

Nordic Peripherality in Europe

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Nordic co-operation

takes place among the countries of Denmark, Finland, Iceland, Norway and Sweden, as well as the autonomous territories of the Faroe Islands, Greenland and Åland.

The Nordic Council

is a forum for co-operation between the Nordic parliaments and governments. The Council consists of 87 parliamentarians from the Nordic countries. The Nordic Council takes policy initiatives and monitors Nordic co-operation. Founded in 1952.

The Nordic Council of Ministers

is a forum for co-operation between the Nordic governments. The Nordic Council of Ministers implements Nordic co-operation. The prime ministers have the overall responsibility. Its activities are co-ordinated by the Nordic ministers for co-operation, the Nordic Committee for co-operation and portfolio ministers. Founded in 1971.

Stockholm, Sweden
2004

Preface

The northernmost parts of the Nordic countries are extremely peripheral in a European context. The lack of accessibility very often coincides with problems of population loss through out-migration. The question for the Nordic countries is how best to develop policies that can stimulate economic activities in these regions despite their geographical handicaps.

This paper was commissioned by the "NERP-EU" Committee of the Nordic Council of Ministers. Its objective is to assess the degree of peripherality of Nordic regions using accessibility concepts:

- to illustrate differences in travel costs throughout Europe
- to show the degree of the peripherality of Nordic regions at the NUTS 3 level
- to get a more detailed picture of the situation in the Nordic countries at the NUTS 5 level.

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The paper was written by Klaus Spiekermann (S&W) and Hallgeir Aalbu (Nordregio), with assistance from Jörg Neubauer (Nordregio) and Nils Leber (S&W). Chris Smith was responsible for the language editing.

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1 Introduction

The background to the study presented in this paper is formed by the coming revision of the eligible areas for national regional policy (competition rules) and for EU regional policy (structural funds) and the need that these changes entail to describe the specific challenges now facing the Nordic countries in an European comparative context.

One of the premier challenges facing the Nordic countries is their relatively remote location within Europe. This is usually described by use of the term 'peripherality'. From a conceptual point of view, peripherality can be seen as synonymous with a relative lack of accessibility to economic activity (Keeble et al., 1988), whereas accessibility is considered as the main 'product' of a transport system. In this way, accessibility determines the locational advantage or disadvantage of an area relative to all other areas considered. Accessibility indicators measure the benefits that accrue to households and firms in a given area in respect of the existence and use of the transport infrastructure and the available transport services relevant to that area. A lack of accessibility, on the other hand, often coincides with problems relating to economic performance and with problems of population loss through out-migration (Spiekermann and Neubauer, 2002).

One of the findings of a previous review study was that existing accessibility studies have been mostly concerned with measuring the accessibility levels of the large European centres and with differentiating between the European core and remote regions (Spiekermann and Neubauer, 2002). There remain however few examples in which the European periphery has been differentiated internally with respect to accessibility or indeed with respect to the wider European context. This lack of knowledge pertains to all peripheral areas in Europe including the Nordic countries.

Therefore, the objective of this study is *to assess the degree of peripherality of Nordic regions within the Nordic countries and within Europe by using accessibility concepts*.

To attain this objective two approaches have been applied, an empirical analysis of travel costs and potential accessibility modelling. Both approaches have provided data for NUTS-3 regions and their equivalents for the whole of Europe. In order to achieve a much finer internal differentiation within the Nordic countries, accessibility indicators have also been calculated for the municipalities (NUTS-5) of the four Nordic countries Denmark, Finland, Norway and Sweden.

The report commences with a brief introduction of the accessibility methodologies used (Chapter 2). It then presents the main findings of the travel cost survey (Chapter 3). The pan-European accessibility indicators at the NUTS-3 level are presented and discussed in Chapter 4. Intra-Nordic accessibility and the European-wide accessibility of the Nordic municipalities is the subject of Chapter 5. Finally, Chapter 6 summarises the main findings and draws some conclusions for regional policy.

2 The methodological concept

There are numerous definitions and concepts of accessibility and peripherality, consequently, there are several ways to develop and implement methodologies for an empirical assessment of it. A general definition is that "accessibility indicators describe the location of an area with respect to opportunities, activities or assets existing in other areas and in the area itself, where 'area' may be a region, a city or a corridor" (Wegener et al., 2002).

In general terms, accessibility can be seen as a construct of two functions, one representing the activities or opportunities to be reached and the other, the effort, time, distance or cost needed to reach them:

$$A_i = \sum_j g(W_j) f(c_{ij})$$

where A_i is the accessibility of area i , W_j is the activity W to be reached in area j , and c_{ij} is the generalised cost of reaching area j from area i . The functions $g(W_j)$ and $f(c_{ij})$ are called *activity functions* and *impedance functions*, respectively. They are associated multiplicatively, i.e. are weights to each other. That is, both are necessary elements of accessibility. W_j is the total of the activities reachable at j weighted by the ease of getting from i to j .

Accessibility indicators can be classified by their specification of the destination and the impedance functions (Schürmann et al., 1997, Wegener et al., 2002):

- *Travel cost* indicators measure the accumulated or average travel cost to a pre-defined set of destinations, for instance, the average travel time to all cities with more than 500,000 inhabitants. In its simplest form the indicator measures the travel cost to one destination only.
- *Daily accessibility* is based on the notion of a fixed budget for travel in which a destination has to be reached to be of interest. The indicator is derived from the example of a business traveller who wishes to travel to a certain place in order to conduct business there and who wants to be back home in the evening (Törnqvist, 1970).
- *Potential accessibility* is based on the assumption that the attraction of a destination increases with size and declines with distance, travel time or cost. Destination size is usually represented by population or economic indicators such as GDP or income.

The different accessibility types all have advantages and disadvantages. Travel time indicators and daily accessibility indicators are easy to understand and to communicate, though they lack a theoretical foundation. Potential accessibility is founded on sound behavioural principles but contains parameters that need to be calibrated while their values cannot be expressed in familiar units (Spiekermann and Neubauer, 2002).

For the assessment of the degree of peripherality of Nordic regions, two of the three basic types of indicators were selected. The first is travel cost, i.e. an indicator easy to communicate. The second is potential accessibility, i.e. an indicator reflecting human behaviour:

- Typical European travel cost structures were gathered by taking a couple of typical trip purposes as examples. The empirical findings are presented in the next chapter.
- Potential accessibility was calculated by adjusting and applying an existing pan-European accessibility model (Schürmann et al., 1997; Spiekermann et al., 2002, Wegener et al., 2002). The accessibility indicator calculated is a multimodal potential accessibility, i.e. it integrates road, rail and air transport into one indicator value. Population is used as destination activity. Accessibility indicators are calculated for all NUTS-3 and equivalent regions in Europe (see Chapter 4) and for all municipalities of the four Nordic countries Denmark, Finland, Norway and Sweden (see Chapter 5).

3 Travel cost

The first approach used to assess the degree of peripherality of Nordic regions within Europe is an empirical analysis of travel cost structures in Europe. The hypothesis is that remote locations, in particular those in the Nordic countries, face serious disadvantages not only in terms of travel time but also in terms of travel costs.

In order to gather empirical evidence concerning the hypothesis of peripheral disadvantages related to travel costs, some typical travel scenarios were developed. Two travel purposes were distinguished: a one-day business meeting and a two-day conference taking place on a Friday and a Saturday to take advantage of cheaper weekend tickets in economy class. For each of the two trip purposes two destinations were selected: Brussels is one of the most central locations hosting a large number of EU institutions and related business; Helsinki on the other hand represents an attractive capital centre in a remote European location.

Travel costs were gathered for all NUTS-3 regions of the European Union and for the accession countries as well as for the regions of neighbouring countries. Travel costs include prices of air and/or rail tickets, public transport or taxi, accommodation if necessary, and daily labour costs or the *per diem* 'daily allowance'. The travel cost surveys were conducted by using information provided by e-commerce travel agents for flights and by using country specific cost functions for rail travel.

3.1 Business trip scenarios

The underlying scenario is a one-day business meeting lasting from 11.00 h to 16.00 h, i.e. arrival at the airport or at the train station must be at 10.00 h at the latest, while the earliest travel home from the airport or rail station can be at 17.00 h. For Brussels as a destination this might reflect a typical visit to the European Commission, for Helsinki this time period could entail a typical meeting with a leading company in telecommunications.

For this type of scenario the typical behaviour of a businessperson was followed to calculate the travel costs from all European regions to Brussels and to Helsinki. The basic assumption is that "time is money", i.e. that a businessperson plans the trip taking primarily the travel time into account and thus practically neglecting travel costs. The only time restriction assumed is that the businessperson is not willing to start the trip from home earlier than 4.30 h in the morning and wants to be back home one hour after midnight at the very latest. If this is not possible, accommodation is necessary. Total trip costs comprise either transfers to the rail station and first class rail fare or transfers to the airport plus flight price in business class, accommodation if necessary and a rate of 500 € reflecting labour costs per day of travel.

Figure 1 shows travel costs for business trips to Brussels for NUTS-3 regions. A huge spatial variation is visible here. Regions from which the trip to Brussels can be made within one day by rail have the lowest total travel costs of between 500 and 1,000 €. These are regions in the Benelux countries, in western Germany and those regions in northern France neighbouring Belgium or which are located along the major TGV lines. Relatively low travel costs are visible also in most parts of the UK, northern Italy and regions located near major airports in Switzerland, Austria, Slovenia, Hungary, the Czech Republic, Slovakia, Poland, and also those in the four Nordic Countries. The highest travel costs are from regions in the Iberian Peninsula, Greece, most of the accession countries and regions outwith the major agglomerations in the Nordic countries, and regions in Eastern Europe. Here, total travel costs can accumulate up to 4,000 €, i.e. more than five times as much as regions in the lowest travel cost category.

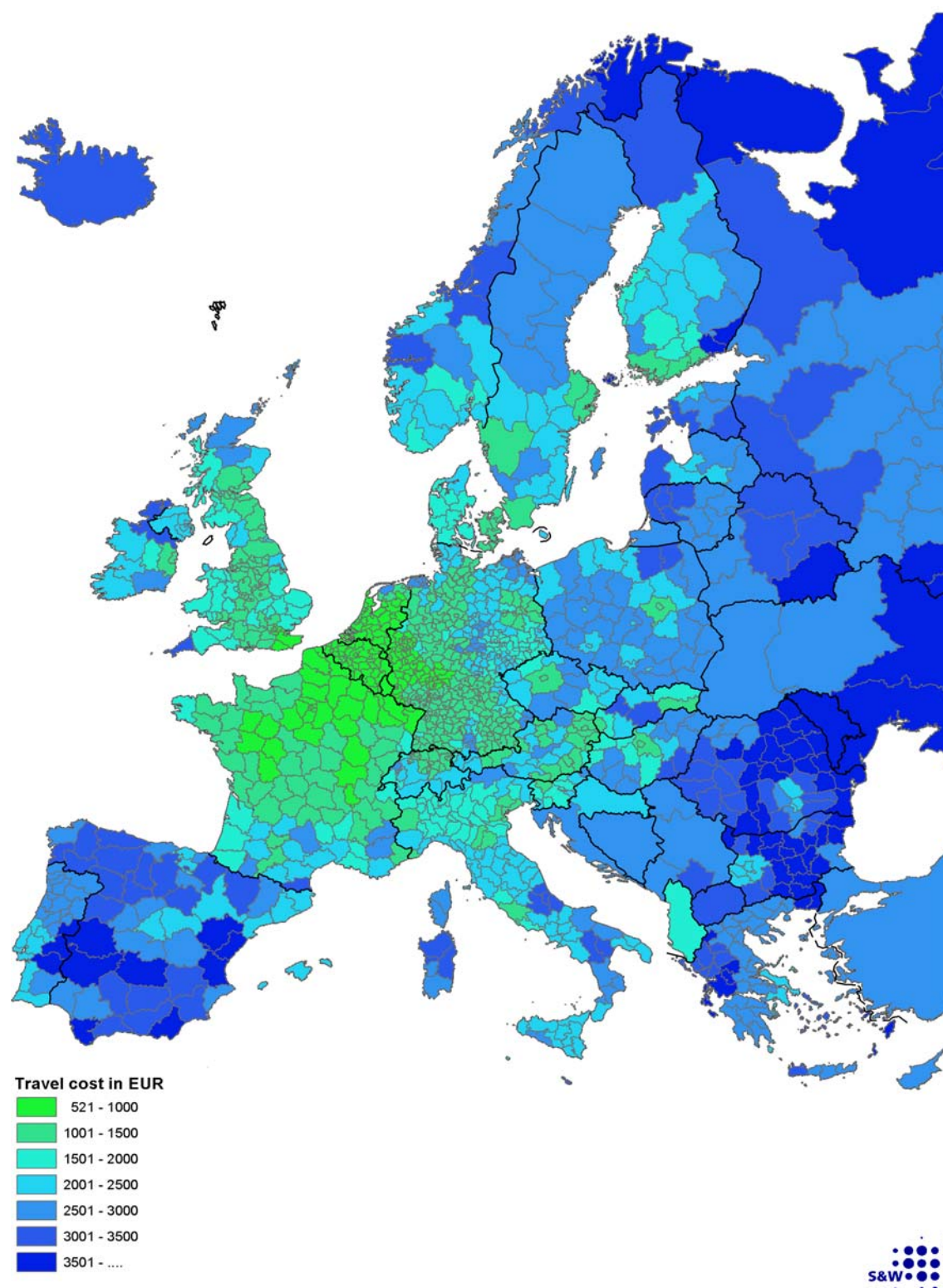


Figure 1. Travel costs of a business trip to Brussels.

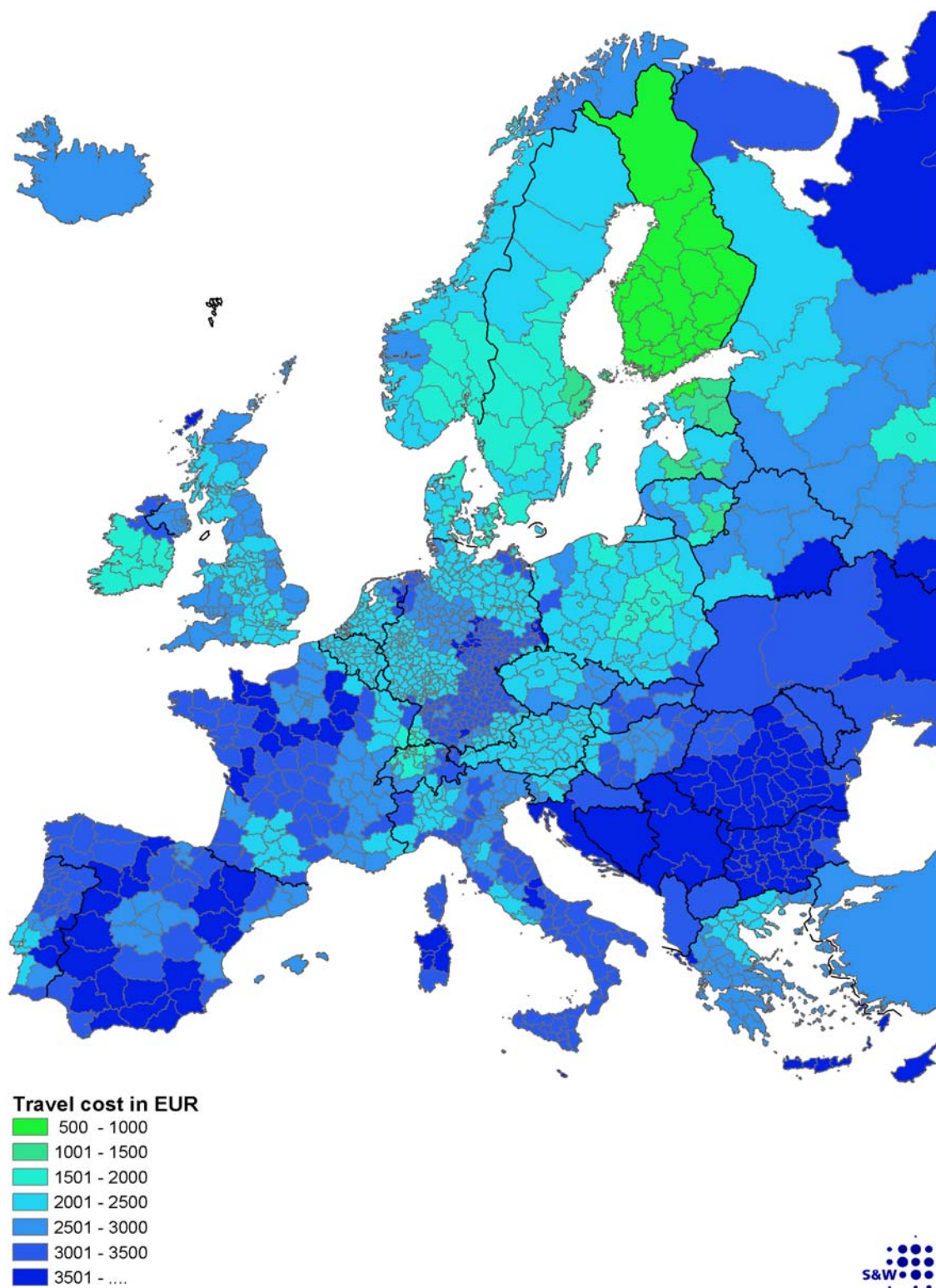


Figure 2. Travel costs of a business trip to Helsinki.

Table 1. Average costs of a business trip

Area	to Brussels		to Helsinki	
	Average per region (EUR)	population weighted average (EUR)	Average per region (EUR)	population weighted average (EUR)
Denmark	1550	1522	2022	2000
Finland	2421	2084	717	662
Norway	2462	2277	2138	2041
Sweden	2316	1947	1832	1680
Iceland	3184	3184	2545	2545
Five Nordic countries	2240	1959	1662	1610
EU 15	1721	1664	2650	2641
Accession countries	2753	2637	2871	2739
EU 27	1875	1880	2682	2663
EU 27 + 3	1880	1881	2667	2651

Figure 2 shows the travel costs of business trips taking Helsinki as their destination. Immediately it becomes apparent that general travel costs are much higher than for Brussels. The regions with travel costs in the lowest category are Finnish only. Journeys with modest travel costs to Helsinki are available from most Nordic origins, the regions around Warsaw in Poland, and from some German and Benelux regions. In addition, there are some regions in southern France and Portugal marked with relatively low travel costs. Those ‘islands’ within areas of high travel costs are however simply the outcomes of the peculiarities of the European air market. At the time that the travel cost survey was conducted the carrier KLM offered flight tickets from Toulouse and Nice to Helsinki for a price of less than 500 € and from Lisbon to Helsinki for less than 600 €. This is only one third of the prices that usually have to be paid from those areas to Helsinki and can only be explained by the aggressive market behaviour of some carriers attempting to increase their market shares.

However, for most of the regions in Europe the total travel costs to Helsinki for a business trip clearly exceed 2,000 €. There are two reasons for this which are, the traditionally high flight costs to Nordic destinations, and the fact that for most business persons a one-day business meeting in Helsinki would require at least a one night stay in a hotel, i.e. two or even three travel days are necessary to attend such a meeting.

Table 1 summarises the findings in terms of average travel costs by region or population weighted average. Business trips to Brussels are up to 45 percent more costly for businesspersons from Nordic regions (even 85 percent from Iceland) than the current European Union average; only from Denmark are travel costs slightly less than the EU15 average. Compared to the average of the enlarged European Union, travel costs from Nordic regions are up to 30 percent higher. Average business travel costs to Helsinki are about 60 percent higher for EU15 and about 40 percent higher for EU27 than to Brussels.

3.2 Conference trip scenarios

The underlying scenario for this travel cost survey is a two-day conference on a Friday and a Saturday meaning that travel will take place the day before and the day after the conference. For this type of scenario the typical behaviour of a conference visitor, e.g. a university lecturer, has been followed to calculate the travel costs from all European regions to Brussels

and to Helsinki. The basic assumption now is that of cost minimising if the travel time is reasonable. The assumptions about the conference settings enable the travellers to benefit from the much less expensive economy class flight tickets. Because all attendees to the conference will travel on the same day, there are no differences in the number of nights required and the number of travel days. The total trip costs comprise either transfers to the railway station and rail fare or transfers to the airport plus flight price in economy class, accommodation for three nights and a rate of 80 € reflecting per diem 'daily allowances' for each of the four travel days.

Figure 3 displays the total travel costs for a conference trip to Brussels for the European regions. The spatial variation is extremely low. Travel cost increase slightly with distance to Brussels and are, for most European regions, less than 1,000 €. Higher travel costs are to be found from the northern regions of Norway and Finland and from the Baltic States. The highest travel costs within the enlarged European Union are from regions in Bulgaria and Romania and from western Greece.

Figure 4 shows the conference travel costs to Helsinki. The picture is comparable to that for Brussels, i.e. the overall cost level is comparable and spatial variation is also low. There are now however more regions with travel costs above 1,000 €. The highest travel costs are again from regions in Bulgaria, Romania and Greece, though they are now joined also by some of the remoter regions of Spain and Portugal.

Table 2 gives the travel costs for a conference trip for the Nordic countries and for European aggregates. Whereas travel costs from Denmark to Brussels are on or about the European average, travel costs from Finland, Norway and Sweden are up to 25 percent higher than the EU15 average, while from Iceland they are almost 80% above the average. However, the absolute difference is much lower than for business trips. A conference trip to Helsinki is cheaper from Nordic regions than the current and future European Union's averages. It is about 15 percent more expensive to attend a conference in Helsinki than in Brussels, but again, the absolute difference is slightly more than 100 € and is thus deemed as negligible. This means that the peripheral disadvantage in terms of travel costs that has been demonstrated for business trips does not really exist for conference trips (and other purposes with similar cost structures such as city tourism).

Table 2. Average costs of a conference trip

Area	to Brussels		to Helsinki	
	Average per region (EUR)	population weighted average (EUR)	Average per region (EUR)	population weighted average (EUR)
Denmark	809	798	944	942
Finland	992	955	684	656
Norway	993	971	938	916
Sweden	893	839	855	838
Iceland	1486	1486	1052	1052
Five Nordic countries	935	887	851	839
EU 15	801	779	926	919
Accession countries	1053	1005	1094	1063
EU 27	838	829	951	951
EU 27 + 3	840	831	950	950

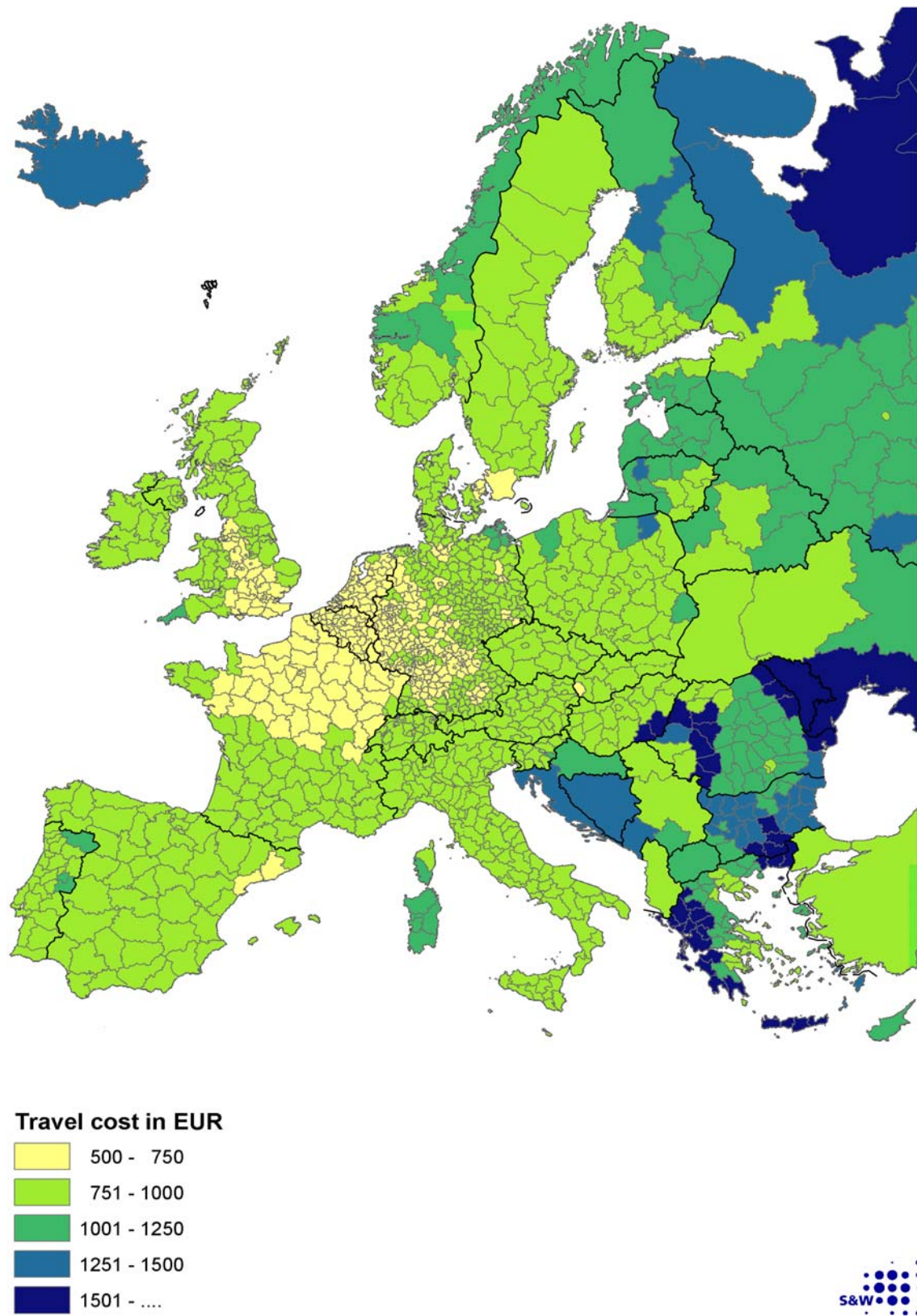


Figure 3. Travel costs of a conference trip to Brussels.

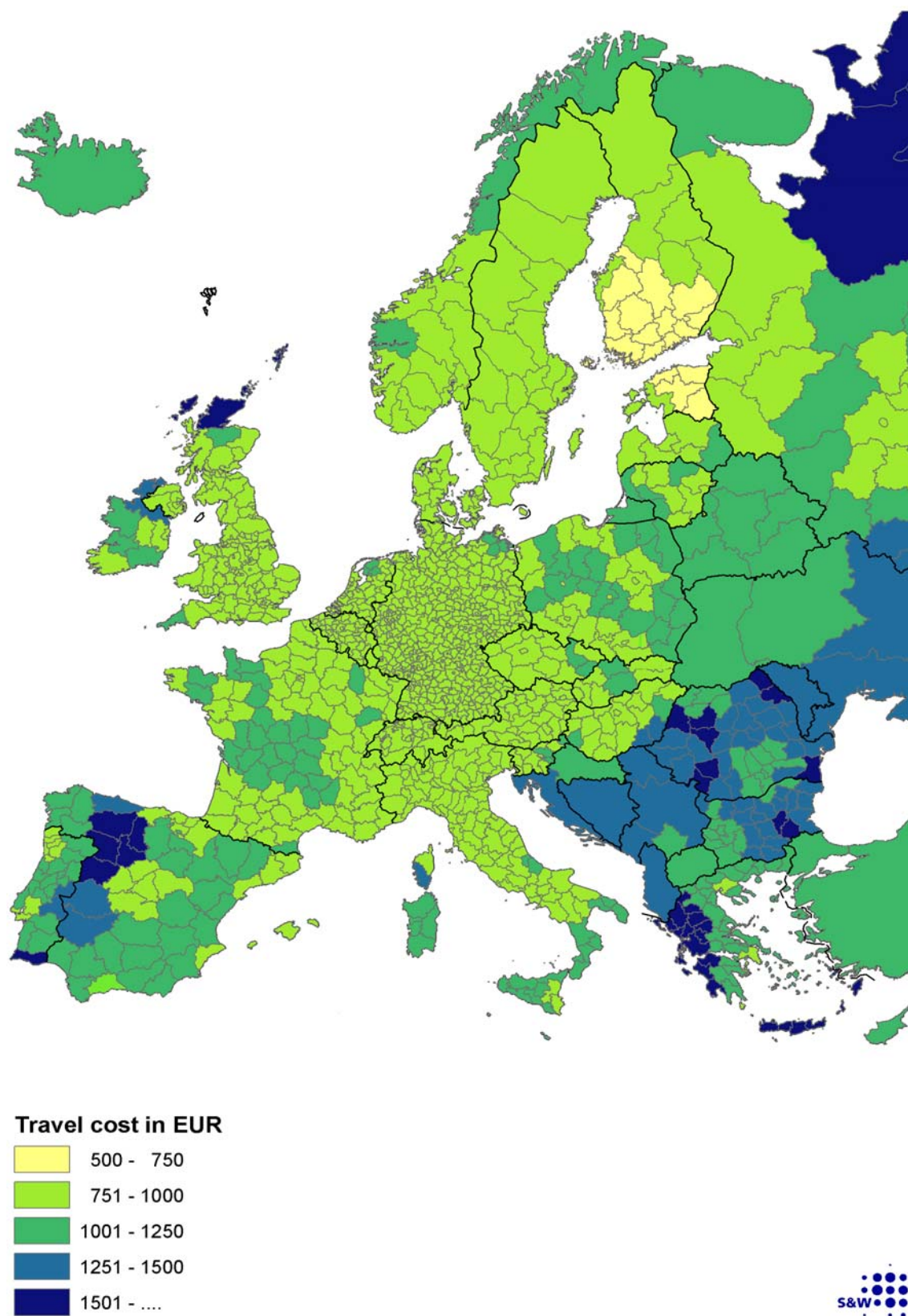


Figure 4. Travel costs of a conference trip to Helsinki.

4 The accessibility of European regions

The second approach used here to assess the degree of peripherality of the Nordic regions is the application of a pan-European accessibility model. The accessibility indicator calculated is a multimodal potential accessibility indicator with population as destination activity. The multimodal indicator has the advantage of integrating road, rail and air transport into a single indicator. The potential type indicator has the advantage of reflecting human behaviour because the attraction of a destination increases with size and decreases with travel time. All areas in Europe, i.e. all EU and non-EU regions, are included as destinations. Accessibility is presented below for NUTS-3 regions. Chapter 5 provides a closer look at Nordic municipalities.

Figure 5 presents the spatial distribution of central and peripheral NUTS-3 regions in Europe. The accessibility indicator is standardised to the average of the enlarged European Union (EU27). Regions with indices of more than 125 are classified as being central; regions with indicator values between 75 and 125 are on or about the European average and classified as being intermediate. Regions with values below 75 are considered peripheral to different degrees.

Regions with *above average accessibility* are primarily located in an arc stretching from Liverpool and London via Paris, Lyon, the Benelux regions, along the Rhine in Germany to Northern Italy. Here, the major agglomerations are central, while the remaining parts are intermediate (above average). Some of the urban regions in more remote areas of the current European Union such as Madrid, Barcelona, Dublin, Rome, Naples and Athens are however also classified as being central or intermediate (above average) because their international airports act in effect to counter their remote location. In the Nordic countries, Copenhagen and Malmö belong to the group of central regions in Europe, Gothenburg and Helsinki are slightly above average, the latter mainly because of its links to St. Petersburg. From the accession countries, only the urban agglomerations of Warsaw, Prague and Budapest are central in the European context.

Intermediate regions (below average) are located around the central regions in the European core. Those regions usually have relatively good road and rail accessibility, but lack access to flight services. In southern Europe, some of the major agglomerations are intermediate, but below average. In the Nordic countries, most regions of Denmark, and the agglomerations of Oslo, Stockholm and Uppsala are slightly below average. In the accession countries a second range of capitals such as Tallinn, Riga, Vilnius, Bucharest, and Sofia are intermediate (below average) as are most regions in Slovenia.

The European periphery begins actually in regions that are usually considered to be central. Some regions in Germany, Austria and France are thus to be considered peripheral, while some may even be viewed as very peripheral, i.e. having an accessibility index of less than 50 percent of the EU27 average. Most regions of Spain and Portugal, southern Italy, Greece, Ireland and several regions in the UK, in particular in Wales and Scotland are peripheral. Most parts of the Nordic countries belong to this group; in particular Iceland and the northern regions of Norway, Sweden and Finland are very or even extremely peripheral. In the accession countries, nearly all regions apart from the capital regions are peripheral, while most of the regions of the Baltic States, Slovakia, Romania and Bulgaria are very or even extremely peripheral.

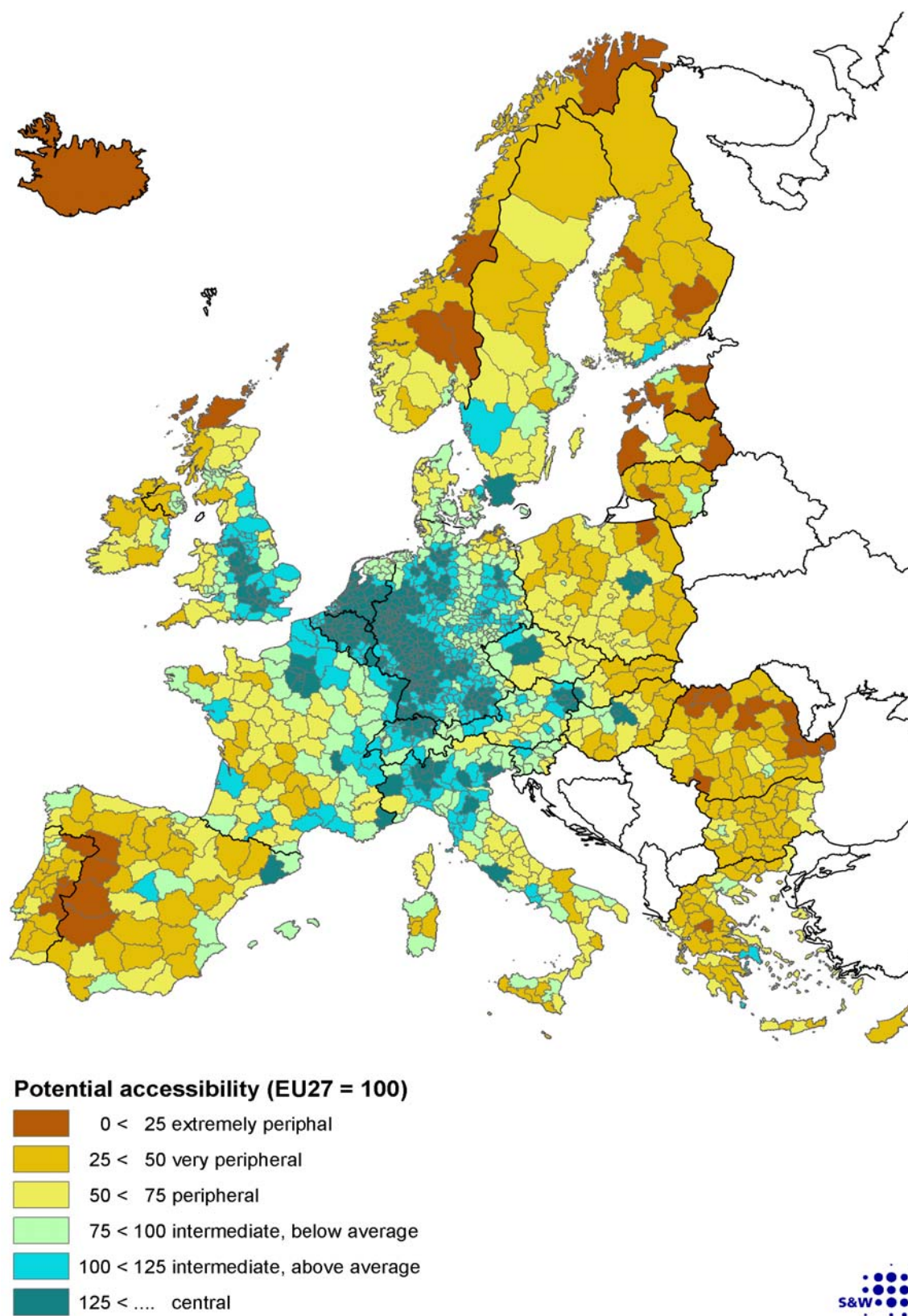


Figure 5. Potential accessibility of European regions.

Table 3. Potential accessibility averages.

Area	Absolute (million)	EU15 = 100
Denmark	38.90	89.0
Finland	22.77	52.1
Norway	21.70	49.8
Sweden	33.15	75.9
Iceland	8.04	18.4
Five Nordic countries	29.77	68.1
EU 15	43.69	100.0
Accession countries	22.89	52.4
EU 27	39.06	89.4
EU 27 + 3	39.06	89.4

Table 3 presents average accessibility values for the Nordic countries and relates them to European averages. The accessibility averages are standardised to the current European Union (EU15 = 100). One should however note that the average goes down by more than 10 percent to an index of 89 for the future European Union, because the accession countries have, on average, only half of the accessibility value of the EU15. The Nordic countries perform very differently. Whereas Denmark (index of 89) is slightly below the EU15 average and Sweden (76) is clearly below, Finland (52) and Norway (50) have even lower accessibility and are at the level of the accession countries (52), while Iceland is in a category of her own (18).

Table 4 gives more details for the peripheral regions. The table presents the percentages of the population that live in NUTS-3 regions below a certain accessibility index value which has been standardised to the future European Union (EU27 = 100). In the EU27 every second person lives in a region with below average accessibility, 34 percent in peripheral regions with less than 75 percent of the average, 17 percent in very peripheral regions with less than 50 percent and only 2 percent in extremely peripheral regions (less than 25 percent accessibility). The corresponding values for the EU15 are slightly lower, i.e. less people live in peripheral regions. The indices for the accession countries are much higher. About 90 percent of the population live in below average regions, nearly 80 percent in peripheral regions, nearly 50 percent in very peripheral and six percent in extremely peripheral regions.

The Nordic countries have values between the EU15 average and the accession countries average. More than 50 percent of the population lives in peripheral regions, a quarter in very peripheral regions and about 4 percent in extremely peripheral regions. Norway is outstanding in this regard with the highest share in extremely peripheral regions, followed by Finland.

Table 4. The degree of Nordic peripherality in Europe.

Area	Population (in %) living in NUTS-3 regions with accessibility below an index value of ... (EU27 NUTS-3 average = 100)							
	< 100	< 75	< 50	< 25	< 20	< 15	< 10	< 5
Denmark	70.7	31.2	0.0	0.0	0.0	0.0	0.0	0.0
Finland	75.2	75.2	52.4	8.5	1.4	1.4	0.0	0.0
Norway	100.0	88.3	37.3	12.7	9.9	4.1	0.0	0.0
Sweden	70.5	42.3	13.3	0.0	0.0	0.0	0.0	0.0
Four Nordic countries	77.1	55.7	23.3	4.2	2.2	1.1	0.0	0.0
EU 15	40.8	21.6	8.3	0.8	0.2	0.1	0.0	0.0
Accession countries	90.9	77.5	46.9	6.0	2.2	0.0	0.0	0.0
EU 27	52.0	34.0	16.9	1.9	0.6	0.1	0.0	0.0

5 The accessibility of Nordic municipalities

This chapter presents the results of a spatially more detailed accessibility model. The model applied in the previous chapter was modified here such that it was able to calculate the same type of multimodal potential accessibility indicator for the municipalities of the four Nordic countries considered, i.e. it provides indicators at the NUTS-5 level. Two different cases were distinguished. First, intra-Nordic accessibility was calculated and will be presented in the first section of this chapter. Then, European-wide accessibility as in the previous chapter was calculated and this will be presented in the second section.

5.1 Intra-Nordic peripherality

Intra-Nordic accessibility was calculated by restricting the destinations in the accessibility model to the four Nordic countries, i.e. the four countries were treated as an 'island' without connections to other countries for this purpose. Thus, the indicator expresses the relative location of a municipality within the Nordic context.

Figure 6 presents the spatial pattern of intra-Nordic accessibility. Not surprisingly, the highest intra-Nordic accessibility is to be found in the south of the area, while intra-Nordic peripherality is a characteristic related mostly to the northern parts of the area. Even in the southern part however there are many municipalities that have intra-Nordic accessibility indices below the average. There are also a few 'islands' of higher intra-Nordic accessibility in the northern parts of the area, which however, never reach above average values. Table 5 adds aggregate information on the degree of intra-Nordic peripherality in a similar fashion to Table 4.

Denmark has almost no municipalities that are peripheral in the Nordic context. The Copenhagen metropolitan area and the area around Billund airport between Esbjerg and Århus are classified as central. Most other municipalities between and around these central areas are above the Nordic average. Municipalities below the Nordic average are located in the western parts of Denmark and along the borders and islands towards Germany. Only one quarter of the Danish population lives in municipalities below the average of intra-Nordic accessibility, and only two percent in municipalities classified as peripheral in the Nordic context.

In Norway, only Oslo and its surroundings are above the average for intra-Nordic accessibility. All other municipalities are below, corresponding to almost 75 percent of the population. Slightly below average municipalities are located between Oslo and the Swedish border; the cities of Kristiansand, Stavanger and Bergen are also in this group. The periphery in Norway already begins at the most southern coastline and extends to the far north. Seen in the Nordic context, about 50 percent of the population lives in peripheral places, with every fourth inhabitant living in very peripheral places. Within the peripheral areas, municipalities close to a regional airport are less peripheral than those without.

Finland displays a somewhat similar spatial pattern of central and peripheral places in terms of intra-Nordic accessibility. Only the Helsinki area is central, the hinterland of the capital as well as the Turku and Tampere urban areas are above the Nordic average. More than two thirds of the population lives in municipalities below the intra-Nordic average accessibility, 50 percent of the population lives in peripheral locations and a quarter in very peripheral locations. Within the peripheral areas, municipalities close to a regional airport or with good rail services to the main cities in Finland are less peripheral than others without access to such services.

The spatial pattern in Sweden is different. There are three urban regions that are central, namely Stockholm/Uppsala, Gothenburg and Malmö. Most of the other municipalities in southern Sweden have intermediate accessibility. Only 16 percent of the population lives in peripheral places, nearly all of them are located in the northern parts of the country.

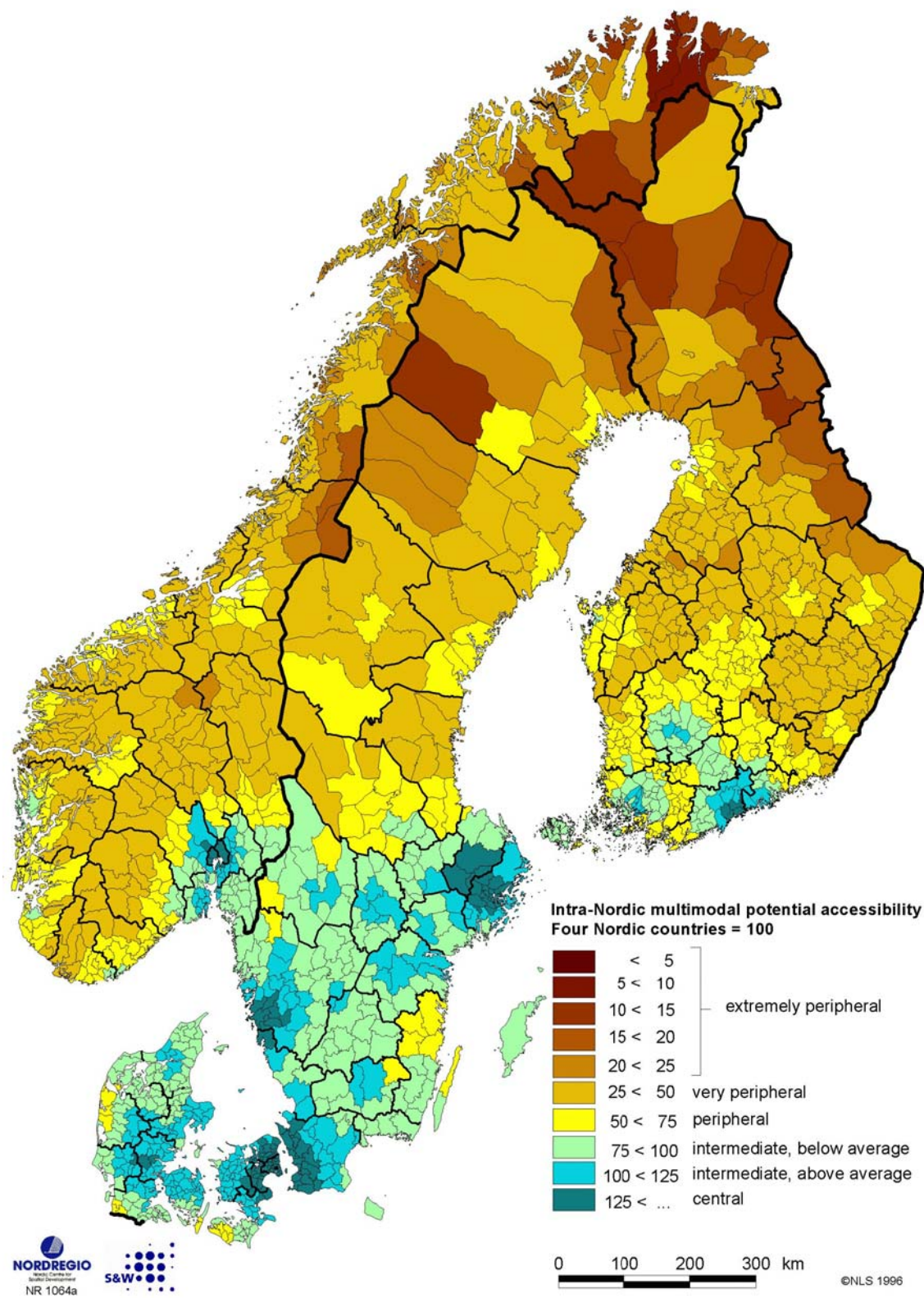


Figure 6. Intra-nordic potential accessibility.

Table 5. The degree of the intra-Nordic peripherality of Nordic municipalities

Area	Population (in %) living in municipalities with intra-Nordic accessibility below an index value of ... (Nordic average = 100)							
	< 100	< 75	< 50	< 25	< 20	< 15	< 10	< 5
Denmark	26.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Finland	70.1	53.9	24.9	3.8	1.6	0.5	0.0	0.0
Norway	73.7	50.6	25.7	2.9	0.8	0.3	0.1	0.0
Sweden	38.2	16.4	6.3	0.5	0.2	0.1	0.0	0.0
Four Nordic countries	49.0	27.8	12.6	1.6	0.6	0.2	0.0	0.0

5.2 European peripherality

European accessibility indicators were calculated by taking all European destinations, including those in Eastern Europe beyond the accession countries, into account. Thus, the accessibility indicator expresses the relative location of a municipality within the European context.

Figures 7 to 9 display the degree of European centrality or peripherality of the Nordic municipalities. The absolute accessibility values are the same in each map. However, the difference is the way the values are standardised, i.e. how the European context is defined. Figure 7 uses the average European accessibility of the four Nordic countries and expresses the indices relative to this average. Figure 8 uses the average of the current European Union; Figure 9 the average of the future European Union with 27 Member States. In principle, the figures repeat the overall pattern of Figure 5, however, the spatial detail has been significantly increased.

Figure 7, using the average accessibility value of the four Nordic countries as a reference point, indicates which Northern areas have the best relative position to European markets, and thus also which have the worst relative position. Primary locations are most municipalities in Denmark, the capital regions of Oslo, Stockholm and Helsinki as well as the Malmö and Gothenburg regions in Sweden. The second best locations are to be found in the remaining parts of Denmark and the major cities in the southern parts of Norway, Sweden and Finland.

Figure 8 shows the competitive position in terms of the relative location of the Nordic municipalities within the European context. The reference value here is the NUTS-3 average of the current European Union. Taking this European reference view, only the capital city regions plus Malmö, Gothenburg and the Billund area are above or about the EU15 average. All other municipalities are peripheral, most of them even very or extremely peripheral.

Figure 9 displays the context of the future European Union, i.e. the EU27 average at the NUTS-3 level is used as a reference point. Here the integration of the twelve accession countries leads to a reduction of average accessibility across the European Union. This leads to a slightly less peripheral classification for the municipalities of the four Nordic countries than in the previous map. The main effect here is that the areas of central and intermediate municipalities around the major Nordic agglomerations have been slightly extended to their hinterlands. All other parts however remain peripheral.

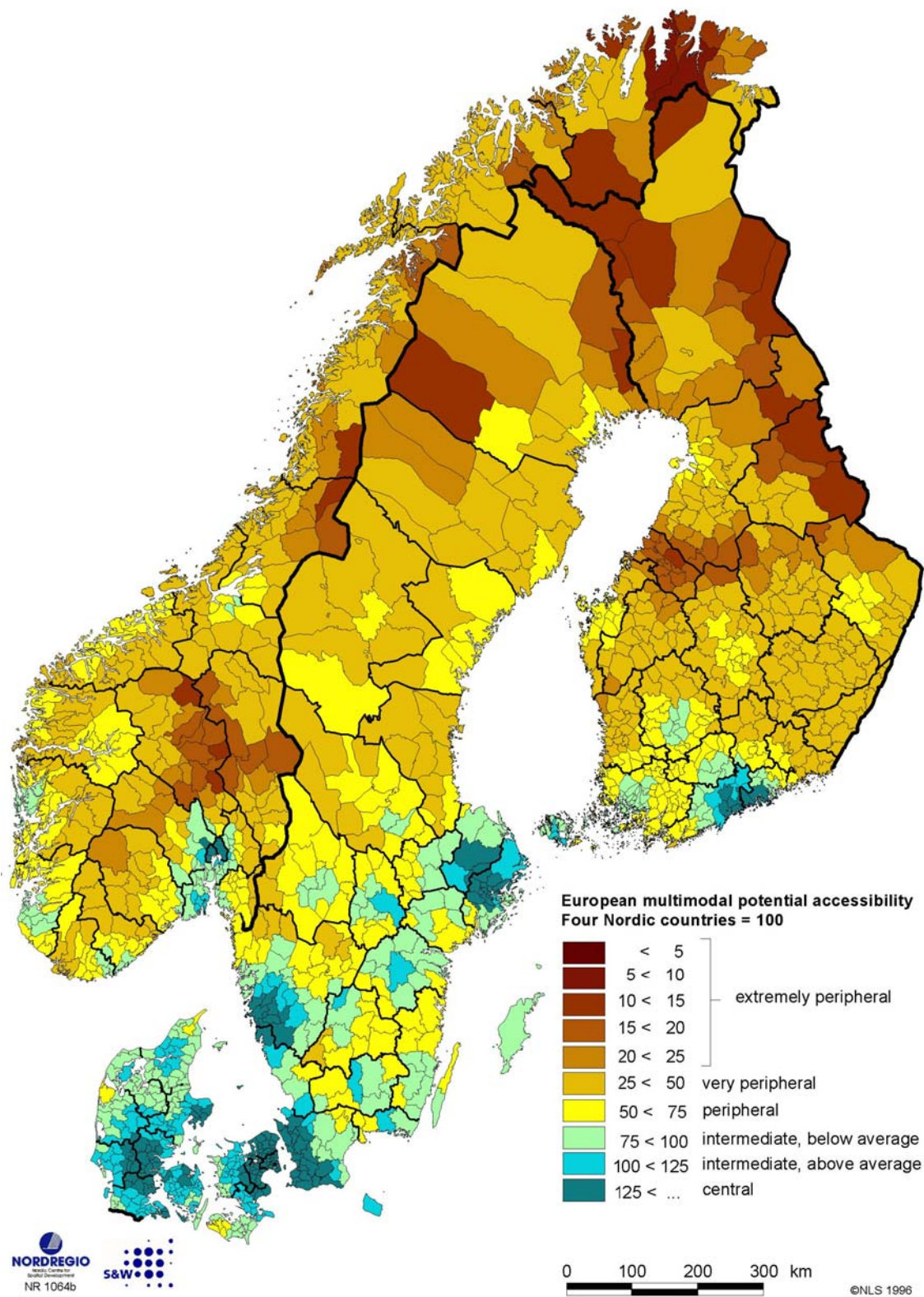


Figure 7. European potential accessibility standardised to the Nordic average.

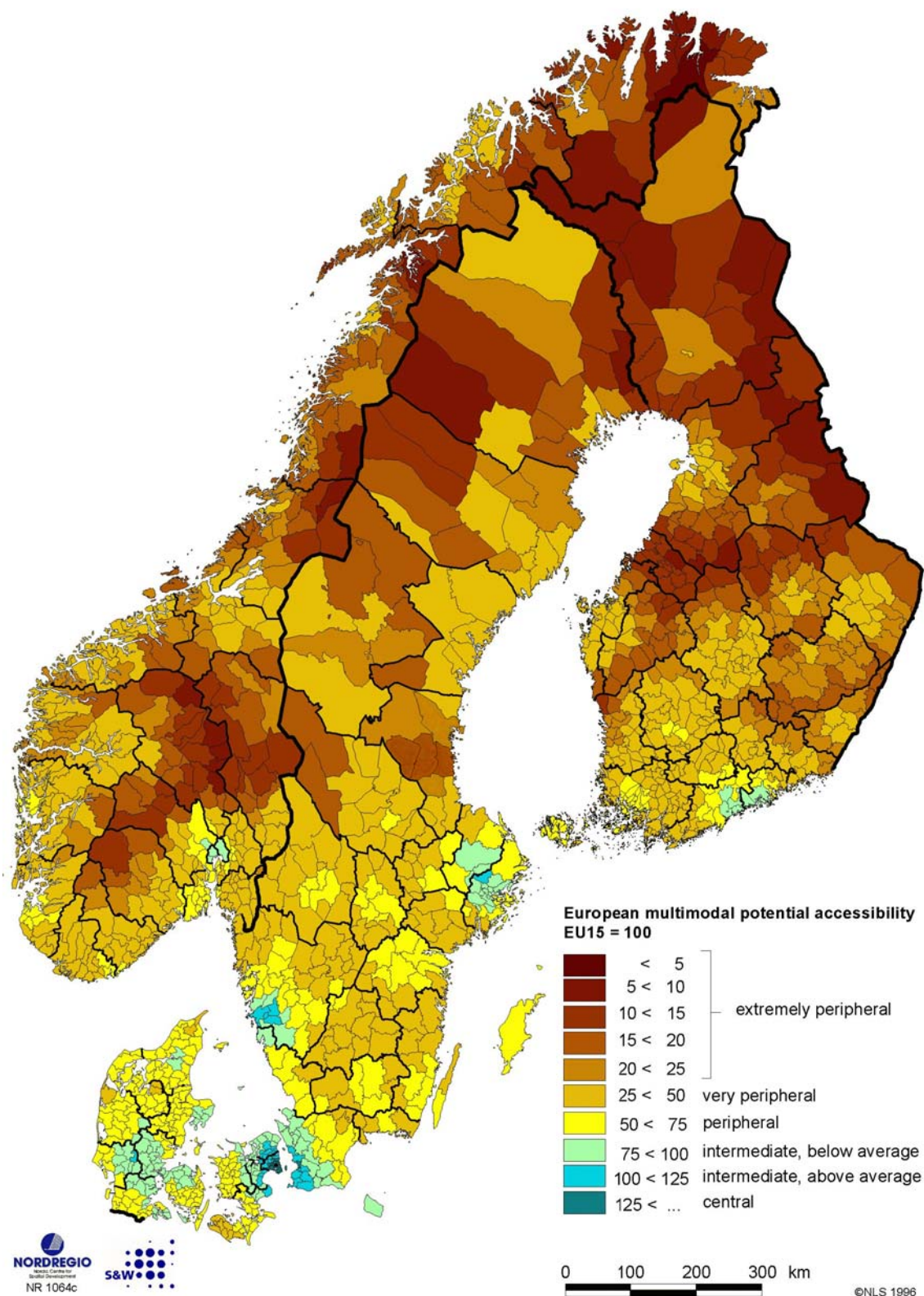


Figure 8. European potential accessibility standardised to the EU15 average.

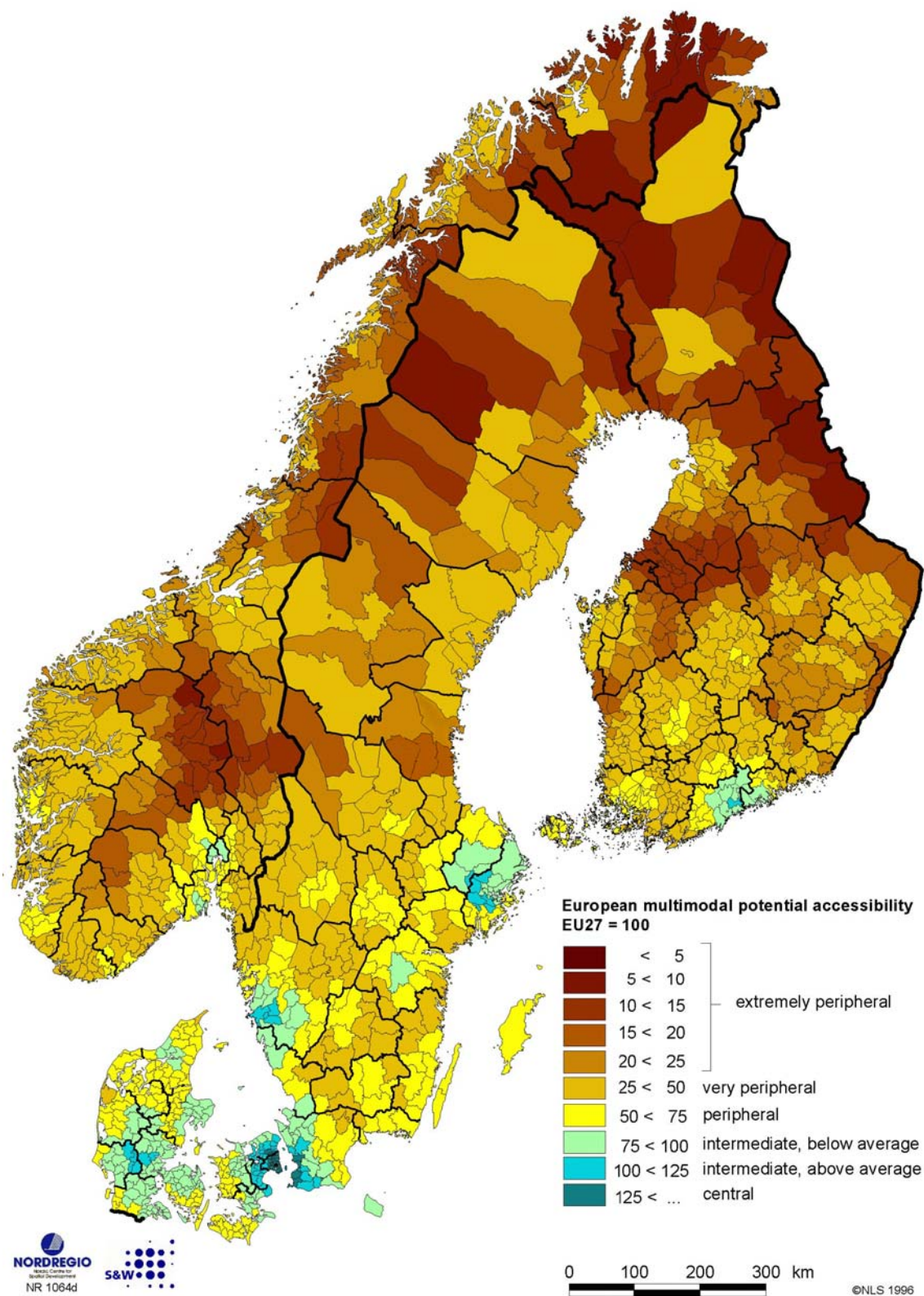


Figure 9. European potential accessibility standardised to the EU27 average.

Table 6. The degree of European peripherality of the Nordic municipalities

Area	Population (in %) living in municipalities with accessibility below an index value of ... (EU27 NUTS-3 average = 100)							
	< 100	< 75	< 50	< 25	< 20	< 15	< 10	< 5
Denmark	65.4	26.1	0.7	0.0	0.0	0.0	0.0	0.0
Finland	96.6	75.6	59.0	19.9	10.6	5.5	0.9	0.0
Norway	100.0	83.5	51.3	15.8	10.6	5.0	0.4	0.0
Sweden	76.9	57.0	27.5	3.9	1.2	0.4	0.1	0.0
Four Nordic countries	82.9	59.4	34.7	10.7	5.8	2.3	0.3	0.0

Table 6 summarises the degree of European peripherality of the Nordic municipalities within the future European Union. Basically, it contains the same information as Table 4. However, the necessary adjustment of the accessibility model and in particular the change from NUTS-3 based averages for the four Nordic countries to NUTS-5 based averages yields some changes in the percentages.

The most important difference between NUTS-3 based and NUTS-5 based population shares in peripheral areas is that the increase of spatial detail leads to higher percentages of population in very peripheral and extremely peripheral areas. Whereas the NUTS-3 model allocates 23 percent of the Nordic population to very peripheral areas and about 4 percent to extremely peripheral areas, the NUTS-5 model has 35 percent in very peripheral municipalities and 11 percent in extremely peripheral municipalities.

There is again a considerable difference between the countries. Denmark has only 1 percent of the population in very peripheral areas, while Sweden has 28 percent, Norway 51 percent and Finland 59 percent. Denmark does not have any extremely peripheral municipalities in an EU27 context, while 4 percent of the Swedish population lives in such municipalities, 16 percent of the Norwegian population and 20% of the Finnish population. While Finland and Norway have as much as 5 percent of their populations living in municipalities with less than 15 percent of the average accessibility of the EU27.

This does not however dramatically change the picture of peripherality of Nordic areas within Europe, however, the increased spatial detail shows that in countries that have such large NUTS-3 areas as the Nordic countries, spatial detail is an absolute necessity to get the picture right.

6 Conclusions

The final chapter of the report summarises its main findings and forwards a couple of policy conclusions to deal with the results obtained.

6.1 The main results

The report approached the question of Nordic peripherality in Europe by using two interrelated though different approaches. A travel cost survey for business and conference trips was conducted to show the peripheral drawback in rather precise, i.e. monetary units. An accessibility modelling exercise at different spatial resolutions was then performed to give a more general picture of the degree of peripherality of the Nordic regions and municipalities.

From the business travel cost survey it can be stated that the Nordic countries face a double disadvantage. On the one hand, business travel to central European locations is much more costly than the European average, while on the other hand, business travel costs to Nordic destinations are much higher than to central locations. Seen strictly from a cost point of view, and neglecting other attraction factors, both cost structures illustrate that Nordic locations shoulder a competitive disadvantage as compared to others. Sending people to meetings in central locations is more expensive, but hosting a meeting in Nordic areas is also more expensive to attend.

The conference travel cost survey did not however uncover significant evidence of peripheral disadvantage in this market. Travel from Nordic regions to conferences in central places is only slightly more expensive than from other European locations. While hosting conferences in Nordic locations does not increase the overall travel costs of such events to visitors that much.

The conclusion then is that there is a **clear disadvantage** to Nordic regions due to their peripheral location if the factor to be minimised in travel behaviour decisions is **travel time**. This is true for most businesses today. However, if the factor to be minimised is **travel cost** as it is the case for conference trips or for city tourism etc., **such a clear Nordic disadvantage does not exist** as long as the destination is one of the capital regions.

In addition, accessibility modelling uncovered more detailed evidence as regards the degree of peripherality of Nordic locations. The Nordic countries have accessibility values that are clearly below European averages, however they are defined. Moreover, Norway and Finland have an extraordinarily high share of population living in very peripheral and extremely peripheral locations. However, the accession countries have an even lower average than the Nordic countries, though they have less population shares in the extreme categories of peripherality.

The report has also shown that the question of centrality and peripherality is relative to the chosen context, i.e. to the spatial reference framework in which this locational question is discussed. Changing for instance the spatial reference from the current EU15 to the future EU27 yields a decrease in average European accessibility and thus a slight extension of areas in the Nordic countries that are above average. In addition, the example of intra-Nordic accessibility has shown that somewhat different spatial patterns of centrality and peripherality emerge if the area considered relevant is restricted.

Finally, the report has demonstrated that the spatial resolution of such indicators has an impact, not on the overall spatial distribution, but on the results in detail. In particular in countries that have such large NUTS-3 areas as the Nordic countries, spatial detail is an absolute necessity if we are to get the picture right. Gothenburg and Helsinki are good examples of

areas representing a large NUTS-3 area of good accessibility, an area that clearly diminishes however if the analysis is done at NUTS-5 level.

6.2 Policy conclusions

Territorial cohesion is, together with economic and social cohesion, one of the main aims of the EU - as stated in the draft Constitution (Article 3) and in the 3rd Cohesion Report unveiled by the EU Commission in February 2004. According to this report, the objective of territorial cohesion is,

"to help achieve a more balanced development by reducing existing disparities, preventing territorial imbalances and by making both sectoral policies which have a spatial impact and regional policy more coherent. The concern is also to improve territorial integration and encourage cooperation between regions" (European Commission, 2004, 27).

Among the aspects of territorial imbalances relating to peripherality mentioned in the 3rd Cohesion Report are areas *constrained by their geographical features such as islands, sparsely populated areas in the far north, and certain mountain areas*, where accessibility is listed as one of the issues (together with population ageing and decline):

"All of these regions, in whichever part of the EU they are located, have common problems of accessibility and of remoteness from major markets which tends to add to both travel and transportation costs and constrains their economic development" (European Commission, 2004, 33).

This study illustrates clearly the points made: the northernmost part of the EU and EEA is extremely peripheral in a national, Nordic, and in a pan-European context. Unlike the situation pertaining in some areas of the New Member states this handicap cannot be radically alleviated by future investments in infrastructure. The lack of accessibility is also most prevalent in the business sector, which is the most important for economic growth. This lack of accessibility also often coincides with problems of economic performance and of population loss through out-migration.

The study has attempted to highlight the peripheral regions that, in a European context, have accessibility below that of the European average. Analysis at the NUTS-5 level has illustrated that in reality very few spots in the Nordic countries achieve the average accessibility level of the EU15 or the EU27, and in only about five areas is accessibility above the European average. Given the argument presented above that further infrastructure investments are unlikely to alleviate these disadvantages, policy discussion centring on motorway density, as for example has occurred in the Third Cohesion Report (European Commission, 2004), will not substantially improve the situation in Nordic peripheral areas.

What then can be done to alleviate this handicap? One important aspect here is of course the fact that everyone must simply 'get by' within the context of prevailing circumstances. In a regional policy context, this means that extremely peripheral regions primarily will have to focus on aspects where they are competitive notwithstanding this handicap and can thus maintain long-term sustainable production. However, supporting policy measures are necessary, both on the national and the European levels.

At the national level, the countries of Finland, Norway and Sweden each have a broad arsenal of policy measures in several governmental sector policies aiming at the integration of the whole national territory. *Infrastructural investments* are of course important here, in terms of transport, communications and education. Nevertheless, the broad *welfare systems* are even more important in maintaining the local societies, as they guarantee the availability of public services and social security **wherever** people live. These policies do not normally have any

deliberate regional profile, though their impact is largest in the extreme peripheries where the dependence upon public sector services is highest.

Regional policies have traditionally concentrated most of their activities on these extreme peripheries. This situation is however gradually changing, as regional policy in the Nordic countries is becoming ever more focused on economic growth in *all* regions rather than on territorial balance within the country. A clear compensatory pattern in governmental spending on regional policy however still remains, with more instruments and generous aid levels in peripheral communities. This study has confirmed the significant differences in the preconditions for economic competitiveness in the Nordic region, and the need for policy measures with a focus on the peripheries.

At the European level, the northernmost parts of Finland and Sweden are, until the end of 2006, eligible for *structural support* under Objective 1. Moreover, the poor accessibility of these regions should, together with their extremely low population densities, provide good arguments for their continued special treatment within EU regional policy.

The European and national levels are brought together under the common EU/EEA *competition rules*, which both limit the use of state aid to businesses and the size of the population living in areas where state aid is legal. These competition rules define the limits under which the national regional policies operate. After enlargement, we can expect significant pressure towards further limitation of the areas where member states can implement regional policies. This study has illustrated that the peripheries of Finland, Iceland, Norway and Sweden remain in an extremely un-advantageous position, even in an enlarged EU/EEA of 27/30 countries. As such, the fundamental point should be continually underlined, that these regions **do** have permanent geographical handicaps that can never be fully and adequately addressed or compensated.

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