



Case Study with National Broadband Ireland

Connecting Rural Ireland with Wavelength Division Multiplexing

Background

The **National Broadband Plan (NBP)** is the Irish government's initiative to extend broadband coverage to all non-commercially viable premises in Ireland. It is the largest ever telecommunications project undertaken by the Irish State and recognised as one of the biggest and most ambitious telecoms infrastructure projects of its kind globally.

National Broadband Ireland (NBI) is responsible for designing, building and operating the high-speed fibre broadband network and, since 2019, Corning has been working with NBI to ensure that every farm, business and home in the designated rollout area has access to high-speed broadband. Around 146,000 kilometres of fibre is expected to be deployed to connect above and beyond half a million homes, stretching across 96% of Ireland's landmass.

The Challenge

To date, NBI has made great strides in progressing the build in urban and more developed areas. Recent figures cite over 440,000 homes, farms and businesses passed out of the 566,000 currently included in the NBP intervention area, but the **ultra-rural segment** poses unique challenges.

One of the biggest challenges NBI faces is deploying **rural fibre runs**, which are often long and expensive to augment later due to their length. In these remote areas, with a typical home density of less than 10 homes per linear km of road, operators need the capability to add additional capacity when and where its required. The amount of fibre deployed by NBI and other network operators impacts everything from the split architecture and speed of build to the closures required. If this isn't carefully managed, it can cause significant cost implications, delays and demand for scarce splice resources.

NBI's Requirements



Flexible, cost-effective solution



Optimised speed of deployment



Nimble adaptability for demand increases over the lifespan of the network

The Solution

Corning has significant experience in developing connectivity solutions optimised for deployments in rural areas. Fundamental to supporting NBI was finding an approach that would enable the deployment of a fibre-light network that avoided wasteful, speculative builds. The two teams worked in close collaboration, leveraging Corning's local design expertise, to explore how the Corning portfolio could be best optimised for NBI's requirements. It was clear from this consultancy process that leveraging **Wavelength Division Multiplexing (WDM)** was a compelling solution.



Wavelength Division Multiplexing (WDM)

Similar to how a motorway is divided into separate lanes to allow multiple cars to travel smoothly at the same time, WDM splits light into multiple wavelengths, allowing several data streams to travel simultaneously over a single fibre.

For NBI, this greatly **increases the capacity of the fibre** without the need to lay new cables, allowing the team to optimise capacity and selectively activate additional wavelengths — as demand grows — in a scalable and cost-effective manner.

Corning has been NBI's connectivity partner since the rural build commenced, providing both splice closures and hardened network access points with the Corning **BPEO fibre closures**. To support this WDM requirement, WDM filters are being embedded within these same BPEO closures, which offers significant operational advantages to NBI. At the exchange end of the build, Corning employs its **Centrix® System**, a high-density optical cabling solution that integrates easily into standard 19- and 21-inch racks. This solution is particularly well-suited to small rural exchanges where space might be at a premium. Both the BPEO Fibre Closures and Centrix System are also pre-assembled, which prevents the need for any time-consuming assembly in the field.

“ **Corning's WDM solution allows us to increase fibre capacity without the need for additional cable installation. It's a smart, efficient way to expand connectivity across rural Ireland, helping NBI reach more homes and businesses, faster and at lower cost.** ”

— **Niall Grimes**, Network Engineer,
National Broadband Ireland



The Impact

In addition to transforming the fibre efficiency of the build, one of the most significant use cases for the solution is **connecting rural cellular sites**, which often have multiple operators. In a traditional network build, one would typically deploy multiple fibres to mast sites in order to accommodate each customer but, with WDM, a single fibre will suffice.

Crucially, the NBI solution has been designed to allow even **more capacity** to be added as and when demand arises, which future-proofs the network even further. This means that NBI can build in full confidence that they have the **flexibility to meet customer needs**, without unnecessary waste and cost.



No Mountain High Enough: Connecting Mount Leinster

When NBI set out to bring broadband to every corner of Ireland, remote areas posed a real challenge. Partnering with Corning, they found a smart solution: leveraging WDM technology to send more data over fewer fibres.

With pre-assembled closures and flexible systems, NBI and Corning made it possible to reach even the most isolated spots, like the peak of Mount Leinster, quickly and efficiently. In November 2024, the technology was deployed successfully on the highest peak in Ireland's eastern province. The mountain hosts a TV transmitter site and was a prime location for cellular backhaul aggregation on Corning's WDM system.

The result? A network that's ready for whatever the future brings, giving rural Ireland the connectivity it deserves.

WDM Brings your Network Further

Corning's WDM product solutions provide efficiency and scalability to your network. Learn more on our website.



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CORNING

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