Trends in the Telecom industry
Drivers for our connected age

Gabrielle Gauthey – President, Government and Public Sector

Global Forum- Geneva-17 november 2014

TELECOMMUNICATION TRENDS
A FAST GROWING INDUSTRY, A CHANGING MOBILE ENVIRONMENT

MOBILE USERS (NO M2M) + 70%

5.3 Billion | 9 Billion

2010 | 2020

M2M CONNECTIONS + 185%

1.4 Billion | 4 Billion

2012 | 2017

MOBILE DEVICES IN USE + 70%

7.7 Billion | 12.1 Billion

2014 | 2018

SMARTPHONE USERS + 57%

1.13 Billion | 2.5 Billion

2012 | 2017

NUMBER OF MOBILE DEVICES PER BUSINESS USER + 43%

1.36 | 1.95

2014 | 2018

MOBILE APP USERS + 267%

1.2 Billion | 4.4 Billion

2012 | 2017

MOBILE APPS DOWNLOAD PER YEAR + 144%

82 Billion | 200 Billion

2013 | 2017

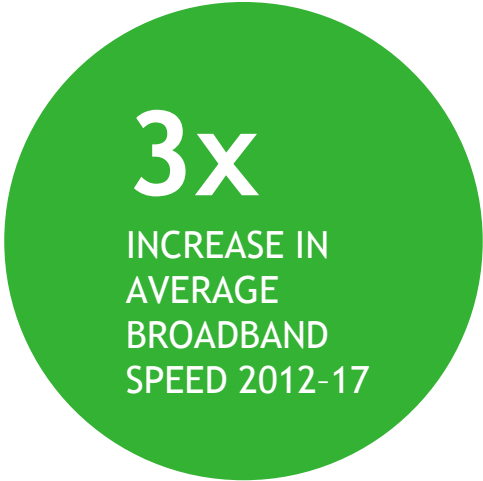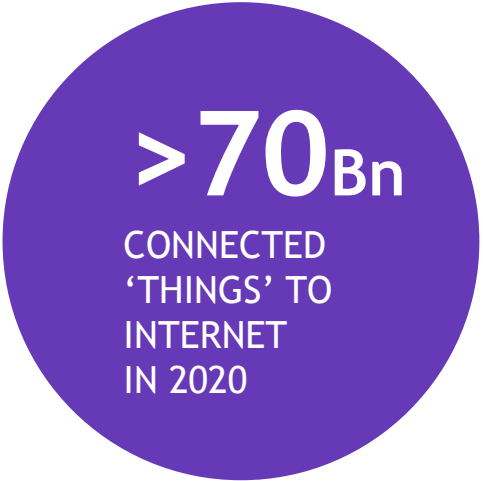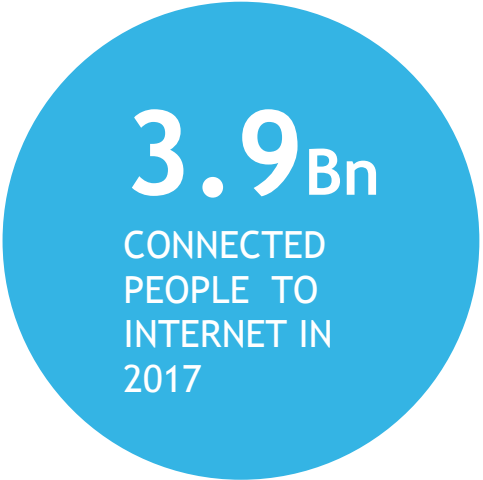**MOBILE DATA TRAFFIC** + 511%

2.6 Exabytes/month | 15.9 Exabytes/month

2014 | 2018

AT THE SPEED OF IDEAS™

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DATA CONSUMPTION IS BOOMING
NEED FOR INVESTMENTS

3.9 Bn
CONNECTED PEOPLE TO INTERNET IN 2017

720%
INCREASE IN VIDEO TRAFFIC 2012-17

30%
YoY INCREASE IN MISSION-CRITICAL SERVICES IN DC

>70 Bn
CONNECTED 'THINGS' TO INTERNET IN 2020

440%
INCREASE IN CLOUD AND DC TRAFFIC 2012-17
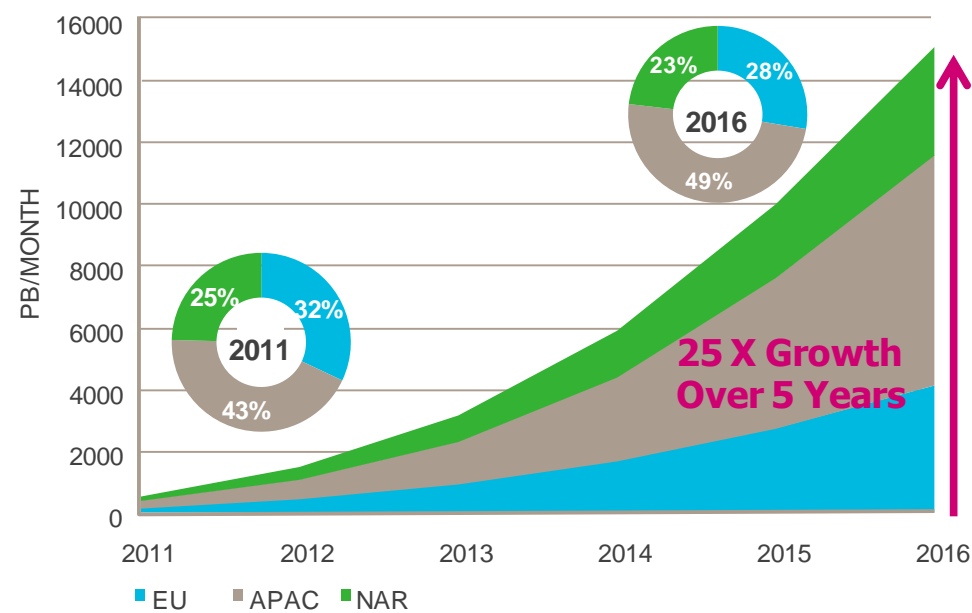
3x
INCREASE IN AVERAGE BROADBAND SPEED 2012-17

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MOBILE DATA TRAFFIC GROWTH
A WORLDWIDE REALITY

Mobile data forecast 2011 - 2016

Europe, North America, and Asia Pacific

2011: NAR 25%, EU 32%, APAC 43%

2016: NAR 23%, EU 28%, APAC 49%

25 X Growth Over 5 Years

Legend: EU, APAC, NAR

Cumulative traffic distribution 2011 - 2016

Europe, North America, and Asia Pacific

Video streaming + Communications
66% OF TRAFFIC BY 2016

Legend: Video communication, Video streaming, Web browsing, Messaging and non-audio/video communication, Audio streaming, File transfer, Gaming, M2M
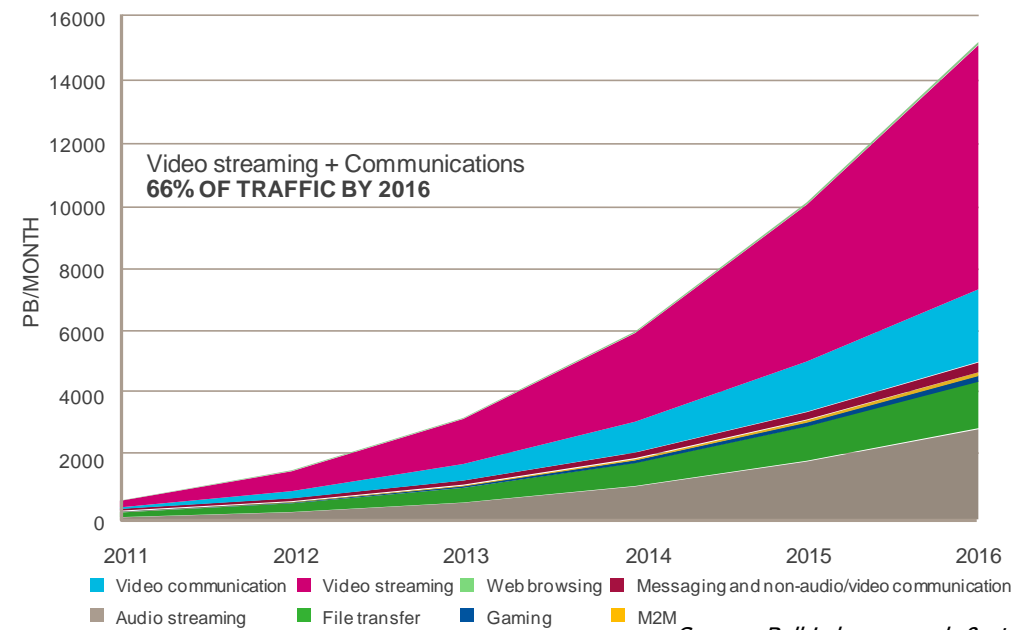
Source: Bell Labs research & studies

10x	20x	720%	440%
WIRELESS BANDWIDTH GROWTH	WIRELINE BANDWIDTH GROWTH	INCREASE IN VIDEO TRAFFIC	INCREASE IN CLOUD AND DATA CENTER TRAFFIC

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BELL LABS STUDY
METRO TRAFFIC GROWING FASTER THAN BACKBONE TRAFFIC

METRO VS. BACKBONE TRAFFIC
METRO CENTRALIZED CASE

5.6X

3.2X

● Metro - Total   ● Backbone - Total
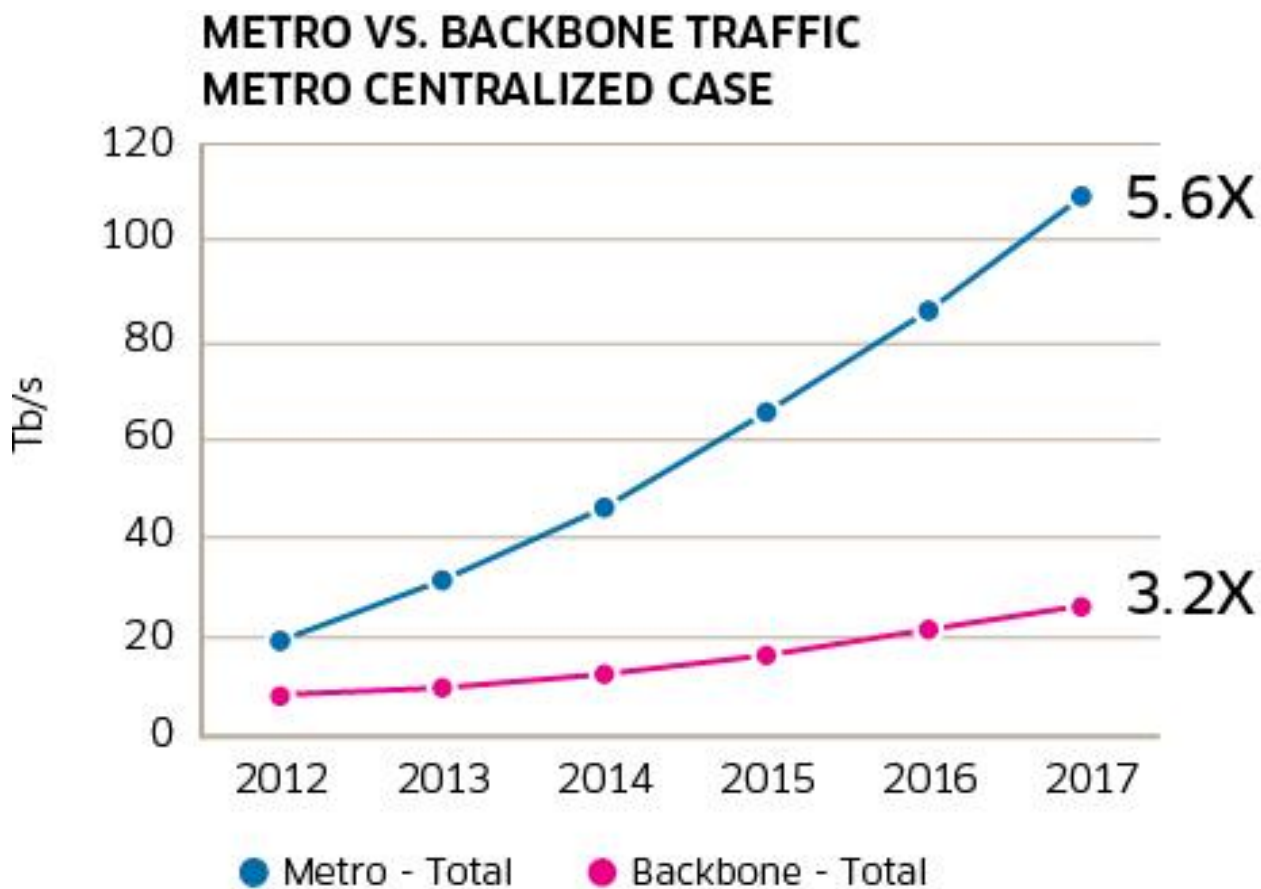
560% INCREASE IN TOTAL METRO TRAFFIC

METRO TRAFFIC GROWS ALMOST **2X** FASTER

Bell Labs Modeling

Source: Bell Labs metro traffic growth story: An architecture impact study

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BELL LABS STUDY
75% OF TOTAL METRO TRAFFIC WILL TERMINATE IN THE METRO BY 2017

Bell Labs Modeling

2012

57% OF TRAFFIC TERMINATED WITHIN METRO NETWORK

43%

2017

75% OF TRAFFIC TERMINATED WITHIN METRO NETWORK

25%
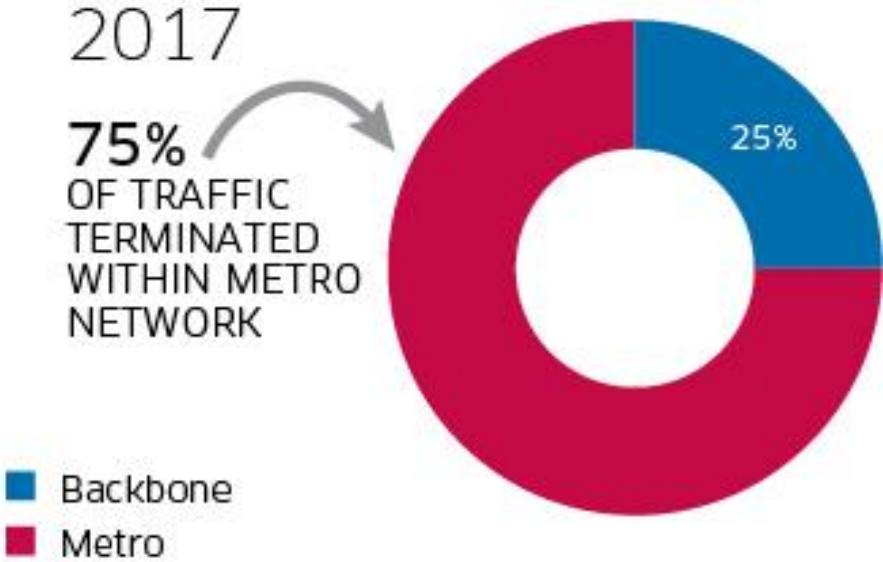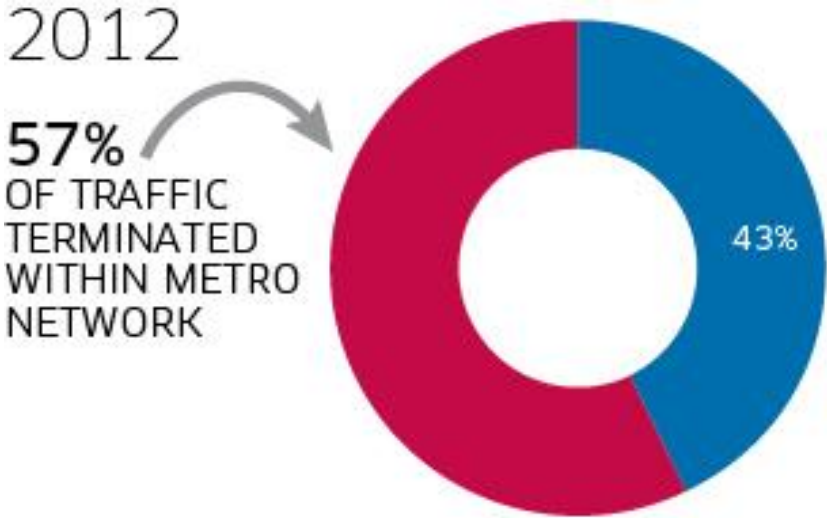
- ■ Backbone
- ■ Metro

PROLIFERATION OF DATACENTERS IN THE METRO DRIVES AN INCREASE IN METRO TRAFFIC AND RESULTS IN MORE TRAFFIC BEING TERMINATED IN THE METRO VS. GOING TO THE BACKBONE

Source: Bell Labs metro traffic growth story: An architecture impact study

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$ 10 TRILLION NEEDED FOR TELECOM (2010 -30)

Global infrastructure investment needed 2013-30 (2010 US$t)

Forecast need ranges from $57-67t

Values (left to right): Roads 17, Rail 5, Ports 1, Airports 2, Power 12, Water 12, Telecom 10, Total Based on external estimates[1] 57, Total Based on ratio of infra. stock to GDP[2] 67
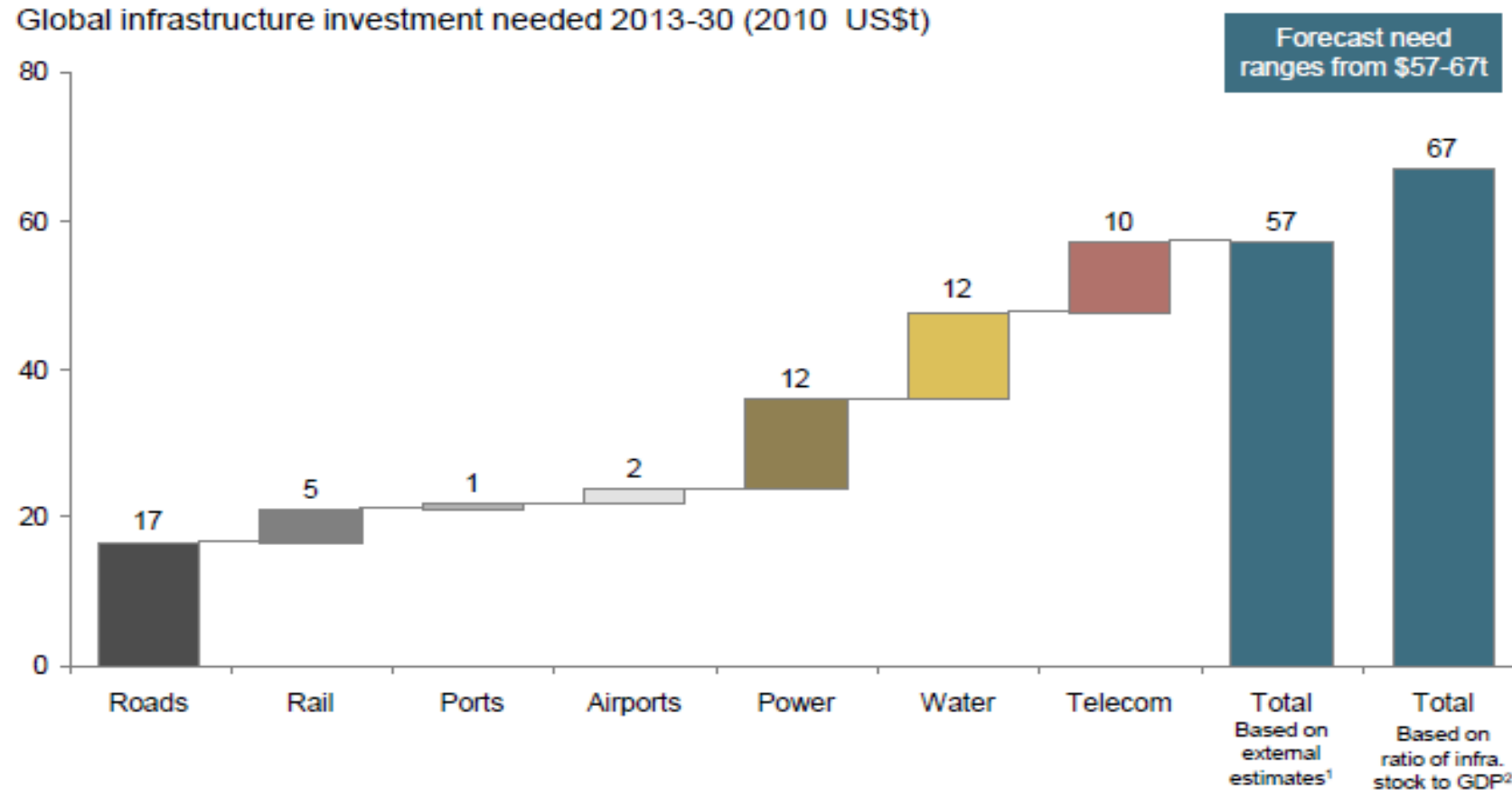
1. Based on external estimates from the OECD, IEA, ITF and GWI. 2. Assuming current ratio of infrastructure stock to GDP is maintained at ~70%.
Source: McKinsey Global Institute, 2013.

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THE INDUSTRY REALITY
ERODING REVENUES, INCREASING TRAFFIC, HIGHER COSTS

TRAFFIC

TRAFFIC & REVENUES

DECOUPLED

REVENUES

COSTS

VOICE Dominated DATA Dominated

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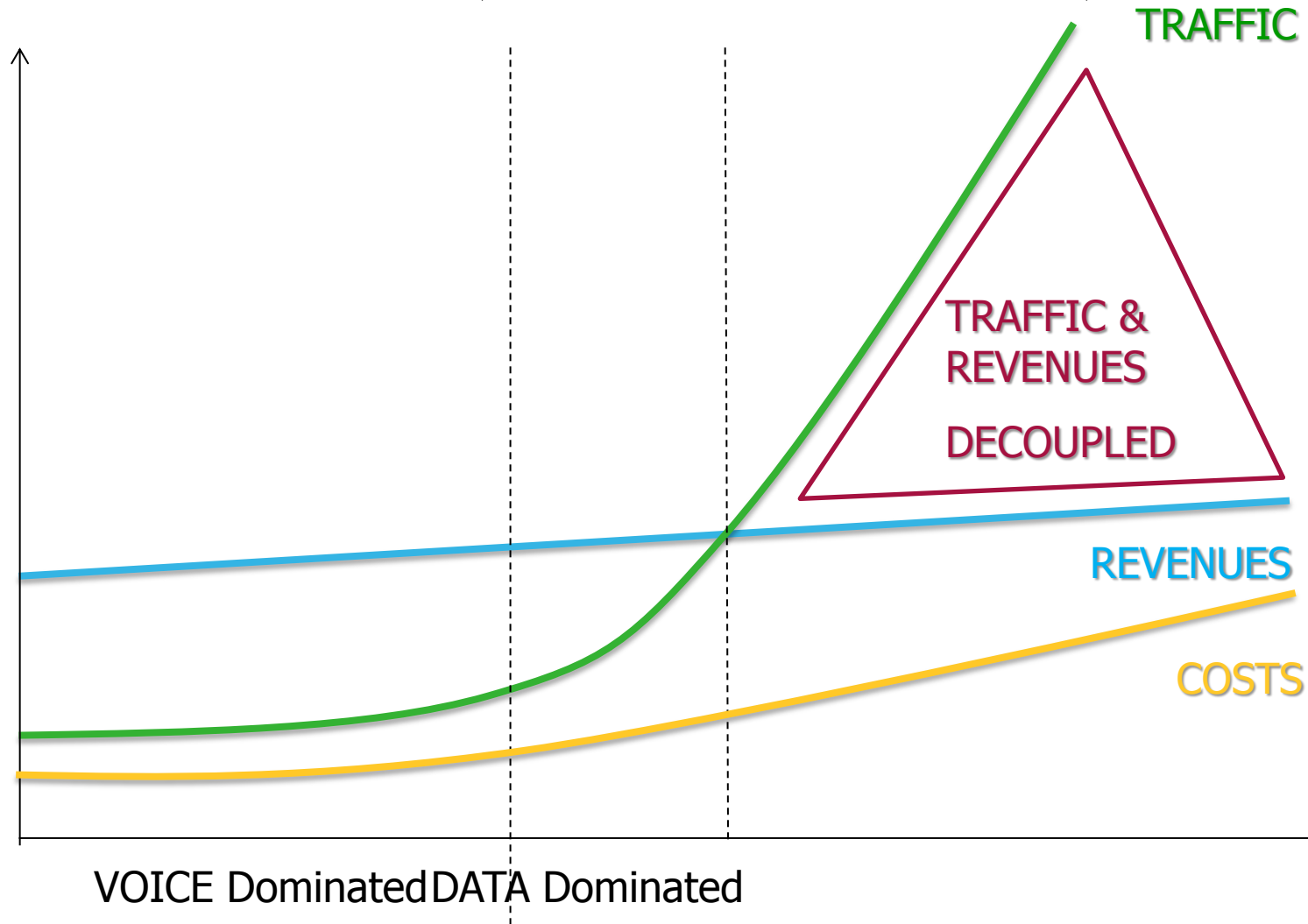
VARIOUS COMPETITION MODELS AROUND THE WORLD

- ## 2 platforms countries

  - Competition between cable and telecom platforms
  - This competition model has been adopted in the US and in a few Northern European countries and in Portugal
  - Infrastructures are rolled-out in parallel and sometimes do not geographically overlap (e.g. US)
  - Debate on competition model , and on coverage of less dense areas

- ## 1 platform countries

  - Active infrastructure competition on top of common passive network
  - Model adopted in France, UK, Italy, Spain for copper. On-going debate on right model for NGA.
  - Slow roll out, focused on dense areas
  - Leads to patchwork segmentation /fragmentation of the territory between dense and non-dense areas
  - Other copper enhancing technologies considered to ease the cost (e.g. vdsl/vectoring)

- ## 0 platform countries

  - Case of developing/emerging countries where fixed infrastructure (access, backhaul, backbones) is poor and limits mobile and fixed internet access expansion
  - Governments step-in to ensure coverage, speed, networks openness and services affordability
  - Open Backbones (South America, Africa, ..), shared LTE access (Mexico, Kenya)

BROADBAND POLICY & REGULATORY TRENDS

AMERICAS

Vertical integration , platform competition, open backbones & LTE

- US : Unregulated broadband markets in the No public intervention outside rural areas; Pro-active spectrum allocation policy
- CALA countries (Mexico, Colombia, Peru, Argentina) focus on open backbones; Digital Dividend allocation for LTE in APT band plan; Open access wireless and Major regulatory reform in Mexico

EMEA

Infrastructure based competition and limited public Intervention

- EU : high fragmentation of markets; difficult balance between active infra competition and passive sharing; On going regulatory reform for NGA but lack of investment; State Aid in rural and medium density areas/infra sharing; On going debate on Telecoms Single Market
- MEA : Open access backbones (Ghana, Burkina Faso), Open access wireless networks in digital dividend bands (Kenya); Nation broadband plans (Morocco, South Africa)

APAC

Network separation, broadband plans & rural coverage

- Pacific Asia :heavy influence of government and regulation (SG, Aus, NZ); Structural separation, growth through premium connectivity and bitstream wholesale; open backbones & universal coverage lead network transformation
- Chinese market remains dominated by integrated operators
- South Asia : Focus on Broadband plans and rural coverage

CHANGES AHEAD !
A RANGE OF SCENARIOS

Survivor Consolidation – Revenue decline , industry loss of confidence, leading to consolidation of Telcos

→ **Worst case scenario !**

Clash of giants – competition between integrated giant carriers, increased competitive threats from OTT

→ **US scenario**

Market Shakeout – Structural separation, growth through premium connectivity sold to third parties

→ **APAC scenario**

Generative Bazaar – Scattered initiatives, passive infrastructure sharing, valorization of active infrastructures

→ **Europe scenario**

→ **HOW CAN GOVERNMENTS MANAGE THE TRANSITION AND ENSURE NEW INVESTMENTS IN NETWORKS?**

TELECOM NETWORK STRUCTURE
A LAYERED MODEL

		Investment needed	Payback
End-user			
Services, Content & Apps (residential, public & business)			**Few m-3 y**
Active Network (network equipments, business & operation support)	20%		**5-7 y**
Passive Infrastructure (trenches, ducts, fibre)	>200 B€ 80%		**10-15 y**
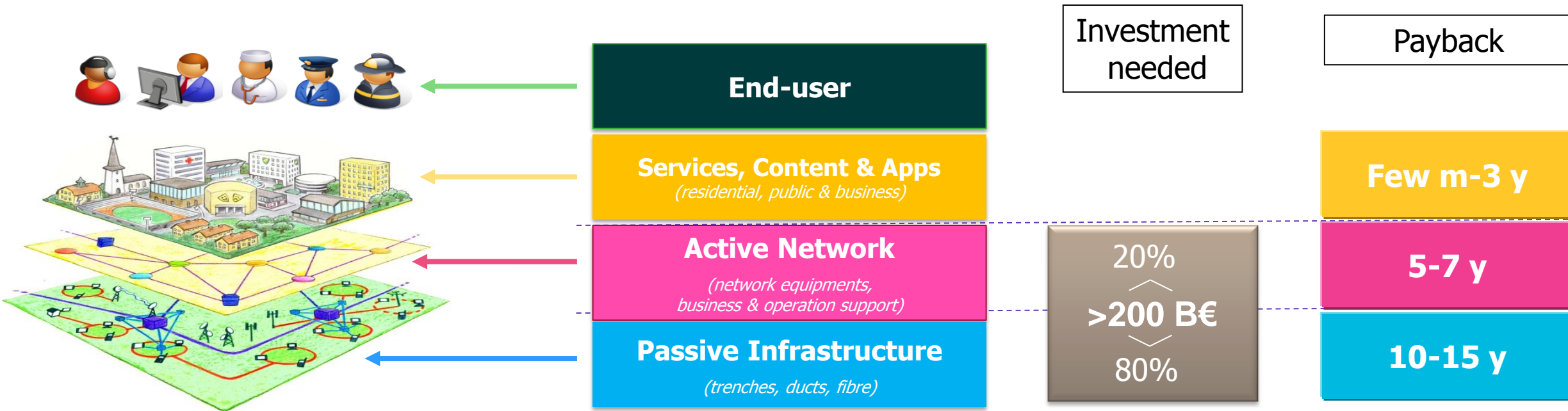
Each layer has very a different financial profile and need to be addressed adequately

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THE SERVICES SPECIALIST
ALL-IP, CLOUD-IP, ULTRA-BROADBAND ACCESS

LTE network build

All-IP network & intelligence automation

Platform deployment
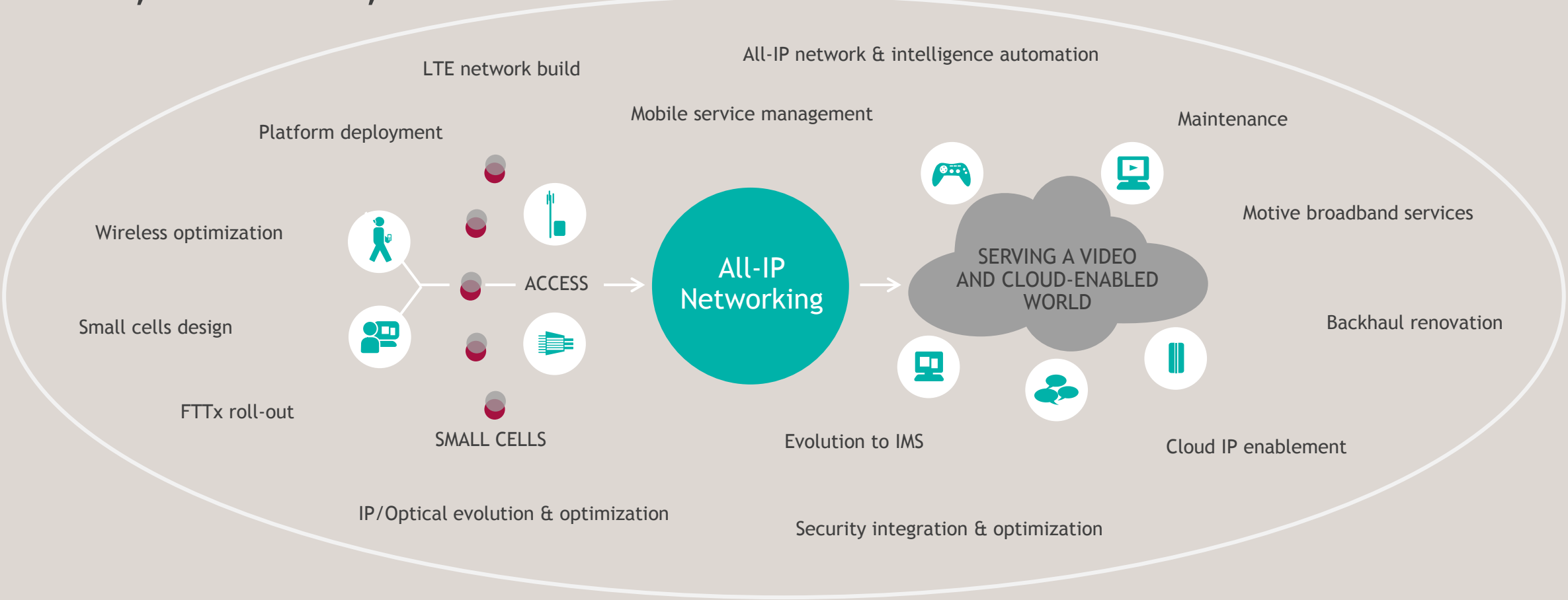
Mobile service management

Maintenance

Wireless optimization

Motive broadband services

All-IP Networking

ACCESS

SERVING A VIDEO AND CLOUD-ENABLED WORLD

Small cells design

Backhaul renovation

FTTx roll-out

SMALL CELLS

Evolution to IMS

Cloud IP enablement

IP/Optical evolution & optimization

Security integration & optimization

Alcatel-Lucent the trusted vendor-of-choice in a € 10+ Bn market(1) ~20% 2012-15 CAGR

(1) 2015 – Alcatel-Lucent analysis based on industry analysts studies

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NETWORK EVOLUTION TO IP & CLOUD BASED ARCHITECTURES
A COMBINATION OF ACTIVE WHOLESALE, SOFTWARE-DEFINED NETWORKING (SDN) AND NETWORK FUNCTIONS VIRTUALIZATION (NFV)

End-users

Retail Services
(residential, public & business)

IP layer-3

Ethernet layer-2

Active Infrastructure
(network equipments, business & operation support)

Active wholesale
- IPstream (IP L3)
- Bitstream (Ethernet L2)

Wavelength

Dark fibre

Ducts, sewers, poles

Passive Infrastructure

Passive wholesale
- Wavelength (by pair)
- Dark fibre
- Ducts/sewers

CORE CLOUD

VNF   VNF

DISTRIBUTED CLOUD

FTTx

SDN

NF

FTTx

SMALLER CELLS

DEVICE VIRTUALIZATION AND HOSTING

CLOUD FUNCTION DISTRIBUTION

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