

Making broadband available to everyone

The national plan of action to improve the infrastructure of the information society



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Abstract <p>Good telecommunications access has evolved from a luxury into a necessity and citizens require telecommunications access of a high standard for both work and leisure. However, certain telecom operators have announced their intention of cutting back services in the fixed telecommunications network across wide swathes of the country and citizens no longer have access to vital services on market terms in all parts of the country. Due to these changes in the communications market it is time for the public sector to take more decisive action to ensure a regionally equitable communications infrastructure.</p> <p>On 8 May 2008, Ms Suvi Lindén, Minister of Communications, appointed Mr Harri Pursiainen, Permanent Secretary, to study the means of ensuring a comprehensive broadband supply throughout the country and of organising its funding especially in non-built-up areas. The first part of the study includes a proposal for a government resolution and the second part examines the reasoning behind the proposal topic by topic.</p> <p>The report proposes that the public sector introduce business subsidies to enterprises that upgrade the public telecommunications network into a condition that makes available to most all citizens by 2015 an optical fibre or cable network supporting 100 Mbit connections. Prior to this goal, the speed of the broadband connection included in the universal service obligation must be raised to an average of 1 Mbit/s by the end of 2010 at the latest.</p> <p>In order to finance the State contribution required for the target for 2015, it is proposed that certain radio frequencies coming up for allocation be auctioned. In the event that auction revenues are insufficient to cover the State's public aid for telecommunications infrastructure construction, the shortfall would be made up with a telecommunications network compensatory payment to be collected from telecommunications operators. The auction revenues and the compensatory payments could be entered as income and decisions on their use made either through the Budget or by means of a fund outside the Budget.</p>			
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To the Ministry of Transport and Communications

The Ministry of Transport and Communications appointed the undersigned on 8 May 2008 to study the means of ensuring a comprehensive broadband supply throughout the country and of organising its funding especially in non-built-up areas.

In Finland, we are accustomed to relying on telecommunications operators to supply comprehensive and reasonably priced communications services on market terms. This reliance has resulted in a communications policy fairly favourable towards telecommunications operators, with no intervention by the State in the activities of telecommunications operators in the form of strict licence terms or taxes and charges, for example. No significant amount of public funds has been used on the construction of the public communications infrastructure.

However, two major shifts have taken place in the communications market that force us to reconsider means in communications policy as well.

Firstly, good telecommunications access has evolved from a luxury into a necessity. Citizens require telecommunications access of a high standard for both work and leisure. One may well state that people can only be members of the ubiquitous information society if their telecommunications access is sufficient in order for them to use services. The national broadband strategy of 2004 has delivered good results, yet the growing need for faster connections mandate a reassessment of that strategy as well.

The second shift in the communications market is a commercial one. Certain telecommunications operators have announced their intention of cutting back services in the fixed telecommunications network across wide swathes of the country. Steps taken by the Ministry of Transport and Communications have in the past, and may also in the future, have such an impact as to ensure that no one's level of service suffers due to measures of this kind. Customers are being offered replacements in the form of wireless connections, which are well able to satisfy basic communication needs in the current situation. Even in the medium term, however, wireless broadband alone will not suffice to meet the demand for more and better connections.

These two shifts in the communications market give rise to the obvious conclusion that citizens no longer have access to vital services on market terms in all parts of the country. This conclusion is made a worrisome one by the fact that advances in the ubiquitous information society are premised on a constantly developing network infrastructure. It has become obvious that in the foreseeable future, this cannot be ensured throughout the country on a commercial basis. The disparity in level of service between built-up and non-built-up areas is increasing.

Owing to the above, Finnish communications policy has reached a turning point. The shift in social and commercial reality necessitates a re-thinking of communications policy means as well. It is time for the public sector to take more decisive action to ensure a regionally equitable communications infrastructure.

In this report, I propose that the public sector (the State, regions and municipalities) introduce business subsidies to enterprises that undertake commercially unviable measures to upgrade the public telecommunications network into a condition that makes available to most all citizens by 2015 an optical fibre or cable network supporting 100 Mbit connections. Prior to this goal, the speed of the broadband connection included in the universal service obligation must be raised to an average of 1 Mbit/s by the end of 2010 at the latest.

In order to finance the State contribution required for the target for 2015, I propose the auctioning of certain radio frequencies coming up for allocation. In the event that auction revenues are insufficient to cover the State's public aid for telecommunications infrastructure construction, the shortfall would be made up with a telecommunications network compensatory payment to be collected from telecommunications operators.

In addition to the situation now at hand, it is also vital to monitor the incipient massive transition in commercial services, advances in communications technology, and the usage habits of people. I propose that the drafting of a new plan of action to prepare for the post-2015 situation commence in 2012. In drafting the new plan of action, the needs for changes to the plan of action in effect must also be catered for, in the event of demand or supply differing from that anticipated, for example.

I hereby respectfully submit to the Ministry of Transport and Communications my proposal drafted in the form of a Government Resolution and inclusive of reasoning.

At the Ministry of Transport and Communications on the 15th of September 2008

Harri Pursiainen

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1. Government Resolution

I propose that the Government issue the following resolution:

Government Resolution

National plan of action for improving the infrastructure of the information society

The Government has on this date issued the following resolution:

Objective of plan of action

1. The development of the communications infrastructure is ensured so as to give citizens and businesses, regardless of place of residence or location, access to information society services as permitted by the supply of such services and required by the needs of each respective user.

Through measures in accordance with the plan of action:

the public telecommunications network will be upgraded in such a manner as to make available to users a number of subscriber connections sufficient for access to information society services,

the reasonable price of broadband services will be ensured, and

the State contribution to funding necessary for the measures will be made available.

Target level in 2010 and measures required

2. Legislation and licence policy will be the tools employed to ensure that by 31 December 2010 at the latest every permanent residence as well permanent office of businesses and public administration bodies has access to the efficient use of e-services, transmission of digital images and up-and downloading of digital music and video clips.

In terms of technology, the use of these services requires a fixed or wireless subscription connection with an average downstream rate of 1 Mbps at least.

3. The network operator licences granted by the Government will be reviewed and the obligations under possible new licences assigned in a manner enabling achievement of the target level in 2010. The change in the UMTS licence of the most important provider of communications services in non-built-up areas will be made effective as of 1 January 2010.

4. The Communications Markets Act will be amended as of 1 July 2009 in such a manner that the target level for 2010 is defined as a universal service which a telecommunications operator subject

to a universal service obligation is obliged to provide to permanent residences and business offices at a reasonable price by 31 December 2010 at the latest.

The definition shall be technology-independent, permitting the universal service to be implemented as a fixed or wireless connection. The Act shall permit the modification of the definition of universal service as necessary to reflect development in the information society.

Pursuant to the Act, the Finnish Communications Regulatory Authority will by 31 December 2009 designate for each area a telecommunications operator subject to universal service obligation, which shall provide services in accordance with the universal service obligation by 31 December 2010 at the latest.

5. The Communications Markets Act will be amended as of 1 July 2009 for the universal service obligation to apply also in practice to network operators as well.

6. A telecommunications operator shall provide the universal service to users at a reasonable price in the area in which the telecommunications operator has been assigned the universal service obligation by the Finnish Communications Regulatory Authority. The Finnish Communications Regulatory Authority shall monitor the reasonableness of service fees as provided in law. Telecommunications operators will be reimbursed for unreasonable net expenditure arising from fulfilment of the universal service obligation if the conditions under law are met. However, the premise shall be for telecommunications operators also in future to perform their universal service obligations without public funding.

Target level in 2015 and measures required

7. The target will be set that by 31 December 2015, an optical fibre or cable network permitting 100-megabit connections shall be available throughout the country according to demand, and that at least 99 percent of permanent residences and permanent offices of businesses and public administration bodies have access, through a fixed or wireless subscriber line of no more than two kilometres' length linked to the said network, to communications services and other information society services that require very high-speed connections.

8. The telecommunications operators will build and maintain the public telecommunications network on a commercial basis in accordance with law, licences and regulations. The public sector will support telecommunications operators in accordance with this plan of action if the target level for 2015 cannot be commercially achieved in a given area and this cannot be required of telecommunications operators under law, licence or regulations. The adverse effects of the business subsidies on the communications markets and competition will be minimised.

9. The public telecommunications network remaining at a standard required by the development of the information society also in non-built-up areas will be ensured as a part of overall regional and community planning. Regard will be had in planning to the needs of citizens, the business sector and public services.

The Ministry of the Environment together with the Ministry of Transport and Communications will by 1 July 2009 assess the means by which the planning of optical fibre-laying will be incorporated into overall land-use planning.

10. Under the leadership of the Ministry of Transport and Communications, the national broadband strategy of Prime Minister Matti Vanhanen's first Cabinet will be revised to support this plan of action. Particular attention will be paid to the promotion of optical fibre and wireless broadband in non-built-up areas.

The Regional Councils together with municipalities will by 30 October 2009, taking into account trends in population and regional development, assess the development of the demand for high-speed connections as well as the need for development of the public telecommunications network in the region. Based on these assessments, plans will be drafted by the two parties for the achievement of the target for 2015.

The regional plans shall comprise municipality-specific surveys of internal migration and changes in actual demand.

11. Inasmuch as the regional plans indicate that the level of service for 2015 will not be achieved commercially, the Regional Councils will put plan implementation out for competitive tendering by telecommunications operators and will select the company or consortium implementing the plan in the best and most economical manner to receive the business subsidy. The competitive tendering will be implemented in such a manner that the necessary construction can take place in 2010–2015 and the target level is achieved by 31 December 2015.

12. Customers will acquire their subscription connection at their own expense from the telecommunications operator or other provider of their choice.

Extending the domestic help credit to cover the installation and maintenance of and guidance in information and communications technology equipment, software, information security and telecommunications will also promote the equality of citizens in acquiring a broadband subscription.

13. The acquisition of subscription connections of a speed higher than the universal service level in agriculture and tourism as well as other business will continue to receive support from public funds through existing forms of subsidisation.

14. Inasmuch as the target level for 2015 is not achieved commercially, business subsidies not to exceed 67% of the costs will be given to upgrade the public telecommunications network. The subsidies will consist of a State contribution (no more than 33 percent), a contribution by regions and municipalities (ca. 27 percent) and a contribution from EU structural funds (ca. 7 percent).

The State will only contribute to those costs of regional plans vital to the achievement of the target level for 2015. The State's broadband subsidy in the years 2010–2015 will come to an estimated 11 million euro at most (at 2008 prices), however no more than the sum equivalent to the auction revenue and compensatory payments mentioned in item 16.

15. The Finnish Communications Regulatory Authority will pay the subsidy contribution of the State to the Regional Councils in accordance with the Government plan described below. The Finnish Communications Regulatory Authority will evaluate the plans of the Regional Councils towards which the subsidy is paid. The Regional Councils would use the broadband subsidy received as business subsidy towards the costs of public telecommunications network upgrades according to contracts.

16. Revenue to finance the plan of action will be accumulated through auctions of radio frequencies and, if these prove insufficient, with a telecommunications network compensatory payment to be collected from telecommunications operators as necessary. A separate Act will be enacted on the auctioning in 2009 of certain radio frequencies set aside for the provision of wireless broadband in the manner modelled by the working group which studied the issue.

In the event that auction revenue proves insufficient to finance the State's expenditure under this resolution, a telecommunications network compensatory payment will be collected from telecommunications operators on a pro rata basis based on their number of broadband subscriptions. The revenue will also be used to finance the administrative and collection costs relating to the compensatory payment.

Revenue crediting and decisions on the use of revenue¹

17. a) Budget model

The revenue from the auctions and the frequency fees are credited to the State budget as distinct items and the funding necessary to pay the broadband subsidy is allocated to the main title of expenditure of the Ministry of Transport and Communications as a distinct expense item.

The Finnish Communications Regulatory Authority pays the subsidy to the Regional Councils on the basis of the plans submitted by these in accordance with the plan on the national need for funding and its regional allocation adopted by the Government.

17. b) Fund model

The revenue from the auctions and frequency fees is credited to an extra-budgetary fund from which the broadband subsidies are paid. The Act on the State Television and Radio Fund (745/1998) is amended to permit the use of the fund's assets also to subsidise construction of the public telecommunications network in order to ensure equality in information society development. The name of the fund is changed to the State Communications Fund.

The utilisation plan for the State Communications Fund is adopted annually by the Government and includes, in addition to the current funding plan for television and radio activities, also a plan on the State broadband subsidy to be allocated to the Regional Councils.

The assets to be used for funding the Finnish Broadcasting Company Ltd on the one hand and for State broadband subsidies on the other are kept separate in the fund and the assets are not used for purposes other than that for which they were collected.

In the event that assets in excess of that required for the State broadband subsidy accumulate into the fund, the assets shall remain in the fund. If assets not spent on expenditure remain at the end of 2015, the excess assets are credited to the State budget. The administrative expenses and overheads

¹ Since the alternatives are either a model of crediting through the State's on-budget activities or an extra-budgetary fund model, a proposal according to both is submitted in the following. The alternatives are described and compared below in the reasoning of the resolution.

necessitated by the administration of the broadband subsidy and payable to the Finnish Communications Regulatory Authority are incorporated into the utilisation plan.

18. The State, provinces and municipalities prepare to support the development of the public telecommunications network also after 2015 in the manner necessitated by the development of the information society.

Conditions to the realisation of the plan of action

19. This resolution is conditional and will be realised in respect of the State provided that the Regional Councils and municipalities for their part act in accordance with the objectives and measures of the resolution.

20. The State subsidy will be notified to the European Commission in the manner separately provided in law. Realisation of the subsidy is subject to Commission approval.

2. Reasoning of the proposal

Objective of plan of action

Objective of plan of action

1. The development of the communications infrastructure is ensured so as to give citizens and businesses, regardless of place of residence or location, access to information society services as permitted by the supply of such services and required by the needs of each respective user.

Through measures in accordance with the plan of action:

the public telecommunications network will be upgraded in such a manner as to make available to users a number of subscriber connections sufficient for access to information society services,

the reasonable price of broadband services will be ensured, and

the State contribution to funding necessary for the measures will be made available

Development of the public telecommunications network is undertaken by telecommunications operators on a commercial basis. Services are supplied according to demand, which is why a telecommunications network covering the entire country will not come about on market terms. Several communications policy means are available to ensure that the target level is achieved. The plan of action concerns the employment of these means.

According to the Government Programme of Prime Minister Matti Vanhanen's second Cabinet,

“The Government will improve the availability of high-speed connections by promoting the construction of optical fibres and wireless networks and develop the service infrastructure of the information society. The availability of versatile and high-standard communications services will be ensured throughout the country by promoting network construction, also with public funding, in areas where such services are not commercially available. The goal is to make available to the citizens and businesses comprehensive and easy-to-use electronic public services geared to make daily life easier.”

Target in 2010 of 1 Mbit access for all

2. Legislation and licence policy will be the tools employed to ensure that by 31 December 2010 at the latest every permanent residence as well permanent office of businesses and public administration bodies has access to the efficient use of e-services, transmission of digital images and up- and downloading of digital music and video clips.

In terms of technology, the use of these services requires a fixed or wireless subscriber connection with an average downstream rate of 1 Mbps at least.

At present, broadband subscriber connections (256 kbit/s)² are available to nearly all 2.4 million households and 250,000 permanent business offices through the standard solutions offered by telecommunications operators. This basic level of service is adequate for i.a. sending and receiving email and for internet browsing, yet insufficient for efficient e-services, image transmission or the uploading and downloading of music and video clips.

Supply differs markedly between non-built-up and built-up areas. In built-up areas, connections of up to 100 megabits are commonly available from competing telecommunications operators. TeliaSonera Finland Corporation (hereinafter TeliaSonera) is the most important communications services provider in non-built-up areas in Finland. In February 2008, TeliaSonera announced its decision to provide voice and data communications to some 53,000 fixed network customers of its in designated areas by means other than the traditional fixed telephone network. The Ministry of Transport and Communications requested a detailed undertaking from the company as to the steps it intended to take to ensure that the measures announced by the company would not result in forfeiture of rights on the part of any customer. The undertaking was supplied by TeliaSonera to the Ministry of Transport and Communications in March 2008 and the company stated therein its commitment to retaining its customers' current voice services and broadband connections until such time that a substitutive wireless solution is available. The company further committed to providing to customers voice services and internet access according to the universal service obligation in all municipalities where TeliaSonera is bound by a universal service obligation in accordance with the Communications Markets Act.

A second major communications services provider Elisa Corporation announced in August 2008 its intention to focus its broadband offering in growth centres and to withdraw from other locales. The withdrawal also applies to mid-sized towns such as Mikkeli, Seinäjoki and Pori.

I propose that the first target date for the plan of action be set at 2010, as the law-drafting and administrative measures under the plan of action and the modification of commercial activities accordingly take some time.

The target level will be set at the kind of fixed or wireless broadband subscriber connection that permits the efficient use of e-service as well as e.g. transmission of digital

² Kotitalouksien telepalveluiden alueellinen saatavuus 2008 [The availability of telecommunications services important to households 2008]. Publications of the Ministry of Transport and Communications 37/2008

images and downloading of digital music and video clips. In terms of technology, the use of these services requires a fixed or wireless subscriber connection with an average downstream rate of 1 Mbit/s at least. In the longer term, the objective must be to achieve sufficient upstream rate as well. Symmetrical connection rates sufficient for the use of information society services can be achieved by realising the target level for 2015 proposed below.

The economically viable achievement of the target level for 2010 in non-built-up areas requires the application of wireless technology as well. Subsequent to the implementation of the measures proposed below, a subscriber connection of at least 1 Mbit will be available to every permanent residence as well permanent office of businesses and public administration bodies in 2010.

In the spirit of the Communications Market Act in force as well as the universal service legislation of the European Union, the plan of action aims only to ensure the level of service available to permanent residences and permanent offices of businesses and public administration bodies. It does not as such ensure broadband access for all holiday homes, yet in practice, the target level would make 1 Mbit connections available to nearly all holiday homes as well.

The target level for 2010 will be secured by reviewing licence regulation and amending the legislation concerning universal service.

Obligations under licences reviewed

3. The telecommunications operator licences granted by the Government will be reviewed and the obligations under possible new licences assigned in a manner enabling achievement of the target level in 2010. The change in the UMTS licence of the most important provider of communications services in non-built-up areas will be made effective as of 1 January 2010.

Licence regulation is limited in scope. Under law, only the provision of telecommunications networks from which wireless subscriber connections are offered constitutes telecommunications subject to licence.

At present, mobile licences do not contain specific coverage requirements except for the licence for the @450 network granted to Digita Oy (hereinafter Digita). However, it might be justified to include in the licences a more detailed determination of the network coverage requirements in order to ensure citizens an adequate level of service.

I propose that in order to secure the level of service, an obligation concerning broadband service (1 Mbit/s) be added to the licence granted to TeliaSonera for the provision of network service in the UMTS mobile network, which obligation shall become applicable if the company is unable to prove that a corresponding level of service can be implemented with other technology. The change to the licence, to which the company has already consented (TeliaSonera's letter of 12 March 2008, response of the Ministry of Transport and Communications on 30 May 2008) would take effect on 1 January 2010.

The Finnish Communications Regulatory Authority (the Finnish Communications Regulatory Authority) is currently looking into the technological potential of allocating one new frequency channel to Digita's @450 network. If the frequency channel can be allocated, I propose expansion of the coverage obligation already included in the company's licence. The study will be completed by the end of September 2008.

The next licences to be granted by the Government will in all likelihood concern the 2.5–2.69 GHz frequency band, in which the costs of network construction will be fairly high and which in terms of technical qualities is best suited for the provision of very high-speed connection rates in built-up areas. The obligation to commence operations included in the licences should be drafted in a manner that requires the deployment of the frequencies to be granted, according to coverage to be determined separately, by a certain deadline.

A second new frequency band that could be used for the provision of wireless broadband service is UHF 790–862 MHz no longer needed for analogue television broadcasting. This frequency band was allocated to broadband digital mobile networks already by virtue of a Decree issued in June 2008 (441/2008). The qualities of the frequency band make it well suited for the construction of a comprehensive network. The possibility of imposing in the licences a requirement of very high population coverage should be evaluated when the licences for this frequency band are granted.

Broadband made universal service under law

4. The Communications Markets Act will be amended as of 1 July 2009 in such a manner that the target level for 2010 is defined as a universal service which a telecommunications operator subject to a universal service obligation is obliged to provide to permanent residences and business offices at a reasonable price by 31 December 2010 at the latest.

The definition shall be technology-independent, permitting the universal service to be implemented as a fixed or wireless connection. The Act shall permit the modification of the definition of universal service as necessary to reflect development in the information society.

Pursuant to the Act, the Finnish Communications Regulatory Authority will by 31 December 2009 designate for each area a telecommunications operator subject to universal service obligation, which shall provide services in accordance with the universal service obligation by 31 December 2010 at the latest.

The internet access rate required under the current universal service obligation is only 30–50 kbit/s. This speed is no longer sufficient for using information society services, as best demonstrated by the fact that the vast majority of internet access today is made available as substantially faster broadband connections.

Universal service shall be defined independent of technology and with respect for market dynamics. The key factor is the level of service to the user, not the technology

employed to achieve the level of service. Imposing a universal service obligation higher than 1 Mbit per second at the current phase of information and communication technology would mean that the universal service could not be implemented with wireless solutions across the country. The cost effects of this would be substantial. Technology is evolving, however, and the speed of wireless broadband is increasing. The question of the level of universal service can be revisited in the next decade.

According to the EU Directive on universal service and users' rights relating to electronic communications networks and services, provision of access includes sending and receiving data at rates that are sufficient to permit functional Internet access, taking into account prevailing technologies used by the majority of subscribers and technological feasibility. The Directive provides no unambiguous definition as to whether functional internet access might refer to broadband access. According to the notification of the Finnish Communications Regulatory Authority, the majority of subscribers in the Finnish communications market have access to a transmission rate of 1 Mbit at least.

Under the Universal Service Directive, Member States may resolve to require impose higher speed requirements on publicly available communications services. In such a case, the Member States shall finance the extra net cost of universal service obligations as separately defined e.g. from general government budgets.

The actual speeds³ of broadband connections vary to a certain degree e.g. at different times of day depending on network load⁴. Likewise, the properties of the terminal equipment device as well as user location, environment and mobility also impact on the data transfer speed perceived by the user. In laying down provisions on the universal service speed of internet access, it would be justified to set a minimum standard for the day's average connection rate, in which case a temporary tolerance of +/- 25% could be considered acceptable⁵. Upstream and downstream rates are symmetrical in optical fibre networks, whereas the maximum upstream and downstream rates in wireless networks are usually defined asymmetrically. In Digita's @450 network, for example, the theoretical downstream rate may be 5.8 Mbit/s while the upstream rate is 1.8 Mbit/s. In Finland, the maximum speeds of the network in practice could be 2 Mbit/s downstream and 512 kbit/s upstream (with one additional channel).

Higher connection rates will obviously be needed in future as the scope and number of information society services available online increases. A dynamic definition of the universal service is therefore appropriate, allowing the related connection rate to be increased in line with advances in the information society. However, any increases in rates must be foreseeable and also feasible in terms of technology as well as economy.

³ Telecommunications operators providing broadband connections state connection rates as nominal rates. Nominal rate refers to the maximum rate of the connection under good conditions. The actual rate of the subscription is often lower than the nominal rate. The nominal and actual rate of a subscription can be compared to road traffic. The nominal speed on a highway is limited to e.g. 120 km/h. More than one lane is built on those roads with the highest volume of traffic; motorways have two lanes both ways, for example, but may nevertheless also experience congestion at times, leaving the actual speed of vehicles below the nominal 120 km/h. Practice has shown that vehicles are capable of interlacing so well in traffic that two lanes suffices for even high traffic flows. All internet traffic is based in principle on the same kind of interlacing as in road traffic. Data moves on the internet in packages which interlace successively in a shared medium dimensioned on the basis of estimated total usage.

⁴ The capacity taken up by an individual user of the internet depends materially on the type of internet service used. The majority of internet usage comprises browsing the World Wide Web, using email or watching videos, which only take up capacity momentarily, whereas major problems arise from P2P heavy users sharing music and films over the internet. The number of such users is relatively small, yet they appropriate much of the available capacity. This kind of usage is the main reason why the actual speed of other users' service falls below the nominal speed. In road traffic, this is analogous to an oversized vehicle blocking both lanes on a motorway but only travelling at 20 km/h, forcing other road users to match that low speed.

⁵ The principles for measuring tolerance should be determined in connection with law-drafting in cooperation with the authorities and the operators.

The provisions governing this procedure would be laid down in the Act currently under preparation in the Ministry of Transport and Communications.

Universal service obligation extended also to network operator

5. The Communications Markets Act will be amended as of 1 July 2009 for the universal service obligation to apply also in practice to network operators as well.

The provisions of the Universal Service Directive do not prevent Member States from designating different companies as universal service provider for the network on the one hand and for services on the other. The Directive has been transposed into Finnish legislation with the Communications Markets Act, which at present contains no mention of the obligation on a network operator to provide a service company with the network equipment necessary for the implementation of a subscription.

I propose more detailed regulation in such a manner that a universal service obligation may in future also be imposed on a network operator. When a telecommunications operator acting solely as a network operator may also be made subject to a universal service obligation, the availability of communications services in non-built-up areas in particular can be secured more effectively than at present. In such a case, the universal service company would be e.g. obligated to provide the network service, such as e.g. a subscriber connection, to the service operator designated as universal service company.

No distinct public funding required for broadband universal service

6. A telecommunications operator shall provide the universal service to users at a reasonable price in the area in which the telecommunications operator has been assigned the universal service obligation by the Finnish Communications Regulatory Authority. The Finnish Communications Regulatory Authority shall monitor the reasonableness of service fees as provided in law. Telecommunications operators will be reimbursed for unreasonable net expenditure arising from fulfilment of the universal service obligation if the conditions under law are met. However, the premise shall be for telecommunications operators also in future to perform their universal service obligations without public funding.

If it becomes apparent that the provision of the universal service places an unreasonable financial burden on the universal service operator, the Finnish Communications Regulatory Authority shall at the request of the universal service operator calculate the net cost of the universal service. Net cost refers to the costs arising from the provision of the service which the universal service operator is unable to cover with the proceeds from the service. To date, no compensation of universal service costs to telecommunications operators subject to universal service obligation has been necessary in Finland.

At the request of the universal service operator, it shall be reimbursed from public funds for the portion of the net cost of the universal service forming an unreasonable financial burden. The decision on reimbursement of costs shall be taken by the Ministry of Transport and Communications. Minor net costs do not necessarily entitle to re-

imbursement; the entire volume of the telecommunications operator's business may be reviewed when assessing unreasonableness. Under current law, a universal service company may have to provide a service at a loss if this is not unreasonable with regard to the telecommunications operator's overall financial situation.

I propose no changes to the universal service determination procedure. Telecommunications operators would retain the right to set their own customer prices also in future. However, the price of the 1-Mbit subscriber connection provided as a universal service shall be reasonable to the customer.

If the provision of the service to customers at a reasonable price becomes an unreasonable burden on the telecommunications operator when assessed as a whole, the Finnish Communications Regulatory Authority shall estimate the net costs and the telecommunications operator will be reimbursed for unreasonable net costs in accordance with the Communications Markets Act. However, the premise shall be for telecommunications operators to perform their universal service obligations also in future without public funding.

Target for 2015: 100 Mbit access available to all

7. The target will be set that by 31 December 2015, an optical fibre or cable network permitting 100-megabit connections shall be available throughout the country according to demand, and that at least 99 percent of permanent residences and permanent offices of businesses and public administration bodies have access, through a fixed or wireless subscriber line of no more than two kilometres' length linked to the said network, to communications services and other information society services that require very high-speed connections.

The need for higher connection rates will increase in line with advances in the information society. I propose the longer-term objective of giving the vast majority of Finnish households, in addition to access to ordinary e-services and digital photo transmission, etc., access i.a. to the following services:

1. television services on several different channels (both standard and high-definition)
2. downloading very large files (e.g. films)
3. more efficient use of several computers at the same time (e.g. remote work, social networking services)

The use of these services requires telecommunications of a materially higher standard than at present.

When setting the target level, particular attention must be paid to the fact that telecommunications needs evolve in rural areas in the same manner as in urban areas. The need for access to the aforementioned services may even be higher in rural areas due to long distances and the remoteness of services. In addition to ordinary household telecommunications requirements, special requirements in rural areas comprise e.g. remote healthcare, which may be estimated to necessitate a connection rate of at least 2 Mbit even at present. Higher connection rates are also needed in business in rural ar-

eas, e.g. at animal farms. A 1-Mbit connection may prove sufficient to monitor animal farms, yet the required speed for e.g. automatic milking systems is expected to rise to 8 Mbit/s in the near future. In farm tourism, connection rates at least equal to those of household are required. Wireless broadband is in particular demand at grain farms and in reindeer farming and forestry machine services.⁶ The more demanding e-services as well as the various forms of remote work, such as remote interpretation, may also call for higher than average connection rates.

The maximum length of the subscriber connection to be acquired by the user could be two kilometres, for example. A proposal along the same lines has also been submitted by a rapporteur to the Swedish Government.⁷ Households will of course themselves decide the technology and connection rate of the subscriber connection extending from the optical fibre or cable network to the home. Laying optical fibre or cable all the way to the home provides households with the fastest internet access. The provision of an optical fibre or cable network close by, however, also has the effect of making very high-speed wired or wireless subscriber connections feasible with other technologies as well.

The target level proposed corresponds to the aims set out in the National Knowledge Society Strategy 2007–2015 adopted by Prime Minister Matti Vanhanen’s first Cabinet, according to which:

The national plan of action will be used to ensure that broadband connections with a speed of 100 Mbit/s are comprehensively available to households, enterprises and public administration bodies. The use of optical fibre is expanded in new buildings and buildings being renovated.

The Cabinet in office has approved the information society policy objectives of its predecessor, giving concrete expression to these in the ubiquitous information society action plan and the measures thereunder. According to the Government Programme, “The Government will improve the availability of high-speed connections by promoting the construction of optical fibres and wireless networks and develop the service infrastructure of the information society. The availability of versatile and high-standard communications services will be ensured throughout the country by promoting network construction, also with public funding, in areas where such services are not commercially available. The goal is to make available to the citizens and businesses comprehensive and easy-to-use electronic public services geared to make daily life easier.”

The target proposed may also be justified by the increasing need in future for symmetrical connections that feature high upstream rates as well. This need will be fuelled by demand from remote work, tourism and rural business, among others.

It is quite possible that by 2015, a majority of households are already provided, on commercial terms, with connection rates of several tens of megabits using wireless technologies. At the same time, however, a rise will be seen in regional disparity in the supply of communications services. The wireless broadband speeds provided will also in future correspond to basic demand in built-up areas whereas in non-built-up

⁶ Omnitele: Selvitys maaseudun tietoliikennetarpeista [Report on rural telecommunications requirements] 15.9.2008

⁷ Bredband till hela landet: SOU 2008:40

areas, the connection rates provided will only be a fraction of those available in cities and built-up areas despite the demand and need for higher speed being exactly the same in non-built-up areas as in built-up areas.

The difference between built-up and non-built-up areas in the wireless broadband speeds provided is of a permanent nature. Moreover, wireless broadband in its asymmetry⁸ is poorly suited to i.a. remote work needs of the kind requiring the transfer of fairly large files. Another feature typical of wireless broadband is the speed provided being reduced by the distance from the base station and the number of users as well as the nature of services used. Regional disparities could be permanently equalised with optical fibre owing to its practically unlimited transmission capacity.

The selection of the year 2015 as the second target year for the plan of action is favoured also by reasons other than the fact that the year already appears as the target year in the Government's information society policy. Achievement of the target level would enable information society services usage of materially wider scope, i.a. remote services of various kinds, than at present, in all sectors of society.

Achievement of the target level would open up new vistas for the entire communications policy. Upon realisation of the proposal, the issue of terrestrial television distribution in future could be examined and the necessary licence decisions taken effective at the beginning of 2017. Other development scenarios in television activities such as the communications policy measures required for high-definition television could be assessed at the same time.

The spread of very high-speed broadband networks would be conducive to promoting competition and leaner structures in the distribution of television programmes. If very high-speed broadband is made available to nearly all Finns by the end of 2015 and competition is successfully boosted in terrestrial television networks at the same time⁹, television programmes could be distributed by three rival network operators almost all across Finland. An increase in network competition would impact on programme distribution costs and offer operators in the sector an opportunity to provide a wider variety of content through new networks.

The Finnish Broadcasting Company is the public service television and radio broadcasting company. Public service duties include i.a. the provision of the service to all at equal terms. Only the availability to all households of telecommunications sufficient to transmit television service will permit the wide-ranging use of the public telecommunications network as a public service provision channel.

At present, a transmission rate of 100 Mbit can be achieved mainly with optical fibre and in the cable television network. Wireless connections in excess of 100 Mbit are already at the pilot stage and these are estimated to become commercially available in major cities in 2010–2012. It will take years, however, for these high-speed wireless connections to become available outside urban areas. It is obvious that wireless connections cannot even in future guarantee connection rates in non-built-up areas equal

⁸ Upstream and downstream traffic moves at symmetrical rates in optical fibre networks, whereas the maximum speeds of upstream and downstream traffic are usually defined asymmetrically in wireless networks. In Digita's @450 network, for example, the theoretical maximum downstream rate could be 5.8 Mbit/s and the upstream rate 1.8 Mbit/s. In Finland, the maximum rates in practice could be 2 Mbit/s downstream and 512 kbit/s upstream (with one additional channel).

⁹ According to an estimate provided by Digita, net sales in terrestrial television operations would come to ca. EUR 60 million in 2008.

to those available in built-up areas. The achievement of regional equality therefore requires support to the construction of high-speed trunk networks and the optical fibre network in particular.

	Nominal maximum speed (Mbit/s)	Actual speed in non-built-up areas (Mbit/s)	Availability in 2015 (% of households)
@450	2.0	1.0	99
Fixed WiMax	40	5.0	5
3G	100+	5.0	93
Mobile WiMax	100+	5.0	60
DSL	48	2.0	60
Cable TV	100+	50	67
Optical fibre	1000+	10–1000	94

Table. Connection rates enabled by technologies and developing on market terms in non-built-up areas in 2015, and estimate of the availability across the entire country of the various network technologies¹⁰

According to an estimate¹¹, the optical fibre and cable networks will develop on commercial terms in such a manner that in 2015,¹² 94% of households will be less than two kilometres distant from the network and built-up area.

It is likely that alternatives (e.g. regional networks of various kinds) will arise alongside commercial solutions, making access to optical fibre or cable network available to ca. 95% according to the aforementioned report.

This would leave the expansion of optical fibre to another four percent of households or 120,000 households up to the measures according to the plan of action.

The upgrade of the public telecommunications network to the target level for 2015 in the manner proposed below would call for investment of some EUR 200 million in the network in addition to the commercial investments that would be made also without this plan of action. The calculations forming the basis of the estimate put the cost of building an optical fibre connection in a non-built-up area at an average of EUR 5.20 per metre. The estimated cost includes excavation and the fibre (an average of EUR 3.60 per metre) as well as access points and active network equipment.¹³ Alternatives

¹⁰ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage] 19.6.2008

¹¹ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008.

¹² The estimated point of departure serving as a basis for the study by Nordic Adviser Group is based on an assumption that by 2015, optical fibre will be available (i.e. no farther away than a 2-km subscriber connection) in all those areas where the activities of telecommunications operators can be made financially viable owing to sufficient household density. In the calculations serving as the basis for the study, a built-up area square (250 m x 250 m) is defined as a map square in which at least four households or ca. 10 residents are located and the immediately adjoining map squares of which (750 m x 750 m) have at least 12 households or ca. 30 residents. The built-up area squares as defined cover a total of ca. 84.5 percent of Finnish households and 94 percent of households are located at a distance of no more than 2 km from a built-up area square. Besides the basic assumption of the study, advances in mobile broadband promote the commercial construction of high-speed fixed connections in two ways: 1) on the one hand, the mobile networks themselves will require fibre-based transmission connections and 2) in order for fixed network operators to be competitive, they must offer substantially higher speeds than the corresponding mobile solutions.

¹³ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008. The estimate of construction costs serving as a basis for the calculation is based on the actual costs of optical fibre network construction in non-built-up areas – in Western, Eastern and Northern Finland – incurred by three Finnish operators. The difference in excavation costs in different parts of Finland is taken into account in the calculation, as have the different network structures due to population density, which impact on the amount of active network equipment. In respect of active equipment, the estimate is based on the additional active equipment needed for this part of the network. The cost calculations concern achievement of the final ca. 5% access coverage (to a distance of 2 km from subscribers), usually by

tively, the cost of adopting a target for 2015 of the telecommunications network extending by fibre and, in some cases, by radio link to households is also estimated. In such a case, the cost in addition to the aforementioned EUR 200 million is estimated at EUR 480–780 million.¹⁴

Upgrade of the telecommunications network gives rise to operating costs as well as investment expenditure. The costs could be taken into account when determining the customer charges for the connections. The operating costs of underground optical fibre networks are not nearly as significant as those of copper networks, which is why these costs have not been taken into account in the business subsidy under the plan of action. The telecommunications operators would cater for the operating costs when setting customer charges.

According to the report, extending the fibre network to some 2,000 households lacks economic viability and the connection for these should be provided by links or other household-specific arrangements.¹⁵ The detailed implementation of these arrangements and the reasonableness of the costs would be evaluated for each municipality separately in the regional broadband strategies.

The plan of action does not seek to include access provision to all holiday homes within the target for 2015. In practice, a substantial portion of holiday homes as well would benefit from the public telecommunications network according to the target level extending to within no more than two kilometres of all households by fixed or wireless subscriber connection. Lifestyles are in flux and remote work is increasing. The question of broadband access for holiday homes may need to be revisited even before the target year.

Adverse effects of public subsidy minimised

8. The telecommunications operators will build and maintain the public telecommunications network on a commercial basis in accordance with law, licences and regulations. The public sector will support telecommunications operators in accordance with this plan of action if the target level for 2015 cannot be commercially achieved in a given area and this cannot be required of telecommunications operators under law, licence or regulations. The adverse effects of the business subsidies on the communications markets and competition will be minimised.

In 2015, the vast majority of Finns will be offered connections in accordance with the target and even at much higher speeds on a commercial basis. The plan of action will not change the situation of maintaining intense competition in the mobile networks through e.g. licensing policy. Competition in all networks serves to improve the standard of service and guarantees reasonable prices. Support measures in accordance

utilising the existing road network. The construction of subscriber connections and the area network to be implemented in built-up areas is more costly particularly due to higher excavation costs.

¹⁴ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008.

¹⁵ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008.

with the plan of action will only be necessary when not a single telecommunications operator undertakes to build a public telecommunications network in accordance with the target level in a given part of the country because the undertaking lacks commercial viability.

Public subsidies will be organised in a manner that generates the least possible disruption to the market. This calls for i.a. technology neutrality and strict compliance with the provisions governing business subsidies. It is vital to focus on allocating business subsidies only according to actual demand that is not met in any respect by commercial supply.

The plan of action does not obligate telecommunications operators to build economically unviable fibre connections in built-up areas any more than in non-built-up areas. The measures under the plan of action, however, materially reduce the investment risk to which companies are exposed in the most sparsely populated areas and thus facilitate the extension of networks also on market terms further beyond built-up areas. Subsidised connections create additional demand also for services distributed via fibre connections that are viable on market terms. Companies would find it in their interest to build the subsidised fibre connection farther than planned on market terms proportionate to the funding contribution (no more than 67% of construction costs), or within reach of households in more sparsely populated areas in a corresponding proportion. Actual demand also gives rise to regional forms of cooperation which are further conducive to reducing the telecommunications operator's risks.

Telecommunications operators already active in an area or its vicinity might be best placed to capitalise on a public business subsidy for the most sparsely populated areas. Others should also be ensured an opportunity to take part, if they so desire, in the bidding for subsidised fibre connection construction in the area.

Bringing the actual demand in non-built-up areas within the scope of communications services and other information society services requiring very high-speed connections in a subsidised manner will to some extent impact on the additional need for trunk connections subject to competitive tendering and built on market terms.

Laying of optical fibre to become a part of regional and community planning

9. The public telecommunications network remaining at a standard required by the development of the information society also in non-built-up areas will be ensured as a part of overall regional and community planning. Regard will be had in planning to the needs of citizens, the business sector and public services.

The Ministry of the Environment together with the Ministry of Transport and Communications will by 1 July 2009 assess the means by which the planning of optical fibre-laying will be incorporated into overall land-use planning.

The planning, construction and maintenance of the public telecommunications network are mainly commercial tasks attended to by telecommunications operators in the communications markets. However, regional and community planning entails ensur-

ing that the network infrastructure required for information society services arises everywhere. Network development is therefore as much a part of the general planning system as e.g. transportation system planning.

I propose that the Ministry of the Environment together with the Ministry of Transport and Communications will by 1 July 2009 assess the means by which the planning of optical fibre-laying will be incorporated into overall land-use planning. For the implementers of telecommunications networks and broadband, this incorporation into land-use planning would safeguard problem-free implementation. Municipalities in turn would become aware of future wishes, and lines to be placed beneath the street network could be situated in shared conduits, for example, thus reducing the adverse traffic impacts of excavation. In non-built-up areas, the issue is also one of master planning.

Broadband strategy and regional plans revised

10. Under the leadership of the Ministry of Transport and Communications, the national broadband strategy of Prime Minister Matti Vanhanen's first Cabinet will be revised to support this plan of action. Particular attention will be paid to the promotion of optical fibre and wireless broadband in non-built-up areas.

The Regional Councils together with municipalities will by 30 October 2009, taking into account trends in population and regional development, assess the development of the demand for high-speed connections as well as the need for development of the public telecommunications network in the region. Based on these assessments, plans will be drafted by the two parties for the achievement of the target for 2015.

The regional plans shall comprise municipality-specific surveys of internal migration and changes in actual demand.

The need for networks of increasing transmission capacity shall be taken into account when comparing the economy of the measures to be subsidised. Since the plan of action sets the target level for 2015 at a transmission capacity of 100 Mbit, regional plans would in general need to favour optical fibre-based solutions. In practice, achievement of the target level for 2015 calls for support to other solutions as well, especially in non-built-up areas and to ensure the level of service available to the most remote households.

Optical fibre cannot replace wireless broadband, however, as the need for mobile use is continually rising. The actual wireless broadband speeds provided in non-built-up areas in 2015 are likely to be in the region of some 5 Mbit at most. Particular attention on a municipality-specific basis should be paid in the regional plans to optical fibre solutions being made available only to those who actually need them, according to demand. The effect of i.a. internal migration within the municipality on changes in actual demand will need to be assessed separately for each municipality.

The issue of how to give all service providers open access to the subsidised network and the means of promoting cooperation in fibre network construction among the

various parties which maintain the network infrastructure (telecommunications networks, electricity distribution networks, water supply networks) will be addressed in the context of work on the national broadband strategy.

Transparent implementation of regional plans

11. Inasmuch as the regional plans indicate that the level of service for 2015 will not be achieved commercially, the Regional Councils will put plan implementation out for competitive tendering by telecommunications operators and will select the company or consortium implementing the plan in the best and most economical manner to receive the business subsidy. The competitive tendering will be implemented in such a manner that the necessary construction can take place in 2010–2015 and the target level is achieved by 31 December 2015.

The regional plans shall be implemented with transparency, economy and on the basis of realistic demand trends. The recipients of business subsidies shall be selected on the basis of open competitive tendering.

I propose that the Regional Councils in spring 2010 put the achievement of the target level for 2015 out for competitive tendering by telecommunications operators. The regional plans are to be forwarded to the Finnish Communications Regulatory Authority, which evaluates the plans and submits a proposal on the national need for funding.

The measures to achieve the target level for 2015 would be implemented over six years.

Households to pay for their own subscriber connection also in future

12. Customers will acquire their subscription connection at their own expense from the telecommunications operator or other provider of their choice.

Extending the domestic help credit to cover the installation and maintenance of and guidance in information and communications technology equipment, software, information security and telecommunications will promote the equality of citizens and the use of new services.

It is justified for consumers in a market economy to choose and pay for connections themselves also when subsidies have helped bring the network closer to consumers. The choice in circumstances such as these would be made from among several rival alternatives provided by different telecommunications operators. Rising service demand steers supply in healthy information society development. The plan of action would also lead to a decline in the prices of telecommunications services, which in and of itself would promote the demand for subscriptions of high standard. In other basis services as well, consumers and businesses must obtain their goods at their own expense. Electricity connections and access to public roads, for example, must be arranged at one's own expense. Measures by the State, regions and municipalities would only ensure that services are available at a reasonable cost to those consumers wishing to obtain them.

Costs of subscriber connection

The average total cost of household fibre connections already implemented in non-built-up areas has been EUR 2000–3000 per household, well comparable to e.g. the actual costs of acquiring an electricity connection.

So-called zone pricing has been observed since 2005 in the pricing of household electricity connections in accordance with the pricing principles adopted by the Energy Market Authority. Zone pricing refers to a breakdown on the basis of the location of the connecting parties into different price zones, for each of which the electricity company determines a standard price in its price list. The electricity company may determine the zones on the basis of e.g. local detailed plan area or distance from the distribution substation. So-called regional pricing applies to contracts for parties outside zone pricing, in which case the connection price is determined to a certain predetermined area to be electrified, e.g. the area of the holiday home or an island. In such cases, the electricity company determines the average connection fee for the said area based on electrification costs and the number of potential connecting parties. Regional pricing allows an electricity company to plan the electrification of the area and network construction in the manner most sensible in terms of the whole. Regardless of pricing method, electricity connections cost thousands of euro, the average price being EUR 2000–3000. In non-built-up areas, the price of an electricity connection may climb as high as EUR 10,000. Broadband could be priced along lines similar to those used in pricing electricity connections.

As concerns subscriber connections, the obligations pertaining to the relinquishing of access rights as well as obligations pertaining to the interconnection of communications networks and services are assessed by the Finnish Communications Regulatory Authority as part of the supervision and regulation of the markets in accordance with the Communications Markets Act.

Extension of the domestic help credit

The Government has resolved to propose in the context of the 2009 budget that the domestic help credit provided for in the Income Tax Act be extended to the installation and maintenance of and guidance in information and communications technology equipment, software, information security and telecommunications. Extension of the domestic help credit in the manner proposed by the Government will promote the equality of citizens and their transition to new services, including high-speed broadband connections. Under the 2009 budget proposal, the credit could also be claimed for the installation work included in the cost of the subscription. Prior to the extension of the credit, tax-deductible home maintenance comprises, besides work on the actual building, also repairs and modernisation performed in yard areas, such as e.g. installation and repairs relating to water and sewage systems, district heating system and electrification. The construction of a drill well or other well may also be equated with home modernisation.

Supply changes demand

The plan of action would extend to telecommunications operators the option of providing user subscriptions with the technology of their choice from the optical fibre or cable network made available to nearly all. At the target level for 2010 (1 Mbit/s), the option most commonly offered in the fixed network would be a DSL line over the telephone network, while at the target level for 2015, telecommunications operators would find it meaningful to offer an optical fibre connection as well. Users would choose their connection from among the options offered by the telecommunications operator. By the year 2015, the supply of online services will increase the demand for high-speed connections. It is likely that a substantial proportion of households will have optical fibre access by that time.

Other business subsidies to be paid as usual

13. The acquisition of subscription connections of a speed higher than the universal service level in agriculture and tourism as well as other business will continue to receive support from public funds through existing forms of subsidisation.

The subsidy may be granted pursuant to i.a. the Decree on Support to Enterprises (1200/2000) and the Rural Development Act (1443/2006). Under the Aid to Business Act and the Decree issued by virtue thereof, aid shall be channelled to projects in which the aid is estimated to have a significant effect on the implementation of the project in such a manner that the project cannot be implemented without the aid or the project can be implemented on an expedited schedule, with a higher standard of quality or with a greater scope. The beneficial environmental impacts of the project shall be taken as a factor speaking of favour of granting the aid.

Pursuant to the Rural Business Funding Act (329/1999), which in respect of project subsidies was supplanted by the Rural Development Act (1173/2006), subsidies in the years 2000–2006 were granted to 76 projects all across Finland for the construction of broadband connections and the planning of such construction. The subsidies totalled EUR 8.4 million, of which sum public aid accounted for EUR 6 million while the remainder came from private financing. EU funding in turn accounted for EUR 2.3 million of the public aid.

The State to contribute one third to commercially non-viable telecommunications network construction, a maximum of EUR 66 million

14. Inasmuch as the target level for 2015 is not achieved commercially, business subsidies not to exceed 67% of the costs will be given to upgrade the public telecommunications network. The subsidies will consist of a State contribution (no more than 33 percent), a contribution by regions and municipalities (ca. 27 percent) and a contribution from EU structural funds (ca. 7 percent).

The State will only contribute to those costs of regional plans vital to the achievement of the target level for 2015. The State's broadband subsidy in the years 2010–2015 will come to an estimated 11 million euro at most (at 2008 prices), however no more than the sum equivalent to the auction revenue and compensatory payments mentioned in item 15.

According to the study, achievement of the target level for 2015 will cost an estimated EUR 200 million in addition to the investment made in the network on a commercial basis up to that time¹⁶. Enterprises have a commercial motivation for their participation in the construction of the network. It is important to elicit the commitment of municipalities and regions as well to the plan of action, which is why I propose that the public portion of the funding be divided among the State, municipalities and regions. The breakdown of costs among telecommunications operators, the State, regions and municipalities as well as the EU structural funds is presented in Annex 2.

I propose four restrictions to the State's broadband subsidy payable as a business subsidy:

- 1) The State's broadband subsidy shall not exceed 33 percent of the costs of the overall investment required in a region. In addition, the aid from the municipalities, regions and EU structural funds shall at least equal the broadband subsidy paid by the State.
- 2) The State's broadband subsidy shall not exceed an amount equal to the auction revenues and the compensatory payment revenues.
- 3) The State will not make the broadband subsidy available for the implementation of regional plans inasmuch as these exceed the target level.
- 4) The State's broadband subsidy is estimated at a total of no more than EUR 66 million (at 2008 prices) in the years 2010–2015.

The estimated annual expenditure arising to the State from the broadband subsidy is itemised in Annex 2.

The EU makes project financing available from structural funds intended to reduce regional disparities and enhance the competitiveness of weaker regions as well as the

¹⁶ Nordic Adviser Group, Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008.

employment opportunities of people. Finland receives EU funding from two structural funds, the European Regional Development Fund and the European Social Fund.

As the State's broadband subsidy only concerns the final 4–5 percent of the market, the subsidy will not distort competition in the markets in which commercial operations are economically viable for telecommunications operators.

Plan on national funding needs adopted by the Cabinet, payment of subsidy ordered and subsidy use monitored by the Finnish Communications Regulatory Authority

15. The Finnish Communications Regulatory Authority will pay the subsidy contribution of the State to the Regional Councils in accordance with the Government plan described below. The Finnish Communications Regulatory Authority will evaluate the plans of the Regional Councils towards which the subsidy is paid. The Regional Councils would use the broadband subsidy received as business subsidy towards the costs of public telecommunications network upgrades according to contracts.

The Finnish Communications Regulatory Authority will order payment of the broadband subsidy to the Regional Councils and monitor its use. The Finnish Communications Regulatory Authority shall perform supervision and control to ensure that distortions of competition do not arise in the broadband networks implemented with public aid to business. The question of whether all service operators should have access to these networks and how to ensure such access is an issue that must be evaluated separately, having regard also to Community legislation. The Finnish Communications Regulatory Authority will prepare clear and consistent criteria to ensure that aid is allocated to the construction of the broadband network in different parts of the country on the basis of the same economic non-viability criteria. Attention shall be paid in the business subsidy criteria also to other aspects of eligibility for public aid and appropriate use of public aid.

The use of the business subsidy is monitored by the Finnish Communications Regulatory Authority, which shall submit an annual report thereon to the Ministry of Transport and Communications. The report shall include an estimate on the development of broadband supply in the coming years. The Ministry will report on the realisation of the plan of action as part of the report on State annual accounts.

The Regional Councils will use the broadband subsidy received towards the costs of public telecommunications network upgrades according to contracts.

In addition to the monitoring by the Finnish Communications Regulatory Authority, particular attention in ensuring the appropriate use of the funding shall be paid to the transparency and subsequent verifiability of the arrangements put in place by the Regional Councils and the municipalities.

Revenues needed to finance plan of action to be accumulated with frequency auctions and telecommunications network compensatory payment

16. Revenue to finance the plan of action will be accumulated through auctions of radio frequencies and, if these prove insufficient, with a telecommunications network compensatory payment to be collected from telecommunications operators as necessary. A separate Act will be enacted on the auctioning in 2009 of certain radio frequencies set aside for the provision of wireless broadband in the manner modelled by the working group which studied the issue.

In the event that auction revenue proves insufficient to finance the State's expenditure under this resolution, a telecommunications network compensatory payment will be collected from telecommunications operators on a pro rata basis based on their number of broadband subscriptions. The revenue will also be used to finance the administrative and collection costs relating to the compensatory payment.

Auctions of radio frequencies

The benefits, drawbacks and market effects of auctions were examined in a recent Ministry of Transport and Communications working group report circulated by the Ministry for comments. Several telecommunications operators in particular are opposed to auctions. Several commentators emphasised that if auctions were to be introduced, any revenues accruing from the auction payments should be spent to advance the sector from which the payments are collected.

I propose initiation of law-drafting and other measures so that the radio frequencies referred to in the report of the working group¹⁷ are auctioned by August 2009 at the latest. The frequency band 2.5–2.69 GHz is well suited for application of a new kind of frequency allocation procedure. One benefit of the auction in the said frequency band is the neutrality and straightforwardness of the procedure. Based on international benchmarking, auction procedure cannot be demonstrated to have a direct effect on the schedules of network investments, end-user pricing or competition. The differences between e.g. EU Member States can be explained by the competitive situation in the telecommunications market and other differences in the overall market environment and regulatory environment rather than by the licence granting procedure in place. On the other hand, the auction procedure may also entail negative side-effects such as high front-loaded payments and the concentration of frequencies in the hands of a few operators. These can be addressed in advance by means such as appropriate licence terms and staggering the auction payment over several years.

The auction payments are determined in the auction and the revenues accruing to the State therefrom cannot be estimated with any accuracy. Proceeds of EUR 25 million were obtained from an auction of corresponding radio frequencies in Norway while in Sweden, the proceeds came to EUR 230 million. A pro rata comparison by population of these to Finland gives rise to a presumption of auction revenues in the vicinity of

¹⁷ Publications of the Ministry of Transport and Communications 19/2008: Markkinalähtöinen taajuushallintomalli . Työryhmän ehdotus. [A proposal for a model of market-based frequency management].

EUR 30–130 million accruing to the State. It would be appropriate to collect the auction payments from the licensees in staggered equal instalments. In a departure from the proposal of the working group, however, I propose a staggering of the auction payments over the six first years of the term of the licence, i.e. the years 2010–2015.

The estimated annual accumulation of auction payments is itemised in Annex 2 based on the six-year term of payment described above.

The auction would be staged by the Finnish Communications Regulatory Authority no later than in August 2009. The administrative costs arising from the auction arrangements would be covered with the auction payments in the same manner as the Authority is currently reimbursed for expenses arising from the collection and monitoring of television fees.

The criticism levelled at auctions by telecommunications operators in particular warrants a thorough evaluation of whether an auction is an appropriate method in general for issuing access rights to radio frequencies. I therefore propose that a separate statute be enacted on the auction to be held in 2009. The said Act would only apply to the radio frequencies now at issue to be used for broadband services. General auction provisions would not be incorporated into the Communications Markets Act.

Telecommunications network compensatory payment

I propose the introduction of a special telecommunications network compensatory payment to cover that part of State expenditure arising from the broadband subsidy not covered by auction revenues. The compensatory payment would be introduced if the auction revenue fell below an estimated EUR 73.6 million (the figure is based on an estimate of the total need for State funding at 2008 prices adjusted by the building cost index).

Telecommunications operators offering broadband services would be liable for tax. The payment, to be determined on the basis of the number of each telecommunications operator's broadband subscriptions, would be in effect for a fixed term and thus collected in the years 2010–2015.

Development in the number of broadband subscriptions would impact on the accumulation of the payment. The number of broadband subscriptions at 31 December 2007 as well as trend estimates are itemised in Annex 2.

The compensatory payment would be a charge of fiscal nature and the provisions thereon would be laid down in manner of enactment of a tax Act. The size of the payment would be set to cover the costs arising from the upgrading of the public telecommunications network and from universal service. In the event that access rights to radio frequencies are auctioned off, only the portion of funding for the target level for 2015 not covered by auction revenues would be collected as compensatory payment.

Telecommunications operators had combined net sales of EUR 4475 million in 2007. The compensatory payment to be collected would be equivalent to 0.2 percent of this figure if the State were to receive auction revenues of a level similar to that seen in Norway. Were net sales to rise at the current rate, the compensatory payments in 2010

would only equal ca. 0.1 percent of the telecommunications operators' combined net sales. The revenues collected as compensatory payment would be used to upgrade the telecommunications network and would thus flow back to the telecommunications operators from which the upgrades would be commissioned.

Based on the above, the possible fixed-term compensatory payment would have only a minor effect on the finances of telecommunications operators and on the communications markets.

Neither would the compensatory payment exert any significant influence on the prices of or demand for broadband service. Typical customer charges would rise by approximately one percent if telecommunications operators were to pass the compensatory payment onto prices in full.

The funding of the broadband subsidy by source of funding and the breakdown of compensatory payment among telecommunications operators is itemised in Annex 2.

Crediting of revenues and decisions on use of revenues

Since the alternatives are either a model of crediting through the State's on-budget activities or an extra-budgetary fund model, a proposal according to both is submitted in the following.

17. a) Budget model

The revenue from the auctions and the frequency fees are credited to the State budget as distinct items and the funding necessary to pay the broadband subsidy is allocated to the main title of expenditure of the Ministry of Transport and Communications as a distinct expense item.

The Finnish Communications Regulatory Authority pays the subsidy to the Regional Councils on the basis of the plans submitted by these in accordance with the plan on the national need for funding and its regional allocation adopted by the Government.

The so-called principle of unity, under which all revenues and expenditure shall be included in the budget, is observed in State budgets. A linkage between related income and expenditure is permitted, however. Section 84(1) of the Constitution reads:

“Estimates of the annual revenues and appropriations for the annual expenditures of the State, the reasons for the appropriations and other justifications of the budget shall be included in the State budget. It may be provided by an Act that, for certain revenues and expenditures immediately linked one to another, a revenue forecast or appropriation corresponding to their difference may be included in the budget.”

Subsection 3 furthermore states that, “the revenue forecasts or appropriations pertaining to linked revenues and expenditures may be included in the budget for several budgetary years, as provided by an Act.”

More detailed provisions as to the types of revenues and expenditure for which net budgeting is permitted, i.e. entering in the State budget the estimated revenues or appropriations equalling the balance between them in accordance with the aforementioned provision of the Constitution, are laid down in section 3a(1) of the State Budget Act (423/1988). The types of revenue and expenditure to which net budgeting shall not apply are also enumerated in the Act and include taxes and charges of a fiscal character on the revenue side, as well as transfer expenditure.

Auction revenues and compensatory payments thus cannot be subject to net budgeting, nor may the revenue accruing therefrom be linked to the broadband subsidy to be granted, which is transfer expenditure by nature. Therefore the revenues from both the auctions and compensatory payments shall be entered separately in the State budget as both income and expenses, allocating these to State expenditure in accordance with the plan of action.

Both the auction revenues and the compensatory payment revenues would be budgeted on a cash-basis principle, i.e. in the year in which payment is made to the State. If the auction were to be held in 2009, the revenues accruing to the State from the auction in the years 2010–2015 could be estimated and a sum corresponding to the revenues accruing would be budgeted for each year. The amount of compensatory payment revenues needed could also be anticipated.

The expenditure arising from the broadband subsidy in turn would be included in the State budget for the years 2010–2015 in the main title of expenditure of the Ministry of Transport and Communications as a distinct expense item. Transfer expenditure as now in question (aid to companies) would require either a fixed appropriation or a deferrable appropriation. Both are fixed by nature and thus independent of e.g. the accumulation of frequency fees. Fixed appropriations must be spent in the year for which they are budgeted while deferrable appropriations can be used over the course of three budget years at the most. In this case, a deferrable appropriation would provide greater flexibility.

Provisions on the use of the auction and compensatory payment revenues would also be laid down in the Acts to be enacted on the auctions and the compensatory payment. These provisions would be in accordance with the section 84(1) of the Constitution referred to above in linking certain revenues and expenditure to each other in the State budget by virtue of a separate statute. The linkage would be included in the reasoning of both the revenue and expenditure items. The reasoning of the items would also provide information as to the manner in which the accumulation of revenue and expenditure correspond to each other, thus ensuring that correspondence is retained.

The drafting schedule of the State budget presents a problem in that the auction revenues and the compensatory payment revenues possibly needed could only be known after the Government budget session. The information would thus need to be included in an amendment to the budget proposal. The size of the expenditure appropriation would be based on the plans drafted by the Regional Councils. In the first year, the required expenditure appropriation would be an estimate only, as the budget proposal needs to be drafted before the plans of the Regional Councils can be processed and the need for funding determined. Taking into account the granting procedure of broad-

band subsidy as well, the required expenditure appropriation is likely to rise by degrees.

Since expenditure appropriations are linked to revenues pursuant to law, expenditure would need to be defined as expenditure outside the budgetary framework

The intent is not to make the auction revenues and telecommunications service compensatory payment a means of levying taxes on the provision of information society services, but instead only to ensure the socially and regionally balanced development of the public telecommunications network.

Regard shall be had to the Regional Development Act (602/2002) when taking decisions on the allocation of appropriations.

17. b) Fund model

The revenue from the auctions and frequency fees is credited to an extra-budgetary fund from which the broadband subsidies are paid. The Act on the State Television and Radio Fund (745/1998) is amended to permit the use of the fund's assets also to subsidise construction of the public telecommunications network in order to ensure equality in information society development. The name of the fund is changed to the State Communications Fund.

The utilisation plan for the State Communications Fund is adopted annually by the Government and includes, in addition to the current funding plan for television and radio activities, also a plan on the State broadband subsidy to be allocated to the Regional Councils.

The assets to be used for funding the Finnish Broadcasting Company Ltd on the one hand and for State broadband subsidies on the other are kept separate in the fund and the assets are not used for purposes other than that for which they were collected.

In the event that assets in excess of that required for the State broadband subsidy accumulate into the fund, the assets shall remain in the fund. If assets not spent on expenditure remain at the end of 2015, the excess assets are credited to the State budget. The administrative expenses and overheads necessitated by the administration of the broadband subsidy and payable to the Finnish Communications Regulatory Authority are incorporated into the utilisation plan.

The fund model is based on the alternative of extra-budgetary funding permitted under the Constitution. The provisions on extra-budgetary funds are laid down in section 87 of the Constitution of Finland. An extra-budgetary fund may be created by an Act, if the performance of a permanent duty of the State requires this in an essential manner. However, the decision of the Parliament to adopt a legislative proposal for the creation of an extra-budgetary fund or the extension of such a fund or its purpose must be supported by at least two thirds of the votes cast. The provision was incorporated into the Constitution in the context of the reform of 1998. The reasoning of the Bill states the advantages of fund creation to be the independence of the activities and the flexibility of asset utilisation in rapidly fluctuating and unforeseeable circumstances as well as

the possibility of linking certain revenues to certain expenditure. In addition, it was reminded in the Bill that extra-budgetary funds spell a departure from the principle of budgetary unity and that the creation of funds would be an exceptional measure. However, in this particular case there is a need for extra-budgetary fund activities.

According to the legislative history of the Constitution, the performance of a duty may be deemed to require the creation of a fund in an essential manner primarily when the said duty is a permanent duty of the State and means within on-budget activities such as net budgeting, multi-year budgeting or variable annual appropriations or deferrable appropriations are not suited for the purpose. Especially activities requiring preparedness for expenditure of a substantial amount and difficult to anticipate, or expenditure which may in fact never be realised, may require the creation of a fund.

An expansion of the purpose of the Television and Radio Fund in the manner now proposed could arguably be deemed essential, as to date the Fund has primarily only financed the activities of the Finnish Broadcasting Company with television fees. The change in the name of the fund would also indicate its modified purpose. The purpose of the fund's assets would expand to subsidising the construction of the public telecommunications network in order to safeguard equality in information society development.

The communications networks required for communications services of a high standard shall be considered part of the basic infrastructure of the modern information society, ensuring the non-discriminatory availability of which may be deemed a duty of the State. Since network construction on market terms throughout the country cannot otherwise be achieved, the tools must be created to subsidise network construction from State funds as necessary.

Funding the licence fees to be collected through frequency auctions in an extra-budgetary fund can be deemed justified, taking into account the extraordinary nature of such auction revenues. The desire is to spend the revenues on expenditure arising from achievement of the strategic intent for the communications network.

Any assets not needed to cover expenses accrued by the end of 2015 will be credited to the State budget unless the decision is taken to use these assets to fund a new plan of action to be drafted at a later date.

The fund will be a permanent one, as connection needs are presumed to keep on increasing in the longer term, although at this point there is little sense in adopting specific technical objectives. Upgrades to the public telecommunications network to meet service provider requirements will be needed also after the interim target of 2015. It is therefore apparent that funding measures akin to those proposed in the plan of action will be needed at a later date as well. It is proposed below that drafting commence in 2012 of a new plan of action preparing for the post-2015 situation.

The purpose of the auction revenues and possible telecommunications network compensatory payment is not to increase the taxation of telecommunications operations but only to direct the funds accruing towards equalising regional disparities in network construction. An appropriate means of achieving this purpose would be to link,

through the fund, the revenue accumulating to the State in the form of payments to the public telecommunications network construction subsidy.

I propose no other changes to the Act on the fund. The fund would remain under the administration of the Finnish Communications Regulatory Authority and its utilisation plan and financial statements would be adopted annually by the Government.

A separate study concerning the funding of the Finnish Broadcasting Company is underway in a parliamentary working group appointed by the Ministry of Transport and Communications. Any proposals concerning the fund are subject to the requirement of the state fund remaining available for the funding of the public service.

Developments after 2015

18. The State, provinces and municipalities prepare to support the development of the public telecommunications network also after 2015 in the manner necessitated by the development of the information society.

Connection needs will only see further growth in the longer term. There is little meaning in setting precise objectives for the period after 2015 at this time, yet the commercial and geographical facts of the matter will remain unchanged. New technologies and services will also in future first become available in cities while viable business on purely commercial terms will remain difficult to achieve in non-built-up areas. The maintenance of the public telecommunications network upgraded according to the plan of action will in all likelihood require a permanent system of public aid.

Upgrading of the public telecommunications network to correspond to the requirements of service provision will be necessary in non-built-up areas also after 2015. It is therefore apparent that measures similar to those proposed in this plan of action will be needed at a subsequent time as well.

I propose that the drafting of a new plan of action to prepare for the post-2015 situation commence in 2012. In drafting the new plan of action, the needs for changes to the plan of action in effect must also be catered for, in the event of demand or supply differing from that anticipated, for example.

Conditions to the realisation of the plan of action

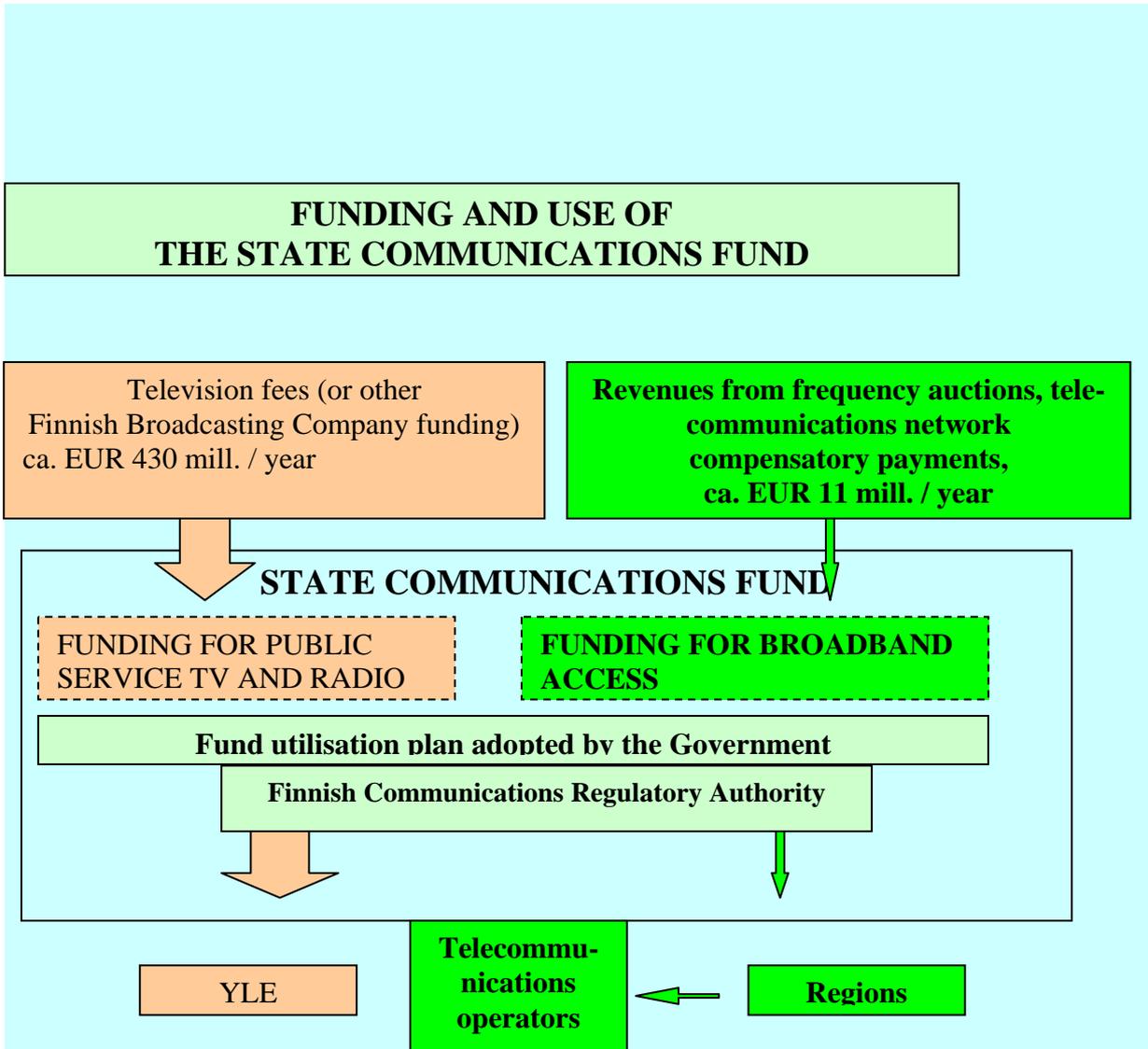
Conditionality of Resolution

19. This resolution is conditional and will be realised in respect of the State provided that the Regional Councils and municipalities for their part act in accordance with the objectives and measures of the resolution.

Notification to the European Commission

20. The State subsidy will be notified to the European Commission in the manner separately provided in law. Realisation of the subsidy is subject to Commission approval.

Annex 1 Administration of the funding for the plan of action in the fund model



Annex 2: Tables

Table 3. Division of costs of target level for 2015 (at 2008 prices)

	Total costs in 2010 – 2015, EUR million	Costs per year, EUR million
Telecommunications operators, min.	66.0	11.0
State broadband subsidy, max.	66.0	11.0
Regions and municipalities	54.0	9.0
EU structural funds	14.0	2.3
Total	200.0	32.3

Table 4. State expenditure on broadband subsidy, max. (at 2008 prices), EUR 1000

	2010	2011	2012	2013	2014	2015	Total
State broadband subsidy	11 000	11 000	11 000	11 000	11 000	11 000	66 000
Administrative expenses and overheads	300	300	300	300	300	300	1 800
Total	11 300	11 300	11 300	11 300	11 300	11 300	67 800
<i>Total (index-adjusted)</i>	<i>11 300</i>	<i>11 673</i>	<i>12 058</i>	<i>12 456</i>	<i>12 867</i>	<i>13 292</i>	<i>73 646</i>

The index-adjusted total in the bottom row is estimated by using the building cost index, according to which the annual change in costs averaged 3.3% in the years 2000–2007.

Table 5. Auction revenue estimates

If EUR 30 million were received in auction payments (Norway level) or correspondingly EUR 130 million (Sweden level), the following revenues would accrue to the State in observance of the payment arrangement proposed:

	2010	2011	2012	2013	2014	2015	Total
Auction revenues (Norway level)	5 000	5 000	5 000	5 000	5 000	5 000	30 000
Auction revenues (Sweden level)	21 666	21 666	21 666	21 666	21 666	21 666	130 000

Table 6. Number of broadband subscriptions in 2007 and estimated development in 2008–2011 (in thousands)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
DSL	1 348	1 400	1 460	1 520	1 580	1 660	1 720	1 780	1 840
Cable modem	210	220	230	240	250	260	270	280	290
Optical fibre, mobile broadband, wireless broadband and others	202	380	510	640	770	880	1010	1140	1270
Total	1 760	2 000	2 200	2 400	2 600	2 800	3 000	3 200	3 400

The sum of EUR 6.4 million per year would need to be collected as compensatory payment if the auction returned the EUR 30 million in line with the experience in Norway. Based on these presumptions, the compensatory payment in 2010 would amount to

EUR 0.22 per month per broadband subscription and would fall by 2015, as the number of subscriptions rises, to EUR 0.16 per month per subscription. Calculated according to market shares at year-end 2007 and the financial statements of the parties proposed to be liable for tax, the largest parties liable for tax would pay the following compensatory payments:

Table 7. Telecommunications services compensatory fees by telecommunications operator in the years 2010–2015

Telecommunications operator	No. of broadband subscriptions	Compensatory payment, EUR million/year	% of compensatory payment accumulated	Net sales in 2007, EUR mill.	% of net sales in 2007 of company/consortium
Elisa Corporation	600 000	2.6	34	1 568	0.17
TeliaSonera Finland Oyj	510 000	2.2	29	1 788	0.12
Telecommunications operators in Finnet group	246 000	1.1	14	330	0.33
DNA	230 000	1.0	13	534	0.19
Swelcom Oyj	80 000	0.3	4.5	146	0.30
Other cable television operators combined	80 000	0.3	4.5	under 100	under 0.30
Total	1 760 000	7.5	100	4 475	0.17

Annex 3: Rapporteur's original letter of appointment and translation



8.5.2008

848/30/2008

Jakelussa mainituille

Viite

Asia Selvitysmiehen asettaminen

Liikenne- ja viestintäministeriö on tänään tekemällään päätöksellä määrännyt kansliapäällikkö Harri Pursiaisen selvitysmieheksi selvittämään, miten voidaan turvata koko maan kattava laajakaistan tarjonta ja järjestää sen rahoitus erityisesti haja-asutusalueilla.

Selvitysmiehen tulee jättää raporttinsa 15.9.2008 mennessä.

Selvitys tehdään virkatyönä.

Viestintäministeri

Suvi Lindén

Osastopäällikkö

Liisa Ero

Jakelu Kansliapäällikkö Pursiainen
Viestintäpolitiikan osasto
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MINISTRY OF TRANSPORT
AND COMMUNICATIONS

8 May 2008

848/30/2008

Those CC'ed

Reference

Matter Appointment of Rapporteur

By virtue of a decision taken on this date, the Ministry of Transport and Communications has appointed Permanent Secretary Harri Pursiainen Rapporteur to report on means by which broadband supply covering the entire nation may be ensured and its funding arranged especially in non-built-up areas.

The Rapporteur shall submit his report by 15 September 2008.

The report shall be prepared as a part of official duties.

(signed)

Minister of Communications

Suvi Lindén

(signed)

Director-General

Liisa Ero

CC Permanent Secretary Pursiainen
Communications Policy Department
Registrar's Office

Annex 4: Reference materials

(All materials are available only in Finnish unless mentioned otherwise)

Bird & Bird: Kansallisen laajakaistaohjelman rahoitus [Funding of the national broadband programme]. 19.8.2008.

Bredband till hela landet, Betänkande av utredningen bredband 2013, SOU 2008:40 *(Available only in Swedish)*

Responses received by the Ministry of Transport and Communications to a survey of ten operators: operators' individual estimates of the development of broadband supply by speed category and technology by the end of 2015 (The responses of the operators are confidential pursuant to section 24(20) of the Act on the Openness of Government Activities, 621/1999).

Responses received by the Ministry of Transport and Communications to a survey of Regional Councils: regional estimates as to current broadband coverage, future development (constructing party/parties included), problems and the need for possible public funding

Response received by the Ministry of Transport and Communications to an enquiry to the Finnish Communications Regulatory Authority: actual connection rates of wireless networks

Publications of the Ministry of Transport and Communications 41/2000: Laajakaista kaikille? Tekniset ja taloudelliset edellytykset Suomessa [Broadband for all? Technical and financial viability in Finland]

Publications of the Ministry of Transport and Communications 19/2008: Markkinalähtöinen taajuushallintomalli. Työryhmän ehdotus. [A proposal for a model for market-based frequency management]

Publications of the Ministry of Transport and Communications 37/2008. Kotitalouksien telepalvelujen alueellinen saatavuus 2008 [The availability of telecommunications services important to households 2008]

Nordic Adviser Group: Suomen koko väestön kattavan laajakaistapalvelun investointikustannukset – kustannusarvio täyden väestöpeiton saavuttamiseksi [Investment costs of broadband service covering the entire Finnish population – estimated costs of achieving full population coverage]. 19.6.2008. (published on the Ministry of Transport and Communications website in Finnish at <http://www.lvm.fi/web/fi/julkaisut/muut>)

Omnitele: Palveluiden asettamat vaatimukset laajakaistanopeuksille [Requirements on broadband speeds imposed by services]. 3.6.2008. (published on the Ministry of Transport and Communications website in Finnish at <http://www.lvm.fi/web/fi/julkaisut/muut>)

Finnish Communications Regulatory Authority: Communications markets in Finland 2007, annual review