

Technical Code Programme 2020

Awareness & Adoption of Technical Codes

Radiocommunications Network Facilities - Smart Pole

MCMC MTSFB TC G010:2017

Mr David Lim Teck Huat
Expert member, Radiocommunications Network Facilities
Working Group (RNF WG), MTSFB
21 Oct 2020



This presentation is to provide information to personnel whose background are:

- a) technical and, &
- b) non-technical (finance, legal, etc..)

Frequency Verses Coverage Distance & Frequency Verses Capacity Phenomenon

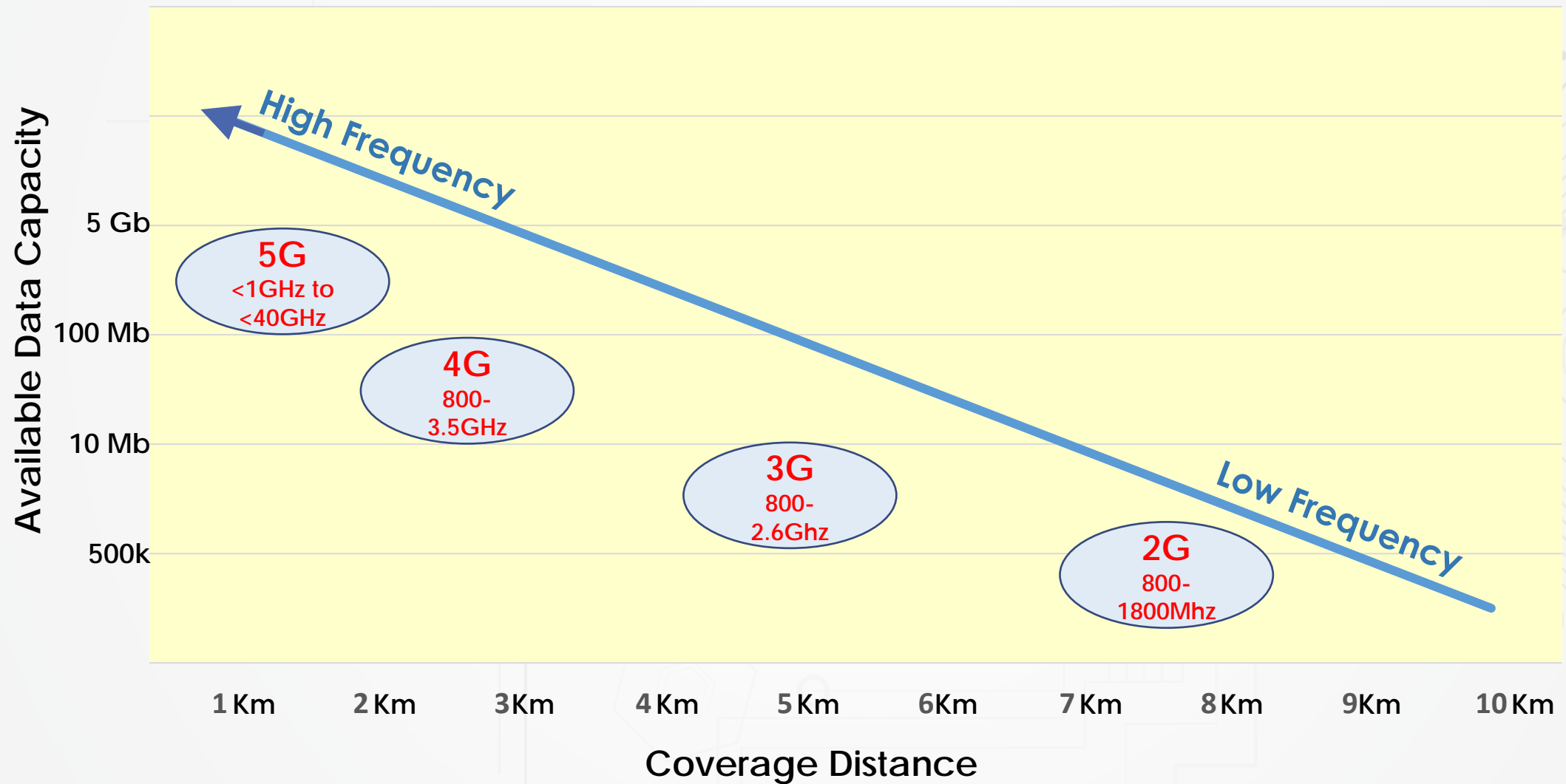
$$\text{Freq} = \frac{1}{\lambda}$$

Law 1: The higher the frequency, the shorter is the coverage distance

Law 2: The higher the frequency, the higher the data capacity



Frequency Vs Distance Vs Capacity



Spectrum determines 5G coverage and speed

5G

High Bands
24GHz - 40 GHz

4G

5G

Mid Bands
3.5GHz - 6 GHz

4G

3G

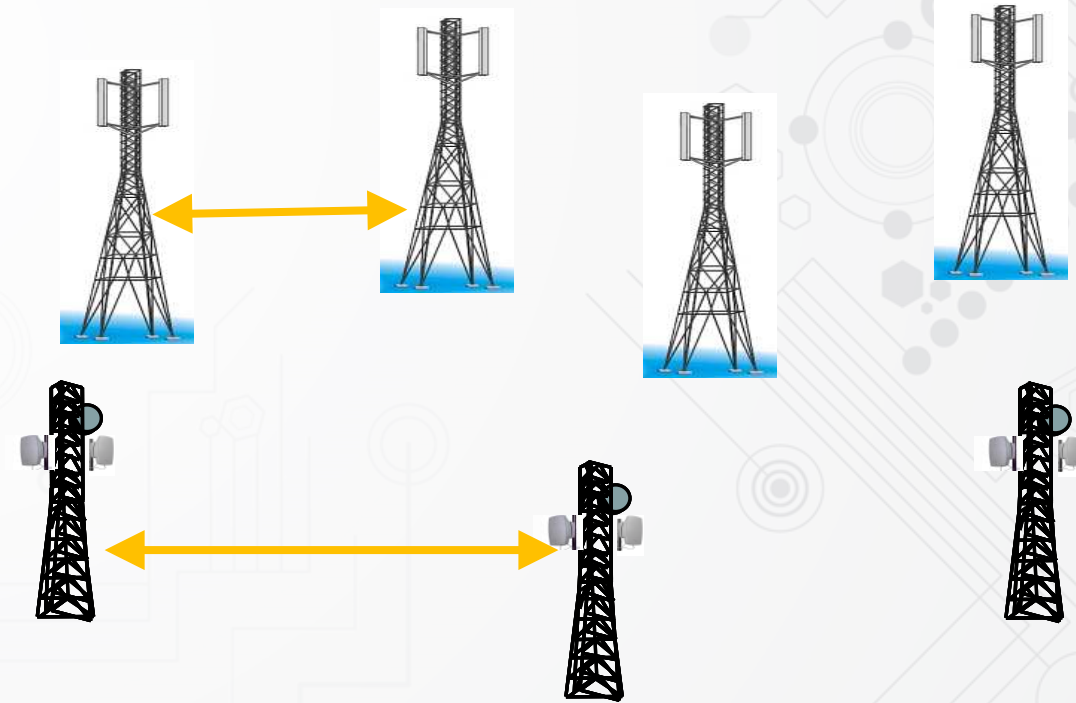
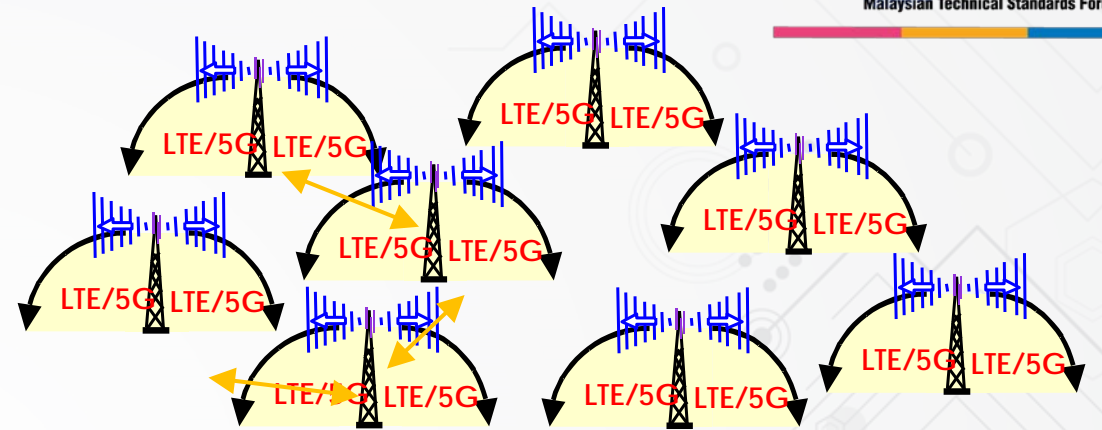
2G

Mid Bands
1GHz - 2.6 GHz

3G

2G

Low Bands
< 1GHz



OUTLINE

1 Introduction & Objective of Technical Code

2 Smart Pole Criteria/Compliance

3 Targeted Applications & Sites

4 Design (Feature & Specs) Summary

5 Conclusion – Q&A

1

Introduction & Objective of Technical Code

Radiocommunications Network Facilities - Smart Pole



No	Title	Technical Code number	Registration date
1.	Radiocommunications Network Facilities - Smart Pole	MCMC MTSFB TC G010:2017	15 November 2017

Three Major Objective of Technical Code

1. The Smart Pole TC was published to provide the guideline to
 - a) Local Authorities,
 - b) Telecom Vendors,
 - c) Telco Industry licensees

on how Smart Poles can be designed and constructed with a **safe design** that will also be **acceptable to public** in places where it will be implemented.

2. It is also to provide clarity on the specification and application of use that will **qualify a pole to be called Smart Pole**.

3. Smart Pole will become a major & critical telecommunications infrastructure that will be **used in the rollout of 5G coverage and services** and development of **Smart City infrastructure**.

Smart Pole: Infra To Help In The Building Of Smart Cities

Ministry of Housing & Local Government

Malaysia Smart City
Framework Launch
23-24 September 2019,
Hotel Istana



The infographic features the Malaysian coat of arms at the top, followed by the text 'KPKT Cities 4.0 MALAYSIA SMART CITY FRAMEWORK 5 Pilot Cities'. Below this is a map of Malaysia with five callout boxes, each listing smart city initiatives for a specific city. An illustration of a smart city is shown in the bottom right corner. At the bottom, there are social media icons and contact information for KPKT Malaysia.

KULIM

1. Smart Internet and Connectivity Enhancement
2. Smart Urban Farming
3. Centralised data within Government Agency in Kulim

KOTA KINABALU

1. Smart Water Management
2. Integrated Public Transport System
3. Integrated Solid Waste Management
4. Affordable Housing

KUALA LUMPUR

1. Smart Bin
2. KL Urban Observatory
3. Smart Pole
4. E-Payment usage for lower retail activities

JOHOR BAHRU

1. Smart Water Management
2. Smart Traffic Light System

KUCHING

1. Integrated Smart Traffic System
2. Integrated Flood Management and Response System

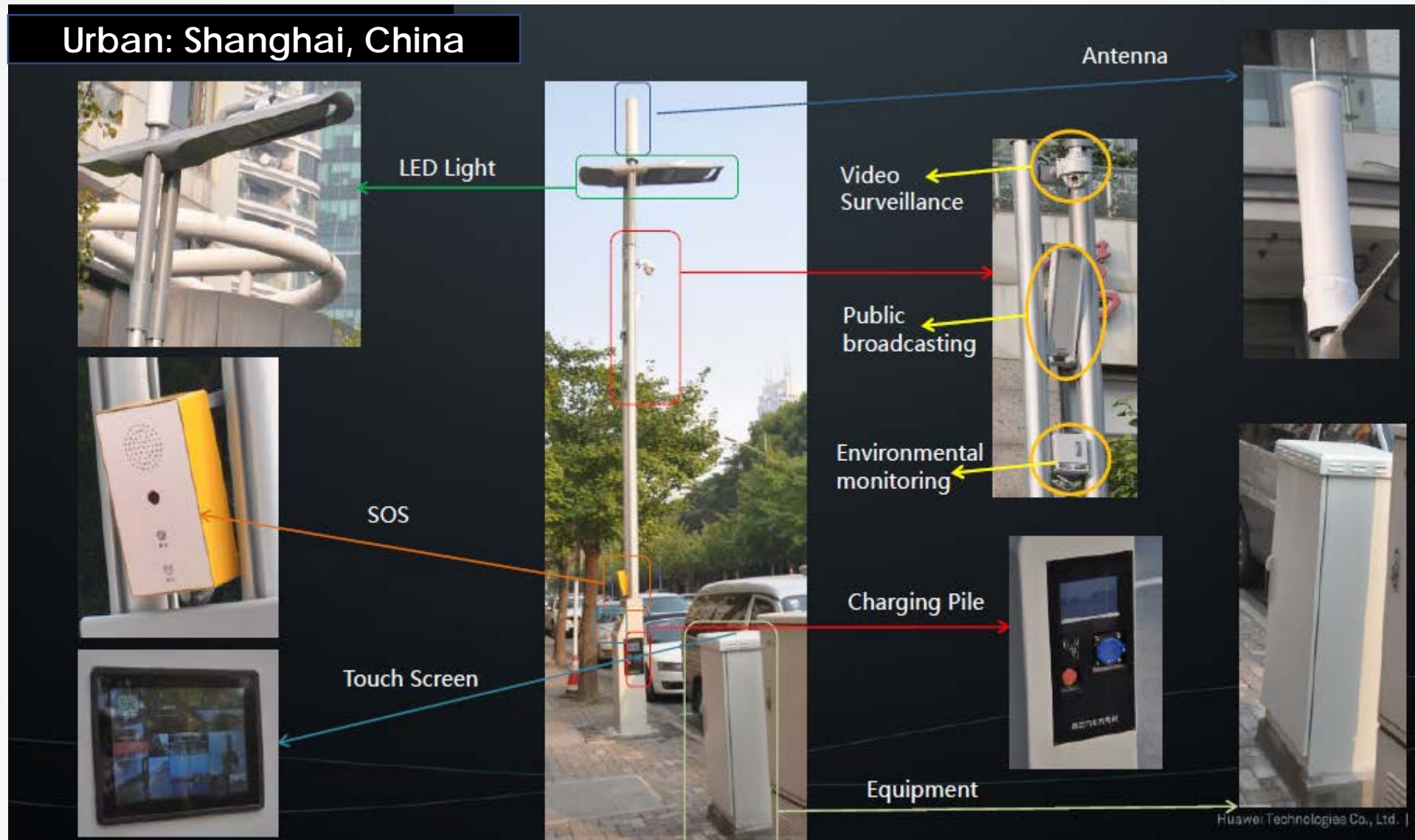
www.kpkt.gov.my KPKT MALAYSIA @kpkt_gov KPKT MALAYSIA @kpkt

Let's collaborate @ MTSFB!

2

Smart Pole Criteria/Compliance

Example of Smart Pole Site in China



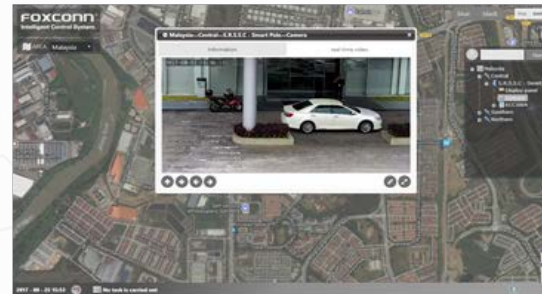
Example Smart Pole Site in Malaysia



MULTI-TIER LOGIN ACCESS



GOOGLE MAP INTERFACE



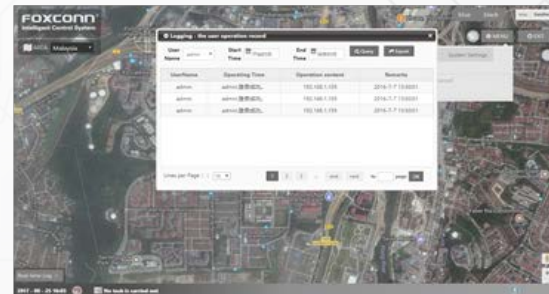
LIVE MONITORING SYSTEM



SMART DEVICE MANAGEMENT



GROUP STREET LIGHT CONTROL



CUSTOMISABLE DATALOG EXTRACTION

SOURCE : SHARP-ROXY SALES & SERVICE COMPANY (M) SDN BHD

Let's collaborate @ MTSFB!

Neighbouring Country News...

National Day Rally 2017: **'Smart' lamp posts** to become key nodes for surveillance and data collection



Police security cameras monitoring traffic at the entrance of Yew Tee Industrial Estate.ST

Aug 20, 2017, 9:17 pm SGT

[Irene Tham](#)

Senior Tech Correspondent

SINGAPORE - Plans are underway to turn every lamp post into a smart lamp post that can carry and transmit information gathered from surveillance cameras and sensors around the country.

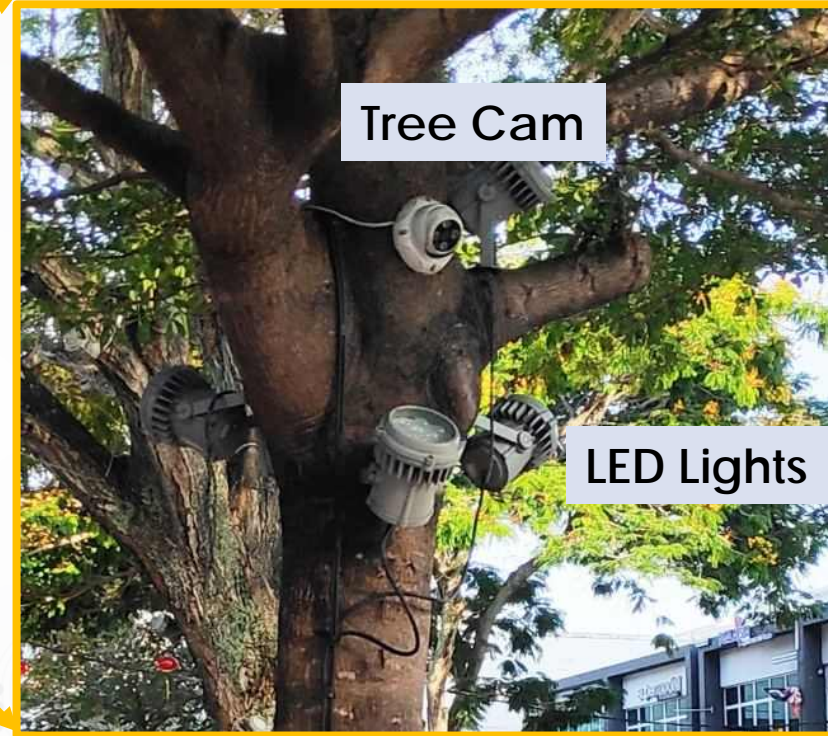
The network of interconnected lamp posts could form the spine of the Smart Nation Sensor Platform (SNSP), which aims to use artificial intelligence (AI) technologies to analyse, for instance, video footage collected by government agencies.

.....PM Lee said on Sunday that the SNSP initiative was born after the Little India riots in December 2013 - the first public disturbance of its kind in 40 years.

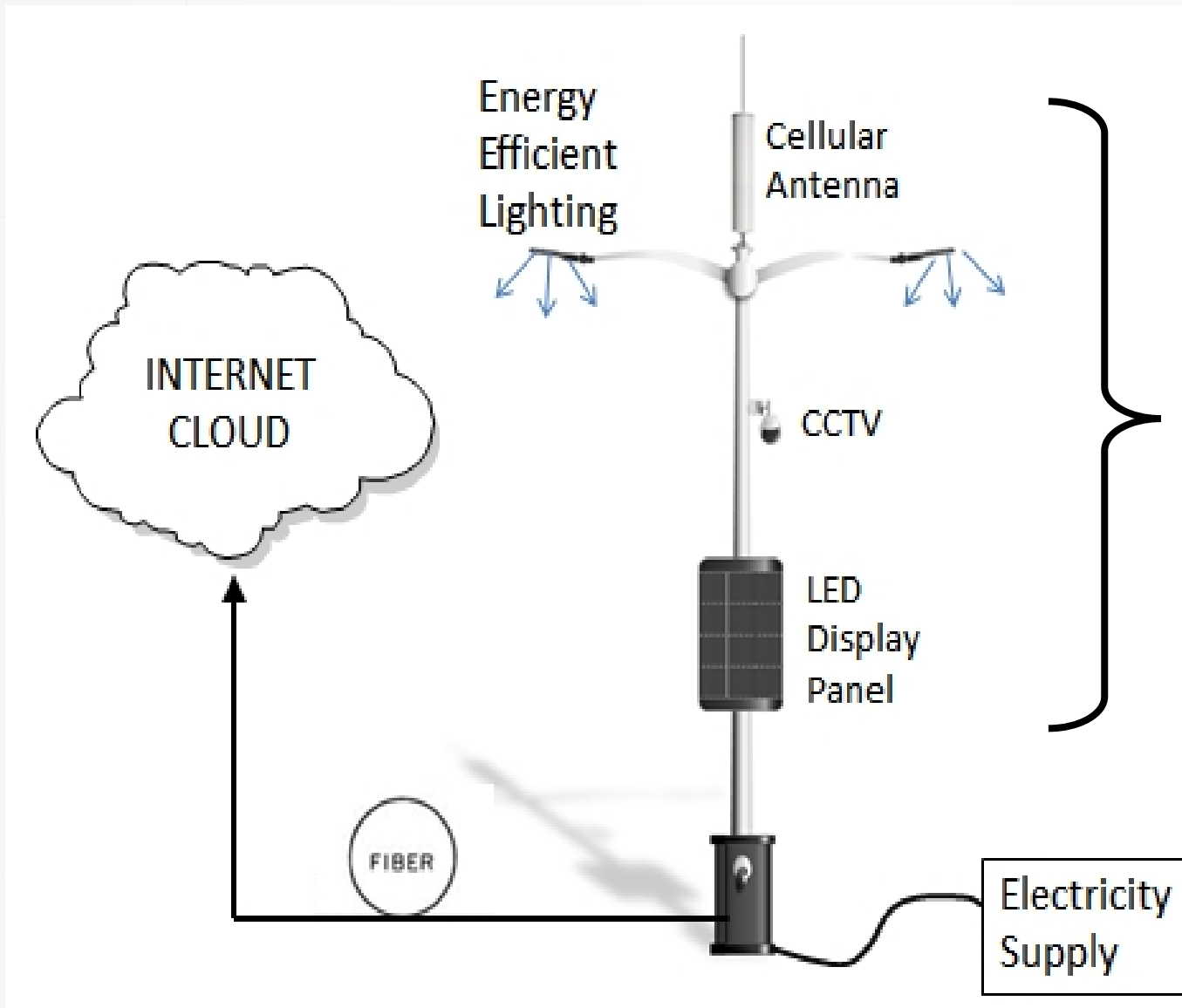
He said: "We were caught a little flat-footed. There were too few CCTV cameras monitoring Little India. We had to rely on footage posted by the public on social media."

THIS IS NOT A SMART POLE !

(Jalan Macalister, Penang)



Generic “Smart Pole” Physical Features



Access connectivity via Fifth Generation (5G), Fourth Generation (4G) and other connectivity technology such as Low Power Wireless Access Network.

Generic “Smart Function” Features

NETWORK CONNECTIVITY

- WiFi HOTSPOT
- MOBILE COVERAGE

SENSOR

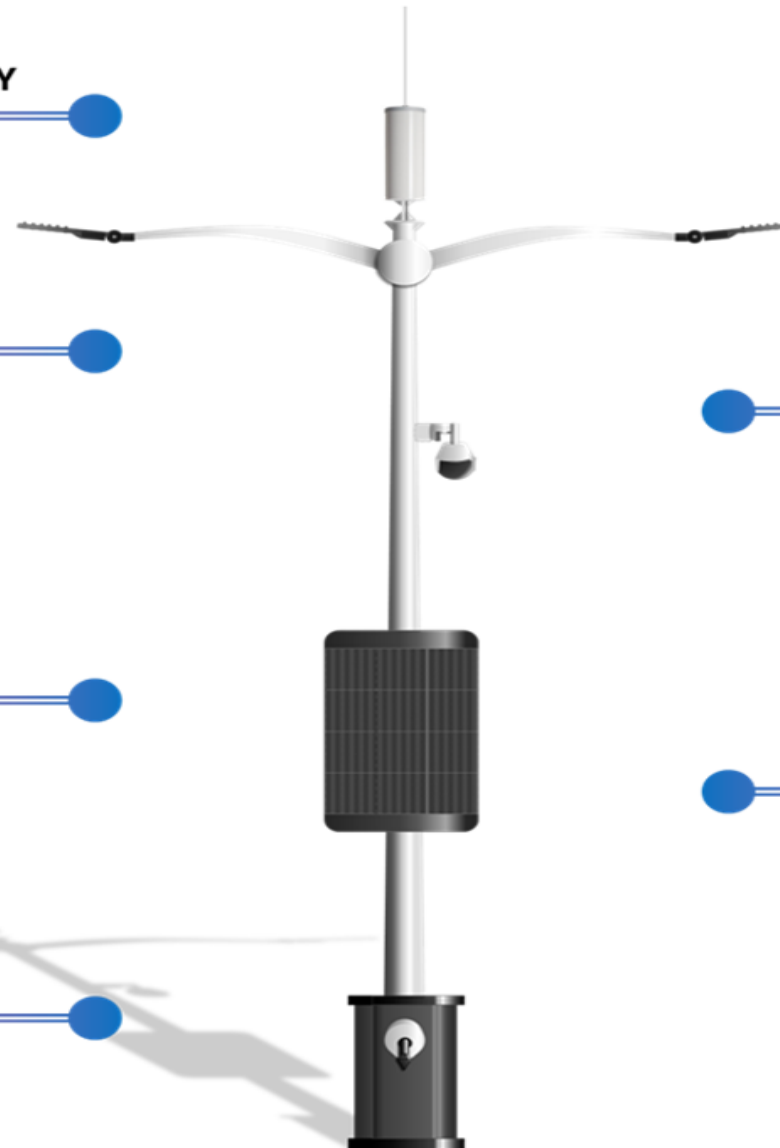
- AIR QUALITY SENSOR
- NOISE SENSOR
- TEMPERATURE SENSOR
- HUMIDITY SENSOR
- FLOOD SENSOR

DIGITAL INFORMATION

- ADVERTISEMENT
- NEWS UPDATE
- ANNOUNCEMENT

GREEN ENERGY

- SOLAR PANEL
- ELECTRIC CAR CHARGER



SAFETY & SURVEILLANCE

- PUBLIC SECURITY
- CROWD DENSITY
- TRAFFIC MONITORING

EMERGENCY

- SIREN
- P.A. SYSTEM
- SOS BUTTON

Table 1: Summary of smart pole requirements

Requirements	Features
Mandatory	<ul style="list-style-type: none"> a) electricity supply; b) fibre technology for backhaul; c) cellular access connectivity (minimum 3G); d) energy efficient lighting; and e) Interactivity
Optional	<ul style="list-style-type: none"> a) environmental monitoring; b) green energy; c) digital information broadcasting; d) WiFi connectivity; e) surveillance; and f) emergency services.

Mandatory Requirements

1. Electricity Supply

- To power the various systems and smart devices & applications

2. Fibre connectivity ready

- mandatory for the smart pole to have fibre backhaul connectivity
- Installed ODF and ducts for fibre cables

3. Cellular Mobile services

- transmitters for mobile cellular coverage is a mandatory
- sharing of antenna by more than one mobile operator

4. Energy Efficient Lighting

- use of energy efficient Light Emitting Diode (LED) lamp
- support individual light control
- light controller able to transmitted fault information

5. Interactivity

- smart pole devices able to interact with a remote network application.

Optional Requirements

1. Environmental monitoring

- Air, noise, temperature, humidity/water monitoring

2. Green energy

- Solar powered lights
- Electric Vehicle charging station facility

3. Digital information broadcasting

- Local Site information display Eg. Traffic, road status, etc

4. WiFi Connectivity

- Local site connectivity to surrounding static/mobile devices using wifi/cellular radio links

5. Surveillance

- CCTV to police, Local Council office, etc

6. Emergency services

- Siren on flood alert, SOS panic button alarms, etc.

Table 2. Category of services & bandwidth

Type	Service	Technical Requirement
High Bandwidth	Surveillance Digital Information Public WiFi Future Self Driving Vehicle	<ul style="list-style-type: none"> • High bandwidth • Low latency • Secure connection • Stable
Low Bandwidth	Sensor Smart Lighting Emergency Response	<ul style="list-style-type: none"> • Low bandwidth • Deep coverage • Low Power consumption • Single hop wireless – ease of deployment • Positioning - Support GPS • Licensed spectrum to avoid interference



3

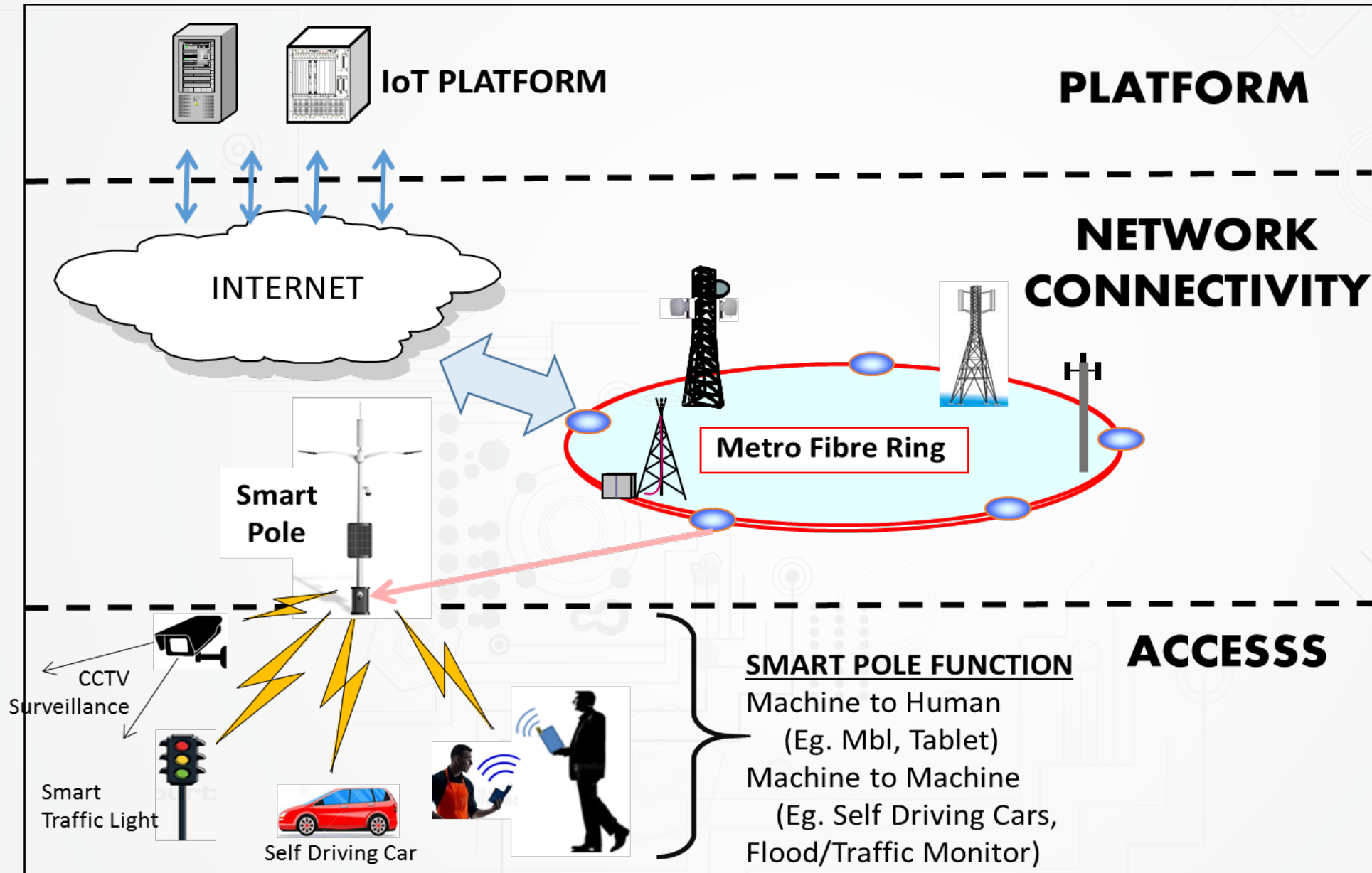
Targeted Applications & Sites

Site Target

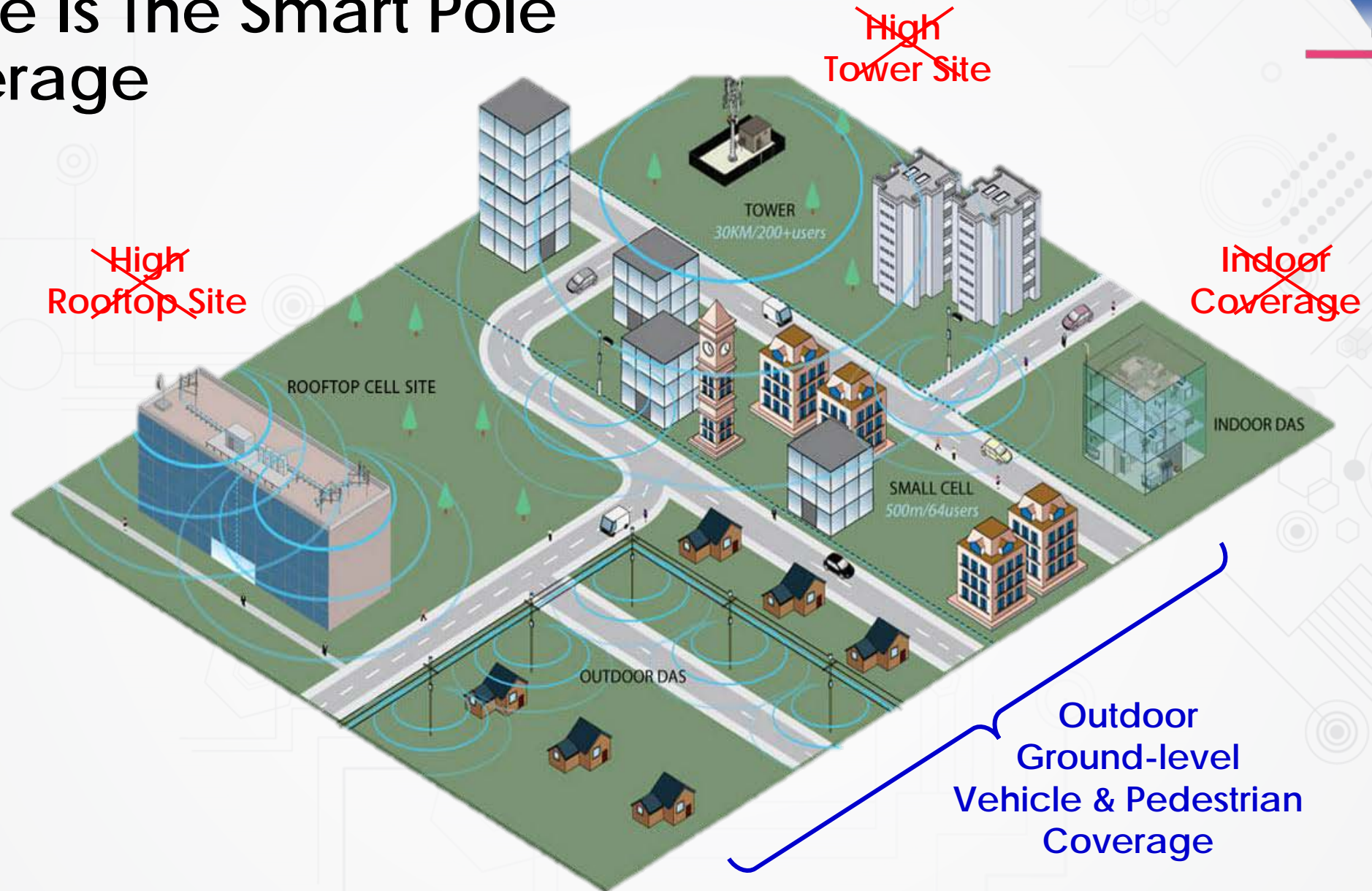


1. Smart pole designed to provide low height, street level coverage or "**Gap Filler**" for capacity and/or coverage blind spot, i.e. structure height of no more than 15 meter.
2. Smart Pole is suitable for sites currently not able to be addressed by conventional macro structures such as tower, monopole, lamp pole or rooftop sites. E.g. Residential playgrounds, traffic junctions, road underpass
3. Telecoms coverage requiring higher height may use other alternates like 35 meter monopoles, 24 meter multi-function lamp poles, etc..
4. The smart pole should blend into its environment with additional smart features as follows:
 - a) promote Common Antenna Sharing (CAS) and fibre transmission bandwidth sharing among telcos; and
 - b) promote additional features such as surveillance, public WiFi, environmental sensors or LED/LCD display.

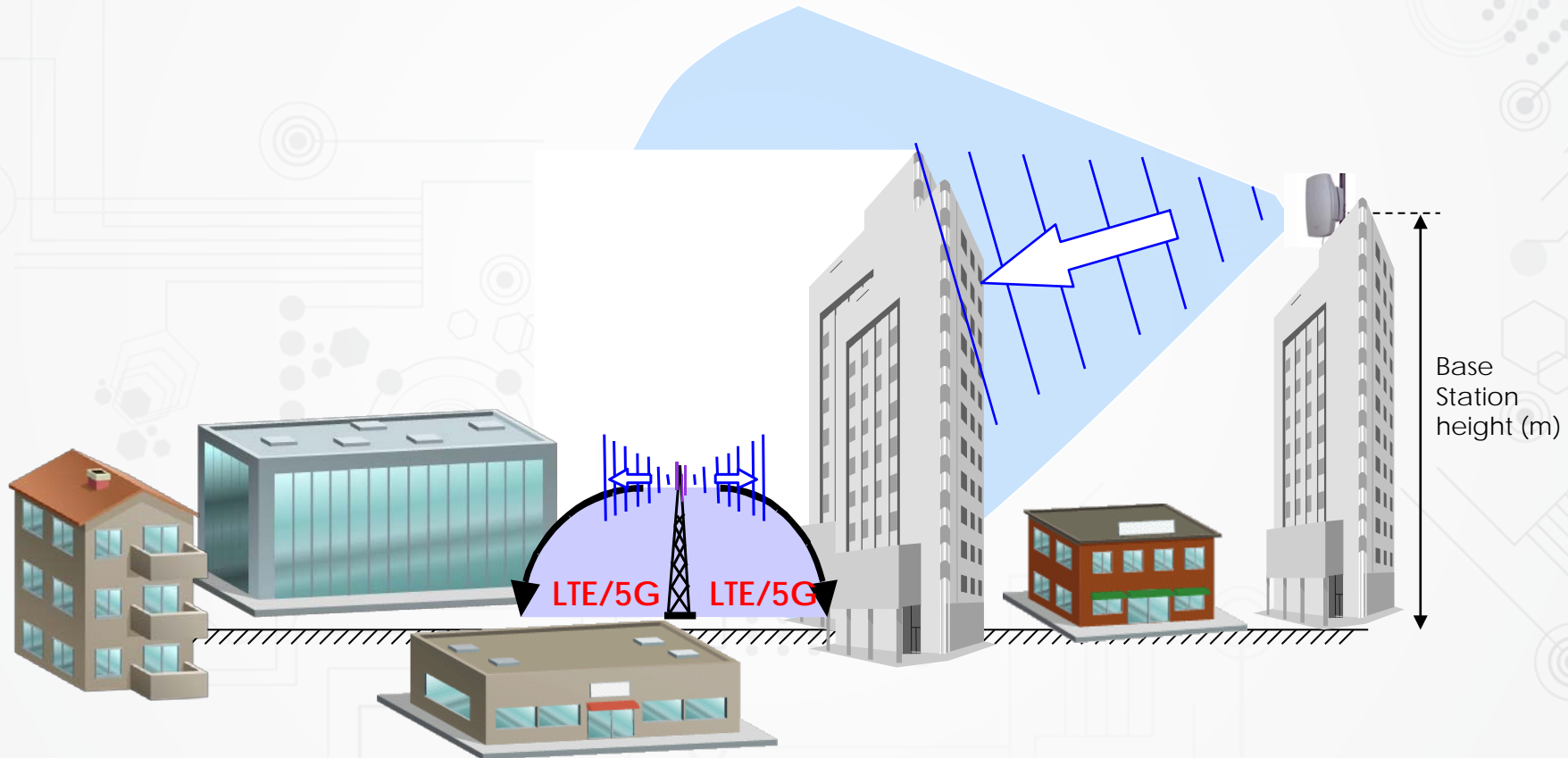
Smart Pole Implementation Topology



Where Is The Smart Pole Coverage



Urban/City Radio Planning

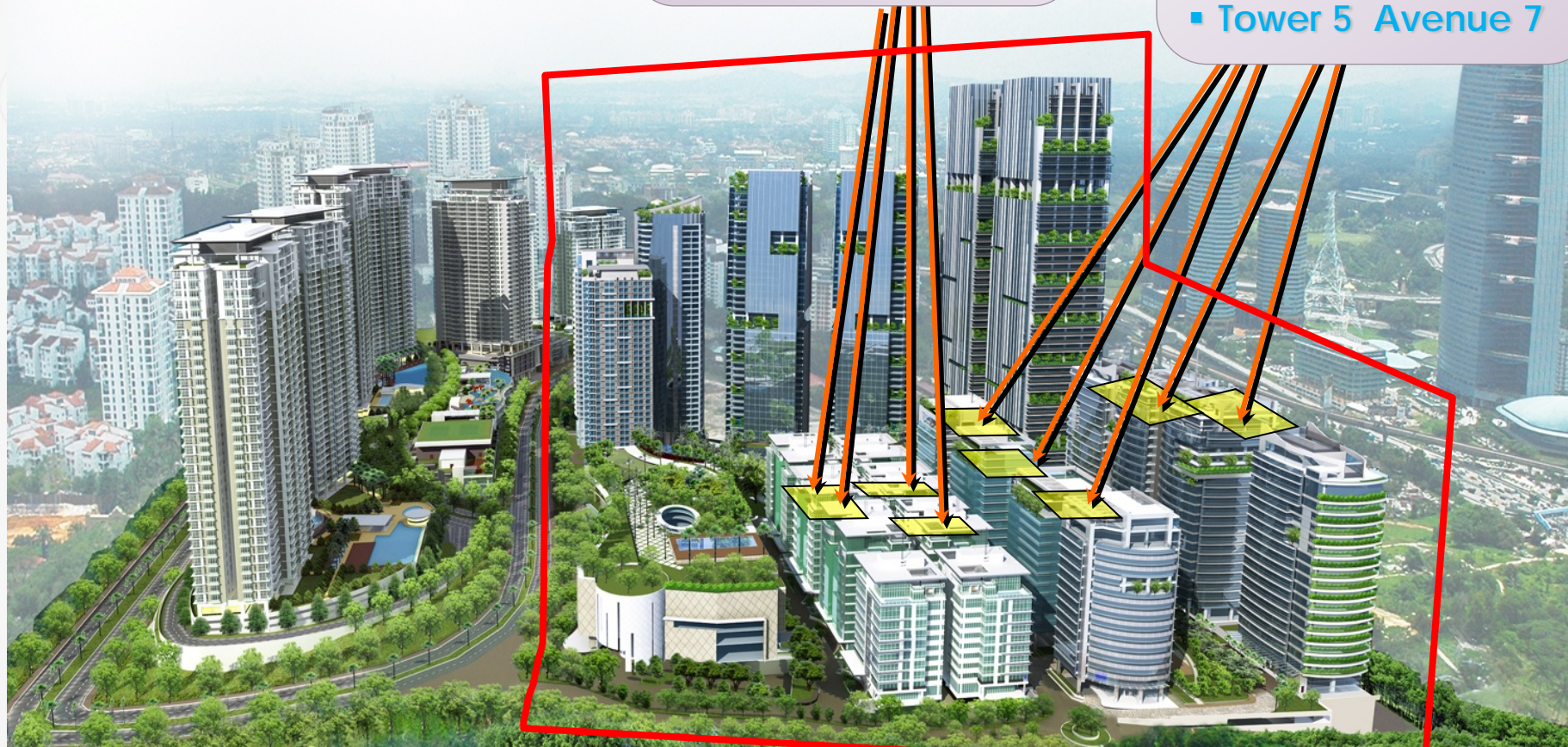


Bangsar South City | MSC BOUNDARY & PREMISES

MSC Malaysia Cybercentre @
Bangsar South City is a 27.5-acre
of Commercial Centre,
consisting of nine (9) designated
premises (all in The Horizon)

- Tower 3 Avenue 3
- Tower 3A Avenue 3
- Tower 5 Avenue 5
- Tower 9 Avenue 5

- Tower 2 Avenue 5
- Tower 2A Avenue 5
- Tower 6 Avenue 5
- Tower 3 Avenue 7
- Tower 5 Avenue 7



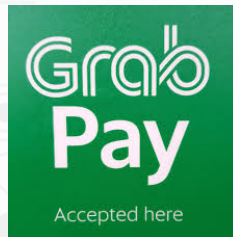
WIRELESS BROADBAND → THE CASHLESS ENABLER

TRANSPORT



Life in the fast lane

FOOD & LIFESTYLE



WE ACCEPT



INTERNATIONAL



JONKER WALK, MELAKA

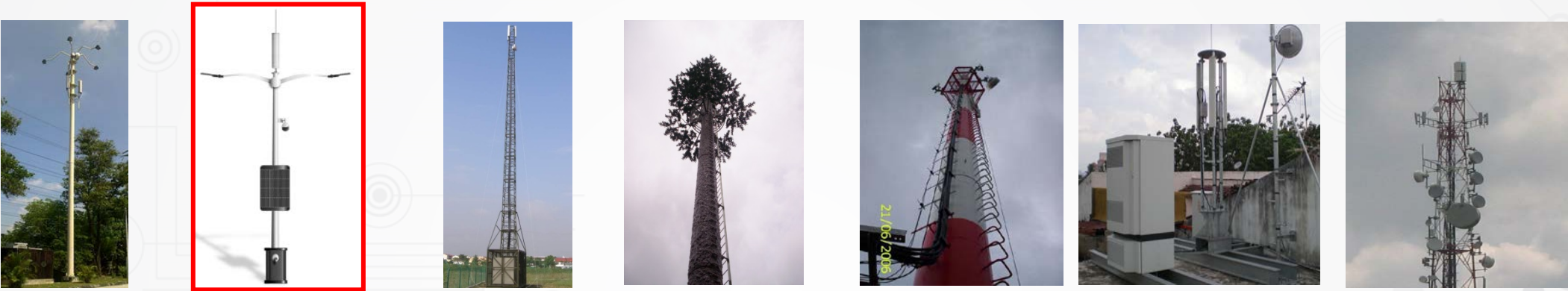
TnG eWallet, ALI Pay, BOOST, M Cash, etc...



SENSITIVE RESIDENTIAL COVERAGE - 2



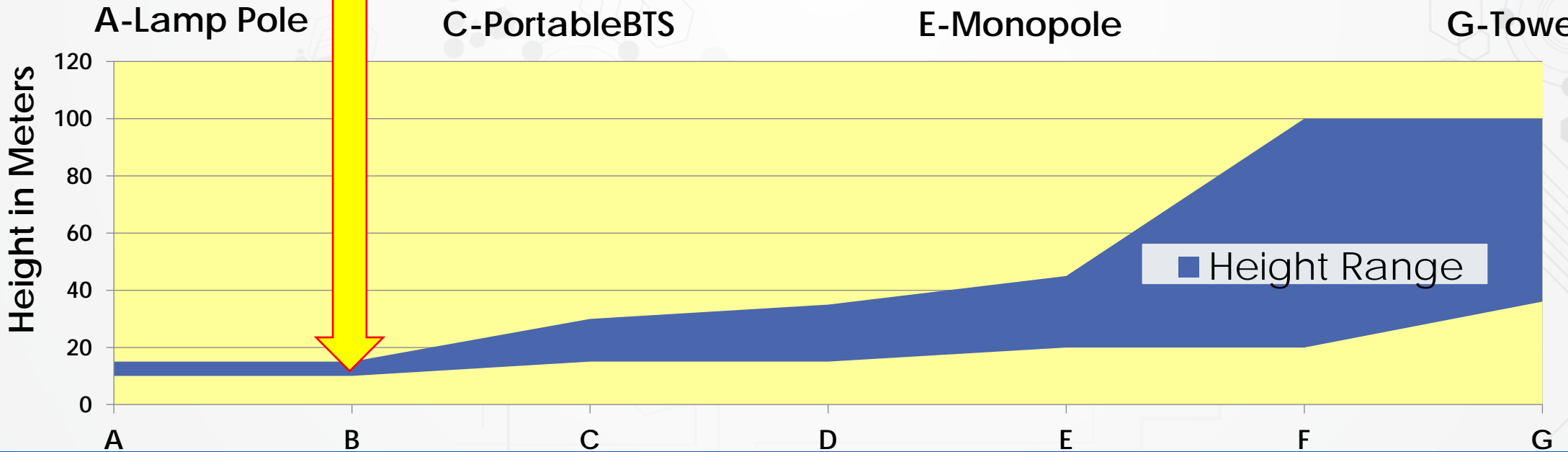
HEIGHT COMPARISON OF THE DIFFERENT EXTERNAL STRUCTURE (Cell site)



B-Smart Pole

D-Monopole Tree

F-Rooftop





4

Design (Feature & Specs) Summary

Design Summary - Feature & Specs

- Maximum **15 meters** in height
- **Not meant to replace Macro Cell sites**, but to complement
- Sites needing more than 15 meters can still use other existing approved taller structures such as towers, rooftops, monopoles, lamp poles
- Requires 5 x Compulsory features
 - ✓ Electricity supply;
 - ✓ Fibre backhaul;
 - ✓ Cellular access;
 - ✓ Energy efficient lighting;
 - ✓ Interactivity (to a network)
- Added optional features for further optimal use of pole
- Aesthetic & safety aspects not compromised
- Follow proper site and device maintenance procedure
- Follow local council guidelines and approval process

Impact Of Non-compliance

– Rejection by local residents at target area

New technology to boost Net speed in Subang Jaya

Thestar.com.my : Metro News Tuesday, 3 Oct 2017

The first smart pole, **measuring 18m high**, was successfully installed on the edge of SS18 in Subang Jaya and officially launched last week.

.....
Subang Jaya assemblyman Hannah Yeoh praised MPSJ councillor Ken Chia for his part in discussing the project with SS18 residents and gaining their support.

“This is how we should be doing business. We should be engaging one another, not pushing things down the residents’ throats and expecting them to just accept it,” she said.

Residents initially objected to the smart pole being constructed in the middle of the local park, so it was later moved to the road shoulder.....





5

Conclusion

COMMON FAQ ASKED

1. **The Smart Pole is supposed to be a fast implementation infra. But the fiber link normally takes 1+ year to install. How then can the smart pole be deployed fast?**

ANS: The TC includes the temporary install of small microwave dish until the fiber is available.

2. **Why is the height limited to only 15 meters? Can it be much higher and still called Smart Pole?**

ANS: Higher pole will have safety “setback” distance that the public cannot go near. This would defeat the install of smart facilities such as EV car charger, etc...

3.

Q&A

*Thank
You*

Let's Collaborate



MTSFB



mtsfb_cyberjaya