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Representing Working Group for Sustainable Cities / Smart Cities

#### from Institution of Engineers Malaysia (IEM)

#### Presentation Background and Objective

- This presentation is a follow up to my earlier presentation to the Conference of the ASEAN Federation of Engineering Organisations (CAFEO)
- Presentation to CAFEO was done on behalf of Institution of Engineers Malaysia(IEM) as I was heading the IEM Working Group for Smart & Sustainable Cities
- One of the objective of this presentation was to show where Engineers can play their role towards Smart & Sustainable City development

Working Group for Sustainable Cities / Smart Cities - AFEO - IEM-Aug 2021



# Cover page for my previous presentation at the CAFEO Conference

#### Speaker Synopsis -Ir Kesavan Jaganathan

Ir. Kesavan Jaganathan has more than 26 years experience in delivering and project managing various global and local engineering projects. He was previous Executive Director and Business Line Leader with AECOM Malaysia, District Energy Market Sector Leader for AECOM Middle East and Director with Turner & Townsend Malaysia. Ir. Kesavan Jaganathan is a Fellow member and Chartered Professional Engineers with Engineers Australia. Locally he is also registered Professional Engineer with Practicing Certificate (PEPC) with affiliations and a committee member for international engineering organizations. He has completed many global and local major projects related to infrastructure, utilities, buildings, district energy/district cooling, renewables, peer reviews, feasibility studies with a valuable experience on commercial, business development, technical and contractual aspects of these works. While having completed some of the largest District Cooling Plants for King Abdullah Financial District (Saudi Arabia & Middle East), Life Science, Industrial High-Tech, Tall buildings, Hyperscale, Data Centre, Rail etc. he has also been instrumental in initiating various EPCM/Design & Built mode of procurement contracts, BIM & IR4. He has been a team member representing Institution of Engineers Malaysia(IEM) for Malaysia Standards, BIM initiatives with Persatuan Architect Malaysia(PAM) and Standard Method of Measurement (MySMM3) with Royal Institution of Surveyors Malaysia(RISM) to incorporate BIM and IBS aspects of projects, Building by Law revision committee with Construction Industry Development Board(CIDB), Smart & Sustainable Cities Working Group(IEM/AFEO), Mentorship and Industry Panel Advisor to Universities/Academic institutions.

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## **Proposed Objectives**

- Policies in place within each country and the respective states within the country. How do we move in parallel with these policies and become a pillar/think-tank for this with our pool of resources/engineers
- To work together with the relevant government bodies to ensure Engineering Institutions included in the policy making team
- To work together with other professional institutions like the Architectural Institution, Landscape Institutions, Surveyors, Master Planners, Quantity Surveyors and other relevant stakeholders etc.
- Development of Guidelines & Standards among member countries
- > Overview on achievable targets amongst member countries



## Smart & Sustainability - Factors

- Encompasses the following major factors:
  - > Social
  - Environmental
  - Economic
- Focusing on one aspect alone, will not significantly achieve these goals.
- Smart cities are used as one of the approaches to resolve urbanization issues and improve the quality of life of societies in the city. It adds intelligence to the urban world and is used to achieve a higher quality of life.
- Engineering, Information & Communication Technology is core to the Smart & Sustainable City

## Smart Cities - Global & Local Agendas in Malaysia

- Global Agenda:
- Sustainable Development Goals(SDG)
- New Urban Agenda(NUA)
- > UN Habitat (Kuala Lumpur Declaration of Cities 2030)
- National Agenda:
- Eleventh Malaysia Plan(11MP)
- National Physical Plan 3(NPP3)
- National Urbanization Policy 2(NUP2)
- Green Technology Master Plan 2017-2030
- > Low Carbon Cities Framework



DEVELOPMENT GALS					
	Goal 3: Ensure healthy lives and promote well-being for all at all ages	9 MEESTRY, INVERTIGATION AND INFRASTRUCTURE	Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation		
	Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all		Goal 10: Reduce inequality within and among countries		
5 GENDER EQUALITY	Goal 5: Achieve gender equality and empower all women and girls		Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable		
6 CLEAN WATER AND SANITATION	Goal 6: Ensure availability and sustainable management of water and sanitation for all	12 RESPONSELE CONSUMETION AND PRODUCTION	Goal 12: Ensure sustainable consumption and production patterns		
7 determination and determined	Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all	13 CLIMATE	Goal 13: Take urgent action to combat climate change and its impacts		
8 DECEMIT WORK AND COMMAND CROWTH	Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all				

Source | World Economic Forum; Sustainable Development Agendu, 2015

#### NUA Habitat iii - Quito, Ecuador

#### HABITAT III, Quito/ New Urban Agenda

Posted on January 24, 2018 by ioannouolga



#### Kuala Lumpur Declaration: Cities 2030





Vientianne

CAMBODIA



Manila

Davao

Cebu City

A plan for



#### Plan for ASEAN Smart & Sustainable

#### Cities Information Source: Asian Post



#### Smart Cities - Malaysia

#### Malaysia's Smart Cities Initiatives

There are 26 pilot smart cities in the ASEAN Smart City Network (ASCN) and four of the 26 cities are in Malaysia, namely, Kuala Lumpur, Kota Kinabalu, Kuching and Iskandar Malaysia. Other smart cities in Malaysia are as illustrated in Figure 1-3.



#### Smart Cities - India





#### MODI's - SMART VISION TAKES SHAPE



## Smart & Sustainable City Influencers - At Planning Stage by Professionals



Green Technologies : Precursor for Transition to Smart Sustainable Cities - WFEO-CIC - IEI- IEM - Feb 2022

#### Masterplanning/ Urban Development

Major part of the sustainability is contributed by Urban Development and Master Planning. It contributes towards early stages of city planning where most of concept level design can be made.

#### Smart & Sustainable city influencers - At Planning Stage by Professionals/Engineers



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#### Infrastructure System Design

- This will ensure the sustainability concepts are planned early.
- Civil Infrastructure, Utilities and Transportation.
- Trigeneration to be incorporated where there's incorporation of power supply, water supply, waste water and other resources.
- Introduction of District Energy, Decentralised Energy, Hydrogen infrastructure, 5G network, Hyperscale/Data Centres etc.
- Sufficient Clean Rivers, Drains- River Restoration, Recycling where necessary

## Smart & Sustainable City Components

Components	Can Engineers Influence	How Can Engineers Influence		
Smart Economy	Yes	IR4.0, Productivity	Entrepreneurship	Local/Global Network
Smart Government	Yes	ICT, Paperless Govt., E-Submissions	E-Gov, E-Elections,E- Disaster Management	Online Services, Cashless/E-Payment
Smart Environment	Yes	Green Building, Net Zero Building	Sustainability, Smart Waste, Renewables	Circular Economy, River Restoration, CO2/capita
Smart People	Yes	Innovation/Creativit y	Digital Workforce	Digital Education/STEM
Smart Living	Yes	Smart Healthcare	Digital Security /Police	Efficient Public Housing
Smart Mobility	Yes	Sustainable Transport Smart Parking/Al/IoT	EV, Driverless, Battery /Charging Technology	Smart Land/Marine/Air /Autonomous Vehicles
Smart Digital Infrastructure	Yes	High Speed Internet/5G/AI/IoT	Cyber Security, Digital Traffic Management	Smart Grid, Data Centre ,Big Data, Drones

### Malaysia Smart City Industry Ecosystem

#### Malaysia Smart City Industry Ecosystem

#### Active or Supporting Role Leading Supporting **Policy Makers** Supporting KKMM MEDAC KPKT MOSTI MITI MOW MOT MIGHT dard Ma ME CORF MCMC Active - Statutory Authorities **Regulators &** CIDB MATRADE yber securit Facilitators MIDA MDEC ...... Active - BEM/IEM Malaysian Professional Associations Practitioners Malaysian Professional Boards Industry & Associations Associations Active Consultants & Planners Developers & Contractors Solution Providers Service Providers Manufacturers Enablers & Providers Applications Developers System Integrators Telco's Companies **Platform Providers** Active End-users Communities NGOs Academia Financial & Investment Institutions, Institute of Higher Learning & Research Institutions

**Engineers Contribution** 

Information Source: Malaysia Smart City Outlook - MIGHT & Confexhub

## Smart & Sustainable City Policies in Malaysia

- > Malaysia Smart City Framework
- > Putrajaya Smart City Blueprint
- Smart Selangor Blueprint
- > Smart City Iskandar Malaysia
- > Mysmart Wilayah
- Penang 2030
- Sarawak Digital Economy Strategy
- > Cyberjaya Smart Low Carbon City



## Smart & Sustainable City - How to Implement

Proposed Steps	Remarks
Identify your city level of smartness	Device a scale of 0 to 10 for all the Smart & Sustainable Cities Components amongst the ASEAN members
Identify Key Urban Challenges	Air Pollution(haze), water pollution, flash flood, high rate of non-renewable energy, improper waste management
Strategy & Initiatives	Tree Planting, River Restoration, development of smart city human capital
Indicator & Threshold	Loss of green area, depleting fresh water sources, river pollution, CO2 level
Key Players & Sources of Funding	Local Authorities, Smart City Councils, GLCs, Global MNCs
Information Source: KPKT	

rmation Source: KPKI

Note: The steps above may differ for different ASEAN countries

## Smart & Sustainable City Financing

Category	Remarks		
User Payment	Charges may be collected from the users of the service		
Land Value	The development of Smart City services might result in an increase in land values adjacent to the project site		
Commercial Revenues	The project generates commercial revenues from the Smart City services it delivers such as concession rights, land access rights provided for technology driven communities, innovation hubs with commercial revenues from advertising, parking, office space, residential space, and retail facilities		
Municipal Payments	The private sector may be paid a fee by the Municipality to make specified Smart City services available for use.		
Public-Private Partnership(PPP)	PPP offers an option that lies somewhere between public procurement and privatization for governments to expand cities infrastructure development. PPPs brings private sector competencies, efficiencies, and capital to improving public assets or services as the government faced deficiency of upfront cash.		
Ma	ain Sources of Revenue for Smart & Sustainable City		

Information Source: World Bank-Singapore/MIGHT

## Smart & Sustainable City - Available Standards

- > ISO 37122 Sustainable Cities & Communities Indicators for Smart Cities
- > ISO 37120 Sustainable Development of Communities
- > ISO 37123 Standards for Resilient Cities Indicators still under development
- IEC 63152 Under IEC, SyC Smart Cities developing best practice tool for city planners, guidelines to sustain city services after a disruption
- EEE P2784 (Smart City Planning Guide) & various standards for Smart Grid, Smart Energy, Smart Health, Smart Mobility & Transportation, Smart Education and Smart Governance
- Other related global initiative:
  - Smart Cities Council : A Global Coalition of leading technology companies and a global network of public sector smart city practitioners
  - LEED-ND for Neighborhood Development. This is developed by U.S. Green Building Council(USGBC)
  - □ ASHRAE MOUs with USGBC

#### Future Initiatives for Smart & Sustainable City within AFEO Members Countries

#### What needs to be developed:

- Identify Smart City components to be prioritized within each ASEAN nations
- Sharing of meaningful data on Smart City initiatives amongst the ASEAN countries and learning from each other mistakes
- Identify Smart & Sustainable City industry ecosystem within each country
- Engineering organizations and members to work closely with the Smart & Sustainable City industry ecosystem and stakeholders within each country
- Creating platform to foster better collaboration between public, private and academic sectors

## Smart & Sustainable Cities Solutions under Pandemic Conditions

- Cities will need to adapt to a new reality & 'New Norm'
- People have been forced inside, online education and work from home as well as away from one another, new challenges have been presented
- Governments, urban planners, developers, engineers need to discuss on methods and best practices to re-imagine our fundamental relationship with the cities and Sustainability in light of new Pandemics to come

#### Smart & Sustainable Cities Solutions under Pandemic & Post Pandemic Conditions

- Imminent factors to be considered
- > High Density Development The Way Forward
- Disaster Readiness: Shelters converted to medical facilities to contain outbreak
- > Development Of Greener And Cleaner Cities
- New Traffic Patterns And Healthy Mobility
- > Better WIFI for connectivity for low income groups & students
- Reduced demand for office space-work from home
- > Reduced commuter trips improved air and water quality & reduced traffic

#### Smart & Sustainable Cities - Post Pandemic Conditions - is it the End of Smart Cities?

- ▶ The COVID-19 pandemic rethink the future of Smart & Sustainable Cities
- Remote working impact office footprints & transportation patterns
- Workforce reshaped with AI & Automation
- Smart Cities need to be more resilient, inclusive, and sustainable.
- Pandemic Smart, Sustainable & Resilient Cities is gaining greater attention
- Smart & Sustainable Cities programs will be crucial for post-pandemic conditions.

## Smart & Sustainable Cities - Post Pandemic - Cybersecurity

- IoT and cloud computing, that collects, manages, and analyzes data to help cities be more efficient and responsive to citizens
- Some examples in progress:
  - Tracking cellphone data to analyze travel patterns and track whether people were self-isolating
  - Drone to deliver COVID-19 test kids
- Trust issues ; Scanning a QR code for identification and information upon entering a public space for contact tracing purposes. How this information can be abused:
  - Monitor your whereabouts Invasion of privacy
  - Selling of private data

## Smart & Sustainable Cities - Post Pandemic - Technologies



An outbreak should be detected in its early stages. For that, different sources of data may be exploited.

Ref:COVID-19 Pandemic: A Review of Smart Cities Initiatives to Face New Outbreaks -Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Anoutbreak-should-be-detected-in-its-early-stages-For-that-different-sources-ofdata\_fig4\_342044985 [accessed 1 Dec, 2021]

#### Smart & Sustainable Cities - Post Pandemic -Cybersecurity - Data Sharing & Trust Issues

- > Data sharing governments to address these real and potential harms.
- The Dutch Data Protection Agency recommendations to ensure smart city initiatives comply with data protection and privacy protections.
- UK's National Cyber Security Centre (NCSC) published principles for developers to build smart cities with security in mind from the start.
- In China, home to half of the world's smart city projects, the highest court ruled that businesses who use facial recognition technology must acquire users' consent before collecting their facial information.

## Smart & Sustainable Cities - Post Pandemic - Technology & Trust

- City governments to ensure their citizens can trust and benefit from this new technology
- Data privacy policy, whereby citizens can be assured that their data is collected for a legitimate purpose and not stored beyond the necessary timeframe
- Data to guide local and national responses to the pandemic need to strike a balance between personal privacy and public interest
- Increased data collection, policymakers will also need to address pervasive fears of public surveillance. Sensors, cameras, and audio solutions that comprise a smart city collect vast amounts of data which can be revealing and abused by the government.
- Finally, smart cities need strong security policies; otherwise IoT backbone that powers a smart city could be exploited by cyber criminals. These should be key components of any smart city strategy.
- Smart & Sustainable Cities to address citizens greatest needs earn their trust, embed security, privacy, and fundamental rights at the outset.

#### Smart & Sustainable Cities

# Thank You

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