 2010

MONITORING THE CITY 24 HOURS A DAY, 7 DAYS A WEEK

more than 1,000 video surveillance cameras, and a team of 500 professionals who take turns in three shifts who monitor the city

CITY MAPS AT THE DECISION CENTER

a geographic platform that allows viewing of the city's assets, legacy systems and occurrences in an integrated manner, with real-time analysis tools

REAL-TIME ASSET TRACKING

administrative buildings, schools, hospitals, government vehicles, bus fleets, police, fire fighting equipment, and municipal agents are tracked in real time



PHOTO: RIO DE JANEIRO OPERATIONS CENTER

CASE STUDIES

RIO DE JANEIRO OPERATIONS CENTER

SURVEILLANCE AND PREDICTABILITY OF WEATHER CONDITIONS

weather radar, rainfall gauges installed in strategic places throughout the city, using mathematical models, and specialized professionals are on duty 24 hours a day

ALARM TRIGGER IN THE COMMUNITIES AND REGULAR TRAINING OF RESIDENTS

involving simulations and adoption of security protocols in communities in landslide-risk areas

DEMOGRAPHIC DATA INTEGRATED INTO THE OPERATION

figures on the population and families living in the different districts of the city



PHOTO: RIO DE JANEIRO OPERATIONS CENTER

CASE STUDIES

RIO DE JANEIRO OPERATIONS CENTER

DIRECT CONTACT WITH THE POPULATION

heavy use of social media and apps, such as Waze, Moovit, Alerta Rio and others through the Citizen Service Center

INVOLVEMENT OF JOURNALISTS AND REPORTERS

the presence of reporters from major media agencies, who closely follow the operations of the city, ensure credibility, transparency of public administration and, in the case of a special situation, the scope of the alerts and recommendations of the local government



PHOTO: POLICE CRISIS ROOM

CASE STUDIES

MAKATI CITY

Initiated in 2017

OBJECTIVE: "DIGITAL CITY"
to make Makati into a "Digital City" and the Philippines' first "Smart City"

"CASHLESS ECOSYSTEM"
started in 2017 with ICT in partnership with Globe – universal card system for health and social benefits to residents and employees, and also to pay bills, purchase items, draw salaries, and send or receive money



PHOTO: MAKATIZEN CARD LAUNCH

CASE STUDIES

MAKATI CITY

Makatizen app, in partnership with Neoconverge (PLDT and Smart) that allows users to access latest news and information, report crimes and accidents and other emergencies – serves over 15,300 individuals

Also serves as gateway to the Makati free WIFI service, following the complete installation of a fiber optic cable loop covering Makati's 25 barangays



PHOTO: MAKATI GOWIFI LAUNCH

Conclusion and Way Forward

- Data-driven decision-making is essential in addressing many if not most of a city’s challenges, but city stakeholders are numerous and diverse, with a wide range of interests, concerns and priorities. What may be an improvement for one group is not necessarily well received by others. Service provision cannot be improved by artificial intelligence any better than sound legislation and urban management.

- While well-applied technology and data analysis can vastly improve a city’s liveability, relying on those tools alone to create a healthy, vibrant city is impossible. The technology industry’s focus on data collection and analysis locks them into a narrow definition of successful governance that focuses on tactics of service provision while ignoring the bigger picture of community health.

- This is not to say that smart cities is not a good idea. The important thing is that the values that inform how data gets gathered are established by the public and their elected officials, rather than by a technology company in their role as technology provider and data-keeper.

- The critical question is whether having a smart city will make us meaningfully better at solving urban problems. No matter how much data a city collects and analyzes, addressing urban challenges will still require good urban planning and management, stable long-term financing and effective personnel.

- Rather than chasing the newest shiny smart-city technology, we should redirect some of that energy towards better cities planned and built with best-in-class, durable approaches to infrastructure and the public realm.

WAY FORWARD

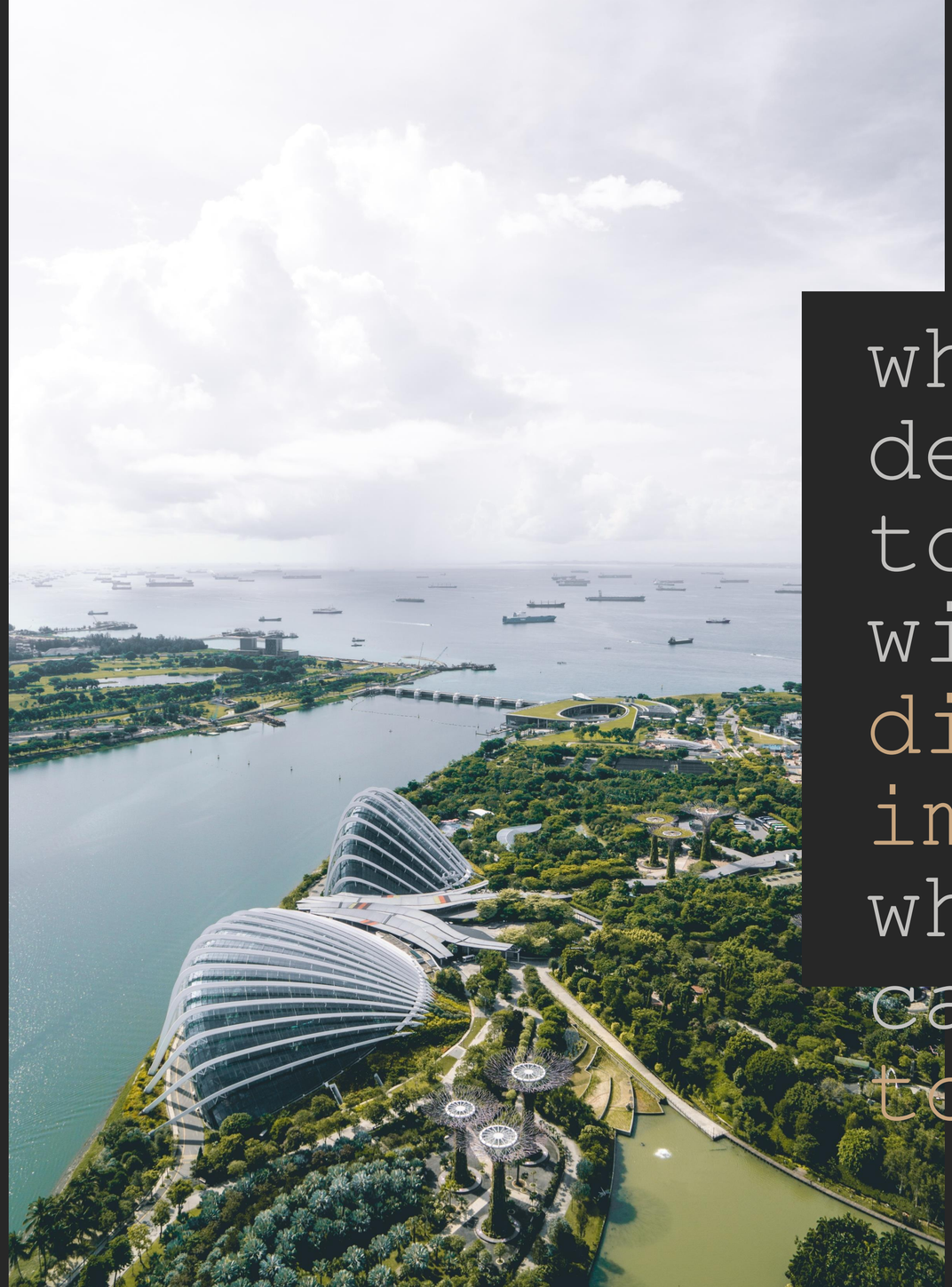


WAY FORWARD

- Define objectives and milestones, and prepare a roadmap
- Adapt an open digital architecture and an ecosystem approach so that data and commands can be shared between systems
- Appoint a smart city “champion”
- Start with the citizens (canvass their views and priorities)
- Explore funding options (e.g. PPP)
- Use or start with what you already have (e.g. streetlights)
- Look for best practices

PHOTO: NYC WIFI INFRANSTRUCTURE

As we consider the city of the 21st century,
we do well to remember that the things we love most
about cities – parks, public places, neighborhood communities,
local culture – are made and populated by people,
not technology. Technology has a place in cities,
but that place is not everywhere.



what a city
decides
today
will have a
direct
impact on
what it
can achieve
tomorrow.

PHOTO: SINGAPORE GARDENS BY THE BAY

THANK YOU FOR YOUR ATTENTION.

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