

# Land take by transport infrastructure

## Dimension - Environment

Associated Key Factor:

### Attitudes and implementation of principles relating to sustainable development

Data Source:

Eurostat

L-2920 Luxembourg

<http://europa.eu.int/eurostat>

General Availability:

Reporting unit: Hectares per km<sup>2</sup>

Reporting level: national and cities

Reporting period: every 10 years

Data available from 1998

Availability by country:

1998 - : EU-15+AC-13

The indicator:

Fragmentation of Land due to the expansion of transport infrastructure networks and the continuous growth in traffic, poses an important threat to biodiversity from direct impacts from proximity and disturbance, and by fragmenting and isolating habitats and creating barriers to wildlife (TERMS 2002).

### Description

Land transportation systems are a cause of habitat fragmentation, the disruption of wildlife habitats and their division into smaller area (van Bohemen). Habitat fragmentation has four components. First, transportation lines cause direct destruction of habitat by replacing it with roads, rails, or other infrastructure. Second, a transport right-of-way will disturb adjacent habitat through chemical pollution, noise, light, or other impacts. Third, the right-of-way creates a barrier separating functional areas within a habitat. Many plants or animals will not cross such a barrier, so a road can have the effect of cutting their ecosystem in two. Ecosystem species diversity is a function of the total size of the area of uninterrupted habitat; thus dividing an area with a road could cut diversity in half rather than reducing it only by the actual area used by the road. Fourth, a transport right-of-way can lead to direct collisions between animals and moving vehicles.

### How is it measured?

Direct and indirect land take by transport infrastructure is based on average land take estimates using infrastructure statistic data (see table 1). Estimates for motorways and high-speed train lines (based on assumptions about the number of lanes or tracks and their average width) may be of variable quality, for example they may not take account of associated facilities such as garages, filling stations and parking areas. Land take by transport infrastructure in urban areas is based on figures for 1950s and 1990s produced in MURBANDY project: land cover mapping for monitoring urban dynamics done for 25 European agglomerations. More about methodology used in MURBANDY can be found on / and (TERM 2002) The importance of road, rail lines, or pipelines as sources of habitat fragmentation will be related to their length and width and to the habitats through which they pass. Direct habitat loss, externalities like pollution and noise, and road kill will be directly affected by the volume of traffic and width of the road. Measures are available to minimise these impacts, by designing infrastructure such as roads and road barriers so as to minimise pollution or light, and so on. These problems are somewhat analogous to the water pollution problems discussed above, in that it may be possible, although difficult, to relate their growth to increased freight use.

### What are the disadvantages of the Indicator?

The creation of barriers which divide ecosystems is much harder both to analyse and to manage. Moreover, the importance of such barriers is very much related to the nature of the surrounding environment. A road or rail line running through an urban area is not likely to cause ecosystem harm, since the area is already not in a natural state. Roads through sensitive areas like the Alps, or protected forest areas in the United States, however, can cause significant ecological harm. A rigorous analysis of the impact of different transport modes on land use and habitat fragmentation would require detailed knowledge of local ecology and land use patterns. Even with such information about particular ambient conditions, it is will be hard to establish a direct correlation with increased goods transport. (OECD 1997)

### What is the policy relevance of the indicator?

The common transport policy (CTP) advocates an optimal use of existing infrastructure before creating new ones, partly to minimise land taken for transport infrastructure (European Commission, 2001).

**The Indicator is relevant for the following pathways of the FORESIGHT FOR TRANSPORT exercise:**