EUROCITIES policy paper on broadband in cities

Bringing the future of a digital Europe into the present

EUROCITIES

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EXECUTIVE SUMMARY

Broadband has an essential role to play in stimulating growth and well-being by fostering greater integration of policies and actions as a cross-sectoral tool, and by making a substantial contribution to a more sustainable future. Within our knowledge economy, a capable and future-proof communication infrastructure is already crucial to a city's economic success and will be even more so in the coming decades. This paper makes the case for the role broadband can play in supporting cities to drive a European economy that is sustainable, inclusive and globally competitive.

We begin by providing a definition of future-proof networks endorsed by EUROCITIES members. This is the starting point for further elaborating the potential of broadband. We believe that networks must be based on open access principles, be unbounded scalable & symmetric, be affordable, widely available and use fibre technology.

By illustrating the transversal role of broadband in tackling the sustainability challenges we face on the ground in our cities, we provide a very practical application for this definition. The roll-out of broadband can no longer be an end in itself. It will have a major impact across all aspects of city life and we believe it should be considered a long-term, strategic decision to create digital economies that are competitive, sustainable and inclusive. We highlight this alongside three aspects of sustainability:

- **Environmental sustainability**: New digital infrastructures hold possibly the greatest yet least known potential for achieving climate change mitigation, as they enable a range of possible 'green' changes across other sectors.
- **Economic sustainability**: Investing in infrastructure such as fibre offers additional job creation benefits because of the 'network effect' it creates. It also creates an additional multiplier effect in employment growth, due to the new consumer and business behaviour it stimulates.
- **Social sustainability:** Access to broadband facilitates skill building, new modes of life-long learning and education and increases employability in the information age. It will increasingly become the main way to access basic services such as social benefits and healthcare.

The potential we see for broadband in cities has to be seen in the context of European policy and legislation, which provides the framework for cities to participate in network roll-out. A number of options exist under the current framework, however cities are still usually categorised as 'black areas', where the public sector should not invest in network roll-out. Nevertheless, there are a number of scenarios in which a case could be made for public intervention in network roll out at the city level, based on examples of current city activities. These include intervention in the case of market failure, providing broadband as a service of general interest, implementing wider public policy such as social inclusion, improving the competitiveness of a place and stimulating local innovation. We use a number of city examples to illustrate these scenarios.

1. EUROCITIES DEFINITION OF FUTURE-PROOF BROADBAND

This definition provides a common understanding of future-proof networks endorsed by EUROCITIES members. It is the starting point and basis for further discussing the role of high-speed broadband. Networks must be based on open access principles, be unbounded scalable & symmetric, be affordable, widely available and use fibre technology.

1. **Open access**: Networks should provide equal opportunities for service providers, free choice for users, and room for innovation. In addition, an open network offers the best guarantee to ensure the services offered develop quickly and remain competitive.
2. **Scalable**: Broadband networks should use point-to-point (PTP) fibre infrastructure and not point-to-network (PON). This means that each user/location can be linked to another with a physical fibre connection. PTP architecture is the most secure set-up to meet future needs of traffic volume and speed.
3. **Symmetric**: Networks must have symmetric up- and downstream speed. Currently this is only available via a fibre-based infrastructure. This offers a flexible and future-proof solution for the growing demands of businesses and citizens, and outplays current or foreseeable architectures based on other technology.
4. **Affordable**: Access to future-proof broadband must be affordable for every citizen and business. The period of return on investments in broadband networks should be calculated in medium to long-term business plans. Long-term planning will allow also for viable investment in disadvantaged areas of a city.
5. **Widely available**: Future-proof broadband must be available to every citizen and business in a city. This includes in particular neighbourhoods which may not be as economically attractive as others. New forms of public-private ventures can prevent 'cherry picking' and provide for an inclusive and integrated approach to fibre deployment.

2. FACING THE ISSUES OF A NEW DECADE – AN INTEGRATED APPROACH TOWARDS SUSTAINABILITY

Three quarters of Europe's population lives and works in an urban environment. Cities therefore function as powerhouses of our economy and provide essential platforms to maximise economic, social and environmental well-being. They provide the critical mass of users, market size, infrastructure and policy support for piloting services and enabling new types of partnerships. Furthermore, they can lead by example in adapting new solutions and changing behavioural patterns. In partnership with the private and voluntary sector municipalities build and strengthen the local development of open innovation and research partnerships. They provide support to local business and start-ups. At the same time, cities are also the places where the effects of social and digital exclusion are most visible and will continue to have the most tangible impact.

2.1 Cross-sectoral importance of broadband

Broadband has used to support and stimulate economic and social activities over the past 15 years: schools, banks, traffic control centres, hospitals, city halls, commerce and media can no longer do without broadband. The roll-out of broadband is no longer an aim in itself: it is crucial to addressing a range of issues in the fields of culture, economic development, environment, mobility and transport, social policy and citizen participation. We believe it is time to take the next step towards Fibre-to-the-Home (FttH) in Europe.

Tackling the big challenges of sustainable economic recovery, climate change and social inclusion will be impossible if we stick to traditional systems and approaches. A cross-sectoral, integrated approach is required, that also engages people in local communities. Rolling out next generation high speed infrastructures will be decisive to achieving this.

Integrated information and communication will be more and more important for city government and the overall functioning of a city's ecosystem in the coming decades. Broadband is an essential tool to support information exchange between silos and to deal with complex questions like sustainability & mobility, an ageing society & cost of healthcare, urban deprivation & poverty, economic growth & changing labour market and raising education & skills levels.

Of all broadband technologies, optical fibre is the only infrastructure that is able to provide simultaneous up- and downstream at unrivalled speed on an almost unrestricted number of parallel connections.[1] Within the next few years, fibre infrastructure will become one of the main drivers of the economic competitiveness of a place and its attractiveness to businesses, as well as the overall quality of life offered. This is particularly true for disadvantaged areas of a city, where investments in new infrastructures would bring a major shift in the economic and social empowerment of communities.

Investments in fibre networks must be supported by strong leadership from the public and private sector and should be approached from a cross-sectoral perspective. Roll-out of fibre will have a major impact across all aspects of city life and should be considered a long-term, strategic decision to create digital economies that are competitive, sustainable and inclusive.

2.2 Environmental sustainability

Two per cent of the world's energy consumption is attributable to ICT, which is comparable to the share used by the aviation sector.[2] At the same time, research suggests that in the case of the direct impact of broadband-based services like telemedicine, teleworking and home assistance, for the first 15 years of network implementation, savings on greenhouse gas emission per user are approximately 330 kg eq. CO_2 or the equivalent of the emissions caused by a car travelling 2,000 kilometres.[3]

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[1] The most future-proof technical architecture for fibre networks is a point-to-point architecture. Point to point describes a network where each end point/user can be physically connected to every other end point/user.

[2] Climate Group, GeSI, Smart 2020, enabling the low carbon economy in the information age, 2008.

[3] FttH Council Europe, FttH network solutions are sustainable and contribute to a greener Europe, FttH Council Europe 2009.

New digital infrastructures hold possibly the greatest yet least known potential for achieving of climate change mitigation, as they enable a range of possible 'green' changes across other sectors.

Some examples:[4]

- Using high-speed networks as infrastructure to enhance the measurability, transparency and visibility of carbon footprints across all sectors;
- Working on 'smart processes' to achieve energy efficiencies through e.g. energy-efficient buildings, new management and end-user services for mobility and public transport or to support 'greener' production and logistics;
- Reducing the material and energy intensity of economic activities while retaining both the quality and quantity of jobs.

Enabling these innovations will require a mix of static, real time and 'consumer' data to be collected and presented in appropriate forms, run on a high-capacity digital infrastructure. Fibre itself also has an intrinsic advantage: lighting a 1Gb/s network can ensure an energy saving of up to 65% compared to energy consumption via copper telephone cables.[5]

2.3 Economic sustainability

New networks have the power to drive innovation and help Europe find a new way forward, out of the current economic situation. Strategic innovation in infrastructure has been the driving force behind economic growth over the past four centuries, starting with ship canals, railways, the first telecommunication networks and high-speed trains.

Cities are now driving the digital economy forward. City governments are continually implementing innovative and citizen-centred public services. In partnership with the private and voluntary sector municipalities build and strengthen the local development of open innovation and research partnerships. Furthermore, they provide support to local business and start-ups in innovative sectors such as creative industries.

Digital infrastructures act as platforms on which a multitude of innovative technologies and services can develop. Recent LSE research showed that a £5 billion investment in new broadband infrastructure in the UK would create up to 280,000 new jobs. Investing in infrastructure like fibre offers greater job creation benefits in part because it creates a 'network effect.' New jobs are generated by upstream investment in industries that create new and innovative applications and services to take advantage of the more robust network.[6] Further employment growth can also come from the new consumer and business behaviour that it stimulates. This also affects general growth in productivity and wages, and works across all parts of industry and business.[7] The network effect of such investments, beyond leading to additional job creation, higher productivity,

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[4] OECD, Measuring the relationship between ICT and the Environment, 2009; Climate Group, GeSI, Smart 2020, enabling the low carbon economy in the information age, 2008.

[5] http://www.reykjavik.is/Portaldata/1/Resources/eurocities/presentations/Eurocities_KSF_june_2009_-_Reykjavik_Fiber_Network.pdf

[6] ITIF, Driving the digital economy: IT investment in the G20 stimulus plans, ITIF September 2009.

[7] The impact of broadband-enabled ICT, content, application and services on the UK society and economy to 2010, UK Broadband Stakeholder Group 2009.

and increased competitiveness, can also generate positive personal and societal benefits.[8]

Recent massive investments in Paris Hauts-de-Seine, Manchester and Amsterdam show that fibre is regarded as a key ingredient in overall investment, in regional strategies to grow the knowledge economy, ICT industries and to provide a foundation for new business opportunities, particularly smaller businesses. A study commissioned by the Berlin government estimated that to maintain its international competitiveness, it will need to upgrade to fibre networks by 2014 at the latest.[9]

The current economic crisis could affect the readiness of some to invest in broadband, which would have a detrimental effect. Investment now would give the economy an extra boost, and speed up the process of economic recovery.

2.4 Social sustainability

Many urban areas face the challenge of increasing social exclusion and in some there is a real danger of deprived areas being left behind. Already today we can see that in some cities the uptake of classic broadband is stalling and people are increasingly relying solely on mobile phones for their communication. This development is particularly noticeable in areas in some of UK cities, where income is lower than average, for example: Birmingham (22% uptake of classic broadband), urban areas in Yorkshire and Humber (18%), Manchester (19%) and Liverpool (21%). Homes within these areas are either entirely disconnected from the internet or access the internet through wireless technology, which does not provide the same quality access as fixed lines. Remarkably, broadband usage in UK rural areas (60 %) exceeded broadband usage in urban areas (58 %) in 2008.[10] Many of these urban areas will not be financially attractive for private investment in new infrastructure, and they run a serious risk of being excluded from any new service being developed on the basis of new high-speed networks. Given the pivotal role of information and knowledge exchange in today's society and economy, it is obvious that this could present worrying scenarios of worsening social exclusion and deprivation.

There is evidence that where fibre has been rolled-out through cooperation between different stakeholders, and especially via community based projects, users point to the benefits of new relationships and closer communities. These also help in finding new work, building social ties and stimulating a more interactive and participative community.[11] In The Hague, the roll-out of fibre by the Glaslokaal foundation had a significant impact on education (e-learning) and social contacts. So far, Glaslokaal has connected more than 300 primary and secondary schools, social welfare services and cultural institutions to highspeed fibre.

Access to broadband also facilitates skill-building, new modes of life-long learning and education and increases employability in the information age. It will also increasingly be the main way to access basic services such as social benefits and healthcare.

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[8] UK's digital road to recovery. LSE Enterprise & the Information Technology and Innovation Foundation, 2009.

[9] FttH Strategie Berlin, Bedarf, Anforderung, Ausbauszenarien, Itcon 2009.

[10] OfCom's Communications Market Review 2008 - http://www.ofcom.org.uk/research/cm/cmrnr08/

Additional facts & figures on affordability and connectivity win UK: http://www.ofcom.org.uk/media/news/2009/06/nr_20090610

[11] FttH Council Europe, Socio-economic benefits of FttH, January 2009

3. IMPACT OF EU POLICY

A number of European frameworks and decisions impact directly on the ambition of cities to facilitate broadband roll-out. The revised EU regulatory framework on Telecoms, adopted in November 2009, sets the wider context in terms of access obligations, user rights and internet neutrality, internal market and competition rules.[12] The European Commission's guidelines on broadband state aid and its draft Recommendation to Member States on NGA networks set out its views on investment in broadband.[13][14] Finally, the overhaul of the European Universal Service obligations, planned for the second half of 2010, is expected to impact on network deployments and minimum quality of broadband service.

The renewed Telecoms Package provides the legislative framework for the design, deployment and delivery of telecommunications networks and services in Europe. There are two main areas of interest in the new package for cities. First, the framework mandates local and regional authorities to take a role in coordinating and planning civil works with physical deployment of fibre optics. Second, the package allows for National Regulatory Agencies (NRAs) to have a 'geographically segmented' approach to decide whether ex-ante regulation is still needed. In effect, this will allow NRAs to make a distinction between sufficiently covered areas and areas where there is market failure. It is important that the use of this instrument does not lead to a 'poor man's broadband' in urban areas, as the situation in a particular city may be quite different from neighbourhood to neighbourhood (from rich to poor, from good broadband provision to little, from strong competition to ineffective competition).

In recent years, the European Commission has taken the position that cities should not generically invest in fibre optic networks, instead permitting only specific investments for target groups (education, culture and care). Cities are commonly considered 'black areas', where broadband services are supplied over at least two competing infrastructures and where more than one competitor is supplying the market.

The recently published Commission guidelines on state aid are mainly based on an underlying distinction between rural areas and 'urban zones', and the two models of low population density/high capital cost on the one hand, and high population density/low capital costs on the other. This is a similar categorisation as the one for investment environments for conventional broadband that has been applied by the Commission in the past. However, the Commission points out in the guidelines that market development and investments by Telecom operators prove that this is no longer necessarily the prevailing distinction. Market developments and investment behaviour also indicate that high population density is no longer an investment guarantee and that many urban and sub-urban areas are economically unattractive to be covered by sole private undertakings.

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[12] The EU Council of Ministers formally adopted the Telecoms Reform package on 20 November 2009 and this was followed by a vote in a plenary session in the European Parliament of 24 November 2009. For a full overview see: ec.europa.eu/information_society/policy/ecomm/tomorrow

[13] Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks (2009/ C 235/04), adopted in September 2009.

[14] The draft Recommendation was published in September 2008 and is expected to be revisited and finalised in 2010. Cf. Draft Commission Recommendation on regulated access to Next Generation Access Networks (NGAs) (C(2008) XXX).

The guidelines leave explicit room for two particular situations in which public investments in black areas could be permitted. Firstly, in some member states, broadband is considered a Service of General Economic Interest (SGEI) and public investments can be admitted if they fulfil a certain set of criteria.[15] Secondly, when a public authority invests in an enterprise on terms and in conditions which would be acceptable to a private investor operating under normal market economy conditions, the investment is not a state aid.[16]

4. A POWERFUL ROLE FOR CITIES

Formulating policy, bringing the relevant parties together and providing small-scale subsidies are instruments that municipalities can use to accelerate developments in all policy areas. With respect to broadband and in particular FttH networks, there are a number of interesting options available for accelerating the relevant processes, working within European and national frameworks. We see 5 different scenarios for public intervention at city level: these illustrate the potential, and in practice may intermix and overlap.

- **Market failure**: It may be that the market led outcomes result in fibre deployments only to specific areas, as other areas might be not attractive or economically viable enough. If incumbent telecom providers are not willing or able to provide sufficient broadband capacity in a given area, the result may be that too few or no companies enter the game, resulting in very high end-user prices or very little choice. The case for government intervention then rests on the assumption that this represents some kind of market failure.

- **Basic infrastructure rationale**: Municipal networks can also be justified on the assumption that the city has an obligation to provide essential infrastructure services. Broadband access can be considered one such key infrastructure. The deployment of a municipal network in this case often implements national legislation which defines broadband as Service of General Economic Interest (SGEI), or is based on a decision by regional/local government to provide broadband as key infrastructure. Such approaches generally are looking to connect all citizens. They also sometimes take the form of a natural monopoly or are based on a 'public good' rationale, and result in considerable spill-over effects.

> The city of Stockholm has been investing in passive fibre infrastructure since 1994 to provide a symmetrical, high-capacity network on non-discriminatory access conditions. Competition on the network is fierce with 90 alternative operators, therefore prices for end-users are very low. The network connects around 260.000 households and all businesses in the city area.
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> Another example is Paris Hauts-de-Seine's investment of 59 million euros in a fibre network covering both profitable and non-profitable areas, which was approved by the European Commission in October 2009.

[15] The four "Altmark" criteria are: (a) the beneficiary of a State funding mechanism for an SGEI must be formally entrusted with the provision and discharge of an SGEI, the obligations of which must be clearly defined; (b) the parameters for calculating the compensation must be established beforehand in an objective and transparent manner, to avoid it conferring an economic advantage which may favour the recipient undertaking over competing undertakings; (c) the compensation cannot exceed what is necessary to cover all or part of the costs incurred in the discharge of the SGEI, taking into account the relevant receipts and a reasonable profit for discharging those obligations; and (d) where the beneficiary is not chosen pursuant to a public procurement procedure, the level of compensation granted must be determined on the basis of an analysis of the costs which a typical undertaking, well run, would have incurred in discharging those obligations, taking into account the relevant receipts and a reasonable profit. See http://ec.europa.eu/competition/state_aid/legislation/specific_rules.html#broadband

[16] Market Economy Investor Principle (MEIP), see DG Competition Newsletter Number 2/2002, http://ec.europa.eu/competition/publications/cpn/2002_2_23.pdf

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- **Distributional policy objectives**: It may be that the costs of supplying the service exceed what customers would pay for it. In economic terms, this would not make it an economically sound investment. In this case there is no market failure in the technical sense, however public intervention may still be warranted to achieve public policy objectives about distributional concerns. This includes objectives relating to wider public policy, including social equity and inclusion.

> Nottingham's Ultraband project will provide access to Next Generation Broadband to businesses located in four Business Centres in disadvantaged inner city areas. This investment is essential for Nottingham to remain competitive. The project will invest in disadvantaged communities first to create attractive locations for businesses to locate, rather than starting in the city centre then working outwards.

- **Competitiveness / Opportunistic rationale**: This covers situations where a municipality is participating in the market due to the relatively low cost of expanding into offering communication services. Such engagement can take advantage of economies of scale and scope provided that only incremental public investments are required. Intervention typically aims at using a powerful infrastructure more cost-efficiently internally, or in conjunction with other public and semi-public institutions. However, the rationale for using public intervention to promote competitiveness may be weaker than others as there could be a greater risk of distorting competition, technology obsolescence, duplicating investment, transient benefits and failing to stand up to a public value test.

> Eindhoven Glasrijk's initiative to supply a FttH network to residential buildings as is linked to the ambitions of several Housing Associations have to increase the value of the houses for their inhabitants. Clear evidence of better and longer living using broadband ICT services made it possible to invest in a network which covers at the moment 450 businesses and 100.000 houses, in combination with a commercial network provider.

- **Innovation rationale**: This is the case when municipalities act as Schumpeterian entrepreneurs[17] to stimulate experimentation and learning of market parties with new infrastructures and services. Here the important questions are for how long governments should act as Schumpeterian entrepreneurs, and if they act in the same way as a private investor[18] would do.

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[17] Schumpeter defines entrepreneurial activity as innovating and implementing change in an economy by introducing new goods or new methods of production. In the Schumpeterian view, the entrepreneur is a disruptive force in an economy.

[18] Referred to in state aid decisions as the Market Economy Investor Principle (MEIP): Investments by public authorities in organisations that carry out economic activities can be considered not to involve State aid if the investments are made on terms that a private investor operating under market conditions would have accepted.

5. CONCLUSION

For EUROCITIES, broadband networks have a massive potential to foster better policy integration and to drive sustainable and inclusive economic growth. To do this however they must be based on open access principles, be unbounded scalable and symmetric, be affordable, widely available and use fibre technology. Better strategic cooperation is needed to overcome the challenges of the present urban environment. This will require a flexible and open European framework, and developments in legislation to enable true public-private innovation and secure a digital Europe beneficial for everyone.
EUROCITIES will continue to support the role of cities in broadband deployment and will actively engage with stakeholders in an open debate alongside the themes touched upon in this paper.