

External Costs of Road Transport - Traffic Congestion

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Industrial Ecology, Beroun 23 – 24.03.2011



Outline:



- External Costs
- Methodology: Choice Modeling (CVM), WTP
- Research
- Results
- Conclusions

External Costs – costs or part of the costs which are not paid by subjects causing them and paid by subjects not responsible for these costs generation, who bear negative responsibility



The External Costs of Transport:

Costs of the accidents

Costs of the emission of noise

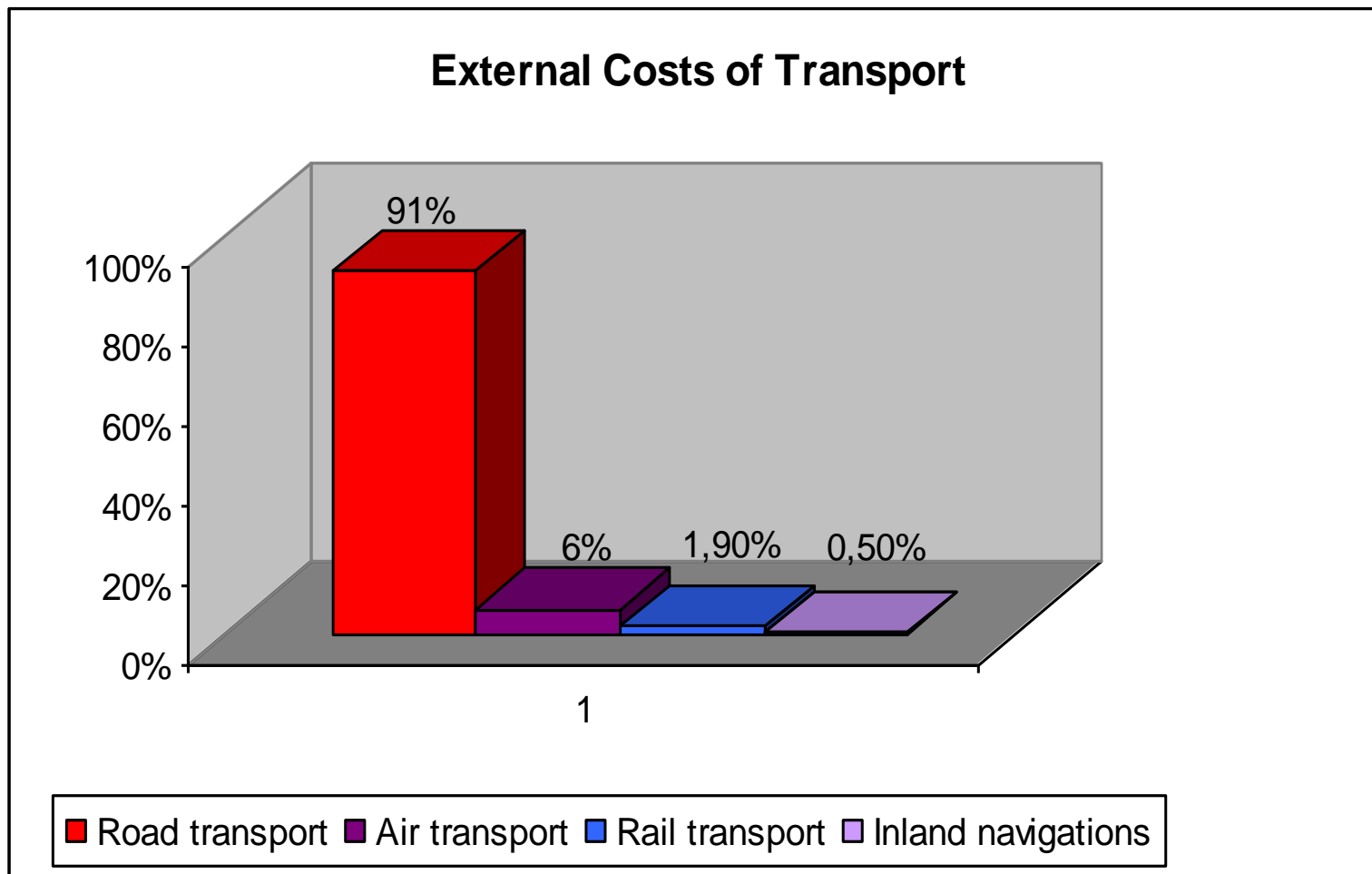
Costs of the emissions of pollutions to the air

Costs of the congestion

Costs of the emissions of pollutions to the water

Costs of taking the ground into the transport infrastructure.





The External Costs of Transport

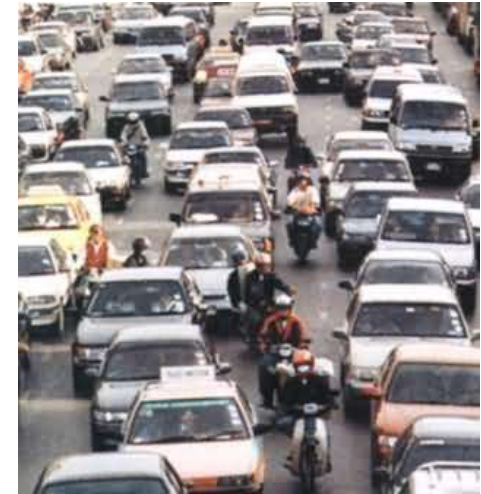
Costs of the congestion:

Traffic congestion is a condition on networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased queuing



The External Costs of Transport

Costs of the congestion:



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the time lost

Choice modeling

(Contingent Valuation Method – CVM)

- Choice modeling attempts to model the decision process of an individual or segment in a particular context.
- Choice modeling may also be used to estimate non-market environmental benefits and costs.

Choice modeling

Utility - or the common measure of preference

Models - or how a human being may be reduced to mathematical equations

Experiments - or how we ensure we collect optimal data



(Contingent Valuation Method – CVM)

Utility (tool)

- WTP (Willingness to Pay)



Experiments: questionnaire research

618 accurate fulfilled surveys

75 % - drivers

78 % - possess car





Asked question (1):

Knowing that you are going to some important meeting or flight as well, how much are you willing to pay, not to stay in the traffic jam and could easily continue your travel? If you actually are standing now 1, 10 or 30 minutes in a traffic jam?

| Estimated parameter | Congestion (10 minutes) | |
|---|-------------------------|-----------|
| Average WTP | 12,32 PLN | 3,08 Euro |
| Average WTP (with min. and max. amount cut) | 11,83 PLN | 2,95 Euro |
| Min. | 1 PLN | 0,25 Euro |
| Max. | 100 PLN | 25 Euro |
| | Congestion (30 minutes) | |
| Average WTP | 17,58 PLN | 4,39 Euro |
| Average WTP (with min. and max. amount cut) | 16,87 PLN | 4,21 Euro |
| Min. | 1 PLN | 0,25 Euro |
| Max. | 200 PLN | 50 Euro |

Asked question (2):



Knowing that you are going for vacation time (you are not in haste), how much are you willing to pay, not to stay in the traffic jam and could easily continue your travel? If actually you are standing now 1, 10 or 30 minutes in a traffic jam?

| Estimated parameter | Congestion (10 minutes) | |
|---|--------------------------------|------------|
| Average WTP | 9,86 PLN | 2,46 Euro |
| Average WTP (with min. and max. amount cut) | 9,46 PLN | 2,36 Euro |
| Min. | 1 PLN | 0,25 Euro |
| Max. | 50 PLN | 12,5 Euro |
| | Congestion (30 minutes) | |
| Average WTP | 15,81 PLN | 3,95 Euro |
| Average WTP (with min. and max. amount cut) | 14,36 PLN | 3,59 Euro |
| Min. | 0,1 PLN | 0,025 Euro |
| Max. | 300 PLN | 75 Euro |

Asked question (3):



What is the value of your 1 minute when you are standing in a traffic jam knowing the fact that this 1 minute is equal to your lost opportunities?

| Estimated parameter | 1 minute in traffic jam | |
|---|-------------------------|------------|
| Average value of 1 minute | 4,87 PLN | 1,21 Euro |
| Average value of 1 minute (with min. and max. amount cut) | 4,67 PLN | 1,16 Euro |
| Min. | 0,01 PLN | 0,025 Euro |
| Max. | 50 PLN | 12,5 Euro |

Conclusions



Thank You for
attention

