



# THE 2018 CANADIAN TELECOM SUMMIT

Toronto | June 2018

## Fiber Networks – A Generational Change

Robert Pothier, Senior Vice President, Design

## Preparing for the Future of Connectivity

Daniel Robillard, Senior Vice President, Connectivity

# CANADA'S LEADING TELECOMMUNICATIONS NETWORK INFRASTRUCTURE SERVICES PROVIDER



**Design**

Engineering  
Locate



**Infrastructure**



**Connectivity**

Wireline  
Wireless



**Turnkey and Project  
Management Solutions**

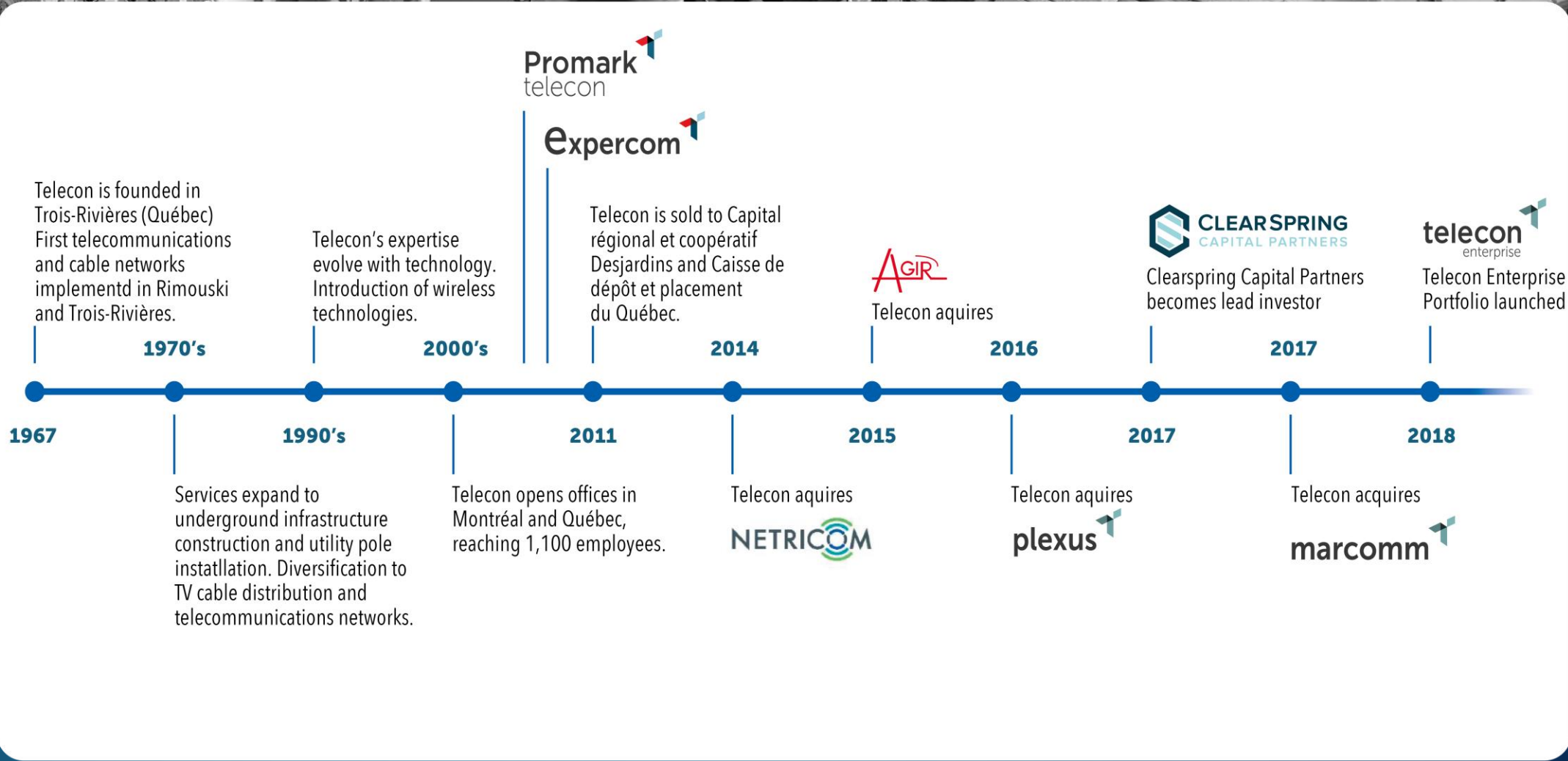






## 50 years of Passion, Expertise and Innovation

Founded in 1967 and headquartered in Montréal, Québec, Telecon is Canada's leading telecommunications network infrastructure services provider. We leverage our national presence, network of 3,250 professionals, client relationships, and 50-year history to offer industry-leading design, infrastructure and connectivity solutions to telecommunications companies nationwide.





## TELECON'S SERVICE OFFERING

## Customer Expectations

## Predictability

## Agility


## Innovative Solutions

## Quality

## Continuous Cost Improvement



**S**  **Safety and Health**

**M**  **Mastery of our line of business**  
**Targeting excellence**

## A Agility

**R**  **Respect and integrity**

**T**  **Teamwork**

# OUR NATIONAL SCALE AND PRESENCE



## Canada

- 45 offices coast-to-coast
- More than 3,000 highly skilled employees
- Extensive network of strategic partnerships and specialized subcontractors
- 2,400 vehicles and specialized equipment

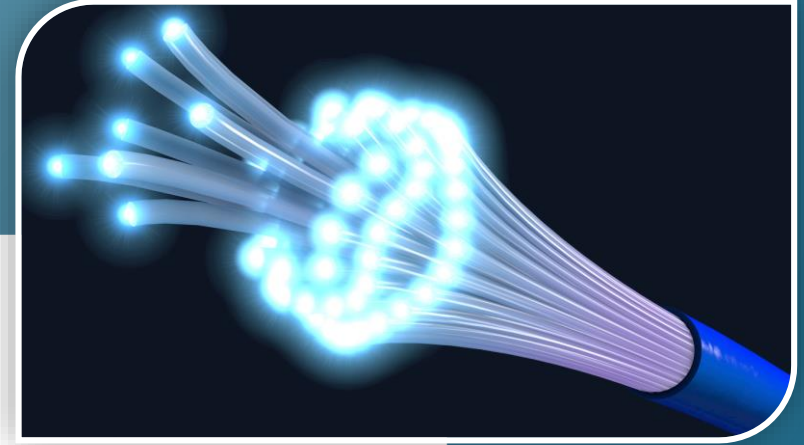
## USA

- Denver, Colorado
- Philadelphia, Pennsylvania
- Salt Lake City, Utah



# FIBER NETWORKS

*A generational change*



# 50 YEARS OF TECHNOLOGY TRANSFORMATION

- ✦ Copper DSL
- ✦ Pole Design
- ✦ Underground Structures & Locates
- ✦ Towers
- ✦ Civil/construction
- ✦ HFC Deployments
- ✦ Small Cell and WiFi
- ✦ FTTx/PON/GPON
- ✦ Long-Haul Fiber
- ✦ Installation & Repair
- ✦ IoT Assessments
- ✦ Indoor design/deployment

**Copper  
telephone  
lines**

**Introduction  
of broadband  
services**

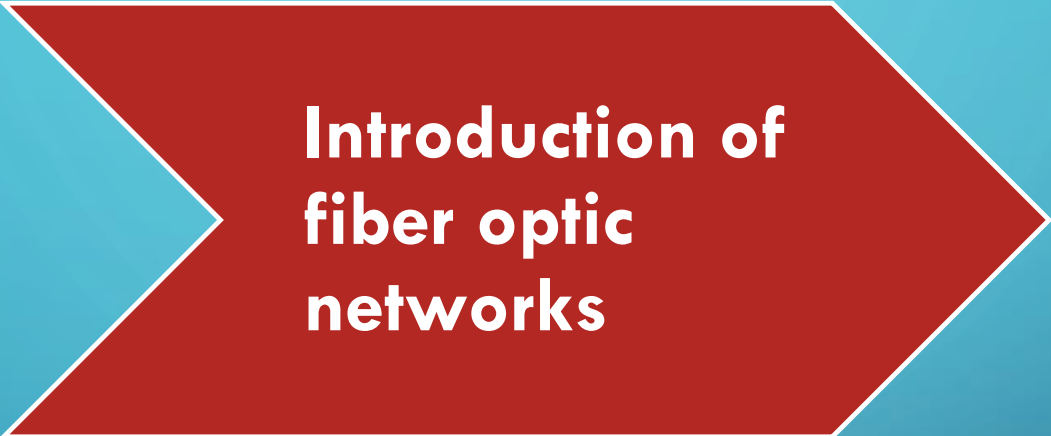
**Introduction of  
mobile networks**

**Introduction of  
fiber optic  
networks**

**5G**



# 50 YEARS OF TECHNOLOGY TRANSFORMATION

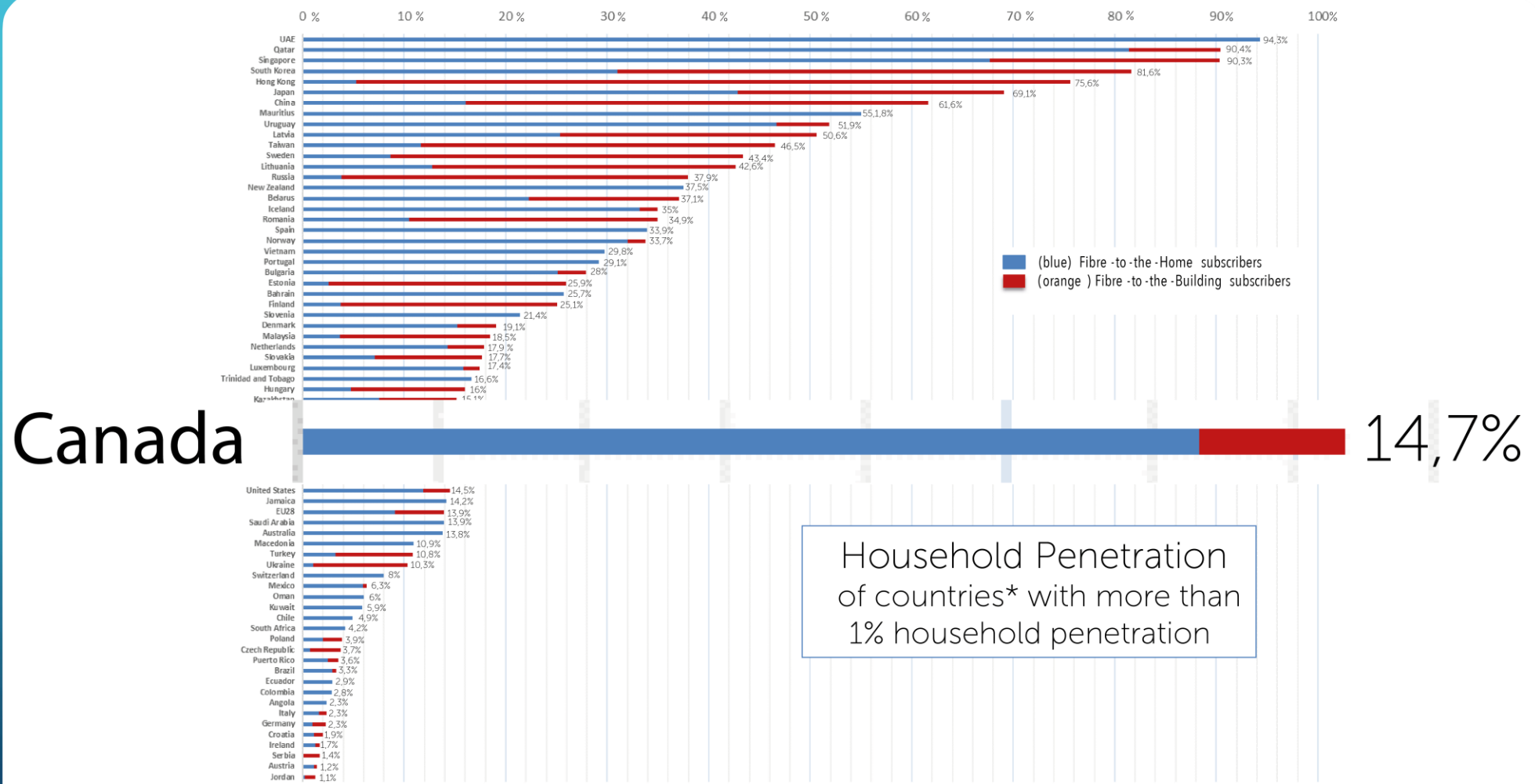


**Introduction of  
fiber optic  
networks**

**However, we are still in the early days of Fiber  
deployment in Canada and the US**

# FIBER IS A GENERATIONAL CHANGE

## THE INDUSTRY HAS QUITE A LONG TAILWIND



Household Penetration of countries\* with more than 1% household penetration

Source: IDATE for FTTH Council Europe, February 2018



# FIBER DEPLOYMENT

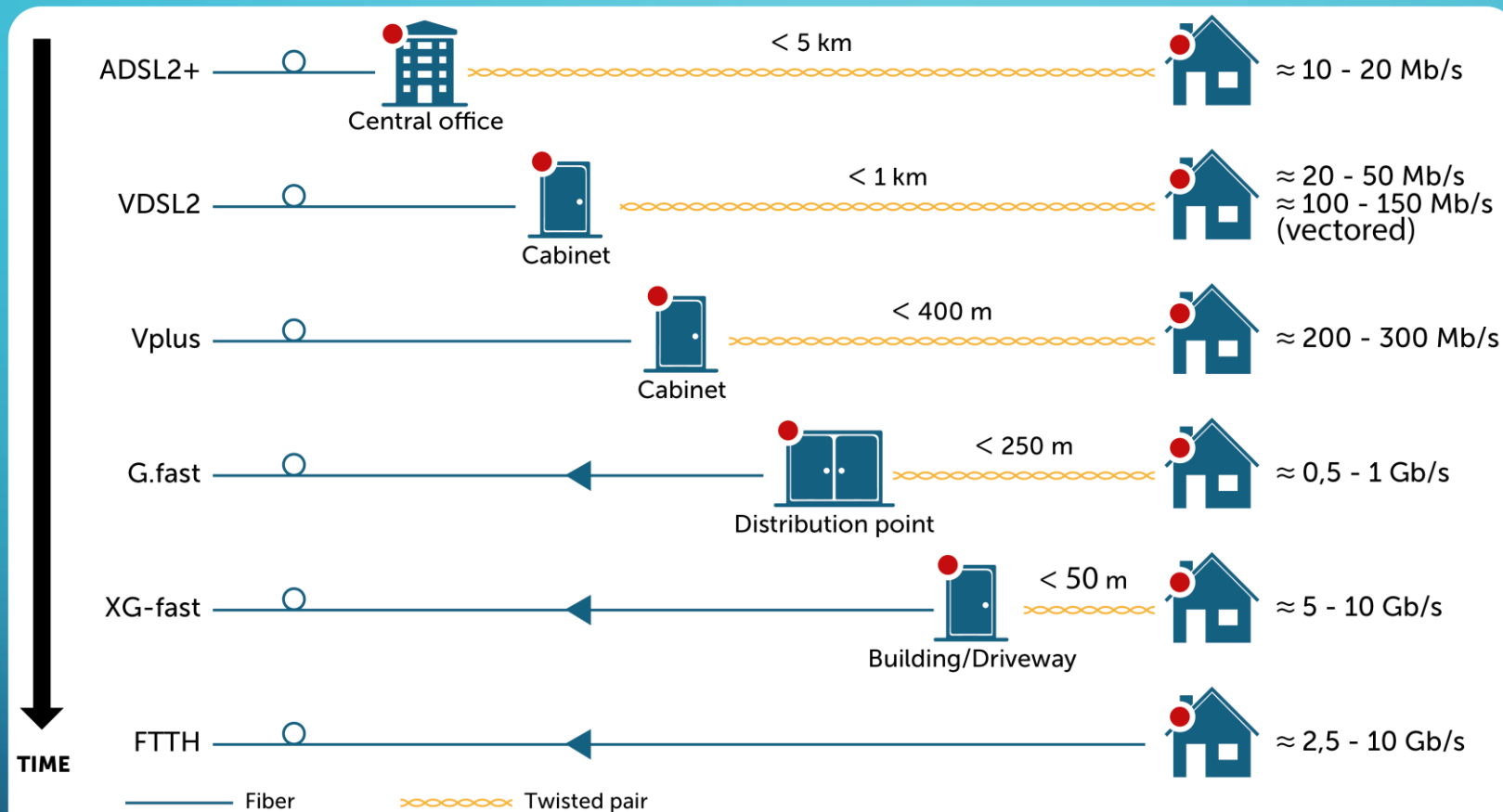
## POSITIVE CONTRIBUTORS

- Most incumbents have shifted strategy towards FTTH/HFC
- Long-term ownership of the customer considered key
- Builds are speeding up due to increased knowledge, technology and innovation in deployments.
- Costs are lowering & predictability growing with turnkey services

## NEGATIVE CONTRIBUTORS

- Still no clear mass-market killer app for FTTH/HFC
- Many municipal and utility builds have faltered, some announced and not moving, or behind schedule/on hold
- Rural areas being forgotten but needed for economic development
- Substitution by 5G may be seen as the way forward (still unclear)

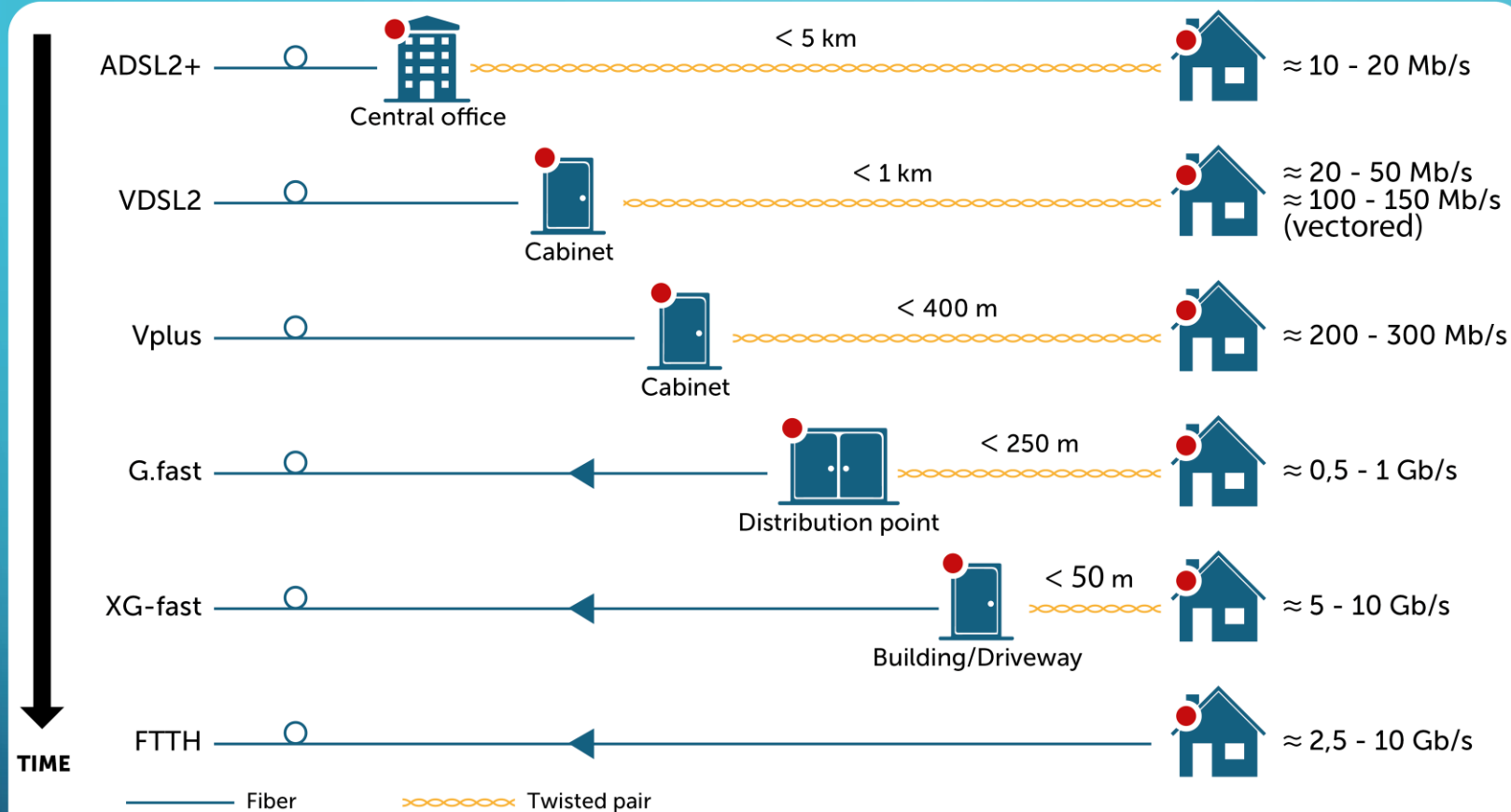
# BROADBAND ACCESS EVOLUTION - EXPANSION OF DEEP FIBER



Higher data speeds require densification of network and expansion of network edge to outside plants



# BROADBAND ACCESS EVOLUTION - EXPANSION OF DEEP FIBER



HARDWARE  
INFRASTRUCTURE  
DOMINATED

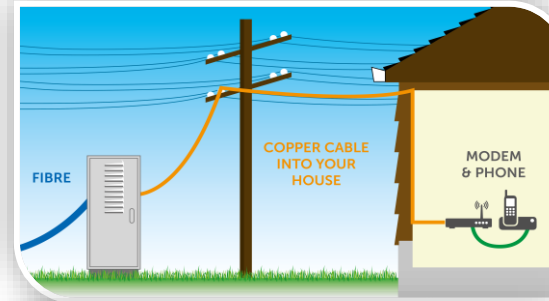
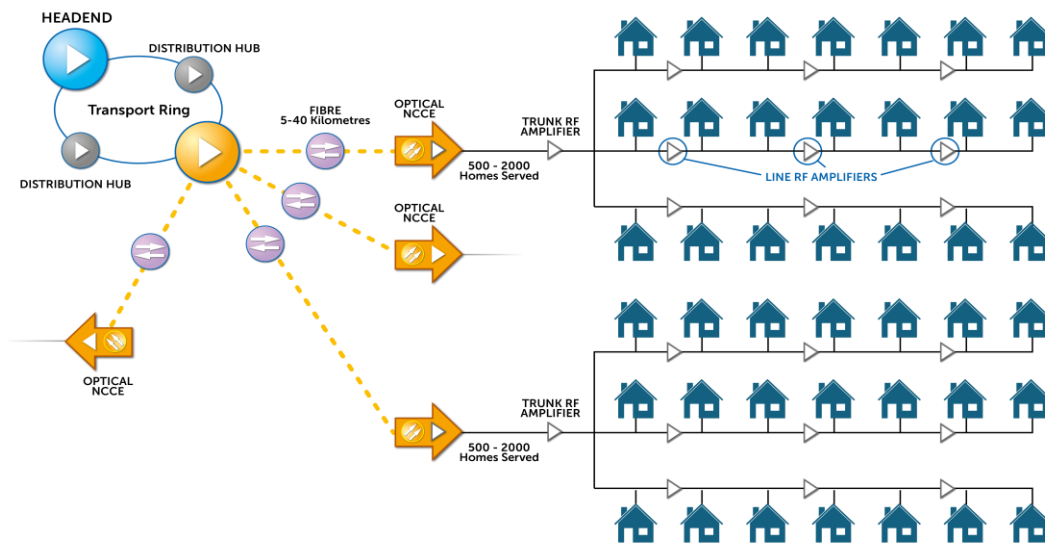
FIELD SERVICES  
DOMINATED

Higher data speeds require densification of network and expansion of network edge to outside plants

Source: The future X network, Weldon, Marcus K. 2016

# ENGINEERING

- Community designs need to be executed in conjunction with construction teams to ensure that are cost effective
- Municipal relationships locally critical
- Nobody wants equipment sitting in front of their house for too long
- Understand where to leave fiber, MDUs, FDH's or at nodes – real estate a main issue, inventory it



# YELLOW PAINT, NOT ROTTEN EGGS



- **Safety First**
- Underground network of utilities
- A blocker for FTTH/HFC
- New processes developed to increase efficiency
- New ways of working with the field, self locate transformation
- New technology being deployed to “see underground” – 5G
- Data points are the future
- Stop heavy digging automatically?

## Guide

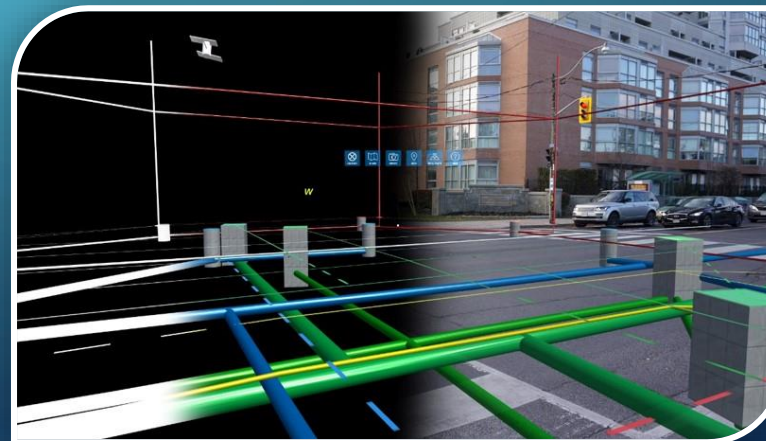
Paint marks colours on the ground

**Blue:** water

**Red:** electricity

**Orange:** communications

**Yellow:** gas

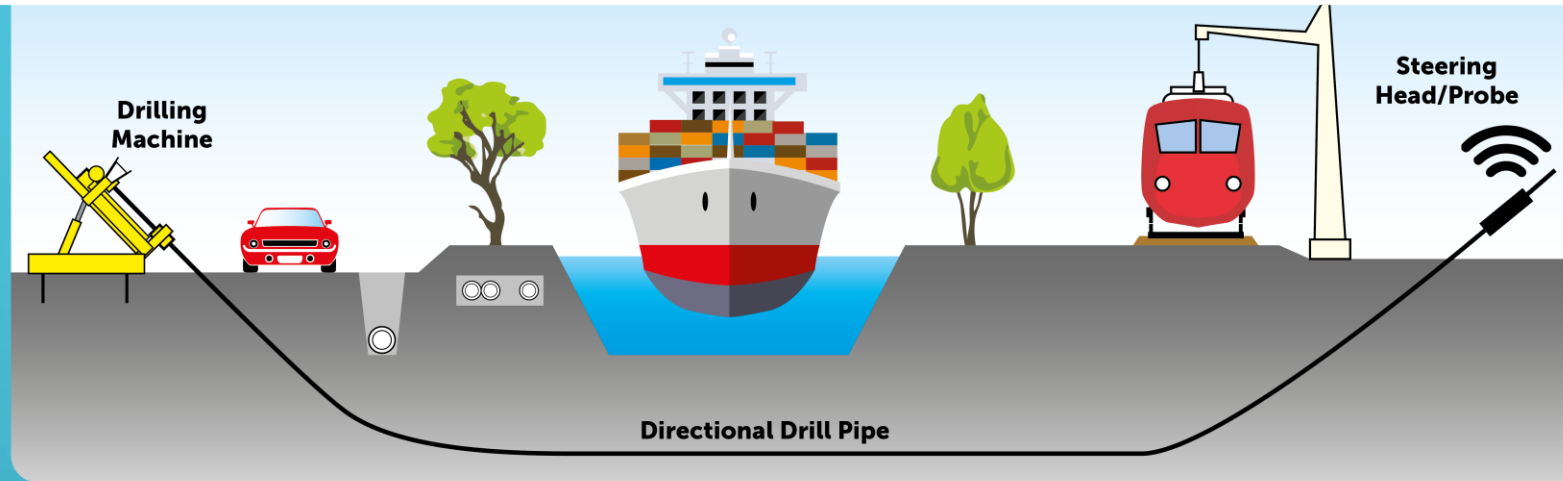


# CIVIL





# DIRECTIONAL DRILLING IS NOT NEW ...



The technology is changing, increasing productivity:

- Creates more accuracy
- “First time right” – CAPEX dollars are here
- Constructability reviews reduce re-do and waste/time
- Self Locate increases the speed to market



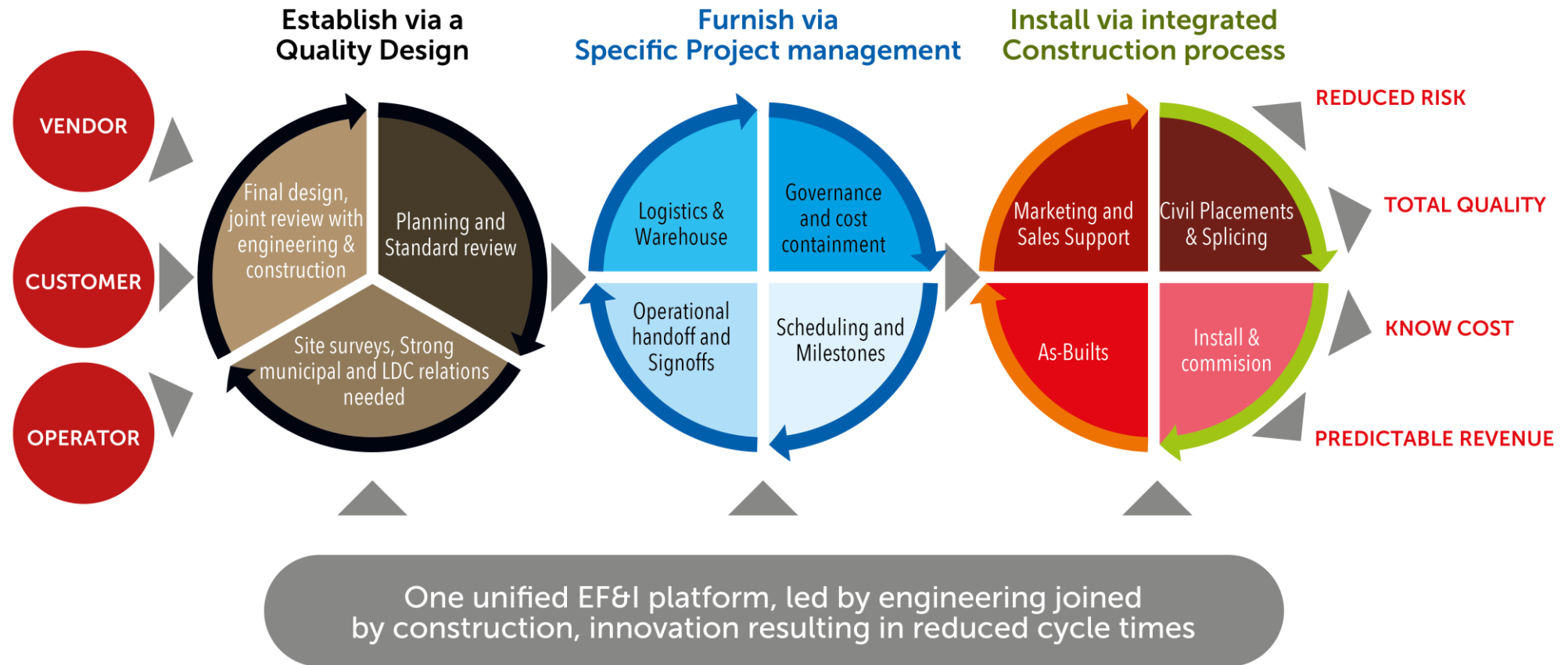
Getting smaller and more versatile. The radio technology to drive the fiber is getting more precise, they were originally designed for oil and gas, but the FTTH industry is changing the technology

# CIVIL AND HYDROVAC

- **CAPEX** for Fiber projects significant in the field
- Hydrovacating originally design for mining, sewer cleaning and gas, now widely used for fiber projects
- The technology is changing, efficiency key combined with engineering and locates
- The industry needs these investments to be working full time, downtime can make or break fiber deployment projects

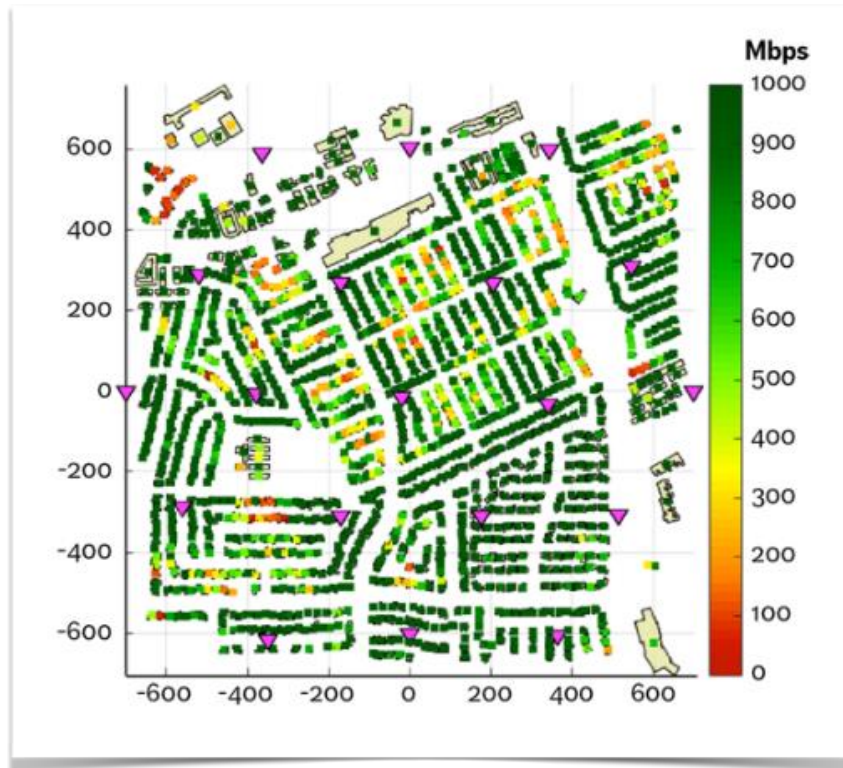


# FIBER TURNKEY, EF&I INNOVATION



# “NOTHING MORE WIRED THAN A WIRELESS NETWORK”

Mass fiber deployment prepping for 5G



28GHz bandwidth of 200MHz, utilizing beamforming and MU-MIMO and antenna array of 8x12 cross-pole elements

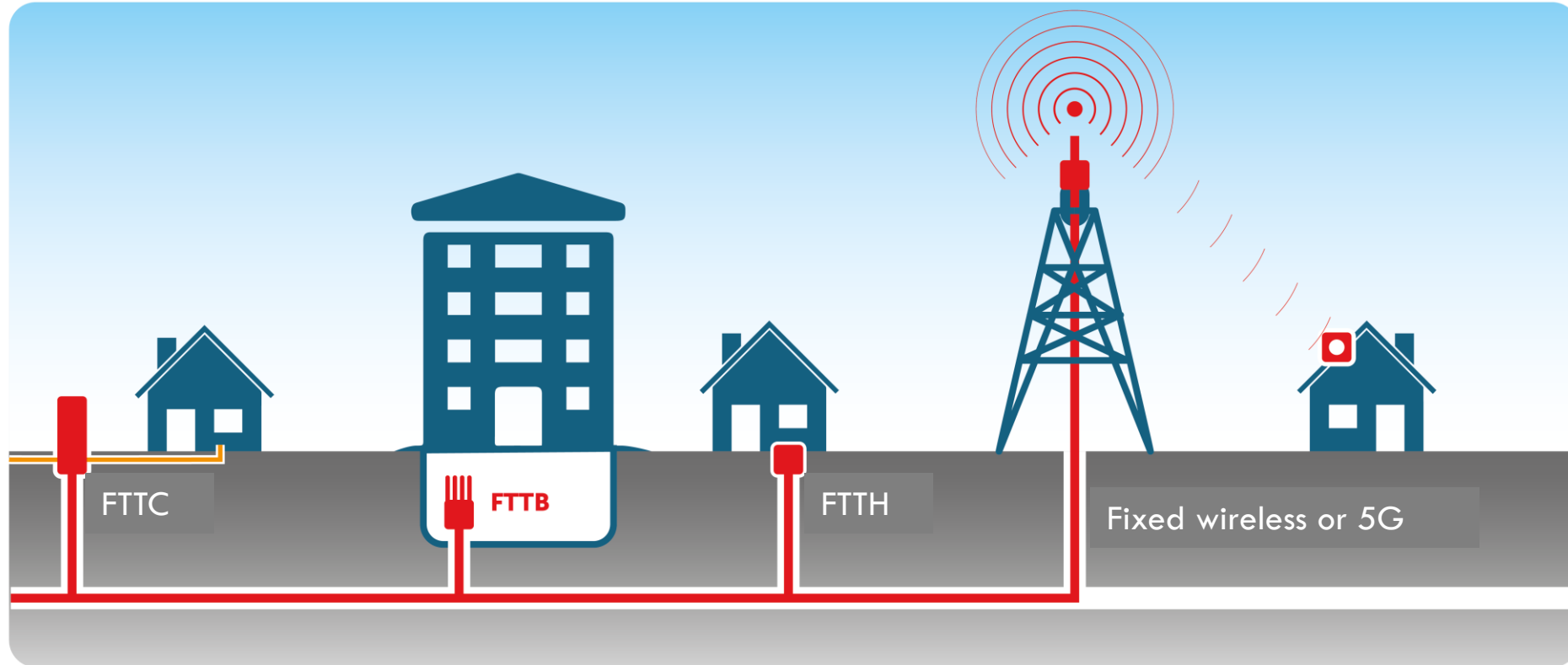
## 5G Deployment

- ◆ **Network Densification of radio equipment needs more fiber**
- ◆ **Radio and Antenna Sites vs. fiber**  
Design, permitting, aerial deployments, power, radio and antenna install, fiber location and amount key
- ◆ **Installation in MXU's**  
During the design phase plan for extra fiber
- ◆ **5G Sites with Cable Nodes**  
FTTC and FTTB – plan for 5G sites in parallel

**Leverage FTTH and 5G Densification**



# FIBER IS A GENERATIONAL CHANGE WHETHER IT BE FOR A TELCO OR MSO



Going indoors, transforming and disrupting the  
traditional ecosystem up next

# PREPARING FOR THE FUTURE OF CONNECTIVITY

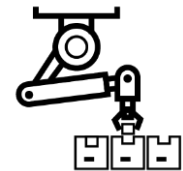
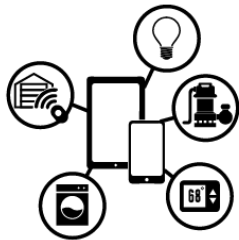


# CONNECTIVITY

**Context:** IoT, Security, PoE, Automation and connected spaces

**Need:** Higher speed, bandwidth and qualified employees

## Disrupting the ecosystem



# CURRENT INDUSTRY TRENDS



**Customer expectations of connectivity, mobility**



**New IoT devices driving new experiences**



**Need to drive operational effectiveness improvements**



**Sustainability Drivers Save energy, water, reduce environmental impacts**



**Productivity gains and workplace of tomorrow**



# Back-to-Basics

## Enterprise and building Management Solutions

### Past



### Present

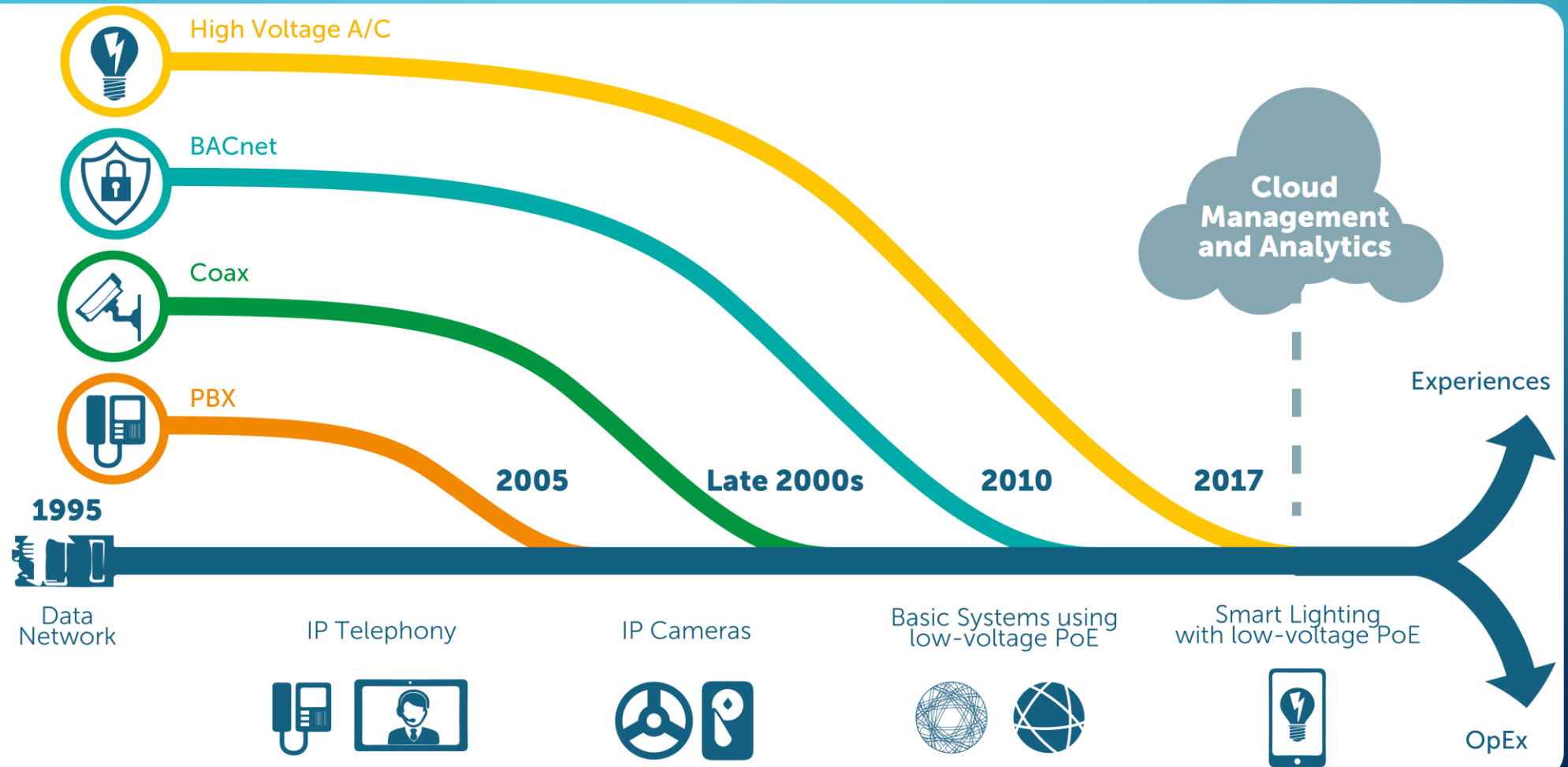


### Ongoing transformation of traditional work environments to smart offices:

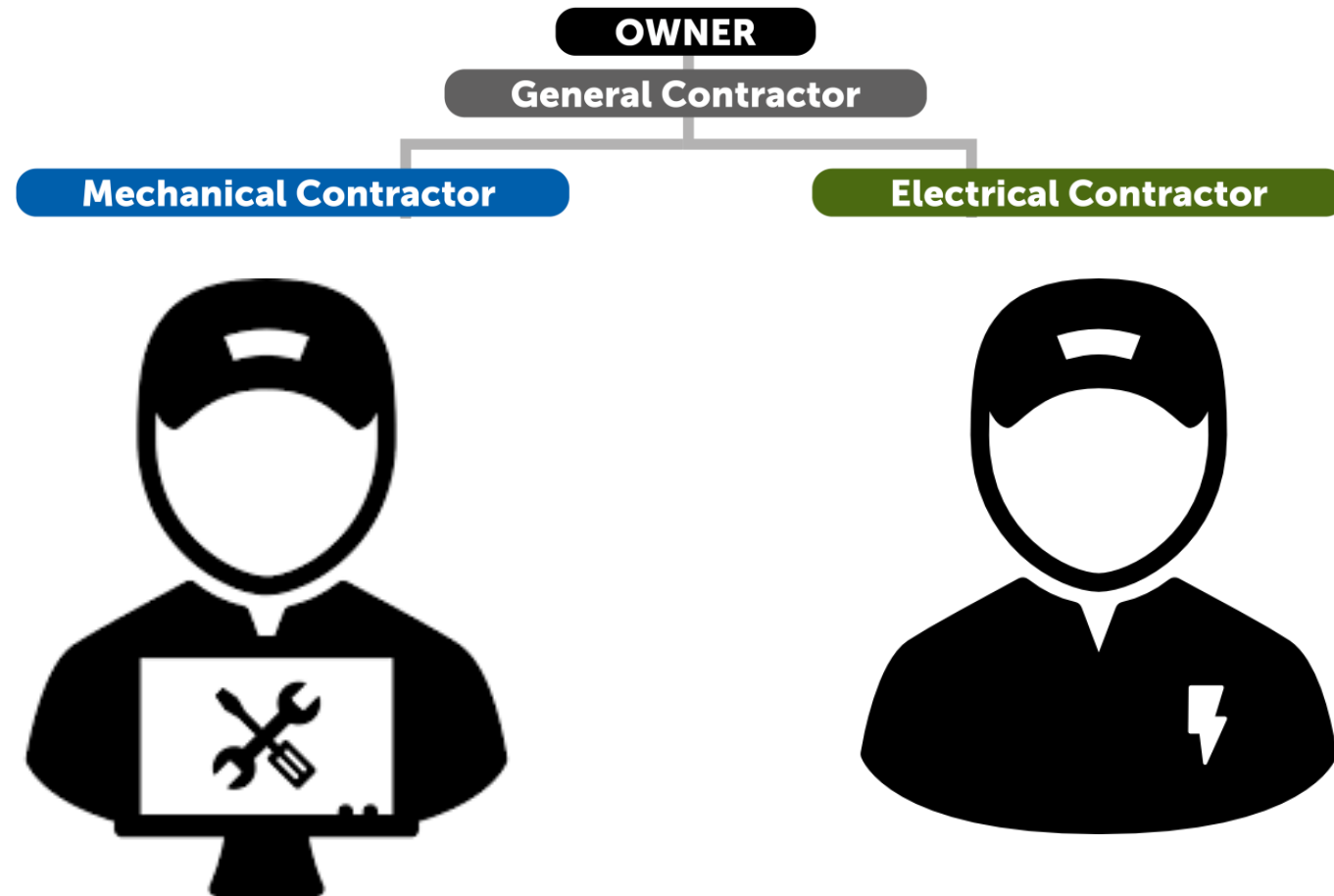
- North American Structured Cabling market valued at \$1.8B in 2015, expected to reach \$2.4B by 2022
- Global growth in IoT sensor deployments from \$242M in 2017 to \$1.3B in 2020
- HVAC Controls global market valued at \$13.6B (2018), expected to grow to \$27B by 2023
- 52% estimated global growth in Smart Lighting to reach \$1.6B in 2025
- IP Camera global market to surpass \$20B by 2024
- Global Wi-Fi market expected to grow from \$6B in 2017 to \$15.6B by 2022

*Figures presented in USD*

# IP CONVERGENCE OF WORKPLACE SERVICES

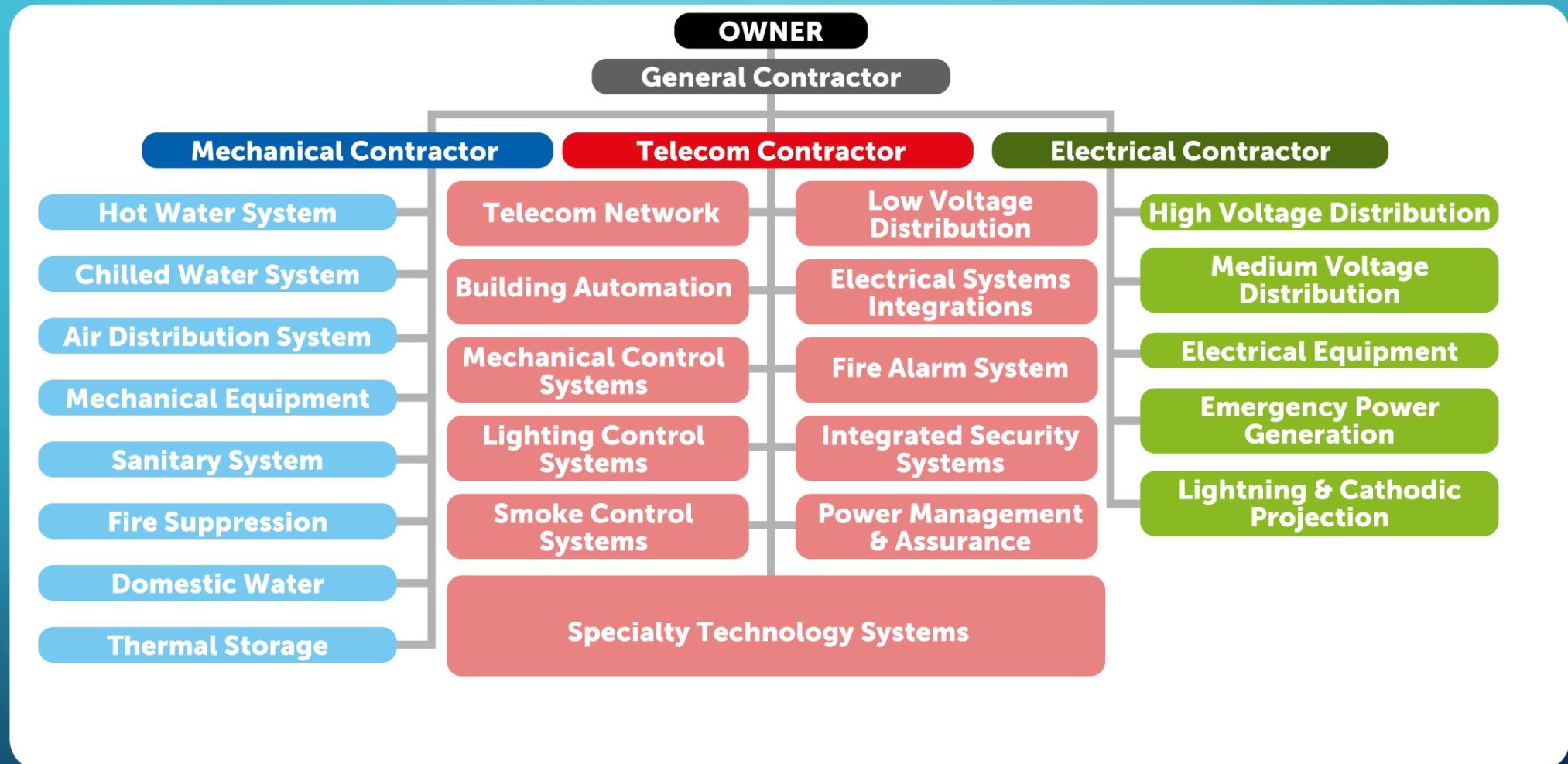


# TRADITIONAL MODEL





# NEW MODEL WITH TELECOM CONTRACTOR





# POE LED LIGHTING - A DISRUPTOR

## STATISTICS - BUILDING LIGHTING

**23%**

of all global **electricity use** is commercial buildings (~60% HVAC, 15% lighting)

**40%**

of building **operational expense** is keeping the lights on

**\$1**  
per ft<sup>2</sup>

of **energy savings** possible with LED's and advanced controls

**30%**

**CAGR** of building integration industry

**\$100**  
per ft<sup>2</sup>

of **productivity gains** from better lighting, personal control

**3<sup>rd</sup>**

**largest expense** after salaries and COGS is Real Estate

**60%**

of typical **workstations unoccupied** during the day

# POE LED LIGHTING – A DISRUPTOR



- 40% of electrical package in a building is lighting
- Low voltage cabling can now power lights
- Fixtures connected via connectors
- Cabling significantly reduced and simplified
- Integrated presence sensor solutions
- “In the box” analytics
- A light becomes “just another appliance”

# SHIFTING FOCUS ON TELECOM

## General Contractor

Mechanical Contractor

Telecom Contractor

Electrical Contractor

**Telecom taking more dominant role in building construction**

## Distributors and Manufacturers

COMMSCOPE®

**BELDEN**

**PANDUIT™**

**EAT•N**

CORNING



**PHILIPS**

## Workforce

**Union's Skills Tools**

**Workforce needs to adapt to shift**

**Cable is a commodity  
Differentiating on  
applications via  
partnerships**

**Opportunity for  
new model for  
operators, building  
owners, general  
contractors &  
telecom services  
contractors**

Can a single  
infrastructure serve  
everyone ?



**FIBER**

**Building  
Automation**



**Fire Alarm  
And Smoke  
Systems**



**Security  
Systems**



**Power  
Management  
Systems**



**Office  
Network**

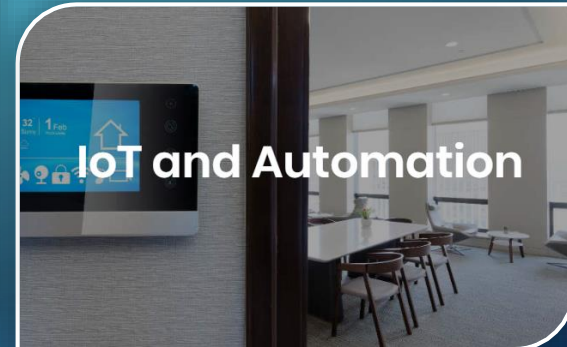
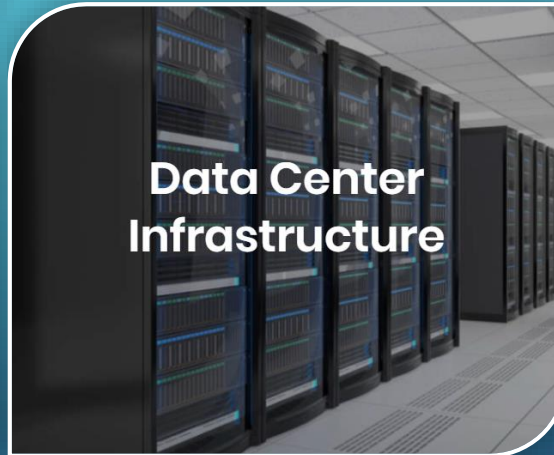
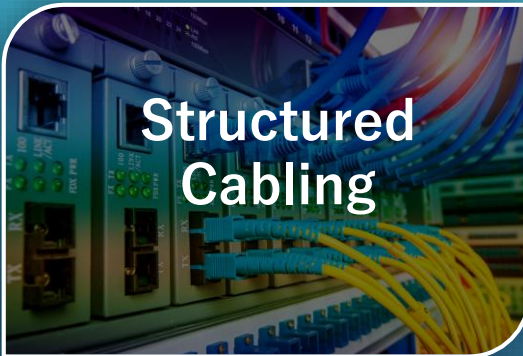


**PoE LED  
Lighting**





# TELECON CONNECTIVITY SOLUTIONS

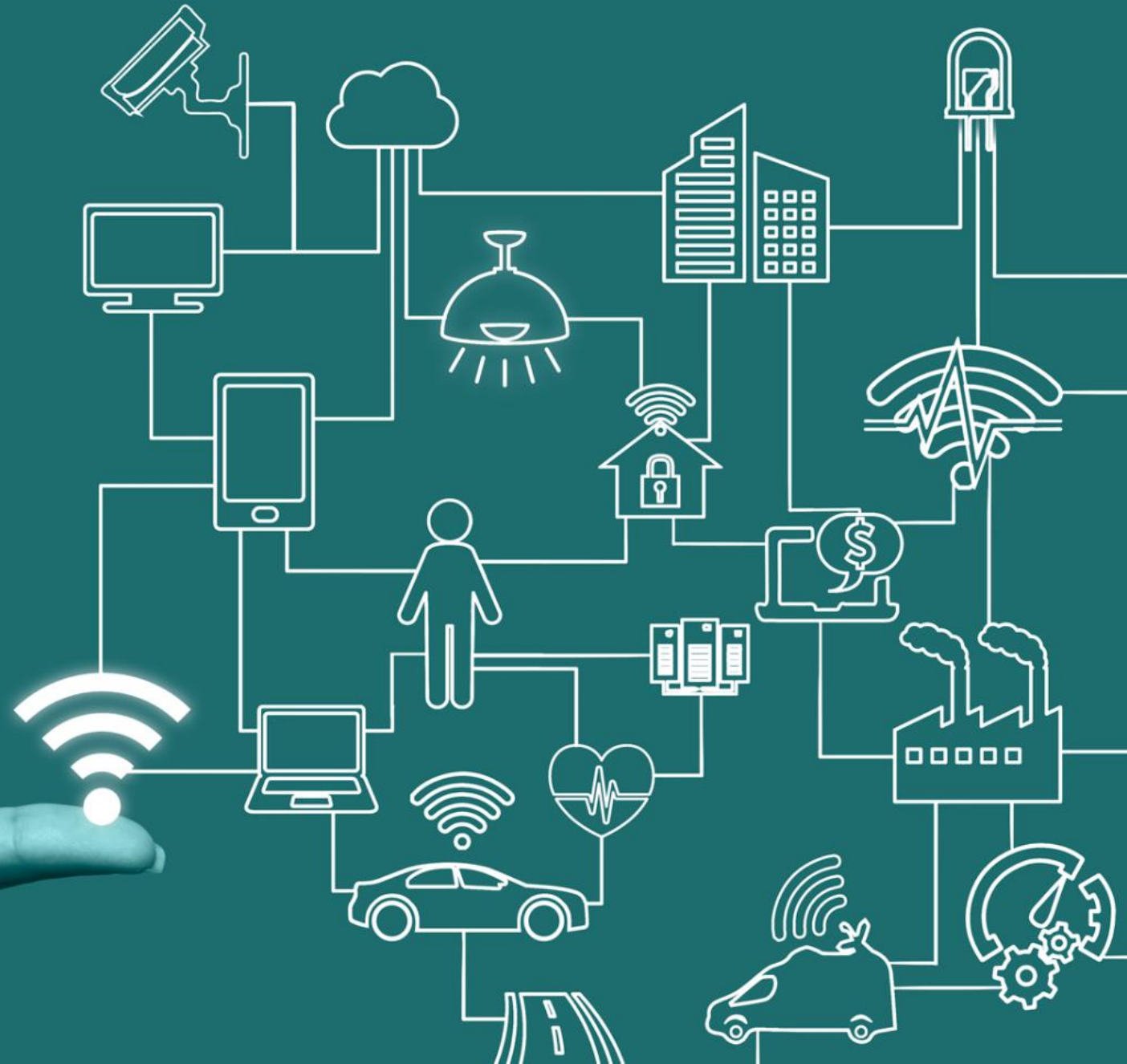




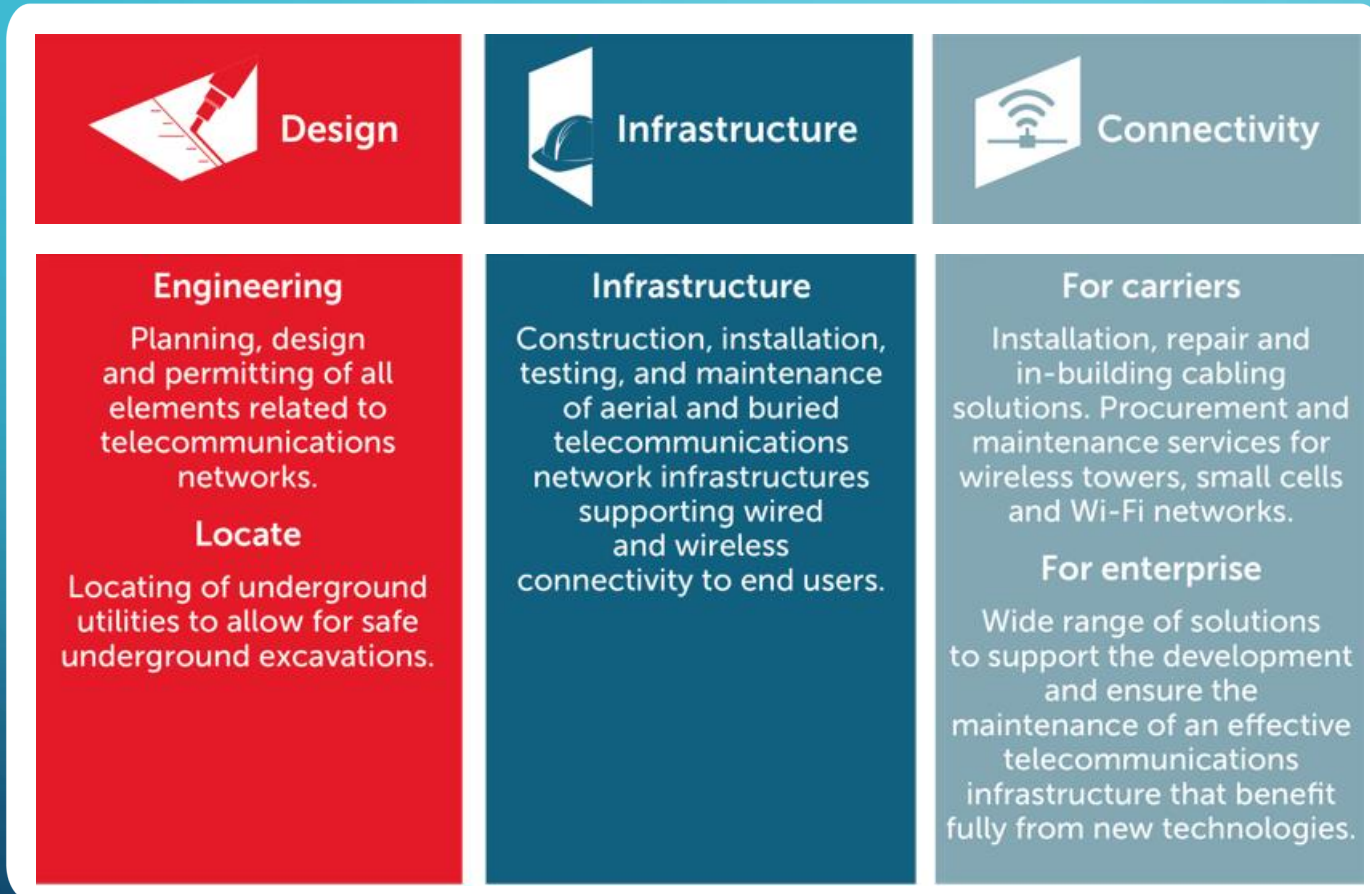


# Connect your business to the future

Develop a powerful and efficient telecommunications infrastructure to benefit fully from technology.



# FULL LIFE CYCLE OF TELECOMMUNICATIONS NETWORK SERVICES



- ♦ Vertical integration of services, innovating and reducing costs
- ♦ End-to-end, turnkey integrated services, reducing cycle time
- ♦ Leverage deployment expertise, synergies and local presence
- ♦ Uniquely positioned as a portfolio complementing with infrastructure vendors and service providers' capabilities





**telecon**  
design • build • connect