



**INTERNATIONAL TELECOMMUNICATION UNION**  
**Telecommunication Development Bureau**  
Telecommunication Statistics and Data Unit

---

**18 December 2002**  
**Original: English**

**3<sup>rd</sup> World Telecommunication/ICT Indicators Meeting**  
*Geneva, 15 - 17 January 2003*

**Document:** WICT-20E

**Source:** Jan Petter Saether and Haakon Christopher Sandven  
Norwegian Post and Telecommunications Authority

**Title:** Now it is happening! A new trend, or just a pent-up demand?



Now it is happening!

A new trend, or just a pent-up demand?

By  
Jan Petter Sæther  
jps@npt.no  
Senior Adviser  
Norwegian Post and Telecommunications Authority

And

Haakon Christopher Sandven  
hcs@npt.no  
Adviser  
Norwegian Post and Telecommunications Authority

## Background

For the first time we experience a decline in metered telephone traffic in Norway - a decline which cannot be explained by external factors, such as fluctuations in general economic activity. ITU indicators for Luxembourg also show a slight decline from 1999 to 2000. We can also observe a significant slower growth in metered traffic in Sweden, Finland, Denmark and Switzerland from 2000 to 2001. We have no reason to believe that traffic growth as such should change in such a radical way.

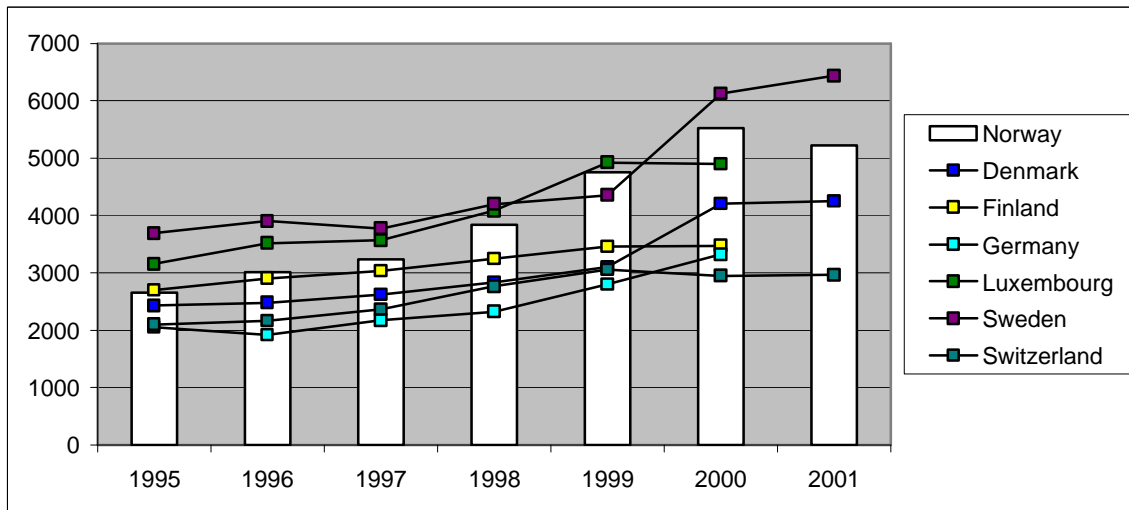


Figure 1 Annual national telephone traffic per capita in selected markets

We suppose that DSL and messaging (e-mail and SMS) are important factors for the decline in fixed network traffic minutes. We will elaborate on this based mainly on data from Norway, Denmark and Sweden. There is reason to believe that a sudden change in the growth of traffic minutes will appear in still more markets than those mentioned above. The natural response to this is to ask whether and how to bring up other indicators in order to monitor telecommunications markets. We do not know whether traditional voice and dial-up Internet traffic will still continue to grow when the “broadbanders” have got what they want. However, we will pay attention to this phenomenon.

## Subscriptions and traffic

In Norway the number of fixed telephone line subscriptions has declined slightly. On the other hand, the number of telephone channels has been stable in recent years. It is being discussed whether the slight decline in fixed line penetration is the beginning of substitution from fixed to mobile telephony. However, mobile traffic patterns do not give such indications. The next figure illustrates the development in the number of fixed lines.

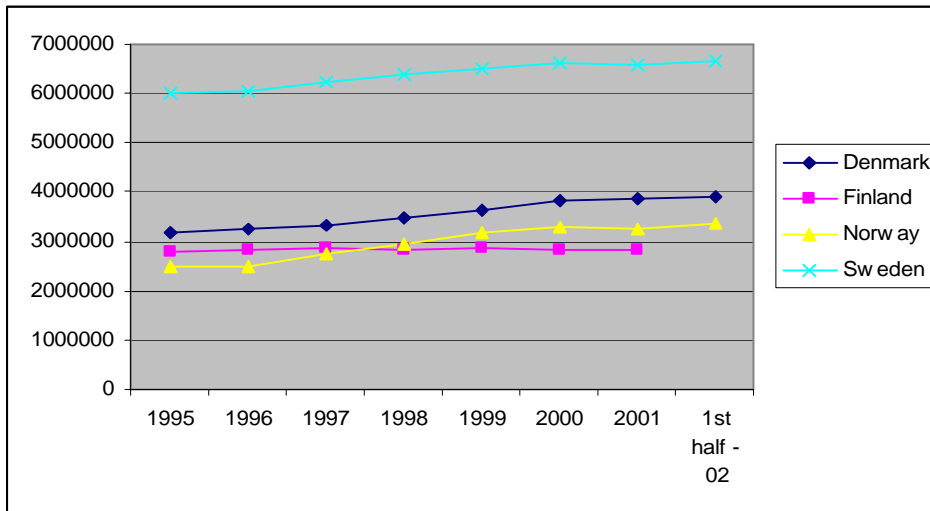


Figure 2 Number of fixed telephone channels (Sources: ITU, ITST, PTS, PT)

The following figure illustrates that the number of mobile subscriptions (prepaid and postpaid) are still rapidly increasing in the Nordic countries, but there are clear indications that the growth is declining.

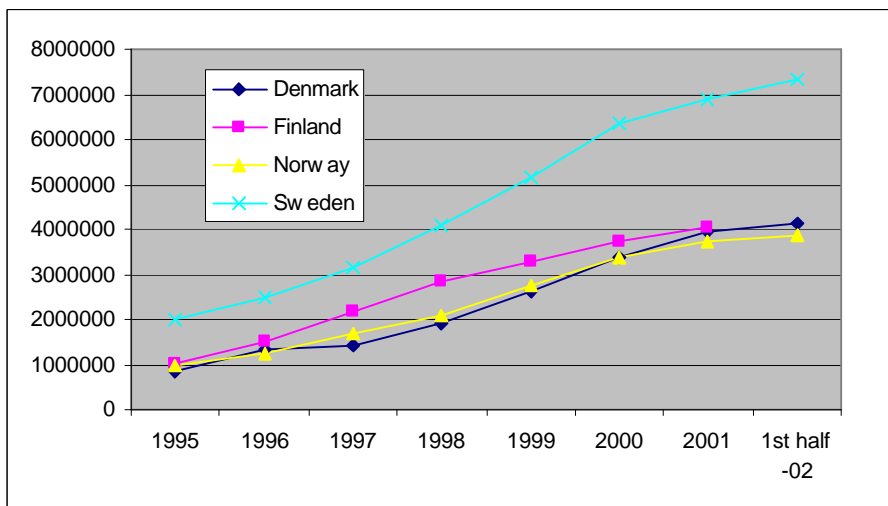


Figure 3 Number of mobile telephone subscriptions (Sources: ITU, ITST, PTS, PT)

To conclude, the total number of telephone accesses, fixed and mobile, has increased. The number of fixed line telephone accesses (channels) has been stable recently.

There has been a considerable growth in fixed line telephone traffic minutes in recent years, particularly because Internet traffic has contributed to this growth. However, voice telephony has also increased, both totally and per channel. The growth pattern is dramatically changed after 2000, and according to half-year figures, this change seems to indicate a new trend. The fixed line telephone traffic is indicated in the next figure, both in total figures and per telephone channel.

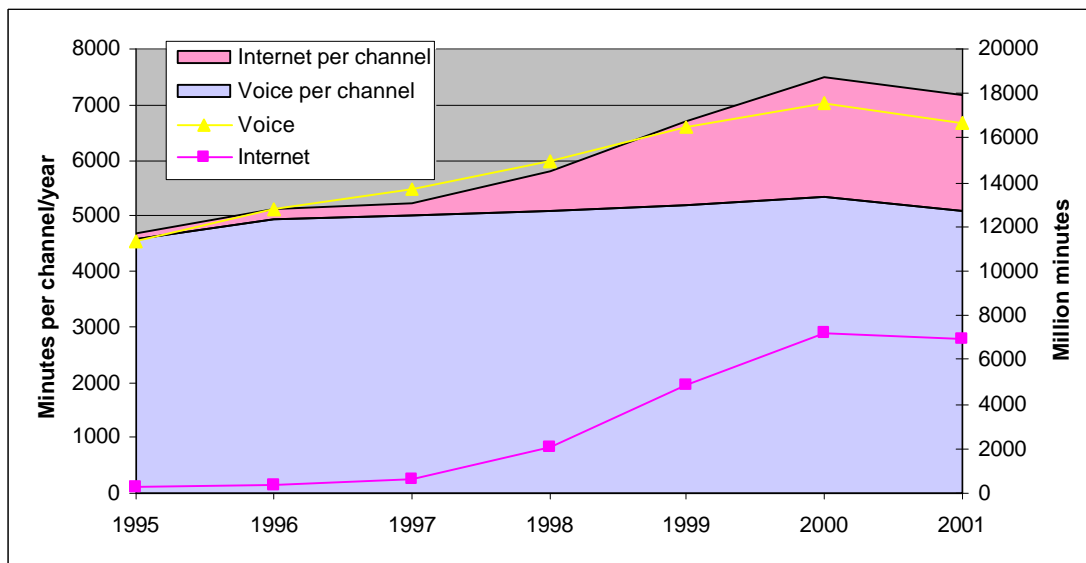


Figure 4 Total fixed telephony traffic and traffic per channel per year, Norway (Source: NPT)

If we even include mobile traffic, the total volume of minute traffic has declined in Norway recently. There may be a variety of reasons for this change, for instance

- price “floor” reached, and less price reductions
- economic activity and people’s expectations may have changed negatively compared to the mid 90-ies

However, as we will try to indicate, the following circumstances may significantly affect fixed line telephone traffic

- SMS and e-mail substitute voice traffic
- Unmetered ADSL and cable modem traffic substitute dial-up Internet traffic

The negative growth rate for total traffic is dramatic at first glance, and represent a break with earlier development. The Norwegian Post and Telecommunications Authority (NPT) believes that this decline is primarily due to two factors. From using traditional speech as a communication tool, customers find other alternatives, such as SMS and e-mail. The number of SMS messages sent increased by 141% from 1999–2000 and by 67% from 2000–2001. The ISP’s e-mail servers are steadily receiving more traffic, and members of the society in general are becoming more accessible via e-mail. These means of communication to a great extent supplement traditional telephony, but will for many also be a well-functioning alternative for a variety of purposes in which speech previously was the only alternative for the majority.

Another reason for the reduction in traffic minutes is increased penetration of broadband access, particularly ADSL and broadband via cable TV network. We may also expect WLAN to be supplied, especially in more scatterly populated areas. In Norway the demand for ADSL boosted in 2001. At the beginning of 2001 there were a total of 20,000 broadband customers, and at the end of 2002 there were 80,000. It is anticipated that the number of broadband customers will reach approximately 200,000 in 2002. In addition to the advantage of always being able to be connected, one important argument for using broadband access is that you currently only pay a fixed monthly charge and nothing for usage. Earlier high volume users of dial-up access (ISDN and PSTN) to the Internet will particularly benefit from a broadband alternative. This leads to a loss of charged traffic for the operators. In the case of Norway, the table below shows our assumptions and the estimates of how much metered traffic has been reduced. We have also made a forecast for 2002.

Broadband customers 2001 (mid-year)	50 000
Broadband customers 2002 (mid-year)	140 000
Average monthly charge for broadband access, USD	64
Per minute charge dial-up access, USD	0,021
"Break even" point, minutes per month	3 000
"High volume user", average minutes per month	4 500
Lost metered traffic 2001	2 700 000 000
Lost metered traffic 2002	7 560 000 000

The average price above is calculated from the price of the least expensive ADSL subscription of three of the largest suppliers. (Actually, a majority of private ADSL customers choose a more expensive bandwidth.) "Break even" is the number of minutes you can be connected to the Internet via dial-up access for it to be more profitable than with broadband. The average number of minutes for a "High Volume User" is estimated to be 50% higher than the point of break even. We believe that this is a good definition of a typical Internet "High Volume User", and it is these users, who have not already started using broadband services, that are the most potential broadband customers. According to a survey carried out for the Norwegian Post and Telecommunications Authority, Norway has the highest Internet penetration and most ISDN connections in Europe in relation to the population. According to a survey performed by Statistics Norway, 34% of the population in Norway used the Internet daily in 2001. This was an increase by 26% from 2000. On average, the Internet was used 640 minutes per month, while the two groups using the Internet most frequently, i.e. people between 16–24, and between 25-44, account for the average 2,000 minutes per month. This is at the same level as the "break even" point calculated above. The NPT believes that there is a sufficient proportion of Internet users having usage of more than 3,000 minutes per month. Another survey shows that 45% of all Internet users in 2001 also used the Internet privately, which is an increase of 73% from 1999. This indicates that the potential customer group for broadband services, i.e. residential customers between 16 and 44, is extremely large and rapidly growing.

Based on the calculations and assumptions above, the operators will in 2001 have lost 2.7 billion charged minutes (10 percent of the expected traffic) regarding customers who choose broadband instead of dial-up access. The total number of charged traffic minutes for 2001 was 27.2 billion (fixed line and mobile), and the reduction from 2000 was 521 million minutes. If broadband customers had continued to use dial-up access, it would most likely have been a continued growth in charged traffic compared to the previous years. As prices for broadband access are reduced and access is improved, the growth in the number of broadband customers will undoubtedly increase in the coming years. If we assume that there is an average of 140,000 broadband customers in 2002, the operators could lose 7.6 billion charged minutes (or 25 percent of "expected" traffic).

The NPT has also recently analysed call data records for a random sample of approx. 1,000 Norwegian residential customers. The call data records were requested by the NPT, and were surprisingly, submitted by the contacted operators. The call data records confirm fully our assumptions and calculations. Our broadband access forecast for end 2002 was 200,000. As of 30 June there were already 130,000 broadband subscriptions in Norway.

## New indicators?

In the past electromechanical exchanges produced “pulse” indicators. Such indicators were quite unreliable for measuring traffic because, instead of changing the price per pulse, operators were likely to change pulse intervals as well. Increasingly, the number of traffic minutes is becoming the most common measure for traffic. Digital telephone systems allow both counting minutes and charging for them.

A traffic minute in one market is not necessarily of the same kind as a traffic minute in another market. Expensive time charging tend to have a higher proportion of “instrumental” than social calls, while inexpensive time rates in comparison tend to give a higher proportion of social calls. Therefore, one may raise the question about the validity of traffic minutes’ indicator across different markets. On the other hand, minutes of traffic are, so far, perhaps the best available measure compared to calls and pulses. As indicated, traffic minutes erode as a valid measure for traffic. “When all becomes digital” has been discussed for some years now. However, little effort has been made bringing up new indicators. If *not* available, we may soon look back at those happy days, when the telecom sector’s players monitored minutes – and for what reason?

A more practical, last comment to the ITU indicators: Still, when minutes are available, we should include mobile telephony. In Norway, the number of mobile calls is about one third of the number of voice calls in fixed networks, and the number of minutes is about 15 per cent of the voice traffic in the fixed network. The situation in other countries may be similar to that of Norway, and is not quite unimportant.