



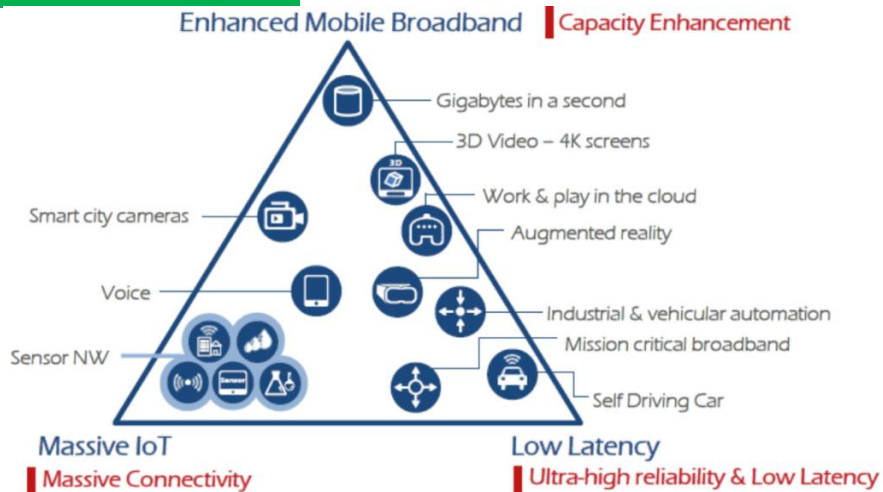
# 5G CityView Jamie Cudden



Comhairle Cathrach  
Bhaile Átha Cliath  
Dublin City Council

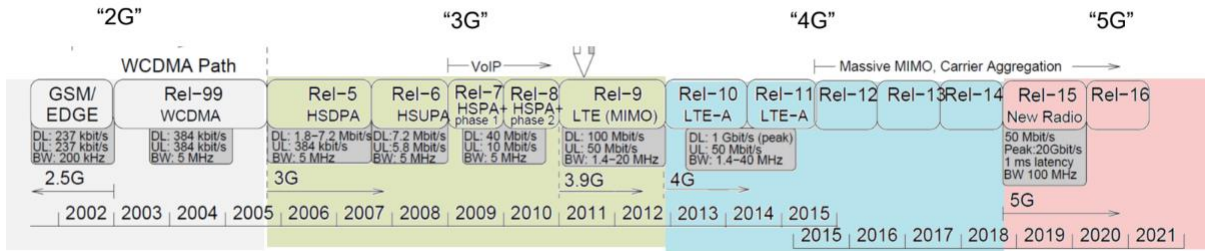
1

## 5G TYPE APPLICATIONS

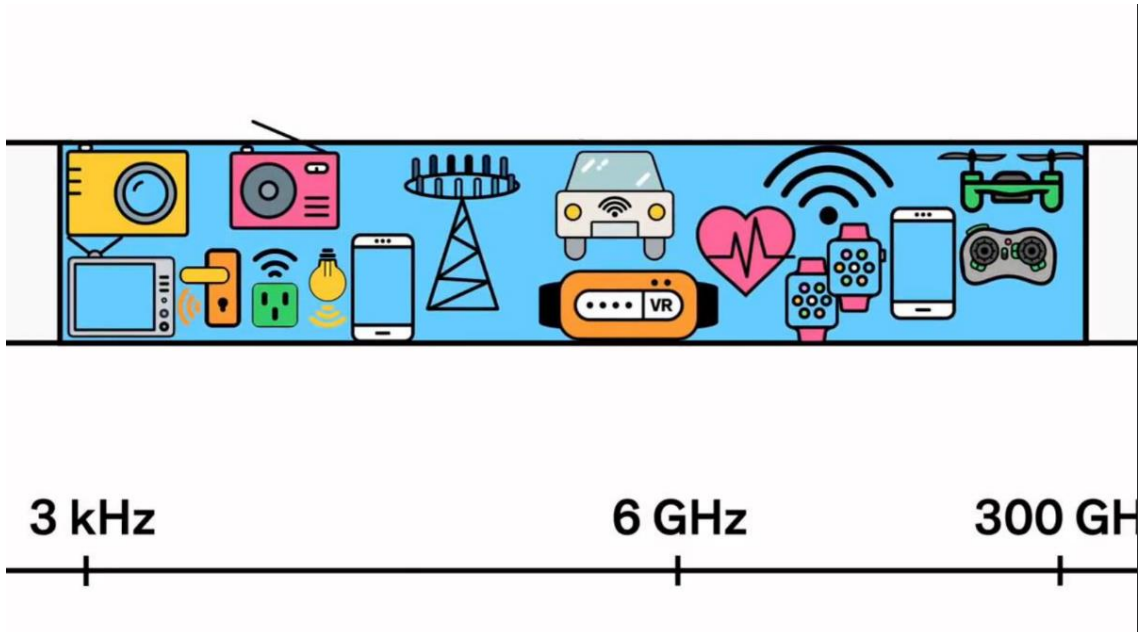


2

# 5G PPP STANDARDS ARE BEING WRITTEN

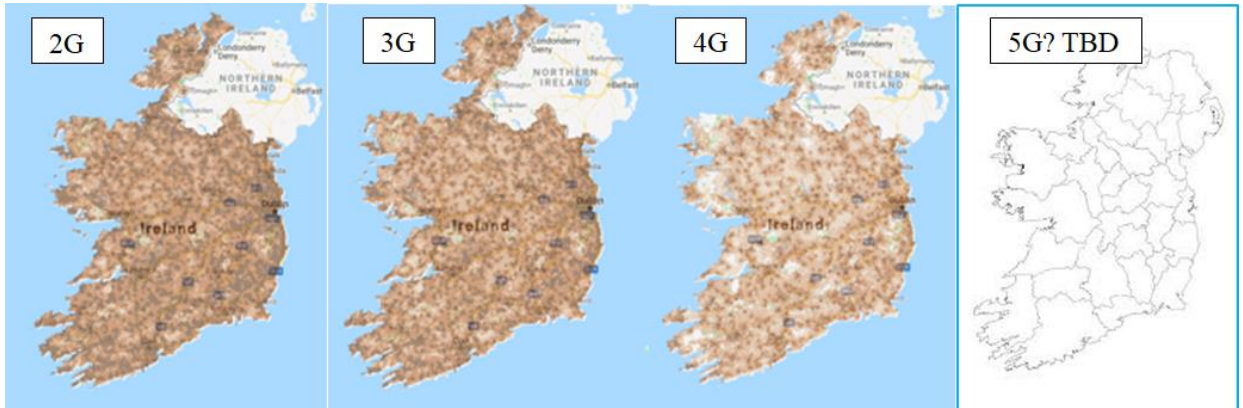


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# 5G ROLLOUT? EXPERIENCE TO DATE

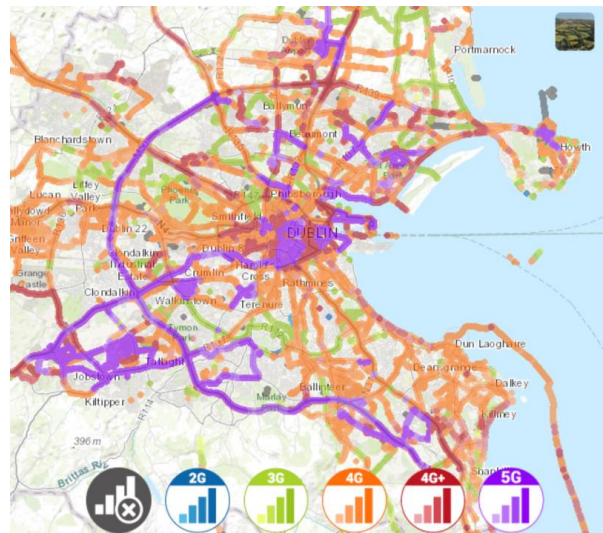


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Budget | Brexit | Irish | World | Technology | Personal Finance | Small Business | Farming | Jobs | Co  
Thursday 26 September 2019



## Vodafone switches on 5G mobile in Ireland: cities first, rural later



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## Dublin City: Big Data Analysis



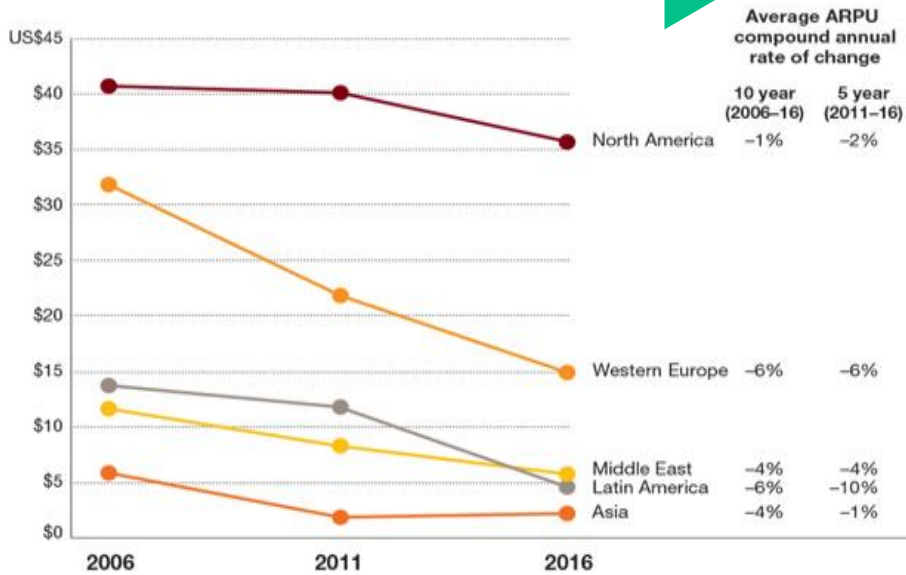
**19,142 (27%) of buildings have poor LTE coverage**

7

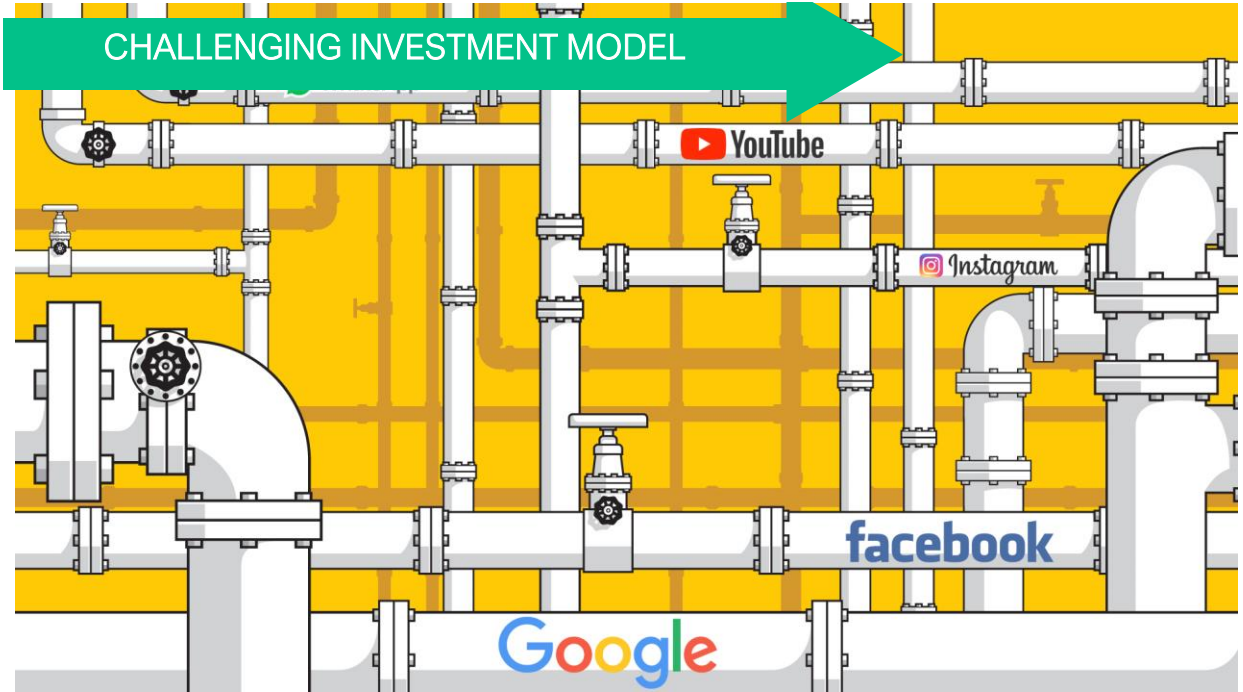
DENSE AIR

7

## CHALLENGING INVESTMENT MODEL

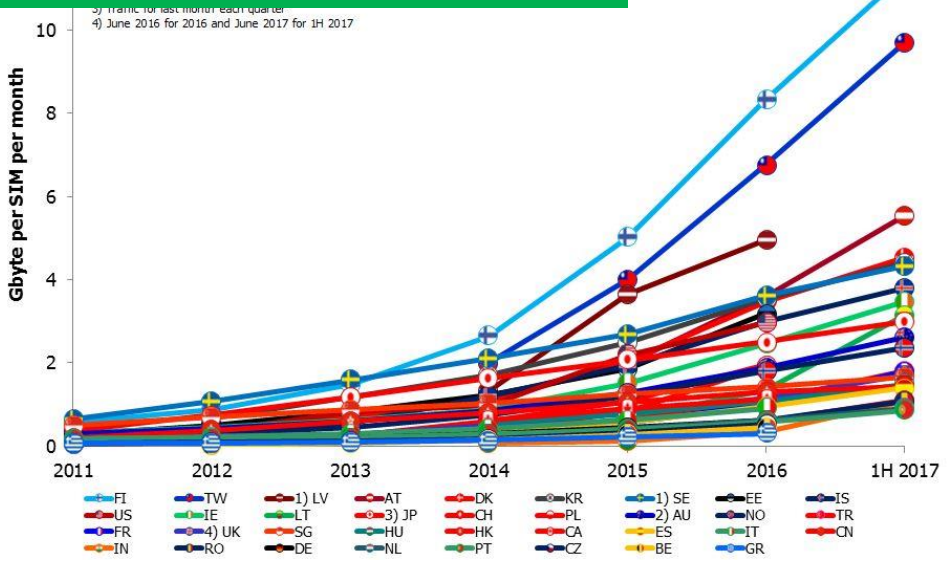


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## DATA CHALLENGE



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## DENSIFICATION CHALLENGE IN CITIES




**More capacity**  
Denser networks of small cells



**More coverage which means more cells**  
Small cells more easily deployed



**More spectrum at higher frequencies**  
Small cells needed for shorter ranges



**More bandwidth with low power shared spectrum**  
Small cells needed for shorter ranges

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## CITIES NEED TO MAKE IT EASIER TO CONNECT THINGS.....



POWER SOURCES / ACCESS POINTS / SMALL CELLS / CABINETS / FIBRE / SENSORS / ACTUATORS

WHERE TO PUT IT?



### ACCESS TO POWER

**CONNECT**  
Networks of the Future

### RULES AND POLICIES AND REGULATIONS

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## ENGAGING THE MARKET THROUGH RFI's

Future proofing of street lighting assets to enable delivery of smart city services and wireless connectivity

GIGABIT WIFI / WIRELESS CONNECTIVITY AND ASSOCIATED SMART CITY SERVICES

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# FEB 2019: DUBLIN 5G TESTBED



## Dublin's docklands could be turned into a playground for testing 5G technology

The city council hopes a 'small cells' network will be available for use by native and international firms.

BY ZUZIA WHELAN REPORTER, FORA  
FEBRUARY 18TH 2019 | 3 MIN READ

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### Dublin to test 'neutral' 5G network

21st February 2019 Jonathan Andrews

Dublin's smart docklands is the city's testbed for smart city solutions

Latest Issue




The digital magazine of Cities Today

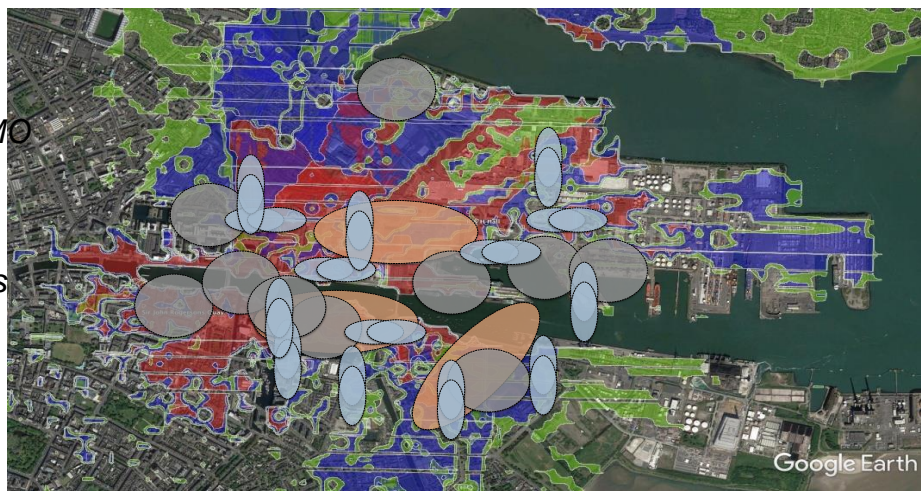
Most Popular

1. New mobility alliance ush
2. CES news round-up
3. Communities are the key s
4. New report reveals that ci
5. Mayor of Stockholm elect

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## Three Layer Connectivity Network

-  **Massive MIMO Macro**
-  **Street Poles**
-  **Magic Box (Indoor)**



DENSE AIR

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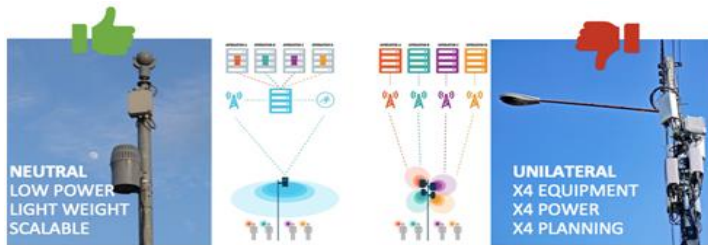




An Example of Urban Disruption caused by trenching. Credit: WPLN/Tony Gonzalez

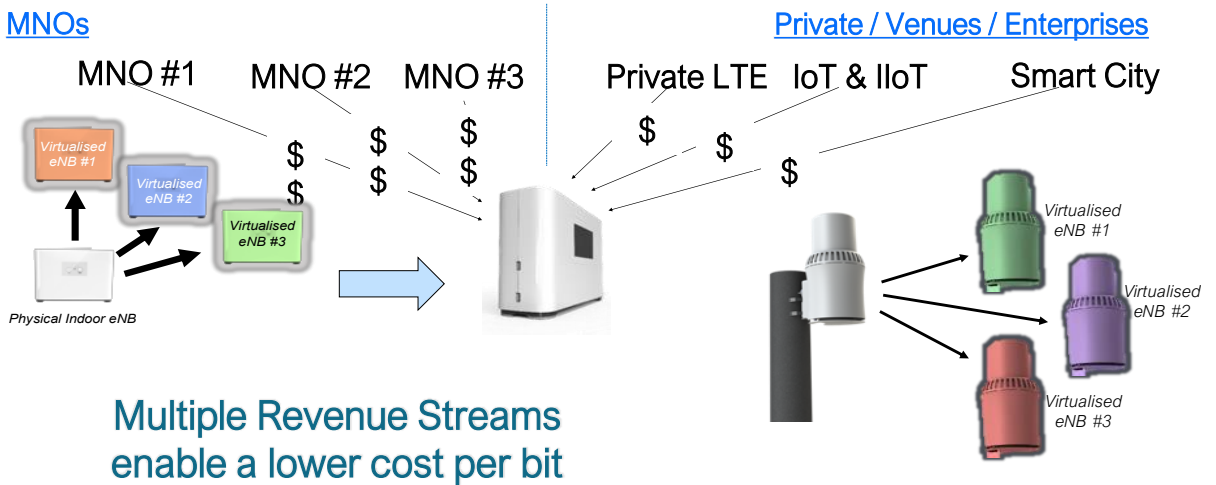


An example of active equipment duplication and the resulting impact on visual pollution. Credit: Shutterstock/kring phromphim



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Dense Air Business Model: Neutral Host



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# AESTHETICS A KEY ASPECT FOR CITIES



**Without collaborative City input:**  
**"Small Cell" at 4471 Moraga Ave Oakland**  
*(bulky boxes, tacky bundles of wiring below unpainted antennas and noisy cooling fans)\**

**With collaborative City input:**  
**Verizon at 1367 Jones Street in San Francisco**  
*(unobtrusive and noiseless)*  
320 built; another 200 expected for other carriers



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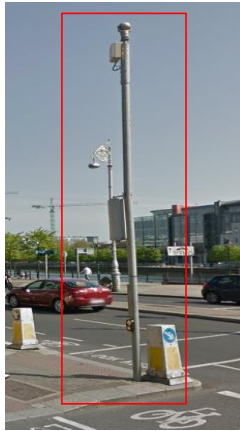
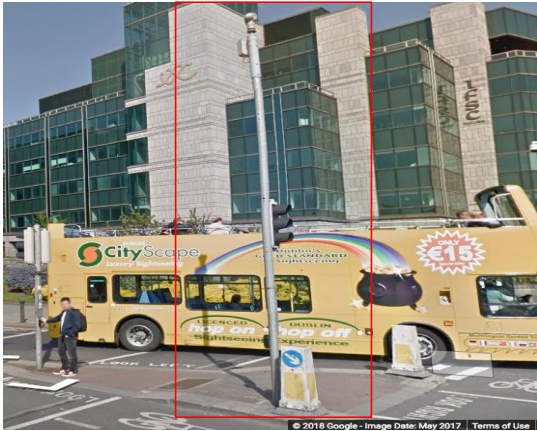
# Managing Aesthetics and Heritage?



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# Leveraging Traffic Infrastructure?

10. TMB - 001 - Talbot Memorial Bridge



## Agreeing SLA's

Traffic Light/CCTV	7m*	300mm Dia	Galvanised	0%	<ul style="list-style-type: none"> <li>- Great Fibre option, important location with no other asset options</li> <li>- Connolly, IFSC focus</li> <li>- Access hole visible</li> </ul>
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# NEW OPPORTUNITIES FOR DEPLOYMENTS

## Hiding in Plain Sight



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## NEW OPPORTUNITIES FOR DEPLOYMENTS



Developing innovative solutions able to host more

JCDecaux has gained an expertise in developing hosting solutions supported by major Small Cell players for the benefit



## SMART POLE INNOVATION?



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## DENSIFICATION CHALLENGE IN CITIES

- Suitable locations
- Access to power
- Access to fiber
- Appropriate Pricing Models to access assets

## HOW DO WE BUILD THESE NETWORKS?

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# THE POWER DILEMMA – UNMETERED SUPPLY

## Unmetered Connections

### In This Section

- Single House
- Housing Estate/Apartment Block
- Single Commercial Unit
- Multi-Unit Development
- Farm Premises

### Unmetered Connections

- [Unmetered Connections](#)
- Unmetered Public Lighting (less than 2kVA)
- Unmetered Electric Loads (less than 2kVA)

## Unmetered Connection

An Unmetered Connection is a connection where the charges for electricity consumption are not measured via a meter. It is available on a very limited basis for small electricity loads where the usage is predictable. Unmetered Connections fall into:



### Unmetered Public lighting (less than 2kVA)

- For connections by a Local Authority
- For connections by builders or developers

Unmetered Public Lighting (less than 2kVA)



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POLITICO Poll of Polls Brussels Brexit Policy Newsletters POLITICOPRO Europe

THE STATE OF 5G

# Anti-antennae warriors stall 5G rollout in Brussels

Activists are warning about antennas and radiation and cancer — oh my!

By JILLIAN DEUTSCH | 7/11/19, 4:05 AM CET | Updated 7/22/19, 3:02 PM CET

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# 5G

An Emerging Framework For Irish Cities & Towns

DISCUSSION DOCUMENT FOR INTERNAL USE ONLY

DRAFT – do not circulate

DUBLIN CITYCOUNCIL / SLIGO COUNTY COUNCIL

13/09/2019

## The 5G Journey in Ireland

- 2017** ComReg assigns 350 MHz of spectrum in the 3.6 GHz band, a pioneering medium for sub-6 GHz 5G, to five winning bidders.
- 2019** Ireland's mobile operators commence the 5G journey, deploying the 3.6 GHz band atop existing 4G macrocells in high traffic hotspots across Irish cities.
- 2019** Consumer adoption of 5G is limited - the high cost of entry and small device ecosystem is prohibitive.
- 2020** ComReg completes the largest multi-band award in its history, releasing the 700 MHz band to enable pervasive 5G.
- 2020** UEFA EURO 2020 showcases 5G, urban coverage expands.
- 2021** Mid to High-end handsets are graced with 5G modems, the application ecosystem explodes.
- 2021** Low-band deployment brings 5G to rural Ireland, massive densification begins in cities.
- 2022** The limitations of the macrocell grid become more apparent.
- 2022** Investment pivots to small cells - a new revenue opportunity emerges for local authorities.
- 2023** Sharing of small cells reduces cost and visual pollution while increasing attainable density.
- 2023** The density of fibre at the edge increases, supporting small cells.
- 2024** Mobile operators exploit mmWave spectrum in dense environments to deliver a dramatic uplift in capacity.

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## WHATS YOUR ROADMAP

- Joined up approach required across government to ensure that Ireland is well positioned to deploy 5G and also realise the economic and societal benefits of 5G.
- Learning to better understand the challenges required to scale so we are 5G ready!
- Working with 'operators' to agree neutral hosting and shared access to assets opportunities.

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## KEY PRINCIPLES OF 5G ROLLOUT?

- To agree a common process and fair pricing to acquire sites  
E.g shared use of assets will be a preferred mechanism for areas of high demand across operators
  
- To agree shared use of assets & appropriate service level agreements to ensure service delivery. E.g How to manage and price risk & change internal perceptions.
  
- Jointly agree with industry key principles of 5g rollout (fair, equitable and transparent access to assets)
  
- Engage with operators on their commercial rollout plans.