Economic Broadband Development through Infrastructure Sharing

Christos Bouras, Computer Technology Institute and Press “Diophantus”, University of Patras, Patras, Greece
Konstantinos Antonis, Department of Computer Engineering, Technological Institute of Central Greece, Lamia, Greece
Georgios Diles, Computer Engineering and Informatics Department, University of Patras, Patras, Greece
Vasileios Kokkinos, Computer Engineering and Informatics Department, University of Patras, Patras, Greece
Leonidas Loukopoulos, Department of Computer Engineering, Technological Institute of Central Greece, Lamia, Greece

ABSTRACT

Broadband is a public utility with positive effects on competitiveness, employment and growth. Although evidence shows that broadband development is increasing, this increment is not homogeneous between urban and rural areas. The main factor is the high cost for deploying next generation networks in rural areas, and especially the cost linked to civil engineering works. In order to overcome the investment challenges arising in the context of broadband deployment, the European Commission made mandatory the sharing of existing telecommunication and non-telecommunication infrastructures and facilities. This manuscript proposes and presents a novel tool that enables the estimation of the expected savings from exploiting existing infrastructures when deploying a broadband network. This is followed by a number of general principles and recommendations that policy makers and national authorities could embrace to diminish deployment costs and promote broadband deployment.

Keywords: Broadband, Case Study, Cost Reduction Tool, Digital Agenda, Policy Recommendations

INTRODUCTION

Broadband constitutes a key priority of the 21st century as it is an important determinant of economic growth, social cohesion and citizen well-being. Broadband development can have a strong and widespread impact by, for example, fostering and facilitating economic development and improving social networks and structures (Bouras et al., 2013; Khan & Raahemi, 2008; Mack,
Effects of broadband on economic growth relate to the positive influence in terms of business activities, technology and productivity enhancement, competition increase and upgraded public sector services. At the same time, societal benefits of broadband mainly stem from the fact that the existence of fast and ultra-fast internet provides individuals access to services which were unattainable before broadband, enhancing social inclusion and equal access.

Although evidence shows that broadband adoption is increasing, this effect is not homogeneous. On the contrary, significant differences exist, not only between countries but also within each country between rural and urban areas. At an international level, countries still show non-convergent paths, while even within the most developed countries a persistent digital divide is present between urban and rural areas, as well as between wealthier and poorer regions (Florence School of Regulation, 2011). The heterogeneous coverage of broadband connections among territories as well as the observed inadequacies in the telecommunication infrastructure and accessibility to services among countries, regions or even individuals hamper substantially economic growth, competitiveness, convergence and social cohesion.

It comes as no surprise that the increase of broadband deployment and the simultaneous reduction of observed disparities have become important policy aims, declared and shared by many national and transnational political institutions, regulatory bodies and independent agencies. To this end, the European Commission (EC) drafted the Digital Agenda for Europe as one of the flagship initiatives for Europe 2020 aiming at providing sustainable economic and social benefits from a digital single market based on high-speed broadband services (European Commission, 2015). The ambitious targets of the Digital Agenda aim to achieve 100% coverage at speeds of at least 30 Mbps for all Europeans and subscription of internet connection above 100 Mbps for 50% or more of European households until 2020.

In order to fulfil the above objectives, the Digital Agenda has stressed the need for additional efforts to be made in order to overcome the investment challenges arising in the context of broadband deployment. By introducing policies that reduce the overall cost of broadband development, the Digital Agenda aims at prompting Member States to accelerate the deployment of Next-Generation Access (NGA) networks across Europe. Integral part of those policy initiatives is the development of a common approach on mapping existing physical infrastructures in conjunction with the systematic coordination by national, regional, and local authorities (e.g. using town planning rules and remedies), mandating the sharing of existing telecommunication and non-telecommunication infrastructures and facilities; civil engineering works are commonly referred to as targets of such infrastructure sharing policies since their cost makes up a significant part of the overall deployment cost.

This manuscript presents a novel tool that enables the calculation of the savings during the deployment or the expansion of NGA networks through the sharing of existing and/or common development of new infrastructures. The tool was developed and financed in the context of the South East Europe (SEE) Transnational Cooperation Programme project “SIVA - South East Europe improved virtual accessibility through joint initiatives facilitating the roll-out of broadband networks”, and was pilot tested for a period of two months. The results of the pilot operation are included in this work together with some recommendations that could be embraced to diminish deployment costs.

The remainder of the manuscript is organized as follows: The following section describes the SEE Transnational Cooperation Programme on improved virtual accessibility that ignited the research for this work. Next we describe the problem that triggered the concept of infrastructure sharing. The fourth section presents the Cost Reduction Assessment Tool and its main features, and in the following section we analyze the main results from its pilot operation. Then, we provide some policy recommendations based on the analysis and in the last section we conclude...
Fractional Reuse Partitioning Schemes for Overlay Cellular Architectures
www.igi-global.com/article/fractional-reuse-partitioning-schemes-overlay/49671?camid=4v1a

Smart Spaces Enabled Mobile Healthcare Services in Internet of Things Environments
www.igi-global.com/article/smart-spaces-enabled-mobile-healthcare-services-in-internet-of-things-environments/160857?camid=4v1a