

The State of Habitat Fragmentation Caused by Transport Infrastructure in the Czech Republic

Jiri Dufek
Transport Research Centre
Brno, Czech Republic

Vladimir Adamec, PhD.
Department of Environmental Chemistry and Ecotoxicology,
Faculty of Science, Masaryk University,
Brno, Czech Republic

Abstract

This presentation describes the activities in Czech Republic aimed to the elimination of transport impacts on the fauna including legislature measures and roles of all interested institutions. One part of the newly constructed highway is described in detail from the view of constructed fauna corridors, its size, design and location and the possibilities of its usage by fauna. Also the most problem identified area and the methodology of assessment of present passages is mentioned.

Introduction

Transport Research Centre and Department of environmental Chemistry and Eco-Toxicology Masaryk University dispose an excellent level of research work and activities in the field of environmental protection. Both institutes represent the Czech Republic in international organisation IENE (Infra Eco Network Europe) and co-ordinates all activities in the Czech Republic in the defragmentation of natural habitats fragmented by transport infrastructure. In addition, we are involved in the team implementing the Strategic Environmental Assessment of transport policies, area and regional plans, and main transport network. Our specialisation is emissions and noise from transport, risk analysis of rail junctions, environmental impact assessment, harmonisation of Czech and EC legislation and acquis and also chemical analysis realised by own chemical laboratory.

Study Area

Study area is situated in surrounding of main oldest Czech highway D1 Prague - Brno, highway D2 (Brno - Olomouc) and also new highway D47 from Olomouc to Ostrava (I will present a map).

Methods

Methods of both on-going projects are described in following text, in the chapter :The overview of the Czech related existing projects and results.

Major Topical Areas

1. Legislative framework

Environmental Impact Assessment, Strategic Environmental Assessment

For planned transport infrastructure is valid the Law 244/92 Coll. The annex of this law introduces the construction parameters, which indicate when is necessary to initiate the EIA process. In the field of transport all highways, roads, rails, airports and waterways constructions and fundamental re-constructions must get through the EIA procedure. Now the novel of this law is prepared and the screening and scoping will be introduced in EIA/SEA procedure.

Brief characterization of EIA procedure in the Czech Republic:

1. EIA documentation includes:

PART A: basic data on the project: title, place, character (new or modernized construction), investor, designer, terms of introduction and finalization

PART B:

- ? data on inputs: land use - permanent and temporary, water consumption if any, raw material and energy sources, energy, data on sources of air pollution,
- ? data on outputs (point, square and line sources of air pollution, waste water if any - amount technological process, character of recipient watercourse, noise and vibration

PART C:

- ? description of varieties
- ? description of the environment possibly influenced (climatology, geology, geomorphology, hydrogeology, ground and surface water, flora and fauna)
- ? supposed impacts description
- ? proposal of measures and monitoring,
- ? non - technical summary, final point of view.

2. EIA review

EIA review evaluates completeness of data presented in documentation, correctness of all impacts assessment, review of maps etc.

3. Public discussion

The investor (Directory of Roads and Highways, Czech Railways), author of documentation and review, and civil initiatives (more than 500 persons), have one representative at discussions. Furthermore, also the interested communities as towns and villages are invited for a public discussion through its authorities after presenting a written expression.

4. Final conclusion of competent authority

The final conclusion gives the competent authority, which is Ministry of Environment or/and District authorities.

Biological valuation according to Law No. 114/92, out of EIA and SEA processes

The Authority of nature protection can order the biological valuation in case any construction does not have a size and parameters for EIA procedure. The content is similar to EIA documentation and includes variety description, environmental description, supposed impact description and proposal of measures, monitoring and a final point of view.

2. Role of interested institutions in connection with habitat fragmentation and infrastructure

Ministry of Transport

Ministry of Transport is responsible for management of transport sector and transport infrastructure planning; create and edit laws and policies concerning the transport sector, harmonise the EU legal in the field of transport, transform the Czech Railways, finance the construction and maintenance of transport networks and transport research.

Ministry of Environment

Ministry of Environment is responsible for environmental sector, create and edit laws and policies concerning the environment, harmonize the EU legal in the field of environment and also finance the environmental programs, projects and research.

Transport Research Centre

Transport Research Centre is the transport research arm of the Czech Ministry of Transport providing the research of habitat fragmentation problematic and coordinating the Czech activities in this field. Transport Research Centre also co-operates with "biologic" organizations as the Department of Environmental Chemistry and Eco-toxicology and

Agency of Nature and Landscape Protection and

Department of Environmental Chemistry and Ecotoxicology, Faculty of Science, MU

Department deals with research habitat fragmentation problematic, diversity and activity of choice communities in terrestrial ecosystems stressed by heterogeneous environmental mixtures of persistent organic pollutants (POPs) and heavy metals.

Directory of Highways and Roads

Directory of Highways and Road is responsible for construction of the approved transport road network (quality and finance), maintenance of present road network (in the frame of financial possibilities) and construction or reconstruction of fauna passages across road infrastructure.

Czech Railways

Czech Railways are responsible for the rail corridors modernization, which should make the rail transport more attractive to the road transport (travelling more comfortable, speed increase to 160 km/hour ...). Czech Railways should also be an investor of passage constructions for fauna migration.

Agency of Nature Protection

Agency of Nature Protection is a co-operator solving the projects concerning a habitat fragmentation, responsible for a slot analysis at the existing highway passages, etc.

3. Existing corridors and fauna passages

The fauna passages weren't constructed till 1992. It deals with the main highway Prague - Brno where the underpasses exist in places of crossing the highway and some watercourse. These passes are documented for fauna usage and completely described: see Chapter 4 - Existing database.

Since 1992 the bio-corridors have been constructed from time to time after the district authority decision. Every district authority has a department of environment that proposes places (laps) and dimensions of fauna corridors. The quality of proposals depends on quality of EIA documentation.

It is possible to say that current highways, not completely constructed till now, do have enough passes with perfect design, usable for small and middle fauna. I will present an overview and photos of corridors at newly constructed motorway.

4. The overview of the Czech related existing projects and results

Presently two projects are solved in Czech Republic.

1. "Habitat fragmentation caused by transport infrastructure"

First part is the identification of conflict points. We collect data for identification of the conflict points right now. The first data are Maps of networks, forests, protected elements, watercourses and area systems of ecological stability. Other significant document is @Atlas of the Mammals in the Czech Republic@ in which the occurrence of selected mammals including the rare species is described. We estimate a number of all monitored species in particular intersections between infrastructure and protected elements from the hunting statistic. We monitor the occurrence of red deer, roe deer and wild pig in individual shootings near the Highway D1 Brno - Prague. The points of intersection are determined with help of maps, and hunting statistic.

These points will be further assessed from the view of traffic intensity, concerned emissions and noise and also by possibility usage of highway underpasses for selected fauna passages (existed highways). Other procedure depends on possibility to use current corridors or necessity to construct new passages.

2. Evaluation of Passage Possibilities for Big Mammals in the Czech Republic Motorway Net

At first stage the whole D1 highway and other main roads as D2, D3 were evaluated.

A: Recognition of all contemporary bridges and corridors

The system of 3 categories was established for recognition of all contemporary bridges and corridors. In first category the objects pervious for animals size of fox, badger and otter are observed. The objects pervious for animals size of red deer are watched in second category and the last category deals with all objects pervious for animals size of elk, deer, lynx, etc..

Each of those categories was also divided into 3 sub-categories: passed fully, partly and hardly.

B: Used criteria:

As the criteria the size of bridge (width and height), the under-bridge character and also the character of surrounding landscape (*connection with wildlife areas (out-urban areas are often surrounded by city estate)*) are considered.

Current usage by animals is very complicated to monitor. Out of 169 objects, which are mentioned in database survey, a half was assessed by slot study. This study will be specified after receiving a detailed hunting statistic.

C: Comparison with over-regional bio-corridors of ecological stability area systems (USES system)

The D1 intersects 11 over-regional bio-corridors, but 9 out of them are quite non-passable, 1 partly and 1 fully passable. Presently Over - regional bio-corridors can not serve as the migration routes for big mammals. The results of project are the maps of fauna passing with identification of the problem and non-problem segments of D1.

Results

Existing database: available is a database of 169 objects on highway D1 and 39 objects on D2. Each object is described by following data:

1. Evidence number
2. Communication
3. Lap (km)
4. Habitat
5. Height
6. Width
7. Depth
8. Description of object
9. Outline
10. Under-bridge description
11. Vegetation
12. Watercourse, if any:
13. Width
14. Shore character
15. Pass assessment
16. Proposal of measures
17. Note
18. Date and responsible person

These data will be further completed with traffic intensity data (passenger and freight road transport), and emission and noise characteristic.

Discussion or Conclusions

I would like to draw your attention to problem, which is not according to my opinion sufficiently considered. The Czech Republic highways were constructed parallel and close to original roads. The original roads, however, are constantly used by motorized road transport. The consequence is a present state: parallel direction of new highways and old roads. The barrier effect is significantly increased. That is why, the part of our research will be the study of "double road" and proposal of measures: for example to restrict the traffic in parallel, old roads and to promote its usage for non-motorized transport (cycling).

References Cited

- BERTHOUD, G.: Fauna /Traffic Safety. Manual for Civil Engineers, Ecole Polytechnique Lausanne, 1997, 119 p.
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