London recently began using underground sewage tunnels to reduce the length of its connections and offer better network diversity.

Europe's Next BIG THING

Sharing the sewer space with broadband cables

BY DR. SISSIS KAMARIANAKIS

The increasing technical and social demands placed on modern communication networks with high-speed options have led to an intensive development of broadband networks in Europe. Due to this growing demand, finding new ways to deliver high bandwidth will be a driving economic factor in the telecommunications sector.

Sharing the Sewer Space

The need to develop and expand broadband networks quickly, flexibly and cost-effectively has increased the pressure to use existing sewer systems for laying the necessary broadband infrastructure. Various product manufacturers offer techniques that allow for placing fiber optic cables through existing sewers to house the connections, which lead directly to individual buildings. For the operators of these assets, future opportunities are available through business-oriented operating models designed for partner projects.

Nevertheless, this simultaneous use of two assets is a new concept and must be further investigated. Discussions in project monitoring committees have shown that dialogue between telecommunications and sewer operators is difficult, as predefined rules and procedures do not currently exist. Accordingly, it has been difficult to plan for these projects, and after years of litigation, any existing installations have been scaled back.

Directive to Reduce Costs

In May 2014, the European Parliament and Council published a directive that outlines measures for reducing the costs associated with deploying a high-speed electronic communications network. As a result, operators of road infrastructure and sewer facilities are obliged to allow for laying broadband cables in their equipment in order to reduce installation costs. However, since drinking water systems were excluded from this directive, telecommunication operators were challenged to find new opportunities for developing broadband infrastructure.

The German Federal Government made it clear that the country needs a modern digital infrastructure for the future—to benefit everyone. This stated aim will be carried out strategically, and one of the key goals will rely heavily on exploiting synergies in new projects designed to reduce costs. Meanwhile,

there is also a corresponding draft law that obliges sewer and road infrastructure operators to pursue broadband expansion through their own infrastructure. Implementation of the draft law is scheduled for January 2016.

Studying Alternative Systems

Against the backdrop of political decisions, a technical and economic analysis of broadband cables using the underground infrastructure, makes sense. In response, IKT, the Institute for Underground Infrastructure, has already launched projects to study alternative laying systems. The studies have shown that a technical assessment of individual systems is quite reasonable and necessary. Operational issues are particularly important and need an intensive discussion, especially since there are many questions that have not yet been addressed. Over time, we are confident that these issues will be solved.

At IKT, the Institute for Underground Infrastructure, experimental studies are underway on the use of broadband cables within the wastewater sewer system.

"...operators of road infrastructure and sewer facilities are obliged to allow for laying broadband cables in their equipment in order to reduce installation costs."

According to a study conducted by the TÜV Rheinland, an international services provider, broadband availability was at just 64 percent for connections greater than 50 megabits until mid-2014. The study also shows that the availability outside of cities drops to just 19 percent for the required 50 megabits. This reflects the particular needs with regard to a future-proof broadband availability. The IKT currently receives an increasing number of inquiries about this problem—specifically the integration of existing and newly planned commercial areas to the broadband network using cables in sewers.

Operational Considerations

Overall, further investigation with regard to operational issues should be carried out in cooperation with wastewater operators and system providers in the next few years. A lifecycle-oriented view of both cable and sewer assets is imperative. Currently, a rather heterogeneous market exists, which offers a range of different systems. In relation to the operational phase, technical tests should be made prior to the installation of cables in the sewers, depending on the local situation. Also, further investigations have to be made regarding the operational phase, addressing such questions as to what happens in the context of a subsequent redevelopment. Another important issue will involve determining how operators will deal with the cable when underground roots are encroaching on the cables and need to be removed.

In addition to the technical studies needed, there are questions in regard to the right of way that also need to be addressed, as many operators are dealing with issues that impact both the asset and the right of way simultaneously. There are also private properties being used by telecommunication and sewer operators, and specific guidelines for this are not available. An intensive investigation concerning private properties and sewer/telecommunication operators is recommended and necessary to solve the right of way problems. The question for operators regarding the Europe Directive is: How could the additional effort concerning the operation of sewer systems including cables be priced so that an offer for a joint use could be made in a timely manner?

Prepared for Future Growth

For the next few years, we anticipate many challenges for Germany, as well as for the entire European Union. However, these challenges will also bring interesting opportunities, especially in the area of new partnerships. As we examine new requirements for testing the latest procedures and methods, the IKT is well positioned to help in this effort. Our expertise is bringing orientation not only Europe-wide, but also to other countries where questions arise about the use of wastewater sewers for placing broadband cables.

In 2016, the IKT and IRWA will introduce a joint professional development initiative, the International Underground Certificate program. The program will offer a forum and venue for international participants to interact, network and learn about the techniques and best practices for resolving underground infrastructure challenges. ✪

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