CORNING

EU FTTH Deployments in Rural Areas

Bridging the Digital Divide

Contents

Introduction – EU Closing the Rural/ Urban Digital Divide

According to the FTTH Council Europe, The European Commission's Digital Agenda for Europe is moving forward with the intention of creating a Gigabit Society by 2025. The programme's goal is to provide every European citizen with access to high-speed internet by the end of next year. This objective is challenging, especially where rural fibre installations are concerned.

The Gigabit Society program currently seeks to offer citizens a minimum of a 100 Mbps connection at home, while businesses and public institutions will have a 1 Gbps connection, and urban areas will enjoy uninterrupted 5G coverage. The COVID-19 crisis emphasized the significance of comprehensive, high-speed connectivity on a social and economic level, underlining the urgency of these plans.

As a result, the Digital Agenda has become even more ambitious, setting additional goals. The European Commission introduced the "Digital Compass 2030," which aims to connect every European household to a gigabit network by the decade's end. This is undoubtedly an enormous task, as a large portion of the European continent is characterized as rural and there are significant disparities in progress among countries.

Keeping the goal of comprehensive gigabit connectivity by 2030 in mind, what are the challenges and implications for the industry moving forward and what strategies must be followed to provide rural fibre in essential regions? In this article, we'll examine those issues in more detail, but first, let's take a closer look at what the Digital Agenda for Europe encompasses and the associated high-level plans for its implementation.

(Montagne, 2023)

Digital Agenda for Europe

The European Commission has introduced the Digital Decade Policy Program 2030, which aims to transform our society digitally. The program includes a road map that brings together connectivity, digital skills, and advanced infrastructures. Let's delve into the plan's implementation details.

Implementation through National Programmes: National governments are allocating funds to build and upgrade digital infrastructure. These governments are being supported by European Union (EU) funding mechanisms like the Recovery and Resilience Facility and the Connecting Europe Facility. It is important to note that these financial allocations often come with stipulations, including the requirement for available fibre.

Public-Private Partnerships: Many countries are engaging in public-private partnerships to develop digital infrastructure and services by mobilising resources and expertise from the private sector.

Regulatory Frameworks: Regulators are updating policies to make deploying digital infrastructures simpler. They are easing right-of-way permissions, encouraging infrastructure sharing, and setting fair competition practices.

Rural and Remote Area Focus: Special emphasis is being placed on extending digital services to rural and underserved areas to ensure comprehensive coverage and prevent digital exclusion.

Sustainability Goals: The expansion of digital infrastructure should align with sustainability goals and contribute to environmental objectives, such as energy efficiency and reduced carbon emissions.

Challenges and Progress: EU member states are coordinating and collaborating to align national programmes with EU-wide targets. Ensuring fair access while balancing investment is essential. Ongoing assessment of progress towards these goals is necessary to adapt strategies as needed.

(Europe's Digital Decade, n.d.)

Understanding Rural Diversity in FTTH Deployments

The Nomenclature of Territorial Units for Statistics (NUTS) is a system employed by the EU to classify its territory into regions at three different levels. At NUTS level 3, regions with a population density below 150 inhabitants per square kilometre are designated as "rural." Although some areas classified as rural may contain higher-density locations, these can still be cost-effectively served through fibre to the home (FTTH). Rural areas across the region are diverse and vary significantly in terms of geography. The challenges involved in providing internet connectivity to these rural areas are wide ranging, including regulatory restrictions, difficult access, and low density that make it economically inefficient to provide connectivity. This means that FTTH networks in rural areas can't have a one-size-fits-all solution. In this context, we will discuss the challenges along with a few methodologies and their implications on network operations.

Design Challenges when Building Rural FTTH Networks

There are many and mixed challenges when building FTTH networks in general and FTTH networks in rural areas in particular. Most notable are:

- A very **challenging business case** because of the low density of homes and large amount of fibre required per home passed. That said, take-up on rural FTTH tends to be far higher because there is less overbuild.
- The network **will be predominantly overhead but will typically contain some underground segments as well.**

This means the network must be able to withstand the environmental challenges of both environments.

- In many cases, the operator is using **third-party poles and infrastructure** which was typically not built to accommodate anything more than the original, minimal copper network and which may carry specific obligations and challenges.
- The complexity of the **interaction between overhead telecom networks** and power networks and, in some cases, the differences in requirements between fibre and copper networks must be considered in the architecture. The challenges of using power infrastructure must be clearly understood.
- The network will typically need to **coexist, at least initially, with the existing copper networks** and the business case for fibre deployment will not support copper rearrangement. The likelihood is that copper will not be removed in rural areas. That is because when the copper network is switched off, the value of recovered copper may not justify the recovery.
- **The most important thing about FTTH deployments is scalability**, however, it is often the most difficult thing to achieve. Scalability usually depends on building an architecture with the **lowest demand for scarce resources**, like splice and design, and developing a process with a **minimised critical path** with the fewest interdependent milestones. While tailoring the network architecture of each rural region/larger project to the diverse nature of that region is strongly recommended, it is equally important to create a **standardised, repeatable design** for the smaller segments within the region that can be easily understood and that minimises the need for interpretation, or more importantly, the risk of misinterpretation. And lastly, scalability depends on **logistic simplicity.** Overall, achieving a balance between customisation and simplification through standardisation is key.
- **Rural house patterns** and road networks are not linear. Instead, they tend to have a mesh of **side roads and lanes.** The design must accommodate that irregularity.
- Ideally, rural and urban networks should use the same materials, **both to minimise stock keeping units (SKUs) and to create a standard drop experience for installers.** But some rural use cases will make that difficult. If the rural portion of the overall solution is small, it may be better to build that smaller segment in a suboptimal way so that it can maintain synergy with the urban build. This will help to scale the solution and help avoid the risk of mistakes. However, if the rural portion of the build is very large, it may demand a completely different architecture from the urban areas.
- When rural networks are built, it is probable that there will be **very high take-up** because there are no alternative solutions available. This is likely to be >90% over the life of the network with >60% penetration at some point. It is also probable that having network access will make rural living more attractive. So, the network needs to be able to **add capacity** later without explicitly reserving ports during the build. In many cases, the modularity of the material will provide excess capacity. However, there also needs to be nearby capacity that is accessible, if needed, and a plan for how it can be accessed.
- Because of the commercial viability challenges of rural builds, many are financed by **state agencies.** This may carry additional specific challenges, the most likely of which is a requirement to provide **wholesale dark fibre capacity**, although an operator may wish to do so with or without a requirement.
- Rural FTTH networks will be impacted by storms. An approach to **repair** is critical.

Comparing Different FTTH Network Options for Rural Areas

As we've detailed above, there are many challenges to address when designing a rural FTTH architecture. The key to success is optimising the relationship between these considerations. We will now look at some common architectures through that lens.

Cascaded or Centralised Split Using a Central Splice Point and Stubbed Hardened Terminals

In this solution a splice node feeds stubbed terminals, either throughout a village or along rural roads. It is very similar to the way that urban FTTH is being deployed in many parts of the world, including the US and UK.

This option works well in villages but will struggle to provide the high volume of network access points (NAP/OSP) necessary for single properties and farms in a cost-effective manner.

The solution works relatively easily with side roads, although not as well as a splice-type solution. That is because the spare fibre will not always be near the side road junction. The design necessitates going back to the splice node to pick up the fibre. Spare, third-party fibre will be available at the splice location, but will not be available at the local ODP/NAP.

- Cost: Due to the need for parallel cable and labour, the cost is very high in the rural road setting. It is likely that for every 1 km of rural road, there will be >3 km of cable, including the feeder cable and various stubs leading away from the splice node. This equates to >3 km of material plus >3 km of cabling labour cost which makes the solution non-viable for a rural road.
- Design: It is very simple and has a standard approach.
- Scalability: It is familiar and relatively simple to scale.
- Use of pole infrastructure: If this solution is being built on a rural road, the amount of cable between the feed fibre and the terminal stubs may be prohibitive because of the need to integrate alongside existing copper infrastructure and accessibility from a third party.

Full Hardened Connectivity

Within the Corning portfolio, this option refers to a FlexNAP™ system build.

This option has a number of significant advantages. It offers very fast deployment time and requires securing permission for only one cable build.

However, the success of this option hinges on the availability of design resources who can enter and exit frequently throughout the critical path process. In addition, an initial route validation is needed to ensure the pre-built cable can be built, a very experienced and reliable logistics capability is crucial, and there is a significant time lapse between initiation and build, therefore delayed monetisation should be expected.

- Cost: The material and design costs are high, but labour costs for deployment are lower because there is only one cable build and splicing is minimal.
- Design: The design is complex and designers must be involved both in route validation and cable configuration.
- Scalability: High-volume scaling is a challenge for several reasons, most particularly in the design and logistics of using pre-built cable. The network must be executed exactly as designed. This means build resources won't have the flexibility to address issues they discover during the build, such as blocked ducts. Any potential issues must be discovered and planned for in advance.

That said, in a number of environments, there are distinct advantages to choosing this type of solution. One common example is when fibre is being erected on poles that carry power cables. This can impose restrictions on the fibre build. In some countries, the power must be switched off before fibre deployment. In this situation, minimising power outages by building a single, pre-designed cable would be highly advantageous.

Distributed TAP

This option is being considered more and more often as a solution for rural builds and is being promoted by some vendors.

The main attraction of DTAP solutions is their low fibre count. A single fibre is used repeatedly and the OLT utilisation can be quite high.

DTAP drops off "just enough" power at each NAP/ODP to support the service requirements at that location while sending on as much power as possible to extend the reach of the network. It tends to be quite complex to design and the build requires very experienced and reliable logistical support. Some vendors have proposed simplifying DTAP by standardising parts, ex: an 80/20 or 70/30 terminal. The downside of this standardisation is that it leaves more power at each location than is required, which means the OLT utilisation will never be maximised. More importantly, in a rural setting there will not be enough power to reach to the extremities of the network and the solution will not achieve reach. Multifibre DTAP is available, but even with standardised parts, it will not reach the 9-10 km required with the 30/40 NAPs/ODPs that will likely be needed on the fibre loop.

DTAP networks also struggle to carry additional fibres to meet wholesale obligations. Each side road has to be specifically engineered to send just enough power into that road, which means the solution will be challenged by the inevitable expansion required when FTTH makes rural living more attractive.

Some operators consider this type of network for last-mile extensions to existing networks. This can be achieved but requires investing in significant design and logistics capability for a very small network segment. Deviating from your standard design also introduces opportunity for error. Additionally, it is not good practice to add high-insertion-loss components to the end of the network when link budget is tight or might deteriorate over time with cable section repairs, etc. Last-mile DTAP could only be justified where the alternatives are even more prohibitive.

- Cost: The material and design costs are high, with a lower fibre count.
- Design: It is highly complex, with precision engineering required for rural routes.
- Scalability: It is complicated due to design complexity and logistics.

Aerial Microduct Solutions

For some operators, this will resemble their urban builds – aerial microduct bundles radiating away from a central splice point. Each microduct bundle is broken open, the individual microduct path is completed on demand, and a small blown fibre drop is installed.

It's an attractive option because it provides the same drop experience for the installer, using the same materials, every time.

But this option does have two main issues: First, the weight of the microducts in the aerial network causes a sag that interacts with the existing copper. The existing copper will probably need to be lowered on the poles, which can as much as double the cost of a rural FTTH deployment. Second, this will sag increase if the opened microducts have not been sealed properly allowing water to enter and travel through them.

- Cost: The material cost is reasonable, with minimal splicing costs. However, the cost to rearrange the existing copper will be prohibitive.
- Design: Using an aerial route for microducts is simple and may complement the operator's urban FTTH drops.
- Scalability: It is relatively simple and attractive, similar to some urban architectures.

Cascaded Split Architecture Splicing Fibres into Each NAP/ODP

This option may seem unattractive at first because of the potential demand for splice resources, but this solution has the potential to solve many of the design challenges we've discussed.

For starters, it is relatively simple to design, each NAP/ODP has a coverage area along a daisy chain of coverage areas.

Cable counts, and therefore splice requirements, can be minimised by reusing elements of the fibre repeatedly along the route. For example, if Tube 1 is feeding the 1:8 splitters, and Tube 2 is feeding between the 1:8 splitters and the 1:4s, Tube 2 can be reused for each new 1:8. Splicing can be further reduced by only accessing the individual fibre needed in the NAP/ODP by window cutting, which means most NAPs/ODPs only have one or two splices. Window cutting of the feed cable is made easier by smaller fibre counts.

Each NAP/ODP is a splice node. So, even if not all the wholesale fibre mandated is needed on day one, it is accessible in the nearby NAP/ODP. Plus, there are ways to mitigate the costs of fulfilling these obligations, such as deferred splice costs in the relevant tube.

Lastly, side roads can be spliced into any NAP/ODP.

Expansions are generally easy to address within the capacity of the network.

- Cost: Splicing costs occur at each remote access point, but the amount of splicing is small. The safe site setup on the rural roadside dominates the cost rather than the single splice. That site setup cost would be present with any NAP/ODP solution.
- Design: It is repeatable and can be executed simply.
- Scalability: It is relatively simple. Material is interchangeable, any drum of feed cable can be used anywhere, and the closure solution can be simplified to use small volumes of NAP/ODP kit types.

Types of Rural Areas

Despite what many people may think, when it comes to rural networks, one size does not fit all. Understanding which topology you are designing for is critical because they each have different challenges.

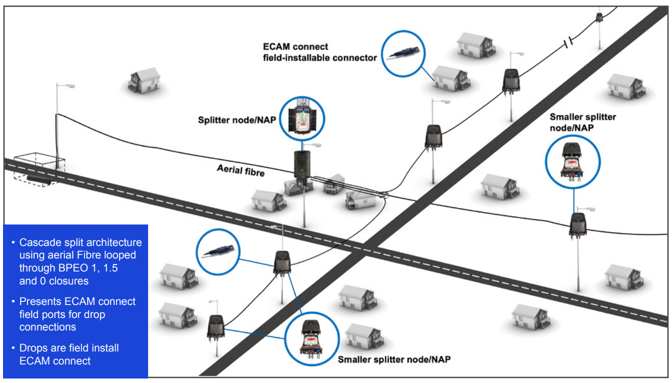
Variances in rural housing patterns tend to derive from historical farming patterns.

Distributed Rural
The first type is distributed rural. This consists of a sparsely distributed housing pattern, with single houses dotting a roadway. Some countries describe this as ribbon development.

Distributed Rural

- This type of rural area is prevalent in the Republic of Ireland, Northern Ireland, parts of the Mediterranean, and parts of the U.S.
- The main challenge of this type is creating daisy-chained NAPs/ODPs along the meshed road network.
- The access points are dispersed, so the opportunity to create synergies with urban deployment is a bonus rather than a priority.
- The drop lengths are very long and there is a high degree of variation in the drop length distribution.

The solution below is a cascaded splitter architecture, in a single cable that contains both the feeder and local distribution. Each local housing area is served by a local NAP/ODP, making drop delivery predictable and manageable. Re-using the local distribution fibre results in cost savings by reducing the cable size which reduces cable cost and weight, minimises cable section splicing, and enables the window cutting approach at each NAP/ODP that is essential for managing splice volumes, spice cost and link budget. The network is built with four types of factory-kitted BPEOs. The underlying assumption is that the poles and ducts are already *in situ* for the copper network.



Distributed Rural FTTH Architecture

There are a few considerations:

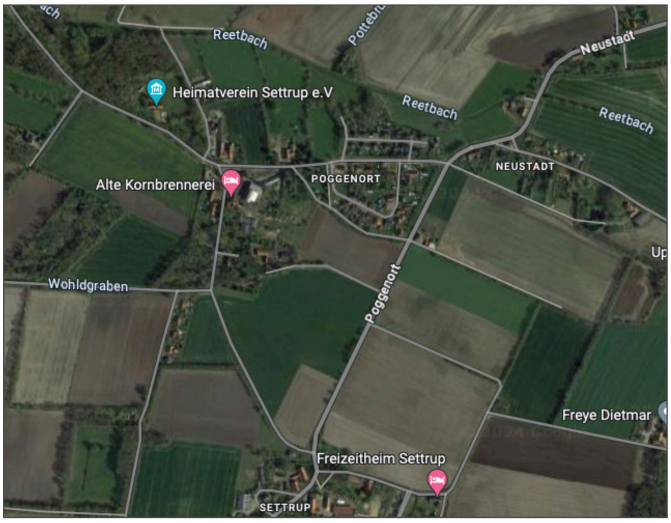
- Because the material is generally interchangeable with other routes, material complexity is minimal. It can be used for whichever route becomes available first.
- Design is relatively simple. Once the coverage cell area

for the secondary 1:4 splitter has been defined, the splice matrix can be automatically generated.

- Within specified tolerances, the build resource can be free to solve certain problems in the field. For example, if they need to cross a road to access an available duct, they can do that with the cable drum. This should be recorded in the as-built but there's no need to involve the designer and the job can continue.
- This population dispersal means that there will be some very long drops, which can skew the average. For field-installed connectivity, like ECAM, choosing bulk drop cable may be a better option. This will allow the installer to manage length dispersal without carrying a lot of long, pre-terminated drop cables.
- The solution needs a splice at each node. The closures permit window cutting, allowing minimal splicing at each node.
- The solution easily adds side roads by splicing some of the spare capacity at the nearest NAP/ODP.
- Expansions are relatively easy.
- Unless the operator is using semi-preconn in the urban portion of the build, it can be difficult to create synergies between the rural and urban builds.

Hamlet-Type Rural

The second type of rural solution is the hamlet. Here, most of the residents live in a small- or medium-sized village. There are also some outlying structures, typically farmhouses or old buildings.

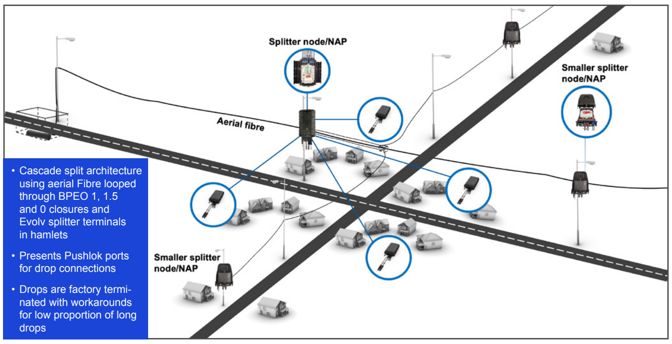


Hamlet Type Rural

- This type of rural area is prevalent in parts of the U.K. and Central and Northern Europe.
- It consists of small- to medium-sized villages with some outlying farmhouses.
- The architecture within the hamlet is generally the same as in urban or suburban areas.
- The ducting and pole infrastructure, if available, is often congested. There will usually be aesthetic constraints for façade installations.
- The main challenges are bringing network capacity to these small hamlets and solving for the small number of farmhouses outside the villages.
- The average length of the drops will be primarily determined by the village drops. There will also be a few very long drops to farmhouses.
- There is an opportunity to create synergies with urban deployments by using the same drops.

In many ways, this is an easier challenge to resolve than the distributed housing type, assuming that poles and ducts are available on an existing, re-useable route.

The solution below is built using BPEOs with Pushlok® technology ports for splitter and splice aggregation. The new, openable Pushlok technology is used where only pass-through is required and for terminals in the village. The terminals' aesthetic and small size are a huge benefit in the village environment. All nodes present the drop port, so the installer experience is identical across the network.



Hamlet Type Rural FTTH Architecture

Along with its own benefits, the hamlet type also includes most of the advantages of the distributed solution as well. These include:

- The opportunity to use drops across both urban and rural builds for synergies.
- The low number of long drops can be managed as exceptions, with the installer either carrying a small volume of 1 km factory-terminated drops or splicing a pigtail onto bulk cable for outlying homes.

Case Study: A Model for Rural FTTH Deployment Applied in Ireland

Ireland presents an interesting and challenging use case in bridging the digital divide between urban and rural areas. With 31.4% of its population residing in rural areas (Eurostat, 2019), Ireland's rural demographic is notably higher than the European average of 27.3%. But even this lower European average far surpasses Ireland's neighbours, including the U.K., where the rural population is only 12.8%. Ireland's rural population is also highly dispersed, which is why its pattern tends to match the distributed type discussed earlier. The dispersed and sparse nature of Ireland's housing can be supported by data, such as the average road length per capita. This combination of factors makes designing rural FTTH networks in Ireland very challenging.

FTTH Builds in Rural Ireland

The high proportion of rural dwellers in Ireland has meant that these rural areas were prioritised much earlier in the FTTH rollouts than many other European countries. Northern Ireland and the Republic of Ireland have already undertaken three major FTTH projects in rural areas. Two of these projects are state-subsidized, recognizing the financial difficulties associated with such builds. The third project is commercially funded and leverages existing urban deployments to extend FTTH deeper into the countryside. This approach is crucial because with rollouts seeing figures as high as about 150 metres of fibre per home passed, the economics of rural FTTH deployments are very tenuous. However, urban/rural network extensions like these can significantly improve their commercial viability.

Because all the deployments were designed for a distributed population pattern, the models had to:

- Solve for sparsely populated areas with a complex network of roadways.
- Provide a dense network of NAPs and ODPs placed typically every 200 to 300 metres along roadways. This density of NAPs is required to allow the drop to be executed in a predictable time frame.
- Reduce the high costs associated with deploying new infrastructure across rural areas by making use of existing poles and duct networks wherever possible. This strategy not only reduced the financial and environmental impact but also sped up the deployment process. Generally, the builds steered clear of power infrastructure, where possible, because of the extra complexity associated with their use.
- Be deployable with a combination of aerial and underground infrastructure. This meant the materials had to withstand the environmental challenges of both to avoid the logistical complications and project scaling impacts of using two sets of materials.

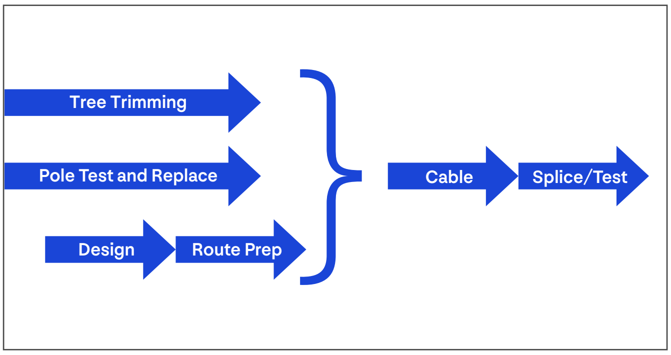
Operationalising the Architecture

Rural network architecture must be designed with a view to how it will be operationalised. And the operationalisation of the architecture must strive for as simple a process as possible to maximise the ability to achieve scale. Because commercial deployment in Ireland moved forward early, many of the approaches subsequently used in other deployments were developed there. Following are the three key learnings to remember.

1. **Standardise components and develop a single, repeatable design for project segments:** The adoption of standard, factory-kitted components, such as pre-kitted Corning BPEOs, was critical to simplifying the deployment process. These preconfigured solutions simplified the design, reduced SKU counts, maximised material interchangeability, and reduced the opportunity for error. Using a single design instead of designing for every issue encountered meant that installers were not carrying an array of alternative solutions that risked errors, multiple SKUs, etc.
2. **Minimise the critical path:** A crucial aspect of the operational strategy was minimising interdependencies between deployment milestones. To achieve this, for example, the build resources were given a certain degree of flexibility to adjust for issues they encountered. This meant the majority of issues did not require design involvement to resolve. The jobs remained fluid, so the build resources were not demobilised pending the designer's availability to develop solutions. Nor was the build resolution dependent on the build team's availability. In the end, the designer could focus on creating the next design rather than stopping to resolve issues at the ongoing build.

   Had an alternative, design-controlled approach been taken, the delays would have caused significant costs for extra designers, build-field visit aborts, etc. They would also have extended the time from commencement to monetisation and required very significant programme management resources to coordinate the many handovers and schedule the work.

   This chart shows a simplified version of the process discussed along with other steps used to minimise the critical path. While some deployments chose not to initiate the pole test and replacement until the design had commenced, so it would be clear exactly which poles were needed, it has been learned that operators know from the start which homes along which roads need to be covered. All the poles along those roads will need to be validated and replaced, if defective. Waiting until design is completed significantly lengthens the critical path while only realizing a minimal savings. The same is true of tree trimming, if required. Getting these jobs done in parallel with the design shortened the overall process.



Minimise the critical path - flow chart

- Initial Preparations (Stage 1)
  - Pole testing and replacement: This step is conducted before the design phase and ensures that poles are suitable for the network. This proactive step allows for quicker progression to construction.
  - Tree trimming: This step is carried out to clear potential cable routes. It needed to be done early in Ireland to avoid delays due to restrictions during bird nesting season.

- Design Phase (Stage 2)
  - Detailed planning: This stage outlines the network's layout, initiates known route remediation, defines the placement of ODPs and cable paths, and determines the splice matrix. It is independent of initial preparations.
- Route Preparation (Stage 3)
  - Making routes ready: This step ensures that the physical infrastructure is prepared for cable installation and is generally independent of the pole and tree preparation stages. This will resolve designer-identified issues, such as damaged chambers, inadequate road crossings, etc.
- Cabling (Stage 4)
  - Laying fibre cables: This step proceeds once routes are prepared, laying down the fibre cables according to the design blueprint. Typically, 15- to 20-metre loops of cable are left at planned NAP/ODP locations.
- Splicing and Testing (Stage 5)
  - Finalizing the network: This step involves splicing and testing the fibre at each NAP/ODP.

3. **Ensure flexibility for variable route availability:** Some routes will be delayed because a council must approve a permit to dig up the road to repair a duct. Others will be delayed while awaiting permission from a private landowner to access and replace a defective pole. All FTTH network builds have these kinds of impacts, but due to the length of rural builds, they tend to occur more frequently. This means that routes do not become available in sequence and the programme must be able to adapt. If route prep on Route 1 is delayed, but is complete on Route 2, the interchangeability of the materials and process would generally facilitate that shift in the work. The build resources could be allocated to cabling Route 2. This would keep the build teams occupied, avoid downtime costs, and maintain a flow of homes passed. Setting up management processes and clear milestones that allow the operator to see available work makes this flexibility possible.

Rural FTTH deployment in Ireland is well on the way to successfully bridging the digital divide by connecting distributed rural communities in an extremely challenging environment. This has been achieved through the integration of innovative architectural and operational strategies. The project has set a benchmark for other regions to follow, proving that even in the most challenging landscapes, the digital divide can be overcome with effective planning and execution. And all these rollouts were based on Corning products and solutions, in particular the BPEO platform.

Impact and Outcomes

Thanks to collaborative efforts, over 600,000 homes in rural Northern Ireland and the Republic of Ireland have been enabled for FTTH, and another 300,000 homes are designed and underway. This approach serves as a model for other regions facing similar challenges and underscores the feasibility of rural FTTH deployment. It is important to note that while the architecture, components, and management processes have proven successful, not all rural deployments will lend themselves to these methods. However, they will assist in most deployments and should be considered accordingly.

Interview with Stephen Carleton, Corning Expert on Rural Deployments

As we strive to gain a deeper understanding of rural network deployments, we recently had the privilege of interviewing Stephen Carleton, Sales Manager for Carrier Networks U.K. & Ireland, an expert in FTTH deployments from Corning Optical Communications. Stephen has a wealth of experience in rural network operations and deployment and was able to provide us with valuable insights into the challenges and strategies involved in building rural networks.

Can you tell us about your experience before joining Corning, particularly about rural networks?
Before joining Corning, I worked in the operator community and, in particular, an operator that was building a rural FTTH deployment in Ireland. I led a team responsible for designing the network architecture, for establishing design rules, for selecting materials, and for developing the management processes. Having initiated the program, I then led the deployment of the network.

What are the most significant challenges that operators face when building rural networks?
The main challenge in rural deployment lies in operationalising and scaling the build. It's important to move from treating each deployment as a unique project to a more standardised, scalable process. We aimed for a repeatable approach, working to transform rural builds into a systematic operation that produces consistent outputs of homes passed while maintaining predictable unit costs. The challenge is to strike a balance between optimal engineering solutions and the practicality of replicable, scalable deployments.

How does the choice of materials impact the deployment process?
Selecting the right materials is crucial. In the face of the numerous challenges associated with rural FTTH deployments, operators need materials with a proven track record. Materials cannot be a risk. Corning's materials have been field-tested in Ireland's rural settings for nearly a decade, offering unmatched reliability and performance and demonstrating the capability to interact successfully with the various environments encountered as well as the various other materials used.

These Corning materials address the immediate needs of the customer – performance, reliability, economics, etc. And because the products are in the network for so long, they are being enhanced all the time with requested additions, such as WDM and rural node capacity expansions. Corning's continuous innovation means operators can confidently build with materials that will adapt and grow with their networks, and will likely adapt and grow in advance, even before the operator knows they needed these adaptions.

Can Corning's experience and materials offer solutions to the challenges of rural deployments?
Absolutely. The benefit of using Corning's solutions in rural networks is the comfort of our products' proven success in the field. Our products are designed to address the complexities of rural deployments head on, with ongoing innovations that keep our solutions at the forefront of the industry.

Alongside the operators, Corning's expertise has also grown. So, Corning is also well placed to assist and guide the operators when they embark on the challenge of a rural FTTH deployment.

(carleton, 2024)

Conclusion

This article emphasises the need for tailored architectures when deploying fibre to the home in rural areas due to their diverse nature. An approach that combines customisation to suit the needs and parameters of each region/larger project with standardized materials and repeatable processes for the segments within each region is strongly recommended for ease of deployment, efficiency, scalability, and quality.

With the world becoming increasingly interconnected, it is crucial to bridge the digital gap in rural Europe. The future of FTTH deployment in rural areas looks promising, thanks to ongoing technological advancements and growing recognition of the importance of connectivity. Telecommunications industry stakeholders are encouraged to explore innovative solutions and collaborations, such as the ones presented in this article, to further bridge the digital divide in these areas.

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Page 3
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Page 10
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