FTTH COUNCIL
ASIA PACIFIC | FIBER TO THE HOME APAC

Smart City Infrastructure

Smart City Standards and Regional Projects

by Smart Cities Committee

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Summary

This paper is the first of a series from the FTTH Council Asia-Pacific Smart City Committee (FTTHCAP_SCC). The paper presents two arguments:

- That fiber infrastructure is a fundamental need for any Smart City and the planning and design of this network should be a critical part of any project.

- Secondly, those standards in the design & operation of the fiber network are needed so that the citizens of Smart Cities are provided with the applications needed to make the "Smart" decisions that define these projects.

In presenting this, the paper addresses how to define fiber networks within a Smart City, why fiber technology over wireless, a description of the available standards and how they enable the objectives of a Smart City project.

Audience for this paper: This paper is relevant to anyone considering or planning a Smart City project. Smart City projects already in delivery mode should consider how they are delivering on the needs raised in this paper, technologists who work in the Smart City space and citizens of Smart Cities can read this paper to understand the link between network, data and applications that enable the Smart decision making of a Smart City.

Smart Cities Committee Objectives

The FTTH Council Asia-Pacific Smart City Committee provides knowledge and best practices to assist with the fundamental infrastructure for Smart City projects which can be integrated over fiber-to-the-home communication networks. We believe a fundamental tenant of a Smart City is the need for an intelligent information and communication system, and that the best way to provide this is through a reliable and secure fiber infrastructure. We understand that there will be several applications such as e-Commerce, e-Entertainment, e-Governance, e-Education, Smart Power Grid, Traffic management, extended capacity and coverage for 4G/5G/WiFi, new applications with the Internet of Things (IoT) and Internet of Everything (IoE). These applications are designed to improve quality of life of each citizen and support sustainable vibrant economy. However, the priority for these applications and associated challenges may vary from country-to-country or region-by-region globally.

1. The Role of Fiber Infrastructure

Urban areas in Asia Pacific are growing at a rapid pace, and cities are becoming denser every day. Smart City projects through the Asia Pacific region are designed to harness smart technologies and smart governance to manage the economic, environmental, and social impact of this large-scale urbanization. And while there is no universal definition of a Smart City, it is widely recognized that an essential component of a Smart City is a state of the art communications infrastructure.

Fiber is a fundamental technology for the Smart City's state of the art communications infrastructure. An ever increasing number of connected people, devices and machines is rapidly transforming urban areas. Smart Cities are expected to lead the growth of the Internet of Things, with 81% of connected things to be found in Smart Cities by 2020*. In this increasingly digitized urban landscape, an fiber infrastructure supports a wide range of smart wired and wireless applications and services including smart energy, waste and water management; smart security, monitoring and access control; smart transport, traffic and parking; smart health, education and wellbeing; smart homes, buildings and industrial facilities; among others.

Citizens can make better informed decisions when presented with better information, in ways that are easier to interpret. This better decision making means better use of scarce resources energy, space, money and time. To provide this information large amounts of data are generated and transmitted in a Smart City every second. Day or night, people, devices and machines require instant connectivity throughout the city. With fiber at its foundation, a Smart City is ready to support the growing number of existing and next generation smart technologies.

For the sustainable smart city infrastructure, it is essential to identify business opportunities through smart services for improving city efficiency, which can be monetized and converted into revenue generating model. With the fast digital connectivity between smart devices, massive data generated can be processed by apps to create value by automation of operations for improved quality of life and productivity while reducing costs of governance. With the greater degree of digitization, more service can be developed and its monetization opportunity will also grow up.

2. Benefits of Smart Cities with Fiber

The demand to deliver uninterrupted voice, high speed internet, high-end video (HD/4K/8K) to large number of subscribers is critical. The wireless technologies have limited bandwidth to deliver high speed data streaming and scalability with large number services as desired in smart city infrastructure. On the other hand, the fiber network can provide unlimited bandwidth to support future proof connectivity solutions with bundled services throughout the life of the Home/Building. Besides, the fiber communication network is more reliable and secure than any other competing access technologies. The fiber based smart cities infrastructure can potentially integrate multiple network of smart grid, offload mobile traffic through Wi-Fi, backhauling 3G/4G/5G system with Fiber to the -antennas solutions, smart metering systems and high speed internet to support a number services from government and private players for remote education, entertainment, governance, security, traffic management, resource management, and waste management, etc.
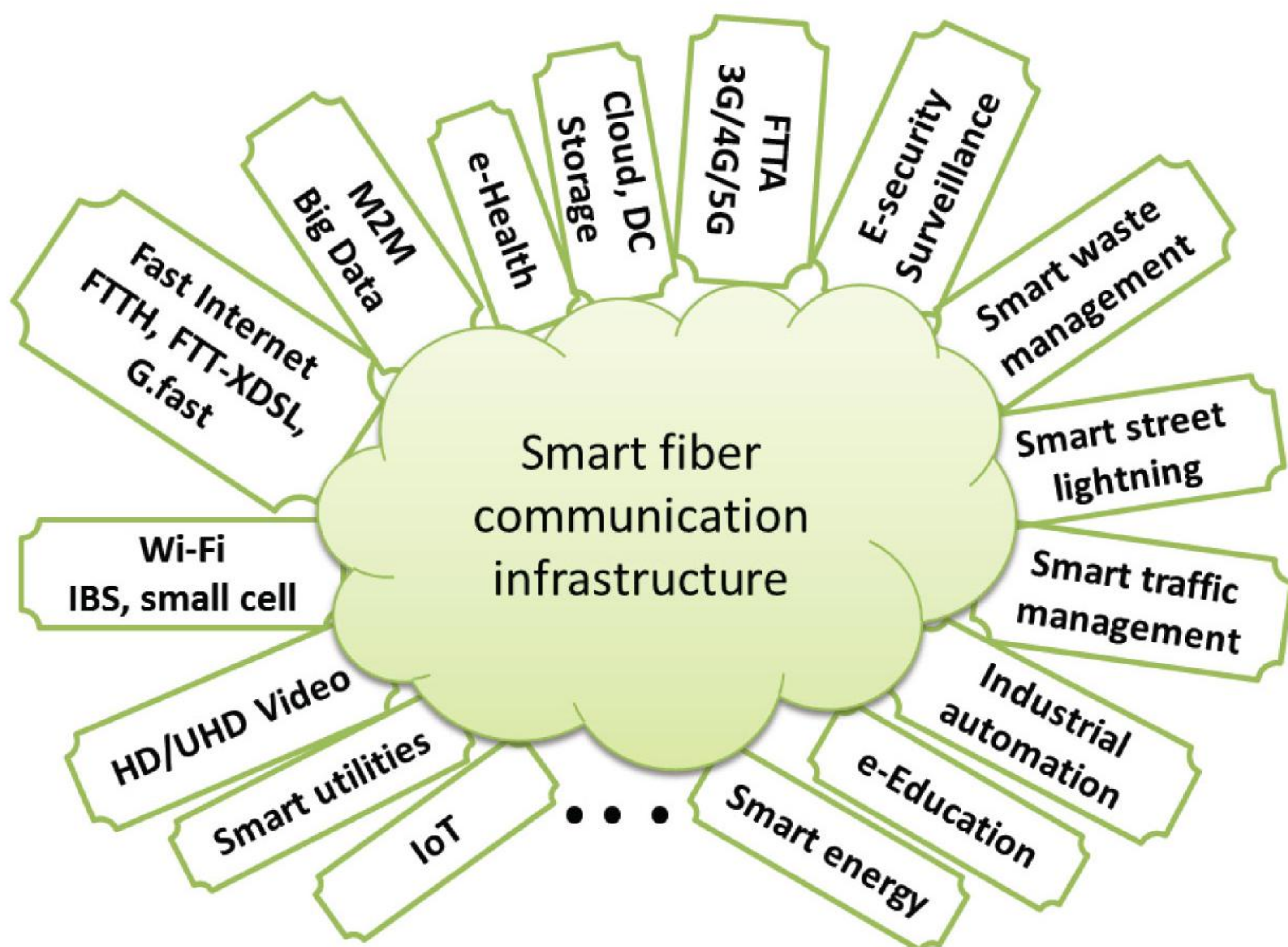

Figure 1: Smart integrated fiber communication infrastructure

3. Why Do We Need Standards

What role do the standards perform?

- Standards provide technology alignment/interoperability

- Network interconnections between smart communities

- Open standards for applications and content providers

- Reduced cost of provisioning - design & build Common design standards

4. Smart Cities Regional Projects

INDIA

India Smart Cities Challenge with $14 billion USD as part of the Smart Cities Mission of the Ministry of Urban Development. The Government of India has planned for creating 100 new Smart Cities in the country by 2022.

> http://www.smartcitieschallenge.in/
> http://smartcities.gov.in/

First x20 India Smart Cities:
1. Bhubaneshwar, 2. Pune 3. Jaipur 4. Surat 5. Kochi 6. NDMC (New Delhi) 7. Ahmedabad 8. Jabalpur 9. Vizag 10. Solapur 11. Devangere 12. Indore 13. Coimbatore 14. Kakinada 15. Belgaum 16. Udaipur 17. Guwahati 18. Chennai 19. Ludhiana 20. Bhopal

The first 20 cities proposals were selected for funding with the focus on creation of basic civil infrastructure, security, transport, and connectivity and e-governance services. The Smart Cities embrace best practices demonstrated elsewhere and customizing them for Indian need and will be developed in phased manner. For example, Gandhinagar smart city project will be built using various components/ systems/ technology with strong communication framework and integration with Centralized control. The scope of work covers establishment of various subsystems like free and paid Wi-Fi Internet access, CCTV Surveillance system including automatic number plate recognition (ANPR), Face and Speed Detection, Smart Street Lights, Environment sensors with public display units, Smart bus with Automatic Vehicle Location System, Bus Stops PA System, Integrated Central control room with Network operation center (NOC) and Value Added Services.

THAILAND
Thailand's first Smart City will be Phuket [Map]. Software Industry Promotion Agency (Sipa) has been allocated 100 million Baht to 'develop digital infrastructure and a data centre'.

Chiang Mai will be the second Smart City in Thailand starting in 2017. [Map]

Thailand's Provincial Electricity Authority (PEA) smart grid pilot

REFERENCE:
http://www.bangkokpost.com/business/news/836160/phuket-set-to-be-thailand-first-smart-city

MALAYSIA
Iskandar Malaysia [Map].
http://irda.com.my

SOUTH KOREA
Songdo international Business District [Map]
Episode 1
https://youtu.be/fHO_zkHPTal

VIETNAM
Vietnam's Ho Chi Minh (HCM) is the first Smart City, with ten cities to follow;
      Bien Hoa, Dalat, Halong, Ha Tinh, Hue, Lao Cai, My Tho, Nha Trang, Thanh Hoa and Vinh

http://www.vir.com.vn/vietnamese-cities-ready-to-get-smart.html
http://www.vir.com.vn/vietnamese-cities-ready-to-get-smart.html

SINGAPORE
Singapore is leading the Asean smart city push
http://www.computerweekly.com/news/4500258202/Singapore-leads-Asean-smart-city-push

Smart Nation Vision
https://www.ida.gov.sg/Tech-Scene-News/Smart-Nation-Vision
http://www.wired.co.uk/news/archive/2016-01/11/smart-city-planning-permission
http://www.smartnation-forbes.com/

5. Conclusions

The FTTH Council Asia-Pacific Smart Cities Committee recommends for a reliable and secure Fiber communication network for a city developing from Standard to Smart. The FTTH network is capable to provide unlimited super-fast internet access and would play a crucial in delivering future proof smart services to all sectors of society. All possible wireless technologies can easily be integrated with FTTH and has capability to transport large volume of data from each corner of city including mobile objects.