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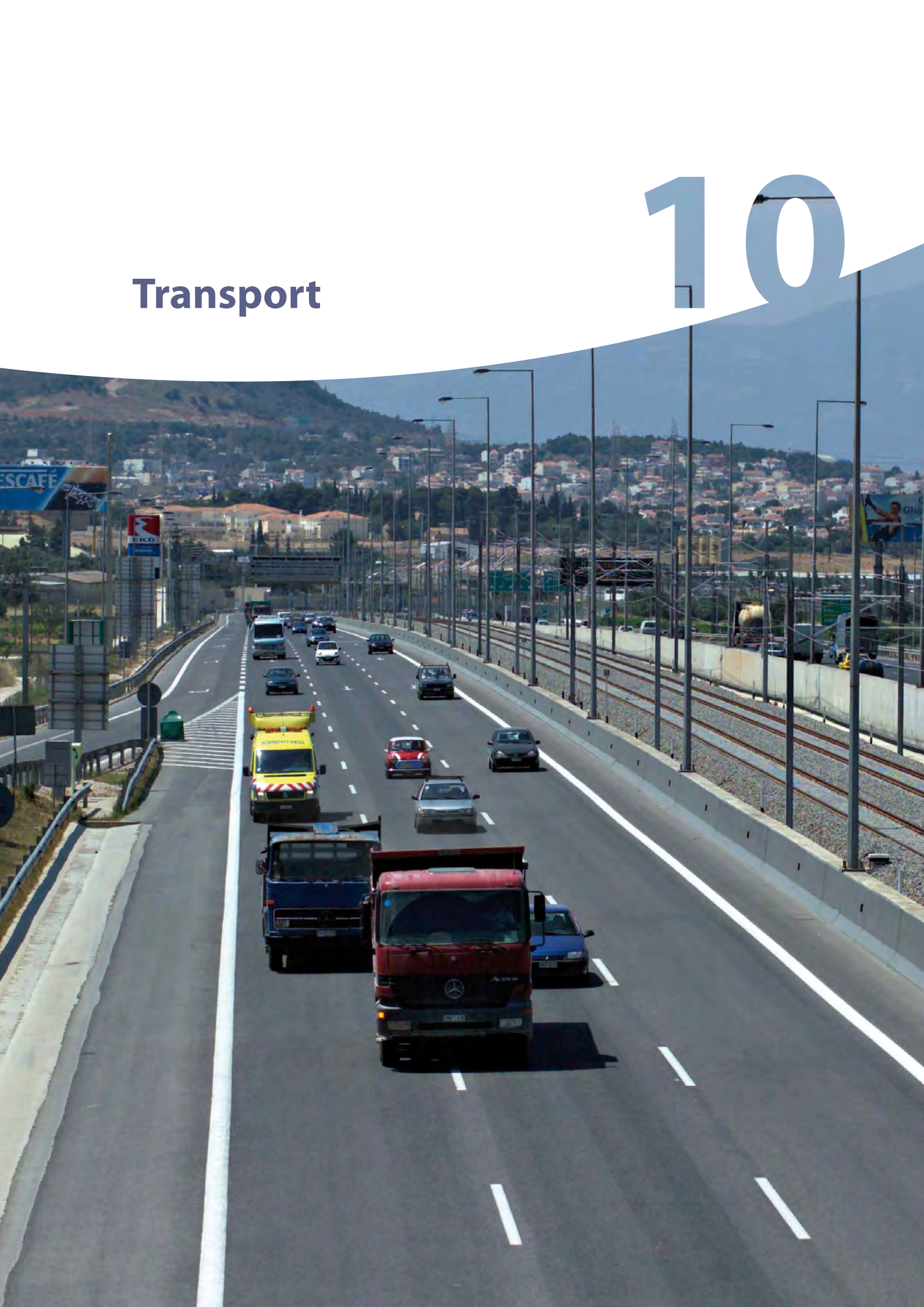
Transport



Introduction

Roads, railway lines, inland waterways, seaports, airports and railway stations form the backbone of transport infrastructure in Europe. Modern transport infrastructure of a high standard is the basic means of moving goods and passengers and, as such, essential both for regional economic development and for creating an internal European market.

In keeping with the high importance of inland transport infrastructure for the economic development of Europe's regions, investment in road and rail infrastructure accounts for a large share of the Union's regional budgets.

Another aspect of transport policies is the aim of reducing the impact of transport activities on the global climate, by means of a more efficient transport system and a switch to transport modes with lower emissions of CO_2 and other substances detrimental to the climate.

The aim of regional transport statistics is to describe regions in terms of a set of transport indicators and to quantify the flows of goods and passengers between, within and through regions. In this 2010 issue of the *Eurostat regional yearbook*, the analysis of regional transport infrastructure is followed by a look at the regional distribution of road fatalities and a sharper focus on the top European regions with respect to the dynamic growth of air and maritime transport.

This chapter is divided into four main sections. The first deals with the regional distribution of motorways and railway lines within Europe, thus helping to identify the regions with comparatively high or low infrastructure density. It reveals regional patterns of infrastructure provision and differences between EU Member States and peripheral and central countries. The second section investigates the regional distribution of road fatalities. While the total number of fatal road accidents in the European Union has fallen since 1991, significant regional disparities remain, providing insight into the conditions that favour low road fatality rates. The third and fourth sections review the top 20 European regions in passenger and freight transport by air and sea and transport growth in these regions between 2003 and 2008.

Transport infrastructure

The major importance for economic integration in Europe of modern high-capacity transport links and hubs for all modes of transport has been recognised by the Union and its Member States. This has led them to define major trans-European transport corridors forming part of the trans-European networks (TENs). These have been a key component for developing the single market and promoting economic and social cohesion within the EU.

Constructing these priority transport corridors involves enhancing and extending existing regional transport infrastructure to include the trans-European corridors identified. However, removing transport bottlenecks, particularly on cross-border sections of the networks, is also important for improving access to regions. The capacity of cross-border links has not always been a priority in national transport planning. However, the cross-border capacity is important for the free flow of freight and passengers within the single market, across national borders. The EU is therefore putting particular emphasis on future development of such cross-border links. In many cases transport bottlenecks are caused not only by insufficient provision of physical infrastructure, but also by organisational constraints. This is especially true of rail transport, where the inherited organisation of the national railway companies, each with their own technical standards, hampers international traffic flows. However, in recent years, progress has been made. Extension of the Schengen area to include the eastern European countries in 2007 was a major step towards improving the mobility of goods and passengers on the roads.

From the regional perspective, an extensive network of roads, motorways and railway links is a prerequisite for economic development and interregional competitiveness.

Map 10.1 shows the density of the motorway network in the NUTS 2 regions in Europe in 2008, expressed as kilometres of motorway per 1 000 km² of land area.

In general, the density of the motorway network is closely correlated with population density and, thus, with the degree of urbanisation. The densest motorway networks can therefore be found in the Netherlands, Belgium, the western regions of

Germany and the United Kingdom. At country level, the Netherlands has the highest motorway infrastructure density with 77 km/1 000 km², followed by Belgium (58 km/1 000 km²) and Luxembourg (57 km/1 000 km²). Trailing some distance behind Luxembourg, Germany comes fourth with 35 km/1 000 km², followed by Slovenia, Cyprus and Spain. The countries with the lowest motorway density are Romania (1 km/1 000 km²) and Estonia, Finland and Poland (2 km/1 000 km²). Bulgaria, Sweden, Lithuania, Ireland, Slovakia and the Czech Republic also all have motorway densities below 10 km/1 000 km².

A closer look reveals that the highest motorway density is found around European capitals and other big cities, in large industrial conurbations and around major seaports. It is fair to say that, historically, the motorway infrastructure in these specific regions was a product of regional development rather than the driving force behind it.

Major industrialised areas with high motorway density include the north-western part of England (Greater Manchester: 138 km/1 000 km² and Merseyside: 100 km/1 000 km²) and, in Germany, the Ruhrgebiet (Düsseldorf: 121 km/1 000 km²) and the Rhein-Main region (Köln: 76 km/1 000 km²; Darmstadt: 64 km/1 000 km²).

Most European capitals and large cities are surrounded by a ring of motorways in order to meet the high demand for road transport originating from these metropolitan areas. Dense motorway networks can be found around the capitals: Wien (107 km/1 000 km²), Amsterdam (Noord-Holland: 106 km/1 000 km²), Madrid (94 km/1 000 km²), Berlin (86 km/1 000 km²), København (Hovedstaden: 61 km/1 000 km²), Luxembourg (57 km/1 000 km²) and Paris (Île de France: 51 km/1 000 km²). Since the motorways are concentrated in a ring close to the cities, the reported density decreases as the area of the NUTS 2 region concerned increases. As a result, the motorway density reported for the small NUTS 2 region of Wien is higher than for the much larger NUTS 2 region of Île de France, even though the motorway network of Paris is actually larger.

Other densely populated regions with high motorway density include the Randstad region in the western part of the Netherlands (Utrecht: 128 km/1 000 km², Zuid-Holland: 125 km/1 000 km² and Noord-Holland: 106 km/1 000 km²) and the area around Birmingham in the United Kingdom (West Midlands: 90 km/1 000 km²).

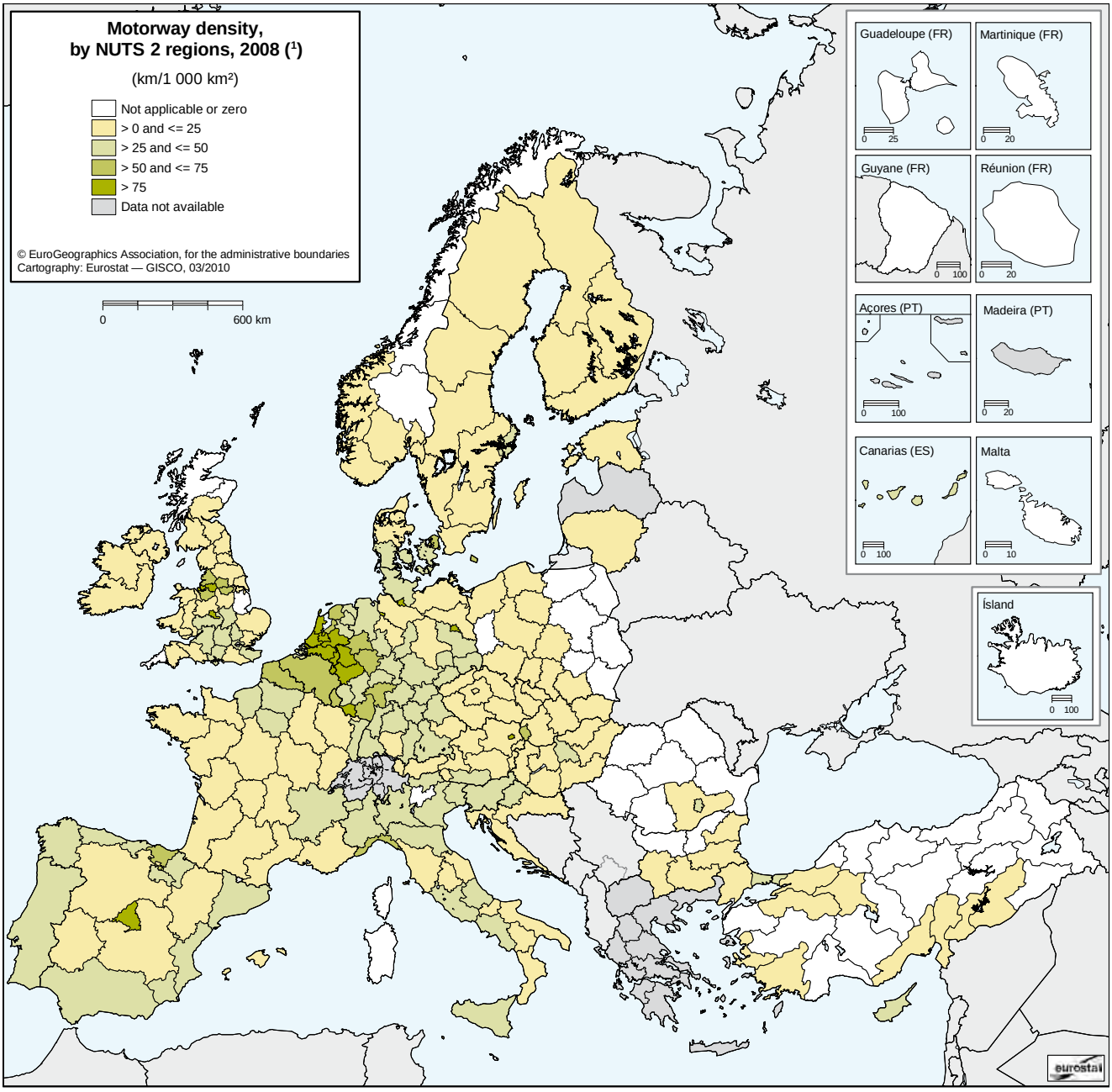
High motorway density is also found around the major seaports of northern Europe: the motorway density of the NUTS 2 regions of Bremen (186 km/1 000 km²) with the port of Bremerhaven, of Zuid-Holland with the port of Rotterdam (125 km/1 000 km²) and of Hamburg (107 km/1 000 km²) is among the highest of all European regions.

Another reason for the high density of the motorway network in central European countries (such as Germany) is the proportionately high and growing volume of transit freight traffic.

In addition to the regional structure described above, coastal regions with a thriving tourism industry have noticeably denser motorway networks than other peripheral regions. This is especially true of the País Vasco in Spain (71 km/1 000 km²) and of Liguria in Italy (70 km/1 000 km²), the two peripheral coastal regions with the densest motorway networks in Europe. Unsurprisingly, the density of motorways on islands is generally low, since islands cannot be reached directly by road but rely on sea or air for access. However, the motorway density of the Canarias is still relatively high at 29 km/1 000 km².

While ready accessibility for goods and passengers may be an important factor in shaping a region's ability to compete, this does not mean that all regions with a high GDP necessarily have a high motorway density. While high accessibility is generally a prerequisite for a region's economic performance, this can be achieved by means of transport other than road, such as air or rail. The regional distribution of railway infrastructure is shaped by economic development, specific historical developments and the geographical characteristics of the regions. As a legacy from the socialist era, the countries in central and eastern Europe have been left with a more concentrated rail network than their western neighbours, but at the same time with a substantially less developed motorway network. Although these countries have made substantial changes to their transport policy since the beginning of the 1990s — with the support of the EU (e.g. under the Phare programme and the Structural Funds) in addition to their national efforts — their infrastructure

Map 10.1: Motorway density, by NUTS 2 regions, 2008 (1) (km/1 000 km²)



(1) Belgium and Slovenia, national level; Portugal, NUTS 1 regions; Italy, 2007 data.

Source: Eurostat (tran_r_net).

still reveals differences. Map 10.2 illustrates the density of railway lines per 1 000 km² of territory in Europe.

In general, the national network-to-area ratio for railway lines is high in western and central parts of Europe (including the Benelux countries, Germany, the Czech Republic and Hungary) and lower in the peripheral countries (including Scandinavia, the Iberian peninsula, Greece, the Baltic countries, Turkey and Bulgaria). The highest network density can be found in the Czech Republic, Belgium, Luxembourg and Germany (above 100 km/1 000 km²), followed by the Netherlands, Hungary, Austria, Slovakia, the United Kingdom and Poland (65 to 86 km/1 000 km²). At the lower end of the range are Turkey, Norway, Finland and Greece, with values of 20 km/1 000 km² and below.

While the significant differences in population density account for most of the differences observed between the individual countries, the relatively high values for the Czech Republic, Slovakia, Hungary and Poland exemplify the persisting strong influence of the socialist heritage on Europe's infrastructure today. Measuring rail network density by population instead of territory changes the overall picture. The highest density of railway infrastructure per inhabitant is in the Scandinavian countries, Latvia and the Czech Republic. The new Member States in central Europe follow some way behind, while by far the lowest values are found in Turkey, the Netherlands and the United Kingdom. In Scandinavia, the sheer vastness of the countries requires high levels of investment per inhabitant in railway lines in order to ensure sufficient accessibility by rail for their population. Another point which has to be remembered is that the way in which the railways are operated differs significantly between countries with low and high population density. While the level of service is comparatively low in countries with high rail infrastructure density per inhabitant, countries with a high population density, like the Netherlands and Germany, use highly complex rail traffic management systems to operate their rail infrastructure in order to meet the high level of demand on their heavily used railway network.

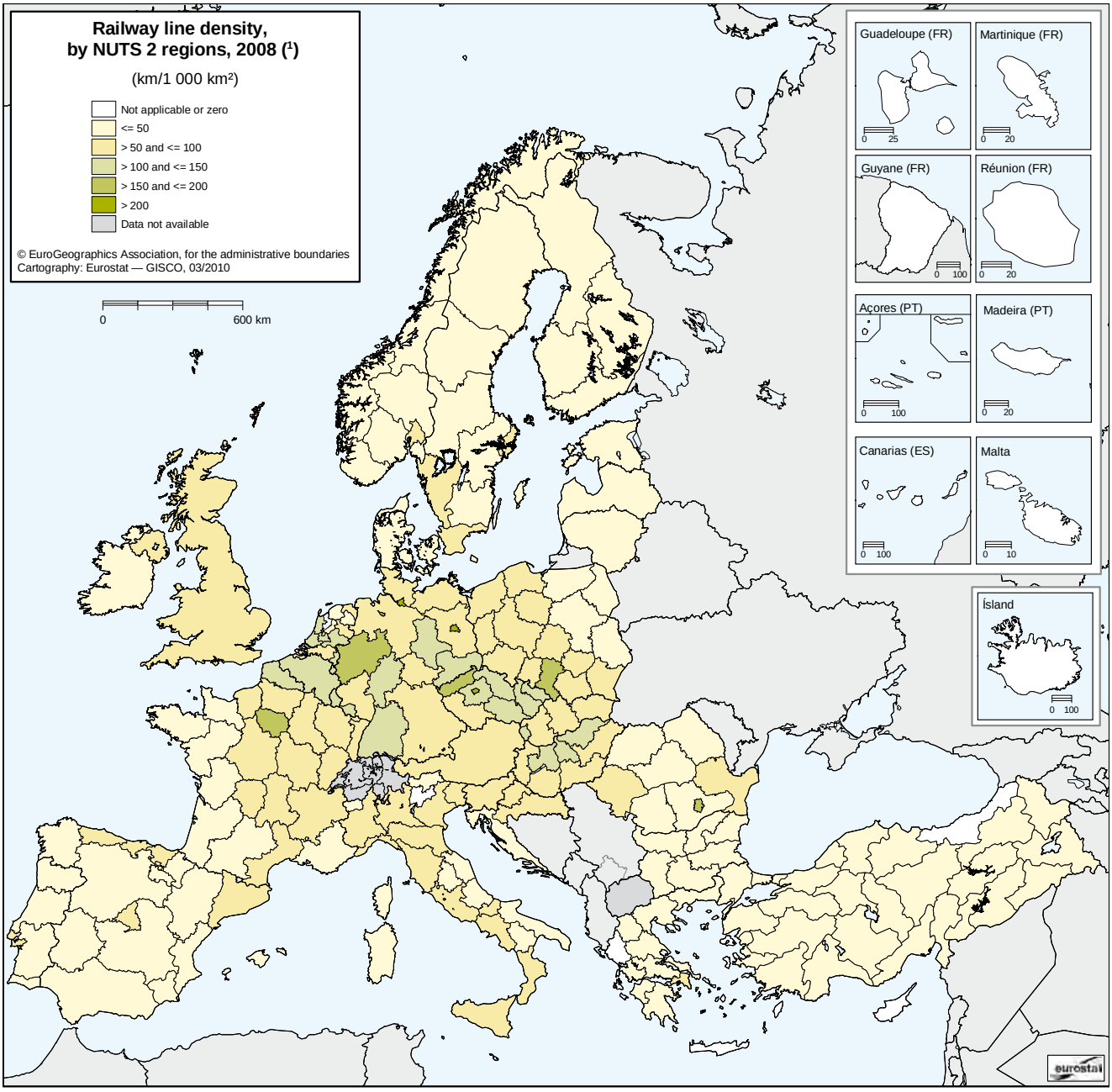
There are also other differences between rail transport systems that are due to the spatial distribution of population within countries. For example, the French system can be described as a 'hub-and-spoke' system, with Paris at its centre, while in Germany the proportion of direct connections between population centres is significantly higher, reflecting Germany's more even population distribution. This results in a more complex railway network.

In many central and eastern European countries, there has been a significant drop in rail freight since 1990, in terms of both total volume and of modal share. By contrast, road transport volumes have soared. This development can be regarded as part of the economic and social transformation undergone by the countries which joined the EU in the last two enlargements. As a result, the density of the railway network decreased in some countries — a phenomenon not seen in any national motorway network. A particularly striking reduction in rail infrastructure was seen in Poland, where the railway density dropped from 84 km/1 000 km² in 1990 to 74 km/1 000 km² in 1998 and then to 65 km /1 000 km² in 2008. Data on regional rail infrastructure in Poland have been available since 1998. The most striking reductions between 1998 and 2008 were in Dolnośląskie (down by 14 % to 88 km/1 000 km² in 2008), Lubelskie (down by 24 % to 43 km/1 000 km²), Warmińsko-Mazurskie (down by 70 % to 50 km/1 000 km²) and Wielkopolskie (down by 46 % to 69 km/1 000 km²), compared with a decline of 13 % for Poland as a whole over the same period. Most of these regions had high-density networks in 1990. One exception is the Śląskie region, where the high-density rail network inherited has actually been significantly extended since 1998 (up by 16 % to 174 km/1 000 km² in 2008).

In the case of passenger transport, the most significant recent development is the continuing expansion of the high-speed rail network. While this is not reflected in the railway density indicator, it does account for major recent investment in railway infrastructure.

Turning to the individual regions, the densest rail networks are in the capital regions: Berlin (708 km/1 000 km²) and Praha (507 km/1 000 km²). While these central European capitals have indeed had traditionally strong railway infrastructure, the strikingly high values are due to the small size of these regions within the NUTS 2 classification and the fact that the density of urban infrastructure tends to be much higher than the density of inter-urban roads and railway lines. Other capital regions with relatively dense rail networks are Bucureşti

Map 10.2: Railway line density, by NUTS 2 regions, 2008 (1) (km/1 000 km²)



(1) Belgium, Denmark, Ireland, Austria, Slovenia and United Kingdom, national level; Germany, NUTS 1 regions; Austria, 2007 data.

Source: Eurostat (tran_r_net).

(Bucureşti - Ilfov: 159 km/1 000 km²), Paris (Île-de-France: 154 km/1 000 km²) and Amsterdam (Noord-Holland: 134 km/1 000 km²).

Next in the ranking come Bremen (423 km/1 000 km²) and Hamburg (373 km/1 000 km²), two smaller NUTS 2 regions where extensive freight lines to and from the seaports contribute to the high density. Like the capital cities mentioned above, these two hanseatic cities, which are also German federal states, are much smaller than regions like Zuid-Holland and Antwerpen, with their competing ports of Rotterdam and Antwerpen. These differences make it hard to draw direct comparisons with the infrastructure at the North Sea ports.

Freight lines also play a leading role in some regions with traditional coal and steel industries, like the Saarland in western Germany (135 km/1 000 km²) and Śląskie in south-west Poland (174 km/1 000 km²). Interestingly, Śląskie is, as mentioned above, also the only Polish region with significant recent net additions to its rail network. Consequently, the development of rail infrastructure in Śląskie bucks the general trend in Poland, although this can probably be attributed to the strong economic development in this region. Further regions with high railway density are Severozápad and Severovýchod in the Czech Republic and the regions making up Randstad in the western part of the Netherlands: Utrecht, Zuid-Holland (with the port of Rotterdam) and Noord-Holland (with Amsterdam).

Road safety

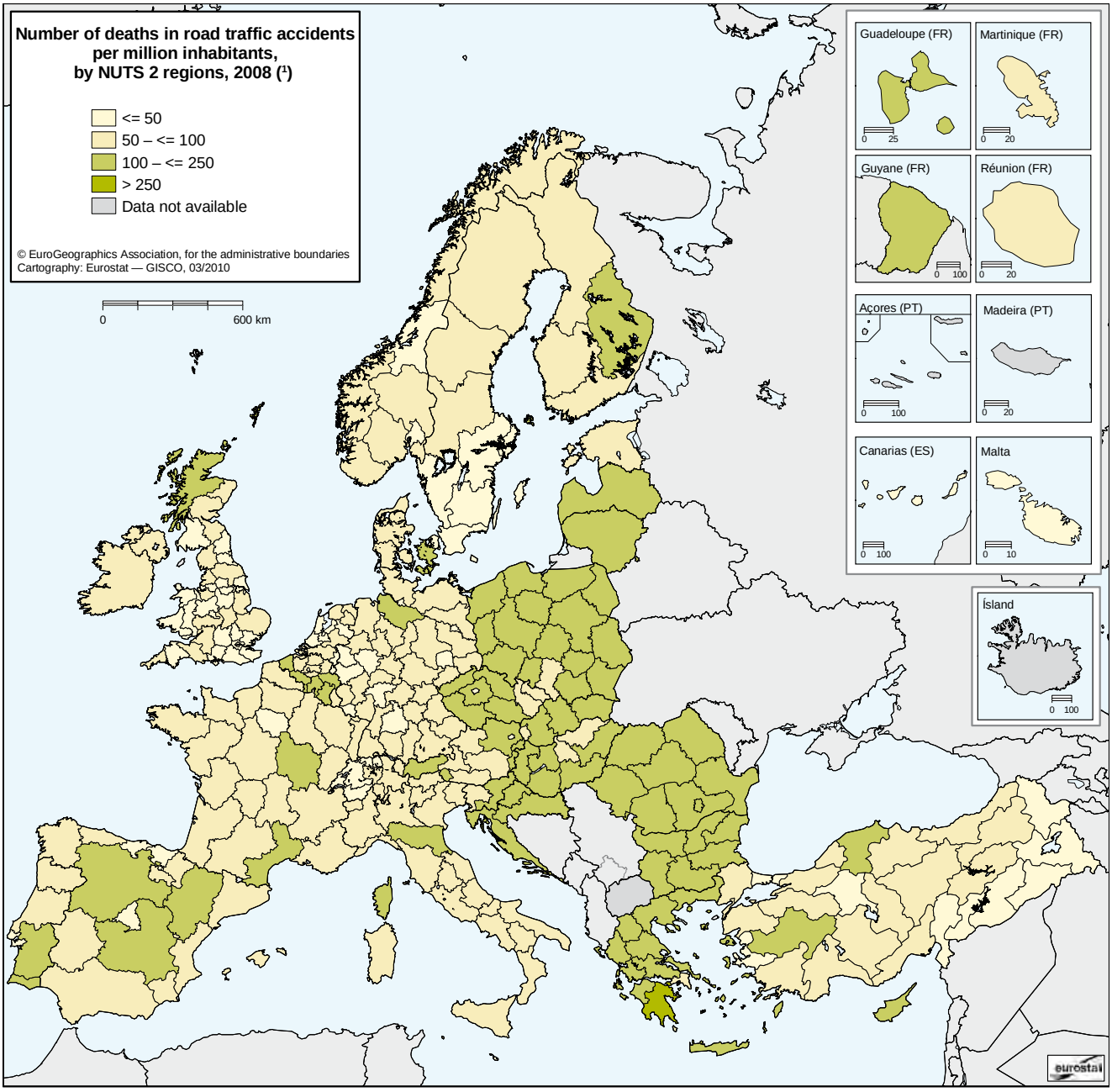
Road mobility comes at a high price in terms of lives lost. In 2008, just under 39 000 people lost their lives in road accidents within the EU-27, continuing the steady decrease in the number of fatalities on Europe's roads. However, this number is still more than 20 times the total fatalities in rail and air transport combined. In response to the growing concern shown by European citizens over road safety, the European Union made this issue a priority of its common transport policy set out in the 2001 White Paper on transport 'Time to decide' and its mid-term review in 2006 ('Keep Europe moving — Sustainable mobility for our continent'). In that White Paper, the European Commission set the target of halving the number of road fatalities between 2000 and 2010. To achieve this objective, a number of steps have been taken, including introducing higher vehicle safety standards, improving the quality of road infrastructure, extending the traffic regulations combined with enforcing the existing regulations and improving driver education. As a result, despite the strong growth in road traffic in Europe, the total road death toll was cut by 48 % between 1991 and 2008 and has fallen by 31 % since the year 2000. While this positive trend can be seen across every country in Europe, there are significant variations between individual regions in the relative risk of fatal road accidents. Map 10.3 shows the number of deaths in road traffic accidents per million inhabitants by NUTS 2 region in 2008.

National totals of fatal road accidents are taken from the CARE database (see the methodological notes). Apart from Liechtenstein and Malta, both very small and therefore difficult to compare with other countries, the lowest numbers of road fatalities per million inhabitants were recorded by Sweden (43) and most regions in the United Kingdom (43 at national level). They are followed by the Netherlands (46), Switzerland (47), Norway (54) and most German regions, especially the federal states in the west (54 at national level). Furthermore, the relative number of fatal road accidents at regional level is comparatively low in major conglomerations and European capitals such as Wien (16 fatalities per million inhabitants), Berlin (16), Bremen (18), Oslo (Oslo og Akershus: 22), Stockholm (23), Birmingham (West Midlands: 23), Hamburg (23), Greater Manchester (24), Istanbul (25), Amsterdam (Zuid-Holland: 27), Outer London (27) and Inner London (28). The fatality rates in the more rural areas surrounding the conglomerations are always significantly higher.

With the exception of the candidate country Croatia (150 fatalities per million inhabitants), the highest rates of road deaths are found in the eastern and south-eastern European countries. Among these Lithuania has the highest fatality rate (148), followed by Poland (143), Romania (142), Latvia (139), Bulgaria (139), Greece (138), Slovakia (112) and Slovenia (106). Given the lower level of vehicle ownership still seen in most of these countries, these high figures — compared with western Europe — might partly be explained by the quality of the infrastructure and partly by the age, size and security standards of the vehicles.

Statistically, the numbers of road deaths are particularly low for many regions with high traffic volumes. This is true especially of many

Map 10.3: Number of deaths in road traffic accidents per million inhabitants, by NUTS 2 regions, 2008 (1)



(1) Ireland, national level.

Source: Eurostat (tran_r_acci).

regions in western Germany and England, in particular around major cities, and of most parts of the Netherlands. Especially around major cities and transport hubs (e.g. seaports), high traffic volumes cause congestion, which reduces average speeds and, therefore, also the likelihood of fatalities when accidents do occur. A closer look at this phenomenon also reveals that many of these regions tend to have high motorway density. In general, motorways are much safer than secondary roads. Furthermore, mainly transit traffic uses existing motorways, thus keeping the number of road fatalities in these regions relatively low, despite high total traffic volumes. In fact, the quality of the roads in these countries is especially high, contributing to the low number of accidents.

By contrast, fatality rates are high in regions with low motorway density, such as all of Romania, Hungary and the Czech Republic except their capitals, the whole of Bulgaria, Poland, the Baltic countries, some of the eastern federal states of Germany and many rural areas in France and Spain. These data strongly suggest that the high proportion of traffic using motorways is an important factor behind the low number of road fatalities in many regions.

In addition to the share of the total road network accounted for by motorways, the significant reductions in the number of road deaths are also due to a combination of high in-vehicle and out-of-vehicle safety standards, speed limits and a general 'safety culture', including the quality of the emergency and healthcare systems.

The relatively low number of fatal road accidents in most major European cities can also be explained by the higher proportion of public transport and other modes, such as cycling and walking. While road accidents in general are more frequent in city traffic, driving at lower speed reduces the probability of serious injuries. However, an increase in the number of accidents involving non-motorised travellers could also lead to an increase in the number of serious injuries. Consequently, the combined effect of lower speeds and of more accidents involving more vulnerable travellers is not clear-cut.

Physical geography might be another reason for the differences in per-inhabitant fatality levels. Driving in mountainous regions like the Alps, the Pyrénées and the Carpathians is often more dangerous than in flat areas and therefore leads to a higher number of accidents and fatalities. In addition, these regions attract a high volume of tourist traffic, thus adding to local traffic and, hence, the number of accidents reported per inhabitant.

Air transport

The rapid growth of air transport has been one of the most significant developments in the transport sector, both in Europe and all over the world. Intra-EU air transport (including domestic flights) more than doubled between 1995 and 2008. After the events of 11 September 2001 led to a decline in 2002, growth rates then bounced back. There is no doubt that completion of liberalisation of the air transport market in the European Union contributed significantly to this development, most noticeably in the form of the massive expansion of low-cost airlines, which also led to remarkable growth of smaller regional airports, which are less congested and charge lower landing fees than large airports in the capital regions.

Eurostat's databases contain regional air transport statistics for passengers and freight. These series show passenger and freight movements by NUTS 2 region, measured in thousand passengers and tonnes respectively. The passenger data are divided into passengers embarking, disembarking and in transit. The freight statistics are divided into tonnes of freight and mail loaded and unloaded. Two series are available on air freight, based on different methods. The series going back to 1978 ended with reference year 1998 and was replaced by a new time series with different definitions as from 1999.

Currently, data on air transport are collected under Regulation (EC) No 437/2003 of the European Parliament and of the Council on statistical returns in respect of the carriage of passengers, freight and mail by air. This regulation provides detailed monthly data for airports handling more than 150 000 passengers a year. The data collected at airport level are then aggregated at NUTS 2 regional level.

This section on air transport focuses on the total number of passengers and the total number of tonnes loaded and unloaded in NUTS 2 regions in Europe. Tables 10.1 and 10.2 show the top 20 regions with the highest number of air passengers and highest volume of air freight in 2008.

The top-ranking regions in terms of the total number of air passengers are the capital regions of western Europe. The list is headed by Île de France, with a total of 86.7 million passengers for Paris-Charles de Gaulle and Paris-Orly airports, followed by Outer London (Heathrow) with 66.9 million passengers, Darmstadt with Frankfurt/Main airport (53.2 million), Comunidad de Madrid (50.4 million), Noord-Holland (Amsterdam/Schiphol: 47.4 million) and Lazio with Roma/Fiumicino and Roma/Ciampino airports (39.6 million).

The big airports in and around western Europe's capitals also serve as central hubs for intercontinental air traffic. This is especially true for Heathrow (London), Charles de Gaulle (Paris), Frankfurt/Main and Schiphol (Amsterdam) airports.

In addition to these capital regions, high air passenger transport volumes can also be observed in Cataluña (Barcelona), Lombardia (Milano) and Oberbayern (München). The high passenger volumes for the south of Spain can be explained to a large extent by tourist traffic.

Although this is not visible from Table 10.1, a significant number of smaller regional airports are among the fastest growing, due to the success of low-cost carriers using them as their main hubs.

Among the top 20 airports for passenger transport, the Niederösterreich region with Wien shows the strongest growth (+55 %) over the five-year period from 2003 to 2008, followed by Cataluña with Barcelona (+50 %), southern and eastern Ireland with Dublin, Cork and Shannon (+47 %), Lazio with Roma (+45 %), Oberbayern with München (+44 %) and Comunidad de Madrid (+42 %). It is not surprising that the biggest airports do not show the fastest growth, since they are starting from a high base and are often already operating near to maximum capacity.

For air freight, Darmstadt (Frankfurt/Main) leads the top 20 European regions with 2.10 million tonnes, followed by Noord-Holland (Amsterdam/Schiphol: 1.59 million tonnes), Outer London (Heathrow: 1.48 million tonnes) and Île de France (Paris: 1.46 million tonnes). Volumes at other European airports are significantly lower, indicating that the biggest European airports serve as the main European hubs for air freight. Relatively high volumes can also be observed in four other regions: Luxembourg (0.79 million tonnes), Vlaams-Brabant (Brussels: 0.61 million tonnes), Lombardia (Milano/Bergamo/Brescia: 0.59 million tonnes) and Köln (Köln-Bonn: 0.57 million tonnes).

While the total volume of air freight is limited in comparison with the much higher volumes of freight transported by road, rail, inland waterway and especially sea, air freight is important and growing steadily for articles with high added value, perishable goods (especially food) and express parcels.

Air freight is clearly dominated by the big airports, such as Frankfurt/Main, Amsterdam/Schiphol, London Heathrow and Paris-Charles de Gaulle and Paris-Orly. However, as with passenger transport, the most dynamic growth over the five-year period from 2003 to 2008 was at smaller airports with relatively low volumes, such as Leipzig/Halle in Germany and at the airports in the Etelä-Suomi region of Finland (including Helsinki and Turku), in Oberbayern (München) and in Niederösterreich (Wien).

Maritime transport

While the number of passengers embarking or disembarking in EU ports has remained stable since 2004, volumes of freight handled in EU ports increased by almost 20 % between 2002 and 2008. This increase highlights the important role that maritime transport plays in transport of goods in extra-EU trade. The landlocked Member States (the Czech Republic, Luxembourg, Hungary, Austria and Slovakia) do not report activity in this sector.

Eurostat's databases contain regional maritime transport statistics for passengers and freight. These series show passenger and freight movements by NUTS 2 region, measured in thousand passengers and tonnes respectively. The passenger data are divided into passengers embarking and disembarking. The freight statistics are divided into tonnes of freight loaded and unloaded. Two series are available on maritime passenger transport, based on different methods. The series going back to 1997 ended with reference year 2003 and was replaced by a new time series with different definitions as from 2004 (now excluding passengers on cruises).

Currently, data on maritime transport are collected under Directive 2009/42/EC on

Table 10.1: Top 20 NUTS 2 regions with highest number of air passengers in 2008 (1 000 passengers carried)

Ranking	NUTS	Region	Airports contributing by NUTS 2 regions	Total passengers in 2008 (1 000 passengers)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
1	FR10	Île de France	Paris-Charles de Gaulle Paris-Orly	86 683	0.8	5.1	1
2	UKI2	Outer London	London Heathrow Biggin Hill	66 907	–1.4	1.8	2
3	DE71	Darmstadt	Frankfurt/Main	53 189	–1.2	2.9	3
4	ES30	Comunidad de Madrid	Madrid/Barajas	50 366	–1.6	9.7	5
5	NL32	Noord-Holland	Amsterdam/Schiphol	47 404	– 0.7	4.7	4
6	ITE4	Lazio	Roma/Fiumicino Roma/Ciampino	39 558	4.8	8.5	9
7	ES51	Cataluña	Barcelona Girona/Costa Reus	37 117	– 4.3	11.9	11
8	ITC4	Lombardia	Milano/Malpensa Bergamo/Orio Al Serio Milano/Linate Brescia/Montichiari	34 940	–11.4	7.7	7
9	DE21	Oberbayern	München Oberpfaffenhofen	34 400	1.7	9.0	12
10	UKJ2	Surrey East and West Sussex	London Gatwick	34 162	–2.9	4.2	6
11	ES70	Canarias (ES)	Las Palmas/Gran Canaria Tenerife Sur/Reina Sofia Arrecife/Lanzarote Puerto Del Rosario/ Fuerteventura Tenerife Norte Santa Cruz De La Palma Hierro	29 808	–1.4	1.9	8
12	ES53	Illes Balears	Palma De Mallorca Ibiza Menorca/Mahon	29 343	–2.2	4.3	10
13	IE02	Southern and Eastern	Dublin Cork Shannon Kerry	29 224	0.0	10.2	13
14	UKH3	Essex	London Stansted Southend	22 383	– 6.0	6.2	15
15	CH04	Zürich	Zürich	22 074	6.6	5.3	17
16	DK01	Hovedstaden	Kobenhavn/Kastrup Bornholm	21 694	1.8	4.8	16
17	UKD3	Greater Manchester	Manchester	21 062	–3.8	2.9	14
18	ES61	Andalucia	Malaga Sevilla Jerez Granada Almeria	20 752	– 6.6	8.9	19
19	SE11	Stockholm	Stockholm/Arlanda Stockholm/Bromma	19 985	1.4	4.4	18
20	AT12	Niederösterreich	Wien-Schwechat	19 687	5.2	10.2	23

Source: Eurostat (tran_r_avpa_nm).

Table 10.2: Top 20 NUTS 2 regions with highest volume of air freight and mail in 2008
(1 000 tonnes of total freight and mail loaded and unloaded)

Ranking	NUTS	Region	Airports contributing by NUTS 2 regions	Total freight and mail in 2008 (1 000 tonnes)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
1	DE71	Darmstadt	Frankfurt/Main	2 104	–2.7	7.1	1
2	NL32	Noord-Holland	Amsterdam/Schiphol	1 592	–3.6	5.1	2
3	UKI2	Outer London	London Heathrow	1 483	6.5	1.7	4
4	FR10	Île de France	Paris-Charles de Gaulle Paris/Orly	1 464	–3.1	4.3	3
5	LU00	Luxembourg (Grand-Duché)	Luxembourg	788	12.1	3.9	5
6	BE24	Prov. Vlaams Brabant	Brussels/National	614	–16.3	4.9	6
7	ITC4	Lombardia	Milano/Malpensa Bergamo/Orio Al Serio Milano/Linate Brescia/Montichiari	585	–14.2	9.7	8
8	DEA2	Köln	Köln/Bonn Bonn-Hangelar	574	–19.0	7.5	7
9	DED3	Leipzig	Leipzig/Halle	430	400.0	52.3	58
10	BE33	Prov. Liège	Liege/Bierset	382	4.9	:	:
11	ES30	Comunidad de Madrid	Madrid/Barajas	355	3.8	3.7	9
12	UKF2	Leicestershire. Rutland and Northants	Nottingham East Midlands	292	– 8.2	7.6	11
13	CH04	Zürich	Zürich	282	1.1	1.8	10
14	DE21	Oberbayern	München Oberpfaffenhofen	265	0.0	12.9	15
15	DK01	Hovedstaden	Kobenhavn/Kastrup Bornholm	247	:	:	:
16	UKH3	Essex	London Stansted Southend	230	2.2	2.6	13
17	AT12	Niederösterreich	Wien-Schwechat	201	–2.0	12.7	17
18	ITE4	Lazio	Roma/Fiumicino Roma/Ciampino	173	–1.7	–1.0	14
19	FI18	Etelä-Suomi	Helsinki-Vantaa Turku Lappeenranta Utti Helsinki-Malmi Immola	146	0.7	15.0	20
20	UKD3	Greater Manchester	Manchester	143	–13.9	7.1	18

Source: Eurostat (tran_r_avgo_nm).

statistical returns in respect of carriage of goods and passengers by sea. This regulation provides detailed quarterly data for ports handling more than 1 million tonnes of goods or recording more than 200 000 passenger movements a year. The data collected at port level are then aggregated at NUTS 2 regional level.

This section on maritime transport focuses on the total number of passengers and the total number of tonnes loaded and unloaded in NUTS 2 regions in Europe. Tables 10.3 and 10.4 show the top 20 regions with the highest number of sea passengers and highest volume of sea freight in 2008.

Not surprisingly, maritime passenger transport is dominated by regions with a sea-faring tradition. By far the largest number of passengers transported by sea (31.5 million) is recorded by the Attiki region, where the port of Piraeus is the main gateway for passengers to the Greek islands. The second highest number of passengers was recorded in Sydsverige in Sweden, although the passenger count of 15.0 million was less than half that of Attiki. The ports of the Sydsverige region service a large number of ferry connections to the other countries around the Baltic Sea. Next comes Sicilia, with 14.9 million passengers. Sicilia services several ferry connections to the mainland of Italy, with Messina the busiest passenger port in Italy, but there are also ferry routes to Malta and Tunisia. The high passenger counts in Kent (14.0 million) and Nord - Pas-de-Calais (13.8 million) reflect the close ties across the English Channel, with the ports of Dover, Medway and Ramsgate on the English side and Calais and Dunkerque on the French side.

From 2004 to 2008, the growth in passenger numbers varied greatly between the top 20 European regions in terms of maritime passenger transport. In particular, the smaller port regions in the top 20 recorded rises in passenger numbers, whereas the numbers fell in several of the largest regions in the top 20. The highest growth rate over this period (+49 %) was recorded for Toscana with the ports of Livorno, Marina Di Carrara and Piombino. Other regions with strong increases in passenger numbers were Notio Aigaio (+21 %) and Sardegna (+12 %).

Several leading maritime regions reported falls in the number of passengers transported from 2004 to 2008. This was the case not only in the largest region, Attiki (down by 13 %), but also in regions around the Baltic Sea, namely Nordjylland in Denmark, with its traditional ties with western Sweden and southern Norway (down by 16 %), and Sydsverige in Sweden (down by 5 %). The regions on both sides of the English Channel also reported slightly lower passenger numbers: down by 3 % in Kent and by 0.4% in Nord - Pas-de-Calais.

For maritime freight, Zuid-Holland with the port of Rotterdam is far in the lead. It handled 391 million tonnes of freight, more than twice the volume of the second of the top 20 European regions, Antwerpen (171 million tonnes). They are followed by Hamburg in Germany (119 million tonnes), Haute Normandie in France (99 million tonnes), Noord-Holland in the Netherlands and Andalucía in Spain (both 98 million tonnes), Provence-Alpes-Côte d'Azur in France (93 million tonnes) and East Yorkshire and Northern Lincolnshire in the United Kingdom (91 million tonnes). These volumes are far higher than those recorded for other modes of transport and clearly illustrate the key role maritime freight plays in the European economy. The geographical spread of the main seaports also illustrates the flexibility of maritime transport, which allows large volumes to be loaded and unloaded close to the main recipients and producers.

Despite the decline in volumes at several key seaports from 2007 to 2008, the freight volumes handled increased in all the top 20 European regions over the five-year period 2003–08, with the exceptions of Sicilia in Italy and Vestlandet in Norway. Noord-Holland in the Netherlands recorded the highest growth in freight volumes over this period (up by 65 %), followed by some of the 'smaller' top 20 regions in terms of freight volumes handled: Comunidad Valenciana in Spain (up by 51 %) and Bremen in Germany (up by 49 %).

Conclusion

The data presented in the three maps and four tables in this chapter show a number of interrelationships between regions' economic and geographical characteristics and the structure of the European transport system. They indicate a close relationship between the availability of motorways and road safety. They also provide basic figures on the regional distribution of air and maritime transport. However, the data presented in this chapter are only part of the

Table 10.3: Top 20 NUTS 2 regions with highest number of maritime passengers in 2008 (1 000 passengers carried)

Ranking	NUTS	Region	Ports contributing by NUTS 2 regions		Total passengers in 2008 (1 000 passengers)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
1	GR30	Attiki	Eleusina Lavrio Megara Paloukia Salaminas	Perama Pireus Rio	31 471	–1.6	–5.3	1
2	SE22	Sydsverige	Helsingborg Karlskrona Karlshamn Malmö	Sölvesborg Trelleborg Ystad	14 964	– 0.8	–0.9	3
3	ITG1	Sicilia	Augusta Catania Gela Lipari Milazzo	Messina Palermo Pozzallo Santa Panagia Trapani	14 905	5.1	0.5	7
4	UKJ4	Kent	Dover Medway	Ramsgate	14 005	–3.4	–0.6	4
5	FR30	Nord - Pas-de-Calais	Calais	Dunkerque	13 796	–2.1	–0.3	6
6	DK01	Hovedsta-den	Avedøreværkets Havn Københavns Havn Helsingør (Elsinore) Rønne	Frederiskværk Havn (Frederiksværk Stålvalseværk)	13 616	– 0.8	–1.5	5
7	FI18	Etelä-Suomi	Helsinki Hanko Hamina Inkoo Kotka Koverhar	Loviisa Naantali Parainen Sköldvik Turku Uusikaupunki	12 589	4.7	–4.7	8
8	HR03	Jadranska Hrvatska	Bakar Biograd na Moru Bol Cres Dubrovnik - Gruž Hvar - passenger port Jablanac Korcula Krk Makarska Novalja Omišalj Ploce Porec - passenger port Preko - passenger port	Pula Rab Rijeka - basin Raša - Bršica Rabac Rogac Rijeka Stari Grad Šibenik Split Sucuraj - passenger port Supetar Vodice Vis - passenger port Zadar - passenger port	12 578	3.9	:	:
9	DK02	Sjælland	Asnæsværkets Havn Gedser Kalundborg Køge	Rødby (Færgehavn) Stigsnæsværkets Havn Statoil-Havnen	12 013	– 4.6	1.7	9

Ranking	NUTS	Region	Ports contributing by NUTS 2 regions		Total passengers in 2008 (1 000 passengers)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
10	ITF3	Campania	Napoli	Salerno	11 848	5.6	–0.5	10
11	SE11	Stockholm	Bergs Oljehamn Kappelskär	Nynäshamn (ports) Stockholm	11 842	2.1	1.9	11
12	DEF0	Schleswig-Holstein	Föhr I. Amrum I. Brunsbüttel Büsum Dagebüll Helgoland I. List/Sylt	Nordstrand. Insel Pellworm I. Flensburg Kiel Lübeck Puttgarden	11 810	– 4.3	3.5	12
13	ITF6	Calabria	Gioia Tauro		10 116	–2.1	1.6	13
14	ITG2	Sardegna	Cagliari Olbia Porto Foxi	Porto Torres Portovesme Oristano	9 902	–5.7	5.1	14
15	ITE1	Toscana	Livorno Marina Di Carrara	Piombino	9 225	28.5	3.7	17
16	GR42	Notio Aigaio	Milos Island	Rhodes	8 394	– 0.4	13.3	20
17	EE00	Eesti	Kunda Miiduranna Pärnu	Tallinn Vene-Balti	6 870	10.5	4.7	19
18	ES61	Andalucía	Málaga Algeciras Cádiz	Huelva Almería Sevilla	6 409	–3.7	1.5	15
19	DK05	Nordjylland	Aalborg Frederikshavn Hirtshals	Aalborg Portland (Cementfabrikken Rordal)	5 202	–11.7	–1.5	16
20	DE94	Weser-Ems	Wangerooge I. Bensersiel Brake Borkum I. Baltrum I. Carolinensiel Emden Juist	Langeoog. Insel Nordenham Neuharlingersiel Norddeich Norderney I. Spieckeroog I. Wilhelmshaven	5 150	–3.0	5.7	21

Source: Eurostat (tran_r_mapa_nm).

Table 10.4: Top 20 NUTS 2 regions with highest volume of maritime goods in 2008 (1 000 tonnes of total goods loaded and unloaded)

Ranking	NUTS	Region	Ports contributing by NUTS 2 regions	Total goods in 2008 (1 000 tonnes)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
1	NL33	Zuid-Holland	Dordrecht Rotterdam Scheveningen Vlaardingen Zwijndrecht	391 335	2.4	4.9	1
2	BE21	Prov. Antwerpen	Antwerpen	171 237	3.5	7.0	2
3	DE60	Hamburg	Hamburg	118 915	0.6	6.0	3
4	FR23	Haute-Normandie	Dieppe Le Havre Rouen	99 350	2.0	2.0	5
5	NL32	Noord-Holland	Amsterdam Den Helder Velsen/Ijmuiden Zaanstad	98 035	16.2	9.1	13
6	ES61	Andalucía	Málaga Algeciras Cádiz Huelva Almería Sevilla	97 705	–5.9	5.1	6
7	FR82	Provence-Alpes-Côte d'Azur	Marseille Toulon	93 086	0.6	0.0	4
8	UKE1	East Yorkshire and Northern Lincolnshire	Trent River River Hull & Humber Goole Hull Immingham	91 010	–1.8	3.5	8
9	ITG1	Sicilia	Augusta Catania Gela Lipari Milazzo Messina Pozzallo Santa Panagia Trapani	82 157	– 6.6	1.3	7
10	ITC3	Liguria	Genova La Spezia Savona - Vado	79 719	–1.4	2.6	10
11	ES51	Cataluña	Barcelona Tarragona	73 575	–3.7	7.0	15

Ranking	NUTS	Region	Ports contributing by NUTS 2 regions	Total goods in 2008 (1 000 tonnes)	Growth rate 2007/08 (%)	Average annual growth 2003/07 (%)	Ranking 2003
12	FI18	Etelä-Suomi	Helsinki Hanko Hamina Inkoo Kotka Koverhar Loviisa Naantali Parainen Sköldvik Turku Uusikaupunki	69 799	– 0.7	2.5	11
13	SE23	Västsverige	Brofjorden Preemraff Göteborg Halmstad Stenungsund (Ports) Uddevalla Varberg	69 297	6.8	2.7	14
14	FR30	Nord - Pas-de-Calais	Calais Dunkerque	69 145	–1.1	2.7	12
15	NO05	Vestlandet	Ålesund Bergen. Mongstad, Sture, Ågotnes, Eikefet, Askøy, Modalen Bremanger Florø/Flora Kristiansund N/Grip Måløy	68 928	–11.4	–0.8	9
16	ES52	Comunidad Valenciana	Alicante Castellón Valencia	65 896	6.4	9.2	27
17	ITF4	Puglia	Brindisi Barletta Bari Manfredonia Taranto	65 358	– 0.6	7.0	21
18	DE50	Bremen	Bremen, Blumenthal Bremerhaven	63 501	7.2	8.7	29
19	ITG2	Sardegna	Cagliari Olbia Porto Foxi Porto Torres Portovesme Oristano	61 163	7.6	4.7	23
20	LV00	Latvia	Liepaja Riga Ventspils	59 956	0.8	2.5	18

Source: Eurostat (tran_r_mago_nm)

wider set of regional transport statistics available in Eurostat's databases. Regional transport statistics show patterns of variation across regions, where transport-related variables are often closely related to levels of economic activity. As mentioned earlier, transport policies are at the very heart of efforts to reduce regional inequality and improve regional cohesion. In the enlarged European Union, economic and infrastructure disparities are now more evident than before. Furthermore, European transport policies seek to reduce the emission of CO_2 and other substances detrimental to the global climate, through a more intelligent transport system and a better mix of transport modes. One of Eurostat's long-term objectives is to expand the current regional transport indicators in order to provide a better understanding of the impact of transport policies on economic growth, transport needs and the environment.

Methodological notes

Eurostat collects, compiles and disseminates a variety of regional indicators. Data on road and railway infrastructure, inland waterways, vehicle stocks and road accidents are currently collected by Member States and candidate countries on a voluntary basis via annual questionnaires. Data on road transport of goods as well as maritime and air transport for passengers and goods are derived directly from the data collection required by law. In addition, data on journeys made by vehicles are derived from a specific study of road transport data.

Eurostat's statistical database contains information on the road, railway and inland waterway infrastructure at NUTS 2 regional level. The road network is divided into motorways and other roads. Railway links are classified on the basis of two criteria: the number of tracks and whether or not they are electrified. Inland waterways include navigable rivers and canals, plus lakes. However, up until now, the varying performance of these transport links (e.g. the capacity per link) has not been reflected in the data Eurostat receives from the Member States.

Regional transport indicators are available on Eurostat's website under 'Transport' and are mirrored in the 'General and regional statistics'. In addition to the full data sets, 16 main tables are currently available for transport data, covering infrastructure, the vehicle fleet, journeys by road, rail, sea and air, and road safety (numbers of deaths and injuries in road accidents). All the data are annual, with time series going back to the reference year 1978 for transport infrastructure, air transport and maritime transport. For road safety data, the series starts from 1988.

Due to the intrinsic nature of transport, a spatial breakdown is built into most legislation calling for collection of transport flow statistics, which makes it possible to derive regional indicators for maritime and air transport directly. Other indicators on regional transport flows can be found under the separate areas of 'Transport', namely 'Road transport', 'Railway transport' and 'Inland waterway transport'. Further information on transport flows between airports and ports can also be obtained under 'Maritime transport' and 'Air transport'.

To demonstrate the potential of transport statistics for analysing regional patterns, this chapter focuses on the data on regional transport infrastructure, road safety, air transport and maritime transport. The latter are derived from the data collection required by law. The regional infrastructure is expressed by a density indicator which divides the total length of the motorway and railway network within a region by the region's land area. Regional road safety is assessed by dividing the number of road fatalities by the number of inhabitants per region. In contrast to the data on persons injured, the data on road casualties are comparable across Europe. Regional air transport volumes are expressed as the total number of air passengers embarking, disembarking and in transit and as tonnes of freight loaded and unloaded at airports in the regions. The data are derived from those provided by the countries at airport level. Precise definitions of all the variables used can be found in the glossary for transport statistics (http://www.internationaltransportforum.org/Pub/pdf/09GloStat.pdf).

The basic data used in the maps and tables were extracted from Eurostat's website, although not all the derived indicators are directly available there. The aim is to provide added value over and above the data already available to the public on the website. Further information can be found in Eurostat's *Statistics in focus* on transport issues, in the 2009 *Panorama of transport* publications and in CARE, a Community database on road accidents resulting in death or injury, which contains detailed data on individual accidents collected by the Member States (http://ec.europa.eu/transport/road_safety/specialist/statistics/care_reports_graphics/index_en.htm).