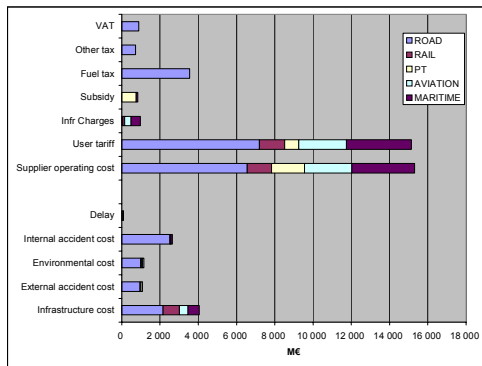


Sustainability effects of Subsidies in Transport

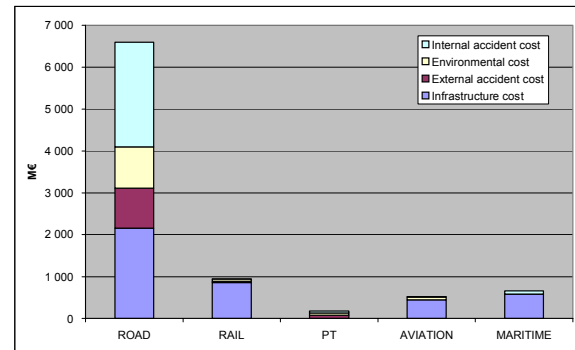
Gunnar Lindberg
VTI, Sweden

1. Swedish Transport Accounts
2. Measuring Marginal Cost
3. Advanced pricing today
4. Infrastructure provision – a decreasing cost activity
5. Financing
6. Conclusion

Swedish transport account, 1998



Infrastructure



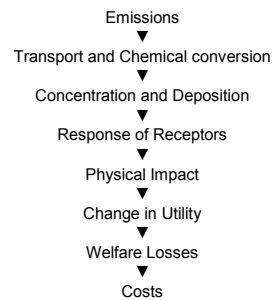
Comment 1

- » External costs are important
- » Accounting information is not enough
- » Marginal cost information is necessary

Measuring the Marginal cost

- » (Infrastructure cost)
- » Air pollution
- » Accidents
- » Noise
- » Congestion/Scarcity
- » Greenhouse gases

Air pollution Impact Pathway Approach



Cost per vehicle kilometre

Country and town/area	Petrol cars EURO II	Diesel cars, EURO II
Belgium, rural	0.22	0.45
Belgium, Brussels	0.84	3.31
Finland, Helsinki	0.31	1.00
German, Stuttgart	0.44	1.33
German, Güstrow-Neustrelitz	0.14	0.25
Greece, Athens centre	1.53	6.52
Greece, rural2	0.26	0.47
Netherlands, Groningen	0.17	0.41
Netherlands, Amsterdam	0.54	2.46
United Kingdom, London	1.10	4.46
United Kingdom, rural	0.14	0.29

Source: Friedrich and Bickel (2001) p 209-210.

External accident cost

Weight tonne	Internal Cost (€/vkm)	External Cost (€/vkm)	Proportion internal (θ)	External Cost (€/vkm)	Marginal
3.5 – 11.9	0.007	0.020	0.27	n.a	
12 – 14.9	0.005	0.032	0.13	n.a	
15 – 18.9	0.004	0.065	0.06	0.006 – 0.010	
19 – 22.9	0.003	0.031	0.08	0.007 – 0.009	
23 – 26.9	0.006	0.048	0.11	0.008 – 0.012	
27 – 30.9	0.003	0.050	0.06	0.015 – 0.017	
31 -	0.003	0.099	0.03	0.030 – 0.033	
Above 12t	0.004	0.047	0.08	0.008 – 0.011	

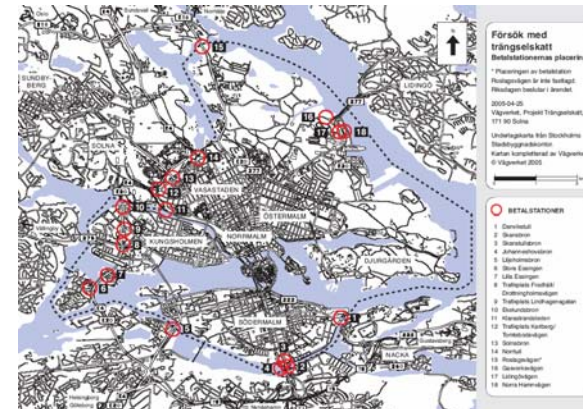
Comment 2

- » Huge variability in marginal costs
- » Advanced pricing instrument necessary

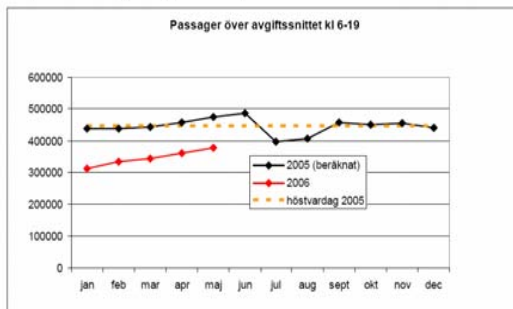
Advanced pricing - Europe

- » Kilometer charges on HGV in Switzerland, Austria and Germany
- » Road pricing in London and Stockholm
- » Advanced experiments - accidents

Stockholm



Passages over the zone



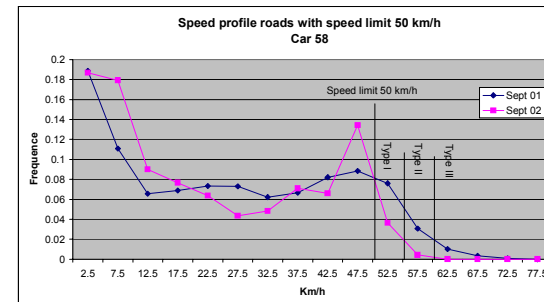
Intelligent economic speed adaptation

- » Charge related to speed behaviour
- » GSM, GPS technology
- » 150 cars in real traffic

Pricing scheme

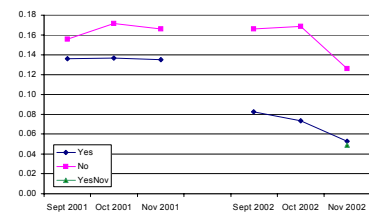
	<i>Low</i>	<i>High</i>
0-10% above speed limit	0.10 SEK/minute	0.20 SEK/minute
11-20% above speed limit	0.25 SEK/minute	0.50 SEK/minute
21% above speed limit	1.00 SEK/minute	2.00 SEK/minute

Speed profile



Reduced speed violations

Figure 1 PVM, all violations, for original participants (Yes) and non-participants (No).



Comments 3

- » Advanced technology works
- » People adjust to pricing signals

Infrastructure – a decreasing cost activity

» Marginal infrastructure cost on railways

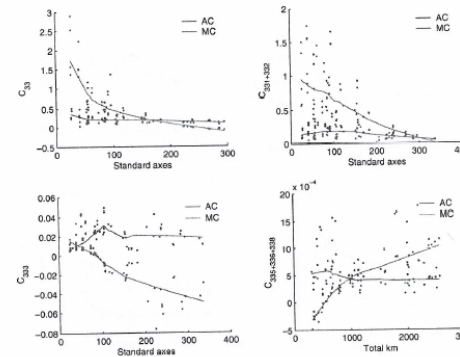
Table: 1 Marginal cost in €/100 gross ton km for Swedish and Finnish railroads

Country	Sweden		Finland	
Year	1995	2000	1995	2000
ALL tracks	0.012	0.013	0.016	0.024
Main/electrified tracks	0.009	0.009	0.012	0.018
Secondary/non-electrified tracks	0.097	0.099	0.026	0.040

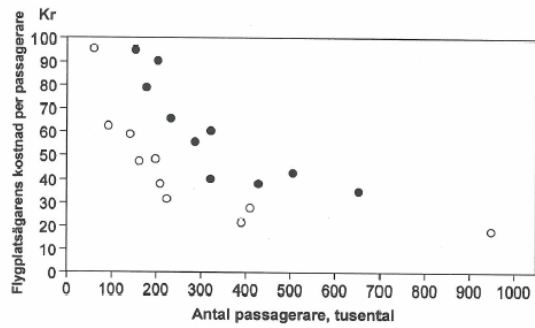
Based on Johansson and Nilsson (2001). Exchange rate: 9.40 €/SEK.

» Cost recovery – 12-17%

Road maintenance cost - Sweden



Airport cost



Comment 4

- » Infrastructure cost is a decreasing cost activity
- » Marginal cost based pricing will not cover the infrastructure cost
- » ...or, average cost pricing will be too high

Financing

- » Two sources;
 - » The users
 - » General taxpayers

Tax money not for free

- » Cost of Public Funds = 1.3 in Sweden
- » Welfare loss of user charges can be accepted up to 30%
- » This depends on case by case elasticities
- » Norway – tunnels and bridges

Conclusions

- » External costs are important and if unpaid, they are a 'hidden subsidy'.
- » We observe huge variability in marginal costs which means that we need to have variability in price signals.
- » Advanced technology is here, it works and people adjust to price signals. Introduce it to minimize external costs.
- » Infrastructure cost is a decreasing cost activity which means that we will have problems with cost recovery if we only look at 'pure' infrastructure costs. Be careful with cost recovery.
- » We only have two sources for financing – users or taxpayers. However, tax money is not for free (CPF = 30%) and we can accept a welfare loss of 30% for other sources.
- » Need to evaluate the welfare loss of user charges case by case. It is also a huge variability in elasticities.