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CEO at Calzavara SpA

NETWORK DENSIFICATION
CHALLENGES AND OPPORTUNITIES



Zhengzhou Airport, China (2019)



In-building/private networks

Trieste, Italy (2024)



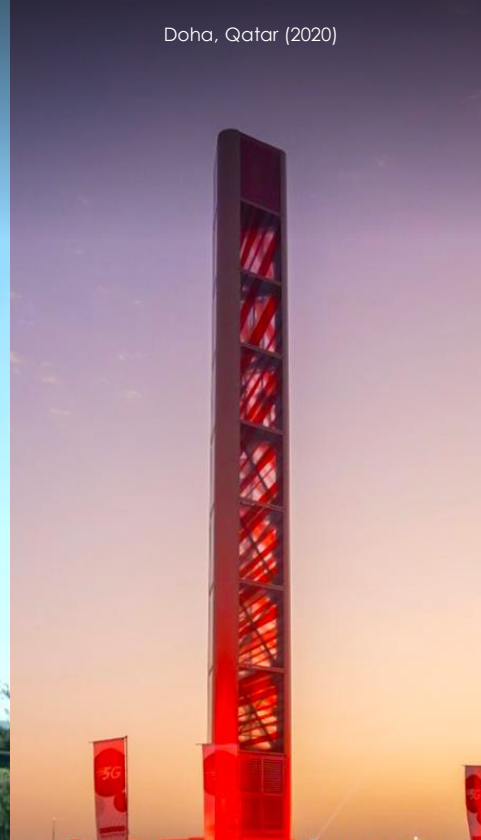
Railways

Rome, Italy (2022)



Roads

Doha, Qatar (2020)



Smart City

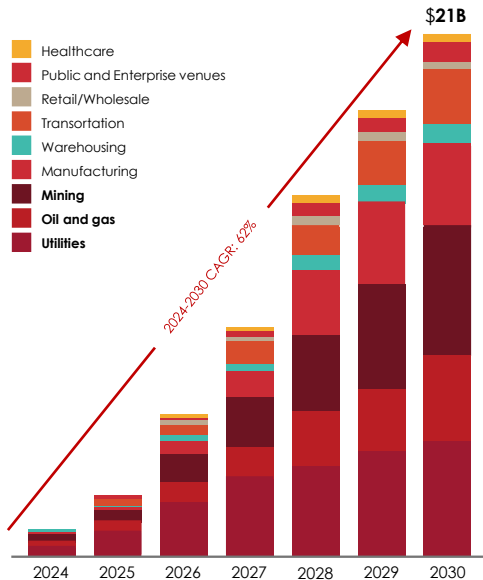


In-building/private networks

Xi'an Int. Airport (2020/2021)

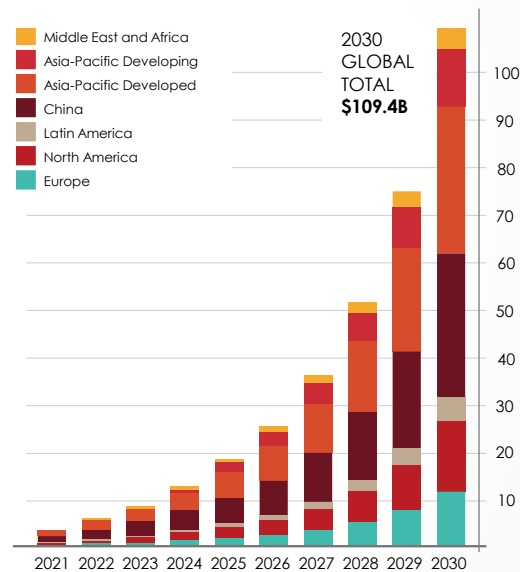
Too early? Is it a mature market or not?

Private networks addressable revenue will reach **US\$21 billion by 2030**



(source: STL Partners)

Revenue from 5G Private Network Deployment

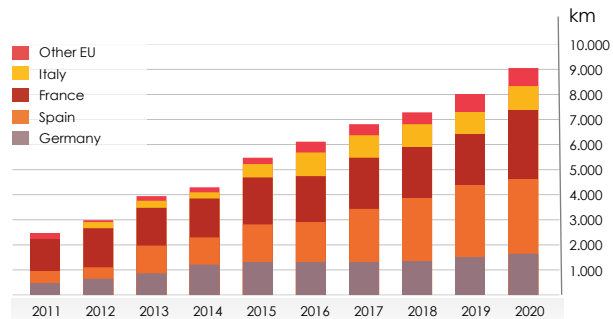


(source: Spectrum Policy Trends 2024, GSMA)



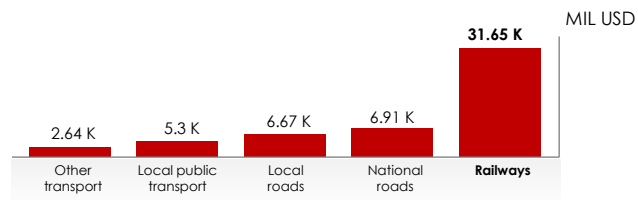
Railways

Trieste, Italy (2024)



Increase over time in the length of railway networks in the EU

(source: Eurostat regional yearbook 2020)



Public sector expenditure on transport in the UK (2022-2023)

(source: GOV.UK HM Treasury)



New high-speed rail network already planned across Europe

(Source: RailwayPro, February 2023)



Germany's planned investment in expanding its railway network

(Source: BMDV, February 2024)

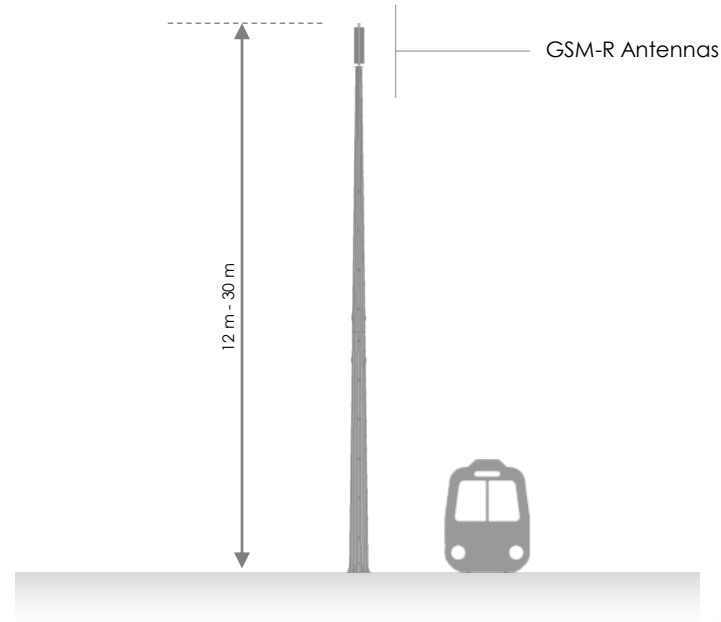




Railways

Trieste, Italy (2024)

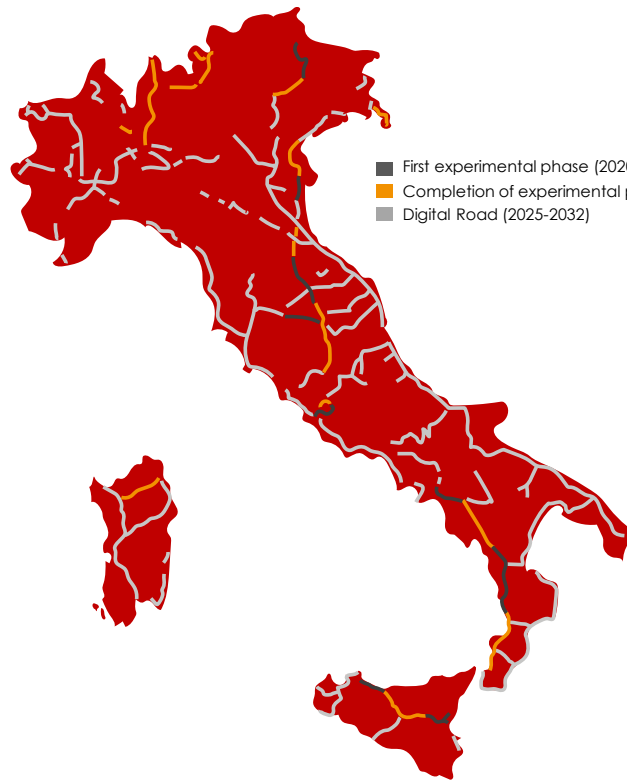
Really... not a business for a towerco?





Smart Roads

Salerno / Reggio Calabria (2020/2021)



Italy was among the very first European countries to launch a smart road project. To this day, **Anas Smart Road** remains the largest project in all of Europe.

6,700 km

Italian road network, which by 2032 will be digitized for future scenarios of autonomous driving

1 billion euros

ANAS SpA funded the first European smart road project



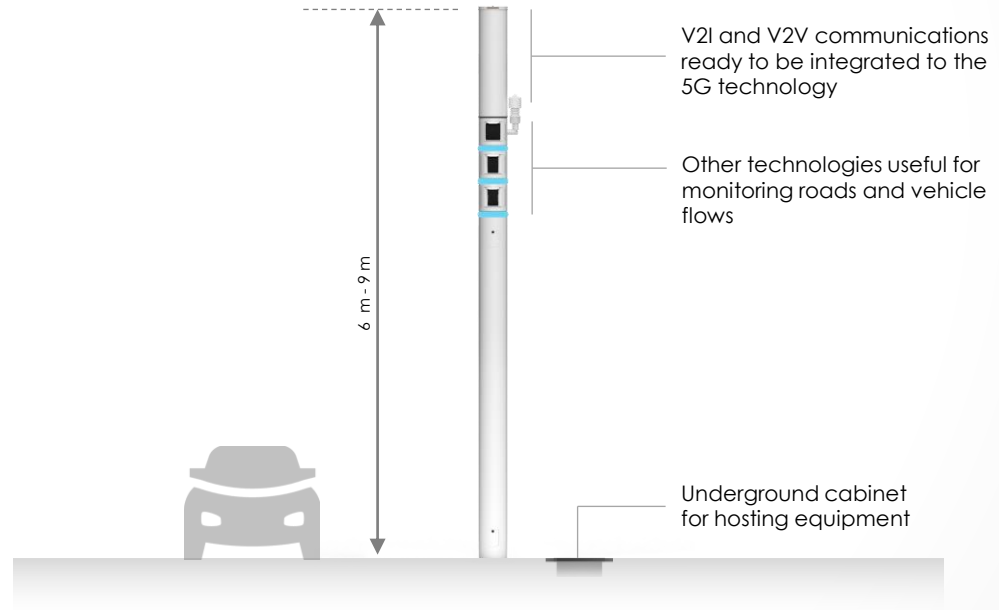


Smart Roads



16-19 April 2024 – Intertraffic Amsterdam 2024

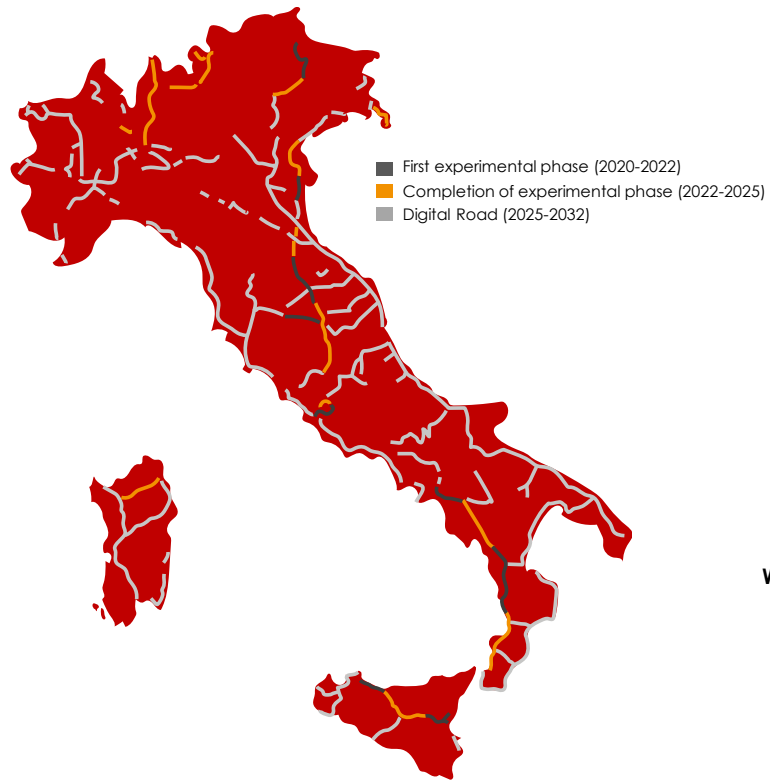
Really... not a business for a towerco²?





Smart Roads

Rome, GRA (2020/2021)



Who and which countries will be the next smart road developers?

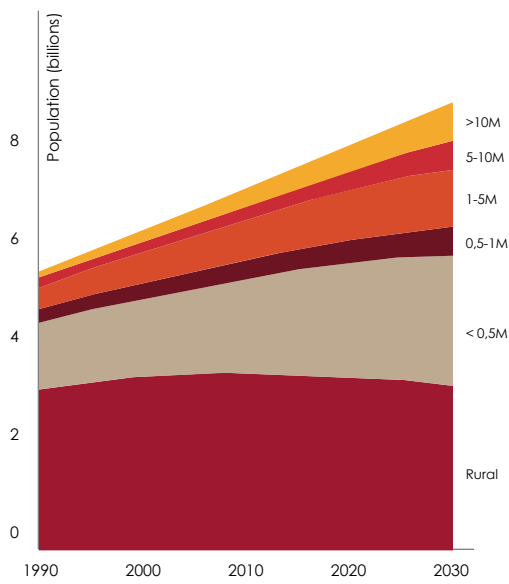




Smart City

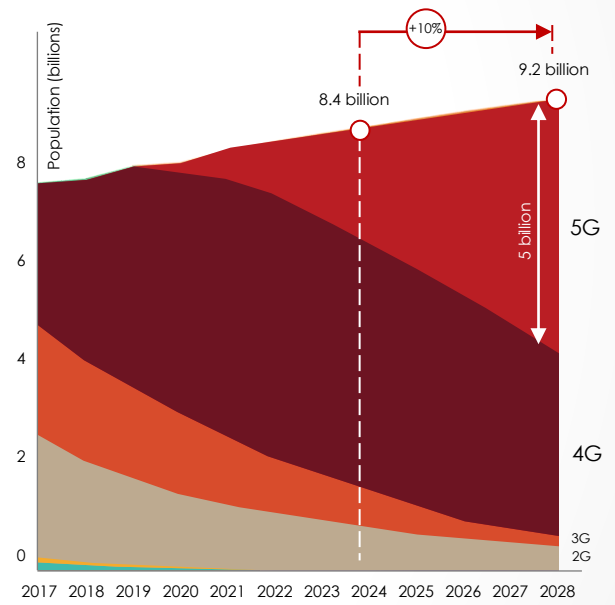


World's population by size class of settlement 1990-2030



(Source: United Nation report 2022)

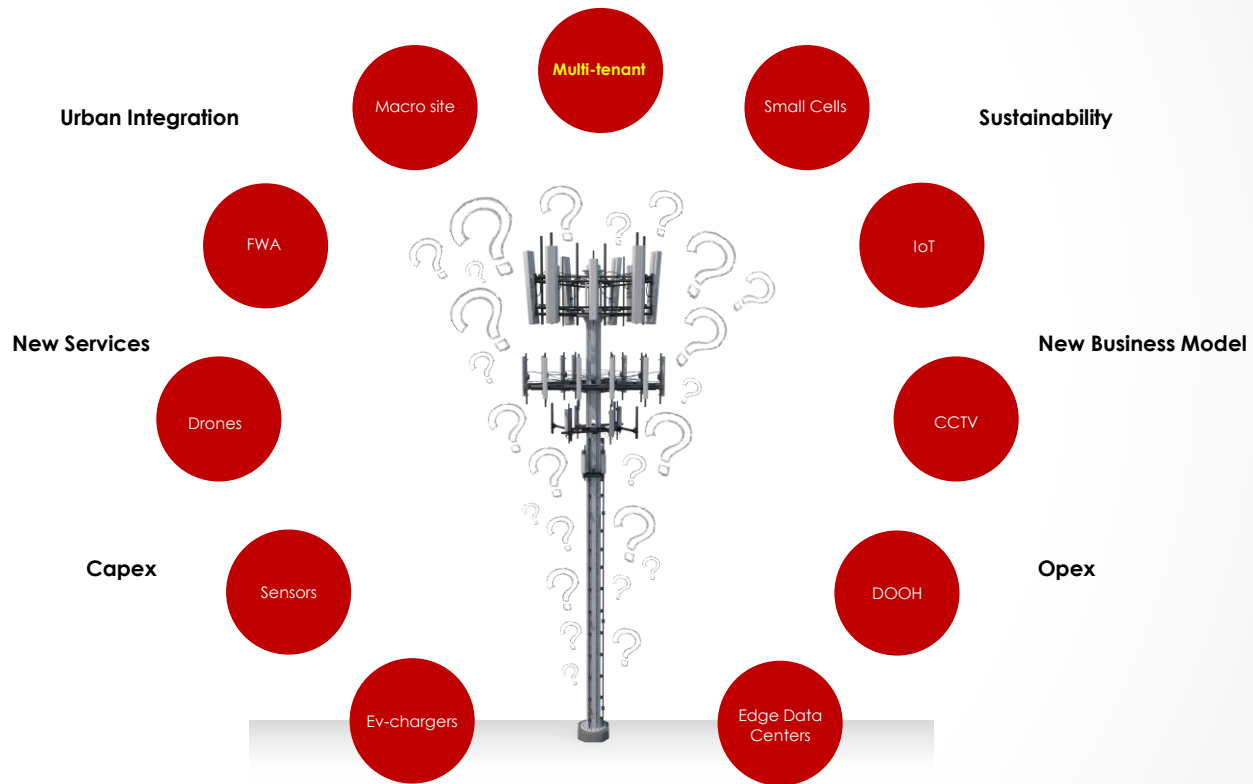
Mobile subscriptions by technology 2017-2028



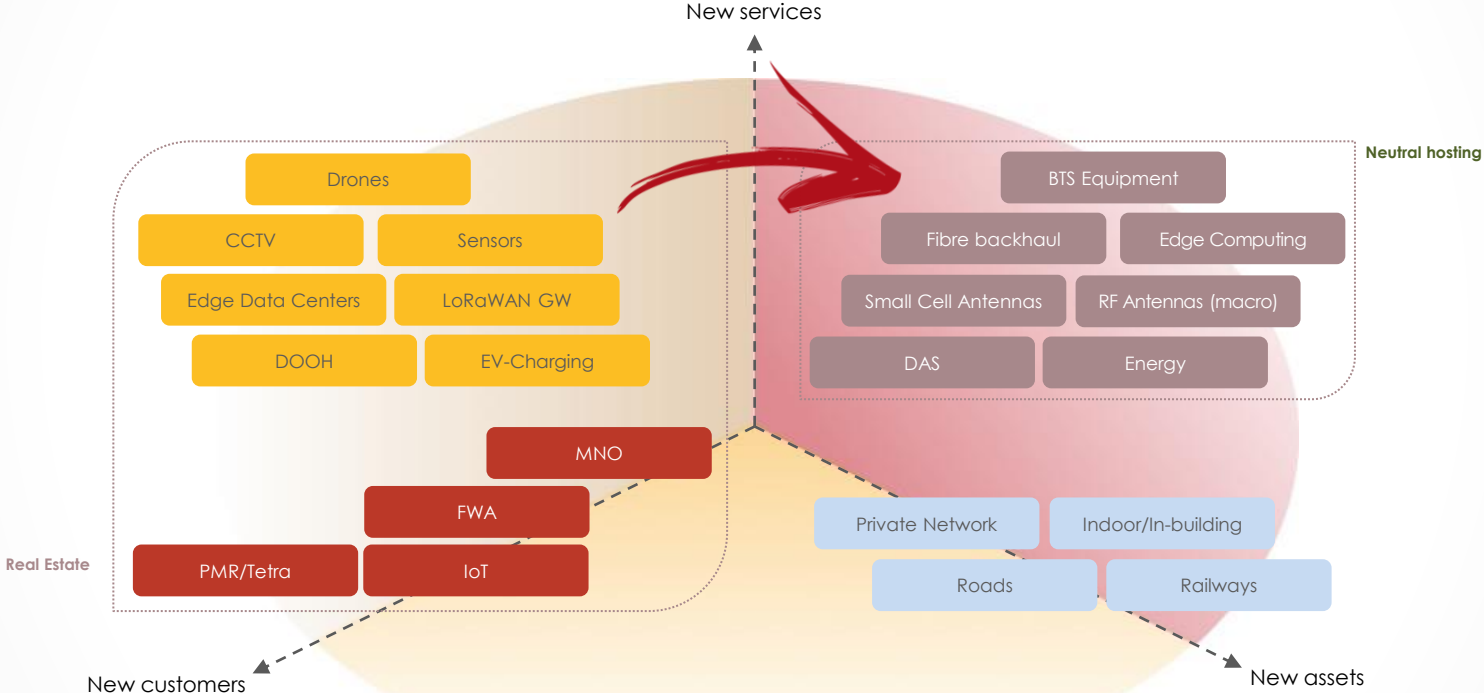
(Source: Ericsson Mobility Report November 2023)

Smart City

New challenges and opportunities

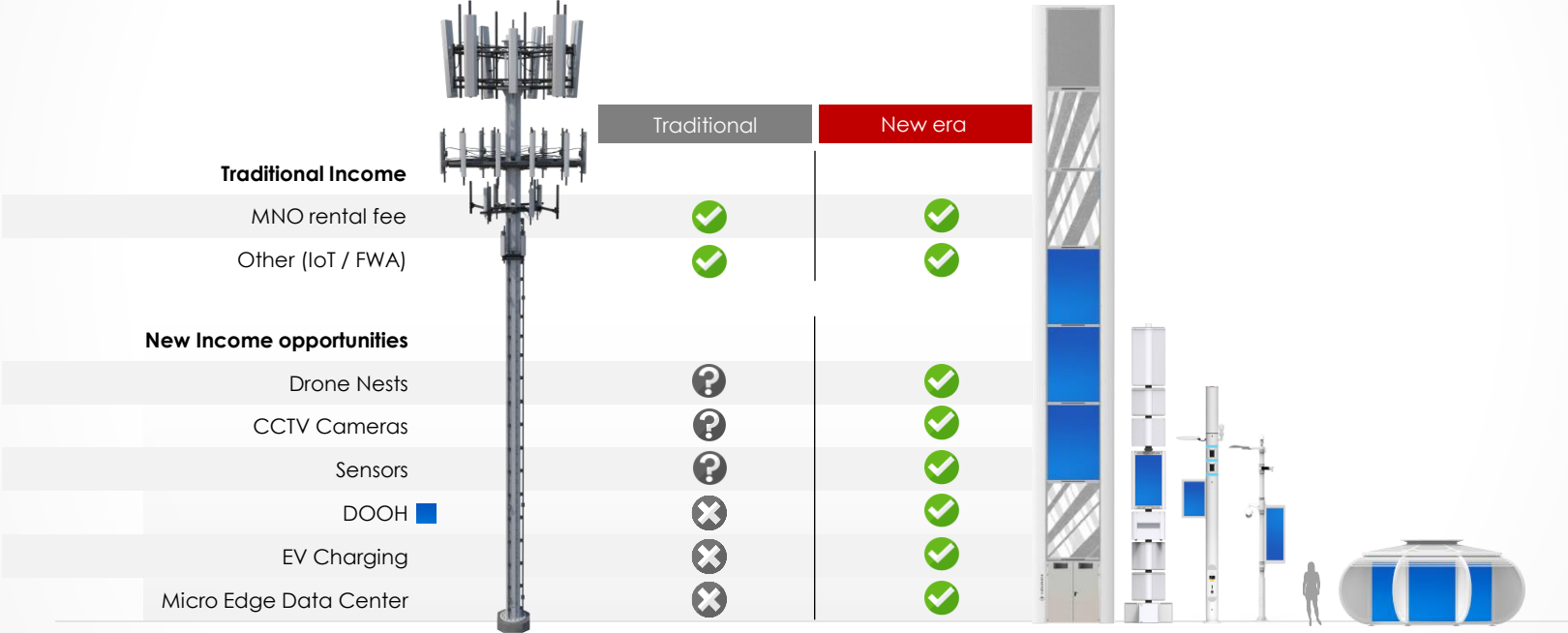


Densification: towerco challenges and opportunities



(Source: Analysis Mason (2022))

Densification: towerco challenges and opportunities



Densification: towerco challenges and opportunities



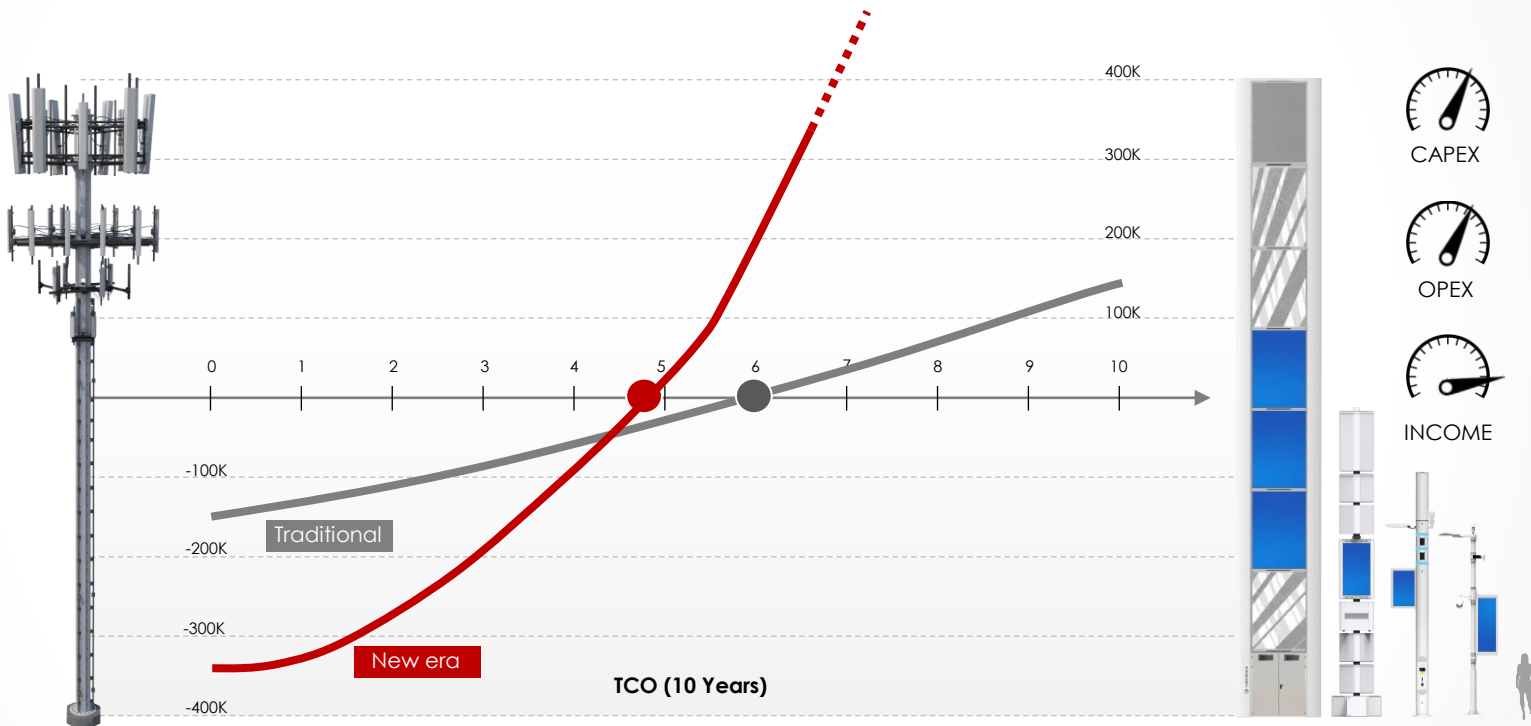
CAPEX



OPEX



INCOME



CAPEX



OPEX




INCOME

NOTE: The calculation is based on values derived from Calzavara's expertise, with the exception of the value of advertising spots, calculated from market quotations for an **18-square-meter screen** located in a location typically crowded in an **Italian city** with over **half a million inhabitants**.



Densification: towerco challenges and opportunities



	Today		Tomorrow?		
	TowerCo	MNO	TowerCo	MNO	New Tenants
Land ownership	Own	Shared	Own	-	-
Cell Tower	Own	Shared	Own	Shared	-
BTS	-	Own	Own	Shared	-
Radio equipment	-	Own	Own	Shared	-
Antennas	-	Own	Own	Shared	-
Data Center	-	Own	Own	Shared	-
Core Network	-	Own	-	Own	-
Other Technologies	-	-	Own	-	Shared

(Source: Amit Kaushal (2024), Digital Nasional Berhad



Basiliano Headquarters, Italy (2024)



Riyadh, Saudi Arabia (2024)



Motorway A4 Milan-Turin, Italy (2024)



Shanghai, NSB HQ, (2021)



Udine, Italy (2024)



Brisbane, Australia (2023)

“ Beauty is not a luxury, but a fundamental necessity for humanity ”

Marco Calzavara



GRAZIE