

Delivering the Goods

Policies to protect sensitive areas from the impact of freight transport



European Federation for
TRANSPORT and ENVIRONMENT

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Policies to protect sensitive areas from the impact
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Author: Markus Liechi

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T&E - European Federation for Transport and Environment

Rue de la Pépinière, 1 | B - 1000 Brussels | Belgium

Site: www.t-e.eu

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Foreword

The term 'sensitive areas' is frequently used in the European transport policy debate but there is still a lack of clarity and a number of misconceptions and uncertainties faced by stakeholders working on the topic.

Although it is widely recognised that sensitive areas deserve protection, stakeholders and decision makers are not always consistent in their approach to the issue. For example, representatives of sensitive areas don't always apply consistent and non-discriminatory instruments to protect areas under threat. The result is that, in certain cases, emissions from foreign trucks are effectively deemed to be worse than those from domestic trucks! Similarly, many decision makers from outside of sensitive areas acknowledge the need for protection but, at the same time, insist on the free movement of goods. There is clearly a lack of information and, perhaps, a lack of mutual understanding.

This publication has been produced for European and national decision makers and non-governmental organisations (NGOs) and aims to aid understanding of the issue, and inform debate about the way forward.

The European Federation for Transport and Environment (T&E) has a wealth of experience regarding the impact of freight transport on sensitive areas. Since 1999, two major T&E projects¹ have dealt with instruments, European and national legislation and the challenges and opportunities of making freight transport more sustainable. Freight transport through sensitive areas, particularly mountainous areas, has been an important issue in these projects. In October 2004, T&E organised, together with Austrian partner organisations, a conference in Vienna on 'Sustainable Freight Transport in Sensitive Areas' (see T&E 04/7, 2004). This publication also serves as a background document to the findings of that conference.

The report begins by explaining why sensitive areas are special and must be protected and goes on to show how traffic in mountainous valleys harms human health and the environment more than the same amount of traffic in flat areas. It also explains the European legal context and shows the importance of applying target-oriented instruments in a non-discriminatory way.

We hope this publication leads to greater mutual understanding between sensitive and peripheral areas in Europe and contributes to a healthy and unambiguous debate about transport policies for Europe, both as a whole and for sensitive areas in particular.

Sonja Klingberg, President, T&E

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¹ 'Freight from Road to Rail' 1999 – 2002; 'Safe and Sustainable Freight Transport' 2002 – 2005

Executive Summary

When are areas sensitive?

It is generally acknowledged that sensitive areas must be protected against negative impacts caused by human activities, among them transport. However, there is no generally approved definition of what can be described as a particularly sensitive area. On one side, international agreements define protected areas, where a balance must be found between protection and the use of the area and its resources. On the other side, the entire planet is sensitive. Thus the question, how to define sensitive areas that do not already belong to legally protected areas but where economic, environmental and social goals might clash, either within the areas or between neighbouring areas.

The sensitivity of an area depends not only on environmental factors but also on social and economic aspects, e.g. on its ecological or cultural value, on the fragility of habitats and on the potential for sustainable development. In order to define sensitive areas, a commonly accepted tool including a list of criteria is recommended.² The European Commission could assist in giving guidelines and encouraging Member States without interfering in their autonomy.

For the time being, sensitive areas are often generally summarised in such categories as coastal zones, mountainous regions, wet and arid areas or landscapes of historic and cultural importance. It is obvious that there are many in Europe.

Why is freight transport a problem in sensitive areas?

Transport volumes have tripled in Europe since the 1970s with a particular growth in freight transport over the last 10 years. In the Alps and the Pyrenees, freight transport has more than tripled in a much shorter period, i.e. since the mid 1980s.

In these areas, freight traffic flows are concentrated in a limited number of links, mostly in narrow valleys, or along coasts - where population is densest. In the Alps two thirds of goods are transported on roads and one third by rail. In the Pyrenees, over 90 % of land transport is road transport.

The growth of freight transport has a number of particular impacts on sensitive areas:

The specific topographic and meteorological conditions found in mountainous valleys hamper the dispersion of air pollutants. This effect is caused by the inversion of cold and warm air layers, which often occurs in winter and at night. Therefore, the impacts of air emissions are, on average, twice as high in winter as in summer and, at night, six times as high as during the day. Even with, compared to urban areas, moderate traffic volumes, emission values are frequently exceeding the limits of the air quality directive (1999a). PM₁₀ averages for 24-hour periods reach up to 70 µg/m³ while the limits are set at 50 µg/m³. (Swiss cantons 2005)

Inversion also plays a role with regard to noise. In the case of inversion, noise levels will not be reduced with increased distance from the source. Again, the same noise source has worse effects in winter than in summer and at night than at day. Furthermore, noise is reflected and intensified by the slopes and produces an echo effect. This means that, at the same distance from the source, noise levels in mountainous areas are higher than in lowland areas.

Emissions of greenhouse gases and their effect on the global climate have particularly strong impacts in sensitive areas. The permafrost soils are shrinking which is a threat to habitation and infrastructure but also to biodiversity in mountainous regions. Global warming also increases the temperature of the oceans and threatens the maritime ecosystem.

² The criteria catalogue developed by the Austrian Ministry of Agriculture, Forestry and Water Management could be a useful tool or starting point to agree on such a list of criteria (Austrian Ministry of Environment 2001).

Finally, the disposable land in mountainous areas is comparably small and transport infrastructure has a relatively high share of it and, inevitably, it is closer to living areas. This has particularly strong impacts on human health but also on species and biodiversity.

Definition of targets

Once sensitive areas are defined, the inhabitants and environment of the area should be effectively protected against the negative impacts caused by transport. Such effective protection requires clear objectives and targets which must be achieved within a certain time frame. Such targets could be:

- ▶ Amount of people exposed to a certain level of air emissions (objective should be to decrease over time, i.e. target level should decrease)
- ▶ Amount of people exposed to a certain level of noise emissions (objective should be to decrease over time, i.e. target level should decrease)
- ▶ Maximum level for air emissions for people, flora and fauna (target should be that zero people and plants should be exposed above a certain level)
- ▶ Maximum level of noise (target should be zero people and plants should be exposed above a certain level)
- ▶ Maximum level of land fragmentation and maximum share of land used for transport infrastructure (considering objectives to protect biodiversity but also ensure other land use needs, e.g. for housing, agriculture, industry)
- ▶ Maximum amount of transport allowed through sensitive areas according to existing infrastructure capacity, environmental and safety requirements.

What instruments to apply in sensitive areas?

A 'one size / one instrument fits all' approach does not effectively protect sensitive areas from the negative impacts of freight transport. The defined targets must be both ambitious and achievable by a set of instruments. For practical, not to mention political, reasons, one single instrument is not enough to achieve the targets. Countries should be allowed to apply the required mix of instruments to achieve the targets.

The protection of sensitive areas and the application of strong and effective instruments is justified by international agreements (IUCN, UN ECE) and is not in contradiction with existing EU legislation. However, the instrument chosen should be the most efficient, i.e. achieving the targets with the least possible costs to citizens and the economy.

The guiding principle of all instruments must be non-discrimination according to the EU Treaty. Non-discrimination is the guiding principle of the internal market and the driver behind the principle of free movement of goods. Current European legislation gives member states ample freedom to apply strong instruments if they do not discriminate.

Economic instruments

Economic instruments are, in theory, the most efficient instruments to achieve goals as the price mechanism gives the incentive to behave appropriately.

The most important economic instruments are:

- ▶ Pricing, which should be used in a target-oriented way, i.e. starting with the question of what level the price for transport should be to achieve a certain target rather than a purely cost-oriented approach?
- ▶ Trading, this already exists in the form of emissions trading in some areas. Tradable permits for the use of transport infrastructure crossing sensitive areas could be a future application.

For political reasons pricing instruments often cannot be implemented in an effective way, i.e. they are not sufficient alone to achieve the targets.

Infrastructure investments

Investments in transport infrastructure are often less efficient and effective than other instruments to achieve a certain target.

It is important to recognise the limited possibilities for changing transport infrastructure in sensitive areas (for economic, environmental and transport reasons). Therefore transport infrastructure should be considered as a scarce resource. Thus, existing infrastructure should be better used and improved before building more.

Investment in transport infrastructure should, in any case, be decided upon using a comprehensive cost benefit analysis and the results of a strategic environment assessment.

Technical instruments

Existing standards for fuel quality and engines should be strengthened.

Prohibitions and restrictions

In certain cases prohibition and quantitative restrictions are the only way to achieve a certain target. This is, for example, true to protect citizens from a certain noise level or from air emissions at night in mountainous regions.

Steps needed

The following steps should be taken at national, regional and European level:

At European level, the European Commission should:

- ▶ Sign the transport protocol of the Alpine Convention
- ▶ Present guidelines to define sensitive areas
- ▶ Present a proposal for a coherent transport policy in sensitive areas including guidelines for targets
- ▶ Present a revision of the Noise Directive including limit values for noise exposure
- ▶ Present a proposal to use economic instruments, e.g. charging or permit trading schemes in a target-oriented way.

At regional level, Member States should:

- ▶ cooperate in defining sensitive areas including trans-boundary areas
- ▶ coordinate targets for trans-boundary sensitive areas
- ▶ coordinate instruments for trans-boundary sensitive areas.

At national level, Member States should:

- ▶ define sensitive areas within their countries
- ▶ define non-discriminating instruments to achieve the targets
- ▶ use the existing flexibility and freedom of EU legislation

Introduction

Sensitive areas, such as mountainous regions, wetlands and coastal zones, are particularly vulnerable to the impacts of transport. The rapid increase of freight transport in Europe over the last 30 years has seriously deteriorated air quality and has caused widespread noise nuisance in valley areas. The increase in freight transport in sensitive areas also represents a safety risk, repeatedly shown by tunnel accidents. Traffic is increasingly congested in urban areas, especially where it is concentrated in a few links through sensitive areas. Maritime areas and coastal zones are threatened by oil spills and big accidents. The increase in transport also threatens biodiversity and habitats from the building of new infrastructure, fragmenting landscapes even more.

The protection of sensitive areas requires special measures and higher standards. Reducing negative transport impacts in sensitive areas conflicts with the economic and social needs of the sensitive areas and even more with one of the main principles of the European Union: protection of the internal market and free movement of passengers, goods, money and services.

This document first describes the particularities of sensitive areas (chapter 1). It goes on to analyse what impacts transport have had in sensitive areas (chapter 2), and shows how measures to protect sensitive areas from growing transport can be applied under current EU legislation (chapter 3).



1. Sensitive Areas

International commitments to the concept of sensitive areas

'Sensitive areas' are often used in political discussions to request particular treatment, special protection, additional measures or funding. Sensitivity is used in different arbitrary ways, according to the interests of the politicians or stakeholders concerned. This can be explained by two facts. Almost every region in the world could claim to be considered as 'sensitive': the entire planet is affected. Secondly, there is no generally approved definition of what can be described as a particularly 'sensitive area'³, as mountainous regions, wetlands, coastal zones or even urban⁴ areas have all been included at some time.

However, it is generally acknowledged that sensitive areas must be protected against negative impacts from different threats, among them transport.⁵ Some particularly sensitive areas are even declared to be protected areas. The IUCN defines protected areas as 'An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.' (IUCN 1998)

In these protected areas, a balance must be found between protection and the use of the area and its resources. This is even more important for sensitive areas, which do not belong to any legally protected areas where economic, environmental and social goals might clash within the area concerned and between neighbouring areas.⁶

The 1997 Vienna Declaration of the UNECE Conference on Transport and the Environment⁷ asked explicitly for protection of sensitive areas from negative impacts of transport on human health and the environment. It also recognized the need to develop and introduce additional and stricter measures for freight transport in sensitive areas.

BOX 1: THE PROTECTION OF SENSITIVE AREAS THROUGH EUROPEAN LEGISLATION⁸

The Treaty of the European Union (EU 2002) does not explicitly mention sensitive areas but Article 2 says that the EU has the task of ensuring a 'high level of protection and improvement of the quality of the environment, the raising of the standard of living and quality of life'.⁹

Under 'environment policy' (articles 174 – 176), the Treaty claims that Community policy shall contribute to the pursuit of the following objectives: preserving, protecting and improving the quality of the environment.

The Habitats Directive 92/43/EEC (EU 1992) aims to maintain biodiversity by defining a common framework for the conservation of wild flora and fauna and habitats of Community interest in EU Member States.

The Directive for the conservation wild birds was implemented in 1979 (EU 1979). All Member States are obliged to create protective zones, maintain habitats, restore destroyed biotopes and create new biotopes.

The Air Quality Framework Directive adopted in 1996 by the European Union (EU 1996) set a general policy framework for dealing with air pollution. In practice, the Directive is applied through a set of four pollutant-specific 'Daughter Directives'. The first Daughter Directive (EU 1999a) set air quality standards for four pollutants, namely: sulphur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM10), and lead (Pb). It specifies limit values aiming to protect ecosystems, vegetation and human health. The limits are based on threshold values recommended by the World Health Organization (WHO 1997). In cases where the concentrations of pollutants exceed the margin of tol-

³ The term 'Particularly Sensitive Areas' is used e.g. by IMO 1973a, UNEP 1993, Austrian Ministry of Environment 2001.

⁴ This document does not deal with urban areas although the impacts of transport on urban areas and the citizens living in them is considerable and thus urban areas must be considered as being very sensitive.

⁵ This has been agreed at international level, e.g. UNEP 1993, UN ECE 1997.

⁶ See e.g. the Convention on Biodiversity (Article 1) which defines the following three protection criteria aiming to balance environmental, economic and social goals: 1) protection of biodiversity, 2) sustainable use of the resources and 3) equitable sharing of benefits among local communities (UNEP 1993).

⁷ UN ECE (United Nations Economic and Social Council, Economic Commission for Europe), Regional Conference on Transport and the Environment (Vienna 12 – 14 November 1997), Vienna Declaration as well as Programme of Joint Action, Chapter IV (Protection of sensitive areas).

⁸ The following list does not represent the complete summary of environmental protection legislation but only some examples.

⁹ This task is of course one amongst others, which potentially conflict with one another (see box chapter 3).

erance, EU Member States must prepare action plans showing how they will achieve the limit value in due time.

The European Parliament and Council adopted of 25 June 2002 whose main aim is to provide a common basis for tackling the noise problem across the EU and to protect citizens from noise annoyance. This directive does not include any limit values.

The protection of maritime areas and coastal zones from pollution caused by accidents has been improved by decisions taken following the sinking of the oil tankers Erika in 1999 and Prestige in 2002. The European Commission adopted a "Communication on the safety of the seaborne oil trade" together with a number of proposals to prevent such accidents.¹⁰

In 2002 the European Parliament and the Council adopted Directive 2002/84/EC (EU 2002c) amending the Directives on maritime safety and the prevention of pollution from ships. The purpose of these Directives was to improve the implementation of Community legislation on maritime safety, the protection of the marine environment and living and working conditions on board ships.

Sensitive areas are explicitly mentioned in the Commission's proposal amending Directive 1999/62¹¹ for charges for heavy goods vehicles (EC 2003). The proposal allows Member States to levy higher charges in sensitive areas.

The European Commission is also a contractual partner of the Alpine Convention¹² which aims to ensure a comprehensive policy to protect the Alps considering the interests of Alpine countries, of its Alpine regions and of the European Union allowing for a sustainable use of the resources. One of the protocols of the Alpine Convention deals with transport. The European Union has not yet signed this protocol.

For the Pyrenees, a special charter has been adopted, and efforts are being made towards the development of charters for the Carpathians and Caucasus. Underlying the Charter for the Protection of the Pyrenees (CIAPP, 1989) are three key objectives: to protect the environment, to allow access for visitors and to support environmentally sustainable economic development.

How to define sensitive areas?

While there is a widespread agreement about the need to protect sensitive areas and to develop sensitive areas in a sustainable way, there is still no common approach for defining such areas.

The IUCN¹³ lists seven different categories of protected areas depending on the level of protection. (IUCN 1998)

The IMO¹⁴ defines 'Particularly Sensitive Sea Area' (PSSA) as an area that needs special protection because of its significance for recognized ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities. In 'Special Areas', according to the IMO, the adoption of special mandatory methods for the prevention of sea pollution is required. In many cases a Particularly Sensitive Sea Area may be identified within a Special Area and vice versa.

For UNECE¹⁵ areas should be identified as sensitive where the ecosystems are particularly sensitive, where the geographic conditions and the topography may intensify pollution and noise or where unique natural resources or unique cultural heritages exist (UNECE 1997).

The European Environment Agency (EEA) defines sensitive areas as 'areas of a country where special measures may be given to protect the natural habitats which present a high level of vulnerability'.¹⁶

The Alpine Convention covers the Alpine region. Its scope is defined according to political units, e.g. countries or regions within the partner countries of the convention. Thus, the scope of the Alpine Convention does not correspond to specific characteristics defining the sensitivity of the area (Alpine Convention 1991).

All these definitions contain only vague characteristics to identify the sensitivity of an area and thus give an indication of the appropriate protection measures. A recent study mandated by the Austrian Environment Ministry¹⁷ defines a criteria catalogue which should help to classify an area as ecologically sensitive.¹⁸

¹⁰The Erika packages I and II was established in 2000. The Erika III package was proposed after *Prestige* wreck in 2002/2003 (see EU 2002c).

¹¹Directive of the European Parliament and of the Council's amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures (EU 1999).

¹²Alpine Convention 1991: Convention on the Protection of the Alps.

¹³International Union of Conservation of Nature and Natural Resources.

¹⁴International Maritime Organisation: see Annexes I, II and V of (IMO 1973a)

¹⁵United Nations Economic Committee for Europe.

¹⁶See EEA 1999 and GEMET 2000.

¹⁷See Austrian Environment Ministry 2001.

¹⁸'Ecologically' is understood in this case as material and non-material benefits of nature and its habitats which are important for physical and mental well-being.

The approach is based on a three-criteria model:¹⁹

- ▶ Value: this serves, for example, to describe rare landscapes and habitats or virgin areas.
- ▶ Fragility: this serves, for example, to describe areas with critically impacted assets to be protected.
- ▶ Potential: this is used for areas with no dominant or irreversible use, and with scope for development

The model contains a checklist with indicators for each of the three criteria which should help decision makers define qualitatively the sensitivity of an area. An area is sensitive if one, two or three of the criteria are applied.

Although, sensitive areas are not clearly identified and defined, it is obvious that there are many in Europe. They are often generally summarised in categories as coastal zones, wet and arid areas, mountainous areas or landscapes of historic and cultural importance. Urban areas must also be considered as very sensitive because of the density of the population and variety of activities.²⁰ There are in fact no insensitive areas but only more or less sensitive areas.

BOX 2: DEFINITION OF SENSITIVE AREAS

The Environment Committee of the European Parliament accepted a comprehensive list of what should be considered as sensitive areas as part of its opinion on the Eurovignette proposal (European Parliament 2003).²¹ This list gives an idea of the variety of sensitive areas and the importance of those areas although the list was not adopted by the European Parliament.

(a)

- Areas which already enjoy international protected status, such as, in particular, Natura 2000 areas pursuant to Directive 79/409/EEC on the conservation of wild birds;

- Areas covered by Directive 92/43/EEC (EU 1992) on the conservation of natural habitats and of wild fauna and flora;

- Areas falling within the scope of the Convention for the Protection of the Alps (Alpine Convention);

- National Parks in accordance with IUNC rules (Category II protected areas);

- UNESCO world cultural and world natural heritage

(b) areas covered by national protection provisions governing the soil, water, the atmosphere, flora, fauna, habitats, the landscape and cultural assets;

(c) Areas which meet the criteria governing ecological and/or cultural value, the fragility of habitats and the potential for sustainable development.

¹⁹ The model is also called the Pügg Criteria and Indicators.

²⁰ The sensitivity of urban areas and the pressure from transport on urban areas are not discussed further in this document.

²¹ The Environment Committee could only give an opinion on this proposal to the Committee on Regional Policy, Transport and Tourism, which did not adopt the list proposed.



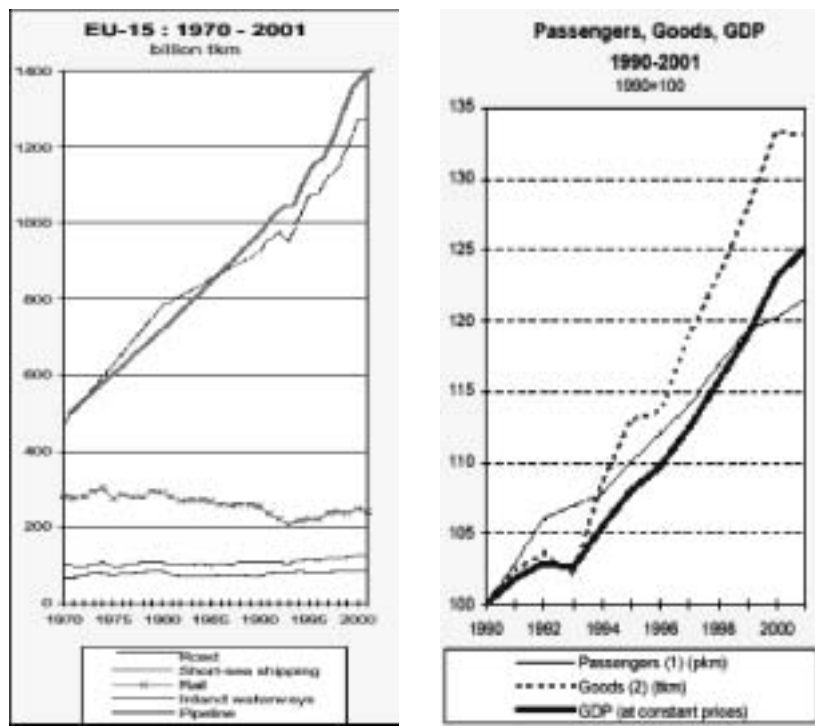
2. Transport Impacts on Sensitive Areas

How unsustainable is transport today?

It is widely recognised that current transport systems and future trends are not sustainable.²² Since 2001 the European Environment Agency has reported on the development of the transport sector with regard to its environmental performance in the TERM reports.²³ The latest report presented in October 2004 concluded that many kinds of transport are becoming less and not more sustainable.

Transport volumes have tripled in Europe since the 1970s, with particular growth in the last 10 years, with growth rates in passenger and freight transport exceeding the growth of European economy (see Figure 1). Road transport is increasing with growth rates of about 4 % per year on average since 1990. Short sea shipping has also been significantly increasing (by 2.6%) while railway use has stagnated. Freight transport is shifting increasingly towards roads: road freight now accounts for 43% of total freight transport compared to 33% in 1980 (EC 2003a).

FIGURE 1: TRANSPORT DEVELOPMENT IN EU-15 (EC 2003)



²²See e.g. the conclusions of the World Business Council for Sustainable Development reflecting consensus by a dozen leading companies, WBCSD 2004.

²³See Transport and Environment Reporting Mechanism EEA 2001a, EEA 2002a and EEA 2004a.

As a consequence of this transport growth, the transport system became unsustainable. OECD mentioned in its guidelines towards Environmentally Sustainable Transport the following five criteria as signs for unsustainable transport trends (OECD 2002):

1. Climate protection:

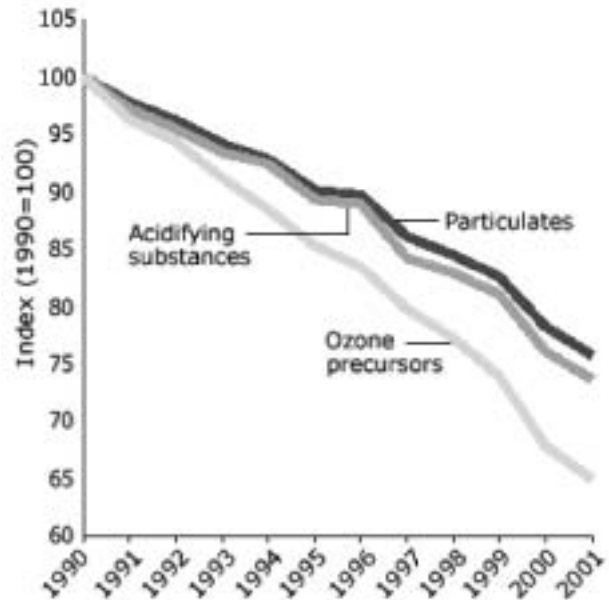
Transport represents a growing source of greenhouse gas emissions. Since 1990, transport-related greenhouse gas emissions have increased by more than 20%. Already 29% of all greenhouse gas emissions are caused by transport, of which road transport accounts for more than 84% and aviation 13% (EC 2004a). Road freight transport is responsible for 25% of transport-caused greenhouse gas emissions. This trend of the transport sector jeopardises the possibility of the EU meeting its Kyoto Protocol target of an 8% reduction in greenhouse gas emissions by 2008–2012. The CO₂ emission rates for freight transport are larger than those for passenger transport. Compared with other land transport routes (rail, inland waterways), trucking is still the least energy-efficient. Trucks consume significantly more energy per tonne-km than rail or ship transport, which causes also comparably higher CO₂ emissions per tonne-km (EEA 2001a).

2. Regional air quality

Sulphur dioxide (SO₂) has been considerably reduced in road transport but these reductions have been offset by a similar increase in emissions from international maritime transport. Thus, the exposure of people to sulphur dioxide has been reduced but not the overall emissions (EEA 2004b). Shipping is also an important contributor to air pollution, as is aviation due to the increase in air traffic.

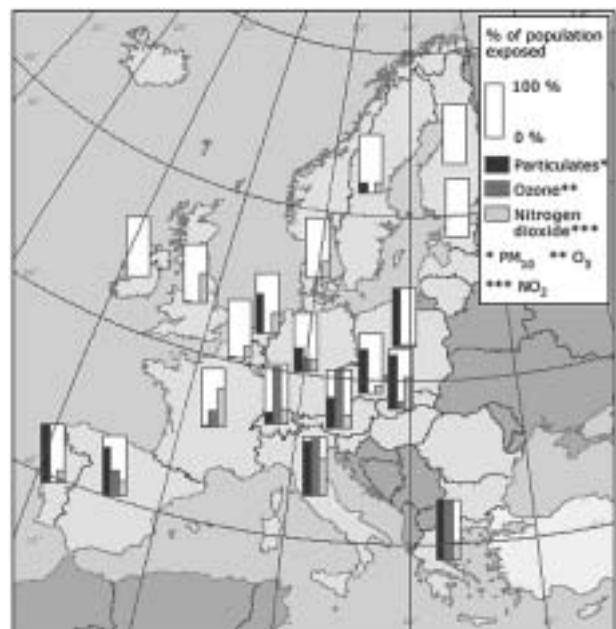
Total NO_x and VOC emissions in the EU-15 countries showed a decreasing trend from 1991 onwards, after a steady increase before that date (see Figure 2). This progression was primarily caused by the introduction of three-way catalyst cars in the late 1980s in all EU countries. The contribution of trucks to NO_x emissions amounted to about 40%. Emission standards for trucks (Directive 91/542 EEC) also contributed — although to a smaller extent — to emission reductions since 1994 (EEA 2001a, EEA 2004c).

FIGURE 2: DEVELOPMENT OF AIR EMISSIONS SINCE 1990 (EEA 2004C)



Despite this progress, a high proportion of European citizens is still exposed to air emissions above the limit level (see Figure 3). Tens of thousands of people still die prematurely as a result of transport-related air emissions. (EEA 2004a). Health risks include heart and lung problems, respiratory symptoms and allergic reactions.

FIGURE 3: POPULATION EXPOSED TO AIR EMISSIONS (EEA 2004B)



3. Local air quality

Road freight transport plays the most important role in particulate matter (PM) emissions. More than 50% of total PM emissions are due to trucks, a contribution which was slow-

ly increasing from 1990 onwards. Particulates are currently a priority as their ingestion affects health, e.g. respiration, increased risk of cancer (see Figure 4). As of 2005, the air quality directive will fix the maximal level of PM exposure.

FIGURE 4: AIR POLLUTANTS AND FIRST DAUGHTER DIRECTIVE (EU 1999A)

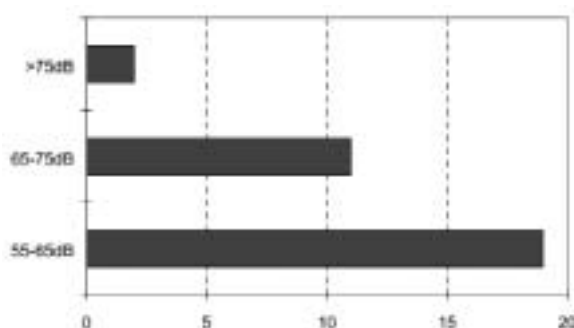
SUMMARY OF LIMIT VALUES, DEADLINES, SOURCES AND EFFECTS OF POLLUTANTS IN THE FIRST DAUGHTER DIRECTIVE				
	EU Limit Values and Deadlines		Sources	Health Effects ¹
SO₂	1 hour average: 350 µg/m ³ by 2005	24 hour average: 125 µg/m ³ by 2005	Combustion of fuel containing sulphur (i.e. maritime bunker fuel), metal smelting and other industrial processes	Short term exposure: breathing impairments, chest tightness, wheezing, reduced lung function Long term exposure: respiratory illness; alterations in lung defences; aggravation of existing cardiovascular disease
NO₂	1 hour average: 300 µg/m ³ by 2010	Yearly average: 40 µg/m ³ by 2010	Fossil fuel combustion (transport and power generation)	Short term exposure: narrowing of the airways, changes in lung function Long term exposure: increased susceptibility to respiratory infections; alterations in the lung; lung damage
PM₁₀	24 hour average: 50 µg/m ³ by 2005	Yearly average: 40 µg/m ³ by 2005	Fossil fuel combustion (transport and power generation); vehicles travelling on unpaved roads; materials handling, crushing and grinding operations	Coughing, wheezing, shortness of breath; aggravations of respiratory conditions such as asthma; chronic bronchitis; lung damage; premature death
Pb	Yearly average: 0.5 µg/m ³ by 2010		Metals processing, leaded fuel (almost completely phased out in the EU, but still an issue in accession countries)	Adverse effects on kidney, liver, nervous system and other organs; neurological impairments (seizures, mental retardation, behavioural disorders); high blood pressure and subsequent heart disease

4. Quietness: Noise

Noise affects people physiologically and psychologically; noise levels above 40dB can influence well-being, with most people being moderately annoyed at 50dB and seriously annoyed at 55dB. Levels above 65dB are detrimental to health (WHO, 2000).

Road, rail and aviation transport are major sources of noise annoyance. More than 30% of EU citizens (EU-15) are seriously annoyed by road noise above 55dB. Almost half of them are exposed to road noise levels above 65dB which seriously harm health (see Figure 5) Around 10% of EU citizens are disturbed by railway noise (EEA 2002b).

FIGURE 5: SHARE OF POPULATION (EU-15) EXPOSED TO NUISANCE FROM ROAD NOISE (EEA 2002B)

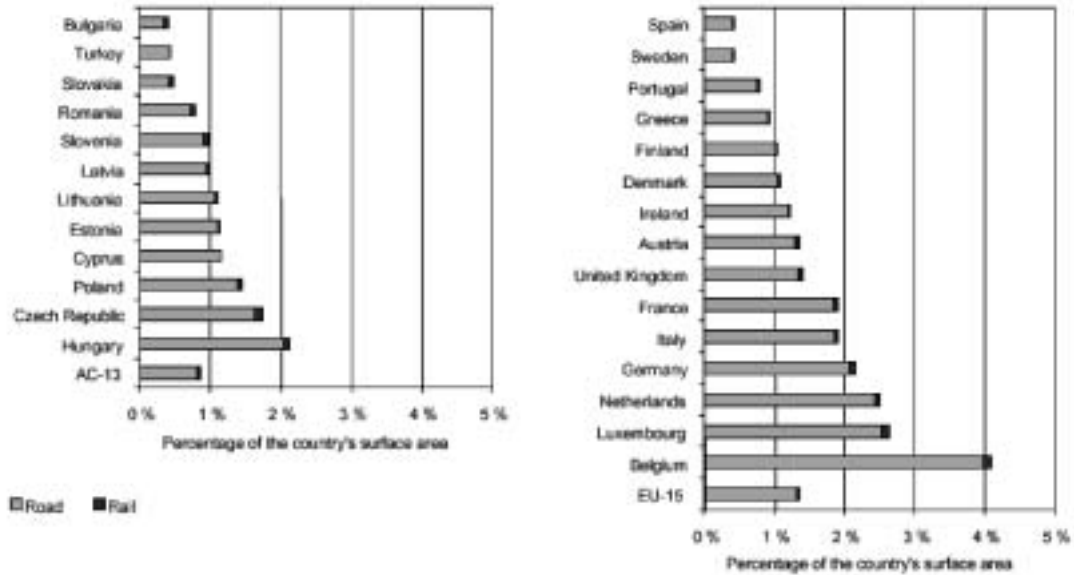


The noise directive adopted in 2002 (2002/49/EC) seeks to monitor the environmental problems caused by noise, requires noise action plans to be produced, the public to be informed and consulted about noise pollution and the measures being taken to deal with it, and a long-term EU noise strategy to be developed with a view to reducing the number of people being affected. However, it does not lay down specific ambient noise limits.

5. Land use and habitats

Land is under continuous pressure from new transport infrastructure. It can be estimated that between 1990 and 1999 almost 10 ha each day were consumed by new motorway construction in the EU-15. Road transport is by far the largest consumer of land for transport. The road network (motorways, State, provincial and municipal roads) occupies 93% of the total area of land used for transport in the EU-15 and 85% in the new Member States and Accession Countries. Rail adds to this only 4% of land taken by transport in the EU-15 and 10% in the new Member States (EEA 2004a). More than 1% of the surface in EU-15 and almost 1% in the new Member States is used for transport infrastructure. In some countries it is up to 4% (see Figure 6)

FIGURE 6: SHARE OF LAND USED FOR TRANSPORT INFRASTRUCTURE (EEA-ETC/TE 2002)



Increasing land absorption leads to fragmentation which affects nature, biodiversity but also agriculture, human communities, outdoor recreation and the overall quality of life. The impact on nature and biodiversity is dependent on the kind of infrastructure, landscape structures, species concerned and their habitat patterns. Land fragmentation is difficult to reverse. Existing instruments such as the SEA and EIA do not yet fully represent the necessary steering instrument. Furthermore, the lost of habitats and fragmentation are not taken into account in approaches to infrastructure charging. The average size of non-fragmented land in the new Member States and Accession Countries (174 km²) is still above the average of that of the EU (121 km²). (EEA 2004a)

Shipping can cause a lot of damage to marine ecosystems. Oil spills (see Figure 7) in particular can be disastrous – wiping out sea life over large areas – but smaller impacts such as ship groundings, anchor damage and the dumping of rubbish and oily waste can also harm marine habitat (WWF 2004).

FIGURE 7: MAJOR OIL SPILLS 1970 – 2001 (EEA 2002A)



Particular impacts of freight transport in sensitive areas

The negative impacts of the continuously increasing freight transport are particularly high in sensitive areas. In mountainous regions, e.g. the Alps and the Pyrenees, freight traffic flows are concentrated in a limited number of links, mostly in narrow valleys, or along coasts, where population is densest (EEA 2001a).

In the Alpine region (from Mont Blanc/ Fréjus to Brenner) freight transport has more than doubled since 1980 and road freight almost tripled (see Figure 8 and Figure 9). For the exchange of goods between northern and southern Europe, only a limited amount of adequate transport infrastructure is available. The consequence is that traffic is concentrated on these routes, i.e. on the Fréjus and Mont Blanc tunnel in France, on the Gotthard tunnel in Switzerland and on the Brenner tunnel in Austria. Two thirds of the goods were transported on roads and one third by rail. Rail share in Switzerland is exceptionally high with over 60%.

Although rail links are also limited, there is still enough capacity on the Alpine links. The capacity problem is rather around the urban areas close to the Alps. There are plans to increase rail capacity through the Alps in Austria, France and Switzerland. The projects are most developed in Switzerland where the first new tunnel should be open in 2007.

FIGURE 8: RAIL FREIGHT TRANSPORT THROUGH THE ALPS (ALPINFO, ARE 2003)

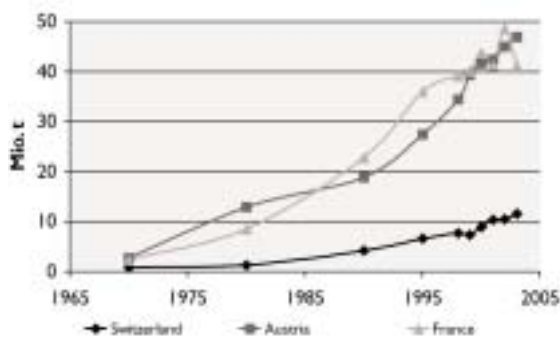
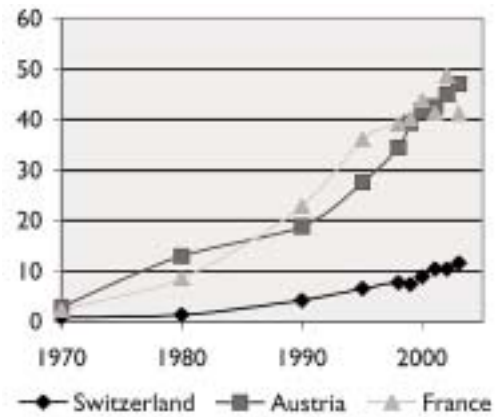
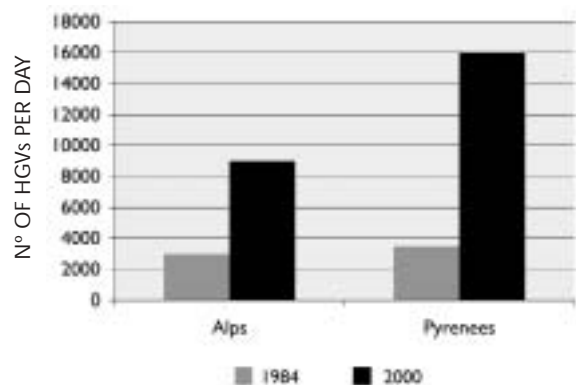


FIGURE 9: ROAD FREIGHT TRANSPORT THROUGH THE ALPS (ALPINFO, ARE 2003)



The situation in the Pyrenees is worse than the situation in the Alps. Transport to and from the Iberian Peninsula increased significantly after Portugal and Spain joined the EU (see Figure 10).²⁴ Between 1985 and 1995, traffic volume of lorries grew by 330% in the Pyrenees (EEA 2001b). Trans-Pyrenean transport is very unevenly allocated to the different transport modes. Over 90% of land transport is road transport (66.4 million tons in 2002). Railways play only a small role with 3.4 million tons in 2002. More than 40% of freight exchange between the Iberian Peninsula and the European Union is done by short sea shipping (see Figure 11).

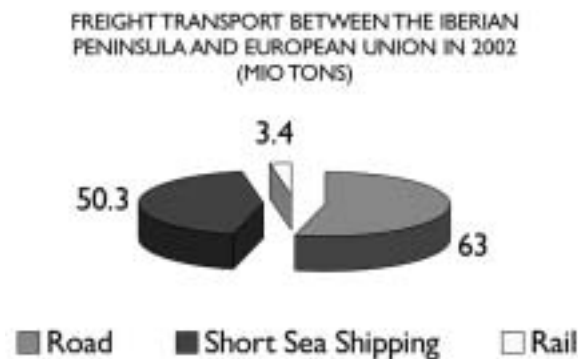
FIGURE 10: DEVELOPMENT OF HEAVY GOODS VEHICLES ON LINKS IN ALPS AND PYRENEES (ETCHELECOU ET AL 2001)



²⁴ While traffic from eastern European countries still forms a limited share of total freight traffic, the enlargement of the EU is expected to have the same effect as in relation with the Iberian Peninsula, resulting in an increase of road freight transport.

Land transport is concentrated on the east and west coasts. There are quite a few road links through the central Pyrenees, but they are mainly used for passenger transport and local goods delivery. Over the last years the number of heavy goods vehicles has increased notoriously on the links through the central Pyrenees although the roads were not suitable.

FIGURE 11: TRANSPORT VOLUMES AND MODAL SPLIT FROM AND TO THE IBERIAN PENINSULA (MIO TONNES) (MINISTÈRE DE L'EQUIPEMENT DES TRANSPORT ET DU LOGEMENT , 2003)



There are only three open rail links between France and Spain, again on the coast, between Irun and Hendaye on the Atlantic coast and between Port Bou and Cerbère on the Mediterranean. A fourth link between Toulouse and Zaragoza is only open on the Spanish side till Canfranc but closed on the French side. Currently a project is being carried out on the Spanish side to improve the access to this link. The problem of different width gauges between the French and the Spanish railway lines reduces the capacity of the rail network and is a significant reason for the low level of rail freight between Spain and France.

Growing freight transport has a number of particular impacts in sensitive areas:²⁵

1. Climate change: vulnerable ecosystem

The impact of climate change on sensitive areas is already visible: eight out of nine Alpine European glaciers show a significant retreat and also the ice in the European Arctic has declined. In parallel, the permafrost soils are shrinking which increases the possibility of avalanches. This represents a threat for habitation and infrastructure in mountainous regions.

Furthermore, it endangers certain species, mountainous forests and the biodiversity of mountainous areas. Finally, the increase in temperature in recent years represents a potential danger for local economies which depend strongly on tourism (EEA 2001). Several ski tourism resorts between 1000m and 1500m above sea level are faced with reduced snowfall which makes them less attractive for winter sports.

Global warming also increases the temperature of the oceans. This threatens species and the biodiversity of maritime areas (EEA 2004c).

Freight transport in sensitive areas contributes to greenhouse gas emissions which cause global warming and subsequent environmental impacts. Nevertheless, these areas alone cannot protect themselves as greenhouse gases are emitted globally.

2. Local and regional air quality: inversion

The specific topographic and meteorological conditions in mountainous valleys hamper the dispersion of air pollutants, thus increasing the harmful effects of pollutant emissions compared to those in non-mountainous areas. The direct effects on the concentration of pollutants in the ambient air per unit NO_x emission is almost one order of magnitude higher than in lowland areas (EEA 2001b).

In winter and at night, air quality in the Alpine valleys is worsened by weather inversion. The cold air lies on the ground of the valleys and is separated from the sunshine on the mountains through a layer of fog. Therefore pollutants cannot escape (Oekoscience 2000). The impacts of emissions are on average:

- ▶ in winter more than twice as high as in summer
- ▶ at night more than six times as high as during the day

Road traffic is concentrated in only a few heavily frequented trunk routes, which results in high concentrations of pollutants in the ambient air in the valleys and areas concerned. In addition, pollutants are transferred by air flows from outside the mountains. Under high solar radiation, valleys work as a pump, transferring air and pollutants from ground level to altitudes of 2,000 to 4,000 metres above sea level. This increases, for example, the concentration of ground level ozone in valleys and on mountains (Oekoscience 2000).

²⁵ A study from the European Environment Agency gives a good illustration of the particular impacts of freight transport in sensitive mountainous areas. EEA 2002b: 'Road freight transport and the environment in mountainous areas'. To be downloaded from: . See also Oekoscience 2000.

The average annual nitrogen concentration in many areas along heavily frequented Alpine crossings exceeds the EU air quality standards²⁶ for the protection of vegetation of 0.030 milligrams per cubic metre (mg/m³) or for the protection of human health (0.040 mg/m³).²⁷ Critical loads for nutrient depositions are reached in the Alps and the Pyrenees.²⁸ The consequence is a destabilisation of the ecosystem in mountainous areas, which are particularly sensitive to air pollutants and pollutant deposition caused by

higher altitudes, lower soil quality, restricted vegetation periods and other hazards (EEA 2001b).

Road freight transport is an important contributor to air emissions in mountainous regions.²⁹ The closure of mountainous links for heavy goods vehicles in the Mont Blanc tunnel in France (Etchelecou et al 2001) and on the Gotthard motorway (see box 3) reduced the concentration of air pollutants within a short period considerably.

BOX 3: HOW ROAD FREIGHT TRANSPORT INFLUENCES AIR QUALITY IN MOUNTAINOUS REGIONS

After the accident causing 11 deaths in the Gotthard tunnel on 24 October 2001, the A2 motorway was closed for heavy goods vehicles until 21 December 2001. During this period the heavy goods vehicles were diverted to the San Bernardino link (A13 motorway).

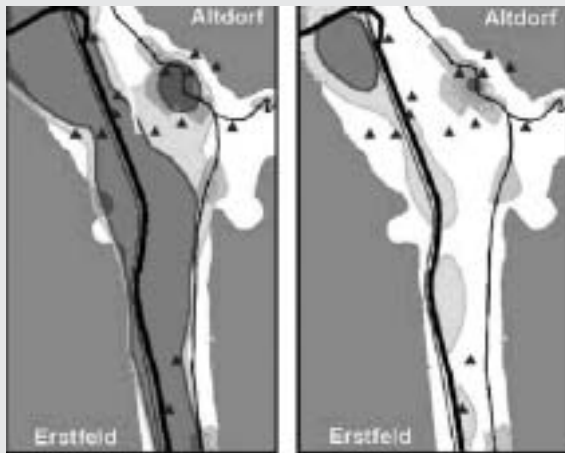
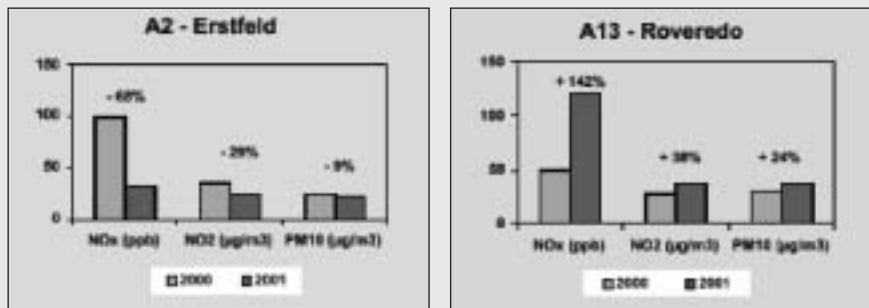


FIGURE 12: NO_x emissions over the same period along the Gotthard motorway in the Reuss Valley: left in 2000 (motorway open for HGV), right in 2001 (motorway closed to HGVs) (BUWAL 2002)

This diversion of traffic led to a marked increase in air pollution along the A13 and to a significant reduction along the A2 (see Figure 12 and Figure 13). Compared to the same period in 2000, total emission of NO_x increased along the A13 by +142% in the south (Roveredo) and by +112% on the north side of the Alps (Chur). NO₂ and PM10 increased by +38% and +32% respectively. Corresponding reductions were recorded along the A2 in the Reusstal (north) and the Leventina (south).³⁰ Over the entire area of the Umer Reusstal (A2) near Erstfeld, exposure to nitrogen oxides was about four times higher after the closure than during it. The exposure displays steep gradients with respect both to distance from the highway and to altitude. In general, pollutant concentrations in the Alpine valleys that are subject to heavy traffic are very high, much higher, for example, than in Zurich during peak periods. In conclusion, it can be stated that a change of 1000 lorries per day leads to an increase of 36 ppb along the A13 and a reduction of 16 ppb in NO_x along the A2. For NO₂, the corresponding reduction or increase was 71.5 g/m³ per 1000 lorries, and for PM10, 21.5 g/m³. The changes recorded in air pollution clearly illustrate the enormous influence that heavy goods traffic has on the sensitive ecosystems in narrow Alpine valleys and on the health of the people living there.

FIGURE 13: Average air emissions on working days from 24 October 2001 to 21 December 2001 during the closure of the A2 motorway for heavy goods vehicles: left graph along the closed motorway, right graph along the alternative motorway (Buwal 2002)



²⁶ First Daughter Directive on Air Quality Framework Directive (EU 1999a). Although the deadlines set in the first Daughter Directive are for 2005 and 2010, it is crucial to start implementing air pollution abatement measures now. Where limits were exceeded in 2001, reports and plans must be completed by the end of 2003, meaning that this work needs to be done immediately.

²⁷ Exceeded near the motorways (A13 Gärberbach, A12 Vomp) and in urban areas (Innsbruck). The NO₂ concentrations (daily mean values) measured in the valley of Bariatou (Pyrenees) and in the Maurienne valley (Alps) reached about 50 micrograms per cubic metre (µg/m³), measured in France. The long-term ozone level for the protection of human health (0.10 mg/m³ 8-hour mean value) and for the protection of vegetation (0.06 mg/m³ 8-hour mean value) were exceeded in the Tyrol (EEA 2001b, Etchelecou & Deletraz 2000 and Etchelecou et al 2001).

²⁸ In the Tyrol annual nutrient deposition reached values up to 30 kilograms per hectare per year (kg/ha/a) which is considered critical for conifers in the long term. The critical load is 10-12 kg/ha/a. In Bariatou annual nutrient depositions (nitrogen) reached values of more than 35 kg/ha/a.

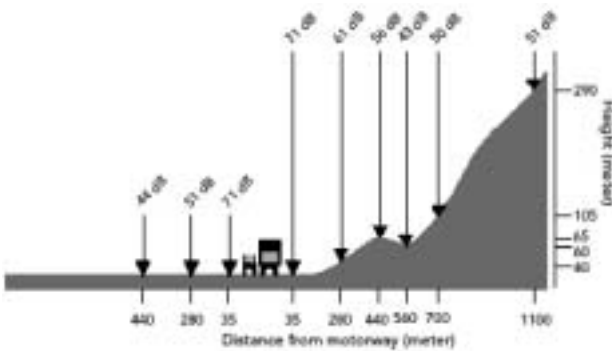
²⁹ Road traffic is responsible for about 66% (8,300 tonnes) of the total NO_x emissions (12,600 tonnes in 1996) in the Tyrol. Of the 8,300 tonnes of NO_x emissions caused by road traffic in the Tyrol, 2,800 tonnes can be attributed to the Brenner route of which trucks account for 1,850 tonnes (Schneider, 1999). See also Etchelecou 2000 and 2001.

³⁰ north (Erstfeld): NO_x -68%; NO₂ -29% and PM10 -9%; south (Bodio): NO_x -58%; NO₂ -38% and PM10 +2%.

3.Noise: inversion and echo-effects

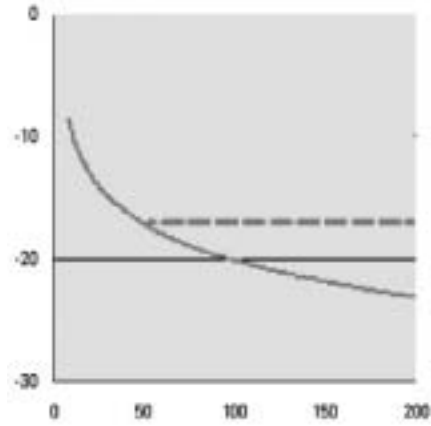
Noise also has a significant environmental impact in mountainous areas. The shape of valleys in high mountains means that noise emissions are intensified. In flat areas noise is absorbed by the greater flat surface area of soil and vegetation, which is not the case in mountainous areas. Noise is reflected by the slopes and produces an echo effect. All this means that at the same distance from the source, noise levels in mountainous areas are higher than in lowland areas (see Figure 14) Due to the narrowness of the valleys and to the reduced space available for settlement areas, it is impossible to solve this problem without silencing the source of the noise.

FIGURE 14: COMPARISON OF NOISE EFFECTS IN LOWLANDS AND IN MOUNTAINOUS REGIONS (EEA 2001B)



Inversion also plays a role in regard to noise. In normal meteorological situations, noise reduces with distance. If there is an inversion, noise level will not be reduced (see Figure 16). Noise is kept in lower and colder air layers and cannot escape to the higher ones. The effect is similar to that of air emissions: the same noise source has worse effects in winter than in summer and at night than at day.

FIGURE 15: NOISE REDUCTION (IN DB) WITHOUT (---) AND WITH (—) INVERSION (DISTANCE FROM NOISE SOURCE IN METRES) (ALPINE INITIATIVE 2001)



Road and rail transport both contribute to noise pollution in narrow mountainous valleys.

4.Land use and habitats

In mountainous regions, permanent settlement areas cover only a small part of the whole area. The disposable land for all human activities in mountainous areas corresponds to approximately one eighth of lowland areas. Therefore the concentration of inhabitants, especially in some Alpine valleys, can reach urban levels.

As the disposable land is comparably small, transport infrastructure has a relatively high share of it in mountainous areas and is inevitably situated close to living and recreation areas.

In addition to the environmental impacts, freight transport in sensitive areas might also have negative economic and social impacts, e.g. on tourism and agriculture or on the living conditions and quality of life of less mobile people who have to stay in the valleys.³¹

³¹There are only a few studies on this topic, e.g. comparing economic development along Swiss motorways on the Gotthard Pass and in neighbouring valleys without motorway (STEINER 2002). Further research is required on this topic.

The need for meaningful targets to protect sensitive areas

The facts so far can be summarised as follows:

1. Although not clearly identified, sensitive areas widely exist in Europe and they need to be protected for environmental, economic and social reasons.
2. Transport poses a continuously growing threat to sensitive areas.
3. So far, current policies have not yet achieved protection for sensitive areas from negative transport impacts.

These three facts show the need for a coherent transport policy for sensitive areas. Such a policy should be based on clear targets and objectives. An agreement on transport and environment objectives and targets is a prerequisite for steering transport strategies in sensitive areas in a sustainable direction. Such targets should be agreed internationally and should address both the freight transport system and its environmental impacts.³²

The targets should most importantly address the previously mentioned problem areas:

1. Climate change: A reduction of greenhouse gas emissions is essential for environmental reasons (mountainous and maritime areas) but also for economic and social reasons. Climate change effects clearly endanger economic development and living conditions in mountainous areas but also in coastal zones. However, greenhouse gases cannot be effectively reduced within sensitive areas only. Measures must be taken globally. Climate change is one of the few areas with an existing target. Developed countries should reduce their emissions of CO₂ according to the Kyoto Protocol. Additional targets should be applied for long-term perspectives and for the transport sector.

Possible targets, e.g.:

- 8% CO₂ reduction by 2008 – 2012
- Y% of CO₂ reduction by 2020
- Z% of GHG emissions from transport by 2010

2. Local and regional air pollution: Although some improvements could be achieved through technical measures, air pollution remains a problem for many mountainous regions due to their topographic and meteorological particularities. Air pollution is also a growing problem in coastal areas around ports.³³ The air quality directives of the European Union fixed limit values for air pollutants for 2005 and 2010 respectively. These limits should be used as targets. Additional targets should be added with intermediate steps to gradually reduce the number of citizens and regions exposed to values exceeding the limits.

Possible targets, e.g.:

- Exposure max 40 µg/m³/a NO_x by 2010 for all citizens
- Exposure max X µg/m³/a NO_x by 2007 for 50% of citizens.

3. Noise: Noise effects are particularly high in mountainous regions because of the meteorological and topographic situation. The EU Noise Directive does not include limited values. However, the WHO identified noise levels which annoy citizens and represent threats for human health. The EU should agree on

Possible targets, e.g.:

- maximum noise exposure at day 55dB for all citizens by 2008
- Maximum noise exposure at night 45dB for all citizens by 2008

4. Land use and habitat protection: Wetlands and bird habitats are internationally protected. However, many other sensitive areas in mountains or coastal zones where disposable land for human activities is scarce. However, there are not yet any targets to limit land use for transportation and fragmentation of habitats in these areas.

Possible targets, e.g.:

- absolute protection: no more land used for transport infrastructure³⁴
- Relative protection: maximum X% of disposable land may be used for transport infrastructure.
- Fragmentation of habitats must not go below X km²

³² This is one of the main conclusions from the EEA report on 'Transport in mountainous areas' (EEA 2001b). UNECE Adapt and develop, at the international level, further environmental quality criteria and standards for sensitive areas to achieve specific environmental targets for air, soil and water quality, noise, and land use; UNECE 1997.

³³ Air pollution is also a problem in urban areas, not covered in this document.

³⁴ The transport protocol of the Alpine Convention includes as instruments e.g.: 'not constructing new high-capacity roads for transalpine traffic (motorways, freeways)' and 'construction of new trunk roads for inner-Alpine traffic only under strict conditions concerning the environment- and transport-related (e.g. potential modal shifts) impact' (Alpine Convention 2001). The Swiss constitution includes an article saying that no new road infrastructure may be built through the Alps (Switzerland 1999)



3. Instruments

This chapter shows how instruments should be implemented in a target-oriented way and where the potential and limits of the instruments are to achieve the targets in the four areas mentioned above.³⁵

Economic instruments

There is a broad recognition that transport users don't pay all the costs they cause to society, although consensus is lacking on the exact value of these external costs.³⁶ The latest study from INFRAS/IWW estimate the total external costs from transport at about 650 billion in 2000 or 7.3% of the GDP.³⁷ These figures include costs for climate change, air pollution, accidents, noise, nature, landscape and urban effects. It does not include infrastructure and congestion costs. In absolute terms, road has the highest part of the external costs at 83.7% and aviation next with 14.0%. Passenger transport accounts for two thirds and freight for one third of the external costs. Aviation has the highest level per tonne kilometre with 271, far in advance of road freight with 87.8 per tonne kilometre.

Therefore, current transport prices do not give the right incentives to users. Transport prices are too cheap for users, which makes transport too expensive for society. Making the users pay for all external costs reduces negative impacts and makes transport more efficient. This means, those who drive more with very polluting vehicles in congested situations should pay more than those driving less with less polluting vehicles on a non-congested road.

Economic instruments have the advantage over command-and-control type of instruments by leaving transport decisions

to the market instead of imposing them on the market. This flexibility permits reaching the objectives with fewer costs than with other instruments, because measures are taken by those that face the lowest compliance costs and allows continuing those transports with the highest value.

The widespread agreement by economists on the rationality of such instruments has not yet found its way into policy-making and implementation.³⁸ The current debate surrounding transport pricing focuses on what costs can be charged rather than on what targets can and should be achieved. Economic instruments could be very effective if they focus on targets and not on academic cost calculations. Examples of possible instruments:

- CO₂ charges on fuels (must be applied at least on EU level to be effective)
- distance-based and emissions-based charges to reduce air pollution (application should exceed sensitive areas in order to be effective, e.g. kilometre charging following the Swiss Heavy Vehicles Fee (HVF) in Europe). Further investigations should be made on how to differentiate pricing according to the degree of sensitivity of the region or certain routes. This would require the development of criteria for the identification of sensitive areas.
- a trading system of permits to use transport infrastructure in sensitive areas in order to use the existing infrastructure more efficiently and recognise the scarcity of transport infrastructure in sensitive areas. The available permits should reflect the capacity of existing infrastructure, taking safety into account, and correspond to traffic volumes respecting the targets for air emissions and noise.³⁹

³⁵ Additional information about target-oriented implementation of pricing instruments can be found in T&E 2002a.

³⁶ A good overview of the terminology of transport pricing can be found in EEA 2004d, page 9.

³⁷ This includes EU-15 plus Norway and Switzerland. There are a number of studies on transport costs and pricing, e.g. CE 2002, ECMT 1998, or EU research projects as UNITE 2002, IMPRINT 2002.

³⁸ At EU level, the directive for charging for heavy goods vehicles Dir 1999/62 is currently being revised for railways (EU 2001a). Switzerland has had a distance-related charging system for HGV on all roads since 2001 (ARE 2002) and Austria on motorways since January 2004 (Schwarz-Herda in T&E 2004a). Further plans exist in Germany (planned to start in 2005), UK and Czech Republic (planned for 2007/2008).

³⁹ Such a system of an 'Alpine Crossing Exchange' is promoted by the Alpine Initiative (Alpine Initiative 2004) and currently under consideration by a research project mandated from the Swiss Transport Ministry (see abstract Neuenchwander in T&E 2004a).

Investments in transport infrastructure

Decisions to build new transport infrastructure are still popular with many politicians on the grounds that they 'help create jobs' and are 'responsible for economic growth'. Incredibly, it is still possible to convince decision-makers that more roads will remove congestion.⁴⁰ However, history shows that new transport infrastructure creates more traffic and does not reduce congestion.⁴¹ Nor is it true that building new transport infrastructure will provide the expected economic and regional development.⁴²

In fact, building new infrastructure is often the most expensive, least effective and even counter-productive instrument for achieving the targets above. Cost overruns and over-estimation of future traffic are common in big infrastructure projects.⁴³ Huge infrastructure projects conflict with the target of limiting land use for transport purposes in sensitive areas. In addition, they cause more noise annoyance independently from the transport mode as transport will increase.⁴⁴ Positive effects on climate change and air pollution from rail projects can only be expected if they are imbedded in a comprehensive transport policy reducing energy consumption and air emissions from the transport system as a whole. In addition to the pull measures coming from the new rail infrastructure such a transport policy needs push measures for other transport modes. This is especially true for the planned rail projects through sensitive mountainous areas which are part of the priority projects of the Trans-European Transport Network.⁴⁵ These projects are particularly expensive and will only be economically viable if they are really used. Therefore, instruments must provide incentives to push freight away from road (see under 3 and 5 below). Furthermore, it is not evident that these huge projects answer a real need. Bottlenecks are rather on the edge of the sensitive areas around urban settlements (e.g. Munich, Milan, Lyon, Toulouse). If these bottlenecks are not eliminated, the expensive rail tunnels will not make financial sense.⁴⁶

Investment in huge transport projects, even in ostensibly reasonable rail projects through sensitive areas, have three risks:

1. Economic risk: much more expensive and much less used than projected
2. Environmental risk: damaging
3. Transport risk: create new congestion elsewhere without removing congestion

Therefore, comprehensive cost-benefit analysis as well as strategic environmental assessment should be applied for all projects not only those co-funded by the European Union.

The emphasis should be shifted away from huge TEN projects towards smaller and more sustainable projects: linking transport modes together and improving real bottlenecks, e.g. around urban areas close to sensitive areas, or transport telematics.⁴⁷ Investments in other areas than transport, e.g. in education, health services, often deliver a higher return on investment and should be considered as valuable alternatives.

Operation

No matter how desirable and sensible the better use of existing infrastructure is, fundamental improvements are required in the operation and services of alternatives to the road sector. The increase of road freight is caused, in addition to competitive distortion, by the flexibility of the sector or the lack of flexibility, client orientation, services and reliability of other transport modes. There is a quite big potential to attract more traffic by improved rail freight services, intermodal transport, inland waterways and maritime transport.⁴⁸ Several studies show that customers are most concerned by reliability and availability (frequency) of services.⁴⁹ The question of how much the alternatives to roads will be used depends on how much these can respond to the clients' requirements.

⁴⁰This is also the motivation for the TEN-Transport projects (see EU 2004a) and also mentioned in the report from the High Level Group on the Lisbon Strategy (see Kok et al 2004).

⁴¹Despite the fact that two-thirds of all transport infrastructure investments in Europe were made in road transport, congestion of the network increased (see EEA 2002 a), EEA 2004d). For the theoretical background of traffic generation see Transtech 2002.

⁴²See SACTRA 1999, T&E 2002b.

⁴³See Flyvbjerg et al 2003: 'Cost overruns by 50-100% in real terms are common on the largest projects.' See also T&E 2004 a and b.

⁴⁴The citizens in the Swiss canton of Uri, where road and rail links through the Alps already exist, insisted on a more expensive construction with more tunnels in order to protect the community from negative impacts once it becomes operational. For the theoretical background of traffic generation see Transtech 2002.

⁴⁵Brenner rail tunnel, Lyon-Turin intermodal link, high capacity rail link through the central Pyrenees.

⁴⁶Transport ministers of the Alpine countries agreed in November 2004 to build seven rail links through the Alps and underlined the need for an accompanying charging system for heavy goods vehicles (see UVEK 2004)

⁴⁷See e.g. abstracts Rauh, Schramm, Duelli/Frank, Burkhardt in T&E 04/7.

⁴⁸See e.g. EC 2000a and 2001, abstracts Schramm, Duelli/Frank, Burkhardt, Fischer, Ruesch, Goiri in T&E 2004a.

⁴⁹See e.g. Ockwell 2001, ECMT 1998, CE 1996.

Another distortion between transport modes is the level of liberalisation and implementation of the internal market. Whereas the road market is fully liberalised and trucks and truck drivers can cross Europe without borders, freight services are still strongly hindered by national borders. The liberalisation of the rail freight market should be continued in order to allow old and new operators providing new client-oriented products.⁵⁰

In the road sector, existing legislation with regard to driving and rest time, load, speed limits, should be better enforced. Calculations show that the cost of road freight transport might be increased by 50% if the existing legal framework was enforced.⁵¹

Technical improvements

The tightening of emission standards for road vehicles and fuel quality regulations has resulted in a significant improvement in the environmental performance of road vehicles and will continue to do so (EEA 2004a). However, it is very likely that technological measures alone are not sufficient to reduce the environmental impact of traffic below critical levels and critical loads in mountainous areas. Furthermore, technical improvements don't address the increasing transport demands and thus the pressure on land use and fragmentation from new transport infrastructure.

The emission levels of test cycles can often not be achieved in real operations (COST 2004, EEA 2004a). The values in mountainous areas are often worse as engines cannot be used at the most efficient levels due to the steep slopes where vehicles have to drive in low gear (EEA 2001b).

However, restrictions for vehicles crossing sensitive areas with low emission classes (e.g. EURO 0 and 1) could be envisaged.

Air emissions from maritime transport and diesel locomotives should also be reduced by similar efforts with regard to fuel qualities and engines' technology.⁵²

Restrictions

Restrictions, command and control measures are quite broad-edged as they apply to all users independently of their costs, to comply with the measure. However, in certain cases restrictions may be the only instrument to provide sufficient protection for citizens and the environment. This might for example be the case for road freight transport through sensitive areas during the night as the impact of air emissions and noise is much higher at night than during the day. Night bans for trucks exist in Europe in Switzerland for all trucks and in Austria for trucks over certain noise levels (EEA 2001).⁵³

Transport restriction is also an effective instrument as a response to scarce transport infrastructure and as an alternative to infrastructure building.

Traffic restrictions are also applied in particularly sensitive sea areas so that, for example, they have to avoid certain areas or ban discharge of waste (WWF 2004).

⁵⁰ The European Commission has with several proposals opened up rail freight services, see e.g. EU 2001a, 2004b and EC 2004b.

⁵¹ See e.g. abstract Leodolter in T&E 2004a.

⁵² Reduction of air emissions from ship could be achieved quite cost effectively by economic instruments (see abstract Ortman in T&E 2004a).

⁵³ See also Alpine Initiative 2001.

BOX 4: ARE TRAFFIC RESTRICTIONS IN CONFLICT WITH THE EUROPEAN TREATY?

The free movement of goods is one of the main principles of the European Union. It is laid down in Article 23 of the Treaty establishing of the European Community (EU 2002a).

Article 23 lays down the principle of the internal market:
'The Community shall be based upon a customs union which shall cover all trade in goods which shall involve the prohibition between Member States of customs duties on imports and exports and of all charges having equivalent effect, and the adoption of a common customs tariff in their relations with third countries.'

In Article 75, the Treaty specifies the meaning of free movement of goods with regard to transport policy:

'In the case of transport within the Community, discrimination which takes the form of carriers charging different rates and imposing different conditions for the carriage of the same goods over the same transport links on grounds of the country of origin or of destination of the goods in question shall be abolished.'

Under the environmental heading (Articles 174–176), the Treaty allows Member States to introduce more stringent protective measures than those foreseen in the Treaty, as long as they are compatible with the Treaty and notified to the Commission.

Although, different interpretations of these clauses are possible, it is quite evident that free movement is thought to ensure unrestricted and non-discriminating trade between the Member States but does not mean unlimited traffic. Non-discriminating restrictions for environmental or safety reasons should not contradict the Treaty. This is confirmed by complaints at the European Court of Justice which deal with the restriction of free movement by establishing discriminating rules. The court case against Austria on sectoral restrictions for certain goods accused Austria of discrimination. In the same time it acknowledged the superiority of environmental and health aspects over internal market considerations (EUGH 2003).

The different instruments have all strengths and weaknesses. A 'one size and one instrument' approach does hardly protect sensitive areas effectively and hardly achieve ambitious and realistic targets. The current European legislation gives member states ample freedom to apply strong instruments. However, these instruments must be implemented in a non-discriminating way.⁵⁴

⁵⁴ Similar argumentation with regard to discrimination was applied for the case on the Brennermaut (EUGH 2000).

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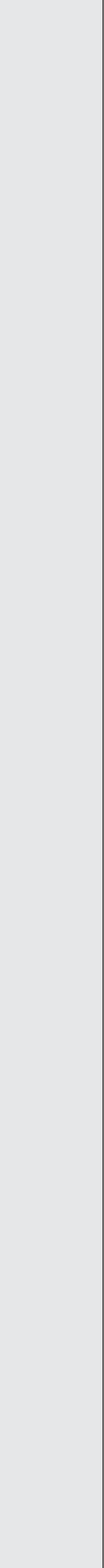
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About T&E

T&E is Europe's principal environmental organisation campaigning specifically on transport. Members are drawn from NGOs in nearly every European country, all of whom promote a more environmentally sound approach to transport.

T&E - European Federation for Transport and Environment

Rue de la Pépinière, 1 | B - 1000 Brussels | Belgium

Tel.: +32(0)2-502 99 09 | Site: www.t-e.eu

The term 'sensitive areas' is frequently used in the European transport policy debate but there is still a lack of clarity and a number of misconceptions and uncertainties faced by stakeholders working on the topic. This publication has been produced for European and national decision makers and non-governmental organisations (NGOs) and aims to aid understanding of the issue, and inform debate about the way forward.