Collaborating to Connect in the ‘New Normal’

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Jamie Cudden, Smart City Lead, Dublin City Council

ALPHA WIRELESS

This article is based on the outputs of a telecoms workshop held by the Connect Research Centre for Future Networks in Trinity College Dublin in conjunction with Dublin City Council and Smart Docklands. The workshop provided an opportunity for knowledge sharing between academia, government and industry players like Alpha Wireless, Aspire Technology and Dense Air.

The article details Dublin's telecoms journey in recent years, and examines the landmark city partnership between the Telecom Infra Project and other ecosystem players like Alpha Wireless, Cellnex and Vodafone.

As the pandemic recedes, the profile of data traffic flowing across Europe's mobile networks is changing. Streets are once again awash with shoppers and tourists, and offices are being relieved of their deafening silence.

For mobile operators, this shift represents a return to old habits- but with a challenging twist. The unprecedented collapse of mobility in the population during the pandemic saw the focal points of data traffic pushed out to suburban, exurban and rural areas.

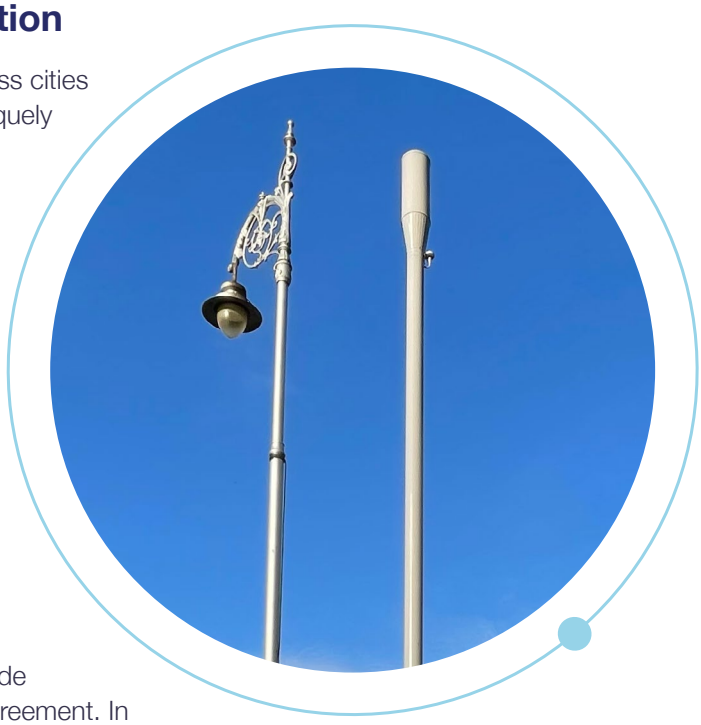
Such is the nature of a black swan event; operators were caught off guard and forced to refocus their investment strategy on less densely populated data traffic hotspots. Scores of new macrosites, broader spectrum allocation and backhaul upgrades became the go-to approach.

Fast forward to today, however, and traffic growth is now returning to the dense urban environments, which were just a second thought for capacity planning teams only some months ago. And the crux of the challenge is that operators need to balance this traffic profile evolution with the reality that usage remains elevated above pre-pandemic levels in less built-up areas.

Consequently, the primacy of in-fill capacity solutions has never been greater. Massive network densification is becoming a fixture of modern mobile network rollouts across Europe, even in less densely populated countries like Ireland.

New deployment solutions for densified 5G, such as small cells and street works sites are transforming how networks are built and perform. But they also introduce entirely new challenges, and force greater collaboration between local authorities and tower companies working on behalf of mobile operators.

The City Challenge: Aesthetics as a foundation



The specter of thousands of telecoms deployments sprawling across cities and towns means municipalities like Dublin City Council have a uniquely important role to play in positively shaping the rollout of telecoms infrastructure within their jurisdictions.

A delicate balance needs to be struck that ensures world-class connectivity can be deployed quickly and cost-effectively to maximize competition and economic growth and social benefit in cities, while also protecting the urban aesthetic through concealment and minimum duplication of telecoms equipment.

Dublin, like every other city located in the European Union, is obliged to provide access to its public assets for the purpose of deploying small cell equipment. This open access model is enshrined in law through the European Commission's Article 57 legislation, which seeks to fast track 5G deployments and reduce rollout costs for operators.

The nature of the legislation is such that municipalities cannot provide exclusive access to assets for any one operator in a concession agreement. In this kind of 'common good' regulatory environment, the ability of cities like Dublin to ensure core aesthetic priorities are met hinges on the extent to which they collaborate with the wider telecoms industry.

Across the municipality and telecoms ecosystem, there is a growing consensus that future deployments in dense urban centers need to exhibit multi-operator capability as standard. The neutral host model is preferable from aesthetic and cost perspectives because it reduces the number of discrete, duplicate deployments and shares the financial burden across more than one operator.

The City Strategy: Deep Cross-Sector Collaboration

In recognition of the urgent need to intervene and support mobile network densification in cities, several municipalities in Europe have established themselves as trailblazers. Dublin is a thought leader and best practice exhibitor, but it too has learned from the experiences of other cities like Glasgow, which is a role model in asset mapping and rate card development.

A defining feature of Dublin City Council's telecoms strategy in recent years, for example, has been its engagement in deep cross-sector collaboration. The city's telecoms journey began in 2017 when it engaged the market and developed a relationship with Dense Air, leading to the deployment of a neutral host 5G small cell testbed in the Docklands financial services and technology district.

The collaboration with Dense Air acted as a valuable learning experience and served as a springboard for the council to develop a landmark partnership with Telecom Infra Project (TIP), a global telecoms community of companies and organizations working to support the development of open, disaggregated radio access networks (RANs).

Through this partnership, the municipality has brought together an ecosystem of telecoms stakeholders in Ireland, including mobile operators like Three and Vodafone, tower companies like Cellnex and equipment vendors like Alpha Wireless. The working relationship between Dublin and TIP culminated in the creation of the "Connected City Infrastructure" solution group.

From the outset, the solution group sought to develop and validate the design and rollout of new construction and retrofitted modular street assets with 4G LTE and 5G small cells. In addition, based on the learnings during this process, the group sought to develop a sustainable business model for street assets managed by municipalities like Dublin City Council.

Thanks to deep collaboration between all stakeholders, the group successfully pioneered the deployment of multiple new small cell solutions in Dublin. The sites are located in areas identified by mobile operators Three and Vodafone as being insufficiently served by the existing macro network, and exhibit both high footfall and challenging space and visual constraints.

As a result, in order to conform to the street aesthetics, new form factors needed to be developed. A telecoms-enabled smart bin solution, Telebelly, was deployed in conjunction with leading bin manufacturer Bigbelly and tower company Cellnex, with radios, power and transmission equipment concealed discreetly within the integrated bin enclosure.

Additionally, a smart pole solution was also designed and deployed. This leveraged a modular pole platform provided by Ligmam Evolve and saw equipment concentrated in a podium integrated at the base of the pole.

The desire to minimize visual clutter in the vertical plane and protect the skyline across both small cell form factors meant that the antenna solution chosen for the sites needed to meet stringent requirements and exhibit the smallest diameter possible.

Alpha Wireless' integrated tri-sector canister antenna solution was selected by stakeholders because it provided the performance capability needed to support in-fill capacity and the discrete aesthetic required to blend in.

In parallel to executing the rollout of the small cell pilots, a key part of the working relationship between Dublin City Council, TIP and the wider stakeholder ecosystem was experience and knowledge sharing.

A thought leadership document was developed to capture the learnings from the pilots, with deployment challenges and future small cell technology evolution detailed in an effort to create a replicable blueprint for other cities.

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The City Future: Building on progress with hard data

Following the successful completion of the Connected City Infrastructure project, Dublin is set to continue its partnership with TIP and implement the learnings through its newly established Telecoms Unit. It will continue to update the small cell playbook to reflect the changing dynamics of commercial rollouts in the city and further afield.

The various challenges encountered during the deployment phase underline the critical nature of close coordination between stakeholders at every level. In this respect, TIP provided significant value to stakeholders engaged in the Dublin small cell pilots because it acted as a neutral umbrella under which operators could interact with other public and private bodies.

Likewise, the pilots have also contributed to a newfound appreciation of fiber and the backbone role it will play in mobile network densification. Dublin's experience makes clear that the availability of high-quality mapping for duct and sub-duct infrastructure is essential to ensure scalable backhaul capacity can be accessed rapidly and at a low cost for small cells.

In fact, the theme of asset mapping, along with data collection and interpretation will be one of the most important work streams for cities to improve on over the coming years. Armed with real-time data about the availability and quality of telecoms services and mobile network coverage across different areas within cities, municipalities will be better able to prioritize deployments so that underserved pockets are more quickly addressed.

Fortunately for municipalities, the task of balancing city priorities like aesthetics and unlocking the social and economic benefits associated with telecoms deployments is becoming easier. Cities like Dublin are taking the difficult initial steps to pioneer new deployment solutions that will make their way to other places in the future.

The technology underpinning small cells and street works solutions is itself evolving to aid concealment and minimization of equipment duplication. Recent breakthroughs have enabled more discrete antenna solutions like Alpha Wireless' integrated tri-sector canister antenna, paving the way for shared, neutral host rollouts in even the most dense and sensitive urban environments, helping cities worldwide prepare for a return to old habits despite the new post-pandemic normal.

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