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MAPPING DIGITAL MEDIA:
THE DIGITAL DIVIDEND

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OPEN SOCIETY FOUNDATIONS

The Digital Dividend: Radio Spectrum, Mobile Broadband, and the Media

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The amount of radio spectrum released by the transition to digital television is known as the *digital dividend*.

Given the growing pressure on spectrum, as well as the social and political importance of television, the digital dividend has sparked intense debate between representatives of the media and advocates of other uses for spectrum—above all, the telecommunications industry.

This paper considers how citizens and policy-makers should approach the changes in the media and communication landscape, as television and broadband mobile internet compete for spectrum.

Successful decisions about the digital dividend are measured in terms of benefitting consumers and citizens as well as maximising spectrum use. Gérard Pogorel proposes a step-by-step, analytical approach to the issue, emphasizing explicit consideration of public policy criteria, their implications and their impact.

Citizens have a major—and as yet undiscovered—role to play in shaping this process.

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Mapping Digital Media

The values that underpin good journalism, the need of citizens for reliable and abundant information, and the importance of such information for a healthy society and a robust democracy: these are perennial, and provide compass-bearings for anyone trying to make sense of current changes across the media landscape.

The standards in the profession are in the process of being set. Most of the effects on journalism imposed by new technology are shaped in the most developed societies, but these changes are equally influencing the media in less developed societies.

The Media Program of the Open Society Foundations has seen how changes and continuity affect the media in different places, redefining the way they can operate sustainably while staying true to values of pluralism and diversity, transparency and accountability, editorial independence, freedom of expression and information, public service, and high professional standards.

The **Mapping Digital Media** project, which examines these changes in-depth, aims to build bridges between researchers and policy-makers, activists, academics and standard-setters across the world.

The project assesses, in the light of these values, the global opportunities and risks that are created for media by the following developments:

- the switchover from analog broadcasting to digital broadcasting
- growth of new media platforms as sources of news
- convergence of traditional broadcasting with telecommunications.

As part of this endeavor, the Open Society Media Program has commissioned introductory papers on a range of issues, topics, policies and technologies that are important for understanding these processes. Each paper in the **Reference Series** is authored by a recognised expert, academic or experienced activist, and is written with as little jargon as the subject permits.

The reference series accompanies reports into the impact of digitization in 60 countries across the world. Produced by local researchers and partner organizations in each country, these reports examine how these changes affect the core democratic service that any media system should provide – news about political, economic and social affairs. Cumulatively, these reports will provide a much-needed resource on the democratic role of digital media.

The **Mapping Digital Media** project builds policy capacity in countries where this is less developed, encouraging stakeholders to participate and influence change. At the same time, this research creates a knowledge base, laying foundations for advocacy work, building capacity and enhancing debate.

The **Mapping Digital Media** is a project of the Open Society Media Program, in collaboration with the Open Society Information Program.

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Television broadcasting technology is passing through a major transition from analog to digital video signal transmission, making possible the broadcasting of six television channels on radio spectrum bandwidth that was previously needed by just one. This change has opened a Pandora's box of questions about the scope and definition of television, challenging its place in the media and communication landscape.

These questions merge with others concerning the impact of the rise of broadband internet. Radio technology has created a wide range of radio spectrum usage options, from multiplying six-fold the number of over-the-air television channels, to preserving television at analog (pre-switchover) levels while transferring most of the newly available spectrum to other uses—not to mention the alternative options in-between.

The amount of radio spectrum released for other and new uses by the transition to digital television has been called the **digital dividend**. Although this resource is created by technical evolution, it affects a medium, television, which is socially, economically, and politically highly sensitive. So it is hardly surprising if the digital dividend has sparked intense debate between representatives of the media and advocates of alternative uses, meaning first and foremost the telecommunications industry.

II. The Digital Dividend and the Open Society

Although it has its roots in technical and economic changes, this debate has strong social and political overtones. It pits two industries against each other, each of which has quite legitimate claims to social and political attention.

Television, which broadcasts programmes to almost 100 per cent of the population all over the world, is a major institution in the national life of states; it plays a central part in practical life, political life, entertainment, culture, and sports. A thriving television industry, alongside other media (the press, radio, etc.), can be a vector of political and cultural diversity. It can be considered a necessary element of the social fabric, and for a long time has played a major role in this respect.

Telecommunications, on the other hand, started very differently, as a means of one-to-one communication. But it would be wrong to conclude that telecoms are less important for social interaction. The ability of citizens, families and members of all sorts of groups and institutions to talk one-to-one, privately, is a human right, and in most places is recognized as such by law. Interpersonal communication today is increasingly mobile, and the right to communicate now combines neatly with the right of free movement, requiring access to ever more radio spectrum.

Furthermore, telecommunications networks today go beyond one-to-one. Through mobile broadband internet, as we can see in developed and emerging countries alike, people have access not only to communications networks (voice, email and text messaging), but also to social networks, and to a nearly infinite trove of information about practical life, political life, specialized interests, entertainment, culture and sports.

In short, television and telecommunications are now equally essential for the functioning of an open society. The claims of television for its role in social inclusiveness is now balanced and complemented by social networks and information sources and applications based on mobile telecommunications networks.

For the past decade, however, digital terrestrial broadcasting has not only introduced a multiplying factor in the number of free-to-air channels; it has put the television industry at loggerheads with telecommunications operators, which are much bigger businesses. Trends in media usage set these industries on a collision course in their quest for radio spectrum.

Broadcasters argue that digital technologies must be used to create more over-the-air channels, provide greater choice for the public, in terms of more diversity in information, entertainment and culture. They also point at the need for bandwidth to accommodate High Definition (HD) television, and—soon enough—3D television, in order to match quantum leaps in the movie industry and provide the audience at home with an ever more spectacular experience.

The claims of telecommunications are quantitative and qualitative. Quantitatively, wireless telecommunications have hugely expanded over the past 20 years, and the massive uptake by consumers of mobile internet access has provoked an explosive growth in data traffic, stimulating an escalating appetite for capacity and bandwidth.

Qualitatively, the frequency bands used until now by over-the-air television enjoy physical qualities of propagation and indoor penetration that are the envy of the mobile telecommunications operators. These characteristics translate into low deployment costs, which make it economically viable in rural or high-cost regions. According to UK regulator Ofcom and the European Commission, the allocation of the digital dividend to new broadband services is expected to have a significant impact on business and the economy.

This debate is sometimes portrayed in a simplistic way. Television is treated either as the guardian of social cohesion, or as low-level entertainment that abuses the public's time and attention, or—in some countries—as a government-controlled medium that serves political interests in a top-down, manner. Telecommunications, conversely, are depicted either as the haven of precious one-to-one, interpersonal, business-generating, communication, or as less important to community-building than the media. The latter view neglects the massive spread of social networks and internet information services, along with the support they provide to grassroots democracy.

III. The Media Meet Radio Spectrum Policy

Outlining a policy framework for the digital dividend requires expanding the scope of analysis in two directions, to include the television industry on one hand, and the whole range of spectrum uses on the other.

Television exploits the radio spectrum, a resource that is shared among various actors and activities, of varying economic and political value and sensitivity. Some of these activities are aimed at the general public, such as broadcast radio and television that are part of the media, or telecommunications (voice and data). Others aim at businesses like professional mobile radio, used by civil engineers around the world or the petroleum industry, or public services, defence, police, the emergency services, etc.[2]

There is growing pressure on spectrum. Consumers around the world shift their preference to mobile voice telephony over fixed-line, as is illustrated by the stable or dropping number of fixed lines in developed or even emerging countries, as opposed to the explosive growth of mobile. New services have also emerged, such as mobile internet access, integrated emergency service response, high-level coordination of defence, remote monitoring of medical conditions, etc., that require extra radio spectrum. Given the limited nature of the resource, coming up with a consistent approach to managing the radio spectrum at large, and dealing with the digital dividend in particular, requires an in-depth look at the existing alternative ways of providing each service.

In some cases, technically speaking, radio spectrum use is hardly replaceable given the nature of the service (emergency services, air traffic control, defence, mobile telecommunications). In other cases, spectrum use is only one among a plurality of ways to provide a service. As for television, terrestrial broadcasting of a restricted number of channels, fewer than 10 at any given location, is still prevalent in most countries. A majority of households worldwide only has access to terrestrial TV. It benefits from a legacy inventory of towers, transmitters, roof antennas and TV sets. Its overall current operating cost is low as most of the infrastructure

2. For a comprehensive presentation of spectrum uses, see Cave, Doyle, Webb (2007) and Chaduc, Pogorel (2008).

costs (towers, roof antennas) are amortized. However, even if television programmes are currently delivered to viewers on over-the-air terrestrial networks, they are also available by satellite, both via radio spectrum based-technologies and via cable, on copper telecommunications networks (ADSL), and also, increasingly, via fibre optic networks.

The television industry has been able over time to undergo major technical and business transitions and adjust to technical and market conditions: the old traditional model of a small number of big, free-to-air national broadcasting networks has been challenged for decades by cable and satellite diffusion, currently by the advent of ADSL, and tomorrow by fibre networks, the latter technologies allowing access to tens or hundreds of TV channels.

The dividend that results from analog to digital switchover poses a difficult public policy problem. Much depends on the way we look at the activities potentially interested in freed-up spectrum. Against the background of competing requests for spectrum usage and a diverse technical landscape for each activity, what can be decided, and on what grounds?

Public policy considerations come first as, in all countries, spectrum allocation remains part of the eminent public domain, however the modalities of its exploitation are decided.

Some authors (Cave, Doyle, Webb) favor a radical, convergent, service and technology-neutral approach: let market forces decide between alternative uses of spectrum, and for that purpose, let agencies in charge of spectrum management in each country put in place market or market-like mechanisms, either swiftly (the "big bang" approach) or gradually, thereby allowing diverse uses and users to compete for the spectrum resource on a level and transparent playing field. Television does not currently pay, in most countries, for the spectrum it uses. If it has to do so, and/or if it can benefit from the proceeds of handing back the spectrum it uses, TV broadcasting will move away from dedicated spectrum. It will then migrate to cable, fibre and satellite, or at least merge into fixed-wireless broadband platforms.

This orientation towards platform neutrality is consistent with the "convergence" view that all sorts of services, broadcasting, voice and data communications will move towards internet platform provision. This approach to a 100 per cent digital dividend is currently under official consideration only in Finland, where a review of spectrum usage is due in 2015. No other government or regulatory agency has yet voiced such a radical perspective, at least in public.

But public policy itself can have a variety of orientations, depending in particular on the extent to which it emphasizes politically and/or market-consumer determined choices. Given the diverse nature of the services provided via spectrum, economic, social and policy considerations are bound to be jumbled together. In the same spirit, a delicate question is how to deal with the allocation of a resource between alternative uses that do not conform to the same rationale, like for instance, commercial vs. non-commercial activities, public interest vs. market determined orientations.

The institutional arrangement in the U.S. reflects this approach: the Federal Communications Commission deals with commercial spectrum, while the National Telecommunications and Information Administration (located, confusingly, within the Department of Commerce!) is responsible for public spectrum.[3] No country has implemented purely market-oriented mechanisms for access to spectrum across the board, encompassing the whole range of services, commercial or non-commercial. Nor has any country made television pay for spectrum access under the same conditions as, for instance, mobile telephony.

3. www.ntia.doc.gov/

IV. Digital Dividend Status in Different Countries

Nowhere has sharing out the digital dividend been left to the market alone, with interested parties bidding for spectrum. International empirical evidence indicates that countries with very dissimilar institutional systems and policy orientations make similar choices on trade-offs between broadcasting vs. wireless broadband. The differences are marginal. Many countries in the International Telecommunication Union (ITU) Regions 1 (EMEA-Europe Middle East Africa) and 3 (APAC-Asia Pacific countries) are converging towards the 790–862 MHz allocation of digital dividend spectrum to wireless broadband (known as the 800 MHz band), as recommended by the World Radio Conference (WRC) 2007. ITU Region 2 (Americas), on the other hand, aligns itself in the 700 MHz band.

In all cases, however, a proportion of 20 to 25 per cent of the spectrum originally allocated to broadcasting, i.e. 72 to 120 MHz, is proposed as a digital dividend to be shifted to broadband wireless. Limited standardization is to be expected in the short term, however, as countries only gradually align themselves with the WRC 2007 recommended 790–862 MHz frequency band. In the short term, only a minority of countries will have broadband within this band.

Let us look at the present status of the digital dividend in a few countries. In the United States, the FCC (Federal Communications Commission) completed the auction of spectrum in the 700 MHz band in March 2008, and the final switchover to digital TV took place in June 2009. Commercial services are currently being tested, and are expected to be launched by the end of 2010. In June 2010, President Barack Obama signed a memorandum committing the U.S. government to the goal of making another 500 MHz of spectrum available by the end of the decade—nearly doubling the total amount available for wireless technologies.[4]

4. PolicyTracker news alert, 30 June 2010.

The Australian government is considering the release of 126 MHz of analog broadcasting spectrum as a digital dividend. This is 54 MHz more than harmonized EU proposals and 22 MHz more than neighboring Asia Pacific countries. This illustrates a current trend: the shift of broadcasting away from terrestrial spectrum is less and less taboo.

In Europe, the digital dividend band is 790–862 MHz, which is different from the U.S., India and most countries in ITU Region 3. The target date set by the EC for analog broadcast switch-off in EU member countries is 2012. Switchover has already taken place in some countries such as Finland, Sweden, Switzerland and the Netherlands. The UK and Germany also have dedicated spectrum in the 790–862 MHz band for wireless services. In May 2010, Germany became the first country in Europe to auction its digital dividend. Most other European countries have not yet decided which band to use, which makes it problematic to achieve common standards in broadband Wireless equipment. In India, the Department of Telecomm is considering auctioning the digital dividend in the 700 MHz band when it becomes available.

V. Exploiting the Digital Dividend for an Open Society: A Policy Roadmap

Bearing in mind the difficulties posed by diverse national contexts, we could sum up the previous analyses along the following guidelines:

Table 1.

The digital dividend roadmap

1.	Assess the feasibility in the local spectrum management context of implementing ITU recommendations on the digital dividend (e.g., up to 72 MHz in the upper UHF band in Region 1)
2.	Assess the national media landscape:
	a. The television offer side: meeting the demands of consumers/citizens (diversity, plurality)
	b. Access to television conditions (free-to-air, cable, fibre, satellite), costs, switching costs, rates, status of universal access
	c. Conditions of access to mobile broadband, voice, data and internet access, with special regard to rural and high-deployment costs areas: possible shortcomings of broadband coverage in low-density areas
	d. Wrap-up on trade-off between media families (television and mobile broadband): qualitative assessment, costs, benefits for economy and society, consumers and citizens
3.	Envisage going beyond ITU WRC 07 and expand the digital dividend
4.	Ex-ante checking of TV landscape after switch-off and future evolutions: provision of HD, 3D TV
5.	Assign broadband licences in digital dividend spectrum
	a. Choice of assignment methods: admin licensing, auctions, or hybrid criteria, including regional planning
	b. Frequency bands packaging (pairing 700 or 800 MHz bands with other frequency bands)
	c. Ex-ante checking the extent of Key Factors of Success of Mobile broadband deployment.

VI. Conclusion

The decisions to be taken in the matter of the digital dividend have technical, social and economic dimensions. The success of the outcome, in terms not only of maximising spectrum use but of benefitting consumers and citizens, will largely depend on the ability of the stakeholders to make informed decisions, and on the institutional arrangements in the business and political sphere. Citizens have a major—and as yet undiscovered—role to play in shaping this process. The challenge confronting policy-makers in the area of radio spectrum is how to combine an informed approach to broadcasting plurality and diversity with ubiquitous broadband internet access.

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Mapping Digital Media is a project of the **Open Society Media Program** and the **Open Society Information Program.**

Open Society Media Program

The Media Program works globally to support independent and professional media as crucial players for informing citizens and allowing for their democratic participation in debate. The program provides operational and developmental support to independent media outlets and networks around the world, proposes engaging media policies, and engages in efforts towards improving media laws and creating an enabling legal environment for good, brave and enterprising journalism to flourish. In order to promote transparency and accountability, and tackle issues of organized crime and corruption the Program also fosters quality investigative journalism.

Open Society Information Program

The Open Society Information Program works to increase public access to knowledge, facilitate civil society communication, and protect civil liberties and the freedom to communicate in the digital environment. The Program pays particular attention to the information needs of disadvantaged groups and people in less developed parts of the world. The Program also uses new tools and techniques to empower civil society groups in their various international, national, and local efforts to promote open society.

Open Society Foundations

The Open Society Foundations work to build vibrant and tolerant democracies whose governments are accountable to their citizens. Working with local communities in more than 70 countries, the Open Society Foundations support justice and human rights, freedom of expression, and access to public health and education.

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