

Max-Planck-Str. 4, D-40237 Düsseldorf  
Parkring 10/1/10, A-1010 Wien  
[www.sbr-net.com](http://www.sbr-net.com)

# **Funding and state aid for NGA**

## **From the telecom to the infrastructure perspective**

**SBR White Paper 13**

Dr. Ernst-Olav Ruhle  
Mag. Jörg Kittl

May 2015

## CONTENTS

<b>Abstract .....</b>	<b>3</b>
<b>1 Introduction.....</b>	<b>4</b>
<b>2 Reasons for NGA.....</b>	<b>5</b>
<b>3 The role of the public sector .....</b>	<b>8</b>
<b>4 Options for municipalities.....</b>	<b>11</b>
<b>5 The legal and consulting perspective .....</b>	<b>14</b>

## **Abstract**

In many countries it has been noticed that the deployment of next generation access networks is crucial for the social and economic development and welfare of a country. Especially Europe, however, is lagging behind in such deployments of ultra-high-speed networks.

One of the main aspects is a perspective which has been taken on this matter is that the lack of rollout is a telecommunications' problem. This implies that in most countries it is seen as the role and the responsibility of network operators to deploy these new infrastructures. However, the incentives for doing so are quite small.

Therefore, a new perspective is required which brings into play alternative providers of infrastructure, industries like developers, building and housing, transport, utilities as well as e.g. municipalities respectively the public sector. With respect to the latter, in several cases, but not only, state aid and public funding come into play.

Also the question of regional development through broadband availability is a very valid one and provides a new point of view on how to realize NGA-networks. The paper will look at the way forward and how to analyse and how to set the right incentives and use the right instruments in order to achieve more broadband deployment in European countries and the way from the vertically integrated business model to horizontally separated layers and changed roles of network operators, service providers and municipalities (as representatives of the public sector) in these business models.

## 1 Introduction

It is a well-known fact, that the availability of broadband networks is a key economic factor which is highly important for the population, for the economy and for the society as well as for public administration. The contribution of broadband networks to economic growth has been widely debated and seen as a key facilitator for further economic and social development. Still, while some countries have undertaken strong efforts to deploy broadband networks, NGA and even nationwide fibre networks, the European countries are still in a very early stage of bringing their networks up to speed. To a large extent, the use of historic technology which is being upgraded and where copper is being enhanced, is still prevailing as of today.

A key question that is often asked is, why despite liberalization and privatization of this sector, current market players are not deploying networks providing higher bandwidths? From an economic perspective, it appears that the incentives are missing and there seems to be a strong tendency towards relying on the public sector in order to make sure that these networks are being built. On the other hand, the public sector questions why it should be responsible for ensuring that these networks are being deployed.

The key explanatory factor is the change of perspective, e.g. to turn the view away from lacking broadband networks being a “telecom problem” to being an “infrastructure challenge”. This implies that the availability of broadband networks and the respective infrastructures are not an issue for the telecom industry alone.

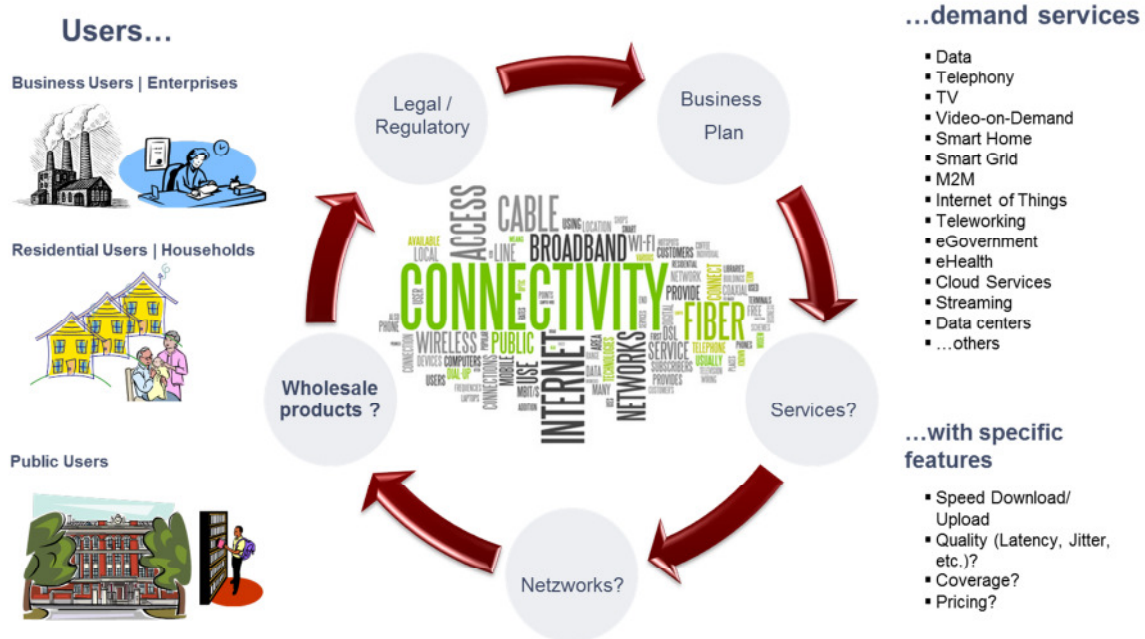
This brings about the necessity to involve the public sector and especially municipalities and regions to a stronger extent and of course also to find solutions how to deal with state aid in order to foster and incentivise the deployment of such networks.

The paper is organized as follows.

After this introduction, we explain the main reasons for the requirement for next generation access networks (chapter 2), followed by the reasons for involving the public sector in these activities (chapter 3). Thereafter, we move into the explanation of options that exist for municipalities (chapter 4) and finally the consulting perspective for cooperation between municipalities, network operators, public sector, etc. (chapter 5).

## 2 Reasons for NGA

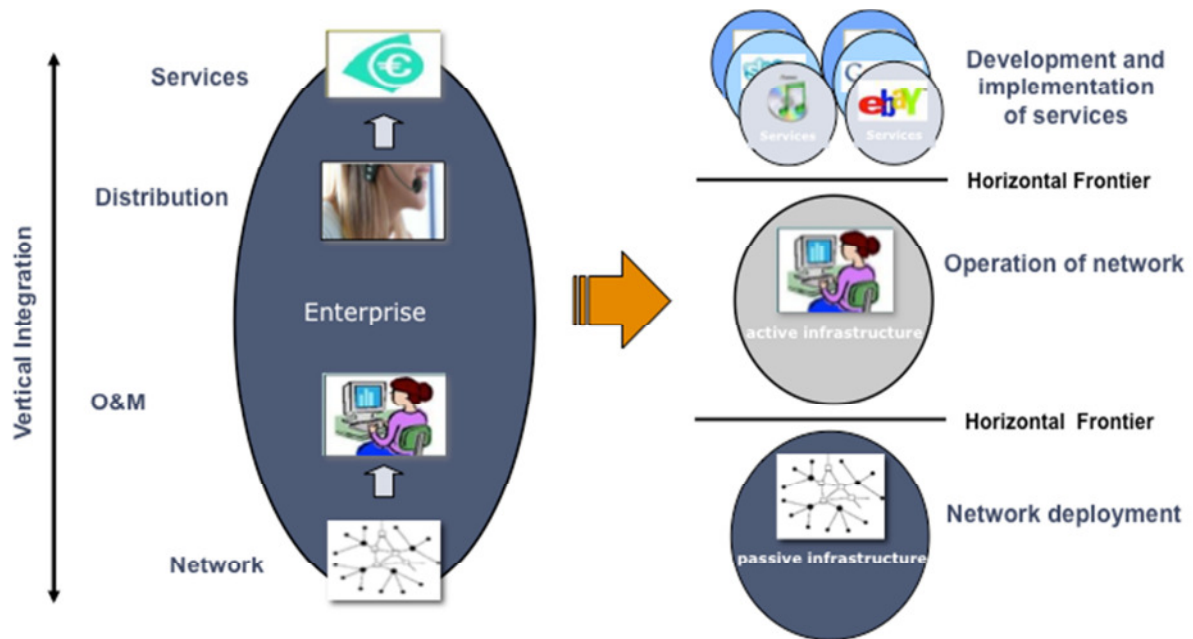
It has generally been realized that modern communication services are relying on modern and capable communications networks. We have in principle three types of users (business users and enterprises, residential users and households, public users) which all demand a certain set of services (e.g. data, telephony, TV, video on demand, cloud services, data centres, etc.) which all require specific features (speed, quality, coverage, price).



**Figure 1: Provision of communications services**

In order to bring users these services, networks need to be deployed and those who deploy these networks need to think about the costs of deploying the network, the business plan, the legal and regulatory implications, the services and the wholesale products that are being offered.

The challenge behind the provision of services and networks is that in the past, the telecommunication industry was vertically integrated. The companies that deployed the network also operated it and provided the services. The high costs of network deployment were regained by providing services to end users. Due to the digitalization, this vertically integration cannot be upheld any longer and the horizontal separation brings about a new set of business models and different players in the value chain. Passive infrastructure, active operation of the network and services can be provided by different players and therefore, each layer now needs to be economically responsible for itself and needs to be commercially sustainable.



**Figure 2: Vertical integration vs. horizontal separation**

The main reasons to conduct the rollout of broadband networks are obviously to be found in the following:

- **Employment:** Due to digitalization of the economy, more and more employment is dependent on the use and the availability of broadband infrastructure due to the increasingly important exchange of data for production processes which are transferred into the internet.
- **Economic growth:** In all areas economic growth is fostered by the availability of modern communications infrastructures that also allow the value chain in other industries to be separated and conducted at different locations.
- **Input factor:** Broadband is an input factor to other sectors of the economy. Efficiency gains in the sectors of education, health, transport and security can be achieved through the availability of broadband.
- **Future proof:** It is important to deploy communications networks that are future proof in the sense that they will be available for a long time. Copper networks and their digital enhancement (VDSL, Vectoring, Phantoming, etc.) create certain difficulties as they are always at the edge of their technical capability and they are not future proof in the sense that they will be able to handle unlimited bandwidths in the future.

- Location factor: Broadband is a key factor for international companies to choose their location and to select certain cities or regions for their production facilities and administrative locations. Therefore, to be able to keep up with other countries and other locations, broadband is necessary.
- Resource efficiency: Broadband can contribute to better efficiency in other sectors and can help reduce energy, water, transport and thus contribute to the improvement regarding the use of natural resources.

### 3 The role of the public sector

In order to provide communication services of high quality it is necessary to have the underlying enabling technology which is an infrastructure. Due to the fact that the vertically integrated business model is not easily defensible anymore or has been split-up through digitalization, we need to re-think the value chain and the business model and turn from the telecom to an infrastructure perspective.

In order to do so, let us compare it with several other developments over the last hundred years. Firstly, if we think about the transport industry, about 120 years ago, the main mode of transport was to ride on horses. Then, a new technology, the car, was invented and the enabling infrastructure that allowed to drive cars to a significant extent and to make use of the services that cars can provide were roads. These roads were built by public involvement and public financing. Now, one can ask the question, whether the old business model, riding on horses, could have survived? Surely, it is still possible to use horses as means of transport as of today and you still see it often for example in Vienna where the Fiaker are still travelling with tourists on the road.

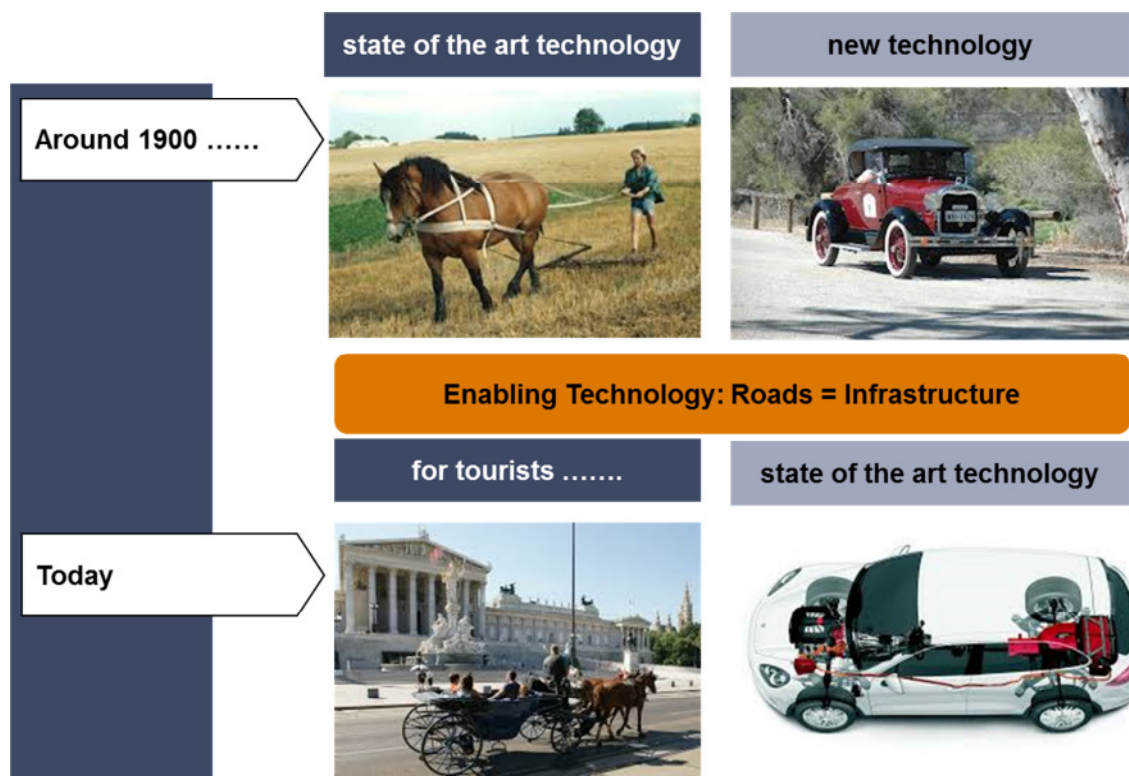


Figure 3: Infrastructure and transport yesterday and today



Still, the state of the art technology as of today is a modern car like the one shown in the picture above.

Thinking of the energy sector, about 100 years ago, the state of the art technology was to use candles to have light and to use an oven filled with wood for heating and for cooking. Then electricity was invented as a new technology.

The enabling infrastructure and basis in order to bring the benefits of the services to the users were the electricity networks which are the key infrastructures still as of today and which allow us to watch TV, switch on the computer, do the ironing, etc. As of today, the old technology is still available, if you think of candle light dinners or chimney fires but the state of the art technology is a modern electricity network that provides the necessary infrastructure to use a lot of services that depend on electrical power.

If we transfer this development to the telecommunication sector and we ask for the need for fibre networks, then the answer is relatively easy. Since the early 20<sup>th</sup> century we have been building infrastructures that used copper in order to have telephony services. Copper is a very good means for low bandwidth / low data services and therefore was very useful at that time. However, as of today, we need higher bandwidths and “broader” networks enabling higher bandwidths. The solution to enhance the copper technology has first been ADSL and later VDSL technology, vectoring and other possibilities to squeeze the capabilities of copper to steadily higher bandwidths.

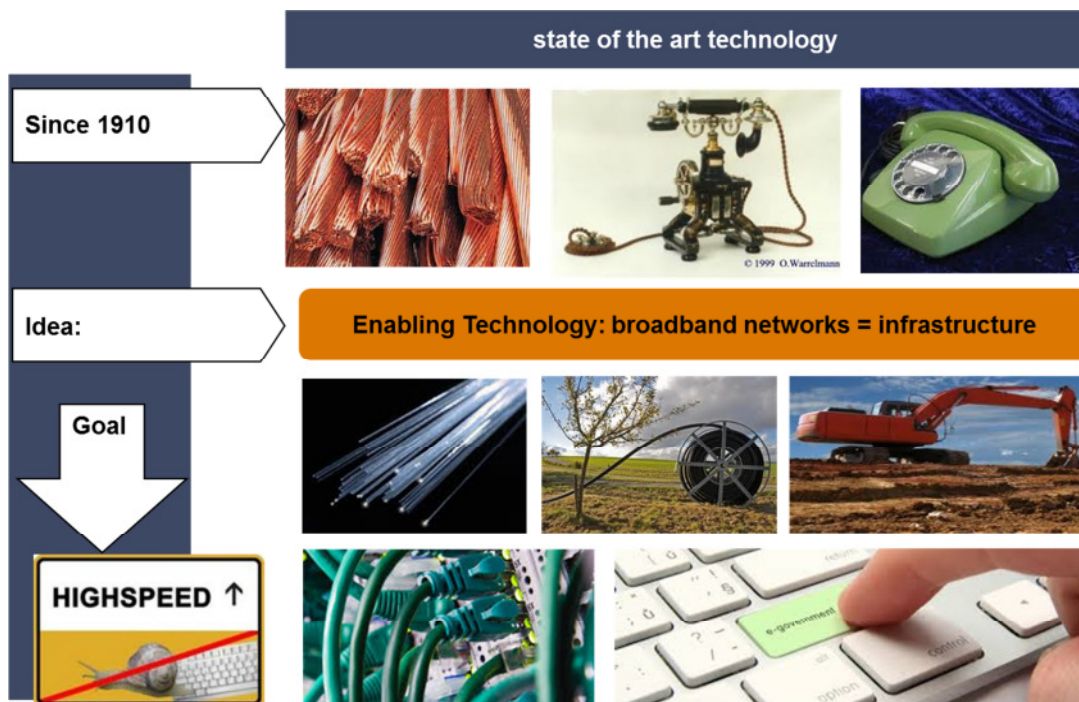
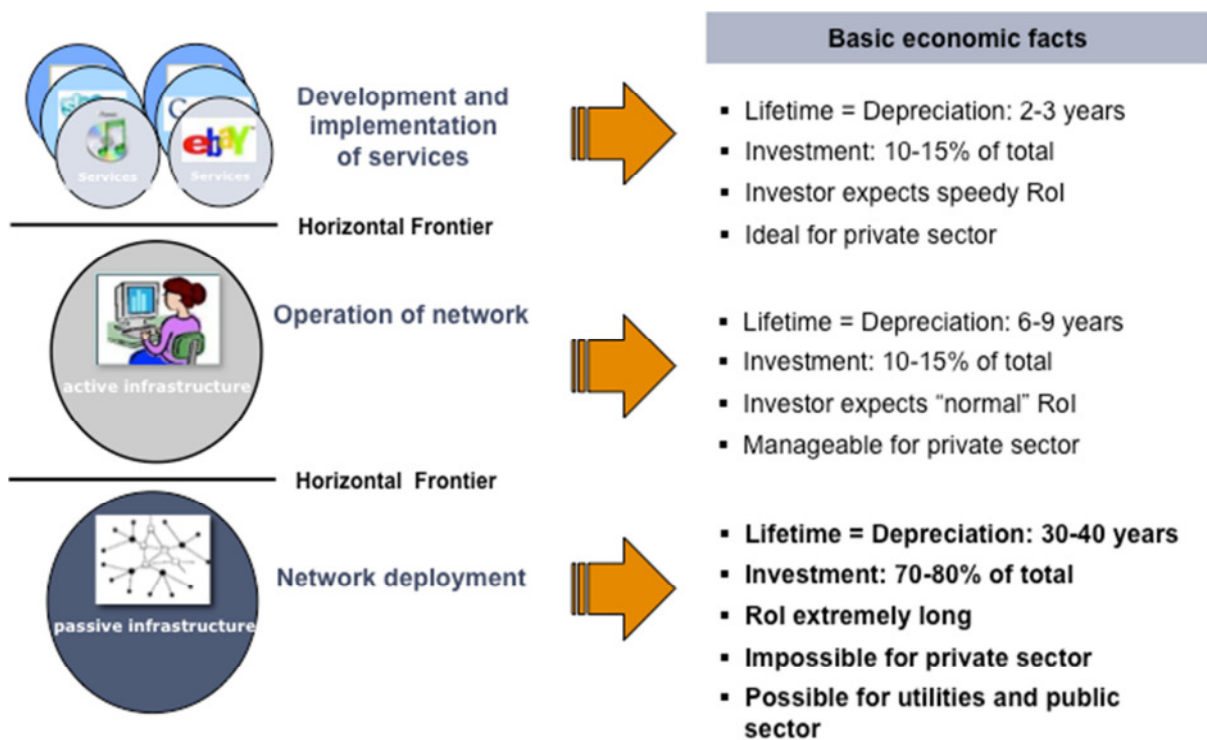


Figure 4: Broadband infrastructure

However, this is not enough in the medium in long term and we need the enabling technology of fibre based broadband networks in order to achieve our goals.

## 4 Options for municipalities

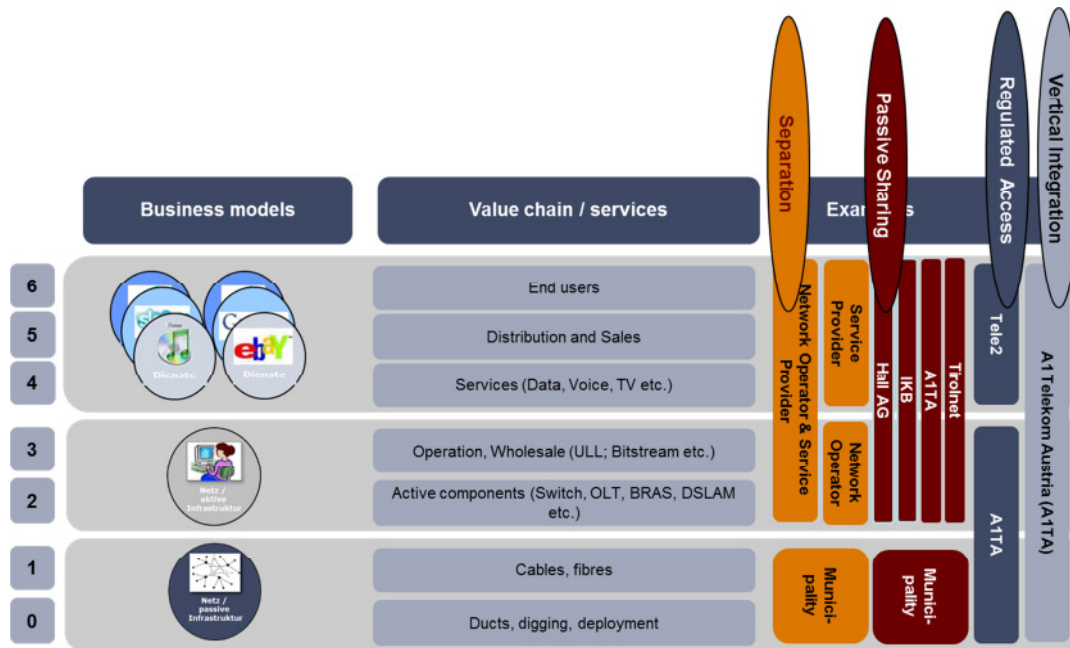
The public sector can get involved in the telecom sector in different ways. The main reason for e.g. municipalities or regions to initiate activity on the infrastructure level can be found in the underlying economics of investment in the horizontally disaggregated market.



**Figure 5: RoI expectations for investors on the different levels of the value chain**

The investments in infrastructure are long term, generate a modest RoI and are suited for investors with a long term perspective. While the network operation and service provision can be managed by the private sector, the passive infrastructure requires an investor with a different perspective. This is the public sector where the same logic applies as for e.g. roads, railways, etc.

The combinations of market players on the different levels of the value chain are manifold. The next figure shows the possible combinations and delineations between private and public sector in the state of Tyrol where different models for realizing the NGA have been developed. The involvement of the public sector is thereby mainly focused on the layer of the passive infrastructure.



**Figure 6: Business models and examples for NGA in Tyrol**

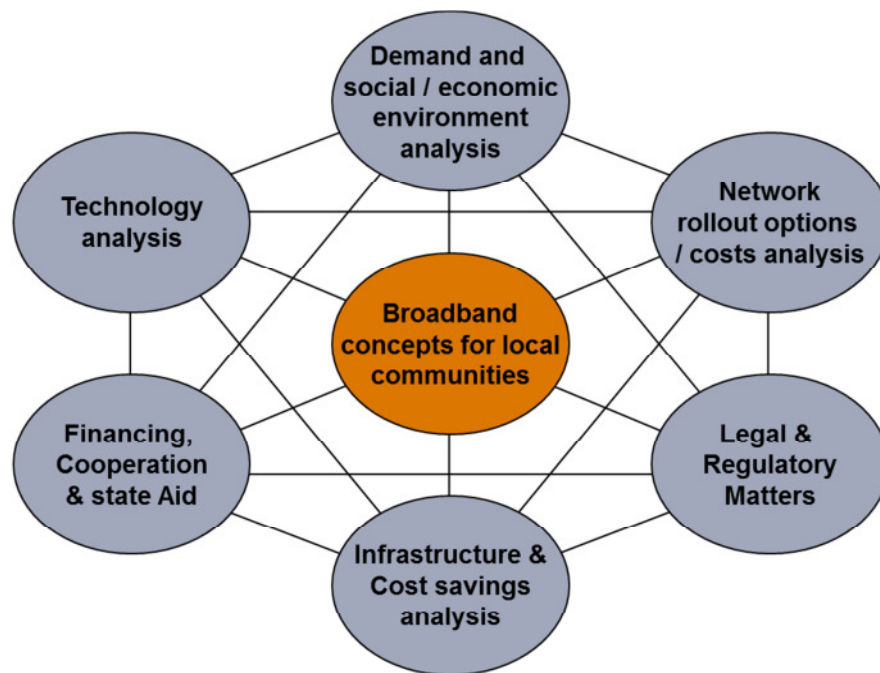
The regional government selected to focus on the two models of passive sharing and separation in its policy to support network deployment. As the passive networks are being built by the support of state aid/support programs, an obligation exists for open access in order to enable other network operators or service providers to enter the market and to participate in downstream competition in the retail market.

Municipalities need to carefully consider how they position themselves on the market. Shall they provide the passive network and hand it over, do they also want to provide operation and maintenance of this network, should they even enter into the sphere of active network operation or service provision to end users? A SWOT analysis and a clear understanding of the dynamics and the requirement of the telecom market will help to find the right position.

A key aspect is to involve the local population and the business in order to create a strong demand push which also takes responsibility to carry the project and the idea forward. Further, there is a need for a holistic approach covering all aspects of such a broadband project, e.g.

- Demand and infrastructure analysis
- Technology options
- Rollout plan and cost analysis
- Business plan

- Network planning
- Financing and state aid issues



**Goal: Holistic, future proof, coordinated, efficient rollout concept**

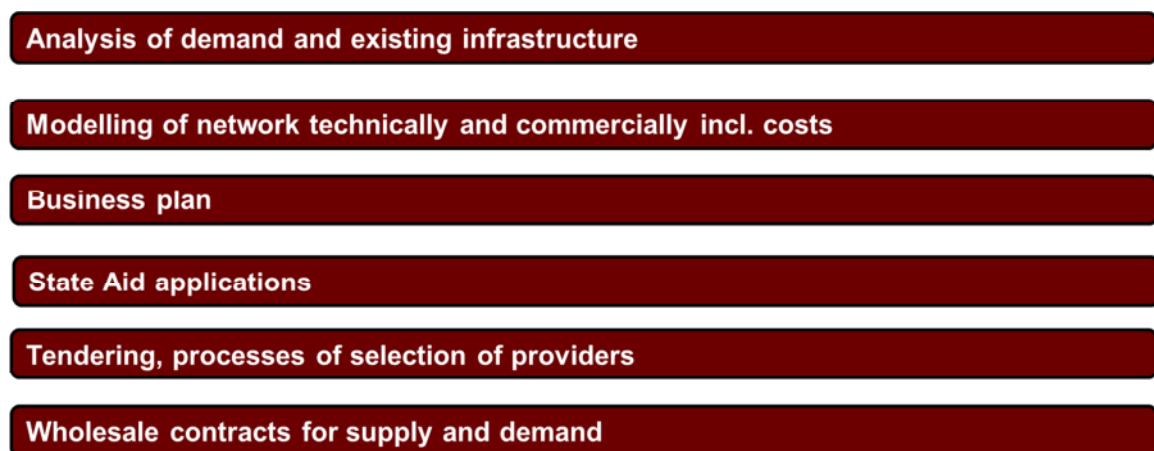
**Figure 7: Elements of a municipal broadband concept**

## 5 The legal and consulting perspective

To deploy broadband networks under regional/municipal leadership is a complex task. It requires a lot of project management for which the public sector may not be fully prepared. Public sector initiatives usually struggle with

- Lack of business orientation
- Complexity of technical, commercial and legal/regulatory issue
- Tendering
- Customer orientation
- Contracts
- Issues of liability and risks associated with regular commercial activity
- Market dynamics

Considering the importance of municipalities, regions and the public sector in general as player on the market for telecommunication infrastructure, a large set of tasks to be conducted arise for professions like lawyers and consultants to main issues:



**Figure 8: Support activities for public sector broadband initiatives**

In these areas the following activities may become very important:

- Demand and infrastructure analysis: NGA projects require a sound basis, i.e. data about existing and re-usable infrastructure, existing networks, current usage and willingness of customers to technical upgrades and their willingness to pay (more).
- Modelling of networks is key to get to a project plan for implementation and to calculate costs and estimates for realization.

- Business planning requires to look at the layer of the value chain and to make a long time calculation of investment, costs and potential revenue. The business plan naturally is dependent on the business model selected.
- Tenders
  - for municipalities requesting network operators to provide a service
  - by municipalities to look for construction companies to deploy the networks
  - related to state aid and public financial support
- Wholesale contracts, i.e. development of contracts for the provision of infrastructure to operators or for services such as unbundling, bitstream access, dark fibre, duct access, etc. The development of open access standard contracts is key in this respect.
- Legal support / Regulation
  - Telecommunications regulatory matters for municipalities, e.g. concerning general authorization, market analysis or rights-of-way
  - Competition law issues
  - Data security/IT security
- Project management

This is just a small overview on what needs to be done. Thus, NGA is key to economic development. The public sector is the key driver on the lowest layer of the value chain. Municipal broadband concepts ensure a complete and holistic approach. Numerous activities thereby require professional support on legal and regulatory matters as well as on project management.

\*\*\*\*\*

## Contact

### **SBR-net Consulting AG**

Parkring 10/1/10

1010 Vienna

T: +43 1 513 514 0

F: +43 1 513 514 095

E: [ruhle@sbr-net.com](mailto:ruhle@sbr-net.com)

URL: <http://www.sbr-net.com>