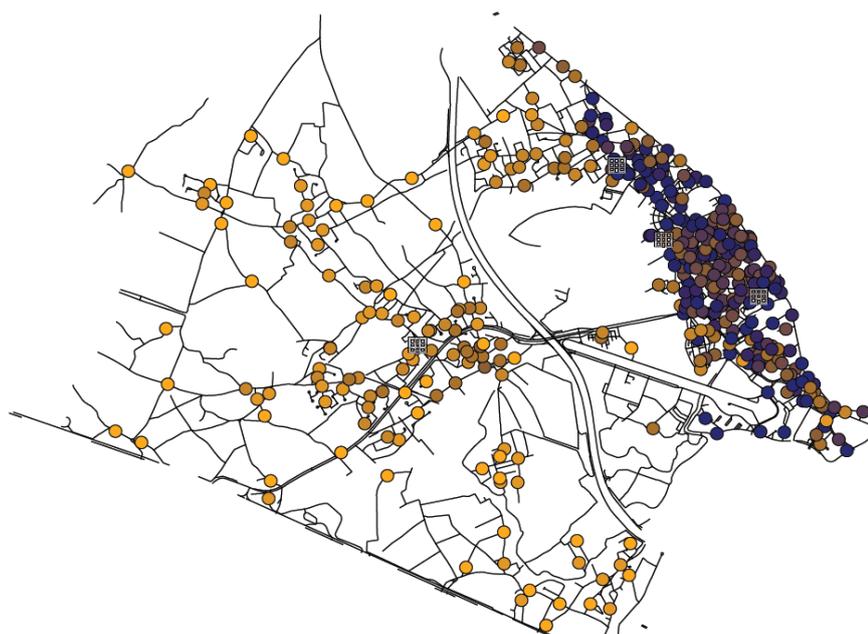


More control over the deployment of superfast broadband in your region

Widespread access to superfast broadband is an important factor to counter social and economic downturn. Therefore, local authorities are enhancing their efforts to stimulate the deployment of superfast broadband within their regions, especially in their rural areas.



Stratix and **Comsof** together provide independent advice to (local) governments on the feasibility of fibre deployment within the context of regulation, technology and financing.

There is no doubt about the social and economic significance of broadband

Local governments are enhancing their efforts to stimulate the deployment of optical fibre networks within their regions, because of the increasing social and economic significance of (super)fast broadband. At the moment fibre deployment is mostly based on investment models used by market parties, according to which the decision to connect an area is made on commercial grounds. As a result, the homes and businesses sited in rural areas often remain deprived from optical fibre, and the – in itself economically feasible – deployment of fibre to smaller townships is often postponed indefinitely. The current practice in fibre roll-out is that in many cases only urban areas are connected to the network, making the business case for peripheral areas even worse. These developments lead to concerns and questions of local authorities.

Concerns about digital divide if remote areas are not connected

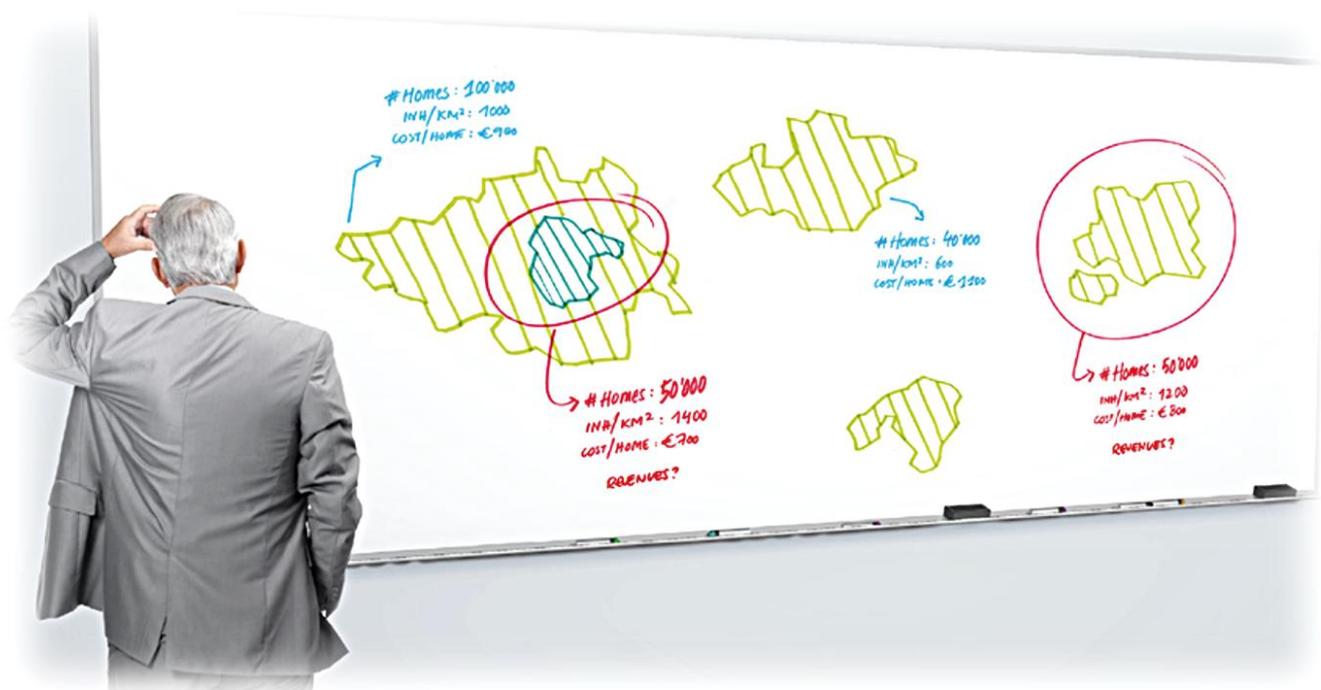
Currently there is much debate on the deployment of optical fibre networks in peripheral areas of the Netherlands. Main reasons are the lack of access to superfast broadband in rural areas and the exclusion of homes sited outside of urban areas with the construction of new (optical) broadband networks by commercial operators.

At its core, the problem arises by the higher investment costs required to connect homes 'too' remote from urban areas. Under the current market conditions, most commercial parties are not (yet) prepared to bear the costs of these higher investments without financial compensation.

At the same time the social and economic significance of superfast broadband connections is increasing:

a pleasant and efficient living and working environment is increasingly dependent on the availability of a fast and stable broadband connection. Worldwide developments by producers of hard- and software and providers of infotainment services (e.g. Apple, Google, Microsoft, Intel, Netflix) are the main drivers behind the growing need for more bandwidth. Moreover, new developments in the fields of education, health care and modern work practices will further accelerate this need.

In order to prevent the digital divide and economic decline, and to enhance the quality of life and accessibility of rural areas, more and more local governments and special interest groups are promoting the deployment of optical fibre networks across their entire region, and not just in urban areas.



Independent advice is essential for local governments

Recently, optical fibre and broadband have often appeared in the news. Various parties hold an interest to make things appear better or worse than they are in reality. Emotions, expectations, hopes and frustrations, as well as commercial or political motives often obscure technical and economic facts.

Many local authorities encourage the roll-out of fast broadband and are therefore in need of independent advice on the legal, technical and financial feasibility of deploying such (optical) networks within their territory, especially in rural areas.

This knowledge not only helps local authorities to be well prepared when negotiating with commercial operators, but also helps them to shape and define their policies in the field of (superfast) broadband.

Stratix and Comsof together provide independent advice to (local) governments on the feasibility of fibre deployment in the light of regulation, technology and financing.

The province of Noord-Brabant has the ambition to provide all of its households, companies and institutes access to the opportunities and possibilities of the digital world. The Broadband Fund offers financial resources to accelerate broadband deployment in rural areas and business parks, and must ensure that everybody in Noord-Brabant can connect to the broadband network. For this purpose 50 million euros have been reserved.

Depending on your need and budget, we provide several options to help you obtain a clear picture of the opportunities to stimulate the deployment of fibre in your region.

1

QuickScan

Current status on broadband coverage in your region and stimulus options

The mapping of European broadband guidelines for state aid, combined with an analysis of the presence of broadband infrastructures in your region, provides you with insights into the stimulus options for the support of broadband deployment in your region.

2

FTTx business case

Costs and revenues per sub area

Both the costs and revenues of an FTTx network will be calculated and visualised for the different sub areas within your region. In this way, you are well prepared for possible discussions with operators on the feasibility of the FTTx business case in your region and on the level of financial compensation that might be necessary to cover the funding gap of broadband deployment in rural areas.

3

Strategic FTTx study

Technical and economical roll-out options en future scenario's

In order to improve the FTTx business case, possibilities are analysed to reduce costs and maximise revenues of the FTTx network, by comparing and evaluating different technical architectures and by seeking an efficient roll-out strategy. Additionally, business models and financial constructions can be provided, which local authorities can apply to fund FTTx deployment in their region.

1 - QuickScan

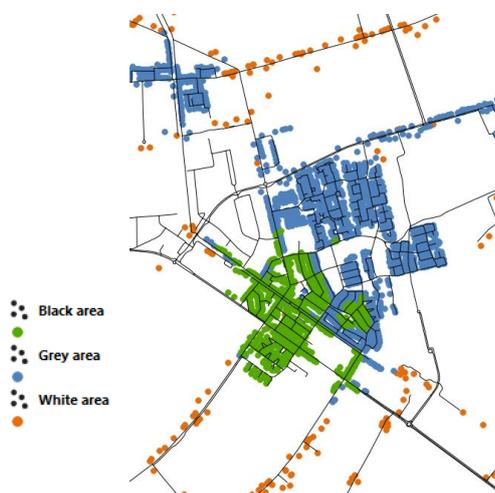
Local authorities can contribute to the stimulation or actual realisation of FTTx network deployment in many different ways, varying from facilitating to (co)financing. The presence of existing broadband networks in a region is an important factor in determining the playing field for local governments.

Which regulations apply to local governments in relation to broadband deployment?

The first question that local authorities should ask themselves when they want to stimulate the deployment of superfast broadband networks in their region is: what is allowed and which rules apply? Stratix will describe in clear wording which European legislation and regulation applies to the specific situation in your region and what (legal) opportunities and roles are available for a local authority. This includes, among others, the options and prerequisites for offering financial aid to commercial operators.

What is the difference between white, grey and black areas for broadband networks?

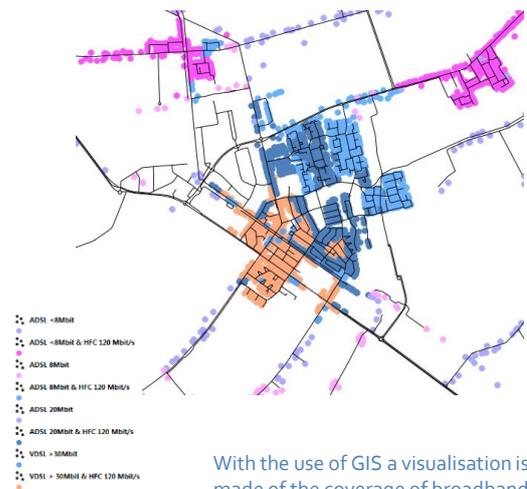
According to European guidelines, the justification of government action in stimulating broadband deployment within a region largely depends on the presence of broadband infrastructure. Geographical areas are marked as so called 'white', 'grey' or 'black' areas, depending on the presence and quality of existing broadband infrastructure. Stratix will describe the criteria for government intervention in these different target areas and will translate these into your specific situation.



Based on the coverage of broadband infrastructures in your region, areas can be classification as white, grey and black.

What is the status on broadband coverage in your area?

A detailed analysis of the availability of broadband infrastructures is essential to assess the possibilities for government intervention. Not surprisingly, commercial providers flatly refuse to disclose their footprint in detail. Yet, with the use of GIS software tools and various information sources, in combination with their in-house expertise and experience, Stratix and Comsof are able to generate a detailed map of available broadband infrastructures in your region. An insightful map enables you to get an idea of the location and distribution of broadband infrastructures in your area at a glance, and indicates 'white', 'grey' and 'black' areas.



With the use of GIS a visualisation is made of the coverage of broadband infrastructures in your region.

What concrete actions can local governments take?

As soon as a local government has clear understanding of the current situation in its region, concrete actions to encourage and/or support the deployment of superfast broadband networks can be evaluated. Possible actions range from drastic measures such as the granting of subsidies or soft loans, to modest measures, like the introduction of lenient permit procedures. We can help you to make well-informed, thoughtful decisions to develop the most effective and suitable approach for your specific situation.

2 - FTTx business case

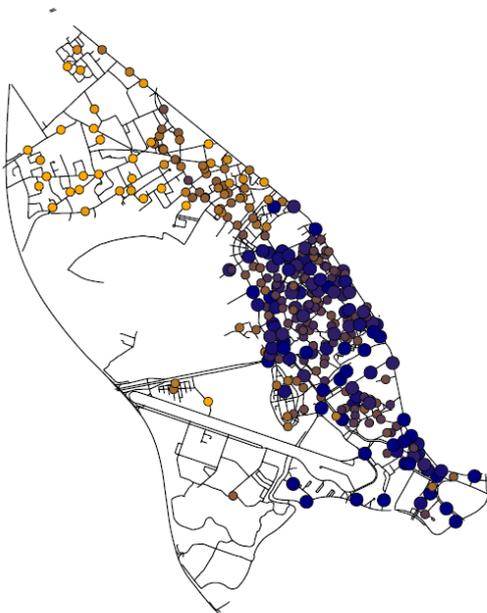
When preparing FTTx deployment it is crucial to make the right decisions with regard to the FTTx target areas. In this decision making process, a geographical analysis providing a classification of the different sub areas ordered by their attractiveness for FTTx roll-out, can be of great value.

How promising is the deployment of an FTTx network in your region?

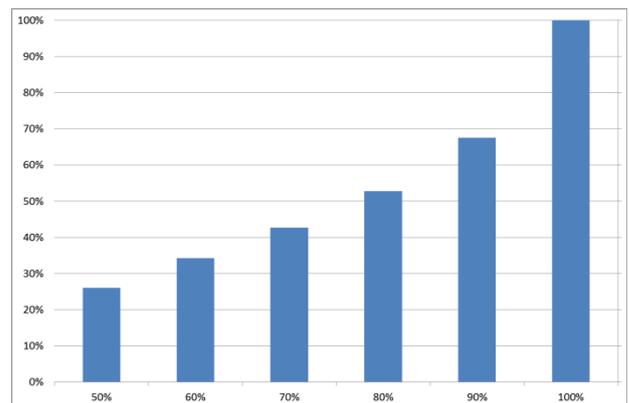
What are the costs of FTTx roll-out?

Depending on your needs and budget Stratix and Comsof can carry out an analysis of the deployment costs of an FTTx network for your region.

For a global cost estimation of FTTx deployment in larger areas (such as provinces) we offer a mathematical model which produces financial estimations based on address density. Such a calculation can be performed in a short time against relatively low costs and offers a sensible estimation of average roll-out costs and cost variations: e.g. per household, per white, grey or black area.



FiberPlanIT allows for a geographical visualisation of detailed cost estimations per sub area, based on reported volumes of material and labour.



A graph shows precisely how the average costs per home connected varies for different levels of network coverage.

Geographical approach

A more thorough analysis of the feasibility of FTTx deployment for different sub areas starts with a reliable cost estimation per sub area. The use of mean values and extrapolation can potentially lead to large error margins, especially for smaller areas. However, traditional detail engineering for a complete area is too much effort for this phase of the project.

Therefore Stratix and Comsof offer the ideal solution: a complete geographical design for your area will be automatically generated using FiberPlanIT, a specialised software tool for optimal planning of FTTx networks. Based on reported volumes of material and labour, a detailed cost estimation per sub area can be calculated and visualised on a geographical map.

This geographical approach results in an estimation which is up to 40% more accurate than traditional cost estimation methods.

Costs versus revenues per sub area

Besides costs, also the number of actual subscribers that will be connected is of crucial importance for the FTTx business case.

Based on the availability of alternative broadband connections and socio-economic profiles in a sub area, the expected percentage of active connections can be estimated. This can have a huge influence on the attractiveness per sub area and the overall business case.

The geographical output gives useful insights into differences in attractiveness of sub areas, for example by showing the required return-on-investment rate per sub area.

Boundaries between sub areas are subtle

The classification of sub areas in order to optimise FTTx network roll-out can be derived from different perspectives.

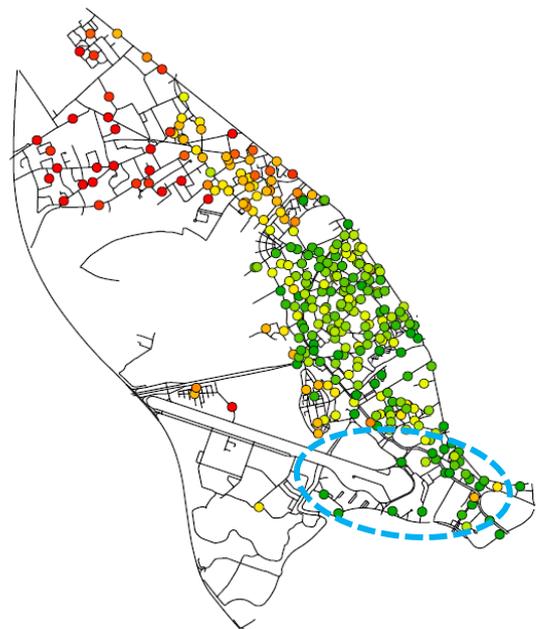
Most commercial operators will use an economic approach, in which costs are minimised and revenues are maximised. Based on the outcome, a roll-out strategy can be determined which includes the decision on network coverage per sub area.

Local authorities generally have a different priority: they are interested in enabling access to superfast broadband to all inhabitants of their region, and aim for an optimum in which roll-out to households in rural areas will also be included. Moreover, they will be interested to know what kind of government support is possible and needed per sub area.

FiberPlanIT offers flexibility in showing the possible variations in the underlying parameters that are used to model an FTTx network in a very accurate and realistic manner. By providing insights into these parameters - within the limitations posed by legislation and local geography - a well-balanced optimum can be aspired between commercial and societal goals.



Cost-classification: shows how the different neighborhoods in the area can be ranked from cheapest to deploy (green) to most expensive (red). Notice most green points in North-East



ROI-classification: shows the difference in estimated break-even period per neighborhood: from quickest return-on-investment (green) to slowest return (red). Notice the most interesting clusters are now in South-East.

3 - Strategic FTTx study

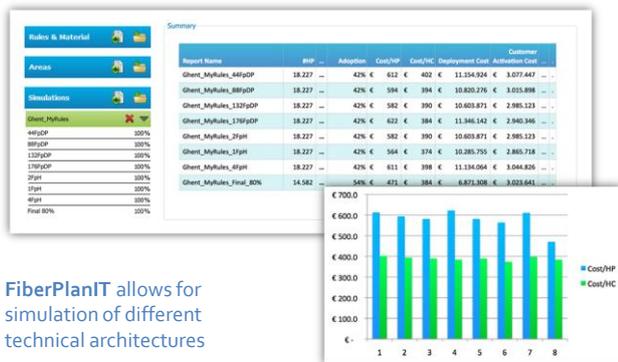
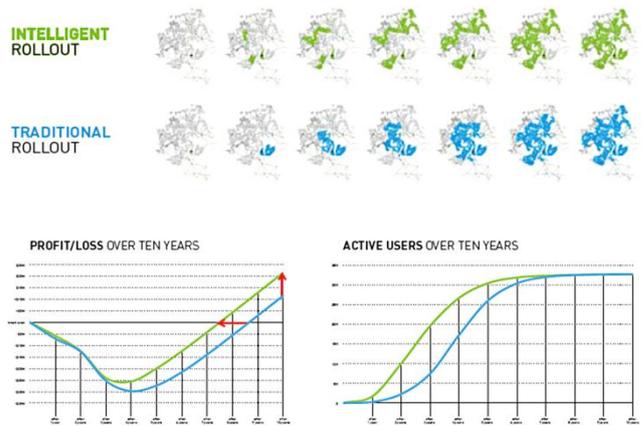
There are many ways to improve the attractiveness of an FTTx business case and, with that, to determine more stringent financial conditions for state aid measures. A strategic study can be used to identify possibilities to lower roll-out costs by comparing different technical architectures or by combining civil works (like trenching) with other infrastructural projects in the region. But it can also be used to seek for an efficient roll-out strategy to optimise network revenues. Additionally, business models and financial constructions can be put forward, which local authorities can use to fund FTTx roll-out in their region.

Minimise FTTx costs?

The technical complexity of FTTx offers several options that can be explored to lower the costs for network roll-out in your region.

Based on many years of (international) experience by Stratix and Comsof, commonly used architectures can be simply and accurately compared, in order to determine the most economically attractive FTTx network solution for the specific situation in your area.

Hybrid solutions, combining fixed and wireless access techniques, can also be taken into account.



FiberPlanIT allows for simulation of different technical architectures

With intelligent roll-out phasing, the GIS and geo-marketing data are combined to accurately predict the revenues and costs for each sub area.

Financing options and business models for government support

As soon as there is more clarity on the financial feasibility of the FTTx business case in your region, you can reflect on the options that you have as a government to financially support the roll-out of an FTTx network in your region.

Several business models and financial constructions are possible, e.g. creation of broadband funds, set-up of joint ventures or European tendering procedures.

Our involvement in various projects regarding the development of broadband strategies for (local) governments, has provided us with a clear view and understanding of a government's potential financing options and business models to support the deployment of FTTx.

Maximise FTTx revenues?

The results of the geo-analysis from Option 2 (FTTx business case) can be used to plan the FTTx deployment in such a way that more connections will be activated at an early stage of the roll-out.

By applying intelligent roll-out phasing, more revenues can be generated at an early stage leading to a better 'return-on-investment' and maximising the business case.

Stratix

Stratix Consulting is an independent research and consulting company specialised in the regulatory, technological, financial, and organisational aspects of information and communication technology, and in particular data- and telecommunication. We assist companies and public institutions in their strategic decisions on broadband and IT. In the process of investing, subsidising, stimulating or tendering, Stratix can provide both technical knowledge on the required solution as well as assistance and guidance in preparing and implementing procurement strategies. The Stratix team consists of experienced consultants with a passion for electronic communication.



COMSOF

Comsof is a spin-off company from Ghent University with 15 years of experience in telecom network planning and cost modelling. Based in Ghent, Belgium, we have a global client base. Our unique combination of technical and economic expertise is proven to be very valuable in many projects with telecom operators, public authorities and investors around the world. Complemented with the availability of our own state-of-the-art software tools for optimised planning and costing of telecom access networks, we offer a unique solution for supporting NGA regulatory decision making.



Inquiries

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