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Strategies and Policies Enabling New Growth Opportunities

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5G Implementation in Europe and CIS

Setting the scene for 5G: Opportunities & Challenges

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∽ 5G

Setting the scene

- What is 5G?
- What are the socio-economic implications?
- What are the technology and spectrum requirements?
- What are the costs and investment implications?
- Is there a viable case for investment in 5G?
- What are the challenges and opportunities?
- What can policy makers and regulators do to facilitate 5G

deployment?





5G requirements: a snapshot

Bandwidth and latency requirements for 5G application



Source: GSMA Intelligence and Intelligens Consulting, 2018



Deploying fiber backhaul networks for small cells – to support high data rates and low latency – will be one of the largest challenges faced by operators due to the limited availability of fiber networks in many cities.



Example of costs and investment implications



Source: Inteligens Consulting, 2018

The model

Typical neutral host wholesale small cell solution **Fibre distance** No. small cells Coverage area No. Small cells Population Inter-cell density distance Inter-cell distance **Capex** calculation Fibre MER RAN Install cost of **Design and** Equipment rack Antenna duct and fibre planning Active Base station Site upgrade equipment electronics Site access Street cabinet permits **Civils**

Source: Intelligens Consulting, 2018

The model assumes the following cost elements:

- **RAN**, which includes the cost of antenna, street cabinet and base station electronics such as battery backup and network maintenance modules.
- Implementation costs, which include design and planning costs, site upgrade costs, permit costs and civils costs to lay street cabinets.
- Fiber network, which includes the provision of 144 fiber and new ducts along the route of the activated street assets.
- Main equipment room (MER), comprising a single rack and termination equipment to provide an interconnection between the mobile operators and the dark fiber network in a co-location site.

The results

Capex for scenario 1 – large dense city

Item	Value
Total capex (USD millions)	55.5
Number of small-cell sites	1,027
Cost per square km (USD millions)	3.7
Capex per site (USD thousands)	54.1

Contributions to capex

Small cell distance	Scenario 1	Scenario 2
RAN equipment (antenna, street cabinet, base station electronics, battery backup and network maintenance modules)	25%	24%
Implementation costs (design and planning costs, site upgrade costs, permit costs and civils costs to lay street cabinets)	50%	46%
Fibre (provision of 144 fibre along the route of activated street assets)	25%	30%
MER (single rack and termination equipment)	<0.1%	<0.1%

Capex for scenario 2 – small less dense city

Item	Value
Total capex (USD millions)	6.8
Number of small-cell sites	116
Cost per square km (USD millions)	2.3
Capex per site (USD thousands)	58.6

Source: Intelligens Consulting, 2017



Key issues for consideration

Investment case	Policy makers may consider undertaking their own independent economic assessment of 5G to evaluate the commercial viability of deploying 5G networks.
4G network strategy	Until such time that the case for 5G networks can be made, policy makers may consider enhancing the availability of and boosting the quality of 4G networks.

Harmonize spectrum	NRAs may consider allocating/assigning globally harmonized spectrum bands for 5G.
Spectrum roadmap	NRAs may consider a spectrum roadmap with a predictable renewal process.
Spectrum sharing	NRAs may consider allowing spectrum sharing to maximize efficient use of available spectrum particularly to benefit rural areas.
Spectrum pricing	NRAs may consider selecting spectrum award procedures that favour investment.
700MHz spectrum	Policy makers may consider supporting the use of affordable wireless coverage (e.g. through the 700 MHz band) to reduce the risks of the digital divide.

Key issues for consideration (continued)

Fiber investment incentives	Where market failure has occurred, policy-makers may consider stimulating fiber investment and passive assets through PPPs, investment funds and offering grant funds, etc.
Fiber tax	Policy-makers may consider removing any tax burdens associated with deploying fiber networks to reduce the associated costs.
Copper migration to fiber	Policy-makers may consider policies and financial incentives to encourage the migration from copper to fiber and to stimulate the deployment of fiber services.
Wireless backhaul	Operators may consider a portfolio of wireless technologies for 5G backhaul in addition to fiber including point to multi point (PMP) microwave and millimeter wave (mmWave) and satellite where possible.



Key issues for consideration (continued)

Access/sharing of passive infrastructure	Policy makers may consider allowing access to government-owned infrastructure such as utility poles, traffic lights and lampposts to give wireless operators the appropriate rights to deploy electronic small cell apparatus to street furniture. NRAs may consider continuing to elaborate existing duct access regimes to encompass 5G networks allowing affordable fiber deployments
Access costs	Policy-makers/NRAs may consider ensuring reasonable fees are charged to operators to deploy small- cell radio equipment onto street furniture.
Asset database	Policy-makers may consider holding a central database identifying key contacts, showing assets such as utility ducts, fiber networks, CCTV posts, lampposts, etc. to help operators cost and plan their infrastructure deployment more accurately.
Wayleave (rights of way) agreements	Policy-makers may consider agreeing upon standardized wayleave agreements to reduce the cost and time to deploy fiber and wireless networks.
5G test beds	cases and to stimulate market engagement.



THANK YOU

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