

**Note:** the presentation from the Eurescom summit on 1 October 2003 is available [here](#). If you use Internet Explorer and click on the  icon in the bottom right corner of your screen the presentation will run online. You do not need Powerpoint for this.

## The Story of the Mexican Railroad, or the Opportunities for Local Investments in Broadband Infrastructure

Paper for the [Eurescom conference](#) on 29 September-1 October 2003

Joost Smits and Martin van Rossum

*Infocities Office, [www.infocities.eu.int/office](http://www.infocities.eu.int/office), written on 6 July 2003, rev. 17/7*

[jsmits@infosociety.com](mailto:jsmits@infosociety.com) and [martin@vanrossum.com](mailto:martin@vanrossum.com)

### Abstract

*More than a 100 years ago the Mexican railroad system was built to serve export. We will show parallels in the development of broadband. How is broadband legitimised? What are the popular applications? How does the market work? Does broadband introduce or solve the “digital divide”? What is the role of government? Which legal issues are there when a government provides dark fibre? How about the EU role in providing structural funding? Is the regulation complete and consistent? What does it presuppose? Is broadband going to be another Mexican railroad? Or are there solutions?*

### 1. Introduction

Erkki Liikanen, European Commissioner for Enterprise and Information Society, said the ultimate aim is that half of all Internet connections in Europe will be broadband connections in 2005. That is quite a challenge, with Greece trailing with no DSL connections. Railroads were the deciding factor in the economic development of countries in the 1800's. Those countries with denser rail grids would be the countries that would successfully modernise and industrialise in the 20th century. In a “normal” economy a rail road serves for internal, incoming and outgoing transports, for people and goods. In the book “Nationalism, Localism, and the Role of Intervention: A View of Rural Mexico” by Daniel Nugent [1] we found that in 1910 the Mexican rail network was radial, designed for importing and exporting rather than internal communication. The network also served growth rather than development: rather “quantity” than “quality”. At the turn of the century, Mexico was less than 15% urbanized.

This paper is about the role of the market and of government, about regulations, their foundations and their consistency. Our purpose is to provide you with an analysis, maybe leave you with more questions than you have now, but contribute to your knowledge of the role of government and the market.

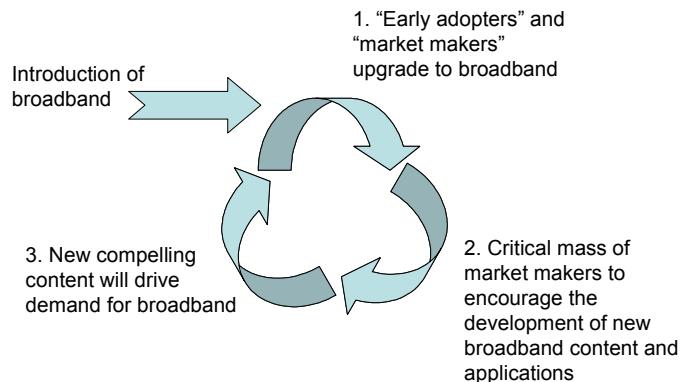
### 2. Need and necessity

In the TEN-Telecom Infocities project (1997-2006, feasibility phase 1997-1999) it was concluded that the only target of the “Information Society” could be the emergence, at an affordable price, of the means to create and process information independently of its nature [2]. There is no claim towards the speed of the information. If we start the analysis with “hi-speed information” we must state that the mode of information is driven by market forces. Investments in broadband solutions will have to compete with other modes of broadband, and alternatives. The users will weigh the perceived need and necessity, and judge solutions on cost-benefit motives. These alternatives each have their own characteristics: cable, DSL, satellite, GPRS, UMTS, radio, WiFi, or no broadband/virtual broadband. This last category is crucial. Consider sending a jet over the Atlantic filled with CD-ROMs. For certain applications real-time delivery is not necessary. Think of a Dutchman going on his bike to the corner video rental store, which takes five minutes. He rents a 100 minute movie. To enjoy the 4 gigabyte on the DVD, he spends 110 minutes, which gives a throughput of ±5 mbps. A speed not available in many countries at a cost comparable to that of the writing-off cost of a bike plus the cost of renting a DVD. Similar comparisons can be made for applications for small- and medium sized enterprises (SMEs).

According to the recently terminated E-commerce Action Team (ECAT), broadband is not essential to the progression of e-commerce in New Zealand. Chairman Gil Simpson said at the end of June: “you can do business at 56k[bit/s]” [3]. If meaningful business can't be done with a comfortable response time over a

56k modem, then the website has been badly designed. In his view there is a higher priority in getting everybody connected, then in having some users on high bandwidths. “It’s business that’s important, not technology.” Indeed, hold that thought.

The case of the Mexican railroad in essence can be described as asymmetric penetration (urban versus rural) and poor take up. Isn’t that also the case with broadband? According to director Tadhg Leonard of Corning Cable Systems, this can have serious consequences for economic development, regional development and even country competitiveness [4]. The “rural digital divide” should not be underestimated. If one considers education as the basis of all progress, the lack of telecommunication services hinders the provision of enhanced educational content for higher education and adult learning, for those living in rural areas. In addition, although some studies have shown that many rural residents have Internet access at work or via public libraries or community centres, home access is still somewhat limited.



**Figure 1: The Broadband Virtuous Circle (based on a figure in the BSG 2<sup>nd</sup> Annual Report [5])**

Figure 1 shows that as soon as broadband is introduced a self-propelling system goes into motion. Market forces decide upon the yae and nae towards investment. A divide will automatically be formed if, because of social, educational, or geographical reasons, people are excluded. And it is this divide, a market imperfection, which is the concern of government, whether local, regional, national or supra-national.

Nielsen/Netratings presented at the end of May research results under Internet-users in eight European countries (Italy, United Kingdom, Germany, Switzerland, Sweden, Spain, France and the Netherlands) and the United States [6]. The use of broadband in Europe continues its fast-paced increase. Especially music services such as Kazaa, the use of film and “adult sites” are supposed to contribute to this. Particularly the porn branch has grown considerably last year. According to the market searcher, the use of broadband has grown in one year with 136 per cent in Europe. The largest increase was realised in United Kingdom: plus 235%. In the European countries listed above now 28 out of 100 users surf by means of broadband (LAN, DSL or cable), says Nielsen/Netratings. By comparison: in the United States that is 35 percent and in Hong Kong even over 80 percent. The Netherlands scores above average with 36.6 percent, and takes thus the third place, after France (39 percent) and Spain (37.2 percent). Italy is the exception, where the use of broadband is relatively low.

At this stage, the main obstacle to achieving the best broadband solution for the consumer is financial rather than technical. The current business model for an entirely new infrastructure such as fibre to the home/SME is difficult to justify in most EU member states. Networking equipment vendor Juniper Networks even called the current business model “communist” [7]. Juniper means that users get the same capacity irrespective of the level of service they demand. Which makes the providers vulnerable, and makes the market virtually unpenetratable for new comers. As broadband becomes more mass market, it seems service providers will have to do more to make themselves stand out from the crowd. The Register quoted IDC analyst Jan Hein Bakkers: “As the market is maturing, an increasing number of operators will have to differentiate their product portfolios, to appeal to as wide an audience as possible.” [8] This will have to be done against the backdrop of incumbent telecommunications companies (telcos) continuing to play a major role in the broadband landscape - not only as the provider of wholesale DSL network connections, but also as retail ISPs. Unbridled competition literally bankrupted the industry, says analyst Blake Bath of Lehman Brothers Inc in BusinessWeek [9]. McKinsey issued a report [10] in which they say that it was also the short-term focus on taking value out of the industry, mostly through lower overall price levels, which has unwittingly dampened competition and slowed the introduction of broadband. Some time ago forecasts predicted 36 million European households with broadband connections in 2005. Now we are at a meagre 4 million.

The Dutch telecom watchdog OPTA made a remark about this in their 2003 “Vision on the Market” [11]. Particularly the consumer and SMEs could get the wrong end of the stick because of the hampered market. The larger enterprises already draw most attention of the providers. It depends on one’s taste if one sees another concern for government. BusinessWeek published a commentary in March 2003 [9] that says that oligopolies and monopolies may sound menacing, but the communications market has lived with them for more than a century: Western Union in telegraphs, AT&T in phones (and their brother and sister companies in Europe), the cable-TV monopolies, and the wireless-phone duopolies. These industries evolved and thrived, as long as there was federal, state, and local regulation. For Europe this story is not different.

At the end of June the Dutch telco KPN called upon local governments and cable companies to join hands and invest in a glass network [12]. The upgrading of the existing networks will reach its limit, and after that waits a € 10.000.000.000 investment in glass fibre that no single party can bear. KPN offers to split up its telephone network into around 50 local networks for the next 10 years, after which they can be retransformed in a larger entity. An interesting suggestion.

To summarise, we stated that market forces bring about ever more advanced technologies. But as soon as they are implemented a self-propelling system goes into motion, and a digital divide may (will?) be created. Which may be a concern for governments. On the other hand there are market imperfections that require regulation, also a subject from the realm of governments. Note the type of services that draw the majority of their audience from broadband surfers. We will get back to this later.

### 3. Regulation

The European Union promotes technology, by stimulating ICT R&D. And the EU makes policy, which is both telecoms policy and political “stimuli”, like eEurope. Call it a two-tier approach. eEurope is a political initiative with which the European Union plans to ensure the European Union fully benefits for generations to come from the changes the Information Society is bringing. eEurope is intended to accelerate positive change in the Union. It aims at ensuring this change towards the Information Society is cohesive, not divisive. The key objectives of eEurope are [13]:

- Bringing every citizen, home and school, every business and administration, into the digital age and online.
- Creating a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas.
- Ensuring the whole process is socially inclusive, builds consumer trust and strengthens social cohesion.

Developing new services needs significant investment, most of it from the private sector. But the Commission sees a problem: funding more advanced multimedia services depends on the availability of broadband for these services to run on, while funding broadband infrastructure depends on the availability of new services to use it. Action is therefore needed to stimulate services and infrastructure to create the dynamic where one side develops from the growth of the other. Developing the services and building the infrastructures is then mainly left to the private sector. And eEurope will create a favourable environment for private investment. This means not only developing an investment friendly legal framework but also taking action that stimulates demand and so reduces uncertainty to private investors. eEurope 2005 applies a number of measures to address both sides of the equation simultaneously. On the demand side, actions on e-government, e-health, e-learning and e-business are designed to foster the development of new services. In addition to providing both better and cheaper services to citizens, public authorities can use their purchasing power to aggregate demand and provide a crucial pull for new networks. On the supply side, actions on broadband and security should advance the roll-out of infrastructure.

To make this clearer, here is a graphic overview of the tasks of government, and the connected risks, as we found them in one of the European Commission’s presentations [14]:

<b>Gov. Roles/Risks</b>	<b>Technical Risk</b>	<b>Financial Risk</b>	<b>Market Risk</b>	<b>Standard Risks</b>
<b>R&amp;D Patron</b>	1	3	3	3
<b>Support/Subsidies</b>	2	1	2	2
<b>Customer</b>	3	1	1	2
<b>Regulator</b>	2	2	1	1
<b>Competitor</b>	3	1	1	2

In eEurope, government mainly has a control function. Besides that government stimulates R&D, functions in the bundling of demand, stimulates financially, is a launching customer, and regulator. The row “Competitor” is not developed in the eEurope program. Given the findings in the paragraph “Need and necessity” in this day and age it would even be rather pretentious to speak of a competitor in a market which is at best an oligopoly. And, where in the case of the Netherlands, industry even asks its competitors and the government to join hands. We find it difficult to form an idea of an elected parliament or council that would make its ministers or aldermen set up an organisation to compete with businesses that emerge from society. We would preferably speak of the “utility function” of government, instead of “competitor”. To distinguish from the comprehensive national plans, as they can be seen in Asia, where large-scale public funding is combined with governmental “guidance” of the private market.

As soon as people started to build boats, they collaborated to dig canals, which is now an obvious function of government. Since the train was invented, government generally took care of railroads. And when the Romans constructed good wagons, and Mr Ford managed to mass produce cars, government was stimulated to build roads. But, when we speak of the digital age, feudal methods are practiced. It is, so to speak, left to the farmers to build roads between their potato-fields. And then one hopes that these potato-truck-roads will be a good solution for citizens to travel from one city to the next, and for salesmen to visit their customers. Yes, quite. Even the telecom part of the European TEN programme hopes that by supporting tiny applications in 2-year projects real transeuropean telecommunications networks will arise. Just compare how different things are in the programme for transeuropean railroads.

Please be reminded that we are still talking at the level of railroads, canals, roads, and not about the boats, trucks, or even truck drivers and the truck stops where they stop for coffee and fries. In analogy, we mean “dark fibre”: unlit glass fibre cables. There is still some unclarity about whether governments are allowed to exploit dark fibre in the same way they do asphalt roads. Without being accused of market disturbance. We have indications that this unclarity is maintained by former state telcos and cable companies, who are already afraid of the unbundling of the local loop. And panic at the thought of having to compete on equal grounds with newer, leaner, more modern service providers. The European Commission puts emphasis on the unbundling of the local loop. See the motivation in Regulation (EC) No 2887/2000 [15]:

*It would not be economically viable for new entrants to duplicate the incumbent's metallic local access infrastructure in its entirety within a reasonable time. Alternative infrastructures such as cable television, satellite, or wireless local loops do not generally offer the same functionality or ubiquity for the time being.*

However, questions have been raised regarding the price the former state telco/cable company asks for use of its infrastructure. Even if the former state telco unbundles, it is difficult to assess whether a fair price is asked for the use of the infrastructure, or the telco subvents its competition on services with the income from the unbundling of its infrastructure. In theory other service providers could use rest capacity and let unused dark fibre pairs. However, there are documented cases of market parties who deny the use of rest capacity.

The European Commission wants companies and citizens to use broadband. Member states have to deliver their broadband strategy by the end of 2003. The EU also supplies funding for regional development. The Commission has specified, at the demand of France, what is and is not allowed with structural funding. In any case, on 9 April the European Investment Bank (EIB), the European Union's financing institution, issued a press release [16] that they signed a € 500 million loan, divided into two tranches of € 125 and 375 million, to Telefónica, for adapting its local loop to broadband services across the existing telephony network. Classed as telecoms infrastructure of European interest (TEN), the project

will allow the deployment of technologies such as ADSL (Asymmetric Digital Subscriber Line), ATM/IP (Asynchronous Transfer Mode/Internet Protocol) and ISDN (Integrated Services Digital Network) throughout Spain. More specifically, the loan will finance the digitalisation of Telefónica's local loop access and platforms for high-speed data transmission, telematics and integrated services. Upgrading the network will contribute to meeting Spain's growing demand for high-speed Internet services by providing faster, cheaper and widely available data transmission services and Internet access. In general, the project will cover Objective 1 and 2 regions, promoting regional development as well as fostering investment in innovation and helping to build the information society in Spain.

This loan comes under the EIB's "Innovation 2000 Initiative" (i2i) aimed at encouraging the development of a knowledge and innovation-based European economy. i2i focuses on human capital formation, research and development, the dissemination of information, promotion of SMEs and entrepreneurship, and development of information and communications technology networks.

From i2i's launch in June 2000 until April 2003, the EIB granted loans totalling over € 10.800 million for projects under this heading in the Union and Accession Countries, including more than € 2.250 million for schemes in Spain.

To conclude this chapter we summarise that under eEurope government mainly has a control function towards broadband. The utility function is underdeveloped.

#### 4. Solution?

We are very much under the impression that in Europe a Mexican railroad is being built. A railroad for purposes that have little or nothing to do with the needs of citizens and companies. And for the exploitation and finances we count on a market that does not exist, while at the same time we are afraid to hinder that non-existing market. While making it difficult for, for example, municipalities to answer to the needs of their citizens and companies. The European programmes try to convince us of a chicken-and-egg problem: funding more advanced multimedia services depends on the availability of broadband for these services to run on, while funding broadband infrastructure depends on the availability of new services to use it. If we may ask: what was the question? Is there demand for the advanced multimedia services? Currently broadband use rests on file-sharing sites, music sites, film sites and adult sites. Semi-legal at best. Is there a digital divide between those who "have" access to these sites and "have nots"? Even with the 4 million current broadband users, where are the applications that answer to needs of citizens and companies? Is distant learning for rural areas the killer application that makes all investments worthwhile? Isn't indeed "quantity" rising, but "quality" lagging? Is the New Zealand ECAT right, that you can do business with 56k as well?

That would be a grim conclusion of this paper, and we do not want to leave you like that.

There is a solution. Let's go back to the statement above, the quote from ECAT chairman Gil Simpson: "It's business that's important, not technology." Remember how a couple of years ago companies all over the world lost a lot of money when they tried to set up a Web site next to their production process, instead of integrated in the business process. Even governments made that mistake. Quite recently a Dutch report concluded that a lot of financial support from the central government to lower administrations seemed to have vaporised. The authors of the paper you are reading claim that in the "market" a lot more money was "vaporised" then in government, and that government at least has some learning capability from which the general public benefits and that these lessons were well spent. Let's not get too far into that. The point of these lessons is that one should *never* put too much emphasis on technology. There should always be a higher goal. A real question, instead of a solution looking for a problem.

And to give you a possibly happy feeling we will give you an example of a European programme, also linked to eEurope, which seems to have a much more productive recipe: Interreg. The Interreg III programmes are a European Community Initiative to stimulate transnational cooperation in the EU between 2000 and 2006. Interreg IIIB programmes cover larger transnational areas and the North Sea Region comprises areas of Sweden, Denmark, Germany, The Netherlands, The Flemish Region of Belgium, UK and Norway [17].

The "Interreg IIIB North Sea Region Programme & The Information Society" chapter quite distinctly starts from the premise that it is evident that ICT structures alone are not sufficient to promote regional development. Accompanying measures in other policy areas, such as regional structural policy or training, are required to improve the spatial advantages of a region. In this regard, it is also important that interaction between regions, towns and cities is enhanced and that they develop complementary characteristics, in addition to their competing features.

Indeed, we are suddenly talking about spatial planning. Just like where you construct roads, railways, canals, you should take care of digital highways. This way one treats the broadband problem from a much more natural viewpoint. Spatial development is fundamentally concerned with where (in what area) development happens. When outlining a project one should consider the wider spatial and regional development implications, instead of putting emphasis on broadband, roads or canals. And we believe that in spatial planning, while installing or modifying types of infrastructure, there is a natural role for government, whether it is national, regional or municipal.

eEurope asks European member states to develop broadband strategies before the end of 2003, but it does not guide them to avoid Mexican railroads. In our view these strategies should not be money-driven, technology-driven or, spare us, consultancy-driven, but problem-driven. To address and solve problems for their citizens and companies which are otherwise not solved.

## 5. About the authors

Infocities Office is the project office of the largest TEN-Telecom project ever: Infocities (1997-2006, feasibility phase 1997-1999 funded by the EU). Martin van Rossum and Joost Smits are project managers and proposal writers for TEN-Telecom, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> Framework projects, often originating from the Telecities network ([www.telecities.org](http://www.telecities.org)).

## 6. References

- [1] Daniel Nugent (ed.), “Nationalism, Localism, and the Role of Intervention: A View of Rural Mexico”, Duke University Press, Durham, NC, 1998
- [2] “Infocities Reference Model”, a contribution of the City of Liège (B) with the sponsoring of the ASBL TITAN, [www.infocities.eu.int](http://www.infocities.eu.int)
- [3] Stephen Bell, ““You can do business at 56k””, interview with ECAT and Chairman Gil Simpson, Computerworld news on 23 June 2003, [www.computerworld.co.nz](http://www.computerworld.co.nz)
- [4] Tadhg Leonard, “The impact of municipal infrastructure on Broadband penetration”, presentation at the ECTA Conference 2002, 18-20 March 2002, Monte Carlo
- [5] “Second Annual Report and Strategic Recommendations”, Broadband Stakeholder Group (BSG), UK Government’s key advisory group, November 2002, [www.broadbanduk.org](http://www.broadbanduk.org)
- [6] “Broadband Revolutionizing Europe’s Internet Behaviour”, Nielsen//Netratings, Press Release, 29 May 2003, [www.nielsen-netratings.com](http://www.nielsen-netratings.com)
- [7] Tim Richardson, “UK broadband users follow ‘communist doctrine’”, The Register, 13 February 2003, [www.theregister.com](http://www.theregister.com)
- [8] Tim Richardson, “BB growth doubles in Europe and US”, The Register, 11 June 2003, [www.theregister.com](http://www.theregister.com)
- [9] Steve Rosenbush with Catherine Yang, “Commentary: Broadband Policy: Did Somebody Say Oligopoly?”, BusinessWeek online, 18 March 2003, [www.businessweek.com](http://www.businessweek.com)
- [10] “A regulatory remedy for European broadband”, The McKinsey Quarterly, 2002 Number 1, [www.mckinseyquarterly.com](http://www.mckinseyquarterly.com)
- [11] “OPTA-Voorzitter: ‘Nieuwe monopolisering dreigt in communicatiesector’” (“OPTA Chairman: ‘New monopolisation threatens communications sector’”), OPTA, Press Release 14 May 2003, [www.opta.nl](http://www.opta.nl)
- [12] “KPN roept op tot allianties in glasvezel” (“KPN calls for alliances in glass fibre”), Het Financieele Dagblad, 27 June 2003, [www.fd.nl](http://www.fd.nl)
- [13] “eEurope, An Information Society For All”, European Commission, Communication on a Commission Initiative for the Special European Council of Lisbon, 23 and 24 March 2000, [www.europa.eu.int/information\\_society/eeurope/](http://www.europa.eu.int/information_society/eeurope/)
- [14] European Commission presentation by Mr Spyros Konidaris, “the Long Way to Broadband”, Global Forum, Washington, October 2002
- [15] Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop

- [16] “Spain: EUR 500 million loan to Telefónica for roll-out of broadband technologies on its local loop”, European Investment Bank, Press Release 2003-035, 9 April 2003, [www.eib.org](http://www.eib.org)
- [17] “Interreg IIIB North Sea Region Programme & The Information Society”, Interreg IIIB North Sea Region, Programme Secretariat, [www.interregnorthsea.org](http://www.interregnorthsea.org)
- [18] N.H.G. Baken, R.W. Wagenaar & M. Weijnen, “Modularity in Infrastructures: between freedom and limits of choice. The case of broadband information infrastructures”, paper, 16 December 2002