



# Holistic Approach to Broadband Infrastructures Building

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# URBANIZATION, RESOURCES CONSUMPTION, GDP GROWTH THINKING CITIES SMARTLY IN APAC

## CITIES ACCOUNT FOR



**53%**

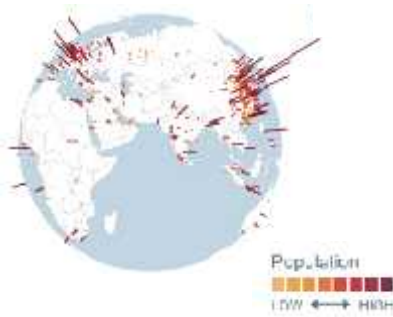
OF THE GLOBAL POPULATION  
(7.0 BILLION) BY 2010



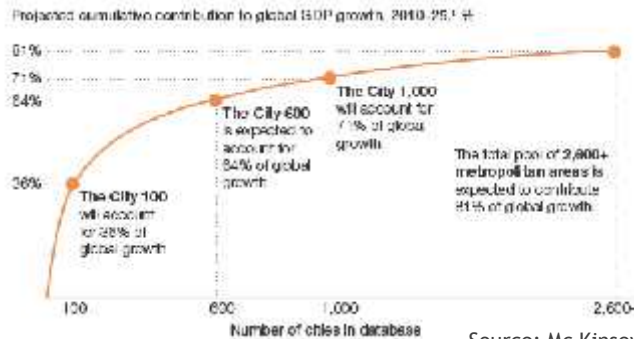
**70%**

WILL BE URBANITES  
(OUT OF 9.3 BILLION) IN 2050

Source: United Nations



## CITIES CONTRIBUTE THE MOST TO GDP



## CITIES CONSUME THE MOST RESOURCES



**70%**

OF ENERGY CONSUMPTION AND CARBON EMISSIONS



**2%**

OF THE EARTH'S LAND

## A SOCIO-ECONOMIC SHIFT DOUBLED BY A GEOGRAPHIC SHIFT



**8,000**

LARGE COMPANIES EXCEEDING \$1B IN REVENUE IN 2010



**+ 7,000**

NEW LARGE COMPANIES EXCEEDING \$1B IN REVENUE IN 2025



**73%**

OF 8,000 LARGEST COMPANIES' HEADQUARTERS IN DEVELOPPED COUNTRIES



**70%**

NEW ENTRANTS LIKELY TO BE BASED IN DEVELOPING COUNTRIES



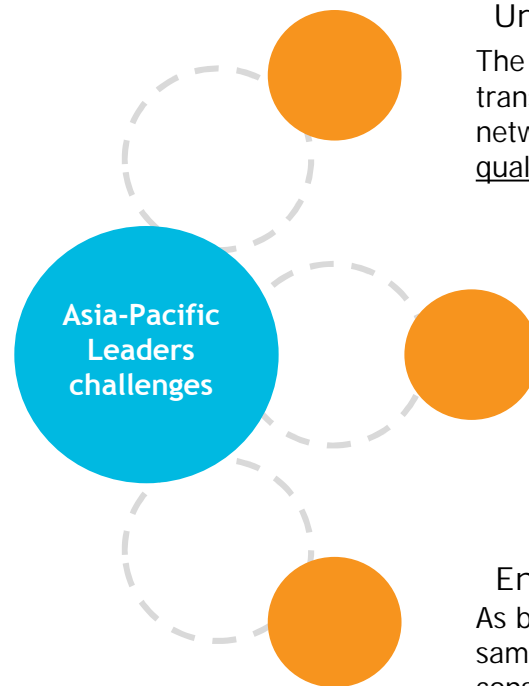
**76%**

OF CONSOLIDATED REVENUE OF ALL LARGE COMPANIES

## THE SITUATION IN ASIA PACIFIC

- By 2050 the number of people over the age of 60 is expected to triple, and will outnumber children under 15 for the first time in history. Some countries in Asia are currently facing an increase of elderly population (Japan, Singapore)
- Besides the doubling of the middle class from 80 million in 2012 to 160 million in 2015, the ASEAN population holds more than 50% of generation Y and Z, which means that this generation is a savvy user of advanced technologies, including mobility, cloud, social and Big Data.
- UN forecasts that ASEAN's urban population in 2050 will exceed 500 million - that was ASEAN's total population in 2000.
- Currently there are 21 mega-cities (with populations >10M). This is forecast to increase to 27 by 2020. Asia will have at least 10 mega-cities by 2025, including: Jakarta, Indonesia (24.9 million), Mumbai, India (33 million), Shanghai, China (27 million), Karachi, Pakistan (26.5 million) and Dhaka, Bangladesh (26 million).

## 3 CHALLENGES FOR THE REGION



### Urbanization challenge

The continuous increase of urban population put pressure on transport, access to clean water, energy supply and telecom network. Infrastructure planning needs to be rethink to ensure a quality of life and security to citizen

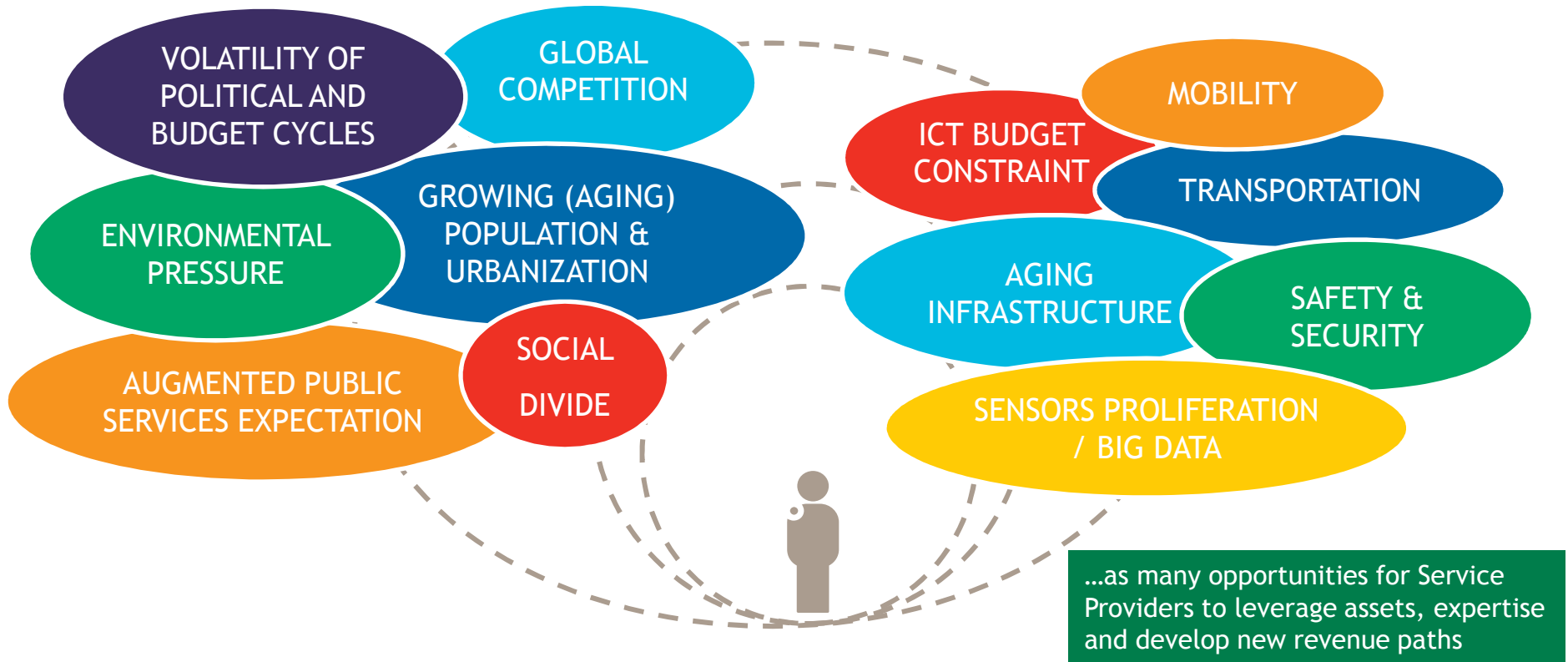
### Social cohesion challenge

Necessity to bridge the gap between the "have" and the "not have"  
Given the dilemma between a rapidly growing urban population and a rural population that is falling further behind, governments must be careful in assigning priorities to development projects. Accelerating rural development is necessary to reach 100% coverage in those areas.

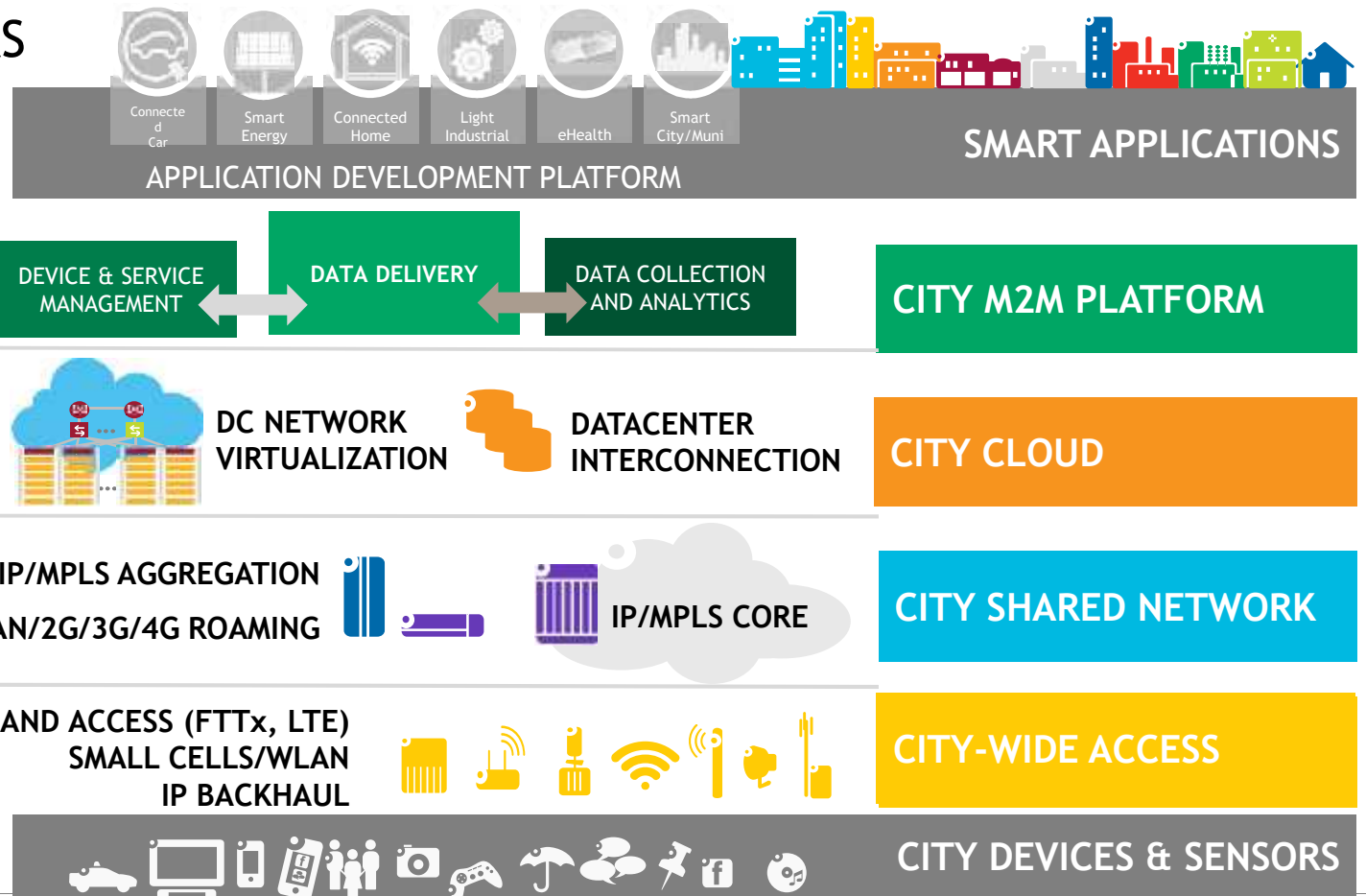
### Environmental challenge

As business and policy leaders, all the stakeholders should avoid to do the same failure as occurred in the past. It requires to reduce energy consumption and to be respectful of the environment.

# CHALLENGES FOR STATE, REGIONS AND LOCAL GOVERNMENT

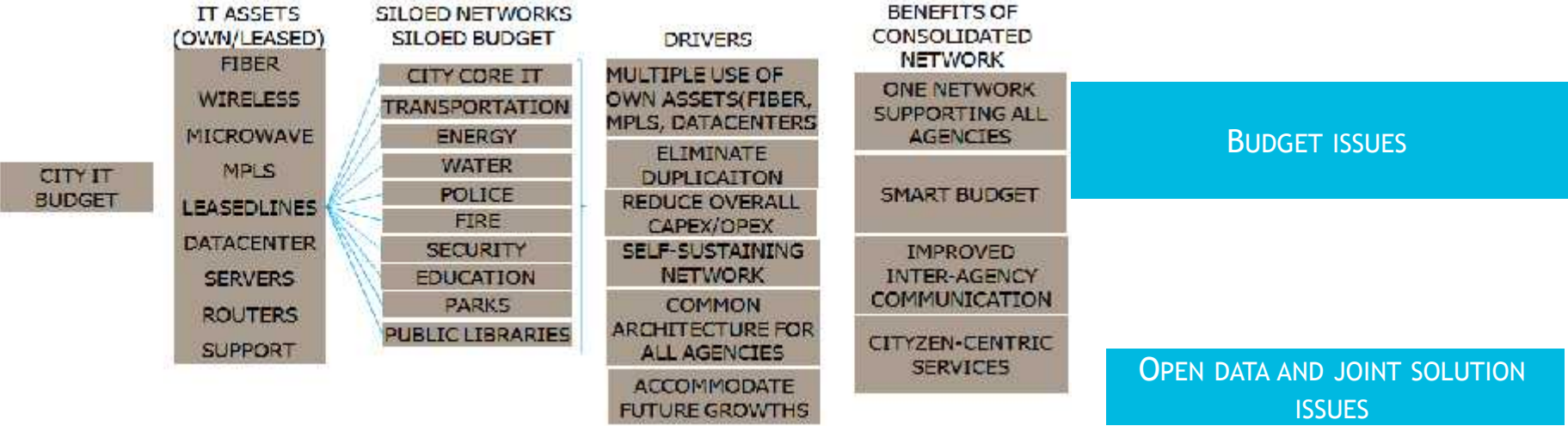


# SMART CITY LAYERS & COMPONENTS



# THE SILOS

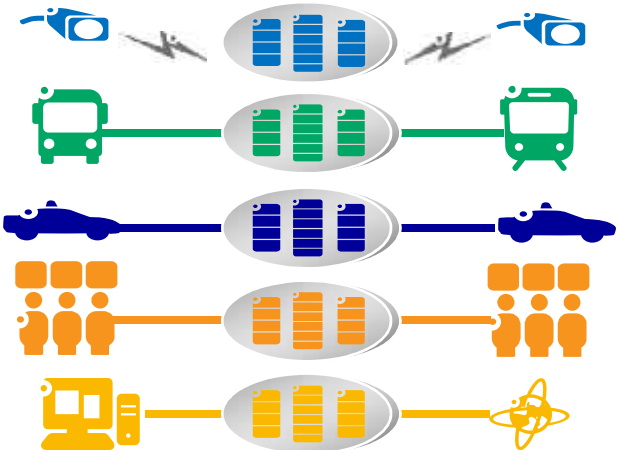
## BUDGET AND INTERCONNECTIVITY MISS OF EFFICIENCY



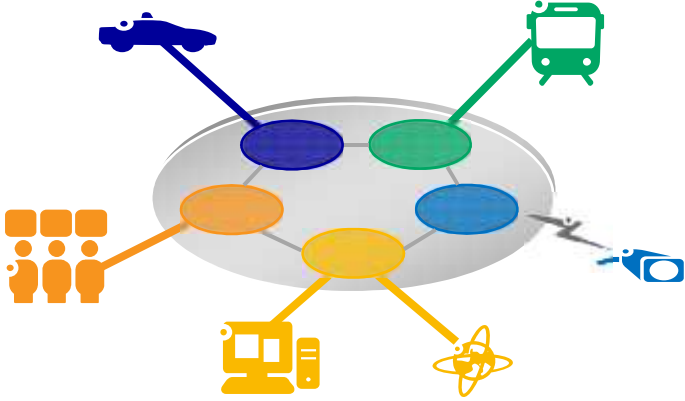
‘A Smart Community is a community seeking to optimize the efficiency and effectiveness of useful and necessary processes, activities and services via ICT-based solutions on the basis of a multi-stakeholder, state and local government based partnership’.

# MODERNIZATION OF ADMINISTRATION INFRASTRUCTURE ADDRESSING NETWORK CHALLENGES THROUGH CONVERGENCE

SEPARATE AGENCY/SERVICE NETWORKS



CONVERGED SERVICES NETWORK



EACH AGENCY HAS ITS OWN NETWORK  
A COMPLEX MIX OF NETWORKING TECHNOLOGIES

ALL ADMINISTRATIONS ON A SINGLE NETWORK WITH  
VIRTUAL NETWORK APPEARANCE AND CONTROL

Multiple use of own assets (Fiber, MPLS, datacenters)

Eliminate duplication

Reduce overall CAPEX/OPEX

Self-sustaining network

Common architecture for all agencies

Accommodate future growths



# CITY OF CALGARY, CANADA



**Creating a common network infrastructure for the City – increasing security and efficiency while reducing costs**



## CHALLENGES

- Address exploding demand for bandwidth in growing city
- Reduce operating costs and improve ROI (leased fiber)
- Resilient & redundant solution for “silo’d “agencies
- Meet the future demand for long-term sustainability

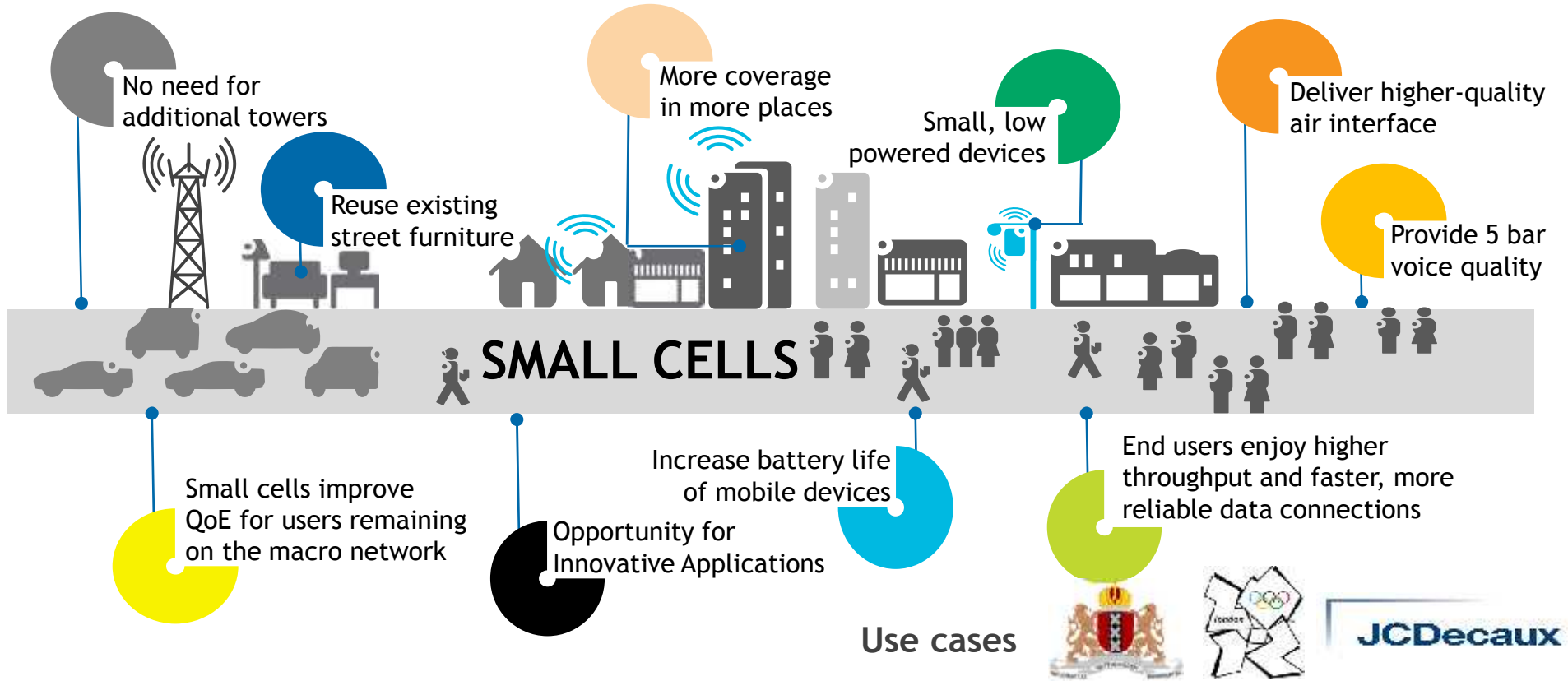
## SOLUTION

- Network design & equipments, engineering, implementation, project management
- Mission critical IP/MPLS network for all authorities operations (administrations, public safety, transportation...)
- Phase I: Core with OmniSwitch 10K (10 Gb), and aggregation/edge with OmniSwitch (10 Gb)

## BENEFITS

- Smooth migration to a converged and shared IP/MPLS infrastructure consolidating separate networks for high-quality user experience, lower network administration costs and a better return on investment (ROI)
  - Risk mitigation/disaster recovery - remote connectivity allocation over alternate paths in the event of failure,...
  - Consolidation of broadband/leased line requirements
  - Lease/sell to carriers the fiber surplus of fiber
  - Easier management
  - Ready to support real-time high speed applications (video, social media, customer service, collaboration,...)

# SEAMLESS WIFI, 4G CITY COVERAGE AND CAPACITY CHALLENGE



# NATIONAL/REGIONAL REGULATORY APPROVALS

## WHAT'S INVOLVED?

COMPLIANCE WITH RF EXPOSURE LIMITS	PLANNING POLICIES	SECTORIAL REGULATIONS	TAXES AND FEES
<ul style="list-style-type: none"> <li>• Sets RF exposure limits for equipment</li> <li>• Ensures equipment meets RF exposure limits by setting certification process</li> </ul>	<ul style="list-style-type: none"> <li>• May issue degrees that limit the scope of local authorities in setting planning policies</li> <li>• Sets planning restrictions for sensitive areas as defined at a national level</li> <li>• Sets public domain rights-of-way &amp; other mutualization requirements</li> </ul>	<ul style="list-style-type: none"> <li>• May set primary and back-up power regulations</li> <li>• May require that backhaul use public right-of-ways</li> </ul>	<ul style="list-style-type: none"> <li>• May impose national taxes and fees per equipment type</li> </ul>

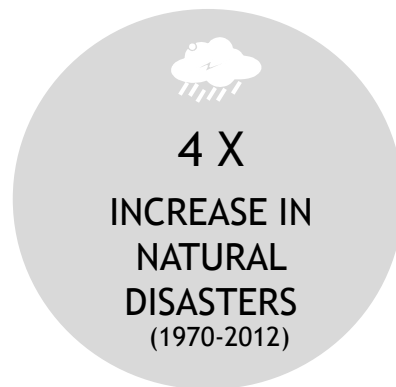
APPROVALS REQUIRE SHOWING COMPLIANCE WITH RF LIMITS, PLANNING POLICIES & SECTORIAL REGULATIONS

# PUBLIC SAFETY AND DISASTER RECOVERY

## INDUSTRIALIZATION



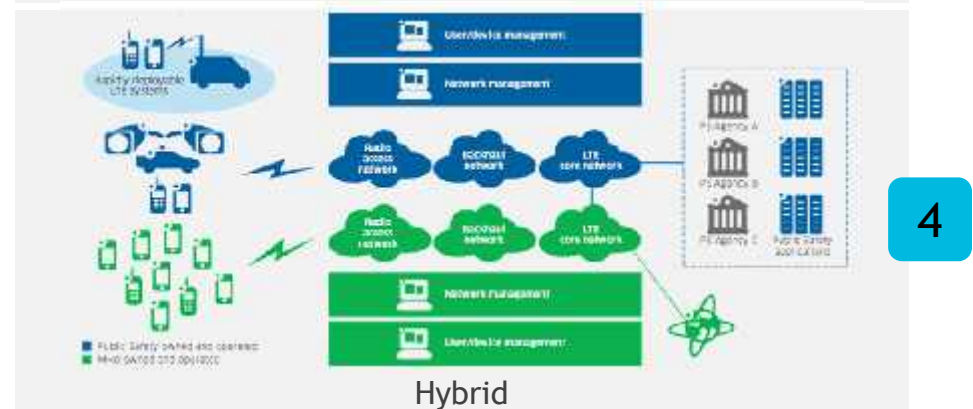
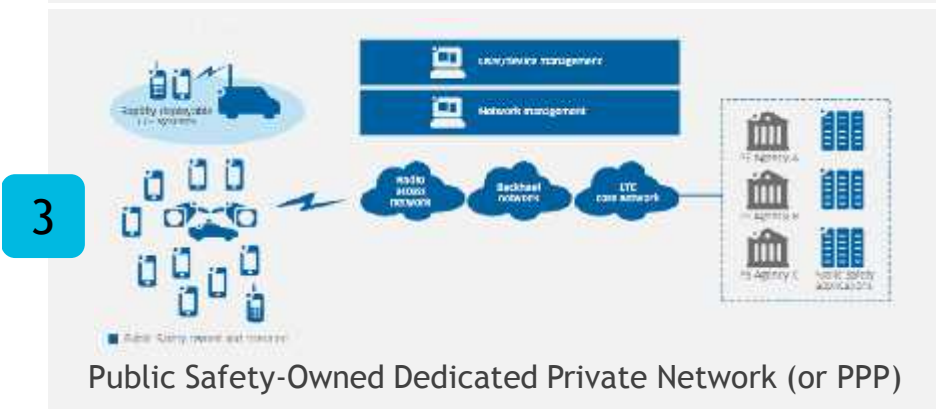
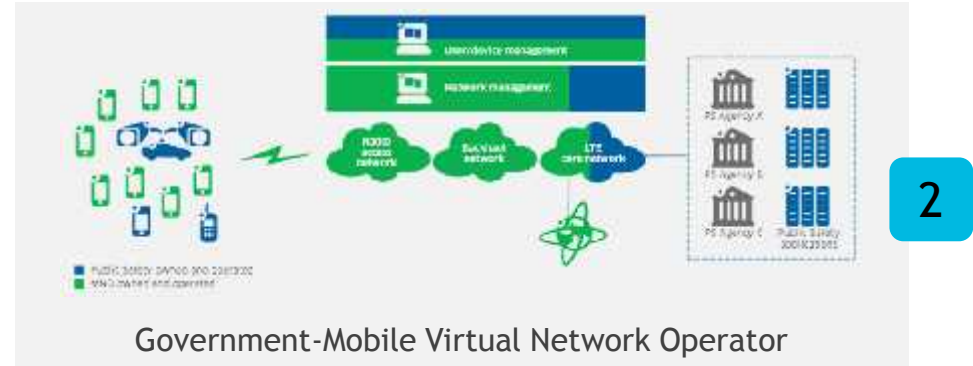
## NATURAL DISASTERS



Source: Swiss Re Economic and Research Consulting

COMMUNICATION IS AN ESSENTIAL TOOL FOR ENHANCING OPERATIONAL EFFECTIVENESS AND IMPROVING SAFETY OF CITIZENS AND PS OFFICERS  
ENHANCEMENT OF SITUATIONAL AWARENESS AND COLLABORATION THORUGH VIDEO AND DATA

# DIFFERENT OPERATION MODELS FOR GOVERNMENT PUBLIC SAFETY



**APPROACH SELECTED MAY DIFFER BY REGION (AND OVER TIME) AS DICTATED BY ECONOMICS, OPERATIONAL REQUIREMENTS, SPECTRUM AVAILABILITY**

# A TALE OF TWO CITIES CHATTANOOGA TN USA, ZURICH SWITZERLAND



1800s - called the **Dynamo of Dixie** for its thriving manufacturing

1970s - known as the **Dirtiest city in America**

Today - has become a gig city with the fastest internet in North America



Prosperous modern city World's banking capital

Zurich Strategies 2025

Smart grid & open access  
2,000 Watt Society



# A SMART ASIA-PACIFIC BECOMING THE LEADING REGION OF THE 21<sup>ST</sup> CENTURY

## A VIBRANT MARKETPLACE WITH STRONG POLITICAL WILLINGNESS

- 2018-2020: a race to stay at the technological and competitive edge with future networks (5G and Virtualisation in Japan, Korea)
- ASEAN 2016-2020: achieving the full connectivity/capacity at the lowest price in ASEAN. Mobile BB has the crucial technology and fixed/fiber in dense urban areas
- successful implementation of government led BB infrastructure (Australia, NZ and Singapore) but what are the next services innovation to stimulate competition and the economy (big data, M2M)?
- Some countries (India, Singapore) have launched ambitious initiative to create smart cities/nation
- Operators business services: potential growth for enterprise solution and innovation (virtualization and cloud service). Strong footprint of big operators and expansion for local operators.

## DEVELOPING A MODERN REGULATORY APPROACH

- Promoting and facilitating networks investment(access to all kind of passive infrastructure, simplification of rights of way granting, mandatory fibre pre-cabling for new buildings, spectrum allocation and sharing)
- Adapting regulatory framework a horizontal layer approach: ensuring healthy and sustainable competition at each layer and avoiding gridlocks between any layers that become inter-dependant
- Operators should be allowed to monetize the data flow through service differentiation which is key to foster innovation, new services and meet demand for different levels of quality. (e.g: providing End to End QoS service delivery, in becoming Cloud and CDN providers)
- Spectrum allocation should be strongly harmonized at regional level to favor timely allocation of frequencies for LTE and prevent market fragmentation.



Every success  
has its network