Conférence Européenne
des Directeurs des Routes

Conference of European
Directors of Roads

Trans-European Road Network, TEN-T (Roads): 2019 Performance Report

CEDR Working Group 3.5 Performance

October 2020

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Approved by:	CEDR's EXECUTIVE BOARD on 26 October 2020
Edited and published by:	CEDR's Secretariat-General
CEDR report:	TR2020-01
ISBN:	979-10-93321-54-7

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EXECUTIVE SUMMARY

The 2019 TEN-T (Roads) Performance Report is the sixth biennial report published by CEDR on this subject and summarises the performance of the TEN-T road network within CEDR participating countries on 1 January 2019.

The Trans-European Transport Network (TEN-T) is a European Commission policy directed towards the implementation and development of a Europe-wide network of roads, railways, inland waterways, maritime shipping routes, ports, airports, and rail-road terminals. It consists of two planning layers:

- the **Comprehensive Network** covering all European regions and expected to be completed by 2050; and
- the **Core Network** consisting of the highest strategic connections within the comprehensive network linking the most important nodes and expected to be completed by 2030[1].

Following a 2013 review of TEN-T policy, nine **Core Network Corridors** (CNCs) were identified to streamline and facilitate the coordinated development of the TEN-T Core Network. Core Network Corridors cover the most important long-distance flows in the Core Network and are intended in particular to improve cross-border links within the union.

CEDR's intention in producing the TEN-T (Roads) Performance Report is to establish a stable set of data with which to monitor trends and identify changes in the performance of the TEN-T road network. The fact that this is the sixth biennial TEN-T (Roads) Performance Report illustrates the value that CEDR members attach to the information this report delivers and to its capacity to serve benchmarking purposes and to monitor the evolution of TEN-T network performance over time. The report provides very detailed information on TEN-T road structure and performance that is not available from any other centralised information source.

Data collected for this report are based on the **CEDR performance reporting framework**. This framework comprises a common Location Referencing Model for the TEN-T road network and a set of common definitions for base data that are used to calculate performance indicators. The TEN-T Location Referencing Model is a link-node model with nodes defined at the intersection of TEN-T links. The methodology for the definition of the model is documented in the report 'TEN-T (Roads) Location Referencing Model: Handbook & Implementation Guidance' published by CEDR's Planning Working Group in 2008.

With 21 national road authorities (NRAs) providing data on a voluntary basis, the 2019 report has the covers approximately 71,000km of TEN-T roads of which 42% are part of the Core Network and 61% are motorways. Approximately 24,500 km of the roads form part of Core Network Corridors.

The network covered by the report represents some of Europe's most heavily used and significant roads with more than 26% carrying in excess of 80,000 vehicles per day and more than 40% with a traffic density of more than 6,000 vehicles per day per lane. Heavy Goods Vehicles (HGVs) make up a significant proportion of this traffic with more than 20% of the total traffic comprising HGVs on 22% of the network. The overall traffic demand has increased by on average 1% each year since 2011 and, although the number of HGVs on the network has remained steady or slightly decreased since 2011, national road administrations have planned capacity improvements on 31% of network sections.

Despite this level of demand, the rate of fatal accidents remains relatively low with an annual average across the network of 3.6 fatal accidents per Billion Vehicle KMs travelled and these figures appear to have remained steady since 2015.

[1] 'Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network'

The report shows that the TEN-T (Roads) Performance Report continues to be a useful analysis of the network at a European and national level that is supported by the majority of CEDR members. Furthermore, the performance report continues to evolve with new indicators being developed that look at safe and secure rest areas for truck drivers and the prevalence of facilities for charging electric vehicles and alternative fuels.

Other significant developments include the planned introduction of a high-level summary report that considers the performance of individual national road administrations through new KPIs covering safety, congestion, environment, finance and asset condition. The intention is that this report will supplement the 2021 TEN-T (Roads) Performance Report.

The 2019 report highlights that there is an ever increasing demand on the network in terms of general traffic flow but that the number of HGVs appears to be steady, or even decreasing. In response, national road administrations are planning to increase capacity and are deploying ITS solutions to actively manage traffic demand. Accident rates on the network remain low and appear to have remained steady since 2015. It will be interesting to see what effect the response COVID-19 pandemic and the impact of Brexit have on the future trends and performance reports.

1 INTRODUCTION

1.1 The Trans-European Transport Network

The Trans-European Transport Network (TEN-T) policy addresses the implementation and development of a Europe-wide network of railway lines, roads, inland waterways, maritime shipping routes, ports, airports and railroad terminals. The ultimate objective is to close gaps, remove bottlenecks and technical barriers, as well as to strengthen social, economic and territorial cohesion in the EU.

The TEN-T (Roads) Network, as laid out by Article 9 of Decision 661/2010/EU , is defined as including motorways and high-quality roads, whether existing, new or to be adapted, which:

- play an important role in long-distance traffic;
- bypass the main urban centres on the routes identified by the network;
- provide interconnection with other modes of transport; or
- link landlocked and peripheral regions to central regions of the Union.

Beyond these, the network should guarantee users a high, uniform and continuous level of services, comfort and safety. It has also include infrastructure for traffic management, user information, dealing with incidents and emergencies and electronic fee collection, such infrastructure being based on active cooperation between traffic management systems at European, national and regional level and providers of travel and traffic information and value added services, which will ensure the necessary complementarity with applications whose deployment is facilitated under the trans-European telecommunications networks programme.

Besides the construction of new physical infrastructure, the TEN-T policy supports the application of innovation, new technologies and digital solutions to all modes of transport. The objective is improved use of infrastructure, reduced environmental impact of transport, enhanced energy efficiency and increased safety.

TEN-T comprises two network ‘layers’:

- The Core Network includes the most important connections, linking the most important nodes, and is to be completed by 2030.
- The Comprehensive Network covers all European regions and is to be completed by 2050.

The backbone of the Core Network is represented by nine Core Network Corridors, which were identified to streamline and facilitate the coordinated development of the Core Network. Two horizontal priorities, the European Rail Traffic Management System (ERTMS) and Motorways of the Sea complement these. Oversight of the Corridors and of the two Horizontal Priorities lies with European Coordinators, nominated by the European Commission.

1.2 Background to the Performance Report

CEDR has long recognised the need for high-quality, comparable information about the performance of the TEN-T road network and has, therefore, undertaken work to develop a simple, low-cost performance reporting framework that could be used by all members to provide such data.

This framework comprises a common location referencing model for the TEN-T road network and a set of common definitions for base data that is used to calculate performance indicators.

The TEN-T location referencing model is a link-node model with nodes defined at the intersection of TEN-T links. The methodology for the definition of the model is documented in the report 'TEN-T

(Roads) Location Referencing Model: Handbook & Implementation Guidance' published by CEDR's Planning Working Group in 2008.

The performance reporting framework has been the basis of the biennial CEDR report on the performance of the TEN-T (Roads) network since 2009.

This framework has advantages over other systems because:

- all data is referenced to a common, stable location referencing model,
- all data is based on common data definitions, and
- data is provided directly by NRAs.

The framework therefore improves data quality and consistency and makes comparison of this information more meaningful.

1.3 Purpose the Report

The 2019 TEN-T (Roads) Performance Report is the sixth biennial report published by CEDR on the performance of the TEN-T road network within CEDR participating countries.

CEDR's intention in producing these reports is to establish a stable set of data with which to monitor trends and identify changes in the performance of the TEN-T road network. As such, the report is a particularly useful source of information for individual national road authorities (NRAs), regulatory bodies, and others for benchmarking purposes and for setting national performance targets.

1.4 Structure of the Report

The document is divided up into six main sections and six annexes.

Section 2 provides general information about the TEN-T (Roads) network including the Core Network and Core Network Corridors, and describes the general characteristics of the network in terms of road type, physical environment, number of lanes and planned capacity improvements.

Section 3 describes the network infrastructure and services including bridges, tunnels, use of intelligent transport systems (ITS) and new indicators about rest areas and refuelling facilities.

Section 4 analyses the performance of the Core Network Corridors in terms of traffic flow, proportion of heavy goods vehicles (HGVs) and fatal accident rate.

Section 5 describes the performance of the network, as a whole and at a national level, in terms of traffic flow, traffic density, proportion of HGVs, road transport mileage and fatal accident rate.

Section 6 provides an overall summary and conclusions.

Section 7 describes planned and potential future development of the report.

The methodology applied to the data collection process is described in **Annex 1**. The definitions for the collected data are provided in **Annex 2**.

Detailed national data for each indicator is provided in **Annex 3** and Thematic maps showing indicators at link level on the whole TEN-T (Roads) network are given in **Annex 4**.

Maps showing the TEN-T Core Network Corridors and their length within the participating countries are provided in **Annex 5**.

Annex 6 concludes the report by providing background information on key socio-economic indicators and on the national road network of each participating country together with a brief profile of the national road authority.

1.5 A Note on Number Usage

In this report the term 'billion' is used to mean 10^9 (i.e. the UK usage) rather than to be mean 10^{12} (i.e. the common EU usage).

1.6 TEN-T (Roads) GIS Web Map

GIS technology has long been valued as a means of enhancing communication and collaboration in decision-making, effectively managing resources and assets, enhancing the efficiency of workflows, and improving the accessibility of information to the public.

The development of web maps further increases the possibility of information-sharing as users do not need to purchase and install software and become GIS experts since they are made available through a regular web browser with a simple, user-friendly interface.

A GIS web map has been developed to support the visualisation of collected data and to give higher visibility to CEDR's valuable 'TEN-T (Roads) Performance Report'

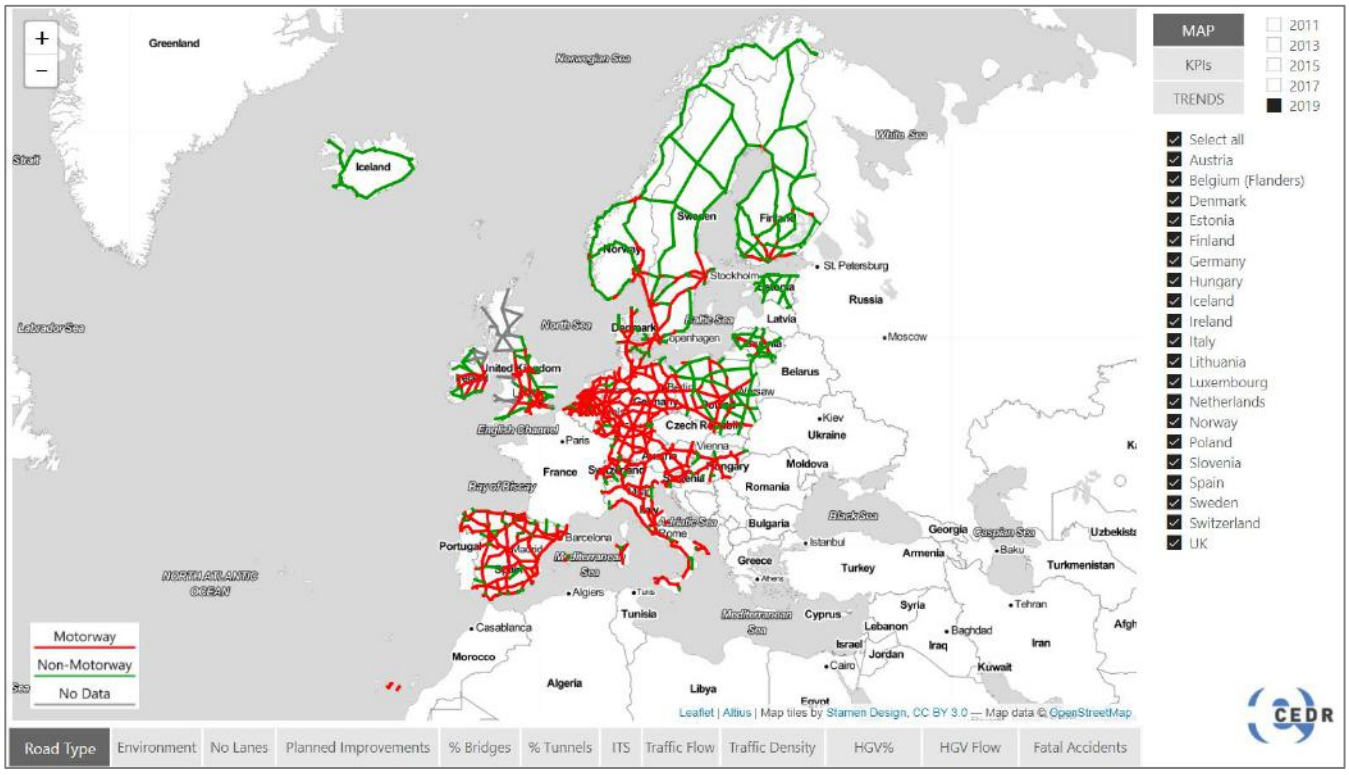


Figure 1: CEDR TEN-T (Roads) Performance GIS web map

The web map displays the GIS layer of CEDR's logical network, in conformity with CEDR's Location Referencing Model, and allows for the visualisation of thematic maps showing road performance indicators at link level (e.g. road type, number of lanes, etc.) and for different years (on the basis of previous CEDR's TEN-T (Roads) Performance Report data). It also supports graphical reporting of network level data, KPIs and trends.

1.7 Participating Countries in 2019

In total, 21 countries voluntarily provided data for the 2019 report. Table 1 below provides with an overview of the countries that have been included in all CEDR TEN-T (Roads) performance reports since 2009.

Table 1: Countries participating in the TEN-T (Roads) Performance Report

Country	2009	2011	2013	2015	2017	2019
Austria	■	■	■	■	■	■
Belgium (Flanders)			■	□	■	■
Belgium (Wallonia)	■	■	■	□	□	□
Cyprus	■	■	□	□	□	□
Czech Republic						□
Denmark	■	■	■	■	■	■
Estonia	■	■	■	■	■	■
Finland	■	■	■	■	■	■
France	■	■	□	□	□	□
Germany	■	■	■	■	■	■
Greece	■	■	■	■	■	□
Hungary	■	■	□	□	■	■
Iceland	■	■	■	■	■	■
Ireland		■	■	■	■	■
Italy	■	■	■	■	■	■
Latvia					□	□
Lithuania	■	■	■	■	■	■
Luxembourg	■	■	■	■	■	■
Malta			■	■	□	■
Netherlands			■	■	■	■
Norway	■	■	■	■	■	■
Poland				□	■	■
Portugal					□	□
Slovenia	■	■	■	■	■	■
Slovak Republic					■	□
Spain	■	■	■	■	■	■
Sweden	■	■	■	■	■	■
Switzerland			■	■	■	■
United Kingdom	■	■	■	■	■	■

■ Network and updated data included in the analysis

□ Network included in maps, data not included in the analysis

As far as data coverage is concerned, it should be noted that:

- for Belgium, only the Flemish road authority contributed to the 2019 report. Consequently, all Belgium (network and traffic) data in this report relate to Flanders region only;
- for Italy, only Anas contributed to the 2019 report. Consequently all Italy (network and traffic) data in this report relate to the TEN-T managed by Anas only;
- for the United Kingdom, the data provided covers the strategic road network in England only.
- Portugal have indicated that they intend to participate in the 2021 report.

More detailed background information about the participating countries is included in Annex 5.

2 ABOUT THE TEN-T (ROADS) NETWORK

The TEN-T (Roads) network is shown in Figure 2 below, the Core Network is coloured red on the map.

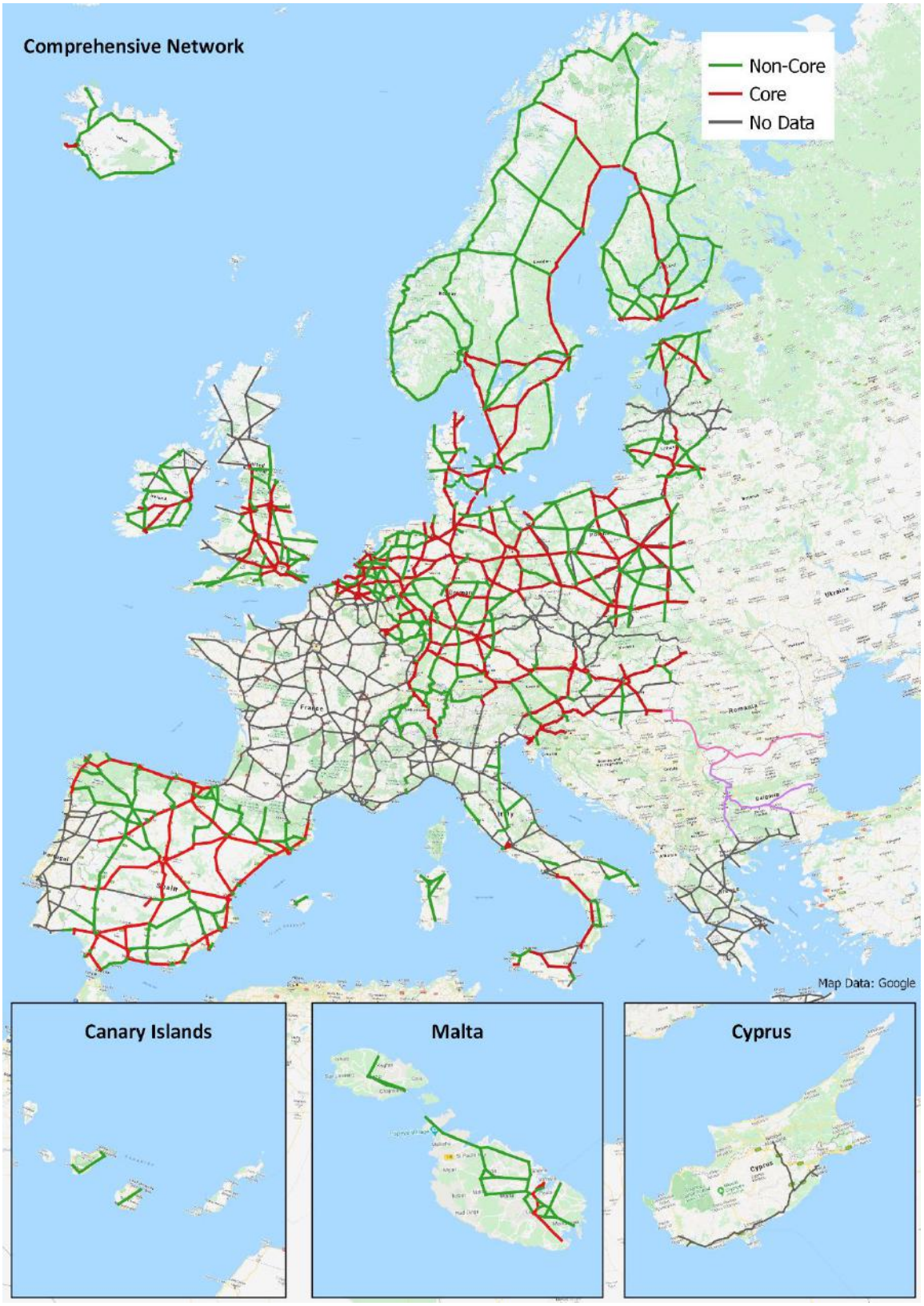


Figure 2: TEN-T (Roads) Networks

The length of Core and Non-Core TEN-T Network in each of the participating countries, and the proportion of the Core and Non-Core Networks with respect to the Comprehensive Network, is shown in Figure 3.

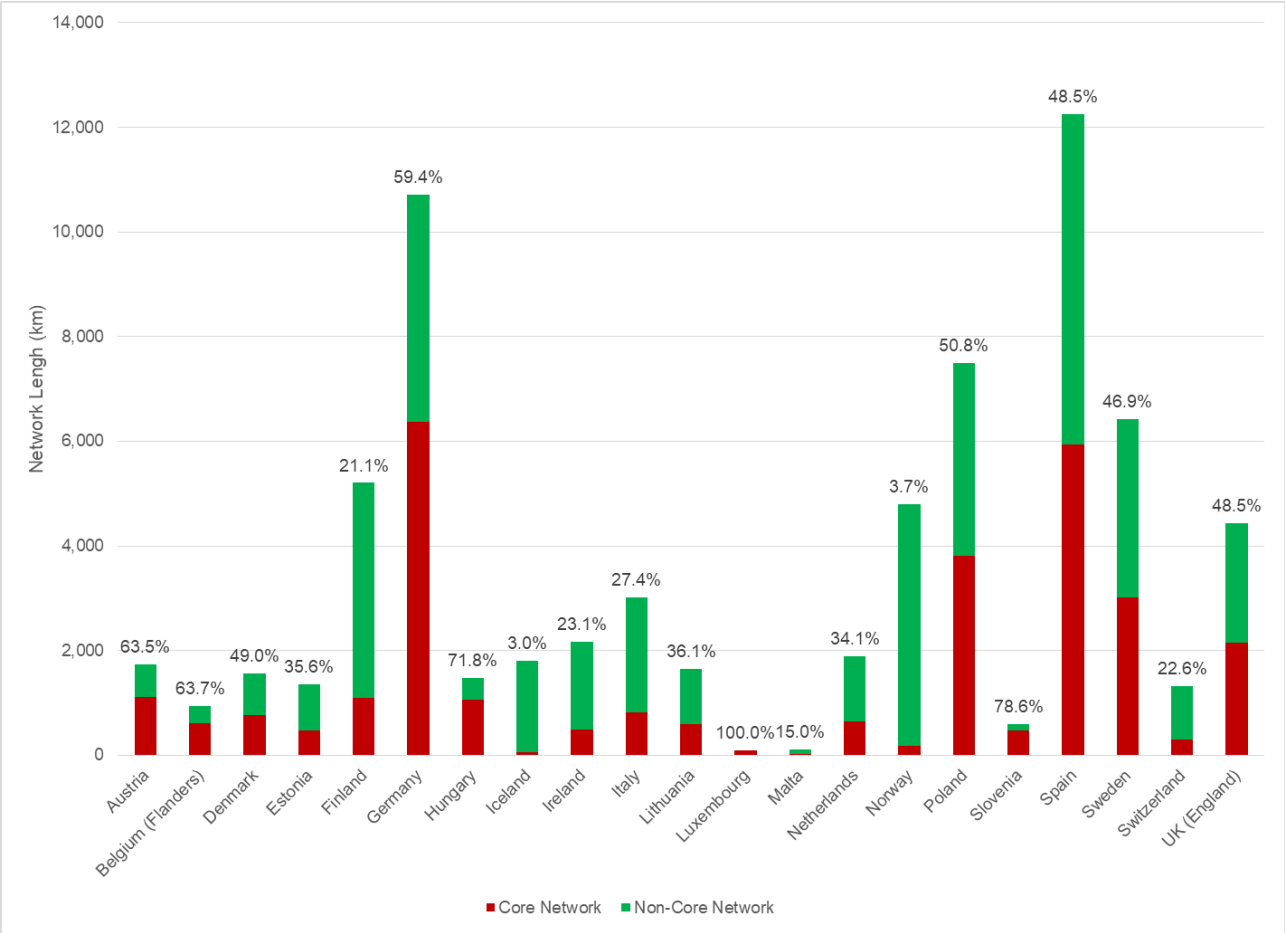


Figure 3: Comparison of Core and Non-Core Network lengths of TEN-T (Roads)

The countries with the greatest extent of TEN-T roads are Spain, German and Poland. Countries with highest proportion of Core Network are Luxembourg (100%), Slovenia (79%) and Hungary (72%) while Iceland (3%) and Norway (4%) have the lowest shares. However, it should be noted that the total TEN-T network in Luxembourg is only 90km and comprises only 0.3% of the total Core network.

2.1 Core Network Corridors

The nine Core Network Corridors (CNCs) are shown in Figure 4. The concept of the CNCs was introduced in 2014, are the backbone of the TEN-T Core Network. Individual maps of the Core Network Corridors are provided in Annex 4.

Table 2 shows the length of the CNCs by road type calculated on the basis of the data collected in this report. It should be noted that some road sections belong to more than one corridor and some sections to none, therefore, the total CNCs' length cannot be computed by summing up the lengths of the individual corridors. Moreover, due to lack of information on some corridor sections, the total length of each corridor could be under estimated.

Overall, Core Network Corridors account for 34% (24,506 km) of the entire TEN-T network covered by the 2019 report.

Section 4 compares the performance of the nine CNCs in terms of traffic, HGVs and accidents.

Table 2: Length of TEN-T Core Network Corridors by Road Type

Corridor	Total Length (km)		
	Motorway	Non-Motorway	Total
Atlantic	2,037	4	2,041
Baltic-Adriatic	1,970	671	2,641
Mediterranean	3,594	134	3,728
North Sea-Baltic	2,577	945	3,522
North Sea-Mediterranean	1,954	317	2,271
Orient/East-Med	1,882	90	1,972
Rhine-Alpine	1,423	24	1,447
Rhine-Danube	2,028	101	2,129
Scandinavian-Mediterranean	4,650	105	4,755
All	**22,115**	**2,392**	**24,506**

Figure 4: TEN-T Road Core Network Corridors

(Dashed lines indicate Core Network Sections where no data was provided for the 2019 Report)

2.2 Road Type

Given the importance of the TEN-T in providing inter-urban connectivity at a European level, the majority of the network is motorway (61%) as indicated in Figure 5.

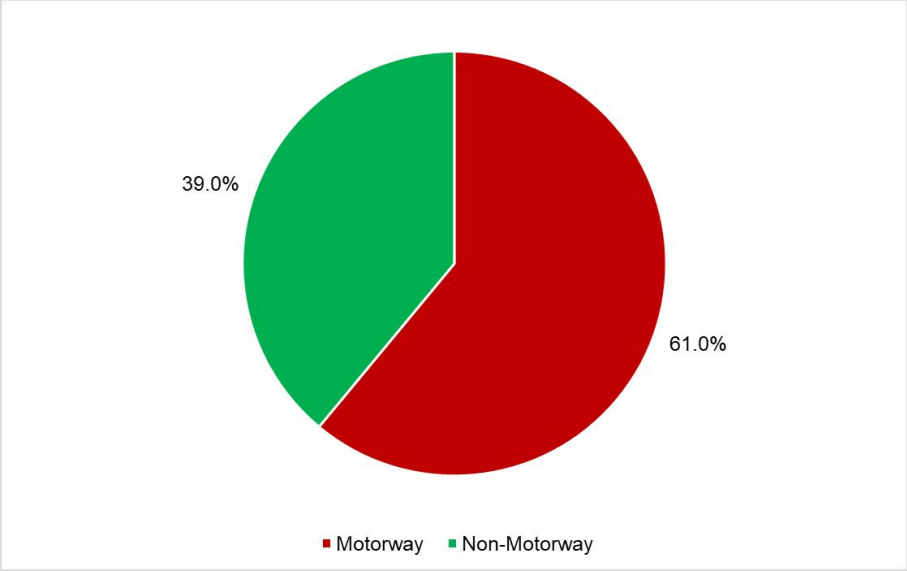


Figure 5: Distribution of Road Types on the TEN-T network

The split between motorway and non-motorway on the TEN-T at a national level is shown in Figure 6. In countries like Austria, Luxembourg, and the Netherlands, the TEN-T road network consists only of motorways. In contrast, in Estonia, Iceland and Malta the network is almost entirely made up of non-motorway roads.

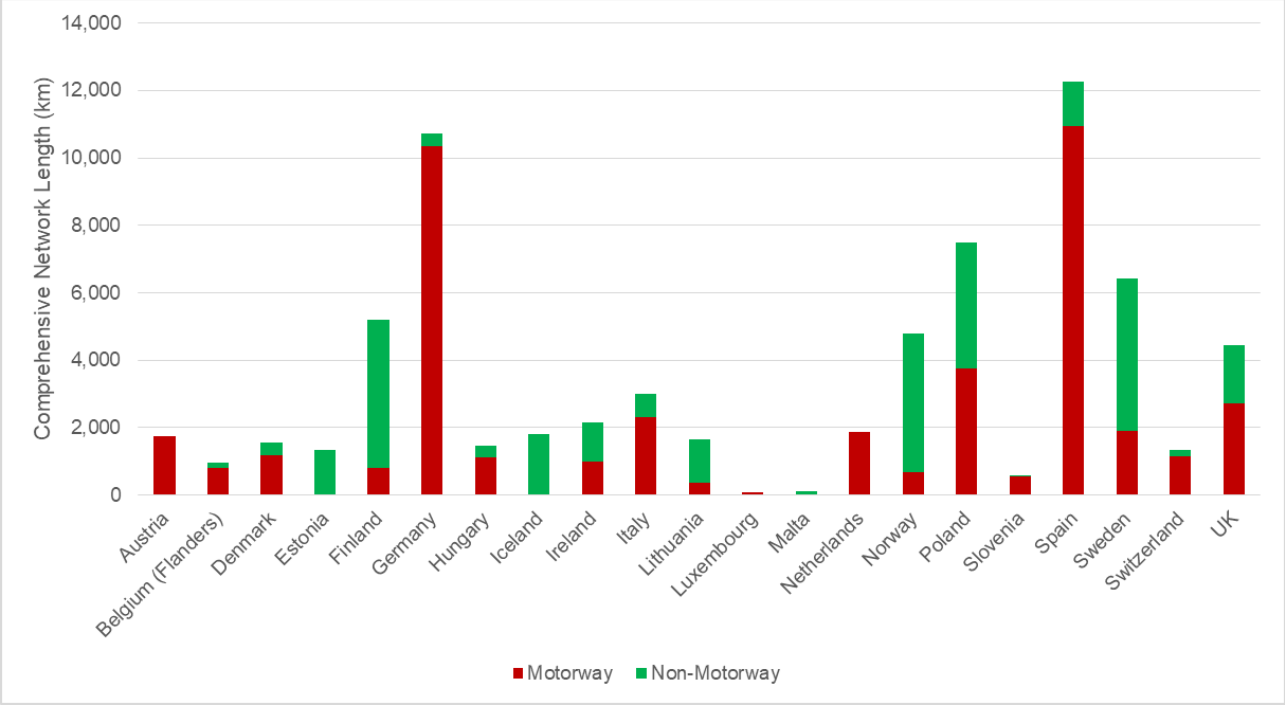


Figure 6: Distribution of Road Types on the TEN-T network by country

The comparison between the composition of Comprehensive, Core and Non-Core networks shown in Figure 7 indicates that the share of motorways on the Comprehensive Network as a whole is 61%. This share rises to 85% in the case of the Core Network and 43% for Non-Core Network.

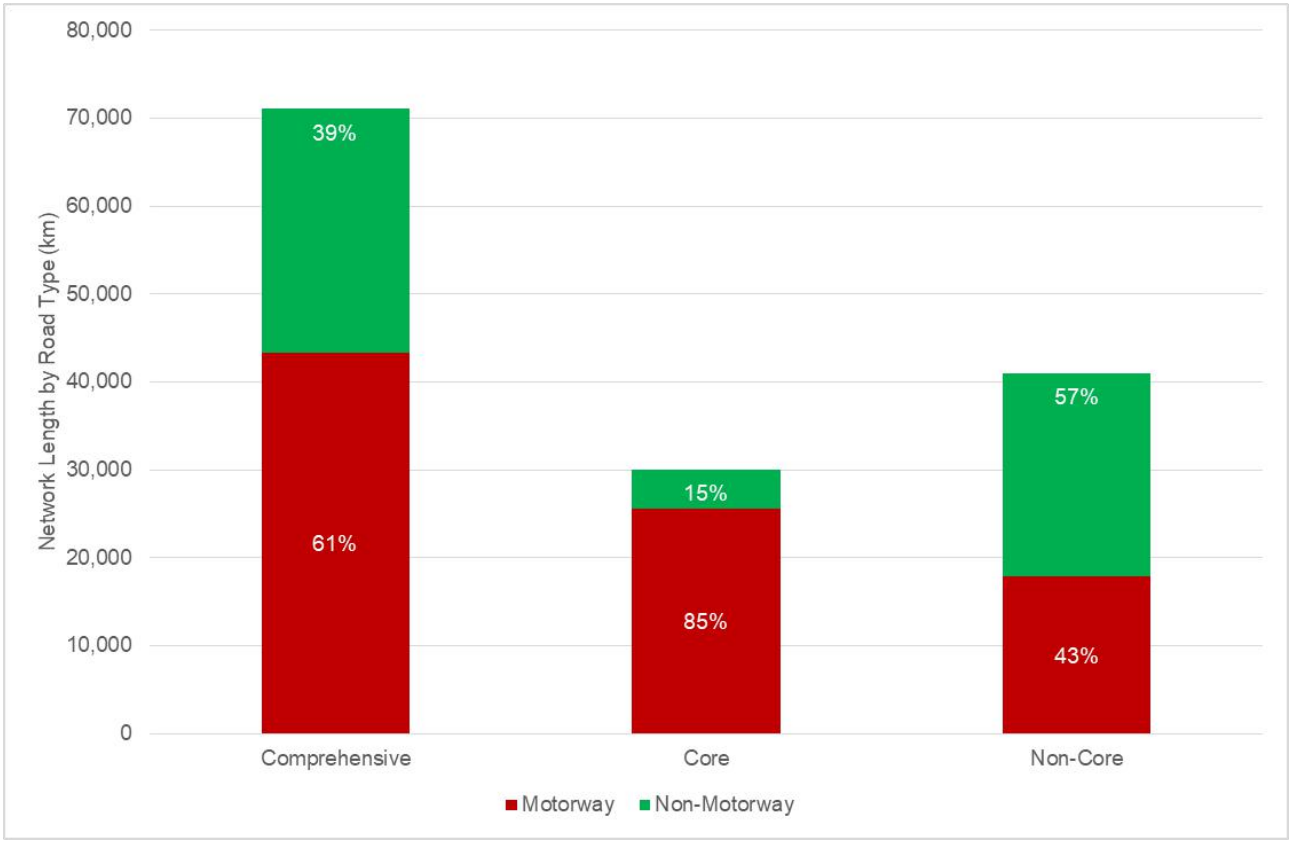


Figure 7: Comparison of Road Types on Comprehensive, Core, Non-Core Networks

2.3 Physical Environment

Figure 8 shows the physical environment around the TEN-T. Again, not surprisingly given its purpose, 91% of the network is rural.

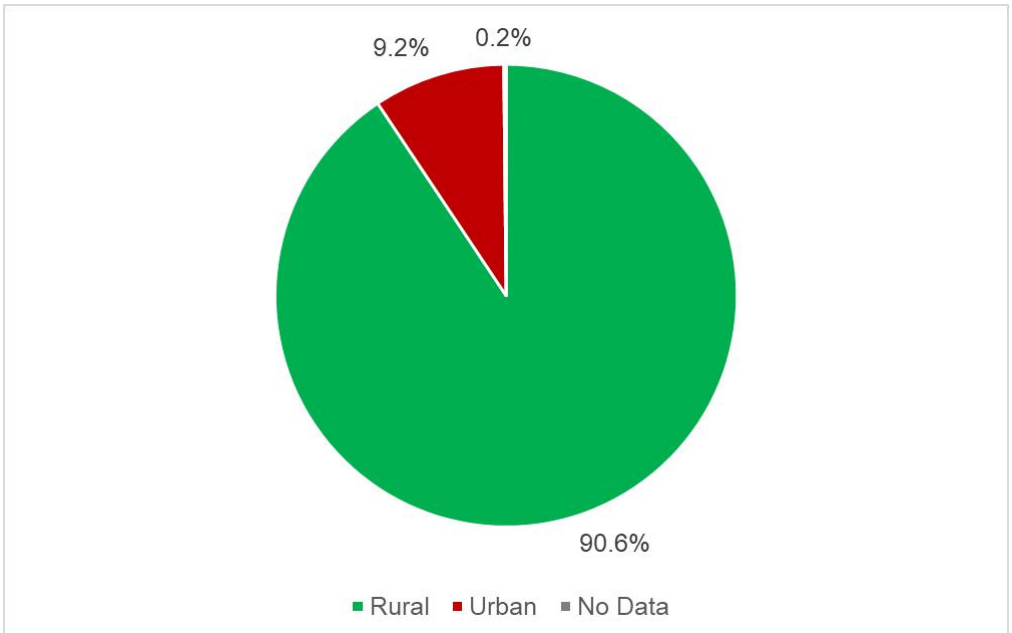


Figure 8: Physical Environment of the TEN-T

2.4 Number of Lanes

The average number of lanes on the road sections composing the TEN-T network provides an indication of the capacity of the network. Figure 9 shows that, amongst the participating countries, 53% of the Comprehensive network has between 2 and 4 lanes; 77% has more than 2 lanes only 3% of the has more than 6 lanes, whereas 94% of the Core Network has more than 2 lanes and 6% has more than 6 lanes.

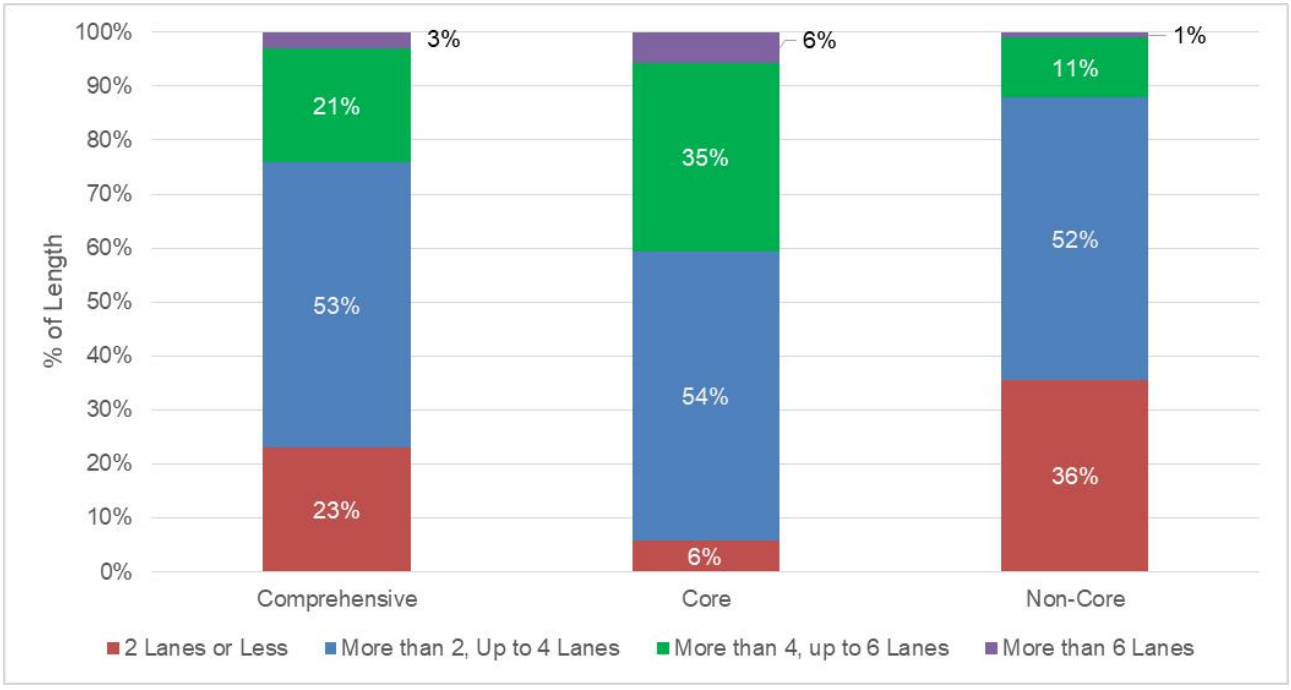


Figure 9: Comparison of Number of Lanes on the Comprehensive, Core and Non-Core Networks

2.5 Planned Capacity Improvements

Participating countries provided information about any planned works to improve the capacity of the TEN-T. This is an indication that there are existing capacity issues, e.g. these parts of the network regularly experience congestion.

Figure 10 shows that all countries that provided data have planned capacity improvements ranging between 3% of sections (Iceland) and 46% of sections (Germany). Overall, 29% of the sections that make up the TEN-T have planned capacity improvements

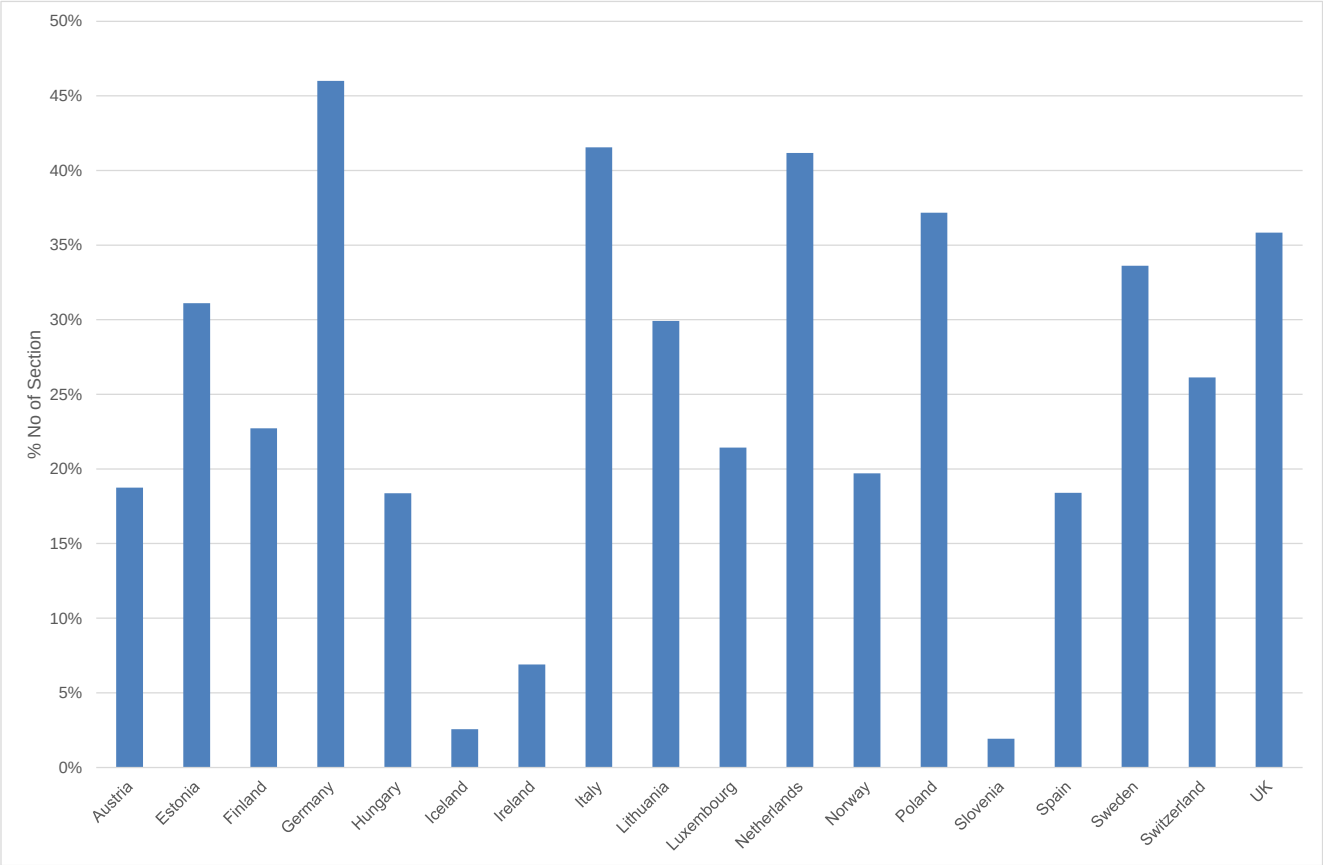


Figure 10: Planned Capacity Improvements on the TEN-T (Roads) network

3 NETWORK INFRASTRUCTURE AND SERVICES

This section describes the physical infrastructure and services provided for users of the network. This includes bridges, tunnels, intelligent transport systems (ITS) and, for the first time in the 2019 report, rest areas with specific facilities for truck drivers and refuelling facilities.

3.1 Bridges

This indicator shows the proportion of the TEN-T road network length made up of bridges (longer than 100 m). On average, 2.15% of the TEN-T network by length, where data on bridges was provided, consists of bridges.

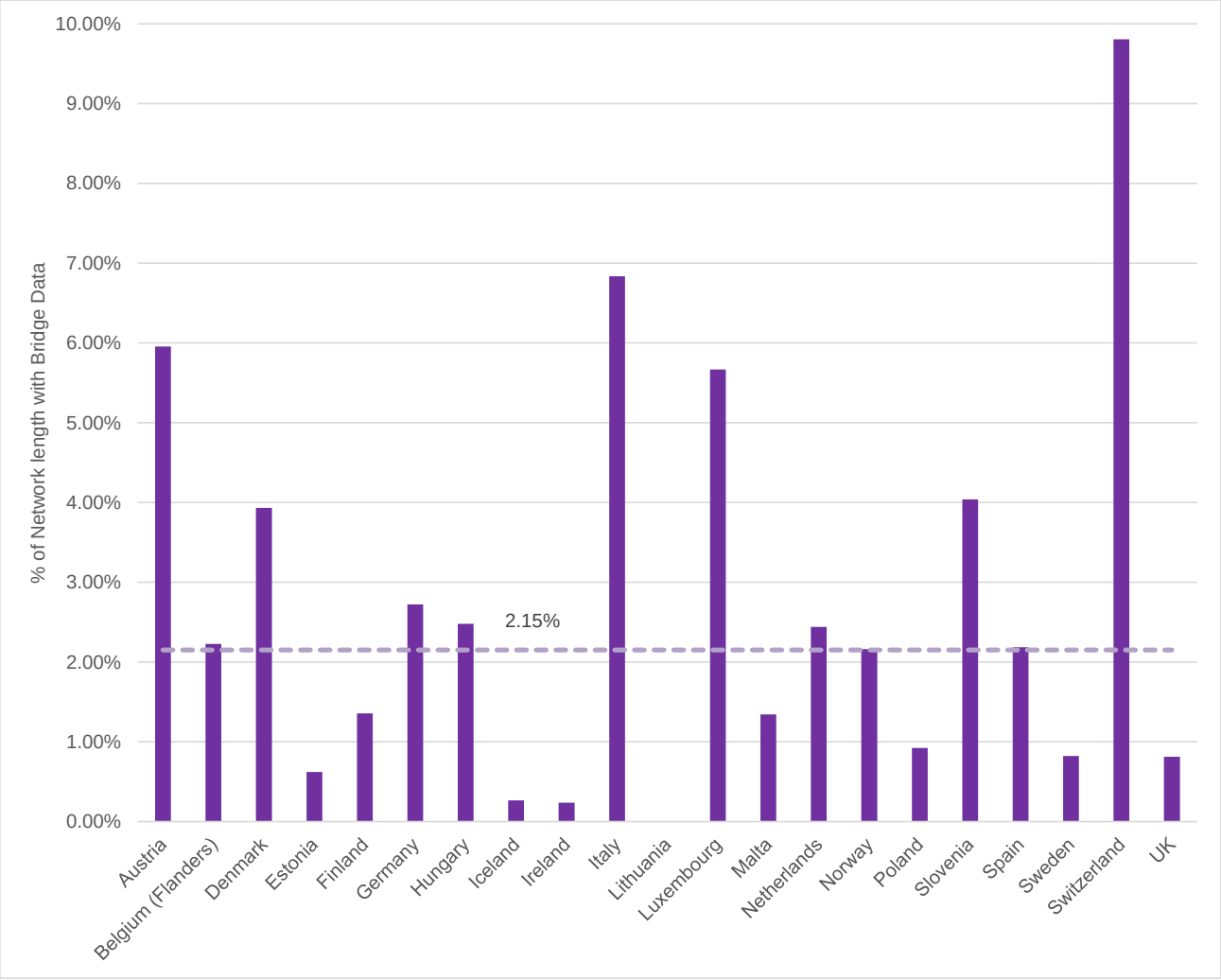


Figure 11: Length of bridges as proportion of total length of national TEN-T network

Figure 11 shows that there is considerable variability between individual countries with mountainous countries in particular (e.g. Austria, Italy, Slovenia and Switzerland) plus Luxembourg having between 4% and 10% of the TEN-T consisting of bridges. Conversely, less than 0.5% of the network in, Iceland Ireland and Lithuania is made up of bridges.

3.2 Tunnels

This indicator shows the proportion of the TEN-T (Roads) network length that is made up of tunnels (longer than 300 m). On average, 1.65% of the TEN-T network by length for which tunnel data was provided consists of tunnels.

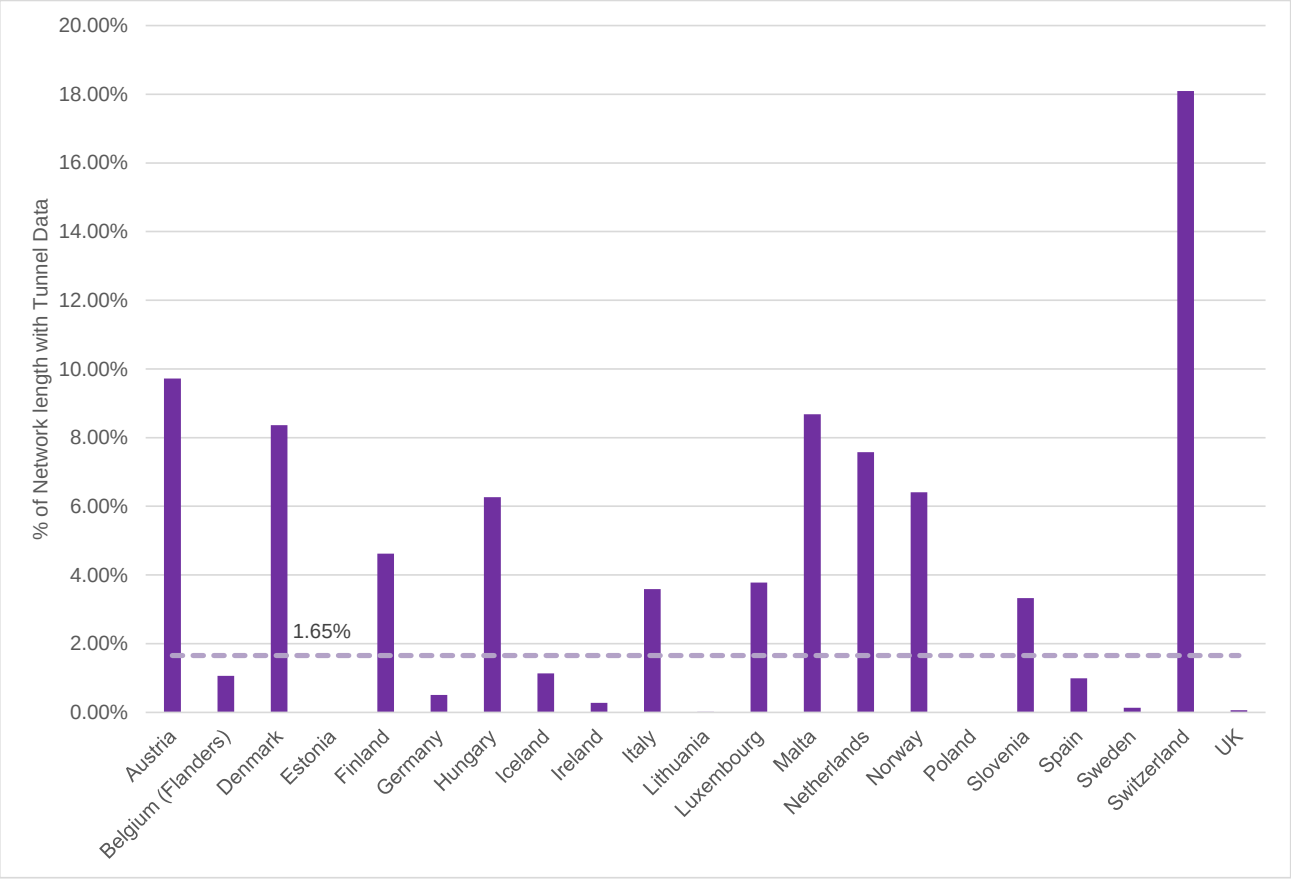


Figure 12: Length of tunnels as share of total length of national TEN-T roads comprising tunnels

Figure 12 shows that, as with bridges, there is considerable variability between individual countries with Austria, Denmark, Hungary, Malta, Netherlands, Norway and Switzerland having between 6% and 18% of the TEN-T where tunnel data was provided consisting of tunnels. Conversely, tunnels make up less than 0.3% of the network in Estonia, Ireland, Lithuania, Poland, Sweden and the UK.

3.3 Intelligent Transport Systems (ITS)

This indicator describes the deployment of Intelligent Transport Systems on the TEN-T road network. The values show the proportion of the road network equipped with different levels of ITS. The levels range from Level 0 to Level 4 as shown below and are based on the EasyWay Deployment Guidelines:

Level 0	None
Level 1	Monitoring system (e.g. real-time data about traffic/weather conditions is collected by the road administration)
Level 2	Traffic information system (road administration passively manages the network e.g. information about traffic/weather conditions is provided to road users)
Level 3	Traffic management system (road administration actively manages the network e.g. variable speed limits, dynamic lane management, ramp metering)
Level 4	Cooperative ITS (i.e. vehicle-to-vehicle or infrastructure-to-vehicle information)

Figure 13 shows the overall distribution of ITS in the participating countries. This shows that 52% of the Comprehensive network is covered by Level 2 ITS (i.e. traffic information systems) while nearly 32% is Level 3 (i.e. actively managed). Less than 4% of the Comprehensive network has no ITS at all while less than 0.5% has Level 4 (i.e. cooperative ITS) but this proportion should increase in future with the continued development of connected autonomous vehicles (CAV).

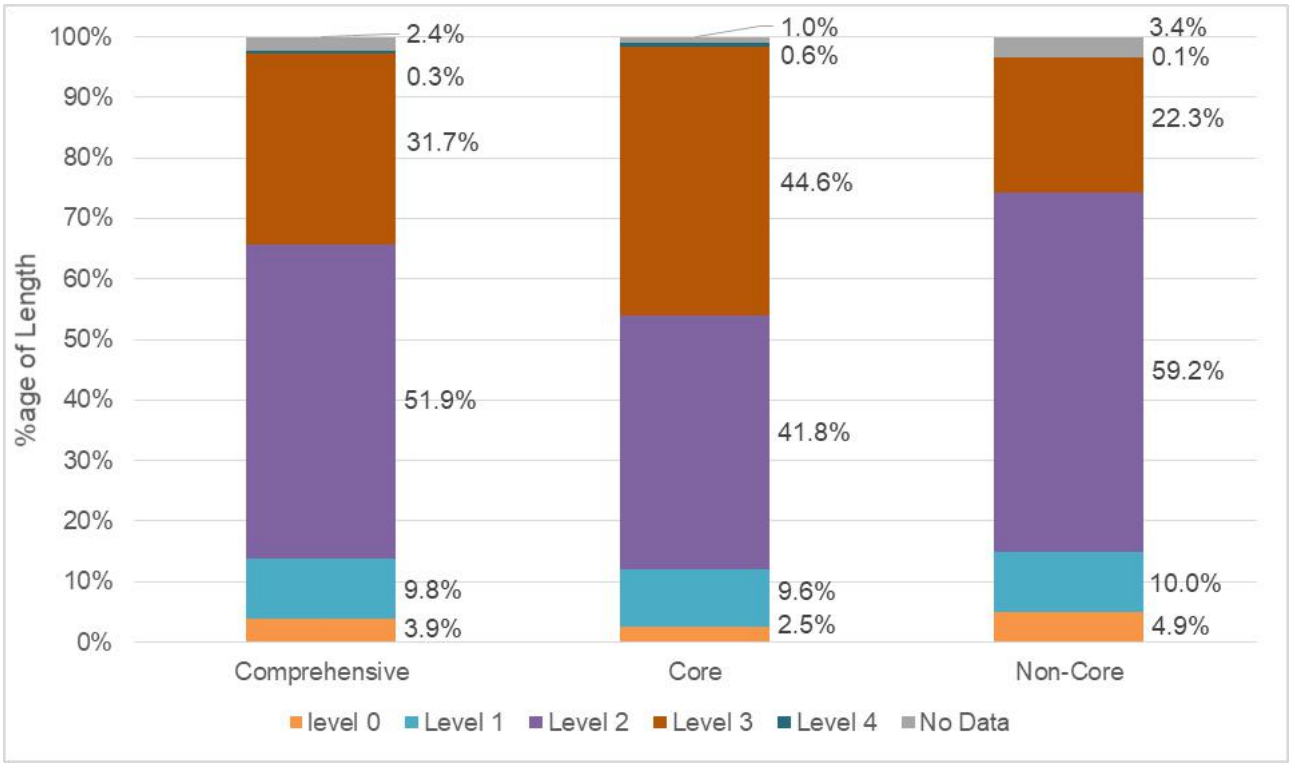


Figure 13: Distribution of ITS on Comprehensive, Core and Non-Core Networks

The biggest share of ITS technology on the Non-Core Network (59.2%) is Level 2 technology (i.e. passive management of the road network), while there is a more even split between Level 2 and Level 3 technology (active management by NRAs) on the Core Network (41.8% and 44.6% respectively).

Table 3 shows the distribution of ITS levels for each participating country. This shows that the countries with the largest proportion of Level 3 and Level 4 ITS are Switzerland (94.5%), Netherlands (85.6%) and Malta (74.6%). The countries with the largest proportion of ITS at Level 2 are Denmark, Iceland (both 100%) and Estonia (99%). The countries with the largest proportion of ITS at Level 1 or below are Ireland (92%) and Austria (84%).

Table 3: Distribution of ITS by level for each participating country

Country	Total length (km)	Level 0	Level 1	Level 2	Level 3	Level 4	No data
Austria	1,740	0.0%	83.6%	0.0%	15.0%	1.4%	0.0%
Belgium (Flanders)	948	0.0%	0.0%	34.3%	65.7%	0.0%	0.0%
Denmark	1,560	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Estonia	1,350	0.0%	0.0%	99.0%	1.0%	0.0%	0.0%
Finland	5,205	0.0%	0.0%	82.9%	17.1%	0.0%	0.0%
Germany	10,713	0.0%	0.0%	49.5%	50.5%	0.0%	0.0%
Hungary	1,474	3.5%	6.3%	69.2%	11.3%	9.8%	0.0%
Iceland	1,805	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Ireland	2,163	84.3%	7.5%	8.1%	0.0%	0.0%	0.0%
Italy	3,016	0.0%	44.5%	4.5%	0.0%	0.0%	51.0%
Lithuania	1,652	0.0%	0.0%	89.6%	10.4%	0.0%	0.0%
Luxembourg	90	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Malta	114	0.0%	4.6%	0.0%	74.6%	0.0%	20.7%
Netherlands	1,886	0.0%	7.7%	6.6%	85.6%	0.0%	0.0%
Norway	4,793	0.0%	0.0%	32.1%	67.4%	0.5%	0.0%
Poland	7,501	11.8%	43.8%	44.4%	0.0%	0.0%	0.0%
Slovenia	599	0.0%	0.0%	47.9%	52.1%	0.0%	0.0%
Spain	12,255	0.0%	4.1%	47.6%	47.7%	0.0%	0.5%
Sweden	6,417	0.0%	0.0%	92.4%	7.6%	0.0%	0.0%
Switzerland	1,325	0.0%	0.0%	5.5%	94.5%	0.0%	0.0%
UK	4,441	0.1%	0.0%	51.3%	48.6%	0.0%	0.0%
Total	**71,046**	**3.9%**	**9.8%**	**51.9%**	**31.7%**	**0.3%**	**2.4%**

3.4 Rest Areas with Facilities for Truck Drivers

This is a new indicator introduced in the 2019 report which records the frequency of rest areas on the network where trucks and commercial vehicles are allowed to park and specific facilities are provided for truck drivers.

Figure 14 shows the overall frequency of rest areas with facilities for truck drivers on the Comprehensive, Core and Non-Core networks. This shows that on the Comprehensive network as a whole, there are on average 2.5 rest stops with facilities for truck drivers every 100km. On the Core network, the frequency increases to nearly 4.0 per 100km compared to just over 1.5 per 100km on the Non-Core network.

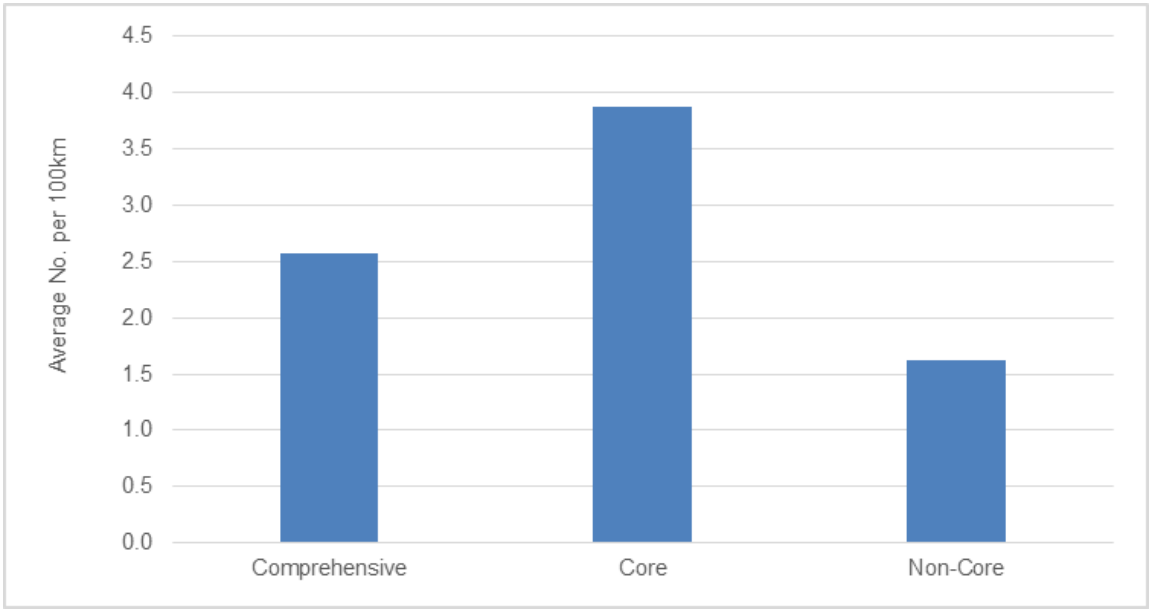


Figure 14: Frequency of rest areas with facilities for truck drivers on Comprehensive, Core and Non-Core networks

Note that the wide range of responses for this new indicator at national level suggests that the definition of this indicator may have been interpreted differently and therefore further clarification may be necessary before the next report.

3.5 Refuelling Facilities

This is a new group of indicators introduced in the 2019 report related to refuelling and recharging facilities.

Electric Vehicle Charging Facilities

Figure 15 shows the overall frequency of electric vehicle (EV) charging facilities on the Comprehensive, Core and Non-Core networks. This shows that on the Comprehensive network as a whole, there are on average 2.4 EV charging facilities every 100km. On the Core network, the frequency decreases to less than 2.0 per 100km compared to more than 2.7 per 100km on the Non-Core network.

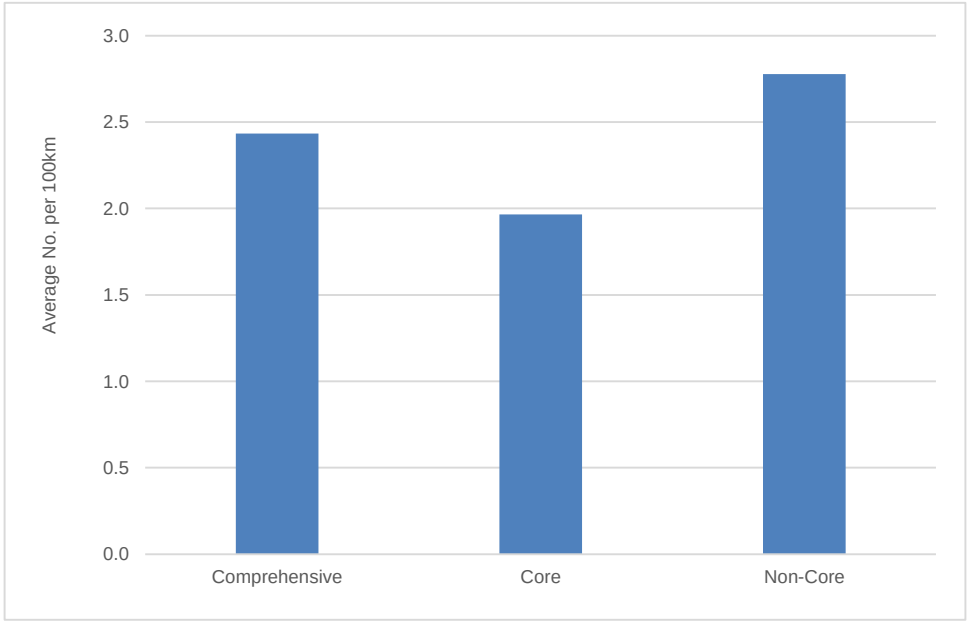


Figure 15: Frequency of EV charging facilities on Comprehensive, Core and Non-Core networks

Note that the wide range of responses for this new indicator at national level suggests that the definition of this indicator may have been interpreted differently and therefore further clarification may be necessary before the next report.

Petrol Stations

Figure 16 shows the overall frequency of petrol stations on the Comprehensive, Core and Non-Core networks. This shows that on all parts of the network, there are on average 4.8 petrol stations every 100km.

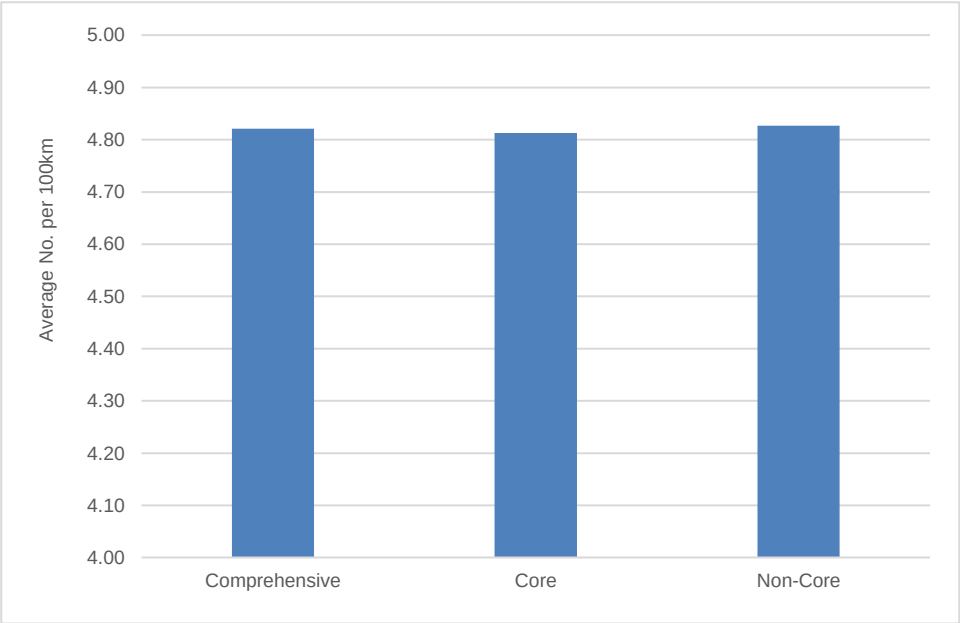


Figure 16: Frequency of petrol stations on Comprehensive, Core and Non-Core networks

Although the average figures look very consistent, the wide range of responses at a national level suggests that the definition of this indicator may have been interpreted differently and therefore further clarification may be necessary before the next report.

Alternative Fuel Stations

The possibility of collecting data about alternative fuel stations was also investigated. This included refuelling stations with facilities CNG (Compressed Natural Gas) and LPG (Liquefied Petroleum Gas). However, very few countries were able to provide this information and further clarification may be necessary before the next report.

4 CORRIDOR PERFORMANCE

This section looks at the network level performance of the nine Core Network Corridors based on data about traffic flow, proportion of HGVs and fatal accident rate collected for this report and which are analysed in more detail in Section 5.

4.1 Average Traffic Flow

Figure 17 compares the average traffic flow (AADT) on the nine Core Network Corridors.

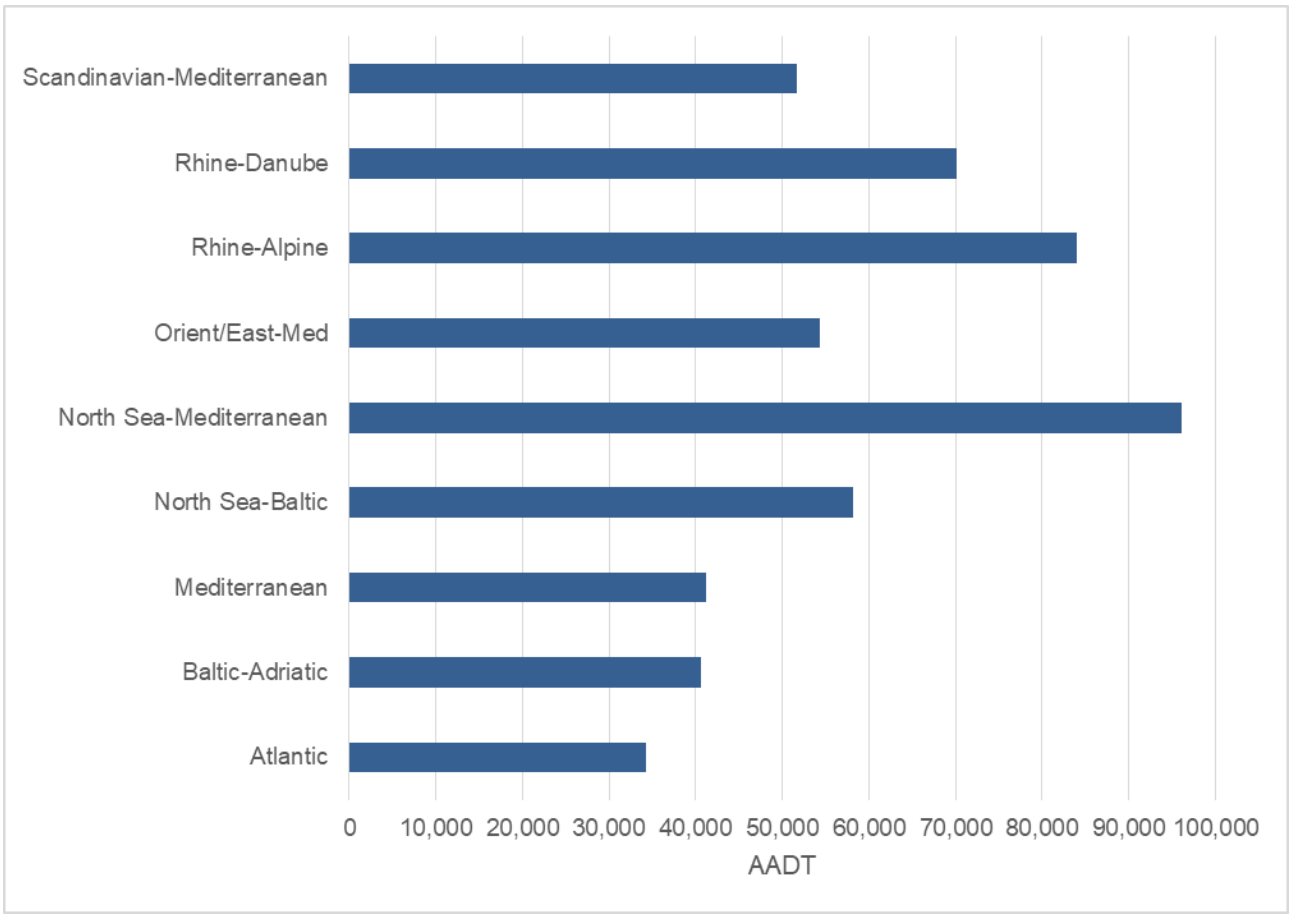


Figure 17: Comparison of Average Daily Traffic Flow on the Core Network Corridors

The North Sea – Mediterranean corridor has the highest average traffic flow at 96,094 vehicles per day followed by the Rhine - Alpine corridor (84,998) and Rhine - Danube corridor (70,188). The corridors with the lowest average traffic flow are Atlantic (34,199) Baltic - Adriatic (40,611) and Mediterranean (41,276). The average for the corridors is 58,952 vehicles per day.

4.2 Proportion of Heavy Good Vehicles

Figure 18 compares proportion of Heavy Goods Vehicles on the nine Core Network Corridors.

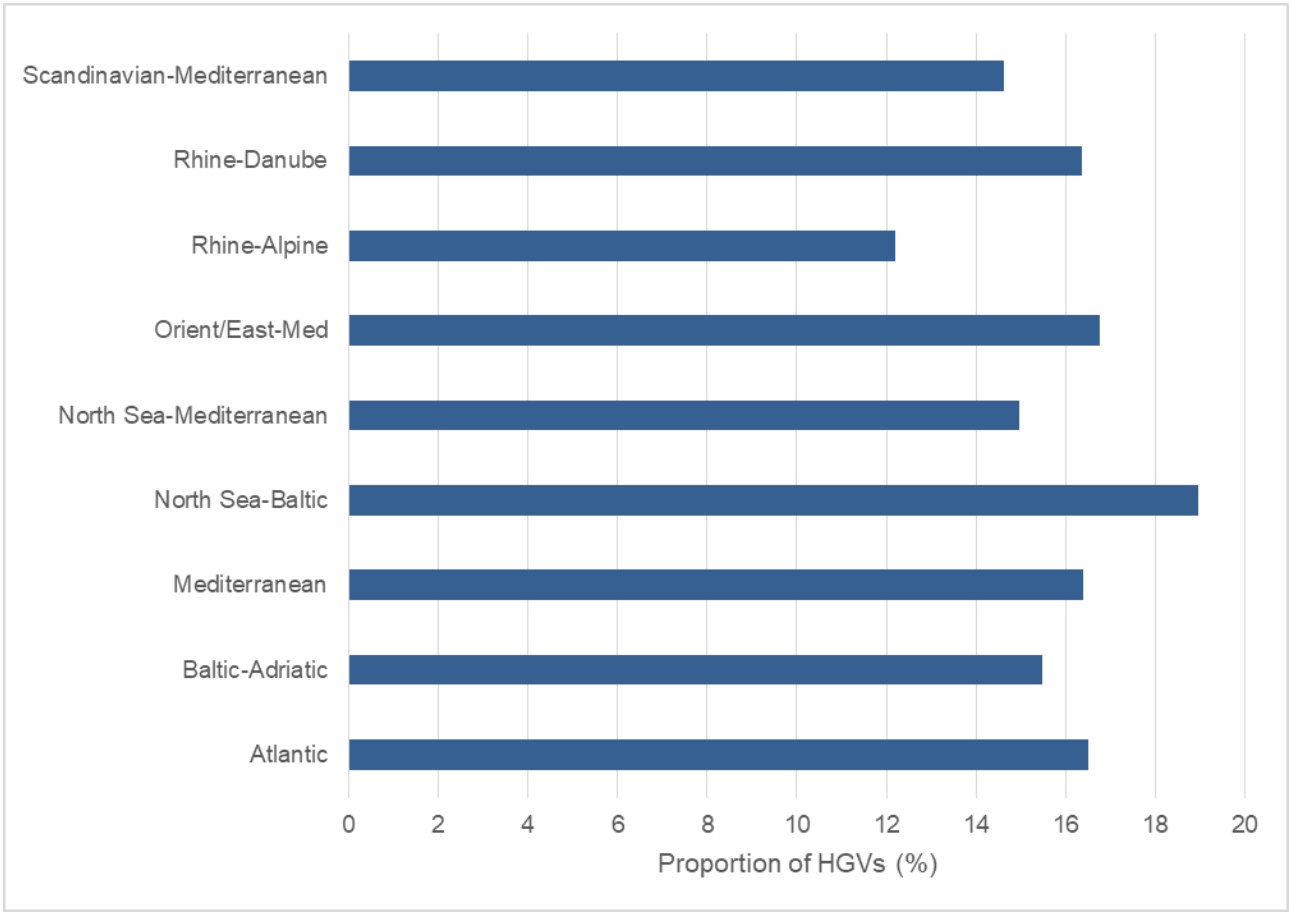


Figure 18: Proportion of HGVs on the Core Network Corridors

The figure shows that North Sea – Baltic corridor has the greatest percentage of HGVs (19%) while the Rhine – Alpine corridor has the smallest proportion of HGVs (12%). The average figure for the corridors is 16% HGVs.

4.3 Fatal Accident Rate

Figure 20 compares Fatal Accident Rate (Number per Billion VehKm) on the nine Core Network Corridors.

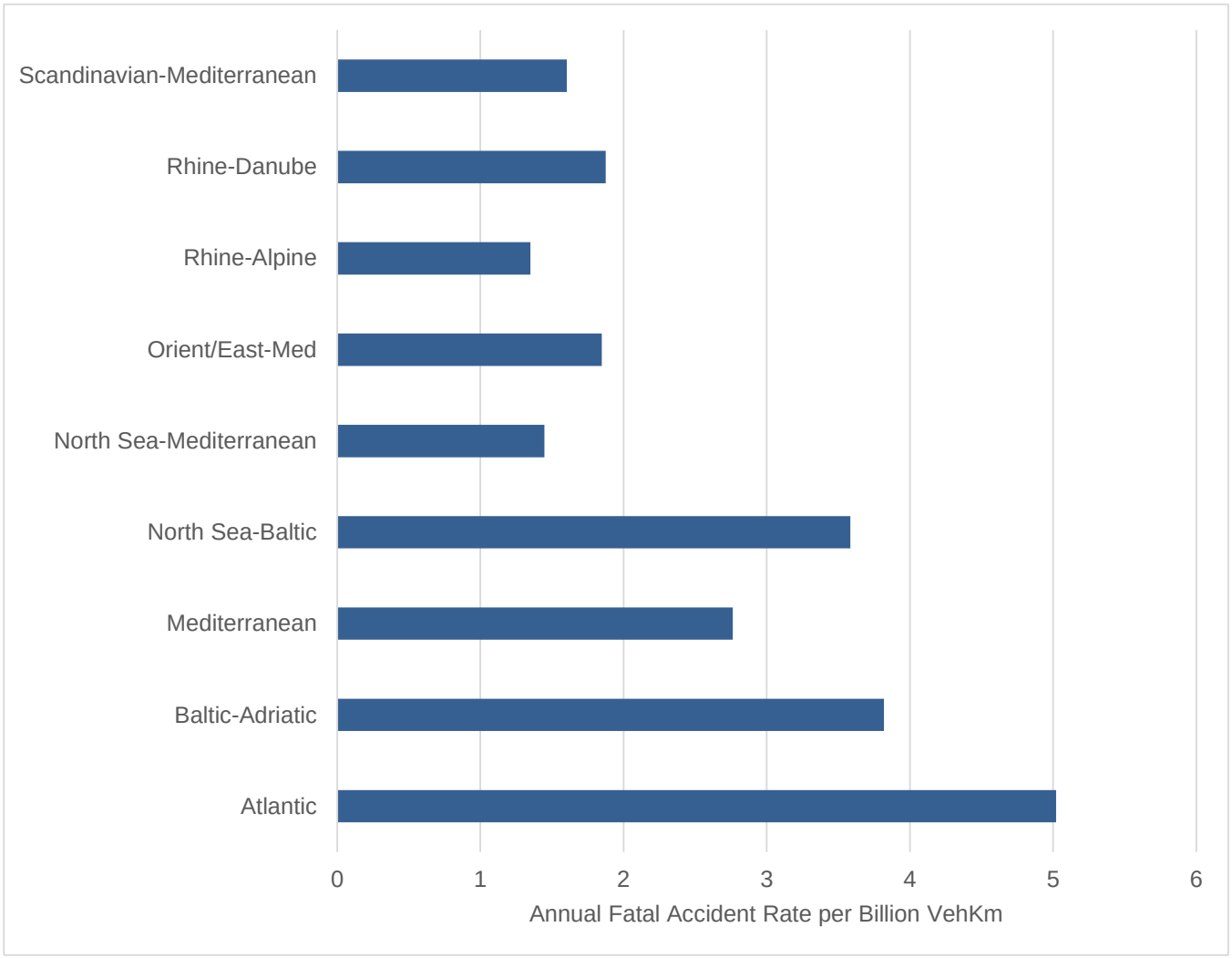


Figure 19: Fatal Accident Rate on the Core Network Corridors

This shows that the Atlantic corridor has the highest annual fatal accident rate (5.0 per Billion VehKm) while the Rhine – Alpine corridor has the lowest (1.4 per Billion VehKm). The average figure for the corridors is 2.6 per Billion VehKm.

5 NETWORK PERFORMANCE

This section looks at the detailed performance of the TEN-T network at a national level. It should be noted that this doesn't necessarily represent the performance of the national networks as a whole, only those sections which have been selected to be part of the TEN-T network and the characteristics of these selected sections may vary between countries.

5.1 Average Traffic Flow

This indicator shows the average number of vehicles per day crossing the section expressed as the Annual Average Daily Traffic (AADT). The values for traffic volumes have been grouped into bands to provide a better understanding of the performance of the roads.

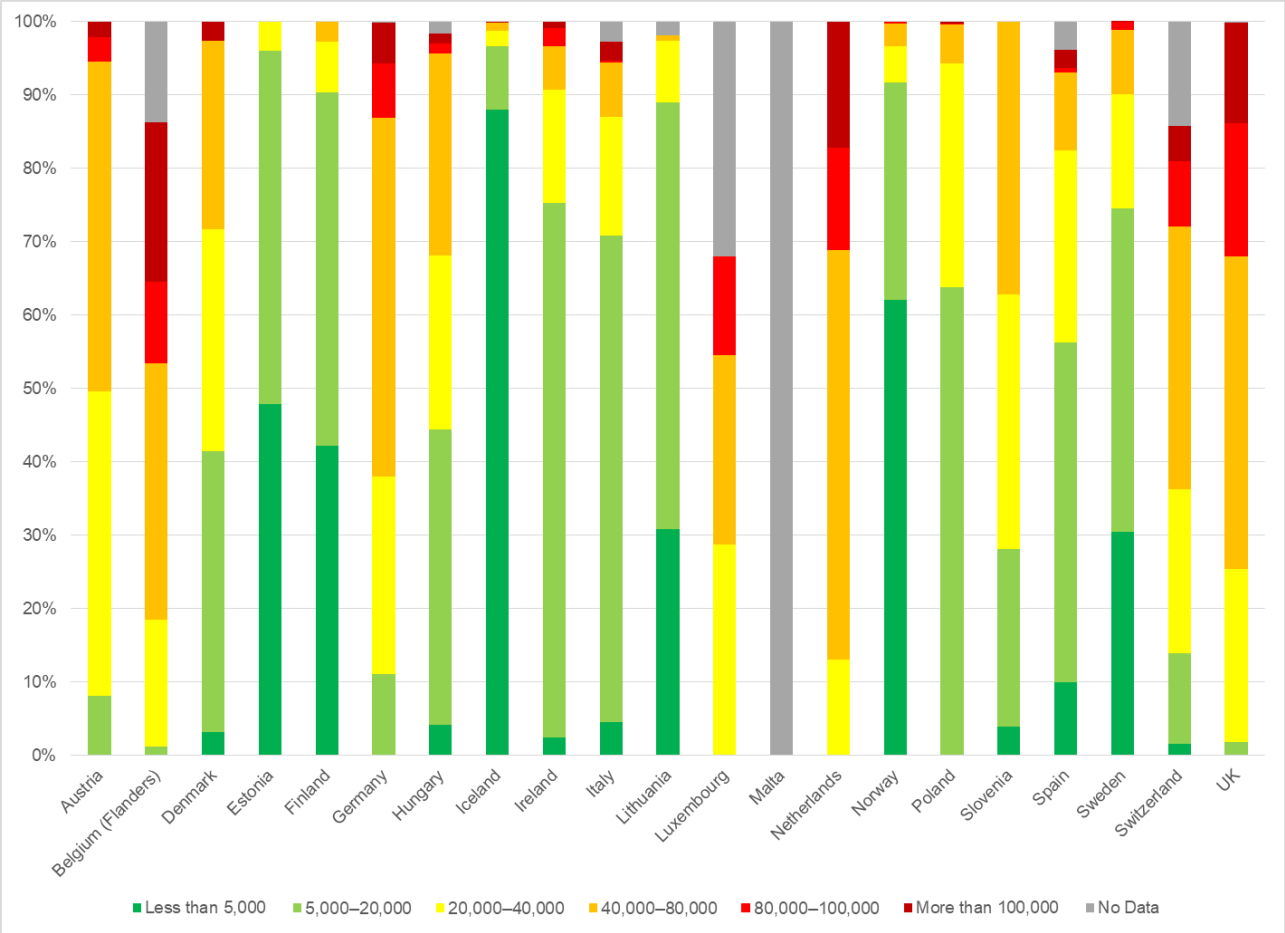


Figure 20: Distribution of Traffic Flow on the TEN-T networks of participating countries

Figure 20 shows the distribution of the network length by Traffic Flow bands for each participating country. This shows that the countries carrying the most traffic are Belgium (Flanders), Netherlands and the UK with 21.7%, 17.2% and 13.8% of the network with an AADT of more than 100,000 vehicles per day respectively.

Conversely, the countries with the least traffic are Iceland, Norway, Estonia and Finland, each with more than 40% of the network carrying less than 5,000 vehicles per day.

Figure 21 shows the distribution of Traffic Flow on the TEN-T network as a whole. This shows that the majority of the network (52%) carries less than 20,000 vehicles per day and 20.5% of the network carries between 20,000 and 40,000 vehicles per day. 19.4% of the network carries between 40,000 and 80,000 vehicles per day and just 6.7% carries more than 80,000 vehicles per day.

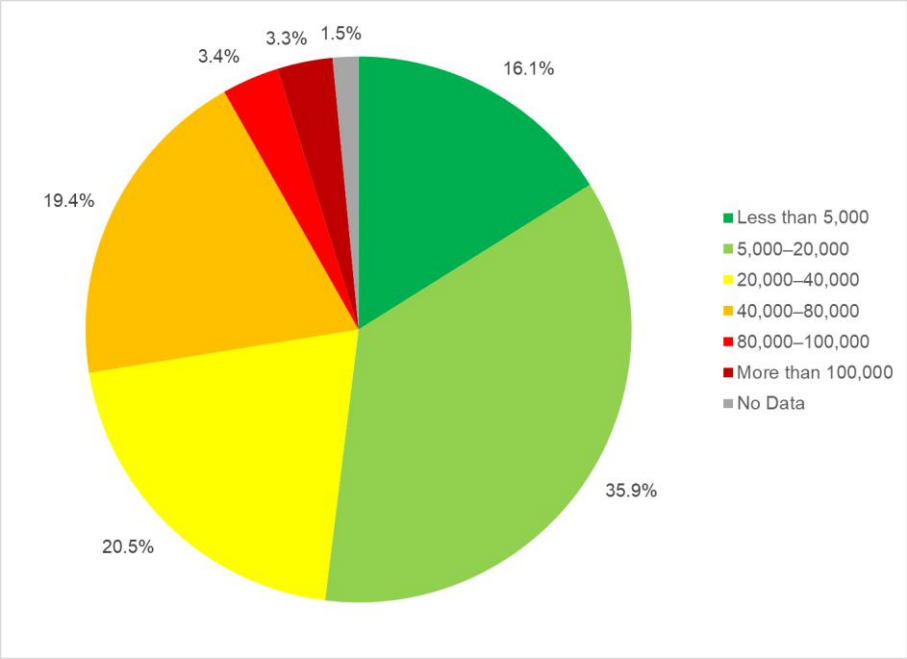


Figure 21: Overall distribution of Traffic Flow on the TEN-T network (AADT)

Figure 22 shows the average value for AADT on the TEN-T (Roads) network by country and road type. The indicator calculated as the length weighted average of the AADT values on the different logical sections.

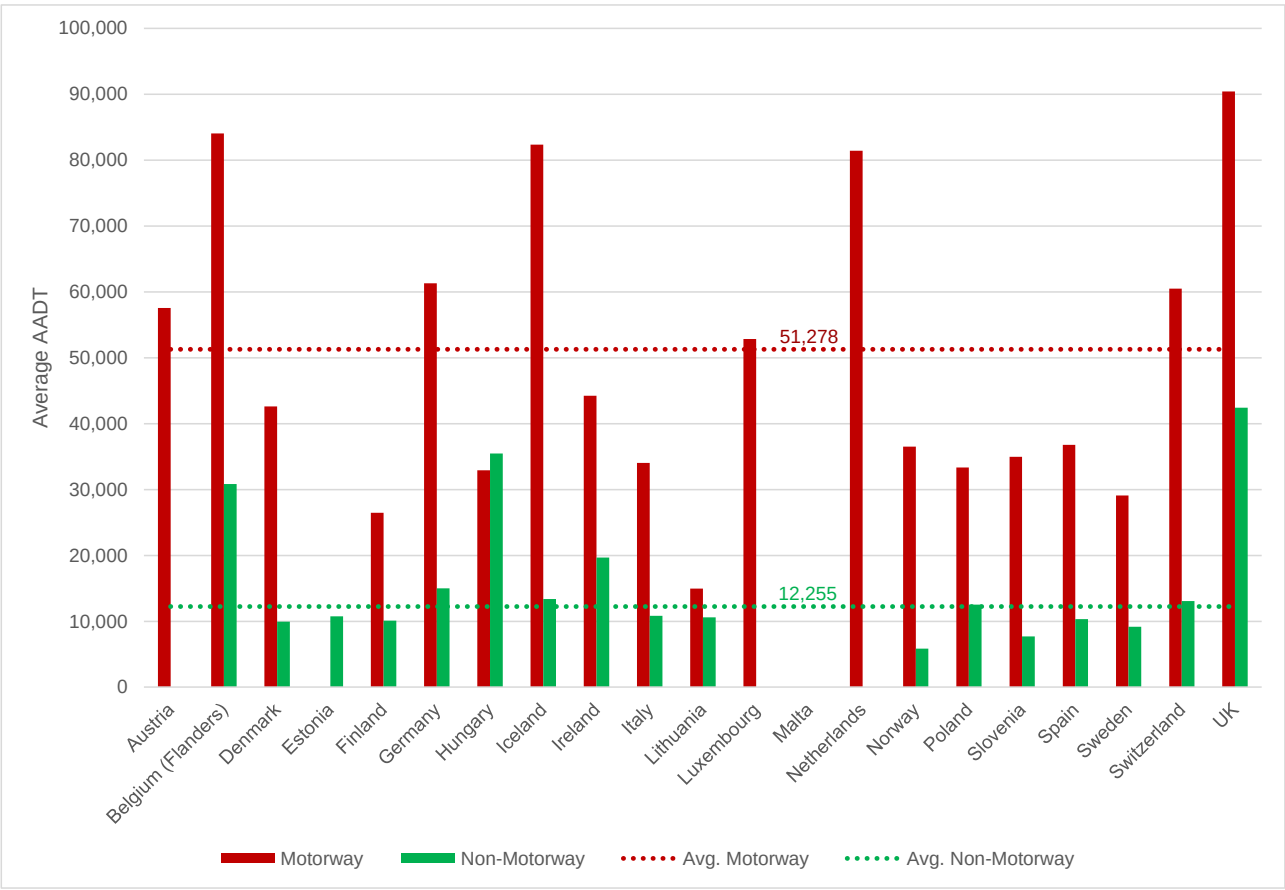


Figure 22: Average AADT on the TEN-T for each participating country and road type

As expected, the length weighted average AADT is substantially higher for motorways than for non-motorway roads in all countries, with the exception of Hungary, where the average traffic flow values are similar for both road types. The weighted average AADT for the whole Comprehensive Network is 38,277 vehicles per day. It ranges from 51,278 vehicles per day on motorways to 12,255 vehicles per day for non-motorway sections.

It should be noted that the high value of the length weighted average AADT for motorways in Iceland can be explained by the fact that the only two sections identified as motorways (accessing Reykjavik) show very high traffic flows.

5.2 Traffic Density

Traffic Density is expressed as the average annual daily traffic per lane and is calculated on the basis of data provided on Traffic Flow and Number of Lanes. By combining information on traffic flow and number of lanes, this indicator identifies the proportion of the TEN-T network which could experience congestion problems.

Figure 23 shows the distribution of Traffic Density for each participating country. It shows that the countries with the greatest average traffic density are Netherlands, Belgium (Flanders), Luxembourg and UK each with more than 11% of the network carrying more than 18,000 vehicles per day per lane.

The countries with the lowest average traffic density are Iceland, Norway, Finland and Estonia, in each of which more than 60% of the network has an average traffic density of less than 3,000 vehicles per day per lane.

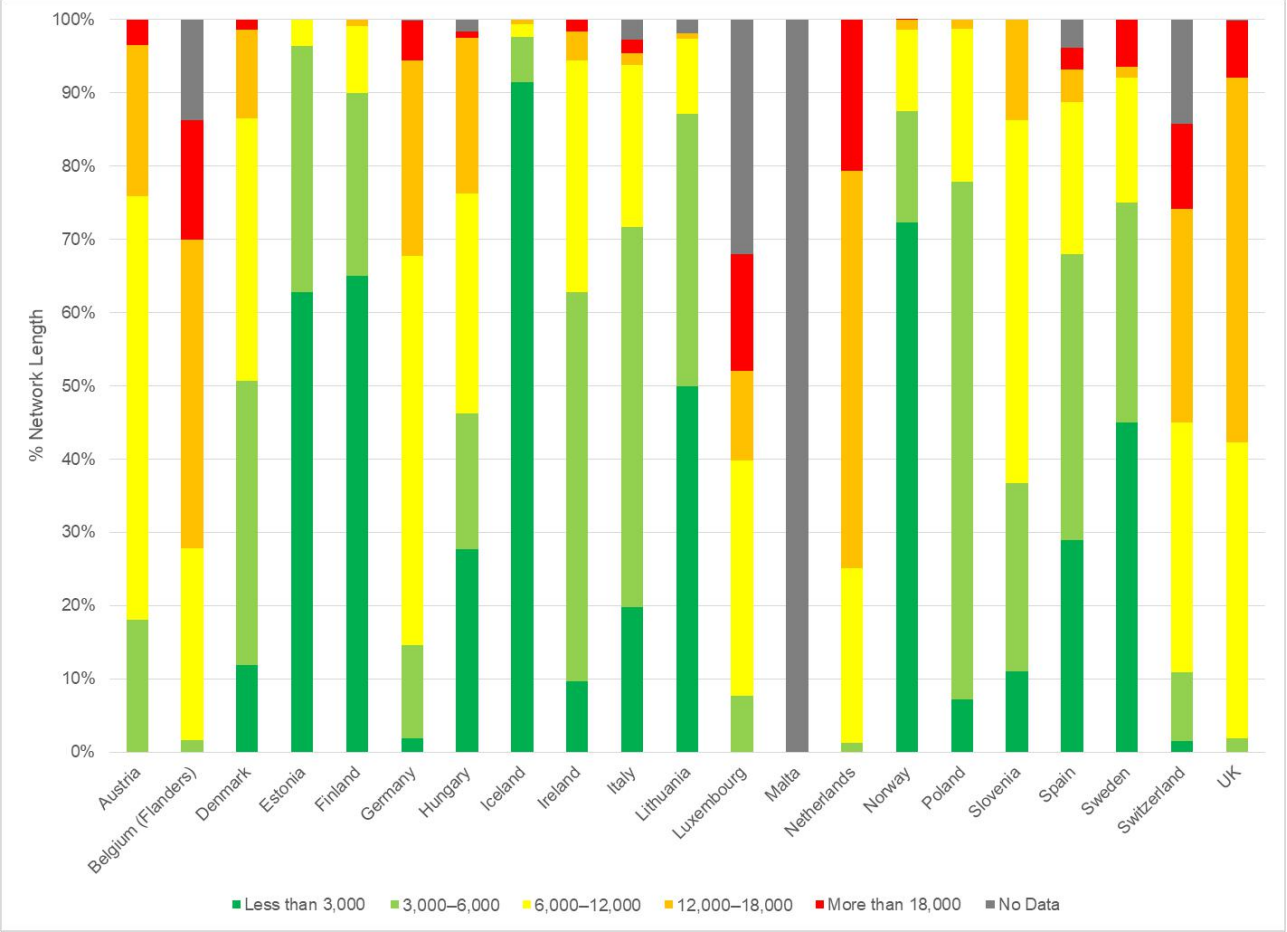


Figure 23: Distribution of traffic density on the TEN-T networks among participating countries

Figure 24 shows the overall distribution of Traffic Density on the TEN-T road network. This shows that the traffic density on the majority of the network (55.9%) is less than 6,000 vehicles per day per lane, 38.8% of the network has a density of between 6,000 and 18,000 vehicles per day per lane while, at the top end, 3.7% of the network has a traffic density of more than 18,000 vehicles per day per lane. Meanwhile, the majority of the Core Network (i.e. 59%) has a traffic density of more than 6,000 vehicles per day per lane and 5% has more than 18,000 vehicles per day per lane. Whereas, only 31% of the Non-Core Network has a traffic density of more than 6,000 vehicles per day per lane and 3% has a traffic density of more than 18,000 vehicles per day per lane.

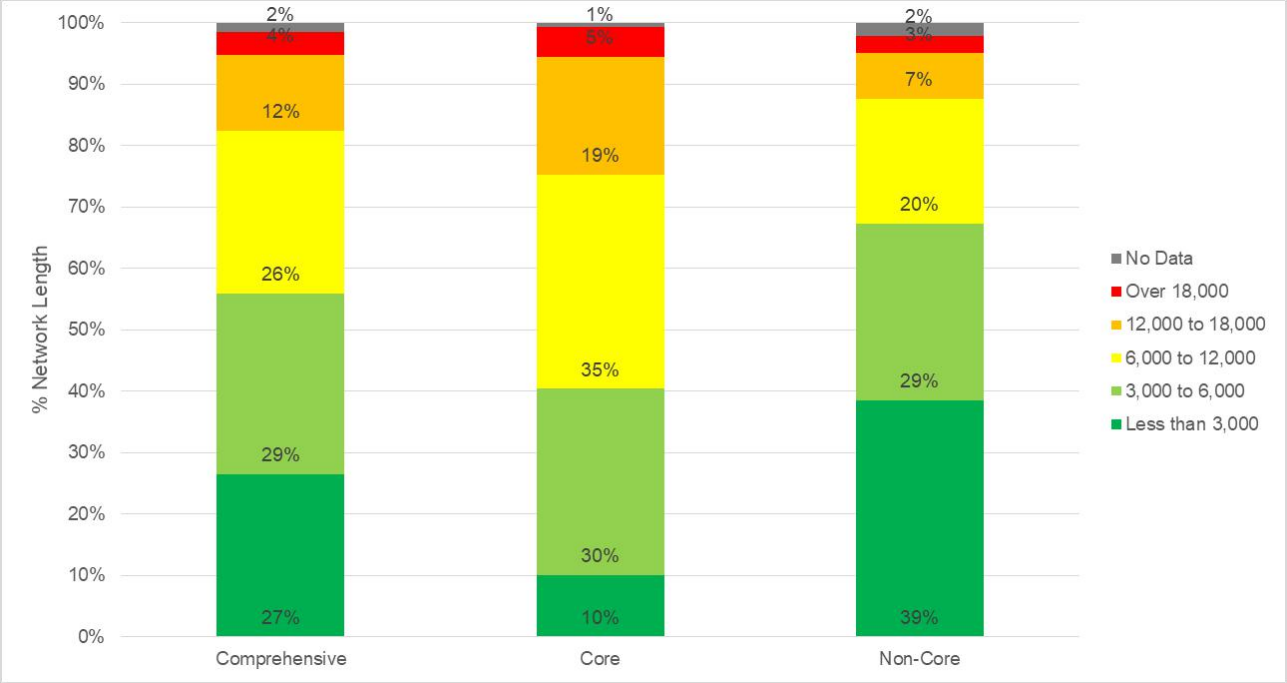


Figure 24: Distribution of Traffic Density on the Comprehensive, Core, Non-Core Networks

Figure 25 shows trends in traffic flow on the comprehensive network since 2011 for those countries that have provided data for each of the five published reports since 2011[2]. Apart from 2015, this shows a steady increase in traffic density with an average annual increase of 1%.

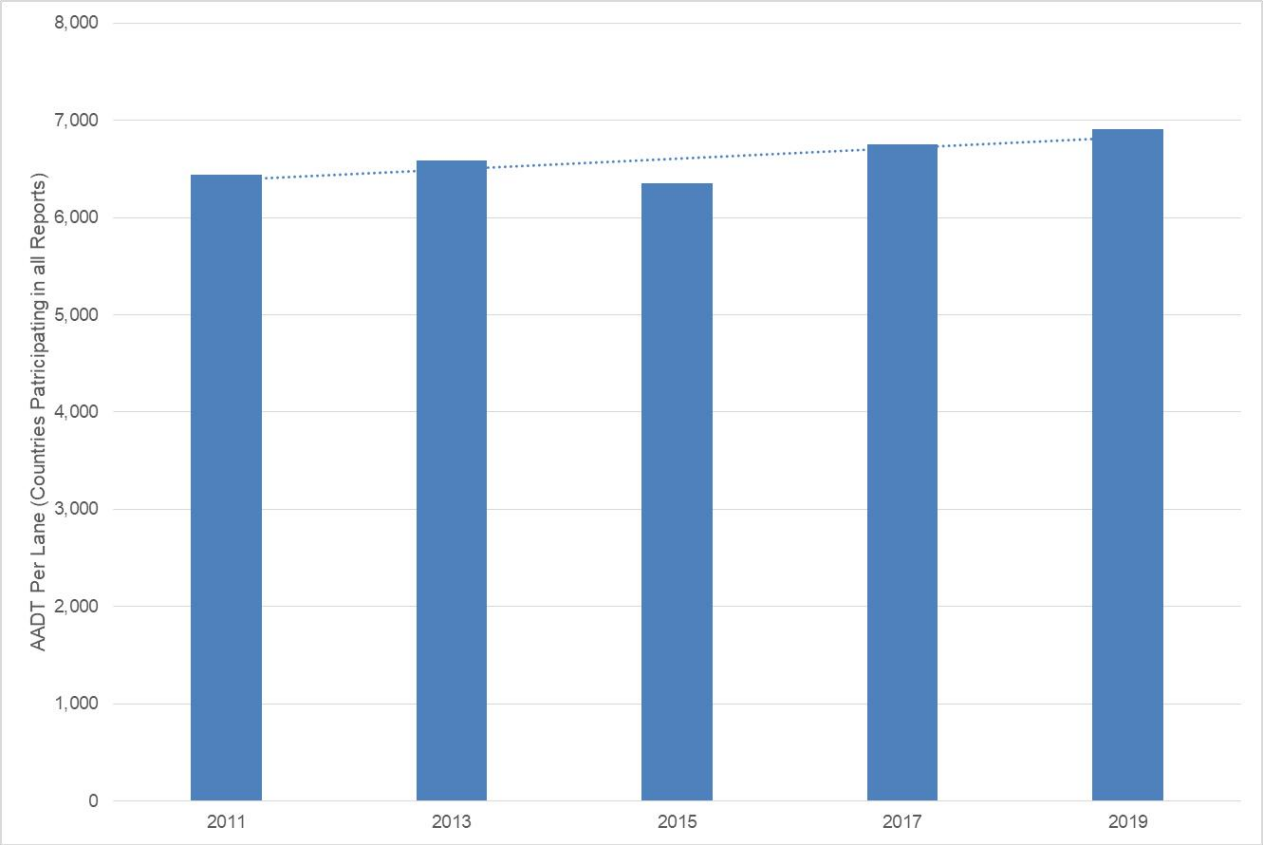


Figure 25: Trends in traffic density on the Comprehensive Network since 2011 (only countries participating in all five reports)

[2] The countries that have provided traffic data for all five published reports are: Austria, Denmark, Estonia, Finland, Germany, Iceland, Ireland, Italy, Lithuania, Luxembourg, Norway, Slovenia, Spain, Sweden, UK

5.3 Proportion of Heavy Good Vehicles

Figure 26 shows the proportion of traffic comprising heavy goods vehicles (HGVs) on the TEN-T in each of the participating countries.

This shows that countries with the highest proportion of HGVs on the TEN-T are Poland, Hungary, Belgium (Flanders) and Norway who each have more than 20% HGVs on at least 30% of the network. Conversely, the countries with the lowest proportion of HGVs on the TEN-T network are Ireland, Switzerland and Italy where HGVs make up less than 10% of traffic on at least 50% of the network.

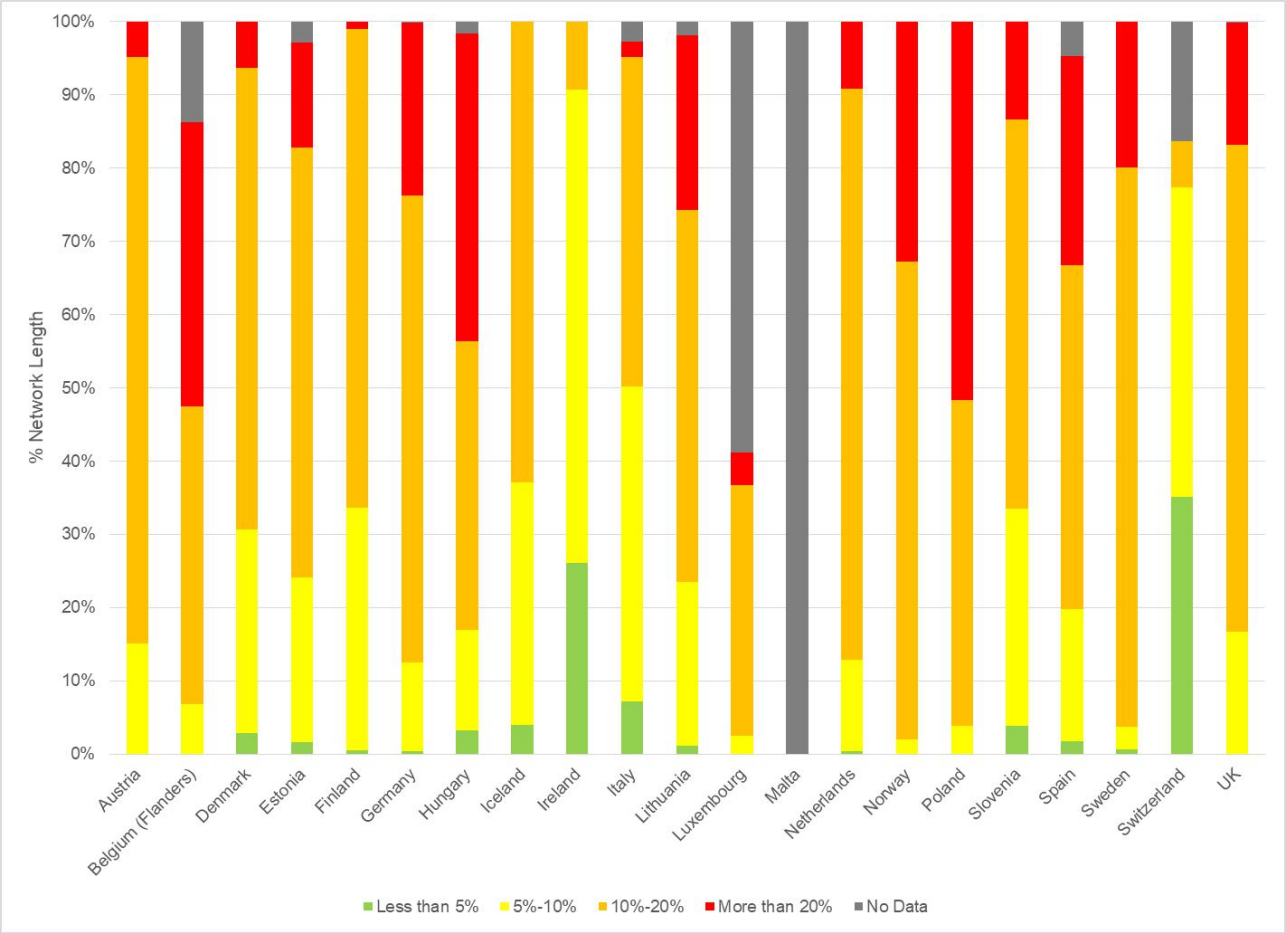


Figure 26: Distribution of HGV traffic proportions on TEN-T by country

Figure 27 shows the overall proportion of HGV traffic on the TEN-T network. It shows that, on the majority of the Comprehensive Network (56.1%) HGVs make up between 10% and 20% of all traffic. Meanwhile, on 20.1% of the network, the proportion of HGVs is less than 10% and the proportion of HGVs is more than 20% on 22% of the network. On the Core Network, 29.6% of traffic is HGVs compared to 16.4% on the Non-Core network.

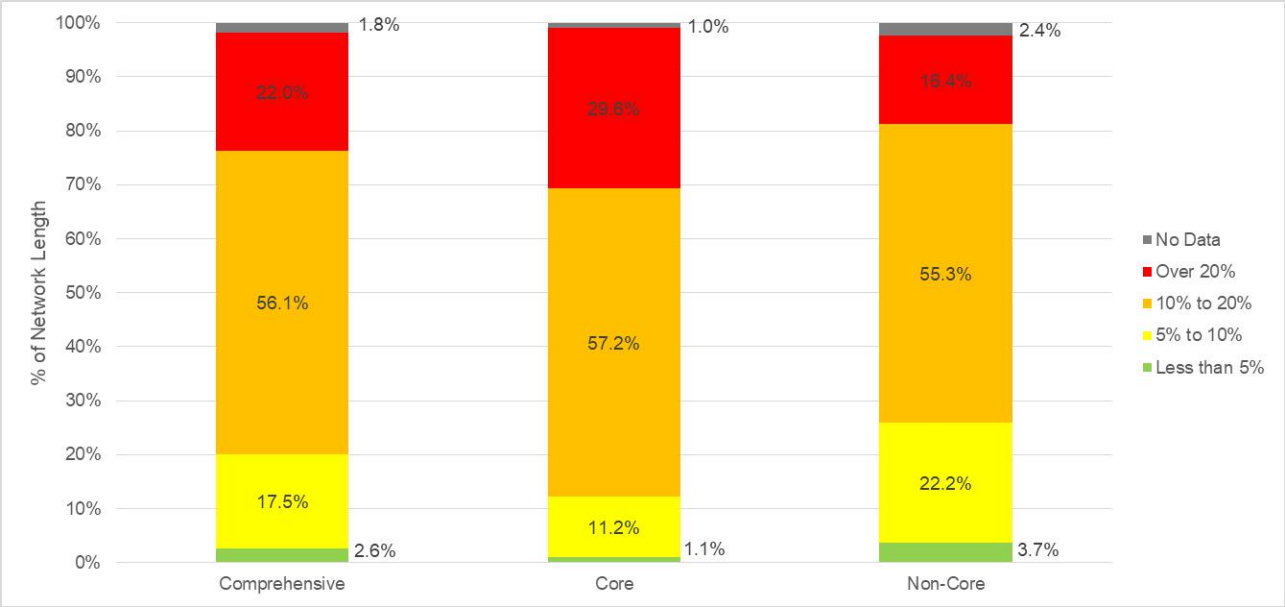


Figure 27: Comparison of HGV proportions on the Comprehensive, Core, Non-Core, and Corridor Networks

5.4 Heavy Goods Vehicle Traffic Flow

Figure 28 shows the distribution of HGV traffic flow in bands as a proportion of network length. These figures were obtained by multiplying the number of total vehicles with the percentage of HGVs.

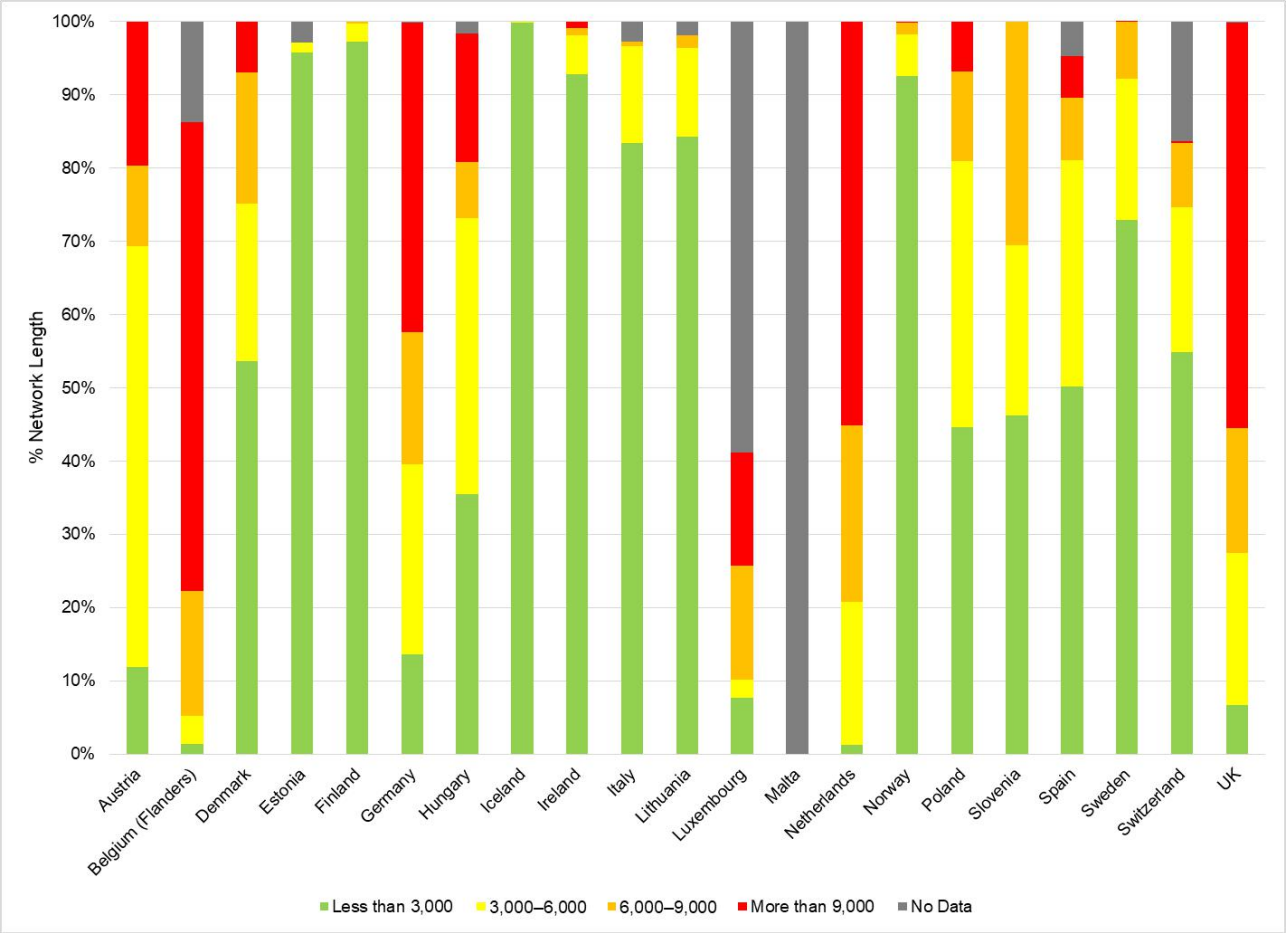


Figure 28: National distribution of HGV traffic flow (AADT)

This shows that the countries with the highest volume of HGV traffic are Belgium (Flanders), Germany, Netherlands, and the UK in each of which more than 50% of the network carries more than 9,000 HGVs per day. Conversely the countries that carry the lowest volume of HGVs are Estonia, Finland, Iceland, Ireland and Norway in each of which more than 90% of the network carries fewer than 3,000 HGVs per day.

Figure 29 shows the weighted average values for Heavy Goods Vehicles traffic on the Comprehensive network. This shows that, as expected, in most countries, HGV traffic on motorways is higher than HGV traffic on non- motorway roads and motorways carry on average 6,630 HGVs per day compared to 1,437 vehicles per day on non-motorway roads.

There is a wide variation between individual countries with the highest average levels of HGV traffic on motorways in Belgium (Flanders) at 14,194 vehicles per day, UK at 13,893 vehicles per day and Netherlands at 10,172 vehicles per day. On non-motorway roads, Hungary carries the most HGVs at 5,995 vehicles per day on average which is slightly higher than the average on motorways (5,675 HGVs per day), the UK non-motorway network carries on average 5,520 HGVs per day.

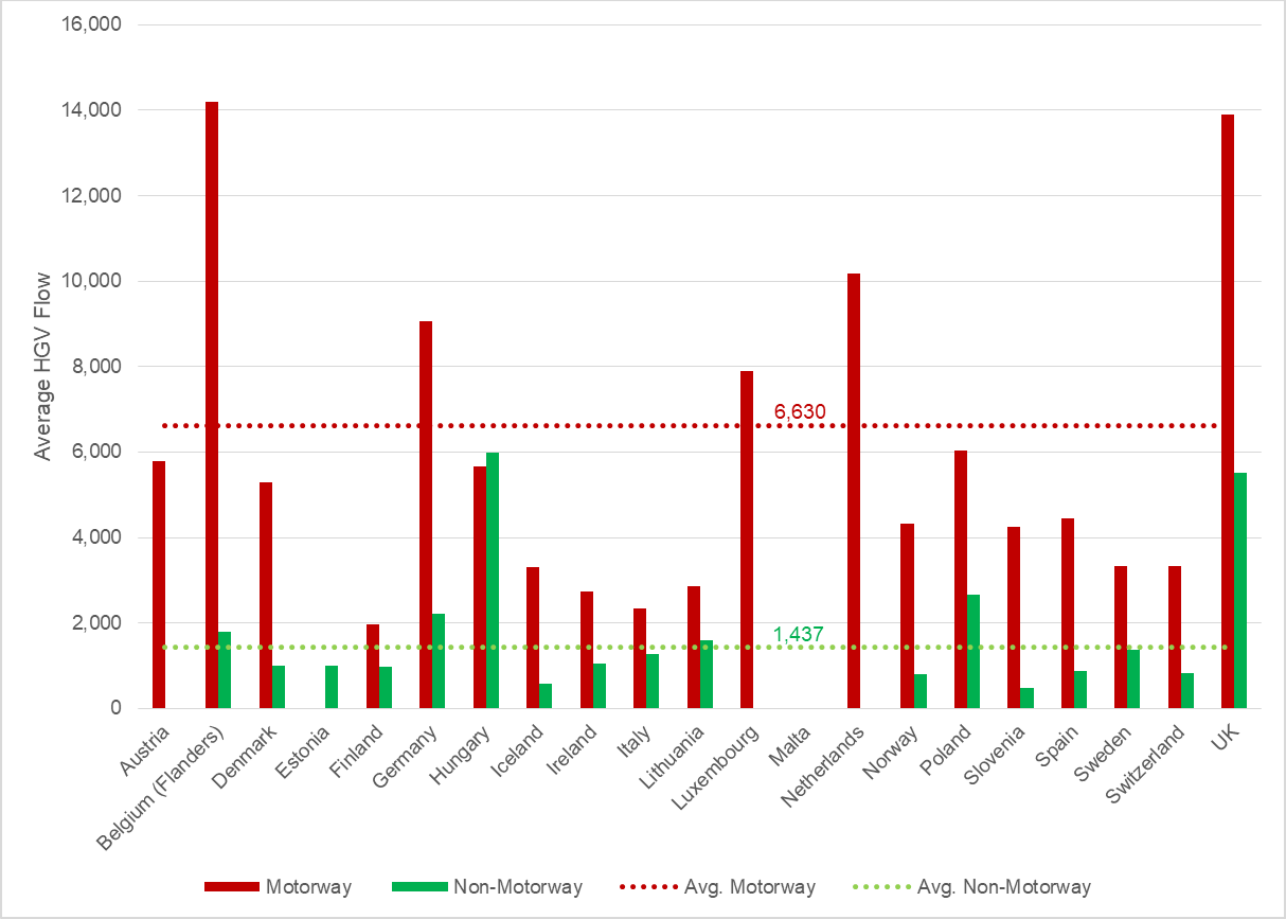


Figure 29: Average HGV Traffic Flow on the Comprehensive Network for each participating country and Road Type (AADT)

Figure 30 shows the overall distribution of HGV traffic on the TEN-T. This shows that the majority (52.2%) carries fewer than 3,000 HGVs per day, 31.1% carries between 3,000 and 9,000 vehicles per day and 14.9% carries more than 9,000 per day. There *is a* significant difference between the Core and Non-Core networks with 28.3% of the Core Network carries more than 9,000 HGVs per day compared to just 5.1% of the Non-Core network.

Figure 30: Comparison of HGV traffic flow distributions on the Comprehensive, Core and Non-Core Networks

Figure 31 shows trends in the average HGV traffic per lane since 2011 for those countries that have provided data for each of the five published reports since 2011[3]. This shows a gradual decline in HGV traffic with an average annual decrease of 0.1%.

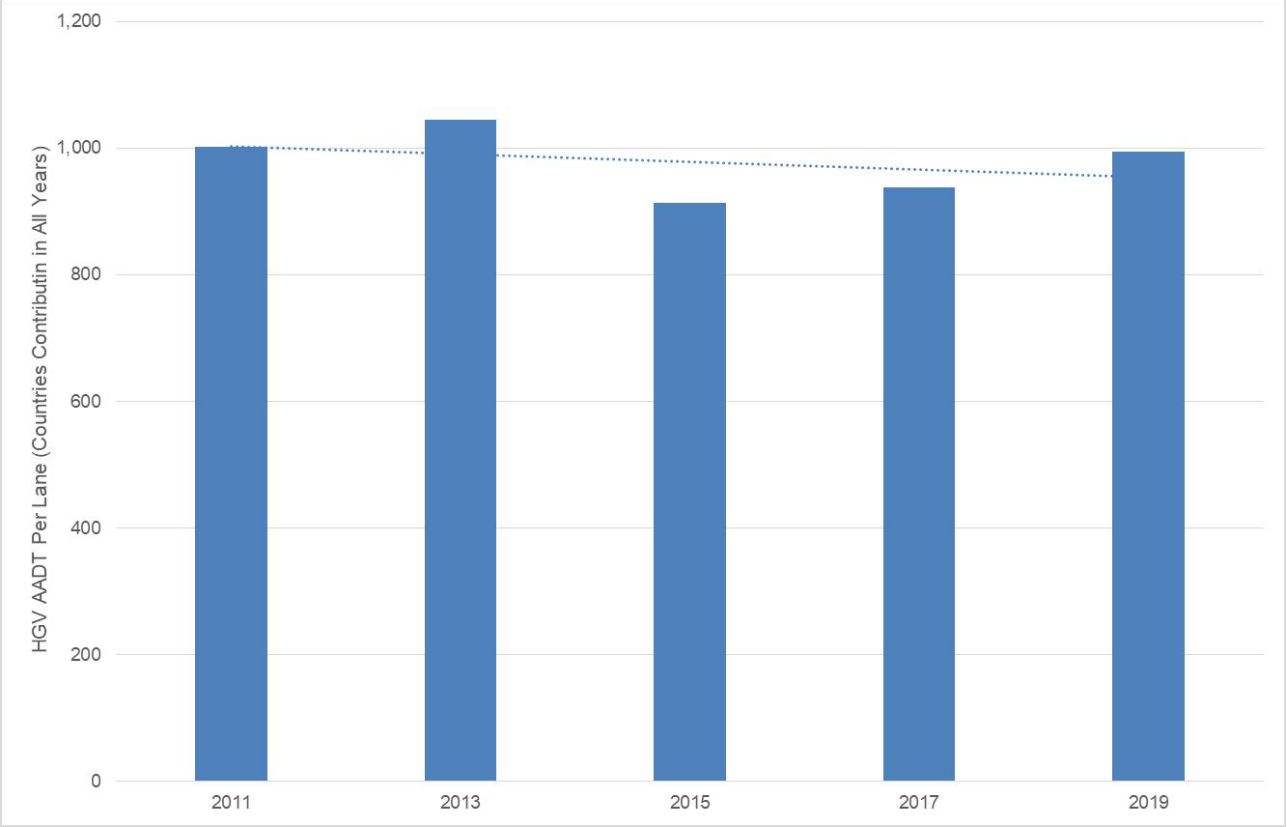


Figure 31: Trends in HGV Traffic Flow per Lane since 2011 (only counties that have participated in all five reports)

[3] The countries that have provided data on HGV traffic flow in all five TEN-T performance reports since 2011 are: Austria, Denmark, Estonia, Finland, Germany, Iceland, Italy, Lithuania, Luxembourg, Norway, Slovenia, Spain, Sweden and UK.

Figure 33 compares the trends in traffic flow per lane between HGVs and all traffic since 2011 for those countries that have participated in all five reports. This shows that while the overall traffic demand has slightly increased by an annual average of 1%, the HGV traffic flow per lane has decreased by an annual average of 0.1%.

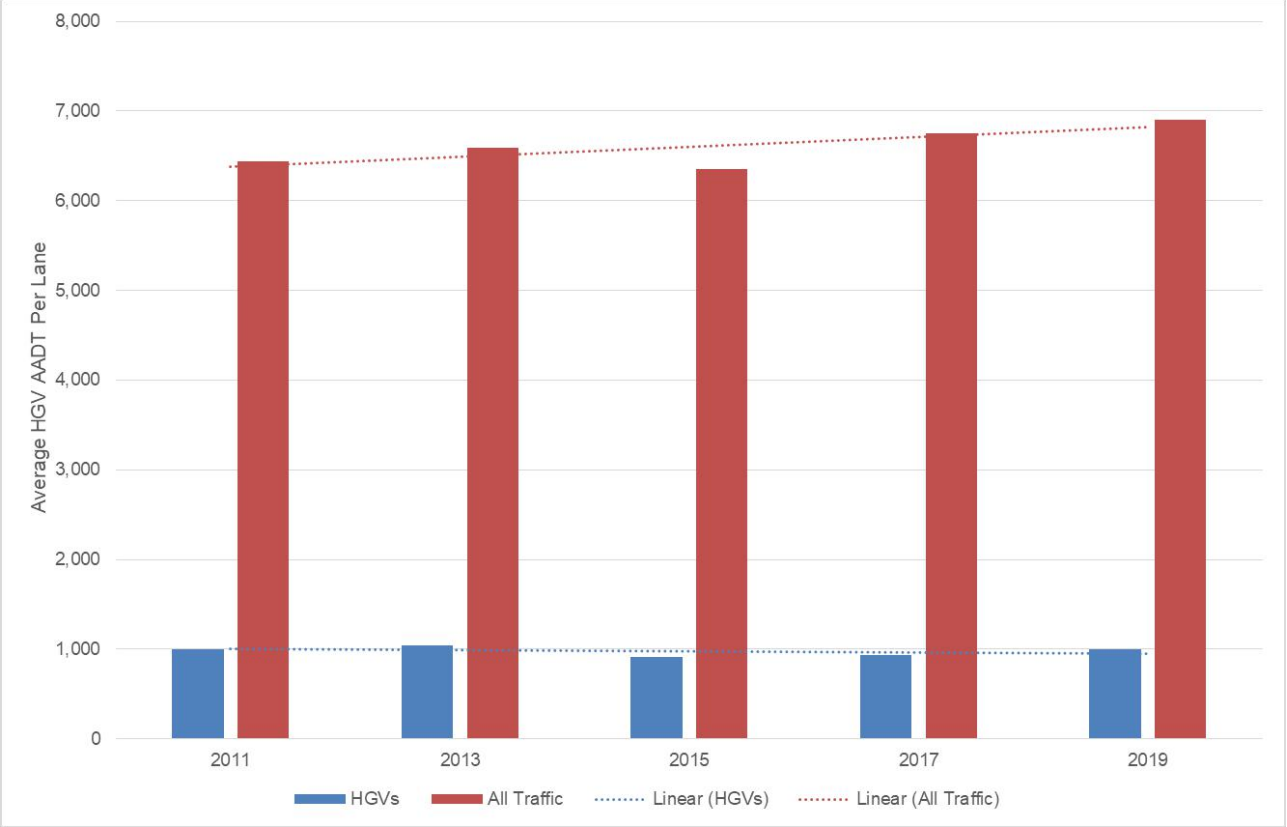


Figure 32: Trends in AADT and HGV Traffic Flow per Lane since 2011 (only countries that have participated in all five reports)

5.5 Road Transport Mileage

Road Transport Mileage shows the mileage travelled every year on the TEN-T network (expressed in terms of total vehicle kilometres per year) and provides a measure of the intensity of total transport activity. It is calculated by multiplying the Average Daily Traffic Flow value along a logical section by the length in km of the section

Figure 33 shows the road transport mileage on the TEN-T network in each participating country.

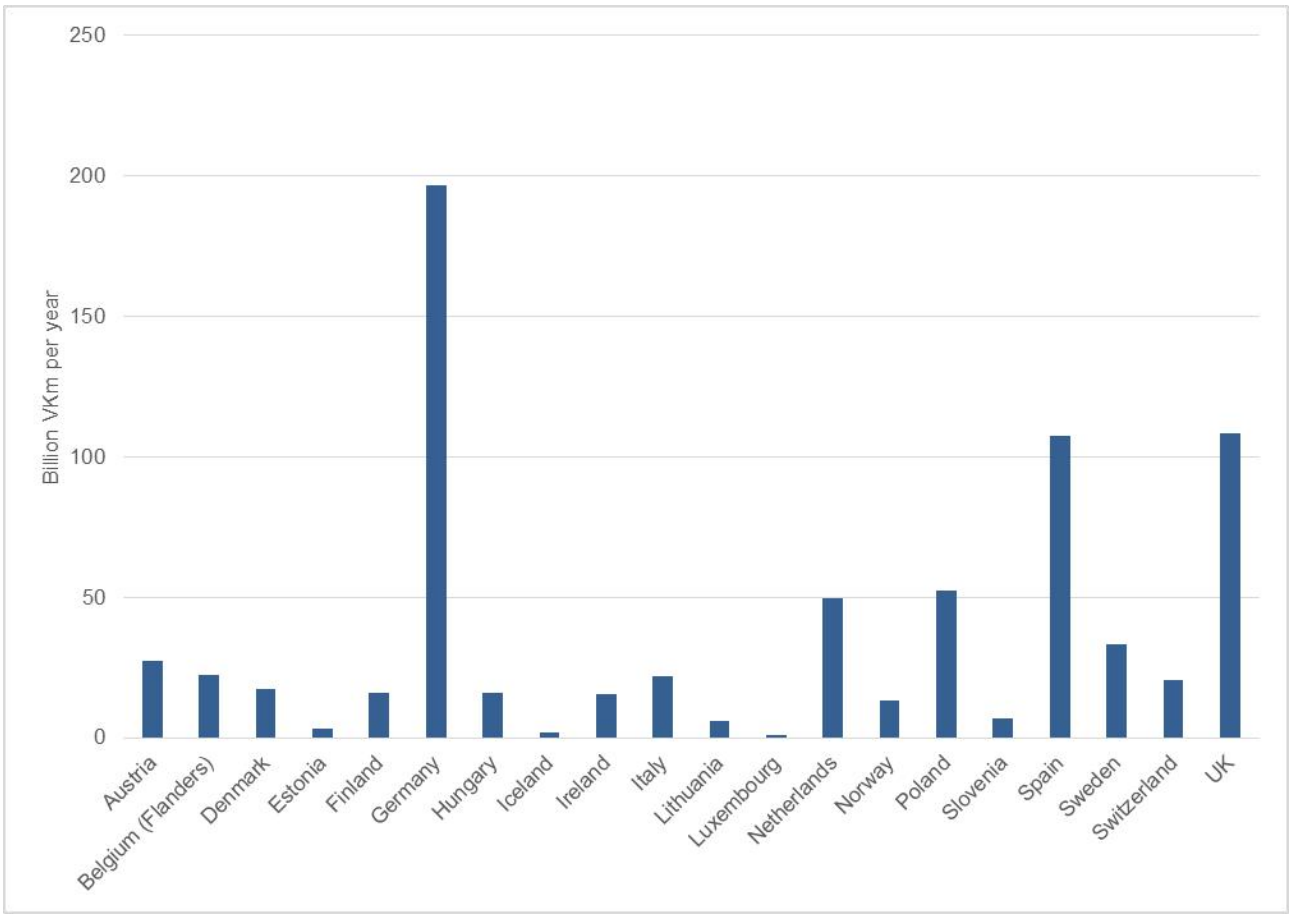


Figure 33: Road Transport Mileage on TEN-T (Roads) networks

The countries with the highest figures are Germany (197 Billion VehKm), UK and Spain (both with 108 Billion VehKm). The countries with the lowest figures are Luxembourg (1 Billion VehKm), Iceland (2 Billion VehKm) and Estonia (3 Billion VehKm). However, as with other indicators, these figures depend on the characteristics of the sections selected to be part of the TEN-T network.

5.6 Fatal Accident Rate

This indicator shows the annual average rate of fatal accidents over the last five years based on the road transport mileage (i.e. expressed as the number per Billion VehKm). It should be noted that there is a relatively small number of accidents on the TEN-T each year which makes this indicator sensitive to changes in traffic flow.

Figure 34 shows the distribution of Average Annual Fatal Accident Rate by country and road type. This shows that the average fatal accident rate on the TEN-T as a whole is 3.6 fatal accidents per Billion VehKm. The average for Motorways is 2.1 per Billion VehKm which rises to 6.5 per Billion VehKm on non-motorways.

There is also significant variation between individual countries which, on Motorways, ranged between 5.1 per Billion VehKm in Lithuania and 0.7 per Billion VehKm in UK. On non-motorway roads, the national figures ranged between 16.3 per Billion VehKm in Poland to 1.5 per Billion VehKm in Switzerland.

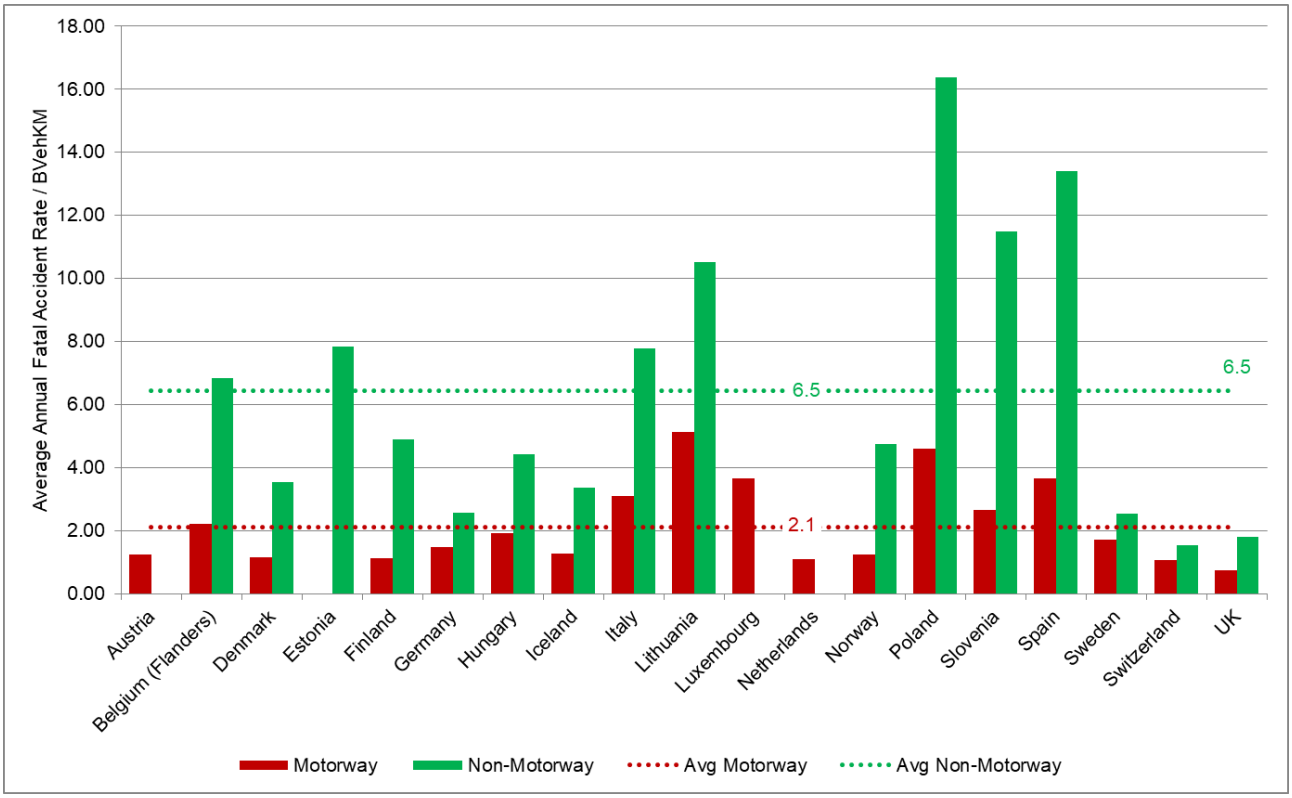


Figure 34: Average Annual Fatal Accident Rate by country

Figure 35 compares the Average Fatal Accident Rates on the Comprehensive, Core and, Non- Core networks. This shows that overall the Core Network has a higher average accident rate compared with the Non-Core Network. The accident rate on motorways that form part of the Core network is slightly higher than the TEN-T as a whole (2.3 per Billion VehKm compared with 2.1 per Billion VehKm) and is more than twice that of Motorways that are not part of the Core Network which have an average accident rate of 1.2 per Billion VehKm.

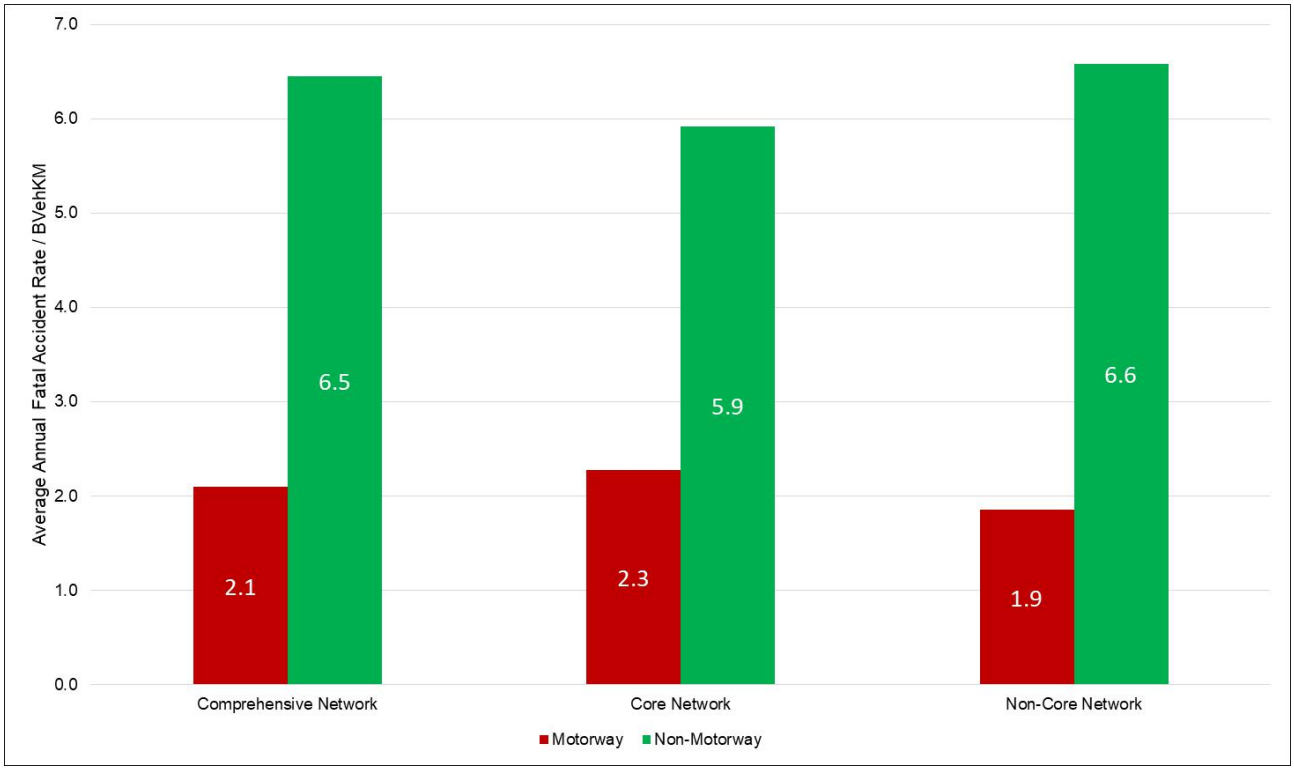


Figure 35: Average Annual Fatal Accident Rate by Road Type on the Comprehensive, Core and Non-Core Networks

Figure 36 shows trends in Annual Average Accident Rate on the comprehensive network since 2011 for those countries that have provided data for all five reports[4]. This shows that before 2015 the average annual accident rate for all road types was approximately 6.2 per BVehKm, but since 2015 has been relatively stable at approximately 3.5 per BVehKm.

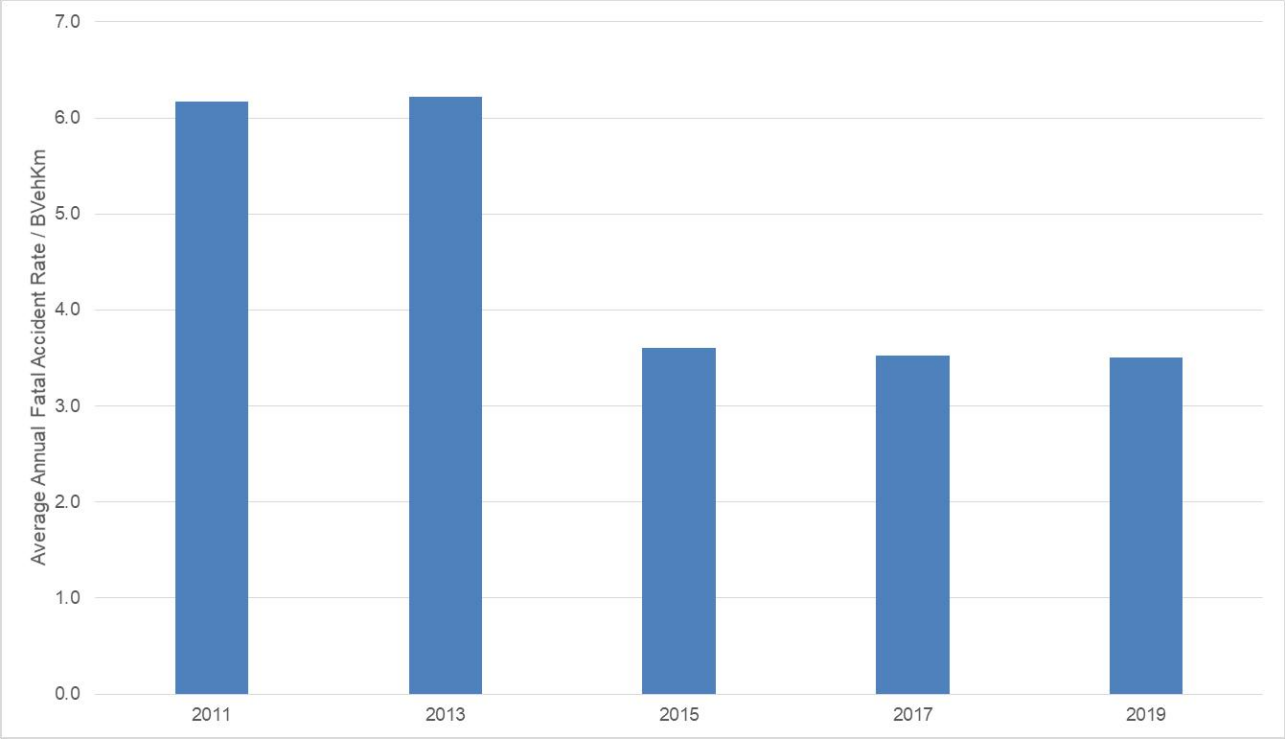


Figure 36: Trends in Average Annual Accident Rate on the Comprehensive Network since 2011 (only countries that have participated in all five reports)

[4] The countries that have provided traffic data for all five published reports are: Austria, Denmark, Estonia, Finland, Germany, Iceland, Ireland, Italy, Lithuania, Luxembourg, Norway, Slovenia, Spain, Sweden, UK

6 SUMMARY AND CONCLUSIONS

This is the sixth biennial report that CEDR has published on the performance of the TEN-T (Roads) network since 2011. The 2019 report includes data from 21 of CEDR's 28 members and covers more than 71,000km of the TEN-T (Roads) network.

6.1 Summary of Key Findings

Section 2 of the report contains information on the general characteristics of the TEN-T (Roads) network. Consistent with the TEN-T Guidelines, this shows that 61% of the Comprehensive network and 85% of the Core network comprises motorways and 91% of the network is rural. In terms of network capacity, 77% of the network as a whole has more than two lanes whereas 94% of the Core network has between two and six lanes and 6% has more than six lanes. Capacity is also planned to be increased on 31% of the network with all but one country having planned capacity improvements on their networks.

Section 3 covers network infrastructure and services. This shows that 2% of the network consists of bridges more than 100m in length and that unsurprisingly these are predominantly in alpine countries. Similarly, less than 1.5% of the network comprises tunnels more than 300m in length and, again, these are predominantly in alpine counties and Norway.

The report also looks at the extent and maturity of ITS on the network this shows that 52% of the network is covered by Level 2 ITS (i.e. traffic information systems) and nearly 32% is Level 3 (i.e. actively managed), while less than 4% of the network has no ITS at all. Currently, less than 0.5% has Level 4 (i.e. cooperative ITS) but this proportion should increase in future with the continued development of connected autonomous vehicles (CAV).

For the first time, the report looks at the services and facilities provided to users. This includes rest areas with facilities for truck drivers and different types of refuelling or recharging facilities. Although further work is needed to refine the definition of these indicators, they indicate that there are on average 2.5 rest areas with facilities for truck drivers per 100km on the network as a whole and that this rises to nearly 4 per 100km on the Core network; in both cases exceeding the guidance on having safe and secure rest areas for truck drivers approximately every 100km. Considering refuelling and recharging facilities, again the definitions need further refinement, but the results show that Norway has the greatest frequency of recharging facilities for electric vehicles, with more than 12 per 100km compared with the average of 3.5 per km, which reflects the high number of electric vehicles in use in Norway. The frequency of petrol refuelling facilities was on average 6.8 per 100km across the network.

Section 4 compares the performance of the Core Network Corridors in terms of traffic flow, proportion of HGVs and rate of fatal accidents. The North Sea – Mediterranean corridor has the highest average traffic flow at 96,094 vehicles per day and the Atlantic corridor has the lowest with 34,199 vehicles per day. The average for the corridors is 58,952 vehicles per day.

The North Sea – Baltic corridor has the greatest percentage of HGVs (19%) while the Rhine – Alpine corridor has the smallest proportion of HGVs (12%). The average figure for the corridors is 16% HGVs.

Considering fatal accident rate, the Atlantic corridor has the highest rate (5.0 per Billion VehKm) while the Rhine – Alpine corridor has the lowest (1.4 per Billion VehKm). The average figure for the corridors is 2.6 per Billion VehKm.

Section 5 looks at the performance of the network in detail. In terms of traffic flow, 54% of the network as a whole carries less than 20,000 vehicles per day and 20.5% of the network carries between 20,000 and 40,000 vehicles per day. 19.4% of the network carries between 40,000 and 80,000 vehicles per day and just 6.7% carries more than 80,000 vehicles per day. The countries carrying the most traffic are Belgium (Flanders), Netherlands and the UK with 21.7%, 17.2% and 13.8% of the network with an

AADT of more than 100,000 vehicles per day respectively. Conversely, the countries with the least traffic are Iceland, Norway, Estonia and Finland, each with more than 40% of the network carrying less than 5,000 vehicles per day.

Traffic density on the network is expressed as average annual daily traffic per lane. This shows that on 55% of the network as a whole, the traffic density is less than 6,000 vehicles per day per lane, 38.8% of the network has a density of between 6,000 and 18,000 vehicles per day per lane while, at the top end, 3.7% of the network has a traffic density of more than 18,000 vehicles per day per lane. Meanwhile, 59% of the Core Network has a traffic density of more than 6,000 vehicles per day per lane and 5% has more than 18,000 vehicles per day per lane.

The countries with the greatest average traffic density are Netherlands, Belgium (Flanders), Luxembourg and UK each with more than 11% of the network carrying in excess of 18,000 vehicles per day per lane. Meanwhile, the countries with the lowest average traffic density are Iceland, Norway, Finland and Estonia, in each of which more than 60% of the network has an average traffic density of less than 3,000 vehicles per day per lane.

Looking at trends in traffic density amongst the 15 countries that have provided data for all six reports shows a steady increase with an average annual increase in traffic density of 1% since 2011.

Considering the number of HGVs on the network shows that 52.2% of the network as a whole carries fewer than 3,000 HGVs per day, 31.1% carries between 3,000 and 9,000 vehicles per day and 14.9% carries more than 9,000 HGVs per day. The countries with the highest volume of HGV traffic are Belgium (Flanders), Germany, Netherlands, and the UK in each of which more than 50% of the network carries more than 9,000 HGVs per day. Conversely the countries that carry the lowest volume of HGVs are Estonia, Finland, Iceland, Ireland and Norway in each of which more than 90% of the network carries fewer than 3,000 HGVs per day.

Looking at trends in HGV traffic amongst the 15 countries that have provided data for all six reports shows a gradual decline in HGV traffic with an average annual decrease of 0.1% since 2011.

Road Transport Mileage shows the mileage travelled every year on the TEN-T network. This shows that the countries with the highest figures are Germany (197 Billion VehKm), UK and Spain (both with 108 Billion VehKm). The countries with the lowest figures are Luxembourg (1 Billion VehKm), Iceland (2 Billion VehKm) and Estonia (3 Billion VehKm).

Finally, the report considers annual average accident rate per Billion VehKm. This shows that on the network as a whole, there are on average 3.6 fatal accidents per Billion VehKm. The average for Motorways is 2.1 per Billion VehKm which rises to 6.5 per Billion VehKm on non-motorways.

There is significant variation between individual countries which, on Motorways, ranged between 5.1 per Billion VehKm in Lithuania and 0.7 per Billion VehKm in UK. On non-motorway roads, the national figures ranged between 16.3 per Billion VehKm in Poland to 1.5 per Billion VehKm in Switzerland.

Looking at trends in Annual Average Accident Rate on the comprehensive network since 2011 for those countries that have provided data for all six reports shows that, before 2015, the average annual accident rate for all road types was approximately 6.2 per Billion VehKm, but since 2015 has been relatively stable at approximately 3.5 per Billion VehKm.

6.2 Conclusions

The report shows that the TEN-T (Roads) Performance Report continues to be a useful analysis of the network at a European and national level that is supported by the majority of CEDR members. Furthermore, the performance report continues to evolve with new indicators being developed that look at safe and secure rest areas for truck drivers and the prevalence of facilities for charging electric vehicles and alternative fuels.

Other significant developments include the planned introduction of a high-level summary report that considers the performance of individual national road administrations through new KPIs covering safety, congestion, environment, finance and asset condition. The intention is that this report will supplement the 2021 TEN-T (Roads) Performance Report.

The 2019 report highlights that there is an ever increasing demand on the network in terms of general traffic flow but that the number of HGVs appears to be steady, or even decreasing. In response, national road administrations are planning to increase capacity and are deploying ITS solutions to actively manage traffic demand. Accident rates on the network remain low and appear to have remained steady since 2015. It will be interesting to see what effect the response COVID-19 pandemic and the impact of Brexit have on the future trends and performance reports.

7 FUTURE DEVELOPMENTS

7.1 New Summary Report

The key development planned for the 2021 TEN-T (Roads) Performance Report will be the introduction of a new summary report that describes the performance of individual National Road Administrations based on information provided by NRAs themselves via an online data collection tool.

The planned report will contain KPIs, supported by detailed performance indicators, covering:

- Safety
- Congestion
- Environment
- Finance
- Asset Condition

It is also the intention that later reports will include a KPI relating to Customer Satisfaction.

The new summary report will supplement the continued TEN-T network performance report and Web GIS map tool as illustrated in the figure below. Work is underway within WG Performance to develop the KPIs for the summary report. An online data collection tool will be used to collect high-level data for the summary report, detailed data for the technical report will be collected using MS Excel workbooks as currently.

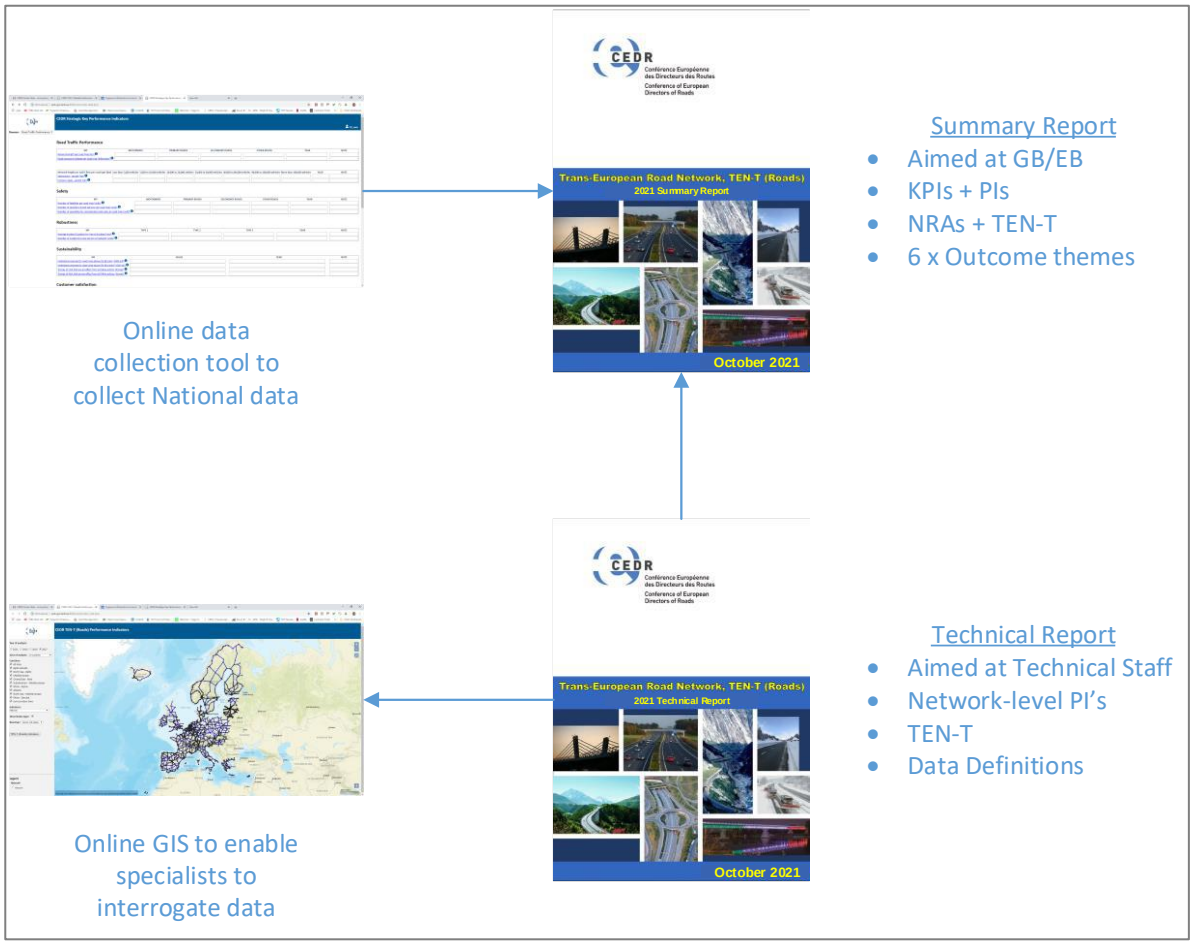


Figure 37: Proposed concept of 2021 Summary and Network Performance reports

7.2 Continued Development of TEN-T (Roads) Performance Report

Work will continue to develop and refine the TEN-T (Roads) Performance Report. In particular:

- Definitions for rest stops with facilities for truck drivers will be reviewed in line with Commission guidelines on safe and secure parking spaces for trucks;
- Definition of indicators for the various refuelling and recharging facilities will be reviewed for clarity and consistency, and to remove any double counting;
- Appropriate methods to compare the performance of the Core Network Corridors will be considered; and
- Further trend analysis will be carried out to look at changes in the performance of the network over time.

In addition, the Web GIS tool will continue to be developed to reflect the development of new indicators as well as to provide improved functionality.

8 ANNEX 1: METHODOLOGY AND DATA VALIDITY

8.1 Methodology

The TEN-T (Roads) Performance Report is based on a common location referencing model and common data definitions that have been developed by practitioners with an understanding of the data.

Data is provided directly by NRAs and is processed centrally to produce this report and the accompanying maps as described below:

1. Individual countries referenced their local networks into Logical Nodes and Sections using the TEN-T (Roads) Location Referencing System developed by CEDR Planning Working Group in 2008.
2. They then submitted their network and performance base data (including the geographical coordinates of each node) using a standard Excel spreadsheet and a set of base data definitions (see Section 7) that they were provided with.
3. Once received, the data was checked, and errors were corrected in consultation with the individual countries.
4. The data was then systematised into a single Excel database and used for:
   - the analysis and the production of charts and tables; and
   - the production of maps in GIS ShapeFile format.

As this is now the fifth biennial report that CEDR has produced, the participating countries are familiar with the requirements and the process and data quality has improved.

Table 4 shows the coverage of the information provided by the NRAs based on the number of sections per country.

Table 4: 2019 TEN-T (Roads) Data Coverage

Name	No of Sections	Road Type	Length	No of Lanes	AADT	Percent HGV	Fatal Accidents	No. of Years Accidents	Length Bridges	Length Tunnels	Env'mnt	Core Network	Planned Upgrade	Rest Area	EV Station	Petrol Station	Alt'Fuel Station	Corridor
Austria	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Belgium (Flanders)	61	61	61	61	61	52	52	60	61	61	61	61	61	0	61	61	61	61
Denmark	74	74	74	74	74	74	74	73	74	26	3	74	74	0	32	11	11	0
Estonia	45	45	45	45	45	45	40	28	45	8	45	45	45	45	41	16	25	0
Finland	176	176	176	176	176	176	176	176	176	176	5	176	176	176	176	176	155	21
Germany	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363
Hungary	49	49	49	49	49	48	48	48	48	49	1	49	49	49	37	0	27	32
Iceland	78	78	78	78	78	78	78	78	78	78	78	78	78	78	0	20	44	0
Ireland	58	58	58	58	58	58	58	24	0	58	58	58	58	58	0	58	58	0
Italy	77	77	77	77	74	74	74	74	77	72	72	77	77	77	25	25	67	25
Lithuania	127	127	127	127	123	122	122	122	127	127	127	127	127	127	22	16	68	0
Luxembourg	28	28	28	28	28	17	10	28	28	28	28	28	28	28	28	28	28	28
Malta	47	47	47	47	47	0	0	0	0	19	5	0	47	0	0	0	0	0
Netherlands	119	119	119	119	119	119	119	119	119	51	13	119	119	119	0	0	0	0
Norway	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	0
Poland	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113
Slovenia	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Spain	423	423	423	423	423	397	395	307	416	338	355	423	423	418	0	0	0	0
Sweden	119	119	119	119	119	119	119	119	119	119	119	119	119	119	0	0	0	119
Switzerland	111	111	111	111	111	111	111	111	111	81	44	111	111	111	111	111	111	0
UK	120	120	120	120	120	119	119	120	119	119	120	120	119	43	51	51	51	51
Total	2,528	2,528	2,528	2,528	2,521	2,425	2,411	2,303	2,414	2,226	1,950	2,481	2,527	2,264	1,400	1,389	1,522	945

8.2 Data quality and validity

The data included in this report is intended to accurately represent the performance of the TEN-T (Roads) network in 2019 and is assumed to be correct as of **1 January 2019**.

However, as the data has been provided by individual NRAs and requires aggregation of local data and interpretation of data definitions, it is possible that the quality of data will vary.

This may particularly be the case where:

- the data is new and is being collected for the first time;
- countries are participating for the first time; or
- network coverage within a country will be extended (e.g. in response to new TEN-T Guidelines).

CEDR therefore takes no responsibility for the accuracy or quality of the data that has been used to produce this report.

9 ANNEX 2: BASE DATA DEFINITIONS

9.1 Road Type

Title	Road Type
Definition	The predominant Road Type along a Logical Section
Permitted values	Motorway or Non-motorway
Definitions	A **motorway** is a road that is part of the TEN-T network that comprises two carriageways, separated by a physical barrier for most of its length. All crossings are normally grade separated. No stopping and usually a minimum speed. Access is generally restricted to certain types of vehicle. A **non-motorway** is a road that is not a motorway but is still a strategic road and is part of the TEN-T network.

9.2 Section Length

Title	Section Length
Definition	The route length of a Logical Section in kilometres
Permitted values	Integer
Definitions	The route length of a section is the distance from the start node to the end node of a Logical Section, measured in one direction only. This means that, for dual carriageways, the length is included once only and is the average of the distances on each carriageway. The route length should be rounded to the nearest kilometre.

9.3 Number of Lanes

Title	Number of Lanes
Definition	The average number of lanes along a Logical Section
Permitted values	Real number to one decimal place (e.g. 4.2)
Definitions	The length-weighted average number of permanent lanes in both directions along a Logical Section, including crawler lanes and bus lanes. The Number of Lanes should be calculated as the length-weighted average number of lanes in one direction plus the length-weighted average number of lanes in the other direction. For example, if a Logical Section has 2 lanes for 25% of its length and 1 lane for 75% of its length in one direction, and has 1 lane for 100% of its length in the other direction, then its length-weighted average number of lanes is: (25% x 2 + 75% x 1) + (100% x 1) = 2.25 This Logical Section will therefore be recorded as having 2.3 lanes.

9.4 Length of Bridges

Title	Length of Bridges
Definition	The total length of bridges along a Logical Section in kilometres
Permitted values	Real number to one decimal place
Definitions	The total Length of Bridges along a section is the total length of road that crosses bridges within that Logical Section, measured in one direction only. This means that, for dual carriageways, the length is included once only and is the average of the total length of bridges on each carriageway. Only road-carrying bridges that have a length greater than 0.1 km should be reported. The total Length of Bridges along a Logical Section should be rounded to the nearest 0.1 km. For example, on a 2-km Logical Section which has two bridges, one 0.5 km long and one 0.075 km long, the total Length of Bridges for that Logical Section would be reported as 0.5 km.

9.5 Length of Tunnels

Title	Length of Tunnels
Definition	The total Length of Tunnels along a Logical Section in kilometres
Permitted values	Real number to one decimal place
Definitions	The Length of Tunnels along a section is the total length of road that passes through tunnels within that Logical Section, measured in one direction only. This means that, for dual carriageways, the length is included once only and is the average of the total length of tunnels on each carriageway. Only tunnels that have a length greater than 0.3 km should be reported. The total Length of Tunnels along a Logical Section should be rounded to the nearest 0.1 km. For example, on a 2-km Logical Section which has two tunnels, one 0.5 km long and one 0.2 km long, the total Length of Tunnels for that Logical Section would be reported as 0.5 km.

9.6 Physical Environment

Title	Physical Environment
Definition	An indication of the predominant physical environment along a Logical Section.
Permitted values	Urban or Rural

Definitions	**Urban:** the Logical Section predominantly passes through built-up areas. **Rural:** the Logical Section predominantly passes through non built-up areas.

9.7 Intelligent Transport Systems

Title	ITS
Definition	An indication of the type of Intelligent Transport System (ITS) in place on the Logical Section.
Permitted values	0, 1, 2, 3, or 4
Definitions	Level 0 None Level 1 Monitoring system (e.g. real-time data about traffic/weather conditions is collected by the road administration) Level 2 Traffic information system (road administration passively manages the network e.g. information about traffic/weather conditions is provided to road users) Level 3 Traffic management system (road administration actively manages the network e.g. variable speed limits, dynamic lane management, ramp metering) Level 4 Cooperative ITS (i.e. vehicle-to-vehicle or infrastructure-to-vehicle information) The types of ITS are based on the EasyWay Deployment Guidelines

9.8 Traffic Flow

Title	Traffic Flow
Definition	The annual average daily traffic along a Logical Section
Permitted values	Integer
Definitions	The length-weighted Average Annual Daily Traffic (AADT) along a Logical Section, in both directions, rounded to the nearest integer. This includes all vehicle types. The Traffic Flow should be calculated as the length-weighted AADT in one direction plus the length-weighted AADT in the other direction. See Number of Lanes for a description of length weighting.

9.9 Proportion of HGVs

Title	Proportion of Heavy Goods Vehicles
Definition	The proportion of annual average daily traffic along a Logical Section that comprises Heavy Goods Vehicles (HGVs)
Permitted values	Percentage to one decimal place
Definitions	The proportion of length-weighted average annual daily traffic (AADT) along a Logical Section, in both directions, that comprises Heavy Goods Vehicles, expressed as a percentage. See Number of Lanes for a description of length weighting. HGVs are goods vehicles weighing in excess of 3.5 tonnes.

9.10 Fatal Accidents

Title	Fatal Accidents	
Definition	The total number of fatal accidents that occurred along the Logical Section over the last five calendar years	
Permitted values	Fatal Accidents	Integer
	Number of Years (if <5)	Integer
Definitions	The aggregated number of fatal accidents that occurred on the section over the last five years. Any accidents that occurred at a Logical Node should be allocated to a single Logical Section as appropriate. If data is not available for the last five years, the number of years that the number of accidents is aggregated over should be provided.	

9.11 Planned Capacity Improvements

Title	Planned Capacity Improvements
Definition	An indication that capacity improvements are planned on the Logical Section
Permitted values	Yes or No
Definitions	Capacity improvements that are planned for all or part of the Logical Section within the organisation's current maintenance or investment plans. The need for capacity improvements is deemed to indicate that the Logical Section currently experiences traffic congestion, i.e. it is a bottleneck.

9.12 Truck Drivers' Resting Areas

Title	Truck Drivers Resting Areas
Definition	Parking areas for trucks and commercial vehicles along a Logical Section
Permitted values	Integer
Definitions	Number of areas in the Logical Section where trucks and commercial vehicles are allowed to park. These areas are equipped with services (e.g. toilets) for drivers and might be monitored or not. For motorways and dual-carriageways, parking areas serving the two directions of traffic must be counted twice.

9.13 Electric Vehicle Charging Stations

Title	Electric Vehicle Charging Stations
Definition	Charging stations for electric vehicles along the Logical Section
Permitted values	Integer
Definitions	Number of charging stations for electric vehicles in the Logical Section. For motorways and dual-carriageways, a charging station serving two directions of traffic must be counted twice.

9.14 Petrol Stations

Title	Petrol Stations
Definition	Petrol stations along the Logical Section
Permitted values	Integer
Definitions	Number of petrol stations (i.e. facility selling fuel for motor vehicles) along the Logical Section. For motorways and dual-carriageways, a petrol station serving two directions of traffic must be counted twice.

10 ANNEX 3: NATIONAL PERFORMANCE DATA

10.1 Road Type

Table 5: Length of the TEN-T (Roads) network by Road Type

Country	Network Length (km)	No of Sections	Average Section Length (km)	Road Type			
				Motorway		Non-Motorway	
				Length (km)	%	Length (km)	%
Austria	1,740	80	22	1,740	100.0%	0	0.0%
Belgium (Flanders)	948	61	16	820	86.5%	128	13.5%
Denmark	1,560	74	21	1,175	75.3%	385	24.7%
Estonia	1,350	45	30	0	0.0%	1,350	100.0%
Finland	5,205	176	30	812	15.6%	4,394	84.4%
Germany	10,713	363	30	10,350	96.6%	363	3.4%
Hungary	1,474	49	30	1,130	76.6%	344	23.4%
Iceland	1,805	78	23	3	0.2%	1,802	99.8%
Ireland	2,163	58	37	990	45.8%	1,172	54.2%
Italy	3,016	77	39	2,297	76.2%	719	23.8%
Lithuania	1,652	127	13	361	21.9%	1,291	78.1%
Luxembourg	90	28	3	90	100.0%	0	0.0%
Malta	114	47	2	0	0.0%	114	100.0%
Netherlands	1,886	119	16	1,886	100.0%	0	0.0%
Norway	4,793	208	23	678	14.1%	4,115	85.9%
Poland	7,501	113	66	3,752	50.0%	3,749	50.0%
Slovenia	599	52	12	556	92.8%	43	7.2%
Spain	12,255	424	29	10,932	89.2%	1,323	10.8%
Sweden	6,417	119	54	1,913	29.8%	4,504	70.2%
Switzerland	1,325	111	12	1,143	86.3%	182	13.7%
UK	4,441	120	37	2,729	61.5%	1,712	38.5%
TOTAL	71,046	2,529	28	43,357	61.0%	27,690	39.0%

10.2 Physical Environment

Table 6: Length of the TEN-T (Roads) network according to Physical Environment

Country	Network length [km]	Rural		Urban		No data	
		Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	1,540	88.5%	200	11.5%	0	0.0%
Belgium (Flanders)	948	792	83.5%	156	16.5%	0	0.0%
Denmark	1,560	1,560	100.0%	0	0.0%	0	0.0%
Estonia	1,350	1,293	95.7%	58	4.3%	0	0.0%
Finland	5,205	5,063	97.3%	142	2.7%	0	0.0%
Germany	10,713	9,827	91.7%	886	8.3%	0	0.0%
Hungary	1,474	1,397	94.8%	77	5.2%	0	0.0%
Iceland	1,805	1,734	96.1%	71	3.9%	0	0.0%
Ireland	2,163	1,979	91.5%	184	8.5%	0	0.0%
Italy	3,016	2,734	90.7%	282	9.3%	0	0.0%
Lithuania	1,652	1,551	93.9%	101	6.1%	0	0.0%
Luxembourg	90	74	82.4%	16	17.6%	0	0.0%
Malta	114	-	0.0%	-	0.0%	114	100.0%
Netherlands	1,886	1,439	76.3%	447	23.7%	0	0.0%
Norway	4,793	4,481	93.5%	313	6.5%	0	0.0%
Poland	7,501	6,547	87.3%	954	12.7%	0	0.0%
Slovenia	599	552	92.2%	47	7.8%	0	0.0%
Spain	12,255	10,819	88.3%	1,436	11.7%	0	0.0%
Sweden	6,417	5,844	91.1%	573	8.9%	0	0.0%
Switzerland	1,325	732	55.2%	593	44.8%	0	0.0%
UK	4,441	4,425	99.6%	16	0.4%	0	0.0%
Total	71,046	64,382	90.6%	6,551	9.2%	114	0.2%

10.3 Number of Lanes

Table 7: Length of the TEN-T (Roads) network by Number of Lanes

Country	Total length [km]	Number of Lanes									
		2 lanes or less		More than 2, up to 4 lanes		More than 4, up to 6 lanes		More than 6 lanes		No data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	16	0.9%	801	46.0%	873	50.2%	50	2.9%	0	0.0%
Belgium (Flanders)	948	0	0.0%	545	57.5%	360	38.0%	43	4.5%	0	0.0%
Denmark	1,560	81	5.2%	1,142	73.2%	287	18.4%	50	3.2%	0	0.0%
Estonia	1,350	1,168	86.5%	182	13.5%	0	0.0%	0	0.0%	0	0.0%
Finland	5,205	2,406	46.2%	2,629	50.5%	170	3.3%	0	0.0%	0	0.0%
Germany	10,713	36	0.3%	5,337	49.8%	5,044	47.1%	296	2.8%	0	0.0%
Hungary	1,474	78	5.3%	1,291	87.6%	105	7.1%	0	0.0%	0	0.0%
Iceland	1,805	1,701	94.2%	95	5.3%	9	0.5%	0	0.0%	0	0.0%
Ireland	2,163	1,107	51.2%	968	44.8%	87	4.0%	0	0.0%	0	0.0%
Italy	3,016	383	12.7%	2,345	77.8%	246	8.2%	0	0.0%	42	1.4%
Lithuania	1,652	1,010	61.1%	616	37.3%	0	0.0%	0	0.0%	26	1.6%
Luxembourg	90	0	0.0%	88	97.3%	2	2.7%	0	0.0%	0	0.0%
Malta	114	38	33.8%	69	61.2%	3	3.1%	2	2.0%	0	0.0%
Netherlands	1,886	0	0.0%	721	38.2%	967	51.2%	199	10.5%	0	0.0%
Norway	4,793	3,270	68.2%	1,407	29.4%	106	2.2%	9	0.2%	0	0.0%
Poland	7,501	194	2.6%	4,268	56.9%	2,921	38.9%	118	1.6%	0	0.0%
Slovenia	599	43	7.2%	388	64.8%	168	28.0%	0	0.0%	0	0.0%
Spain	12,255	1,701	13.9%	8,811	71.9%	1,448	11.8%	295	2.4%	0	0.0%
Sweden	6,417	2,944	45.9%	3,399	53.0%	74	1.2%	0	0.0%	0	0.0%
Switzerland	1,325	125	9.4%	857	64.7%	277	20.9%	66	5.0%	0	0.0%
UK	4,441	0	0.0%	1,552	34.9%	1,892	42.6%	997	22.5%	0	0.0%
Total	71,046	16,301	22.9%	37,512	52.8%	15,040	21.2%	2,125	3.0%	68	0.1%

10.4 Planned Capacity Improvements

Table 8: Number of TEN-T (Roads) sections with Planned Capacity Improvements

Country	Total sections	Number of sections with Planned Capacity Improvements	%
Austria	80	15	18.8%
Belgium (Flanders)	61	0	0.0%
Denmark	74	0	0.0%
Estonia	45	14	31.1%
Finland	176	40	22.7%
Germany	363	167	46.0%
Hungary	49	9	18.4%
Iceland	78	2	2.6%
Ireland	58	4	6.9%
Italy	77	32	41.6%
Lithuania	127	38	29.9%
Luxembourg	28	6	21.4%
Malta	47	0	0.0%
Netherlands	119	49	41.2%
Norway	208	41	19.7%
Poland	113	42	37.2%
Slovenia	52	1	1.9%
Spain	424	78	18.4%
Sweden	119	40	33.6%
Switzerland	111	29	26.1%
UK	120	43	35.8%
Total	2,529	650	25.7%
Total (ex No Data)	2,265	650	28.7%

10.5 Length of Bridges

Table 9: Length of the TEN-T (Roads) network comprising bridges

Country	Network length with Bridge Data[km]	Length of Bridges [km]					
		All roads	%	Motorway	%	Non- motorway	%
Austria	1,740	104	6.0%	104	6.0%	0	0.0%
Belgium (Flanders)	948	21	2.2%	19	2.0%	2	0.2%
Denmark	811	32	3.9%	28	3.5%	4	0.5%
Estonia	273	2	0.6%	0	0.0%	2	0.6%
Finland	5,205	71	1.4%	30	0.6%	41	0.8%
Germany	10,713	292	2.7%	285	2.7%	6	0.1%
Hungary	1,474	21	1.5%	16	1.1%	6	0.4%
Iceland	1,805	5	0.3%	0	0.0%	5	0.3%
Ireland	2,163	5	0.2%	3	0.1%	2	0.1%
Italy	2,925	200	6.8%	171	5.8%	29	1.0%
Lithuania	1,652	0	0.0%	0	0.0%	0	0.0%
Luxembourg	90	5	5.7%	5	5.7%	0	0.0%
Malta	64	1	1.3%	0	0.0%	1	1.3%
Netherlands	978	24	2.4%	24	2.4%	0	0.0%
Norway	4,793	104	2.2%	65	1.4%	39	0.8%
Poland	7,501	69	0.9%	56	0.7%	13	0.2%
Slovenia	599	24	4.0%	24	4.0%	0	0.0%
Spain	10,281	225	2.2%	220	2.1%	4	0.0%
Sweden	6,417	53	0.8%	30	0.5%	23	0.4%
Switzerland	1,140	112	9.8%	101	8.9%	11	0.9%
UK	4,423	36	0.8%	29	0.6%	7	0.2%
Total	65,995	1,404	2.1%	1,209	1.8%	195	0.3%

10.6 Length of Tunnels

Table 10: Length of the TEN-T (Roads) network comprising tunnels

Country	Network length with Tunnel Data [km]	Length of Tunnels [km]					
		All roads	%	Motorway	%	Non-motorway	%
Austria	1,740	169	9.7%	169	9.7%	0	0.0%
Belgium (Flanders)	948	10	1.1%	10	1.1%	0	0.0%
Denmark	55	5	8.4%	5	8.4%	0	0.0%
Estonia	1,350	0	0.0%	0	0.0%	0	0.0%
Finland	160	7	4.6%	6	3.7%	2	0.9%
Germany	10,713	54	0.5%	54	0.5%	0	0.0%
Hungary	48	3	6.3%	3	6.3%	0	0.0%
Iceland	1,805	21	1.1%	0	0.0%	21	1.1%
Ireland	2,163	6	0.3%	6	0.3%	1	0.0%
Italy	2,925	105	3.6%	98	3.4%	7	0.2%
Lithuania	1,652	0	0.0%	0	0.0%	0	0.0%
Luxembourg	90	3	3.8%	3	3.8%	0	0.0%
Malta	13	1	8.7%	0	0.0%	1	8.7%
Netherlands	227	17	7.6%	17	7.6%	0	0.0%
Norway	4,793	307	6.4%	98	2.1%	209	4.4%
Poland	7,501	1	0.0%	1	0.0%	0	0.0%
Slovenia	599	20	3.3%	20	3.3%	0	0.0%
Spain	10,100	100	1.0%	86	0.8%	14	0.1%
Sweden	6,417	9	0.1%	7	0.1%	2	0.0%
Switzerland	693	125	18.1%	109	15.7%	17	2.4%
UK	4,441	3	0.1%	3	0.1%	0	0.0%
Total	58,433	966	1.7%	693	1.2%	273	0.5%

10.7 Intelligent Transport Systems

Table 11: Length of the TEN-T (Roads) network featuring Intelligent Transport Systems

Country	Total length [km]	Intelligent Transport Systems (ITS)											
		Level 0		Level 1		Level 2		Level 3		Level 4		No data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	0	0.0%	1,454	83.6%		0.0%	261	15.0%	25	1.4%	0	0.0%
Belgium (Flanders)	948	0	0.0%	0	0.0%	325	34.3%	623	65.7%	0	0.0%	0	0.0%
Denmark	1,560	0	0.0%	0	0.0%	1,560	100.0%	0	0.0%	0	0.0%	0	0.0%
Estonia	1,350	0	0.0%	0	0.0%	1,336	99.0%	14	1.0%	0	0.0%	0	0.0%
Finland	5,205	0	0.0%	0	0.0%	4,313	82.9%	892	17.1%	0	0.0%	0	0.0%
Germany	10,713	0	0.0%	0	0.0%	5,298	49.5%	5,415	50.5%	0	0.0%	0	0.0%
Hungary	1,474	51	3.5%	92	6.3%	1,019	69.2%	167	11.3%	144	9.8%	0	0.0%
Iceland	1,805	0	0.0%	0	0.0%	1,805	100.0%	0	0.0%	0	0.0%	0	0.0%
Ireland	2,163	1,824	84.3%	163	7.5%	176	8.1%	0	0.0%	0	0.0%	0	0.0%
Italy	3,016	0	0.0%	1,343	44.5%	136	4.5%	0	0.0%	0	0.0%	1,537	51.0%
Lithuania	1,652	0	0.0%	0	0.0%	1,481	89.6%	171	10.4%	0	0.0%	0	0.0%
Luxembourg	90	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	90	100.0%
Malta	114	0	0.0%	5	4.6%	0	0.0%	85	74.6%	0	0.0%	24	20.7%
Netherlands	1,886	0	0.0%	146	7.7%	125	6.6%	1,615	85.6%	0	0.0%	0	0.0%
Norway	4,793	0	0.0%	0	0.0%	1,539	32.1%	3,229	67.4%	25	0.5%	0	0.0%
Poland	7,501	888	11.8%	3,284	43.8%	3,329	44.4%	0	0.0%	0	0.0%	0	0.0%
Slovenia	599	0	0.0%	0	0.0%	287	47.9%	312	52.1%	0	0.0%	0	0.0%
Spain	12,255	5	0.0%	505	4.1%	5,838	47.6%	5,850	47.7%	0	0.0%	57	0.5%
Sweden	6,417	0	0.0%	0	0.0%	5,927	92.4%	490	7.6%	0	0.0%	0	0.0%
Switzerland	1,325	0	0.0%	0	0.0%	73	5.5%	1,252	94.5%	0	0.0%	0	0.0%
UK	4,441	3	0.1%	0	0.0%	2,278	51.3%	2,159	48.6%	0	0.0%	0	0.0%
Total	71,046	2,771	3.9%	6,991	9.8%	36,847	51.9%	22,535	31.7%	194	0.3%	1,707	2.4%

10.8 Rest Areas with Facilities for Truck Drivers

Table 12: Number of Rest Stops with Facilities for Truck Drivers

Country	Total Network length with Rest Area Data [km]	Number of Rest Stops with facilities for Truck Drivers	
		Total Number	Average Frequency [No. per 100 km]
Austria	1,740	277	15.9
Belgium (Flanders)	948	70	7.4
Denmark	927	91	9.8
Estonia	1,300	150	11.5
Finland	5,205	102	2.0
Germany	10,713	104	1.0
Hungary	1,319	184	14.0
Iceland	1,805	-	0.0-
Ireland	2,163	-	0.0-
Italy	1,003	40	4.0
Lithuania	441	33	7.5
Luxembourg	90	6	6.7
Malta	114	-	0.0-
Netherlands	1,886	-	0.0-
Norway	4,793	63	1.3
Poland	7,501	337	4.5
Slovenia	599	76	12.7
Spain	12,255	-	0.0-
Sweden	6,417	-	0.0-
Switzerland	1,325	154	11.6
UK	2,228	144	6.5
Total	40,132	1,831	4.6

10.9 Electric Vehicle Charging Stations

Table 13: Number of Electric Vehicle Charging Stations

Country	Total Network length with Data [km]	Number of Electric Vehicle Charging Stations	
		Total Number	Average Frequency [No. per 100 km]
Austria	1,740	43	2.5
Belgium (Flanders)	948	28	3.0
Denmark	419	20	4.8
Estonia	751	23	3.1
Finland	5,205	453	8.7
Germany	10,713	60	0.6
Hungary	1,474	-	0.0-
Iceland	594	26	4.4
Ireland	2,163	83	3.8
Italy	1,003	2	0.2
Lithuania	301	20	6.6
Luxembourg	90		0.0
Malta	114	-	0.0-
Netherlands	1,886	-	0.0-
Norway	4,793	600	12.5
Poland	7,501	172	2.3
Slovenia	599	41	6.8
Spain	12,255	-	0.0-
Sweden	6,417	-	0.0-
Switzerland	1,325	35	2.6
UK	2,228	123	5.5
Total	40,374	1,729	4.3

10.10 Petrol Refuelling Stations

Table 14: Number of Petrol Refuelling Stations

Country	Total network length with data [km]	Number of Petrol Refuelling Stations	
		Total Number	Average Frequency [No. per 100 km]
Austria	1,740	114	6.6
Belgium (Flanders)	948	37	3.9
Denmark	419	20	4.8
Estonia	1,112	69	6.2
Finland	4,827	526	10.9
Germany	10,713	365	3.4
Hungary	1,123	79	7.0
Iceland	1,121	78	7.0
Ireland	2,163	158	7.3
Italy	2,731	243	8.9
Lithuania	925	119	12.9
Luxembourg	90	6	6.7
Malta	114	-	0.0-
Netherlands	1,886	-	0.0-
Norway	4,793	277	5.8
Poland	7,501	1,062	14.2
Slovenia	599	56	9.3
Spain	12,255	-	0.0-
Sweden	6,417	-	0.0-
Switzerland	1,325	64	4.8
UK	2,228	152	6.8
Total	44,359	3,425	7.7

10.11 Traffic Flow

Table 15: Length of the TEN-T (Roads) network by Average Traffic Flow categories

Country	Network Length [km]	Annual Average Daily Traffic Flow [AADT]													
		Less than 5,000		5,000 – 20,000		20,000 – 40,000		40,000 – 80,000		80,000 – 100,000		More than 100,000		No data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	0	0.0%	141	8.1%	721	41.4%	784	45.1%	58	3.3%	36	2.1%	0	0.0%
Belgium (Flanders)	948	0	0.0%	11	1.2%	164	17.3%	332	35.0%	105	11.1%	206	21.7%	130	13.7%
Denmark	1,560	50	3.2%	596	38.2%	473	30.3%	400	25.6%	0	0.0%	41	2.6%	0	0.0%
Estonia	1,350	647	47.9%	650	48.1%	54	4.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Finland	5,205	2,196	42.2%	2,506	48.2%	359	6.9%	144	2.8%	0	0.0%	0	0.0%	0	0.0%
Germany	10,713	0	0.0%	1,191	11.1%	2,878	26.9%	5,246	49.0%	791	7.4%	598	5.6%	9	0.1%
Hungary	1,474	61	4.1%	593	40.2%	350	23.8%	406	27.5%	20	1.4%	20	1.3%	24	1.6%
Iceland	1,805	1,588	88.0%	156	8.6%	39	2.2%	20	1.1%	0	0.0%	2	0.1%	0	0.0%
Ireland	2,163	52	2.4%	1,576	72.9%	335	15.5%	128	5.9%	52	2.4%	20	0.9%	0	0.0%
Italy	3,016	136	4.5%	1,999	66.3%	491	16.3%	221	7.3%	8	0.3%	80	2.7%	81	2.7%
Lithuania	1,652	509	30.8%	962	58.2%	137	8.3%	13	0.8%	0	0.0%	0	0.0%	31	1.9%
Luxembourg	90	0	0.0%	0	0.0%	26	28.7%	23	25.9%	12	13.4%	0	0.0%	29	32.0%
Malta	114	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	114	100.0%
Netherlands	1,886	0	0.0%	0	0.0%	246	13.0%	1,052	55.8%	264	14.0%	324	17.2%	0	0.0%
Norway	4,793	2,978	62.1%	1,417	29.6%	240	5.0%	146	3.0%	12	0.2%	0	0.0%	0	0.0%
Poland	7,501	0	0.0%	4,790	63.9%	2,288	30.5%	394	5.3%	6	0.1%	23	0.3%	0	0.0%
Slovenia	599	23	3.8%	145	24.2%	208	34.7%	223	37.2%	0	0.0%	0	0.0%	0	0.0%
Spain	12,255	1,225	10.0%	5,667	46.2%	3,214	26.2%	1,296	10.6%	81	0.7%	299	2.4%	473	3.9%
Sweden	6,417	1,958	30.5%	2,829	44.1%	996	15.5%	560	8.7%	71	1.1%	3	0.0%	0	0.0%
Switzerland	1,325	20	1.5%	164	12.4%	296	22.3%	475	35.8%	118	8.9%	63	4.8%	189	14.3%
UK	4,441	0	0.0%	82	1.8%	1,046	23.6%	1,890	42.6%	806	18.2%	614	13.8%	3	0.1%
Total	71,046	11,441	16.1%	25,475	35.9%	14,562	20.5%	13,754	19.4%	2,404	3.4%	2,328	3.3%	1,083	1.5%

10.12 Traffic Density

Table 16: Length of the TEN-T (Roads) network by Traffic Density Bands (Calculated)

Country	Network Length [km]	Traffic Density [AADT/Lane]											
		Less than 3,000		3,000 – 6,000		6,000 –12,000		12,000 – 18,000		More than 18,000		No Data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	0	0.0%	314	18.0%	1,007	57.9%	359	20.6%	60	3.4%	0	0.0%
Belgium (Flanders)	948	0	0.0%	16	1.7%	248	26.2%	399	42.1%	155	16.4%	130	13.7%
Denmark	1,560	185	11.9%	606	38.8%	559	35.8%	188	12.1%	22	1.4%	0	0.0%
Estonia	1,350	848	62.8%	453	33.6%	49	3.6%	0	0.0%	0	0.0%	0	0.0%
Finland	5,205	3,386	65.0%	1,296	24.9%	477	9.2%	47	0.9%	0	0.0%	0	0.0%
Germany	10,713	204	1.9%	1,368	12.8%	5,686	53.1%	2,863	26.7%	583	5.4%	9	0.1%
Hungary	1,474	409	27.7%	273	18.5%	443	30.0%	313	21.3%	12	0.8%	24	1.6%
Iceland	1,805	1,652	91.5%	111	6.1%	31	1.7%	11	0.6%	0	0.0%	0	0.0%
Ireland	2,163	210	9.7%	1,148	53.1%	685	31.7%	86	4.0%	34	1.6%	0	0.0%
Italy	3,016	597	19.8%	1,567	52.0%	666	22.1%	49	1.6%	54	1.8%	83	2.8%
Lithuania	1,652	825	49.9%	615	37.2%	168	10.2%	13	0.8%	0	0.0%	31	1.9%
Luxembourg	90	0	0.0%	7	7.7%	29	32.2%	11	12.2%	14	15.9%	29	32.0%
Malta	114	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	114	100.0%
Netherlands	1,886	0	0.0%	25	1.3%	448	23.8%	1,023	54.2%	391	20.7%	0	0.0%
Norway	4,793	3,468	72.4%	728	15.2%	531	11.1%	65	1.3%	2	0.0%	0	0.0%
Poland	7,501	536	7.1%	5,303	70.7%	1,570	20.9%	92	1.2%	0	0.0%	0	0.0%
Slovenia	599	66	11.0%	154	25.7%	297	49.6%	82	13.7%	0	0.0%	0	0.0%
Spain	12,255	3,542	28.9%	4,793	39.1%	2,547	20.8%	539	4.4%	361	2.9%	473	3.9%
Sweden	6,417	2,888	45.0%	1,927	30.0%	1,096	17.1%	91	1.4%	415	6.5%	0	0.0%
Switzerland	1,325	20	1.5%	125	9.4%	452	34.1%	386	29.1%	153	11.5%	189	14.3%
UK	4,441	0	0.0%	82	1.8%	1,797	40.5%	2,208	49.7%	351	7.9%	3	0.1%
Total	71,046	18,834	26.5%	20,911	29.4%	18,786	26.4%	8,824	12.4%	2,607	3.7%	1,085	1.5%

10.13 Proportion of HGVs

Table 17: Length of the TEN-T (Roads) network according to proportion of Heavy Goods Vehicles

Country	Total length [km]	Proportion of total traffic comprising HGVs									
		Less than 5%		5% – 10%		10% – 20%		More than 20%		No Data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	0	0.0%	262	15.1%	1,393	80.1%	85	4.9%	0	0.0%
Belgium (Flanders)	948	0	0.0%	65	6.9%	385	40.6%	368	38.8%	130	13.7%
Denmark	1,560	45	2.9%	433	27.8%	984	63.1%	98	6.3%	0	0.0%
Estonia	1,350	23	1.7%	303	22.4%	792	58.7%	195	14.4%	38	2.8%
Finland	5,205	27	0.5%	1,722	33.1%	3,404	65.4%	52	1.0%	0	0.0%
Germany	10,713	48	0.4%	1,295	12.1%	6,834	63.8%	2,527	23.6%	9	0.1%
Hungary	1,474	48	3.3%	202	13.7%	580	39.4%	619	42.0%	24	1.6%
Iceland	1,805	72	4.0%	598	33.1%	1,135	62.9%	0	0.0%	0	0.0%
Ireland	2,163	563	26.0%	1,398	64.6%	202	9.3%	0	0.0%	0	0.0%
Italy	3,016	217	7.2%	1,295	42.9%	1,358	45.0%	65	2.2%	81	2.7%
Lithuania	1,652	18	1.1%	370	22.4%	839	50.8%	394	23.8%	31	1.9%
Luxembourg	90	0	0.0%	2	2.5%	31	34.3%	4	4.4%	53	58.8%
Malta	114	0	0.0%	0	0.0%	0	0.0%	0	0.0%	114	100.0%
Netherlands	1,886	7	0.4%	235	12.5%	1,471	78.0%	173	9.2%	0	0.0%
Norway	4,793	0	0.0%	99	2.1%	3,123	65.2%	1,571	32.8%	0	0.0%
Poland	7,501	0	0.0%	294	3.9%	3,333	44.4%	3,874	51.6%	0	0.0%
Slovenia	599	23	3.8%	178	29.7%	318	53.1%	80	13.4%	0	0.0%
Spain	12,255	220	1.8%	2,210	18.0%	5,751	46.9%	3,491	28.5%	582	4.7%
Sweden	6,417	40	0.6%	201	3.1%	4,896	76.3%	1,280	19.9%	0	0.0%
Switzerland	1,325	465	35.1%	561	42.3%	83	6.3%	0	0.0%	216	16.3%
UK	4,441	0	0.0%	741	16.7%	2,954	66.5%	742	16.7%	3	0.1%
Total	71,046	1,817	2.6%	12,465	17.5%	39,866	56.1%	15,619	22.0%	1,280	1.8%

10.14 HGV Traffic Flow

Table 18: Length of the TEN-T (Roads) network according to Heavy Goods Vehicle Traffic Flow (Calculated)

Country	Total length [km]	HGV traffic flow [AADT]									
		Less than 3,000		3,000 – 6,000		6,000 – 9,000		More than 9,000		No Data	
		Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%	Length [km]	%
Austria	1,740	207	11.9%	999	57.4%	191	11.0%	343	0	0	0.0%
Belgium (Flanders)	948	13	1.4%	37	3.9%	161	17.0%	607	1	130	13.7%
Denmark	1,560	837	53.7%	335	21.5%	279	17.9%	109	0	0	0.0%
Estonia	1,350	1,293	95.8%	19	1.4%	0	0.0%	0	0	38	2.8%
Finland	5,205	5,060	97.2%	132	2.5%	13	0.3%	0	0	0	0.0%
Germany	10,713	1,462	13.6%	2,778	25.9%	1,926	18.0%	4,538	0	9	0.1%
Hungary	1,474	524	35.6%	555	37.7%	113	7.7%	257	0	24	1.6%
Iceland	1,805	1,803	99.9%	2	0.1%	0	0.0%	0	0	0	0.0%
Ireland	2,163	2,007	92.8%	115	5.3%	23	1.1%	18	0	0	0.0%
Italy	3,016	2,515	83.4%	399	13.2%	21	0.7%	0	0	81	2.7%
Lithuania	1,652	1,393	84.3%	199	12.0%	29	1.8%	0	0	31	1.9%
Luxembourg	90	7	7.7%	2	2.5%	14	15.6%	14	0	53	58.8%
Malta	114	0	0.0%	0	0.0%	0	0.0%	0	0	114	100.0%
Netherlands	1,886	25	1.3%	367	19.5%	456	24.2%	1,039	1	0	0.0%
Norway	4,793	4,440	92.6%	270	5.6%	74	1.5%	9	0	0	0.0%
Poland	7,501	3,344	44.6%	2,731	36.4%	917	12.2%	509	0	0	0.0%
Slovenia	599	277	46.2%	139	23.2%	183	30.6%	0	0	0	0.0%
Spain	12,255	6,154	50.2%	3,780	30.8%	1,045	8.5%	694	0	582	4.7%
Sweden	6,417	4,682	73.0%	1,232	19.2%	499	7.8%	4	0	0	0.0%
Switzerland	1,325	727	54.9%	262	19.8%	116	8.8%	4	0	216	16.3%
UK	4,441	299	6.7%	922	20.8%	754	17.0%	2,463	1	3	0.1%
Total	71,046	37,069	52.2%	15,275	21.5%	6,814	9.6%	10,608	14.9%	1,280	1.8%

10.15 Road Transport Mileage (All Vehicles)

Table 19: Road Transport Mileage on the TEN-T (Roads) network for each country, Road Type, and Core and Non-Core Networks, All Traffic (Calculated)

Country	Billion VKm per Year					Share %				
	Total	Motorway	Non- motorway	Core	Non- Core	Total	Motorway	Non-motorway	Core	Non- Core
Austria	27.46	27.46	0	20.34	7.13	3.7%	100.0%	0.0%	74.0%	26.0%
Belgium (Flanders)	22.23	22.08	0.15	17.77	4.46	3.0%	99.3%	0.7%	80.0%	20.0%
Denmark	17.42	16.23	1.18	11.60	5.81	2.4%	93.2%	6.8%	66.6%	33.4%
Estonia	3.30	0	3.30	1.55	1.75	0.4%	0.0%	100.0%	47.1%	52.9%
Finland	16.21	6.94	9.26	5.93	10.27	2.2%	42.8%	57.2%	36.6%	63.4%
Germany	196.68	194.97	1.71	140.68	56.00	26.6%	99.1%	0.9%	71.5%	28.5%
Hungary	16.19	13.06	3.13	14.53	1.66	2.2%	80.6%	19.4%	89.7%	10.3%
Iceland	2.00	0.10	1.90	0.51	1.49	0.3%	5.0%	95.0%	25.3%	74.7%
Ireland	15.52	9.77	5.74	5.93	9.59	2.1%	63.0%	37.0%	38.2%	61.8%
Italy	22.08	19.33	2.75	8.75	13.33	3.0%	87.5%	12.5%	39.6%	60.4%
Lithuania	5.96	1.78	4.18	3.27	2.69	0.8%	29.9%	70.1%	54.9%	45.1%
Luxembourg	1.12	1.12	0	1.12	0.00	0.2%	100.0%	0.0%	100.0%	0.0%
Malta	-	-	-	-	-	-	-	-	-	-
Netherlands	49.60	49.60	0	19.48	30.13	6.7%	100.0%	0.0%	39.3%	60.7%
Norway	13.06	7.16	5.90	1.44	11.62	1.8%	54.8%	45.2%	11.0%	89.0%
Poland	52.35	36.78	15.57	34.41	17.94	7.1%	70.3%	29.7%	65.7%	34.3%
Slovenia	7.01	6.90	0.11	6.11	0.89	0.9%	98.5%	1.5%	87.3%	12.7%
Spain	107.68	105.34	2.34	71.36	36.32	14.6%	97.8%	2.2%	66.3%	33.7%
Sweden	33.49	17.53	15.96	17.56	15.93	4.5%	52.3%	47.7%	52.4%	47.6%
Switzerland	20.47	20.04	0.42	4.77	15.70	2.8%	97.9%	2.1%	23.3%	76.7%
UK	108.40	84.20	24.21	67.23	41.18	14.7%	77.7%	22.3%	62.0%	38.0%
Total	738.23	640.41	97.81	454.33	283.90	100.0%	86.8%	13.2%	61.5%	38.5%

10.16 Road Transport Mileage (HGVs)

Table 20: Road Transport Mileage on the TEN-T (Roads) network for each country, Road Type, and Core and Non-Core Networks, HGVs (Calculated)

Country	Billion VKm per Year					Share %				
	Total	Motorway	Non- motorway	Core	Non- Core	Total	Motorway	Non-motorway	Core	Non- Core
Austria	3.52	3.52	0	2.69	0.83	3.2%	100.0%	0.0%	76.5%	23.5%
Belgium (Flanders)	3.83	3.82	0.01	2.84	0.99	3.5%	99.8%	0.2%	74.2%	25.8%
Denmark	2.20	2.08	0.12	1.68	0.52	2.0%	94.6%	5.4%	76.5%	23.5%
Estonia	0.39	0	0.39	0.21	0.18	0.4%	0.0%	100.0%	53.7%	46.3%
Finland	1.60	0.57	1.04	0.59	1.01	1.5%	35.4%	64.6%	36.9%	63.1%
Germany	31.27	31.01	0.26	23.37	7.90	28.8%	99.2%	0.8%	74.7%	25.3%
Hungary	2.94	2.37	0.57	2.66	0.28	2.7%	80.7%	19.3%	90.5%	9.5%
Iceland	0.12	0.00	0.12	0.02	0.10	0.1%	3.2%	96.8%	16.7%	83.3%
Ireland	1.03	0.69	0.34	0.48	0.54	0.9%	67.1%	32.9%	47.1%	52.9%
Italy	1.97	1.64	0.33	0.78	1.19	1.8%	83.4%	16.6%	39.7%	60.3%
Lithuania	1.00	0.33	0.67	0.71	0.29	0.9%	33.3%	66.7%	70.7%	29.3%
Luxembourg	0.10	0.10	0	0.10	0.00	0.1%	100.0%	0.0%	100.0%	0.0%
Malta	-	-	-	-	-	-	-	-	-	-
Netherlands	6.60	6.60	0	2.63	3.97	6.1%	100.0%	0.0%	39.9%	60.1%
Norway	1.83	0.89	0.95	0.19	1.65	1.7%	48.5%	51.5%	10.3%	89.7%
Poland	11.04	7.87	3.17	7.42	3.63	10.2%	71.3%	28.7%	67.2%	32.8%
Slovenia	0.90	0.89	0.01	0.84	0.06	0.8%	99.2%	0.8%	92.9%	7.1%
Spain	15.69	15.40	0.30	10.84	4.86	14.5%	98.1%	1.9%	69.1%	30.9%
Sweden	5.05	2.40	2.65	2.65	2.41	4.7%	47.5%	52.5%	52.4%	47.6%
Switzerland	1.14	1.12	0.02	0.37	0.77	1.1%	98.5%	1.5%	32.4%	67.6%
UK	16.20	12.93	3.27	10.93	5.27	14.9%	79.8%	20.2%	67.5%	32.5%
Total	108.44	94.25	14.19	72.01	36.43	100.0%	86.9%	13.1%	66.4%	33.6%

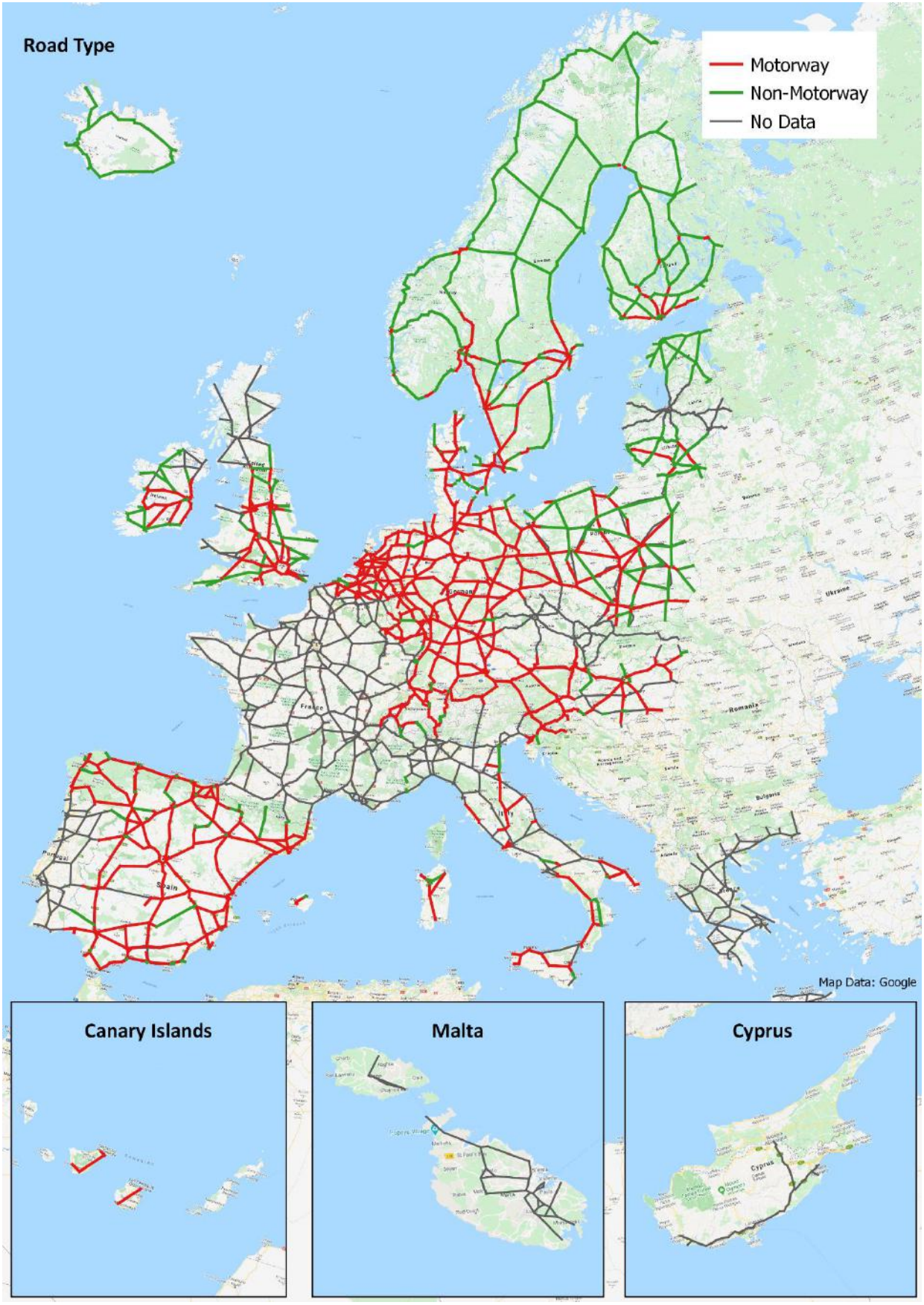
10.17 Fatal Accidents

Table 21: Average TEN-T (Roads) Annual Fatal Accident Rate by country

Country	Average Annual Fatal Accident Rate [Fatal Accidents/BVehKm]	
	Motorway	Non-motorway
Austria	1.25	-
Belgium (Flanders)	2.20	6.84
Denmark	1.15	3.53
Estonia	-	7.83
Finland	1.12	4.88
Germany	1.48	2.56
Hungary	1.93	4.42
Iceland	1.28	3.37
Ireland	-	-
Italy	3.10	7.77
Lithuania	5.12	10.52
Luxembourg	3.64	-
Malta	-	-
Netherlands	1.09	-
Norway	1.25	4.75
Poland	4.60	16.36
Slovenia	2.66	11.49
Spain	3.65	13.40
Sweden	1.72	2.55
Switzerland	1.06	1.53
UK	0.74	1.79
Average	2.09	6.45

11 ANNEX 4: THEMATIC MAPS

11.1 Road Type

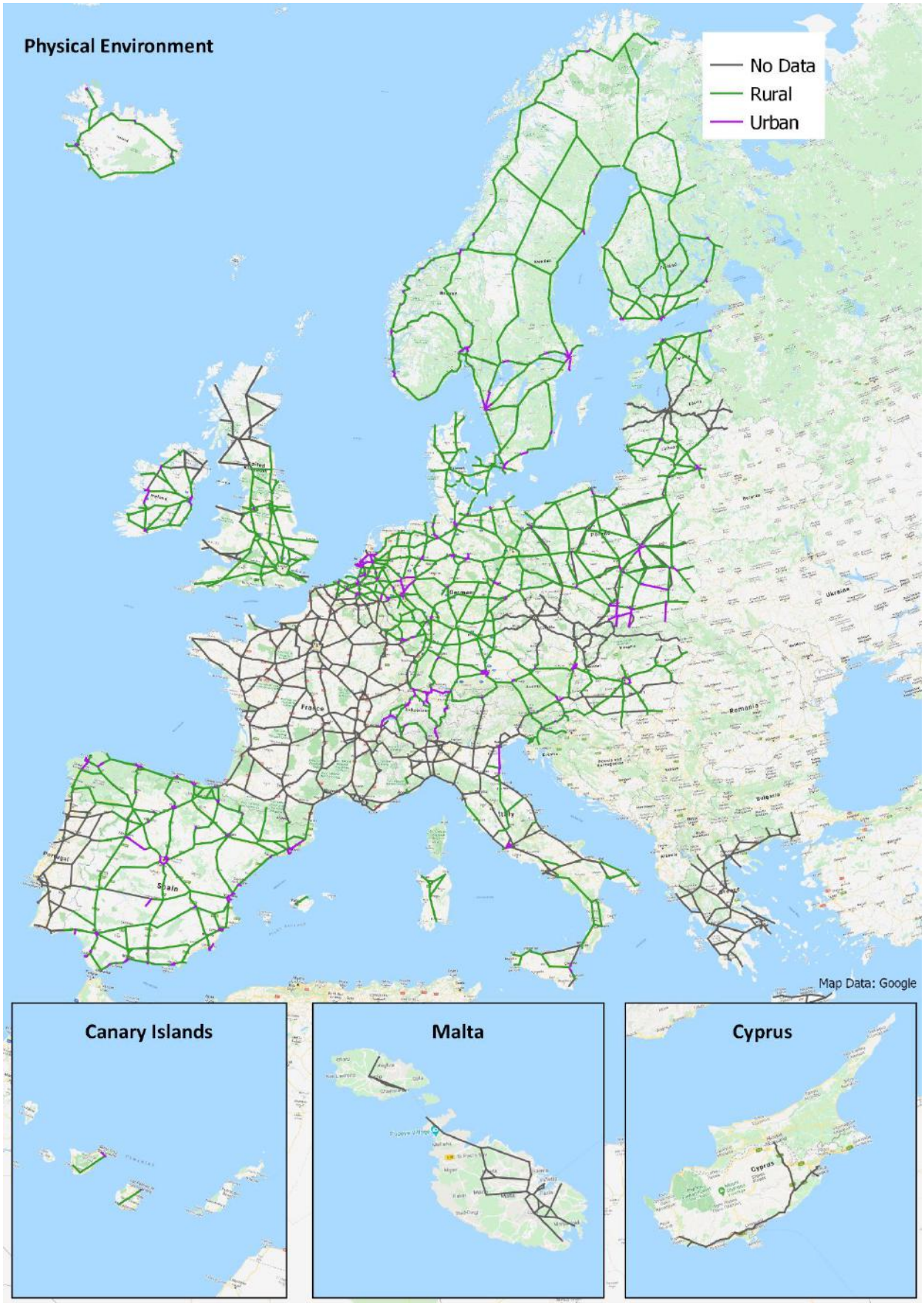


11.2 Number of Lanes

11.3 Length of Bridges

11.4 Length of Tunnels

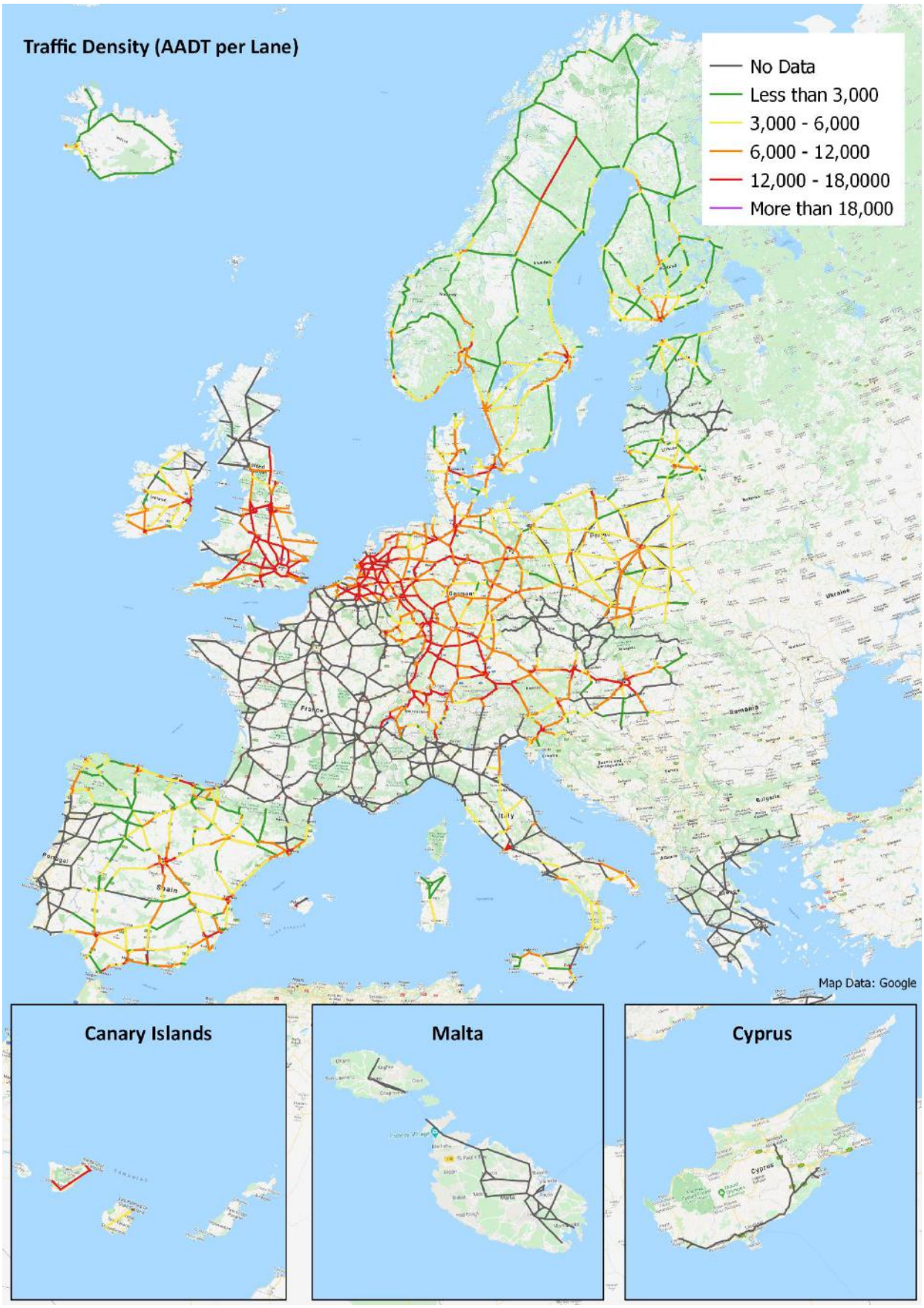
11.5 Physical Environment



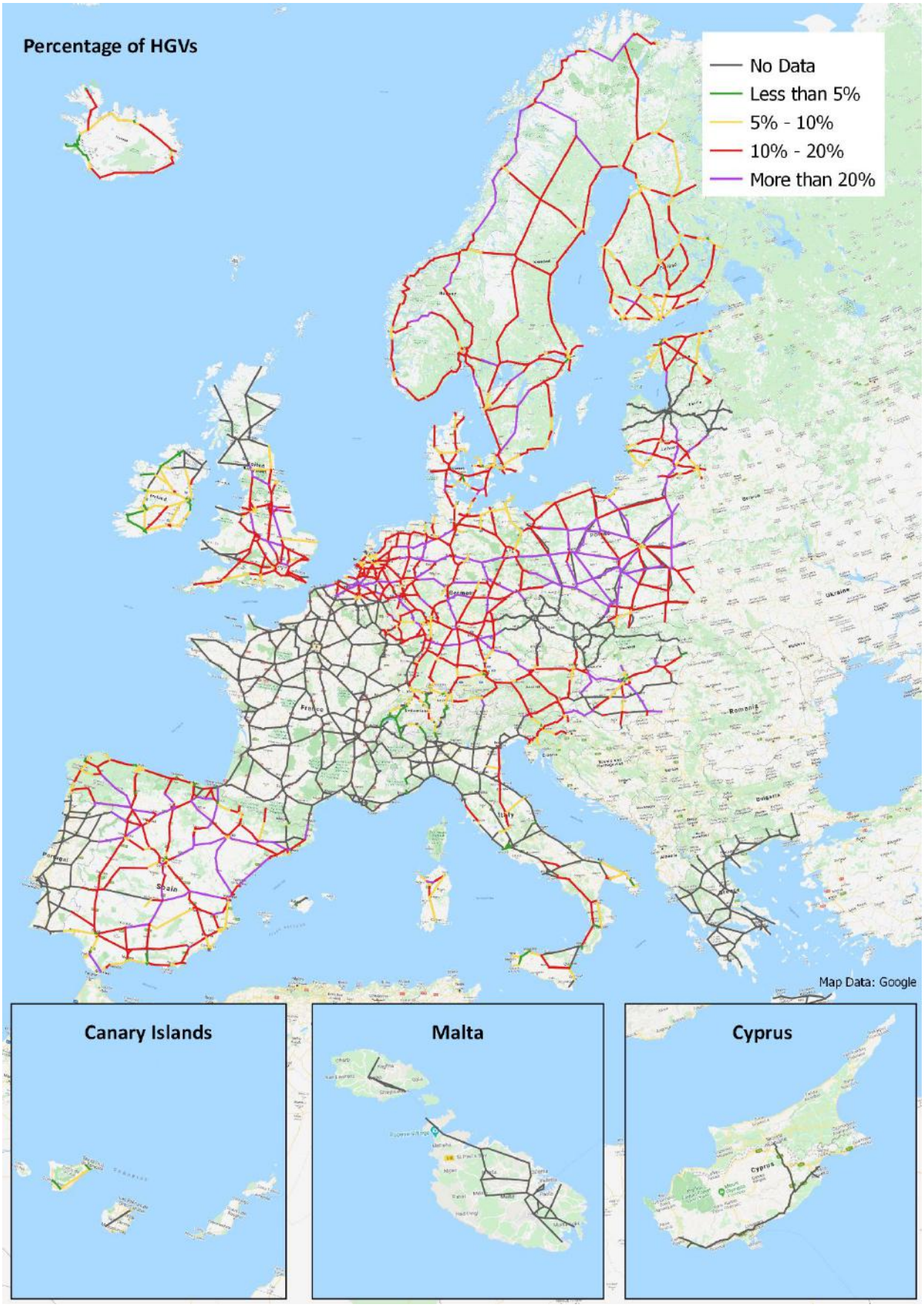
11.6 Intelligent Transport Systems (ITS)

11.7 Average Daily Traffic Flow

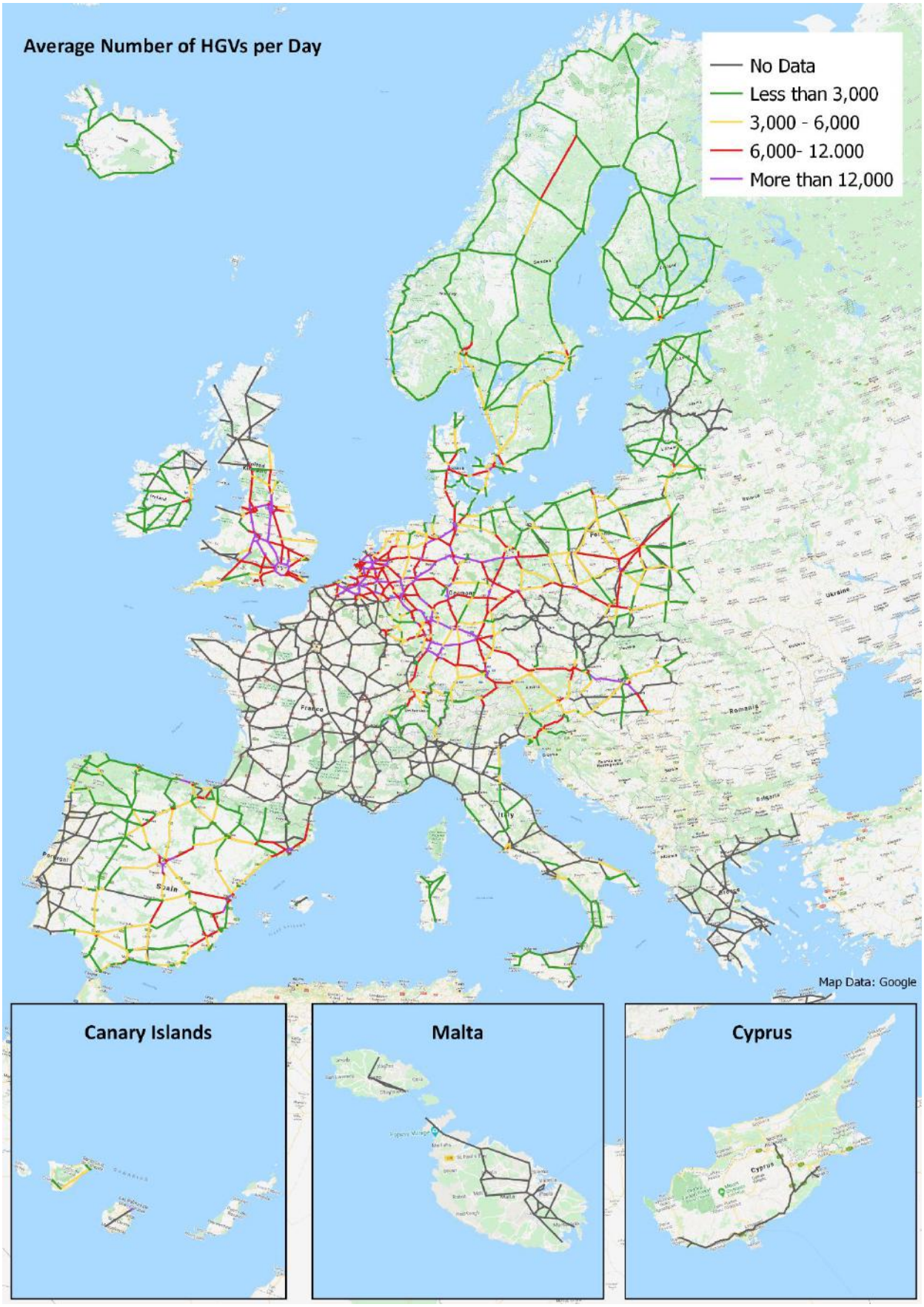
11.8 Traffic Density



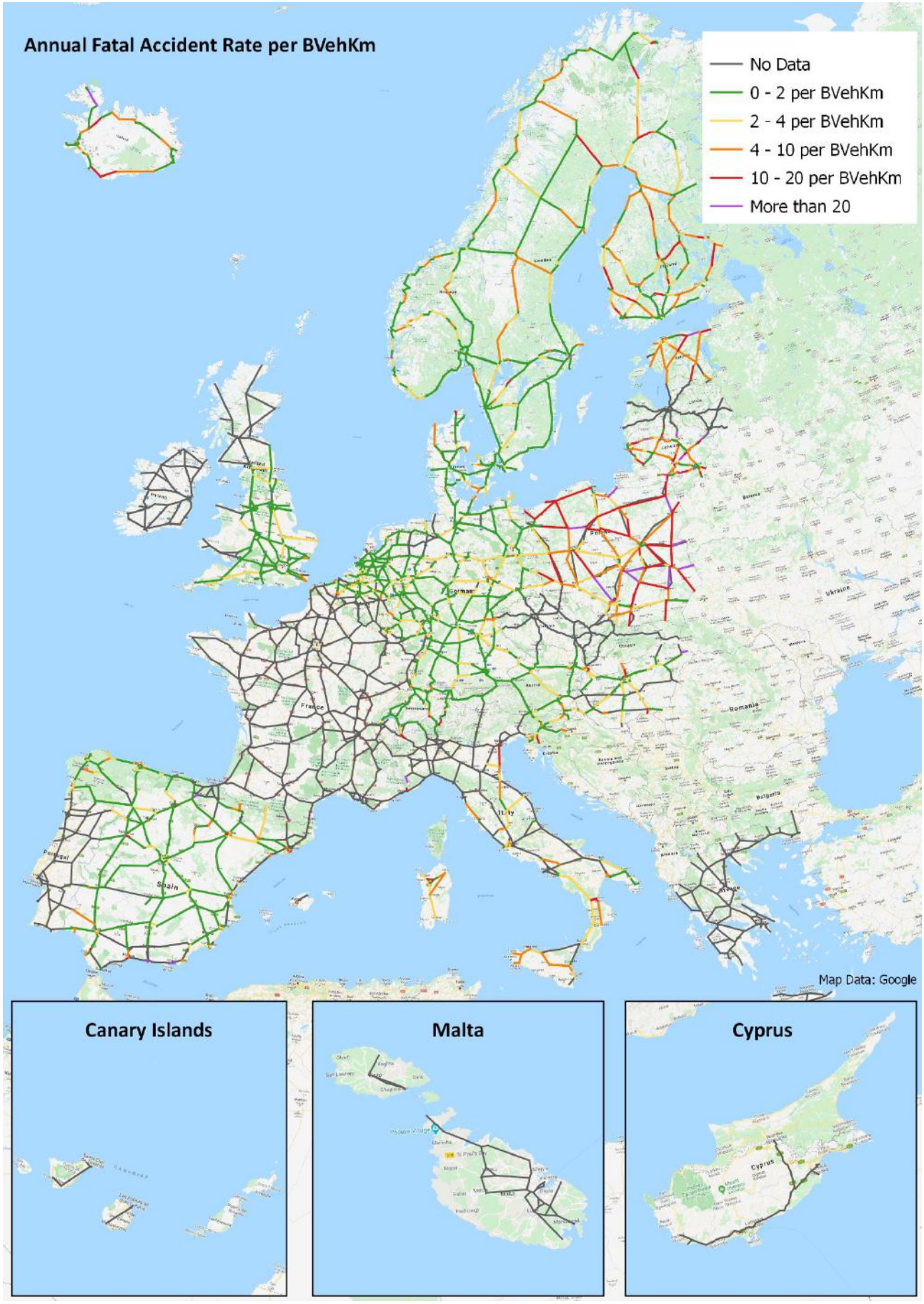
11.9 Proportion of Average Daily Traffic comprising HGVs



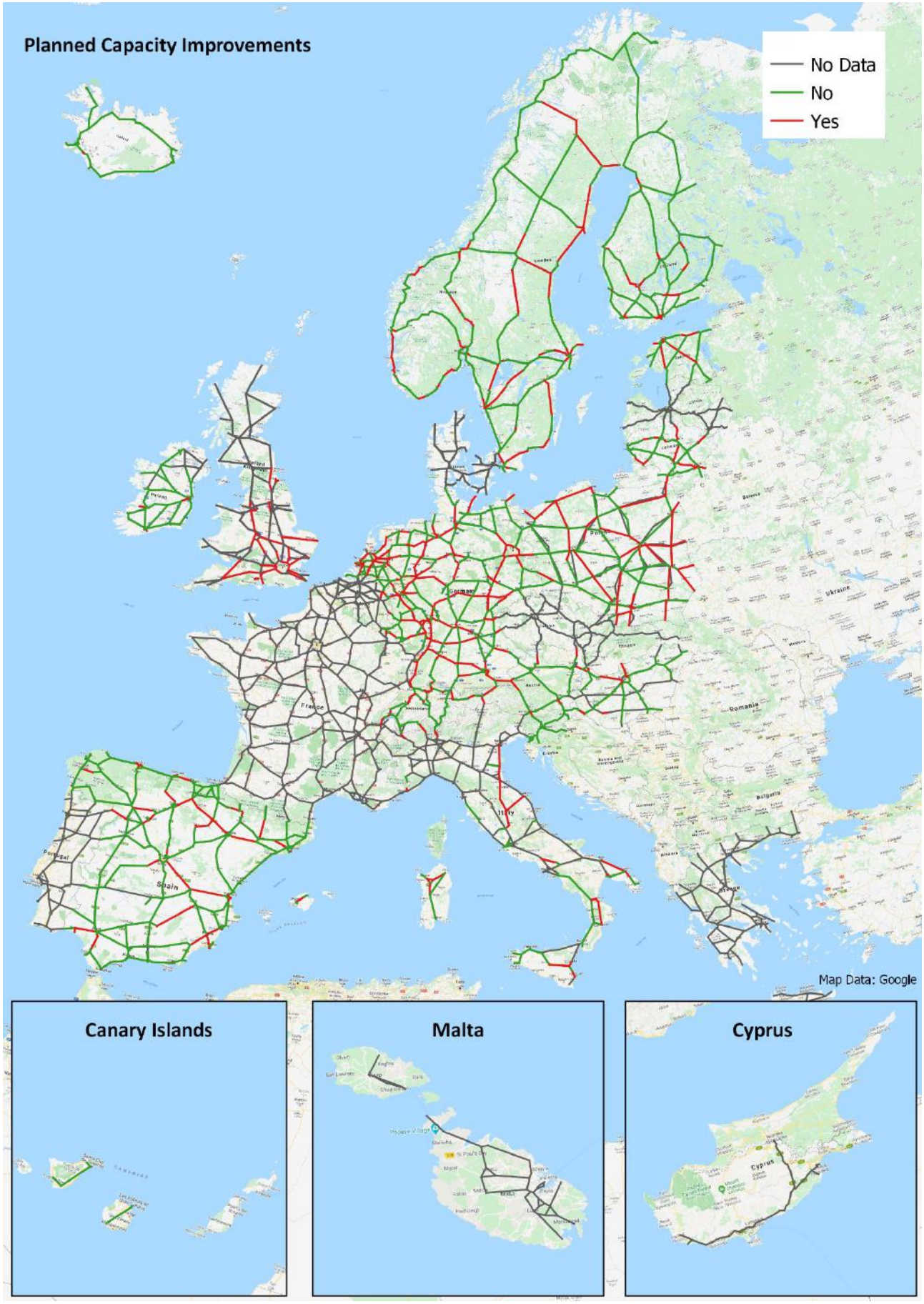
11.10 Average Daily HGV traffic



11.11 Annual Average Fatal Accident Rate



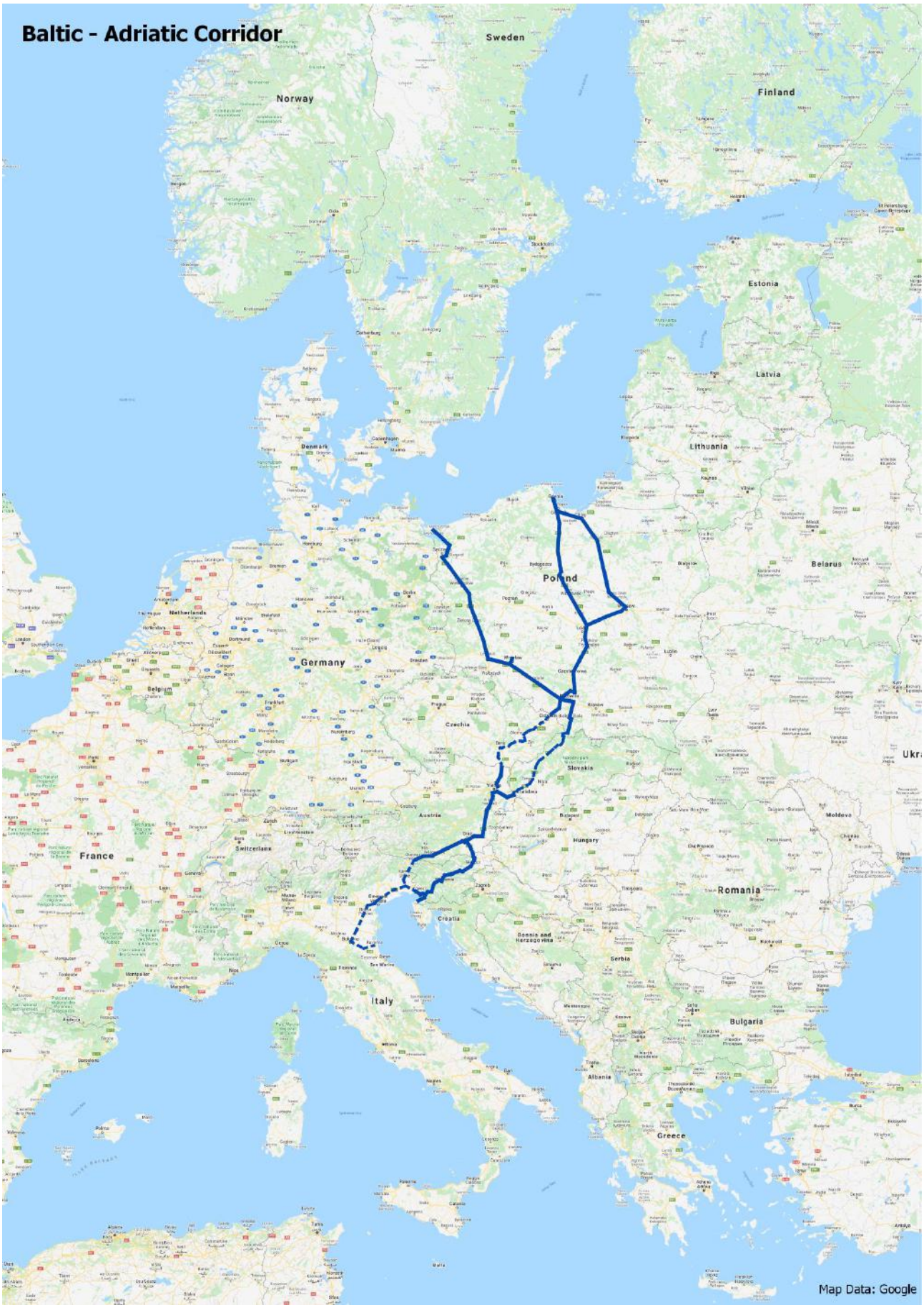
11.12 Planned Capacity Improvements



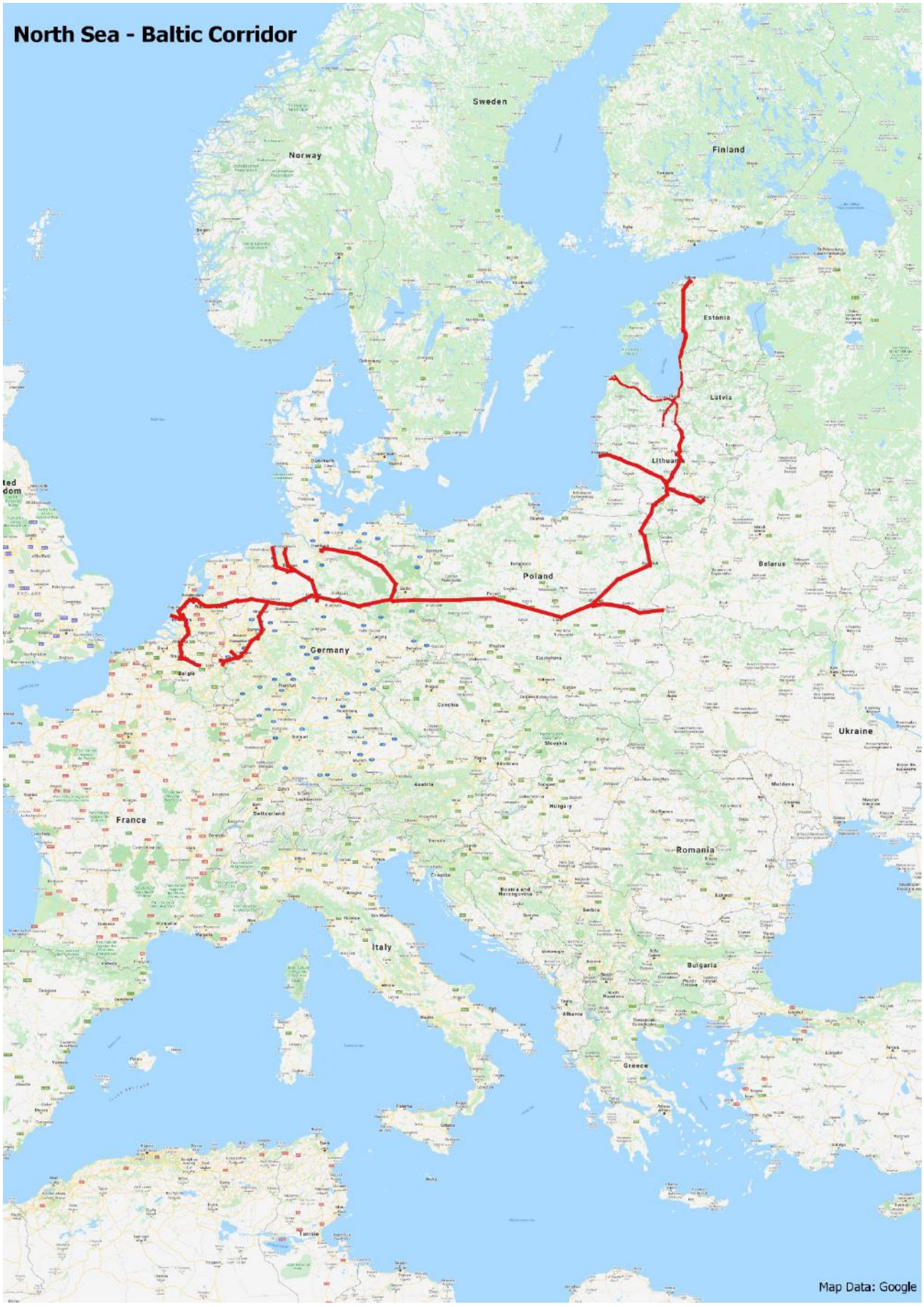
12 ANNEX 5: CORRIDOR MAPS

Solid lines in the maps show the Core Network Corridors in participating countries. Dashed lines show the route of the corrifors through non-participating countries or where there is no data available.

12.1 Baltic–Adriatic Road Corridor

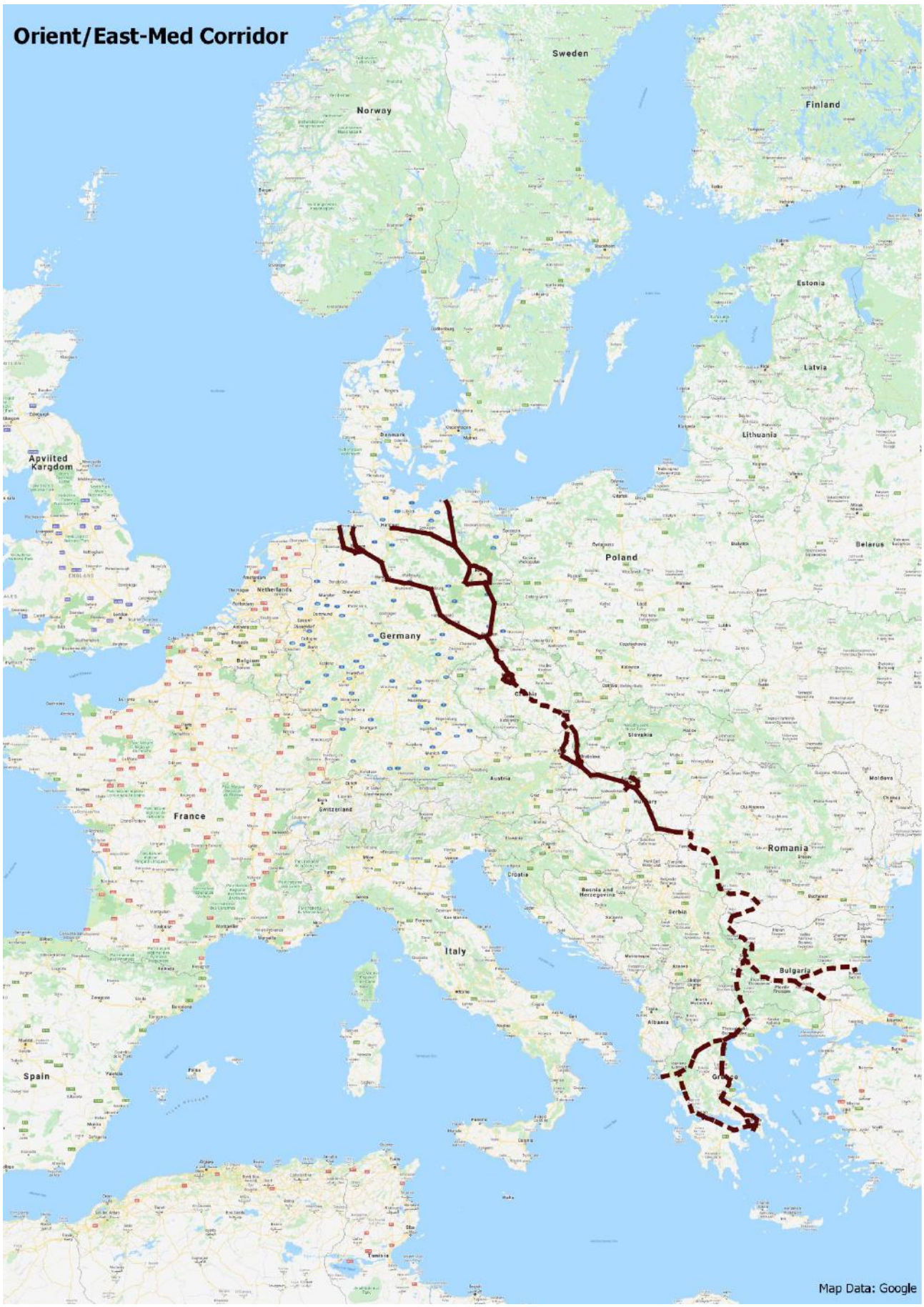


12.2 North Sea–Baltic Road Corridor

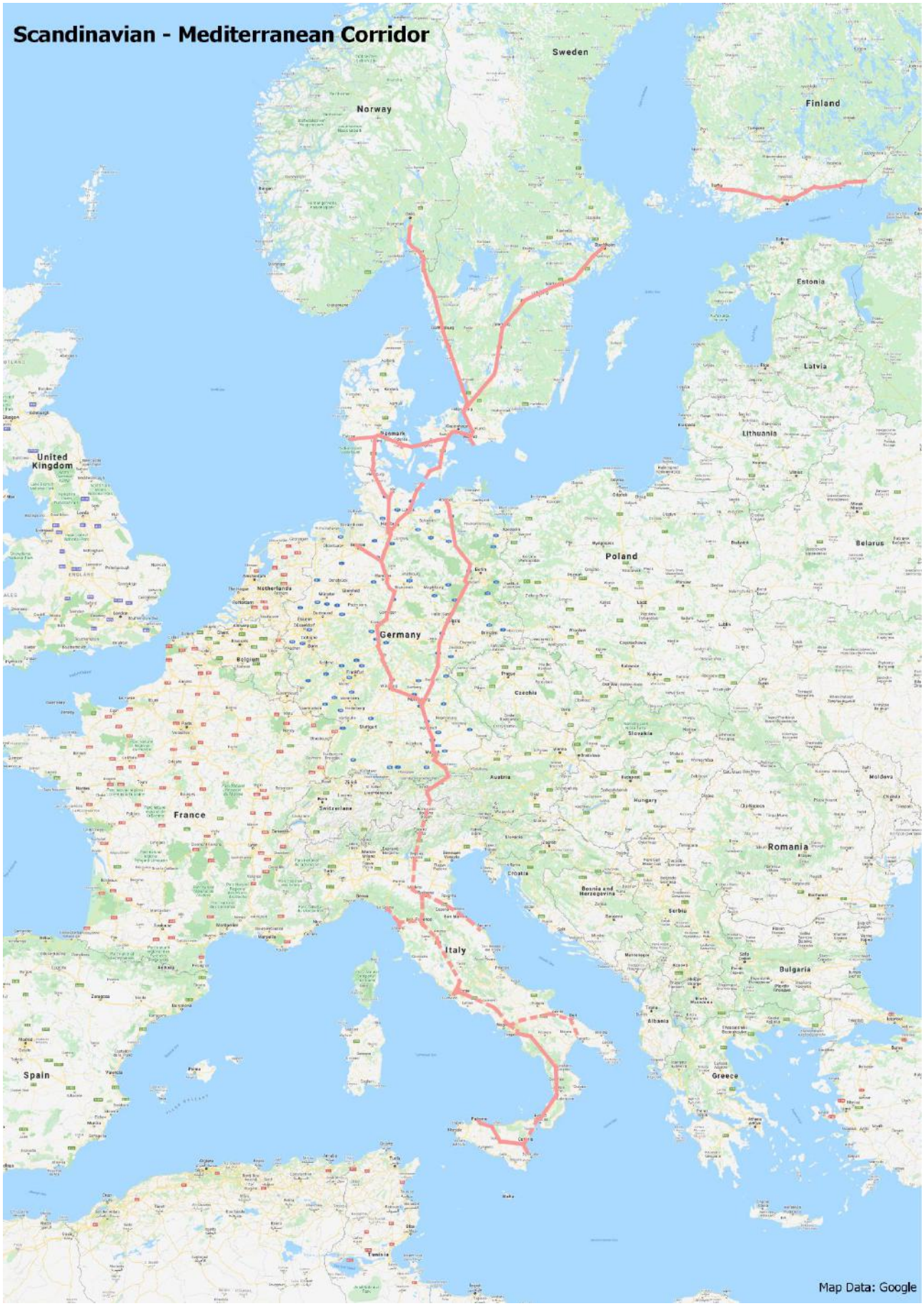


12.3 Mediterranean Road Corridor

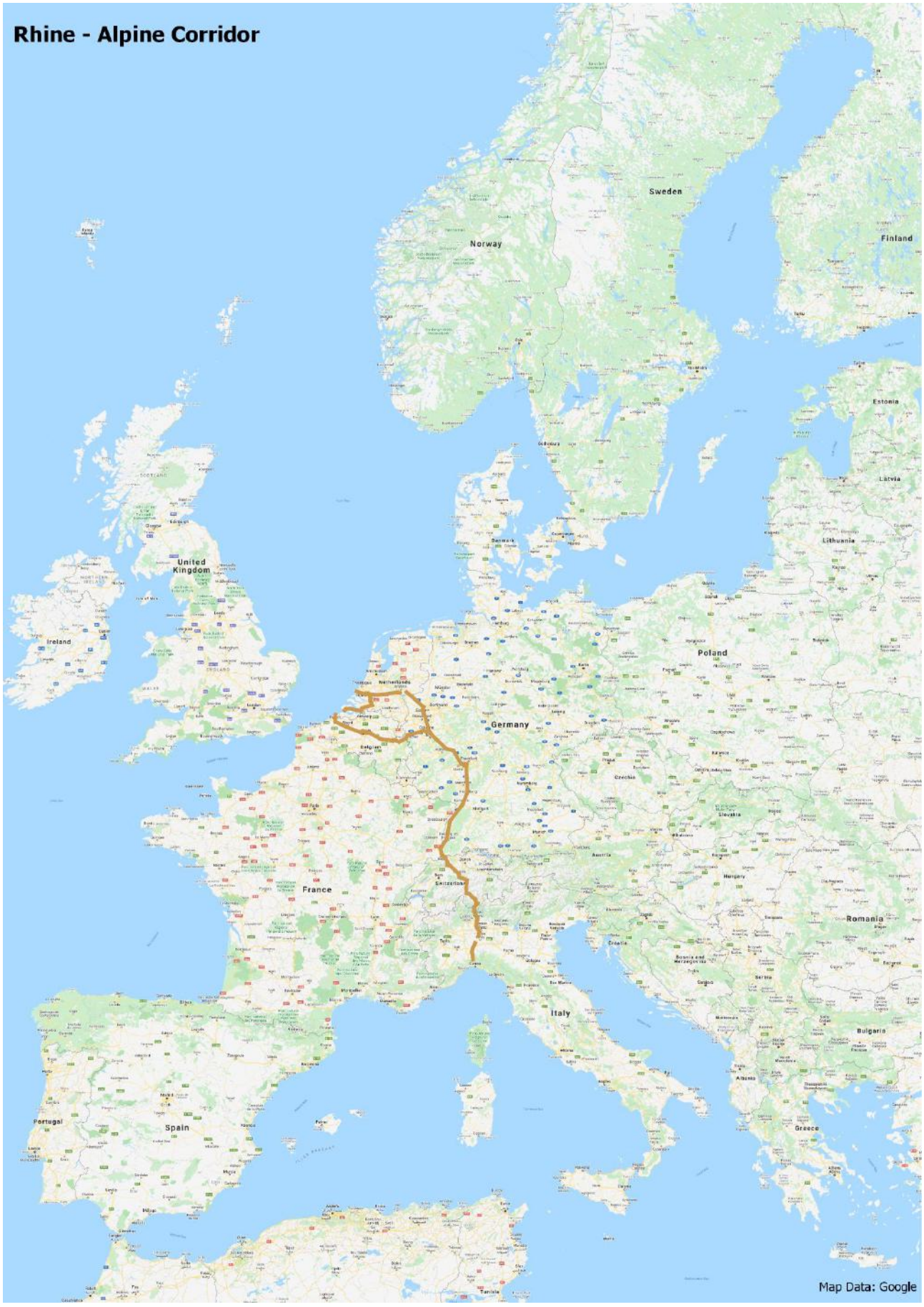
12.4 Orient/East–Med Road Corridor



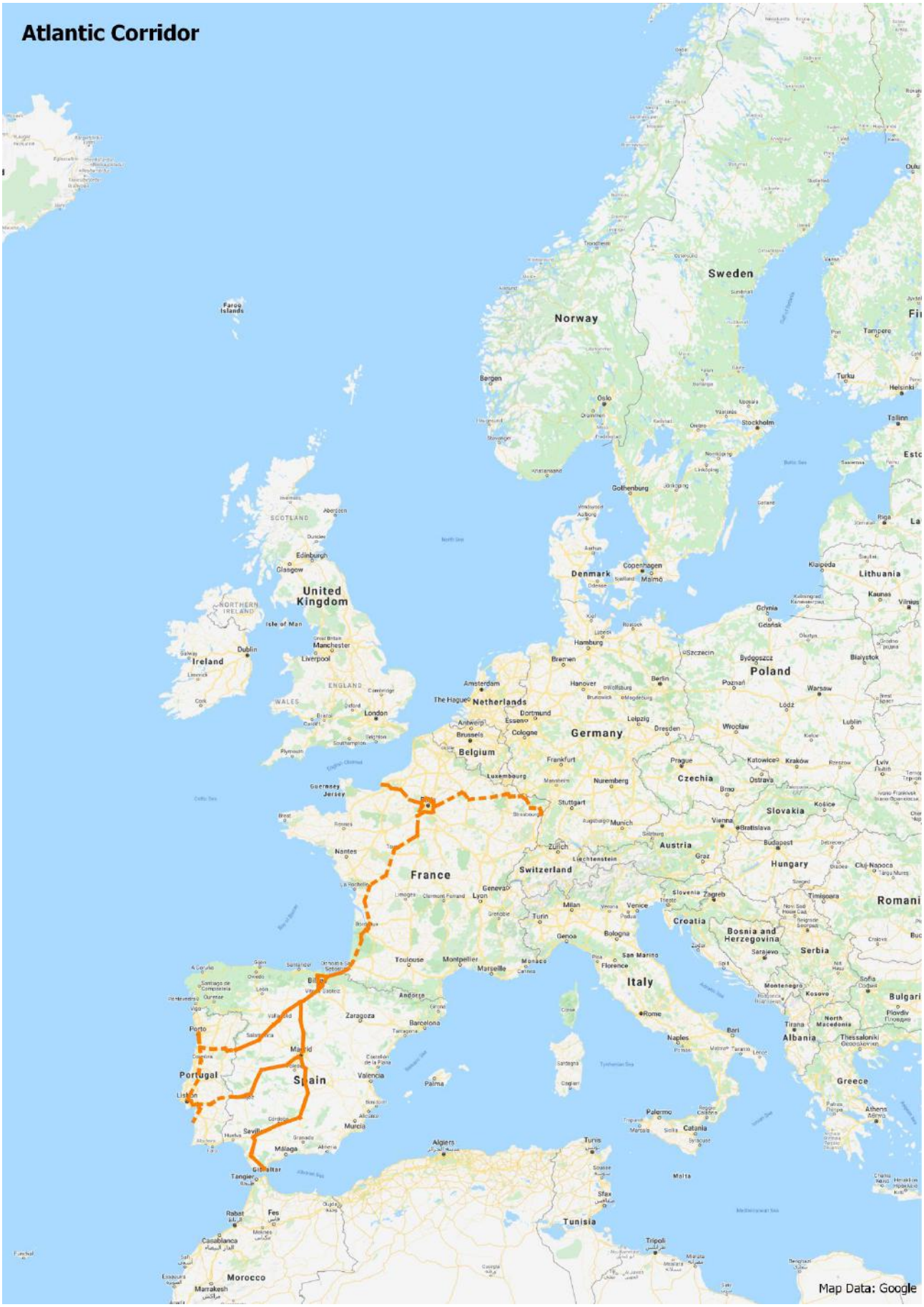
12.5 Scandinavian–Mediterranean Road Corridor



12.6 Rhine–Alpine Road Corridor

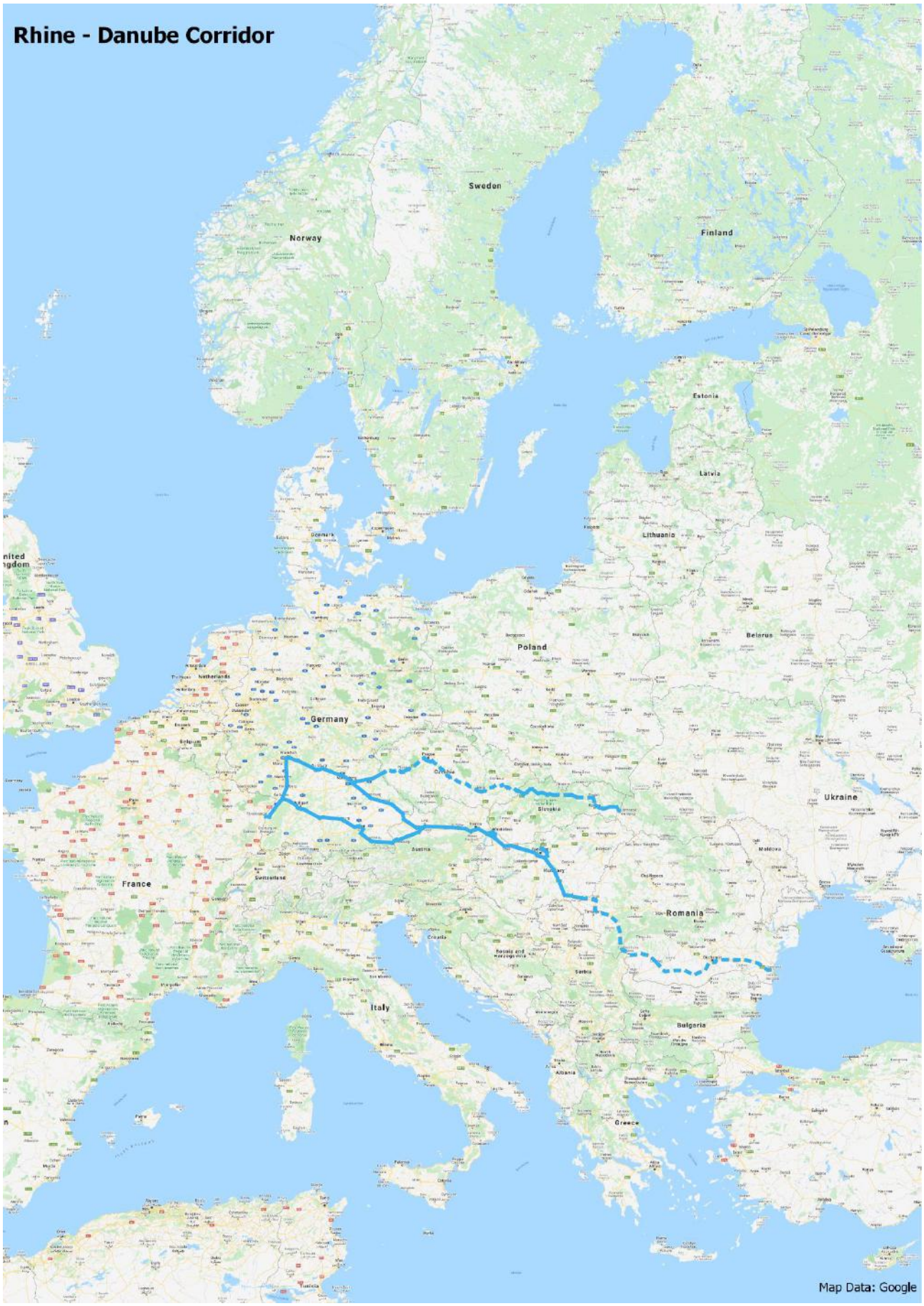


12.7 Atlantic Road Corridor



12.8 North Sea–Mediterranean Road Corridor

12.9 Rhine–Danube Road Corridor



13 ANNEX 6: COUNTRY BACKGROUND INFORMATION

13.1 National Statistics

Table 22 shows the length and performance of the TEN-T road network computed for the 22 participating countries on the basis of the data delivered.

Table 22: Length and performance of the TEN-T (Roads) network

Country	National statistics		TEN-T (Roads) network length (km)[5]					TEN-T (Roads) network use (Average)		
	Population [1,000s][6]	Total area [km²]	Comprehensive	Core	Non-Core	Motorway	Non-motorway	Traffic Flow [AADT]	Traffic Density [AADT/Lane]	HGV [%]
AT	8,847	83,872	1,740	1,105	635	1,740		57,554	11,590	11.6%
BE-F	11,422	30,510	948	604	344	820	128	83,014	15,542	18.4%
CH	8,517	41,290	1,325	300	1,025	1,143	182	56,235	12,481	6.0%
DE	82,928	357,021	10,713	6,365	4,348	10,350	363	59,244	11,935	15.1%
DK	5,797	43,098	1,560	764	796	1,175	385	34,213	7,823	12.3%
EE	1,321	45,228	1,350	481	870		1,350	10,742	3,871	12.1%
ES	46,724	504,030	12,255	5,940	6,315	10,932	1,323	32,867	7,530	14.0%
FI	5,518	338,424	5,205	1,100	4,106	812	4,394	14,734	4,384	10.2%
HU	9769	93030	1,474	1,058	416	1,130	344	33,936	8,256	17.6%
IR	4,854	70,280	2,163	499	1,664	990	1,172	31,546	8,817	6.7%
IS	354	103,001	1,805	54	1,751	3	1,802	15,158	4,283	7.1%
IT	60,431	301,338	3,016	827	2,189	2,297	719	28,097	6,690	9.3%
LT	2,790	65,200	1,652	597	1,055	361	1,291	11,338	3,838	17.4%
LU	608	2,586	90	90	0	90	0	52,835	13,070	14.2%
MT	484	-	114	17	96	-	114	-	-	-
NL	17,231	41,543	1,886	643	1,243	1,886	0	81,417	15,269	13.7%
NO	5,314	385,252	4,793	175	4,618	678	4,115	15,865	4,834	14.8%
PO	37,979	312,685	7,501	3,812	3,689	3,752	3,749	25,508	6,328	20.7%
SE	10,183	449,964	6,417	3,012	3,405	1,913	4,504	18,382	5,102	14.4%
SI	2,067	20,273	599	471	128	556	43	33,402	8,302	13.4%
UK - E	66,489	223,010	4,441	2,152	2,286	2,729	1,712	77,527	13,990	15.0%
Total/ Average	389,627	3,511,635	71,046	30,065	40,978	43,357	27,690	38,681	8,697	13%

Source: Eurostat, CEDR data on TEN-T road network

[5] The Comprehensive network comprises the Core and the Non-core networks. The sum of Motorway and Non- motorway road lengths equals the length of the Comprehensive network.

[6] Population as at 1 January 2020 from Eurostat.

Table 22 shows a high proportion of HGVs for Central European countries and in particular for the Slovak Republic, Poland, Hungary, and Lithuania, and a low proportion for Iceland, Ireland, and Switzerland. The lowest value for Switzerland is due to the construction of infrastructure to transfer HGV's from road to rail and the use of taxes for HGV's to encourage this transfer.

Figure 38 compares the Traffic Density on the TEN-T road network (calculated from data provided on the Annual Average Daily Traffic and Number of Lanes) to the national population (from Eurostat) for each participating country.

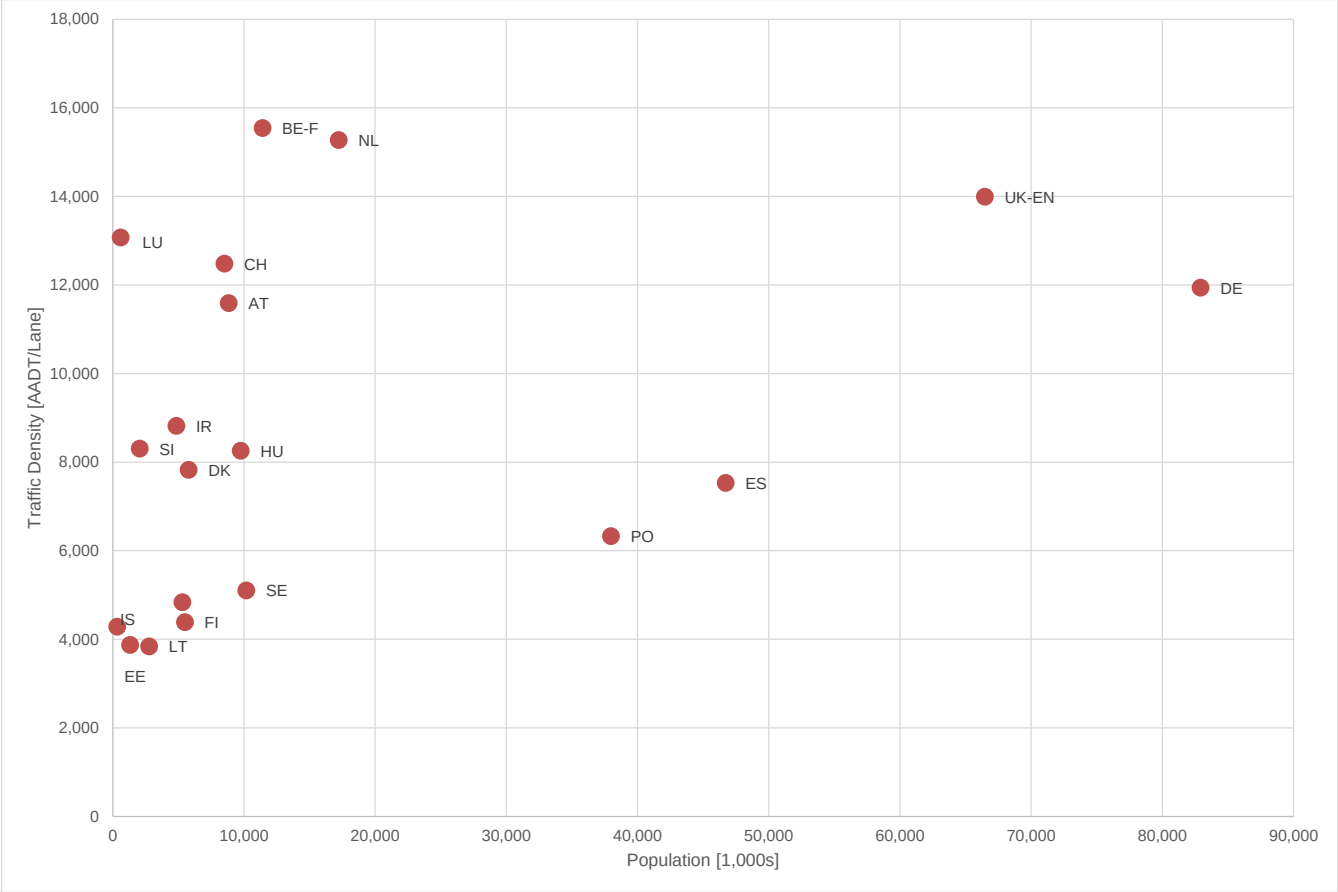


Figure 38: Comparison of Population and Traffic Density on TEN-T (Roads)

The correlation between the length of the TEN-T road network and the surface area of each participating country is shown in Figure 39. It can also be seen that most of the participating countries have a surface area of less than 100,000 km^2 and a TEN-T road network shorter than 2,200 km.

The trend line clearly shows that the length of the TEN-T network is proportional to the size of the country.

Moreover, this figure shows how the countries form two groupings based on their surface area and length of TEN-T road network: bigger countries (i.e. those with a surface area greater than 100,000 km^2), which can be further broken down into countries with a relatively long TEN-T network (above the trend line) and countries with a relatively short network compared to their surface area (below the trend line), and smaller countries (i.e. those with a surface area smaller than 100,000 km^2).

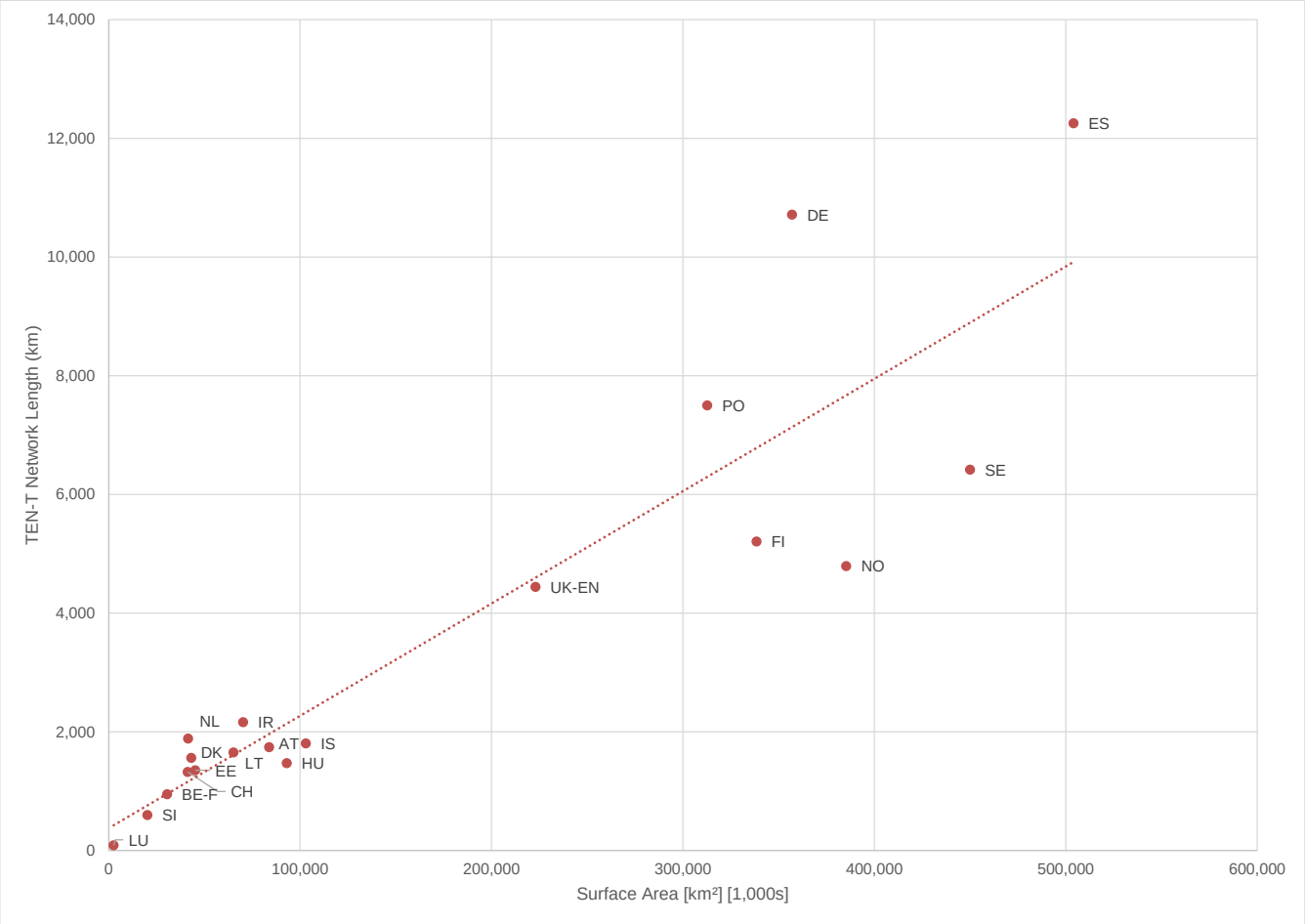


Figure 39: Comparison of the length of the TEN-T (Roads) network and the surface area of CEDR countries

Figure 40 combines the surface area (y axis), population (x axis), and relative Traffic Density (size of the circles). It shows that Switzerland, Austria, Luxembourg, and the Netherlands have a relatively high traffic density on their TEN-T network in relation to their population and surface area when compared with Germany.

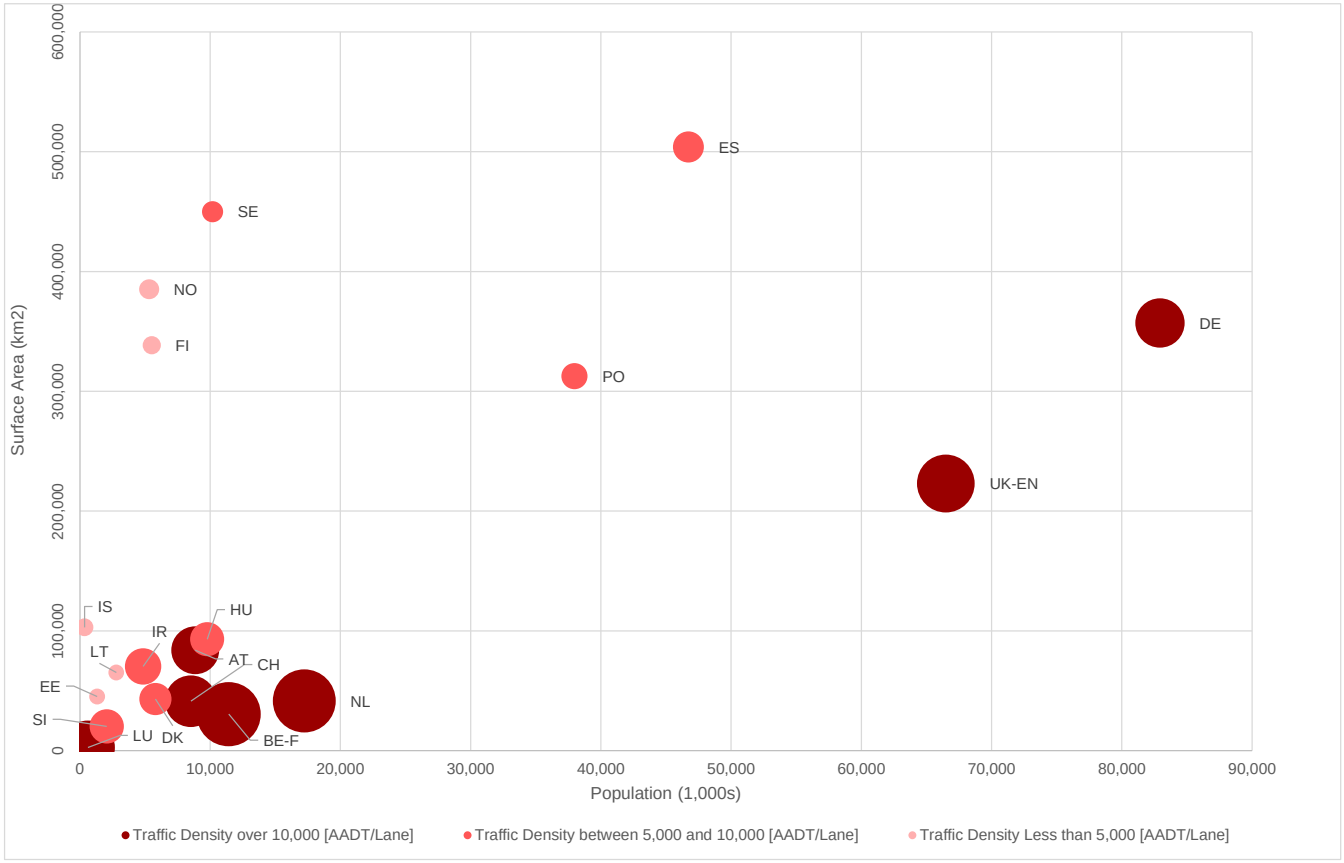


Figure 40: Traffic density vs. surface area and population

13.2 National Road Administration Profiles

The country factsheets provided below are based on information collected from different sources.

1. The description of the National Road Authorities has been provided by NRAs themselves to give an overview of their structure, responsibilities, and financing sources.
2. As far as possible, data provided in the infographics has been gleaned from centralised international data sources (i.e. EUROSTAT, World Bank) to get harmonised data for all member states and to avoid any problems regarding a lack of comparability.
3. Data on median age, GDP per capita, motorisation rate, road network length, road passengers' performance, road freight performance, and road fatalities have been sourced from EUROSTAT.
4. Data on total population, total area, urban and rural population and population ratio, population density, GDP composition and unemployment have been sourced from the World Bank.
5. Data on TEN-T roads network length (Total, Non-Core, Core, Corridors) have been sourced from data provided by NRAs.

Table 23 gives detailed references and links to the sources of data.

Table 23: Data Sources for National Road Administration Profiles

Data Item	Year	Source
Total Population	2018	The World Bank
Total Area	2018	The World Bank
Median Age	2018	EuroStat
Urban Population [1,000s]	2018	The World Bank
Urban Population Ratio (%)	2018	The World Bank
Rural Population [1,000s]	2018	The World Bank
Rural Population Ratio (%)	2018	The World Bank
Inhabitants per Sq.km	2018	The World Bank
GDP per Capita (€ per capita)	2019	EuroStat
% GDP by Sector	2018	The World Bank
Unemployment Rate	2018	The World Bank
Cars per 1000 Inhabitants	2018	EuroStat
Total Classified Road Length (km) (2017)	2017	EuroStat
Non-Strategic Length (km)	2017	EuroStat
Strategic Length (km)	2017	EuroStat
TEN-T Network (km)	2019	TEN-T Report Data as supplied by NRAs
Non-Core TEN-T Network (km)	2019	TEN-T Report Data as supplied by NRAs
Core TEN-T Network (km)	2019	TEN-T Report Data as supplied by NRAs
TEN-T Core Network Corridor (km)	2019	TEN-T Report Data as supplied by NRAs
Billion tkm by truck	2017	European Commission
Billion pkm by car	2017	European Commission
Road Fatalities	2017	European Commission

Austria

DEMOGRAPHY

8.84 million inhabitants in 2018

43.2 years median age in 2018

58.30% Urban Population

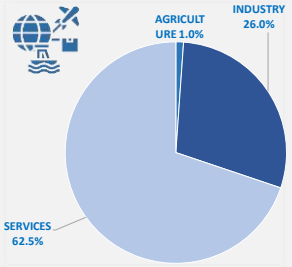
41.70% Rural Population

107 Inhabitants per sq. km in 2018

ECONOMY

44,900 GDP per capita in 2019

4.8% unemployment rate in 2018



ROAD TRANSPORT

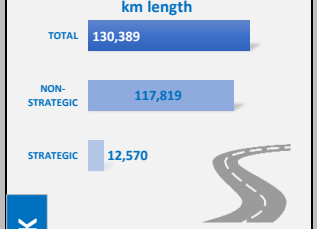
562 cars per 1000 inhabitants in 2018

45.8 billion tkm by truck in 2017

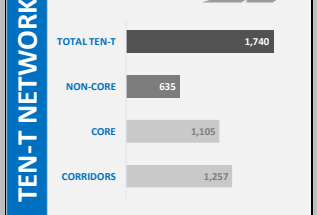
81.8 billion pkm by car in 2017

414 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



ASFINAG

General description

ASFINAG is an Austrian highway financing stock corporation which is 100% owned by the Republic of Austria. ASFINAG provides a road network that meets its customers' requirements, is well-serviced and developed with a special focus on road safety and optimal availability as well as user-friendly tolling systems. All of the activities are directed towards fulfilling economic, environmental, and social responsibilities while strengthening Austria's position as a business location. The focus areas of ASFINAG are planning, financing, construction, maintenance, operating and tolling. The ASFINAG motorway and expressway network currently comprises 2,223 kilometres. As of 2018 the ASFINAG group has 2,687 employees.

Responsibility

The company has a comprehensive area of responsibilities:

- The company has a comprehensive area of responsibilities:
- The planning and construction of new road projects
- The operation and maintenance of the existing network
- The tolling of motorways and expressways
- The development of telematics services
- The funding of investments into the road network
- Under a sustainable future-oriented approach

Financing

In 2018 ASFINAG invested a total of EUR 844 million in the maintenance and construction of the road network. ASFINAG is a fully user financed network provider and does not receive any subsidies. ASFINAG is financed via the capital market and is a well-established issuer of bonds that is highly regarded on the national and international financial markets. The bonds issued are provided with a guarantee by the Republic of Austria and receive the rating of Aa1/AA+ by rating agencies. International financing activities are based on the ASFINAG European MediumTerm Note Programme (EMTN), which is updated regularly and defines the legal framework for issues.

Belgium (Flanders)

Agentschap Wegen en Verkeer (AWV)

DEMOGRAPHY

11.43 million Inhabitants in 2018

41.6 years median age in 2018

98.00% Urban Population

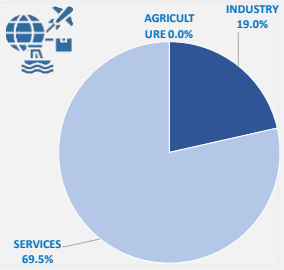
2.00% Rural Population

377 Inhabitants per sq. km in 2018

ECONOMY

41,240 GDP per capita in 2019

5.9% unemployment rate in 2018



ROAD TRANSPORT

511 cars per 1000 inhabitants in 2018

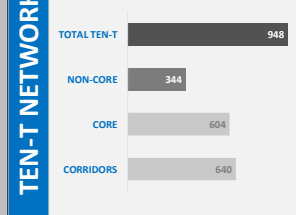
52.4 billion tkm by truck in 2017

106.9 billion pkm by car in 2017

615 road fatalities in 2017

ROAD NETWORK

TEN-T NETWORK



General description

The Agency for Roads and Traffic (Agentschap Wegen en Verkeer/AWV) is the Flemish road authority responsible for Flemish motorways and regional roads. It operates about 7,000 km of roads and 7,700 km of cycling paths.

The agency's mission is to ensure safe, smooth, and sustainable mobility for all road users in Flanders.

In total, the agency employs about 1,300 people. AWV is divided into four horizontal and six territorial divisions. The horizontal knowledge domains (road construction, traffic engineering, Flemish traffic control centre, and planning & coordination) work in a matrix structure and run horizontally through the territorial departments.

Head offices are in Brussels, the six territorial departments are situated in Antwerp, Ghent, Leuven, Hasselt, and Bruges.

Responsibility

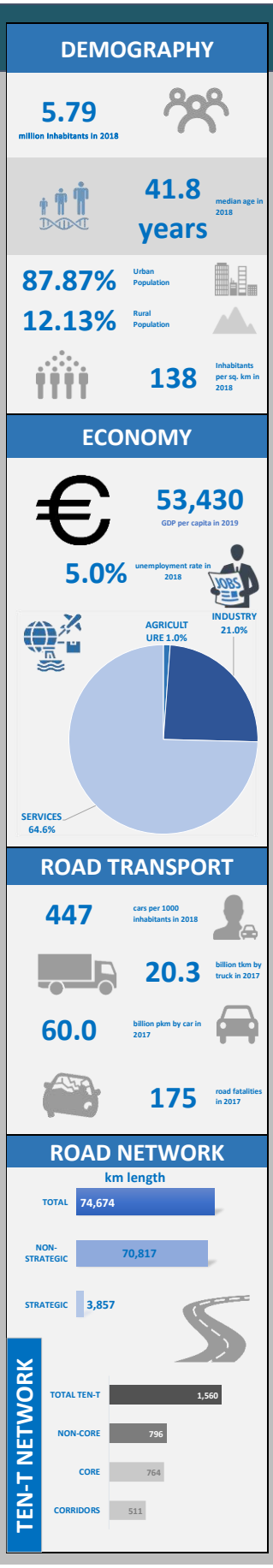
AWV is responsible for the design, construction, maintenance, and improvement of the road infrastructure (including bridges and electromechanics) that is assigned to it. AWV is also responsible for traffic management and the implementation of the mobility policy of the Flemish Government.

Financing

The total budget of AWV (€782 million) is distributed as follows: €470 million for investments, €170 million for maintenance, and the remainder for the cost of PPS constructions, operational costs, overheads, etc.

AWV is fully financed by the Flemish Government. €100 million of the total amount comes indirectly from road charging for lorries.

Denmark



Danish Road Directorate (DRD)

General description

The mission of the Danish Road Directorate is to be responsible for the national road network. The DRD promotes a coherent road and transportation system, taking the surroundings into account and striving to ensure that people and goods reach their destinations easily and safely.

DRD employed approx. 750 people in 2019. Six service centres are located in Copenhagen, Fløng, Næstved, Middelfart, Skanderborg, and Aalborg.

Responsibility

DRD is responsible for the national road network: Its main business areas are:

- Planning: the DRD conducts studies and plans in order to determine where new roads are to be built and where there is a need for increased traffic safety or capacity on the national road network;
- Design and construction: the DRD constructs new roads, roundabouts, cycle paths, and bridges, puts up noise barriers, and develops the existing road network;
- Traffic Management: the DRD guides road users through traffic, for example, in the event of accidents or road works via signposting, electronic information boards, and traffic information in various media;
- Maintenance: the DRD operates and maintains the roads and the surrounding areas by laying new asphalt, mowing the grass, and clearing snow from the roads.

Financing

With the exception of some minor business areas, the activities of the DRD are in general financed by national funding. Budget 2019: DKK 1,404 million for construction, DKK 1,213 million for maintenance, and DKK 483 million for other services.

Estonia

DEMOGRAPHY

1.32 million inhabitants in 2018

42 years median age in 2018

68.88% Urban Population

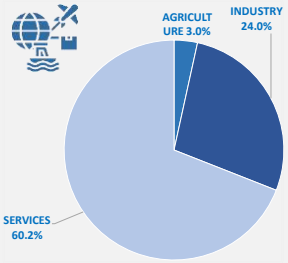
31.12% Rural Population

30.4 Inhabitants per sq. km in 2018

ECONOMY

21,160 GDP per capita in 2019

5.4% unemployment rate in 2018



ROAD TRANSPORT

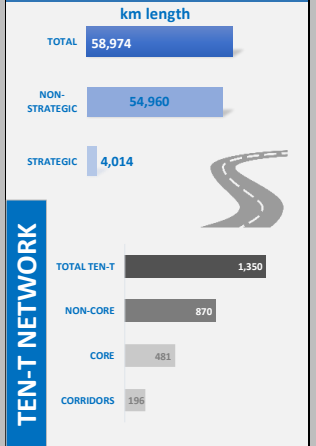
563 cars per 1000 inhabitants in 2018

2.9 billion tkm by truck in 2017

13.1 billion pkm by car in 2017

48 road fatalities in 2017

ROAD NETWORK



Estonian Road Administration (ERA)

General description

The Estonian Road Administration (ERA) is a governmental agency who operates within the administrative area of the Ministry of Economic Affairs and Communications and executes state supervision, implements state policies and offers public services on the basis and to the extent prescribed by law. The governmental agency was established in 1918 and it has had several official names during more than 100 years.

Responsibility

The main responsibilities and functions of ERA are as follows:

- Road management and creation of conditions for safe traffic on national roads.
- Increasing traffic safety and reducing harmful environmental impact of vehicles.
- Management of road traffic and public transport.
- Organisation of state supervision over compliance with the requirements established by legislation regulating area of activity and applying enforcement powers of the state.
- Keeping state registers of roads, vehicles and public transport, maintaining the system of stationary automated speed cameras.
- Participation in development of legislation regulating area of activity and making proposals for amending and supplementing the legislation, participation in working out the terminology connected with area of activity.
- Participating in elaboration of policies, strategies and development plans and preparation and implementation of international projects in area of activity.
- Implementing state policies and development plans in area of activity

The management structure consists of 3 divisions:

- Division of Strategic Planning
- Division of Road Works
- Division of Traffic Safety and Public Transport

Approximately 530 employees work for ERA.

The Head Office is located in Tallinn. National road network is managed centrally by the Head Office though there are 4 state road regions in Estonia named by the weather arc: Northern, Eastern, Southern and Western region. A service bureau is located in each of 15 counties. The Traffic Management Centre is a unit of the entire organization and is located in Tallinn also.

ERA is a possessor of 16 608 km of national road network.

National road network includes 1 609 km (9.7%) of main roads, 2 405 km (14.5%) of basic roads, 12 480 km (75.1%) of secondary roads and 114 km (0.7%) of other connecting roads. 72% of those are paved roads and 28% gravel roads. The density of national roads is 366 km per 1,000 km²

Local governments are the owners of 24 000 km of local rural roads and streets.

Financing

The main sources for costs and investments for state roads and other areas of responsibility of ERA arise from state revenues and external resources.

	In 2018 the overall annual expenditure from the state budget was 300 million euros, including 65 million euros for operating costs, 179 million euros for investments and 56 million euros for public transport grants (bus, waterways and air). External resources mainly consist of EU funds and revenues collected by ERA itself, which come from state fees and road user fees. 22 million euros from EU were invested into construction and reconstruction of national roads additionally to the state budget. 60%, i.e. 39 million euros of operating costs were used for maintenance of national roads. In recent years ERA has made rather big investments to the e-service area in order to enhance efficiency and improve the quality of services.

Finland

DEMOGRAPHY

5.52 million Inhabitants in 2018

42.7 years median age in 2018

85.38% Urban Population

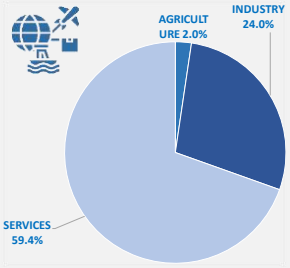
14.62% Rural Population

18.2 Inhabitants per sq. km in 2018

ECONOMY

43,480 GDP per capita in 2019

7.4% unemployment rate in 2018



ROAD TRANSPORT

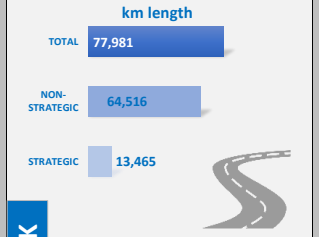
629 cars per 1000 inhabitants in 2018

27.5 billion tkm by truck in 2017

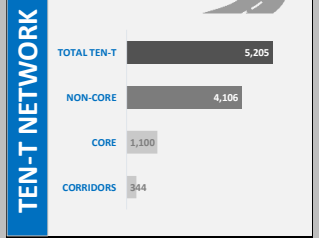
66.6 billion pkm by car in 2017

238 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Finnish Transport Infrastructure Agency (FTIA)

General description

Finnish Transport Infrastructure Agency (FTIA) is the Finnish Transport Administration, responsible for public roads, railways and waterways. The length of the public road network is about 83,000 km, including about 5,400 km of bicycle paths.

The mission of the FTIA is to make sure that the transport system works as a whole, which is a basic precondition for guaranteeing that society will function. The administration creates the prerequisites for ensuring that all transportation and travel is conducted in the best and safest way, regardless of where citizens live, with due consideration given to industries' needs, the environment and health.

The Finnish Transport Infrastructure Agency has approximately 850 employees, of which 420 work in the regional road centres. The Head Office is in Helsinki. There are nine regions for road keeping activities with regional centres (from south to north): Helsinki, Turku, Tampere, Kouvola, Kuopio, Jyväskylä, Vaasa, Oulu and Rovaniemi.

Responsibility

The main task of the Finnish Transport Infrastructure Agency is to be responsible for the long-term planning of the transport system for road, rail and waterways traffic, and for the construction, operation, and maintenance of state roads, waterways and railways.

The FTIA is a planning and procurement organisation, all road keeping and planning works, including traffic management have been outsourced to the private market since early 2000's.

Financing

Financing of FTIA activities is funded 100% from the state budget. The total budget (in 2019) was 903 million euros in business volume, of which 290 million euros for investments and 613 million for operation, maintenance, and traffic control, including costs for the planning process, state joint-financing (e.g. for public transport), state subsidies for private roads, contracted traffic, and support for research and innovation in the transport area.

Germany

Federal Ministry of Transport and Digital Infrastructure

DEMOGRAPHY

82.91 million inhabitants in 2018

46 years median age in 2018

77.31% Urban Population

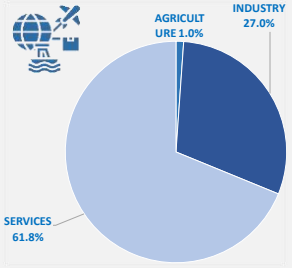
22.69% Rural Population

237 Inhabitants per sq. km in 2018

ECONOMY

41,340 GDP per capita in 2019

3.4% unemployment rate in 2018



ROAD TRANSPORT

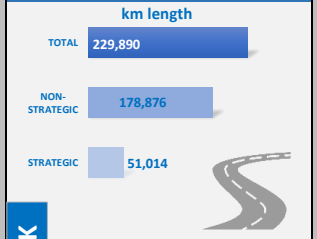
567 cars per 1000 inhabitants in 2018

463.3 billion tkm by truck in 2017

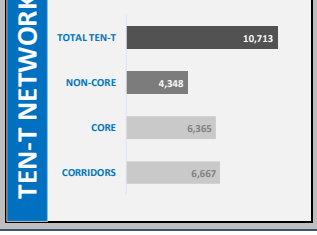
935.7 billion pkm by car in 2017

3,180 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



General description

Growing traffic and the need to ensure that Germany, as a leading exporting nation, remains a competitive site for economic activity means that the transport infrastructure, especially the road sector, has to meet enormous challenges in terms of efficiency, road safety, environmental protection and nowadays climate change mitigation.

A key question today is how to ensure that the necessary investments in maintenance and construction (for roads, bridges and tunnels) are made with the budget at disposal. Innovations for the “roads of the future” are necessary. According to the Federal Governments high-tech strategy the future roads will become more intelligent by means of modern traffic management, innovative road works and better incident management. Digitalisation in road traffic will help to reduce number of accidents and smooth the traffic flow.

The Department of Federal Trunk Roads within the Federal Ministry of Transport and Digital Infrastructure has about 120 employees. Together with the staff of the 16 road administrations in the Federal States (Länder) the management of the strategical road network is done under a framework of legal, financial and technical supervision. This framework ensures that a uniform, safe and efficient national road network is available in Germany.

Responsibility

The Federal Ministry of Transport and Digital Infrastructure is responsible for construction, maintenance, extension and improvement of the Federal Trunk Road Network (Motorways and Federal Highways including bridges, tunnels, service stations etc.) These responsibilities include financing, designing and drafting the part of roads in the overall Federal Transport Infrastructure Plan. The 16 Federal States construct, maintain and operate the Federal Trunk Roads on behalf of the Federal Government according to the Constitution of Germany within their own road administrations. For this purpose they also use procurement and tendering of contracts with private companies.

Financing

According to the new Federal Transport Infrastructure Plan 2030 Germany will invest in the years 2016-2030 more than 132 Billion € for the Federal Trunk Road network. The biggest part of 67 Billion € is foreseen for maintenance and more than 53 Billion € for extension and new construction of the network. The remaining of 12 Billion € is reserved for additional investments in roads. For operational cost (non-investments) the annual budget is about 1.2 Billion €. The source of financing is mainly federal tax funds and with increasing tendency to revenues from tolls.

Hungary

DEMOGRAPHY

9.78 million Inhabitants in 2018

42.6 years median age in 2018

71.35% Urban Population

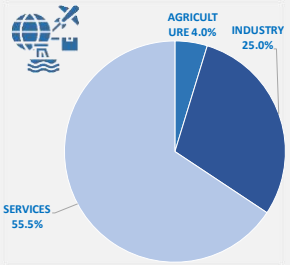
28.65% Rural Population

108 Inhabitants per sq. km in 2018

ECONOMY

14,720 GDP per capita in 2019

3.7% unemployment rate in 2018



ROAD TRANSPORT

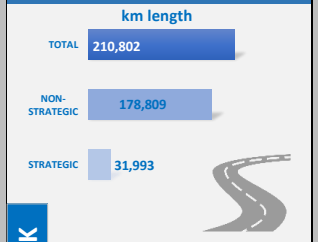
373 cars per 1000 inhabitants in 2018

25.8 billion tkm by truck in 2017

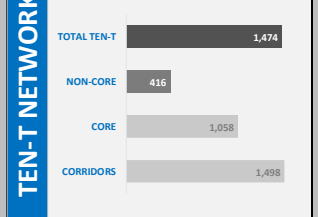
60.6 billion pkm by car in 2017

625 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Hungarian Public Roads

General description

Hungarian Public Roads is responsible for the operation and maintenance of more than 32,000 km of national roads and near 1,000 km bicycle roads. The company was established on 1 October 2005 by merging several individual road operator directorates at county level. Based on its 6,000 employees and economic indicators, the company is one of the first ten state-owned enterprises in Hungary. Road operations are carried out in 19 counties, at 94 maintenance centres, under the supervision of the headquarters in Budapest.

Responsibility

The activities of Hungarian Public Roads consist of the operation and performance of routine and preventive maintenance on the state-owned public road network, which includes expressways and motorways. In addition, Hungarian Public Roads is responsible for traffic management measures on the operated network, including dynamic traffic management and traffic lights, issuance of route permits for oversized vehicles, the control of trucks at weight control stations, the provision of training for professionals across the entire road sector, the operation of the Road User Information Services, the National Road Database, and the Road Museum in the municipality of Kiskőrös. It also plays a leading role in the renewal of technical legislation. In addition to performing its duties under contract, Hungarian Public Roads is also committed to social responsibility, the education of new generations of road users towards environmentally responsible behaviour, and the improvement of traffic ethics and safety.

Financing

State financing in the framework of contract on activities of public interest granted under the central state budget support. Data from recent years:

2017: HUF73 billion

2018: HUF81 billion

2019: HUF89 billion

In case of funds for road rehabilitations, or ITS investments, EU co-financed projects (TOP, CEF etc.) are carried out with external resources..

Iceland

DEMOGRAPHY

0.35 million inhabitants in 2018

36.3 years median age in 2018

93.81% Urban Population

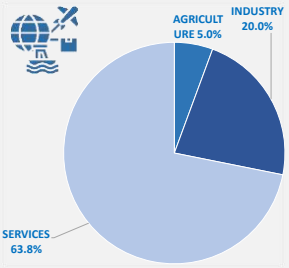
6.19% Rural Population

3.53 Inhabitants per sq. km in 2018

ECONOMY

59,910 GDP per capita in 2019

2.7% unemployment rate in 2018



ROAD TRANSPORT

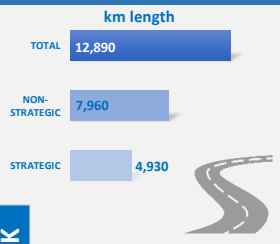
N/A cars per 1000 inhabitants in 2018

0.0 billion tkm by truck in 2017

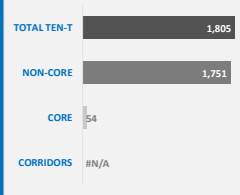
0.0 billion pkm by car in 2017

16 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Vegagerðin, the Icelandic Road and Coastal Administration (IRCA)

General description

Vegagerðin is the Icelandic Road and Coastal Administration (IRCA). The mission of the IRCA is to develop and maintain a transport network on land and sea in the most cost-effective manner, guided by the needs of the community. The main objectives are the following:

• safe and smooth traffic on roads and secure sea transport;

• the cost-effective development and management of the transport network in harmony with the environment;

• efficient and well-organised operations;

• responsible, skilled, and satisfied staff. Vegagerðin has approximately 300 employees and the following main divisions:

• Administration division: legal, public relations, human resources, research fund;

• Finance division: finance, economics, logistics and equipment, public transport;

• Development division: transport plans, regional planning, traffic and traffic safety, IT;

• Roads division: design, construction, maintenance, service;

• Maritime division: design, coastal construction, lighthouses;

• Regions: region west, north, east and south. The head office is in Reykjavík. There are four regions with regional centres in Selfoss (South), Borgarnes (West), Reyðarfjörður (East), and Akureyri (North).

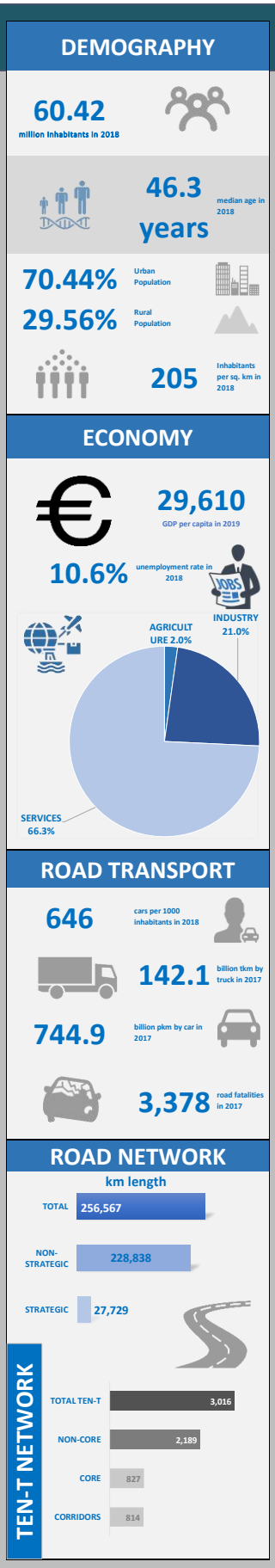
Responsibility

National roads are divided into state roads and public and private roads. State roads – including their design, construction, service, and maintenance – are managed by the Icelandic Road and Coastal Administration.

Financing

The IRCA's budget is approximately €260 million from national funds. €89 million is earmarked for road investments, about €71 million for maintenance, and €39 million for services (mainly winter services). €26 million is earmarked for public transport subsidies and €26 million for harbours, ferries, lighthouses, and breakwaters. The remaining €9 million is for general operations and research.

Italy



ANAS S.p.a.

General description

ANAS manages about 26,500 km of Italian roads and motorways, including junctions and slip roads. ANAS is a joint-stock company, with the Italian Ministry of Economy and Finance as its sole shareholder and is subject to the supervision of the Ministry of Infrastructure and Transport. ANAS commitment to the design, construction, and management of road infrastructure focuses on network safety, environmental protection, and energy efficiency, as well as on safeguarding the landscape.

ANAS has approximately 6,000 employees, divided into a General Directorate and eight territorial coordination centres with 23 regional offices which ensure a widespread presence, strict control over the whole road network, and facilitate direct cooperation with local authorities.

Responsibility

The main services provided are:

- the operation and maintenance (ordinary and special) of the roads and motorways;
- the renovation and gradual improvement of the roadway network and related signs;
- the construction of new roads and motorways, both directly and through contracts with third parties;
- the provision of information services for customers;
- the implementation of laws and regulations regarding protection of the roads and motorways, and the safeguarding of traffic and signs;
- the adoption of necessary measures to ensure traffic safety on roads and motorways;
- design and participation in studies, research and experiments on road networks, traffic and circulation.

Financing

The update of the 2016-2020 Multiannual Plan contracted between Ministry of Infrastructures and Transport (MIT) and ANAS for 2018-2019, increased the previous version from 23.4 billion to a total of 29.9 billion investments, including a plan for the extraordinary maintenance of bridges, viaducts and tunnels and a plan for Cortina (2021 World Cup and 2026 Olympic Games), in addition to the previous investment to strengthen the country's strategic infrastructure, renovating and ensuring the safety of infrastructure, and to complete routes and new works.

Long-term investments are now distributed as follows: 53% (€15.9 billion) for extraordinary maintenance adaptations and works to increase safety, and 47% (14 billion) for new works and route completion.

Planned financial resources are mainly national; but European Funds are also taken into account.

Lithuania

DEMOGRAPHY

2.80 million inhabitants in 2018

43.9 years median age in 2018

67.68% Urban Population

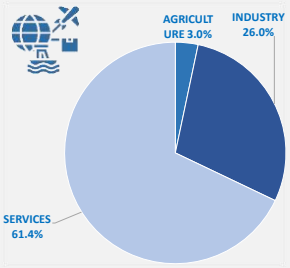
32.32% Rural Population

44.5 Inhabitants per sq. km in 2018

ECONOMY

17,310 GDP per capita in 2019

6.1% unemployment rate in 2018



ROAD TRANSPORT

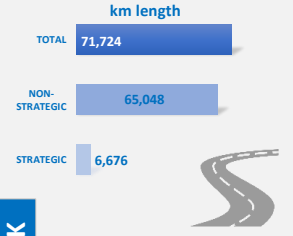
512 cars per 1000 inhabitants in 2018

7.7 billion tkm by truck in 2017

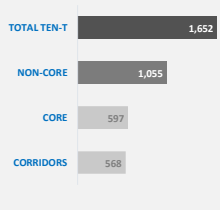
31.4 billion pkm by car in 2017

191 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Lithuanian Road Administration (LRA)

General description

The Lithuanian Road Administration (LRA) under the Ministry of Transport and Communications is an enterprise founded by the Government of the Republic of Lithuania which is in charge of organising and coordinating the reconstruction, maintenance, and development of the roads of national significance.

The LRA aims to satisfy the needs of society and road users, to work economically and efficiently while creating adequate traffic conditions, and to ensure that transport on roads of national significance is safe, fast, convenient, and environment-friendly, to develop the roads and their network, the top priority being traffic safety improvement. The LRA has 187 employees. Its head office is in the capital city, Vilnius.

Responsibility

Its main tasks are:

- to implement the state policy regarding road maintenance and development formulated by the Seimas of the Republic of Lithuania;
- to implement the programmes on road maintenance and development drafted by the Ministry of Transport and Communications;
- to organise the development, modernisation, and functioning of the network of the roads of national significance.

Financing

Total budget for 2019 (Road Maintenance and Development Programme + EU funds) is €577.8 million (incl. €41.1 million of EU funds), out of which €424.9 million is earmarked for state significance roads investment and other expenses (incl. €79 million for state road maintenance) and €152.9 million for local significance roads.

Financing sources are: 1) a share of the revenue from excise duty from the sale of petrol, diesel fuel, and energy products that are produced from materials of biological origin or contain their supplements and are intended for use as motor fuel; 2) a share of the revenue from excise duty for the sale of liquefied petroleum gas intended for use as motor fuel; 3) the tax on heavy goods vehicles registered in the Republic of Lithuania; 4) road user charges; 5) the tax levied for using vehicles on roads (vehicle combinations) the dimensions of which exceed those authorised; 6) the charge for the restriction of traffic; 7) targeted funds transmitted by natural or legal persons, other organisations, their affiliations and foreign states; 8) funds from the paid or recovered penalties for exceeding the speed limit registered by speed cameras installed on state significance roads.

Luxembourg

DEMOGRAPHY

0.61 million Inhabitants in 2018

39.4 years median age in 2018

90.98% Urban Population

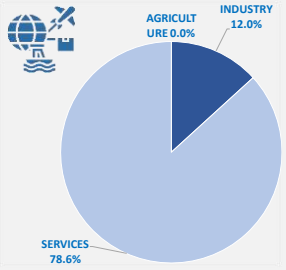
9.02% Rural Population

250 Inhabitants per sq. km in 2018

ECONOMY

102,200 GDP per capita in 2019

5.6% unemployment rate in 2018



ROAD TRANSPORT

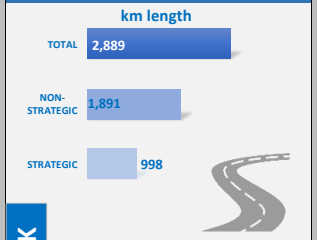
676 cars per 1000 inhabitants in 2018

3.0 billion tkm by truck in 2017

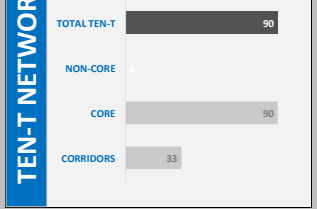
7.7 billion pkm by car in 2017

25 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



National Road Administration (Administration des Ponts et Chaussées)

General description

Administration des Ponts et Chaussées" is placed under the authority of the Ministry for Mobility and Public Works. It manages about 165 km of motorways, 837 km of national roads, 1.891 km of "Chemins repris" and around 650 km of cycle path, which represented about half of the entire road network in Luxembourg.

- Around 1.150 people are employed at the Administration, among them 650 staff member based all over Luxembourg, who take care of the road maintenance.

Responsibility

Administration des Ponts et Chaussées' main activities are the construction, maintenance and modernisation of the motorway, tunnels and the state's public road network. Infrastructures of the Luxembourg airport, the inland port of Mertert and the navigable channels and banks are also under the responsibility of the "Administration des Ponts et Chaussées". It is also responsible for the traffic management on the motorway network, ITS, the management of public lighting, traffic lights and signs.

Financing

The financing of the activities of the "Administration des Ponts et Chaussées" is allocated by the annual government budget and its multiannual spending targets. 2019, the National Road Administration has a budget of about 400 million euros for investments and maintenance operations.

Norway

DEMOGRAPHY

5.31 million inhabitants in 2018

39.5 years median age in 2018

82.25% Urban Population

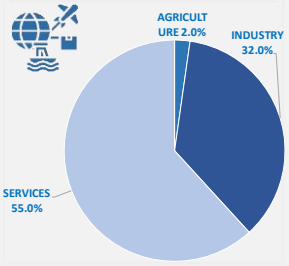
17.75% Rural Population

14.6 Inhabitants per sq. km in 2018

ECONOMY

67,040 GDP per capita in 2019

3.8% unemployment rate in 2018



ROAD TRANSPORT

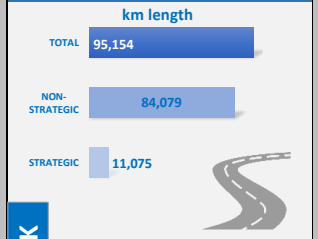
516 cars per 1000 inhabitants in 2018

22.6 billion tkm by truck in 2017

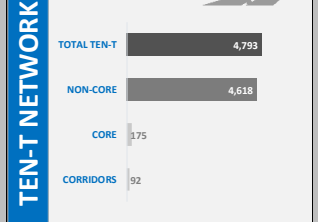
66.4 billion pkm by car in 2017

106 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Norwegian Public Roads Administration (NPRA)

General description

Statens vegvesen is the Norwegian Public Roads Administration (NPRA). It is a government agency under the Ministry of Transport and Communications with approximately 7,085 employees, 39% of whom are women. It comprises the Directorate of Public Roads and five regional units: Northern Region, Central Region, Western Region, Southern Region and Eastern Region. The NPRA has 72 Driver and Vehicle Licensing Offices and five Traffic Control Centres distributed across the county.

Responsibility

The agency has three roles: Road and Traffic Manager, Disciplines and Government Agencies.

The NPRA shall contribute to the national objectives of the government, which impose requirements for security, environment, and an efficient transportation system that is available to all. Like a road and road traffic manager, the NPRA is a road administration for the state on the national roads (10,713 km) and for counties on county roads (44,639 km). This means that the NPRA is responsible for taking care of, planning, developing, operating, and maintaining roads.

The agency is also responsible for national road ferries. As a specialist body, the NPRA is responsible for contributing to investigations, facts and proposals for the Ministry of Transport work on the National Transport Plan, the state budget and other parliamentary documents. The research and dissemination of results, the development of guidelines and guidance material and contact with relevant educational institutions is important in this context.

The NPRA is the authority responsible for the control of vehicles, supervisory tasks and conducting driver tests. In several areas, the agency has the authority to develop and approve regulations and make decisions that apply to road users and vehicles. The NPRA has the authority to adopt regulations and norms in certain areas of public road, and enforce laws, regulations and normal on the highway.

Financing

The budget of the NPRA in 2018 was NOK 60.3 billion. NOK 29.8 billion came from government funds for national road and was earmarked, among other things, as follows: traffic and vehicle supervision (NOK 2.3 billion), Operation (NOK 3.5 billion), Maintenance (NOK 2.7 billion), Investment (NOK 15.9 billion), National ferries (NOK 1.3 billion), and subsidies for county roads (NOK 1.0 billion). The funds for county roads were NOK 24.4 billion (44,639 km). The revenues from road toll in 2018 were NOK 7.2 billion.

Poland

DEMOGRAPHY

37.97 million inhabitants in 2018

40.6 years median age in 2018

60.06% Urban Population

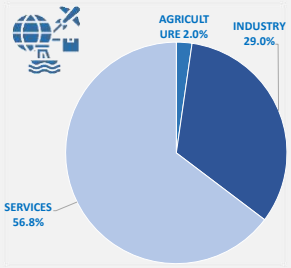
39.94% Rural Population

124 Inhabitants per sq. km in 2018

ECONOMY

13,730 GDP per capita in 2019

3.8% unemployment rate in 2018



ROAD TRANSPORT

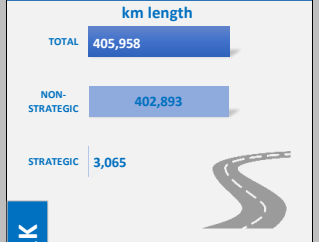
617 cars per 1000 inhabitants in 2018

N/A billion tkm by truck in 2017

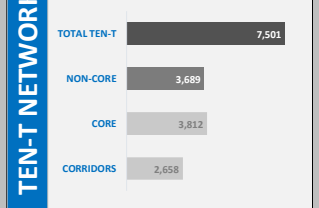
N/A billion pkm by car in 2017

2,831 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Generalna Dyrekcja Dróg Krajowych I Autostrad (GDDKIA)

General description

The GDDKIA, 'Generalna Dyrekcja Dróg Krajowych I Autostrad' (General Directorate for National Roads and Motorways) is an administrative body, subordinated to the Ministry of Infrastructure. It consists of 16 regional divisions and the Head office in Warsaw. The GDDKIA employs about 4,000 people, mostly in road maintenance units. The GDDKIA manages about 19,400 km of national roads; other categories of roads (regional, county, or local) are managed locally.

The Polish national road network consists of three categories of roads:

- motorways (toll), administrated by the GDDKIA and three private concessionaires;
- expressways (toll for HGV), administrated totally by the GDDKIA;
- other trunk roads, administrated by the GDDKIA and the presidents of local councils.

Responsibility

The main goals of the GDDKIA's activities are:

- traffic management on national roads with the implementation of the National Traffic Management System;
- asset management by performance-based contracts;
- road safety by implementation of the EU Directive;
- investment management by new contracts, tender procedures, EU funds;
- technology management by quality inspection of investments as well as tests of the existing network done by regional road laboratories.

Financing

The GDDKIA is financed partly from the state budget, partly from National Road Fund (NRF), and partly from EU strategic programmes. GDDKIA's budget reaches approximately PLN13–17 billion (€3–4 billion). The National Road Fund financially supports the Programme for National Roads Construction and covers expenditure for planning, constructing, reconstructing, and renovating national roads.

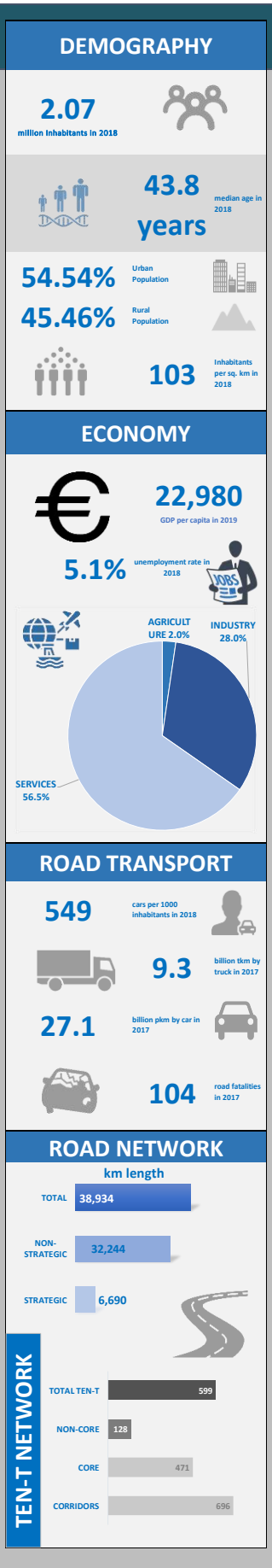
The sources of income for the NRF are:

- fuel charges
- European Investment Bank loans
- road bonds
- revenues from the ETS (Electronic Toll System)

The GDDKIA spends approximately PLN2–2.5 billion (€0.5–0.6 billion) on standard summer and winter maintenance of the national road network every year.

Slovenia

Ministry of Infrastructure – Slovenian Infrastructure Agency



General description

As at 31 December 2018, Slovenia had almost 39,000 kilometres of public roads; 6,540 km of which were categorised as state (national) roads. Motorways and expressways are managed by Družba za avtoceste v Republiki Sloveniji (Motorway Company in the Republic of Slovenia – DARS), main and regional roads are managed by Direkcija Republike Slovenije za infrastrukturo (DRSI; Slovenian Infrastructure Agency – SIA), while the rest of the roads are managed by local communities. DARS and SIA have a joint Traffic information centre in Dragomelj, which provides online information for users about conditions on national roads. 599 km of state roads belong to the TEN-T road network (556 km of motorways and 43 km of main roads), which represents 9% of the national road network. SIA maintains 43 km of TEN-T roads, which represents only 0.7% of national network under its control.

Responsibility

DARS is a joint-stock company that is 100% owned by the Republic of Slovenia. It is responsible for the motorways of Slovenia. The head office is in Celje and a branch office in Ljubljana. It has 1,232 employees. On the motorway network, there are nine big motorway centres and six small motorway centres. DARS' mission is to ensure modern approaches to and responsibility for the environment, to optimise traffic flow, safety, and comfort on the Slovenian motorway network. Slovenia's main and regional roads are managed by SIA, a body within the Ministry of Infrastructure based in Ljubljana, which comprises the field of road and railway infrastructure. It has 93 employees (of which 68 work in the field of road infrastructure and 25 in the field of railway infrastructure). Mission: to ensure optimal management of available resources, protection, maintenance and construction of main and regional roads and the railway network in Slovenia, so that within the scope of its competencies, SIA contributes to the improvement of mobility, ensuring road safety, accessibility, usability, minimal burden on the natural and living environment, and coherence with the economic and spatial development of municipalities, regions, and the state.

Financing

DARS is partly financed by the state budget on the basis of a concession for motorways and own-based tolls (91.1%). In 2018, funding amounted to €260 million (44.1% for road construction, 18.1% for the maintenance and management of roads, and 37.8% for company management and administration).

SIA is financed from the state budget. The 2018 budget included €290 million for road infrastructure (35.9% for road construction, 62.6% for the maintenance and management of roads, and 1.5% for administration), and €332 million for rail infrastructure.

Spain

DEMOGRAPHY

46.80 million Inhabitants in 2018

43.6 years median age in 2018

80.32% Urban Population

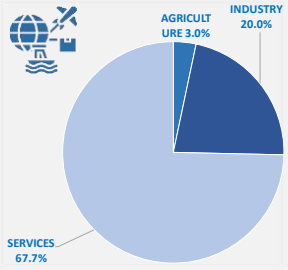
19.68% Rural Population

93.5 Inhabitants per sq. km in 2018

ECONOMY

26,440 GDP per capita in 2019

15.3% unemployment rate in 2018



ROAD TRANSPORT

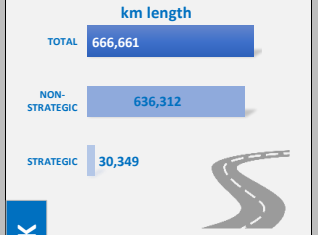
513 cars per 1000 inhabitants in 2018

198.0 billion tkm by truck in 2017

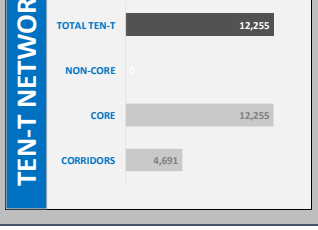
332.9 billion pkm by car in 2017

1,830 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



General Directorate of Roads

General description

The General Directorate of Roads in the Ministry of Public Works and Transport (DGC) is the Spanish Road Administration responsible for the management of the State Road Network ('Red de Carreteras del Estado', RCE), which represents 16% of the overall length and carries more than 52% of the total traffic (and more than 65% of the total of heavy good vehicles traffic) on the Spanish interurban network.

The DGC is organised in Central Services, located in Madrid, and Peripheral Services (Demarcaciones de Carreteras), which are the 15 territorial organisations depending on the DGC.

Central Services are organically organised in General Sub-directorates, according to the different stages of the infrastructures development. These sub-directorates are: Projects, Construction, Maintenance, Operation (includes Road Safety), and Coordination (and economical management). Finally, there is a Technical Directorate, providing technical support for every service in the DGC.

The DGC has approximately 1,800 employees, 10% in Central Services and 90% in Peripheral Services.

Responsibility

The DGC is responsible for planning, designing, constructing, maintaining, and operating the State Road Network, RCE. It is also responsible for road safety on this network. The General Directorate of Traffic in the Ministry of Home Affairs is the authority responsible for traffic management and regulation on all road networks in Spain. Environmental evaluation on the RCE is conducted in coordination with the Ministry of Agriculture and Fisheries, Food and Environmental Affairs. The three appointed ministries are part of the Government of Spain.

The management of other interurban road networks in Spain is the responsibility of other administrations: Autonomous Communities for regional roads, Provincial Governments for provincial roads, and City Councils for local roads.

Financing

The 2017 budget for the State Road Network RCE is about €1,913 million, of which €955 million is earmarked for new infrastructures and €958 million for the maintenance and operation of the existing network.

Sweden

DEMOGRAPHY

10.18 million Inhabitants in 2018

40.6 years median age in 2018

87.43% Urban Population

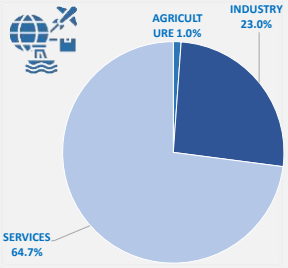
12.57% Rural Population

25 Inhabitants per sq. km in 2018

ECONOMY

46,180 GDP per capita in 2019

6.3% unemployment rate in 2018



ROAD TRANSPORT

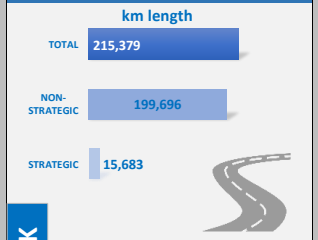
476 cars per 1000 inhabitants in 2018

50.4 billion tkm by truck in 2017

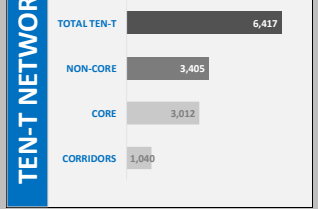
116.0 billion pkm by car in 2017

253 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK



Trafikverket - Swedish Transport Administration

General description

Trafikverket is the Swedish Transport Administration. The mission of the Transport Administration is to make sure that the transport system works, which is a basic precondition for guaranteeing that society will function. The administration creates the prerequisites for ensuring that all transportation and travel is conducted in the best and safest way, regardless of where citizens live, with due consideration given to the environment and health.

The Transport Administration has approximately 6,600 employees. Many employees work in the following areas: traffic control work on the roads and railways, community planning and negotiation and survey work, IT- work, technical survey and development, survey, inspection and supervision work, shipping work, architectural and infrastructure design works, production planning and production management.

The Head Office is in Borlänge. There are six regions with regional centres: Kristianstad (South), Gothenburg (West), Eskilstuna (East), Stockholm (Stockholm), Gävle (Central) and Luleå (North).

Responsibility

Trafikverket's main tasks are:

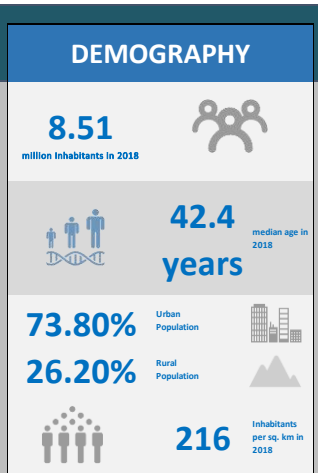
- to be responsible for the long-term planning of the transport system for road and rail traffic, shipping and aviation, and for the construction, operation, and maintenance of state roads and railways;
- to work for public passenger transport through the procurement of agreements and private aspects of state grants for the Swedish shipping industry.

Financing

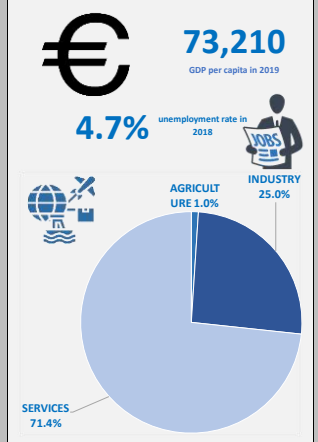
SEK54 billion in business volume, of which some SEK23.5 billion for investments and about SEK19.5 billion for operation, maintenance, and traffic control. The remaining SEK11 billion includes costs for the planning process, state joint-financing (e.g. for public transport), state subsidies for private roads, contracted traffic, and support for research and innovation in the transport area.

Switzerland

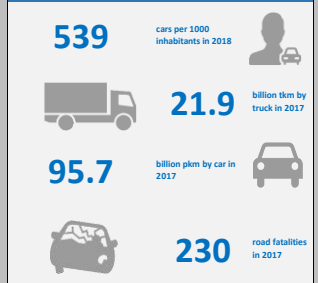
DEMOGRAPHY



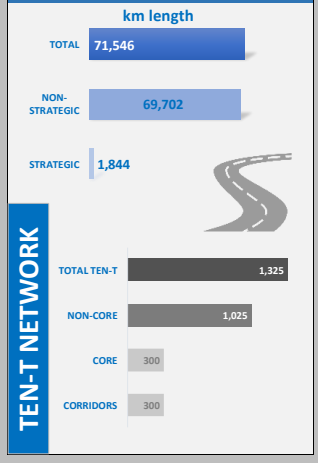
ECONOMY



ROAD TRANSPORT



ROAD NETWORK



FEDRO - Federal Roads Office

General description

The Federal Roads Office (FEDRO) was established in 1998 as Switzerland's federal authority responsible for road infrastructure and private road transport. It belongs to the Federal Department of the Environment, Transport, Energy and Communications (DETEC), and focuses on securing sustainable and safe mobility on the country's roads. The office creates the prerequisites for ensuring that roads are used for people and vehicles in the best and safest way, regardless where people live and gives due consideration to the environment and health. FEDRO is responsible for all strategic and operational duties required to fulfil this expectation.

FEDRO has approximately 620 employees. The Head Office is in Ittigen near Bern. The national road network is managed locally in the five regional centres (from West to East): Estavayer-Le-Lac, Thun, Zofingen, Winterthur, Bellinzona. The Traffic Management Centre is located in Emmen near Lucerne.

Responsibility

The main responsibilities and duties of FEDRO are:

- the construction, operation, and maintenance of the national road network (mainly motorways). The national road network is 1,900 km long. The TEN-T network represents 72% of it;
- to ensure access by persons and vehicles to all roads in the country;
- to set traffic rules and regulations for road-related topics;
- to be the Federal competence centre for motorised individual traffic.

Financing

The current funding basis consists mainly of revenue from the oil tax on motor fuel (CHF3.85 billion) and the revenue provided by motorway stickers (CHF350 million). The overall annual expenditure of the administration is CHF4.2 billion, of which CHF1.5 billion is spent on operations and the performance of maintenance work on the network and CHF1.3 billion is invested on road network completion and the agglomeration of traffic. The rest of the budget includes state subsidies for main roads, multimodal transport investments, environmental protection, research, and administration.

United Kingdom (England)

DEMOGRAPHY

66.46 million Inhabitants in 2018

40.1 years median age in 2018

83.40% Urban Population

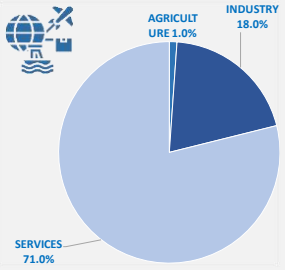
16.60% Rural Population

275 Inhabitants per sq. km in 2018

ECONOMY

37,760 GDP per capita in 2019

4.0% unemployment rate in 2018



ROAD TRANSPORT

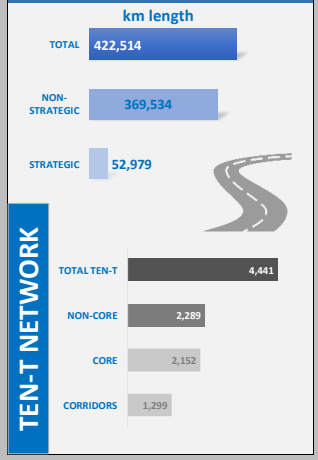
473 cars per 1000 inhabitants in 2018

161.8 billion tkm by truck in 2017

670.4 billion pkm by car in 2017

1,856 road fatalities in 2017

ROAD NETWORK



TEN-T NETWORK

Highways England

General description

Highways England is the government company responsible for operating, maintaining and improving England's motorways and major A roads. Formerly the Highways Agency, it became a government company in April 2015.

Highways England has over 5,000 employees based in various locations around England. This includes a uniformed Traffic Officer Service who serve in control centres and patrol key areas of the network.

Responsibility

Highways England is responsible for motorways and major A roads (trunk roads) in England. These roads are referred to as the Strategic Road Network and total around 4,300 miles. While this represents only 2 per cent of all roads in England by length, these roads carry a third of all traffic by mileage and two thirds of all heavy goods traffic.

Highways England is responsible for operating, maintaining, and improving the Strategic Road Network.

Highways England does not manage all roads in Britain:

- Local roads are managed by the relevant local authority
- Scottish roads are managed by Transport Scotland
- Welsh roads are managed by the Welsh Assembly
- London roads are managed by Transport for London

Financing

Over the period 2015–2020, Highways England will deliver £15 billion of investment on the strategic road network as described in the government's Road Investment strategy. This includes £11 billion of capital funding committed between 2015 and 2020 as set out in our Strategic Business Plan.

Ref: CEDR REPORT: TR2020 - 01

ISBN: 979-10-93321-54-7

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