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# **Integrating the replacement cost of biodiversity in the Distance- related Heavy Vehicle Fee (HVF) in Switzerland**

CGDD-OEDC Seminar on the assessment of ecosystem services and its  
use for public policies

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# Agenda

1. Giving loss of biodiversity a monetary value
2. External costs in 2009
3. Distance-related Heavy Vehicle Fee (HVF):  
internalising external costs
4. Final remarks



# 1. Giving loss of biodiversity a monetary value

Two effects identified as relevant and quantifiable:

**Habitat loss:** How many square meters of different types of habitat have been lost due to road and rail infrastructure? How much would it cost to replace these habitats?

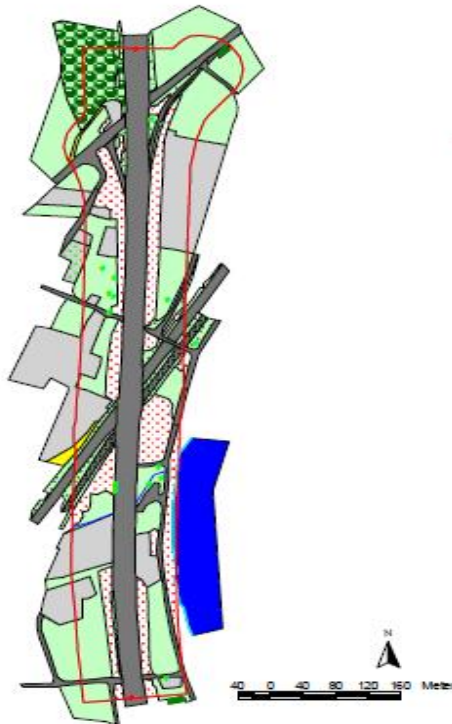
**Habitat fragmentation:** Where do we have parts of habitats, that are separated by road or rail infrastructure? How much would it cost to construct links between the habitat fragments?



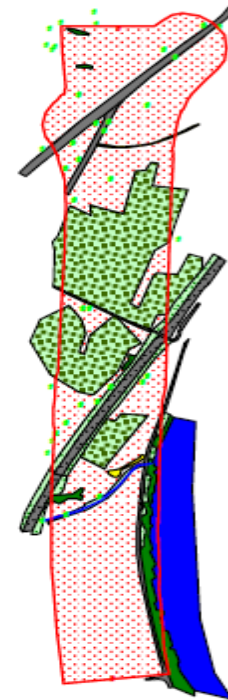
# 1. Giving loss of biodiversity a monetary value: Loss of habitats

Comparison: surfaces of habitats in a strip bordering the road and rail infrastructure

**Situation in 1998**



**Situation in 1950**





# 1. Giving loss of biodiversity a monetary value: Loss of habitats (cont.)

- Calculation of the replacement costs include: land purchase, initial restoration and maintenance measures
- Annual costs are calculated on the basis of amortisation of the investment costs over 30 years (one generation)



# 1. Giving loss of biodiversity a monetary value: Fragmentation of habitats

- Six groups of animals with different needs and mobility patterns
- Analysis of aerial photographs to identify habitats that are fragmented by road or rail infrastructure
- What type of link would be needed for the animals in question to make the crossing of the infrastructure possible? How much would it cost to construct these links between the habitat fragments?
- Annual costs: amortisation of the investment costs over 80 years



# 1. Giving loss of biodiversity a monetary value: 'At least' approach

**Costs calculated tend to underestimate the actual costs:**

- Conservative assumptions in different stages of quantifying and monetarising the external costs.
- Some effects could not be covered for methodological reasons: e.g. aesthetic effects and the impact on the appearance of landscape, or pollution and noise that affect fauna and flora.



## 2. External Costs in 2009

Total external costs of habitat loss and habitat fragmentation (category 'Nature and Landscape'): ca. 870 million CHF (ca. 670 million Euro)

| Year 2009                          | Road<br>m CHF | Rail<br>m CHF | Total<br>m CHF | Total<br>%  | Share of<br>Road: Heavy<br>goods traffic<br>m CHF |
|------------------------------------|---------------|---------------|----------------|-------------|---------------------------------------------------|
| Accidents                          | 2'076         | 24            | 2'100          | 23%         | 149                                               |
| Noise                              | 1'262         | 85            | 1'347          | 15%         | 278                                               |
| Health costs of air pollution      | 1'970         | 141           | 2'111          | 24%         | 489                                               |
| Building damage                    | 298           | 19            | 317            | 3%          | 82                                                |
| Climate costs                      | 1'210         | 3             | 1'213          | 14%         | 155                                               |
| <b>Nature and Landscape</b>        | <b>747</b>    | <b>121</b>    | <b>868</b>     | <b>10%</b>  | <b>65</b>                                         |
| Harvest losses                     | 49            | 1             | 50             | 0.5%        | 16                                                |
| Damage to forests                  | 37            | 1             | 38             | 0.5%        | 13                                                |
| Soil contamination                 | 119           | 36            | 155            | 2%          | 43                                                |
| Additional costs in urban<br>areas | 87            | 23            | 110            | 1%          | 5                                                 |
| Up- and downstream<br>processes    | 604           | 41            | 645            | 7%          | 92                                                |
| <b>Total</b>                       | <b>8'459</b>  | <b>494</b>    | <b>8'953</b>   | <b>100%</b> | <b>1387</b>                                       |
| <b>Percentage</b>                  | <b>94%</b>    | <b>6%</b>     | <b>100%</b>    |             | <b>16%</b>                                        |





# 3. Distance-related Heavy Vehicle Fee (HVF): internalising external costs

**The following costs enter into the calculation of the HVF:**

- external costs caused by HV traffic
- congestion costs caused by HV traffic

**Law on HVF stipulates that**

- total revenue paid by HV traffic (tax on fuel, HVF, ...)

**must not exceed**

- costs caused by HV traffic (infrastructure costs, external costs, congestion costs).

**Since 1.1.2012 the following rates apply:**

- Euro 0 - 2: 3.10 SwissCts / tonne-km
- Euro 3: 2.69 SwissCts / tonne-km
- Euro 4 – 5: 2.28 SwissCts / tonne-km
- Euro 6: 2.05 SwissCts / tonne-km



## 4. Final remarks

- **Ongoing project to reassess methods used for all external cost categories.**

The external costs of transport for the year 2010 will then be calculated on the basis of the best available data and methods.

- **Pilot project** to test another approach to quantify the negative impact of transport infrastructure on nature and landscape:  
Results of **referendums on transport infrastructure projects** have been analysed: How much is the voter (= taxpayer!) willing to pay to avoid damage to nature and landscape?



## 4. Final remarks (cont.)

### Rate of the Heavy Vehicle Fee:

- The **road transport industry filed a lawsuit** at the Federal Court against the calculation method of the external costs (specifically against the inclusion of congestion costs)
- Big share of the revenue of the HVF is used for the Public Transport Fund creating **conflicting interests**: lower external costs means lower revenue of the HVF and less money available for the Public Transport Fund.



# Thank you for your attention !

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