Fixed to mobile substitution

The operator's opportunity uncovered

Introduction

Fixed to mobile substitution (FMS) offers interesting business opportunities for all types of mobile operators. The size and timing of the opportunity varies between markets and operators.

Ongoing 3G network investments will impact Western European fixed to mobile substitution development, and capacity utilisation will become an increasing challenge for mobile operators.

Markets with underdeveloped fixed-line infrastructure, in e.g. Eastern Europe and Latin America offer extensive FMS business expansion opportunities to operators, provided that low enough cost levels can be met to support local demand.

In markets with well-developed fixed-line infrastructure, Western Europe and the US, for example, FMS business opportunities leverage the fact that mobile communication has become an integrated part of a modern lifestyle.

Northstream analyzed this development during the period 1994-2002, focusing on the Nordic Region, and this White Paper summarizes key findings from this case study regarding the operator's role in fixed to mobile substitution development.

In this White Paper Northstream discusses fixed to mobile substitution, its drivers, and business opportunities from an operator's perspective and presents key strategic operator considerations related to fixed to mobile substitution.

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About Northstream

Northstream provides strategic technology and business advice to the global wireless industry. Northstream has assembled a multinational team with some of the world's best experts and analysts on wireless communication business and technology. Northstream´s list of clients include several of the world's leading operators and system suppliers as well as some of the leading investment banks and financial institutions.

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The operator's opportunity uncovered

While mobile operators have focused on capitalizing on business opportunities for mobile data services, that until now have not met revenue expectations, some of the potential of voice services is still to be realized.

The possibility of using mobile technology to substitute PSTN was a futuristic vision in the early 1990s. In the mid-1990s, only high-paying segments would consider making calls on a mobile phone in situations when the same call could be made over a fixed line. At that time, the industry was not concerned with how to substitute existing PSTN with mobile, but concentrated instead on creating PSTN-like solutions based on mobile technology, e.g. creating so called 'fixed wireless' solutions.

In the late 1990s, fixed telephony was no longer considered to be the 'normal' mode of communication in certain subscriber segments. Mobile telephony had become the primary means of communication and had effectively *substituted* fixed telephony.

What is fixed to mobile substitution?

'Fixed to mobile substitution' is a common term for a number of market developments that all result in a proportionate increase in the volume of voice calls carried by mobile networks compared with the volume carried over fixed networks. It also refers to the fact that an increasing proportion of subscribers only use mobile phones for voice calls.

In countries with less developed fixed-line infrastructure, voice traffic-growth is carried over mobile networks instead of fixed networks, making mobile networks the key means of communication rather than a substitute for existing fixed-line communication.

The cost and speed of fixed-network build-out favours mobile communications in such markets, and users do not have a real choice between fixed and mobile but are forced to use mobile technology for calls with traditional fixed-line characteristics.

In other markets with well-developed fixed and mobile networks, where consumers have a real choice, there is a trend for traffic to shift from fixed to mobile networks. This trend is driven by changed user attitudes and preferences.

In this White Paper, Northstream discusses fixed mobile substitution and its drivers using the following definitions:

Fixed line replacement; users replace fixed lines with mobile subscriptions. This can either be a fixed-line subscriber who decides to discontinue his fixed-line subscription, or a user who chooses a mobile solution to meet basic connectivity needs in an area where fixed-line access is not available.

Usage substitution; users opt to make calls on their mobile phones rather than on their fixed-line phones.

In this White Paper fixed mobile convergence is defined as convergence of fixed and mobile services, which means that the same services become available in fixed and mobile networks. Convergence as such may be considered as a means for fixed to mobile substitution, reducing the barriers for users to switch from

fixed to mobile and vice versa, but is not itself a phenomenon that will be a key driver for fixed to mobile substitution.

In Latin America, the very low fixed-line penetration results in demand for mobile phones as a substitute for fixed lines. Demand is driven by a need for basic voice services and in Mexico, for example, mobile penetration is twice that of fixed line. This growth in mobile networks offers mobile operators an opportunity to capture voice-call revenues otherwise destined for fixed-line operators. A similar trend can be expected in other regions with underdeveloped fixed-network infrastructure, such as Eastern Europe, since the cost and speed of rolling out mobile networks simply is more attractive than cost and speed of fixed-network rollout.

In the Nordic Case study, mobile calls were found substituting existing traffic volumes previously carried over fixed networks. In this case, the substitution is driven by changed attitudes rather than demand for basic telephony services. Understanding the process facilitating the migration of voice traffic from fixed networks to mobile networks will increase operators' ability to benefit from this development.

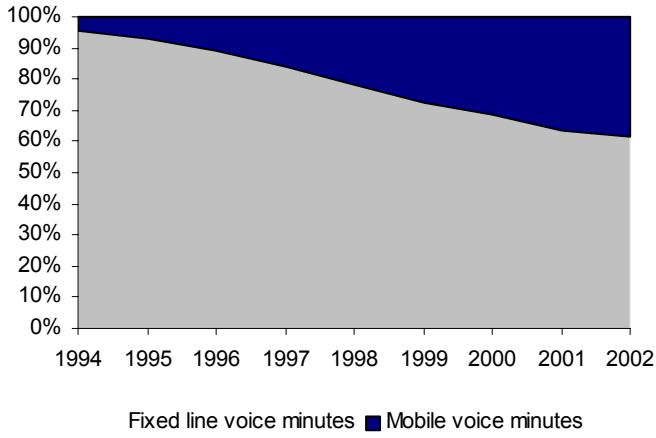

Figure 1 Voice traffic (originated) - Finland

Not all traffic growth on mobile networks can be considered as fixed-line substituted traffic, but growth includes a large proportion of traffic that is generated specifically by the mobile context. Line substitution trends may, of course, also reflect effects of developments other than fixed to mobile substitution. Therefore any analysis of fixed to mobile substitution is highly market specific and has to be conducted on a market-by-market basis, taking a large number of market-specific issues into account.

Theoretically, of course, fixed to mobile substitution could also include other non-voice services, but so far the only real substitution development worth discussing relates to voice calls. In terms of data services, performance differences remain too significant to persuade people to substitute fixed-line with mobile connectivity.

An analysis of SMS's impact on fixed to mobile substitution development, as the only mobile non-voice service with a mass-market profile, shows that SMS tends to drive rather than substitute mobile voice traffic. In Norway, where users are extremely keen on using SMS to communicate with friends and family, SMS has spurred the mobile's central role in communication.

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Nordic case study

In the Nordic case study three different well-developed fixed-network markets (Sweden, Finland and Norway) with high mobile penetration were analysed.

	Finland	Sweden	Norway
Mobile penetration	87%	89%	85%
Residential fixed lines per 100 households	68	99	86
Fixed line channels per 100 capita	52	73	74
Mobile originated minutes of voice traffic	38%	15%	21%
of voice traffic from fixed networks terminates to a mobile	15%	9%	13%

Figure 2 Evidence of fixed to mobile substitution in the Nordics.

As discussed, in assessing fixed to mobile substitution a number of parameters must be observed, such as mobile and fixed penetration development, as well as the proportion of traffic in fixed and mobile networks. The table on the left outlines some of the parameters that will help us to assess the market status exemplified with data from Finland, Sweden and Norway. Despite their relatively well-developed fixed-network infrastructure, Finns refrain from PSTN services to a greater, and increasing, extent compared with, for example, Swedes and Norwegians.

A brief overview of a market may show plenty of similarities in the economy, mobile phone penetration, market history, market structure and competition in fixed telephony, regulatory framework, and so on. Despite an overview of this kind, however, it often remains very difficult to explain differences in the trend of fixed to mobile substitution.

The Nordic countries are good examples of markets with many apparent similarities, but showing very different fixed to mobile substitution development. In Finland, for example, 38% of all voice calls were made over mobile networks in 2002, compared with only 15% in Sweden. What has caused this difference in development? In a more detailed analysis, we will see that there are underlying differences in the forces driving the market, which have a vital effect on fixed to mobile substitution development:

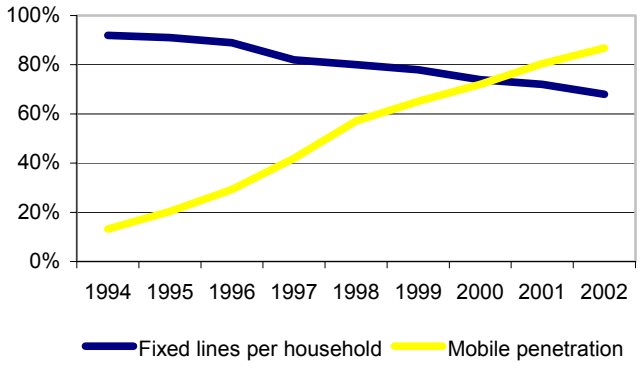

Figure 3 Penetration development in Finland

- Macro economic growth
- Market regulation
- Voice quality
- Lifestyle
- Pricing
- Competition
- Service and marketing
- Network size

Macro economic growth encourages continued fixed to mobile substitution
Economic growth is a key facilitating background factor in substituting fixed traffic with mobile traffic. Positive GDP development means more money is available to be spent on telecommunications, which also reduces price sensitivity to the price premium paid for mobile services.

Regulators take an unbiased position to fixed to mobile substitution
Telecom market de-regulation was a key trend in Western Europe during the 90s that paved the way for new types of service providers and competition in the fixed and mobile market.

Regulators generally have no explicit interest in driving fixed to mobile substitution, but rather focus on improving competition regulation, including interconnect pricing, which in some cases has a positive impact on fixed to mobile substitution.

Voice quality no longer a major issue
When mobile telephony gained acceptance within mass-market segments in Western Europe during the mid-1990s, quality of service was still perceived to be one of the key weaknesses when making mobile calls. Voice quality problems were more or less solved during the second half of the 1990s and are no longer a key issue when deciding whether calls are made over fixed lines or mobile. In contrast to Western Europe, coverage remains an important issue in many markets, including the US and Eastern Europe. Insufficient network coverage results in low voice quality, which has a direct negative effect on fixed to mobile substitution development.

Mobile terminal plays a central role in everyday life
In the early days of mobile telephony the mobile telephone was viewed as a relatively complex tool that improved efficiency. Since then, the perception of mobile telephony has transformed and it is now viewed as an indispensible tool supporting flexible lifestyles and maximising convenience.

Fixed telephony's inferior position in terms of keeping pace with service development, as well as lack of service interoperability for non-voice services has increased user focus on the mobile terminal. For example SMS, which revolutionised the communications market in the late 1990s by turning the mobile phone into a personal 'multimode communication device'. High mobile penetration and personalisation of services and applications, including simple applications such as a telephone book, have increased the reliance on the mobile service to the extent that fixed-line service is perceived as less attractive and in some situations does not fulfil basic needs.

Lifestyle is a key factor in analysing communicative behaviour and identifying what may encourage people to change this behaviour. Generally there is a global trend for increased focus on individual performance and values. Mobile communication is in tune with this societal value shift as it offers a means to express individualism. Mobile communication has become an integrated part of this lifestyle.

Symbiotic relationship between individualism and mobile
In a modern household, each family member may very well have one mobile phone, but there is seldom more than one fixed line. Personal calls are, increasingly made to mobile phones, in order to ensure that the right person is reached. Children and young people do not "call home" or to somebody's home, but to selected individuals. This phenomenon suddenly positions mobile

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communication in a non-mobile context, where fixed-mobile substitution is driven more by emotions than rational arguments.

Among young people, the mobile phone has long been the natural first choice when opening a subscription, and penetration of fixed-line subscriptions within this market segment is rapidly declining. Even outside youth segments, people are adapting to more flexible lifestyles, which, combined with a rising proportion of the population living in single households, reduces the need for fixed-line subscriptions.

Decreasing price premium for mobile calls

Given that mobile telephony now better serves customers than fixed telephony in most aspects, what holds people back from substituting all fixed calls with mobile calls?

The relatively large price premium that is generally associated with mobile calls compared with fixed-line calls is a very important obstacle for fixed to mobile substitution from a subscriber point of view.

To understand how price may impact people's preferences, pricing principles, as well as absolute and relative price levels, must be analysed.
When studying the correlation between price and traffic development we found that in Norway for example the relatively low price difference between fixed and mobile calls has encouraged people to substitute their fixed-line calls with mobile. The drastic decrease in the price difference between fixed and mobile in Sweden is still not enough to reach levels where price elasticity will have a positive effect on fixed to mobile substitution.

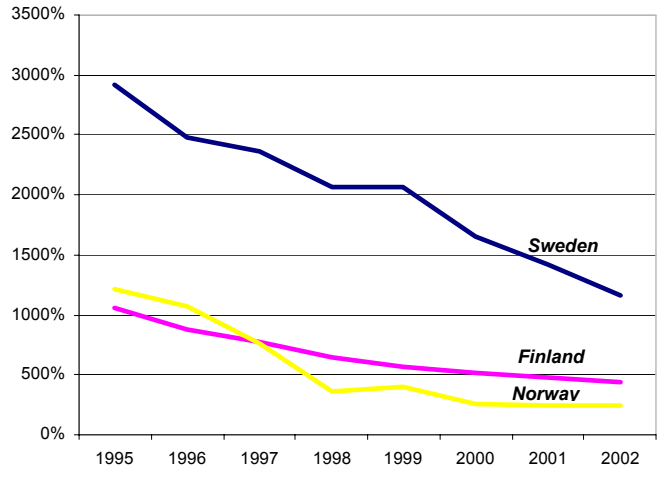

Figure 4 Relative price difference between fixed line local call and mobile-to-mobile call
Source: Northstream

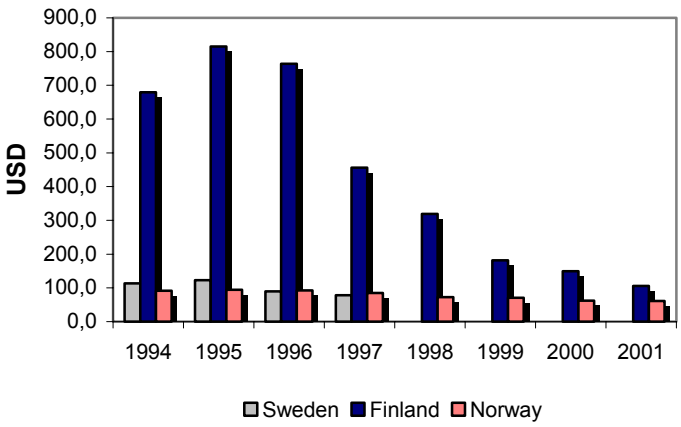

Figure 5 Difference between fixed- line installation and mobile subscription activation

Low fixed line connection charges challenge mobile advantage

The difference between mobile subscription activation fees and PSTN installation fee has a great impact on fixed to mobile line substitution. Consumers are generally very sensitive to activation fees and other upfront payments, which explain the reluctance of Finnish

customers to start subscribe to PSTN services. Even if the difference between fixed line installation and mobile subscription activation has declined substantially, the new behaviour has continued. In Finland the market-leading operator Sonera has leveraged this sensitivity in market communication by pointing out the cost of a fixed-line installation fee by translating it into mobile minutes.

Why operators drive fixed to mobile substitution

From an operator's perspective it may be argued that fixed to mobile substitution is primarily a redefinition of competition**,** driven by operators competing to increase market share and revenues. By redefining the addressable market, operators' competitive advantages may improve and some operators can use this in order to gain market share.

In markets with intense competition, operators are inclined to push boundaries to expand the business. For mobile operators who have a dominant position in both fixed and mobile business, defending market share for fixed-line business may be one reason to ignore promotion of fixed to mobile substitution. By defending this position, competition may theoretically be limited, but in fact, fixed to mobile substitution may become a threat as this leaves the market open for niche players to target FMS customers.

In terms of revenue, substitution of fixed-network voice traffic by mobile traffic also offers attractive opportunities for incumbent operators, which could outshine the possible loss in aggregated market share. Naturally, the strategic review preceding any activities related to fixed to mobile substitution has to outline any long-term profitability and market share objectives.

Innovative concepts encourage development

In the US, flat-rate packages with different bucket sizes containing mobile voice minutes are currently being offered. In order to encourage fixed-mobile substitution development, targeting households, packages that could be shared within families are promoted. This has proven to be a rather successful tool in attracting voice minutes to mobile networks. In Europe, other consumer-targeted promotions are exploited such as 'friends and family' packages, which provides discount plans intended to reduce household reluctance to increase usage of mobile services.

Other examples of market and product innovations paving the way for increased interest in substituting fixed line traffic as well as subscription to mobile, has to a large extent focused on business segments, in Western Europe. Cheap mobile calls between co-workers within companies, wireless VPN solutions and PABX solutions are some of the promotions being offered. Small and mid-size companies have proved to be more inclined to substitute fixed-line services with mobile services.

Network size

Although voice call interoperability is generally offered between mobile and fixed services, a clear 'network effect' is observed related to mobile penetration and line substitution development. Mobile initiated and terminated calls increase exponentially compared with penetration.

Network effect, as a result of an increased number of mobile-only subscribers driving fixed to mobile substitution are currently identified in particular within communities characterized by mobile lifestyles and intense group-internal communication patterns, but will in the long-term drive fixed to mobile substitution in all market segments.

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Calling a mobile number increases the likelihood of directly reaching the intended person. High mobile penetration in combination with lifestyle changes in favour of mobility, flexibility and individualism increase the network effect.

Operators' role in fixed to mobile substitution

The various drivers can be categorized in different groups, defined by who is in control of them. High-level drivers can be grouped in three categories;

- ***Macro-level drivers***: drivers that cannot be influenced by any single operator. To influence macro-level drivers, operators have to utilize operator forums, industry coalitions, etc.;
- ***Operator-level drivers***: drivers that can be influenced by a single operator determined to drive fixed to mobile substitution;
- ***Market-dynamic drivers***: trends developing independently from fixed to mobile substitution but influencing fixed to mobile substitution development. Operators indirectly influence market dynamics, but we have not seen any cases of direct influence of a specific operator's actions related to these drivers and FMS development.

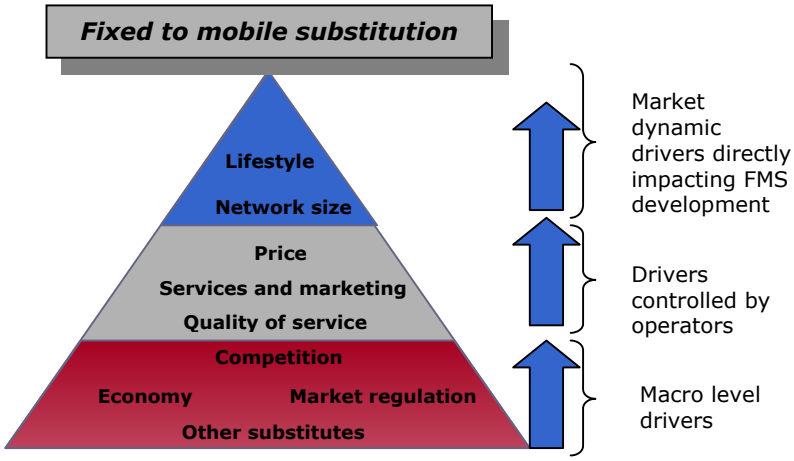

Figure 6 FMS driver-hierarchy. Source: Northstream

This means that an operator in a given market has to consider the Macro-level factors as a starting point for any fixed to mobile substitution strategies. At any point in time, operators control part of the fixed to mobile substitution development, but dependencies to Macro-level have to be carefully considered when developing FMS strategies.

The impact and intensity of different drivers varies over time, changing the relative importance of the drivers over time. In order to focus on the right set of activities at the right development stage it is of course important to assess the current level of fixed to mobile substitution.

Operators opting for fixed to mobile substitution strategies

Reasons driving operators to develop fixed to mobile substitution strategies and concepts can vary over time and are likely to be different between operators depending on whether the operator operates both fixed and mobile networks or mobile only (see figure 6).

Developing fixed to mobile substitution strategies requires thorough market analysis. Depending on maturity reached in a specific market and the operator objective, there may be alternative sets of drivers to focus on.

As key FMS drivers differ between market stages, operators should focus FMS strategies on the drivers providing the most impact in a given market situation.

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Operators need primarily to secure basic requirements such as network quality and coverage so that basic access convergence between fixed and mobile is fulfilled.

To further stimulate development, operators actively need to include fixed to mobile substitution objectives in pricing and marketing strategies.

Modelling fixed to mobile substitution development

When analysing interdependencies between fixed to mobile substitution drivers timing and the sequential flow of drivers are critical to gain full advantage of the drivers. By outlining a 'fixed to mobile substitution stage model' different stages of development and key drivers applicable to a specific stage, can be identified.

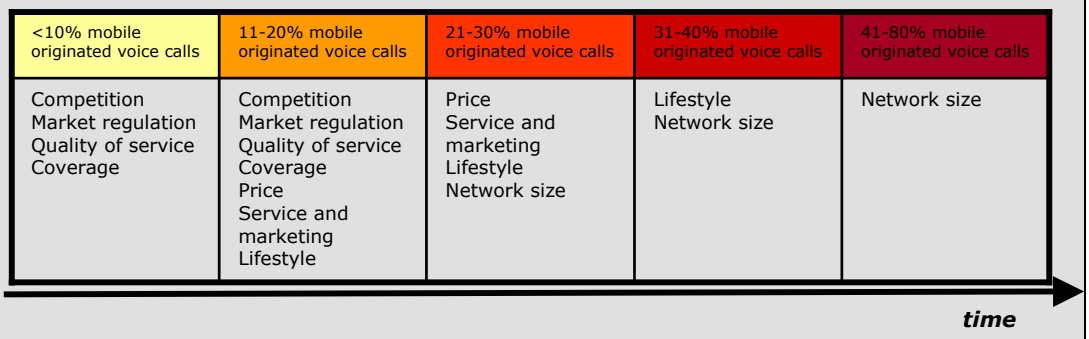

Figure 7 FMS-stage model outline. Source Northstream

The model is based on a relative scale, represented by the proportion of outgoing voice calls made in mobile networks. By applying this perspective on fixed to mobile substitution development the relative level of development in a market can be assessed. The model is based on the market development stages and driving forces observed in Northstream's Nordic Case study.

When markets mature, typically with >10-30% of originated voice calls being mobile, development and marketing of more advanced 'fixed to mobile substitution' products will gain attention and thus potentially be successful. Efforts spent on development and marketing of advanced fixed to mobile substitution' services in immature market stages can only occasionally be turned in to successful and profitable market concepts.

In order to secure profitable business growth when expanding into traditional fixed markets, FMS-related activities should be subject to thorough financial analysis. Network capacity investments have to be balanced with a profitable mixture of revenues, of which fixed to mobile substitution may be a vital component.

In this perspective, Northstream believes that fixed to mobile substitution will play an interesting role in particular for operators launching 3G networks. In the long term, 3G will offer a shift in cost structure that may drive fixed to mobile substitution development from a profitability perspective, irrespective of whether the operator is a mobile-only operator or serves both fixed and mobile customers.

Incumbent's perspective on fixed to mobile substitution

A market position in both fixed and mobile offers an opportunity to target and transfer well-defined market segments and traffic clusters from fixed to mobile, thereby increasing the total end user bill. Being the dominant operator, the combined fixed & mobile operator may define the FMS market and thereby limit other operators' opportunities to leverage competitive advantages.

Fixed & mobile operators are in a very favourable position as they have the opportunity to balance the potentially reduced price level on mobile traffic with a

relative revenue increase from substituted fixed-line traffic compared with fixed line traffic.

This category of operators typically also operate high capacity networks which offer interesting business opportunities related to fixed to mobile substitution creating better utilization of infrastructure investment.

Mobile operators in mature markets challenged to find growth

By enlarging the addressable market beyond mobile traffic volumes, mobile operators can capture revenues destined for fixed operators. Mobile operators are challenged to find revenue growth. In markets with saturated mobile penetration, fixed to mobile substitution offers an attractive opportunity to grow voice related ARPU.

By aggressively addressing fixed market segments mobile operators may challenge incumbent operators position within fixed line services. Besides increasing the total scope of business, this may also reduce incumbents' possibilities to leverage market positions in the fixed market.

Conclusions

Fixed to mobile substitution offers business opportunities for all types of mobile operators. The opportunity itself will vary between markets and operators both in size and timing. For continued analysis and strategy development it should be acknowledged that operators control some of the key drivers for continued development.

Introduction of new mobile value-added data services will continue to increase the importance of mobile communication in everyday life. Similar to the positive FMS effect of SMS, as exemplified by the intense SMS usage in Norway, new mobile data services will further drive subscribers to substitute fixed-line calls with mobile calls.

Ongoing 3G network investments will impact the Western European fixed to mobile substitution development, as capacity utilisation will become an increasing challenge for mobile operators.

Markets with underdeveloped fixed-line infrastructure, such as Eastern Europe and Latin America, offer considerable FMS business expansion opportunities to operators, provided that low enough cost levels can be met to support local demand.

In markets with well-developed fixed-line infrastructure, such as Western Europe and the US, FMS business opportunities leverage the fact that mobile communication has become an integrated part of a modern lifestyle.

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Mobile operators are challenged to increase revenues from services, including voice services. Northstream experts have analyzed fixed to mobile substitution from a business opportunity perspective and created an analytical framework that can be used by operators to support FMS strategy development.
Northstream's experience encompasses well-reputed industry experience of advice on business planning including revenue analysis, service roadmap development and development of service launch strategies.

Contact

Northstream has studied and assisted mobile players in the area of FMS and is well suited to help mobile operators and others on how and when they best can benefit from FMS opportunities.

Please contact us if you would like to find out more about this or about our company and the services we provide: E-mail us at info@northstream.se or call +46 8 564 84 800.