

Report for the European Commission
Guide to broadband investment

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1 Executive summary

1.1 Introduction and aims of the guide

This document sets out best practice examples in planning an investment of public funds in broadband projects. The guidance provided is targeted at all Managing Authorities¹ in the European Union (EU). The guide has been prepared by Analysys Mason on behalf of the European Commission (EC), and details the issues associated with investment planning and procurement that must be considered by any Managing Authority that is aiming to implement an EU-funded broadband project.

The EC has recognised that Member States will need to make significant investments in broadband infrastructure to meet the objectives set out in the Digital Agenda for Europe (DAE): by 2020, all Europeans should have access to the Internet at speeds above 30Mbit/s and 50% or more of European households should have subscriptions above 100Mbit/s.

The EC considers this guide a particularly important resource for Member States which have the facility to use funds from the current (2007-2013) and the future programming period (2014–2020) to assist in the deployment of new broadband and high speed broadband infrastructure. Those Member States are urged to use this guide to develop an action plan that will ensure the DAE targets for 2020 are met.

The EU's aims of regional policy are to achieve social, economic and territorial cohesion². Territorial balance and improved quality of life in rural areas are other objectives underlying the EU rural development policy³. Access to an affordable, good-quality and open ICT infrastructure for all citizens will contribute to cohesion and rural development policy aims and to increase innovation and productivity of regional and rural actors. As a result, it is of primary importance for Managing Authorities to be aware that access to affordable broadband has a positive effect in terms of meeting the most basic needs of the households, communities, public administrations and businesses in a territory.

By ensuring that ICT services are available to as many people as possible, Member States will contribute to cohesion, to innovation, and to social, economic and political change. Most of the benefits of new ICT services will be derived from outside the ICT sector. Since large amounts of

¹ For the purpose of this document and for simplification reasons, Managing Authority should be understood as public authorities (national, regional, local) responsible for supporting the deployment of high speed networks in the context of the EU Structural (ERDF) and Rural Development funds (EAFRD). In the context of this guide, it also refers to agencies (e.g., intermediate bodies such as regional/rural development agencies) delegated to provide public support to these networks and even Paying agencies under the Common Agriculture Policy..

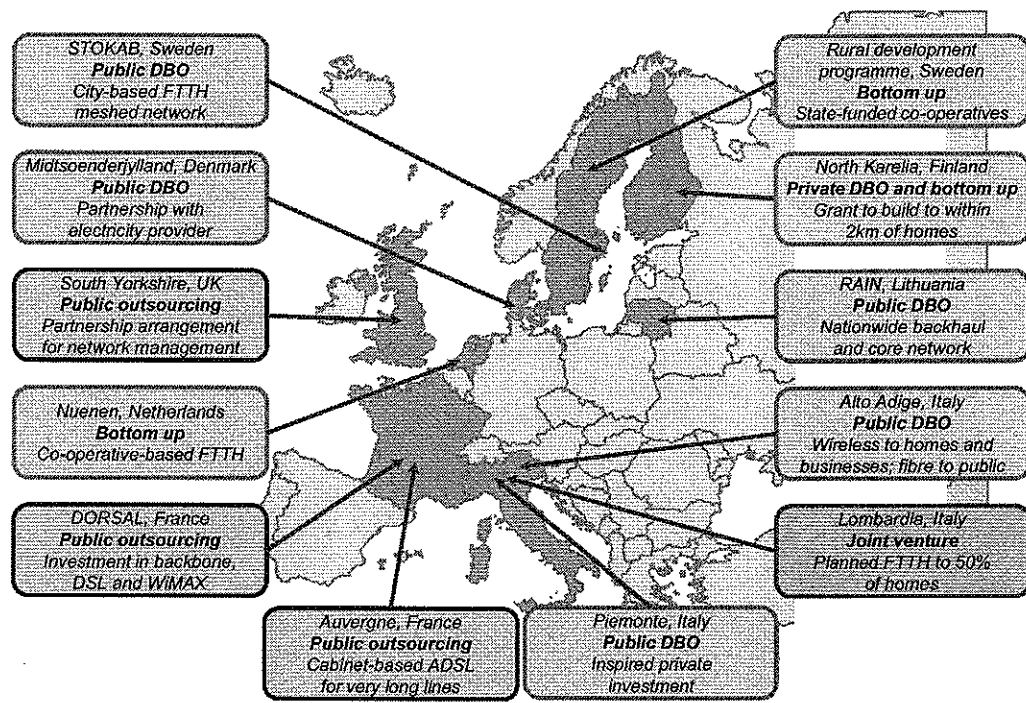
² Managing Authorities should consult the EC cohesion guidelines, available at: http://ec.europa.eu/regional_policy/sources/docoffic/2007/osc/l_29120061021en00110032.pdf

³ Managing Authorities should consult the EC rural development guidelines, available at: http://ec.europa.eu/agriculture/rurdev/leg/index_en.htm

public funds are involved, it is important for Managing Authorities to keep the goals of delivering socio-economic benefit to entire territories in mind, and prioritise the long-term benefit of all socio-economic actors of regions and rural areas over short-term gain of any specific socio-economic actor.

1.2 Basis and content of the guide

The main basis for the recommendations presented in this guide is a series of interviews with stakeholders from example projects which have already been successfully implemented. These example projects are summarised in Figure 1.1.



Note: DBO = design, build and operate; FTTH = fibre to the home

Figure 1.1: Summary of example projects [Source: Analysys Mason]

Due to the complexity and unique circumstances of each broadband investment, this guide is not intended to provide a rigid, prescriptive framework within which investment decisions should be made. Instead, it gathers together insights from the example projects to help Managing Authorities understand each of the key issues they must consider as they move through the investment preparation and planning process, and to help them make informed decisions.

In addition to the interviews with stakeholders from the example projects, our research has also included insights from the following sources:

- feedback from the eris@ annual conference regarding a range of possible financial models for broadband investment
- *Models for efficient and effective public-sector interventions in next-generation broadband access networks*, Analysys Mason report for the Broadband Stakeholder Group, 9 June 2008⁴
- a blogosphere consultation co-ordinated by eris@
- feedback from the first Digital Agenda Assembly held in Brussels on 16 and 17 June 2011.

The guide is structured as a series of questions that a Managing Authority must ask itself when planning a broadband infrastructure investment. The structure of the guide is shown in Figure 1.2.

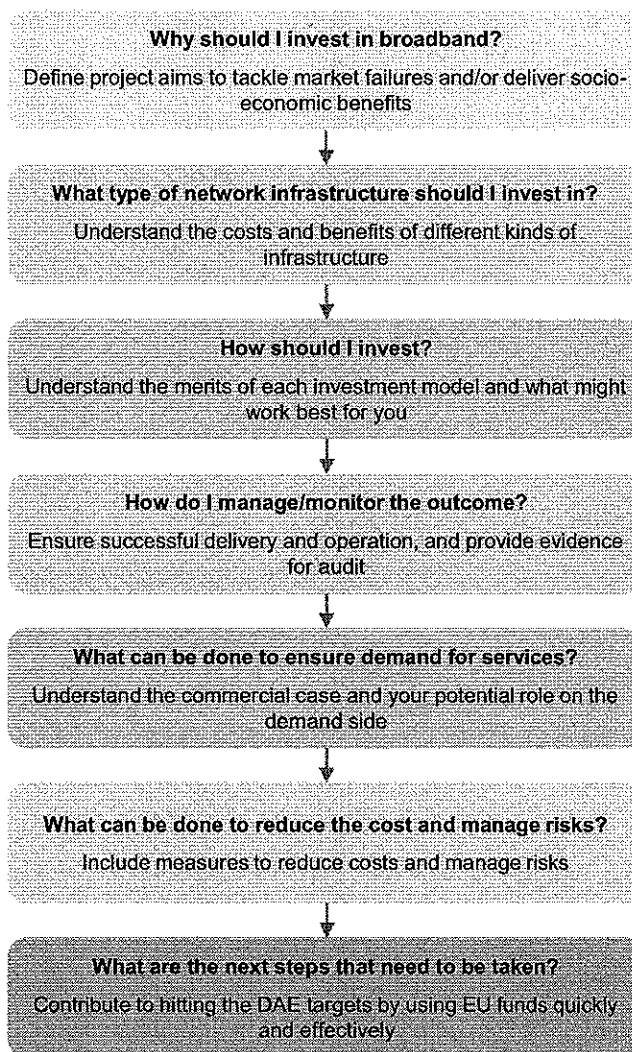


Figure 1.2: The seven stages of planning a broadband investment
[Source: Analysys Mason]

This guide is complementary to existing guidance material which is publicly available, including:

⁴ Available at http://www.broadbanduk.org/component/option,com_docman/task,doc_view/gid,1008/Itemid,63/

- Guide to Regional Broadband Deployment (1st edition)⁵
- Check List of Actions for Public Authorities Considering Broadband Interventions in Under-served Territories⁶
- FTTH Business Guide (2nd edition)⁷.

Additional guidance for the implementation of each investment model will be made available on the European Broadband Portal⁸.

The guide should be read in conjunction with the following important European Policy areas:

- The implementation of the EU's cohesion policy, as outlined in the *Strategic report 2010 on the implementation of the programmes 2007–2013*⁹
- The implementation of the EU's rural development policy, as outlined in the report on the implementation of the national strategy plans and the Community strategic guidelines for rural development (2007-2013)¹⁰;
- The EC Communication on *Regional Policy contributing to smart growth in Europe 2020*¹¹ and the accompanying Staff Working Document¹²
- The EC Communication on *Digital Agenda for Europe*¹³
- The EC Communication on *European Broadband: investing in digitally driven growth*¹⁴
- Policy actions aimed at the achievement of EU targets for broadband networks¹⁵.

1.3 Guidance on different investment models

A key aspect of the investment preparation and planning phase is the choice of investment model.

⁵ Available at <http://www.broadband-europe.eu/Lists/Competences/Guide%20to%20regional%20broadband%20development%20-%201st%20edition.pdf>

⁶ Available at <http://www.broadband-europe.eu/Pages/checklist.aspx>

⁷ Available at <http://www.ftthcouncil.eu/documents/Reports/FTTH-Business-Guide-2011-2ndE.pdf>

⁸ See <http://www.broadband-europe.eu/Pages/Home.aspx>

⁹ Available at http://ec.europa.eu/regional_policy/policy/reporting/cs_reports_en.htm

¹⁰ Available at: http://ec.europa.eu/agriculture/rurdev/publi/index_en.htm

¹¹ Available at http://ec.europa.eu/regional_policy/sources/docoffic/official/communic/smart_growth/comm2010_553_en.pdf

¹² Available at http://ec.europa.eu/regional_policy/sources/docoffic/official/communic/smart_growth/annex_comm2010_553.pdf

¹³ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF>

¹⁴ Available at http://ec.europa.eu/information_society/activities/broadband/docs/bb_communication.pdf

¹⁵ Available at http://ec.europa.eu/information_society/newsroom/cf/pillar.cfm?pillar_id=46&pillar=Very%20Fast%20Internet

The investment models presented in this guide have been selected on the basis of public data on broadband projects from around Europe, and input from DG REGIO and eris@. The models represent a range of options for combining public and private investment, and are presented in increasing order of involvement by the Managing Authority. Each model is applicable in different circumstances, depending on the scope of the required infrastructure, the specific aims of the Managing Authority, and the investment/risk appetite of potential private sector partners. The five investment models are shown in Figure 1.3 and summarised below.

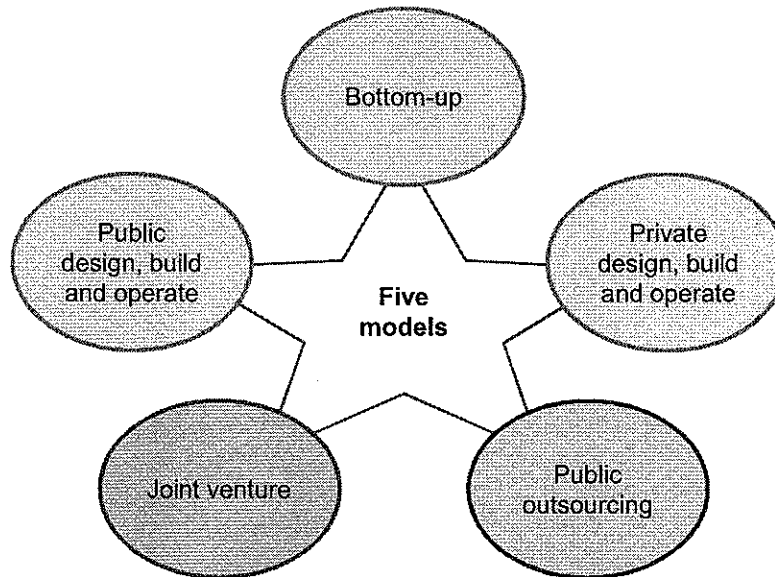


Figure 1.3: Summary of available investment models [Source: Analysys Mason]

*Bottom-up model*¹⁶ The bottom-up, or local community, model involves a group of end users organising themselves into a jointly owned and democratically controlled group (frequently a co-operative) capable of overseeing the contract to build and operate their own local network.

Private design, build and operate (DBO) model The private design, build and operate (DBO) model involves the Managing Authority issuing funding (often in the form of a grant) to a private sector organisation to assist in its deployment of a new network. The public sector has no specific role in the ownership or running of the network, but may impose obligations in return for the funding.

¹⁶ In this context, 'bottom-up' does not refer to the LEADER initiative.

Public outsourcing model Under a public outsourcing model a single contract is awarded for all aspects of the construction and operation of the network. The major characteristic of this model is that the network is run by the private sector, but the public sector retains ownership and some control of the network.

Joint venture model A joint venture is an agreement under which ownership of the network is split between the public and private sector. Construction and operational functions are likely to be undertaken by the private sector.

Public design, build and operate model A public DBO model involves the public sector owning and operating a network without any private sector assistance. All aspects of network deployment are managed by the public sector. A public sector operating company may operate the entire network, or may operate the wholesale layer only (with private operators offering retail services).

Guidance regarding the advantages and disadvantages of each investment model and the suitability of each to different circumstances is given in Figure 1.4.

<i>Model</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>Recommended use</i>
Bottom up	<ul style="list-style-type: none"> • Long-term, non-profit view, suitable for high-cost infrastructure (e.g. FTTH) • Focuses demand and encourages local social cohesion 	<ul style="list-style-type: none"> • Localised deployments, with risk of differing technologies 	For targeting localised areas and for gaining the most benefit from small amounts of funding
Private DBO	<ul style="list-style-type: none"> • Larger scale (than bottom up) • Low public burden, which can lead to faster deployments 	<ul style="list-style-type: none"> • There is a minimum funding threshold to attract private interest • Limited control over operations, which may reduce the socio-economic impact 	For larger-scale investments, where sufficient funding is available to attract private interest in rural areas, and where the operations (and risk) of the network can be confidently transferred to a private operator
Public outsourcing	<ul style="list-style-type: none"> • Public financial stability with private expertise • Greater control (than private DBO) 	<ul style="list-style-type: none"> • Reduced financial benefit to private sector (compared to private DBO) • Additional bureaucracy 	Where the Managing Authority requires a high level of control over the network, and where the private operator has a more conservative risk profile than the private DBO model

<i>Model</i>	<i>Advantages</i>	<i>Disadvantages</i>	<i>Recommended use</i>
Joint venture (JV)	<ul style="list-style-type: none"> • Potential financial benefit for both parties, based on risk sharing • The creation of special-purpose vehicles (SPVs) can make the model very scalable, and allow alternative investment sources 	<ul style="list-style-type: none"> • Potential conflicts of interest must be resolved and may block creation/ successful operation of the JV • Few examples of implemented JVs to indicate best practice 	Where the interests of the public and private sectors can be closely aligned
Public DBO	<ul style="list-style-type: none"> • Managing Authority has full control to promote competition and enforce standards • Managing Authority can ensure socio-economic benefits are prioritised 	<ul style="list-style-type: none"> • Size and scope limited by public expertise • Potentially excludes private sector expertise 	Where a Managing Authority needs to have absolute control over the operations of the network, or where small targeted investment will inspire investment from private sources

Figure 1.4: Summary of advantages, disadvantages and recommended uses of the investment models [Source: Analysys Mason]

In terms of the choice of investment model, a Managing Authority should consider the delivery of benefits to end users over the *long term* as a key criterion in making that choice. The EC believes that from a cohesion perspective, longer-term investment models work best for financing high speed infrastructures, promote competition and allow the delivery of cheaper and better-quality services for end users. This is particularly the case when an investment focuses on future-proof passive or backhaul infrastructure, which supports effective competition among a wide range of service providers. Issues associated with the long-term management of end-user benefits and effective competition are discussed in more detail in Section 1.5.

However, the EC wishes to encourage innovation in the choice of investment models, and is keen to stress that there is no one model that is preferred above all others. Indeed, it is an important role of a Managing Authority to use an appropriate combination of investment models from different stakeholders to match their needs and to deliver a long-term solution for end users.

A Managing Authority also needs to be innovative in terms of both the sources of funding and the available financial instruments for investment. It must consider private investment from both within and outside the telecoms sector, including operators, institutional investors, utilities, end users, content providers and equipment providers. In terms of financial instruments available to the public sector, the European Investment Bank (EIB) has developed examples of innovative products and services,¹⁷ such as:

¹⁷ See <http://www.eib.org/products/index.htm> for more information.

- Individual loans
- Intermediated loans
- Structured finance facilities
- Risk sharing finance facilities
- Guarantees.

Regardless of the mix of public and private investment, a Managing Authority should choose the investment model on the basis of its ability to offer end users a range of affordable, high-quality services on a long-term basis.

1.4 Next steps following preparation and planning

The guide also includes detailed guidance on the next steps that need to be taken, following the investment preparation and planning phase, as shown in Figure 1.5.

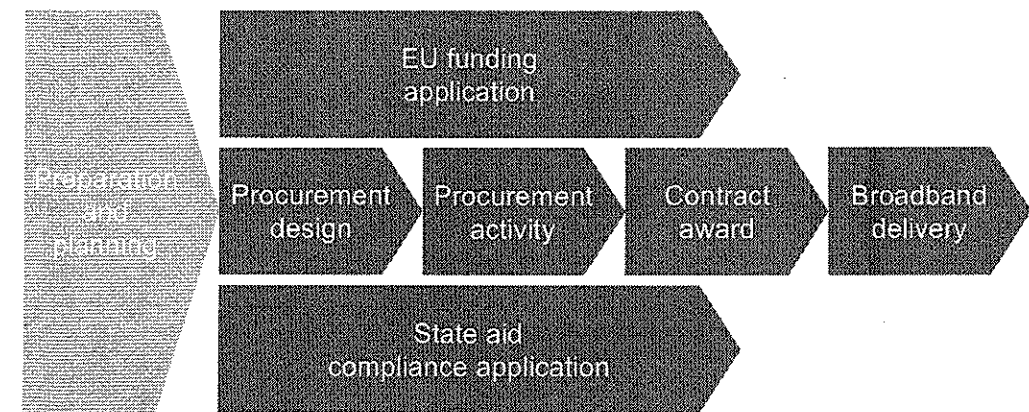


Figure 1.5: Next step activities [Source: Analysys Mason]

There are three key activity flows that follow preparation and planning: the EU funding application, complying with State aid regulations¹⁸, and the four separate activities that contribute to procurement and delivery. These three activity flows are carried out broadly in parallel, and a summary description of each activity is provided below.

1.4.1 EU funding application

To complete an EU funding application, or any other relevant funding application, a Managing Authority will need to assess the funding application guidelines and application form(s), and ideally check that its understanding is consistent with that of the funding body, through the use of meetings and dialogue.

¹⁸ Under the State aid regime, projects developed under the "de minimis" rule do not need a state-aid clearance.

There are a variety of sources of EU funding, and these can be combined with national or local sources of public sector funding, before being leveraged with private sector financing where appropriate, as discussed in Section 1.3.

1.4.2 Complying with State aid regulations

The EC monitors the investment of public funds to ensure that State aid is not used to unduly favour one or more private entities in a way that would distort a market. The key activities for achieving compliance with State aid regulations relate to justifying the need for public intervention¹⁹. However, there are four situations in which a State aid notification is *not* required:

- If the investment is made on terms that are equivalent to those available to the market
- If the level of aid is below a threshold of EUR200 000
- If the broadband network is only used for public services
- If the broadband project is being implemented as part of a national framework scheme which has already received State aid approval.

If none of the above conditions is met, an individual State aid notification must be submitted to the EC. A Managing Authority should prepare a State aid pre-notification paper in consultation with the relevant government department.

In addition to describing the project objectives and approach in the State aid pre-notification paper, the Authority will need to gather and prepare evidence about the broadband demand and supply situation in the localities of interest for the project. This includes a requirement for detailed mapping and coverage analysis, to determine whether infrastructure has already been (or is about to be) deployed on the supply side, as well as a mapping of the expected service requirement on the demand side.

Other inputs to the State aid process are derived from the project design, the procurement requirements specifications and the responses from bidders during the procurement process. In particular, the requirements specifications and questions posed by bidders during the procurement should be designed to help satisfy the EC's guidelines on State aid for broadband.

1.4.3 Procurement design, procurement activity, contract award and broadband delivery

The procurement design is shaped by a number of factors and options that should be assessed methodically by a Managing Authority and developed into a coherent, agreed procurement strategy. Due to the wide range of factors involved in procurement design, a Managing Authority is likely to need specialist procurement and technical support to ensure the procurement will both meet its objectives and comply with procurement legislation and State aid guidelines.

¹⁹ For more detail, see *Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks*, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:235:0007:0025:EN:PDF>

Each procurement route will include a specific set of activities. For example, the OJEU Competitive Dialogue procedure includes the following steps:

- market awareness
- pre-qualification questionnaire (PQQ)
- invitation to participate in dialogue (ITPD)
- dialogue process
- invitation to tender (ITT)
- contract award.

A Managing Authority may award the contract to the winning bidder, once the key dependencies of State aid approval and funding confirmation have been achieved.

The broadband delivery stage is a complex undertaking and presents the contracting Authority with a variety of challenges. Many areas will require close monitoring and management, including checking the functionality/performance of the network, checking deployment costs and checking the services offered / prices charged to wholesale and retail customers.

1.5 Conclusions and recommendations

Based on research of the example projects and analysis of the steps that need to be taken towards effective broadband delivery, we have derived the following conclusions and recommendations for any Managing Authority that is planning a public broadband investment.

Socio-economic benefit must be managed alongside project sustainability to deliver long-term benefits

Due to the large investment required to deploy broadband networks, public investment of some kind will often be required (particularly in rural areas). When large amount of public funds are involved to deliver the *socio-economic aims* of EU policies, the *long-term* needs of territories must be prioritised over the commercial aims of specific private companies.

For this reason, a Managing Authority might favour those models which provide long-term control over the operations of the project to ensure that the needs of the entire territory are met. Effective control of the project by the Managing Authority will also help to ensure that access to the network infrastructure is made available on an *open* and *non-discriminatory* basis (as discussed in more detail below). Effective control of the project will also allow the Managing Authority to ensure that the network is operated in a way that supports the delivery of long-term socio-economic benefits (e.g. by ensuring that service availability and performance meet minimum requirements, and also ensuring that the desire for commercial returns does not overtake the need to provide affordable services).

However, the private sector can bring invaluable expertise to broadband projects, and commercial discipline that can ensure projects are delivered efficiently. The involvement of large-scale private operators can help to ensure

the sustainability of the project, as their expertise and experience can help in adapting to changes in the market or embracing technological developments.

It is therefore essential for a Managing Authority to engage with potential private partners at an early stage of the procurement planning process to gauge their appetite for different investment models, while keeping the procurement process transparent and non-discriminatory.

The bottom-up model may often be suitable for small-scale fibre projects

Fibre to the home (FTTH) provides the very highest connection speeds to end users, but is usually very expensive to deploy. Our research suggests that the bottom-up model is a suitable complement to small-scale FTTH deployments, as co-operatives can take a long-term not-for-profit view of the investment. Larger-scale deployments may be possible, where an existing large-scale co-operative exists (e.g. a local utility company). In the example projects we observed bottom-up models being deployed both on a small scale (e.g. Nuenen and Swedish Rural Development Programme) and on a larger scale (e.g. the local co-operative electricity companies deployed fibre in Midtsoenderjylland, Denmark).

However, Managing Authorities may face a challenge in leveraging the bottom-up model for a project involving widespread deployment (if large-scale co-operatives do not already exist). They should explore measures to aggregate discrete co-operative areas and promote common technical standards to enable major players in the industry to participate and hence deliver benefits to end users, particularly regarding the choice and affordability of services.

Small investments can provide a catalyst through innovative partnerships

None of the example projects incorporates a formally established joint venture (the Lombardia project is still at the planning stage). However, particular elements of some projects were undertaken using a collaborative approach. In many cases, small investments led to innovative partnerships, and provided a catalyst for further investment from other sources.

These examples included the Managing Authority in Piemonte, Italy investing in services in return for investment in infrastructure by the incumbent. And in North Karelia, many end users were inspired to commit to the bottom-up funding of the network once they saw cable being installed along their street.

Managing Authorities should engage with potential private partners to explore the possibility of innovative partnerships to catalyse investment.

Open access to infrastructure supports effective

As discussed above, a Managing Authority should aim to ensure that the broadband investment delivers a choice of affordable, innovative services from a range of retail suppliers over the long term. This aim is supported by

competition

promoting effective and sustainable competition on the network, which in turn is supported by providing open and non-discriminatory access for operators to use the infrastructure to provide services.

Infrastructure access is possible on two broad bases:

- Access to the *passive* infrastructure, such as underground ducts, dark fibre and terrestrial wireless sites
- Access to the *active infrastructure*, which refers to the active electronics such as those attached to fibre or copper cables, or terrestrial wireless and satellite electronic equipment.

The concept of *open* and *non-discriminatory* access refers to a situation in which any operator can interconnect with the network on the same terms as any other. The infrastructure operator must ensure that it does not unduly favour any service provider(s) over any others. For this reason it is advantageous to use a model under which the infrastructure operator is not also a service provider, as this reduces any incentive for favouritism. It is a condition of granting State aid approval that the recipient of the aid provides open wholesale access, regardless of the presence of significant market power (which is determined by national regulatory authorities through an established 'market review' process).

It is generally accepted that if an operator has access to the passive infrastructure (e.g. copper, dark fibre or underground ducts) it will have more freedom to develop innovative services, and therefore compete with other operators and hopefully deliver lower prices to consumers. However, access to passive infrastructure generally requires a higher level of investment both from the access provider (which must ensure sufficient capacity in ducts, dark fibre, cabinets, etc.) and from the access seeker (which must provide its own active equipment). In areas where the business case for next-generation access (NGA) broadband networks is already challenging (such as rural areas), the additional investment required by the access seeker may mean that passive infrastructure access may be less likely to support effective and sustainable competition, unless alternative and more innovative investment models are used which could mean lower cost and lower access charges (e.g.: bottom up model)²⁰.

Therefore, a Managing Authority should plan an investment with a view to

²⁰

The majority of costs are associated with deploying the passive infrastructure. Under a *passive access model*, the access seeker needs to deploy its own active electronic equipment relatively close to the end user, in order to connect with the passive infrastructure. Although this cost is small when compared to the passive investment, it may still be enough to create an unviable business case in very sparsely populated areas. The alternative is an *active access model*, which allows the access seeker to interconnect via active electronics from a more centralised location, which provides lower cost, but requires less upfront investment.

ensuring that any new network infrastructure is opened at as many levels as possible, thus allowing all market players to operate in a level playing field. Also, by investing in infrastructure rather than directly in services, a Managing Authority will help to ensure that it does not distort the market, which could be detrimental to end users.

These considerations will encourage effective and sustainable competition, which will help to create an environment that stimulates the availability of innovative services at low prices, offered by a range of retail providers to consumers and businesses.